



2021 INTERNATIONAL CODE COUNCIL GROUP A ICC PROPOSAL PACKET

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IFC Record Keeping Requirements for Owners (6125)

IFC: 701.6, 701.6.1 (New), 901.6.3

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association

2021 International Fire Code

Revise as follows:

701.6 Owner's responsibility. The *owner* shall maintain an inventory of all required *fire-resistance-rated* construction, construction installed to resist the passage of smoke and the construction included in Sections 703 through 707 and Sections 602.4.1 and 602.4.2 of the *International Building Code*. Such construction shall be visually inspected by the *owner* annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. ~~Records of inspections and repairs shall be maintained.~~ Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space.

Add new text as follows:

701.6.1 Recordkeeping Records of all required system inspections, testing, repairs, and maintenance shall be maintained by Section 108.3 of this code.

Revise as follows:

901.6.3 Records. Records of all system inspections, tests and maintenance ~~required by the referenced standards~~ shall be maintained by Section 108.3 of this code.

Reason: The intent of this proposal is to provide correlation and consistency for record keeping requirements throughout the IFC. The previous requirements provided no guidance for owners to maintain their records to Section 108.3. Furthermore, the deletion of "required by referenced standards" is already covered by 108.3. Having the requirement for a record of inspections and repairs buried in the center of this section hides the requirement for uniform maintenance. The previous requirements provided no guidance for owners to maintain their records to Chapter 1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This is an editorial clarification and coordination with record keeping requirements.

IBC Undivided Areas and Draft Curtains (6135)

IBC: 910.2.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Building Code

Revise as follows:

910.2.1 Group F-1 or S-1. Smoke and heat vents installed in accordance with Section 910.3 or a mechanical smoke removal system installed in accordance with Section 910.4 shall be installed in buildings and portions thereof used as a Group F-1 or S-1 occupancy having more than 50,000 square feet (4645 m²) of ~~undivided area~~ undivided by draft curtains 4 feet (1.8 m) or greater in depth or walls constructed in accordance with Sections 706, 707, 708, 709, or 710. In occupied portions of a building equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 where the upper surface of the *story* is not a roof assembly, a mechanical smoke removal system in accordance with Section 910.4 shall be installed.

Exception: Group S-1 aircraft repair hangars.

Reason: Per the commentary for 910.2.1, "The code is not clear on what is meant by the term "undivided area." However, the intent is to provide the ability to manage the smoke in large spaces. Draft curtains or potentially any physical separation (regardless of rating) would provide such division." The commentary goes on to specify what constitutes construction that bounds smoke and the passage of smoke and it states that draft curtains are typically 6-feet in depth. NFPA 204, the Standard for Smoke and Heat Venting requires draft curtains to be 20% of the total ceiling height. For example, a 40 ft. ceiling would have an 8 ft. draft curtain, 30 ft. = 6 ft. draft curtain, 20 ft. = 4 ft. draft curtain. Having construction requirements in the commentary is a clear indication that the code text needs some prescriptive requirements. The proposal will provide additional language to section 910.2.1 that clarifies the requirements of what constitutes a divided area by putting requirements on draft curtain depth and the other passive systems found in Chapter 7.

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

Draftstopping Term Correlation (6136)

IBC: 708.4.2, 713.11, 718.1, 718.3, 718.3.1, 718.4, 718.4.1; IFC: 707.1; IMC: SECTION 202 (New), 504.2; IPC: SECTION 202 (New)

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Building Code

Revise as follows:

708.4.2 Fireblocks and draftstops in combustible construction.

In combustible construction where *fire partitions* do not extend to the underside of the floor or roof sheathing, deck or slab above, the space above and along the line of the *fire partition* shall be provided with one of the following:

1. *Fireblocking* up to the underside of the floor or roof sheathing, deck or slab above using materials complying with Section 718.2.1.
2. ~~Draftstopping~~ *Draftstops* up to the underside of the floor or roof sheathing, deck or slab above using materials complying with Section 718.3.1 for floors or Section 718.4.1 for *attics*.

Exceptions:

1. Buildings equipped with an *automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1, or in accordance with Section 903.3.1.2 provided that protection is provided in the space between the top of the *fire partition* and underside of the floor or roof sheathing, deck or slab above as required for systems complying with Section 903.3.1.1.
2. Where *corridor walls* provide a *sleeping unit* or *dwelling unit* separation, ~~draftstopping~~ *draftstops* shall only be required above one of the *corridor walls*.
3. In Group R-2 occupancies with fewer than four *dwelling units*, *fireblocking* and ~~draftstopping~~ *draftstops* shall not be required.
4. In Group R-2 occupancies up to and including four *stories* in height in buildings not exceeding 60 feet (18 288 mm) in height above *grade plane*, the *attic* space shall be subdivided by *draftstops* into areas not exceeding 3,000 square feet (279 m²) or above every two *dwelling units*, whichever is smaller.
5. In Group R-3 occupancies with fewer than three *dwelling units*, *fireblocking* and ~~draftstopping~~ *draftstops* shall not be required in floor assemblies.

713.11 Enclosure at the bottom.

Shafts that do not extend to the bottom of the building or structure shall comply with one of the following:

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

Exceptions:

1. The fire-resistance-rated room separation is not required, provided that the only openings in or penetrations of the *shaft enclosure* to the interior of the building occur at the bottom. The bottom of the *shaft* shall be closed off around the penetrating items with materials permitted by Section 718.3.1 for ~~draftstopping~~ *draftstops*, or the room shall be provided with an *approved automatic sprinkler system*.
2. A *shaft enclosure* containing a waste or linen chute shall not be used for any other purpose and shall discharge in a room protected in accordance with Section 713.13.4.

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

718.1 General. ~~Fireblocking and draftstopping~~ draftstops shall be installed in combustible concealed locations in accordance with this section. *Fireblocking* shall comply with Section 718.2. ~~Draftstopping~~ draftstops in floor/ceiling spaces and attic spaces shall comply with Sections 718.3 and 718.4, 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 718.5.

718.3 ~~Draftstopping~~ Draftstops in floors.

~~Draftstopping~~ draftstops shall be installed to subdivide floor/ceiling assemblies where required by Section 708.4.2. In other than Group R occupancies, ~~draftstopping~~ draftstops shall be installed to subdivide combustible floor/ceiling assemblies so that horizontal floor areas do not exceed 1,000 square feet (93 m²).

Exception: Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

718.3.1 ~~Draftstopping~~ Draftstop materials. ~~Draftstopping~~ *Draftstop* materials shall be not less than 1/2-inch (12.7 mm) *gypsum board*, 3/8-inch (9.5 mm) *wood structural panel*, 3/8-inch (9.5 mm) *particleboard*, 1-inch (25-mm) nominal lumber, cement *fiberboard*, batts or blankets of mineral wool or glass fiber, or other *approved* materials adequately supported. The integrity of *draftstops* shall be maintained.

718.4 ~~Draftstopping~~ Draftstops in attics.

~~Draftstopping~~ *Draftstops* shall be installed to subdivide *attic* spaces where required by Section 708.4.2. In other than Group R, ~~draftstopping~~ draftstops shall be installed to subdivide combustible *attic* spaces and combustible concealed roof spaces such that any horizontal area does not exceed 3,000 square feet (279 m²). *Ventilation* of concealed roof spaces shall be maintained in accordance with Section 1202.2.1.

Exception: Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

718.4.1 ~~Draftstopping~~ Draftstop materials. Materials utilized for ~~draftstopping~~ draftstops of *attic* spaces shall comply with Section 718.3.1.

2021 International Fire Code

Revise as follows:

707.1 Fireblocking and ~~draftstopping~~ draftstops. Required *fireblocking* and ~~draftstopping~~ draftstops in combustible concealed spaces shall be maintained to provide continuity and integrity of the construction.

2021 International Mechanical Code

Add new definition as follows:

DRAFTSTOP A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor/ceiling assemblies, roof/ceiling assemblies and attics.

Revise as follows:

504.2 Exhaust penetrations. Where a clothes dryer exhaust duct penetrates a wall or ceiling membrane, the annular space shall be sealed with noncombustible material, *approved* fire caulking or a noncombustible dryer exhaust duct wall receptacle. Ducts that exhaust clothes dryers shall not penetrate or be located within any fireblocking, ~~draftstopping~~ draftstops or any wall, floor/ceiling or other assembly required by the *International Building Code* to be fire-resistance rated, unless such duct is constructed of galvanized steel or aluminum of the thickness specified in Section 603.4 and the fire-resistance rating is maintained in accordance with the *International Building Code*. Fire dampers, combination fire/smoke dampers and any similar devices that will obstruct the exhaust flow shall be prohibited in clothes dryer exhaust ducts.

2021 International Plumbing Code

Add new definition as follows:

DRAFTSTOP A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor/ceiling assemblies, roof/ceiling assemblies and attics.

Reason: This is an editorial change. The word draftstopping is used multiple times throughout the IBC, IFC, IMC and IPC. This term is used with no definition. However, the term draftstop is a defined term in the IBC and IFC. These are the

same terms. This development replaces all occurrences of draftstopping with the defined term of draftstop. Additionally, this development inserts the definition for draftstop into the IMC and IPC.

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

Assembly Occupancies that serve alcohol (6137)

IBC: 903.2.1.8 (New)

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Building Code

Add new text as follows:

903.2.1.8 Assembly occupancies serving alcohol. A fire area where alcoholic beverages are being consumed that exceeds 100 occupants shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: The nature of assembly occupancies has evolved over time and the protection of those occupancies should evolve as well. New types of assembly spaces are being created and with the creation of those spaces so should the protection evolve. Additionally, with these new types of assembly occupancies, new types of fire loads are appearing. When these things are combined with increased occupancy loads of individuals under the influence of alcohol; the opportunity for tragedy increases exponentially.

One of these new occupancies is the use of “wedding barns.” These are barns that are being built or retrofitted to hold wedding ceremonies and receptions. Naturally, these barns have unique fire loads that many occupancies would not normally have present. (I.e., hay bales for seating and decoration, lanterns for lighting and décor, heating equipment for winter months, etc.) The NFPA (National Fire Protection Association) conducted a study on structure fires in barns. The study shows that during a four-year period there were 830 structure fires in barns with one civilian death, 10 civilian injuries and around \$28 million in property damage annually. The leading causes for these fires were heating equipment, electrical distribution, and lighting. As with most wedding events, substantial amounts of alcohol are involved. All these factors combined create a hazardous space filled with occupants whose reactions and thought processes are slowed and impaired. Additionally, in A-1 occupancies such as movie theatres and concert halls are evolving to become more of a luxury event. Many movie theatres and concert venues across the nation are now selling alcohol to its patrons or are renting the space to private parties. Also, many other types of occupancies within the assembly category provide alcohol to attendees. Protecting these spaces with sprinkler systems is a need that has been present for some time.

Fires are occurring in these types of spaces where sprinkler systems are present, and lives are being saved. An automatic sprinkler system extinguished a fire that erupted during a wedding banquet at a hotel in San Antonio, Texas. In Rancho Santa Fe, California sprinklers make a difference in golf clubhouse fire during a wedding party. The Battalion Fire Chief Fred Cox stated that, “... without fire sprinklers this could have been a major fire. The fire was well established before sprinkler activation, and without them, it would have easily spread unchecked through a very large and open attic space before being detected.” Two fires were extinguished by a single sprinkler in golf clubhouse in Grapevine, Texas on two separate occasions. Four fire sprinklers held a fire in check under a table in the kitchen of the indoor go kart racing facility until fire crews arrived on scene. Damage was contained to the table involved and slight charring on the wall where the table was situated. Addison Fire Marshal stated, “Without the fire sprinkler activation, we would have had a total loss of the kitchen.” This facility serves alcohol and hosts parties on a regular basis.

Finally, most authorities having jurisdiction have a resource within their structure to help identify these types of occurrences when occupancies are being changed or the use of the space has been modified. Most jurisdictions require a liquor license to serve alcohol. This aids in the enforcement of this development.

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

Increasing floor level height for 13R systems in R Occupancies (6138)

IBC: [F] 903.3.1.2

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org); Paula Cino, representing National Multifamily Housing Council (pcino@nmhc.org); Dan Buuck, National Association of Home Builders, representing National Association of Home Builders (dbuuck@nahb.org); Margo Thompson, Newport Ventures, representing National Multifamily Housing Council (mthompson@newportventures.net)

2021 International Building Code

Revise as follows:

[F] 903.3.1.2 NFPA 13R sprinkler systems.

Automatic sprinkler systems in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or fewer above *grade plane*.
2. The floor level of the highest story is ~~30~~ 35 feet (~~9144~~ 10668 mm) or less above the lowest level of fire department vehicle access.
3. The floor level of the lowest story is ~~30~~ 35 feet (~~9144~~ 10668 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 shall be measured from grade plane.

Reason: During the previous code development cycle, an issue of significant concern was rectified with respect to NFPA 13R sprinklers in Group R occupancies in podium-style buildings and allowance for as many as four stories up to 60' in height above grade to be constructed on top of the horizontal building separation. However, while continuing to allow for NFPA 13R systems in four story Group R occupancies, the height limit from fire department vehicle access to the floor level of the highest story was changed to only 30'. In most cases, this height limit will not allow for NFPA 13R sprinklers in a four-story apartment building.

According to feedback from contractors, developers, and design professionals, typical height of floor assembly framing in multifamily buildings is slightly less than twelve inches. A four-story apartment building with 8'-6" ceiling heights and the necessary 8" to 12" foundation exposure above grade, would exceed this 30' limit. Likewise, a very common mixed use building type of three stories of residential occupancy above ground level retail space would also exceed the 30' limit. The current 30' limit is at the very low end of fourth-story floor level height and offers little flexibility for floor-to-ceiling heights greater than 8'-0". With the current 30' limitation, NFPA 13R sprinkler systems are essentially limited to three-story buildings: The NFPA 13R standard was specifically created to permit these systems in buildings up to four stories. This proposal will allow the use of NFPA 13R sprinkler systems as envisioned by the standard.

It is also important to understand that the floor level measurement is not taken from the grade adjacent to the building but from the lowest level of fire department vehicle access, which can be up to 150 feet away. The difference in elevation over that distance can be significant, further limiting the number of buildings which can meet this section. Below is an example of a 4-story multifamily building. The 4th floor is at a height of 32' above grade. However, the dimension used as the threshold for a 13R system increases where the lowest level of fire department vehicle access is below the level of grade at the building.



The dimension of 35' was selected as the limit because it allows more flexibility for building design and floor-to-ceiling height while still remaining well within the 75' reach of typical fire truck ladders. It is also significantly lower than the 60' height limit which had been in place prior to the code change in 2021.

NFPA 13R systems have been extremely effective in protecting human lives as well as preventing significant property damage from fire in low-rise residential buildings since the NFPA 13R Standard was first published in 1989. A 2016 issue of the NFPA Journal published the findings of a workshop attended by subject matter experts that focused on the adequacy of 13R sprinklers. Overarching conclusions were 1) that major fires in 13R-protected buildings were the exception – not the rule and 2) that there was not sufficient evidence to indicate that 13R sprinklers have not been effective in protecting human life and reducing property damage. To quote the June 2016 NFPA Report describing the outcomes of the workshop:

- *"NFPA 13R/13D are effective standards that reduces loss of life and building damage due to a fire event."*
- *"To consider or make any changes to NFPA 13R/13D, better (more refined) data needs to be identified as well as collected on a consistent basis. A national database that describes fire events with information on building type/codes would assist in making intelligent changes to any sprinkler standards."*

Essentially limiting the use of NFPA 13R sprinkler systems to Group R buildings three-stories or less does not recognize other significant changes in the codes in recent cycles that offer increased fire protection. Furthermore, there may be some unintended consequences with respect to the current language. Recent cycles have seen changes such as sprinkler requirements for balconies in buildings where 13R sprinklers are used, increased attic protection if it is not sprinklered such as construction of the attic using fire retardant wood or non-combustible materials, and the recent 2021 requirement for special inspections of sealing fire penetrations and draft stopping. All of these ancillary provisions have increased fire protection and stringency of the fire code. Furthermore, by reducing the use of NFPA 13R systems in R-2 occupancies, requirements for sprinkler protection of balconies in these buildings have also been reduced – historically, an issue of significant concern. By extending requirements for NFPA 13 sprinklers in R-2 occupancies, sprinkler requirements for balconies are fewer or non-existent when compared to the absolute mandate of sprinklers on balconies for NFPA 13R systems through the IBC.

Census data reports that of the 13,000 multifamily buildings completed in 2019, more than 10,000 (77%) of these buildings were four stories or less. By reducing the percentage of multifamily buildings where NFPA 13R sprinklers are permitted, the code language as it currently stands will significantly impact housing affordability. The National Multifamily Housing Council estimates that moving from NFPA 13R to NFPA 13 sprinkler systems would carry an incremental installed cost increase of approximately \$1.00/sq. ft. to \$2.00/sq. ft. of overall building area on average across the US.

NFPA 13R sprinklers are a very effective means of assuring life safety and property protection in Group R buildings four

stories and less while maintaining housing affordability. An increase in height to 35' above or below the lowest level of fire department vehicle access is reasonable and modest and can easily be reached by the typical fire truck ladder.' This proposal recognizes the long-standing effectiveness of 13R life safety systems, which have been allowed since the early years of the I-codes as well as the legacy codes.

Cost Impact: The code change proposal will decrease the cost of construction. Costs associated with requirements for attic protection in NFPA 13 systems not only includes the additional sprinklers and piping but also costs associated with increased hydraulic demand and water supply as well as necessary freeze protection in cold and even moderate climates. Greater density and spacing of sprinklers, larger pipe diameter, sprinklers in concealed spaces, and especially, requirements for attic protection (with some exceptions) all contribute to the added cost. This cost increase does not include the final cost with markup to the building owner or the potential need to add a fire pump in the NFPA 13 system. Moving from a 13R system to a 13 system for a \$9,342,688, four-story, 48-unit apartment building increased construction costs by \$102,255 or a little over \$2,100/unit. (Home Innovation Research Labs, *Cost Analysis of Proposed Group A Code Changes (2018-2019 ICC Code Development Cycle)* - October 2018). This would have a substantial impact on both tenant rental rates and owner-occupied units. The detailed cost analysis is shown below.

Four-Story Building on Grade, 48 Units & Common Areas



[ELEVATION]

Table F117-A. Cost of NFPA 13 Sprinkler System Compared to NFPA 13R System

Component	Unit	Material	Labor	Total	w/O&P	Qty	Cost
Residential sprinkler heads	EA	16	21.50	37.5	53	292	15,476
3/4" diameter CPVC piping (NFPA 13R)	LF	7	6.90	13.9	19.05	4292	81,763
Wet standpipe riser, schedule 20, 4" diameter pipe	FL	5800	2875	--	8675	4	34,700
Total NFPA 13R System							131,939
Additional sprinkler heads (attic)	EA	16	21.50	37.5	53	44	2,332
Additional sprinkler heads (non-exempt bathrooms)	EA	16	21.50	37.5	53	2	106
3/4" diameter CPVC piping (NFPA 13R)	LF	7	6.90	13.9	19.05	(4292)	(81,763)
1-1/2" CPVC piping (NFPA 13)	LF	18.55	9.75	28.3	36.50	4292	156,658
Additional 1-1/2" CPVC piping for new sprinkler heads (NFPA 13)	LF	18.55	9.75	28.3	36.50	618	22,557
Additional floor, wet standpipe riser, schedule 20, 4" diameter pipe	FL	1475	890	--	2365	1	2,365
Total NFPA 13 System							234,194
Total to Builder							102,255

Sprinklers for certain B Occupancies (6139)

IBC: [F] 903.2.2, 903.2.2.1 (New)

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Building Code

Revise as follows:

~~[F] 903.2.2 Ambulatory care facilities. Group B. An automatic sprinkler system shall be installed throughout the entire floor containing an ambulatory care facility where either of the following conditions exist at any time: An automatic sprinkler system shall be provided throughout buildings containing a Group B occupancy where one of the following conditions exists:~~

- ~~1. Four or more care recipients are incapable of self-preservation.~~
- ~~2. One or more care recipients that are incapable of self-preservation are located at other than the level of exit discharge serving such a facility.~~

1. Buildings having more than three stories above grade plane.
2. Business occupancies that have areas used in the cooking of food.

Exception: Areas only using microwaves and small food preparation appliances

~~In buildings where ambulatory care is provided on levels other than the level of exit discharge, an automatic sprinkler system shall be installed throughout the entire floor as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the nearest level of exit discharge, the level of exit discharge, and all floors below the level of exit discharge.~~

~~**Exception:** Floors classified as an open parking garage are not required to be sprinklered.~~

Add new text as follows:

903.2.2.1 Ambulatory Care Facilities An automatic sprinkler system shall be installed throughout the entire floor containing an ambulatory care facility where either of the following conditions exist at any time:

1. Four or more care recipients are incapable of self-preservation.
2. One or more care recipients that are incapable of self-preservation are located at other than the level of exit discharge serving such a facility.

In buildings where ambulatory care is provided on levels other than the level of exit discharge, an automatic sprinkler system shall be installed throughout the entire floor as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the nearest level of exit discharge, the level of exit discharge, and all floors below the level of exit discharge.

Exception: Floors classified as an open parking garage are not required to be sprinklered.

Reason: Item #1: With the ever-decreasing land availability in metropolitan areas, landowners and design professionals are having to construct vertically. Employee areas are becoming more open and less boundaries are being added. In addition, accessory use assembly areas, team gathering areas and the like are being more and more incorporated in the today's modern office. This is causing a large increase in occupancy loads on floors plates. Due to the increasing occupancy loads it is causing travel times, evacuation times, and the like are all being increased. This will lead to an increase in fire related injuries and deaths. By providing automatic sprinkler systems in these business occupancies, it will provide the time required for occupants to exit the structure safely and reduce the risk of fire related injury and death. It will also provide additional time and flexibility for fire operations to occur efficiently and safely. **Item #2:** The use of ambulatory surgery centers (ASC) has spiked in recent years, partly because they're more convenient for patients than hospitals. It's also cheaper as well. As of 2017, more than half of outpatient surgeries were performed in an ASC setting. That is an increase of 32% since 2005. The ASC market is projected to increase to \$40 billion by 2020. Drivers for revenue growth are lower outpatient surgery costs compared to other settings, improved safety driven by technological advancements, and the aging U.S. population. There are more than 6,100 ASCs in the U.S. and as of 2016,

more than 5,500 were Medicare-certified. As medical technology continues to advance, so will the increase of ability to complete more and more procedures in ASCs. This will increase the load of patients who are not capable of self-preservation. Couple this with a lack of knowledge of the surgery facility layout, those patients and other occupants are at greater risk of fire related death or injury. **Item #3:** There has been an increase in cooking related fires in business occupancies. According to the latest report by the U.S. Fire Administration, cooking fires in business occupancies have increased by 43% since 2003. This is due to the increased extravagance in workplaces. Employees are required to work longer hours and increase production. Employers are feeling the need to provide nicer facilities for the employees, so that to maintain moral and production. Among these facilities are extravagant break areas that include full kitchens with all the necessary appliances. Combine this with the ever-decreasing land availability in metropolitan areas, it has caused owners and design professionals to construct vertically. This has caused higher risk areas to be pushed vertically and an increase in building evacuation times due to height.

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

N/A

NFPA 409 Correlation (6143)

IBC: [F] 412.3.6

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Building Code

Revise as follows:

[F] 412.3.6 Fire suppression.

Aircraft hangars shall be provided with a fire suppression system designed in accordance with NFPA 409, based on the classification for the hangar given in Table 412.3.6.

Exception: Where a *fixed base operator* has separate repair facilities on site, Group II hangars operated by a *fixed base operator* used for storage of *transient aircraft* only shall have ~~a~~ an automatic fire sprinkler suppression system, but the system and is exempt from foam requirements provided the system is designed in accordance with Section 903.3.1.1 with a minimum sprinkler design density of 0.2 gpm over 5,000 sq. ft.

Reason: Group II hangars in NFPA 409 are protected with a combination of fire sprinkler and foam systems. The current exception in the IBC allows the foam system to be removed without any direction from NFPA 409 protection to do so. It is easily misinterpreted reading NFPA 409, Section 7.2.5 to permit a fire sprinkler system density of 0.17 gpm over 5,000 sq ft. however, this density is applied with a foam system.

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

N/A

IFC/IBC Standpipe Signage Requirements (6144)

IBC: [F] 912.5, 912.5.1 (New), 912.5.2 (New), 912.5.3 (New), 912.5.4 (New); IFC: 912.5, 912.5.1 (New), 912.5.2 (New), 912.5.3 (New), 912.5.4 (New)

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Building Code

Revise as follows:

[F] 912.5 Signs. A metal sign ~~with raised letters not less than 1 inch (25 mm) in size~~ shall be mounted on all fire department connections serving automatic sprinklers, standpipes or fire pump connections. Such signs shall read: "AUTOMATIC SPRINKLERS," "STANDPIPES," or "TEST CONNECTION," ~~or "STANDPIPE AND AUTOSPKR or AUTOSPKR AND STANDPIPE,"~~ or a combination thereof as applicable. ~~Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.~~

Add new text as follows:

912.5.1 Lettering. Each fire department connection (FDC) shall be designated by a sign with raised letters at least 1 inch (25.4mm) in height. For manual standpipe systems, the sign shall also indicate that the system is manual and that it is either wet or dry.

912.5.2 Serving Multiple Buildings. Where a fire department connection (FDC) services multiple buildings, structures or location, a sign shall be provided indicating the building, structures or locations served. Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.

912.5.3 Multiple or combined systems. Where combination or multiple systems types are supplied by the fire department connection, the sign or combination of signs shall indicate both designated services.

912.5.4 Indication of pressure. The sign also shall indicate the pressure required at the outlets to deliver the standpipe system demand.

Exception: The requirements of section 912.5.4 shall not be required when the pressure required is 150 psi (10.3 bar) or less.

2021 International Fire Code

Revise as follows:

912.5 Signs. A metal sign with raised letters not less than 1 inch (25 mm) in size shall be mounted on all fire department connections serving automatic sprinklers, standpipes or fire pump connections. Such signs shall read: "AUTOMATIC SPRINKLERS" or "STANDPIPES" or "TEST CONNECTION," ~~or "STANDPIPE AND AUTOSPKR or AUTOSPKR AND STANDPIPE,"~~ or a combination thereof as applicable. ~~Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.~~

Add new text as follows:

912.5.1 Lettering. Each fire department connection (FDC) shall be designated by a sign with letters at least 1 in (25.4mm) in height. For manual standpipe systems, the sign shall also indicate that the system is manual and that it is either wet or dry.

912.5.2 Serving multiple buildings. Where a fire department connection (FDC) services multiple buildings, structures or location, a sign shall be provided indicating the building, structures or locations served. Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.

912.5.3 Multiple or combined systems. Where combination or multiple systems types are supplied by the fire department connection, the sign or combination of signs shall indicate both designated services.

912.5.4 Indication of pressure. The sign also shall indicate the pressure required at the outlets to deliver the standpipe system demand.

Exception: The requirements of section 912.5.4 shall not be required when pressure required is 150 psi (10.3 bar) or less.

Reason: Currently both the IBC section 905.2 and IFC section 905.2 require the signage for fire department connection to meet the requirements found in NFPA 14 Standard for the Installation of Standpipes and Hose Systems. This amendment simply pulls those requirements into the IFC and IBC for quick identification.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This is already a requirement and is an editorial clarification.

Buildings with stages (6146)

IBC: [F] 410.6

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Building Code

Revise as follows:

[F] 410.6 Automatic sprinkler system.

Buildings and structures that contain stages shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.

Exceptions:

1. Sprinklers are not required under *stage* areas less than 4 feet (1219 mm) in clear height that are utilized exclusively for storage of tables and chairs, provided that the concealed space is separated from the adjacent spaces by Type X *gypsum board* not less than $\frac{5}{8}$ -inch (15.9 mm) in thickness.
2. Sprinklers are not required for *stages* 1,000 square feet (93 m²) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on *stages*.

Reason: This change clarifies Section 410.1 requirement for application, "...to all parts of the buildings and structures..." Section 410.6 leaves the user with the possibility to interpret that only requires stages to be protected and the rest of the building unprotected. The commentary supports this by allowing a limited area system for the stage. The "tradeoffs" or exceptions in Section 410.6 could not or should not apply, unless the whole building is sprinklered throughout. Sections 410.2.1 and 410.5.3.2 require the entire building to be sprinklered.

Cost Impact: The code change proposal will increase the cost of construction. Additionally, most assembly or educational occupancies where stages would be located, would normally be protected anyhow.

Omitted sprinkler locations (6148)

IBC: [F] 903.3.1.1.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Building Code

Revise as follows:

[F] 903.3.1.1.1 Exempt locations.

Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an *approved* automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from a room merely because it is damp, of fire-resistance-rated construction or contains electrical equipment.

- ~~1. A room where the application of water, or flame and water, constitutes a serious life or fire hazard.~~
- ~~2.~~ 1. A room or space where sprinklers are considered undesirable because of the nature of the contents and constitutes a serious life of fire hazard, where *approved* by the fire code official.
- ~~3.~~ 2. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a *fire-resistance rating* of not less than 2 hours.
- ~~4.~~ 3. Rooms or areas that are of noncombustible construction with wholly noncombustible contents.
- ~~5.~~ 4. Fire service access elevator machine rooms and machinery spaces.
- ~~6.~~ 5. Machine rooms, machinery spaces, control rooms and control spaces associated with occupant evacuation elevators designed in accordance with Section 3008.

Reason: This is an editorial change to the omitted sprinkler locations. The first two locations were essentially the same locations and caused confusion among authorities having jurisdiction. This simplifies the section and clarifies the allowable omissible locations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This is already a requirement and is an editorial clarification.

Removing Zones from IBC (6149)

IFC: 914.3.1.1, 914.3.1.1.1; IBC: [F] 403.3.1, [F] 403.3.1.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association; Jeffrey Hugo, representing NFSA (hugo@nfsa.org)

2021 International Fire Code

Revise as follows:

914.3.1.1 ~~Number of sprinkler risers and system~~ Fire protection zone design. Each automatic sprinkler system located in fire protection system zone s in of buildings that are more than 420 feet (128 m) in height shall be supplied by not fewer than two standpipes or express mains in accordance with Section 905.1 and Section 913.1 ~~risers~~. Each standpipe or express main ~~riser~~ shall supply sprinklers on alternate floors. ~~If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~

914.3.1.1.1 Riser location. ~~Sprinkler risers~~ Standpipes and express mains supplying automatic sprinkler systems shall be placed in *interior exit stairways* and *ramps* that are remotely located in accordance with Section 1007.

2021 International Building Code

Revise as follows:

[F] 403.3.1 ~~Number of sprinkler risers and system~~ Fire protection zone design. Each automatic sprinkler system located in fire protection system zone s in of buildings that are more than 420 feet (128 m) in *building height* shall be supplied by not fewer than two standpipes or express mains in accordance with Section 403.4.3 and Section 913.1 ~~risers~~. Each riser standpipe or express main shall supply the automatic sprinklers systems on alternate floors. ~~If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~

[F] 403.3.1.1 Riser location. ~~Sprinkler risers~~ Standpipes or express mains supplying automatic sprinkler systems shall be placed in *interior exit stairways* and *ramps* that are remotely located in accordance with Section 1007.1.

Reason: This code change is to remove the word zone from the International Building Code as it pertains to automatic sprinkler systems. The word zone is used and defined by NFPA 14 (standpipes), NFPA 20 (fire pumps) and NFPA 72 (fire alarms), however it is not used or defined by NFPA 13 or the IBC/IFC. It is confusing to apply zone to a sprinkler system when other installation standards use the term in a way that accounts for multiple floors or systems. Sprinkler systems are individual to each floor, meaning, each sprinkler system is required to have a floor control assembly which, by NFPA 13 and NFPA 25 definition, serves as a separate system. For example, a 50-story building, has at least 50 sprinkler systems, or one per floor. The term “fire protection system” is defined by the IBC/IFC and when used with the term zone, is better correlated with the other fire protection installation standards. A (vertical) fire protection zone is more commonly used by the installation standards (NFPA 14 and 20) for high rises of this height and better aligns with the original intent of G46-07/08.

This change also removes the word riser. Riser is meant to be the water supply through the standpipe system or directly in the express main(s) through the fire pump system. Using riser is not incorrect, but it confuses the terms used by NFPA 13. A riser is a vertical supply pipe in NFPA 13, but in high rises are usually combined with the standpipe system. To state “riser” in the IBC/IFC implies a separate feed to just the sprinkler system where the common practice (and intent of this section) is to use the standpipe system to be the water supply to each sprinkler system per floor.

Since the changes to this section by proposal G46-07/08 for the 2009 IBC/IFC, the current editions of NFPA 20 and NFPA 14 have had similar changes in regard to the NIST WTC report. NFPA 20 added Section 5.6 for very tall buildings which requires redundancy of fire pumps and water storage tanks for buildings beyond the pumping capacity of the fire pump. NFPA 14, expanded the technical explanation and application of zones in buildings.

This change keeps the redundancy of the original G46-07/08 intent but better works with the other standards that designers, engineers, and code officials use.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This is an editorial change and will not affect the cost of construction.

Sprinkler Protection in Animal Housing (6488)

IBC: SECTION 202 (New), 903.2.11.6 (New), 903.2.11.6.1 (New); IFC: SECTION 202 (New), 322 (New), 322.1 (New), 322.2 (New), 903.2.11.6 (New),

903.2.11.6.1 (New)

Proponents: Andrew Bevis, representing National Fire Sprinkler Association (bevis.andrew1988@gmail.com); Jeffrey Hugo, representing NFSA (hugo@nfsa.org); Joe Scibetta, representing BuildingReports (jscibetta@buildingreports.com)

2021 International Building Code

Add new definition as follows:

ANIMAL HOUSING FACILITY

Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production. Such facilities include but are not limited to barns and stables; kennels; animal shelters; animal hospitals and veterinary facilities; zoos; laboratories; agricultural facilities housing animals; and mercantile or business occupancies with animals.

Add new text as follows:

903.2.11.6 ANIMAL HOUSING FACILITIES

903.2.11.6.1 Automatic Sprinkler Protection. An automatic sprinkler system in accordance with Section 903.3 shall be provided throughout animal housing facilities that contain Group R occupancies or where occupants are expected to delay their emergency egress to care for animals.

2021 International Fire Code

Add new definition as follows:

ANIMAL HOUSING FACILITY

Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production. Such facilities include but are not limited to barns and stables; kennels; animal shelters; animal hospitals and veterinary facilities; zoos; laboratories; agricultural facilities housing animals; and mercantile or business occupancies with animals.

Add new text as follows:

322 ANIMAL HOUSING FACILITIES

322.1 Sources of Ignition. Smoking or the use of heating or other devices employing an open flame, or the use of spark-producing equipment is prohibited in all areas of an animal housing facility, including agricultural buildings housing livestock or poultry.

322.2 Waste Housekeeping. Permanent storage of waste shall be prohibited in aisles, hallways, or other types of egress components.

903.2.11.6 ANIMAL HOUSING FACILITIES

903.2.11.6.1

ANIMAL HOUSING FACILITIES An automatic sprinkler system in accordance with Section 903.3 shall be provided throughout animal housing facilities that contain Group R occupancies or where occupants are expected to delay their emergency egress to care for animals.

Reason: This proposal does two things: it addresses a special type of occupancy that is not covered by IBC or IFC by providing a definition of animal housing and it addresses when residential occupancies are mixed with animal housing facilities. It is important for the IBC to recognize the special operations that take place in these unique facilities, where a secondary population is wholly reliant on a primary population for the necessary, prompt attention required during a fire emergency. Additionally, this proposal addresses the concerns of the code committee from the previous cycle. Further clarification is provided within the definition of what type of facilities are considered animal housing facilities. This proposal's main goal is to make the protection of human occupant's paramount, i.e., where residential dwelling or sleeping units are part of the animal housing facility. It also addresses the concern from the committee that the protection of

occupant's lives was secondary. The model codes currently do not adequately address facilities in which people may delay evacuation for the care of animals.

Many states exempt agricultural buildings and is often and traditionally lumped in with "animal housing". A lot of jurisdictions and residents unconsciously do not get permits or inquire about construction codes because of being classified as an agricultural community. The addition of a dwelling unit to a barn, stable, or veterinary office triggers permits and automatic fire sprinkler systems.

Fire data indicates that 98% of civilian injuries in livestock or poultry storage properties were due to structure fires. While 64% of those fires were caused by heating equipment and electrical distribution and lighting equipment. Fires within livestock production properties, 84% of civilian injuries were due to structure fires. While 53% of those fires were caused by heating equipment and electrical distribution and lighting equipment.

Fire sprinklers are installed in some animal housing facilities and have a significant impact saving lives and property. The McKinney, TX Fire Department responded to an incident at The Collin County Animal Shelter. First responders upon arrival noted the fire alarm was sounding and strobes activated. The investigation revealed the fire sprinkler system had activated and extinguished the fire within the shelter. A single sprinkler is credited for the minimal fire damage and reinforced the value of fire sprinkler systems. Shelter staff reported no injuries to the 124 sheltered animals. "This successful sprinkler save continues to demonstrate the effectiveness of automatic fire sprinkler systems in a commercial environment. Had a fire sprinkler system not been present, the outcome may have been very different," said Deputy Fire Marshal Andrew Barr.

Another fire occurred in the Sea Life Center's avian curatorial on the second floor of the facility. Firefighters saw smoke coming from the building upon arrival and discovered that the fire sprinkler system had already extinguished what was believed to have been a small electrical fire. No staff or other animals were injured in the fire.

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

The change may increase the cost of construction due to the increased level of life safety for the occupants.

Standpipe exit stairways fix (6489)

IFC: 905.4; IBC: [F] 905.4

Proponents: JEFFREY HUGO, National Fire Sprinkler Association, representing NFSA (hugo@nfsa.org)

2021 International Fire Code

Revise as follows:

905.4 Location of Class I standpipe hose connections.

Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway* and exterior exit stairway, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise approved by the *fire code official*.

Exception: A single hose connection shall be permitted to be installed in the open *corridor* or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the *exit* opening of a horizontal *exit*.

Exception: Where floor areas adjacent to a horizontal *exit* are reachable from an *interior exit stairway* or exterior exit stairway hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal *exit*.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior exit stairway* or exterior exit stairway hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall.
5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in approved locations.

2021 International Building Code

Revise as follows:

[F] 905.4 Location of Class I standpipe hose connections.

Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway* or exterior exit stairway, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise approved by the *fire code official*.

Exception: A single hose connection shall be permitted to be installed in the open *corridor* or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

2. On each side of the wall adjacent to the *exit* opening of a *horizontal exit*.

Exception: Where floor areas adjacent to a *horizontal exit* are reachable from an *interior exit stairway* or exterior exit stairway hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the *horizontal exit*.

3. In every *exit passageway*, at the entrance from the *exit passageway* to other areas of a building.

Exception: Where floor areas adjacent to an *exit passageway* are reachable from an *interior exit stairway* or *exterior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit passageway* to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall. In *open mall buildings*, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an *exit passageway* or *exit corridor* to the mall.
5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or *story* is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or *story* is more than 200 feet (60 960 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in *approved* locations.

Reason: This proposal corrects an error that first appeared in the 2015 IFC. Proposal E2-12, submitted by ICC-CTC, went through the codes to separate "exit stairway" references into either "interior exit stairway" or "exterior exit stairway" wherever the term appeared. Unfortunately, the revision to Section 905.4, Item 1 mistakenly added "interior" but not "exterior." This resulted in an unintended and unjustified technical change; whereby, Class I hose connection locations were no longer specified for exterior exit stairways, even if a building exceeds the height thresholds requiring installation of a standpipe system. Although tall buildings don't often have exterior exit stairways, they sometimes do, and the code needs to be fixed to address these instances.

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

From a literal perspective, this proposal might be viewed as increasing the cost of construction in that it technically adds a requirement for additional hose connections in buildings with exterior exit stairways and which require standpipes. However, the change to the 2015 edition that eliminated this requirement was done in error, with no disclosure or substantiation. The intent is to return the code to where it should have been all along.

IFC Appendix I (6757)

IFC: I101.2 (New), I101.3, I101.4

Proponents: Jeffrey Hugo, National Fire Sprinkler Association, representing NFSA (hugo@nfsa.org); Jason Webb, Potter Electric Signal Company, representing Automatic Fire Alarm Association Codes & Standards Committee (jasonw@pottersignal.com)

2021 International Fire Code

Add new text as follows:

I101.2 Impaired conditions requiring immediate action. The following conditions indicate noncompliant and impaired fire protection systems. An impaired system(s) shall require immediate action by the building owner to return the fire protection system back to service:

1. Valves in the shut or closed position:
 - 1.1 Water supply valves, such as in riser rooms, yards, and vaults.
 - 1.2 Water supply floor control valves in multi-story buildings.
 - 1.3 Fuel supply valves for fire pumps.
 - 1.4 Commercial kitchen hood suppression valves
2. Impaired fire alarm systems:
 - 2.1 Fire alarm systems with no power (primary or secondary).
 - 2.2 No active communication path to the supervising/remote station (unless the system is local)

Revise as follows:

~~**I101.2**~~ **I101.3 Noncompliant conditions requiring component replacement.** The following conditions shall be deemed noncompliant and shall cause the related component(s) to be replaced to comply with the provisions of this code:

1. Sprinklers ~~heads~~ having any of the following conditions:
 - 1.1. Signs of leakage.
 - 1.2. Paint or other ornamentation that is not factory applied.
 - 1.3. Evidence of corrosion including, but not limited to, discoloration or rust.
 - 1.4. Deformation or damage of any part.
 - 1.5. Improper orientation of sprinkler ~~head~~.
 - 1.6. Empty glass bulb.
 - 1.7. Sprinklers ~~heads~~ manufactured prior to 1920.
 - 1.8. Replacement sprinklers ~~heads~~ that do not match existing sprinkler ~~heads~~ in orifice size, K-factor temperature rating, coating or deflector type.
 - 1.9. Sprinklers ~~heads~~ for the protection of cooking equipment that have not been replaced within one year.
2. Water pressure and air pressure gauges; ~~that have been installed for more than 5 years and have not been tested to within 3 percent accuracy.~~
 - 2.1 Installed for more than 5 years and have not been tested to within 3 percent accuracy.
 - 2.2 Indicate zero pressure.

~~**I101.3**~~ **I101.4 Noncompliant conditions requiring component repair or replacement.**

The following shall be deemed noncompliant conditions and shall cause the related component(s) to be repaired or replaced to comply with the provisions of this code:

1. Sprinkler and standpipe system piping and fittings having any of the following conditions:
 - 1.1. Signs of leakage.
 - 1.2. Evidence of corrosion.
 - 1.3. Misalignment.
 - 1.4. Mechanical damage.
2. Sprinkler piping support having any of the following conditions:
 - 2.1. Materials resting on or hung from sprinkler piping.
 - 2.2. Damaged or loose hangers or braces.
3. Class II and Class III standpipe systems having any of the following conditions:
 - 3.1. No hose or nozzle, where required.
 - 3.2. Hose threads incompatible with fire department hose threads.
 - 3.3. Hose connection cap missing.
 - 3.4. Mildew, cuts, abrasions and deterioration evident.
 - 3.5. Coupling damaged.
 - 3.6. Gaskets missing or deteriorated.
 - 3.7. Nozzle missing or obstructed.
4. Hose racks and cabinets having any of the following conditions:
 - 4.1. Difficult to operate or damaged.
 - 4.2. Hose improperly racked or rolled.
 - 4.3. Inability of rack to swing 90 degrees (1.57 rad) out of the cabinet.
 - 4.4. Cabinet locked, except as permitted by this code.
 - 4.5. Cabinet door will not fully open.
 - 4.6. Door glazing cracked or broken.
5. Portable fire extinguishers having any of the following conditions:
 - 5.1. Broken seal or tamper indicator.
 - 5.2. Expired maintenance tag.
 - 5.3. Pressure gauge indicator in "red."
 - 5.4. Signs of leakage or corrosion.
 - 5.5. Mechanical damage, denting or abrasion of tank.
 - 5.6. Presence of repairs such as welding, soldering or brazing.
 - 5.7. Damaged threads.
 - 5.8. Damaged hose assembly, couplings or swivel joints.
6. Fire alarm and detection control equipment, initiating devices and notification appliances having any of the following conditions:
 - 6.1. Corroded or leaking batteries or terminals.
 - 6.2. Smoke detectors having paint or other ornamentation that is not factory-applied.
 - 6.3. Mechanical damage to ~~heat or smoke detectors~~ any fire alarm equipment, devices, or appliances.
 - 6.4. Tripped fuses.
 - 6.5 Fire alarm systems not in "normal" (no alarm, supervisory, or trouble) state.

7. Fire department connections having any of the following conditions:

- 7.1. Fire department connections are not visible or able to be accessed from the fire apparatus access road.
- 7.2. Couplings or swivels are damaged.
- 7.3. Plugs and caps are missing or damaged.
- 7.4. Gaskets are deteriorated.
- 7.5. Check valve is leaking.
- 7.6. Identification signs are missing.

8. Fire pumps having any of the following conditions:

- 8.1. Pump room temperature is less than 40°F (4.4°C).
- 8.2. Ventilating louvers are not freely operable.
- 8.3. Corroded or leaking system piping.
- 8.4. Diesel fuel tank is less than two-thirds full.
- 8.5. Battery readings, lubrication oil or cooling water levels are abnormal.

Reason: New in the 2009 IFC through F304-07/08, the ICC hazard abatement in existing buildings committee submitted this appendix as a bridge to the essential fire protection inspection, testing, and maintenance standards. This is a frequently adopted appendix by fire departments in jurisdictions using company inspections.

The new section, I101.2 should come first, because of the priority of an impaired system. Impaired systems are an immediate priority, because items, such as shut valves and no fuel prevent fire protection systems from operating. The NFPA 25 and NFPA 72 standards have more impairment conditions but getting fire code officials on company level inspections to recognize shut valves should be first on their checklist. This proposal is attempting to keep in original spirit and purpose of the original submitters, to highlight "...conditions readily identifiable by the fire code official during the course of an inspection..."

The new and updated sections above include terminology, such as impairment and deficiency, to continue the correlation of common issues between the codes and standards for the fire code official. The term impaired and deficiency are defined terms in NFPA 25 and NFPA 72. They are used to categorize the level of system status. Adding these to the appendix only helps the fire code official recognize and understand the issue better.

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

Sprinkler Term Correlation - Part I (7055)

IBC: 410.5.3.2, [F] 415.11.12.3, 901.4, [F] 903.2.5.2, TABLE 903.2.5.2, TABLE 903.2.11.6, [F] 903.3.1, [F] 903.5, [F] 909.6.1, TABLE 1006.2.1, TABLE 1017.2, [BF] 1705.15, 3007.2.2; IFC: 315.3.1, TABLE 903.2.5.2, 903.3.1, 903.4, [BE] TABLE 1006.2.1, [BE] TABLE 1017.2, [BE] TABLE 1020.2, 1103.4.1, 1103.5.4, 2703.10.4.4.1, 3204.2, 3206.10.1.1, 3303.3, 3501.3, TABLE 5104.3.2, E103.1.5, 903.5

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo (hugo@nfsa.org)

2021 International Building Code

Revise as follows:

410.5.3.2 Exit access travel distance. The *exit access* travel distance shall be not greater than 300 feet (91 440 mm) for buildings without a n automatic sprinkler system and 400 feet (122 mm) for buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

[F] 415.11.12.3 Automatic sprinkler locations. Automatic sprinklers ~~systems~~ shall be installed at 12-foot (3658 mm) intervals in horizontal ducts and at changes in direction. In vertical ducts, sprinklers shall be installed at the top and at alternate floor levels.

901.4 Threads. Threads provided for fire department connections to automatic sprinkler systems, standpipes, yard hydrants or any other fire hose connection shall be compatible with the connections used by the local fire department.

[F] 903.2.5.2 Group H-5 occupancies.

An *automatic sprinkler system* shall be installed throughout buildings containing Group H-5 occupancies. The design of the automatic sprinkler system shall be not less than that required by this code for the occupancy hazard classifications in accordance with Table 903.2.5.2.

Where the design area of the automatic sprinkler system consists of a *corridor* protected by one row of sprinklers, the maximum number of sprinklers required to be calculated is 13.

TABLE 903.2.5.2
GROUP H-5 AUTOMATIC SPRINKLER SYSTEM DESIGN CRITERIA

LOCATION	OCCUPANCY HAZARD CLASSIFICATION
Fabrication areas	Ordinary Hazard Group 2
Service corridors	Ordinary Hazard Group 2
Storage rooms without dispensing	Ordinary Hazard Group 2
Storage rooms with dispensing	Extra Hazard Group 2
Corridors	Ordinary Hazard Group 2

**TABLE 903.2.11.6
ADDITIONAL REQUIRED PROTECTION SYSTEMS**

SECTION	SUBJECT
402.5, 402.6.2	Covered and open mall buildings
403.3	High-rise buildings
404.3	Atriums
405.3	Underground structures
407.7	Group I-2
410.6	Stages
411.3	Special amusement buildings
412.2.4	Airport traffic control towers
412.3.6, 412.3.6.1, 412.5.6	Aircraft hangars
415.11.11	Group H-5 HPM exhaust ducts
416.5	Flammable finishes
417.4	Drying rooms
424.3	Play structures
428	Buildings containing laboratory suites
507	Unlimited area buildings
508.5.7	Live/work units
509.4	Incidental uses
1030.6.2.3	<i>Smoke-protected assembly seating</i>
<i>IFC</i>	<i>Automatic sprinkler system requirements as set forth in Section 903.2.11.6 of the International Fire Code</i>

[F] 903.3.1 Standards. Automatic ~~s~~prinkler systems shall be designed and installed in accordance with Section 903.3.1.1 unless otherwise permitted by Sections 903.3.1.2 and 903.3.1.3 and other chapters of this code, as applicable.

[F] 903.5 Testing and maintenance. Automatic ~~s~~prinkler systems shall be inspected, tested, and maintained in accordance with the *International Fire Code*.

[F] 909.6.1 Minimum pressure difference. The pressure difference across a *smoke barrier* used to separate smoke zones shall be not less than 0.05-inch water gage (0.0124 kPa) in ~~fully-sprinklered~~ buildings equipped throughout with automatic sprinkler systems.

In buildings permitted to be ~~other than fully-sprinklered~~ not to be equipped throughout with automatic sprinkler systems, the smoke control system shall be designed to achieve pressure differences not less than two times the maximum calculated pressure difference produced by the design fire.

**TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY**

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without <u>Automatic Sprinkler System</u> (feet)		With <u>Automatic Sprinkler System</u> (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
A ^c , E, M	49	75	75	75 ^a
B	49	100	75	100 ^a
F	49	75	75	100 ^a
H-1, H-2, H-3	3	NP	NP	25 ^b
H-4, H-5	10	NP	NP	75 ^b
I-1, I-2 ^d , I-4	10	NP	NP	75 ^a
I-3	10	NP	NP	100 ^a
R-1	10	NP	NP	75 ^a
R-2	20	NP	NP	125 ^a
R-3 ^e	20	NP	NP	125 ^{a, g}
R-4 ^e	20	NP	NP	125 ^{a, g}
S ^f	29	100	75	100 ^a
U	49	100	75	75 ^a

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

- a. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.
- b. Group H occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.2.5.
- c. For a room or space used for assembly purposes having *fixed seating*, see Section 1030.8.
- d. For the travel distance limitations in Group I-2, see Section 407.4.
- e. The *common path of egress travel* distance shall only apply in a Group R-3 occupancy located in a mixed occupancy building.
- f. The length of *common path of egress travel* distance in a Group S-2 *open parking garage* shall be not more than 100 feet.
- g. For the travel distance limitations in Groups R-3 and R-4 equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.3, see Section 1006.2.2.6.

**TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE^a**

OCCUPANCY	WITHOUT <u>AUTOMATIC</u> SPRINKLER SYSTEM (feet)	WITH <u>AUTOMATIC</u> SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200 ^e	250 ^b
I-1	Not Permitted	250 ^b
B	200	300 ^c
F-2, S-2, U	300	400 ^c
H-1	Not Permitted	75 ^d
H-2	Not Permitted	100 ^d
H-3	Not Permitted	150 ^d
H-4	Not Permitted	175 ^d
H-5	Not Permitted	200 ^c
I-2, I-3	Not Permitted	200 ^c
I-4	150	200 ^c

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to exit access travel distance requirements:

- Section 402.8 : For the distance limitation in malls
- Section 407.4: For the distance limitation in Group I-2.
- Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.
- Section 411.2: For the distance limitation in special amusement areas.
- Section 412.6: For the distance limitations in aircraft manufacturing facilities.
- Section 1006.2.2.2: For the distance limitation in refrigeration machinery rooms.
- Section 1006.2.2.3: For the distance limitation in refrigerated rooms and spaces.
- Section 1006.3.4: For buildings with one exit.
- Section 1017.2.2: For increased distance limitation in Groups F-1 and S-1.
- Section 1030.7: For increased limitation in assembly seating.
- Section 3103.4: For temporary structures.
- Section 3104.9: For pedestrian walkways.

[BF] 1705.15 Sprayed fire-resistant materials. *Special inspections* and tests of sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be performed in accordance with Sections 1705.15.1 through 1705.15.6. *Special inspections* shall be based on the fire-resistance design as designated in the *approved construction documents*. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members. *Special inspections* and tests shall be performed during construction with an additional visual inspection after the rough installation of electrical, automatic sprinkler systems, mechanical and plumbing systems and suspension systems for ceilings, and before concealment where applicable. The required sample size shall not exceed 110 percent of that specified by the referenced standards in Sections 1705.15.4.1 through 1705.15.4.9.

3007.2.2 Automatic Sprinkler system monitoring. The automatic sprinkler system shall have a sprinkler control valve supervisory switch and water-flow-initiating device provided for each floor that is monitored by the building's *fire alarm system*.

2021 International Fire Code

Revise as follows:

315.3.1 Ceiling clearance.

Storage shall be maintained 2 feet (610 mm) or more below the ceiling in nonsprinklered areas of buildings or not less than 18 inches (457 mm) below sprinkler head deflectors in sprinklered areas of buildings.

Exceptions:

1. The 2-foot (610 mm) ceiling clearance is not required for storage along walls in nonsprinklered areas of buildings.
2. The 18-inch (457 mm) ceiling clearance is not required for storage along walls in areas of buildings equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

TABLE 903.2.5.2
GROUP H-5 AUTOMATIC SPRINKLER SYSTEM DESIGN CRITERIA

LOCATION	OCCUPANCY HAZARD CLASSIFICATION
Fabrication areas	Ordinary Hazard Group 2
Service corridors	Ordinary Hazard Group 2
Storage rooms without dispensing	Ordinary Hazard Group 2
Storage rooms with dispensing	Extra Hazard Group 2
Corridors	Ordinary Hazard Group 2

903.3.1 Standards. Automatic sprinkler systems shall be designed and installed in accordance with Section 903.3.1.1, unless otherwise permitted by Sections 903.3.1.2 and 903.3.1.3 and other chapters of this code, as applicable.

903.4 Automatic Sprinkler system supervision and alarms.

Valves controlling the water supply for *automatic sprinkler systems*, pumps, tanks, water levels and temperatures, critical air pressures and waterflow switches on all automatic sprinkler systems shall be electrically supervised by a *listed* fire alarm control unit.

Exceptions:

1. *Automatic sprinkler systems* protecting one- and two-family *dwelling*s.
2. Limited area sprinkler systems in accordance with Section 903.3.8.
3. *Automatic sprinkler systems* installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the *automatic sprinkler system*, and a separate shutoff valve for the *automatic sprinkler system* is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.
8. Underground key or hub gate valves in roadway boxes.

**[BE] TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY**

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without <u>Automatic</u> Sprinkler System (feet)		With <u>Automatic</u> Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
A ^c , E, M	49	75	75	75 ^a
B	49	100	75	100 ^a
F	49	75	75	100 ^a
H-1, H-2, H-3	3	NP	NP	25 ^b
H-4, H-5	10	NP	NP	75 ^b
I-1, I-2 ^d , I-4	10	NP	NP	75 ^a
I-3	10	NP	NP	100 ^a
R-1	10	NP	NP	75 ^a
R-2	20	NP	NP	125 ^a
R-3 ^e	20	NP	NP	125 ^{a, g}
R-4 ^e	20	NP	NP	125 ^{a, g}
S ^f	29	100	75	100 ^a
U	49	100	75	75 ^a

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

- a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2
- b. Group H occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.2.5.
- c. For a room or space used for assembly purposes having fixed seating, see Section 1030.8.
- d. For the travel distance limitations in Group I-2, see Section 407.4 of the International Building Code.
- e. The common path of egress travel distance shall apply only in a Group R-3 occupancy located in a mixed occupancy building or within a Group R-3 or R-4 congregate living facility.
- f. The length of common path of egress travel distance in a Group S-2 open parking garage shall be not more than 100 feet.
- g. For the travel distance limitations in Groups R-3 and R-4 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3, see Section 1006.2.2.6.

**[BE] TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE^a**

OCCUPANCY	WITHOUT <u>AUTOMATIC</u> SPRINKLER SYSTEM (feet)	WITH <u>AUTOMATIC</u> SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200	250 ^{b, e}
I-1	Not Permitted	250 ^b
B	200	300 ^c
F-2, S-2, U	300	400 ^c
H-1	Not Permitted	75 ^d
H-2	Not Permitted	100 ^d
H-3	Not Permitted	150 ^d
H-4	Not Permitted	175 ^d
H-5	Not Permitted	200 ^c
I-2, I-3	Not Permitted	200 ^c
I-4	150	200 ^c

For SI: 1 foot = 304.8 mm.

- a. See the following sections for modifications to exit access travel distance requirements:

Section 402.8 of the International Building Code: For the distance limitation in malls.
Section 407.4 of the International Building Code: For the distance limitation in Group I-2.
Sections 408.6.1 and 408.8.1 of the International Building Code: For the distance limitations in Group I-3.
Section 411.2 of the International Building Code: For the distance limitation in special amusement areas.
Section 412.6 of the International Building Code: For the distance limitations in aircraft manufacturing facilities.
Section 1006.2.2.2: For the distance limitation in refrigeration machinery rooms.
Section 1006.2.2.3: For the distance limitation in refrigerated rooms and spaces.
Section 1006.3.4: For buildings with one exit.
Section 1017.2.2: For increased distance limitation in Groups F-1 and S-1.
Section 1030.7: For increased limitation in assembly seating.
Section 3103.4 of the International Building Code: For temporary structures.
Section 3104.9 of the International Building Code: For pedestrian walkways.

- b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.
- c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
- d. Group H occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.2.5.1.
- e. Group R-3 and R-4 buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.

**[BE]TABLE 1020.2
CORRIDOR FIRE-RESISTANCE RATING**

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without <u>automatic</u> sprinkler system	With <u>automatic</u> sprinkler system
H-1, H-2, H-3	All	Not Permitted	1 ^c
H-4, H-5	Greater than 30	Not Permitted	1 ^c
A, B, E, F, M, S, U	Greater than 30	1	0
R	Greater than 10	Not Permitted	0.5 ^c /1 ^d
I-2 ^a	All	Not Permitted	0
I-1, I-3	All	Not Permitted	1 ^{b, c}
I-4	All	1	0

- a. For requirements for occupancies in Group I-2, see Sections 407.2 and 407.3 of the International Building Code.
- b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Section 408.8 of the International Building Code.
- c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.
- d. Group R-3 and R-4 buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.

1103.4.1 Group I-2 and I-3 occupancies.

In Group I-2 and I-3 occupancies, interior vertical openings connecting two or more stories shall be protected with 1-hour *fire-resistance-rated* construction.

Exceptions:

1. In Group I-2, unenclosed vertical openings not exceeding two connected stories and not concealed within the building construction shall be permitted as follows:
 - 1.1. The unenclosed vertical openings shall be separated from other unenclosed vertical openings serving other floors by a *smoke barrier*.
 - 1.2. The unenclosed vertical openings shall be separated from *corridors* by smoke partitions.
 - 1.3. The unenclosed vertical openings shall be separated from other fire or *smoke compartments* on the same floors by a *smoke barrier*.
 - 1.4. On other than the lowest level, the unenclosed vertical openings shall not serve as a required *means of egress*.

2. In Group I-2, atriums connecting three or more stories shall not require 1-hour *fire-resistance-rated* construction where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3, and all of the following conditions are met:

2.1. For other than existing *approved* atriums with a smoke control system, where the atrium was constructed and is maintained in accordance with the code in effect at the time the atrium was created, the atrium shall have a smoke control system that is in compliance with Section 909.

2.2. Glass walls forming a smoke partition or a glass-block wall assembly shall be permitted where in compliance with Condition 2.2.1 or 2.2.2.

2.2.1. Glass walls forming a smoke partition shall be permitted where all of the following conditions are met:

2.2.1.1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway or occupied space on the atrium side.

2.2.1.2. The sprinklers shall be not more than 12 inches (305 mm) away from the face of the glass and at intervals along the glass of not greater than 72 inches (1829 mm).

2.2.1.3. Windows in the glass wall shall be nonoperating type.

2.2.1.4. The glass wall and windows shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the automatic sprinkler system operates.

2.2.1.5. The automatic sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction.

2.2.2. A *fire barrier* is not required where a glass-block wall assembly complying with Section 2110 of the International Building Code and having a ³/₄-hour *fire protection rating* is provided.

2.3. Where doors are provided in the glass wall, they shall be either self-closing or automatic-closing and shall be constructed to resist the passage of smoke.

3. In Group I-3 occupancies, exit *stairways* or *ramps* and exit *access stairways* or *ramps* constructed in accordance with Section 408 of the International Building Code.

1103.5.4 High-rise buildings. Where Appendix M has not been adopted, existing high-rise buildings that do not have a previously *approved* ~~fire~~ automatic sprinkler system shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 where any of the following conditions apply:

1. The high-rise building has an occupied floor located more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access.

2. The high-rise building has occupied floors located more than 75 feet (22 860 mm) and not more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, and the building does not have at least two *interior exit stairways* complying with Section 1104.10 that are separated from the building interior by fire assemblies having a *fire-resistance rating* of not less than 2 hours with opening protection in accordance with Table 716.1(2) of the *International Building Code*.

3. The high-rise building has occupied floors located more than 75 feet (22 860 mm) and not more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, and the building does not have a fire alarm system that includes smoke detection in mechanical equipment, electrical, transformer, telephone equipment and similar rooms; *corridors*; elevator lobbies; and at doors penetrating *interior exit stairway* enclosures. Building owners shall file a compliance schedule with the *fire code official* not later than 365 days after receipt of a written notice. The compliance schedule shall not exceed 12 years for completion of the *automatic sprinkler system* retrofit.

2703.10.4.4.1 Sprinkler head locations. Automatic sprinklers shall be installed at 12-foot (3658 mm) intervals in horizontal ducts and at changes in direction. In vertical runs, automatic sprinklers shall be installed at the top and at alternate floor levels.

3204.2 Designation based on engineering analysis. The designation of a *high-piled combustible storage* area, or portion thereof, is allowed to be based on a lower hazard class than that of the highest class of commodity stored where a limited quantity of the higher hazard commodity has been demonstrated by engineering analysis to be adequately protected by the *automatic sprinkler system* provided. The engineering analysis shall consider the ability of the automatic sprinkler system to deliver the higher density required by the higher hazard commodity. The higher density shall be based on the actual storage height of the pile or rack and the minimum allowable design area for sprinkler operation as set forth in the density/area figures provided in NFPA 13. The contiguous area occupied by the higher hazard commodity shall not exceed 120 square feet (11 m²) and additional areas of higher hazard commodity shall be separated from other such areas by 25 feet (7620 mm) or more. The automatic sprinkler system shall be capable of delivering the higher density over a minimum area of 900 square feet (84 m²) for wet pipe systems and 1,200 square feet (111 m²) for dry pipe systems. The shape of the design area shall be in accordance with Section 903.

3206.10.1.1 Sprinklered buildings.

Aisles in sprinklered buildings shall be not less than 44 inches (1118 mm) wide. Aisles shall be not less than 96 inches (2438 mm) wide in *high-piled storage areas* exceeding 2,500 square feet (232 m²) in area, that are accessible to the public and designated to contain high-hazard commodities.

Aisles shall be not less than 96 inches (2438 mm) wide in areas open to the public where mechanical stocking methods are used.

Exceptions:

1. Aisles in *high-piled storage areas* exceeding 2,500 square feet (232 m²) in area, that are open to the public and designated to contain high-hazard commodities, and that are protected by a n automatic sprinkler system designed for multiple-row racks of high-hazard commodities, shall be not less than 44 inches (1118 mm) wide.
2. Aisles that are in *high-piled storage areas* exceeding 2,500 square feet (232 m²) in area, not open to the public and protected by a n automatic sprinkler system designed for multiple-row racks, shall be not less than 24 inches (610 mm) wide.

3303.3 Daily fire safety inspection. The site safety director shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on-site until a certificate of occupancy has been issued. Documentation shall be immediately available on-site for presentation to the *fire code official* upon request.

1. Any contractors entering the site to perform hot work each day have been instructed in the hot work safety requirements in Chapter 35, and hot work is performed only in areas *approved* by the site safety director.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. *Flammable liquids* and other hazardous materials are stored in locations that have been *approved* by the site safety director when not involved in work that is being performed.
6. Fire apparatus access roads required by Section 3311 are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet (6096 mm).
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service automatic sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.

9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3313.1.
10. Portable fire extinguishers are available in locations required by Sections 3316 and 3318.3.

3501.3 Restricted areas.

Hot work shall only be conducted in areas designed or authorized for that purpose by the personnel responsible for a hot work program. Hot work shall not be conducted in the following areas unless approval has been obtained from the *fire code official*:

1. Areas where the automatic sprinkler system is impaired.
2. Areas where there exists the potential of an explosive atmosphere, such as locations where flammable gases, liquids or vapors are present.
3. Areas with readily ignitable materials, such as storage of large quantities of bulk sulfur, baled paper, cotton, lint, dust or loose combustible materials.
4. On board ships at dock or ships under construction or repair.
5. At other locations as specified by the *fire code official*.

**TABLE 5104.3.2
SEGREGATED STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS AND PLASTIC AEROSOL 3 PRODUCTS IN
GENERAL PURPOSE WAREHOUSES**

STORAGE SEPARATION	MAXIMUM SEGREGATED STORAGE AREA ^a		<u>AUTOMATIC SPRINKLER SYSTEM REQUIREMENTS</u>
	Percentage of building area (percent)	Area limitation (square feet)	
Separation area ^{e, f}	15	20,000	Notes b, c
Chain-link fence enclosure ^d	20	20,000	Notes b, c
1-hour fire-resistance-rated interior walls	20	30,000	Note b
2-hour fire-resistance-rated interior walls	25	40,000	Note b
3-hour fire-resistance-rated interior walls	30	50,000	Note b

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

- a. The maximum segregated storage area shall be limited to the smaller of the two areas resulting from the percentage of building area limitation and the area limitation.
- b. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B and be approved. Building areas not containing aerosol product storage shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.
- c. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B and be approved. Sprinkler system protection shall extend a minimum 20 feet beyond the aerosol storage area.
- d. Chain-link fence enclosures shall comply with Section 5104.3.2.1.
- e. A separation area shall be defined as an area extending outward from the periphery of the segregated aerosol product storage area as follows:
 1. The limits of the aerosol product storage shall be clearly marked on the floor.
 2. The separation distance shall be not less than 25 feet and maintained clear of all materials with a commodity classification greater than Class III in accordance with Section 903.3.1.1.
- f. Separation areas shall only be permitted where approved.

E103.1.5 Surrounding conditions. Conditions such as other materials or processes in the area, type of construction of the structure, fire protection features (for example, *fire walls*, automatic sprinkler systems, alarms), occupancy (use) of adjoining areas, normal temperatures, exposure to weather, etc., must be taken into account in evaluating the hazard.

903.5 Inspection, ~~T~~esting and maintenance. Automatic ~~S~~sprinkler systems shall be inspected, tested and maintained in accordance with Section 901.

Reason: Across the I codes there are varying ways to describe an automatic sprinkler system. his proposal correlates several of the I codes to use the defined term of automatic sprinkler system. This allows for a better understanding of the term and application. Other proposals have been submitted to make several sprinkler and fire protection correlations and improvements.

Each section noted in this proposal has been changed to clarify what type of system is installed. In many cases, it is a simple deletion of the word "fire" or an added "automatic" and changes are to refer to the italicized term of automatic sprinkler system as is defined.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. There are not technical changes in this proposal. It is for term correlation.

Sprinkler Term Correlation - Part II (7497)

IRC: P2904.1, P2904.3.4, P2904.4.2, P2904.7, P2904.8.1

Proponents: Andrew Bevis, National Fire Sprinkler Association, representing National Fire Sprinkler Association (bevis@nfsa.org); Jeffrey Hugo (hugo@nfsa.org)

2021 International Residential Code

Revise as follows:

P2904.1 General. The design and installation of ~~residential~~ automatic fire sprinkler systems shall be in accordance with NFPA 13D or Section P2904, which shall be considered to be equivalent to NFPA 13D. Partial ~~residential~~ automatic sprinkler systems shall be permitted to be installed only in buildings not required to be equipped with a ~~residential~~ automatic sprinkler system. Section P2904 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose ~~fire~~ automatic sprinkler system shall provide domestic water to both fire sprinklers and plumbing fixtures. A stand-alone automatic sprinkler system shall be separate and independent from the water distribution system. A backflow preventer shall not be required to separate a n automatic sprinkler system from the water distribution system, provided that the sprinkler system complies with all of the following:

1. The system complies with NFPA 13D or Section P2904.
2. The piping material complies with Section P2906.
3. The system does not contain antifreeze.
4. The system does not have a fire department connection.

P2904.3.4 Drain. A means to drain the automatic sprinkler system shall be provided on the system side of the water distribution shutoff valve.

P2904.4.2 System design flow rate. The design flow rate for the system shall be based on the following:

1. The design flow rate for a room having only one sprinkler shall be the flow rate required for that sprinkler, as determined by Section P2904.4.1.
2. The design flow rate for a room having two or more sprinklers shall be determined by identifying the sprinkler in that room with the highest required flow rate, based on Section P2904.4.1, and multiplying that flow rate by 2.
3. Where the sprinkler manufacturer specifies different criteria for ceiling configurations that are not smooth, flat and horizontal, the required flow rate for that room shall comply with the sprinkler manufacturer's instructions.
4. The design flow rate for the automatic sprinkler system shall be the flow required by the room with the largest flow rate, based on Items 1, 2 and 3.
5. For the purpose of this section, it shall be permissible to reduce the design flow rate for a room by subdividing the space into two or more rooms, where each room is evaluated separately with respect to the required design flow rate. Each room shall be bounded by walls and a ceiling. Openings in walls shall have a lintel not less than 8 inches (203 mm) in depth and each lintel shall form a solid barrier between the ceiling and the top of the opening.

P2904.7 Instructions and signs. An owner's manual for the ~~fire~~ automatic sprinkler system shall be provided to the owner. A sign or valve tag shall be installed at the main shutoff valve to the water distribution system stating, "Warning, the water system for this home supplies fire sprinklers that require certain flows and pressures to fight a fire. Devices that restrict the flow or decrease the pressure or automatically shut off the water to the fire sprinkler system, such as water softeners, filtration systems and automatic shutoff valves, shall not be added to this system without a review of the fire sprinkler system by a fire protection specialist. Do not remove this sign."

P2904.8.1 Preconcealment inspection. The following items shall be verified prior to the concealment of any automatic sprinkler system piping:

1. Sprinklers are installed in all areas as required by Section P2904.1.1.
2. Where sprinkler water spray patterns are obstructed by construction features, luminaires or ceiling fans, additional sprinklers are installed as required by Section P2904.2.4.2.
3. Sprinklers are the correct temperature rating and are installed at or beyond the required separation distances from heat sources as required by Sections P2904.2.1 and P2904.2.2.
4. The pipe size equals or exceeds the size used in applying Tables P2904.6.2(4) through P2904.6.2(9) or, if the piping system was hydraulically calculated in accordance with Section P2904.6.1, the size used in the hydraulic calculation.

5. The pipe length does not exceed the length permitted by Tables P2904.6.2(4) through P2904.6.2(9) or, if the piping system was hydraulically calculated in accordance with Section P2904.6.1, pipe lengths and fittings do not exceed those used in the hydraulic calculation.
6. Nonmetallic piping that conveys water to sprinklers is *listed* for use with fire sprinklers.
7. Piping is supported in accordance with the pipe manufacturer's and sprinkler manufacturer's installation instructions.
8. The piping system is tested in accordance with Section P2503.7.

Reason: Across the I codes there are varying ways to describe an automatic sprinkler system. This proposal correlates several of the I codes to use the defined term of automatic sprinkler system. This allows for a better understanding of the term and application. Other proposals have been submitted to make several sprinkler and fire protection correlations and improvements.

Each section noted in this proposal has been changed to clarify what type of system is installed. In many cases, it is a simple deletion of the word "fire" or an added "automatic" and changes are to refer to the italicized term of automatic sprinkler system as is defined.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. There are no technical changes in this proposal. It is for term correlation.

Townhouse standpipe exception (7220)

IFC: 905.3; IBC: [F] 905.3

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

2021 International Fire Code

Revise as follows:

905.3 Required installations.

Standpipe systems shall be installed where required by Sections 905.3.1 through 905.3.8. Standpipe systems are allowed to be combined with *automatic sprinkler systems*.

Exceptions:

1. Standpipe systems are not required in Group R-3 occupancies.
2. Standpipe systems are not required in Group R-2 townhouses.

2021 International Building Code

Revise as follows:

[F] 905.3 Required installations.

Standpipe systems shall be installed where required by Sections 905.3.1 through 905.3.8. Standpipe systems are allowed to be combined with *automatic sprinkler systems*.

Exceptions:

1. Standpipe systems are not required in Group R-3 occupancies.
2. Standpipe systems are not required in Group R-2 townhouses.

Reason: This proposal doesn't technically change the code, recognizing that there are no locations in a townhouse that would require hose connections in accordance with Sections 905.4, 905.5, or 905.6. Regardless of whether a standpipe is technically required by Section 905.3, you would not install such a system if hose connections are never required. Clearly, it is not the intent of the code to require standpipes in individual townhouse units, but there are cases where townhouses might exceed the story or height thresholds in Section 905.3.1, which introduces a conflict. This proposal fixes that issue and brings clarity to the code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. The proposal doesn't change how the code applies and is intended to simply bring clarity to the existing requirements. Accordingly, there is no cost impact.