Reason: The 2006 revision to section 707.14 does not include allowanced for stack effect which are often greater than the pressure differentials allowed by this section. Without consideration of stack effect, the hoistway can be lower pressure than many of the building floors, thus rendering the pressurization system ineffective. Thus, without the proposed change, design of hoistway pressurization systems in most climates for high rise buildings is not feasible.

For example assuming a 150 foot tall building with an inside temperature of 70°F and an outside temperature of 40°F, which would not be considered extreme in most climates. The calculated pressure in the shaft with respect to the building can be calculated using the methods established in Principles of Smoke Management Systems by Klote and Milke. For this example, we can use equation 5.6 from the Principles of Smoke Management Systems book. The calculations (shown below) show a differential pressure of 0.065 inches of water column at the top of the shaft. This would effectively prohibit the design of any hoistway pressurization system for this building. If we add the effect of a pressurization system and other smoke controls systems, it becomes almost impossible to pressurize any high rise building and remain within the limits specified.

Other jurisdictions are aware of these issues and have begun giving allowances for stack effect. For example, Oregon has published "Acceptable Alternatives to Required Elevator Lobbies" which allows differential pressure of 0.06 inches of water column above the maximum stack pressure.

Equation 5.26 from Principles of Smoke Management Systems

$$\Delta P_{SO} = K_s \left(\frac{1}{T_O} - \frac{1}{T_S} \right) h$$

Calculations for our example building:

$$\Delta P_{SO} = 7.64 \left(\frac{1}{(70+460)} - \frac{1}{(40+460)} \right) 75 = 0.065 \; inches \; of \; W.C$$

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS63–07/08
707.14.2.1

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

Revise as follows:

707.14.2.1 (Supp) Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.04 inches of water (9.96 Pa) and a maximum positive pressure of 0.06 inches of water (14.94 Pa) with respect to adjacent occupied space on all floors <u>as well as accounting for the stack and wind effect expected on the mean low temperature January day</u>. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

Reason: Smoke control systems are complex mechanical systems that provide for a tenable environment, in this instance, in the elevator shaft for the duration of a fire event. Smoke control provides for evacuation and relocation in most instances and the use of the elevator by emergency personnel in a fire fulfills these rolls. Smoke control systems play a different roll from smoke and heat vents that serve to exhaust smoke from an area or building. Smoke control prevents entry of smoke to an area such as the elevator shaft in the case of exception 6 application in 707.14.1.

The 2006 IBC Commentary correctly states that smoke is a complex problem. The active mechanical system for elevator shaft pressurization must meet design and performance requirements of the Code. The IBC Commentary for smoke control systems states that "simply determining airflow, exhaust rates, and pressures to maintain tenable conditions is not adequate." The numerous factors to consider for smoke control include stack effect, wind effect, and climate. This proposal includes consideration of these key elements as a part of the determination of pressure differentials in the elevator shaft. Establishing these design requirements within the building code will insure that they are incorporated and that the pressurization system installed near the end of the construction of the building will perform properly in a fire.

Stack effect, states the IBC Commentary, if great enough, may overcome the pressures determined during the design analyses and allow smoke to enter areas outside the zone of origin. If stack effect is not accounted for in an elevator shaft pressurization design, in application it may overcome the pressures of the system and allow smoke to enter the shaft.

Wind effects on a smoke control system are also important to the performance of the system when a fire occurs. In larger buildings a wind study is a normal part of the structural design and the data from those studies can be used in the analysis of the effects on the pressures and airflow within the building with regard to the performance of the smoke control system.

Climate is the third key element in this proposed change with the specific language having a reference to designing to the mean low temperature January day. Temperature can not only effect the stack effects in the building, but the equipment used in the smoke control system must be able to perform under the temperature variations of the area of the country where the building is constructed.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS64–07/08
707.14.2.1

Proponent: Masoud Sabounchi, PE, CBO, Advanced Counseling Engineers, Inc., representing Colorado Chapter ICC

Revise as follows:

707.14.2.1 (Supp) Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of ~~0.04~~ 0.05 inches of water (9.96 Pa) ~~and a maximum positive pressure of 0.06 inches of water~~ (14.94 Pa) with respect to adjacent occupied space on all floors. The maximum hoistway positive pressure with respect to adjacent occupied spaces shall be maintained such that all elevator doors remain operational when the pressurization system is active. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

Reason: To maintain the hoistway pressure differential in the range of 0.04" W.C. and 0.06" W.C. with respect to the adjacent floor areas is not practical considering the stack effect in cold climates. The pressure differential between the lowest and highest level of the building can far exceed the prescribed range during winter. Also reveres stack effect is a concern during summer in air conditioned buildings. Also the minimum prescribed 0.04" W.C. pressure differential may not be sufficient to overcome the piston effect of the elevators-depending on number of elevators per hoistway, area of the hoistway, free area around elevator cars and similar.

The proposed language provides a performance criterion to be used for design of the elevator hoistway pressurization system to allow the maximum positive pressure differential to be governed by limiting the pressure such that all elevator doors remain operational.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS65–07/08
707.14.2.1

Proponent: Bill Ziegert, Smoke Guard, Inc.

Revise as follows:

707.14.2.1 (Supp) Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.04 inches of water (9.96 Pa) and a maximum positive pressure of 0.06 inches of water (14.94 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet. Where the shaft being protected connects more than eight stories, multiple point injection shall be required with the pressurization air introduced every third floor.

Reason: Chapter 10 of the ASHRAE/SFPE Principles of Smoke Management indicates that single point injection for vertical shafts typically works for up to 8 stories and recommends multiple point injection be provided every third floor for buildings taller than this. A similar comment is contained in the Smoke Control Handbook for the IBC 2003.

Cost Impact: The code change proposal will not increase the cost of construction. In order to insure that the elevator shaft pressurization system stays within the maximum and minimum pressure limits over the full height of the shaft over all potential climate conditions, prudent engineering would require this approach. This statement only clarifies what would normally be done.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS66–07/08
707.14.2.1

Proponent: Bill Ziegert, Smoke Guard, Inc.

Revise as follows:

707.14.2.1 (Supp) Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.04 inches of water (9.96 Pa) and a maximum positive pressure of 0.06 inches of water (14.94 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet. Pressurization air shall be designed, installed and maintained so as not to impede elevator operation by impinging on traveling cables, selector tapes, governor ropes, compensating ropes and other components sensitive to excessive movement or deflection.

Reason: To insure consistency with the requirements of ASME A17.1 (Elevator Code). The next publication of the Elevator Code will contain this language.

Cost Impact: The code change proposal will not increase the cost of construction. None, there should be no cost impact on construction from this proposed change.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS67–07/08
707.14.1, 707.14.2, 707.14.2.1, 909.21 (New)

Proponent: Maureen Traxler, City of Seattle, WA, representing Department of Planning & Development; John H. Klote, John H. Klote, Inc.; Douglas H. Evans, Clark County, NV, representing Department of Development Services; Assistant Chief Kenneth L. Tipler, Fire Marshall, City of Seattle, WA, representing Seattle Fire Department

1. Revise as follows:

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

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. In other than Group I-2 and I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section ~~707.14.2~~ 909.21.

2. Delete without substitution:

~~**707.14.2 Enclosed elevator lobby pressurization alternative.** Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with this section.~~

~~**707.14.2.1 Pressurization requirements.** Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.04 inches of water column (1.0 Pa) and a maximum positive pressure of 0.06 inches of water column (1.49 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all ground floor level hoistway doors open and all other hoistway doors closed. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.~~

3. Add new text as follows:

909.21 Elevator shaft pressurization. Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies as allowed by 707.14.1 exception 6, the pressurization system shall maintain a minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum positive pressure of 0.35 inches of water (87 Pa) in the elevator hoistway relative to the building measured with all elevator doors closed under maximum anticipated conditions of stack effect and wind effect.

Reason: This proposal has two objectives—it relocates the provisions for elevator hoistway pressurization to Section 909, and it changes the required pressure difference to a range of 0.10 to 0.35 instead of the current range of 0.04 to 0.06. The purpose of the proposal is to establish criteria for pressurization systems that will control smoke under actual fire conditions.

Elevator pressurization is a smoke control system in that it is intended to control the movement of smoke. The proposed change moves elevator pressurization to Section 909 so that it is subject to the requirements of Section 909 like other smoke control systems including stairway pressurization. These requirements include rational analysis, equipment, electrical power systems, detection, control, fire-fighter's smoke control panel, special inspection and testing. It provides consistency with the requirements for stairway pressurization. Consistency is important because, in buildings that have both elevator and stair pressurization, the systems will interact with each other, making proper design analysis per Section 909.4 especially important.

Currently IBC Section 707.14.2.1 specifies a minimum pressure difference of 0.04 inches of water and a maximum pressure difference of 0.06 inches of water. There are two problems with these values. First, 0.04 inches of water is not enough to reliably keep smoke out of the hoistway. It could provide some protection from smoke migration, but will not control it during a fully-involved fire. A pressure difference of 0.10 inches of water is sufficient to prevent smoke from infiltrating elevator hoistways under the extreme condition of a fully-involved fire in the space next to the elevator door. This is supported by both engineering analysis and full scale fire tests (see NFPA 92A 2006; Klote and Milke 2002).

While at NIST, Dr. John Klote did a series of full-scale fire tests at the Plaza Hotel Building in Washington, D.C. In these fires, the section of a corridor near the stairs was fully involved in fire. In these tests, a pressure difference of 0.10 inches controlled smoke from very large fires that were only a few feet away from the stairway door. Another test consisted of a room fire that flashed over and remained at fully-developed conditions for some time. A number of other full scale tests have confirmed that pressurization can control smoke from extremely large fires. These tests show that 0.10 inches of water is sufficient to control smoke with a flashed-over fire anywhere on the floor even when it is in the corridor next to the stair door.

The second problem with the current provisions is that the pressure difference range of only 0.02 inches of water is too small. Normal fluctuations in pressure due to changes in wind and barometric pressure are about 0.01 to 0.03 inches of water. While it may be possible to design an elevator shaft pressurization system that would work with a range this small for a very short and simple building, it is not possible to design systems that would work for most buildings. Because of stack effect and floor-to-floor variations in building leakage, hoistway pressurization systems in most buildings will naturally require a much larger pressure difference range.

This proposal and a related one would require the same pressure difference for both stairs and elevators (minimum of 0.10 inches of water and maximum of 0.35 inches of water). Many buildings will have both pressurized stairs and elevators, and having the same design pressure differences will make design much simpler and the systems more reliable.

Some people have concerns about elevator doors jamming during hoistway pressurization. Increased pressure difference can sometimes cause elevator doors to jam closed, but such jammed doors typically require only modest force to open. They are not difficult to open by trained and properly-equipped firefighters. John Klote has conducted extensive research with elevator smoke control systems, and he has encountered only one instance of elevator doors jammed closed. In that case the doors were easily opened by hand. In fire situations, the elevators are required to go into Phase II operation which is sometimes called firefighter's service. The elevators are only used by firefighters who are equipped with various tools and capable of opening a door that has been jammed shut.

The intent of smoke control systems as stated in Section 909.1 is "to provide a tenable environment for the evacuation or relocation of occupants." Hoistway pressurization acts to prevent smoke from flowing through elevator hoistways and going to floors remote from the fire, helping to provide a tenable environment for the evacuation or relocation of occupants on floors remote from the fire. The changes made in this proposal are essential for design of hoistway pressurization systems that will be effective in controlling smoke.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS68–07/08
707.14.2.5

Proponent: Johathan Siu, City of Seattle, WA, representing Washington Association of Building Officials Technical Code Development Committee

Revise as follows:

707.14.2.5 Activation of pressurization system. The elevator pressurization system shall be activated upon activation of the building fire alarm system or upon activation of the elevator lobby smoke detectors. Where both a building fire alarm system and elevator lobby smoke detectors are present, each shall be independently capable of activating the pressurization system.

Reason: The purpose of this proposal is to clarify the code requirement for how the elevator pressurization system is activated. The current language in the code appears to allow the designer to choose to activate the hoistway pressurization system with either the fire alarm system or the lobby smoke detectors, even if both are present. In other words, the designer could choose to use just the fire alarm system to trigger the pressurization system, and not hook the lobby smoke detector up to the pressurization system at all, or vice versa. We do not believe this is the intent of the code. Whether the fire is a hot fire away from the hoistway that triggers the fire alarm via sprinkler system activation or a smoky fire near the elevator lobby, the pressurization system should be activated as soon as possible in order to be effective at preventing the spread of smoke from floor to floor through the elevator hoistway. If only one system is capable of activating the hoistway pressurization, there could be a delay in providing that protection from smoke.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS69–07/08
707.14.2.6 (New)

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

Add new text as follows:

707.14.2.6 Special inspection. Special inspection for performance shall be required in accordance with Section 909.18.8. System acceptance shall be in accordance with Section 909.19.

Reason: The enclosed elevator lobby pressurization alternative does not have a clear link to inspection and performance of the pressurization system once installed. These new referenced requirements of Section 909, Smoke Control clearly establish acceptance testing responsibilty and performance. The current 707.14.2.1 measurement requirements don't clearly establish who will acknowledge that the pressurization system meets the performance requirements established in 707.14.2.

In the 2006 IBC Commentary on 909.18.8 it is simply and accurately sated," Smoke control systems require special inspection since they tend to be unique and complex life safety systems." Special inspections established in 909.18.8.1 are a key to insuring that at key stages the elevator shaft pressurization system meets design criteria. The IBC commentary states that the first round of special inspections occur before concealment of ductwork or fire protection elements and then second round that will result in a certificate of occupancy for the building. Inspections include the verification of pressure differences required in 707.14.2 in addition to the interconnection to the fire alarm and detection systems.

The new 909 references will insure that the proper professional trades are involved in the not only the design process, but the acceptance testing of these complex mechanical systems as well.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS70–07/08
708.1

Proponent: Anthony C. Apfelbeck, City of Altamonte Springs, Building/Fire Safety Division

Revise as follows:

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

1. Walls separating dwelling units in the same building as required by Section 419.2.
2. Walls separating sleeping units in the same building as required by Section 419.2.
3. Walls separating tenant spaces in covered mall buildings as required by Section 402.7.2.
4. Corridor walls as required by Section 1017.1.
5. Elevator lobby separation as required by Section 707.14.1.
6. Walls separating tenant spaces in buildings not protected by an automatic sprinkler system installed in accordance with Section 903.1.

Reason: During the 2006 code hearings in Orlando, there was significant discussion on a similar proposal requiring tenant separation in all occupancies. Some valid concerns were raised regarding the need for open spaces such as a bank within a grocery store or a fast-food restaurant within a retail store space. Even with these concerns, the code proposal failed by a narrow 7-6 vote. Based on the discussion, it appears there was some possible consensus regarding the need for tenant separation with an exception for fire sprinkler protected properties. This proposal moves that concept originally discussed in Orlando before the Fire Safety Committee. Providing this 1-hour separation in non-sprinklered buildings will increase

the passive fire protection requirements in the area where it is most needed and relied upon; unsprinklered properties. This protection will provide a first line defense to contain the fire to a tenant of origin and preventing damage to the rest of the building. This additional time will significantly assist the fire department in providing manual fire suppression operations in these properties.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS71–07/08
708.1

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing Alliance for Fire and Smoke Containment and Control (AFSCC)

Revise as follows:

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

1. Walls separating dwelling units in the same building as required by Section 419.2.
2. Walls separating sleeping units in the same building as required by Section 419.2.
3. Walls separating tenant spaces in covered mall buildings as required by Section 402.7.2.
4. Corridor walls as required by Section 1017.1.
5. Elevator lobby separation as required by Section 707.14.1.
6. Walls separating enclosed tenant spaces required to have two or more exits or exit access doorways by Section 1015.1.

Reason: This code change proposal is a follow up to our previously submitted Code Change Proposal FS64-06/07. We also submitted a Public Comment on FS64-06/07 which was heard during the ICC Final Action Hearings held in Rochester, NY this past May. We fell a few votes short of overturning the Committee's recommendation for disapproval but received good testimony indicating where we might be able to modify the code change proposal to make it more acceptable. The basic issue was that this would apply to any enclosed tenant space regardless of size. Obviously, for a very small tenant space this would be a financial hardship, especially in rather small buildings where the tenants may move in an out on a fairly regular basis. Therefore, we provided a trigger for this requirement to apply the 1-hour fire-resistance rating to separate enclosed tenant spaces based on the requirement for such a space to have two or more exits or exit access doorways in accordance with Section 1015.1. So, for example, a typical office tenant would not require the 1-hour fire-resistive separation until the space exceeded 5,000 sq ft. We believe this is a reasonable compromise because it takes into consideration that the larger space will have more property at risk, as well as more occupants necessitating the need for some fire-resistive protection between the tenant and its adjacent spaces. This we believe is a reasonable compromise while still providing an acceptable level of fire and life safety to multi-tenant buildings.

This would also be consistent with several of the previous legacy model building codes for buildings required to be of a fire-resistance rated type of construction. One of the legacy codes, the SBCCI Standard Building Code, specifically required enclosed tenant spaces to have a 1-hour fire-resistance rating separating them from adjacent tenants regardless of the building's type of construction or the size of the tenant space. We are not aware of any problems that such a requirement caused with the construction of non-fire-resistance rated buildings.

Part of the Committee's reason for disapproving our previous code change states: "This requirement is beyond the purpose of the IBC and is generally considered as a property protection issue." However, Section 101.3 Intent of the IBC states that its purpose is "to establish the minimum requirements… {for} safety to life and property from fire…" Thus, property protection is certainly within the purpose and intent of the code. The Committee also states that such a requirement does not belong within a "minimum" code for the purpose of limiting the exposure to fire from neighbors or addressing business continuity should a fire occur in an adjacent tenant space. Then why was such a requirement included in the previous legacy codes? The Committee also indicates that this requirement may create confusion that a higher rated "occupancy separation" specified in Table 508.3.3 could be reduced to this 1-hour fire partition requirement where the different occupancies are in adjacent tenant spaces. However, Section 102.1 General states: "Where, in any specific case, different sections of this code specify different… requirements, the most restrictive shall govern." So that is a non-problem. The Committee's Reason statement also indicates that this code change proposal could create conflicts with other sections of the code such as the non-separated use option in Section 508.3 or the corridor provisions in Section 1017.1. Again, Section 102.1 General addresses this issue where it states: "Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable." Furthermore, in most cases there may actually be no conflict but simply a difference in requirements with the most restrictive being applicable as discussed above.

By requiring these tenant separation walls to be a fire partition, they will be required to have a minimum 1-hour fire-resistance rating as required by Section 708.3. Although we are not that concerned about the fire-resistance, per se, we are concerned that a reasonably fire-resistant wall construction be provided to separate adjacent tenants for the reasons given in our previous code change proposal. The importance of this requirement is to protect tenants from one another in the event of an accidental fire developing in one tenant space and threatening the adjacent tenant spaces. We believe that tenants have a right to a reasonable level of fire safety by having some minimal degree of fire-resistive protection to keep a fire in his/her neighbor from involving his/her space, at least in the early stages of the fire, until the fire department has had the chance to respond and control and extinguish the fire.

By specifying a fire partition, we get the 1-hour fire-resistance rating which means that the wall is required to be tested in accordance with ASTM E119 to meet the hose stream test. Walls that are less than 1-hour in fire-resistance rating are not required to meet the hose stream test in accordance with Section 11.1.1 of ASTM E119. We believe the hose stream test requirement is very important since it will result in a wall that has a minimum degree of structural integrity. The hose stream test subjects the wall to the cooling impact and erosion effects of a stream of water discharging from a specified size nozzle. Section X.5.9 Integrity of Appendix X5 Commentary of ASTM E119 states: "In this hose stream test, the ability of the construction to resist disintegration under adverse conditions is examined."

Another critical component that comes with a 1-hour fire partition is its continuity as specified in Section 708.4. The essential element of the continuity requirement is that the wall must be constructed continuous from the floor to the underside of the floor or roof deck above. There is an exception to this condition when the entire ceiling is part of a fire-resistive ceiling assembly. This cuts off the most likely place where fire and smoke will spread in the early stages of fire, that is above the ceiling through the open spaces throughout the ceiling plenum, or at the head of the wall where it intersects the underside of the floor slab or roof deck above. However, that protection is provided by the joint protection requirements in Section 708.8 which refers to Section 713 for the protection of joints. If the wall stops at the underside of a ceiling that is part of a fire-resistive floor/ceiling assembly, then the ceiling itself serves to prevent fire and smoke from gaining early access to the ceiling plenum and spreading throughout the floor area to adjacent tenant spaces, at least until the fire department arrives on the scene and takes control of the fire.

Another added benefit is that penetrations which are generally a weak point in any fire-resistive rated assembly are also required to be protected in accordance with Section 708.7 which references Section 712 for protection of penetrations. And, finally, ducts and air transfer openings in fire partitions are also required to be protected with fire dampers in accordance with Section 708.9 which references Section 716 for the protection of ducts and air transfer openings.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS72–07/08
708.4

Proponent: Tim Pate, City & County of Broomfield, CO, representing Colorado Chapter ICC

Revise as follows:

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

Exceptions:

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

Reason: This code change will add language that will help clarify the requirements for continuity of fire partitions. The intent of this code section is to not require a fire resistance rated floor/ceiling or roof/ceiling assembly if the fire partition does not extend through the assembly. The intent of this code section is to only require fire blocking or draftstopping in the interstitial spaces and in line with these fire partitions if the designer does not choose to run them through these areas. If the building is required to have fire resistance rated assemblies due to type of construction (VA) then the fire partition only needs to extend to the bottom membrane of that assembly. This added language will help clarify the intent of this section and help clear up the confusion that we see with designers and plan checkers.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS73–07/08
708.4, 711.3, 711.7.1 (New), 716.6 (IMC 607.6), 1017.1 (IFC [B] 1017.1)

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

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

1. Revise as follows:

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

Exceptions:

1. The wall need not be extended into the crawl space below where the floor above the crawl space has a minimum 1-hour fire-resistance rating.
2. ~~Where the room side fire-resistance-rated membrane of the corridor is carried through to the underside of the floor or roof sheathing, deck or slab of a fire-resistance-rated floor or roof above, the ceiling of the corridor shall be permitted to be protected by the use of ceiling materials as required for a 1-hour fire resistance rated floor or roof system.~~
3. ~~Where the corridor ceiling is constructed as required for the corridor walls, the walls shall be permitted to terminate at the upper membrane of such ceiling assembly.~~

~~4~~ 2. The fire partition separating tenant spaces in a covered mall building, complying with Section 402.7.2, are not required to extend beyond the underside of a ceiling that is not part of a fire-resistance-rated assembly. A wall is not required in attic or ceiling spaces above tenant separation walls.

~~5~~ 3. Fireblocking or draftstopping is not required at the partition line in Group R-2 buildings that do not exceed four stories above grade plane, provided the attic space is subdivided by draftstopping into areas not exceeding 3,000 square feet (279 m^2) or above every two dwelling units, whichever is smaller.

~~6~~ 4. Fireblocking or draftstopping is not required at the partition line in buildings equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, provided that automatic sprinklers are installed in combustible floor/ceiling and roof/ceiling spaces.

2. Revise as follows:

711.3 (Supp) Fire-resistance rating. The fire-resistance rating of floor and roof assemblies shall not be less than that required by the building type of construction. Where the floor assembly separates mixed occupancies, the assembly shall have a fire-resistance rating of not less than that required by Section 508.3.3 based on the occupancies being separated. Where the floor assembly separates a single occupancy into different fire areas, the assembly shall have a fire-resistance rating of not less than that required by Section 706.3.9. Horizontal assemblies separating dwelling units in the same building and horizontal assemblies separating sleeping units in the same building shall be a minimum of 1-hour fire-resistance-rated construction.

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

Where corridor ceiling construction is required to be fire-resistance rated as required by Section 1017.1, such ceiling shall comply with one of the following:

1. The corridor ceiling shall be an element of a floor/ceiling or roof/ceiling assembly having not less than a 1-hour fire-resistance rating at the entire story.

   Exception: Where the room-side of the corridor partition extends to the underside of a floor or roof constructed of materials approved for a 1-hour fire-resistance rated floor/ceiling or roof/ceiling assembly, slab or deck above, the corridor ceiling shall be of ceiling materials as required for any 1-hour fire-resistance rated floor or roof system.

2. The corridor ceiling shall be constructed as required for the corridor walls. The room-side of the corridor partition shall extend to the upper ceiling membrane. The corridor-side of the corridor partition shall be permitted to extend to the lower ceiling membrane.

3. Add new text as follows:

711.7.1 Corridors. Ducts and air transfer openings that penetrate horizontal assemblies in fire-resistance rated corridors shall comply with the provisions of Section 716.5.4 for fire partitions.

4. Revise as follows:

716.6 (IMC [B] 607.6) Horizontal assemblies. Penetrations by ducts and air transfer openings of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall be protected by a shaft enclosure that complies with Section 707 or shall comply with Sections 716.6.1 through 716.6.3.

Exception: Corridors in accordance with the provisions of Section 711.7.1.

PART II – IBC MEANS OF EGRESS

Revise as follows:

1017.1 (IFC [B] 1017.1) Construction. Corridors shall be fire-resistance rated in accordance with Table 1017.1. ~~The corridor~~ Walls in corridors which are required to be fire-resistance rated shall comply with Section 708 for fire partitions. Ceilings in corridors which are required to be fire-resistance rated shall comply with Section 711 for horizontal assemblies.

Exceptions:

1. A fire-resistance rating is not required for corridors in an occupancy in Group E where each room that is used for instruction has at least one door directly to the exterior and rooms for assembly purposes have at least one-half of the required means of egress doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
2. A fire-resistance rating is not required for corridors contained within a dwelling or sleeping unit in an occupancy in Group R.
3. A fire-resistance rating is not required for corridors in open parking garages.
4. A fire-resistance rating is not required for corridors in an occupancy in Group B which is a space requiring only a single means of egress complying with Section 1015.1.

Reason: Current rated corridor ceiling construction requirements are very difficult to determine. This is primarily owed to the fact that ceiling construction details are presently contained within the continuity requirements for fire partitions in Section 708. Additionally, those requirements are very confusing as now articulated.

This proposal remedies the situation by creating more comprehensive charging language at Section 1018.1. Although corridor rating requirements apply to the ceilings, reference at Section 1018.1 is now only made to walls. The proposal creates cross-references to Section 711 for rated corridor ceiling requirements.

Corridor ceiling requirements currently contained in Exceptions 2 and 3 to Section 708.4 have been deleted. They have been relocated and modified in Section 711, horizontal assemblies. A new paragraph in Section 711.3 contains rated corridor ceiling construction requirements. Current Exception 2 to Section 708.4 is almost moot as currently stated. Section 708.4 permits fire partition wall construction to terminate at the underside of a fire-resistance rated floor/ceiling or roof/ceiling assembly. That general provision renders the labor-intensive exception as highly impractical, especially in buildings required to have a rated floor/ceiling or roof/ceiling assembly by Table 601 based on building type of construction. That exception has been historically intended to apply fire-resistance rated construction not occurring at the entire story. Condition 1 of Section 711.3 makes that distinction. The intent of former Exception 2 to Section 708.4 is now included as an exception to Condition 1 of Section 711.3.

During discussion of a similar proposal in Orlando, as indicated in the published reason for disapproval, there was both floor and committee comment that the proposal could be interpreted as requiring the ceiling to extend throughout the area and not just the corridor. This type of comment reinforces the concern that current provisions are misunderstood. In fact, the proposal achieves just the opposite. It states that if the ceiling is a portion of a rated assembly above the entire story, it may also serve as the ceiling of the corridor. If such were not the case, the exception or Condition 2 would serve as acceptable alternate methods of construction.

Essentially, the former and current exceptions are intended to allow for hybrid assemblies constructed of typical fire-resistance rated materials that represent continuous double membrane fire resistive construction. As is the case with the horizontal wall permitted in former Exception 3 to Section 708.4 and proposed condition 2 to Section 711.3, such construction techniques will likely not pass test as a rated horizontal assembly in accordance with the provisions of Section 703.2. In corridor construction, however, this is not a critical design criterion. This is due to the fact that the otherwise lowest common temporal denominator in rated corridor construction is the 20-minute fire door assembly. Such unorthodox assemblies easily exceed that time period and test or calculation would likely demonstrate at least 40 minutes of anticipated protection. It is not crucial to maintain a true 1-hour fire-resistance rating in an exit access component within which travel distance is being measured. This is also why 0.5-hour fire partitions are permitted in certain rated corridor wall construction. Given the somewhat counterintuitive aspect of this technical provision, it is suggested that applicable commentary explain these requirements and their associated logic. It should be noted that the proposed corridor ceiling construction requirements were contained in at least one legacy code. Unfortunately, some of the subtle construction details were lost in the IBC drafting process. This proposal corrects those inaccuracies and in doing so, greatly improves the usability and comprehensiveness of IBC means of egress provisions.

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

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS74–07/08
708.4, 717.1, 717.3, 717.3.2, 717.4 through 717.4.3

Proponent: Phillip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

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

Exceptions:

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

717.1 General. Fireblocking and draftstopping shall be installed in combustible concealed locations in accordance with this section. Fireblocking shall comply with Section 717.2. Draftstopping in ~~floor/ceiling~~ concealed floor and roof spaces and attic spaces shall comply with Sections 717.3 and 717.4, respectively. The permitted use of combustible materials in concealed spaces of buildings of Type I or II construction shall be limited to the applications indicated in Section 717.5.

717.3 Draftstopping in floors. In combustible construction, draftstopping shall be installed to subdivide ~~floor/ceiling assemblies~~ concealed floor spaces in the locations prescribed in Sections 717.3.2 through 717.3.3.

717.3.2 Groups R-1, R-2, R-3 and R-4. Draftstopping shall be provided in ~~floor/ceiling~~ concealed floor spaces in Group R-1 buildings, in Group R-2 buildings with three or more dwelling units, in Group R-3 buildings with two dwelling units and in Group R-4 buildings. Draftstopping shall be located above and in line with the dwelling unit and sleeping unit separations.

Exceptions:

1. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed spaces.

717.4 Draftstopping in attics. In combustible construction, draftstopping shall be installed to subdivide attic spaces and concealed roof spaces in the locations prescribed in Sections 717.4.2 and 717.4.3. Ventilation of attic spaces and concealed roof spaces shall be maintained in accordance with Section 1203.2.

717.4.1 Draftstopping materials. Materials utilized for draftstopping of attic spaces and concealed roof spaces shall comply with Section 717.3.1.

717.4.1.1 Openings. Openings in the partitions shall be protected by self-closing doors with automatic latches constructed as required for the partitions.

717.4.2 (Supp) Groups R-1 and R-2. Draftstopping shall be provided in attics, mansards, overhangs or other concealed roof spaces of Group R-2 buildings with three or more dwelling units and in all Group R-1 buildings. Draftstopping shall be installed above, and in line with, sleeping unit and dwelling unit separation walls that do not extend to the underside of the roof sheathing above.

Exceptions:

1. Where corridor walls provide a sleeping unit or dwelling unit separation, draftstopping shall only be required above one of the corridor walls.
2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. In occupancies in Group R-2 that do not exceed four stories above grade plane, the attic space or concealed roof space shall be subdivided by draftstops into areas not exceeding 3,000 square feet (279 m^2) or above every two dwelling units, whichever is smaller.
4. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible attic spaces or concealed roof spaces.

717.4.3 Other groups. Draftstopping shall be installed in attic~~s~~ spaces and concealed roof spaces, such that any horizontal area does not exceed 3,000 square feet (279 m^2).

Exception: Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Reason: The purpose for this proposal is to improve the technical consistency of the terminology in the provisions for draftstopping and to eliminate use of the term "floor/ceiling assembly," which is associated with fire-resistance-rated assemblies. This proposal was prepared in conjunction with a related proposal on fire-resistance-rated floor/ceiling and roof/ceiling assemblies. The references to "floor/ceiling spaces" are replaced with "concealed floor spaces," which will bring consistency with "concealed roof spaces" in Section 717.4 on draftstopping in attics. Revisions to this section are also made so that the references to "attic spaces and concealed roof spaces" are more consistent.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS75–07/08
709.5

Proponent: Tom Lariviere, Madison Fire Department, representing Joint Fire Service Review Committee

Revise as follows:

709.5 Openings. Openings in a smoke barrier shall be protected in accordance with Section 715.

Exceptions:

1. In Group I-2, where doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic closing by smoke detection in accordance with Section 715.4.7.3. Positive-latching devices are not required.
2. In Group I-2, horizontal sliding doors installed in accordance with section 1008.1.3.3 and protected in accordance with Section 715.

Reason: Horizontal sliding doors meeting those provisions of section 1008.1.3.3 and 715 are acceptable components in a means of egress. Current language prohibits the use of these doors. This proposal will provide consistency and correlation with the other sections of the IBC.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS76–07/08
709.5

Proponent: John Woestman, The Kellen Company, representing Door Safety Council

Revise as follows:

709.5 Openings. Openings in a smoke barrier shall be protected in accordance with Section 715.

Exception: In Group I-2, where doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts in excess of ¾", louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic closing by smoke detection in accordance with Section 715.4.7.3. Where permitted by the door manufacturer's listing, ~~P~~positive-latching devices are not required.

710.5.2 Smoke and draft control doors. Where required elsewhere in the code, doors in smoke partitions shall be tested in accordance with UL 1784. ~~with an artificial bottom seal installed across the full width of the bottom of the door assembly during the test.~~ The air leakage rate of the door assembly shall not exceed 3 cubic feet per minute per square foot [ft3/(min · ft2)](0.015424 m3/ s · m2) of door opening at 0.10 inch (24.9Pa) of water for both the ambient temperature test and the elevated temperature exposure test.

Reason: All doors have undercuts of some nominal dimension in order to permit operation. This proposal defines a maximum dimension, in compliance with that specified by NFPA 80 – Standard for Fire Doors and Other Opening Protectives – 2007 Edition.

Fire door assemblies required to have a minimum fire protection rating of 20 minutes where located in smoke barrier walls must be tested in accordance with NFPA 252 or UL 10C. These test protocols include requirements for positive latching of the test specimens. As proposed in the second revision, the new language would permit the omission of latching hardware where the door manufacturer's listing includes such applications.

The third revision in this proposal recommends deleting text that is redundant to the language of UL 1784, which requires the application of a bottom seal in order to conduct the test.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS77–07/08
710.5.2

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Revise as follows:

710.5.2 Smoke and draft control doors. Where required elsewhere in the code, doors in smoke partitions shall ~~be~~ meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784 ~~with an artificial bottom seal installed across the full width of the bottom of the door assembly during the test~~. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot ~~[ft^3/(min ft^2)]~~ (0.015424 m^3/(s m^2)) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test. Installation of smoke doors shall be in accordance with NFPA 105.

Reason: The requirements for smoke and draft control doors are covered in Sections 707.14.1, 710.5.2 and 715.4.3.1 of the International Building Code (IBC). These three sections use somewhat different language. As such, the intent of this proposal is to harmonize the language of Section 710.5.2 with the language of Section 715.4.3.1 recently Approved under FS106-06/07, to the extent appropriate. A separate proposal was submitted for Section 707.14.1.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS78–07/08
711.3, 711.3.1, 711.3.2 (New)

Proponent: Sean DeCrane, Cleveland (OH) Fire Department, representing International Association of Fire Fighters, Local 93

1. Revise as follows:

711.3 (Supp) Fire-resistance rating. The fire-resistance rating of floor and roof assemblies shall not be less than that required by the building type of construction. Where the floor assembly separates mixed occupancies, the assembly shall have a fire-resistance rating of not less than that required by Section 508.3.3 based on the occupancies being separated. Where the floor assembly separates a single occupancy into different fire areas, the assembly shall have a fire-resistance rating of not less than that required by Section 706.3.9. ~~Horizontal assemblies separating dwelling units in the same building and horizontal assemblies separating sleeping units in the same building shall be a minimum of 1-hour fire-resistance-rated construction.~~

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

711.3.1 Dwelling and sleeping units. Horizontal assemblies separating dwelling units in the same building and horizontal assemblies separating sleeping units in the same building shall be a minimum of 1-hour fire-resistance-rated construction.

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

2. Add new text as follows:

711.3.2 Lightweight materials. Floor/ceiling assemblies in Group R-3 and R-4 occupancies shall be a minimum of 1-hour fire-resistance-rated construction when constructed using prefabricated wood I-joists, trusses, or steel structural members.

> **Exception:** Fire-resistance-rated construction required by this subsection shall not be required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

(Renumber subsequent sections)

Reason: On August 13, 2006 a Wisconsin fire fighter was killed, and a second fire fighter injured, when the floor they were operating on collapsed sending them into the basement. One fire fighter fell directly into the room of origin and was killed, the second fire fighter landed on the opposite side of a block wall and survived by shielding herself and making an escape through a rear window. They checked the floor to ensure it was safe and solid, just prior to collapse they heard a loud crack.

The floor they were operating on was unprotected lightweight construction that collapsed without warning. In the ensuing investigation, the National Institute for Occupational Safety and Health released report F2006-26. One of the recommendations is to "modify current building codes to require that lightweight trusses be protected with a fire barrier". This should not only pertain to truss construction. There are additional forms of construction that can be determined to be lightweight, cold form steel, bar joists, wooden engineered I-beam, etc., the recent trend in residential construction is to use products that are financially beneficial. It is the belief of many of us in the fire service that as the industry engineers products to a more finite point we are losing our safety factors.

In April, 2005, NIOSH released their report "Preventing Injuries and Deaths of Fire Fighters due to Truss System Failures". In their release they recommended the placement of a labeling system on buildings to indicate the type of construction. While labeling the building will notify responding fire fighters to the type of construction, the fact that R-3 and R-4 occupancies will possibly contain individuals who are incapable of self rescue, or in the least, are challenged in self rescue, will require incidents of fire fighters entering these occupancies when they are compromised by fire to affect rescue. These incidents will require fire fighters to place themselves at greater risk when for a reasonable cost, we can protect these construction practices to allow the extended period of time for possible rescue.

1. National Institute for Occupational Safety and Health Report F206-26. July, 2007.
2. National Institute for Occupational Safety and Health Alert, "Preventing Injuries and Deaths of Fire Fighters due to Truss System Failures".

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

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

FS79–07/08
Table 601, 711.3

Proponent: Jim Ambrose, Code Consultants, Inc.

Revise as follows:

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

	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
BUILDING ELEMENT	**A[h]**	**B[h]**	**A[d, h]**	**B**	**A[d]**	**B**	**HT**	**A[d]**	**B**

h. The roof deck is not required to be protected in accordance with Section 711.3.

(Portions of table and footnotes not shown remain unchanged)

711.3 (Supp) Fire-resistance rating. The fire-resistance rating of floor and roof assemblies shall not be less than that required by the building type of construction. Where the floor assembly separates mixed occupancies, the assembly shall have a fire-resistance rating of not less than that required by Section 508.3.3 based on the occupancies being separated. Where the floor assembly separates a single occupancy into different fire areas, the assembly shall have a fire-resistance rating of not less than that required by Section 706.3.9. Horizontal assemblies separating dwelling units in the same building and horizontal assemblies separating sleeping units in the same building shall be a minimum of 1-hour fire-resistance-rated construction.

Exceptions:

1. Dwelling unit and sleeping unit separations in buildings of Types IIB, IIIB, and VB construction shall have fire-resistance ratings of not less than ½ hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. The roof deck in Types IA, IB and IIA construction is not required to be protected where the roof/ceiling assembly and the primary structural frame is protected in accordance with Tables 601 and 602.

Reason: Section 711.4 of the code permits unprotected duct penetrations and non combustible skylights to be unlimited in area in fire resistance rated roof ceiling assemblies when the structural framing supporting the roof deck is protected as required for the construction type of the building, Basically the code is stating that the roof deck is not a key element in the fire rating of the roof ceiling design provided that Section 704.10 of the code does not apply to the design of the building.

Cost Impact: No increase in cost. This will reduce the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

FS80–07/08
711.5, 711.6, 712.4.1.2, 902.1 (IFC [B] 902.1)

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

711.5 Penetrations. Penetrations of ~~fire-resistance-rated~~ horizontal assemblies shall comply with Section 712.

711.6 Joints. Joints made in or between ~~fire-resistance-rated~~ horizontal assemblies shall comply with Section 713. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 713.4.

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

Exceptions:

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

SECTION 902
DEFINITIONS

902.1 (Supp) (IFC [B] 902.1) Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

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

Reason: The changes are proposed for consistency with the definition of "horizontal assembly" in Section 702.1, which is a "fire-resistance-rated floor or roof assembly of materials designed to restrict the spread of fire in which continuity is maintained." The changes will eliminate superfluous language. The code sections above contain the only instances of "fire-resistance-rated" preceding "horizontal assembly(ies)" in the IBC.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS81–07/08
711.9 (New), 407.4.3 (New),

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing Alliance for Fire and Smoke Containment and Control (AFSCC)

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Add new text as follows:

711.9 Smoke barrier. Where horizontal assemblies are required to resist the movement of smoke by other sections of this code in accordance with the definition for smoke barrier, penetrations and joints in such horizontal assemblies shall be protected as required for smoke barriers in accordance with Sections 712.5 and 713.6. Doors located in elevators shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 707.14.1. Horizontal assemblies shall not be allowed to have unprotected vertical openings. Openings through a horizontal assembly shall be protected as required by Section 707.

PART II – IBC GENERAL

Add new text as follows:

407.4.3 Horizontal assemblies. Horizontal assemblies supporting smoke barriers required by this section shall be designed to resist the movement of smoke and shall comply with Section 711.9.

Reason: This code change proposal is intended to clarify the requirements for horizontal assemblies that are used to support smoke barrier walls such as in Group I-2 occupancies where smoke barriers are required to subdivide floors by Section 407.4. It is clear from the definition for "smoke barrier" that a smoke barrier can be a horizontal assembly. Furthermore, in order to provide for the continuity of the smoke protection for smoke compartments created by vertical smoke barriers to provide for relative safe areas for horizontal movement of patients in a fire emergency, it follows that the floors supporting those smoke barrier walls should also be able to resist the passage or movement of smoke through the assembly to maintain the appropriate level of protection for the occupants. Generally, occupants of Group I-2 occupancies are moved into a smoke barrier that is away from the area where the fire occurred so that they can remain until further moved as necessary or until the fire has been extinguished by the responding fire department. The provisions contained in this code change proposal we believe will provide the equivalent level of smoke protection to that of the smoke barrier for the horizontal assemblies that support the smoke barriers.

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

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS82–07/08
712.2 (New), 712.2.1

Proponent: Bill McHugh, Firestop Contractors International Association

1. Add new text as follows:

712.2 Installation. Penetration firestops shall be installed as tested in an approved fire-resistance-rated assembly and the approved manufacturer's instructions, and shall protect the assembly from fire and smoke when exposed to conditions expected in the environment firestop is applied.

2. Revise as follows:

712.2.1 Installation details, sleeves. Where sleeves are used, they 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: Firestopping is a vital part of effective compartmentation. Firestopping is a very technical industry, requiring technical knowledge of the firm to analyze conditions on construction documents and in the field, select the firestop system that matches the construction documents and / or field conditions and install to zero-tolerance parameters of the firestop design as tested.

Firestop systems are used in many locations in buildings including exposed and concealed locations. In some cases, the materials are exposed to humidity, moisture, chemicals, atmospheric conditions, movement of penetrating items or assemblies, to name a few. As charging language for the firestopping section, the code should state how the firestop is expected / anticipated to be used in buildings. This code change brings the general language into this code change that is found in other sections.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS83–07/08

712.2 (New), 712.2.1, 712.2.2 (New)

Proponent: Bill McHugh, Firestop Contractors International Association

1. Revise as follows:

712.2 Installation. Penetration firestops shall be installed as tested in an approved fire-resistance-rated assembly and the approved manufacturer's instructions, and shall protect the assembly from fire and smoke.

712.2.1 Installation details, sleeves. Where sleeves are used, they 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.

712.2.2 Installation details, field installation. Field installations of penetration firestops shall be installed by contractors certified by an approved agency for such installations.

Reason: Firestopping is a vital part of effective compartmentation. Firestopping is a very technical industry, requiring technical knowledge of the firm to analyze conditions on construction documents and in the field, select the firestop system that matches the construction documents and / or field conditions and install to zero-tolerance parameters of the firestop design as tested. There are firestop installation processes that outline requirements for firestop systems installation and are administered by approved agencies such as FM Approvals and Underwriters Laboratories. Any contractor can be approved or qualified to the programs administered by these agencies.

Firestopping by a contractor firm who has been approved or qualified means that the firm provides audit tested fire and life safety through:

-Designated Responsible Individual – who has passed an industry exam based on the Firestop Contractors International Association's Firestop Industry Manual of Practice, FM Standard FM 4991, Standard for the Approval of Firestop Contractors, and / or the UL Qualified Firestop Contractor Program requirements.

-Quality Audits – The process to install firestopping is very technical, and needs attention to detail. The specialty firestop contractor firm, or trade contractor firm has their quality manual audited and approved or qualified by an auditor from either FM Approvals or Underwriters Laboratories to be recognized by the approved agency.

Firestopping is a vital part of effective compartmentation. When installation is not performed correctly, it can cause delays of certificate of occupancy, reducing building owners' revenue generating time. Firestopping installation is a process that is knowledge sensitive, and uses small sized materials, that can be delivered or drop shipped directly to the project site. It is lightweight and not sensitive to huge freight costs.

There is already a pool of contractor firms who have been approved or qualified. Visit http://www.fcia.org to view these firms, who service the country as well as international locations.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS84–07/08
712.2 (New), 712.2.1, 712.2.2 (New)

Proponent: Bill McHugh, Firestop Contractors International Association

Revise as follows:

712.2 Installation. Penetration firestops shall be installed as tested in an approved fire-resistance-rated assembly and the approved manufacturer's instructions, and shall protect the assembly from fire and smoke when exposed to conditions expected in the environment firestop is applied.

712.2.1 Installation details, sleeves. Where sleeves are used, they 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.

712.2.2 Installation details, field installation. Field installations of penetration firestops shall be installed by contractors certified by an approved agency for such installations.

Reason: Firestopping is a vital part of effective compartmentation. Firestopping is a very technical industry, requiring technical knowledge of the firm to analyze conditions on construction documents and in the field, select the firestop system that matches the construction documents and / or field conditions and install to zero-tolerance parameters of the firestop design as tested.

Firestop systems are used in many locations in buildings including exposed and concealed locations. In some cases, the materials are exposed to humidity, moisture, chemicals, atmospheric conditions, movement of penetrating items or assemblies, to name a few. As charging language for the firestopping section, the code should state how the firestop is expected / anticipated to be used in buildings. This code change brings the general language into this code change that is found in other sections.

Firestopping by a contractor firm who has been approved or qualified means that the firm provides audit tested fire and life safety through:

-Designated Responsible Individual – who has passed an industry exam based on the Firestop Contractors International Association's Firestop Industry Manual of Practice, FM Standard FM 4991, Standard for the Approval of Firestop Contractors, and / or the UL Qualified Firestop Contractor Program requirements.

-Quality Audits – The process to install firestopping is very technical, and needs attention to detail. The specialty firestop contractor firm, or trade contractor firm has their quality manual audited and approved or qualified by an auditor from either FM Approvals or Underwriters Laboratories to be recognized by the approved agency.

Firestopping is a vital part of effective compartmentation. When installation is not performed correctly, it can cause delays of certificate of occupancy, reducing building owners' revenue generating time. Firestopping installation is a process that is knowledge sensitive, and uses small sized materials, that can be delivered or drop shipped directly to the project site. It is lightweight and not sensitive to huge freight costs.

There is already a pool of contractor firms who have been approved or qualified. Visit http://www.fcia.org to view these firms, who service the country as well as international locations.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS85–07/08
202 (New), 712.3, 2102.1

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND IBC STRUCTURAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

1. Revise as follows:

712.3 (Supp) Fire-resistance-rated walls. Penetrations into or through fire walls, fire-barriers, smoke-barrier walls, ~~and~~ fire partitions and fire-resistance-rated load-bearing walls shall comply with Sections 712.3.1 through 712.3.4. Penetrations in smoke barrier walls shall also comply with ~~712.5~~ 712.6.

2. Add definition as follows:

SECTION 202
DEFINITIONS

PARTITION. A nonstructural interior wall that spans horizontally or vertically from support to support.

PART II – IBC STRUCTURAL

1. Revise as follows:

SECTION 2102
DEFINITIONS AND NOTATIONS

WALL. A vertical element with a horizontal length-to-thickness ratio greater than three, used to enclose space.

The definition of "Wall" is limited in application to the provisions of Chapter 21.

Cavity wall. A wall built of masonry units or of concrete, or a combination of these materials, arranged to provide an airspace within the wall, and in which the inner and outer parts of the wall are tied together with metal ties.
Composite wall. A wall built of a combination of two or more masonry units bonded together, one forming the backup and the other forming the facing elements.
Dry-stacked, surface-bonded walls. A wall built of concrete masonry units where the units are stacked dry, without mortar on the bed or head joints, and where both sides of the wall are coated with a surface-bonding mortar.
Masonry-bonded hollow wall. A wall built of masonry units so arranged as to provide an airspace within the wall, and in which the facing and backing of the wall are bonded together with masonry units.
Parapet wall. The part of any wall entirely above the roof line.

Reason: Section 712.3 requires penetrations into and through vertical fire containment assemblies (i.e., fire walls, fire barriers, smoke barrier walls and fire partitions) to be protected with listed penetration firestop systems or equivalent protection. It is common in light-frame and similar methods of construction for load-bearing walls to be constructed of wood studs or cold-formed steel studs and covered with gypsum wallboard, thereby forming cavities between the studs. When the load-bearing walls are also fire-resistance-rated due to the building's type of construction and other requirements, penetrations into or through the load-bearing walls by pipes, tubes, conduits, electrical boxes and other penetrating items can compromise the ability of the wall to support design loads unless the penetrations are protected in the same manner as the penetrations of fire containment assemblies are currently required to be protected.

The continuity provisions for fire barriers (Section 706.5), shaft enclosures (by reference to the provisions for fire barriers), fire partitions (Section 708.4), smoke barriers (Section 709.4), and horizontal assemblies (Section 711.4) require the supporting construction to be protected with fire-resistance-rated construction at least equal to that of the fire containment assembly being supported. If the supporting construction consists of load-bearing walls constructed of wood studs or cold-formed steel studs and covered by gypsum wallboard, penetrations into or through the membranes of these walls can also compromise the ability of the wall to support the fire containment assembly unless the penetrations are protected in the same manner as the penetrations of fire containment assemblies are currently required to be protected.

The ability of a fire containment assembly to provide its intended protection is only as good as its weakest link. The purpose of this proposal is to eliminate fire-resistance-rated load-bearing walls as a potential weakest link.

Several definitions are revised in conjunction with this proposal. A load-bearing wall is defined in Section 202 as a "metal or wood stud wall that supports more than 100 pounds per linear foot of vertical load in addition to its own weight," or a "masonry or concrete wall that supports more than 200 pounds per linear foot of vertical load in addition to its own weight." Section 2102 defines "wall" as a "vertical element with a horizontal length-to-thickness ratio greater than three, used to enclose space." It is apparent from this latter definition that its application is intended to be limited to the provisions of Chapter 21 on masonry. This proposal clarifies the intent by adding text after the definition of "wall" to specify this limited application.

The IBC uses the term "partition" in numerous places but does not provide a definition for it. Without one in the IBC, it has no technical meaning except to the extent that a technical meaning can be derived from the ordinarily accepted meaning of "partition" (refer to Section 201.4). There is confusion among some code users about the distinction between a "wall" and a "partition." This apparent confusion could have an impact on understanding the application of the requirements for load-bearing walls in this proposal. Consequently, this proposal adds a definition for "partition," which was modeled after the definition of "partition" in Section 11.2 of ASCE 7-05.

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

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS86–07/08
712.3.1, 712.4.1.1; IRC R317.3.1

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

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STUCTURAL AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

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

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

1. In concrete or masonry walls ~~where the penetrating item is a maximum 6-inch (152 mm) nominal diameter and the area of the opening through the wall does not exceed 144 square inches (0.0929 m^2)~~, concrete, grout or mortar ~~is~~ shall be permitted where it is installed the full thickness of the wall or the thickness required to maintain the fire-resistance rating~~; or~~ , provided:
   1.1. The nominal diameter of the penetrating item is a maximum of 6 inches (152 mm); and
   1.2. The area of the opening through the wall does not exceed 144 square inches (92 900 mm^2).
2. The material used to fill the annular space shall prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.

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

Exceptions:

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

~~3~~ 4. Penetrations by listed electrical boxes of any material shall be permitted, provided such boxes have been tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listing.

PART II – IRC BUILDING/ENERGY

Revise as follows:

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

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

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

Reason: The purpose for this proposal is to editorially revise the exceptions to IBC Sections 712.3.1 and 712.4.1.1 and IRC Section R317.3.1 so that they are more readily understandable to the code user. This is done by rearranging each group of limitations into a series of items. The phrase "shall be permitted" is also inserted in several areas so that the exceptions are uniformly stated in the form of complete sentences. In Exception #3 to Section 712.4.1.1 (Exception #2 in 2007 Supplement), penetrations in "two or more consecutive" concrete floors is specified to prevent a penetrating item that penetrates alternate floors from being required to comply with the conditions of Item #3 rather than Item #2 (single concrete floor) in order to qualify for the prescriptive use of concrete, grout or mortar to protect the penetration. Penetrations of alternate floors could occur where a penetrating item is protected by listed through penetration firestop systems at intervening floors. In Exception #2 to Section 712.4.1.1, "in" is changed to "through" for consistency with Exception #1 and with the subject of Section 712.4.1.1, which is through penetrations.

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

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS87–07/08

712.3.1, 712.3.2, 712.4.1.1, 712.4.1.2, 716.6.1 (IMC [B] 607.6.1); IRC R317.3.1

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

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

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

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

1. In concrete or masonry walls ~~where the penetrating item is a maximum 6-inch (152 mm) nominal diameter and the area of the opening through the wall does not exceed 144 square inches (0.0929 m^2)~~, concrete, grout or mortar ~~is~~ shall be permitted where it is installed the full thickness of the wall or the thickness required to maintain the fire-resistance rating~~; or~~ , provided:
   1.1. The nominal diameter of the penetrating item is a maximum of 6 inches (152 mm);
   1.2. The area of the opening through the wall does not exceed 144 square inches (92 900 mm^2); and
   1.3. The aggregate area of openings through the wall does not exceed 144 square inches (92 900 mm^2) in any wall area measuring 10 feet (3048 mm) in width by 10 feet (3048 mm) in height
2. The material used to fill the annular space shall prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.

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

Exceptions:

1. Membrane penetrations of maximum two-hour fire-resistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches (0.0103 m^2) in area, provided the aggregate area of the openings through the membrane does not exceed 100 square inches (0.0645 m^2) in any ~~100 square feet (9.29m^2) of~~ wall area measuring 10 feet (3048 mm) in width by 10 feet (3048 mm) in height. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm). Such boxes on opposite sides of the wall or partition shall be separated by one of the following:
   1.1. By a horizontal distance of not less than 24 inches (610 mm);
   1.2. By a horizontal distance of not less than the depth of the wall cavity where the wall cavity is filled with cellulose loose-fill, rockwool or slag mineral wool insulation;
   1.3. By solid fireblocking in accordance with Section 717.2.1;
   1.4. By protecting both outlet boxes with listed putty pads; or
   1.5. By other listed materials and methods.
2. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise. Such boxes on opposite sides of the wall or partition shall be separated as follows:
   2.1. By a horizontal distance of not less than 24 inches (610 mm);
   2.2. By solid fireblocking in accordance with Section 717.2.1;
   2.3. By protecting both boxes with listed putty pads; or
   2.4. By other listed materials and methods.
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of a wall opening protective material system for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
4. Membrane penetrations by boxes other than electrical boxes provided such penetrating items and the annular space between the wall membrane and the box, are protected by an approved membrane penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and shall have an F and T rating of not less than the required fire-resistance rating of the wall penetrated and be installed in accordance with their listing.
5. The annular space created by the penetration of an automatic sprinkler, provided it is covered by a metal escutcheon plate.

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

Exceptions:

1. Penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or masonry items through a single fire-resistance- rated floor assembly where the annular space is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance

rating of the construction penetrated. Penetrating items with a maximum 6-inch (152 mm) nominal diameter shall not be limited to the penetration of a single fire resistance-rated floor assembly, provided the aggregate area of the openings through the assembly does not exceed 144 square inches (92 900 mm^2) in any ~~100 square feet (9.3 m^2) of~~ floor area measuring 10 feet (3048 mm) in width by 10 feet (3048 mm) in length.

2. Penetrations ~~in~~ through a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter shall be permitted, provided:
   2.1 ~~the~~ Concrete, grout or mortar is installed the full thickness of the floor or the thickness required to maintain the fire-resistance rating; and
   2.2. The aggregate area of openings through the floor does not exceed 144 square inches (92 900 mm^2) in any floor area measuring 10 feet (3048 mm) in width by 10 feet (3048 mm) in length.
   ~~The penetrating items shall not be limited to the penetration of a single concrete floor, provided the area of the opening through each floor does not exceed 144 square inches (92 900 mm^2).~~
3. Penetrations through two or more consecutive concrete floors by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter shall be permitted, provided:
   3.1. Concrete, grout or mortar is installed the full thickness of each floor or the thickness required to maintain the fire-resistance rating;
   3.2. The area of each opening through the floors does not exceed 144 square inches (92 900 mm^2); and
   3.3. The aggregate area of openings through each floor does not exceed 144 square inches (92 900 mm^2) in any floor area measuring 10 feet (3048 mm) in width by 10 feet (3048 mm) in length.

~~3~~ 4. Penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listing.

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

Exceptions:

1. Membrane penetrations by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the annular space is protected either in accordance with Section 712.4.1.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm^2) in any ~~100 square feet (9.3m^2) of~~ ceiling area measuring 10 feet (3048 mm) in width by 10 feet (3048 mm) in length in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour fire-resistance-rated horizontal assemblies by steel electrical boxes that do not exceed 16 square inches (10 323 mm^2) in area, provided the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm^2) in any ~~100 square feet (9.29m^2) of~~ ceiling area measuring 10 feet (3048 mm) in width by 10 feet (3048 mm) in length, and the annular space between the ceiling membrane and the box does not exceed 1/8 inch (3.12 mm).
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of an opening protective material system for use in horizontal fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
4. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the ceiling membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise.
5. The annular space created by the penetration of a fire sprinkler, provided it is covered by a metal eschutcheon plate.

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

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

1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel not less than 0.019 inch (0.48 mm) (26 gage) in thickness.

2. The duct shall open into only one dwelling or sleeping unit and the duct system shall be continuous from the unit to the exterior of the building.
3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m^2) in any ~~100 square feet (9.3 m^2) of~~ floor area measuring 10 feet (3048 mm) in width by 10 feet (3048 mm) in length.
4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.
5. Grille openings located in a ceiling of a fire-resistance- rated floor/ceiling or roof/ceiling assembly shall be protected with a listed ceiling radiation damper installed in accordance with Section 716.6.2.1.

PART II – IRC BUILDING/ENERGY

Revise as follows:

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

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

1. In concrete or masonry wall or floor assemblies ~~where the penetrating item is a maximum 6 inches (152 mm) nominal diameter and the area of the opening through the wall does not exceed 144 square inches (92 900 mm^2)~~, concrete, grout or mortar ~~is~~ shall be permitted where installed to the full thickness of the wall or floor assembly or the thickness required to maintain the fire-resistance rating, provided:
   1.1. The nominal diameter of the penetrating item is a maximum of 6 inches (152 mm);
   1.2. The area of the opening through the wall does not exceed 144 square inches (92 900 mm^2); and
   1.3. The aggregate area of openings through the wall or floor assembly does not exceed 144 square inches (92 900 mm^2) in any wall or floor area measuring 10 feet (3048 mm) in width by 10 feet (3048 mm) in height or length.
2. The material used to fill the annular space shall prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time temperature fire conditions under a minimum positive pressure differential of 0.01 inch of water (3 Pa) at the location of the penetration for the time period equivalent to the fire resistance rating of the construction penetrated.

Reason: The use of concrete, grout or mortar to protect penetrations of fire-resistance-rated concrete and masonry walls and floor assemblies in lieu of listed through-penetration firestop systems is reasonable, to a point. The exceptions permitting this method of protection limit the diameter of the penetrating item and, in the cases of walls and multiple floors, limit the area of the opening through the wall or floor, which contains the penetrating item and the concrete, grout or mortar. What the exceptions fail to limit, however, is the aggregate area of openings through the wall or floor. Consequently, an unlimited number of openings are possible. This can lead to groups of openings close enough to each other that the effect can be similar to a single opening many times larger than any one of the individual openings. This could lead to premature failure of the fire-resistance-rated assembly.

The exceptions allowing the use of concrete, grout or mortar are intended for occasional penetrations located so that the distances between penetrating items are several times greater than the dimensions of individual openings. The proposal will place a reasonable limitation upon the aggregate area of openings ensuring that the intent is achieved in most cases.

A proposal similar to this one was submitted for consideration during the 2006/2007 ICC code development cycle (FS 80-06/07-D). The Committee raised objections over the limits on aggregate area of openings based on any 100 square feet of wall or floor area. This limit was included in Proposal FS80-06-07 for consistency with its use elsewhere in Chapter 7. This proposal contains a revised limit as well as revisions to those provisions with the current limit. The revised limit is any wall or floor area measuring 10 feet in width by 10 feet in height or length.

This proposal was prepared in conjunction with a related proposal on editorial revisions to the same provisions. The proposed revisions in the related proposal are included in this proposal where necessary to ensure that the revisions in this proposal are clearly understood when considered with the proposed revisions in the related proposal.

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

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS88–07/08
712.3.1.1

Proponent: Bill McHugh, Firestop Contractors International Association

1. Revise as follows:

712.3.1.1 Fire-resistance-rated assemblies. Through penetrations shall be installed as tested in an approved fire-resistance-rated assembly by contractors certified by an approved agency for such installations.

Reason: Firestopping is a vital part of effective compartmentation. Firestopping is a very technical industry, requiring technical knowledge of the firm to analyze conditions on construction documents and in the field, select the firestop system that matches the construction documents and / or field conditions and install to zero-tolerance parameters of the firestop design as tested. There are firestop installation processes that outline requirements for firestop systems installation and are administered by approved agencies such as FM Approvals and Underwriters Laboratories. Any contractor can be approved or qualified to the programs administered by these agencies.

Firestopping by a contractor firm who has been approved or qualified means that the firm provides audit tested fire and life safety through:

-Designated Responsible Individual – who has passed an industry exam based on the Firestop Contractors International Association's Firestop Industry Manual of Practice, FM Standard FM 4991, Standard for the Approval of Firestop Contractors, and / or the UL Qualified Firestop Contractor Program requirements.

-Quality Audits – The process to install firestopping is very technical, and needs attention to detail. The specialty firestop contractor firm, or trade contractor firm has their quality manual audited and approved or qualified by an auditor from either FM Approvals or Underwriters Laboratories to be recognized by the approved agency.

Firestopping is a vital part of effective compartmentation. When installation is not performed correctly, it can cause delays of certificate of occupancy, reducing building owners' revenue generating time. Firestopping installation is a process that is knowledge sensitive, and uses small sized materials, that can be delivered or drop shipped directly to the project site. It is lightweight and not sensitive to huge freight costs.

There is already a pool of contractor firms who have been approved or qualified. Visit http://www.fcia.org to view these firms, who service the whole country as well as international locations.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS89–07/08
712.3.2

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Revise as follows:

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

Exceptions:

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

2.1. By a horizontal distance of not less than 24 inches (610 mm);
2.2. By solid fireblocking in accordance with Section 717.2.1;
2.3. By protecting both boxes with listed putty pads; or
2.4. By other listed materials and methods.

3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of a wall opening protective material system for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
4. Membrane penetrations by boxes other than electrical boxes provided such penetrating items and the annular space between the wall membrane and the box, are protected by an approved membrane penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and shall have an F and T rating of not less than the required fire-resistance rating of the wall penetrated and be installed in accordance with their listing.
5. The annular space created by the penetration of an automatic sprinkler, provided it is covered by a metal escutcheon plate.

Reason: This proposal is intended to coordinate the requirement of the International Building Code (IBC) with the requirements of the International Residential Code (IRC). During the 2006/2007 Code Development Cycle, this same wording was proposed for inclusion in the IRC and the IBC under Proposal No. FS83. The IRC Building/Energy Committee approved the proposal for inclusion in Section R317.3.2 of the IRC. The IBC Fire Safety Committee brought up concerns and the proposal was disapproved for the IBC. Although the code language included herein is identical to that submitted during the previous cycle under Proposal No. FS83, the justification will attempt to address the concerns of the IBC Fire Safety Committee.

Exceptions 1 and 2 to Section 712.3.2 of the IBC permit electrical boxes to penetrate the membranes of fire-resistance-rated walls and partitions with certain limitations. The limitations on steel electrical boxes covered in Exception 1 include the maximum size of box, the maximum aggregate area of boxes per 100 sq ft of wall area, the annular space between the boxes and the wall membrane, and various methods of separating boxes on opposite sides of walls. Item 1.1 currently requires separation of electrical boxes on opposite sides of walls or partitions by a minimum of 24 in. Presumably, this is intended to place boxes on opposite sides of walls or partitions in separate stud cavities. However, Item 1.1 does not differentiate between installations in walls or partitions constructed with individual stud cavities versus those where the adjacent stud cavities are interconnected. An example of the former would be a wall constructed of either wood or steel studs with gypsum board applied directly to the studs. Examples of the later would be walls or partitions constructed using resilient channels, or those using parallel rows of studs or staggered studs. Parallel stud construction typically consists of two rows of studs on separate wood plates or steel tracks at the top and bottom. Staggered stud construction typically consists of the two rows of studs on oversized common wood plates top and bottom, with the studs alternately aligned with opposite sides of the common wood plates.

When electrical boxes are placed in adjacent cavities on opposite sides of walls or partitions constructed with individual stud cavities, the studs act as fireblocking to limit the transfer of heat through the wall via the electrical boxes. However, this fireblocking by the studs does not exist for walls or partitions without individual stud cavities. In walls or partitions without individual stud cavities, such as with walls constructed with parallel rows of studs or staggered studs, penetrations by electrical boxes expose the interior spaces within the wall to the free passage of heat and products of combustion, which can travel laterally within the wall. The free transfer of heat and products of combustion could potentially compromise the integrity of the fire-resistance-rated barrier if unprotected outlet box penetrations exist on both sides of the wall.

In summary, the specific intent of this proposal is to limit the use of the current 24 in. separation in Item 1.1 to walls constructed with individual stud cavities. Electrical boxes on opposite sides of walls or partitions without individual cavities will as a result need to be protected by one or more of the methods described in Items 1.2 through 1.5.

During the 2006/2007 Code Development Cycle, the Fire Safety Committee had two concerns about the proposed changes to Item 1.1. First, they questioned how the revisions to Item 1.1 coordinate with Items 1.2 through 1.5. With or without this proposal, Item 1.1 provides one solution for separating boxes on opposite sides of the wall. If it applies, it is an option. If not, some other solution is needed. Items 1.2 though 1.5 provide other solutions. Second, they questioned whether a 24 in. separation between boxes on opposite sides of the wall was needed in a wall constructed with non-communicating stud cavities. For wood stud walls, this question is already addressed via Item 1.2. Item 1.2 allows the boxes to be separated by solid fireblocking. Section 718 lists nominal 2 in. lumber as appropriate for fireblocking. As such, boxes separated by a nominal 2 in. wood stud, regardless of the spacing, are permitted by Item 1.2. The answer to the Committee's question is not as clear for steel stud walls. The 24 in. separation first appeared in the 1979 Edition of the ICBO Uniform Building Code. Unfortunately, the original proposal does not state the justification for the 24 in. separation. As indicated earlier, presumably it was intended to place boxes on opposite sides of walls in separate stud cavities. Presumably, it was also intended to cover wood and steel stud walls. Since stud spacing is typically 12, 16 or 24 in. OC, a 24 in. box separation always assures the boxes are in different cavities. Certainly alternative wording could be developed to likewise assure boxes on opposite sides of the wall are in different cavities even with some lesser spacing. However, without having data to justify some other approach, it is suggested the more conservative approach of maintaining the current 24 in. separation be retained for walls constructed with non-communicating stud cavities.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS90–07/08
712.3.2

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Revise as follows:

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

Exceptions:

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

Reason: This proposal is intended to coordinate the requirement of the International Building Code (IBC) with the requirements of the International Residential Code (IRC). During the 2006/2007 Code Development Cycle, this same wording was proposed for inclusion in the IRC and the IBC under Proposal No. FS83. The IRC Building/Energy Committee approved the proposal for inclusion in Section R317.3.2 of the IRC. The IBC Fire Safety Committee brought up concerns with other provisions included within Proposal No. FS83, and the proposal was disapproved in it's entirety for the IBC. There were no concerns expressed on the proposed revision to Item 2.1. As such, the proposed revision to Item 2.1 included herein is identical to that submitted during the previous cycle under Proposal No. FS83 and approved for inclusion in the IRC.

Exceptions 1 and 2 to Section 712.3.2 of the IBC permit electrical boxes to penetrate the membranes of fire-resistance-rated walls and partitions with certain limitations. Exception 1 addresses steel electrical boxes while Exception 2 addresses listed electrical boxes of any materials. Exception 2 specifically permits membrane penetrations of electrical boxes of any materials provided the boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with their listing. In the case of listings through UL, the listings are covered under the product category "Outlet Boxes and Fittings Classified for Fire Resistance" (CEYY). Each listing states the Model No., the wall construction, the maximum individual opening size, the maximum aggregate area of openings per 100 sq ft of wall area, the maximum annular space between the boxes and the wall membrane, and the minimum separation between boxes on opposite sides of the wall. Prior to the year 2000, all UL listed nonmetallic boxes had been tested with a minimum separation of 24 in. The 24 in. separation was intended to assure that boxes on opposites sides of the wall were in separate stud cavities. In 2000, one manufacturer developed, tested and listed boxes with a lesser separation, allowing boxes on opposite sides of the wall to be located in the same stud cavity. As such, their listing states the lesser spacing. Since that time several other manufacturers have developed, tested and listed boxes which can also be installed at a separation less than 24 in. As such, Item 2.1 is more

restrictive than the testing and listings would now suggest is needed. This proposal is simply intended to permit the installation of boxes on opposites sides of the wall at the horizontal separation permitted by the listing.

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

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

FS91–07/08
712.3.2

Proponent: Julius Ballanco, PE, JB Engineering and Code Consulting, PC, representing In-O-Vate Technologies

Revise as follows:

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

Exceptions:

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

Reason: During the last cycle, this section was modified. In the modification, a T rating requirement was added for the first time for penetrations of wall assemblies. The justification for the change was flawed by stating that this is already required. T ratings have only been required for floor/ceiling assembly penetrations, not wall penetrations. Section 712.3.1.2 currently only requires a F rating for a through penetration firestop system.

There is no justification for adding a T rating when an assembly only penetrates a membrane. If the penetration is completely through the wall assembly a T rating is not required. A complete through penetration presents a higher hazard than a membrane penetration. Hence, it is inappropriate to require a T rating for a membrane.

The F rating guarantees the integrity of the wall assembly to prevent the passage of flame. Furthermore, a hose stream test is applied at the end of the test to determine the wall's capabilities.

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

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

FS92–07/08
712.4.1.1

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

Revise as follows:

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

Exceptions:

1. Penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or masonry items which are capable of preventing the passage of flame, hot gases, and heat through and around the penetrating items in conformance with ASTM E119 temperature rise criteria, and are through a single fire-resistance-rated floor assembly where the annular space is protected with materials that prevent the passage of flame, heat, and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated. Penetrating items with a maximum 6-inch (152 mm) nominal diameter shall not be limited to the penetration of a single fire resistance-rated floor assembly, provided the aggregate area of the openings through the assembly does not exceed 144 square inches (92 900 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 the concrete, grout or mortar is installed the full thickness of the floor or the thickness required to maintain the fire-resistance rating. The penetrating items shall not be limited to the penetration of a single concrete floor, provided the area of the opening through each floor does not exceed 144 square inches (92 900 mm^2).
3. Penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listing.
4. Penetrations contained and located within the cavity of a wall are not required to prevent the passage of heat in conformance with ASTM E119 temperature rise criteria.

Reason: The purpose of the code change is to provide greater consistency between the two options permitted by the Code as applicable to temperature rise performance of steel, ferrous or copper pipes or steel conduit penetrants through fire resistance-rated horizontal assemblies and to establish and maintain the minimum level of performance.

The code is currently inconsistent in the application of temperature rise criteria for continuous metallic penetrants such as pipes and steel conduit.

The exceptions in Section 712.4.1 provide a generic allowance for the annular space between the steel, ferrous or copper pipes or steel conduits and fire-resistance rated floors, up to a maximum of 6-inch (152 mm) penetrant size, to be protected with concrete, grout or mortar installed at full thickness of the wall (or the thickness required to maintain the fire-resistance rating). It also provides for the option of using any material tested to prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature fire conditions to be installed in the annular space.

One of the problems with the provisions in exceptions 1 & 2 is that they do not currently address the performance requirement for the penetrating item itself as part of the penetration system protecting the fire-resistance rating of the floor assembly. By comparison, 7.12.4.1.1.2 requires penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479 to have an F rating and a T rating of not less than 1 hour or the required rating of the floor penetrated unless the Floor penetrations are contained and located within the cavity of a wall

In previous cycles, attempts were made to introduce the same exception to the "T"-rating requirements that exists in 712.3.1, and 712.4.1 Exception 1 & 2 for walls and horizontal assemblies, into 7.12.4.1.1.2. This has been rejected by both the Committee and the assembly, even though the proposed new exception was not a new concept, but was contained in the National Building Code (1999) and the Standard Building Code (1999), and stipulated that these metallic penetrants not be in direct contact with combustible materials. In an effort to provide the Fire Safety Committee with sufficient information to assess this proposed Code change, the International Firestop Council commissioned Underwriters' Laboratories Inc. to conduct a "Fact-Finding Investigation". The objective of this Fact-Finding investigation was to determine whether metallic through-penetrations sealed in accordance with IBC Section 712.4.1, Exception 2, using concrete, grout or mortar would develop temperatures in excess of the T- Rating requirements specified in ANSI/UL 1479 (ASTM E814). The results from the test clearly demonstrates that such an opening, complying with this IBC allowance, reaches temperatures in excess of 401°F in under 17 minutes, will reach temperatures in excess of 1160°F in a 3h Standard fire test exposure, and which is sufficient to ignite cotton waste. To put this into some context, in addition to the cotton waste specified in the ASTM E119 and ASTM E814 test methods, there are numerous materials which have auto ignition temperatures around or below 400°F.

Since the steel, ferrous or copper pipes or steel conduits are identical in both provisions, it is obvious that the materials used to protect the annular space between the penetrants and the fire-resistance rated concrete or masonry floors cannot provide a T-rating for any substantial heat conductive metal objects that have been run as a continuous item through the floors. Grout or mortar cannot turn a heat conductive object into a non-conductive object, and the testing requirements used from ASTM E119 in this requirement do not include limiting the transfer of heat. Since proposals to waive the "T"-rating requirements for floor penetrations tested in accordance with ASTM E 814 or UL 1479 and consisting of either a pipe, tube, conduit or electrical conductor that are not in direct contact with combustible materials were not acceptable to either the Committee or the assembly, there is no rational for permitting such an exception in 7.12.4.1.1. Waiver of the shaft provisions of Section 707 makes sense if the penetration conforms to the F and T ratings described in 712.4.1.1.2, because it provides an equivalent performance level. However, not requiring these conductive penetrants to be insulated when installed or tested as described in Exceptions 1 & 2 of 7.12.4.1.1 permits unlimited lengths of these penetrants to be installed, even if in direct contact with combustible materials, without shaft or temperature rise protection.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS93–07/08
712.4.1.1

Proponent: Tony Crimi, AC Consulting Solutions Inc, representing International Firestop Council

Revise as follows:

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

Exceptions:

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

Reason: The purpose of the code change is to provide greater consistency between the two options permitted by the Code as applicable to temperature rise performance of steel, ferrous or copper pipes or steel conduit penetrants through fire resistance-rated horizontal assemblies and to establish and maintain the minimum level of performance.

The code is currently inconsistent in the application of temperature rise criteria for continuous metallic penetrants such as pipes and steel conduit.

In the last three cycles, code committees have taken the position that temperature rise performance is required for these categories of penetrants, in some case, even when they are contained and located within the cavity of a wall. Various submissions were made to introduce an exception to the "T"-rating requirements that currently exists in 712.3.1, and 712.4.1.1 (Exception 1 & 2) for walls and horizontal assemblies, into 7.12.4.1.2. These proposals would have created greater consistency between the technical requirements of these sections of the Code. In each case, this was ultimately rejected by both the Committee and the assembly, even though the proposed new exception was not a new concept, but had been derived from the National Building Code (1999) and the Standard Building Code (1999), and would have stipulated that metallic penetrants not be in direct contact with combustible materials. In doing this, the Committee has clearly established that their intent for the IBC was to not provide any exceptions from the T-ratings other than where the penetrant is within the cavity of a wall, as indicated in the exception to 712.4.1.1.2.

That being the case, since the steel, ferrous or copper pipes or steel conduits are identical in all of these provisions, it is a given that metal penetrants simply passing through a fill of concrete, grout, or mortar cannot provide a T-rating for any substantial heat conductive metal objects that have been run as a continuous item through the floors, due to the inherent thermal conductivity of the metal penetrants. Consequently, these concrete, grout, or mortar sealed penetrations without a T-rating must similarly only be acceptable if located within a chase wall. The complete lack of temperature rise limits on floor penetrations, as allowed in 712.4.1 Exceptions 1 and 2, is completely inconsistent with the Committee's actions over 3 cycles, and lowers the required level of performance of a fire resistance rated separation selectively based on firestopping methods rather than safety.

In an effort to provide the Fire Safety Committee with sufficient information to assess this proposed Code change, the International Firestop Council commissioned Underwriters' Laboratories Inc. to conduct a "Fact-Finding Investigation". The objective of this Fact-Finding investigation was to determine whether metallic through-penetrations sealed in accordance with IBC Section 712.4.1, Exception 2, using concrete, grout or mortar would develop temperatures in excess of the T- Rating requirements specified in ANSI/UL 1479 (ASTM E814). The results from the test clearly demonstrates that such an opening, complying with this IBC allowance, reaches temperatures in excess of 401°F in under 17 minutes, will reach temperatures in excess of <u>1160°F in a 3h Standard fire test exposure</u>, and which is sufficient to ignite cotton waste. To put this into some context, in addition to the cotton waste specified in the ASTM E119 and ASTM E814 test methods, there are numerous materials which have auto ignition temperatures around or below 400°F. For example, with convective heating of wood, unpiloted ignition has been reported to be as low as 270°C and as high as 470°C. Some other typical flash ignition temperatures are as reported below:

FLASH IGNITION TEMPERATURE COMPARISON[1]

Material	^{0}C	^{0}F
CPVC	482	900
PVC, rigid	399	750
Polyethylene	343	650
White Pine	204	400
Paper	232	450

Having recognized that "t"-ratings are necessary, the Code needs to apply the same level of protection, regardless of the test method used to qualify the firestopping material. This proposed Code change will establish the minimum level of safety at the same level, regardless of whether firestopping is achieved by using concrete, grout, mortar or ASTM E814 tested materials and systems.

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

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

FS94–07/08
712.4.1.1.1

Proponent: Bill McHugh, Firestop Contractors International Association

1. Revise as follows:

712.4.1.1.1 Installation. Through penetrations shall be installed as tested in the approved fire-resistance-rated assembly by contractors certified by an approved agency for such installations.

Reason: Firestopping is a vital part of effective compartmentation. Firestopping is a very technical industry, requiring technical knowledge of the firm to analyze conditions on construction documents and in the field, select the firestop system that matches the construction documents and / or field conditions and install to zero-tolerance parameters of the firestop design as tested. There are firestop installation processes that outline requirements for firestop systems installation and are administered by approved agencies such as FM Approvals and Underwriters Laboratories. Any contractor can be approved or qualified to the programs administered by these agencies.

Firestopping by a contractor firm who has been approved or qualified means that the firm provides audit tested fire and life safety through:

-Designated Responsible Individual – who has passed an industry exam based on the Firestop Contractors International Association's Firestop Industry Manual of Practice, FM Standard FM 4991, Standard for the Approval of Firestop Contractors, and / or the UL Qualified Firestop Contractor Program requirements.

-Quality Audits – The process to install firestopping is very technical, and needs attention to detail. The specialty firestop contractor firm, or trade contractor firm has their quality manual audited and approved or qualified by an auditor from either FM Approvals or Underwriters Laboratories to be recognized by the approved agency.

Firestopping is a vital part of effective compartmentation. When installation is not performed correctly, it can cause delays of certificate of occupancy, reducing building owners' revenue generating time. Firestopping installation is a process that is knowledge sensitive, and uses small sized materials, that can be delivered or drop shipped directly to the project site. It is lightweight and not sensitive to huge freight costs.

There is already a pool of contractor firms who have been approved or qualified. Visit http://www.fcia.org to view these firms, who service the whole country as well as international locations.

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

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

FS95–07/08
712.4.1.1.2

Proponent: John Valiulis, PE, Hilti, Inc.

Revise as follows:

712.4.1.1.2 Through-penetration firestop system. Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F-rating and a T-rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exception: Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T- rating.

Reason: To clarify what types of installation conditions can prevent a floor through-penetration from getting unsafely hot in the event of a fire.

The normal requirement for firestopping of a penetration through a floor is for the firestop system to provide a T-rating that is equivalent to the F-rating, so as to prevent the penetrant from exceeding a temperature rise of 325 F on the unexposed (non-fire) side. This is normally accomplished by providing some amount of thermal insulation on the penetrating item.

It has long been generally recognized that if the penetrating item is concealed within a wall, then the conditions that can lead to an unsafe temperature rise in the penetrating item should not exist. This occurs due to two possible conditions:

1. The penetrating item is shielded from the fire below the floor by being contained within the cavity of a wall. This will prevent direct heat transfer from the fire to the penetrating item, thus allowing the temperature above the floor from rising as it would if the penetrating item was exposed to the fire.
2. The penetrating item is protected from accidentally igniting combustible contents in the space above the floor by being contained above the floor within the cavity of a wall.

Either will achieve the desired effect, either by keeping the penetrant from getting as hot as quickly, or by shielding an overheated penetrant from combustibles in the room above. The clarification to the exception is thus proposed to indicate that either option would accomplish the desired goal, albeit in a different way.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS96–07/08
712.4.1.2

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing Spray Polyurethane Foam Alliance

Revise as follows:

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

Exceptions:

1. Membrane penetrations by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the annular space is protected either in accordance with Section 712.4.1.1 or ~~to prevent the free passage of flame and the products of combustion.~~ Section 717.2.5. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm^2) in any 100 square feet ($9.3m^2$) of ceiling area in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour fire-resistance-rated horizontal assemblies by steel electrical boxes that do not exceed 16 square inches (10 323 mm^2) in area, provided the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm^2) in any 100 square feet ($9.29m^2$) of ceiling area, and the annular space between the ceiling membrane and the box does not exceed 1/8 inch (3.12 mm).
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of an opening protective material system for use in horizontal fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
4. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the ceiling membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise.
5. The annular space created by the penetration of a fire sprinkler, provided it is covered by a metal escutcheon plate.

Reason: Currently, Section 717.2.5 references Section 712.4.1.2 in that it states "Where annular space protection is provided in accordance with …Exception 1 of Section 712.4.1.2…."

This proposal provides an appropriate cross reference to Section 717.2.5 wherein the performance of the materials is specified.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS97–07/08
712.4.2.1

Proponent: John Valiulis, PE, Hilti, Inc.

Revise as follows:

712.4.2.1 Noncombustible penetrating items. Noncombustible penetrating items that connect not more than three stories are permitted, provided that the annular space is filled to resist the free passage of flame and the products of combustion with an approved noncombustible material ~~to resist the free passage of flame and the products of combustion~~ or with a fill, void or cavity material that is tested and classified for use in through-penetration firestop systems.

Reason: The purpose of this code change is to expand the range of materials that are allowed to be used for sealing of penetrations in non-fire-resistance rated floors to include the materials that are already allowed by this code to be used to seal penetrations in fire-resistive floors.

Materials that are tested and classified by accredited test laboratories as "fill, void or cavity materials for use in through-penetration firestop systems" are used as part of firestop systems that are tested and listed in accordance with test method ASTM E814 (UL 1479) to meet the requirements of IBC section 712. 4.1.1.2 "Through-penetration firestop system". With very few exceptions, these materials would NOT meet the definition of non-combustible, and thus would not be permitted per the 2006 IBC to seal penetrations in non-fire-resistance rated assemblies. However, if these materials can be used to meet the requirements for the sealing of penetrations in fire-resistance rated assemblies, it stands to reason that they should also be allowed as an option in sealing penetrations through non-fire-resistance rated floors. The present code language is overly restrictive and prohibits the use of other products that can achieve the same performance just as well or possibly even better.

Another indication of the fact that the requirement in 712.4.2.1 is unnecessarily restrictive is the fact that the very next code article, 712.4.2.2, which deals with both combustible and noncombustible penetrating items, does not mandate the sealing material to be non-combustible. Since the sealing of penetrating items that are combustible is logically more demanding than the sealing of penetrating items that are non-combustible, it stands to reason that if the requirement for a non-combustible sealant does not exist for sealing combustible penetrants, then there is no need to impose that restriction for the sealing of non-combustible penetrants, as long as the sealant material has been demonstrated to have properties that make it suitable for use in fire-related applications, as is the case with the classified "fill, void or cavity materials".

The exceptional demands placed on such materials by firestop system testing (per ASTM E814/UL1479) means that materials that have succeeded in being so listed will have properties that make them particularly suitable to seal the annular space in both rated or non-rated floors, with properties such as excellent adhesion to both substrate and penetrants, and good high-temperature resistance via a variety of chemical and physical processes such as insulation, ablation or intumescence.

Materials that have met the requirements for Classification as "Fill, void or cavity material for use in though-penetration firestop systems" can be found, for example, in the UL Fire Resistance Directory (or online at www.UL.com) under the listing category XHHW.

Cost Impact: The code change proposal will not increase the cost of construction. The proposed code change would allow the user additional options and additional flexibility, without disallowing the solution that has previously existed.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS98–07/08
712.4.2, 712.4.2.1, 712.4.2.2

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing Spray Polyurethane Foam Alliance

Revise as follows:

712.4.2 (Supp) Nonfire-resistance-rated assemblies. Penetrations of nonfire-resistance rated floor or floor/ceiling assemblies or the ceiling membrane of a nonfire-resistance rated roof/ceiling assembly shall meet the requirements of Section 707 or shall comply with Section 712.4.2.1 or 712.4.2.2.

712.4.2.1 Noncombustible penetrating items. Noncombustible penetrating items that connect not more than three stories are permitted, provided that the annular space is ~~filled with an approved noncombustible material to resist the free passage of flame and the products of combustion~~ fireblocked in accordance with Section 717.2.5.

712.4.2.2 Penetrating items. Penetrating items that connect not more than two stories are permitted, provided that the annular space is ~~filled with an approved material to resist the free passage of flame and the products of combustion.~~ fireblocked at each floor level in accordance with Section 717.2.5.

Reason: Currently, Section 717.2.5 references Section 712.4.1.2 in that it states "Where annular space protection is provided in accordance with …or Section 712.4.2…."

This proposal provides an appropriate cross reference to Section 717.2.5 wherein the performance of the materials is specified.

In the revision to Section 712.4.2.1 the words “approve noncombustible material” were removed. Exception 19 of Item 2 in Section 603.1 allows materials used to protect penetrations in fire-resistance rated assemblies in accordance with Section 712 to be combustible. Thus, in a nonfire-resistance rated assembly, the same allowance should be provided for materials used as fireblocking.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS99–07/08
712.5

Proponent: John Williams, Washington State Department of Health, Construction Review Services, representing Washington Association of Building Officials, Technical Code Development Committee

Revise as follows:

712.5 Penetrations in smoke barriers. Penetrations in smoke barriers shall be tested in accordance with the requirements of UL 1479 for air leakage~~. The air leakage rate of the penetration assembly shall not exceed 5.0 cfm per square foot ($0.025 m^3 / s \bullet m^2$) of penetration opening at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature tests.~~

Reason: To delete the requirement for an individual penetration of a smoke barrier to comply with 5 cfm/sq ft. The 5 cfm/sq ft value imposes a restriction on an individual opening rather than minimizing the total smoke leakage within a given area. Thus, it does not significantly improve life safety and only serves to raise the cost of construction.

The Standard, UL 1479 includes an optional air leakage test to determine how well a particular opening is sealed against particulate air and smoke. While in principle it is a good idea to be cognizant of air leakage, this code requirement does not make buildings safer because the method used to report air leakage is flawed.

Reporting air leakage by expressing it in terms of cfm/sq ft is not the actual leakage through the opening. This allows the test to be manipulated to comply with the 5 cfm/sq ft value while at the same time not reducing the air leakage through the opening.

Air leakage occurs within unsealed space within a given opening. In the case of grouped electrical or communications cabling, it represents the interstitial space between each cable within the bundle. In other words, the cables typically do not nest tightly enough to prevent leakage from occurring within the bundle itself. Using caulk to provide a seal around the bundle will provide a near hermetic seal around the bundle, but it will not reduce the leakage through the interstitial space within the bundle. Therefore, the leakage within the bundle is a constant. To mathematically show the flaw in expressing leakage in terms of cubic feet per minute per square foot, please see the examples below:

Consider a 4” diameter cable bundle passes through a 0.5 sq ft opening and the actual leakage is 4.9 cfm - expressed in cfm/sq ft, the leakage would be 9.8 cfm/sq ft (4.9/0.5=9.8).

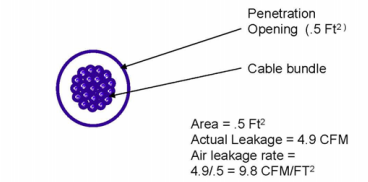
However, if the same 4” diameter cable bundle passes instead through a 2.5 sq ft opening, the interstitial (i.e. unsealed) space within the bundle does not change, so the actual leakage is still 4.9. However, dividing 4.9 by 2.5 will yield a leakage rating of 1.96 cfm/sq ft (4.9/2.5=1.96). The 2 cfm/sq ft value complies with the requirements of Section 712.5 yet the leakage remains the same.

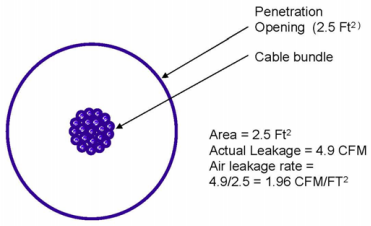
The easy way to make a system pass is to increase the size of the opening. It is not improving life safety because the actual leakage has not been reduced despite the fact that the design listing may state that it provides an L Rating of 5 cfm/sq ft or less. Additionally, most third party laboratories list opening sizes in terms of a “maximum”, but they do not specify a minimum opening size. Therefore, a design listing with a published L Rating less than 5 cfm/sq ft may actually provide false comfort since the same grouped penetrant bundle installed through a smaller opening will have a computed L Rating above 5 cfm/sq ft when tested despite the fact that the design listing permits the installation in smaller openings by specifying a maximum opening size without restricting the minimum size.

Finally, limiting an individual opening to 5 cfm/sq ft, but not capping the aggregate may encourage the practice of simply making more small openings that do comply with 5 cfm/sq ft to simply get the same volume of building services into a given area. If a group of air conditioning line sets has an L Rating greater than 5 cfm/sq ft, simply splitting the bundle into two openings may in fact allow each individual bundle to comply with 5 cfm/sq ft, but if you calculate the interstitial space, the actual leakage doesn’t change. This has the effect of weakening the wall overall.

Section 712.5 as presently written in the 2006 IBC may actually have a negative impact on life safety by compromising the performance of the assembly by promoting the concept of creating larger openings or a series of smaller openings. The 5 cfm/sq ft value was prematurely added to the codes. It should be struck until such time that reporting methods improve or a better methodology for evaluating leakage through a smoke barrier can be developed.

I am not averse to leaving a reference to the air leakage tests of UL 1479 in the code for now provided that the value is eliminated. It plays up the importance of looking for tested systems, while not mandating a specific value that is arbitrary and subject to exploitation of present testing and reporting methods.





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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS100–07/08
712.5

Proponent: John Williams, Washington State Department of Health, Construction Review Services, representing Washington Association of Building Officials, Technical Code Development Committee

Delete without substitution:

~~**712.5 Penetrations in smoke barriers.** Penetrations in smoke barriers shall be tested in accordance with the requirements of UL 1479 for air leakage. The air leakage rate of the penetration assembly shall not exceed 5.0 cfm per square foot ($0.025 m^3/s \cdot m^2$) of penetration opening at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature tests.~~

Reason: The 5 cfm/sq ft value imposes a restriction on an individual opening rather than minimizing the total smoke leakage within a given area. Thus, it does not significantly improve life safety and only serves to raise the cost of construction.

The Standard, UL 1479 includes an optional air leakage test to determine how well a particular opening is sealed against particulate air and smoke. While in principle it is a good idea to be cognizant of air leakage, this code requirement does not make buildings safer because the method used to report air leakage is flawed.

Reporting air leakage by expressing it in terms of cfm/sq ft is not the actual leakage through the opening. This allows the test to be manipulated to comply with the 5 cfm/sq ft value while at the same time not reducing the air leakage through the opening.

Air leakage occurs within unsealed space within a given opening. In the case of grouped electrical or communications cabling, it represents the interstitial space between each cable within the bundle. In other words, the cables typically do not nest tightly enough to prevent leakage from occurring within the bundle itself. Using caulk to provide a seal around the bundle will provide a near hermetic seal around the bundle, but it will not reduce the leakage through the interstitial space within the bundle. Therefore, the leakage within the bundle is a constant. To mathematically show the flaw in expressing leakage in terms of cubic feet per minute per square foot, please see the examples below:

Consider a 4" diameter cable bundle passes through a 0.5 sq ft opening and the actual leakage is 4.9 cfm - expressed in cfm/sq ft, the leakage would be 9.8 cfm/sq ft (4.9/0.5=9.8).

However, if the same 4" diameter cable bundle passes instead through a 2.5 sq ft opening, the interstitial (i.e. unsealed) space within the bundle does not change, so the actual leakage is still 4.9. However, dividing 4.9 by 2.5 will yield a leakage rating of 1.96 cfm/sq ft (4.9/2.5=1.96). The 2 cfm/sq ft value complies with the requirements of Section 712.5 yet the leakage remains the same.

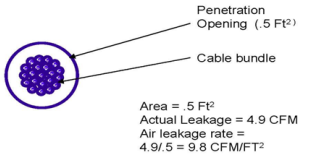
The easy way to make a system pass is to increase the size of the opening. It is not improving life safety because the actual leakage has not been reduced despite the fact that the design listing may state that it provides an L Rating of 5 cfm/sq ft or less. Additionally, most third party laboratories list opening sizes in terms of a "maximum", but they do not specify a minimum opening size. Therefore, a design listing with a published

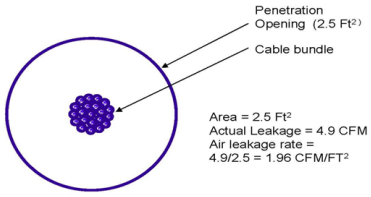
L Rating less than 5 cfm/sq ft may actually provide false comfort since the same grouped penetrant bundle installed through a smaller opening will have a computed L Rating above 5 cfm/sq ft when tested despite the fact that the design listing permits the installation in smaller openings by specifying a maximum opening size without restricting the minimum size.

Finally, limiting an individual opening to 5 cfm/sq ft, but not capping the aggregate may encourage the practice of simply making more small openings that do comply with 5 cfm/sq ft to simply get the same volume of building services into a given area. If a group of air conditioning line sets has an L Rating greater than 5 cfm/sq ft, simply splitting the bundle into two openings may in fact allow each individual bundle to comply with 5 cfm/sq ft, but if you calculate the interstitial space, the actual leakage doesn't change. This has the effect of weakening the wall overall.

Section 712.5 as presently written in the 2006 IBC may actually have a negative impact on life safety by compromising the performance of the assembly by promoting the concept of creating larger openings or a series of smaller openings. The 5 cfm/sq ft value was prematurely added to the codes. It should be struck until such time that reporting methods improve or a better methodology for evaluating leakage through a smoke barrier can be developed.

Although devising test methods that quantify air leakage through assemblies is in theory a good practice, until the test method is corrected, it is premature to have it referenced in the code.





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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS101–07/08
712.5

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Add new text as follows:

712.5 Structural members. Penetrations of membranes and other materials that provide, or are components of, the fire-resistance rating at structural members required to be fire-resistance-rated by other provisions of this code are prohibited.

Exceptions:

1. Membrane penetrations protected by an approved penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and with an F-rating and a T-rating of not less than the required fire-resistance rating of the assembly penetrated shall be permitted.
2. Membrane penetrations installed as tested in an approved fire-resistance-rated assembly shall be permitted.

(Renumber subsequent section)

Reason: Section 712.3 requires penetrations into and through vertical fire containment assemblies (i.e., fire walls, fire barriers, smoke barrier walls and fire partitions) to be protected with listed penetration firestop systems or equivalent protection. Section 712.4 contains similar requirements for horizontal assemblies, which are fire-resistance-rated by definition (see Section 702.1). There are numerous provisions in the IBC requiring structural members to be fire-resistance-rated or to be protected with fire-resistance-rated assemblies. This protection is often in the form of gypsum board supported by cold-formed steel members, which forms cavities between the structural member and the gypsum board. Penetrations into these cavities by pipes, tubes, conduits, electrical boxes and other penetrating items can compromise the ability of the structural member to support design loads.

The fire-resistance ratings of structural members are typically established through testing in accordance with ASTM E 119 or UL 263. Section 703.3 requires such testing unless an equivalent method of protection is used. The ASTM E 119 and UL 263 test methods for membranes protecting structural members do not account for the possibility of unprotected penetrations in the membranes. Reliance on a listed assembly for the fire-resistance-rated protection of structural members in a building or structure that has not tested for unprotected penetrations of the membranes but where unprotected penetrations of the membranes occur could lead to premature failure of the protection, which could result in premature failure of the structural member to support design loads.

This proposal resolves the problem by prohibiting penetrations of the membranes or other materials that provide, or are components of, the fire-resistance rating of structural members required to be fire-resistance-rated by other provisions of the IBC. It also proposes two exceptions that are similar to the exceptions for through-penetrations and other membrane penetrations of fire-resistance-rated assemblies. The first exception is protection by a listed membrane firestop system with an F rating and a T rating at least equal to the fire-resistance rating of the assembly penetrated. The second exception is a penetrating item that has been tested in accordance with ASTM E 119 or UL 263 and found to meet the test requirements without protection other than provided by the penetrating item.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS102–07/08
713.1

Proponent: Jason J. Krohn, PE, Precast/Prestressed Concrete Institute

Revise as follows:

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

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

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 707.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.
5. Floors within open and enclosed parking ~~structures~~ garages constructed in accordance with Sections 406.3 and 406.4, respectively.
6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263.

Reason: Exception 8 of Section 707.2 permits floor openings for automobile ramps in open and enclosed parking garages without shaft enclosures. If floor openings for ramps are unenclosed in enclosed garages, there is no logic in requiring fire-resistive joint systems for joints in floors of enclosed garages. The revised wording of Exception 5 is similar to existing text in Exception 8 of Section 707.2. The change from open parking “structure” to “garage” is consistent with the terminology used in Section 406.3.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS103–07/08
713.1

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

Revise as follows:

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

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

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 707.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.
5. Floors and ramps within ~~open parking structures~~ and enclosed parking garages or structures constructed in accordance with Sections 406.3 and 406.4, respectively.
6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263.

Reason: Section 713.1 Exception 2 states,*" Floors where the joint is protected by a shaft enclosure in accordance with Section 707*". Section 707.2, Exception 8 states, "*A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively".* The code is not clear that compliance with Exception 8 to Section 707.2; in turn is complying with Exception 2, to Section 713.1.

It makes no sense to permit the ramps or floors in open and enclosed parking facilities to open to the other levels with no protection; however require that the joints created between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies to be protected.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS104–07/08
713.3

Proponent: Bill McHugh, Firestop Contractors International Association

Revise as follows:

713.2 Installation. Fire-resistant joint systems shall be securely installed in or on the joint 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 while exposed to conditions expected in the environment applied.

Reason: Firestopping the various types of joints from expansion, to tops of fire resistance rated walls, and building perimeters is a vital part of effective compartmentation. Firestopping is a very technical industry, requiring technical knowledge of the firm to analyze conditions on construction documents and in the field, select the firestop system that matches the construction documents and / or field conditions and install to zero-tolerance parameters of the firestop design as tested.

In some cases, the materials are exposed to humidity, moisture, chemicals, atmospheric conditions, movement of penetrating items or assemblies, to name a few. As charging language for the firestopping section, the code should state how the firestop is expected / anticipated to be used in buildings. This code change brings the general language into this code change that is found in other sections.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS105–07/08
713.2

Proponent: Bill McHugh, Firestop Contractors International Association

1. Revise as follows:

SECTION 713
FIRE RESISTANT JOINT SYSTEMS

713.2 Installation. Fire-resistant joint systems shall be securely installed in or on the joint 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, installed by contractors certified by an approved agency for such installations.

Reason: Firestopping the various types of joints from expansion, to tops of fire resistance rated walls, and building perimeters is a vital part of effective compartmentation. Firestopping is a very technical industry, requiring technical knowledge of the firm to analyze conditions on construction documents and in the field, select the firestop system that matches the construction documents and / or field conditions and install to zero-tolerance parameters of the firestop design as tested. There are firestop installation processes that outline requirements for firestop systems installation and are administered by approved agencies such as FM Approvals and Underwriters Laboratories. Any contractor can be approved or qualified to the programs administered by these agencies.

Firestopping by a contractor firm who has been approved or qualified means that the firm provides audit tested fire and life safety through:

-Designated Responsible Individual – who has passed an industry exam based on the Firestop Contractors International Association's Firestop Industry Manual of Practice, FM Standard FM 4991, Standard for the Approval of Firestop Contractors, and / or the UL Qualified Firestop Contractor Program requirements.

-Quality Audits – The process to install firestopping is very technical, and needs attention to detail. The specialty firestop contractor firm, or trade contractor firm has their quality manual audited and approved or qualified by an auditor from either FM Approvals or Underwriters Laboratories to be recognized by the approved agency.

Firestopping is a vital part of effective compartmentation. When installation is not performed correctly, it can cause delays of certificate of occupancy, reducing building owners' revenue generating time. Firestopping installation is a process that is knowledge sensitive, and uses small sized materials, that can be delivered or drop shipped directly to the project site. It is lightweight and not sensitive to huge freight costs.

There is already a pool of contractor firms who have been approved or qualified. Visit http://www.fcia.org to view these firms, who service the whole country as well as international locations.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS106–07/08
713.2

Proponent: Bill McHugh, Firestop Contractors International Association

Revise as follows:

SECTION 713
FIRE AND SMOKE-RESISTANT JOINT SYSTEMS

713.2 Installation. Fire and smoke-resistant joint systems shall be securely installed in or on the joint 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 while exposed to conditions expected in the environment applied. Fire and smoke-resistant joint systems shall be installed by contractors certified by an approved agency for such installations.

Reason: Firestopping the various types of joints from expansion, to tops of fire resistance rated walls, and building perimeters is a vital part of effective compartmentation. Firestopping is a very technical industry, requiring technical knowledge of the firm to analyze conditions on construction documents and in the field, select the firestop system that matches the construction documents and / or field conditions and install to zero-tolerance parameters of the firestop design as tested.

In some cases, the materials are exposed to humidity, moisture, chemicals, atmospheric conditions, movement of penetrating items or assemblies, to name a few. As charging language for the firestopping section, the code should state how the firestop is expected / anticipated to be used in buildings. This code change brings the general language into this code change that is found in other sections.

There are firestop installation processes that outline requirements for firestop systems installation and are administered by approved agencies such as FM Approvals and Underwriters Laboratories. Any contractor can be approved or qualified to the programs administered by these agencies.

Firestopping by a contractor firm who has been approved or qualified means that the firm provides audit tested fire and life safety through:

-Designated Responsible Individual – who has passed an industry exam based on the Firestop Contractors International Association's Firestop Industry Manual of Practice, FM Standard FM 4991, Standard for the Approval of Firestop Contractors, and / or the UL Qualified Firestop Contractor Program requirements.

-Quality Audits – The process to install firestopping is very technical, and needs attention to detail. The specialty firestop contractor firm, or trade contractor firm has their quality manual audited and approved or qualified by an auditor from either FM Approvals or Underwriters Laboratories to be recognized by the approved agency.

Firestopping is a vital part of effective compartmentation. When installation is not performed correctly, it can cause delays of certificate of occupancy, reducing building owners' revenue generating time. Firestopping installation is a process that is knowledge sensitive, and uses small sized materials, that can be delivered or drop shipped directly to the project site. It is lightweight and not sensitive to huge freight costs.

There is already a pool of contractor firms who have been approved or qualified. Visit http://www.fcia.org to view these firms, who service the whole country as well as international locations.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS107–07/08

704.9.1, 711.6, 713.1, 713.4

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

704.9.1 (Supp) Voids. The void created at the intersection of a floor/ceiling assembly and an exterior ~~curtain~~ wall assembly shall be protected in accordance with Section 713.4.

711.6 Joints. Joints made in or between fire-resistance-rated horizontal assemblies shall comply with Section 713. The void created at the intersection of a floor/ceiling assembly and an exterior ~~curtain~~ wall assembly shall be protected in accordance with Section 713.4.

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

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

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

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

Reason: The protection of voids at the perimeters of fire-resistance-rated floor assemblies is limited to locations of curtain wall assemblies adjacent to the floor assemblies. Curtain wall assemblies, however, are not the only type of exterior wall assembly that can create voids at the perimeters of fire-resistance-rated floor assemblies (i.e., storefront glazing, refer to IECC Section 202). This proposal addresses the discrepancy by deleting "curtain" at all applicable locations in the IBC. The deletion will also align the provisions with ASTM E 2307 on the testing of perimeter fire barrier systems, which consistently references exterior wall assemblies in its provisions. Curtain wall assemblies are defined in Section 3.1.2 but are not referenced anywhere else in the provisions.

This proposal was prepared in conjunction with related proposals on limiting the protection of voids created at the intersections of exterior curtain wall assemblies and fire-resistance-rated floor assemblies to listed perimeter fire barrier systems, and the placement of the revised provisions in a separate section on perimeter fire barrier systems.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS108–07/08

704.9.1, 711.6, 713.1 713.6, 713.4, 714.2 (New), 713.5

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

1. Revise as follows:

~~**704.9.1**~~ **704.10 (Supp) Perimeter Voids**. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section ~~713.4~~ 714.

(Renumber subsequent sections)

711.6 Joints. Joints made in or between fire-resistance-rated horizontal assemblies shall comply with Section 713.

711.7 Perimeter Voids. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section ~~713.4~~ 714.

(Renumber subsequent sections)

713.1 (Supp) General. Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which it is installed. Fire-resistant joint systems shall be tested in accordance with Section 713.3. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section ~~713.4~~ 714.

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

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

~~**713.6**~~ **713.4 Fire-resistant joint systems in smoke barriers.** Fire-resistant joint systems in smoke barriers shall be tested in accordance with the requirements of UL 2079 for air leakage. The air leakage rate of the joint shall not exceed 5 cfm per lineal foot (0.00775 m^3/s m) of joint at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature tests.

SECTION 714
PERIMETER FIRE BARRIER SYSTEMS

~~713.4~~ **714.1 (Supp)** ~~**Exterior curtain wall/floor intersection**~~ **General.** Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be ~~sealed with an approved material or~~ protected by an approved perimeter fire barrier system ~~to prevent the interior spread of fire. Such material or systems shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected either to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) or~~ installed as tested in accordance with ASTM E 2307 for ~~the~~ a time period at least equal to the required fire-resistance rating of the floor assembly. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 704.9.

714.2 Installation. The portions of the systems in the voids shall be securely installed for their entire length so as not to dislodge, loosen or otherwise impair their ability to accommodate expected building movements.

~~713.5~~ **714.3 Spandrel wall.** Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 704.9. Where Section 704.9 does not require a fire-resistance-rated spandrel wall, the requirements of Section 713.4 shall still apply to the intersection between the spandrel wall and the floor.

(Renumber subsequent sections)

Reason: This proposal was prepared in conjunction with a related proposal on limiting the protection of voids created at the intersections of exterior curtain wall assemblies and fire-resistance-rated floor assemblies to listed perimeter fire barrier systems. Section 713.4 on the protection of such voids places the current provisions in Section 713 on fire-resistant joint systems. Perimeter fire barrier systems, however, are distinct fire containment systems with performance characteristics and qualification requirements substantially different from that of fire-resistant joint systems. This proposal places the provisions for perimeter fire barrier systems in a renumbered Section 714 to clearly distinguish them from fire-resistant joint systems.

The Exception to Section 713.1 lists nine building elements where fire-resistant joint systems are not required. None of them, however, apply to the voids created by exterior curtain wall assemblies and floor assemblies. Note that the charging language of the Exception specifies joints in, not at the perimeter of, the listed locations.

The proposed text in Section 713.4.1 is adapted from Section 713.2 on the installation of fire-resistant joint systems, which does not specifically apply to systems tested in accordance with ASTM E 2307. This proposal was also prepared in conjunction with a related proposal on the references in the current provisions to exterior curtain wall systems.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS109–07/08
713.4

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

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

Reason: With the publishing of the Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using the Intermediate-scale, Multistory Test Apparatus (ASTM E 2307) in 2004 and its inclusion in the 2006 IBC as a referenced standard, the performance language in Section 713.4 for protecting voids between curtain walls and horizontal assemblies has become superfluous. It is also prone to misunderstandings by designers who believe that their professional opinion is sufficient to demonstrate compliance with the requirements of Section 713.4. The intent, however, is that test data demonstrate the material or system is capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure

differential of 0.01 inch of water (2.5 Pa). The proposal will establish a consistent requirement for protection with a proven system that has demonstrated its capabilities by having been tested in accordance with a nationally recognized test standard specifically developed for the protection of voids between curtain walls and horizontal assemblies.

This proposal was prepared in conjunction with related proposals on the placement of the revised provisions in a separate section on perimeter fire barrier systems and the references in the current provisions to exterior curtain wall systems.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS110–07/08
713.4

Proponent: Tony Crimi, AC Consulting Solutions Inc, representing North American Insulation Manufacturers' Association (NAIMA) and International Firestop Council

Revise as follows:

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

Reason #1: (NAIMA) To require perimeter fire barrier joint protection systems to be tested to confirm with ASTM Standard E2307 for determining Fire Resistance of Perimeter Fire Barrier Systems rather than continue to permit the outdated reference to ASTM E119.

Perimeter fire barrier systems are unique building construction details not specifically addressed by other fire test methods. The ASTM E2307 test method specifies criteria and methods to be used to determine the fire resistance of perimeter fire barrier systems. Reference to the existing provisions for testing in accordance with ASTM E119, under the conditions stipulated in IBC Section 713.4, was originally retained in order to allow Code users and manufacturers sufficient time to transition to the new test method. At this point, there is no reason to continue to do so.

Perimeter fire barrier systems are unique building construction details not specifically addressed by other fire test methods. ASTM Committee E5 completed the development of ASTM E2307 *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus* in March of 2004. A perimeter fire barrier system is the perimeter joint protection installed in the space between an exterior wall assembly and a floor assembly. Section 713.4 of the IBC currently addresses these exterior wall and floor intersections by requiring materials or systems to be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature fire conditions under a specified minimum positive pressure. However, the ASTM E2307 Standard is clear in identifying that the perimeter fire barrier protection respresents a complete system made of numerous material components. Reference to "materials" is not correct or appropriate.

The test method specifies criteria and methods to be used to determine the fire resistance of perimeter fire barrier systems using the intermediate-scale, multistory test apparatus (ISMA). The use of the multi-story test apparatus and this test method are specifically intended to simulate a possible fire exposure on a perimeter fire barrier system. Consequently, this new test method specifies the fire exposure conditions, methods of test, and criteria for evaluation of the ability of a perimeter fire barrier system to maintain the fire resistance where a floor and exterior wall assembly intersect to a create a perimeter joint. The fire exposure used is that specified by the test method for the first 30 min of exposure, and then conforms to the Test Methods E 119 time-temperature curve for the remainder of the test in the test room.

ASTM 2307 measures the performance of the perimeter fire barrier system and its ability to maintain a seal to prevent fire spread during the deflection and deformation of the exterior wall assembly and floor assembly expected during a fire condition, while resisting fire exposure from both an interior compartment and from the flame plume emitted from a window burner below. The end point of the fire resistance test is the period of time elapsing before the first condition of compliance is reached as the perimeter fire barrier system is subjected to the time-temperature fire exposure. Having developed this test method, reference to the existing provisions for testing in accordance with ASTM E119, under the conditions stipulated in IBC Section 713.4, should be deleted as the IBC has allow Code users and manufacturers sufficient time to transition to the new test method.

Reason #2: (International Fire Stop Council) To require perimeter fire barrier joint systems to be tested to confirm with ASTM Standard E2307 for determining Fire Resistance of Perimeter Fire Barrier Systems rather than continue to permit the outdated reference to ASTM E119.

Perimeter fire barrier systems are unique building construction details not specifically addressed by other fire test methods. The ASTM E2307 test method specifies criteria and methods to be used to determine the fire resistance of perimeter fire barrier systems. Reference to the existing provisions for testing in accordance with ASTM E119, under the conditions stipulated in IBC Section 713.4, was originally retained in order to allow Code users and manufacturers sufficient time to transition to the new test method. At this point, there is no reason to continue to do so.

ASTM Committee E5 completed the development of ASTM E2307 *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus* in March of 2004. A perimeter fire barrier system is the perimeter joint protection installed in the space between an exterior wall assembly and a floor assembly. Section 713.4 of the IBC currently addresses these exterior wall and floor intersections by requiring such materials or systems to be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature fire conditions under a specified minimum positive pressure.

Perimeter fire barrier systems are unique building construction details not specifically addressed by other fire test methods. The test method specifies criteria and methods to be used to determine the fire resistance of perimeter fire barrier systems using the intermediate-scale, multistory test apparatus (ISMA). The use of the multi-story test apparatus and this test method are specifically intended to simulate a possible fire exposure on a perimeter fire barrier system. Consequently, this new test method specifies the fire exposure conditions, methods of test, and criteria for evaluation of the ability of a perimeter fire barrier system to maintain the fire resistance where a floor and exterior wall assembly intersect to a create a perimeter joint. The fire exposure used is that specified by the test method for the first 30 min of exposure, and then conforms to the Test Methods E 119 time-temperature curve for the remainder of the test in the test room.
ASTM 2307 measures the performance of the perimeter fire barrier system and its ability to maintain a seal to prevent fire spread during the deflection and deformation of the exterior wall assembly and floor assembly expected during a fire condition, while resisting fire exposure from both an interior compartment and from the flame plume emitted from a window burner below. The end point of the fire resistance test is the period of time elapsing before the first condition of compliance is reached as the perimeter fire barrier system is subjected to the time-temperature fire exposure. Having developed this test method, reference to the existing provisions for testing in accordance with ASTM E119, under the conditions stipulated in IBC Section 713.4, should be deleted as the IBC has allow Code users and manufacturers sufficient time to transition to the new test method.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS111–07/08
713.4.1 (New)

Proponent: Tony Crimi, AC Consulting Solutions Inc, representing North American Insulation Manufacturers' Association (NAIMA)

Add new text as follows:

713.4.1 Exterior curtain wall & non fire-resistance rated floor assembly intersections. Voids created at the intersection of exterior curtain wall assemblies and non fire-resistance-rated floor or floor/ceiling assemblies shall be sealed with an approved material or system to prevent the interior spread of fire and the free passage of heat and hot gases.

Reason: To require some minimal level of protection of the void spaces located at the perimeter of a building between non-fire-resistance rated floor assemblies and exterior walls or curtain walls. This proposal would treat perimeter openings similar to the way in which Ducts and Penetration through non fire resistance rated horizontal assemblies are currently handled in the IBC.

Section 713.4 addresses the perimeter fire barrier joint for cases were the floor assemblies have a fire resistance rating. However, there is still a need to prevent the free passage of flame, heat and hot gases at the voids created around the perimeter of a floor assembly, even if the floor is not fire resistance rated. Reference to the existing provisions for testing in accordance with ASTM E2307 or ASTM E E119 in IBC Section 713.4, is not applicable to unrated floor assemblies.

The provisions of IBC Section 713.4 only apply to cases where fire resistance-rated floor or floor/ceiling assemblies are required. However, the risk of spread of flames, smoke, heat, and hot gases through the voids created at the intersection of the exterior curtain wall assemblies and unrated floor assemblies still exist. This proposed change is consistence with sections 716.6.3 dealing with Ducts through non fire resistance rated floor assemblies, and 712.4.2 the treatment of penetrations through non fire resistance rated floor assemblies. Both of these sections require the annular space around the penetrating duct to be protected with an approved noncombustible material that resists the free passage of flame and the products of combustion.

There are numerous examples of severe fires spreading through unprotected perimeter gaps created at the zone of interface between an exterior curtain walls and floor or floor/ceiling assemblies. Most notable among these are the First Interstate Bank Tower fire in Los Angeles in 1988 in which lack of any protection around the perimeter of the floor assemblies led to rapid spread of fire and smoke.

This code change proposal will add performance language which will provide minimum protection for these conditions by requiring some type of noncombustible material to be installed to prevent the interior spread of fire and the free passage of heat and hot gases.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS112–07/08
713.6

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

Revise as follows:

713.6 Fire-resistant joint systems in smoke barriers. Fire-resistant joint systems in smoke barriers, and joints at the intersection of a horizontal smoke barrier and an exterior curtain wall, shall be tested in accordance with the requirements of UL 2079 for air leakage. The air leakage rate of the joint shall not exceed 5 cfm per lineal foot (0.00775 $m^3/s \cdot m$) of joint at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature tests.

Reason: To require perimeter joints installed at the intersection of exterior curtain wall and horizontal smoke barriers to have the same minimum performance requirement for smoke leakage that currently exists for penetrations and joints in the remainder of the smoke barriers.

When the IBC was updated to require leakage ratings for penetrations and joints in smoke barriers, the joints located at the intersection of the horizontal smoke barrier and the exterior curtain wall were not specifically addressed. Perimeter fire barrier systems are unique building construction details which are required to comply with Section 713.4. This Code change proposal is intended to provide that consistency.

This proposed code change would clarify that the IBC requirements for leakage rating of joints in smoke barriers (Section 713.6) also apply to the perimeter joints installed at the intersection of the exterior curtain wall assemblies and the horizontal smoke barrier. Perimeter fire barrier systems are unique building construction details not specifically addressed by other fire test methods. The current requirements in the IBC specify criteria and methods to be used to determine the fire resistance of perimeter fire barrier systems using either the intermediate-scale, multistory test apparatus (ISMA), or ASTM E119 time-temperature fire conditions. The test criteria for leakage rating of these joints is contained in UL 2079.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS113–07/08
714.1.1

Proponent: Maureen Traxler, City of Seattle, WA, representing Washington Association of Building Officials Technical Code Development Committee

Revise as follows:

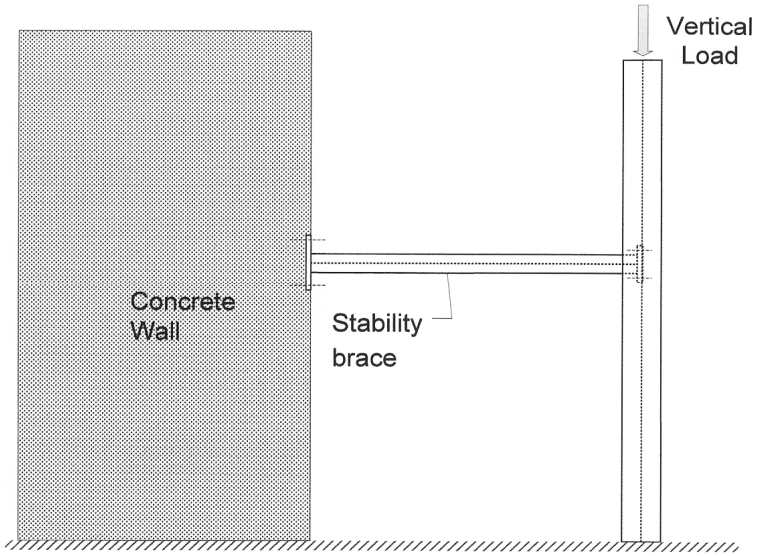
714.1.1 (Supp) Primary structural frame. The primary structural frame ~~shall be~~ is the columns and other structural members including the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. Bracing members that are essential to the vertical stability of the primary structural frame under gravity loading shall be considered part of the primary structural frame whether or not the bracing member carries gravity loads.

Reason: The purpose of this code change is to clarify the code provisions regarding what portions of the structure should be considered "primary structural frame", and therefore, require a fire-resistive rating.

The current language is clear in its intent that bracing members that carry only lateral loads (wind or earthquake) are not required to have a fire-resistive rating. Bracing members that carry vertical (gravity) loads as well as lateral loads are required to have a fire-resistive rating. However, the code is silent on bracing members that contribute to the overall stability of the building under gravity loading, but do not directly carry gravity loads.

The figure below illustrates an example where a brace is used to shorten the effective length of a column, preventing the column from buckling under gravity loads. The brace is not directly carrying gravity loads, but under full design loads, if it were not there, the column would fail (assuming the members are designed to the minimum size allowed). In a fire, the brace could be subjected to the same fire conditions as the column. Yet, under the current language in the code, there is no requirement to protect it. So if the fire causes the brace to fail, regardless of what fire-resistive rating is required for the column, the column will also fail.

The proposed language addresses this issue by including these types of braces in the definition of "primary structural frame". Logically, if the column is required to have a fire-resistance rating, in order for the column to perform as expected, the brace should be protected to the same degree.



Cost Impact: The code change proposal will increase the cost of construction, but only marginally.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

FS114–07/08

Table 601, 704.8.1, 714.1.1, 714.1.2, 714.2, 714.6, 1704.10.5.2

Proponent: Maureen Traxler, City of Seattle, WA, representing Washington Association of Building Officials Technical Code Development Committee

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

PART I – IBC GENERAL

Revise as follows:

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

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A[d]	B	A[d]	B	HT	A[d]	B
Primary structural frame[g] See Section ~~714.1.1~~ 202 ~~Including columns, girders, trusses~~	3[a]	2[a]	1	0	1	0	HT	1	0

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
c. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
d. An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.
e. Not less than the fire-resistance rating required by other sections of this code.
f. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
g. Not less than the fire-resistance rating as referenced in Section 714.5

PART II – IBC FIRE SAFETY

Revise as follows:

~~**714.1.1**~~ **202 Primary structural frame.** ~~The primary structural frame shall be~~ The columns and other structural members including the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. The members of floor or roof construction that are not connected to the columns are not part of the primary structural frame.

~~**714.1.2 Secondary members.** The members of floor or roof construction that are not connected to the columns shall be considered secondary members and not part of the primary structural frame.~~

714.2 Individual encasement protection. ~~Girders, trusses, beams, lintels or other~~ Structural members that are required to have a fire-resistance rating and that support more than two floors or one floor and roof, or support a load-bearing wall or a nonload-bearing wall more than two stories high, shall be individually protected on all sides for the full length, including connections to other structural members, with materials having the required fire-resistance rating.

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

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

1704.10.6.2 (Supp) Structural frame members. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, trusses, columns and other structural members at the rate of not less than one sample for each type of primary structural frame member for each 2,500 square feet (232 m^2) of floor area or portion thereof in each story.

Reason: This proposal completes the change begun by FS98-06/07 which responded to the NIST WTC recommendations by enhancing the IBC provisions related to structural frame. This proposal distributes the term "primary structural frame" in appropriate places throughout the code and makes several other changes.

Table 601. The language deleted from the first row of Table 601 is misleading because it is only a portion of the definition of structural frame. The code user is given an incorrect impression that the structural frame consists of only the columns, girders and trusses when, according to the definition, it includes all members with direct connections to the columns, and all bracing members designed to carry gravity loads.

Definition of "primary structural frame". The term "primary structural frame" is used in other portions of the code, including Chapters 6 and 7, so definition should be located where it's accessible for those chapters. The substance of this definition is added to the definition of "primary structural frame".

Definition of "secondary structural frame". The term "secondary members" is deleted because it isn't used. Members that aren't primary structural frame are simply structural frame or structural members.

Section 714.2. The list of types of structural members is deleted from Section 714.2 to eliminate confusion and unnecessary language. Table 601 either requires all structural members to be protected, or none. Protection is never required for only some of them, so there is no need to have a list of members—the definition of primary structural frame has a more complete description of the term.

Other sections. The word "primary" is added to other sections where use of the defined term is appropriate. A list of the sections in which the terms "structural frame" and "structural framing" are used is shown for reference.

Term "structural frame" is used:	Term "structural framing" is used:
704.8.1 #2 (2007 supplement)	410 definition of "gridiron"
Table 601	1704.10.3.2
714.6	1704.10.5.2
2104.2.1	2109.7.4
2109.4.3	
2109.7.4	
3402	
H109.1	

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

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS115–07/08
Table 601, 704.8.1, 714.1, 714.1.1, 714.1.2, 714.4, 714.2, 714.2.1, 714.3, 714.6

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

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

Exceptions:

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

714.1 (Supp) Requirements. The fire-resistance ratings of structural members ~~and assemblies~~ shall comply with this section and the requirements for the type of construction as specified in Table 601 ~~and~~. The fire-resistance ratings shall not be less than the ratings required for the fire-resistance-rated assemblies supported by the structural members.

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

714.1.1 (Supp) Primary structural frame. The primary structural frame shall ~~be~~ include all of the following structural members:

1. The columns ~~and other~~ ;
2. Structural members ~~including the girders, beams, trusses and spandrels~~ having direct connections to the columns, including girders, beams, trusses and spandels;
3. Members of the floor construction and roof construction having direct connections to the columns; and
4. Bracing members designed to carry gravity loads.

~~714.2~~ 714.1.2 (Supp) Secondary members. The following structural members ~~of floor or roof construction that are not connected to the columns~~ shall be considered secondary members and not part of the primary structural frame:

1. Structural members not having direct connections to the columns;
2. Members of the floor construction not having direct connections to the columns; and
3. Bracing members not designed to carry gravity loads.

~~714.4~~ 714.2 (Supp) Column protection. Where columns are required to be fire-resistance rated, the entire column, ~~including its connections to beams or girders,~~ shall be provided individual encasement protection by protecting it on all sides for the full column length, including connections to other structural members, with materials having the required fire-resistance rating. Where the column extends through a ceiling, the ~~fire resistance rating of the column~~ encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.

~~714.2~~ 714.3 (Supp) ~~Individual encasement protection~~ Protection of the primary structural frame other than columns. ~~Girders, trusses, beams, lintels or other structural~~ Members of the primary structural frame other than columns that are required to have a fire-resistance rating and ~~that~~ support more than two floors or one floor and roof,

or support a load-bearing wall or a nonload-bearing wall more than two stories high, shall be ~~individually protected~~ provided individual encasement protection by protecting them on all sides for ~~the~~ their full length, including connections to other structural members, with materials having the required fire resistance rating.

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

~~**714.2.1**~~ **714.4 (Supp)** ~~**Alternative**~~ **Protection of secondary members.** ~~The structural~~ Secondary members that are required to have a fire-resistance rating ~~and are not required to be provided individual encasement protection according to Section 714.2~~ shall be protected by individual encasement protection, by ~~a~~ the membrane or ceiling ~~protection as specified in~~ of a horizontal assembly in accordance with Section 711, or by a combination of both.

~~**714.3**~~ **714.4.1 (Supp)** ~~**Membrane protection**~~ **Light-frame construction.** King studs and boundary elements that are integral elements in load-bearing walls of light-framed construction shall be permitted to have required fire-resistance ratings provided by the membrane protection provided for the load-bearing wall.

(Renumber Sections 714.2.3-714.2.5 as Sections 714.5-714.7, and Sections 714.3-714.5 as Sections 714.8-714.10)

~~**714.6**~~ **714.11 Bottom flange protection.** Fire protection is not required at the bottom flange of lintels, shelf angles and plates, spanning not more than 6 feet (1829 mm) whether part of the primary structural frame or not, and from the bottom flange of lintels, shelf angles and plates not part of the primary structural frame, regardless of span.

(Renumber subsequent sections)

PART II – IBC GENERAL

Revise table as follows:

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

	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
BUILDING ELEMENT	**A**	**B**	**A [d]**	**B**	**A [d]**	**B**	**HT**	**A [d]**	**B**
Primary structural frame [g] See Section 714.1.1 ~~Including columns, girders, trusses~~	3[a]	2[a]	1	0	1	0	HT	1	0
Bearing walls									
Exterior [f, g]	3	2	1	0	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior [e]	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and secondary members See Sections 714.1.1 and 714.1.2 ~~Including supporting beams and joists~~	2	2	1	0	1	0	HT	1	0
Roof construction and secondary members See Sections 714.1.1 and 714.1.2 ~~Including supporting beams and joists~~	1-½[b]	1[b, c]	1 [b, c]	0[b, c]	1[b, c]	0[b, c]	HT	1[b, c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
c. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.

d. An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.
e. Not less than the fire-resistance rating required by other sections of this code.
f. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
g. Not less than the fire-resistance rating as referenced in Section 714.5

Reason: The purpose for this proposal is to make the provisions approved by Proposal FS98-06/07-AS more technically sound and to improve coordination with other provisions of the IBC. Reference to "columns, girders and trusses" in the item under "Building Element" for primary structural frame" in Table 601 is deleted because it is effectively replaced by the reference to Section 714.1.1 and conflicts with the references in Section 714.1.1 to columns, girders, beams, trusses and spandrels.

In Section 714.1, "and assemblies" is deleted because the subject of Section 714.1 is structural members, not assemblies, which implies floor, roof or wall assemblies. The other revisions are editorial. Note that "structural member" is not currently defined in the IBC.

The revision to Section 714.1.1 may appear editorial but it is being done to make it clear which components of the structure are part of the primary structural frame. The current language implies that, in addition to columns and bracing members designed to carry gravity loads, only girders, beams, trusses and spandrels having direct connections to the columns are part of the primary structural frame. The intent, however, is that, in addition to columns, all structural members having direct connections to the columns, including structural members of the floor construction and roof construction and bracing members that are designed to carry gravity loads, are part of the primary structural frame. The listing of girders, beams, trusses and spandrels in Section 714.1.1 should be viewed as examples of such structural members.

Section 714.1.1 is also revised to specify all members of the primary structural frame as structural members. This revision makes it clear that bracing members are structural members and reduces questions over the scope of Section 714.1, which specifies structural members but not bracing members. Structural members of the floor construction and roof construction having direct connections to the columns are also identified as members of the primary structural frame. This revision correlates Section 714.1.1 with Section 714.1.2 on secondary members, which specifies members of the floor construction and roof construction not connected to columns.

Section 714.1.2 is revised because the current language does not make it clear whether structural members not having direction connections to the columns and bracing members not designed to carry gravity loads are members of the floor or roof construction such that they are considered secondary members. The current language also creates a gap between what structural members are considered part of the primary structural frame and what are considered secondary members. This gap consists of a third group of structural members that are neither part of the primary structural frame nor secondary members. Section 714.1.2 is revised to close this gap by clearly specifying what structural members are secondary members, including structural members not having direct connections to the columns as structural members and bracing members not designed to carry gravity loads.

Also in Section 714.1.2, members of the floor or roof construction "not connected" to the columns is changed to "not having direct connections" to the columns to make it clear that structural members indirectly connected via supporting beams or girders that are directly connected to the columns are not intended to be members of the primary structural frame. Note that horizontal bracing members typically are part of the floor or roof construction. The format of Section 714.1.2 is revised to specify individual items in the same manner as Section 714.1.1.

In conjunction with the proposed changes to Section 714.1.2, secondary members are added to the listings of floor construction and roof construction in Table 601 along with references to Sections 714.1.1 and 714.1.2 in the same manner as the listing for primary structural frame. With the approval of FS98-06/07, secondary members become a distinct type of building element and should be specified in Table 601 along with primary structural frame.

The order of the technical provisions in Section 714 is revised. The primary structural frame consists of the columns with the most restrictive technical provisions (Section 714.4), other members of the primary structural frame with technical provisions that are less restrictive than columns (Section 714.3), and secondary members with technical provisions that are less restrictive than the primary structural frame (Section 714.2.1). These sections are rearranged beginning with the most restrictive: columns in Section 714.2, primary structural frame members other than columns in Section 714.3 and secondary members in Section 714.4.

References to individual encasement protection are clarified. Renumbered Sections 714.2 and 714.3 (current Sections 714.4 and 714.2) reference individual encasement protection but neither section contains technical provisions for it. Also, the title of renumbered Section 714.3 is "individual encasement protection" but the provisions in the section do not mention it. Instead, individual protection on all sides of the structural member for its full length, including connections to other structural members, is specified. If individual encasement protection is the intent, it is not achieved by reliance on the title of the section, which is nonmandatory. Renumbered Sections 714.2 and 714.3 are revised by specifying individual encasement protection as individual protection on all sides of the structural member for its full length, including connections to other structural members, with materials having the required fire-resistance rating.

An exception is added to renumbered Section 714.3 (current Section 714.2) on primary structural frame members other than columns. Beams and girders typically support floor or roof construction, which prevents the protection of their surfaces that bear against floor or roof members (i.e., steel decks). The exception permits the protection on all sides to be only on exposed sides provided the assembly being relied on for the required fire resistance rating limits protection to the exposed sides.

"Structural frame" in Item (a) of Table 601, Section 704.8.1 (Exception 2) and Section 714.6 (Section 714.11 in proposal) is changed to "primary structural frame" for better consistency with the changes approved by FS98-06/07. With these changes a clear distinction will be established between "primary structural frame" in the nonstructural provisions of the IBC and "structural frame" in the structural provisions. The use of "structural frame" is found in Sections 2104.2.1, 2109.4.3, 2109.7.4, 2110.1.1, 3402.1 (technically infeasible) and H109.1.

Additional references to the footnotes in Table 601 at the fire-resistance ratings for roof construction in Table 601 are made to restore the original references, which were inadvertently deleted in the 2007 IBC Supplement. Note that Footnotes (c) and (d) in the 2006 IBC are Footnotes (b) and (c) in the 2007 IBC Supplement.

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

PART I —IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II —IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS116–07/08
714.4

Proponent: Donald R. Monahan, Walker Parking Consultants, representing Parking Consultants Council of the National Parking Association

Revise as follows:

714.4 Impact protection. Where the fire protective covering of a structural member is subject to impact damage from moving vehicles, the handling of merchandise or other activity, the fire protective covering shall be protected by corner guards or by a substantial jacket of metal or other noncombustible material to a height adequate to provide full protection, but not less than 5 feet (1524 mm) from the finished floor.

Exception: Corner protection is not required on concrete columns in open or enclosed parking garages.

Reason: This code change is intended to clarify the impact protection requirements to preserve the fire rating for concrete columns in parking garages.

Concrete is a durable material that is not susceptible to damage from moving vehicles at the relatively low speeds in a parking garage. Further, the structural concrete members are designed to resist such impact. Therefore, supplemental impact protection should not be required.

The proponent has 30 years of experience in parking garage design and restoration and has not observed any problems with damage to concrete columns from moving vehicles in parking garages. Further, the vast experience of the 52 members of the Parking Consultants Council of the National Parking Association indicates that corner guards are not necessary in concrete parking structures. Corner guards have seldom been provided in over 3000 parking garages designed by Walker Parking Consultants.

Also, data from the National Fire Incident Reporting System indicates that fires in parking structures are an infrequent occurrence, that they typically do not spread, and that damage to the structural members from vehicle fires is minimal. Therefore, an infrequent chip off a concrete column is not likely to cause significant exposure to fire damage of the concrete column.

The requirement to add corner guards increases the cost of the parking structure by approximately $0.50 per sf. Per 2007 R.S. Means Square Foot Costs, the corner guards are approximately $25 per lineal foot installed. For a 5 foot height, the cost per each corner guard is $125. On a recent project in San Diego at Children's Hospital, there are 66 columns on 5 levels requiring two corner guards and 33 columns on five levels requiring 4 corner guards or 264 corner guards per level. There were then 1320 corner guards required at a cost of $125 each or a total cost of $165,000. The total cost is approximately $0.49 per sf. This cost is an unnecessary expense and does not increase the benefit to life safety in a concrete parking structure.

Cost Impact: This code change proposal will not increase the cost of construction - see the last paragraph of the reason statement above.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS117–07/08
714.5

Proponent: Susan Lamont, Arup Fire

Revise as follows:

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

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

Exception: Where the external fire exposure to structural members located outside of a building can be shown to be less than the standard fire exposure and stability of the structure is maintained for the duration of the design basis fire, an approved reduced fire resistance rating shall be permitted.

Reason: The purpose of the code change proposed is to include new text such that performance based design of external structural steel members in response to credible design basis fires in place of the traditional standard fire, can be proposed on projects.

For external steel members the code change would allow engineers to consider the behavior of the steel elements when exposed to external flaming from a credible worst case design fire which in many cases has been shown to be less severe than the fire exposure inside an enclosure or compartment and therefore also less severe than the standard fire.

In general this approach would allow the level of passive fire protection applied to external steel members to be calculated based on the expected fire scenario which could be more or less severe than the standard fire exposure.

Passive fire protection is not always easy to apply or maintain in an external environment. It can also be ineffective when applied to structural steel members such as rods or cables. This code change provides engineers with an alternative approach allowing greater innovation in design. Architects would gain increased freedom to use unprotected steel members on the outside of buildings or structures for aesthetic reasons.

Construction costs may be reduced where passive fire protection is removed or reduced.

This proposal will allow a performance based approach and alternative solutions on a case by case basis whilst ensuring building officials can approve each project on its own merits.

Exposure of external steel members to fire has been recognized as a special fire exposure case for many years. Law and O'Brien developed a methodology to assess the temperature of external steel members exposed to flaming and radiation through openings from post-flashover compartment fires in the 1980s. This has been accepted as performance based design guidance all over the world including the UK, Europe and the US.

Bibliography:

Law M. and O'Brien T. Fire sand steel construction: Fire safety of bare external structural steel. The Steel Construction Institute, Ascot, Berks, 1981.
BS EN 1991-1-2:2002 Eurocode 1: Actions on structures — Part 1-2: General actions — Actions on structures exposed to fire, British Standards Institution.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS118–07/08
714

Proponent: Sarah A. Rice, Schirmer Engineering

Revise as follows:

(Entire section relocated from Section 714 and renumbered to Section 704)

SECTION ~~714~~ 704
FIRE-RESISTANCE RATING OF STRUCTURAL MEMBERS

(Entire section relocated from Section 704 and renumbered to Section 705)

SECTION ~~704~~ 705
EXTERIOR WALLS

(Entire section relocated from Section 705 and renumbered to Section 706)

SECTION ~~705~~ 706
FIRE WALLS

(Entire section relocated from Section 706 and renumbered to Section 707)

SECTION ~~706~~ 707
FIRE BARRIERS

(Entire section relocated from Section 707 and renumbered to Section 708)

SECTION ~~707~~ 708
SHAFT ENCLOSURES

(Entire section relocated from Section 708 and renumbered to Section 709)

SECTION ~~708~~ 709
FIRE PARTITIONS

(Entire section relocated from Section 709 and renumbered to Section 710)

SECTION ~~709~~ 710
SMOKE BARRIERS

(Entire section relocated from Section 710 and renumbered to Section 711)

SECTION ~~710~~ 711
SMOKE PARTITIONS

(Entire section relocated from Section 711 and renumbered to Section 712)

SECTION ~~711~~ 712
HORIZONTAL ASSEMBLIES

(Entire section relocated from Section 712 and renumbered to Section 713)

SECTION ~~712~~ 713
PENETRATIONS

(Entire section relocated from Section 713 and renumbered to Section 714)

SECTION ~~713~~ 714
FIRE-RESISTANT JOINT SYSTEMS

Reason: The material contained in Section 714 Fire-resistance Rating of Structural Members is a fundamental provision applicable to all types of fire rated assemblies. It would seem to be something that the user should find right away when reading Chapter 7. As there are no references to Section 714 in any of the specific sections covering specific types of assemblies, it's relocation to the beginning of Chapter 7 seems reasonable.

The order of Chapter 7 would then be:

701 General
702 Definitions
703 Fire Resistance Ratings and Fire Tests
704 Fire Resistance Rating of Structural Members
705 Exterior Walls
706 Fire Walls
707 Fire Barriers
708 Shaft Enclosures
709 Fire Partitions
710 Smoke Barriers
711 Smoke Partitions

Etc.

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

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS119–07/08

715.2 (New), 715.2.1 through 715.2.5 (new), 715.4.5.1, 715.4.5.1.1 (new), 715.4.5.4, 715.4.5.4.1 (new, 715.4.6.3, 715.5.8 (new), 715.5.8.1 (new), 715.5.8.9

Proponent: William O'Keeffe, SAFTIFIRST

1. Add new text as follows:

715.2 Classification of fire doors, door frames and window frames. Fire doors, door frames and window frames tested and rated in accordance with Section 703 and Section 715 shall be classified and labeled under the following rating classifications:

715.2.1 R-Rated fire doors and door frames. Fire-resistance rated fire doors and door frames determined in accordance with ASTM E119 shall be classified as R-Rated fire doors and door frames.

715.2.2 P-Rated fire doors and door frames. Fire-protection rated fire doors and door frames determined in accordance with NFPA 252 shall be classified as P-Rated fire doors and door frames.

715.2.3 P-Rated fire window frames. Fire-protection rated fire window frames determined in accordance with NFPA 257 shall be classified as P-Rated fire window frames.

715.2.4 R-Rated fire window frames. Fire-resistance rated window frames determined in accordance with ASTM E119 shall be classified as R-Rated fire window frames.

715.2.5 Identification. Fire doors, door frames and window frames classified in accordance with 715.2 shall be identified by a designation of R-xxx or P-xxx, in accordance with sections 715.4.5.1.1, 715.4.5.4.1, and 715.5.8.1.

(Renumber subsequent sections)

2. Revise as follows:

715.4.5.1 (Supp) Fire door labeling requirements. Fire doors shall be labeled showing the name of the manufacturer or other identification readily traceable back to the manufacturer, the name or trademark of the third-party inspection agency, the fire test standard, the fire protection or fire-resistance rating, the information required in Section 715.4.5.1.1 and, where required for fire doors in exit enclosures and exit passageways by Section 715.4.4, the maximum transmitted temperature end point. Smoke and draft control doors complying with UL 1784 shall be labeled as such and shall also comply with Section 715.4.5.3. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

715.4.5.1.1 Fire door identification. Fire protection-rated doors tested to NFPA 252 shall bear the identification of P-xxx. Fire resistance rated doors tested to ASTM E119 shall bear the identification of R-xxx.

715.4.5.4 Fire door frame labeling requirements. Fire door frames shall be labeled showing the names of the manufacturer, ~~and~~ the third-party inspection agency, the fire test standard, the fire-protection or fire-resistance rating, and information required in Section 715.4.5.4.1. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

715.4.5.4.1 Fire door frame identification. Fire protection-rated door frames tested to NFPA 252 shall bear the identification of P-xxx. Fire resistance rated door frames tested to ASTM E119 shall bear the identification of R-xxx.

3. Add new text as follows:

715.5.8 Fire window frame labeling requirements. Fire window frames shall be labeled showing the names of the manufacturer, the name of the third-party inspection agency, the fire test standard, and the fire protection or fire resistance rating. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

715.5.8.1 Fire window frame identification. Fire protection-rated window frames tested to NFPA 257 shall bear the identification of P-xxx. Fire resistance rated window frames tested to ASTM E119 shall bear the identification of R-xxx.

(Renumber subsequent sections)

Reason: Proponent is a manufacturer and distributor of both fire rated glazing and framing products. This proposal accompanies the code proposal providing for classification and identification of fire rated glazing products as either P-xxx for fire-protection rated products, or R-xxx for fire-resistance rated products.

In soliciting input from the code enforcement community regarding a simplified, useful labeling system, it was suggested that both the fire door and window framing also be marked according to performance, so that the code enforcer can make sure that a fire resistance-rated product is installed in a fire-resistance rated frame, to maintain the fire resistance rating. Likewise, fire protection rated glazing and framing products can be identified according to their respective fire protection ratings.

Cost Impact: This will not result in a cost impact, as frames are already required to be labeled, and only the content of the label will be changed to specify P or R.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS120–07/08

715.4, 715.4.5 (New)

Proponent: William F. O'Keeffe, SAFTIFIRST

1. Revise as follows:

715.4 Fire door and shutter assemblies. Approved fire door and fire shutter assemblies shall be constructed of any material or assembly of component materials that conforms to the test requirements of Section 715.4.1, 715.4.2 or 715.4.3 and the fire-protection rating indicated in Table 715.4. Fire door frames with transom lights, sidelights or both shall comply with Section 715.4.5. Fire door assemblies and shutters shall be installed in accordance with the provisions of this section and NFPA 80.

Exceptions:

1. Labeled protective assemblies that conform to the requirements of this section or UL 10A, UL 14B and UL 14C for tin-clad fire door assemblies.
2. Floor fire door assemblies in accordance with Section 711.8.

2. Add new text as follows:

715.4.5 Fire door frames with transom lights and sidelights. Door frames with transom lights, sidelights, or both shall be permitted where a ¾-hour fire protection rating or less is required in accordance with Table 715.4. Where a fire protection rating exceeding ¾-hour is required in accordance with Table 715.4, fire door frames with transom lights, sidelights, or both, shall be installed with fire-resistance rated glazing tested as an assembly in accordance with ASTM E119.

(Renumber subsequent sections)

Reason: The proposed text is consistent with NFPA 80 (2006) provisions 6.3.3.3 and 6.3.3.4, which specify the limitations on door frames with transom and sidelights. NFPA 80 was revised in the 2006 revision cycle to clarify that door frames with transom and sidelights installed with fire resistance-rated glazing tested to NFPA 251 (ASTM E119) are permitted where a fire protection rating exceeding ¾-hour is required. This code revision brings the NFPA 80 clarification of the limitations on sidelight and transom door frames into the IBC, where code enforcers and other code users can readily identify the limits, rather than having to refer to NFPA 80.

This code change is needed to address the current confusion by code users that fire protection rated glazing listed for use in door and frames rated in excess for ¾-hours are permitted, when they are not. The use of fire protection rated glazing materials that do not meet the temperature rise limits of ASTM E119 compromise fire safety where door openings are needed for egress in fire wall assemblies requiring 1-hour or above door opening protection.

Cost Impact: This is a clarification of the code and will have no cost impact.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS121–07/08
715.4.3

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Revise as follows:

715.4.3 Door assemblies in corridors and smoke barriers. Fire door assemblies required to have a minimum fire protection rating of 20 minutes where located in corridor walls or smoke-barrier walls having a fire-resistance rating in accordance with Table 715.4 shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have at least a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. Corridor door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for corridors in multitheater complexes where each motion picture auditorium has at least one-half of its required exit or exit access doorways opening directly to the exterior or into an exit passageway.
4. Horizontal sliding doors in smoke barriers that comply with 408.3 and 408.7.4 in occupancies in Group I-3.

Reason: Horizontal sliding doors are frequently used when highest security is required and in high usage situations in detention and correctional facilities. Exception 4 allows the use of horizontal sliding doors in smoke barriers for Use Group I-3 occupancies in accordance with Section 410.0. This exception recognizes that many security doors are of the sliding type. Swinging doors may present a concern in the operation of such facilities since they can more easily be blocked from opening and used as a weapon. Horizontal sliding doors are allowed in Group I-3 by Section 1008.1.2 and are an integral part of maintaining the security necessary in buildings containing this type of occupant. This exception will allow proper levels of security to be maintained in the highest security areas without compromising occupant life safety in the buildings.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS122–07/08
715.4.3.2

Proponent: Wayne G. Carson, PE, Carson Associates, Inc., representing SAFTIFIRST

Revise as follows:

715.4.3.2 (Supp) Glazing in door assemblies. In a 20-minute fire door assembly, the glazing material in the door itself shall have a minimum fire protection rating of 20 minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly, including transom lites and sidelites, shall be tested in accordance with ~~NFPA 257 or~~ UL 9~~, including the hose stream test, in accordance with Section 715.5~~ with a heat flux not exceeding 12 Kw/m^2 for 20 minutes.

Reason: The application of the hose stream test to the sidelight and transom components of a 20-minute door assembly is a new requirement that was added to the 2000 IBC as the result of a code change proposal submitted on behalf industry interests. The last full editions of the legacy codes did not include a requirement for special treatment of sidelights and transoms. Sidelights and transoms were treated as part of the door assembly and were exempt from the hose stream requirement. The SBC supplement to the 1997 edition was the first code to introduce the provision for the hose stream test for sidelights and transoms. See excerpts of legacy codes below.

When the IBC code change passed that included a hose stream test for the sidelight and transom components of a 20-minute door assembly, there was no technical data or fire case history information provided to show that products tested without hose stream pose a fire safety threat. As a matter of fact, the technical evidence and actual fire case data showed, and continue to show, that these products provide the level of fire protection needed for the opening, and do not fail under real fire conditions.

FACTS: 20-minute glazing products tested without hose stream to NFPA 252 have been listed in the U.S. for use in 20-minute sidelight and transom assemblies since 1991. These products have been available in Europe, and millions of square feet have been supplied worldwide, since 1983.

There are no reported incidents of failure due to thermal shock from fire sprinklers in the U.S. or anywhere in the world to indicate a fire safety problem.

Actual fire case experience in Europe has shown these products perform adequately when sprinklers activate.

Clinical fire test data show these products resist thermal stress when exposed to sprinklers activated at temperatures as rated.

All U.S. fire-rated glazing distributors offer 20-minute glazing products tested without hose stream Prices of 20-minute safety glazing products have dropped to 50-150% below that of 45-minute safety rated glazing products tested to hose stream.

The introduction of NFPA 257 as a test standard for part of a door assembly is inconsistent with the testing of fire rated doors as required in NFPA 252. NFPA 252 is the test standard for doors and the definition of doors clearly includes sidelights and transoms.
(3.3.107 Side Light. An opening in a fire door frame alongside the fire door opening that is filled with glazing material.3.3.108 Side Light Frame. A fire door frame prepared for the application of a glazing material alongside the door opening.)* The IBC section 715.4.3.2 now includes a conflict between the Building Code and NFPA 252.

The use of the hose stream test has never been validated as an appropriate test for evaluating the fire risk of glazing. It was originally used for cast iron columns to evaluate the risk of collapse during fire fighting operations. It is not true that this issue has been debated in NFPA 101 and NFPA 80 and has always been defeated. This is simply not true. NFPA 80 clearly states that the sidelights and transoms are considered part of the door assembly. See Excerpt NFPA 80-1999, section 1-4 below.

The NFPA Standards Council addressed the same fire safety performance issues in 1997 and rejected a comment to NFPA 101 that proposed to remove the hose stream exception applied to glazing in 20-minute doors altogether. See attached Decision of the Standards Council, 1/27/97.

The Standards Council found no safety justification to limit use of these products based on the absence of any field failures reported or other evidence of a thermal shock problem.

The Standard Council's written decision gives this guidance in resolving this matter: "Prior to restricting the use of products or methods from a standard there should generally be adequate substantiation for doing so."

The IBC section 404.5, exception 1 allows a glass wall with no restriction on size, no specifications on the type of glass, and no fire testing for the glass. This provision has been in the code for years without any recorded adverse outcomes. If this unregulated glass is permitted for an entire wall, why is a sidelite in a tested assembly suddenly a big problem? It isn't.

SUMMARY:

The 2000 IBC change to require separate testing of the sidelights and transoms from the testing specified in NFPA 252 for doors in the 2000 IBC was clearly to support a market position. Sidelights and transoms were used for years without the hose stream test without any documented unfavorable experience. There is no documentation to demonstrate any problem with the way the legacy codes dealt with this issue up to 1997. And there is no documentation to substation the need for separate testing of the sidelights and transoms since.

We are causing the expenditure of money for glazing in sidelights when there is no documented need for such extra protection. This code change will reduce the cost of glazing in sidelights without reducing fire protection.

EXCERPTS OF LEGACY CODES:

BOCA 1999, section 717.1.1;

717.1 Fire door assemblies: *Approved fire door assemblies as defined in this code shall be constructed of any material or assembly of component materials which conforms to the test requirements of NFPA 252 listed in Chapter 35 and the fire protection rating herein required in Table 717.1, unless otherwise specifically provided for in this code.*

Exception*: Floor fire doors shall comply with Section 714.2.6*

717.1.1 Twenty-minute doors*: Fire doors having a fire protection rating of 20 minutes shall be tested in accordance with ASTM E152 listed in Chapter 35 without the hose stream test.*

SBC 1997, section 705.1.3;

705.1.3 Approved types of fire windows, doors and shutters

705.1.3.1 *Wall openings required to be protected shall be protected by approved listed and labeled fire doors, windows and shutters and their accompanying hardware, including all frames, closing devises, anchorage and sills, in accordance with the requirements of NFPA 80, except as otherwise specified in the code.*

705.1.3.2. *Openings are classified in accordance with the character and location of the wall in which they are situated. Fire protection ratings for products intended to comply with this section shall be as determined and reported by a nationally recognized testing agency in accordance with NFPA 252 or NFPA 257. All such products shall bear an approved label. In each of the following classes, the minimum fire protection ratings are shown.*

705.1.3.2.1 *Fire doors are classified as 3-hour, 1-1/2 hour, 1-hour, ¾ hour or 20 minutes.*

705.1.3.2.2 *Unless otherwise specified, door assemblies in walls required to have a fire resistance rating of 1-hour or less shall have a fire resistance rating of 20 minutes when tested in accordance with NFPA 252 without the hose stream.*

Exception: For Group I Unrestrained, corridor doors shall be in accordance with 409.41.4

UBC 1977, sections 713.7 &1004.3.4.3.2.1. Doors

713.7 Glazed Openings in Fire Doors: Glazed openings in fire doors shall not be permitted in a fire assembly required to have a three-hour fire-resistive rating.

The area of glazed openings in a fire door required to have one- and one-half-hour or one-hour fire resistive rating shall be limited to 100 square inches (64 500 mm²) with a minimum dimension of 4 inches (102 mm). When both leaves of a pair of doors have observation panels, the total area of the glazed openings shall not exceed 100 square inches (64 500 mm²) for each leaf.

Glazed openings shall be limited to 1,296 square inches (0.84 m²) in wood and plastic-faced composite or hollow metal doors, per light, when fire-resistive assemblies are required to have a three-fourths-hour fire-resistive rating.

1004.3.4.3.2.1 Doors. *All exit-access doorways and doorways from unoccupied areas to a corridor shall be protected by tightfitting smoke- and draft-control assemblies having a fire-protection rating of not less than 20 minutes when tested in accordance with UBC Standard 7-2, Part II. Such doors shall not have louvers, mail slots or similar openings. The door and frame shall bear an approved label or other identification showing the rating thereof, followed by the letter "S", the name of the manufacturer and the identification of the service conducting the inspection of materials and workmanship at the factory during fabrication and assembly. Doors shall be maintained self-closing or shall be automatic closing by actuation of smoke detector in accordance with Section 713.2 Smoke- and draft-control door assemblies shall be provided with a gasket installed so as to provide a seal where the door meets the stop on both sides and across the top.*

Exception: View ports may be installed if they require a hole not larger than 1 inch (25 mm) in diameter through the door, have at least a ¼ inch thick (6.4mm) glass disc and the holder is of metal that will not melt out when subject to temperatures of 1,700°F (927°C).

NFPA 80-1999, section 1-4:

Fire Door.* *The door component of a fire door assembly.*

Fire Door Assembly*. Any combination of a fire door, a frame, hardware, and other accessories that together provide a specific degree of fire protection to the opening.*

Fire Door Frame*. A component, forming the perimeter of an opening in a fire door assembly, that is supplied welded or knocked down and anchored to the surrounding structure.*

Fire Door Frame for Lights*. A frame that, in addition to a door opening, contains an opening(s) for use with glazing materials. Various types include transom light, side light, and transom and side light frames. (See Figures B-66, B-67 and B-68 for elevations.)*

NFPA 80-2007, section 3.3.52-55:

3.3.52* Fire Door. *The door component of a fire door assembly.*

3.3.53 Fire Door Assembly*. Any combination of a fire door, a frame, hardware, and other accessories that together provide a specific degree of fire protection to the opening.*

3.3.54 Fire Door Frame. *A component forming the perimeter of an opening in a fire door assembly that is supplied welded or knocked down and anchored to the surrounding structure.*

3.3.55* Fire Door Frame for Lights. *A frame that, in addition to a door opening, contains an opening(s) for use with glazing materials.*

NFPA 80 does not specify separate testing for the sidelights or transoms from the glazing in the door. It simply refers to NFPA 252 for the testing of the door.

3.3.59 Fire Protection Rating. *For the purposes of this standard, the designation indicating the duration of the fire test exposure to which a fire door assembly or fire window assembly was exposed and for which it successfully met all acceptance criteria as determined in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies, or NFPA 257, Standard on Fire Test for Window and glass Block Assemblies, respectively. (See also Annex D.)*

DECISION OF THE NFPA STANDARDS COUNCIL, 1/27/97:

Decision of the Standards Council on the Complaint of W. Koffel, Koffel Associates On Comment 101-164 for the 1997 Edition of NFPA 101, *Life Safety Code*®

On January 15, 1997, the Standards Council considered the complaint of W. Koffel, Koffel Associates, on behalf of O'Keefe's Inc. The complaint sought the rejection of Comment 101-164 on the proposed 1997 edition of NFPA 101, *Life Safety Code*®.

Public Comment 101-164 would, in pertinent part, sharply limit an exception (which for convenience, will be referred to as "the hose stream" exception) contained in the prior edition of NFPA 101. Specifically, it would change the requirements applicable to the testing of 20-minute doors protecting openings in one hour corridor walls or smoke barriers and ½ hour fire barriers by permitting the hose stream test to be omitted only for door assemblies that do not incorporate vision panels. In the prior edition (NFPA 101-1994) all 20 minute doors were exempted form the hose stream test regardless of the presence of vision panels.

The limitation of the hose stream exception was first proposed in Public Proposal 101-128. This Proposal was rejected by the Technical Committee on Fire Protection Features and the Life Safety Technical Correlating Committee. The issue was raised again in Comment 101-164 and, this time, was Accepted in Principle by the Technical Committee and Technical Correlating Committee. A motion to reject Comment 101-164 was moved on the floor of the 1996 Fall Association Meeting. On a tie vote, the floor motion failed.

Attending a hearing on the complaints and speaking in favor of rejecting Comment 101-164 were: W. Koffel, Koffel Associates Inc. representing O'Keeffe's Inc, and K. Steel, O'Keefe's Inc. J. Beitel, Hughs Associates, Representing the Wired Glass Industry, was in attendance speaking in support of Comment 101-+164 as accepted in the Report on Comments.

There were numerous arguments make in the written submissions and at the hearing. Without attempting to summarize fully, some the most salient fell into the following categories. Those in favor of rejecting Comment 101-164 argued that the Comment fails to address the concerns raised by the submitter, that the testing submitted as the substantiation is not a valid reason for such a change, that the change would have a significant impact on existing assemblies without any adverse experience being documented, and that the change focuses on one specific performance characteristic which favors the wired glass industry. They also argued that the reversal of the Committee position between the Proposal and Comment stage and the tie vote of the membership at the Association Technical Meeting failed to provide a convincing evidence of consensus.

Those in favor of retaining Comment 101-164 argued that the limitation of the hose stream exception would improve safety, would eliminate inconsistency in the Code, and would close what they considered a loophole in the current requirements of NFPA 101. They also argued that test work done by one laboratory showed that one unspecified type of listed 20-minute rated glass failed early under certain circumstances when exposed to a small water spray. They also claimed that inclusion of a hose stream test would be consistent with practice in Canada and Europe.

After the hearing, the Council reviewed and considered all of the information available to it regarding the complaint and voted to uphold the complaint and reject Comment 101-164. The effect of this decision is to return to the Report on Proposals wording, which effectively retains the hose stream exception as it existed in the previous edition of NFPA 101.

Comment 101-164 has come through the standards development process with a recommendation to accept, and the Council would generally adopt that recommendation unless there were substantial reason presented for not doing so. In this case, the Council has concluded that there are substantial reasons for rejecting the Comment. The effect of this Comment would be to severely restrict the use in door assemblies of alternative types of fire rated glazings to wired glass. Because of the hose stream exception, such alternative glazings have been in use in door assemblies. The proponent of Comment 101-164, however, could point to no documented history of problems with these door assemblies. Moreover, the other arguments offered by the proponents were not persuasive. In particular, the test results offered by the proponents in favor of their position were, for reason brought out at the hearing, far from conclusive.

Prior to restricting the use of products or methods from a standard there should generally be adequate substantiation for doing so. The Council, after reviewing the entire record, does not believe that the proponents of Comment 101-164 have provided such substantiation. The Council, moreover, is influenced in its decision by the fact that, although a recommendation in favor of the Comment was technically achieved under NFPA rules, there is reason to question whether a clear consensus on the issue has been achieved. The Technical Committee declined to remove the hose stream exception during the Proposal stage, and only came around to that position at the Comment stage. It did so without any clear indication of the reasons for the position change. Moreover, although the floor motion to reject the Comment failed, the membership on the floor were divided evenly on the question. In these circumstances and given the insufficiency of the substantiation in favor of the Comment, the Council believes that there is an inadequate basis to limit the hose stream exception. Of course, if further action to review and address this issue is deemed necessary, such action can be taken during the next revision cycle, or if it is determined to be of an emergency nature, through the processing of a Tentative Interim Amendment.

Council member Belles recused himself from participation in the hearing and was not present during the deliberations and vote on this issue.

Note: Anyone may appeal to the Board of Directors concerning Council action on any matters in accordance with the Procedures for Appeals to the Board of Directors. Notice of the intent to file an appeal shall be submitted to the Board within 20 days of action by the Council. See section 1-7 and 3-8 of the Regulations Governing Committee Projects.

SC 97-4(c)(d)
D#97-3

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS123–07/08
715.4.3.2

Proponent: William O'Keeffe, SAFTIFIRST

Revise as follows:

715.4.3.2 (Supp) Glazing in door assemblies. In a 20-minute fire door assembly, the glazing material in the door itself shall have a minimum fire protection rating of 20 minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly, including transom lites and sidelites, shall be tested in accordance with NFPA 25~~7~~ 2 or ~~UL 9~~ UL10, ~~including~~ and shall be exempt from the hose stream test~~, in accordance with Section 715.5~~.

Reason: The application of the hose stream test to the sidelight and transom components of a 20-minute door assembly is a new requirement that was added to the 2000 IBC as the result of a code change proposal submitted on behalf specific industry interests. The last full editions of the legacy codes did not include a requirement for special treatment of sidelights and transoms. Sidelights and transoms were treated as part of the door assembly and were exempt from the hose stream requirement. The SBC supplement to the 1997 edition was the first code to introduce the provision for the hose stream test for sidelights and transoms. See excerpts of legacy codes below.

When the IBC code change passed that included a hose stream test for the sidelight and transom components of a 20-minute door assembly, there was no technical or fire case history to show that products tested without hose stream pose a fire safety threat. As a matter of fact, the technical evidence and actual fire case data showed, and continue to show, that these products provide the level of fire protection needed for the opening, and do not fail under real fire conditions.

20-minute glazing products tested without hose stream to NFPA 252 have been listed in the U.S. for use in 20-minute sidelight and transom assemblies since 1991. These products have been available in Europe, and millions of square feet have been supplied worldwide, since 1983.

There are no reported incidents of failure due to thermal shock from fire sprinklers in the U.S. or anywhere in the world to indicate a fire safety problem.

Actual fire case experience in Europe has shown these products perform adequately when sprinklers activate.

Clinical fire test data show these products resist thermal stress when exposed to sprinklers activated at temperatures as rated.

All U.S. fire-rated glazing distributors offer 20-minute fire and safety glazing products tested without hose stream Prices of 20-minute fire and safety glazing products have dropped to 50-500% below that of fire and safety rated glazing products tested to hose stream.

The introduction of NFPA 257 as a test standard for part of a door assembly is inconsistent with the testing of fire rated doors as required in NFPA 252. NFPA 252 is the test standard for doors and the definition of doors clearly includes sidelights and transoms. The IBC section 715.4.3.2 now includes a conflict between the Building Code and NFPA 252.

The use of the hose stream test has never been validated as an appropriate test for evaluating the fire risk of glazing. It was originally used for cast iron columns to evaluate the risk of collapse during fire fighting operations.

It is not true that this issue has been debated in NFPA 101 and NFPA 80 and has always been defeated. This is simply not true. NFPA 80 clearly states that the sidelights and transoms are considered part of the door assembly. See Excerpt NFPA 80-1999, section 1-4 below.

The NFPA Standards Council addressed the same fire safety performance issues in 1997 and rejected a comment to NFPA 101 that proposed to remove the hose stream exception applied to glazing in 20-minute doors altogether. See attached Decision of the Standards Council, 1/27/97.

The Standards Council found no safety justification to limit use of these products based on the absence of any field failures reported or other evidence of a thermal shock problem.

The Standard Council's written decision gives this IBC Fire Safety Committee guidance in resolving this matter: "Prior to restricting the use of products or methods from a standard there should generally be adequate substantiation for doing so."

The 2000 IBC change to require separate testing of the sidelights and transoms from the testing specified in NFPA 252 for doors in the 2000 IBC was clearly to support a market position. Sidelights and transoms were used for years without the hose stream test without any documented unfavorable experience. There is no documentation to demonstrate any problem with the way the legacy codes dealt with this issue up to 1997. And there is no documentation to substation the need for separate testing of the sidelights and transoms since.

We are causing the expenditure of money for glazing in sidelights when there is no documentation that hose stream-tested products in non-structural fire protective locations provide extra safety. Particularly hard-hit by the current market-driven code requirements are public entities, like schools and hospitals.

DECISION OF THE NFPA STANDARDS COUNCIL, 1/27/97:

Decision of the Standards Council on the
Complaint of W. Koffel, Koffel Associates
On Comment 101-164 for the 1997 Edition of
NFPA 101, *Life Safety Code*®

On January 15, 1997, the Standards Council considered the complaint of W. Koffel, Koffel Associates, on behalf of O'Keefe's Inc. The complaint sought the rejection of Comment 101-164 on the proposed 1997 edition of NFPA 101, *Life Safety Code*®.

Public Comment 101-164 would, in pertinent part, sharply limit an exception (which for convenience, will be referred to as "the hose stream" exception) contained in the prior edition of NFPA 101. Specifically, it would change the requirements applicable to the testing of 20-minute doors protecting openings in one hour corridor walls or smoke barriers and ½ hour fire barriers by permitting the hose stream test to be omitted only for door assemblies that do not incorporate vision panels. In the prior edition (NFPA 101-1994) all 20 minute doors were exempted form the hose stream test regardless of the presence of vision panels.

The limitation of the hose stream exception was first proposed in Public Proposal 101-128. This Proposal was rejected by the Technical Committee on Fire Protection Features and the Life Safety Technical Correlating Committee. The issue was raised again in Comment 101-164 and, this time, was Accepted in Principle by the Technical Committee and Technical Correlating Committee. A motion to reject Comment 101-164 was moved on the floor of the 1996 Fall Association Meeting. On a tie vote, the floor motion failed.

Attending a hearing on the complaints and speaking in favor of rejecting Comment 101-164 were: W. Koffel, Koffel Associates Inc. representing O'Keeffe's Inc, and K. Steel, O'Keefe's Inc. J. Beitel, Hughs Associates, Representing the Wired Glass Industry, was in attendance speaking in support of Comment 101-+164 as accepted in the Report on Comments.

There were numerous arguments make in the written submissions and at the hearing. Without attempting to summarize fully, some the most salient fell into the following categories. Those in favor of rejecting Comment 101-164 argued that the Comment fails to address the concerns raised by the submitter, that the testing submitted as the substantiation is not a valid reason for such a change, that the change would have a significant impact on existing assemblies without any adverse experience being documented, and that the change focuses on one specific performance

characteristic which favors the wired glass industry. They also argued that the reversal of the Committee position between the Proposal and Comment stage and the tie vote of the membership at the Association Technical Meeting failed to provide a convincing evidence of consensus.

Those in favor of retaining Comment 101-164 argued that the limitation of the hose stream exception would improve safety, would eliminate inconsistency in the Code, and would close what they considered a loophole in the current requirements of NFPA 101. They also argued that test work done by one laboratory showed that one unspecified type of listed 20-minute rated glass failed early under certain circumstances when exposed to a small water spray. They also claimed that inclusion of a hose stream test would be consistent with practice in Canada and Europe.

After the hearing, the Council reviewed and considered all of the information available to it regarding the complaint and voted to uphold the complaint and reject Comment 101-164. The effect of this decision is to return to the Report on Proposals wording, which effectively retains the hose stream exception as it existed in the previous edition of NFPA 101.

Comment 101-164 has come through the standards development process with a recommendation to accept, and the Council would generally adopt that recommendation unless there were substantial reason presented for not doing so. In this case, the Council has concluded that there are substantial reasons for rejecting the Comment. The effect of this Comment would be to severely restrict the use in door assemblies of alternative types of fire rated glazings to wired glass. Because of the hose stream exception, such alternative glazings have been in use in door assemblies. The proponent of Comment 101-164, however, could point to no documented history of problems with these door assemblies. Moreover, the other arguments offered by the proponents were not persuasive. In particular, the test results offered by the proponents in favor of their position were, for reason brought out at the hearing, far from conclusive.

Prior to restricting the use of products or methods from a standard there should generally be adequate substantiation for doing so. The Council, after reviewing the entire record, does not believe that the proponents of Comment 101-164 have provided such substantiation. The Council, moreover, is influenced in its decision by the fact that, although a recommendation in favor of the Comment was technically achieved under NFPA rules, there is reason to question whether a clear consensus on the issue has been achieved. The Technical Committee declined to remove the hose stream exception during the Proposal stage, and only came around to that position at the Comment stage. It did so without any clear indication of the reasons for the position change. Moreover, although the floor motion to reject the Comment failed, the membership on the floor were divided evenly on the question. In these circumstances and given the insufficiency of the substantiation in favor of the Comment, the Council believes that there is an inadequate basis to limit the hose stream exception. Of course, if further action to review and address this issue is deemed necessary, such action can be taken during the next revision cycle, or if it is determined to be of an emergency nature, through the processing of a Tentative Interim Amendment.

Council member Belles recused himself from participation in the hearing and was not present during the deliberations and vote on this issue.

Note: Anyone may appeal to the Board of Directors concerning Council action on any matters in accordance with the Procedures for Appeals to the Board of Directors. Notice of the intent to file an appeal shall be submitted to the Board within 20 days of action by the Council. See section 1-7 and 3-8 of the Regulations Governing Committee Projects.

SC 97-4(c)(d)

D#97-3

EXCERPTS OF LEGACY CODES:

BOCA 1999, section 717.1.1;

717.1 Fire door assemblies: *Approved fire door assemblies as defined in this code shall be constructed of any material or assembly of component materials which conforms to the test requirements of NFPA 252 listed in Chapter 35 and the fire protection rating herein required in Table 717.1, unless otherwise specifically provided for in this code.*

Exception*: Floor fire doors shall comply with Section 714.2.6*

717.1.1 Twenty-minute doors*: Fire doors having a fire protection rating of 20 minutes shall be tested in accordance with ASTM E152 listed in Chapter 35 without the hose stream test.*

SBC 1997, section 705.1.3;

705.1.3 Approved types of fire windows, doors and shutters

705.1.3.1 *Wall openings required to be protected shall be protected by approved listed and labeled fire doors, windows and shutters and their accompanying hardware, including all frames, closing devises, anchorage and sills, in accordance with the requirements of NFPA 80, except as otherwise specified in the code.*

705.1.3.2. *Openings are classified in accordance with the character and location of the wall in which they are situated. Fire protection ratings for products intended to comply with this section shall be as determined and reported by a nationally recognized testing agency in accordance with NFPA 252 or NFPA 257. All such products shall bear an approved label. In each of the following classes, the minimum fire protection ratings are shown.*

705.1.3.2.1 *Fire doors are classified as 3-hour, 1-1/2 hour, 1-hour, ¾ hour or 20 minutes.*

705.1.3.2.2 *Unless otherwise specified, door assemblies in walls required to have a fire resistance rating of 1-hour or less shall have a fire resistance rating of 20 minutes when tested in accordance with NFPA 252 without the hose stream.*

Exception: For Group I Unrestrained, corridor doors shall be in accordance with 409.41.4

UBC 1977, sections 713.7 &1004.3.4.3.2.1. Doors

713.7 Glazed Openings in Fire Doors: Glazed openings in fire doors shall not be permitted in a fire assembly required to have a three-hour fire-resistive rating.

The area of glazed openings in a fire door required to have one- and one-half-hour or one-hour fire resistive rating shall be limited to 100 square inches (64 500 mm²) with a minimum dimension of 4 inches (102 mm). When both leaves of a pair of doors have observation panels, the total area of the glazed openings shall not exceed 100 square inches (64 500 mm²) for each leaf.

Glazed openings shall be limited to 1,296 square inches (0.84 m²) in wood and plastic-faced composite or hollow metal doors, per light, when fire-resistive assemblies are required to have a three-fourths-hour fire-resistive rating.

1004.3.4.3.2.1 Doors. *All exit-access doorways and doorways from unoccupied areas to a corridor shall be protected by tightfitting smoke- and draft-control assemblies having a fire-protection rating of not less than 20 minutes when tested in accordance with UBC Standard 7-2, Part II. Such doors shall not have louvers, mail slots or similar openings. The door and frame shall bear an approved label or other identification showing the rating thereof, followed by the letter "S", the name of the manufacturer and the identification of the service conducting the inspection of materials and workmanship at the factory during fabrication and assembly. Doors shall be maintained self-closing or shall be automatic closing by actuation of smoke detector in accordance with Section 713.2 Smoke- and draft-control door assemblies shall be provided with a gasket installed so as to provide a seal where the door meets the stop on both sides and across the top.*

Exception: View ports may be installed if they require a hole not larger than 1 inch (25 mm) in diameter through the door, have at least a ¼ inch thick (6.4mm) glass disc and the holder is of metal that will not melt out when subject to temperatures of 1,700°F (927°C).

NFPA 80-1999, section 1-4:

Fire Door.* *The door component of a fire door assembly.*

Fire Door Assembly*. Any combination of a fire door, a frame, hardware, and other accessories that together provide a specific degree of fire protection to the opening.*

Fire Door Frame*. A component, forming the perimeter of an opening in a fire door assembly, that is supplied welded or knocked down and anchored to the surrounding structure.*

***Fire Door Frame for Lights**. A frame that, in addition to a door opening, contains an opening(s) for use with glazing materials. Various types include transom light, side light, and transom and side light frames. (See Figures B-66, B-67 and B-68 for elevations.)*

NFPA 80-2007, section 3.3.52-55:

***3.3.52* Fire Door.** The door component of a fire door assembly.*

***3.3.53 Fire Door Assembly**. Any combination of a fire door, a frame, hardware, and other accessories that together provide a specific degree of fire protection to the opening.*

***3.3.54 Fire Door Frame.** A component forming the perimeter of an opening in a fire door assembly that is supplied welded or knocked down and anchored to the surrounding structure.*

***3.3.55* Fire Door Frame for Lights.** A frame that, in addition to a door opening, contains an opening(s) for use with glazing materials.*

NFPA 80 does not specify separate testing for the sidelights or transoms from the glazing in the door. It simply refers to NFPA 252 for the testing of the door.

***3.3.59 Fire Protection Rating.** For the purposes of this standard, the designation indicating the duration of the fire test exposure to which a fire door assembly or fire window assembly was exposed and for which it successfully met all acceptance criteria as determined in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies, or NFPA 257, Standard on Fire Test for Window and glass Block Assemblies, respectively. (See also Annex D.)*

Cost Impact: The code change proposal will not increase the cost of construction. This code change will reduce the cost of glazing in sidelights without reducing fire protection.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS124–07/08

715.4.6.4, 715.4.6.4.1 (New), 715.5.3, 715.5.3.1 (New)

Proponent: William O'Keeffe, SAFTIFIRST

Revise as follows:

715.4.6.4 (Supp) Safety glazing. Fire protection and fire-resistance-rated glazing installed in fire doors in areas subject to human impact in hazardous locations shall comply with Chapter 24.

715.4.6.4.1 Identification. Fire-protection and fire-resistance-rated glazing complying with the safety glazing requirements of Chapter 24 shall bear a label or other identification issued by an approved agency showing the information required in Section 2406.2, and shall bear the marking "S."

715.5.3 (Supp) Safety glazing. Fire protection and fire-resistance-rated glazing installed in fire window assemblies in areas subject to human impact in hazardous locations shall comply with Chapter 24.

715.5.3.1 Identification. Fire-protection and fire-resistance-rated glazing complying with the safety glazing requirements of Chapter 24 shall bear a label or other identification issued by an approved agency showing the information required in Section 2406.2, and shall bear the marking "S."

Reason: Since both fire protection and fire resistance rated glazing are used in fire doors and other fire assemblies in hazardous locations, these provisions should be clarified to include fire resistance rated glazing.

The further identification of fire rated glazing used in fire doors, sidelites, and other assemblies in hazardous locations where there is a risk of human impact, is required because of the field practice of allowing fire rated glazing in fire doors and other fire rated assemblies in hazardous locations without a safety glazing identification marking as required by Chapter 24. Further, this code change requires the safety glazing impact testing and labeling to be issued by a third party agency, just as fire rated testing and labeling are done under the certification follow-up programs of approved agencies. Human impact safety is equally important as fire safety, and the impact testing and labeling of glazing products should be carried out by an independent, approved agency, to protect public safety.

This code change will also address the practical reality that code enforcers have for years allowed traditional wired glass in fire doors without a safety rating marking. The change will help code enforcers today to identify safety rated wired glass products meeting requirements of 16 CFR 1201 that are now on the market, and are allowed in fire doors and other fire assemblies in hazardous locations.

Cost Impact: No cost increase for labeling, as fire rated glazing is already subject to third-party certification requirements. It will reduce injury by helping assure a safety glazing product is used in doors and will thereby reduce expenses in claims and insurance costs while meeting government regulations and current code.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS125–07/08
715.5

Proponent: John Berry, Cole + Russell Architects, Inc.

Revise as follows:

715.5 Fire protection-rated glazing. Glazing in fire window assemblies shall be fire protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.6. Fire protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 704.3, 704.8, 704.9 or 704.10 shall have a fire protection rating of not less than 3/4 hour.

Exceptions:

1. Wired glass in accordance with Section 715.5.3.
2. Fire protection-rated glazing in 0.5-hour fire-resistance-rated partitions ~~is permitted to have an~~ shall have a fire protection rating of not less than 0.33-hour ~~fire-protection rating~~.
3. Fire protection-rated glazing in one-hour fire-resistance-rated corridor walls shall have a fire protection rating of not less than 0.33 hour.

Reason: This proposal accomplishes the same intent as my proposal to add footnote "b" to Table 715.5. The two proposals should be considered together by approving one and denying the other.

Per Table 715.4 fire door and shutter assemblies are allowed to be 1/3 hour rated in one hour rated corridor walls. It only makes sense that if fire doors can be 1/3 hour rated in a one-hour rated wall, then fire windows should also be allowed to 1/3 hour rated in that same wall. Approving this change will coordinate this section with Table 715.4.

The revisions to item #2 are editorial in nature and intended to be consistent with the style and format of the ICC Codes.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS126–07/08
715.5

Proponent: William O'Keefe, SAFTIFIRST

Revise as follows:

715.5 Fire protection-rated glazing. Glazing in fire window assemblies shall be fire protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.6. Fire protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 704.3, 704.8, 704.9 or 704.10 shall have a fire protection rating of not less than 3/4 hour.

Exceptions:

1. Wired glass in accordance with Section 715.5.3.
2. Fire protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.
3. Fire-protection rated glazing with a rating of ¾-hour or less in 1 hour fire-resistance-rated corridor walls constructed in accordance with Section 1017.1 shall be exempt from the hose stream test requirement.

Reason: There is no fire safety reason to apply a hose stream to glazing used in corridors. The hose stream test does **not** simulate the performance of glazing exposed to fire suppression sprinklers activated in the early stages of a fire. The hose stream will be applied by the responding fire department and evacuation of the fire floor is likely complete by that time. There is no test data to show that activation of a sprinkler will cause tested fire rated glazing to fall out. There is actual fire case history in Europe, where the hose stream test is not required for glazing or other fire rated building components, showing that glazing products tested without hose stream, and rated up to 60-minutes, actually resist the thermal shock of fire sprinklers activated in the early stages of a fire. Millions of square feet of fire rated glazing products tested without hose stream and rated up to 60-minutes have been used world-wide over the last 20 years, without a single reported instance of failure when exposed to fire sprinklers.

Proponents of a hose stream test for glazing in corridors have never demonstrated that it is necessary for fire safety, or related to thermal shock resistance of glazing exposed to fire sprinklers. The hose stream test was developed to measure the structural integrity of a fire assembly. NFPA 252 describes the history and basis for the hose stream test as follows: "The application of water produces stresses in the assembly and provides a measure of its structural capability

The 1996 Commentary to BOCA National Building Code, section 717.1.1 likewise confirms that the hose stream test is a measurement of structural strength, not the thermal shock resistance of the fire assembly or the glazing component: "The hose stream is intended to provide a measurement of structural integrity. It has been determined, however, that a hose stream is not justified for 20-minute doors, which are acceptable only as corridor doors." (1996 Commentary, p.7-79) For that same reason, there is no fire safety justification for applying a hose stream test to glazing in corridors. The requirement for the one-hour corridor wall was primarily based on a quality of construction, rather than a specific fire resistance. The purpose of this requirement is to keep smoke and heat out of the corridor for the time required to evacuate that floor. That is why a ¾ hour door was never required, only a 20 minute door. The glazing in a window in the corridor also has the same purpose.

The storage of fuels against the glazing as noted in the committees reason last code cycle has nothing to do with the hose stream test. This is more of an issue with radiant heat transmission than with any stresses that may be created by the application of water. It is important to note that some of the glazing materials that will pass the hose stream test will allow almost 100% of the radiant heat from a fire to pass through. Because the committee last cycle state fuel storage next to the glazing was a concern, proponent has submitted a separate code change that squarely addresses the committee's concern by limiting radiant heat flux.

Cost Impact: This will result in a substantial cost savings, specifically in schools and hospitals. The current application of a hose stream test to glazing rated 45-minutes or less in a corridor unnecessarily increases the cost of construction, without proving any fire safety benefits.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS127–07/08
715.5, 715.5.7.3 (New)

Proponent: William O'Keeffe, SAFTIFIRST

1. Revise as follows:

715.5 (Supp) Fire protection-rated glazing. Glazing in fire window assemblies shall be fire protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.6. Fire protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 704.3, 704.8, 704.9 or 704.10 shall have a fire protection rating of not less than 3/4 hour.

Exceptions:

1. Wired glass in accordance with Section 715.5.3.
2. Fire protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.
3. Fire-protection rated glazing with a rating of ¾-hour or less in 1 hour fire-resistance rated corridor walls constructed in accordance with Section 1017.1 shall be exempt from the hose stream test requirement, and shall meet the requirements of Section 715.5.7.3.

2. Add new text as follows:

715.5.7.3 Radiant heat flux limitations. Glazing material in fire window assemblies shall limit radiant heat flux to a maximum of 12 kW/m^2 at 45-minutes, as determined in accordance with UL 9, section 5.1A.

Reason: There is no fire safety reason to apply a hose stream to glazing used in corridors. The hose stream test does **not** simulate the performance of glazing exposed to fire suppression sprinklers activated in the early stages of a fire. The hose stream will be applied by the responding fire department and evacuation of the fire floor is likely complete by that time. There is no test data to show that activation of a sprinkler will cause tested fire rated glazing to fall out. There is actual fire case history in Europe, where the hose stream test is not required for glazing or other fire rated building components, showing that glazing products tested without hose stream, and rated up to 60-minutes, actually resist the thermal shock of fire sprinklers activated in the early stages of a fire. Millions of square feet of fire rated glazing products tested without hose stream and rated up to 60-minutes have been used world-wide over the last 20 years, without a single reported instance of failure when exposed to fire sprinklers.

Proponents of a hose stream test for glazing in corridors have never demonstrated that it is necessary for fire safety, or related to thermal shock resistance of glazing exposed to fire sprinklers. The hose stream test was developed to measure the structural integrity of a fire assembly. NFPA 252 describes the history and basis for the hose stream test as follows: "The application of water produces stresses in the assembly and provides a measure of its structural capability

The 1996 Commentary to BOCA National Building Code, section 717.1.1 likewise confirms that the hose stream test is a measurement of structural strength, not the thermal shock resistance of the fire assembly or the glazing component: "The hose stream is intended to provide a measurement of structural integrity by evaluating the ability of the assembly to withstand impact. It has been determined, however, that a hose

stream is not justified for 20-minute doors, which are acceptable only as corridor doors." (1996 Commentary, p.7-79) For that same reason, there is no fire safety justification for applying a hose stream test to glazing in corridors. The requirement for the one-hour corridor wall was primarily based on a quality of construction, rather than a specific fire resistance. The purpose of this requirement is to keep smoke and heat out of the corridor for the time required to evacuate that floor. That is why a ¾ hour door was never required, only a 20 minute door. The glazing in a window in the corridor also has the same purpose.

The storage of fuels against the glazing as noted in the committees reason last code cycle has nothing to do with the hose stream test. This is more of an issue with radiant heat transmission than with any stresses that may be created by the application of water. It is important to note that some of the glazing materials that will pass the hose stream test will allow almost 100% of the radiant heat from a fire to pass through. Because the committee last cycle state fuel storage next to the glazing was a concern, this proposal squarely addresses that issue with radiant heat flux limits, as tested in accordance with UL 9, sec. 5.1.A.

UL 9 has been revised to provide for a method of testing radiant heat flux on the unexposed side, pursuant to UL 9 section 5.1.A. The proposed radiant heat flux limit of 12 kW/m^2 is based on critical intensity levels determined by SFPE, for non-piloted ignition of combustibles.

Cost Impact: This will result in a substantial cost savings, specifically in schools and hospitals. The current application of a hose stream test to glazing rated 45-minutes or less in a corridor unnecessarily increases the cost of construction, without providing any fire safety benefits.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS128–07/08
715.5

Proponent: Wayne G. Carson, PE, Carson Associates, Inc., SAFTIFIRST

Revise as follows:

715.5 (Supp) Fire protection-rated glazing. Glazing in fire window assemblies shall be fire protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.6. Fire protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 704.3, 704.8, 704.9 or 704.10 shall have a fire protection rating of not less than 3/4 hour.

Exceptions:

1. Wired glass in accordance with Section 715.5.3.
2. Fire protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.
3. Glazing in 1 hour corridor walls constructed in accordance with 1017.1 and having a maximum heat flux of 12Kw/m^2 at 45 minutes when tested in accordance with UL9.

Reason: The application of the hose stream test to the sidelight and transom components of a 20-minute door assembly is a new requirement that was added to the 2000 IBC as the result of a code change proposal submitted on behalf industry interests. The last full editions of the legacy codes did not include a requirement for special treatment of sidelights and transoms. Sidelights and transoms were treated as part of the door assembly and were exempt from the hose stream requirement. The SBC supplement to the 1997 edition was the first code to introduce the provision for the hose stream test for sidelights and transoms. See excerpts of legacy codes below.

When the IBC code change passed that included a hose stream test for the sidelight and transom components of a 20-minute door assembly, there was no technical data or fire case history information provided to show that products tested without hose stream pose a fire safety threat. As a matter of fact, the technical evidence and actual fire case data showed, and continue to show, that these products provide the level of fire protection needed for the opening, and do not fail under real fire conditions.

FACTS:

20-minute glazing products tested without hose stream to NFPA 252 have been listed in the U.S. for use in 20-minute sidelight and transom assemblies since 1991. These products have been available in Europe, and millions of square feet have been supplied worldwide, since 1983.

There are no reported incidents of failure due to thermal shock from fire sprinklers in the U.S. or anywhere in the world to indicate a fire safety problem.

Actual fire case experience in Europe has shown these products perform adequately when sprinklers activate.

Clinical fire test data show these products resist thermal stress when exposed to sprinklers activated at temperatures as rated.

All U.S. fire-rated glazing distributors offer 20-minute glazing products tested without hose stream Prices of 20-minute safety glazing products have dropped to 50-150% below that of 45-minute safety rated glazing products tested to hose stream.

The introduction of NFPA 257 as a test standard for part of a door assembly is inconsistent with the testing of fire rated doors as required in NFPA 252. NFPA 252 is the test standard for doors and the definition of doors clearly includes sidelights and transoms.

(3.3.107 Side Light. An opening in a fire door frame alongside the fire door opening that is filled with glazing material.
3.3.108 Side Light Frame. A fire door frame prepared for the application of a glazing material alongside the door opening.)*

The IBC section 715.4.3.2 now includes a conflict between the Building Code and NFPA 252.

The use of the hose stream test has never been validated as an appropriate test for evaluating the fire risk of glazing. It was originally used for cast iron columns to evaluate the risk of collapse during fire fighting operations.

It is not true that this issue has been debated in NFPA 101 and NFPA 80 and has always been defeated. This is simply not true. NFPA 80 clearly states that the sidelights and transoms are considered part of the door assembly. See Excerpt NFPA 80-1999, section 1-4 below.

The NFPA Standards Council addressed the same fire safety performance issues in 1997 and rejected a comment to NFPA 101 that proposed to remove the hose stream exception applied to glazing in 20-minute doors altogether. See attached Decision of the Standards Council, 1/27/97.

The Standards Council found no safety justification to limit use of these products based on the absence of any field failures reported or other evidence of a thermal shock problem.

The Standard Council's written decision gives this guidance in resolving this matter: "Prior to restricting the use of products or methods from a standard there should generally be adequate substantiation for doing so."

The IBC section 404.5, exception 1 allows a glass wall with no restriction on size, no specifications on the type of glass, and no fire testing for the glass. This provision has been in the code for years without any recorded adverse outcomes. If this unregulated glass is permitted for an entire wall, why is a sidelite in a tested assembly suddenly a big problem? It isn't.

SUMMARY:

The 2000 IBC change to require separate testing of the sidelights and transoms from the testing specified in NFPA 252 for doors in the 2000 IBC was clearly to support a market position. Sidelights and transoms were used for years without the hose stream test without any documented unfavorable experience. There is no documentation to demonstrate any problem with the way the legacy codes dealt with this issue up to 1997. And there is no documentation to substation the need for separate testing of the sidelights and transoms since.

We are causing the expenditure of money for glazing in sidelights when there is no documented need for such extra protection. This code change will reduce the cost of glazing in sidelights without reducing fire protection.

EXCERPTS OF LEGACY CODES:

BOCA 1999, section 717.1.1;

717.1 Fire door assemblies: *Approved fire door assemblies as defined in this code shall be constructed of any material or assembly of component materials which conforms to the test requirements of NFPA 252 listed in Chapter 35 and the fire protection rating herein required in Table 717.1, unless otherwise specifically provided for in this code.*

Exception*: Floor fire doors shall comply with Section 714.2.6*

717.1.1 Twenty-minute doors*: Fire doors having a fire protection rating of 20 minutes shall be tested in accordance with ASTM E152 listed in Chapter 35 without the hose stream test.*

SBC 1997, section 705.1.3;

705.1.3 Approved types of fire windows, doors and shutters

705.1.3.1 *Wall openings required to be protected shall be protected by approved listed and labeled fire doors, windows and shutters and their accompanying hardware, including all frames, closing devises, anchorage and sills, in accordance with the requirements of NFPA 80, except as otherwise specified in the code.*

705.1.3.2. *Openings are classified in accordance with the character and location of the wall in which they are situated. Fire protection ratings for products intended to comply with this section shall be as determined and reported by a nationally recognized testing agency in accordance with NFPA 252 or NFPA 257. All such products shall bear an approved label. In each of the following classes, the minimum fire protection ratings are shown.*

705.1.3.2.1 *Fire doors are classified as 3-hour, 1-1/2 hour, 1-hour, ¾ hour or 20 minutes.*

705.1.3.2.2 *Unless otherwise specified, door assemblies in walls required to have a fire resistance rating of 1-hour or less shall have a fire resistance rating of 20 minutes when tested in accordance with NFPA 252 without the hose stream.*

Exception: For Group I Unrestrained, corridor doors shall be in accordance with 409.41.4

UBC 1977, sections 713.7 &1004.3.4.3.2.1. Doors

713.7 Glazed Openings in Fire Doors: Glazed openings in fire doors shall not be permitted in a fire assembly required to have a three-hour fire-resistive rating.

The area of glazed openings in a fire door required to have one- and one-half-hour or one-hour fire resistive rating shall be limited to 100 square inches (64 500 mm²) with a minimum dimension of 4 inches (102 mm). When both leaves of a pair of doors have observation panels, the total area of the glazed openings shall not exceed 100 square inches (64 500 mm²) for each leaf.

Glazed openings shall be limited to 1,296 square inches (0.84 m²) in wood and plastic-faced composite or hollow metal doors, per light, when fire-resistive assemblies are required to have a three-fourths-hour fire-resistive rating.

1004.3.4.3.2.1 Doors. *All exit-access doorways and doorways from unoccupied areas to a corridor shall be protected by tightfitting smoke- and draft-control assemblies having a fire-protection rating of not less than 20 minutes when tested in accordance with UBC Standard 7-2, Part II. Such doors shall not have louvers, mail slots or similar openings. The door and frame shall bear an approved label or other identification showing the rating thereof, followed by the letter "S", the name of the manufacturer and the identification of the service conducting the inspection of materials and workmanship at the factory during fabrication and assembly. Doors shall be maintained self-closing or shall be automatic closing by actuation of smoke detector in accordance with Section 713.2 Smoke- and draft-control door assemblies shall be provided with a gasket installed so as to provide a seal where the door meets the stop on both sides and across the top.*

Exception: View ports may be installed if they require a hole not larger than 1 inch (25 mm) in diameter through the door, have at least a ¼ inch thick (6.4mm) glass disc and the holder is of metal that will not melt out when subject to temperatures of 1,700°F (927°C).

NFPA 80-1999, section 1-4:
Fire Door.* *The door component of a fire door assembly.*

***Fire Door Assembly**. Any combination of a fire door, a frame, hardware, and other accessories that together provide a specific degree of fire protection to the opening.*

***Fire Door Frame**. A component, forming the perimeter of an opening in a fire door assembly, that is supplied welded or knocked down and anchored to the surrounding structure.*

***Fire Door Frame for Lights**. A frame that, in addition to a door opening, contains an opening(s) for use with glazing materials. Various types include transom light, side light, and transom and side light frames. (See Figures B-66, B-67 and B-68 for elevations.)*

NFPA 80-2007, section 3.3.52-55:

***3.3.52* Fire Door.** The door component of a fire door assembly.*

***3.3.53 Fire Door Assembly**. Any combination of a fire door, a frame, hardware, and other accessories that together provide a specific degree of fire protection to the opening.*

***3.3.54 Fire Door Frame.** A component forming the perimeter of an opening in a fire door assembly that is supplied welded or knocked down and anchored to the surrounding structure.*

***3.3.55* Fire Door Frame for Lights.** A frame that, in addition to a door opening, contains an opening(s) for use with glazing materials.*

NFPA 80 does not specify separate testing for the sidelights or transoms from the glazing in the door. It simply refers to NFPA 252 for the testing of the door.

***3.3.59 Fire Protection Rating.** For the purposes of this standard, the designation indicating the duration of the fire test exposure to which a fire door assembly or fire window assembly was exposed and for which it successfully met all acceptance criteria as determined in accordance with NFPA 252, Standard Methods of Fire Tests of Door Assemblies, or NFPA 257, Standard on Fire Test for Window and glass Block Assemblies, respectively. (See also Annex D.)*

DECISION OF THE NFPA STANDARDS COUNCIL, 1/27/97:

Decision of the Standards Council on the
Complaint of W. Koffel, Koffel Associates
On Comment 101-164 for the 1997 Edition of
NFPA 101, *Life Safety Code*®

On January 15, 1997, the Standards Council considered the complaint of W. Koffel, Koffel Associates, on behalf of O'Keefe's Inc. The complaint sought the rejection of Comment 101-164 on the proposed 1997 edition of NFPA 101, *Life Safety Code*®.

Public Comment 101-164 would, in pertinent part, sharply limit an exception (which for convenience, will be referred to as "the hose stream" exception) contained in the prior edition of NFPA 101. Specifically, it would change the requirements applicable to the testing of 20-minute doors protecting openings in one hour corridor walls or smoke barriers and ½ hour fire barriers by permitting the hose stream test to be omitted only for door assemblies that do not incorporate vision panels. In the prior edition (NFPA 101-1994) all 20 minute doors were exempted form the hose stream test regardless of the presence of vision panels.

The limitation of the hose stream exception was first proposed in Public Proposal 101-128. This Proposal was rejected by the Technical Committee on Fire Protection Features and the Life Safety Technical Correlating Committee. The issue was raised again in Comment 101-164 and, this time, was Accepted in Principle by the Technical Committee and Technical Correlating Committee. A motion to reject Comment 101-164 was moved on the floor of the 1996 Fall Association Meeting. On a tie vote, the floor motion failed.

Attending a hearing on the complaints and speaking in favor of rejecting Comment 101-164 were: W. Koffel, Koffel Associates Inc. representing O'Keeffe's Inc, and K. Steel, O'Keefe's Inc. J. Beitel, Hughs Associates, Representing the Wired Glass Industry, was in attendance speaking in support of Comment 101-+164 as accepted in the Report on Comments.

There were numerous arguments make in the written submissions and at the hearing. Without attempting to summarize fully, some the most salient fell into the following categories. Those in favor of rejecting Comment 101-164 argued that the Comment fails to address the concerns raised by the submitter, that the testing submitted as the substantiation is not a valid reason for such a change, that the change would have a significant impact on existing assemblies without any adverse experience being documented, and that the change focuses on one specific performance characteristic which favors the wired glass industry. They also argued that the reversal of the Committee position between the Proposal and Comment stage and the tie vote of the membership at the Association Technical Meeting failed to provide a convincing evidence of consensus.

Those in favor of retaining Comment 101-164 argued that the limitation of the hose stream exception would improve safety, would eliminate inconsistency in the Code, and would close what they considered a loophole in the current requirements of NFPA 101. They also argued that test work done by one laboratory showed that one unspecified type of listed 20-minute rated glass failed early under certain circumstances when exposed to a small water spray. They also claimed that inclusion of a hose stream test would be consistent with practice in Canada and Europe.

After the hearing, the Council reviewed and considered all of the information available to it regarding the complaint and voted to uphold the complaint and reject Comment 101-164. The effect of this decision is to return to the Report on Proposals wording, which effectively retains the hose stream exception as it existed in the previous edition of NFPA 101.

Comment 101-164 has come through the standards development process with a recommendation to accept, and the Council would generally adopt that recommendation unless there were substantial reason presented for not doing so. In this case, the Council has concluded that there are substantial reasons for rejecting the Comment. The effect of this Comment would be to severely restrict the use in door assemblies of alternative types of fire rated glazings to wired glass. Because of the hose stream exception, such alternative glazings have been in use in door assemblies. The proponent of Comment 101-164, however, could point to no documented history of problems with these door assemblies. Moreover, the other arguments offered by the proponents were not persuasive. In particular, the test results offered by the proponents in favor of their position were, for reason brought out at the hearing, far from conclusive.

Prior to restricting the use of products or methods from a standard there should generally be adequate substantiation for doing so. The Council, after reviewing the entire record, does not believe that the proponents of Comment 101-164 have provided such substantiation. The Council, moreover, is influenced in its decision by the fact that, although a recommendation in favor of the Comment was technically achieved under NFPA

rules, there is reason to question whether a clear consensus on the issue has been achieved. The Technical Committee declined to remove the hose stream exception during the Proposal stage, and only came around to that position at the Comment stage. It did so without any clear indication of the reasons for the position change. Moreover, although the floor motion to reject the Comment failed, the membership on the floor were divided evenly on the question. In these circumstances and given the insufficiency of the substantiation in favor of the Comment, the Council believes that there is an inadequate basis to limit the hose stream exception. Of course, if further action to review and address this issue is deemed necessary, such action can be taken during the next revision cycle, or if it is determined to be of an emergency nature, through the processing of a Tentative Interim Amendment.

Council member Belles recused himself from participation in the hearing and was not present during the deliberations and vote on this issue.

Note: Anyone may appeal to the Board of Directors concerning Council action on any matters in accordance with the Procedures for Appeals to the Board of Directors. Notice of the intent to file an appeal shall be submitted to the Board within 20 days of action by the Council. See section 1-7 and 3-8 of the Regulations Governing Committee Projects.

SC 97-4(c)(d)
D#97-3

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS129–07/08
715.5

Proponent: William O'Keeffe, SAFTIFIRST

Revise as follows:

715.5 (Supp) Fire protection-rated glazing. Glazing in fire window assemblies shall be fire protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.6. Fire protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 704.3, 704.8, 704.9 or 704.10 shall have a fire protection rating of not less than 3/4 hour.

Exceptions:

1. Wired glass in accordance with Section 715.5.3.
2. Fire protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.
3. Fire-protection rated glazing with a rating of ¾-hour or less in 1 hour fire resistance-rated corridor walls constructed in accordance with Section 1017.1, in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1, shall be exempt from the hose stream test requirement.

Reason: This proposal provides for an exception to hose stream test for fire protection rated glazing rated 3/4 –hour or less when installed in 1-hour corridors of buildings equipped with automatic sprinklers. The radiant heat concerns stated by the committee last cycle due to the potential use of large expanses of glazing is addressed by allowing the exception only in sprinklered buildings, where fire sprinklers will activate to contain the fire and prevent non-piloted ignition fire spread.

There is no fire safety reason to apply a hose stream to glazing used in corridors. The hose stream test does **not** simulate the performance of glazing exposed to fire suppression sprinklers activated in the early stages of a fire. The hose stream will be applied by the responding fire department and evacuation of the fire floor is likely complete by that time. There is no test data to show that activation of a sprinkler will cause tested fire rated glazing to fall out. There is actual fire case history in Europe, where the hose stream test is not required for glazing or other fire rated building components, showing that glazing products tested without hose stream, and rated up to 60-minutes, actually resist the thermal shock of fire sprinklers activated in the early stages of a fire. Millions of square feet of fire rated glazing products tested without hose stream and rated up to 60-minutes have been used world-wide over the last 20 years, without a single reported instance of failure when exposed to fire sprinklers.

Proponents of a hose stream test for glazing in corridors have never demonstrated that it is necessary for fire safety, or related to thermal shock resistance of glazing exposed to fire sprinklers. The hose stream test was developed to measure the structural integrity of a fire assembly. NFPA 252 describes the history and basis for the hose stream test as follows: "The application of water produces stresses in the assembly and provides a measure of its structural capability

The 1996 Commentary to BOCA National Building Code, section 717.1.1 likewise confirms that the hose stream test is a measurement of structural strength, not the thermal shock resistance of the fire assembly or the glazing component: "The hose stream is intended to provide a measurement of structural integrity by evaluating the ability of the assembly to withstand impact. It has been determined, however, that a hose stream is not justified for 20-minute doors, which are acceptable only as corridor doors." (1996 Commentary, p.7-79) For that same reason, there is no fire safety justification for applying a hose stream test to glazing in corridors. The requirement for the one-hour corridor wall was primarily based on a quality of construction, rather than a specific fire resistance. The purpose of this requirement is to keep smoke and heat out of the corridor for the time required to evacuate that floor. That is why a ¾ hour door was never required, only a 20 minute door. The glazing in a window in the corridor also has the same purpose.

The storage of fuels against the glazing as noted in the committees reason last code cycle has nothing to do with the hose stream test. This is more of an issue with radiant heat transmission than with any stresses that may be created by the application of water. It is important to note that some of the glazing materials that will pass the hose stream test will allow almost 100% of the radiant heat from a fire to pass through. Because the committee last cycle state fuel storage next to the glazing was a concern, proponent has submitted a separate code change that squarely addresses the committee's concern by limiting radiant heat flux.

Cost Impact: This will result in a substantial cost savings, specifically in schools and hospitals. The current application of a hose stream test to glazing rated 45-minutes or less in a corridor unnecessarily increases the cost of construction, without providing any fire safety benefits.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

FS130–07/08

715.5, 715.5.3, Table 715.5.3, 715.5.4

Proponent: William F. O'Keeffe, SAFTIFIRST

1. Revise as follows:

715.5 (Supp) Fire protection-rated glazing. Glazing in fire window assemblies shall be fire protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.6. Fire protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 704.3, 704.8, 704.9 or 704.10 shall have a fire protection rating of not less than ¾ hour.

Exceptions:

1. ~~Wired glass~~ Fire protection-rated glazing with a ¼-inch (6.4 mm) thickness used in non labeled steel window frames in accordance with Section 715.5.3.
2. Fire protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.

715.5.3 ~~Wired glass~~ Non labeled steel window frames. Steel window frame assemblies of 0.125-inch (3.2 mm) minimum solid section or of not less than nominal 0.048-inch-thick (1.2 mm) formed sheet steel members fabricated by pressing, mitering, riveting, interlocking or welding and having provision for glazing with ¼-inch (6.4 mm) ~~wired glass~~ where securely installed in the building construction and glazed with ¼-inch (6.4 mm) labeled ~~wired glass~~ ~~fire~~ protection-rated glazing shall be deemed to meet the requirements for a ¾-hour fire window assembly. ~~Wired glass~~ Fire protection-rated glazing panels with a ¼-inch (6.4 mm) thickness shall conform to the size limitations set forth in Table 715.5.3.

Table 715.5.3
LIMITING SIZES OF ~~WIRED GLASS PANELS~~ ¼-INCH-THICK FIRE PROTECTION-RATED GLAZING USED IN NON LABELED STEEL WINDOW FRAMES

OPENING FIRE PROTECTION RATING	MAXIMUM AREA (SQUARE INCHES)	MAXIMUM HEIGHT (INCHES)	MAXIMUM WIDTH (INCHES)
~~3 hours~~	~~0~~	~~0~~	~~0~~
~~1 1/2 hour doors in exterior walls~~	~~0~~	~~0~~	~~0~~
~~1 and 1 1/2 hours~~	~~100~~	~~33~~	~~10~~
¾ hour	1,296	54	54
20 minutes	~~Not limited~~ Maximum size tested	~~Not limited~~ Maximum size tested	~~Not limited~~ Maximum size tested
~~Fire window Assemblies~~	~~1,296~~	~~54~~	~~54~~

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm^2.

715.5.4 ~~Nonwired glass~~ Size limitations. Fire-protection-rated glazing used in fire windows ~~other than wired glass in fire window assemblies shall be fire-protection-rated glazing installed in accordance with and~~ complying with the size limitations set forth in NFPA 80.

Reason: Clarify the reference to traditional wired glass as fire protection-rated glazing. Traditional wired glass should be designated as fire protection-rated glazing to be consistent with how other types of glazing products are described.

1. Traditional wired Glass is fire-protection-rated glazing and should be referenced in the code as such. This would be in sync with how NFPA 80 describes this type of product. NFPA 80 does not contain specific requirements for any specific type of glazing material. This proposal does not eliminate the use of traditional wired glass from the code. This proposal is intended to include traditional wired glass under the designation of fire-protection-rated glazing with all the other types of glazing materials currently available today. Traditional wired glass is suitable for use in fire windows and transoms of fire door assemblies located in non-hazardous locations. There is listed and labeled safety wired glass for use in hazardous locations complying with Chapter 24.

During the last code cycle, the committee agreed with the proposal to delete the reference to this specific type of fire protection-rated glazing in fire doors based on the following:

- The code should not be product specific and should address the required performance.
- Traditional non-safety wired glass is no longer permitted as a safety glazing in hazardous locations. Therefore Section 715.4.6.1 should not include traditional non-safety wired glass since it may not be used in the doors which are considered as a hazardous location.

These changes in the fire window section 715.5 will also improve the code by eliminating the possible misuse of traditional wired glass in hazardous locations specified in Section 2406 of Chapter 24 simply because this specific type of fire protection-rated glazing is specified in the code without clarification that it is for use in non hazardous locations only.

The previous committee reason for not approving the deletion of traditional wired glass in fire windows and making a modification to leave traditional wired glass in fire windows was as follows:

"The modification recognizes that the code has historically accepted wired-glass in a steel frame as equivalent to a 3/4hour assembly. The deletion of this section and table would require a listed frame which would increase the cost of construction without justification supporting such a change. The listing of wired-glass assemblies use the steel frames specified in this section during their testing. These prescriptive steel frame products have worked well historically and the option of using this should remain in the code."

This proposal clarifies 715.5.3 by revising the heading to "Non labeled steel window frames" and replacing "wired glass" with "fire protection-rated glazing". Table 715.5.3 has been re-titled to "1/4-inch fire protection-rated glazing for use in non labeled steel window frames".

2. Table 715.5.3 presently covers installations in both door assemblies and window assemblies. Section 715.5 applies to fire window assemblies only and this table should only contain requirements for fire window assemblies. The part of Table 715.5.3 that applies to fire door assemblies should be removed from this table as follows:

Under the "Open Fire Protection Rating" column, the first three rows titled "3 hours", "1-1/2 hour doors in exterior walls" and "1 and 1-1/2 hours" should be deleted as it applies to fire door assemblies and not fire window assemblies which is covered in Section 715.5.

The last row in this table for "fire window assemblies" is redundant information already covered in the row titled "3/4". This last row should be deleted.

Lastly, in the row for "20 minutes" the wording "Not limited" has been corrected to "Maximum size tested". "Maximum size tested" is better language because the dimensions "not limited" would imply the sizes of glazing could be anything where it should be based on the maximum size tested. This wording is also consistent with the language in NFPA 80.

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

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FS131–07/08

715.5, 715.5.3, Table 715.5.3, 715.5.4

Proponent: William F O'Keeffe, SAFTI FIRST

1. Revise as follows:

715.5 (Supp) Fire protection-rated glazing. Glazing in fire window assemblies shall be fire protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.6. Fire protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 704.3, 704.8, 704.9 or 704.10 shall have a fire protection rating of not less than 3/4 hour.

Exceptions:

~~1. Wired glass in accordance with Section 715.5.3.~~

~~2~~ 1. Fire protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.

2. Delete without substitution as follows:

~~**715.5.3 Wired glass.** Steel window frame assemblies of 0.125-inch (3.2 mm) minimum solid section or of not less than nominal 0.048-inch-thick (1.2 mm) formed sheet steel members fabricated by pressing, mitering, riveting, interlocking or welding and having provision for glazing with 1/4-inch (6.4 mm) wired glass where securely installed in the building construction and glazed with 1/4-inch (6.4 mm) labeled wired glass shall be deemed to meet the requirements for a 3/4-hour fire window assembly. Wired glass panels shall conform to the size limitations set forth in Table 715.5.3.~~