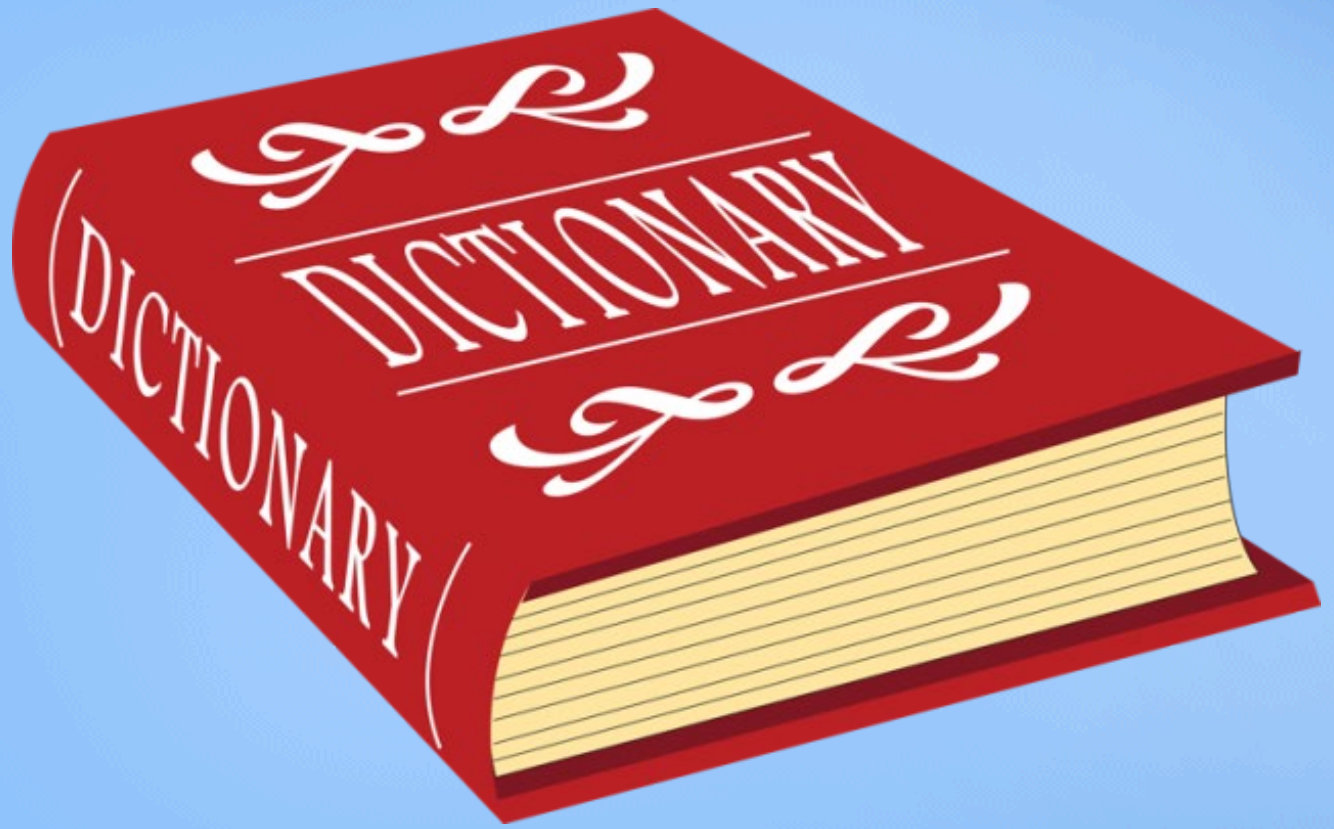
Significant Changes to the 2021 International Building Code & 2022 California Building Code

Fire Life Safety Provisions

Administration

CHAPTERS 1 & 2

Definitions



Definitions

- **202. [A] CHANGE OF OCCUPANCY.** Either of the following shall be considered as a change of occupancy where this code requires a greater degree of safety, accessibility, structural strength, fire protection, *means of egress*, ventilation or sanitation than is existing in the current building or structure:
    1. Any change in the occupancy classification of a building or structure.
    2. Any change in the purpose of, or a change in the level of activity within, a building or structure.

Definitions

- **202. [A] CHANGE OF OCCUPANCY.**

- The intent of revisions to this definition is to limit the application of a change of occupancy where there is no change in classification to only when new uses present a higher risk to the life safety or welfare of the occupants than was created by the previous use.

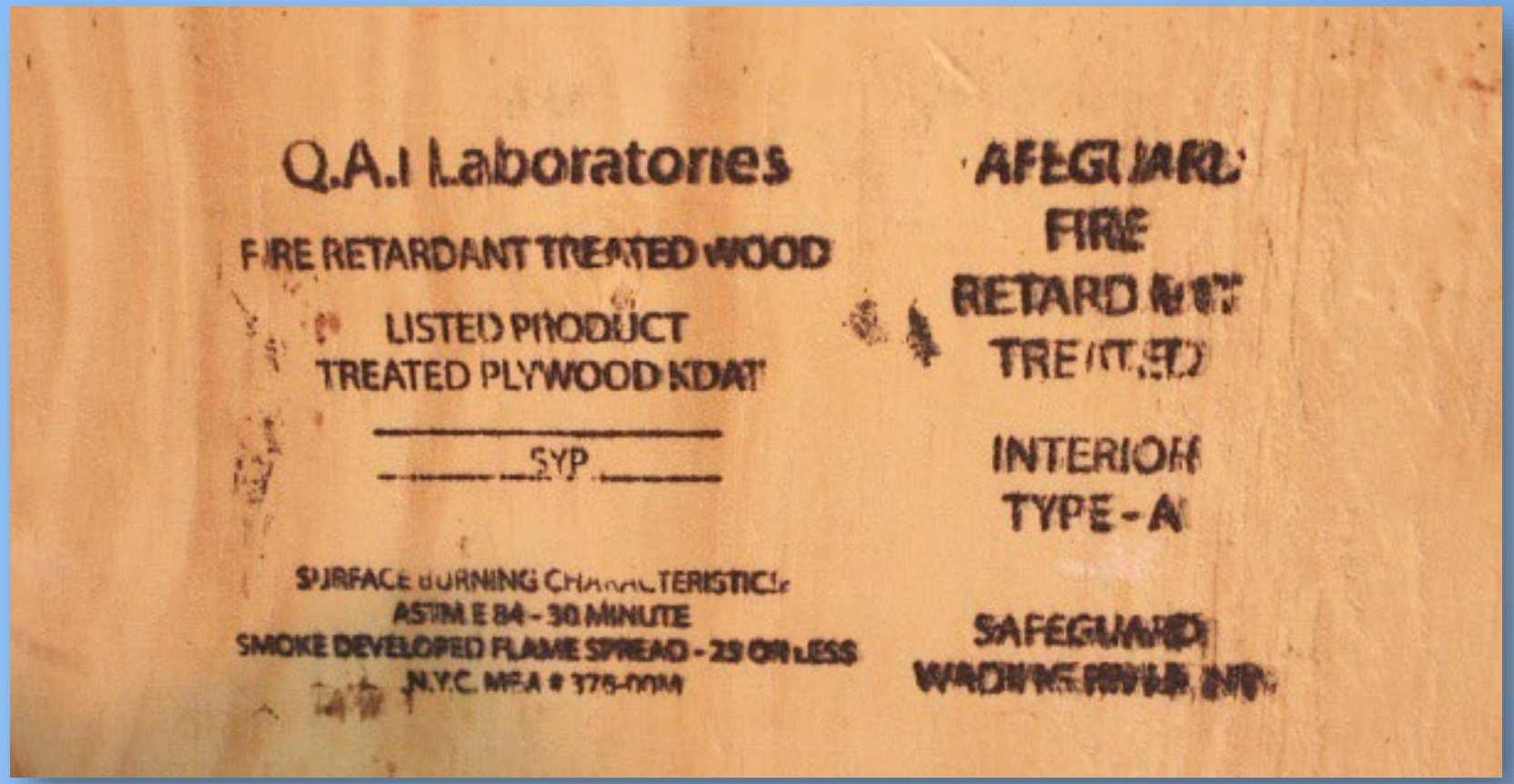
- See also Section 1224.3, Change in Function.

Definitions

- **202. [BS] FIRE-RETARDANT-TREATED WOOD.** Wood products that, when impregnated with chemicals by a pressure process or other means during manufacture, exhibit reduced surface-building characteristics and resist propagation of fire.
- **202. [BS] PRESERVATIVE-TREATED WOOD.** Wood products that, when impregnated with chemicals by a pressure process or other means during manufacture, exhibit reduced susceptibility to damage by fungi, insects or marine borers.

- Previously located as subjects in the definition for treated wood, fire-retardant-treated wood and preservative-treated-wood have their own definitions.

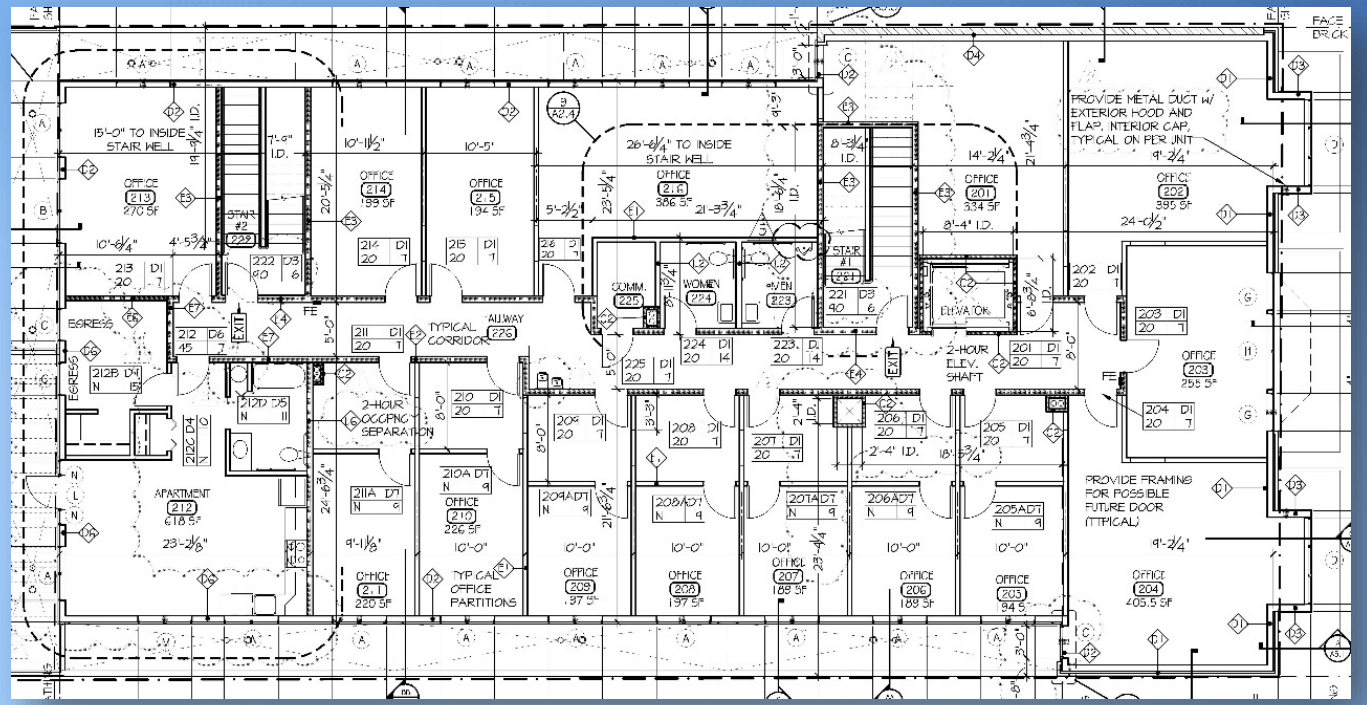
Definitions



Definitions

- **202. [BG] SMOKE COMPARTMENT.** A space within a building separated from other interior areas of the building by *smoke barriers*, including interior walls and *horizontal assemblies*.

- Smoke compartments are "separated from other interior areas . . . by smoke barriers" (per the definition of smoke compartment) and that such separation between compartments "form an effective membrane enclosure."



Building Planning

CHAPTERS 3 THROUGH 6

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Occupancy Classification

304.1 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

…

Ambulatory care facilities *serving five or fewer patients (see Section 308.3.3, Institutional Group I-2.1 for facilities serving more than five patients)*

The threshold for classification as a Group I-2.1 is 6 or more patients.

Occupancy Classification

- ***308.3.3 Institutional Group I-2.1.*** *A Healthcare facility that receives persons for outpatient medical care that may render the patient incapable of unassisted self-preservation and where each tenant space accommodates more than five such patients.*

- A Group I-2.1 is not considered an ambulatory health care facility. Ambulatory health care facilities are limited to no more than five patients incapable of unassisted self-preservation and are classified as Group B occupancies.

Occupancy Classification

5 or less: Group B
6 or more: Group I-2.1

Occupancy Classification

- **306.2 Moderate-hazard factory industrial, Group F-1.** Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

  Energy storage systems (ESS) in dedicated use buildings

  Water/sewer treatment facilities

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Occupancy Classification

- Where a single-occupancy building is used only for energy storage systems (ESSs), electrical energy generation and other electrical grid operations, the building is to be considered a Group F-1 occupancy.
- Administrative and support areas that do not contain ESSs are allowed provided they do not exceed 10 percent of the building area on the story they are located. In the evaluation of the anticipated fuel load hazard, a moderate hazard Group F-1 classification is deemed appropriate. For comparison purposes, electric generation plants have been historically classified as Group F-1 occupancies.
- If an ESS is installed in a building having an occupancy other than Group F-1, the ESS is to be considered as part of that other occupancy. However, the provisions of CFC Section 1207 addressing an ESS will apply for the space the ESS occupies.

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High–Rise Buildings

High-Rise Buildings

- **[F] 403.4.8 Standby and emergency power.**
  - **[F] 403.4.8.2 Fuel line piping protection.** Fuel lines supplying a generator set inside a building shall be separated from areas of the building other than the room the generator is located in by one of the following methods:

1. A fire-resistant pipe-protection system that has been tested in accordance with UL 1489. The system shall be installed as tested and in accordance with the manufacturer's installation instructions,and shall have a rating of not less than 2 hours. Where the building is protected throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1, the required rating shall be reduced to 1 hour.

High-Rise Buildings

- UL has recently created and published a test method to evaluate protection materials and systems, and to satisfy the intent of the building code requirement for fuel pipe. This new test method is UL 1489.

Fire-resistant pipe-protection system during installation on horizontal offset fuel pipe.

Group I-2 & I-2.1 Corridors

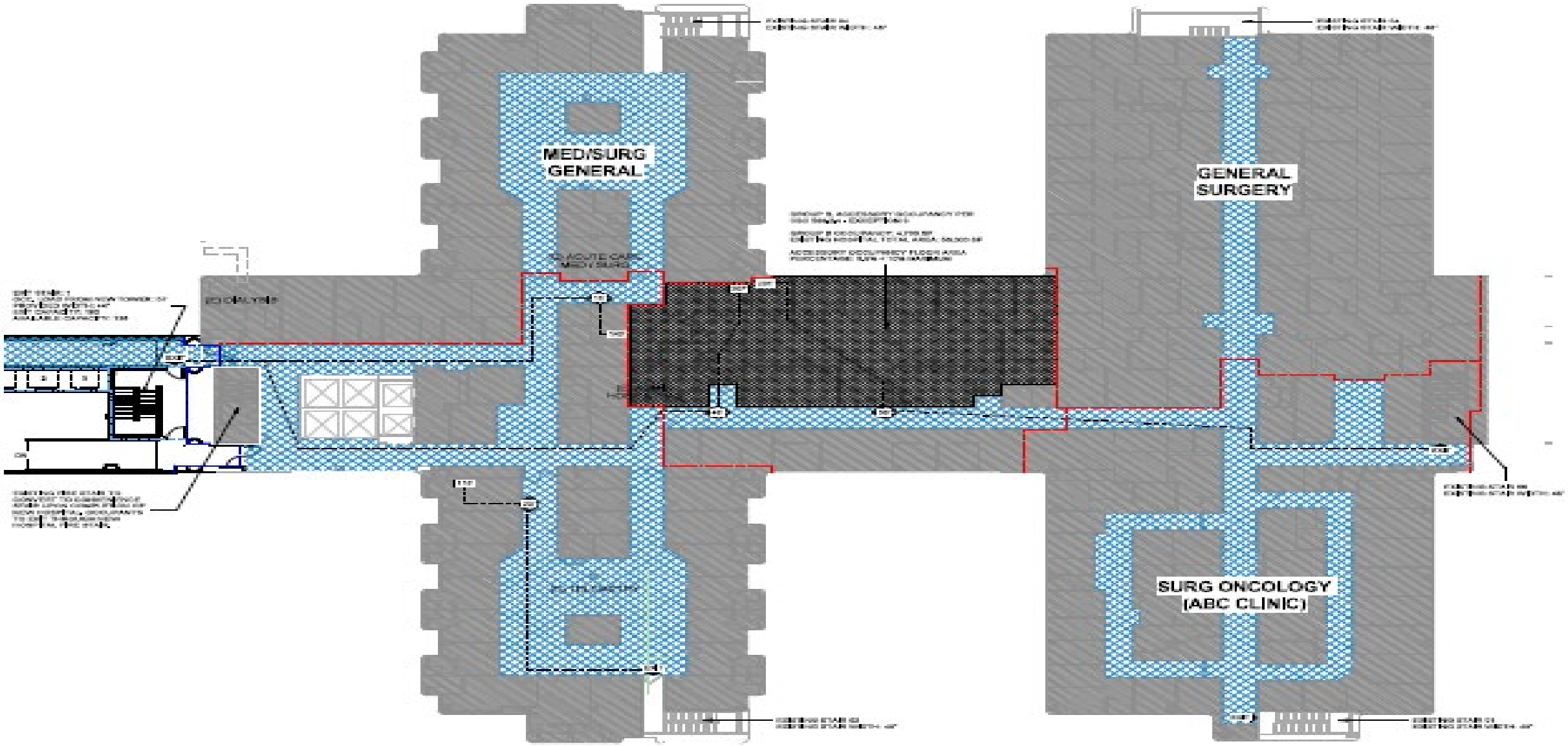
Group I-2 & I-2.1 Suites

Group I-2 & I-2.1 Suites

407.4.4.5 Care suites containing sleeping room areas. Sleeping rooms shall be permitted to be grouped into care suites where one of the following criteria is met:

1. The arrangement of the *care suite* allows for direct and constant visual supervision into the sleeping rooms by care providers.
2. *In fully sprinklered buildings, an* automatic smoke detection system is provided in the sleeping rooms and installed in accordance with *Section 907.2.6.2.2, Item 1 and* NFPA 72.

A care suite with sleeping rooms requires constant visual supervision or *both* sprinklers and smoke detection. IBC assumes the suite will be sprinklered. With existing construction, this is not always the case.


MED/SURG
GENERAL
GENERAL
SURGERY
SURG ONCOLOGY
(ABC CLINIC)

Group I-2 & I-2.1 Suites

- Special means of egress provisions are provided for care suites in Group I-2 and I-2.1 occupancies. The scope of such specialized requirements is limited to those areas of a health care facility arranged in a manner where staff has an increased level of supervision of patients in specific treatment and sleeping rooms. The function of the care suite concept is to allow for an alternative means of egress system.

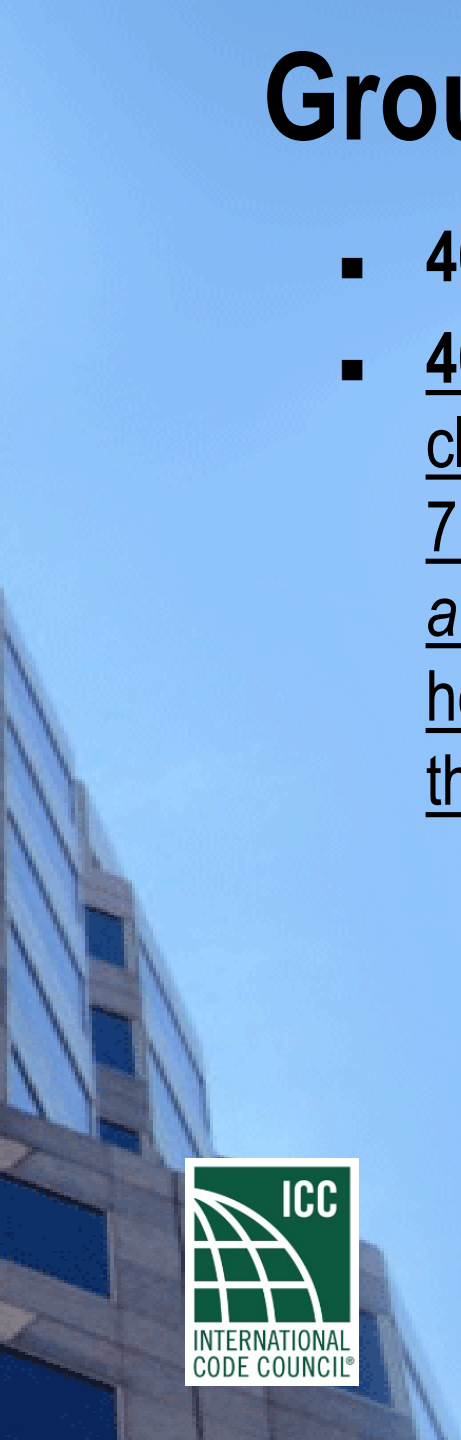
Group I-2 & I-2.1 Automatic-Closing Doors

Photo courtesy of SDI Productions

Cross-corridor doors in hospital.

Group I-2 & I-2.1 Automatic-Closing Doors

- **407.6 Automatic-closing doors.**
- **407.6.1 Activation of automatic-closing doors.** Automatic-closing doors on hold-open devices in accordance with Section 716.2.6.6 shall also close upon activation of a *fire alarm* system, an *automatic sprinkler system*, or both. The *automatic* release of the hold-open device on one door shall release all such doors within the same *smoke compartment.*



Group I-2 & I-2.1 Automatic-Closing Doors

- In addition to the requirements of Section 716.2.6.6, automatic-closing doors with hold-open devices must also close upon activation of a fire alarm system or an automatic sprinkler system. If any of these conditions occur within an Group I-2 or I-2.1 occupancy, the doors shall automatically close.
- As an additional requirement, all automatic-closing doors with hold open devices that are located within the same smoke compartment shall be released upon the automatic release of the hold-open device on any one of such doors.
- Provisions similar to these are included as a State Fire Marshal amendment in CBC Section 716.2.6.6.

Accessory Occupancies

- Porte-cocheres.

Separation of Occupancies

- **508.2.4 Separation of occupancies.** No separation is required between accessory occupancies and the main occupancy.

...

Group I-2 and I-2.1 shall be separated from all other occupancies in accordance with Section 508.4.

Exception: *No separation is required between Group B, E and R-2 sleeping units accessory to Group I-2 and I-2.1 and covered exterior entrances required by Section 11B-206.4.10 or Section 1224.33.2.1 accessory to Group I-2.*

Group I-3 and vehicle sally-ports shall be separated from all other occupancies in accordance with Section 508.4.

Exception: *No separation is required between Group B, E, R-2 sleeping units and S-2 occupancies accessory to Group I-3 of Type I Construction.*

Separation of Occupancies

- For Group I-2 occupancies, the SFM amendment permits unseparated accessory covered entrances to those required by CBC Section 11B-206.4.10, for weather protection at entrances to medical care and long-term care facilities or those required by Section 1224.33.2.1, for emergency medical service exterior entrances.

- CBC Section 903.2.21 requires that these weather protected exterior entrances are protected by automatic sprinklers.

Accessory Occupancies

As an accessory occupancy, a porte-cochere is considered as part of the building and is required to be protected by an automatic sprinkler system.

Table 508.4 Separation of Occupancies

- **Table 508.4**
- **Footnotes:**

i. When not considered an accessory use in accordance with 508.2.4, the required separation between Group I-2 and required covers for accessible entrances and emergency vehicle entrances when in accordance with Section 406.5.2 and protected by an automatic sprinkler system shall be reduced by 1 hour but not to less than 1 hour. See Section 903.2.21.

These covered entrances must be protected by fire sprinklers and must be open in accordance with Sec. 406.5.2.

Combustible Materials in Types I & II

- **603.1 Allowable materials.** Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

  1. *Fire-retardant-treated wood* shall be permitted in:

     1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less except in *shaft enclosures* within Group I-2 occupancies and *ambulatory care facilities*.

     1.2. Nonbearing *exterior walls* where fire resistance-rated construction is not required.

Combustible Materials in Types I & II

1. *Fire-retardant-treated wood* shall be permitted in (continued):

1.3. Roof construction, including girders, trusses, framing and decking.

Exceptions:

1. In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

2. Group I-2, roof construction containing *fire-retardant-treated wood* shall be covered by not less than a Class A *roof covering* or roof assembly, and the roof assembly shall have a *fire-resistance rating* where required by the construction type.

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Combustible Materials in Types I & II

- Although Fire-retardant-treated wood (FRTW) does not meet the IBC criteria for a noncombustible material, it is permitted as an alternative to noncombustible materials in specific locations in Type I and II construction. One of those locations is nonbearing partitions having a fire-resistance rating of 2 hours or less. However, the use of FRTW is not permitted for such partitions that create shaft enclosures in Type I and II buildings housing Group I-2 occupancies or Group B ambulatory care facilities. The limitations provide conformity with the applicable CMS enforcement rules.

Combustible Materials in Types I & II

- An additional requirement addresses FRTW roof construction of buildings housing Group I-2 occupancies. In such buildings, the intent is to provide for a Class A roof covering or roof assembly where FRTW is used. This mandate provides consistency with the applicable CMS certification requirements.

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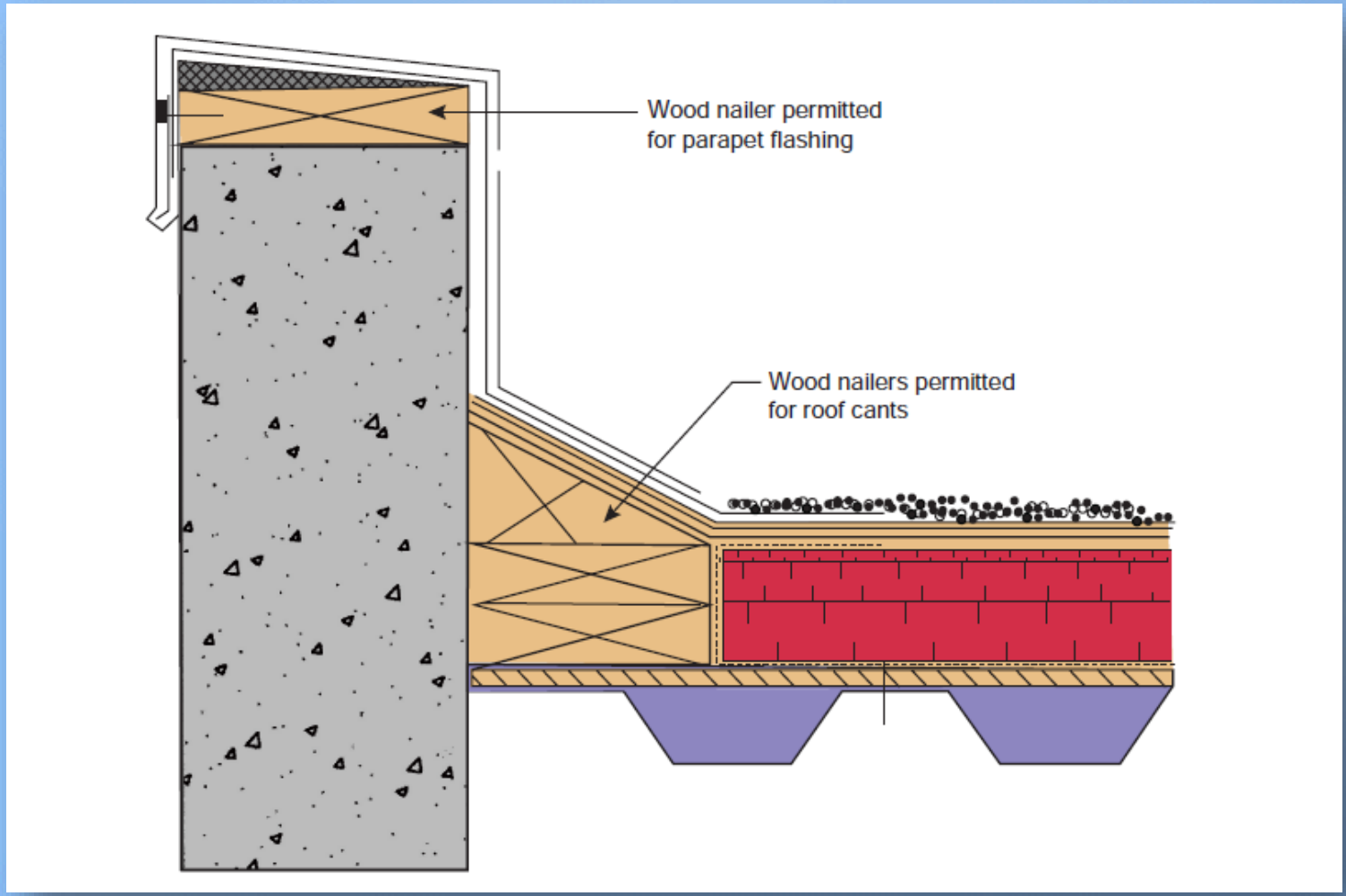
Combustible Materials in Types I & II

- **603.1 Allowable materials.**

  27. Wood nailers for parapet flashing and roof cants.



Combustible Materials in Types I & II

- An allowance permitting the use of wood nailers for parapet flashing and roof cants in buildings of Type I and II construction recognizes how they are necessary for the proper fastening of roofing materials.
- Much like the rationale for the use of wood in other limited applications such as blocking and millwork, the amount of combustible materials due to the use of wood nailers in roof construction is relatively insignificant.
- As a matter of practice these wood nailers have often been permitted when FRTW was used. This is no longer necessary.

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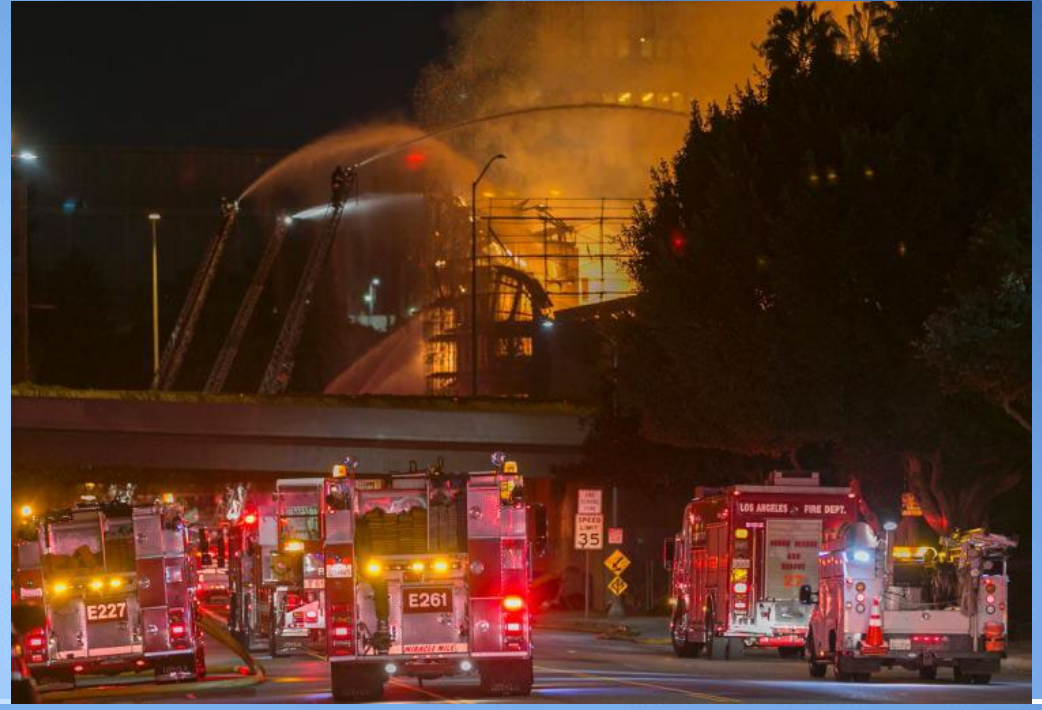


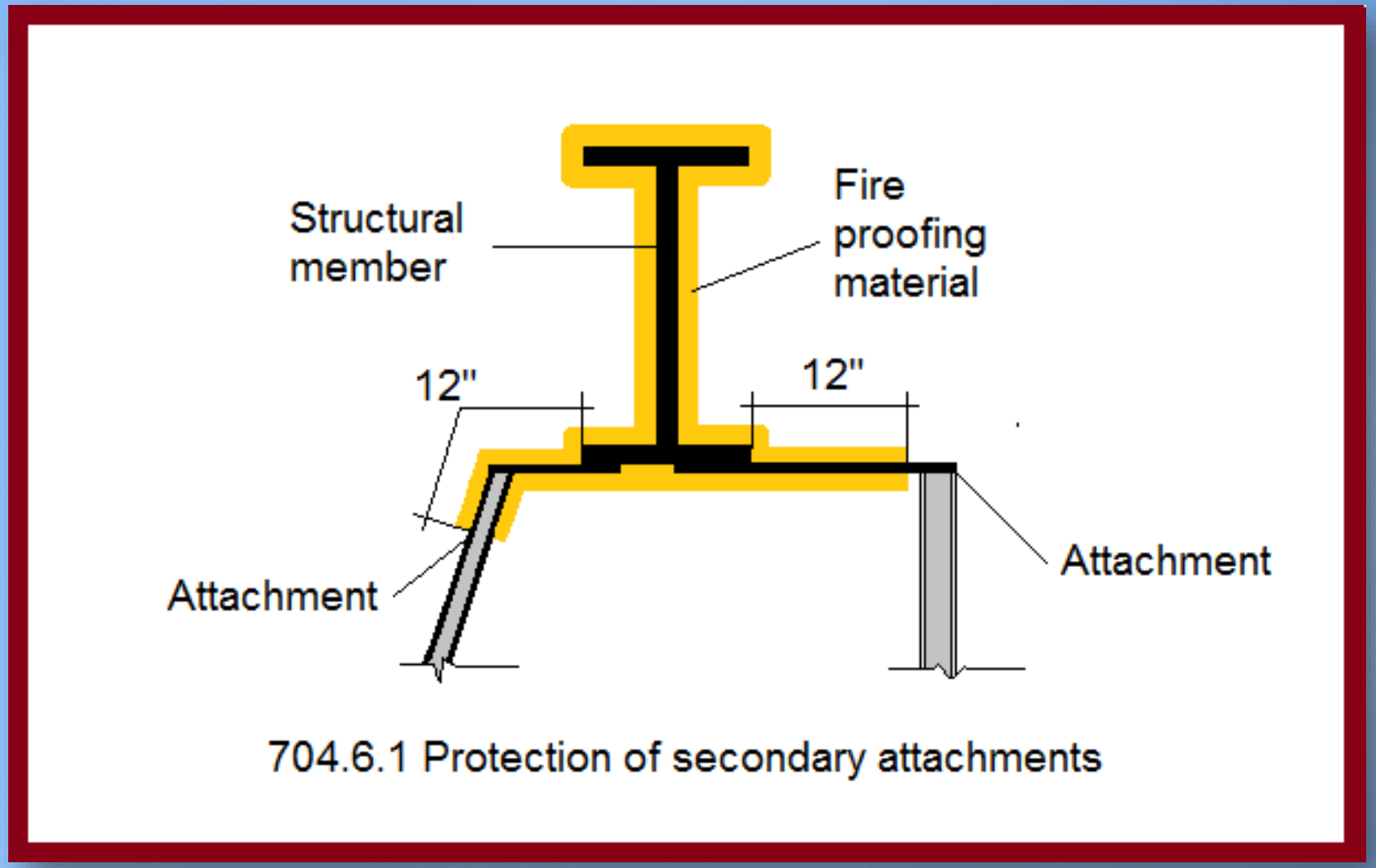
Fire Protection

CHAPTERS 7 THROUGH 9

Attachments to Structural Members

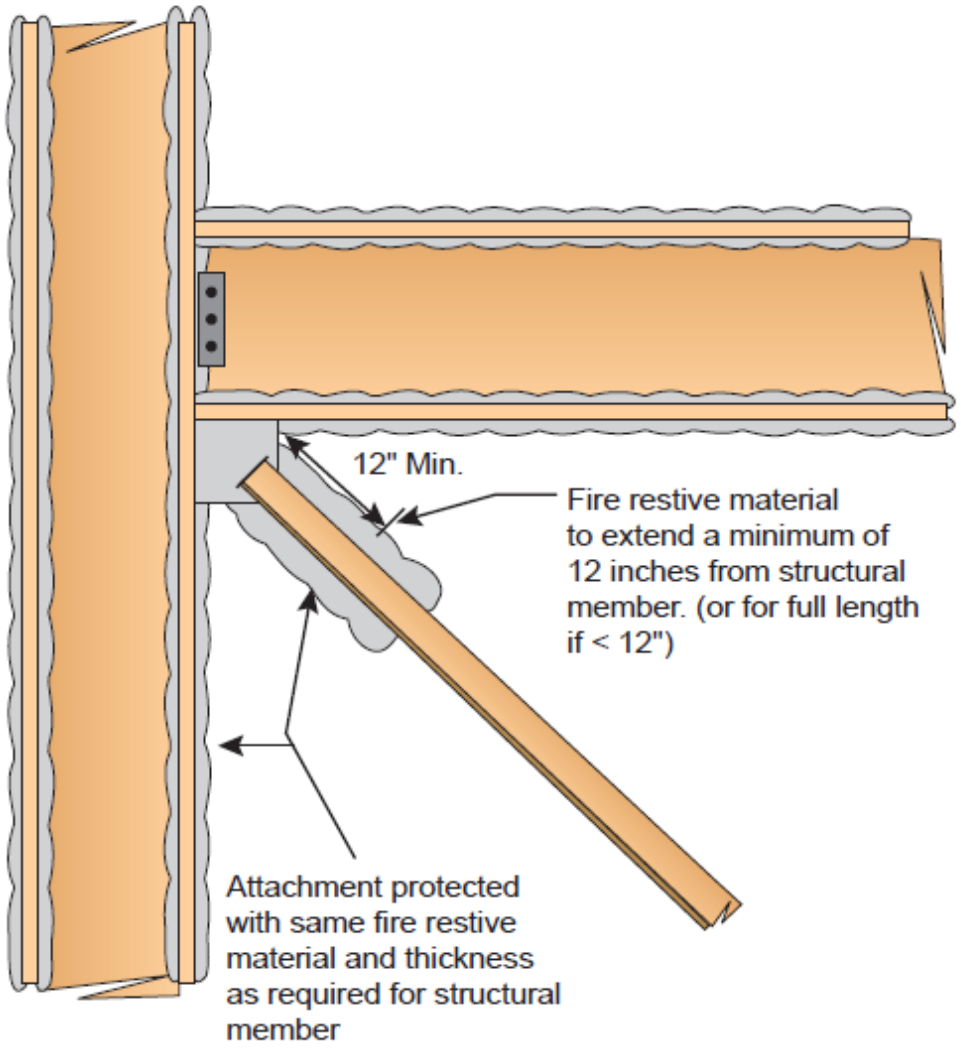
- **704.6.1 Secondary attachments to structural members.** Where primary and secondary structural steel members require fire protection, *any additional structural steel members having direct connection to the primary structural frame or secondary structural members* shall be protected with the same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

Attachments to Structural Members



704.6.1 Protection of secondary attachments

Attachments to Structural Members



Protection of secondary attachments.

International Code Council

Hollow attachment with open ends.

Fire-Resistance Ratings

- **705.5 Fire-resistance ratings.** *For other than Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11* exterior walls shall be fire-resistance rated in accordance with Table 601 based on the type of construction, and Table 705.5 based on the fire separation distance. The required fire-resistance rating of exterior walls with a fire separation distance of greater than 10 feet (3048 mm) shall be rated for exposure to fire from the inside. The required fire-resistance rating of exterior walls with a fire separation distance of less than or equal to 10 feet (3048 mm) shall be rated for exposure to fire from both sides.

Fire-Resistance Ratings

- **705.5 Fire-resistance ratings (continued).**
- *For Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, exterior walls shall be fire-resistance rated in accordance with Tables 601 and 705.5 and this section. The required fire-resistance rating of exterior walls shall be rated for exposure to fire from both sides.*

- Unlike model code, SFM requires the fire-resistance rating of exterior walls be rated for exposure from both sides regardless of the distance to an exposure.

Table 705.5

- Table 705.5 was formerly Table 602 located in Chapter 6.

TABLE 705.5
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE[a, d, g]

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

For SI: 1 foot = 304.8 mm.

a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
b. See Section 706.1.1 for party walls.
c. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
d. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
e. For special requirements for Group H occupancies, see Section 415.6.
f. For special requirements for Group S aircraft hangars, see Section 412.3.1.
g. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.
h. For a building containing only a Group U occupancy private garage or carport, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.
i. For a Group R-3 building of Type II-B or Type V-B construction, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

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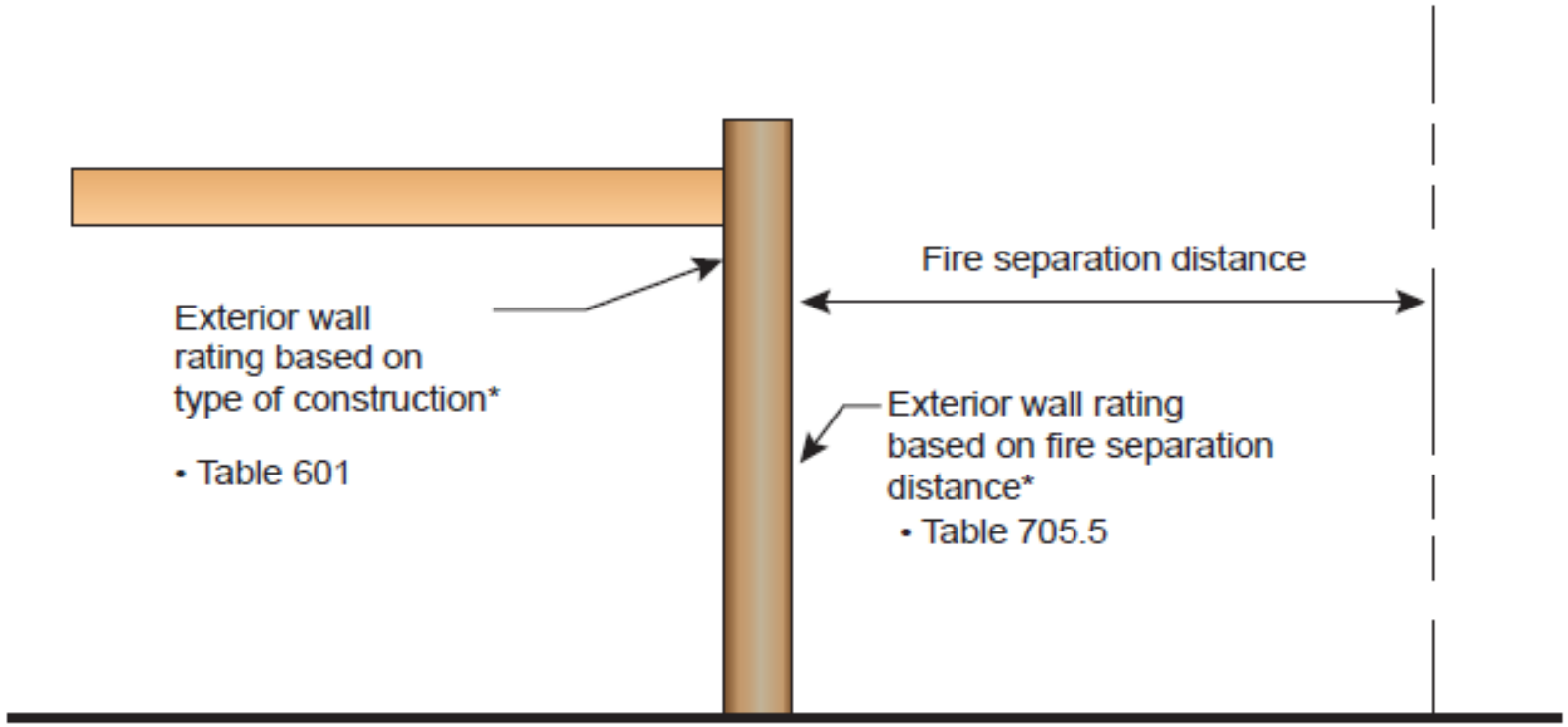
Table 705.5

- It takes two tables.



Rating of exterior wall.

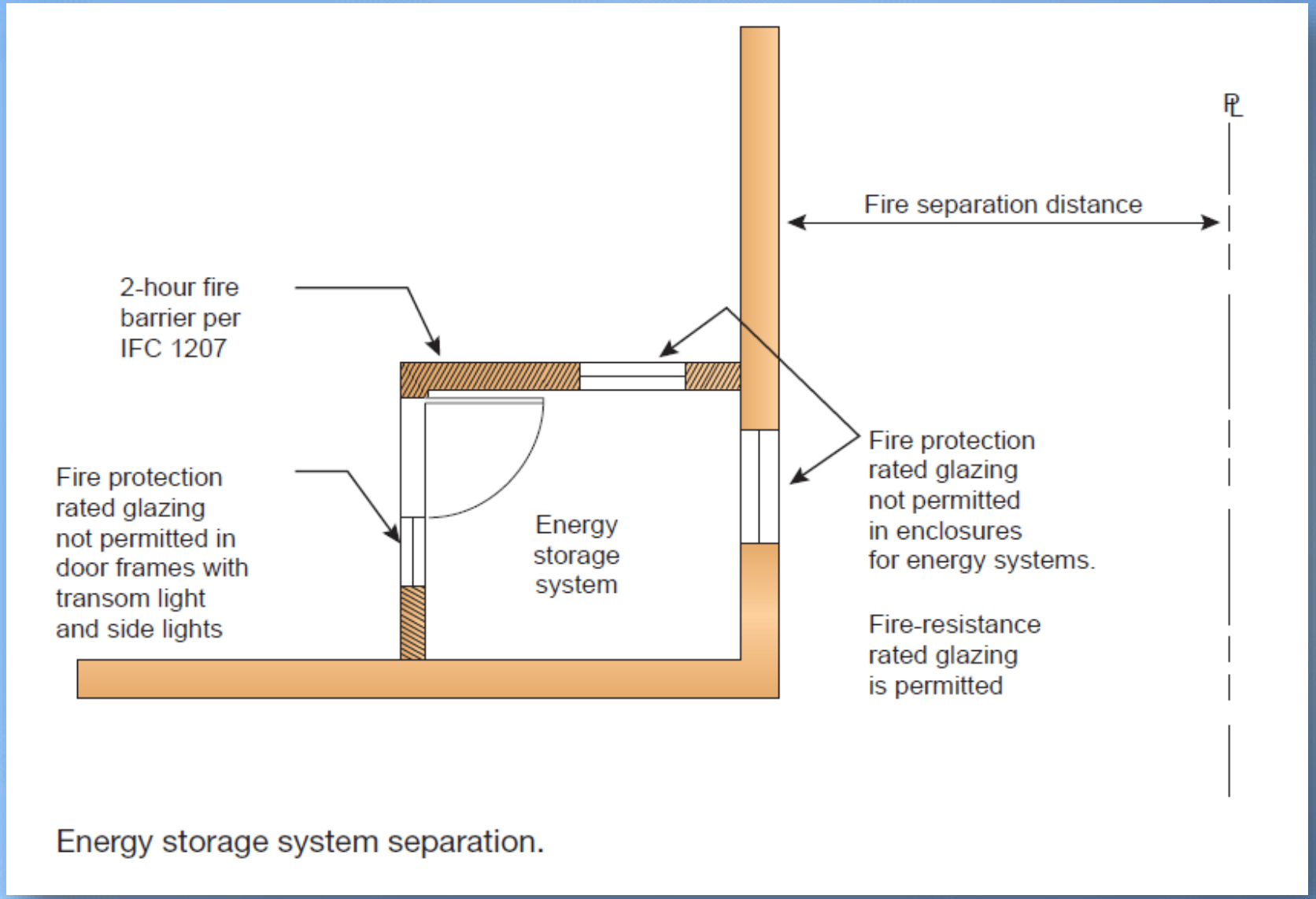
Fire Barriers/Energy Storage Systems

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

  Exceptions:

  1. *Exterior walls* required to be *fire-resistance rated* in accordance with Section 1021 for exterior egress balconies, Section 1023.7 for *interior exit stairways and ramps,* Section 1024.8 for *exit passageways* and Section 1027.6 for *exterior exit stairways and ramps.*
  2. *Exterior walls* required to be *fire-resistance rated* in accordance with Section 1207 of the *California Fire Code* for enclosure of energy storage systems.

Fire Barriers/Energy Storage Systems



Energy storage system separation.

Fire Barriers/Energy Storage Systems

- 707.4 Exterior walls, Exception 2 accommodates provisions in the CFC concerning energy storage system enclosure requirements.
- In the 2021 CFC, the separation is required to be not less than a 2-hour fire barrier. One energy storage system hazard is thermal runaway leading to a fire event that can be significant and enduring.

Fire Barriers/Energy Storage Systems

- **716.3.2.1.1.1 Energy storage system separation.** Fire-protection rated glazing is not permitted for use in fire window assemblies in fire barriers required by Section 1207 of the California Fire Code to enclose energy storage systems.
- **Table 716.1(2)**

  h. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 of the *California Fire Code* to enclose energy storage systems. Fire-resistance-rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 716.1.2.3, shall be permitted.

- **Table 716.1(3)**

  c. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 of the *California Fire Code* to enclose energy storage systems. Fire-resistance-rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 716.1.2.3, shall be permitted.

Fire Barriers/Energy Storage Systems

- Footnote "h" in Table 716.1(2) prohibits fire-protection rated glazing in exterior wall openings, however; Section 705.8 and Table 705.8 allow limited amounts of "unprotected" openings for both sprinklered and unsprinklered buildings. In addition, Section 705.8.2 includes an exception that permits the use of a water curtain system instead of protected openings in fully sprinklered buildings.
- Both the limited amounts of unprotected openings and the water-curtain protected openings are allowed even though they are seemingly contrary to the provisions' intended application. And, despite Exception 2 in Section 707.4, the requirements of IFC Section 1207.7.4 only require the 2-hour separation "from other areas in the building." Therefore, exterior wall ratings, including those enclosing energy storage systems, are regulated by the building's construction type and the adjacent fire separation distance.

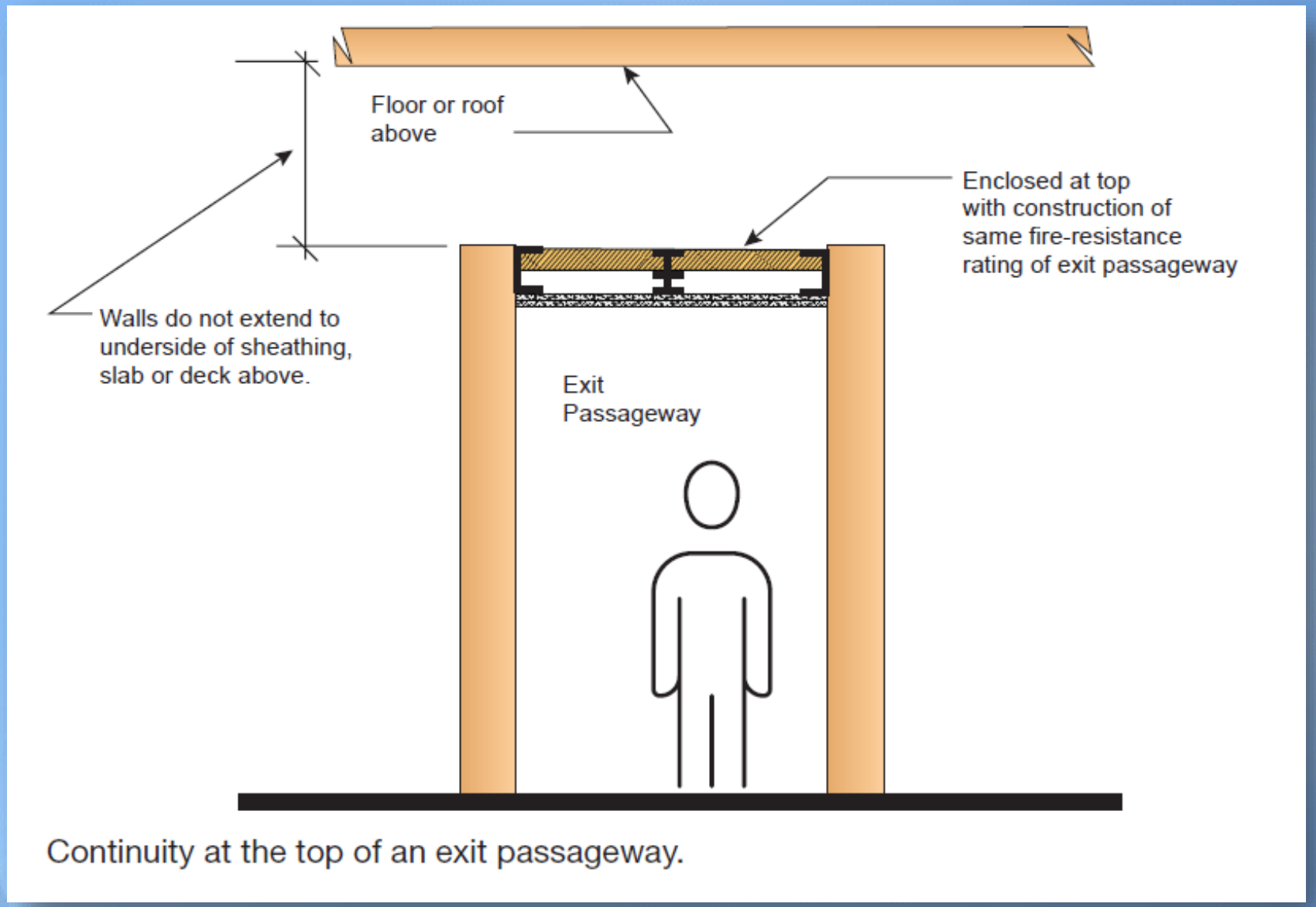
Fire Barriers/Exit Passageways

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

  Exceptions:

  3. An *exit passageway* enclosure required by Section 1024.3 that does not extend to the underside of the roof sheathing, slab or deck above shall be enclosed at the top with construction of the same *fire-resistance rating* as required for the *exit passageway*.

Fire Barriers/Exit Passageways



Continuity at the top of an exit passageway.

Fire Barriers/Exit Passageways

- Exception 3 recognizes that exit passageways only require the egress path to be isolated and protected from adjacent spaces, and that their construction is not intended to compartmentalize the entire story of the building as the general continuity provisions would impose.
- How long have we known this? Sometimes you have got to wonder.
- But the IBC is still not quite there…they are not sure they also meant a floor above or just a roof. But we know don't we?

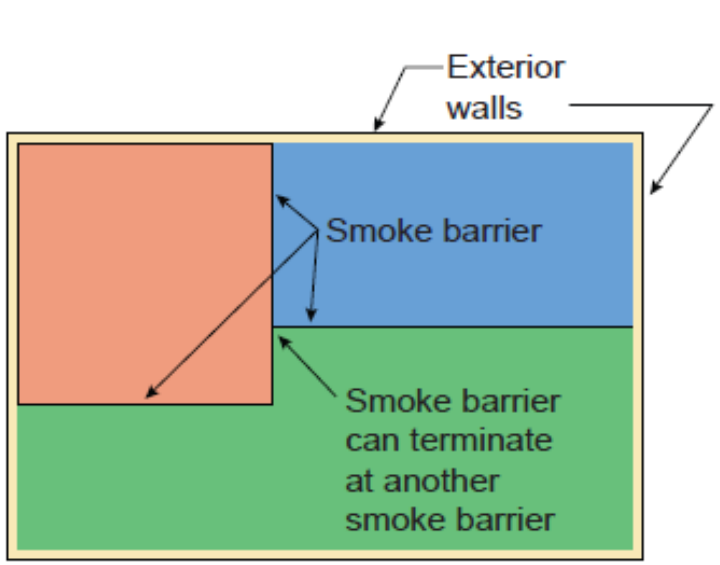
Smoke Barriers

Smoke Barriers

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

- The separation between adjacent smoke compartments may include both walls and horizontal *assemblies*.
- Smoke barriers are permitted to terminate at other smoke barriers and are not always required to extend to an exterior wall.

Smoke Barriers



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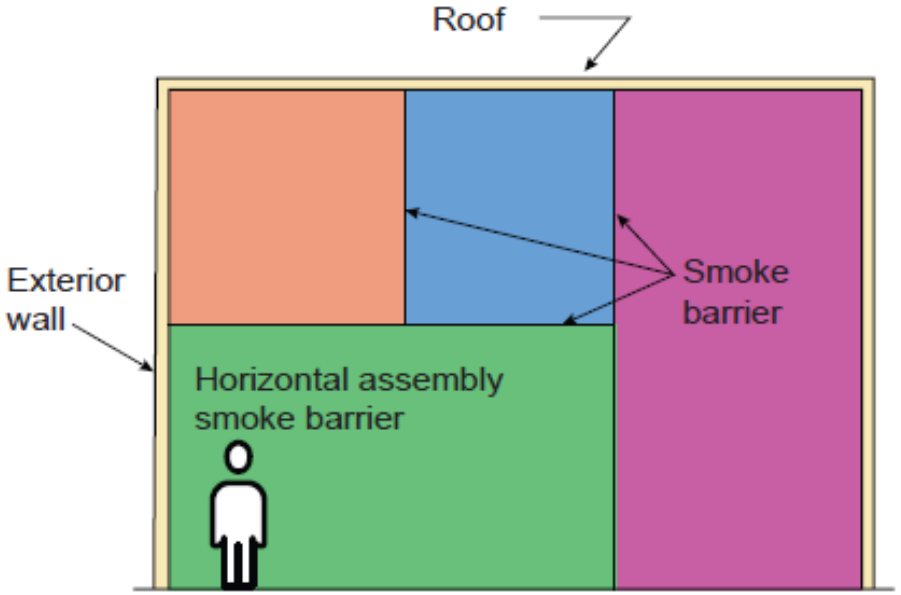


SECTION

Smoke compartments are created by separating interior areas using smoke barriers that are continuous to:

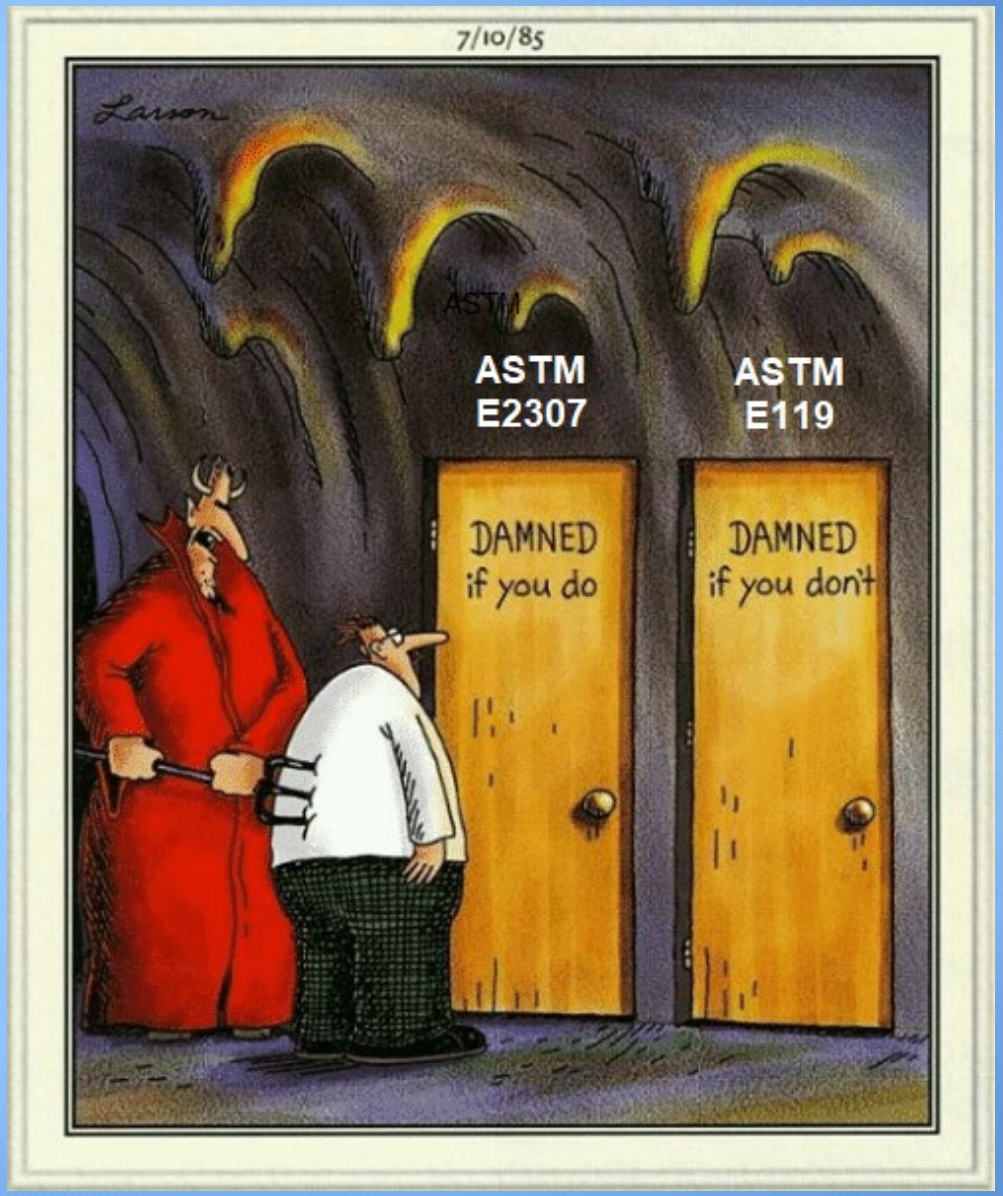
- Exterior wall or roof
- Another smoke barrier (wall or horizontal assembly)

It's a box!

Smoke barrier continuity.

Joints & Voids

Where protection is required, must pass a test one way or another.



Joints & Voids

- **715.7 Curtain wall spandrels.** Height and *fire-resistance* requirements for curtain wall spandrels shall comply with Section 705.8.5. Where Section 705.8.5 does not require fire-resistance-rated curtain wall spandrels, the requirements of Sections 715.4 and 715.5 shall still apply to the intersection between the curtain wall spandrels and the floor.

Joints & Voids

- What is a spandrel panel?
- In multi-story buildings the sections between floors, where building components are held, is called spandrel. When a building has a full glass facade with a seamless appearance, the glass covering the spandrel areas is referred to as spandrel glass. A spandrel panel can be steel, glass, ceramic or aluminum.

Joints & Voids

- **715.8 Joints and voids in smoke barriers.** *Fire-resistant joint systems* protecting *joints* in *smoke barriers*, and perimeter fire containment systems protecting voids at the intersection of a horizontal *smoke barrier* and an exterior curtain wall, shall be tested in accordance with the requirements of UL 2079 for air leakage. The L rating of the joint system shall not exceed 5 cubic feet per minute per linear foot (0.00775 m3/s m) of joint at 0.30 inch (74.7 Pa) of water for both the ambient temperature and elevated temperature tests.

- Oh no! Must have an L rating in accordance with UL2079. Typical for floors in Group I-2 occupancies as well as for smoke barrier walls.

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Joints & Voids

- A joint or void is to be "protected" where the protection method is required to be tested to a specific test standard. Where a void is only required to be "filled," there is no specific test standard or listing requirement.

Dampers

Damper Access

- **717.4 Access and identification.** Access and identification of fire and *smoke dampers* shall comply with Sections 717.4.1 through 717.4.2.
  - **717.4.1 Access.** *Fire* and *smoke dampers* shall be provided with an approved means of access that is large enough to permit inspection and maintenance of the *damper* and its operating parts. *Dampers* equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 inches (305 mm) square or provided with a removable duct section.

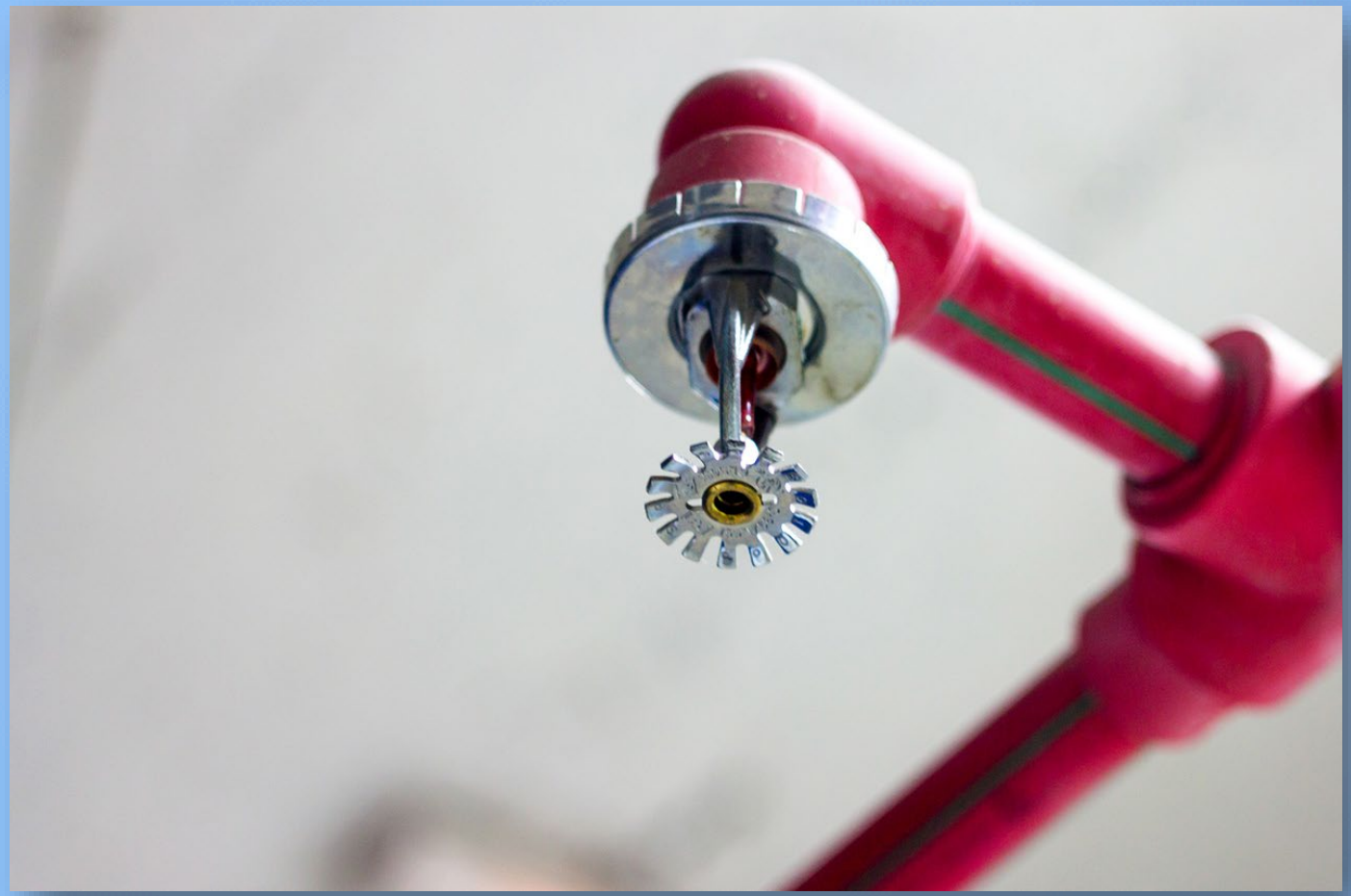
Damper Access

- **717.4 Access and identification.**
  - **717.4.1 Access.**
    - **717.4.1.1 Access openings.** The access shall not affect the integrity of *fire-resistance-rated* assemblies. The access openings shall not reduce the *fire-resistance rating* of the assembly. Access doors in ducts shall be tight fitting and suitable for the required duct construction.
    - **717.4.1.2 Restricted access.** Where space constraints or physical barriers restrict access to a damper for periodic inspection and testing, the *damper* shall be a single- or multi-blade type *damper* and shall comply with the remote inspection requirements of NFPA 80 or NFPA 105.

Damper Access

- There is a dimensional criteria of 12" square for a damper access door.

Automatic Sprinkler Systems



Automatic Sprinkler Systems

- **903.1.1 Alternative protection.** Alternative automatic fire-extinguishing systems complying with Section 904 shall be permitted instead of automatic sprinkler *system* protection where recognized by the applicable standard and approved by the fire code official.

- Not so fast!
- California law, Health and Safety Code Section 13113(a) requires an automatic sprinkler system in hospitals, nursing and convalescent homes.

Automatic Sprinkler Systems

- **California Health and Safety Code Section 13113(a)**
- Except as otherwise provided in this section, a person, firm, or corporation shall not establish, maintain, or operate a hospital, children's home, children's nursery, or institution, home or institution for the care of people who are elderly, persons with mental health disorders or intellectual disabilities, or nursing or convalescent home, wherein more than six guests or patients are housed or cared for on a 24-hour-per-day basis unless there is installed and maintained in an operable condition in every building, or portion thereof where patients or guests are housed, an automatic sprinkler system approved by the State Fire Marshal.

Fire Sprinklers @ Required Entrance Covers

Fire Sprinklers @ Required Entrance Covers

- ***903.2.21 Required exterior entrance covers.*** *An automatic sprinkler system shall be provided throughout covered exterior entrances required by California Building Code Section 11B-206.4.10 or Section 1224.33.2.1.*

- These are accessible entrances at 24-hour care facilities and exterior emergency ambulance entrances.
- Often referred to as porte-cocheres.

Means of Egress

CHAPTER 10

Means of Egress

- **1006.2.2.4 Electrical rooms.** The location and number of *exit* or *exit access doorways* shall be provided for electrical rooms in accordance with Section 110.26 of NFPA 70 for electrical equipment rated 1,000 volts or less, and Section 110.33 of NFPA 70 for electrical equipment rated over 1,000 volts. Panic hardware shall be provided where required in accordance with Section 1010.2.9.2.

Means of Egress

- **1008.1 Means of egress illumination.**
  - **1008.2 Illumination required.**
    - **1008.2.1 Illumination level under normal power.** The *means of egress* illumination level shall be not less than 1 footcandle (11 lux) at the walking surface. Along *exit access stairways*, exit stairways and at their required landings, the illumination level shall not be less than 10 footcandles (108 lux) at the walking surface when the *stairway* is in use.

Means of Egress

- The minimum illumination of 10 foot-candles does not apply to stairs or steps located in the exit discharge.
- The stairways are not expected to be continuously illuminated to the 10 foot-candle level. The increased illumination is only applicable "when the stairway is in use". Occupant sensor controls, daylight-responsive controls or other energy saving techniques are permitted.
- The general means of egress uses the 1 foot-candle minimum. Only the stairways within the exit and exit access portion of the egress path must be illuminated to a higher level "when the stairway is in use."

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Illumination of the Exit Discharge

- Not quite there yet:
- IBC Section 1008.2.3 does not require that emergency illumination be provided for the exit discharge path or the safe dispersal area. The IBC requires exterior emergency illumination only at exterior landings at exit doors as stated in Section 1008.3.2.
- NFPA 101-2012, The Life Safety Code® requires emergency lighting for the exit discharge only for designated stairs, ramps, aisles, walkways, and escalators leading to a public way. Additional information in the NFPA 101 Annex further clarifies that emergency lighting provided outside the building should extend to either a public way or a distance away from the building that is considered safe; whichever is closest to the building being evacuated.

Illumination of the Exit Discharge

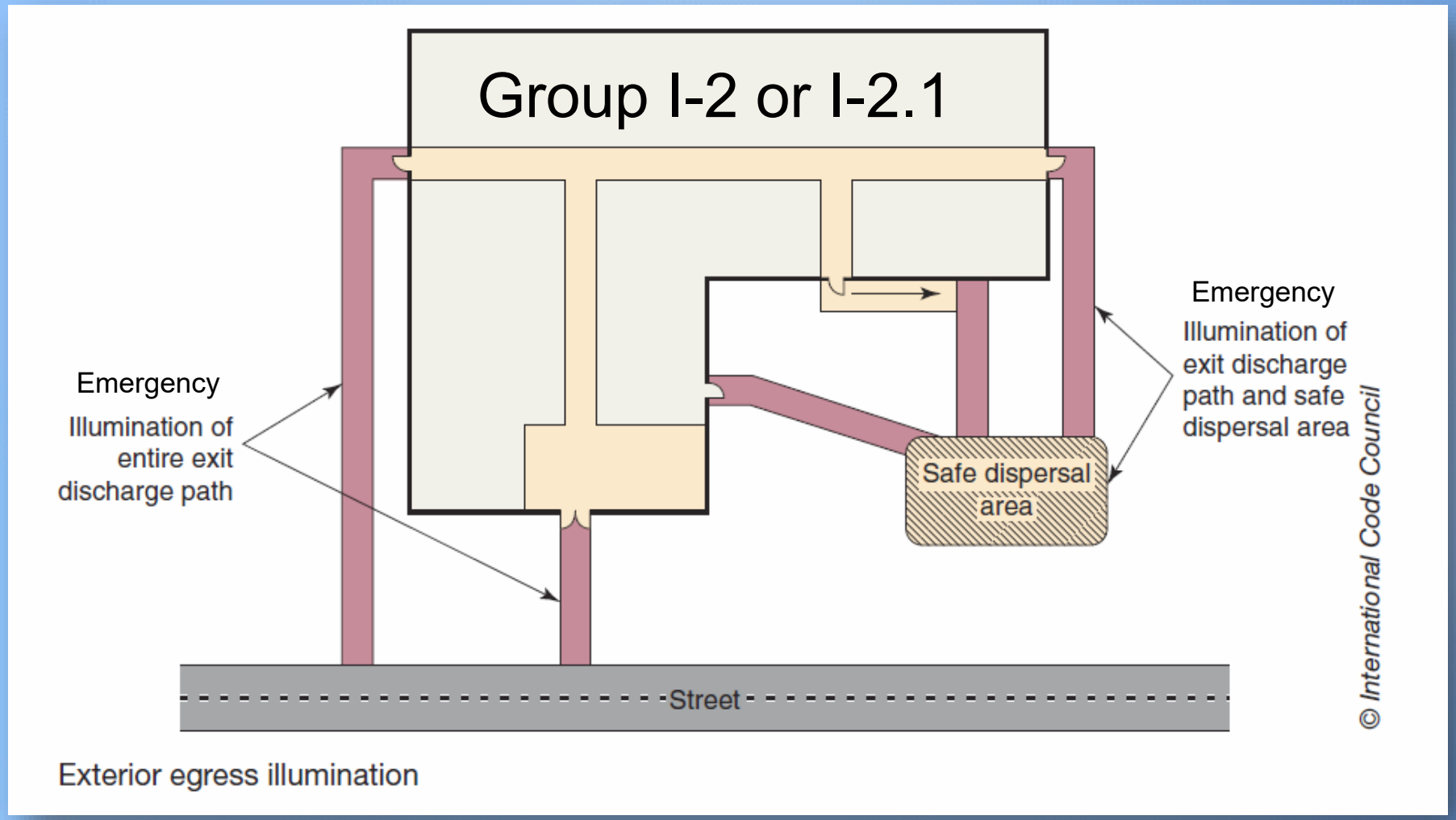
- The State Fire Marshal amends Section 1008.3.2 to require egress illumination of the exit discharge serving Group I-2 and I-2.1 occupancies and that such illumination shall be on emergency power. This is consistent with NFPA 101, The Life Safety Code®.

- **1008.3.2 Buildings.** In the event of power supply failure in buildings that require two or more *exits* or access to exits, an emergency electrical system shall automatically illuminate all of the following areas:

  6. *Group I-2 and I-2.1 exit discharge stairways. ramps, aisles, walkways and escalators leading to a public way or to a safe dispersal area in accordance with Section 1028.5.*

Illumination of Exit Discharge

- State Fire Marshal amendment requires emergency illumination of the exit discharge for Group I-2 and I-2.1 occupancies.



Exterior egress illumination

Illumination of Exit Discharge

- After a power failure, HID lamps such as Metal Halide and High Pressure Sodium may take too long to reestablish minimum lighting levels. A review should include confirmation that outdoor lighting fixtures used for emergency egress illumination are a type that do not require a *restrike time* that exceeds 10 seconds.

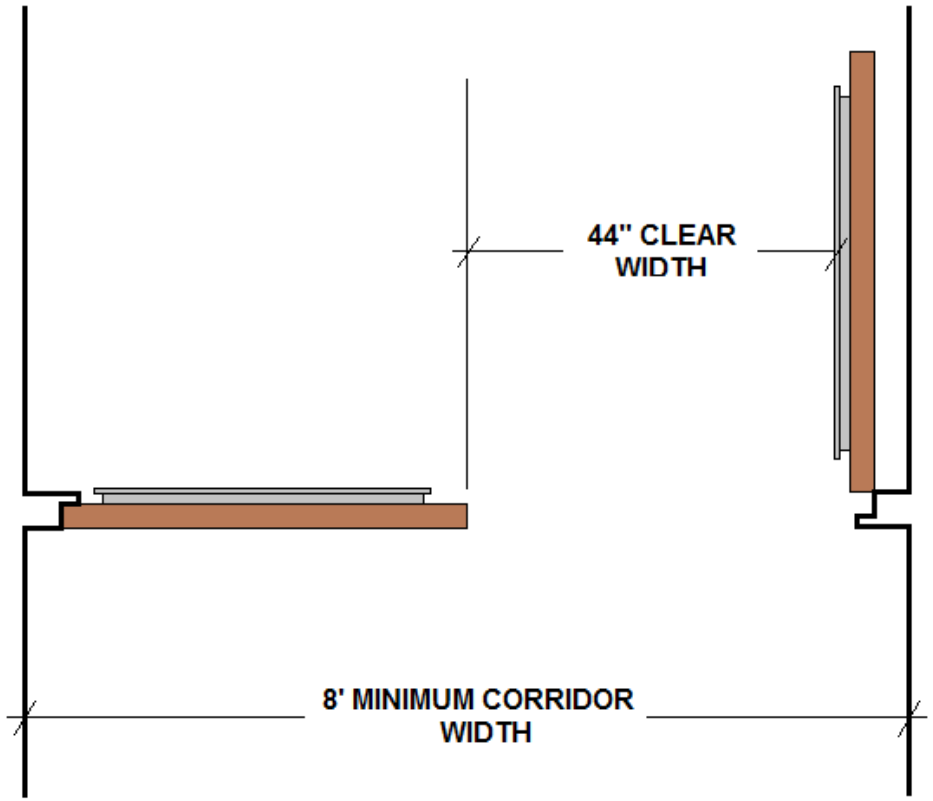
Means of Egress

- **1010.1.1 Size of doors.** The required capacity of each door opening shall be sufficient for the *occupant load* thereof and shall provide a minimum clear opening width of 32 inches (813 mm). The clear opening width of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear opening width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a minimum clear opening width of 32 inches (813 mm). In Group I-2 *or I-2.1*, doors serving as means of egress doors where used for the movement of beds *and stretcher patients* shall provide a minimum clear opening width of *44 inches (1118 mm). Where this section requires a minimum clear opening width of 44 inches (1118 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a minimum clear opening width of 44 inches (1118 mm).*The minimum clear opening height of doors shall be not less than 80 inches (2032 mm).

Size of Doors

- **1010.1.1 Size of doors.**
- A State Fire Marshal amendment clarifies that as is the case with 32" doors, when a door opening includes two leaves, the clear width of an opening must be provided with a single leaf when a 44" clear opening is required.

Size of Doors



CBC (CFC) 1010.1.1.1, Exception 2

Means of Egress

- **1010.2.4 Locks and latches.** Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

    1. Places of detention or restraint.

    2. In Group I-1, Condition 2 and Group I-2 occupancies where the clinical needs of persons receiving care require containment or where persons receiving care pose a security threat, provided that all clinical staff can readily unlock doors at all times, and all such locks are keyed to keys carried by all clinical staff at all times or all clinical staff have the codes or other means necessary to operate the locks at all times.

Means of Egress

- **1010.2.4 Locks and latches.**
- Conditions permitting locks in Group I-2 occupancies are consistent with provisions published in NFPA 101, The Life Safety Code® and SFM amendments previously published in the 2001 California Building Code.

Means of Egress

- **1010.2.4 Locks and latches (continued).** Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

8. Other than egress *courts*, where occupants must egress from an exterior space through the building for *means of egress*, exit access doors shall be permitted to be equipped with an approved locking device where installed and operated in accordance with all of the following:

8.1. The maximum *occupant load* shall be posted where required by Section 1004.9. Such signage shall be permanently affixed inside the building and shall be posted in a conspicuous space near all the exit access doorways.

Means of Egress

- **1010.2.4 Locks and latches (continued).** Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

  8. Other than egress courts conditions continued:

  8.2. A weatherproof telephone or two-way communication system installed in accordance with Sections 1009.8.1 and 1009.8.2 shall be located adjacent to not less than one required exit access door on the exterior side.

  8.3. The egress door locking device is readily distinguishable as locked and shall be a key-operated locking device.

Means of Egress

- **1010.2.4 Locks and latches (continued).** Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

  8. Other than egress courts conditions continued:

     8.4. A clear window or glazed door opening, not less than 5 square feet (0.46 m^2) in area, shall be provided at each exit access door to determine if there are occupants using the outdoor area.

Means of Egress

- **1010.2.4 Locks and latches (continued).** Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

  8. Other than egress courts conditions continued:

     8.5. A readily visible, durable sign shall be posted on the interior side on or adjacent to each locked required exit access door serving the exterior area stating, "THIS DOOR TO REMAIN UNLOCKED WHEN THE OUTDOOR AREA IS OCCUPIED." The letters on the sign shall be not less than 1 inch (25.4 mm) high on a contrasting background.

     8.6. The *occupant load* of the occupied exterior area shall not exceed 300 occupants in accordance with Section 4.

Means of Egress

- **1010.2.4 Locks and latches (continued).** Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

9. Locking devices are permitted on doors to balconies, decks or other exterior spaces serving individual dwelling or sleeping units.

10. Locking devices are permitted on doors to balconies, decks or other exterior spaces of 250 square feet (23.23 m^2) or less serving a private office space.

Means of Egress

- **1010.2.4 Locks and latches.**
- The general locking provisions allow locked doors in the egress system when desired due to the clinical needs of care recipients or where exterior areas egress back through the building.
- Item 2 addresses certain institutional occupancies where the needs of the care recipients are better addressed by containment.
- Items 8, 9 and 10 try to strike a balance between egress safety and building security.

Means of Egress

- **1010.2.5 Bolt locks.** Manually operated flush bolts or surface bolts are not permitted.
  - **Exceptions:**

    5. *Manually operated edge and surface mounted bolts shall be permitted on the inactive leaf of* pairs of doors *that serve* patient care rooms in Group I-2 occupancies *provided that the bolts are self-latching and* the inactive leaf is not needed to meet *the minimum clear opening width required by Section 1010.1.1 of the California Building Code. T*he inactive leaf shall not contain doorknobs, *panic* bars or similar operating hardware.

Means of Egress

- The provisions of Exception 5 are concerned with the operation of door hardware on egress doors. The provisions of Exception 5 are often misconstrued to be concerned with opening protection issues. The intent of Exception 5 is often confused with provisions of CBC Section 407.3.1 which require positive latching and CBC Section 1010.2.4.4 and NFPA 101, Section 18.2.3.7(4)(c) which on some occasions, require automatic flush bolts.
- The amendment reorganizes the provisions of CBC Section 1010.2.5 Exception 5 to affirm the intent of Exception 5 is to permit self-latching hardware on inactive leaves when the inactive leaf is not needed to provide the minimum clear opening width.

Means of Egress

- **1010.2.4 Locks and latches.**
- The exemptions in items 8, 9 and 10 provide guidance to directly address how exterior doors can be provided with locking devices and still be considered for required egress purposes from the exterior spaces.

Photo courtesy of Getty Images/Nikada

Courtyard egressing through building.

Means of Egress

[BE] TABLE 1020.3
MINIMUM CORRIDOR WIDTH

OCCUPANCY	MINIMUM WIDTH (inches)
Corridors in Group I-2 and I-3 occupancies serving any area caring for one or more nonambulatory persons. [a]	72

a. See Section 1224.4.7.1 for Group I-2.

- Additional information in CBC Section 1224.4.7.1 related to Group I-2 corridor width is provided in footnote a.

Means of Egress

- **1020.5 Dead ends.** Where more than one *exit* or *exit access doorway* is required, the *exit access* shall be arranged such that dead-end *corridors* do not exceed 20 feet (6096 mm) in length.

  Exceptions:

  4. In Group I-2 *and I-2.1* occupancies, *where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1,* the length of dead-end *corridors* that do not serve patient rooms or patient treatment spaces shall not exceed 30 feet (9144mm).

Means of Egress

- CBC Section 1020.5 limits the length of a dead-end corridor to not more than 20 feet. An IBC provision in CBC Section 1020. 5, Exception 4 permits a dead-end corridor in a Group I-2 30 feet in length. The SFM amendment to CBC Section 1020.5 Exception 4 requires fire sprinkler protection throughout a building before dead-end corridors are permitted to be increased from 20 feet to 30 feet in length.

Means of Egress

- **1020.6 Air Movement in Corridors.** Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

  Exceptions:

  1. (exceptions 1 thru 3 remain unchanged)

  …

  4. Transfer air movement required to maintain the pressurization difference within health care facilities *and Group L occupancies*, in accordance with ASHRAE 170.

  5. (exception 5 remains unchanged)

  …

Means of Egress

- ***1022.3 Basement exits in Group I-2 occupancies.*** *For additional requirements for occupancies in Group I-2 or I-2.1, see Section 407.4.1.2.*
- This information is relocated from the exit access section of the CBC to the exit section of the CBC.

Exterior Walls

- Metal Composite Panels

International Code Council

MCM use for cladding of an urban building.

Exterior Walls

- **Section 1406 Metal Composite Materials (MCM)**
- **1406.10 Types I, II, III and IV construction.** Where installed on buildings of Types I, II, III and IV construction, *metal composite material* (MCM) shall comply with Sections 1406.10.1 and 1406.10.2 for installations up to 40 feet (12 192 mm) above *grade plane*. Where installed on buildings of Types I, II, III and IV construction, MCMs and MCM systems shall comply with Sections 1406.10.1 through 1406.10.3, for installations greater than 40 feet (12 192 mm) above *grade plane*.

Exterior Walls

- **Section 1406 Metal Composite Materials (MCM)**
- **1406.10 Types I, II, III and IV construction.**
  - **1406.10.2 Thermal barriers.** MCM shall be separated from the interior of a building by an approved thermal barrier consisting of 1/2-inch (12.7 mm) *gypsum wallboard* or material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

    Exceptions:

    1. The MCM system is specifically approved based on tests conducted in accordance with NFPA 286 and with the acceptance criteria of Section 803.1.1.1, UL 1040 or UL 1715. Such testing shall be performed with the MCM in the maximum thickness intended for use. The MCM system shall include seams, joints and other typical details used in the installation and shall be tested in the manner intended for use.

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Exterior Walls

- **Section 1406 Metal Composite Materials (MCM)**
- **1406.10 Types I, II, III and IV construction.**
  - **1406.10.2 Thermal barriers.**

    Exceptions:

    2. The MCM is used as elements of balconies and similar projections, architectural trim or embellishments.
- **1406.12 Foam plastic insulation.** Where MCM systems are included in an exterior wall envelope containing foam plastic insulation, the exterior wall envelope shall also comply with the requirements of Section 2603.

Exterior Walls

Fires involving MCM panels in the United Kingdom and the Middle East have prompted concerns about the applications of this product.

Requirements have been simplified and limited by the deletion of alternate conditions previously set forth in Section 1406.11. In other than Type V construction, the installation of MCM panels and MCM systems are regulated based on one of two thresholds:

1) those applications where MCMs are installed no more than 40 feet above grade plane, and

2) those conditions where MCM panels and systems are installed at heights more than 40 feet above grade plane.

Electrical

- **[F] 2702.1.2 Fuel-line piping protection.** Fuel lines supplying a generator set inside a *high-rise building or new Group I-2 occupancy having occupied floors located more than 75 feet above the lowest level of fire department vehicle access* shall be separated from areas of the *building* other than the room the generator is located in by one of the following methods:

    1. A fire-resistant pipe-protection system that has been tested in accordance with UL 1489. The system shall be installed as tested and in accordance with the manufacturer's installation instructions, and shall have a rating of not less than 2 hours. Where the *building* is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, the required rating shall be reduced to 1 hour.

Electrical

- The SFM amendment corrects an omission that failed to include Group I-2 occupancies located more than 75 feet above the lowest level of fire department vehicle access in CBC Section 2702.1.2. This is in accordance with CBC Section 403.1 and CBC Section 403.4.8 requirements for such occupancies and stand by and emergency power systems.
- IBC revisions include more options for the protection of fuel lines supplying emergency and standby generators. Similar requirements are published in the California Fire Code, Section 1203.1.2.

Building Services, Special Devices, and Special Conditions

CHAPTERS 27 THROUGH 33

Elevators

- Additional communication capabilities are required in accessible elevators to enhance the usability of the two-way communication system by individuals with varying degrees of hearing or speech impairments.

- An accessible elevator is however, not always required. See Section 1009.2.1:
- An accessible elevator is not required when a building is less than four stories above or below the level of exit discharge or when greater than three stories, is sprinklered and provided with horizontal exits.

Elevators

- **3001.2 Emergency elevator communication systems for the deaf, hard of hearing and speech impaired.** An emergency two-way communication system shall be provided. The system shall provide visible text and audible modes that meet all of the following requirements:

  1. When operating in each mode, include a live interactive system that allows back and forth conversation between the elevator occupants and emergency personnel.
  2. Is operational when the elevator is operational.
  3. Allows elevator occupants to select the text-based or audible mode depending on their communication needs to interact with emergency personnel.

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Elevators

- As a model code requirement, the expectation is that new elevators will comply or have the capability to achieve compliance. This requirement addresses the elevator emergency communication system.

Elevators

- **3005.4 Machine rooms, control rooms, machinery spaces, and control spaces.** The following rooms and spaces shall be enclosed with *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both:

    1. Machine rooms
    2. Control rooms
    3. Control spaces
    4. Machinery spaces outside of the hoistway enclosure

    NO CHANGE JUST FORMATTING

Elevators

- **Automatic sprinklers and elevator shunt trip.**
- The presence and operation of automatic sprinklers in elevator hoistways and equipment rooms is a major concern requiring complex interfaces with fire alarm systems that provide for the operation of elevator shutdown (shunt trip) prior to activation of fire sprinklers.
- The operation of automatic sprinklers located in elevator hoistways and equipment rooms and the function of elevator shutdown compromises the operation of elevators by fire fighters during emergency recall.
- This concern has resulted in the exemption of sprinkler requirements for hoistways and equipment rooms associated with high rise fire service access elevators, occupant evacuation elevators and many passenger elevators.

Elevators

- Protecting elevators.
- In deference to the shunt trip concerns of the fire service, sprinkler protection is not required for traction elevators. NFPA 13-2022, Secs. 9.3.6.2, 9.3.6.3, 9.3.6.3.1, 9.3.6.6, 9.3.6.7.1 and 9.3.6.7.2.

Elevators

- Protecting elevators.
- Where sprinkler protection is omitted from elevator machine rooms, elevator machinery spaces and control spaces, Phase 1 Emergency Recall is required in such spaces as a provision for the removal of sprinkler protection. NFPA 13-2022, Sec. 9.3.6.3 and NFPA 72-2022, Sec. 21.3.6.

- Where elevator hoistways contain motor controllers, control spaces or driving machines, smoke detection for initiation of Phase 1 Emergency Recall is required in hoistways as a provision for the removal of sprinkler protection. NFPA 72-2022, Sec. 21.3.6.

Elevators

- Where sprinkler protection is omitted from elevator machine rooms, elevator machinery spaces, control spaces, or hoistways of traction elevators, these areas shall be separated with a fire-resistance rating not less than the required rating of the hoistway. CBC Sec. 3005.4.1 and NFPA 13-2022, Sec. 9.3.6.3.

Elevators

- Sprinkler protection is required in elevator pits serving hydraulic elevators. NFPA 13-2022, Sec. 9.3.6.3. The sprinkler in the pit is permitted to be omitted when combustible hydraulic fluid is not present. NFPA 13-2022, Sec. 9.3.6.2. (This is seldom the case).
- Where sprinklers are located in elevator machine rooms, elevator machinery spaces, control spaces, or hoistways (including pits), smoke detection for initiation of Phase 1 Emergency Recall operation is required. NFPA 72-2022, Sec. 21.3.8.

Elevators

- **3006.3 Hoistway opening protection.** Where Section 3006.2 requires protection of the elevator hoistway door opening, the protection shall be provided by one of the following:

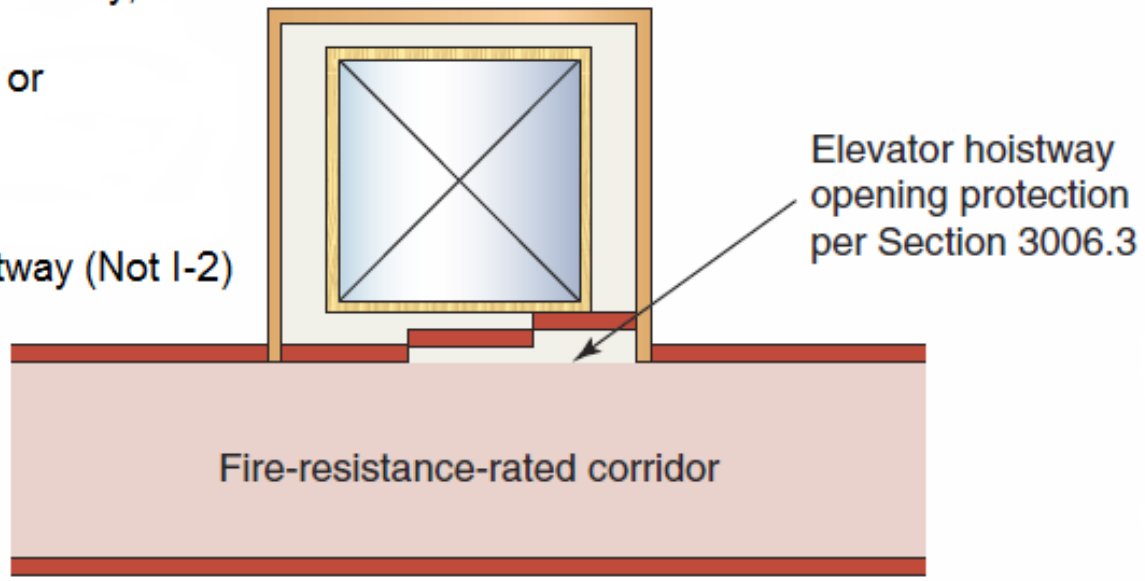
  *5. **[SFM]** Enclosed elevator lobbies are not required where the hoistway door has a fire-protection rating as required by Section 708.6 and the hoistway door opening is also protected by a listed and labeled smoke containment system complying with ICC ES AC 77.*

- Where an elevator hoistway door opens into a fire-resistance-rated corridor, the door opening must be protected in accordance with one of the methods established in Section 3006.3.

Elevators

Opening protection to be:

- Enclosed elevator lobby, or
- Additional doors, or
- Smokeguard, or
- Pressurized hoistway (Not I-2)



Corridor opening at elevator hoistway

Based on International Code Council

Buildings Under Construction

- **[F] 3313.1 Where required.** An *approved* water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible building materials arrive on the site, on commencement of vertical combustible construction, and on installation of a standpipe system in buildings under construction, in accordance with Sections 3313.2 through 3313.5.

  Exception: The *fire code official* is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

  Any reduction of fire flow requirements requires local fire authority approval.

Buildings Under Construction

- **[F] 3313.2 Combustible building materials.** When combustible building materials of the building under construction are delivered to a site, a minimum fire flow of 500 gallons per minute (1893 L/m) shall be provided. The fire hydrant used to provide this fire flow supply shall be within 500 feet (152 m) of the combustible building materials, as measured along an approved fire apparatus access lane. Where the site configuration is such that one fire hydrant cannot be located within 500 feet (152 m) of all combustible building materials, additional fire hydrants shall be required to provide coverage in accordance with this section.

The concern is the on site accumulation of combustible building materials regardless of the construction type. See Sec. 3313.4.

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Buildings Under Construction

- **[F] 3313.3 Vertical construction of Types III, IV and V construction.** Prior to commencement of vertical construction of Type III, IV or V buildings that utilize any combustible building materials, the fire flow required by Sections 3313.3.1 through 3313.3.3 shall be provided, accompanied by fire hydrants in sufficient quantity to deliver the required fire flow and proper coverage.

  Before vertical construction begins, additional requirements are imposed for Type III, IV and V buildings.

Buildings Under Construction

- **[F] 3313.3 Vertical construction of Types III, IV and V construction.**
  - **[F] 3313.3.1 Fire separation up to 30 feet.** Where a building of Type III, IV or V construction has a *fire separation distance* of less than 30 feet (9144 mm) from property lot lines, and an adjacent property has an *existing structure* or otherwise can be built on, the water supply shall provide either a minimum of 500 gallons per minute (1893 L/m), or the entire fire flow required for the building when constructed, whichever is greater.

Buildings Under Construction

- **[F] 3313.3 Vertical construction of Types III, IV and V construction.**
  - **[F] 3313.3.2 Fire separation of 30 feet up to 60 feet.** Where a building of Type III, IV or V construction has a *fire separation distance* of 30 feet (9144 mm) up to 60 feet (18 288 mm) from property lot lines, and an adjacent property has an *existing structure* or otherwise can be built on, the water supply shall provide a minimum of 500 gallons per minute (1893 L/m), or 50 percent of the fire flow required for the building when constructed, whichever is greater.

Buildings Under Construction

- **[F] 3313.3 Vertical construction of Types III, IV and V construction.**
  - **[F] 3313.3.3 Fire separation of 60 feet or greater.** Where a building of Type III, IV or V construction has a fire separation of 60 feet (18 288 mm) or greater from a property lot line, a water supply of 500 gallons per minute (1893 L/m) shall be provided.

Buildings Under Construction

- **[F] 3313.4 Vertical construction, Types I and II construction .** If combustible building materials are delivered to the construction site, water supply in accordance with Section 3313.2 shall be provided. Additional water supply for fire flow is not required prior to commencing vertical construction of Type I and II buildings.
- **[F] 3313.5 Standpipe supply.** Regardless of the presence of combustible building materials, the construction type or the *fire separation distance*, where a standpipe is required in accordance with Section 3313, a water supply providing a minimum flow of 500 gallons per minute (1893 L/m) shall be provided. The fire hydrant used for this water supply shall be located within 100 feet (30 480 mm) of the fire department connection supplying the standpipe.

Buildings Under Construction

- A water supply, the required fire flow, or a portion thereof, must be provided as soon as combustible building materials arrive on site with additional requirements prior to any vertical construction of Type III, IV and V buildings.
- Only building materials are addressed in the scope of the provisions. There is no intent to require water supply or fire flow for elements such as construction trailers.
- It is not the intent to require an additional water supply during the vertical construction of noncombustible Type I and II buildings.

Buildings Under Construction

- The focus is on the on site accumulation of combustible construction materials and the vertical construction of Types III, IV and V.

Referenced Standards

CHAPTER 35

Referenced Standards

- The 2022 California Building Code references the following editions of these NFPA standards:

NFPA 10-2021 Portable Fire Extinguishers

NFPA 13-2022 Installation of Sprinkler Systems

NFPA 13D-2022 Standard for the Installation of Sprinkler Systems in One- and Two-family Dwellings and Manufactured Homes

NFPA 13R-2022 Standard for the Installation of Sprinkler Systems in Low-rise Residential Occupancies

NFPA 14-2019 Standard for Installation of Private Fire Service Mains and Their Appurtenances

Referenced Standards

- 2022 California Building Code referenced NFPA standards (continued):

NFPA 36-2018 Installation and Use of Stationary Combustion Engines and Gas Turbines

NFPA 45-2015 Standard on Fire Protection for Laboratories Using Chemicals

NFPA 54-2018 National Fuel Gas Code

NFPA 72-2022 National Fire Alarm and Signaling Code

NFPA 111-2019 Standard on Stored Electrical Energy Emergency and Standby Power Systems

Referenced Standards

- 2022 California Building Code referenced NFPA standards (continued):

NFPA 130-2020 Standard for Fixed Guideway Transit and Passenger Rail Systems

NFPA 289-2019 Standard Method of Fire Test for Individual Fuel Packages

NFPA 502-2020 Standard for Road Tunnels, Bridges, and Other Limited Access Highways

NFPA 2001-2018 Standard on Clean Agent Fire Extinguishing Systems

Referenced Standards

- The State Fire Marshal prohibits the use of a positive alarm sequence feature for patient room smoke detectors. What is a positive alarm sequence feature?
- A positive alarm sequence feature permits acknowledging and silencing an alarm within 15 seconds and further delaying or resetting the alarm within an additional 3 minutes.
- ***NFPA 72·2022, 23.8.1.2 Positive Alarm Sequence***

  23.8.1.2.1 *Systems that have positive alarm features complying with 23.8.1.2 shall be permitted if approved by the authority having jurisdiction. Operation of a patient room smoke detector in Group I-2, and R-2.1 occupancies shall not include a positive alarm sequence feature.*

FINIS