IBC — Fire Safety

2022 GROUP A PUBLIC COMMENT AGENDA

SEPTEMBER 21 - 28, 2021
DAVID L. LAWRENCE CONVENTION CENTER
PITTSBURGH, PA

ICC
INTERNATIONAL CODE COUNCIL®

2021 Public Comment Agenda

First Printing

Publication Date: August 2021

PRINTED IN THE USA

FS3-21

Proposed Change as Submitted

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

2021 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. Engineering analysis based on a comparison of *building element,* component or assemblies designs having *fire-resistance ratings* as determined by the test procedures set forth in ASTM E119 or UL 263.
5. *Fire-resistance* designs certified by an *approved* agency.
6. Fire resistance ratings obtained by extension of data from fire resistance tests conducted in accordance with ASTM E119 when using the principles contained in ASTM E2032.

Add new text as follows:

ASTM

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

E2032 Standard Guide for Extension of Data From Fire Resistance Tests Conducted in Accordance with ASTM E 119 (2009, reapproved 2017)

Reason: ASTM E2032 provides a mandatory method to calculate a fire resistance rating by extension of the results of fire tests conducted in accordance with ASTM E119. This method has been in use for many years and should also be specifically referenced in the code.
1. Note that the methodology in ASTM E2032 is based on having conducted successful tests in accordance with ASTM E119. Furthermore, the methodology in the standard cannot be used for developing fire resistance ratings without having conducted such tests.

2. Note that ASTM E2032 (although labeled a "guide") is written in mandatory language and has been issued by a consensus standards organization (ASTM) and, thus, complies with CP 28.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply adds another option without deleting an existing option.

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2032 Standard Guide for Extension of Data From Fire Resistance Tests Conducted in Accordance with ASTM E 119 (2009, reapproved 2017), with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

FS3-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded that the proposed item 6 text to section 703.2.2 is similar to the existing section 703.2.2 item 4. Adding proposed item 6 text to section 703.2.2 will create confusion. (Vote: 7-6)

FS3-21

Individual Consideration Agenda

Public Comment 1:

IBC: 703.2.2

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

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. Fire-resistance ratings obtained by using the methodology of ASTM E2032 to extend data from fire resistance tests determined by the test procedures set forth in ASTM E119 or UL 263.
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.
6. ~~Fire resistance ratings obtained by extension of data from fire resistance tests conducted in accordance with ASTM E119 when using the principles contained in ASTM E2032.~~

Commenter's Reason: The technical committee was concerned that the new language could have been confused with the language in item 4. In order to solve that problem, the public comment places the new language as item 4 and maintains the existing item 4 as a more generic option, since the use of ASTM E2032 is one example of engineering analysis that has been standardized, and is, in fact, one that is widely used.
The public comment also adds "UL 263" to "ASTM E119", to be consistent with the existing section 4.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal and comment add another option and will not require anything new.

Public Comment# 2311

FS9-21

Proposed Change as Submitted

Proponents: Shane Nilles, City of Cheney, WA, representing WABO (snilles@cityofcheney.org); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov)

2021 International Building Code

Revise as follows:

~~**704.2 Column protection.** Where columns are required to have protection to achieve a *fire-resistance rating*, the entire column shall be provided individual encasement protection by protecting it on all sides for the full column height, including connections to other structural members, with materials having the required *fire-resistance rating*. Where the column extends through a ceiling, the encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.~~

~~**Exception:** Columns that meet the limitations of Section 704.4.1.~~

704.2 ~~**704.3** **Protection of the primary structural frame other than columns.**~~ Members of the *primary structural frame* ~~other than columns~~ that are required to have protection to achieve a *fire-resistance rating* ~~and support more than two floors or one floor and roof, or support a *load-bearing wall* or a *nonload-bearing wall* more than two *stories* high,~~ shall be provided individual encasement protection by protecting them on all sides for the full length, including connections to other structural members, with materials having the required *fire-resistance rating*.

~~**Exception** **Exceptions:** Individual encasement protection on all sides shall be permitted on all exposed sides provided that the extent of protection is in accordance with the required *fire-resistance rating*, as determined in Section 703.~~

1. Individual encasement protection is permitted to be interrupted where the primary structural member is in direct contact with another structural member.
2. Primary structural members other than columns that do not support more than two floors or one floor and roof, or a load-bearing wall or a nonload-bearing wall more than two stories high, are permitted to be protected by the membrane of a fire-resistance rated wall or horizontal assembly.
3. Members that are integral elements in walls of light-frame construction, including studs, columns, and boundary elements located entirely between the top and bottom plates or tracks, shall be permitted to be protected by the membrane of a fire-resistance rated wall assembly.

~~**704.4**~~ **704.3 Protection of secondary structural members.** *Secondary structural members* that are required to have protection to achieve a *fire-resistance rating* shall be protected by individual encasement protection, by the membrane of a fire-resistance rated wall or horizontal assembly, or a combination of both.

~~**704.4.1 Light-frame construction.** Studs, columns and boundary elements that are integral elements in *walls* of *light-frame construction* and are located entirely between the top and bottom plates or tracks shall be permitted to have required *fire-resistance ratings* provided by the membrane protection provided for the *wall*.~~

~~**704.4.2 Horizontal assemblies.** *Horizontal assemblies* are permitted to be protected with a membrane or ceiling where the membrane or ceiling provides the required *fire-resistance rating* and is installed in accordance with Section 711.~~

Reason: The current language is confusing and misleading. It does not follow regular code language structure that provides charging language, and exceptions thereto. It further divides the primary structural elements into two separate sections, columns and those other than columns, and it also mixes some secondary member language in with the primary structure section. This proposal restructures and consolidates into two sections, primary and secondary members, to have the charging language first and outlines the appropriate exceptions thereto. This will lead to more consistent application and safer buildings without increasing the stringency of the provisions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Proposal only restructures the code section language to be more understandable.

FS9-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded that the proposed text is not editorial. The proposal is making technical changes without providing technical justification. (Vote: 13-0)

FS9-21

Individual Consideration Agenda

Public Comment 1:

IBC: 704.2 , 704.3, 704.4.1, 704.4.2

Proponents: Shane Nilles, representing WABO TCD (snilles@cityofcheney.org); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

704.2 Protection of the primary structural frame . Members of the *primary structural frame* that are required to have protection to achieve a *fire-resistance rating* shall be provided individual encasement protection by protecting them on all sides for the full length, including connections to other structural members, with materials having the required *fire-resistance rating*. Where a column extends through a ceiling, the encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.

Exceptions:

1. ~~Individual encasement protection is permitted to be interrupted where the primary structural member is in direct contact with another structural member.member~~ Individual encasement protection on all sides shall be permitted on all exposed sides provided that the extent of protection is in accordance with the required fire-resistance rating, as determined in Section 703.
2. Primary structural members other than columns that do not support more than two floors or one floor and roof, or a load-bearing wall or a nonload-bearing wall more than two stories high, are permitted to be protected by the membrane of a fire-resistance rated wall or horizontal ~~assembly.~~ assembly where the membrane provides the required *fire-resistance rating* .
3. ~~Members that are integral elements in walls of light-frame construction, including studs, columns, and boundary elements located entirely between the top and bottom plates or tracks, shall be permitted to be protected by the membrane of a fire-resistance rated wall assembly.~~ Columns that meet the limitations of Section 704.3.1.

704.3 Protection of secondary structural members . *Secondary structural members* that are required to have protection to achieve a *fire-resistance rating* shall be protected by individual encasement protection, or by the membrane of a fire-resistance rated wall or horizontal assembly, where the membrane provides the required *fire-resistance rating*~~, or a combination of both.both.~~

704.3.1 Light-frame construction . Studs, columns and boundary elements that are integral elements in *walls* of *light-frame construction* and are located entirely between the top and bottom plates or tracks shall be permitted to have required *fire-resistance ratings* provided by the membrane protection provided for the *wall*.

704.3.2 Horizontal assemblies . *Horizontal assemblies* are permitted to be protected with a membrane or ceiling where the membrane or ceiling provides the required *fire-resistance rating* and is installed in accordance with Section 711.

Commenter's Reason: The proposal was intended to rewrite and rearrange the sections without changing the intent. The committee felt that the language rewriting has some unintended consequences. We have addressed those concerns by maintaining the existing language that was identified as being critical, while still providing for a much-needed restructuring to make the code easier to interpret and apply. In that process we determined that there are some perceivable technical changes that we feel are still consistent with the intent and how these sections are most commonly interpreted:

1. The exception permitting the individual encasement of primary structural members to be provided on exposed sides only where the unexposed sides are other elements that afford the same required protection has been expanded to apply to columns as well.
2. Currently there is a hole in the code where there is no type of protection method prescribed for primary structural members that do not support more than two floors or one floor and roof, or a load-bearing wall or a nonload-bearing wall more than two stories high, the proposal clarifies that the intent is that they must still be protected, but rather than by “individual encasement”, they are permitted to be protected by the membrane on an assembly they are located in.
3. Currently the main section for secondary members is to be protected by individual encasement only, but then there are two subsections that clarify those within horizontal assemblies, or light-frame walls, are permitted to be protected by the membrane of the horizontal assembly or wall respectively. This suggests that secondary members are actually intended to be protected by either individual encasement, or by the membrane of an assembly, which may be selected by the designer depending on what is more feasibly constructive and appropriate. The

proposal simply adds that language into the charging language to be clearer.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There should be negligible or no change in costs. The proposal is primarily to clarify the intent of the code. Clarified language may lead to a decrease in costs in areas where membrane protection clarified to be allowed on secondary members in lieu of individual encasement.

Public Comment# 2356

FS12-21

Proposed Change as Submitted

Proponents: Stephen DiGiovanni, Clark County, representing Self (sdigiovanni@clarkcountynv.gov)

2021 International Building Code

Revise as follows:

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

Exceptions:

1. On buildings of Types I and II construction, three *stories* or less above *grade plane*, *fire-retardant-treated wood* shall be permitted for balconies, porches, decks and exterior *stairways* not used as required exits.
2. Untreated wood and plastic composites that comply with ASTM D7032 and Section 2612 are permitted for pickets, rails and similar *guard* components that are limited to 42 inches (1067 mm) in height.
3. Balconies and similar projections 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.

Reason: The Ad Hoc Committee for Tall Wood Buildings (TWB) was formed by the ICC Board of Directors in 2016 to explore the building science of tall wood buildings with the scope to investigate the feasibility of and take action on developing code changes. A total of 17 proposals were presented and approved in the Group A and Group B code cycles leading to the 2021 edition of the I-codes. Having provided the technical foundation for deploying tall wood buildings in the various codes, the Ad Hoc Committee for Tall Wood Buildings was sunset in 2020.
Upon reflection of the codes, there appears to be at least one item that was not adequately addressed by the TWB. In particular, this proposal seeks to address the allowance of balconies and similar projections on Type IV buildings to be constructed of Type V construction.

A goal of the TWB code changes was to minimize exterior fire spread for Type IV buildings that were proposed for increased heights over what was previously permitted for traditional Type IV Heavy Timber construction. The committee took particular care in eliminating combustibles from the exterior walls for Types IV-A, IV-B, and IV-C construction, as evidenced by the language presented for IBC Section 602.4. The only combustibles permitted are mass timber elements, and a water barrier. Outboard of these materials, the proposals required non-combustible protection with a minimum rating of 40 minutes. The allowances in IBC 705.2.3.1 to allow Type V balconies and projection, exterior of and thus without the benefit of the non-combustible protection, are incongruent with the TWB code proposals in terms of the type of construction materials allowed and the lack of protection in place. While it can be argued that the specific language in Section 602.4 overrides the general exception in Section 705.2.3.1, still the apparent conflicting provisions would benefit from clarification. For this reason, the proposed fix is being offered. In adding the new construction types, the TWB took care to not affect the existing requirements for traditional Type IV Heavy Timber construction. Where the TWB found codes that were to be maintained for traditional Type IV construction, but were not applicable to the new Type IV-A, IV-B, and IV-C construction types, the committee proposed a change to add the -HT designator, to clarify the particular code requirement applied to Type IV-HT only.

Thus, in order to correct an apparent code conflict, to clarify the intent of the TWB, and to maintain consistency with the traditional Type IV Heavy Timber construction, the proposal simply seeks to add a "-HT" designator to the Type IV construction addressed in Exception 3, thus eliminating the perceived allowance of adding balconies and similar projections of Type V construction for new Types IV-A, IV-B and IV-C construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Cost impact is based on interpretation of the code conflict between IBC 602.4 and IBC 705.2.3.1. The author's interpretation is that Type V balconies are not currently permitted on Types IV-A, IV-B, and IV-C construction, and that this proposal only seeks to clarify the code's intent, and thus there is no cost impact.

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee concluded that the proposal clarifies and corrects the type of construction within the exception. The committee

encourages the proponent to fix the conflict with section 705.2.2. (Vote: 8-5)

FS12-21

Individual Consideration Agenda

Public Comment 1:

IBC: 705.2.2, 705.2.3.1

Proponents: Stephen DiGiovanni, representing Self (sdigiovanni@clarkcountynv.gov) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

705.2.2 Type III, IV or V construction . Projections from walls of Type III, IV-HT or V construction shall be of any *approved* material. Projections from walls of Type IV-A, IV-B or IV-C construction shall be of materials consistent with the materials permitted in exterior walls, including exterior noncombustible protection provisions, as set forth in Section 602.4

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

Exceptions:

1. On buildings of Types I and II construction, three *stories* or less above *grade plane*, *fire-retardant-treated wood* shall be permitted for balconies, porches, decks and exterior*stairways* not used as required exits.
2. Untreated wood and plastic composites that comply with ASTM D7032 and Section 2612 are permitted for pickets, rails and similar *guard* components that are limited to 42 inches (1067 mm) in height.
3. Balconies and similar projections 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.

Commenter's Reason: The purpose of the proposal remains the same, to address code provisions that do not coincide with the efforts of the Ad Hoc Committee for Tall Wood Buildings. The original proposal sought to address this by amending Section 705.2.3.1 to clarify that Type V construction is not a permitted material for balconies and other projections from Types IV-A, IV-B and IV-C construction. During the the code committee hearing and discussion it was noted that Section 705.2.2 also required revision for consistency. The proposed revision to Section 705.2.2 allows any approved material to continue to be used for projections from exterior walls of Type IV-HT construction. Further, the proposed revision limits projections from exterior walls of Type IV-A, IV-B, and IV-C to those materials that are permitted for the exterior wall, including requiring the application of those provisions of 602.4 calling for non-combustible protection of mass timber elements.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
As indicated with the original proposal, the cost impact is based on interpretation of the code. The author's interpretation is that Type V balconies are not currently permitted on Types IV-A, IV-B and IV construction, that this proposal only seeks to clarify the code's intent, and thus there is no cost impact due to the proposed code change.

Public Comment# 2220

FS18-21

Proposed Change as Submitted

Proponents: Eirene Knott, BRR Architecture, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

2021 International Building Code

Add new text as follows:

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

1. The underside of the floor or roof sheathing, deck or slab above.
2. The underside of a one-hour fire-resistance rated floor/ceiling or roof/ceiling assembly.

Parapets shall be provided as required by Section 705.11.

Revise as follows:

~~705.6~~ **705.7 Structural stability.** ~~*Exterior walls* shall extend to the height required by Section 705.11.~~ Interior structural elements that brace the *exterior wall* but that are not located within the plane of the *exterior wall* shall have the minimum *fire-resistance rating* required in Table 601 for that structural element. Structural elements that brace the *exterior wall* but are located outside of the *exterior wall* or within the plane of the *exterior wall* shall have the minimum *fire-resistance rating* required in Table 601 and Table 705.5 for the *exterior wall*.

Reason: This is the same proposal that was brought forth last code cycle, FS-19. Steve pointed out a problem with the code in the continuity of exterior wall ratings. While his proposal may have been too simplistic, it really does provide the needed clarification on how to address the continuity of the required exterior wall rating. This is a huge issue in Type III construction where there is little direction on how the supporting construction for the exterior walls are to be rated, especially in the case of a parapet. FS-20 of the same code cycle got into too many specific requirements but attempted to address the same concern.

Cost Impact: The code change proposal will decrease the cost of construction
I like the Steve Thomas's reason statement from last cycle - this will reduce the cost because confusion will be eliminated and people won't be making things up.

In all seriousness, this could reduce the cost of construction as it will clearly define how exterior wall continuity is to be provided.

FS18-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded that the proposal is not clear enough and missing significant technical aspects. The committee recommended that the proponent work on more clarification during the public comment phase. Such as addressing the intersection with a rated roof ceiling assembly and protecting the sides. (Vote: 13-0)

FS18-21

Individual Consideration Agenda

Public Comment 1:

IBC: 705.6, 705.11.1

Proponents: Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

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

1. The underside of the floor or roof sheathing, deck or slab above.
2. The underside of a ~~one-hour fire-resistance rated~~ floor/ceiling or roof/ceiling ~~assembly.~~ 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 705.11.

705.11.1 Parapet construction . Required ~~Parapets~~ parapets shall have the same *fire-resistance rating* as that required for the supporting wall, and on any side adjacent to a roof surface, shall have noncombustible faces for the uppermost 18 inches (457 mm), including counterflashing and coping materials. The height of the parapet shall be not less than 30 inches (762 mm) above the point where the roof surface and the wall intersect. Where the roof slopes toward a parapet at a slope greater than 2 units vertical in 12 units horizontal (16.7-percent slope), the parapet shall extend to the same height as any portion of the roof within a *fire separation distance* where protection of wall openings is required, but the height shall be not less than 30 inches (762 mm).

Commenter's Reason: The committee was concerned that the original code change was too broad and missing technical aspects. There was concern about how the floor/ceiling or roof/ceiling assemblies that may carry a higher rating were to be addressed. There was also concern about an exterior wall condition that may have been needing a rating due to proximity to the property line, thus the added language on the fire separation distance.
The additional language to the parapet section is to clearly indicate that when the parapet is required, then it must comply. Parapets may be provided on a building which are not required and in those instances, the parapet does not need to comply with the parapet language.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
With the clarification on how exterior wall continuity is to be provided, it may decrease the cost of construction.

Public Comment# 2733

FS19-21

Proposed Change as Submitted

Proponents: David Tyree, representing AWC (dtyree@awc.org); Paul Coats, representing American Wood Council (pcoats@awc.org)

2021 International Building Code

Add new text as follows:

705.6.1 Supporting construction.
Construction that supports gravity loads from fire-resistance-rated exterior walls shall have a fire-resistance rating that is equal to or greater than the required fire resistance rating of the supported wall. For achieving the required fire resistance rating for exposure from the interior of the building, ceiling materials shall be permitted to contribute to the required fire-resistance of the supporting construction.

705.6.1.1 Materials.
The material requirements of floor/ceiling assemblies shall be in accordance with requirements for interior building elements for the Type of Construction, including portions of the floor/ceiling construction that support gravity loads from an exterior wall.

Reason: There is increasing controversy about the requirements for loadbearing exterior walls in Type III construction when floors intersect the exterior wall in typical "platform" framing. Driving this are overlapping concerns for maintaining the fire resistance of the exterior wall at the intersection with the floor, as well as material requirements for the floor structure, given that the wall itself is required to be fire-retardant treated wood if wood framing is used.
Platform framing can be accomplished without compromising the fire resistance of the exterior wall. When an unrated or one-hour fire-resistance rated floor intersects and supports the two-hour exterior wall at each floor level, the code requires the construction supporting the wall to have the same fire-resistance rating as the supported wall. This can be accomplished by several means, such as providing extra rim board members or blocking, and extra protection for the floor elements at the intersection. AWC's 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. One example of these details (there are four details in DCA 3) is shown below this reason statement.

Maintaining the fire resistance of supporting construction plays a much more important role in the performance of the wall than the use of fire-retardant treated wood in the supporting floor. There is no demonstrated increase in fire-resistance rating for fire-retardant-treated wood when compared to untreated wood. Fire-retardant treated wood exhibits reduced flame spread, but it does not increase the fire-resistance rating of the assembly. In other words, requiring the end of the floor to be fire-retardant treated does not increase the fire-resistance of the wall. The code does not require elements of the floor to be fire-retardant treated even if they serve to support the gravity loads from the wall above. However, it does require those supporting floor elements to provide fire resistance equal to that required for the wall.

The current code language is subject to multiple interpretations, including requiring the floor elements to be fire-retardant-treated or prohibiting platform details altogether. These interpretations are costly and do not serve to increase safety. Often, they may jeopardize the fire performance of the floor for the sake of protecting the wall. The proposed subsections will clarify the issues, encouraging a practical and effective approach without compromising fire resistance or safety.

[Below page 7 from DCA 3 here: Figure 1B example detail and accompanying "methodology" notes]

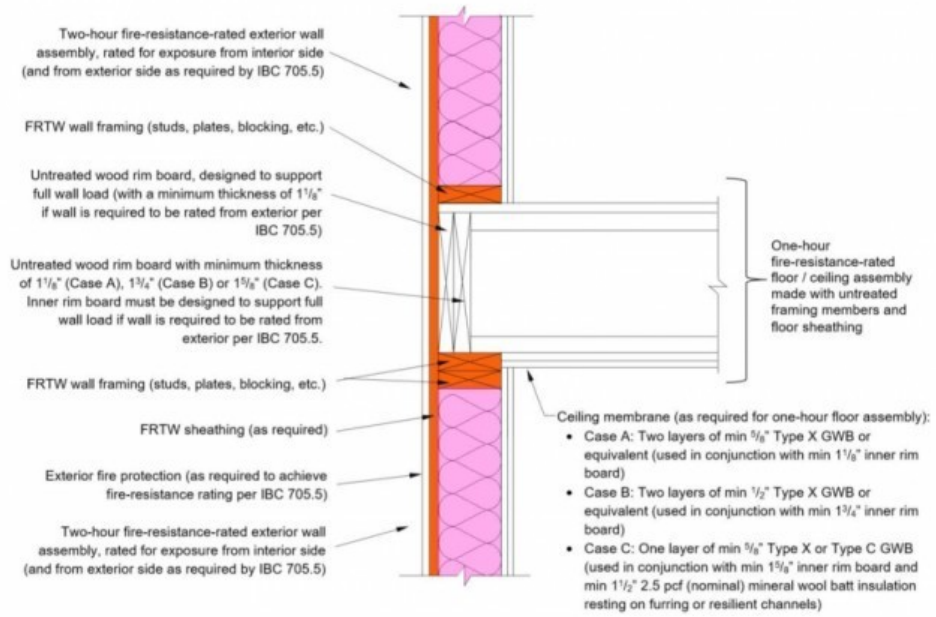


Figure 1B: Example detail for Type III-A exterior wall–floor intersection with two rim boards

Methodology:

Fire-resistance for exposure from interior side:

- Case A: Minimum $1^{1}/_{8}$-inch-thick inner rim board plus two layers of minimum $^{5}/_{8}$ in. Type X GWB in the ceiling membrane provides 2 hours of protection to the outer rim board, based on the NDS-calculated time for the char depth to reach the inner rim board / outer rim board interface plus 40 minutes for each layer of $^{5}/_{8}$ in. Type X GWB (per IBC Table 722.6.2(1)).
- Case B: Minimum $1^{3}/_{4}$-inch-thick inner rim board plus two layers of minimum $^{1}/_{2}$ in. Type X GWB in the ceiling membrane provides 2 hours of protection to the outer rim board, based on the NDS-calculated time for the char depth to reach the inner rim board / outer rim board interface plus 25 minutes for each layer of $^{1}/_{2}$ in. Type X GWB (per IBC Table 722.6.2(1)).
- Case C: Minimum $1^{5}/_{8}$-inch-thick inner rim board plus one layer of minimum $^{5}/_{8}$ in. Type X GWB in the ceiling membrane plus minimum $1^{1}/_{2}$-inch-thick, 2.5 pcf (nominal) mineral wool batt insulation provides 2 hours of protection to the outer rim board, based on the NDS-calculated time for the char depth to reach the inner rim board / outer rim board interface, plus 40 minutes for the $^{5}/_{8}$ in. Type X GWB (per IBC Table 722.6.2(1)), plus 15 minutes for the mineral wool batt insulation.

The outer rim board must be designed to support the load from the wall above.

Fire-resistance for exposure from exterior side (where required per IBC Section 705.5): A combination of exterior fire protection, FRTW sheathing, and minimum $1^{1}/_{8}$-inch-thick outer rim board is used to provide two hours of protection to the inner rim board. Layers to the exterior of the outer rim board (e.g., exterior fire protection, FRTW sheathing, etc.) must be sufficient to provide at least 80 minutes of protection to the outer rim board. The inner rim board must be designed to support the load from the wall above.

Note: *NDS®* is the *2018 National Design Specification® for Wood Construction*

Bibliography: AWC Design for Code Acceptance (DCA) 3 - Fire-Resistance-Rated Wood-Frame Wall and Floor/Ceiling Assemblies can be downloaded at https://awc.org/codes-standards/publications/dca3

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

This code change only clarifies the intent of this section for more uniform and consistent application. It may decrease costs in some jurisdictions depending on interpretation and application of the current code language.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded that the proposed language is confusing for the building official. The committee recommended that the proposed language is a good step in the right direction but needs to address more aspects, such as intersections and rated assemblies. (Vote: 7-5)

FS19-21

Individual Consideration Agenda

Public Comment 1:

IBC: 705.6.1, 705.6.1.1

Proponents: David Tyree, representing AWC (dtyree@awc.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

705.6.1 ~~Supporting construction~~ Floor Assemblies in Type III Construction . ~~Construction that~~ In Type III construction where a floor assembly supports gravity loads from ~~fire-resistance-rated exterior walls shall have a fire-resistance rating that is equal to or greater than the required fire resistance rating of the supported wall. For achieving the required fire resistance rating for exposure from the interior of the building, ceiling materials shall be permitted to contribute to the required fire-resistance of the supporting construction.~~ an exterior wall, the fire-resistance rating of the portion of the floor assembly that supports the exterior wall shall not be 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.

~~**705.6.1.1 Materials .** The material requirements of floor/ceiling assemblies shall be in accordance with requirements for interior building elements for the Type of Construction, including portions of the floor/ceiling construction that support gravity loads from an exterior wall.~~

Commenter's Reason: The original proposal is rewritten to address opposition testimony and comments from the committee members during their discussion. The reason statement provided with the original proposal is applicable and pertinent to what is being proposed in this public comment and should be made a part of the record.
Following is a detailed explanation of the proposed text addressing each of the statements made in opposition to this proposal. The first sentence of 705.6.1 limits the application of this section to ONLY Type III construction. No other material interests are affected. Although it is not stated, the criteria will most commonly apply to platform construction where the floor assembly is supported by the top of the wall below and the wall above is supported by that floor assembly. The portion of the floor assembly directly within the gravity load path of the exterior wall is required to provide a two-hour fire-resistance rating as required by Table 601. This requirement is to ensure the fire resistance rating required of the exterior wall of the story above, will continue through the supporting segment of the floor assembly, to the exterior wall of the story below. The second sentence states that it is permissible to consider the contribution from the ceiling membrane when assessing the fire-resistance rating of the floor assembly at the exterior wall. A ceiling membrane may or may not be present, but as shown in AWC's DCA3, 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.

The original section and subsection have now been combined to better clarify the construction and fire-resistive requirements of the intersection of the exterior wall and floor construction. With the combination of all of the requirements in one section, it clarifies the nature of the material permitted as building elements in the floor construction of Type III construction. The terms “building element” and “floor construction” are from Table 601 to eliminate confusion. Typically, material at the perimeter of the floor assembly (construction) may include a single rim joist, multiple rim joists and/or blocking to achieve the required fire-resistance rating, while also maintaining a gravity load path for the duration of the required fire resistance rating. AWC's DCA 3 provides specific examples of how this can be achieved. Material requirements for the materials within the wall space but part of the floor construction are to be consistent with what is required for the interior floor assembly, not the exterior wall. For example, if the exterior wall studs are light gauge steel, the perimeter material in the floor assembly which bears on the wall below can be constructed of any material permitted for the interior building elements in Type III construction, provided the required fire resistance rating, as clarified in 705.6.1, is demonstrated.

To better understand how these revisions interrelate to the original proposal, we felt it would be helpful to include the section in it's entirety so it could be reviewed and considered in the proper context as follows:

705.6 Structural stability. Exterior walls shall extend to the height required by Section 705.11. Interior structural elements that brace the exterior wall but that are not located within the plane of the exterior wall shall have the minimum fire-resistance rating required in Table 601 for that structural element. Structural elements that brace the exterior wall but are located outside of the exterior wall or within the plane of the exterior wall shall have the minimum fire-resistance rating required in Table 601 and Table 705.5 for the exterior wall.

705.6.1 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 not be 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.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This code change only clarifies the intent of this section for more uniform and consistent application. It may decrease costs in some jurisdictions depending on interpretation and application of the current code language.

Public Comment# 2376

FS23-21

Proposed Change as Submitted

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

2021 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: Penetrations in exterior walls that are permitted to have unprotected openings 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~~ 4. Penetrations in *smoke barrier* walls shall also comply with Section 714.5.4.

Add new text as follows:

714.4.4 Penetrations in exterior walls.
Walls that are permitted to have unprotected openings in accordance with 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. The language here mirrors the existing requirements to protect joints, openings, and duct and air transfer openings in exterior walls. Although this is for very limited situations, in those cases where it applies, it is critical to also protect penetrations. Currently, the IBC 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 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.

Cost Impact: The code change proposal will increase the cost of construction
This code change proposal will increase the cost of construction, but only for fire resistance rated exterior walls that are not otherwise permitted to have unprotected openings.

FS23-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee indicated the proposal is unnecessary, and there is no issue with the current code text. (Vote: 11-2)

FS23-21

Individual Consideration Agenda

Public Comment 1:

IBC: 705.11, 714.4, 714.4.4

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

requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

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: Penetrations in exterior walls that are permitted to have unprotected openings do not require protection of penetrations.

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 714.4.4. Penetrations in *smoke barrier* walls shall also comply with Section 714.5.4.

Exception: Penetrations in exterior walls that are permitted to have unprotected openings in accordance with Section 705.8.

~~**714.4.4 Penetrations in exterior walls .** Walls that are permitted to have unprotected openings in accordance with 705.8 do not require protection of penetrations.~~

Commenter's Reason: Although this is for very limited situations, in those cases where it applies, it is reasonable to expect that the level of fire performance required by the Code is maintained. Protection of penetrations through fire resistance rated exterior walls which are not otherwise permitted to have unprotected openings is a glaring omission.
During the Hearings, there was testimony that some jurisdictions have already been enforcing this provision because it seems consistent with the intent of the current IBC. The language here has also been modified per the testimony and discussions to further simplify interpretation and enforcement.

Currently, the IBC 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. As such, those levels of risk to adjacent buildings need to be maintained by explicitly clarifying the need to protect penetrations.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
While there may be some increased cost, this only occurs in a very limited number of building conditions.

Public Comment# 2658

Public Comment 2:

IBC: 705.11, 714.4, 714.4.4

Proponents: Ronald Geren, representing Self (ron@specsandcodes.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

~~**705.11**~~ **705.9 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: Penetrations in exterior walls that are permitted to have unprotected openings ~~do not require protection of penetrations~~.

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 ~~714.4.4.~~ 714.4.3. Penetrations in *smoke barrier* walls shall also comply with Section 714.5.4.

~~**714.4.4 Penetrations in exterior walls .** Walls that are permitted to have unprotected openings in accordance with 705.8 do not require protection of penetrations.~~

Commenter's Reason: The requirements for exterior walls in Section 705 currently do not address penetrations--just openings, joints, and ducts and air transfer openings. The opening requirements could apply to penetrations, but since there is no definition for openings and the sections for fire-resistance-rated assemblies include separate sections for openings, penetrations, joints, and ducts and air transfer openings (e.g., Section 706.8 Openings, 706.9 Penetrations, Section 706.10 Joints, and Section 706.11 Ducts and air transfer openings for fire walls) could lead users to believe that penetrations are not considered openings, which leaves the question: how does one handle penetrations? The addition of a section specifically for penetrations provides the answer.
However, unlike fire-resistance-rated wall assemblies (i.e., fire walls, fire barriers, and fire partitions), exterior walls have unique requirements. For

example, exterior walls are not always required to have protected openings. this unique characteristic needs to be taken into consideration when applying requirements for penetrations, just like it does for joints. The current requirement for joints in exterior walls (Section 705.9) allows joints to be unprotected if unprotected openings are permitted. A similar exception should be provided for penetrations.

The revisions offered in this public comment simply the requirements. The first is the relocation of the new penetrations section. The revision places the new section before the joints section so that each of the sections (i.e., openings, penetrations, joints, and ducts and air transfer openings) follow the same order as they appear in the sections for fire-resistance-rated assemblies. The second revision deletes the sentence referring to ducts and air transfer openings, as this is unnecessary since they are not considered penetrations and are covered in separate sections. The third revision deletes the last part of the exception so that it is written similarly to the exception for joints. The fourth, and last, revision deletes in its entirety the new Section 714.4.4 and its reference in Section 714.4. This section is unnecessary since Section 714 is only applicable when penetrations would be required to be protected per the new Section 705.9, which is similar to Section 715 (Joints and Voids). Although Section 717 (Ducts and Air Transfer Openings) does have a section addressing exterior walls, the section only states what type of protection is required and does not provide an exception to the protection requirement.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction However, in jurisdictions where all penetrations in exterior walls are required to be protected because of a lack of clarity in the code, the cost will decrease slightly.

Public Comment# 2316

FS25-21

Proposed Change as Submitted

Proponents: sarah rice, The Preview Group. Inc., representing The Preview Group (srice@preview-group.com)

2021 International Building Code

Revise as follows:

706.2 Structural stability. *Fire walls* shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. ~~*Fire walls* designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section.~~

Exception: In *Seismic Design Categories* D through F, where double *fire walls* are used in accordance with NFPA 221, floor and roof sheathing not exceeding $^{3}/_{4}$ inch (19.05 mm) thickness shall be permitted to be continuous through the wall assemblies of *light frame construction.*

Add new text as follows:

706.3 Double Fire Walls.
Back to back walls designed and constructed in accordance with NFPA 221 shall be deemed to be fire walls and shall comply with this section.

706.5 Double Fire Wall Fire-resistance.
Each wall of a double fire wall assembly shall have a minimum fire-resistance rating as specified in Table 706.5.

TABLE 706.5 DOUBLE FIRE WALL FIRE-RESISTANCE

Fire resistance of a double fire wall assembly (hours)	Minimum fire resistance of each wall in a double fire wall assembly (hours)
4	3
3	2
2	1

Reason: Currently the IBC relies on the reference to NFPA 45 for the constructability details for a double fire wall, including the means by which a fire-resistance rating is assigned to a double fire wall assembly. While a very old concept, the IBC only recently came to include a specific acknowledgement and regulations for its use. As often happens with new regulations, we are seeing interesting interpretations , and in this case the most common is in regard to the determination the fire ratings needed for each of the walls that make up a double fire wall assembly.
This proposal seeks to add a new section and a new table that will add clarity by specifically stating what the minimum fire-resistance rating must be for each of the walls that make up a double fire wall assembly. The values specified in new Table 706.5 are fundamentally based upon Harmathy's Ten Rules of Fire Endurance Ratings (1965) and are consistent with those found in NFPA 45, and which have been documented by actual fire tests.

Harmany's Rule 1 - The “thermal”1 fire endurance of a construction consisting of a number of parallel layers is greater than the sum of the “thermal” fire endurances characteristic of the individual layers when exposed separately to fire. The minimum performance of an untested assembly can be estimated if the fire endurance of the individual components is known. Though the exact rating of the assembly cannot be stated, the endurance of the assembly is greater than the sum of the endurance of the components.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change only adds clarity to the construction of a double fire wall.

FS25-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee indicated the proposal is not needed since NFPA 221 already includes double firewalls provisions. The committee mentioned that the disapproval is based on the approval of FS 29-21. (Vote: 11-2)

FS25-21

Individual Consideration Agenda

Public Comment 1:

IBC: 706.2, 706.3, 706.5, TABLE 706.5, 706.4, TABLE 706.4

Proponents: Sarah Rice, representing The Preview Group. Inc. (srice@preview-group.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

706.2 Structural stability . *Fire walls* shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. Fire walls designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section.

Exception: In *Seismic Design Categories* D through F, where double *fire walls* are used in accordance with NFPA 221, floor and roof sheathing not exceeding $^3/_4$ inch (19.05 mm) thickness shall be permitted to be continuous through the wall assemblies of *light frame construction*.

~~**706.3 Double Fire Walls .** Back to back walls designed and constructed in accordance with NFPA 221 shall be deemed to be fire walls and shall comply with this section.~~

~~**706.5 Double Fire Wall Fire-resistance .** Each wall of a double fire wall assembly shall have a minimum fire-resistance rating as specified in Table 706.5.~~

TABLE ~~706.5 DOUBLE FIRE WALL FIRE-RESISTANCE~~

~~Fire resistance of a double fire wall assembly (hours)~~	~~Minimum fire resistance of each wall in a double fire wall assembly (hours)~~
~~4~~	~~3~~
~~3~~	~~2~~
~~2~~	~~1~~

706.4 Fire-resistance rating . *Fire walls*, *including double fire walls*, shall have a *fire-resistance rating* of not less than that required by Table 706.4.

TABLE 706.4 FIRE WALL FIRE-RESISTANCE RATINGS

GROUP	FIRE-RESISTANCE RATING OF A SINGLE FIRE WALL (hours)	FIRE-RESISTANCE RATING OF EACH WALL IN A DOUBLE FIRE WALL (hours)
A, B, E, H-4, I, R-1, R-2, U	3[a]	2c
F-1, H-3b, H-5, M, S-1	3	2
H-1, H-2	4[b]	3b
F-2, S-2, R-3, R-4	2	1

a. In Type II or V construction, walls shall be permitted to have a 2-hour fire-resistance rating.

b. For Group H-1, H-2 or H-3 buildings, also see Sections 415.7 and 415.8.

c. In Type II or V construction each wall in a double fire wall shall be permitted to have a 1-hour fire-resistance rating.

Commenter's Reason: As stated in the original Reason statement, to know what the fire-resistance rating is for each wall in a double fire wall, the IBC solely relies on the reference to NFPA 221 in Section 706.2. Only there have been interpretations made by AHJ's that because the reference to NFPA 221 is in the section titled "Structural stability" that ONLY the structural stability provisions of NFPA 221 are to be used - that the constructability details and fire resistance ratings in NFPA 221 do not apply. When this was never the intent when the reference to NFPA 221 was originally brought into the code - by a code change that I submitted!
The revision to Table 706.4 is is not technically a change, as the same information is found in NFPA 221, but rather it it is intended to provide a tool that makes it clear to both the designer and the AHJ know what the minimum fire-resistance rating of each of the walls that make up a double fire wall must be.

Should the committee action for FS29-21 be sustained (approved as modified), having the fire resistance rating of the double fire walls within the body of the IBC will not be a conflict, only a correlation.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is a correlation code change to add clarity and does not affect cost of construciton.

Public Comment# 2965

FS29-21

Proposed Change as Submitted

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

2021 International Building Code

Add new text as follows:

706.1.2 Double fire walls.
Double fire walls designed and constructed in accordance with NFPA 221 and its Annex shall be deemed to comply with this section.

Revise as follows:

706.2 Structural stability. *Fire walls* shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. ~~*Fire walls* designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section.~~

Exception: In *Seismic Design Categories* D through F, where double *fire walls* are used in accordance with NFPA 221, floor and roof sheathing not exceeding $^{3}/_{4}$ inch (19.05 mm) thickness shall be permitted to be continuous through the wall assemblies of *light frame construction*.

Reason: The use of NFPA 221 for the design and construction of double fire walls is permitted in Section 706.2 regarding structural stability. Additional details and specific requirements in NFPA 221 go beyond simply structural stability and should be a part of the designated requirements for design of fire walls.

Cost Impact: The code change proposal will decrease the cost of construction
This code change adds clarification how NFPA 221 is used to provide for double fire walls which are signifiantly less expensive to build than independent fire walls.

FS29-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

706.1.2 ~~Double fire walls~~ Deemed to comply. ~~Double f~~ Fire walls designed and constructed in accordance with NFPA 221 and its Annex shall be deemed to comply with this section.

Committee Reason: The committee concluded the modification corrected the proposal by adding "Deemed to comply". The proposed change adds clarity to the code section by adding the Annex and NFPA 221. (Vote: 13-0)

FS29-21

Individual Consideration Agenda

Public Comment 1:

IBC: 706.1.2

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

Further modify as follows:

2021 International Building Code

706.1.2 Deemed to comply . Fire walls designed and constructed in accordance with NFPA 221 ~~and its Annex~~ and providing the reqired fire resistance required in Section 706.4 shall be deemed to comply with this section.

Commenter's Reason: An error in the changes was called to our attention after the committee hearing. NFPA 221 does not include a requirement for a specific fire resistance. It depends on the building code to set the fire resistance requirement. FS29 makes NFPA 221"deemed to comply" with Section 706 which includes the requierd fire resistance. Similarly, the NFPA 221 Annex includes non-mandrory languge which can cause problems with design and enforcement.
The code change committee approved this change as modified. With this additional modification, Section 706.4 is referenced directly to establish the necessary fire resistance and the NFPA 221 Annex material would no longer be referenced.

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

Public Comment# 2600

Public Comment 2:

IBC: 706.1.2

Proponents: Jonathan Siu, representing Self; David Collins, representing The American Institute of Architects (dcollins@preview-group.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

706.1.2 Deemed to comply. Fire walls designed and constructed in accordance with NFPA 221 ~~and its Annex~~ shall be deemed to comply with this section subject to the limitations of Section 102.4. The required fire resistance rating shall be determined by Section 706.4 .

Commenter's Reason: The purposes of this public comment are 1) to prevent adoption of commentary as code requirements; 2) to clarify that the code will still govern over the adopted reference standard; and 3) to clarify how to determine the fire-resistance rating for fire walls designed and constructed using NFPA 221. Our intent is to allow the use of NFPA 221 so designers can utilize the pieces in NFPA 221 to construct double fire walls and to rate each wall as prescribed in NFPA 221, as well as create vestibules for doors to facilitate connections through the fire wall, without reducing the protections required by the IBC.
First, as approved (as modified) by the committee, FS29-21 directly references the annex to NFPA 221—essentially, adopting the annex as code. However, according to introductory notes before the requirements and before the annex, the annex is clearly commentary ("Annex A is not part of the requirements of this NFPA document, but is included for informational purposes only. This annex contains explanatory material….")

Second, there are provisions in NFPA 221 that are less stringent than IBC or where NFPA 221 does not address a requirement in IBC. This public comment points the user back to IBC Section 102.4 to set the IBC provisions as the minimum requirements for fire wall construction.

As approved by the committee, NFPA 221 is a wholesale replacement for the IBC provisions for fire walls ("deemed to comply"). Essentially, nothing in IBC Section 706 would apply. Ordinarily, Section 102.4 would say that where there's a conflict between the code and a standard, the code governs. In this case, since NFPA 221 is "deemed to comply" with IBC, at least three requirements in the IBC will not be able to be enforced:

1. IBC 706.3 requires fire walls be constructed of noncombustible materials, with an exception for Type V construction. NFPA 221 doesn't appear to address fire wall materials at all. So one could argue that NFPA 221 would allow combustible materials in Types III and IV construction, where IBC would not. There is another code change that may align these but at this moment, there is a disconnect.
2. IBC allows termination of fire walls at the inside face of noncombustible exterior sheathing, exterior siding, or other exterior finishes (IBC 706.5 Exception 2). NFPA 221 adds "limited combustible" sheathing/siding/other finishes to the exception (NFPA 221 Section 6.9.1.2). "Limited combustibles" is not defined in the IBC, nor in NFPA 221, so it will be difficult for the code officials to enforce. In addition, on its face, "limited combustibles" is less stringent than noncombustible.
3. IBC prohibits duct and air transfer openings at lot lines (IBC 706.1.1 and 706.11). NFPA 221 points back to the building code in Section 4.9.2 ("Unless required otherwise by the applicable building code…"), but since NFPA 221 is "deemed to comply," IBC Section 706 is no longer in play. Therefore, there is no prohibition in NFPA 221 for duct and air transfer openings at lot lines/party walls.

Thirdly, NFPA 221 does not contain any requirements for fire resistance rating of the fire walls. On the other hand, it does provide the fire resistance of each wall in a double fire wall, whereas the IBC does not. This public comment points the user who wants comply with NFPA 221 to IBC 706.4 so they will know the required fire resistance ratings on which to base a design.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
The original cost impact statement said the proposal will "add clarification how NFPA 221 is used to provide for double fire walls, which are significantly less expensive to build than independent fire walls." This public comment will not change that, and will not affect how fire walls are constructed under the IBC.

Public Comment 3:

IBC: 706.1.2

Proponents: Stephen Skalko, representing Masonry Alliance for Codes and Standards (svskalko@svskalko-pe.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

706.1.2 Deemed to comply . Fire walls designed and constructed in accordance with NFPA 221 ~~and its Annex~~ shall be deemed to comply with this section.

Commenter's Reason: Reformatting of Section 706 by FS29-21, which was Approved As Modified, places compliance with NFPA 220 into a stand-a-alone deemed to comply section in the IBC, which makes sense. However, including "**the Annex"** from NFPA 220 as part of the deemed to comply for the IBC does not for two reasons.
First, there are two annexes in NFPA 220; **Annex A – Explanatory Material**, and, **Annex B Informational References**. Using the term "the Annex" does not tell the user of the IBC which annex is considered deemed-to-comply. Not all features of either annex are necessarily suitable to be considered "deemed-to-comply".

Second, NFPA makes it clear that both Annexes are not a part of the requirements of NFPA 220, and are intended for "informational purposes only". In fact, Annex A contains multiple instances of permissive language, such as "should" and "may". A word search indicated "should" is used about 45 times in Annex A. Clearly, the application of provisions in Annex A will require some judgement by the user and the approval by authority having jurisdiction (AHJ) to determine if the suggested actions to meet fire wall requirements intended by the IBC are appropriate. FS29-21 as worded does not give the AHJ much choice in deciding if the portions of Annex A are acceptable.

Recommend Approval as Further Modified by this public comment to delete any use of either Annex to NFPA 220 since those annexes are intended for informational purposes only.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This change will not have an impact on the cost of construction.

FS31-21

Proposed Change as Submitted

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com)

2021 International Building Code

Revise as follows:

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

Exception: Buildings of Type III, IV and V construction.

Reason: The requirement for noncombustible fire walls in buildings of type III and IV construction is problematic in tall buildings, control of shrinkage or differential vertical shrinkage between dissimilar noncombustible fire wall materials and the combustible building bearing wall construction may cause damage to the fire wall. In high seismic areas the last thing the structural designer wants to do is put a heavy, earthquake load attracting concrete or masonry wall in a relatively light wood structure.
When CLT was added to the code, a three hour load bearing E-119 test was provided by the American Wood Council to justify the fire resistance of CLT. It was constructed of 5 ply CLT with one layer of 5/8" type X gypsum each side. In the 2021 code the same three hour bearing wall for Type IV-A construction would require 2/3 of the fire resistance to come from noncombustible protection on each side so the wall would have 3 layers of 5/8" type x gypsum or equivalent on each side and would be expected to last in an E 119 test for over 4 hours. Because the wall is constructed of similar materials as the remainder of the structure, differential shrinkage issues would be minimized. There is no reason why Type IV construction can not have combustible fire walls as they would be expected to perform better than noncombustible walls both from a shrinkage compatibility standpoint and from a fire performance standpoint.

The core of Type III buildings are the same as Type V construction. Two hour combustible fire walls are allowed in Type V buildings and the allowable area is equal to half of the allowable area of Type III buildings. If double 2 hour wood frame fire walls were allowed in Type III construction the area per two hour wall would be exactly the same. Having two-two hour walls at the fire wall location would actually provide better resistance to collapse in a fire than the current practice of a one hour wood bearing wall on each side of the noncombustible three hour fire wall wall. Differential settlement issues would also go away with this option making damage to the noncombustible fire wall due to shrinkage of the wood bearing walls less of a factor.

Another potential combustible fire wall for Type III would be CLT. The advantage of CLT fire walls in Type III would be the immediate performance once installed to minimize the danger of construction fires instead of waiting for the wall to be completed.

Cost Impact: The code change proposal will decrease the cost of construction
Following science and allowing options of more materials that perform equal or better to current noncombustible fire walls would result in less cost.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded there seems to be a lot of performance uncertainty and prefers to be careful on giving allowances to Type III and IV construction. (Vote: 8-5)

Individual Consideration Agenda

Public Comment 1:

IBC: 706.3

Proponents: Shane Nilles, representing WABO TCD (snilles@cityofcheney.org); Micah Chappell, representing Washington Association of Building Officials (micah.chappell@seattle.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

706.3 Materials . *Fire walls* shall be constructed of any ~~*approved* noncombustible~~ materials that are permitted for exterior walls based on the most restrictive type of construction adjoining the *fire wall* .

Exception: ~~Buildings of Type III, IV and V construction.~~ Double wall fire walls are permitted to have each wall constructed with materials permitted for the exterior walls based on the type of construction of their respective side.

Commenter's Reason: The way that fire walls are applied, to create separate buildings for purposes of allowable area and type of construction, by nature has the same effect as two adjoining exterior walls. This modification recognizes that fact and provides provision to treat the specifications for materials of fire walls to be consistent with that which would be required for exterior walls. This will lead to a fair and logical approach to determining the permissible materials for firewalls.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Cost of construction should not change as the proposed provisions are not more restrictive. It is possible that costs may be decreased in certain scenarios such as double walls where the materials used for one side of the wall are permitted to be less restrictive per the exception.

Note from ICC staff: This PC is based on floor modification ruled in order and discussion during the CAH.

Public Comment# 2553

Public Comment 2:

IBC: 706.3

Proponents: Dennis Richardson, representing self (dennisrichardsonpe@yahoo.com) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

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

~~Exception~~ Exceptions:

1. In Seismic Design Categories D through F, buildings greater than 4 stories of Types IIIA or IV construction where the main occupancy is regulated in Section 420.
2. Buildings of Type V construction.

Commenter's Reason: As a code official if you truly believe in public safety considering all sources including both fire and earthquakes please fully read this reason statement and consider with an open mind.
First of all, fire walls are a reflection of allowable area provisions which are somewhat arbitrary at best made up of an amalgamation of the legacy codes when the IBC was formed. Fifteen years ago, I served as one of the building official representatives on the ICC Code Technology Committee, Height and Area Study Group. We met several times in multiple cities but ultimately only slightly tweaked the height and area requirements fixing a couple of allowable area anomalies.

Later the workgroup was renamed the Balanced Fire Protection work group to reflect the fact that building performance depends on a number of factors especially the contribution of active fire protection measures (like sprinklers) and passive fire protection measures (like built in fire resistance and the degree of compartmentalization). We developed a white paper that was considered for submittal as an appendix to the IBC which noted there are two types of passive compartmentation in buildings:

First: One hour compartmentalization commonly found between dwelling units and between floors in multi- family residential.

Second: Two to four hour compartmentalization found between fire walls and in some cases between floors that determine fire area and building area in IBC 707.3.10 and 706.4.

As wood buildings with area limitations get taller over three stories the maximum building footprint gets smaller and smaller as a designer adds more stories over three stories in IBC Sections 506.2.3 and 506.2.4. Addressing structural compatibility caused by differential shrinkage in wood buildings (as required in IBC Section 2304.3.3) becomes increasingly complex if different materials are used for fire walls than for structural support. Finally seismic detailing requires that structural materials transmit forces across fire walls both parallel and perpendicular to the fire wall so that the building

does not tear itself apart in an earthquake. This becomes even more critical as buildings get taller. Finally when noncombustible fire walls are required in a relatively light wood building in addition to the wood framing that provides vertical and lateral support, typically more dead load is added that must be resisted as lateral loads and overturning by the structural system.

The IBC Section 420 regulates occupancy in Groups I-1, R-1, R-2, R-3, and R-4 by mandating fire rated separation of walls and floors between dwelling and sleeping units as well as separation of dwelling and sleeping units from other occupancy groups regardless of whether or not the designer chooses separated or nonseparated occupancies in Section 508. There are no exceptions for these minimum one hour separations in IBC 708.3 and 711.2.3 in buildings of Type IIIA and IV construction.

Fires starting in a one hour compartment protected by an NFPA 13 sprinkler system (required if over 4 stories) nearly always do not leave the compartment of origin. Fire walls in these types of buildings RARELY IF EVER even function as a fire wall. However a very large portion of residential buildings built in high seismic areas WILL be exposed to strong motion from earthquakes during the building life. One thing that is sure for a large residential building is they are almost ALWAYS occupied when an earthquake strikes.

The IBC Fire Safety Committee split 8 to 5 in their disapproval of FS 31-21 language to allow combustible fire walls in any building of Type III or Type IV construction. Their official reason is there seems to be performance uncertainty and they prefer to be careful with allowances in Type III and IV construction. One thing is for sure there are a multitude of wood walls with a fire resistance rating and structural properties required for a fire wall and by not allowing them this section of the code creates detailing and compatibility issues which can be a problem for structural performance and safety during earthquakes.

This public comment proposal narrows the focus of the original proposal to one hour minimum compartmentalized primarily residential buildings built over 4 stories and hence protected by an NFPA 13 sprinkler system. Please vote to reverse the 8-5 decision of the committee for this highly compartmentalized and protected subset of the original proposal. This proposal will result in greater seismic resilience in multi family housing which are highly likely to be subjected to earthquake loads during their building life.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This proposal gives designers more options for construction of fire walls in Types IIIA and IV buildings in high seismic areas.

Public Comment# 2917

FS32-21

Proposed Change as Submitted

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com)

2021 International Building Code

Revise as follows:

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

Exception: Buildings of Type III or Type V construction.

Reason:
Fire-retardant-treated wood is currently allowed for use in Type III construction in lieu of noncombustible materials in exterior walls. This code change eliminates any potential conflict with Section 602.3.

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

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Eliminates a potential conflict in the code and grants designers more flexibility.

FS32-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee deemed the proposal does not stipulate the use of Fire-Retardant-Treated wood in Type III construction which is less conservative than the current requirements. (Vote: 11-1)

FS32-21

Individual Consideration Agenda

Public Comment 1:

IBC: 706.3

Proponents: Christopher Athari, representing Hoover Treated Wood Products (cathari@frtw.com); Mike Eckhoff, representing Hoover Treated Wood Products, Inc. (meckhoff@frtw.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

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

~~**Exception**~~ **Exceptions:**

1. Buildings of Type V construction.
2. Buildings of Type III construction where the fire wall is constructed with fire-retardant-treated wood complying with Section 2303.2 and is limited to a fire resistance rating of 3 hours or less.

Commenter's Reason: I am seeking approval as modified by public comment. I understood the committee's concern coming out of the CAH and have updated the proposal as noted in the modification. In my opinion, there was confusion that the proposed fire walls would be entirely constructed out of fire-retardant-treated wood (FRTW) as opposed to allowing FRTW to be used in their construction.

For both framed steel and wood stud supported fire rated assemblies, the gypsum board membranes perform equally and produce the bulk of the fire resistance. Once the assembly is breached, wood performs better than steel. See bibliography.

Currently, Type III construction allows for the use of untreated combustible materials in all locations except in a fire wall or an exterior wall. The code already allows a 2-hour exterior wall constructed of FRTW. Recognizing and approving the use of FRTW in fire walls is entirely logical as it has been historically allowed to substitute for noncombustible materials.

This change will give manufacturers the ability to create and test designs to meet the requirements using a greater variety of building materials. In addition to promoting competition and affordability, replacing other materials with wood has a potential carbon sequestration benefit.

Bibliography: American Wood Council. TR9: Heat Release Rates of Construction Assemblies. Available online at: https://awc.org/pdf/codes-standards/publications/tr/AWC-TR09-0707.pdf

https://awc.org/pdf/codes-standards/publications/tr/AWC-TR09-Appendix-0708.pdf

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There is no change to current methods of construction. This change will allow for another option.

Public Comment# 2736

FS34-21

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

706.3 Materials. *Fire walls* shall be ~~of any *approved* noncombustible materials.~~ constructed of any of the following materials:

~~**Exception:** Buildings of Type V construction.~~

1. Fire walls in buildings of Type I, II, IV-A, and IV-B construction shall be of any noncombustible materials permitted by this code.
2. Fire walls in buildings of Type III, IV-C, and IV-HT construction shall be of noncombustible materials, or cross-laminated timber (CLT) and appurtentant heavy timber structural members having noncombustible protection on each side of the fire wall with a minimum assigned time of 80 minutes for a two-hour fire wall and 120 minutes for a three-hour fire wall and complying with Section 722.7.
3. Fire walls in buildings of Type V construction shall be of any materials permitted by this code.

Reason: This proposal does two things. First, it changes the structure of the section. The new structure will specify the materials based on a list that corresponds to the types of construction (i.e., Types I, II, III, IV, and V). Second, this proposal would permit cross-laminated timber walls with noncombustible protection as fire walls in Types III, IV-C, and IV-HT construction.
The ICC Tall Wood Building Ad Hoc Committee (TWB) reviewed extensive data, including various presentations, at the inception of its work. Upon deliberation of that information, they decided that there seemed to be three levels of construction performance for the new mass timber systems. The TWB Codes Work Group determined that, based on the available data and research, the construction type with mid-level protection, Type IV-B construction, performed equivalently to Type I-B. Since Type I-B is a noncombustible type of construction, it makes sense to include Types IV-A and IV-B in item 1 which requires noncombustible materials for fire walls. The net effect here is that buildings of those two mass timber types will be required to use noncombustible materials for fire walls.

Type IV-C and IV-HT are unprotected mass timber types of construction. It makes sense to permit fire walls to be constructed of mass timber elements of the required fire resistance with the additional caveat of having the required noncombustible protection typically required of rated walls in Types IV-A (and IV-B) construction. In Types IV-A and IV-B construction, the TWB required that where mass timber is required to be rated and protected, the noncombustible protection must constitute at least two-thirds of the required fire resistance rating of the assembly. For a two-hour fire wall, two-thirds of the rating is 80 minutes (at least two layers of 5/8-inch Type X gypsum wall board), and for a three-hour fire wall, it is 120 minutes (at least three layers of 5/8-inch Type X gypsum wall board). In the testing undertaken at the U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives fire test lab during the TWB deliberations, this amount of protection was shown to be sufficient to protect mass timber and keep it from becoming involved in the full burn-out of a high fuel load fire without sprinkler activation or fire department intervention. Therefore mass timber fire walls constructed with the noncombustible protection as required in Type IV-A construction will result in performance more than adequate for the hazards associated with buildings of IV-C and IV-HT construction. Buildings of Type III construction are more limited in area and height than IV-C construction and therefore can be well served by these same rated and protected mass timber fire walls.

Reference to Section 722.7 provides for establishing the contribution of the noncombustible material to the required fire-resistance rating of the fire wall and the installation details for gypsum wall board layers as required for walls in the new Type IV-A and IV-B construction types.

Bibliography: For test reports, testing videos, and other supporting documentation related to the new mass timber provisions in the 2021 IBC, see this web page: https://awc.org/tallmasstimber.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since the proposal adds additional options for materials in three construction types, it will not increase the cost of construction. It may decrease the cost of construction when protected cross-laminated timber is used in lieu of noncombustible materials, depending on the variables involved.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Based on the committee decision and comments on code changes FS31-21 and FS 32-21. (Vote: 7-5)

Individual Consideration Agenda

Public Comment 1:

IBC: 706.3

Proponents: David Tyree, representing AWC (dtyree@awc.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

706.3 Materials . *Fire walls* shall be constructed of any of the following materials:

1. Fire walls in buildings of Type I, II, ~~IV-A,~~ and ~~IV-B~~ construction shall be of any noncombustible materials permitted by this code.
2. Fire walls in buildings of Type III~~, IV-C, and IV-HT~~ construction shall be of noncombustible materials, or cross-laminated timber (CLT) and appurtentant heavy timber structural members having noncombustible protection on each side of the fire wall with a minimum assigned time of 80 minutes for a two-hour fire wall and 120 minutes for a three-hour fire wall and complying with Section 722.7.
3. Fire walls in buildings of Type V construction shall be of any materials permitted by this code.

Commenter's Reason: The committee indicated disapproval of our original proposal was based on their earlier actions on FS31-21 and FS33-21. Taking that reason into consideration we have modified the original proposal to limit the Type of Construction that can use properly rated and protected CLT walls to Type III. Given the structural integrity of CLT when coupled with the added noncombustible protection that will be used to obtain the necessary fire resistance ratings we feel the concerns raised by the committee have been satisfied.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal will allow more alternative methods to comply with the code requirement for fire walls.

Public Comment# 2300

FS45-21

Proposed Change as Submitted

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

2021 International Building Code

Add new definition as follows:

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

Revise as follows:

[BF] F RATING. The time period that the *through-penetration firestop system,* ~~*or*~~ *perimeter fire containment system* or *continuity head-of-wall joint system* limits the spread of fire through the penetration or void.

[BF] T RATING. The time period that the *penetration firestop system*, including the penetrating item, or *continuity head-of-wall joint system* limits the maximum temperature rise to 325°F (~~163~~ 181°C) above its initial temperature through the penetration or void on the nonfire side ~~when tested in accordance with ASTM E814 or UL 1479~~.

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

715.2 Installation. Systems or materials protecting *joints* and voids shall be securely installed in accordance with the manufacturer's installation instructions in or on the *joint* or void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases. *Fire-resistant joint systems*, ~~or~~ systems used to protect voids at exterior curtain walls and fire-resistance-rated floor intersections , and *continuity head-of-wall joint systems* shall also be installed in accordance with the listing criteria.

Add new text as follows:

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

Add new standard(s) as follows:

ASTM

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

E2837-2013 (2017)	Standard Test Method for Determining the Fire Resistance of Continuity Head-of- Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies

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

A. It moves the details on how to protect this void from Section 707.9 to new Section 715.6, leaving Section 707.9 as simply a pointer to Section 715.

B. The phrase relating to installation in a manner "so as not to dislodge, loosen or otherwise impair its ability to accommodated expected building movement" is not necessary in new Section 715.6 as it has been incorporated into Section 715.2 of the 2021 IBC.

C. New Section 715.6 includes an OPTION for protecting this void with a tested continuity head-of-wall joint system, without changing the current protection option. The use of a continuity head-of-wall joint system provides a simpler method for code compliance and enforcement as the system defines the materials necessary and the installation details.

D. A definition of continuity head-of-wall joint system is provided.

E. The definition of F rating is being revised to add continuity head-of-wall joint systems.

F. The definition of T rating is being revised to add reference continuity head-of-wall joint systems. In addition, it is being revised to remove reference to the two firestop test standards. Because these two firestop test standards were similarly removed from the definition of the F rating during the last code cycle, this change provides further consistency.

G. ASTM E2837 is being added as new referenced standard.There are currently over 20 continuity head-of-wall joint system tested and certified by UL.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal does not increase construction cost as it simply makes some editorial changes and offers an additional option to install a tested continuity head-of-wall joint system.

Staff Analysis: A review of the standard proposed for inclusion in the code, E2837-2013(2017), Standard Test Method for Determining the Fire Resistance of Continuity Head-of- Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

FS45-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

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

[BF] F RATING. The time period that the *through-penetration firestop system, perimeter fire containment system* or *continuity head-of-wall ~~joint~~ system* limits the spread of fire through the penetration or void.
[BF] T RATING. The time period that the *penetration firestop system*, including the penetrating item, or *continuity head-of-wall ~~joint~~ system* limits the maximum temperature rise to 325°F (181°C) above its initial temperature through the penetration or void on the nonfire side.
715.2Installation.
Systems or materials protecting
joints and voids shall be securely installed in accordance with the manufacturer's installation instructions in or on the *joint* or void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases. *Fire-resistant joint systems,* systems used to protect voids at exterior curtain walls and fire-resistance-rated floor intersections, and *continuity head-of-wall ~~joint~~ systems* shall also be installed in accordance with the listing criteria.
715.6Fire barriers/nonfire-resistance-rated roof assembly intersections.
Voids created at the intersection of a *fire barrier* and the underside of a nonfire-resistance-rated roof sheathing, slab or deck above shall be filled by an *approved* material to retard the passage of fire and hot gases, or shall be protected by an *approved continuity head-of-wall ~~joint~~ 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.

Committee Reason: The committee concluded the modification enhances the proposed text by removing the word joint from the continuity head-of-wall system. The proposal removes redundant language and gives another option for voids to be protected by an approved continuity head-of-wall joint system tested in accordance with ASTM E2837 to provide an F rating/T rating. (Vote: 8-5)

FS45-21

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 202, 715.6

Proponents: Nestor Iwankiw, representing Metal Building Manufacturers Association (niwankiw@jensenhughes.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Building Code

[BF] T RATING . The time period that the *penetration firestop system*, including the penetrating item, ~~*or continuity head-of-wall system system*~~ limits the maximum temperature rise to 325°F (181°C) above its initial temperature through the penetration ~~or void~~ on the nonfire side.

715.6 Fire barriers/nonfire-resistance-rated roof assembly intersections . Voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof sheathing, slab or deck above shall be filled by an approved material 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.~~ installed,but no more than 1 hour.

Commenter's Reason: The reasons for the modification consist of 1) F rating and T rating confusion, and 2) the lack of a maximum duration limit for the testing in accordance with ASTM E2837.

F Rating and T Rating Confusion: In the added section 715.6 Fire barriers/nonfire-resistance-rated roof assembly intersections, it requires that the system is tested ". . . 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." Since F ratings and T ratings are usually different, this requirement is ambiguous. Does this mean that both F ratings and T ratings must meet the fire barrier rating, or just one of them? Listed assemblies for fire barriers, such as those listed in the UL database, provide one rating in terms of time, and the rating is not identified as a F rating or T rating. So there would be questions and confusion on whether assemblies meet these new requirements. To eliminate this confusion, the proposed modifications remove the T rating requirements in Section 715.6, and remove "continuity head-of-wall system" from the definition of T rating.

Maximum Duration Limit: Providing a maximum limit of 1 hour addresses the condition where a fire-resistance rated wall assembly intersects with a nonfire-resistance-rated roof assembly. An assembly in the void with a rating, such as 1-hour, is not the weak link of the fire protection system. The weak link is the nonfire-resistance-rated roof assembly; it will fail first.

Also, the 1-hour duration limit was selected for the following reasons:

1. Limited availability of approved assemblies:

- Total available assemblies are limited, only 24 UL listed continuity head of wall assemblies.
- 23 of 24 UL listed assemblies are 1-hour.
- The 23 1-hour UL listed assemblies are one-unique design , gypsum board clad metal stud framed wall intersecting metal building roof system
- According to IBC Table 508.4, Required Separation of Occupancies, where permitted, there are a total of 50 conditions, only 16 are 1 hour, the other 34 are 2-hour, 3-hour, and 4-hour.

2. The limited availability of systems greater than 1-hour will require a significant investment in testing and new assemblies may not be available in time of code adoption.

3. Assemblies with higher ratings typically require more material, such as another layer of gypsum board, a thicker bead of firecaulk, more mineral wool, and more fasteners.

4. More material will requires more time for construction, which will increase the inspection time for building officials

In summary, the proposed modifications will truly not increase the cost of construction because available systems can be used for all fire-barrier walls, and will not require the development of new systems, additional materials, construction time, and inspection time. It will also clarify the system rating requirement to avoid potential interpretation issues.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
However, without this modification, the code change proposal will increase construction costs. due to the following:

•The limited availability of systems greater than 1-hour will require a significant investment in testing.

•Assemblies with higher ratings typically require more material, such as another layer of gypsum board, a thicker bead of firecaulk, more mineral wool, and more fasteners.

•More material will require more time for construction, which will increase the inspection time for building officials.

Public Comment# 2610

Public Comment 2:

Proponents: Vincent Sagan, representing Metal Building Manufacturers Association (vsagan@mbma.com) requests Disapprove

Commenter's Reason: This proposal has the following significant flaws:

- The revisions do not fully replace the deleted text in Section 707.9, specifically the voids created at the intersection of a fire barrier and a nonfire-resistance-rated exterior wall assembly. A new section is required because Section 715 only addresses intersections at curtain walls. The proposal eliminates a condition that is currently permitted. Other related proposals add a section similar to the above, but there is no guarantee that the other proposals will be approved.
- In the added section 715.6 Fire barriers/nonfire-resistance-rated roof assembly intersections, it requires that the system is tested ". . . 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." Since F ratings and T ratings are usually different, this requirement is ambiguous. Does this mean that both F ratings and T ratings must meet the fire barrier rating, or just one of them? Listed assemblies for fire barriers, such as those listed in the UL database, provide one rating in terms of time, and the rating is not identified as a F rating or a T rating. So there would be questions and confusion on whether assemblies meet these new requirements.

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

Public Comment# 2251

FS49-21

Proposed Change as Submitted

Proponents: John Williams, representing Healthcare Committee (ahc@iccsafe.org)

2021 International Building Code

Revise as follows:

710.4 Continuity. *Smoke partitions* shall extend from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke.

Exception: In Group I-2, a lay-in ceiling system shall be considered capable of limiting the transfer of smoke where the ceiling tiles that weigh a minimum of one pound per square foot and where the HVAC system is fully ducted in accordance with Section 603 of the *International Mechanical Code.*

Reason: Current interpretation of an allowable ceiling system is to be "monolithic." This type of ceiling is not feasible in a hospital setting, because main utility and ductwork lines run in the corridor to keep them out of patient care areas. This would facilitate the need for many access panels which compromise the smoke tight nature of the monolithic ceiling. The construction of the lay-in system would basically mean no open portions or gaps in the ceiling, either as an architectural feature or between items such as louvers. Normal ceiling fixtures such as lights, sprinkler heads, and diffusers and grills (as part of a fully ducted air system) can be considered part of the smoke tight system, as there is no opportunity for smoke to travel straight through them. A tight fitting lay-in grid is defined as one with no gaps in them, which is easily enforced via visual inspection and is therefore simply maintained.
Group I-2 is being specified, to make clear that this allowance applies to nursing homes (Condition 1) and hospitals (Condition 2), which is consistent with federal standards.

Lay in ceiling assemblies meeting this requirement would be consistent with listed fire resistance rated floor and roof ceiling assemblies using lay-in ceilings as a component of the assembly. Enforcement of this provision including fire code maintenance inspections would be far less challenging than currently exists for the fire-resistance rated floor- and roof-ceiling assemblies which require a specific manufacture's product for each of the assemblies that are listed by an approved testing facility. This proposal would allow any manufacturer's product to be used as long as it met the 1 pound per square foot criteria and other code requirements related to combustibility or flame spread. This is also supported by UL's BXUV Guide Information - Fire Resistance Ratings - ANSI/UL 263, Section III - FLOOR-CEILINGS AND ROOF-CEILINGS, Paragraph 10 which states "Hold down clips are required for assemblies incorporating ceiling panels weighing less that 1 lb per square foot."

As noted in past studies, the ceiling tile weight is also consistent with the findings of NBSIR 81-2444 Smoke Movement Through A Suspended Ceiling System (by John H Klote, 1982, NBS/VA), as noted on page 4 which states "[t]he ceiling tiles weighed 49.6 N/m2 (1.00 lb/ft2). During plan review, a cut sheet of the desired ceiling tile (readily available from any manufacturer) can be included in the review package or the one pound per square foot criteria can be listed in the specifications. The NBSIR 81-2444 report also notes in its abstract and conclusions that "smoldering fires of the type examined in this test series are not significant problems in hospitals." This is even more true today because of the expanded use of non combustible materials in construction as well as bedding and other typically used items in the hospital.

In terms of enforcement, hospitals have maintenance teams that are tasked with performing preventative maintenance and timely repairs as not to compromise the environment of care. Also, each hospital has personnel resources that deal specifically with regulatory issues. This regulatory staff has many regulations that deal with direct patient care, but they also help monitor the environment of care. There is also Infection Prevention professionals that Multidisciplinary teams regularly round in the hospital, reviewing delivery of care and the condition of the built environment. The multidisciplinary rounding team typically consists of representatives from Facilities, Regulatory, Infection Prevention, and leadership from the nursing care team. The status of a ceiling system is a key element that is observed to maintain its integrity.

A ceiling's role is a component of the life safety system of the hospital, by way of the relationship to activation of sprinkler heads and control of smoke. With the exception of mechanical rooms, all spaces in a patient care area have ceilings as part of the life safety system of the hospital, in particular the corridor. it is also a key component of the infection prevention elements of the hospital. These are some elements that Infection Prevention professionals focus on for the integrity of the ceiling:

· Minimize dust and particulates to enter patient care environments, including corridors, patient rooms, procedure rooms, storage rooms of medical supply, clean utility rooms, among others.

· Contribute to the air pressure relationships provided for each room. For example, negative pressure patient bed rooms to treat patients with infectious diseases.

When monitoring the integrity of the ceiling, missing or cracked tiles are a main area of focus, and are easily seen by all staff. The replacement of a ceiling tile is a top priority of a hospital maintenance department. This information is also tracked by the agencies that regulate hospitals, including Centers for Medicare and Medicaid Services (CMS), and deemed authorities including The Joint Commission (TJC). According to TJC, in 2009,

citations in the Life Safety portion of surveys that involved ceilings ranked #2 in 2009. In 2019, this citation rank fell to #6. This demonstrates the focus on the issue, even when the criteria for a citation can be the smallest scratch, or stain from a water leak, much less the more obvious missing or tile with a corner out or other damage.

This code change proposal is a key element of compliance with the federal standards that are enforced for I-2 occupancies, and are important to be aligned with those standards.

Also limiting the HVAC system to ducted systems will preclude the possibility of an open plenum return system. Plenum systems are generally not used in hospitals due to the required pressure relationships foe infection prevention considerations and to maintain more accurate control of the temperature and humidity control.

Corridor walls are built to structure in most cases based on FGI (acoustic requirements), however, having to access the above ceiling space for inspection and maintenance causes issues with infection control, whereas maintaining a suspended acoustic ceiling to limit the transfer of smoke is visible and easily maintained and as noted above, is being done as part of infection control procedures with the interdisciplinary team.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2020 the CHC held several virtual meeting, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at CHC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This represents current common practice in Group I-2 facilities.

FS49-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee concluded the proposal clarifies the limitation of the transfer of smoke in Group I-2. (Vote: 11-2)

FS49-21

Individual Consideration Agenda

Public Comment 1:

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

Commenter's Reason: There is no evidence that the weight of ceiling tile required will provide any resistance to smoke movement. The historic context for the 1 lbs/ft^2 density was in order to waive the requirement for hold down clips in air plenums, so that the tiles would not be dislodged. It was not related to prevent smoke migration into the plenum during a fire. Fire resistance ratings do not measure or limit smoke movement into plenums. Typical pressure differentials across these barriers are sufficient to draw smoke through the perimeter of these tile and grid systems.I would also note that the IMC defines *Plenums* as an enclosed portion of the building structure, other than an occupiable space being conditioned, that is designed to allow air movement, and thereby serve as part of an air distribution system. As such, the ceiling space can be used as a plenum and the ceiling tiles could be subject to this pressure differential.
Also, as was pointed out by a Committee member 7.11.2.5 has similar requirements related to fire resistance ratings which uses more quantitative requirements, but it is not related to preventing smoke movement. In fact, 7.11.2.4.4 would still require horizontal smoke barriers to comply with Section 709. As such, this will create a conflict in the Code.

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

Public Comment# 2660

FS51-21

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

712.1.3.2 Automatic shutters. Protection of the vertical opening by *listed* or *approved* shutters at every penetrated floor shall be permitted in accordance with this section. The shutters shall be installed in accordance with the manufacturer's instructions. The shutters shall be of noncombustible construction and have a *fire-resistance rating* of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3.1 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.

Reason: This proposal requires the shutters used to protect escalator openings to be *listed* or *approved*, rather rather than just approved. It also requires them to be installed in accordance with the manufacturer's instructions.
There is currently a product available which is being marketed to meet this code provision, and is *listed* in a manner consistent with this proposal.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase construction cost but instead will now recognize both listed or approved shutters.

FS51-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee objects to adding "listed or" in section 712.1.3.2, while it is not prohibited in the section. The proposal could be confusing by requiring listed as an alternative to "approved". The committee also disagrees with the cost impact statement since the proposal will increase the cost of construction. (Vote: 8-5)

FS51-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Michael O'Brian, representing FCAC (fcac@iccsafe.org) requests As Submitted

Commenter's Reason: This public comment is asking that this proposal be approved as submitted (AS). The committee was concerned that the language should say "listed and approved." However, the listed products are fairly limited at this time and requiring "listed or aproved" provides flexibility and would not increase the cost of applying the code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The 2021 IBC only requires they be approved. This proposal and PC simply provides more flexibility. The revised code text recognizes that there are some listed products available but would not be limited to listed products.

FS56-21

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

713.12.1 Penthouse mechanical rooms. A fire/*smoke damper* shall not be required at the penetration of the *rooftop structure* where *shaft enclosures* extend up through the *roof assembly* into a *rooftop structure* conforming to Section 1511. ~~Ductwork in the~~*shaft* ~~shall be connected directly to HVAC equipment.~~

Reason: The design of the mechanical system that is conveyed by the shaft enclosure may or may not contain actual duct work. However, even if the shaft itself were utilized as the means of conveying the exhaust or supply air and there were no direct connection to the HVAC equipment there should not be any created hazard which would require the installation of the fire/smoke damper at the shaft penetration of the roof.

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

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded deleting the sentence "Ductwork in the shaft shall be connected directly to HVAC equipment" from section 713.12.1 will cause confusion and misinterpretation. (Vote: 13-0)

Individual Consideration Agenda

Public Comment 1:

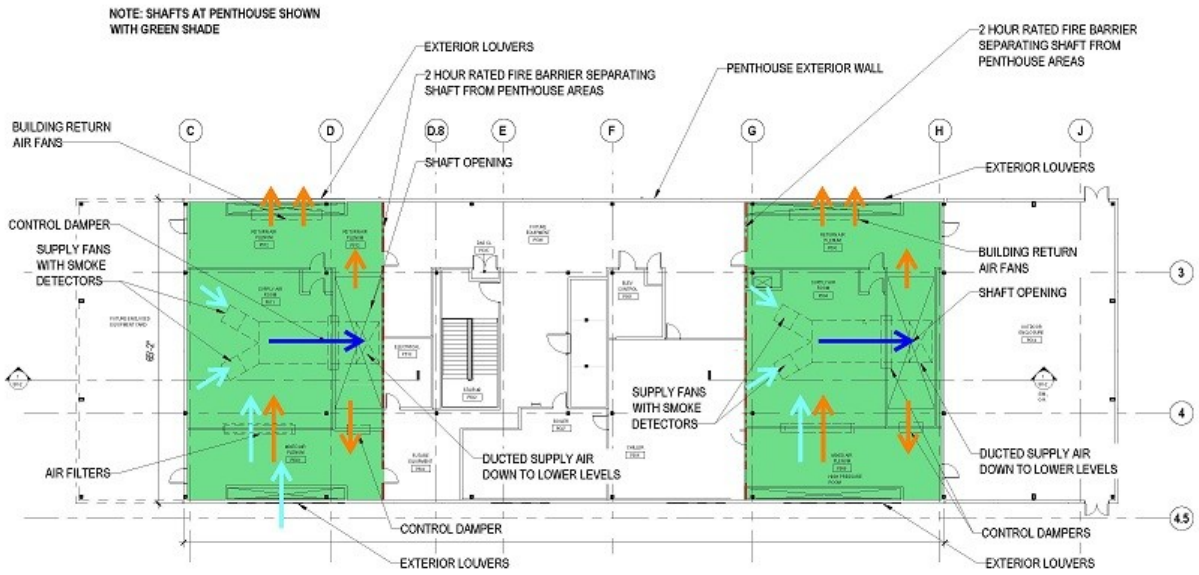
Proponents: Homer Maiel, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com) requests As Submitted

Commenter's Reason: The mechanical HVAC system design where the supply or exhaust air is conveyed via an internal building shaft, to or from the mechanical penthouse, may not actually be provided with a mechanical duct system for the design of the HVAC system. The removal of the last sentence of the provision above does not appear to be relevant if the HVAC system under consideration follows the other existing code provisions and is thereby found acceptable to the AHJ approving the submitted design drawings.
The design of the HAVC system must meet all other provisions of the code to assure that smoke will not be conveyed from the mechanical room in the Penthouse to the internal portions of the building.

The HVAC supply air design may not have mechanical duct but use the shaft itself as a mean of conveyance between the mechanical room within the Penthouse and the floors of the building.

Likewise, the HVAC exhaust design may not have mechanical duct for the exhaust system but instead use the shaft itself as the means of conveyance of the exhaust air from theinternal portions of thebuilding up to the mechanical room at the Penthouse for discharge to the exterior atmosphere or to be used as a portion of recirculated make-up air for the HVAC system supply air for the building, when permitted by the International Mechanical Code, Chapter 4.

Attached sketches show just one example of where the design of the HVAC system utilized the shaft itself for conveying the exhaust to the penthouse level

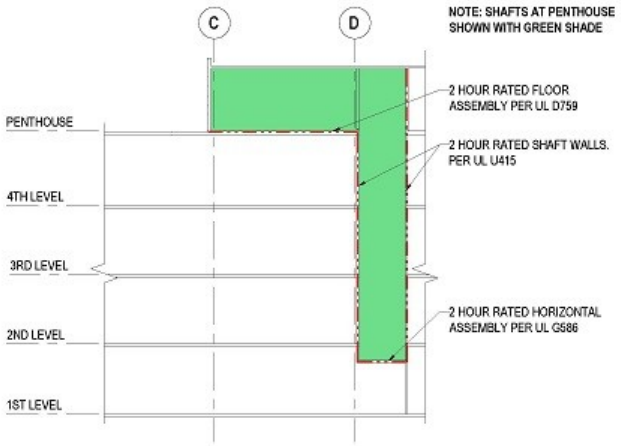


1 SHAFTS AT PENTHOUSE INQUIRY - PENTHOUSE PLAN

SCALE: 1/16" = 1'-0"

DATE: June 30, 2020

SK-1
ALT-2

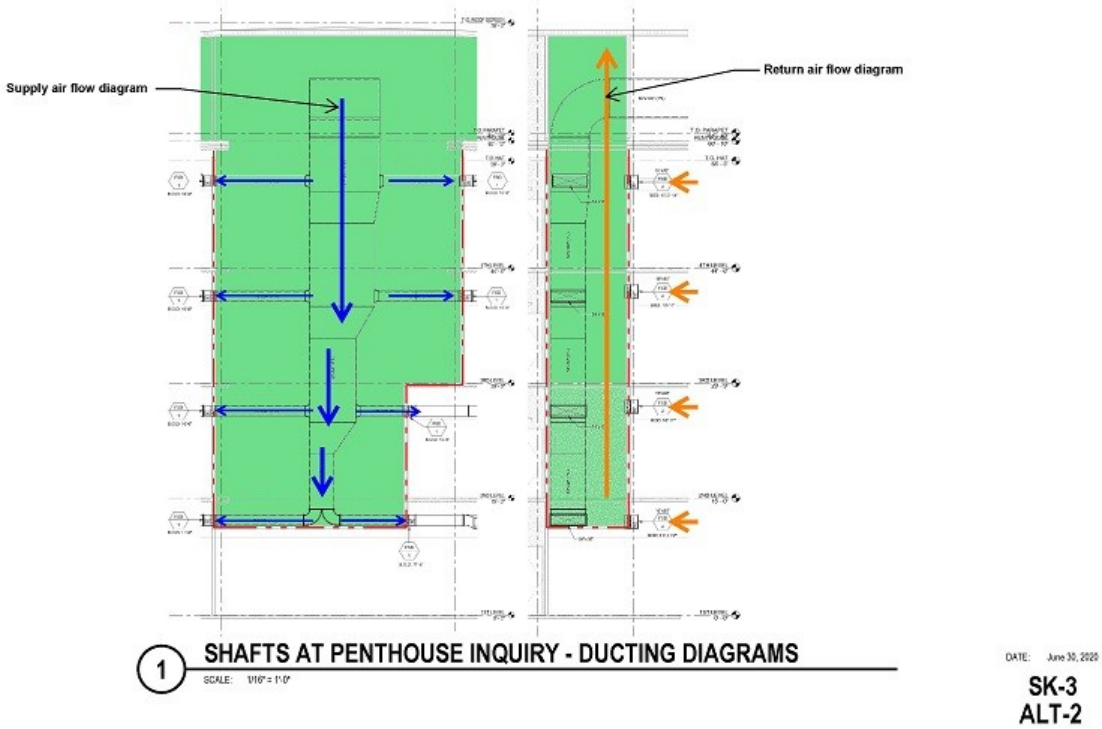


1 SHAFTS AT PENTHOUSE INQUIRY - PARTIAL SECTION

SCALE: 1/16" = 1'-0"

DATE: June 30, 2020

SK-2
ALT-2



Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is clarifying where code is silent. It will not affect construction cost.

Public Comment# 2559

FS60-21

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

714.3 Sleeves. Where sleeves are used, they shall be ~~securely fastened to the assembly penetrated~~ installed in accordance with manufacturer's installation instructions and the listing criteria for the listed system. Where listed systems are not used, sleeves shall be securely fastened to the assembly penetrated. The space between the item contained in the sleeve and the sleeve itself and any space between the sleeve and the assembly penetrated shall be protected in accordance with this section. Insulation and coverings on or in the penetrating item shall not penetrate the assembly unless the specific material used has been tested as part of the assembly in accordance with this section.

Reason: Currently, sleeve installation details are only described generically in this section. The listing needs to be the guiding document for sleeve installations with firestop systems. Not all sleeves are required by the listing to be securely fastened to the assembly. In fact, some listings state fastening is not required. This change allows the instructions shown in the listing to take precedence, where it is part of the listing criteria. If the system is not a listed system, the sleeves shall be securely attached to the assembly penetrated.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed language is consistent with current construction practice.

FS60-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee concluded the proposal clarifies the current language for sleeves. The committee advised the proponent to clarify the second sentence of the proposal in the public comment phase. (Vote: 13-0)

FS60-21

Individual Consideration Agenda

Public Comment 1:

IBC: 714.3

Proponents: William Koffel, representing Firestop Contractors Association International (wkoffel@koffel.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

714.3 Sleeves . Where sleeves are used, they shall be ~~installed~~ securely fastened to the assembly penetrated and installed in accordance with the sleeve manufacturer's installation instructions . ~~and the~~ Where listed systems are used, the sleeve shall be installed in accordance with the listing criteria for the~~ listed~~ system. ~~Where listed systems are not used, sleeves shall be securely fastened to the assembly penetrated..~~ The space between the item contained in the sleeve and the sleeve itself and any space between the sleeve and the assembly penetrated shall be protected in accordance with this section. Insulation and coverings on or in the penetrating item shall not penetrate the assembly unless the specific material used has been tested as part of the assembly in accordance with this section.

Commenter's Reason: Although the Committee approved FS60-21 As Submitted, the Committee did note that the second sentence needed to be clarified during the Public Comment period. The Public Comment attempts to clarify the requirements be resequencing some of the language, as recommended by at least one Committee member.

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

Editorial clarification.

Public Comment# 2778

FS64-21

Proposed Change as Submitted

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

2021 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 (2.49 Pa) of water at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated. Penetrating items with a maximum 6-inch (152 mm) nominal diameter shall not be limited to the penetration of a single fire-resistance-rated floor assembly, provided 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: Section 712.1.10 currently permits unprotected vertical openings in parking garages for ramps, elevators and duct systems and Section 715.1 currently permits unprotected joints in floors and ramps within parking garages or structures. Based on these allowances, it goes to reason that penetrations through floors and ramps of parking garages should also be permitted to be unprotected. This proposal allows such unprotected penetrations but is limited to concrete floors and ramps since these unprotected penetrations do not compromise the fire-resistance rating of the floor, while an unprotected penetration through a floor/ceiling assembly would allow a fire enter the cavity of the assembly and compromise the fire-resistance rating. These unprotected penetrations are further limited to penetrations with parking above and below the penetration, which is consistent with 712.1.10 and 715.1 that allow vertical openings and joints "in" or "within" parking garages or structures - this also essentially prohibits concealed penetrations which could allow a fire through a penetration to go undetected for some period of time.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal will allow unprotected penetrations in garages which will reduce the cost of construction due to a reduction in through-penetration firestop systems.

FS64-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee concluded that this exception for "penetrations of concrete floors or ramps within parking garages or structures constructed per Sections 406.5 and 406.6 where the areas above and below the penetrations are parking areas" is common sense. (Vote: 10-3)

FS64-21

Individual Consideration Agenda

Public Comment 1:

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

Commenter's Reason: The current provisions in the IBC for unprotected vertical openings in parking garages are limited to a few areas that are easily identifiable within the parking structure, like ramps and elevators. Penetrations can be located throughout the parking garage, be more difficult to locate and access for fire fighting, and are often located directly adjacent to parked vehicles. It is also not uncommon that significant quantities of other combustible materials are stored in parking garages, whether temporarily or not.
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 the intent of FS75In recent years Europe has seen a series of large fires (Liverpool, UK (2017); Cork, Ireland (2018); Stavanger, Norway (2019); Warsaw, Poland (2020)) that brought the car park fire safety into the focus of the public discussion. We are also seeing new battery technologies which are leading to much more rapid fire growth than previously contemplated in parking garage design. The fire accidents caused by the thermal runaway of lithium-ion battery has impeded the development of electric vehicles, but also demonstrated that additional fire safety precautions are needed.

Another recent study on fires from 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]

Parking garages often have penetrants (piping, electrical conduit, cables, etc) extending vertically through multiple levels of the parking garage. Unprotected penetrations will allow fire to spread vertically, uncontrolled, exposing multiple levels with significant fire loads and significantly impact fire fighting operations and the ability to compartmentalize a fire to a single floor. As written FS64 includes both sprinklered and unsprinklered parking garages. It has always been the intent in the IBC to limit the fire and hot gases from spreading vertically even in nonfire resistance rated assemblies. No additional justification or information is provided as to why this would no longer be needed. Not providing effective vertical fire separations in a parking garage is contrary to good fire safety practices.

Bibliography: [1] 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

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

Public Comment# 2511

FS67-21

Proposed Change as Submitted

Proponents: Timothy Pate, Colorado Chapter ICC Code change Committee, representing City and County of Broomfield (tpate@broomfield.org)

2021 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 <u>1-hour fire-resistance-rated horizontal assembly is permitted to be interrupted with a single 2 inch nominal thickness wood top plate and a maximum</u> 2-hour fire-resistance-rated *horizontal assembly* is permitted to be interrupted with the double<u> 2 inch nominal thickness</u> wood top plate of a wall assembly that is sheathed with Type X *gypsum wallboard*, provided that all penetrating items through the ~~double~~ top plates are protected in accordance with Section 714.5.1.1 or 714.5.1.2 and the ceiling membrane is tight to the top plates.
8. Ceiling *membrane penetrations* by listed luminaires (light fixtures) or by luminaires protected with *listed* materials, which have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.

Reason: This code change is proposing to add language to allow a single 2 X wood top plate to be equivalent to one layer of 5/8" type X drywall for a one hour rated horizontal floor/ceiling or roof/ceiling assembly. It also still allows a double 2 X wood top plate to be equivalent to two layers of 5/8" type X drywall for a two hour rated horizontal floor/ceiling or roof/ceiling assembly. It adds language to clarify that the top plates need to be nominal size - that is at least 1 1/2" thick. We have seen some architects and engineers specify a 3/4" thick top plate in order to allow a gap between top of wall to the floor or roof trusses in taller wood buildings and this change would clarify the original intent of the code change that I was able to get approved by the membership.
IBC section 722.1 states that the calculated fire resistance of exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC National Design Specification for Wood Construction (NDS). This chapter gives a nominal char rated of 1.5 inches of wood thickness per hour of fire resistance. Per NDS's calculations a single 2 X wood stud provides an equivalent of 60 minutes of fire protections. Per IBC Table 722.6.2(1), 5/8 inch Type X gypsum wall board provides 40 minutes of fire protection, so the protection by a 2 X wood stud is above and beyond that provided by one layer of 5/8 inch Type X gypsum. Utilizing the IBC calculated fire resistance method, a single 2 X wood top plate provides equal or greater fire resistance to one layer of 5/8 inch Type X gypsum and a double 2 X wood top plate provides equal or greater fire resistance to two layers of 5/8 inch Type X gypsum.

Cost Impact: The code change proposal will not 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.

Public Hearing Results

This proposal includes published errata

Errata: The proponent did not underline some new text. See the Consolidated Monograph Updates document; https://cdn-web.iccsafe.org/wp-content/uploads/2021-GROUP-A-CONSOLIDATED-MONOGRAPH-UPDATES-Updated-4-02-2021-complete.pdf.

Committee Action: **As Submitted**

Committee Reason: The committee determined the proposal is a suitable acknowledgment of existing practice without any issues. The proposal allows the use of a single or double top plate. The committee is also concerned about the possible insufficient attachment of the gypsum wallboard to a single top plate. (Vote: 12-1)

FS67-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Tim Earl, representing The Gypsum Association (tearl@gbhint.com) requests Disapprove

Commenter's Reason: The proposed single top plate is both unfeasible and a reduction in fire safety.
The overwhelming majority of one-hour horizontal assemblies (e.g. floor-ceiling assemblies) listed in the GA-600 *Fire Resistance and Sound Control Design Manual* are comprised as follows:

1. Two layers of 5/8" type X gypsum panels, which means a total system depth of 1-1/4" inches, or
2. One layer of a 5/8" type X gypsum panel and a layer of resilient channel (1/2" deep), which means a total system depth of 1-1/8".

In addition, GA-216 *Application and Finishing of Gypsum Panel Products* prescribes that the fasteners for the panels must be set a minimum of 3/8" from the edge of the panel.

Nominal 2x lumber is 1-1/2" deep. Because best practice is to hang the ceiling panels first and then the wall panels, and since the ceiling membrane must be abutted to the top plate anyway as prescribed in the code, there is not adequate top plate surface left on which to fasten the wall panels once the ceiling is installed.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No change to code if this PC is approved.

Public Comment# 2634

Public Comment 2:

Proponents: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com) requests Disapprove

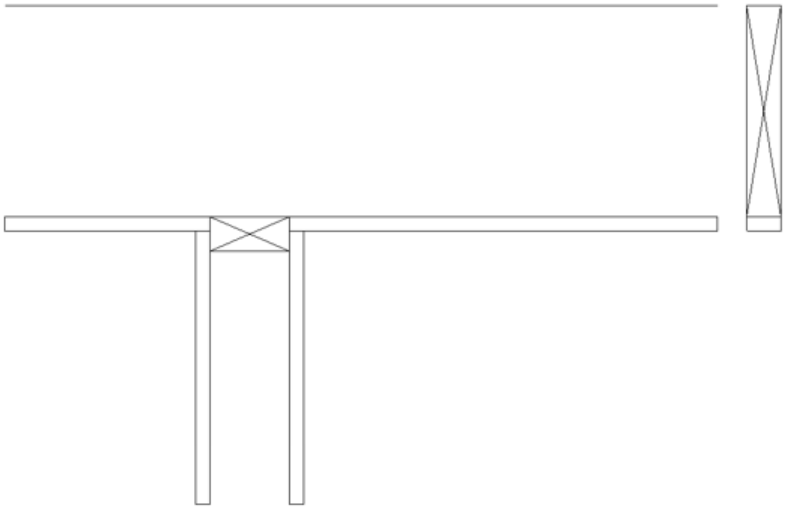
Commenter's Reason: In looking more closely at the impact of this proposal we have identified unintended consequences that make it problematic to implement this construction for wood stud walls. For the reasons explained below, we urge Disapproval of FS67-21 because this change leads to an unforeseen consequence of improper constructability.
This construction method decreases the depth of the wood surface needed at the top of the wall to properly fasten the gypsum material. In the case of the single top plate with a single layer of 5/8" attached to the ceiling or floor joists above (see figure 1) the remaining wood surface would be 7/8 of an inch or less and would not allow for nails or screws attaching the gypsum to be driven in straight, as required for proper attachment (see figure 2). Securing gypsum with fasteners driven at an angle results in breaking the face paper or fracturing the gypsum core.

Many fire-resistance rated ceiling designs require the use of resilient channels and this proposed construction method further reduces the available surface for nailing. Figure 3 illustrates an additional reduction of ¾ of an inch of fastening surface on the top plate, leaving only ¼ inch of wood surface accessible below the gypsum on the ceiling. This proposed code change results in too little nailing surface for the gypsum on the wall at the top plate resulting in construction where the gypsum cannot be properly fastened as required for the construction.

In addition to not being able to construct the wall properly, decreasing the requirement for the top plate from the currently required, two top plates to only one for the intersection of a 1-Hour rated horizontal assembly with a type-X gypsum sheathed wall, is not supported by any technical data to

show there is no reduction of the fire resistance for the horizontal assemblies with the reduced thickness of a single top plate wall.

Figures 1 through 3 – Provided to illustrate the problems that will arise during construction with a single top plate.



This illustrates a single top plate and one layer of gypsum (no furring strips of channels in place) there is insufficient space to nail or screw straight into the top plate.

Figure 1

(Proper Nailing - Drive nails in straight, not at an angle. Do not overdrive or countersink nails. This results in breaking the face paper or fracturing the gypsum core.)

Figure 2

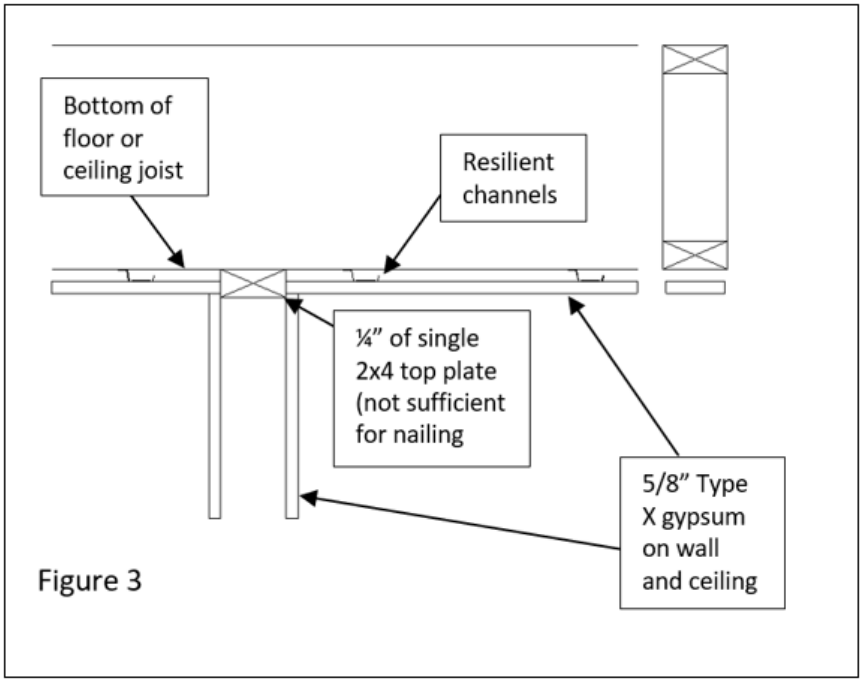


Figure 3

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

Public Comment# 2648

FS74-21

Proposed Change as Submitted

Proponents: Tony Crimi, representing North American Insulation Manufacturers Association (NAIMA), representing representing North American Insulation Manufacturers Association (NAIMA)

2021 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.

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 ~~material~~ systems shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste in the horizontal orientation where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period not less than the fire-resistance rating of the floor assembly.

Reason: This proposal provides additional clarification to the requirements and exceptions for perimeter fire containment systems (PFC).
First, it clarifies that a perimeter fire containment system can be installed in the voids between a floor assembly and any exterior wall or curtain wall. It then clarifies that, for the exception in 715.4, the protection of the void needs to be based on a system that has been test to ASTM E119, but in the horizontal orientation. This clarifies that it would not be acceptable for any individual material that has been part of an ASTM E119 test to be acceptable if it has not been tested in some configuration that represents an installation that is similar to the intended purpose here. For example, an insulation material tested to ASTM E119 within the cavity of an interior wall assembly provides no assurance that that material would provide the intended protection for a void installed horizontally between a floor assembly and a curtain wall. Information such as joint width, adhesion to substrates, fastening, etc. need to be representative of what is being installed

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal clarifies the intent of the provision and the exception.

FS74-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded that extending section 715.4 to all walls without any technical data is not acceptable because this section was initially introduced in the code to address exterior curtain wall/fire-resistance-rated floor intersections. (Vote: 11-2)

FS74-21

Individual Consideration Agenda

Public Comment 1:

IBC: 715.4, 715.4.1

Proponents: Tony Crimi, representing representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

715.4 Exterior curtain wall/fire-resistance-rated floor intersections . Voids created at the intersection of exterior curtain wall assemblies and

fire-resistance-rated floor or floor/ceiling assemblies shall be protected with an *approved perimeter fire containment system* to prevent the interior spread of fire. Such systems shall provide an *F rating* for a time period not less than the *fire-resistance rating* of the floor or floor/ceiling assembly.

715.4.1 Fire test criteria . *Perimeter fire 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 system to prevent the interior spread of fire. Such systems shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste in the horizontal orientation where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period not less than the fire-resistance rating of the floor assembly.

Commenter's Reason: During the CAH deliberations, the primary issue of concern was the removal of the word "curtain" wall from 715.4. This public comment restores that language. The remainder of the proposal is then intend to clarify that what is needed in the exception is for the generic system is installed to achieve this needs to include all of the materials that were used to demonstrate that it can work successfully in a horizontal orientation.
For example, we should not be using ASTM E119 data from a wall assembly where the "material" in the stud cavity can be used to protect this type of condition. It would not have been tested horizontally. Furthermore, its' performance in the wall would have been significantly enhanced by wallboard protecting it. It is important that the IBC specify these requirements more clearly.

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

Public Comment# 2366

FS75-21

Proposed Change as Submitted

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

2021 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.

Exception: *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.

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

Exception: *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. *Mezzanine* floors.

Reason: Section 715.3 for fire-resistant joint systems includes exceptions for several types of floors, which essentially allows open joints between fire-resistant floors or floor/ceiling assemblies. This proposal extends exceptions that are applicable to curtain wall/floor intersections to the void at the curtain wall/floor intersection. If an an open joint within these floors is acceptable, it goes to reason that it is also acceptable to have an open void between these floors and exterior curtain wall. The exceptions for this condition include floors within a dwelling unit, floors and ramps in parking garages or structures, and mezzanine floors. An example of the use of these exceptions is a parking garage on the lower floors of a building that have exterior curtain walls to "hide" the garage to match the exterior appearance of the building above the garage levels. Also, in Section 715.5, the words "between stories" is proposed to be deleted to align the wording of this section with that of 715.4 and 715.3.

Cost Impact: The code change proposal will decrease the cost of construction
For certain conditions, this proposal will remove the requirement for approved systems at voids at curtain wall/floor intersections so the cost of construction will decrease.

FS75-21

Public Hearing Results

This proposal includes unpublished errata

Errata: Proposal's reason statement. The proponent did not use the correct section. The two references in the reason statement to 715.1 should be 715.3 instead, based on the renumbering of the section in 2021 IBC.
Reason Statement**:** Section 715.3 ~~715.1~~for fire-resistant joint systems includes exceptions for several types of floors, which essentially allows open joints between fire-resistant floors or floor/ceiling assemblies. This proposal extends exceptions that are applicable to curtain wall/floor intersections to the void at the curtain wall/floor intersection. If an an open joint within these floors is acceptable, it goes to reason that it is also acceptable to have an open void between these floors and exterior curtain wall. The exceptions for this condition include floors within a dwelling unit, floors and ramps in parking garages or structures, and mezzanine floors. An example of the use of these exceptions is a parking garage on the lower floors of a building that have exterior curtain walls to "hide" the garage to match the exterior appearance of the building above the garage levels. Also, in Section 715.5, the words "between stories" is proposed to be deleted to align the wording of this section with that of 715.4 and 715.3 ~~715.1~~.

Committee Action: **As Submitted**

Committee Reason: The committee based their approval on the proponent's reason statement and concluded the code change clarifies existing criteria. The committee also mentioned that the relocation is necessary and practical. (Vote: 11-2)

FS75-21

Individual Consideration Agenda

Public Comment 1:

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

Commenter's Reason: As written, FS75 would not even require perimeter openings to be filled with any material, leaving them entirely open though all floors of the parking garage, in a direct vertical path. The current provisions in the IBC for unprotected vertical openings in parking garages are limited to a few areas that are easily identifiable within the parking structure, like ramps and elevators. Joints and voids at curtain walls extend extensively throughout an entire parking structure, where openings will often be located directly adjacent to parked vehicles, which can further complicate fire fighting operations. Furthermore, when this is applied in dwelling units, it can create a path between floors of sleeping areas at the perimeter joint which would cause a significant reduction in fire safety. It is also not uncommon that significant quantities of other combustible materials are stored in parking garages, whether temporarily or not.
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 the intent of FS75In recent years Europe has seen a series of large fires (Liverpool, UK (2017); Cork, Ireland (2018); Stavanger, Norway (2019); Warsaw, Poland (2020)) that brought the car park fire safety into the focus of the public discussion. We are also seeing new battery technologies which are leading to much more rapid fire growth than previously contemplated in parking garage design. The fire accidents caused by the thermal runaway of lithium-ion battery has impeded the development of electric vehicles, but also demonstrated that additional fire safety precautions are needed.

Another recent study on fires from 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]

As written FS75 includes both sprinklered and unsprinklered parking garages. It has always been the intent in the IBC to limit the fire and hot gases from spreading vertically even in nonfire resistance rated assemblies. No additional justification or information is provided as to why this would no longer be needed. Not providing effective vertical fire separations in a parking garage is contrary to good fire safety practices.

Bibliography: [1] 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

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

Public Comment# 2652

FS83-21

Proposed Change as Submitted

Proponents: Mike Nugent, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2021 International Building Code

Revise as follows:

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.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have not less than a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. *Corridor* door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for *corridors* in multitheater complexes where each motion picture auditorium has not fewer than one-half of its required *exit* or *exit access doorways* opening directly to the exterior or into an *exit passageway*.
4. Horizontal sliding doors in *smoke barriers* that comply with Sections 408.6 and 408.8.4 in occupancies in Group I-3.
5. In corridor walls required to have a fire-resistance rating in accordance with Section 1020.2, an elevator hoistway door opening directly into the corridor is not required to meet the smoke and draft control door assembly requirements in this section where the elevator connect 3 stories or less and the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

1020.2.1 Hoistway ~~opening~~ protection. Elevator hoistway doors in elevators hoistway enclosures required to be fire resistance rated shall be protected in accordance with Section 716. Elevator hoistway doors ~~openings~~ shall also be protected in accordance with Section ~~3006.2.1~~ 3006.2.

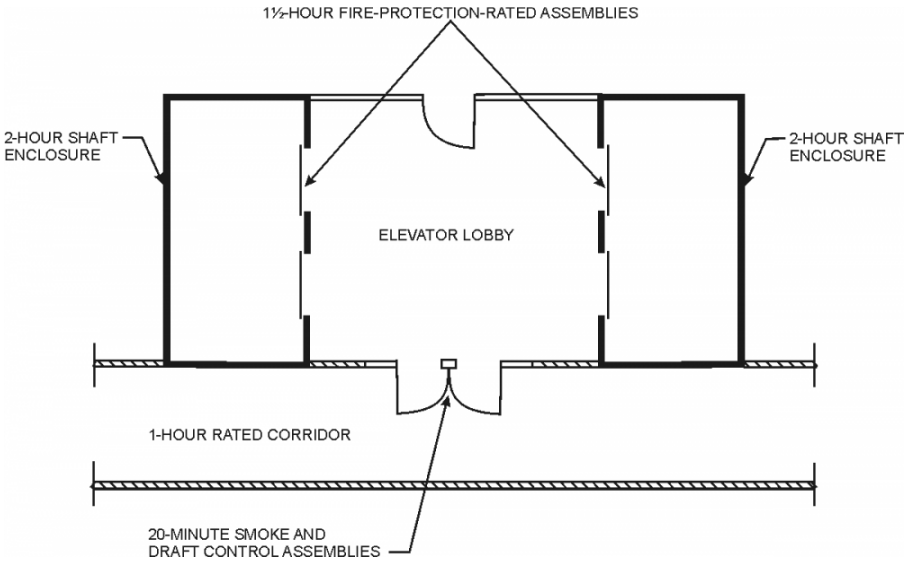
Reason: The intent of this proposal is to allow for two and three story Group R and Group I-1 buildings that do not have to have elevator lobbies to not have smoke and draft control at the doors. Even with sprinklers, these buildings have fire resistance rated corridors.
Elevators are within vertical shafts and are sent to fire barrier protection requirements in Section 712.1.1, 713.14 and 3002.1. Section 707.6 in fire barriers references Section 716 for opening protection of all openings, which would include door through the shaft to allows entrance into the elevator car. Elevator car doors often open directly into a rated corridor, so Section 716.2.2.1 is applicable to those elevator doors.

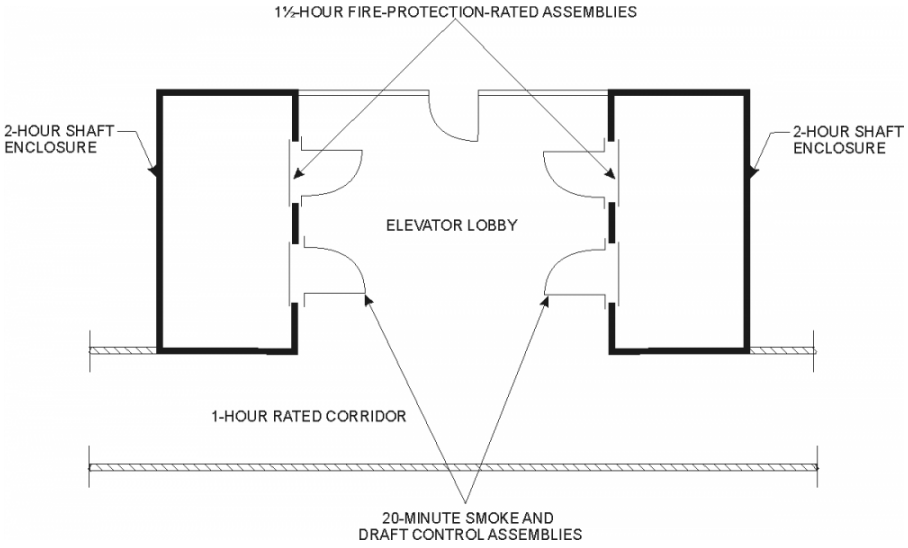
The new exception 5 in Section 716.2.2.1 is to allow for elevators in low rise building to not to have to meet the smoke and draft requirements of opening protectives in corridors. While many elevator hoistway/vertical shaft doors are tested and labeled for the 1-hour or $1^1/2$-hour fire resistance rating (see Section 716.2.1), very few, if any of the doors typically sold in the United States will also meet the smoke and draft requirements (see Section 716.2.2.1.1) that would allow them to open directly into a fire-resistance-rated corridor.

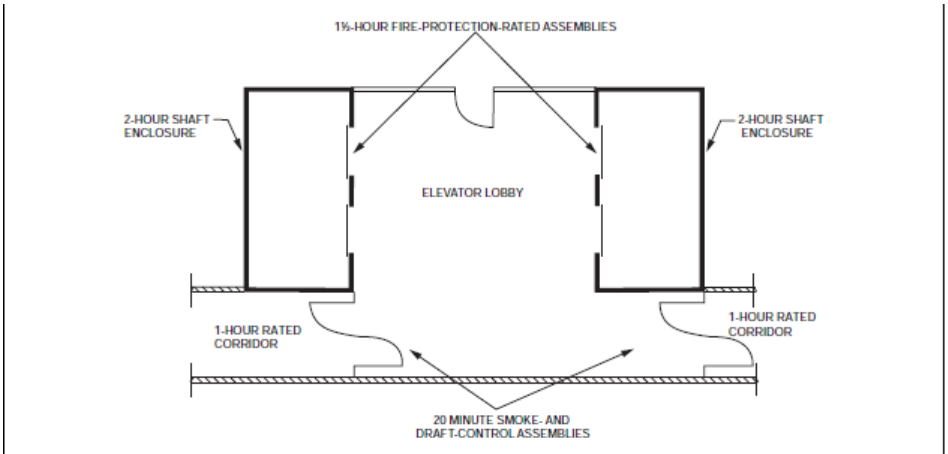
Current text literally results in elevator lobbies or other protection in front of the elevator doors in all rated corridors. There would not be significant stack effect for the movement of smoke with this minimal allowance. The code currently allows other floor vertical openings in Sections 712 and 1019.3 for four stories, so how is the elevator shaft more of a hazard? This allowance would make these buildings then require elevator lobbies/elevator opening protect at the same point, thus coordinating Section 716 and 3006.

The pointer in Section 1020.2.1 is in recognition that elevator entrance doors in rated corridors have to meet both criteria.

Below are what is currently required in even 2 story building with rated corridors.







Commentary Figure 1020.6(6)
ELEVATOR LOBBY/CORRIDOR OPTION 4

This proposal is submitted by the ICC Building Code Action Committee (BCAC) and ICC Fire 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 2020 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.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will decrease the cost of construction
This will be a decrease in some 2 and 3 story buildings. The shaft would need a fire resistant elevator entrance door, but would not require a lobby or other protection options to meet the smoke and draft control.

FS83-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded the proposed text is not clear on the number of stories. Based on the reason statement, "The intent of this proposal is to allow for two and three-story Group R and Group I-1 buildings". However, the proponent indicated the text could be applicable for five-story or six-story buildings. (Vote: 9-4)

FS83-21

Individual Consideration Agenda

Public Comment 1:

IBC: 716.2.2.1

Proponents: Mike Nugent, representing ICC Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

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.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have not less than a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. *Corridor* door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for *corridors* in multitheater complexes where each motion picture auditorium has not fewer than one-half of its required *exit* or *exit access doorways* opening directly to the exterior or into an *exit passageway*.
4. Horizontal sliding doors in *smoke barriers* that comply with Sections 408.6 and 408.8.4 in occupancies in Group I-3.
5. In corridor walls required to have a fire-resistance rating in accordance with Section 1020.2, an elevator hoistway door opening directly

into the corridor is not required to meet the smoke and draft control door assembly requirements in this section where the elevator ~~connect~~ is located in a building 3 stories or less in height and the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Commenter's Reason: The modification is to address the concern raised by the committee. The intent is to allow for 2 and 3 story building with rated corridors to not have to have an elevator lobby or doors/curtains in front of the elevator openings.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This will be a decrease in some 2 and 3 story buildings. The shaft would need a fire resistant elevator entrance door, but would not require a lobby or other protection options to meet the smoke and draft control.

Public Comment# 2631

Public Comment 2:

Proponents: William Koffel, representing Fire Safe North America (wkoffel@koffel.com) requests Disapprove

Commenter's Reason: FSNA requests that the ICC Membership support the action of both the Fire Safety and General Code Development Committees.
FS83-21 proposes to eliminate a requirement that has been in the IBC and requires that openings between elevator hoistways and corridors required to have a fire-resistance rating be protected with smoke- and draft-control assemblies. A proposal submitted by the ICC Code Technology Committee reinforced the requirement by adding Section 3006.2.1 in the 2018 Edition of the IBC. Another BCAC proposal (G182-21) proposed to eliminate Section 3006.2.1 and added language to 3006.2 for buildings more than three stories in height. However, FS83-21 proposes to eliminate the requirement from Chapter 7 which would apply to buildings up to three stories in height without technical justification.

BCAC indicates that the requirement should be deleted because the stack effect in buildings up to three stories is not significant. While we agree with that statement, the requirement in this paragraph is intended to protect the integrity of a corridor required to have a fire-resistance rating, regardless of the height of the building. While FSNA opposed the G182-21 that deleted Section 3006.2.1, we did so only because it was heard before FS83-21. It should be noted that the Committee Action on G182-21 was Approval as Modified and the modification retained 3006.2.1. The Committee noted the need to protect elevator hoistway openings in corridors even in two- and three-story buildings. FSNA would support the removal of Section 3006.2.1 but only if the requirements in Chapter 7 remain as they currently exist in the IBC. FSNA agrees with both the Fire Safety Committee and General Committee actions that elevator hoistway openings in corridors required to have a fire-resistance rating need to be protected regardless of the height of the building. Why should the requirement only apply to buildings four stories or more in height? Why should the elevator hoistway opening be one of the few openings that are not required to be protected with smoke- and draft-control assemblies. It is recognized that currently available elevator doors do not meet the smoke- and draft-control assembly requirements. However, FS84-21, which as Approved as Submitted by the Committee, addresses the issue by identifying methods by which the elevator hoistway openings can be protected to meet current Code requirements.

Most buildings three stories or less in height are served by hydraulic elevators. In addition to the hydraulic fluid, such elevators are have electrical equipment, brakes, and pumps that can be reasonably credible fire scenarios. According to NFPA, a review of NFIRS data indicates that there are credible documented incidents of elevator equipment being the item ignited. One such incident was an elevator transformer fire in a three story hospital in Massachusetts in which oily black smoke from the fire filled an occupied hospital. Although sprinklers were provided in most areas of the building, sprinklers were not provided in the machine room on the first floor. One of the two transformers overheated, igniting the oil which resulted in the production of heavy black smoke. (Kenneth J. Tremblay, 1996, "Firewatch," *NFPA Journal*, September/October.

Although BCAC failed to provide any technical justification to support FS83-21, Koffel Associates did an analysis using FDS modeling. The modeling focused on fires involving the hydraulic oil lines and tanks. Three fire scenarios were modeled simulating a pool fire at the bottom of the shaft (container failure) and a container leak at the bottom of the shaft. The elevator cab remained on the First Floor and the elevator hoistway door openings were closed for all three fire scenarios, both of which are conservative assumptions. The leakage area of the elevator opening was 0.55 sq ft from the Smoke Control Handbook. The smoke detector provided for elevator recall on the third floor activated between 7.2 second and 25.2 seconds. The modeling clearly illustrates that the protected exit access corridor can be impacted by a fire in an elevator shaft.

It should be noted that the proposal does not consider whether sprinklers will be in the elevator hoistway. In many occupancies, fire-resistance rated corridors are only required in buildings that are not protected with an automatic sprinkler system. In those buildings that are protected with an automatic sprinkler system, the elevator shaft may not have a sprinkler within the shaft. At the time of submission of the Public Comment a Certified Amended Motion to eliminate the requirement for a sprinkler at the bottom of the elevator shaft from the 2022 Edition of NFPA 13 was being voted on by the NFPA membership.

The blanket deletion of the requirement to protect elevator hoistway openings into corridors having a fire-resistance rating also does not consider egress arrangement (possibility of being in a dead end corridor), occupant load, or occupant conditions (sleeping or density). Absent any justification that such openings in fire-resistance rated corridors need not be protected in all instances, other than buildings four or more stories in

height, FSNA encourages the ICC membership to support the positions of both the Fire Safety and General Code Development Committees.

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

Public Comment# 2518

FS86-21

Proposed Change as Submitted

Proponents: Tony Crimi, representing International Firestop Council

2021 International Building Code

Revise as follows:

717.2.1 Smoke control system. Where the installation of a *fire damper* will interfere with the operation of a required smoke control system in accordance with Section 909, ducts used to supply uncontaminated air shall be protected with a shaft enclosure in accordance with Section 713, or tested in accordance with ASTM E2816, with equal F and T ratings, or shall utilize other *approved* alternative protection. ~~shall be utilized.~~ Where mechanical systems including ducts and *dampers* utilized for normal building ventilation serve as part of the smoke control system, the expected performance of these systems in smoke control mode shall be addressed in the rational analysis required by Section 909.4.

Add new standard(s) as follows:

ASTM

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

ASTM E2816 Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

Reason: This proposal adds the option to install tested and Listed pressurization ducts that supply uncontaminated air for stairwell pressurization to be enclosed with an ASTM E2816 tested system.
The ASTM standard evaluates the fire performance of metallic duct systems based on the same fire exposure, principles and criteria for fire-resistance rating that are defined in ASTM E119. The Standard has the ability to test the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, and includes the penetration firestop system installed. The fire performance of pressurization ducts are evaluated by both Condition A – Horizontal, and Condition B – Vertical,, which are the test configurations appropriate for pressurization ducts.

The ASTM E2816 standard was developed to establish requirements for fire resistive enclosure systems applied to metallic HVAC ducts in order to provide a tested alternate to required fire-resistance-rated shafts. When pressurization ducts are used, the protection is installed continuously from the air handling equipment to the air inlet and outlet terminals, so the penetration firestop systems installed in these ASTM E2816 protected ducts are included as part of the tested Condition A and Condition B systems. There are several systems currently Listed and in use for these applications.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds an additional option, but does not remove any prior options.

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2816 Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

FS86-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded the proposed standard is beneficial; however, technical issues need to be addressed. (Vote: 13-0)

FS86-21

Individual Consideration Agenda

Public Comment 1:

IBC: 717.2.1

Proponents: john pattillo, representing Conquest Firespray LLC (jpattillo@conquest-firespray.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

717.2.1 Smoke control system . Where the installation of a *fire damper* will interfere with the operation of a required smoke control system in accordance with Section 909, ducts used to supply ~~uncontaminated~~ air shall be protected with a shaft enclosure in accordance with Section 713, or ~~tested in accordance with~~ a fire rated duct enclosure tested by all Conditions (A and B and C and D) per ASTM E2816 ~~, with equal F and T ratings, or shall utilize other~~ or *approved* alternative protection shall be utilized. Where mechanical systems including ducts and *dampers* utilized for normal building ventilation serve as part of the smoke control system, the expected performance of these systems in smoke control mode shall be addressed in the rational analysis required by Section 909.4. For pressurization systems the rational analysis shall address the average air temperature, inside the duct, at the point of discharge.

Commenter's Reason: ASTM E2816 is a full-scale, fire-resistance rating test requiring an ASTM E119 compliant furnace to conduct the fire test. ASTM E2816 follows the same test protocols as ASTM E119 regarding the test's test specimen size, instrumentation and requirements for performing the fire test. In addition, ASTM E2816 requires the ductwork be pressurized or have airflow during the entire fire test. Also, fire-resistance rated ductwork must be tested to all four Conditions (A, B, C and D) in order to be code compliant and used everywhere a conventional ductwork is used in a building.
Testing all four Conditions (A, B, C and D) is required in order for the ductwork to comply with Section 707, Fire Barriers, 717 Ducts and air transfer openings and Section 712, Vertical Openings, Subsection 712.1.5, Ducts and Section 703.2.1 Nonsymmetrical wall construction, where testing both sides of all nonsymmetrical fire barriers is required.

ASTM E2816 nomenclature for all four conditions:

Condition A: Fire Outside Exposure, Horizontal Orientation

Condition B: Fire Outside Exposure, Vertical Orientation

Condition C: Fire Inside Exposure, Horizontal Orientation

Condition D: Fire Inside Exposure, Vertical Orientation

Corresponding ASTM E814 Standard Test Method for Fire Tests of Penetration Firestop Systems is also required.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The reasoning for no change in costs.

Reasoning 1:

Today, the assemblies referenced in the code require several different contractors to install a code compliant assembly:

The mechanical contractor will install hvac ductwork and fans designed to carry the air flow.

A second contractor (typically drywall) will install metal hangers and drywall to construct the 2 hour rated enclosure

The code change will eliminate the additional contractor (namely drywall)

Effects on the project costs:

A faster installation will reduce the time for the installation of the assembly

Less field personnel are necessary on the project

Less field coordination is necessary as one trade (drywall) is eliminated

Saves space as the fire rated ductwork assembly requires less physical dimension which allows easier coordination

Reasoning 2

This code change is an option for the design and construction industry.

The design and construction industry can measure the cost benefits of an assembly under several criteria

1. Is the first cost of the assembly less
2. Is the long term cost of the assembly less
3. Does the assembly take less space to install
4. Does the assembly take less time to install
5. Does the assembly take less field personnel to install

These questions are answered by the introduction of this change

Yes to items 1, 3, 4, and 5

Reasoning 3:

Because this assembly is an option the market and bidding contractors will always choose the lease expensive option and the market pricing will meet the demand

More competition will drive down costs

For example, if today the cost of a drywall enclosure to too expensive, and a fire resistant duct is chosen the market will swing towards the fire resistant ductwork assembly.

This will drive the market to the least cost solution.

Public Comment# 2525

FS93-21

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

717.6.2.1.2 Static systems. Static *ceiling radiation dampers* shall be provided with systems that are not designed to operate during a fire.

Exceptions:

1. Where a static *ceiling radiation damper* is installed at the opening of a duct, a *smoke detector* shall be installed inside the duct or outside the duct with sampling tubes protruding into the duct. The detector or tubes 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. ~~3~~ 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.

Reason: Exception 2 does not make sense because the exception implies that the dampers are motor-driven, which they are not. Static ceiling radiation dampers are not really able to be effectively controlled by the smoke detection system. Static ceiling radiation dampers have no provision in UL 555C or UL 263 that makes them compatible with any kind of wiring, unless perhaps by a switch (which is impractical). Thus, the exception does not really apply and should be removed for technical accuracy.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no added cost to this proposal, since it is just clarifying technical capabilities of existing equipment as detailed in this section.

FS93-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproval is based on the proponent's request to bring it back in the public comment phase. (Vote: 13-0)

FS93-21

Individual Consideration Agenda

Public Comment 1:

IBC: 717.6.2.1, 717.6.2.1.1, 717.6.2.1.2

Proponents: William Koffel, representing Air Movement and Control Association (wkoffel@koffel.com); Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

717.6.2.1 Ceiling radiation dampers testing and installation . *Ceiling radiation dampers* shall be tested in accordance with Section 717.3.1. *Ceiling radiation dampers* shall be installed in accordance with the details specified in the fire-resistance-rated assembly and the manufacturer's instructions and the listing.

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 ~~provided~~ in ~~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.~~

Commenter's Reason: There were three Public Proposals (FS93-21, FS94-21, and FS95-21) attempting to revise these sections. During the Committee Action Hearings, the proponents agreed to work together to develop a Public Comment to address the concerns with the current code text (which is new to the 2021 Edition of the IBC). The Committee voted for Disapproval of all three proposals based on the proponents' request to bring the item back during the Public Comment period.
This Public Comment is the result of the work by the three proponents. The proposed text greatly simplifies the section while still accomplishing the intent of identifying when static dampers are appropriate.

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

Staff Analysis: The public comments on Code Change Proposals FS93-21 and FS95-21 address requirements in a contradicting manner. FS93-21 PC1 proposes deleting all the exceptions in Section 717.6.2.1.2, Static systems. FS95-21 PC1 proposes keeping exceptions 1 and 3 in Section 717.6.2.1.2, Static systems. The eligible ICC voting members are urged to make their intentions clear with their actions on these proposals.

Public Comment# 2816

FS95-21

Proposed Change as Submitted

Proponents: Shaun Ray, representing Shaun Ray (shaunr@mtlfab.com)

2021 International Building Code

Revise as follows:

717.6.2.1.2 Static systems. Static *ceiling radiation dampers* shall be provided with systems that are not designed to operate during a fire.

Exceptions:

1. Where a static *ceiling radiation damper* is installed at the opening of a duct, a *smoke detector* shall be installed inside the duct or outside the duct with sampling tubes protruding into the duct. The detector or tubes in the duct shall be within 5 feet (1524 mm) of each static ceiling radiation ~~the~~ *damper* installed in the system. Air outlets and inlets shall not be located between the detector or tubes and the damper. Each ~~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. ~~3~~ 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.
3. Static radiation dampers shall be allowed for installation in systems that can possibly continue operation during a fire, provided a thermal control switch is used at or within 1 foot (305 mm) of each static ceiling damper. The thermal control switch shall be listed, provide a resettable feature and be accessible for inspection and service. The thermal control switch shall be tested/evaluated for the maximum air velocity and temperature of the system design and shall be independent of the activation of static ceiling dampers during a fire. Each thermal control switch is to be connected to activate fan shutdown when elevated temperature is detected at any static ceiling damper location within the system.
4. For control switches and sensing devices noted in these exceptions, information shall be provided at the air handler for heat, ventilation and air-conditioning service and repair technicians stating that shutdown devices are present in the system. Further instruction regarding installation, inspection and repair of such devices shall be provided by the manufacturer.

Reason: It is known that the large majority of floor/ceiling designs used for residential construction are tested under static (no airflow) conditions during fire exposure. Where system design does not take into account the requirement for dynamic ceiling designs (which include dynamic ceiling dampers), or in cases where a dynamic ceiling design does not exist for the application, workaround solutions have been used. In some jurisdictions, a single thermal sensing switch has been allowed to address the requirement of fan shutdown in the event of a fire.
The use of a single thermal switch (typically located near the return or supply duct connected at the furnace or air handler) is not adequate protection in the event of a fire. In multi-room residential construction, a fire could originate in a room on a separate floor and could be three, four, five or more rooms separated from the room or closet that the furnace fan resides. Static ceiling designs are tested with zero airflow at the start of a fire exposure. These ceilings are tested with substantial loading on the floor, which in some instances results in ceiling collapse very soon after the rated exposure (such as 1-hour fire rated) has concluded. It has been long understood that UL testing of such floors that have not been evaluated for conditions that allow a fan to operate at the beginning of a fire should require some control means to cease fan operation once a fire is detected in the room that the rated floor/ceiling is exposed. However, code language does not specifically state that thermal or smoke detection at the air handler alone is adequate (or inadequate) coverage to ensure that static ceiling designs indeed only see a fire exposure without airflow during the start of a fire.

Furthermore, a static ceiling damper is not tested/evaluated to endure the physical shock that may occur during activation under a dynamic condition. In other words, a damper might be damaged if it closes while airflow is still present. If this happens, the damaged ceiling damper cannot continue to provide its listed performance expectations even if the furnace fan is shut down soon after the static ceiling damper activates (closes). It is not a stretch to consider that a static ceiling damper located in a room one or more floors or multiple rooms away from the furnace will activate during a fire in that room prior to a sensor located at the supply duct near the furnace detects a rise in temperature adequate enough to shut down the fan.

The minor wording change proposed in Exception 1 ensures that the code's intention is that a protection device (smoke detector) is used for each static ceiling damper installed. Current language could be interpreted as requiring just one smoke detector for one static ceiling damper per system even though multiple static ceiling dampers are likely used in the entire system. The added wording is intended to clarify the code's intent.

Exception 2 specifies use of static ceiling radiation dampers that have a provision to allow a smoke detector to control the damper (interpreted as

being able to “close” a static ceiling radiation damper). Such ceiling radiation dampers are rare (and likely costly). Due to the rarity of the possible application/solution, the inclusion of this exception probably provides more confusion than resolution.

Exception 3 is also a limited application. Bathrooms that have motion sensing that turns on lights and exhaust fans as a person enters the room, comes to mind. When no one is occupying the room, the exhaust fan shuts down. In such applications, a static ceiling radiation damper could be a suitable solution. However, the wording “when unoccupied” is added to clarify when a fan system would be shut down regardless of a fire or not. This exception could also be applied to ceiling damper/exhaust fan combinations that are currently on the market and have been tested in a static ceiling design for use where the fan is in operation during the start of a fire. Testing such as this establishes precedence that testing/listing laboratories take into account that a damper could become damaged if closure occurs before a fan can be completely shut down. Devices tested and listed are intended for applications such as used for a bathroom exhaust and are independent of the HVAC system in a building.

New Exception 4 is added to clarify comments made earlier in this justification. Simply providing a heat sensing device at or near the furnace that is intended to shut down the fan during a fire does not adequately address concerns that could arise from such practices. Exception 4 is a means to improve on what is currently intended in the 2021 IMC.

Since it is possible that nuisance tripping may occur from protective sensing devices installed within the HVAC system, an exception note (New note 5) should be included to allow service technicians to be made aware that fan shutdown could be a result of a sensing device that has provided a change in control signal to the furnace/air handler. This label or other means of notification located at the furnace would be provided so that the technician is not wasting hours of time trouble shooting a service call related to a furnace that is not operating as expected.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed changes and new additions to Sec. 607.6.2.1.2 are intended to clarify the current intent of the code. Inclusion of control switches such as a thermostat switch could be less expensive when compared to smoke detection sensing elements and ceiling dampers that allow the ability to be closed upon a fan shutdown, which are currently prescribed in this section of the code.

FS95-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproval is based on the proponent's request to bring it back in the public comment phase. (Vote: 13-0)

FS95-21

Individual Consideration Agenda

Public Comment 1:

IBC: 717.6.2.1.2

Proponents: Shaun Ray, representing Shaun Ray (shaunr@mtlfab.com) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

717.6.2.1.2 Static systems . Static *ceiling radiation dampers* shall be provided with systems that are not designed to operate during a fire.

Exceptions:

1. Where a static *ceiling radiation damper* is installed at the opening of a duct, a *smoke detector* shall be installed inside the duct or outside the duct with sampling tubes protruding into the duct. The detector or tubes in the duct shall be within 5 feet (1524 mm) of ~~the~~ each *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.*~~

2.~~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 when the room is vacant.

Commenter's Reason:

1. There were three Public Proposals (FS93-21, FS94-21, and FS95-21) attempting to revise 717.6.2.1.2. FS93-12 looked to delete Exception 2. FS94-21 simply requested to add when the room is vacant at the end of Exception 3. FS95-21 looked to clarify whether one or more smoke detectors are required in Exception 1. FS95-121 also attempted to add 2 new Exceptions that addressed an alternative method of shutting off the HVAC system in the event of fire. During the Committee Action Hearings, the proponents agreed to work together to develop a Public Comment to address the concerns with the current code text. The Committee voted for Disapproval of all three proposals based on the proponents" request to bring them back during the Public Comment period. I worked with the proponents of FS93-21 and FS94-21 but could not agree with their conclusion to remove all Exceptions from 717.6.2.1.2 (which was not the intent of FS93-21 or FS94-12 during the CAH of April 2021). I therefore have submitted my Public Comment which retains Exception 1 and 3, while addressing the concern about how smoke detection should be applied to allow static radiation ceiling dampers to be used in dynamic applications.
2. Exception 1 has been modified to add the word "each" before the word "damper". Current wording in the IBC (and IMC) could be interpreted as "for each damper", "for only one damper" or something in-between. Earlier this year, I confirmed with ICC (through code intent Q&A) that the code's intention is to have multiple smoke detectors if the system (including static ceiling dampers) services multiple rooms. In most all cases, HVAC systems indeed provide air flow to more than one room in a building. By adding the word "each" to Exception 1, this helps the AHJ understand that a single smoke detector is not the intent of the Code.
3. Exception 2 is confusing. Smoke detectors used to control a static ceiling radiation damper (which are 99+% of the time activated by use of a fusible link) does more harm than good. Exception 2 should be deleted. Since proponents of FS-93-21 and FS94-21 now want to remove ALL 3 Exceptions, one can conclude that we are all in agreement to remove Exception 2.
4. Exceptions 1 & 3 for when static ceiling radiation dampers can be used in "dynamic" applications are important and should remain in the code. Other methods of controlling an HVAC system to shut down in the event of fire are expected to be developed in the future. As new methods become more common place this Exceptions section can be modified to provide even more valuable guidance for system designers, contractors and AHJ's.

Bibliography: CABS.GuideInfo - Ceiling Dampers (UL Product iQ website)
Fire performance measured by UL 263 is based upon the assumption that **air movement will be effectively stopped at the start of a fire.** Ceiling dampers intended for use in HVAC systems where the airflow is operational at the time of a fire, such as in a smoke-control system, or from other situations in which the fan system is operational at the time of a fire, are investigated for dynamic closure. **Ceiling dampers intended for use where the air movement is effectively stopped at the start of a fire are not required to be investigated for dynamic closure.**

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Changes proposed are for clarification purposes only.

Staff Analysis: The public comments on Code Change Proposals FS93-21 and FS95-21 address requirements in a contradicting manner. FS93-21 PC1 proposes deleting the exceptions in Section 717.6.2.1.2, Static systems. FS95-21 PC1 proposes keeping exceptions 1 and 3 in Section 717.6.2.1.2, Static systems. The eligible ICC voting members are urged to make their intentions clear with their actions on these proposals.

Public Comment# 2847

FS101-21

Proposed Change as Submitted

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

2021 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 and Appendix 4 of AISC 360.
4. Exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC NDS.

Reason: ANSI/AISC 360-16 *Specification for Structural Steel Buildings* is a consensus developed standard that applies to the design, fabrication, and erection of structural steel systems. Appendix 4 contains provisions for the design and evaluation of structural steel components, systems, and frames under fire conditions, and it includes methods of design to determine fire resistance or fire resistance rated protection (a) by analysis and (b) by qualification testing. The proposed revision to Section 722.1 will direct users to Appendix 4 for the steel-specific calculation procedures for fire resistance ratings. We are proposing to use this pointer method as it mirrors the other current pointer methods by the concrete, masonry, and timber provisions that appear in Section 722.1.
The upcoming 2022 edition of ANSI/AISC 360 will further consolidate existing steel-related provisions from other standards into one location. This will allow users to refer to one source for all steel-related calculation procedures for structural design and evaluation for design fire scenarios.

Bibliography: There are four attached files to this code change proposal. They are:
AISC-360-2022-Appendix-4-Prone-Draft

AISC-360-2022-Change-List-Section-12-Prone-Draft

AISC-360-2022-Summary-of-Revisions

AISC-360-2022-Description-of-Appendix-4

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Any cost associated with this proposal will be borne at the owner's project requirement and/or design stages of a building project. Incorporating ANSI/AISC 360 Appendix 4 will provide the user with a greater number of options for achieving the required, or program required, minimum for fire resistance. In addition, this reference will allow the user the opportunity to examine and design more effectively through an efficient selection of fire protection materials versus choosing the conservative approach as shown in the prescriptive provisions of the building code. It will be up to the building owner to choose a method to apply in order to determine if the cost of construction will increase or decrease.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee determined the proposal provides another option for fire resistance calculations, but it needs more work. The committee suggested including more reason statement language for non-structural engineers. The proponent is encouraged to look into a specific section of AISC instead of referencing the entire Appendix 4. (Vote: 13-0)

Individual Consideration Agenda

Public Comment 1:

IBC: 722.1

Proponents: Kevin LaMalva, representing Self requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

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 and Section 4.3 of AISC 360 Appendix 4.
4. Exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC NDS.

Commenter's Reason: At the ICC Code Action Hearings, the originally submitted FS101-21 Proposal was unanimously disapproved by the ICC Fire Safety Committee (13-0). To address the many concerns this proposal raises, I propose the modification contained herein (FS101-21-LAMALVA-1).

FS101-21-LAMALVA-1 serves as a key clarification for the originally submitted FS101-21 Proposal. Although the originally submitted FS101-21 Proposal has some validity, it must be fixed to prevent gross misinterpretation and unintended consequences in practice. Notably, the originally submitted FS101-21 Proposal is seriously flawed because it lacks a section clarification that would inappropriately introduce performance-based structural engineering (PBSE) provisions into IBC Section 722. AISC 360 Appendix 4 contains sections pertaining to both analytical methods to calculate fire resistance as well as PBSE under fire conditions based upon structural engineering limit states. As deliberated within the ICC FCAC Working Group on PBSE for fire conditions that I co-chaired over an approximately two-year period, PBSE provisions based on structural engineering limit states and realistic growth and decay fire exposures do not belong in IBC Section 722. Also, the originally submitted FS101-21 Proposal would be in conflict with the Society of Fire Protection Engineers (SFPE) Core Competencies Guide which states that “The prescriptive compliance method relates to the qualification and prescription of structural fire protection as measured by the level of fire resistance, including the understanding of fire testing qualification, equivalence calculations per fire testing and its specific acceptance criteria, and explicit simulation of fire testing (if permissible)” and that “Structural fire [design] relates to the explicit design of structural systems to adequately endure thermal load effects from structural design fires based on specific performance objectives. This alternative method requires participation by a structural engineer.” Hence, the originally submitted FS101-21 Proposal would create an unnecessary conflict and confuse both fire protection engineers and structural engineers alike. FS101-21-LAMALVA-1 rectifies the critical flaw of the originally submitted FS101-21 Proposal, which does not specifically identify Section 4.3 of AISC 360 Appendix 4 exclusively - the section of AISC 360 Appendix 4 that specifically pertains to analytical methods to calculate fire resistance. Hence, I propose FS101-21-LAMALVA-1 for approval, and strongly urge disapproval of the originally submitted FS101-21 Proposal.

Bibliography: SFPE Recommended Minimum Technical Core Competencies for the Practice of Fire Protection Engineering, Society of Fire Protection Engineers, Bethesda, Maryland, 2018

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Any cost associated with this proposal will be borne at the owner’s project requirement and/or design stages of a building project

Public Comment# 2241

FS102-21

Proposed Change as Submitted

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

TABLE 722.2.1.4(1) MULTIPLYING FACTOR FOR FINISHES ON NONFIRE-EXPOSED SIDE OF CAST-IN-PLACE OR PRECAST CONCRETE WALL

TYPE OF FINISH APPLIED TO CONCRETE OR CONCRETE MASONRY WALL	TYPE OF AGGREGATE USED IN CONCRETE OR CONCRETE MASONRY			
	Concrete: siliceous or carbonate concrete masonry: siliceous or carbonate; solid claybrick	Concrete: sand-lightweight concrete masonry: clay tile; hollow clay brick; concrete masonry units of expanded shale and < 20% sand	Concrete: lightweight concrete masonry: concrete masonry units of expanded shale, expanded clay, expanded slag, or pumice < 20% sand	Concrete masonry: concrete masonry units of expanded slag, expanded clay, or pumice
Portland cement-sand plaster	1.00	0.75[a]	0.75[a]	0.50[a]
Gypsum-sand plaster	1.25	1.00	1.00	1.00
Gypsum-vermiculite or perlite plaster	1.75	1.50	1.25	1.25
Gypsum wallboard	3.00	2.25	2.25	2.25

For SI: 1 inch = 25.4 mm.

a. For Portland cement-sand plaster $^5/_8$ inch or less in thickness and applied directly to the concrete or concrete masonry on the nonfire-exposed side of the wall, the multiplying factor shall be 1.00.

TABLE 722.2.1.4(2) TIME ASSIGNED TO FINISH MATERIALS ON FIRE-EXPOSED SIDE OF CAST-IN-PLACE OR PRECAST CONCRETE WALL

FINISH DESCRIPTION	TIME[b] (minutes)
Gypsum wallboard	
3/8 inch	10
1/2 inch	15
5/8 inch	20
2 layers of 3/8 inch	25
1 layer of 3/8 inch, 1 layer of 1/2 inch	35
2 layers of 1/2 inch	40
Type X gypsum wallboard	
1/2 inch	25
5/8 inch	40
Portland cement-sand plaster applied directly to concrete masonry	See Note a
Portland cement-sand plaster on metal lath	
3/4 inch	20
7/8 inch	25
1 inch	30
Gypsum sand plaster on 3/8-inch gypsum lath	
1/2 inch	35
5/8 inch	40
3/4 inch	50
Gypsum sand plaster on metal lath	
3/4 inch	50
7/8 inch	60
1 inch	80

For SI: 1 inch = 25.4 mm.

a. The actual thickness of Portland cement-sand plaster, provided that it is 5/8 inch or less in thickness, shall be permitted to be included in determining the equivalent thickness of the masonry for use in Table 722.3.2.

b. The time assigned is not a finish rating.

Reason: Design professionals may cite Table 722.2.1.4(2) as justification for the added fire-resistance from one layer of 5/8 inch Type X gypsum wallboard to one side of a wood stud or steel stud wall assembly to increase the overall rating of the assembly by 40 minutes because this is the first table that references gypsum wallboard protection. However, the charging language in Section 722.2.1.4 states these time values are only applicable to cast-in-place or precast concrete walls. Section 722.6 provides more appropriate guidance.
The first part of this proposal is to modify the titles of Tables 722.2.1.4 (1) and 722.2.1.4 (2) and add clarifying language that these tables only apply to cast-in-place and precast concrete walls. This clarification in the title ensures that the reader understands that these time values can only be used for concrete type walls.

The second part of this proposal is to add a note to Table 722.2.1.4 (2) stating that the times found in the table are not associated with the finish ratings, as defined in the front of the UL Fire Resistance Directory. This note was taken directly from Table 722.6.2 (1). UL Designs have shown that the finish rating of 5/8 inch Type X gypsum wallboard is closer to 20-24 minutes rather than the 40 minutes assumed by the client. UL Design U332 states the finish rating of a single layer 5/8 inch Type X gypsum wallboard as 23 minutes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There will be no cost impact associated with this proposal as these changes are clarification in nature.

FS102-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee has several concerns with modifying table 722.2.1.4(1) title to include " Cast-in-place or precast concrete". CMU is included in the table but is not included in the proposed table title. The change does not correspond with the material shown in table 722.2.1.4(1). The proposal also creates a disconnect with the text in table 722.2.1.4(1). (Vote: 13-0)

FS102-21

Individual Consideration Agenda

Public Comment 1:

IBC: TABLE 722.2.1.4(2)

Proponents: Daniel Martin, representing Jensen Hughes (dmartin@jensenhughes.com) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

TABLE 722.2.1.4(2) TIME ASSIGNED TO FINISH MATERIALS ON FIRE-EXPOSED SIDE OF WALL[a]

FINISH DESCRIPTION	TIME[b] (minutes)
Gypsum wallboard	
$^3/_8$ inch	10
$^1/_2$ inch	15
$^5/_8$ inch	20
2 layers of $^3/_8$ inch	25
1 layer of $^3/_8$ inch, 1 layer of $^1/_2$ inch	35
2 layers of $^1/_2$ inch	40
Type X gypsum wallboard	
$^1/_2$ inch	25
$^5/_8$ inch	40
Portland cement-sand plaster applied directly to concrete masonry	See Note ~~a~~ c
Portland cement-sand plaster on metal lath	
$^3/_4$ inch	20
$^7/_8$ inch	25
1 inch	30
Gypsum sand plaster on $^3/_8$-inch gypsum lath	
$^1/_2$ inch	35
$^5/_8$ inch	40
$^3/_4$ inch	50
Gypsum sand plaster on metal lath	
$^3/_4$ inch	50
$^7/_8$ inch	60
1 inch	80

For SI: 1 inch = 25.4 mm.

a. This table applies to precast concrete, cast-in-place concrete, or masonry walls.

b. The time assigned is not a finish rating.

~~a~~ c. The actual thickness of Portland cement-sand plaster, provided that it is $^5/_8$ inch or less in thickness, shall be permitted to be included in determining the equivalent thickness of the masonry for use in Table 722.3.2.

Commenter's Reason: The intent of the original proposal attempted to accomplish two things: specify that Tables 722.2.1.4(1) and 722.2.1.4(2) were to only be used for concrete and masonry walls and add a note that the time values in Table 722.2.1.4(2) were not actual finish rating times. This was an attempt to limit confusion with wood stud framed walls membrane protection times which are found Table 722.6.2(1). The committee and opposition speakers did not oppose the addition of the finish rating note to the end of the table. Opposition speakers were in favor of adding in the finish rating note to match Table 722.6.2(1). The committee and opposition stated that the proposed title changes did not successfully capture all applicable concrete and masonry wall materials, specifically concrete masonry type materials.
This public comment was developed in cooperation with some of those that spoke in opposition to the original proposal. Instead of changing the titles in both tables, this public comment will only modify Table 722.2.1.4(2) by adding a note to clarify its applicability to concrete and concrete masonry based wall construction. The contents of Table 722.2.1.4(1) clearly show its applicability to concrete and masonry wall types and will not be modified. This new note will successfully capture the wall construction materials that were omitted in the original proposal. The finish rating note will remain the same as what was originally proposed. As a formatting clarification, the Note numbering has also been updated.

I urge your support of overturning the committee action of Disapproval and vote for As Modified by this public comment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There will be no cost impact associated with this proposal as these changes are clarification in nature.

Public Comment# 2732

FS104-21

Proposed Change as Submitted

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

2021 International Building Code

Revise as follows:

TABLE 722.6.2(1) TIME ASSIGNED TO WALLBOARD MEMBRANES ON WOOD FRAME[a, b, c, d, e]

DESCRIPTION OF FINISH	TIME[e, f] (minutes)
$^3/_8$-inch wood structural panel bonded with exterior glue	5
$1^5/_{32}$-inch wood structural panel bonded with exterior glue	10
$1^9/_{32}$-inch wood structural panel bonded with exterior glue	15
$^3/_8$-inch gypsum wallboard	10
$^1/_2$-inch gypsum wallboard	15
$^5/_8$-inch gypsum wallboard	30
$^1/_2$-inch Type X gypsum wallboard	25
$^5/_8$-inch Type X gypsum wallboard	40
Double $^3/_8$-inch gypsum wallboard	25
$^1/_2$-inch + $^3/_8$-inch gypsum wallboard	35
Double $^1/_2$-inch gypsum wallboard	40

For SI: 1 inch = 25.4 mm.

a. These values apply only where membranes are installed on framing members that are spaced 16 inches o.c. or less.

b. Gypsum wallboard installed over framing or furring shall be installed so that all edges are supported, except $^5/_8$-inch Type X gypsum wallboard shall be permitted to be installed horizontally with the horizontal joints staggered 24 inches each side and unsupported but finished.

c. On wood frame floor/ceiling or roof/ceiling assemblies, gypsum board shall be installed with the long dimension perpendicular to framing members and shall have all joints finished.

d. The membrane on the unexposed side shall not be included in determining the fire resistance of the assembly. Where dissimilar membranes are used on a wall assembly, the calculation shall be made from the least fire-resistant (weaker) side.

e. *Fire-resistance ratings* calculated for assemblies using this table shall be limited to not more than one hour. ~~The time assigned is not a finished rating.~~

f. The time assigned is not a finished rating.

Reason: This proposal inserts language to clarify the use of this table. Although this information is already stated in Section 7.6, it is far removed from the table itself (by 10 pages in the 2018 edition, for example). If a user simply opens the code book to this table, they may miss this important information.
Specifically, this proposal adds the words “on wood frame” to the title, along with a footnote stating the limitations on fire resistance ratings calculated using this table.

Again, this is not new information. It is already in Section 7.6, but needs to be restated in the table for greater visibility.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply adds some clarification to the table with no change in requirements.

FS104-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee determined clarification is not needed for table 722.6.2(1). The requirements are clarified in Section 722.6.1.1. Section 722.6.1.1 specifies that Fire-resistance ratings calculated for assemblies using the methods in Section 722.6 shall be limited to not more than 1 hour. (Vote: 13-0)

FS104-21

Individual Consideration Agenda

Public Comment 1:

IBC: TABLE 722.6.2(1)

Proponents: Tim Earl, representing The Gypsum Association (tearl@gbhint.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

TABLE 722.6.2(1) TIME ASSIGNED TO WALLBOARD MEMBRANES ON WOOD FRAME[a, b, c, d, ~~e~~]

DESCRIPTION OF FINISH	TIME[e, f] (minutes)
$^3/_8$-inch wood structural panel bonded with exterior glue	5
$1^5/_{32}$-inch wood structural panel bonded with exterior glue	10
$1^9/_{32}$-inch wood structural panel bonded with exterior glue	15
$^3/_8$-inch gypsum wallboard	10
$^1/_2$-inch gypsum wallboard	15
$^5/_8$-inch gypsum wallboard	30
$^1/_2$-inch Type X gypsum wallboard	25
$^5/_8$-inch Type X gypsum wallboard	40
Double $^3/_8$-inch gypsum wallboard	25
$^1/_2$-inch + $^3/_8$-inch gypsum wallboard	35
Double $^1/_2$-inch gypsum wallboard	40

For SI: 1 inch = 25.4 mm.

a. These values apply only where membranes are installed on framing members that are spaced 16 inches o.c. or less.

b. Gypsum wallboard installed over framing or furring shall be installed so that all edges are supported, except $^5/_8$-inch Type X gypsum wallboard shall be permitted to be installed horizontally with the horizontal joints staggered 24 inches each side and unsupported but finished.

c. On wood frame floor/ceiling or roof/ceiling assemblies, gypsum board shall be installed with the long dimension perpendicular to framing members and shall have all joints finished.

d. The membrane on the unexposed side shall not be included in determining the fire resistance of the assembly. Where dissimilar membranes are used on a wall assembly, the calculation shall be made from the least fire-resistant (weaker) side.

~~e. *Fire-resistance ratings* calculated for assemblies using this table shall be limited to not more than one hour.~~

e.~~f.~~ The time assigned is not a finished rating.

Commenter's Reason: This proposal is necessary to address confusion with the application of this table. We often receive calls from people trying to apply this table to assemblies other than wood.
This public comment deletes the new footnote proposed in the original proposal, based on conversations with opponents. The text of 722.6 already contains this information, so it is not necessary to repeat it here in the table.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment and code change are simply a clarification, with no impact on cost.

Public Comment# 2626

FS108-21

Proposed Change as Submitted

Proponents: Shamim Rashid-Sumar, National Ready Mixed Concrete Association, representing National Ready Mixed Concrete Association (ssumar@nrmca.org); Larry Williams, representing Steel Framing Industry Association (williams@steelframingassociation.org)

2021 International Building Code

Revise as follows:

803.3 Heavy timber exemption. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3, ~~Exposed~~ 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.

Reason: The intent of this code change is to require exposed portions of building elements in buildings of Type IV construction to comply with the interior finish requirements of Chapter 8, unless the building is protected by automatic sprinklers. Exposed timber building elements in interior exit stairways, interior exit ramps, and exit passageways will continue to meet the interior finish requirements of Chapter 8, regardless of sprinkler protection.
Based on revisions in the 2018 edition of the IBC, exposed portions of building elements in Type IV construction in means of egress elements such as interior exit stairways, interior exit ramps, and exit passageways are required to comply with the interior finish requirements of Chapter 8. Exposed elements of Type IV construction in these means of egress components must meet the minimum interior wall and ceiling finish requirements of Table 803.13.

With the revisions to Type IV construction in the 2021, glue-laminated or cross-laminated timber may be used to form large portions of entire interior surfaces of rooms, corridors, and enclosures that form part of the necessary access to the means of egress. These spaces should also comply with interior finish requirements, particularly in any instances where the timber elements are exposed in buildings that are not protected with automatic sprinkler protection. The revisions to Type IV construction and allowance for portions of exposed timber in the 2021 revisions of the IBC are based on the provision of automatic sprinklers in the building.

Cost Impact: The code change proposal will increase the cost of construction
The code change may result in minimal increase in the cost of construction as interior finish with a lower flame spread index required would be required in buildings not equipped with automatic sprinkler protection. However, when considering overall cost impact, the proposal may decrease costs or losses over time due to fire incidents.

FS108-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee determined that the proposed text is not clear. The reason statement does not state the hazards that need to be mitigated with this proposal. The cost impact is not minimal, as stated in the proposal. The proposal imposes a new restriction without justification. (Vote: 13-0)

FS108-21

Individual Consideration Agenda

Public Comment 1:

IBC: 803.3

Proponents: Shamim Rashid-Sumar, representing National Ready Mixed Concrete Association (ssumar@nrmca.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

803.3 Heavy timber exemption. ~~In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3, exposed~~ Exposed portions of *building elements* in Type IV-HT construction 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.

Commenter's Reason: FS108-21 is recommended for Approval As Modified By Public Comment. The public comment seeks to address the concerns of the proponent of the proposed code change regarding extension of the heavy timber exception to interior finish requirements to Type IV-A, IV-B, and IV-C construction, while addressing the committee's concerns on imposing new restrictions to Type IV-HT construction.
With the revisions to Type IV construction in the 2021 edition of the Code, glue-laminated or cross-laminated timber may be used to form large portions of entire interior surfaces of rooms, corridors, and enclosures that form part of the necessary access to the means of egress. These spaces should also comply with interior finish requirements.

The modification clarifies that the heavy timber exception in Section 803.3 applies to Type IV-HT construction, without imposing additional requirements for automatic sprinkler protection. Type IV-A, IV-B, and IV-C are required to comply with the interior finish requirements of Chapter 8.

Recommend APPROVAL AS MODIFIED BY PUBLIC COMMENT for FS108-21.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment will result in editorial changes to the code and will not increase or decrease the cost of construction.

Public Comment# 2832

FS111-21

Proposed Change as Submitted

Proponents: Tony Crimi, representing International Firestop Council

2021 International Building Code

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.

909.20.2.1 Door closers. Doors in a *smokeproof enclosure* shall be self- or automatic closing by actuation of a smoke detector in accordance with Section 716.2.6.6 and shall be installed at the floor-side entrance to the *smokeproof enclosure*. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the *smokeproof enclosure* at all levels. Smoke detectors shall be installed in accordance with Section 907.3.

Add new text as follows:

909.20.2.2 Pressurized stair and vestibule air supply.
Where the installation of a fire damper will interfere with the operation of a required smoke control system in accordance with Section 909, ducts used to supply uncontaminated air to a smokeproof enclosure shall be protected with a shaft enclosure in accordance with Section 713 or a fire resistive metallic duct assembly tested in accordance with ASTM E2816. When installed, the required rating of a duct assembly tested in accordance with ASTM E2816 shall have equal F and T ratings not less than the assembly penetrated.

Add new standard(s) as follows:

ASTM

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

ASTM E2816-20a Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

2021 International Fire Code

[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] 909.20.2.1 Door closers. Doors in a *smokeproof enclosure* shall be self-closing or automatic closing by actuation of a smoke detector in accordance with Section 716.2.6.6 of the *International Building Code* and shall be installed at the floor-side entrance to the *smokeproof enclosure*. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the *smokeproof enclosure* at all levels. Smoke detectors shall be installed in accordance with Section 907.3.

Add new text as follows:

[FS] 909.20.2.2 Pressurized stair and vestibule air supply..
Where the installation of a fire damper will interfere with the operation of a required smoke control system in accordance with Section 909, ducts used to supply uncontaminated air to a smokeproof enclosure shall be protected with a shaft enclosure in accordance with Section 713 or a fire resistive metallic duct assembly tested in accordance with ASTM E2816. When installed, the required rating of a duct assembly tested in accordance with ASTM E2816 shall have equal F and T ratings not less than the assembly penetrated.

Add new standard(s) as follows:

ASTM

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

ASTM E2816-20a Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

Reason: This proposal would add the option to install HVAC ducts installed to supply uncontaminated air for stairwell pressurization to be

protected either with a shaft in accordance with section 713, a tested system in accordance with ASTM E2816 *Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems*, or any other approved alternative means.
The ASTM E2816 standard evaluates the fire performance of metallic duct systems based on the same fire exposure, principles and criteria for fire-resistance rating that are defined in ASTM E119. The ASTM E2816 standard has the ability to test the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, and includes the penetration firestop system installed. The fire performance of pressurization ducts are evaluated by both Condition A – Horizontal, and Condition B – Vertical,, which are the test configurations appropriate for pressurization ducts. The ASTM E2816 standard was developed to establish requirements for fire resistive enclosure systems applied to metallic HVAC ducts in order to provide a tested alternate to required fire-resistance-rated shafts. When pressurization ducts are used, the protection is installed continuously from the air handling equipment to the air inlet and outlet terminals, so the penetration firestop systems installed in these ASTM E2816 protected ducts are included as part of the tested configuration A and configuration B systems. There are several systems currently Listed and in use for these applications.

Bibliography: ASTM E2816-20a, Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not mandate any particular system, but provides several options for protection of these pressurization ducts, including currently approved methods.

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2816 Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

FS111-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded disapproval as requested by the proponent to bring back in the public comment phase. (Vote: 13-0)

FS111-21

Individual Consideration Agenda

Public Comment 1:

IBC: 909.20.2, 909.20.2.1, 909.20.2.2; IFC: [BF] 909.20.2, [BF] 909.20.2.1, [FS] 909.20.2.2

Proponents: john pattillo, representing Conquest Firespray LLC requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

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.

909.20.2.1 Door closers . Doors in a *smokeproof enclosure* shall be self- or automatic closing by actuation of a smoke detector in accordance with Section 716.2.6.6 and shall be installed at the floor-side entrance to the *smokeproof enclosure*. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the *smokeproof enclosure* at all levels. Smoke detectors shall be installed in accordance with Section 907.3.

909.20.2.2 Pressurized stair and vestibule air supply . Where the installation of a fire damper will interfere with the operation of a required smoke control system in accordance with Section 909, ducts used to supply ~~uncontaminated~~ air to a smokeproof enclosure shall be protected with a shaft enclosure in accordance with Section 713 or a fire resistive metallic duct assembly tested ~~in~~ to all four conditions (A, B, C and D) in accordance with ASTM E2816. ~~When installed, the required rating of a duct assembly tested in accordance with ASTM E2816 shall have equal F and T ratings not less than the assembly penetrated.~~

[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] 909.20.2.1 Door closers . Doors in a *smokeproof enclosure* shall be self-closing or automatic closing by actuation of a smoke detector in accordance with Section 716.2.6.6 of the *International Building Code* and shall be installed at the floor-side entrance to the *smokeproof enclosure*. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the *smokeproof enclosure* at all levels. Smoke detectors shall be installed in accordance with Section 907.3.

[FS] 909.20.2.2 Pressurized stair and vestibule air supply. . Where the installation of a fire damper will interfere with the operation of a required smoke control system in accordance with Section 909, ducts used to supply ~~uncontaminated~~ air to a smokeproof enclosure shall be protected with a shaft enclosure in accordance with Section 713 or a fire resistive metallic duct assembly tested to all four conditions (A, B, C and D) in accordance with ASTM E2816. ~~When installed, the required rating of a duct assembly tested in accordance with ASTM E2816 shall have equal F and T ratings not less than the assembly penetrated.~~

Commenter's Reason: ASTM E2816 is a full-scale, fire-resistance rating test requiring an ASTM E119 compliant furnace to conduct the fire test. ASTM E2816 follows the same test protocols as ASTM E119 regarding the test's test specimen size, instrumentation and requirements for performing the fire test. In addition, ASTM E2816 requires the ductwork be pressurized or have airflow during the entire fire test. Also, fire-resistance rated ductwork must be tested to all four Conditions (A, B, C and D) in order to be code compliant and used everywhere a conventional ductwork is used in a building.
Testing all four Conditions (A, B, C and D) is required in order for the ductwork to comply with Section 707, Fire Barriers, 717 Ducts and air transfer openings and Section 712, Vertical Openings, Subsection 712.1.5, Ducts and Section 703.2.1 Nonsymmetrical wall construction, where testing both sides of all nonsymmetrical fire barriers is required.

ASTM E2816 nomenclature for all four conditions:

Condition A: Fire Outside Exposure, Horizontal Orientation

Condition B: Fire Outside Exposure, Vertical Orientation

Condition C: Fire Inside Exposure, Horizontal Orientation

Condition D: Fire Inside Exposure, Vertical Orientation

Corresponding ASTM E814 Standard Test Method for Fire Tests of Penetration Firestop Systems is also required.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The reasoning for no change in costs.
Reasoning 1:

Today, the assemblies referenced in the code require several different contractors to install a code compliant assembly:

The mechanical contractor will install hvac ductwork and fans designed to carry the air flow.

A second contractor (typically drywall) will install metal hangers and drywall to construct the 2 hour rated enclosure

The code change will eliminate the additional contractor (namely drywall)

Effects on the project costs:

A faster installation will reduce the time for the installation of the assembly

Less field personnel are necessary on the project

Less field coordination is necessary as one trade (drywall) is eliminated

Saves space as the fire rated ductwork assembly requires less physical dimension which allows easier coordination

Reasoning 2

This code change is an option for the design and construction industry.

The design and construction industry can measure the cost benefits of an assembly under several criteria

1. Is the first cost of the assembly less
2. Is the long term cost of the assembly less
3. Does the assembly take less space to install
4. Does the assembly take less time to install
5. Does the assembly take less field personnel to install

These questions are answered by the introduction of this change

Yes to items 1, 3, 4, and 5

Reasoning 3:

Because this assembly is an option the market and bidding contractors will always choose the lease expensive option and the market pricing will meet the demand

More competition will drive down costs

For example, if today the cost of a drywall enclosure to too expensive, and a fire resistant duct is chosen the market will swing towards the fire resistant ductwork assembly.

This will drive the market to the least cost solution.

Public Comment# 2670

FS113-21

Proposed Change as Submitted

Proponents: Jeffrey S. Grove, P.E. FSFPE, Jensen Hughes, representing Jensen Hughes (jgrove@jensenhughes.com)

2021 International Building Code

Revise as follows:

909.20.5 Stairway and ramp pressurization alternative. Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the vestibule is not required, provided that each *interior exit stairway* or *ramp* is pressurized to not less than 0.10 inch of water (25 Pa) and not more than 0.35 inches of water (87 Pa) in the *shaft* relative to the ~~building~~ floor of fire origin measured with all *interior exit stairway* and *ramp* doors closed under maximum anticipated conditions of stack effect and wind effect.

2021 International Fire Code

Revise as follows:

[BF] 909.20.5 Stairway and ramp pressurization alternative. Where the building is equipped throughout with an*automatic sprinkler system* in accordance with Section 903.3.1.1, the vestibule is not required, provided that each *interior exit stairway* or *ramp* is pressurized to not less than 0.10 inch of water (25 Pa) and not more than 0.35 inch of water (87 Pa) in the shaft relative to the ~~building~~ floor of fire origin measured with all *interior exit stairway* and *ramp* doors closed under maximum anticipated conditions of stack effect and wind effect.

Reason: Section 202 of the IBC defines “Building” as: Any structure utilized or intended for supporting or sheltering any occupancy.
Using term “building” as a reference point to measure pressure differentials is ambiguous. The proposed change clearly defines the reference point. In addition, this change aligns with Section 4.6 NFPA 92 which states as follows:

4.6.1 General. When stairwell pressurization systems are provided, the pressure difference between the ***smoke zone*** *and the stairwell, with zero and the design number of doors open, shall be as follows:*

(1) Not less than the minimum pressure difference specified in 4.4.2

(2) Not greater than the maximum pressure difference specified in 4.4.2.2

NFPA 92, Section 3.3.25.2 defines Smoke Zone as: The smoke control zone in which the fire is located.

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

FS113-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded the proposed text of "floor of fire origin" is confusing compared to checking any and every floor in practice. The general practice for stairwell pressurization systems is to check the pressure from a stairway ending to the floor or landing outside the door. (Vote: 13-0)

FS113-21

Individual Consideration Agenda

Public Comment 1:

IBC: 909.20.5; IFC: [BF] 909.20.5

Proponents: Jeffrey Grove, representing Jensen Hughes (jgrove@jensenhughes.com) requests As Modified by Public Comment

Replace as follows:

2021 International Building Code

909.20.5 Stairway and ramp pressurization alternative . Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the vestibule is not required, provided that each *interior exit stairway* or *ramp* is pressurized to not less than 0.10 inch of water (25 Pa) and not more than 0.35 inches of water (87 Pa) in the *shaft* relative to the ~~building~~ floor(s) of fire origin measured with all *interior exit stairway* and *ramp* doors closed under maximum anticipated conditions of stack effect and wind effect.

2021 International Fire Code

[BF] 909.20.5 Stairway and ramp pressurization alternative . Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the vestibule is not required, provided that each *interior exit stairway* or *ramp* is pressurized to not less than 0.10 inch of water (25 Pa) and not more than 0.35 inch of water (87 Pa) in the shaft relative to the ~~building~~ floor(s) of fire origin measured with all *interior exit stairway* and *ramp* doors closed under maximum anticipated conditions of stack effect and wind effect.

Commenter's Reason: The proposed change does not modify the intent of the code, nor decrease the level of protection. The proposed modification clarifies the intent of stairway and ramp pressurization: to prevent smoke migration from the floor of origin (floors of origin, in the case of non-separated or interconnected floors) into the enclosed pressurized stairway or ramp. This modification is also consistent with the code intent to assume only a single fire occurrence in a building as considered design scenarios. As floor assemblies or floor/ceiling assembles form a smoke barrier between floors, a single fire scenario would occur on one floor. The exception is when a fire occurs on a floor that is non-rated and/or atmospherically connected to other floors. Where more than one floor is atmospherically connected, the pressure differentials must be maintained on all interconnected floors. Where floor, atrium or zoned smoke control is provided, the pressure differentials must be maintained relative to all floor(s) of fire origin and/or smoke zone(s) of origin.
There are multiple conditions that can impact the ability to obtain the minimum pressure differentials, without exceeding the maximum, on all levels. Other systems such as HVAC systems with large air changes typically provided in server rooms, elevator pressurization systems, kitchen exhaust systems, etc. will adversely impact the ability to maintain pressure differentials within the stair enclosures relative to all floors simultaneously on any given floor(s) of origin.

While pressure differentials to enclosed stairs/ramps may be achieved on all floors within a building, mitigating the impact generally would require multiple dampers and complex sequence of operation that jeopardize the reliability of the system, particularly for very tall high-rise buildings.

The term "floor(s) of fire origin" is consistent with the fact that every connected story of a pressurized stair is a potential fire origin and a design scenario. Each and every individual story that the stair connects to needs to be a design scenario for the stair pressurization system, the proposed change does not intend to change that. The intent of the proposed change is to clarify that system sequencing and interaction with other normal/emergency systems is most critical for the pressure differential between the stairway and a given design origin floor or group of floors, as determined by the designer and authority

Requiring maintenance of minimum pressures on all floors assumes there could be fire events on multiple floors simultaneously and/or substantial smoke migration across fire-resistance-rated floor separations. This contradicts a fundamental intent of Section 909 which is to consider only one fire event at a time to determine operational sequences. In addition, this change aligns with Section 4.6 NFPA 92 (2015 Edition) which states as follows:

*4.6.1*General. When stairwell pressurization systems are provided, the pressure difference between the* ***smoke zone*** *and the stairwell, with zero and the design number of doors open, shall be as follows:*

(1) Not less than the minimum pressure difference specified in 4.4.2

(2) Not greater than the maximum pressure difference specified in 4.4.2.2

NFPA 92, Section 3.3.25.2 defines Smoke Zone as: The smoke control zone in which the fire is located.

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

Public Comment# 2846

FS117-21

Proposed Change as Submitted

Proponents: Tony Crimi, representing International Firestop Council

2021 International Building Code

Revise as follows:

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

Exception: Ducts tested and listed in accordance with ASTM E2816 having equal F andT ratings not less than the assembly being penetrated.

Add new standard(s) as follows:

ASTM

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

ASTM E2816-20a Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

2021 International Fire Code

Revise as follows:

[BF] 909.21.3 Ducts for system. Any duct system that is part of the pressurization system shall be protected with the same *fire-resistance rating* as required for the elevator shaft enclosure.

Exception: Ducts tested and listed in accordance with ASTM E2816 having equal F and T ratings not less than the assembly being penetrated.

Add new standard(s) as follows:

ASTM

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

ASTM E2816-20a Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems

Reason: This proposal adds the option to install tested and Listed pressurization ducts that supply uncontaminated air for stairwell pressurization to be enclosed with an ASTM E2816 tested system.
The ASTM E2816 standard evaluates the fire performance of metallic duct systems based on the same fire exposure, principles and criteria for fire-resistance rating that are defined in ASTM E119. The ASTM E2816 Standard has the ability to test the fire performance of HVAC ducts for both supply (pressurization) and return air, in the vertical and horizontal orientation, and includes the penetration firestop system installed. The fire performance of pressurization ducts are evaluated by both Condition A – Horizontal, and Condition B – Vertical,, which are the test configurations appropriate for pressurization ducts.

The ASTM E2816 standard was developed to establish requirements for fire resistive enclosure systems applied to metallic HVAC ducts in order to provide a tested alternate to required fire-resistance-rated shafts. When these pressurization ducts are used, the protection is installed continuously from the air handling equipment to the air inlet and outlet terminals, so the penetration firestop systems installed in these ASTM E2816 protected ducts are included as part of the tested Condition A and Condition B systems. There are several systems currently Listed and in use for these applications.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal only adds an additional option to existing requirements.

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2816 Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems, with regard to some of the key ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before March 20, 2021.

FS117-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproval is based on the proponent's request. (Vote: 13-0)

FS117-21

Individual Consideration Agenda

Public Comment 1:

IBC: 909.21.3; IFC: [BF] 909.21.3

Proponents: john pattillo, representing Conquest Firespray LLC requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

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

Exception: Ducts tested ~~and~~ to all four conditions (A, B, C, and D) ~~and listed~~ in accordance with ASTM E2816 ~~having equal F and T ratings not less than the assembly being penetrated~~.

2021 International Fire Code

[BF] 909.21.3 Ducts for system. Any duct system that is part of the pressurization system shall be protected with the same *fire-resistance rating* as required for the elevator shaft enclosure.

Exception: Ducts tested ~~and~~ to all four conditions (A, B, C and D) ~~and listed~~ in accordance with ASTM E2816 ~~having equal F and T ratings not less than the assembly being penetrated~~.

Commenter's Reason: ASTM E2816 is a full-scale, fire-resistance rating test requiring an ASTM E119 compliant furnace to conduct the fire test. ASTM E2816 follows the same test protocols as ASTM E119 regarding the test's test specimen size, instrumentation and requirements for performing the fire test. In addition, ASTM E2816 requires the ductwork be pressurized or have airflow during the entire fire test. Also, fire-resistance rated ductwork must be tested to all four Conditions (A, B, C and D) in order to be code compliant and used everywhere a conventional ductwork is used in a building.
Testing all four Conditions (A, B, C and D) is required in order for the ductwork to comply with Section 707, Fire Barriers, 717 Ducts and air transfer openings and Section 712, Vertical Openings, Subsection 712.1.5, Ducts and Section 703.2.1 Nonsymmetrical wall construction, where testing both sides of all nonsymmetrical fire barriers is required.

ASTM E2816 nomenclature for all four conditions:

Condition A: Fire Outside Exposure, Horizontal Orientation

Condition B: Fire Outside Exposure, Vertical Orientation

Condition C: Fire Inside Exposure, Horizontal Orientation

Condition D: Fire Inside Exposure, Vertical Orientation

Corresponding ASTM E814 Standard Test Method for Fire Tests of Penetration Firestop Systems is also required.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The reasoning for no change in costs.
Reasoning 1:

Today, the assemblies referenced in the code require several different contractors to install a code compliant assembly:

The mechanical contractor will install hvac ductwork and fans designed to carry the air flow.

A second contractor (typically drywall) will install metal hangers and drywall to construct the 2 hour rated enclosure

The code change will eliminate the additional contractor (namely drywall)

Effects on the project costs:

A faster installation will reduce the time for the installation of the assembly

Less field personnel are necessary on the project

Less field coordination is necessary as one trade (drywall) is eliminated

Saves space as the fire rated ductwork assembly requires less physical dimension which allows easier coordination

Reasoning 2

This code change is an option for the design and construction industry.

The design and construction industry can measure the cost benefits of an assembly under several criteria

1. Is the first cost of the assembly less
2. Is the long term cost of the assembly less
3. Does the assembly take less space to install
4. Does the assembly take less time to install
5. Does the assembly take less field personnel to install

These questions are answered by the introduction of this change

Yes to items 1, 3, 4, and 5

Reasoning 3:

Because this assembly is an option the market and bidding contractors will always choose the lease expensive option and the market pricing will meet the demand

More competition will drive down costs

For example, if today the cost of a drywall enclosure to too expensive, and a fire resistant duct is chosen the market will swing towards the fire resistant ductwork assembly. This will drive the market to the least cost solution.

Public Comment# 2672

FS121-21

Proposed Change as Submitted

Proponents: Christopher Athari, Hoover Treated Wood Products, representing Hoover Treated Wood Products (cathari@frtw.com); James Gogolski, representing self (jgogolski@frtw.com)

2021 International Building Code

Revise as follows:

1402.5 Water-resistive barriers. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.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. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* complies with the following:

   2.1 A peak heat release rate of less than 150 kW/m2, a total heat release of less than 20 MJ/m2 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/m2.

   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 shall comply with 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 listing for an FRTW lumber and plywood assembly. Demonstrating compliance with NFPA 285 (UL-EWS0045).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. There is a potential for construction savings where FRTW use was denied due to existence of a combustible water-resistive barrier.

FS121-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee agreed with the reason statement on the need to be careful not to repeat building cladding fires, such as the Grenfell Tower fire in London, UK. The committee's disapproval is based on the charging statement of section 1402.5 to meet section 703.3 or to have an exception based on having one combustible component based on the previous testing. The fire-retardant-treated wood is not predictable based on testing since NFPA 285 is a test for the entire exterior wall assembly. The proponent could rewrite the whole exception by addressing the condition of only having a combustible weather barrier and a fire-retardant-treated wood. The proponent needs to have backup data. (Vote: 11-1)

FS121-21

Individual Consideration Agenda

Public Comment 1:

IBC: 1402.5

Proponents: James Gogolski, representing Hoover Treated Wood Products, Inc. (jgogolski@frtw.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1402.5 Water-resistive barriers . *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.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. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* complies with the following:

   2.1 A peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg when tested on specimens at the thickness intended for use, in accordance with ASTM 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 complying with the acceptance criteria of NFPA 285,~~and the water-resistive barrier shall comply with Exception 1 or Exception 2.~~ where the fire-retardant-treated wood and the water-resistive barrier constitute the only combustible wall components, and where the water-resistive barrier complies with the following:

   3.1. A peak heat release rate of less than 150 kW/m2, a total heat release of less than 20 MJ/m2 and an effective heat of combustion of less than 18MJ/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/m2.

   3.2. 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.

Commenter's Reason: This section requires exterior walls to be tested to NFPA 285 when a combustible water resistive barrier (WRB) is used underneath wall cladding. Fundamentally, this requirement is an exterior surface or undercladding propagation-of-fire concern as demonstrated by Exception 1, which exempts testing requirements when the WRB is the only combustible material in the noncombustible wall.
The proposed exception extends the same exception to Type III exterior walls employing fire-retardant-treated wood (FRTW) construction that is currently allowed for noncombustible construction. These FRTW walls are required to comply with NFPA 285, exempting only the thin (low-fuel) WRB from being part of the test in the exception. The reason being is that each thin WRB used requires its own separate test with every variation of cladding considered. This additional testing adds substantial costs to construction.

The currently allowed noncombustible exception is frequently applied when gypsum board is used as the exterior sheathing in Type I and II construction when the excepted WRB is placed in contact with the face of the gypsum board. IBC Section 703.3.1 allows the facing of the gypsum

board to have up to 0.125 inch thickness of combustible material as the face. This material is then tested for 10 minutes per ASTM E84 (UL723), and if it demonstrates a maximum allowable flame spread of 50, then it is recognized for this purpose as being acceptable as a noncombustible material.

In the case of Type III construction where FRTW is used in exterior walls, the WRB is placed in contact with the FRTW sheathing that is tested for 30 minutes per ASTM E84 (UL723) with a maximum allowable flame spread of 25. As required in IBC Section 2303.2, the FRTW's test is three times the duration required for gypsum board and must have no more than half of the 50 flame spread required by the code for gypsum board.

Therefore, since the surface burning performance of FRTW is required to be substantially more restrictive than gypsum board, it seems entirely reasonable to allow the same exception allowing thin membrane WRBs with extremely limited fire propagation potential.

This is a fire-resistance-rated and tested assembly. Most fire-resistant assemblies are not tested with a WRB. In these cases, the WRB is allowed by the exception and is considered an insignificant source of fuel or energy for combustion.

Exceptions 1 and 2 in this section allow a product with a flame spread of 50 to be used for this thin (low-fuel) sheathing. We are requesting the use of FRTW with a maximum flame spread of 25 to be allowed the same exception.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There is a potential for construction cost savings because fire-retardant-treated wood will not need to be tested with every possible combination of WRBs and cladding types

Public Comment# 2840

FS123-21

Proposed Change as Submitted

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com)

2021 International Building Code

Add new text as follows:

1402.5 Vertical and lateral flame propagation.
Exterior wall assemblies of buildings of Type I, II, III or IV construction that contain a combustible *exterior wall covering*, combustible *water-resistive barrier*, or combustible insulation shall be tested in accordance with and comply with the acceptance criteria of NFPA 285 and shall comply with sections 1402.5.1 though 1402.5.5, as applicable. Combustibility shall be determined in accordance with Section 703.3. Plastics, other than *foam plastic insulation*, shall comply with the applicable provisions of Chapter 26.

1402.5.1 Water-resistive barriers.
Exterior wall assemblies containing a combustible water-resistive barrier shall comply with Section 1402.6.

1402.5.2 Metal Composite Material (MCM) exterior wall coverings.
Exterior wall assemblies greater than 40 feet in height above grade plane with an MCM exterior wall covering shall comply with Section 1406.

1402.5.3 Exterior Insulation and Finish Systems (EIFS) exterior wall coverings.
Exterior wall assemblies of any height above grade plane with an EIFS exterior wall covering shall comply with Section 1407.

1402.5.4 High-Pressure Decorative Exterior-Grade Compact Laminate (HPL) exterior wall coverings.
Exterior wall assemblies greater than 40 feet in height above grade plane with an HPL exterior wall covering shall comply with Section 1408.

1402.5.5 Foam Plastic Insulation.
Exterior wall assemblies of any height above grade plane containing foam plastic insulation shall comply with Section 2603.

Reason: This is a clarification of the general requirement for testing of vertical and lateral flame propagation of noncombustible exterior wall assemblies containing combustible components. Evaluation of vertical and lateral flame propagation in accordance with NFPA 285 is applicable to all combustible exterior wall assemblies where permitted for installation in or on exterior walls of Type I, II, III, IV construction. Current IBC Section 1402.5 only describes the case of water-resistive barriers with other combustible wall coverings and components addressed in other sections Chapter 14 and 26. This proposed code change also provides references to sections containing more specific information and applicable requirements regarding the application of NFPA 285 testing

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change existing performance or construction requirements.

FS123-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproval is based on the proponent's request and based on committee action on FS122-21. (Vote: 12-0)

FS123-21

Individual Consideration Agenda

Public Comment 1:

IBC: 1402.5, 1402.5.1, 1402.5.2, 1402.5.3, 1402.5.4, 1402.5.5, 1402.5.6 (New)

Proponents: Jeffrey Greenwald, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1402.5 Vertical and lateral flame propagation . Exterior wall assemblies of buildings of Type I, II, III or IV construction that contain a combustible *exterior wall covering*, combustible insulation , or combustible *water-resistive barrier*, ~~or combustible insulation shall be tested in accordance with and comply with the acceptance criteria of NFPA 285 and~~ shall comply with sections 1402.5.1 though ~~1402.5.5~~ 1402.5.6, as applicable. ~~Combustibility shall be determined in accordance with Section 703.3. Plastics, other than *foam plastic insulation*, shall comply with the applicable provisions of Chapter 26.~~ Where compliance with NFPA 285 and associated acceptance criteria is required in Sections 1402.5.1 through 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 barriers . Exterior walls ~~wall assemblies assemblies~~ containing a combustible water-resistive barrier shall comply with Section 1402.6.

1402.5.2 Metal Composite Material (MCM) ~~exterior wall coverings~~ . Exterior walls ~~wall assemblies greater than 40 feet in height above grade plane with an MCM exterior wall coveringcovering shall~~ containing MCM systems shall comply with Section 1406.

1402.5.3 Exterior Insulation and Finish Systems (EIFS) ~~exterior wall coverings~~ . Exterior walls ~~wall assemblies of any height above grade plane with an EIFS exterior wall covering~~ containing EIFS shall comply with Section 1407.

1402.5.4 High-Pressure Decorative Exterior-Grade Compact Laminate (HPL) system ~~exterior wall coverings~~ . Exterior walls ~~wall assemblies greater than 40 feet in height above grade plane with with an HPL exterior wall covering covering shall comply~~ containing an HPL system shall comply with Section 1408.

1402.5.5 Foam Plastic Insulation . Exterior walls ~~wall assemblies of any height above grade plane~~ containing foam plastic insulation shall comply with Section 2603.

1402.5.6 Insulated Metal Panels (IMP) . Exterior walls containing *insulated metal panels* shall comply with Section 1409.

Commenter's Reason: This Public Comment seeks to do two things:

1. Revise the language to be equivalent to FS122-21 that was Approved as Modified, and
2. Add an additional reference to [new] Section 1409 for insulated metal panels (IMPs).

[New] Section 1409 regarding Insulated Metal Panels (IMP) was Approved as Submitted under FS149-21 Part I. Under the [new] Section 1409, insulated metal panels (IMP) are subject to NFPA 285 testing if the core insulation is combustible. As such, adding a reference to Section 1409 is appropriate and in line with the intent of both FS122-21 and FS-123-21.

FS123-21, similar to FS122-21, was disapproved by request of the proponent. What this public comment does is incorporate the language approved with FS122-21 and adds a new section (1402.5.6) that provides that linkage for IMPs.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, EPS Industry Alliance, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, and Rmax - A Business Unit of the Sika Corporation.

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

Public Comment# 2563

FS124-21

Proposed Change as Submitted

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com)

2021 International Building Code

Add new definition as follows:

ENGINEERING ANALYSIS.
A report from an approved source or an approved agency providing an analysis of alternative building elements, components, assemblies, designs, constructions, or other identified attributes and comparing them to existing data or prescriptive designs for compliance of the alternative with identified provisions prescribed by the code or other identified standard.

Add new text as follows:

1402.7 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 engineering analysis based on NFPA 285 test data as allowed by Section 104.11.

Reason: The new proposal defines engineering analysis, a term that is widely used within the IBC. Terms used in the I-Codes include engineering evaluation, engineering assessment, engineering calculations, engineering judgement, engineering analysis, and rational analysis with “engineering analysis” used most often in the IBC. Engineering analyses are used to perform critical performance evaluation support the use of alternate materials and methods as allowed in Section 104.11.
The new section on compliance methods assists code enforcement by providing three compliance methods for those exterior wall assemblies that must be tested in accordance with NFPA 285. While the Code accepts the concept of approval-by-analysis under Section 104.11 this proposal provides specific guidance to credible sources of compliance information for required NFPA 285 testing

In the context of exterior wall assemblies of Type I – IV construction, analysis of deviations from an as-tested assembly are an acceptable means by which to support recognition of a modified assembly. All analysis or extension of results must be substantiated as being based on the fire exposure and acceptance criteria of NFPA 285. Upon submission of such documentation to the building official, the engineering analysis or engineering judgement can be approved as the basis for showing compliance with Section 2603.5.5 of the code.

Each compliance method is addressed below:

1. NFPA 285 test data, from an accredited laboratory, for the exterior wall assembly confirms specific performance of a specific assembly.

2. Designs listed by an accredited and approved agency will be based on successful NFP 285 testing of the exterior wall assembly and accompanying analysis of data.

3. Analysis of deviations in construction or material(s) from a successful NFPA 285 test using principles of fire science and fire protection engineering is an appropriate means to support recognition of an assembly where such analysis considers influences that deviation(s) will have on the performance of the tested assembly and determines the deviations will not significantly alter the full-scale results.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal clarifies methods available to designers, builders, and building officials that are acceptable to support verification and approval exterior wall assemblies regarding testing and compliance with the acceptance criteria of NFPA 285.

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded there are serious issues with the proposal and a lot of controversy with it. Section 104.11, Alternative materials, design, and methods of construction and equipment, could be used. The proposed definition of engineering analysis is not broad enough to apply to the use of the term currently in the code. The proposal could have been submitted as two different proposals for each item. (Vote: 13-0)

FS124-21

Individual Consideration Agenda

Public Comment 1:

IBC: , 1402.7

Proponents: Jeffrey Greenwald, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

~~**ENGINEERING ANALYSIS .** A report from an approved source or an approved agency providing an analysis of alternative building elements, components, assemblies, designs, constructions, or other identified attributes and comparing them to existing data or prescriptive designs for compliance of the alternative with identified provisions prescribed by the code or other identified standard.~~

1402.7 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 engineering~~ An ~~engineering~~ approved analysis based on ~~NFPA 285 test data as allowed by Section 104.11~~ 104.11. an assembly or condition tested in accordance with and meeting the acceptance criteria of NFPA 285 .

Commenter's Reason: This Public Comment is necessary to address concerns raised during opposition testimony and by committee statements supporting Disapproval. Our members believe that clarification of prescriptive compliance pathways regarding NFPA 285 provides clear and valuable guidance to all code users and for the enforcement of the Code. The three pathways described in the proposal are to the same as those prescribed and allowed for other large-scale assembly tests (often accompanied by Labeling) such as ASTM E119 / UL 263, and several other disciplines not related to fire testing or fire performance. Where this proposal differs is that it prescribes all three routes to compliance within a single section.

This Public Comment:

- Removes the Engineering Analysis term and proposed definition.
- Retains the [New] Section 1402.7, but with revisions to:
  - Remove “engineering” terminology
  - Remove reference to 104.11
  - Add clarifying language regarding the analysis is based on NFPA 285 data for a tested assembly / condition
  - Add language requiring approval of the analysis

Publications describing NFPA 285 and the use of NFPA 285 test data for analysis of assembly fire performance are included with this public comment.

We respectfully request Approval FS124-21 as Modified by this Public Comment. The modification is an improvement to the original proposal and

addresses concerns expressed during the Committee Action Hearings.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, EPS Industry Alliance, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, and Rmax - A Business Unit of the Sika Corporation.

Bibliography:

1. NFPA 285 - Extending Data with Comparative Engineering Analysis, IIBEC Interface, March 2021
2. NFPA 285 Engineering Judgements: A Practical Compliance Option, The Construction Specifier, June 2021

The link for the two articles: https://www.modernbuildingalliance.us/resources/

See labels: IIBEC Interface Article and Construction Specifier Article and use download resource button.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal clarifies existing methods available to designers, builders, and building officials that are acceptable to support verification and approval exterior wall assemblies regarding testing and compliance with the acceptance criteria of NFPA 285.

Public Comment# 2799

FS125-21

Proposed Change as Submitted

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com); Bob Zabcik, representing Metal Construction Association (MCA) (bob@ztech-consulting.com)

2021 International Building Code

Add new text as follows:

1402.8 Exterior wall veneers manufactured using combustible adhesives.
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 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, with the adhesive level at the maximum application rate intended for use. Combustibility shall be determined in accordance with Section 703.3.

Exception:

1. Walls in which the adhesive is the only combustible component and the adhesive complies with the following:
   1.1. A peak heat release rate of less than 150 kW/m2, a total heat release of less than 20 MJ/m2 and an effective heat of combustion of less than 18 MJ/kg when tested, in accordance with ASTM E1354, with the adhesive applied to a noncombustible substrate at the maximum application rate intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m2.
   1.2. 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.

Reason: This proposed new section is specific to exterior wall veneers composed of a metal core and facings that are both noncombustible materials, and the facings are laminated to the core using a combustible laminating adhesive. IBC Section 703.3.1 on noncombustible materials does not address the condition of combustible adhesives used to adhere a noncombustible surfacing (i.e. facings) to a noncombustible base (i.e. a metal core). The language of Section 703.3.1 has, in practice, been interpreted such that the scope of the exception includes veneer materials / products with a noncombustible core and thin facings (noncombustible or having limited surface burning characteristics), even though a combustible adhesive present.

Interpreting Section 703.3.1 in such manner has resulted in determinations that the veneer materials described above are considered noncombustible and, therefore, exterior wall coverings using these materials are not required to be tested in accordance with, or comply with the acceptance criteria of, NFPA 285 even though the veneer may contain a combustible material (the adhesive) of unknown and unregulated flammability. The IBC does not currently contain provisions regulating the flammability of combustible adhesives when used in exterior wall applications. The proposed change establishes a flame propagation requirement for this type of exterior veneer when used in exterior wall covering applications.

The proposal contains an exception to required NFPA 285 testing for the condition where the combustible adhesive is the only combustible component in the exterior wall assembly and the adhesive complies with specific flammability limitations and surface burning characteristics. The flammability limitations and surface burning characteristics prescribed in the proposed exception are equivalent to those currently recognized for the condition where a combustible water resistive barrier is the only combustible component in an exterior wall assembly.
The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

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 code change proposal will increase the cost of construction
By expanding required compliance with NFPA 285, the proposal will increase testing for a segment of this exterior wall covering putting them at a level that is consistent with other exterior wall coverings specifically identified in the IBC including Metal Composite Materials (MCM), Exterior Insulation and Finish Systems (EIFS), High-Pressure Laminates (HPL), etc.

FS125-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee disapproval is based on the committee action on FS121-21. (Vote: 11-1)

FS125-21

Individual Consideration Agenda

Public Comment 1:

IBC: 1402.8

Proponents: Jeffrey Greenwald, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com); Bob Zabcik, representing Metal Construction Association (MCA) (bob@ztech-consulting.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1402.8 Exterior wall veneers manufactured using combustible adhesives . 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 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, with the adhesive level at the maximum application rate intended for use. Combustibility shall be determined in accordance with Section 703.3.

~~**Exception:**~~

1. ~~Walls in which the adhesive is the only combustible component and the adhesive complies with the following:~~
   1.1. ~~A peak heat release rate of less than 150 kW/m2, a total heat release of less than 20 MJ/m2 and an effective heat of combustion of less than 18 MJ/kg when tested, in accordance with ASTM E1354, with the adhesive applied to a noncombustible substrate at the maximum application rate intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m2.~~
   1.2. ~~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.~~

Commenter's Reason: This proposal and public comment are necessary to address a loophole by which the use of certain exterior cladding materials containing a combustible adhesive in Type I-IV construction are not required to undergo NFPA 285 tests because they "…shall be acceptable as noncombustible…" under the Exception to Section 703.3.1. In effect, this loophole allows the unregulated use of a combustible adhesive in exterior wall veneers of Type I-IV construction. While the volume of this adhesive may be limited, it has been shown to lead to excessive flame propagation in exterior veneer uses. The proposal and this PC seek to add a prescriptive requirement for NFPA 285 testing when these materials are used in or on exterior walls of Type I-IV construction.
This Public Comment removes the proposed Exception that the committee found objectionable while retaining the prescribed requirement for NFPA 285 testing when these materials are used on exterior walls of Type I-IV construction.

The committee's reason for Disapproval was based on the Disapproval action taken on FS121-21 that sought to add an exception to NFPA 285 testing for exterior walls containing a combustible WRB and FRTW. This code proposal is actually the opposite of FS121-21 in that it seeks to add the NFPA 285 testing requirement for these metal-core with metal-faced laminated panel products using combustible adhesives.This loophole in the IBC allows exterior laminated panels to be exempt from the fire performance criteria of NFPA 285 when used on exterior walls of Type I-IV buildings greater than 40ft in height even though there is a known potential flame propagation. Metal-core panels with thin metal faces adhered using a combustible laminating adhesive have shown significant flame propagation in NFPA 285 testing, and several other large-scale tests around the world (also due to excessive vertical and lateral flame spread). These test results have led to significant limitations in the use of this product type on high-rise and even mid-rise buildings in both England and Australia.

Language contained in IBC Section 703.3.1 has been used to accept this type of material as noncombustible. This proposal does nothing to change 703.3.1 but adds a prescriptive requirement for metal core laminated panels to be tested in accordance with NFPA 285 when used as an exterior wall veneer on exterior walls for buildings taller than 40ft in height as is required for all other combustible materials (i.e., combustible WRBs, MCM, HPL, EIFS, foam plastic insulation, etc.).

In the initial proposal, the intent of the exception was to limit the amount of combustible material; as is currently allowed for walls containing only a combustible WRB. This exception has been eliminated because:

- No cone calorimeter data exists to provide a benchmark on the adhesive performance with respect to the exception criteria.
- It would be rare, if not impossible for this type of panel to be installed without the use of a WRB, so a combustible limitation based on the adhesive being the only combustible material in the exterior wall assembly is not realistic and the exceptions of Section 1402.5 would not apply; thus NFPA 285 testing would be required.

At the hearings in April, there was no opposition to this proposal. This proposal actually adds a requirement for NFPA 285 testing of what is technically a combustible cladding element; which is currently being installed as noncombustible due to the loophole in the IBC. A final comment from the committee was a reference to Grenfell Tower and that "we need to get this issue addressed correctly." That is exactly what this proposal is designed to do. Take what has been shown to be a combustible cladding material with vertical and lateral flame spread issues and require testing to NFPA 285.

We respectfully request Approval as Modified by this Public Comment.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp.,

BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, EPS Industry Alliance, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, and Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
By expanding required compliance with NFPA 285, the proposal will increase testing for a segment of this exterior wall covering putting them at a level that is consistent with other exterior wall coverings specifically identified in the IBC including Metal Composite Materials (MCM), Exterior Insulation and Finish Systems (EIFS), High-Pressure Laminates (HPL), etc.

Public Comment# 2802

FS129-21

Proposed Change as Submitted

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com)

2021 International Building Code

Revise as follows:

1403.8 Plastics. ~~Plastic panel, apron or spandrel walls as defined in this code shall not be limited in thickness, provided that such plastics and their assemblies conform to the requirements of Chapter 26 and are constructed of *approved* weather-resistant materials of adequate strength to resist the wind *loads* for cladding specified in Chapter 16.~~ Plastics intended for use in or on *exterior walls* shall comply with the applicable requirements of Chapter 14 and of Chapter 26.

Reason: This proposal revises the language of 1403.8 in order to maintain confirmation of the general acceptance of plastics used in exterior wall assemblies under Section 1403 Materials, but provide more relevant references.
Plastic (and plastic panel), apron (and plastic apron), spandrel (and spandrel wall), and plastic spandrel (and plastic spandrel wall) are not defined terms within Chapter 2 of the IBC, therefore, the "…as defined…" language of Section 1403.8 is incorrect and creates confusion that distracts the User from the more relevant sections of the IBC. This section has caused confusion because the referenced products and applications ("Plastic panel, apron or spandrel walls …") are more specifically addressed under other sections of the Code. Dating to the 2000 Edition of the IBC, this section has become outdated as more specific provisions have been added to Chapters 14, 16, 17 and 26 over the last 20+ years.
The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change existing performance or construction requirements.

FS129-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded that the language in the proposal could be misleading to contain all the plastics within a wall. The reference to chapter 14 is not appropriate, while the section is in chapter 14. The proposed text is not clear and not concise. The proponent could incorporate the approved FS120-21 code change text of "exterior wall assembly" to clarify the proposal's intent. (Vote: 13-0)

FS129-21

Individual Consideration Agenda

Public Comment 1:

IBC: 1403.8

Proponents: Jeffrey Greenwald, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1403.8 Plastics . Plastics intended for use in or on *exterior walls* shall comply with the applicable requirements ~~of Chapter 14 and~~ of Chapter 26.

Commenter's Reason: FS129 was submitted to revise Section 1403.8 since this section has become outdated as more specific provisions have been added to Chapters 14, 16, 17 and 26. This public comment removes the reference to Chapter 14 in response to committee comments. The public comment now provides a direct reference to Chapter 26 where the requirements for the use of plastics in building construction and components are addressed.
We respectfully request Approval as Modified by this Public Comment.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, EPS Industry Alliance, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, and Rmax - A Business Unit of the Sika Corporation.

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

Public Comment# 2805

FS144-21

Proposed Change as Submitted

Proponents: Theresa Weston, representing The Holt Weston Consultancy, LLC (holtweston88@gmail.com)

2021 International Building Code

Add new definition as follows:

RAINSCREEN. An assembly applied to an exterior wall which consists of, at minimum, an outer layer, an inner layer, and a cavity between them sufficient for the passive removal of liquid water and water vapor.

Revise as follows:

TABLE 1404.3(3) CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a, b]
4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall
8	Continuous insulation with *R*-value ≥ R12.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R20 over 2 × 6 wall

a. Vented cladding shall include vinyl lap siding, polypropylene, or horizontal aluminum siding, brick veneer with airspace as specified in this code, *rainscreens*, and other approved vented claddings.

b. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class III vapor retarders. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of the International Energy Conservation Code.

Reason: Rainscreens are aa common and growing construction technique that is not material specific. The concept of cladding and substrates layers separated by a cavity that allows water to drain and air flow to accelerate drying is the most basic understanding of how a rainscreen system works. This proposal seeks to define the term *rainscreen* and to add to include *rainscreens* to the list of vented claddings that work in a system with Class III Vapor Retarder assemblies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This does not add a new requirement but clarifies existing requirements and already existing option and so will not either increase or decrease the cost of construction.

FS144-21

Public Hearing Results

Committee Action: **As Modified**

Committee Modification:

RAINSCREEN SYSTEM. An assembly applied to the exterior side of an exterior wall which consists of, at minimum, an outer layer, an inner layer, and a cavity between them sufficient for the passive removal of liquid water and water vapor.

TABLE 1404.3(3) CLASS III VAPOR RETARDERS

Portions of table not shown remain unchanged.

a. Vented cladding shall include vinyl lap siding, polypropylene, or horizontal aluminum siding, brick veneer with airspace as specified in this code, ~~*rainscreens*~~ *rainscreen systems*, and other approved vented claddings.

b. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class III vapor retarders. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of the International Energy Conservation Code.

Committee Reason: The committee concluded that the modification is an essential addition to clarify the exterior side of the exterior wall. Adding the word "system" is critical to guide to the appropriate system. The proposal defines an already used concept. (Vote: 13-0)

Individual Consideration Agenda

Public Comment 1:

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

Commenter's Reason: The AIA urges RAINA to withdraw the two code change proposals that add a definition for rainscreens to Chapters 2 (FS144) and requirements for rainscreens to Chapter 14 (FS151). Instead we urge RAINA to work towards a fully vetted and scientifically-based code change for the next cycle that AIA and other parties can all support. The AIA Building Performance Knowledge Committee (BPKC)worked for many years to develop “Definitions for Building Performance”. One of the goals of developing these definitions was to assist clear communication between architects, owners, product manufacturers, contractors and code officials. Due to the lack of clear definitions of many terms, and in particular the term “Rainscreen”, communication has been seriously impaired. Some people interpret rainscreen to mean any open joint cladding, others think it must be part of a pressure-equalized rainscreen assembly, others feel 1/16” high bumps on house wraps will produce a rainscreen. Obviously these are widely varying concepts. The AIA BPKC has published a definition of rainscreen wall assembly based on elevated performance for the control of water infiltration using building science principles.

RAINSCREEN WALL ASSEMBLY: A type of exterior wall that is designed and detailed to reduce the movement of water through joints in cladding while promoting both drainage and air movement within the drainage cavity. A rainscreen assembly comprises a structurally supported exterior cladding, an airspace and a water-resistive barrier that also serves as air barrier. Continuous thermal insulation may be included within the airspace.

With the formation of RAINA, the AIA sees a great opportunity to further clarify the use of rainscreens and supports the idea of defining rainscreen in the code. However, the definitions included in the two proposed code changes presented by RAINA are so brief and vague that the AIA cannot support them. The AIA feels the proposed definitions in the IBC would further contribute to the misunderstanding and misuse of the term currently in the design and construction industry. Furthermore the AIA feels the new definitions provide no useful information to allow code officials to better serve the public health, safety and welfare. Finally, adoption of such a weak definition will make implementation of a more robust definition much more difficult in the future.

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

Public Comment# 2606

FS146-21

Proposed Change as Submitted

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com); William Egan, representing EIFS Industry Members Association (EIMA) (bill@billegangroup.com)

2021 International Building Code

Add new text as follows:

1407.5 Exterior walls of buildings of any height.
Exterior wall assemblies containing an EIFS *exterior wall covering* shall be tested in accordance with, and comply with the acceptance criteria of, NFPA 285 and comply with Section 2603.5.

Reason: This code proposal clarifies the fire testing requirements for EIFS systems and add a reference to Section 2603.5 to ensure the exterior wall assemblies with EIFS exterior wall coverings will comply with the relevant requirements for fire resistance (E119/UL 263), surface burning characteristics (E84/UL 723), vertical and lateral flame propagation (NFPA 285), and ignition resistance (NFPA 268). The current Section 1407.1 references, "…in addition to other applicable requirements of […] Chapter 26.," the new proposed Section 1407.5 provides clear and specific reference to the codified fire testing and fire performance requirements for exterior wall assemblies containing foam plastic insulation and associated exterior coatings and facings.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change existing performance or construction requirements.

FS146-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee indicated this is an unnecessary and unclear pointer. The fire testing criteria is already addressed in ASTM E2568. (Vote: 9-4)

FS146-21

Individual Consideration Agenda

Public Comment 1:

IBC: 1407.5

Proponents: Jeffrey Greenwald, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

1407.5 Exterior walls of buildings of any height . Exterior wall assemblies containing an EIFS *exterior wall covering* shall ~~be tested in accordance with, and comply with the acceptance criteria of, NFPA 285 and~~ comply with Section 2603.5.

Commenter's Reason: FS146 was recommended for disapproval since fire test requirements in section 2603.5 are contained in ASTM E 2568

(Standard Specification for Exterior Insulation and Finish Systems) which is referenced in section 1407.2.
The North American Modern Building Alliance requests FS146-21 to be approved as modified for the following reasons:

1. ASTM standards are living documents subject to change and modification at any time. Stakeholders, including Building Code officials, may not have ready access to the applicable edition of the ASTM standard that is in the code therefore a specific reference to section 2603.5 should be included under section 1407.
2. The addition of proposed section 1407.5 adds a clear pointer that will be helpful to all stakeholders (building code officials, design professionals, contractors, owners, etc.) as to the fire performance requirements for EIFS with foam plastic insulation.
3. NFPA 285 is a test requirement within section 2603.5 therefore the proposed modification removes this unnecessary reference, plus NFPA 285 only applies as set forth in 2603.5.

The proposed change and Public Comment are supported by EIMA, the EIFS industry trade association.

We respectfully request Approval as Modified by this Public Comment.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, EPS Industry Alliance, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, and Rmax - A Business Unit of the Sika Corporation.

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

Public Comment# 2472

FS147-21

Proposed Change as Submitted

Proponents: Jeffrey H. Greenwald, North American Modern Building Alliance, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com); William F Egan, Bill Egan Group LLC, representing EIFS Industry Members Association (EIMA) (bill@billegangroup.com)

2021 International Building Code

Add new text as follows:

1407.7 Fire-resistance.
Where EIFS are used on *exterior walls* required to have a *fire-resistance rating* in accordance with Section 705, evidence shall be submitted to the building official that the required *fire-resistance rating* is maintained.

Exception: EIFS which are part of an exterior wall assembly not containing foam plastic insulation and are installed on the outer surface of a fire-resistance-rated exterior wall in a manner such that the attachments do not penetrate through the entire exterior wall assembly, shall not be required to comply with this section.

Reason: The proposal adds a new subsection to Section 1407, EIFS (Exterior Insulation and Finish Systems), consistent with Sections 1406 (on MCM systems) and 1408 (on HPL systems), that requires evidence is provided to support that a fire resistance rating, when required by Section 705, is not reduced. The proposal adds this same language to Section 1407 on EIFS.
Section 1407.2 requires that "EIFS shall be constructed such that it meets the performance characteristics required in ASTM E2568." The ASTM specification contains a requirement equivalent to what is proposed, but adding this proposed language to the IBC makes it easier for the code official to note that the same requirement to verify fire-resistance applies to EIFS as it does to the other assemblies.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, Rmax - A Business Unit of the Sika Corporation.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal does not change existing performance or construction requirements.

FS147-21

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded this code change is not needed since ASTM E2568 already addresses this issue. (Vote: 10-3)

FS147-21

Individual Consideration Agenda

Public Comment 1:

Proponents: Jeffrey Greenwald, representing North American Modern Building Alliance (jgreenwald@operativegreenwald.com) requests As Submitted

Commenter's Reason: FS147-21 was Disapproved by the committee for the stated reason that the committee believed ASTM E2568 *Standard Specification for Exterior Insulation and Finish Systems* (referenced and required in Section 1407.2) already addresses the issue of fire resistance for EIFS.
The North American Modern Building Alliance requests FS147-21 to be Approved as Submitted for the following reasons:

1. ASTM standards are living documents subject to change and modification at any time.
2. Stakeholders, including Building Code officials, may not have ready access to ASTM E2568, therefore, a specific reference to section 705 for the applicable requirements should be included under section 1407.
3. The addition of proposed new section 1407.7 adds a clear pointer that will be helpful to all stakeholders (building code officials, design professionals, contractors, owners, etc.) as to the fire resistance requirements for EIFS.

The proposed change and Public Comment are supported by EIMA, the EIFS industry trade association.

We respectfully request Approval as Submitted.

The North American Modern Building Alliance (NAMBA) is focused on addressing fire safety through the development and enforcement of building codes. Members of NAMBA are: ACC Center for the Polyurethanes Industry, ACC North American Flame Retardant Alliance, Atlas Roofing Corp., BASF Corporation, Carlisle Construction Materials, Covestro, DuPont, EIFS Industry Members Association, EPS Industry Alliance, GAF, Huntsman, Kingspan Insulation LLC, Metal Construction Association, Owens Corning, Polyisocyanurate Insulation Manufacturers Association, and Rmax - A Business Unit of the Sika Corporation.

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

Public Comment# 2473

FS150-21

Proposed Change as Submitted

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

2021 International Building Code

Add new text as follows:

SECTION 1410
BIPV SYSTEMS FOR EXTERIOR WALL COVERINGS AND FENESTRATION

1410.1 Listing required.
In addition to complying with other provisions of this code, BIPV systems used as exterior wall coverings or fenestration shall be listed and labeled in accordance with UL 1703 or both UL 61730-1 and UL 61730-2.

Reason: Building Integrated Photovoltaic (BIPV) Systems are increasingly becoming popular due to efforts to achieve Net Zero Energy. Requirements for BIPV Systems used as roof assemblies and roof coverings are already addressed in Chapter 15. New applications for BIPV systems are systems that are used as either exterior wall coverings or fenestration. The IBC is silent on the requirements for such systems. Chapter 14 contains a variety of requirements for exterior wall coverings and exterior wall assemblies. Clearly, if BIPV systems are included in exterior walls they should comply with all such requirements (including fire tests and weather protection). In addition to those requirements, this proposal requires that BIPV systems be listed and labeled in accordance with the applicable UL standards. Note these UL standards are already addressed in the IBC.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal clarifies what requirements apply to BIPV systems used as an exterior wall covering or fenestration.

FS150-21

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal provides needed installation guidelines for BIPV systems used as exterior wall coverings or fenestration to be listed and labeled. The committee also mentioned that the safety glazing issue and adding duality to those products need to be addressed. The committee suggested including a general reference to chapter 14. (Vote: 9-4)

FS150-21

Individual Consideration Agenda

Public Comment 1:

IBC: SECTION 1410, 1410.1

Proponents: Marcelo Hirschler, representing self (mmh@gbhint.com) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

SECTION 1410
BIPV SYSTEMS FOR EXTERIOR WALL COVERINGS AND FENESTRATION

1410.1 Listing required . In addition to complying with Section 1405 ~~other provisions of this code~~, BIPV systems used as exterior wall coverings or fenestration shall be listed and labeled in accordance with UL 1703 or both UL 61730-1 and UL 61730-2.

Commenter's Reason: The systems proposed to be added to the IBC are described in the proposal as exterior wall coverings. Section 1405 is entitled "COMBUSTIBLE MATERIALS ON THE EXTERIOR SIDE OF EXTERIOR WALLS". Therefore the requirements for exterior wall coverings are contained in Section 1405. In order to ensure that the same requirements as other exterior wall coverings apply, this public comment revises the wording to clarify that BIPVs need to meet the requirements of Section 1405 while leaving them in the new section for more visibility. No requirements are being proposed to be changed.
This public comment addresses the concerns of the committee regarding a reference to the relevant sections of chapter 14.

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

Public Comment# 2373