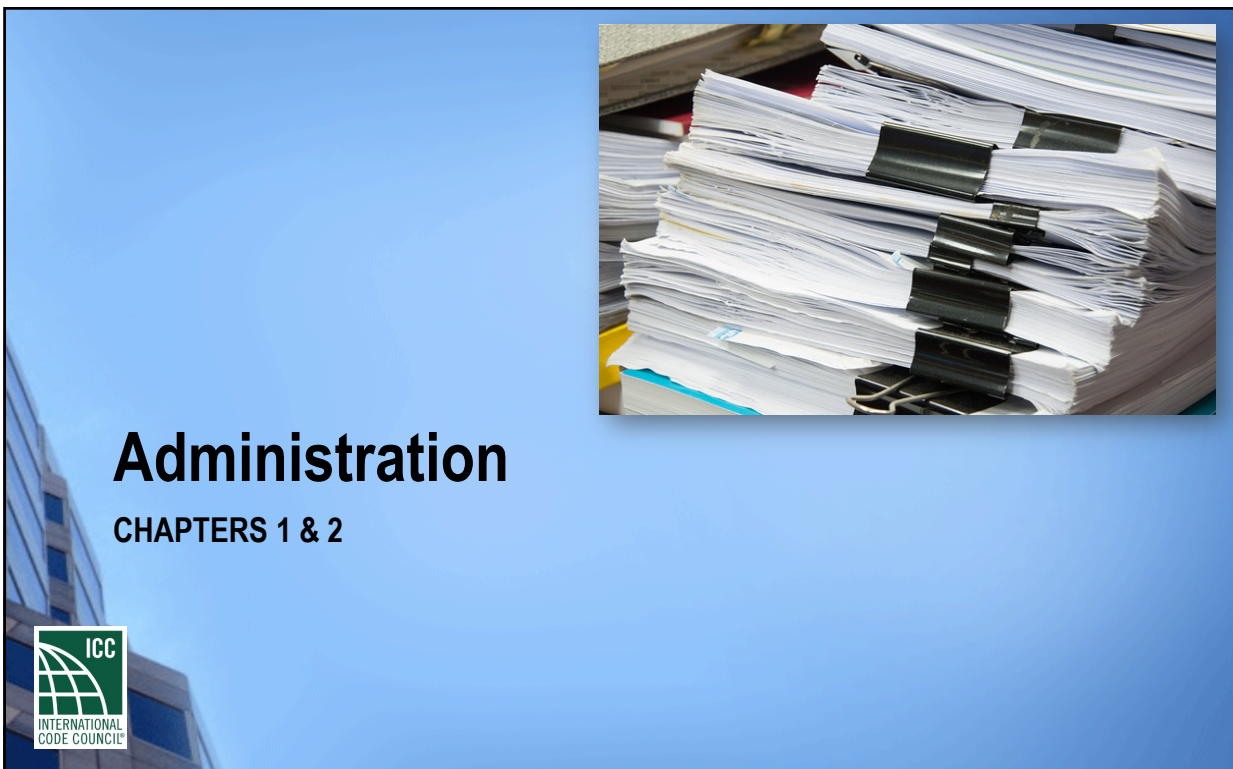





Significant Changes to the 2021 International Building Code & 2022 California Building Code

Fire Life Safety Provisions

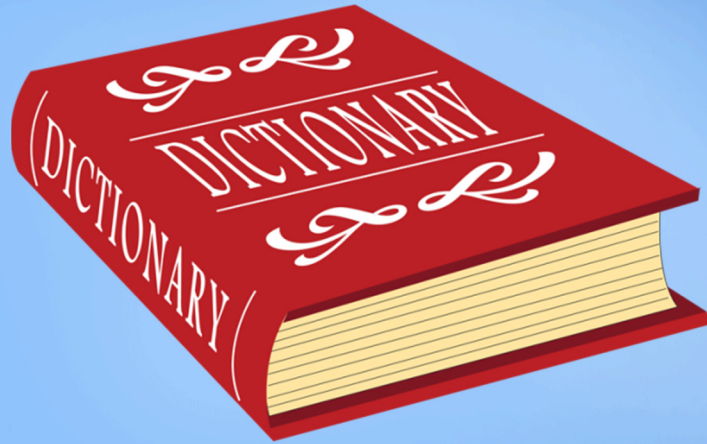


Administration

CHAPTERS 1 & 2



Definitions



Definitions

- **202. [BG] ATRIUM.** A vertical space that is closed at the top, connecting two or more stories in Group I-2 and I-3 occupancies or three or more stories in all other occupancies.
- The definition of atrium is simplified. Some previous language is eliminated and other text is relocated to Section 712.1.7. The listing of those components that are not considered as atriums is deleted, and the reference to balconies and mezzanines is moved to Chapter 7.
- The remaining terminology in Section 202 is limited to the closure at the top of an atrium and that an atrium typically connects three or more stories (except Group I-2 and I-3).
- The threshold before an atrium condition is created is increased from two to three stories in all occupancies except Group I-2 and I-3.



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. [BG] PENTHOUSE.** An enclosed, unoccupied rooftop structure used for sheltering mechanical and electrical equipment, tanks, elevators and related machinery, *stairways*, and vertical *shaft* openings.
- The definition of penthouse, and Section 1511.2.2, are expanded to clarify that rooftop structures that enclose stairways, when in compliance with Section 1511, may be considered as penthouses.

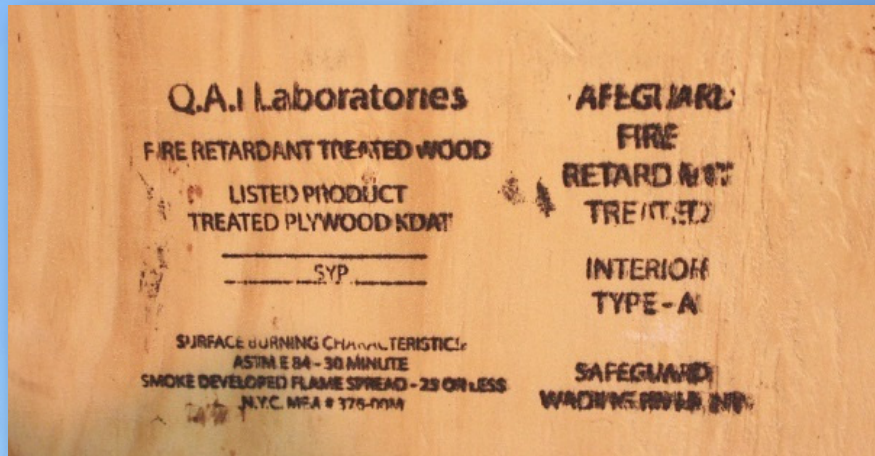


Definitions

- **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] PRIMARY STRUCTURAL FRAME.** The primary structural frame shall include all of the following structural members:
 1. The columns.
 2. Structural members having direct connections to the columns, including girders, beams, trusses and spandrels.
 3. Members of the floor construction and roof construction having direct connections to the columns.
 4. Members that are essential to the vertical stability of the *primary structural frame* under gravity loading.

References to "bracing" members is deleted from Primary Structural Frame, Item 4.



Definitions

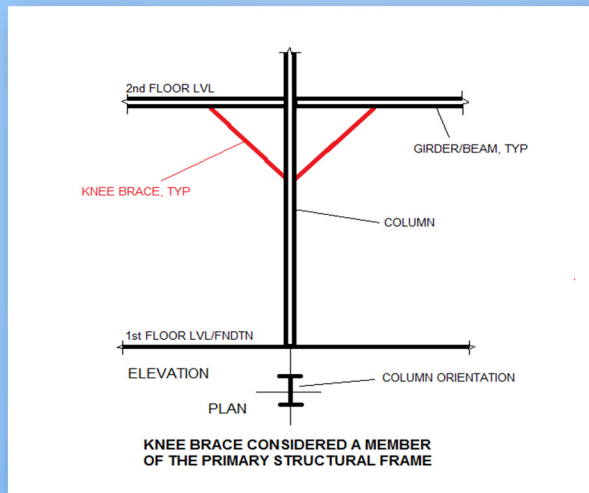
- Primary Structural Frame Members must be essential to carrying gravity loads. Any member or component that is essential to the vertical stability of the building under gravity loads is to be classified and protected as part of the primary structural frame. The definition is intended to also apply to bearing walls, which are assemblies rather than single components.



Definitions

- Item 4. Structural members

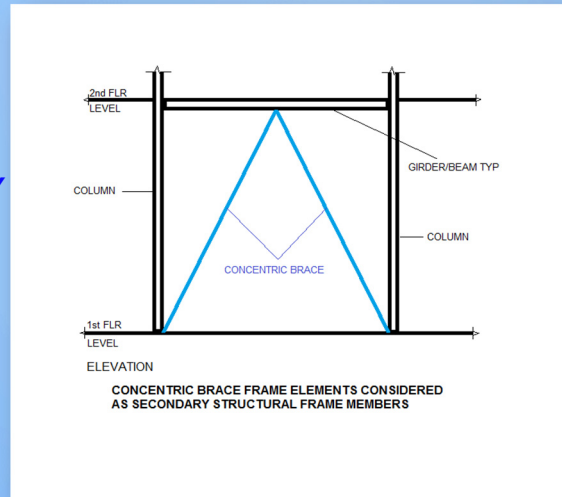
PRIMARY



Definitions

- Item 4. Structural members

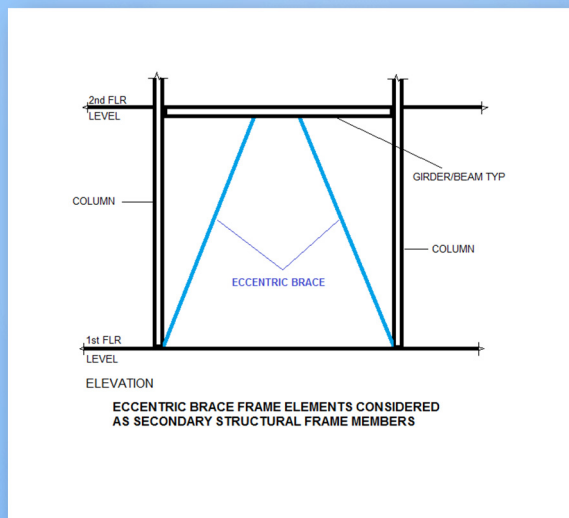
SECONDARY



Definitions

- Item 4. Structural members

SECONDARY



Definitions

- **202. [BG] SECONDARY STRUCTURAL MEMBERS.** The following structural members shall be considered secondary members and not part of the *primary structural frame*:
 1. Structural members not having direct connections to the columns.
 2. Members of the floor construction and roof construction not having direct connections to the columns.
 3. Bracing members that are not designated as part of a primary structural frame or bearing wall.

Structural members and components that are built into an assembly that supports a portion of a floor, roof or only their own weight are considered to be Secondary Structural Members.



Definitions



Columns and girder trusses form the primary structural frame in a roof; trusses are considered secondary structural members.



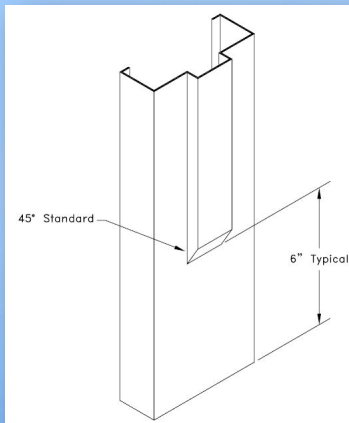
Definitions

- **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.”



Definitions

- **202. [BF] TERMINATED STOPS.** Factory feature of a doorframe where the stops of the door frame are terminated not more than 6 inches (152 mm) from the bottom of the door frame. Terminated stops are also known as “hospital stops” or “sanitary stops.”

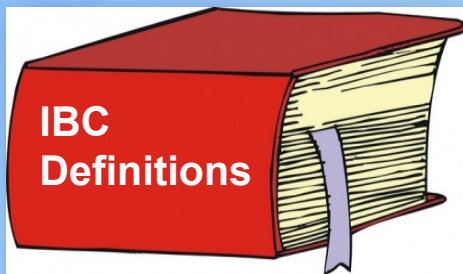


Definitions

- An alphabetical listing of all defined terms is located in Chapter 2.
- Codes are technical documents and every word, term and punctuation mark can impact the meaning of the code text and the intended results. The code often uses terms that have a unique meaning in the code and the code meaning can differ substantially from the ordinarily understood meaning of the term as used outside of the code.
- Where understanding of a term's definition is especially key to or necessary for understanding a particular code provision, the term is shown in *italics* wherever it appears in the code. This remains the only manner by which defined terms found in Chapter 2 are referenced.
- Where a term is not defined, such terms shall have the ordinarily accepted meaning.



Definitions



Italics

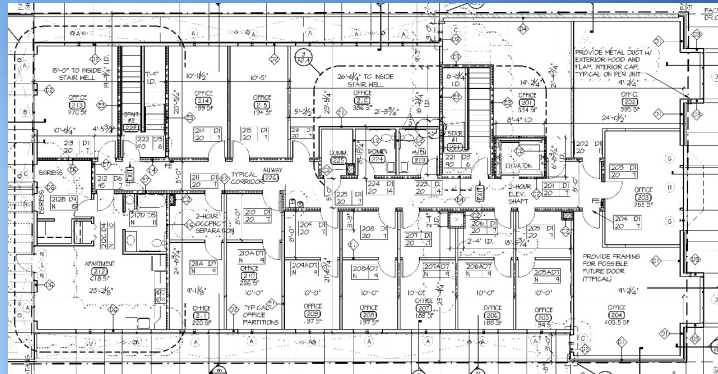
California Amendments



Italics

Some confusion here





Building Planning

CHAPTERS 3 THROUGH 6



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



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.



High-Rise Buildings



High-Rise Buildings

- **[F] 403.3.2 Water supply to required fire pumps.** In *all* buildings having an occupied floor that is more than 120 feet above the lowest level of fire department vehicle access, required fire pumps shall be supplied by connections to no fewer than two water mains located in different streets. Separate supply piping shall be provided between each connection to the water main and the pumps. Each connection and the supply piping between the connection and the pumps shall be sized to supply the flow and pressure required for the pumps to operate.

Exception: Two connections to the same main shall be permitted provided the main is valved such that an interruption can be isolated so that the water supply will continue without interruption through no fewer than one of the connections.



High-Rise Buildings

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

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



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.

Atriums

- 404.5 Smoke control.



Atriums

- **404.1 General.** The provisions of Sections 404.1 through 404.11 shall apply to buildings containing atriums. *Atriums* are not permitted in buildings or structures classified as Group H.

Exception: Vertical openings that comply with Sections 712.1.1 through 712.1.3, and Sections 712.1.9 through 712.1.14.

The exception references provisions of Section 712, (Vertical Openings), for vertical openings other than atriums.



Atriums

- **404.5 Smoke control.** A smoke control system shall be installed in accordance with Section 909.

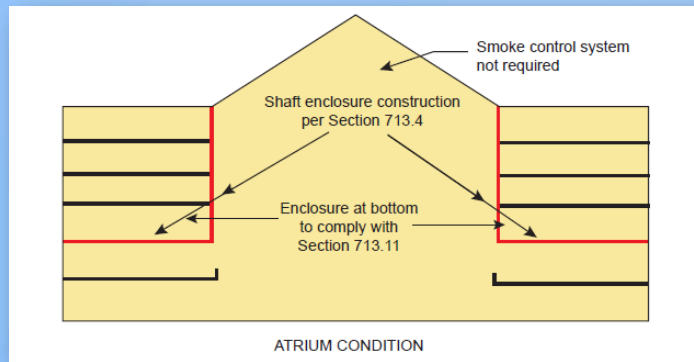
Exceptions:

1. In other than Group I-2, and R-2.1, Condition 2, smoke control is not required for *atriums* that connect only two *stories*.
2. A smoke control system is not required for *atriums* connecting more than two *stories* when all of the following are met:
 - 2.1. Only the two lowest *stories* shall be permitted to be open to the *atrium*.
 - 2.2. All *stories* above the lowest two *stories* shall be separated from the *atrium* in accordance with the provisions for a *shaft* in Section 713.4.

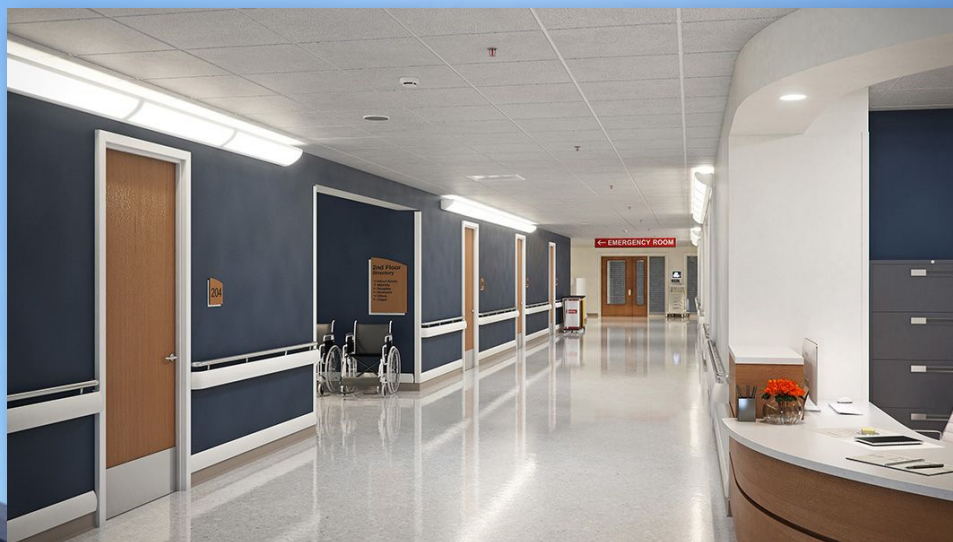


Atriums

- Exception 1 requires smoke control for any atrium in a Group I-2.
- Exception 2 permits an atrium to extend more than two stories without smoke control when only the two lowest floors are open to the atrium and all subsequent levels are protected by shaft construction.



Group I-2 & I-2.1 Corridors



Group I-2 & I-2.1 Corridors

- **407.3 Corridor wall construction.**
 - **407.3.1 Corridor doors.**
 - **407.3.1.1 Door construction.** *Corridor* doors not required to have a *fire protection rating* shall comply with the following:
 1. Solid doors shall have close-fitting operational tolerances, head and jamb stops.
 2. Dutch-style doors shall have an astragal, rabbet or bevel at the meeting edges of the upper and lower door sections. Both the upper and lower door sections shall have latching hardware. Dutch-style doors shall have hardware that connects the upper and lower sections to function as a single leaf.



Group I-2 & I-2.1 Corridors

- Corridor doors are required to “provide an effective barrier to limit the transfer of smoke.”
- Dutch-style doors are specifically permitted in Group I-2 corridors where several conditions are met. A bevel, rabbet or astragal is required at the meeting edges of the upper and lower door sections. In addition, latching hardware is mandated on both the upper and lower sections. There must also be a means for connecting the upper and lower door sections in a manner that will allow the entire assembly to function as a single leaf.



Group I-2 & I-2.1 Corridors

- **407.3.1.2 Swing of corridor doors.** Corridor doors, other than those equipped with self-closing or automatic-closing devices shall not swing into the required width of corridors.

Exception: In detention and/or secure mental health facilities, doors may swing into required width of corridors as long as 44 inches clear is maintained with any one door open 90 degrees and clear corridor widths required by Chapter 12 can be maintained with doors open 180 degrees.



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.



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.



Occupied Roofs



Occupied Roofs

- **503.1.4 Occupied roofs.** A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the occupied roofs shall not be included in the building area as regulated by Section 506. An occupied roof shall not be included in the building height or number of stories as regulated by Section 504, provided the penthouses and other enclosed roof structures comply with Section 1511.
- *Always the intent, an occupied roof is not to be included in building height or considered as a story.*



Occupied Roofs

- **503.1.4 Occupied roofs.**

Exceptions:

1. The occupancy located on an occupied roof shall not be limited to the occupancies allowed on the *story* immediately below the roof where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification in accordance with Sections 907.5.2.1 and 907.5.2.3 is provided in the area of the occupied roof. *Emergency voice/alarm communication* system notification per Section 907.5.2.2 shall also be provided in the area of the occupied roof where such system is required elsewhere in the building.



Occupied Roofs

- The conditions of Exception 1 recognize there is no story limitation to be applied on rooftop occupancies where specified fire protection features are provided.
- In the application of the exception, the building must be provided with an automatic sprinkler system. In addition, occupant notification shall be extended to the occupiable area of the roof where a fire alarm system is required. The new provisions specifically reference Sections 907.5.2.1, 907.5.2.2 and 905.5.2.3 addressing audible alarms, emergency voice/alarm communication systems and visual alarms, respectively.
- Due to the absence of scoping language mandating a fire alarm system be installed, occupant notification at the roof level is only applicable where an alarm system is already required elsewhere in the building.



Allowable Area Frontage Increase

- **506.3.2 Minimum frontage distance.** To qualify for an area factor increase based on frontage, the *public way* or open space adjacent to the building perimeter shall have a minimum distance (W) of 20 feet (6096 mm) measured at right angles from the building face to any of the following:
 1. The closest interior lot line.
 2. The entire width of a street, alley or *public way*.
 3. The exterior face of an adjacent building on the same property.
- The frontage increase shall be based on the smallest *public way* or open space that is 20 feet (6096 mm) or greater, and the percentage of building perimeter having a minimum 20 feet (6096 mm) *public way* or open space.



Allowable Area Frontage Increase

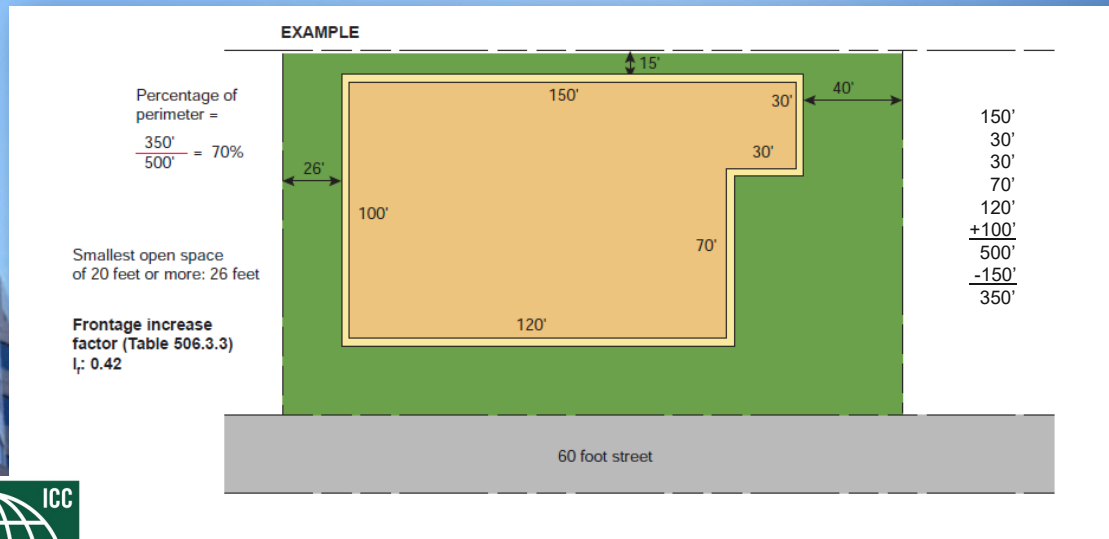
- 506.3.3 Amount of increase.** The area factor increase based on frontage shall be determined in accordance with Table 506.3.3.

**TABLE 506.3.3
FRONTAGE INCREASE FACTOR³**

PERCENTAGE OF BUILDING PERIMETER	OPEN SPACE (feet)			
	0 to less than 20	20 to less than 25	25 to less than 30	30 or greater
0 to less than 25	0	0	0	0
25 to less than 50	0	0.17	0.21	0.25
50 to less than 75	0	0.33	0.42	0.50
75 to 100	0	0.50	0.63	0.75



Allowable Area Frontage Increase



Allowable Area Frontage Increase

- Example

**TABLE 506.3.3
FRONTAGE INCREASE FACTOR³**

PERCENTAGE OF BUILDING PERIMETER	OPEN SPACE (feet)			
	0 to less than 20	20 to less than 25	25 to less than 30	30 or greater
0 to less than 25	0	0	0	0
25 to less than 50	0	0.17	0.21	0.25
50 to less than 75	0	0.33	0.42	0.50
75 to 100	0	0.50	0.63	0.75



Allowable Area Frontage Increase

- The process is a matter of:
 - 1) determining the percentage of perimeter considered to be open,
 - 2) identifying the smallest open space or public way that is at least 20 feet in width, and;
 - 3) applying the applicable row and column in the table to identify the allowable frontage increase *If* for the building under consideration.
- In applying the factors established in Table 506.3.3, it is acceptable to interpolate both the percentage of perimeter and the width of the open space if necessary to gain an additional limited increase for frontage; however, such interpolation will typically not be necessary.



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.



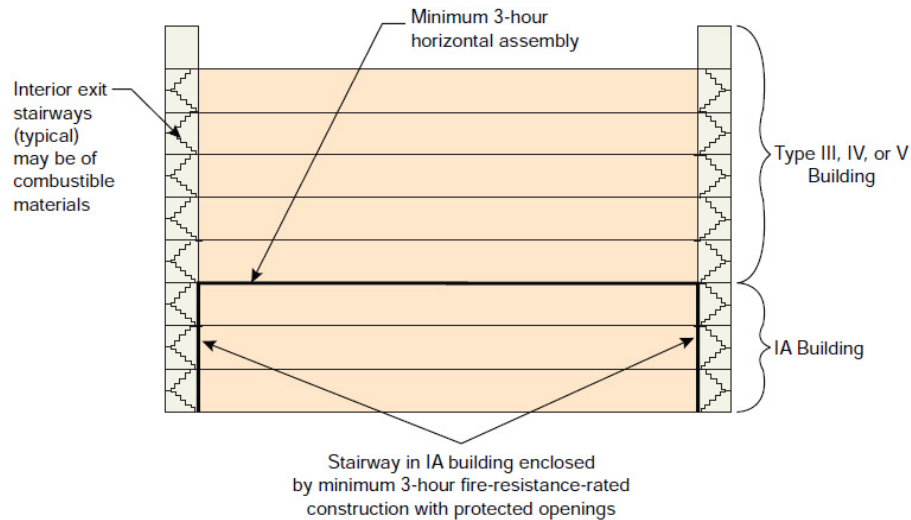
Horizontal Building Separation

- **510.2 Horizontal building separation allowance.** A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of fire walls, limitation on number of stories and type of construction where all of the following conditions are met:
 4. Interior exit stairways located within the Type IA building are permitted to be of combustible materials where the following requirements are met:
 - 4.1. The building above the Type IA building is of Type III, IV, or V construction.
 - 4.2. The stairway located in the Type IA building is enclosed by 3-hour fire-resistance rated construction with opening protectives in accordance with Section 716.

(No change to remaining listed conditions.)



Horizontal Building Separation



Horizontal Building Separation

- Where an interior exit stairway is located in a building utilizing the horizontal building separation allowance, it is permissible for the stairways to be constructed of combustible materials throughout, including in the Type IA portion of the building, provided two conditions are met.
- One, the upper building is classified as Type III, IV or V construction, and two, the stairway located in the lower building is enclosed by a minimum 3-hour fire-resistance-rated shaft enclosure. (Where the upper building is of noncombustible construction (Type I or II), the entire stairway must be constructed of noncombustible materials).



Horizontal Building Separation

- Where Condition 4 is applied, the minimum 3-hour fire resistance-rated horizontal separation is extended vertically downward adjacent to the stairway enclosure, in effect isolating the exit stairway in the upper building. As a result, the interior exit stairways are considered as located only in the upper building where combustible stairway construction is permitted.



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.



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.



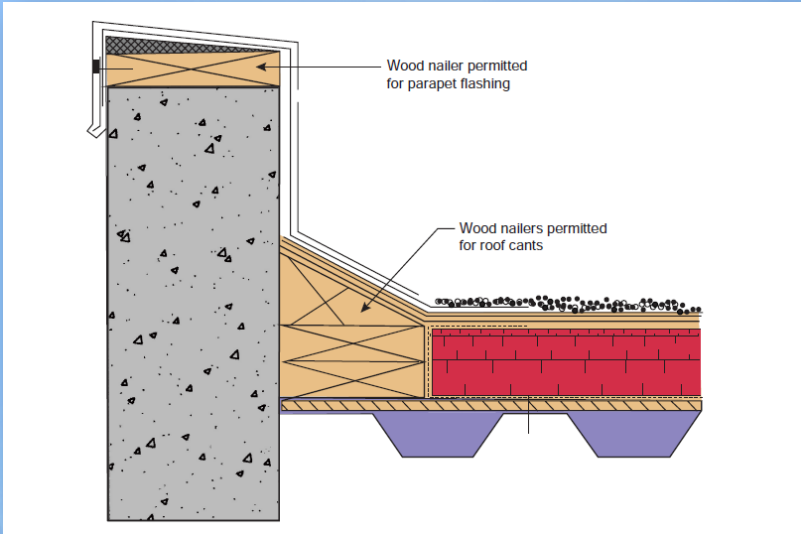

Combustible Materials in Types I & II

- 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.




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.

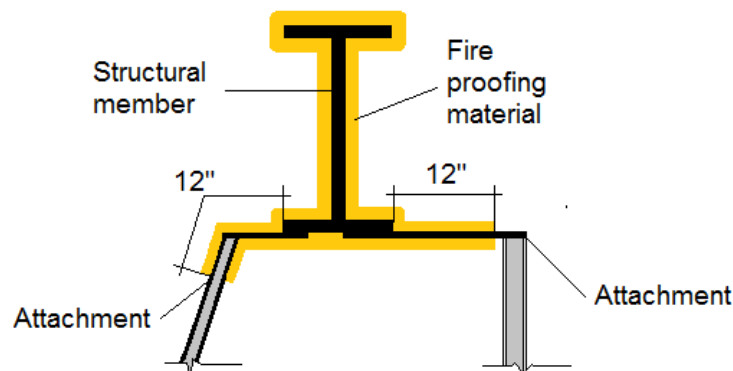


Attachments to Structural Members

- 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.



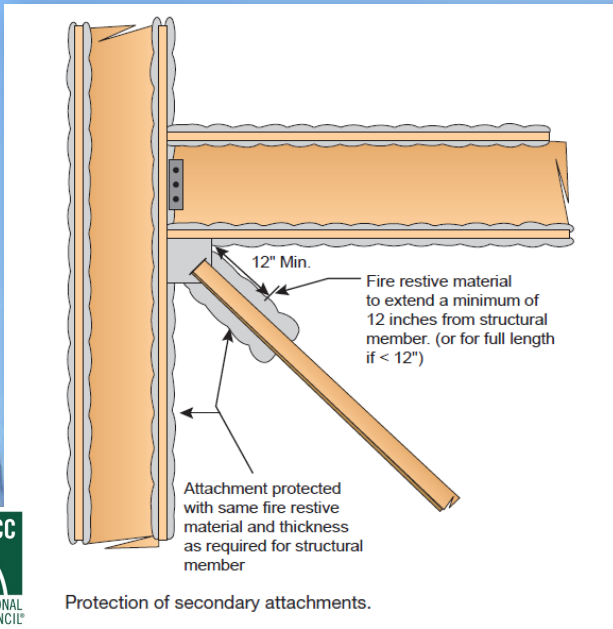
Attachments to Structural Members



704.6.1 Protection of secondary attachments



Attachments to Structural Members



International Code Council

Extent of Projections

- SECTION 705
- EXTERIOR WALLS
- Yet again, Table 705.2 is modified.

**TABLE 705.2
MINIMUM DISTANCE OF PROJECTION**

FIRE SEPARATION DISTANCE (FSD) (feet)	MINIMUM DISTANCE FROM LINE USED TO DETERMINE FSD
0 to less than 2	Projections not permitted
2 to less than 3	24 inches
3 to less than 5	Two-thirds of FSD
5 or greater	40 inches

For SI: 1 foot = 304.8 mm; 1 inch = 25.4 mm.



Extent of Projections

- SECTION 705
- EXTERIOR WALLS
- Table 705.2. The permitted extent of projections is established by Table 705.2 and based solely on the clear distance between the building's exterior wall and an interior lot line, centerline of a public way or assumed imaginary line between two buildings on the same lot.
- 202. FIRE SEPARATION DISTANCE (FSD). The distance measured from the building face to one of the following:
 1. The closest interior *lot line*.
 2. To the centerline of a street, an alley or *public way*.
 3. To an imaginary line between two buildings on the lot.

The distance shall be measured at right angles from the face of the wall.



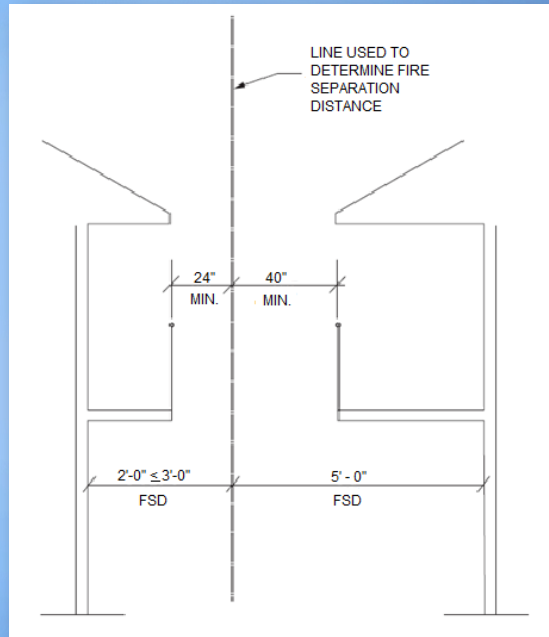
Extent of Projections

- SECTION 705
- EXTERIOR WALLS
- Table 705.2.
- Projections are allowed to extend beyond the exterior wall, but only for a limited distance. The required clearance is based on the fire separation distance measured from the exterior wall.



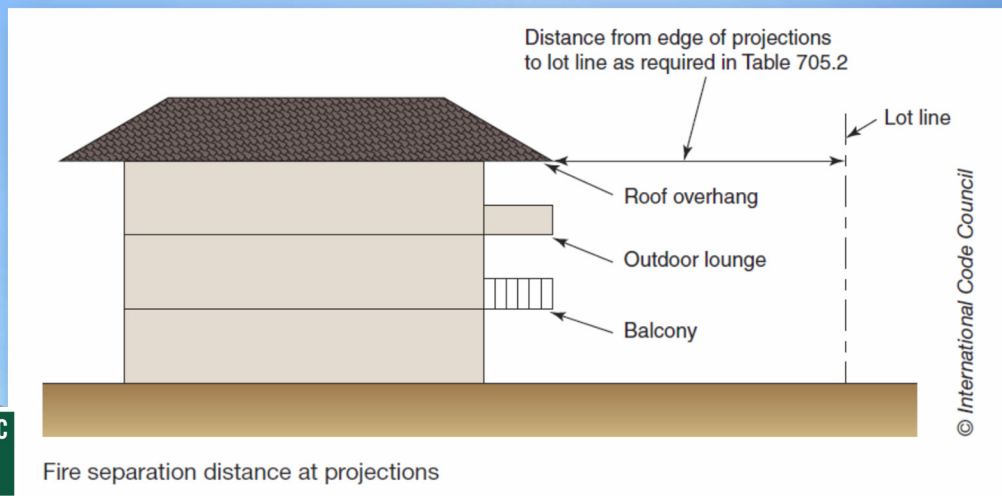
Extent of Projections

Table 705.2,
what does
that look like?



Extent of Projections

- Table 705.2. Examples of projections:



Extent of Projections

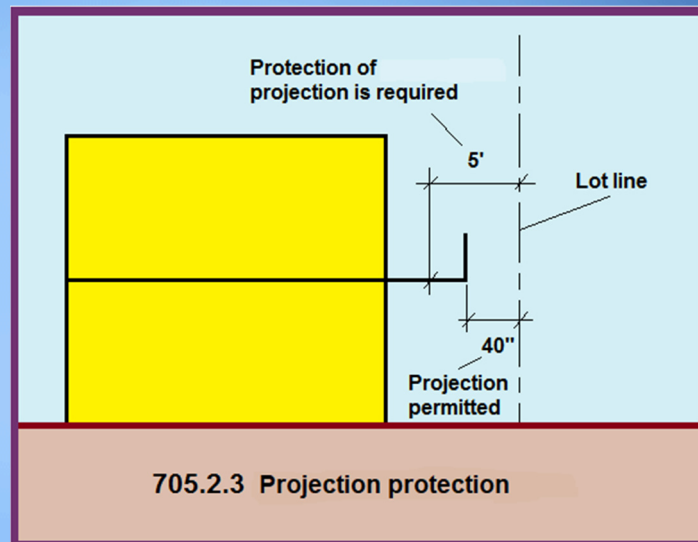
- **705.2.3 Projection protection.** Projections extending to within 5 feet (1524 mm) of the line used to determine the *fire separation distance* shall be one of the following:
 1. Noncombustible materials.
 2. Combustible materials of not less than 1-hour fire resistance-rated construction.
 3. Heavy timber construction complying with Section 2304.11.
 4. Fire-retardant-treated wood.
 5. As permitted by Section 705.2.3.1.

Exception: Type VB construction shall be allowed for combustible projections in Group R-3 and U occupancies with a *fire separation distance* greater than or equal to 5 feet (1524 mm).



Projection Protection

- 705.2.3 Projection protection.
- What just happened?
- Yes, in accordance with Table 705.2, a projection may be within 40" of the FSD but if it is within 5' of the FSD, the projection must be protected.



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}

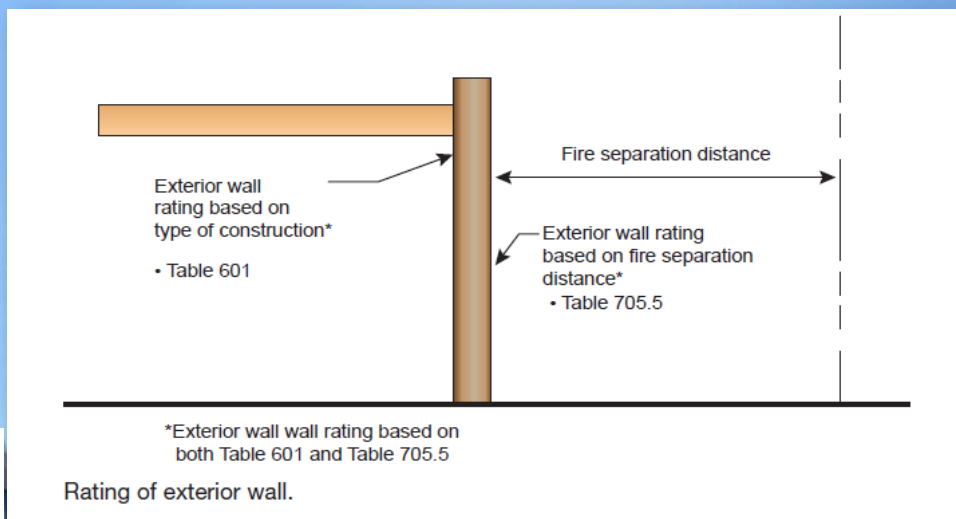
FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H ^a	OCCUPANCY GROUP F-1, M, S-1 ^f	OCCUPANCY GROUP A, B, E, F-2, I, R ^f , S-2, U ^b
$X < 5^b$	All	3	2	1
$5 \leq X < 10$	IA, IVA	3	2	1
	Others	2	1	1
$10 \leq X < 30$	IA, IB, IVA, IVB	2	1	1 ^c
	IIB, VB	1	0	0
	Others	1	1	1 ^c
$X \geq 30$	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.



Table 705.5

- It takes two tables.



Fire Barriers/Energy Storage Systems

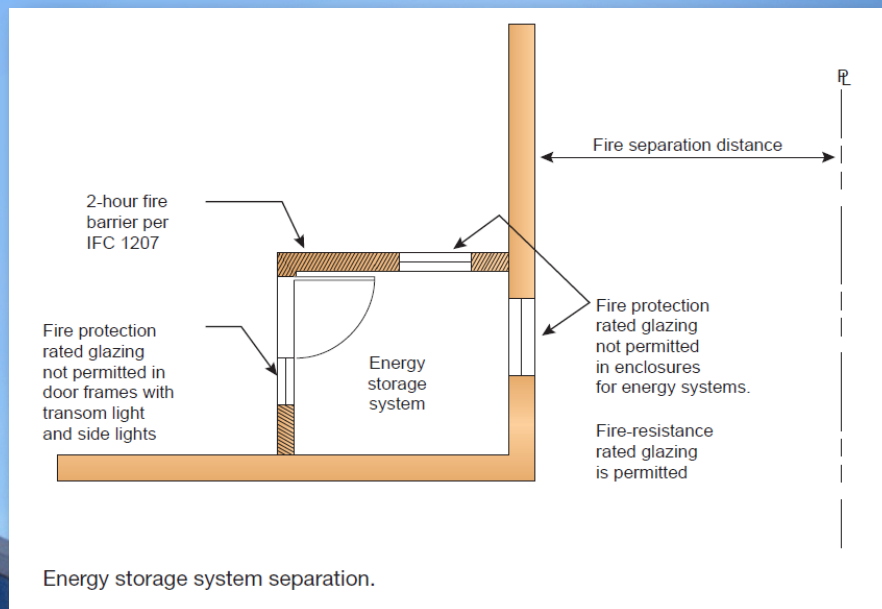
- 707.4 Exterior walls.** Where *exterior walls* serve as a part of a required fire-resistance-rated *shaft*, or separation or enclosure for a *stairway*, *ramp* or *exit passageway*, such walls shall comply with the requirements of Section 705 for *exterior walls* and the fire-resistance-rated enclosure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

Exceptions:

- 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*.
- 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



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/Exit Passageways

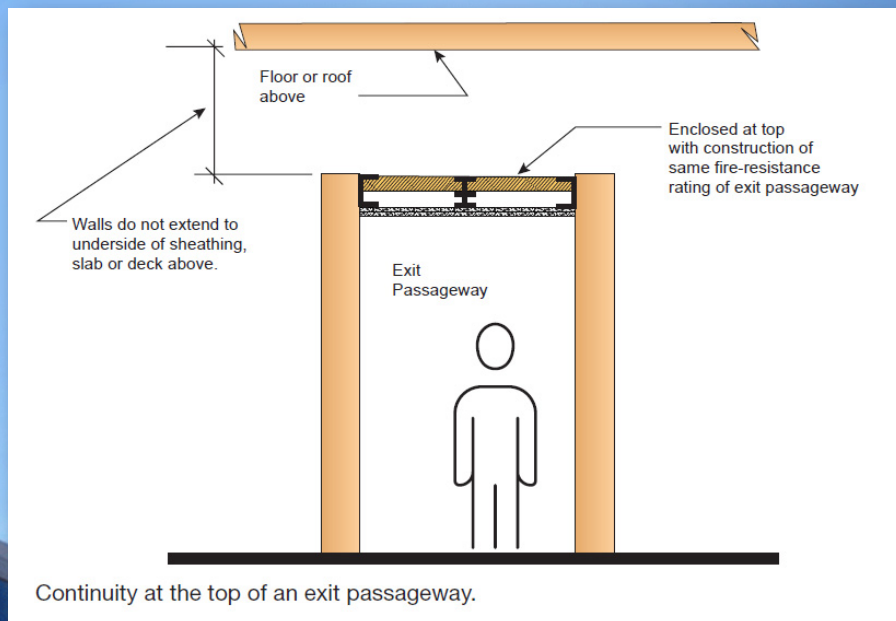
- 707.5 Continuity.** Fire barriers shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed space, such as the space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

Exceptions:

- 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



Fire Partitions



Fire Partitions

- **708.1 General.** The following wall assemblies shall comply with this section:
 3. Corridor walls as required by Section 1020.3 and in Group I-2 and I-2.1 as required by Section 407.3.
 6. Walls separating ambulatory care facilities from adjacent spaces, corridors or tenant as required by Section 422.2.
 7. Walls separating dwelling and sleeping units in Groups R-1 and R-2 in accordance with Sections 907.2.8.1 and 907.2.9.1.
 8. Vestibules in accordance with Section 1028.2.

Not new requirements. Items 3, 6, 7 & 8 include locations omitted from the list of where fire partitions are required.



Smoke Barriers

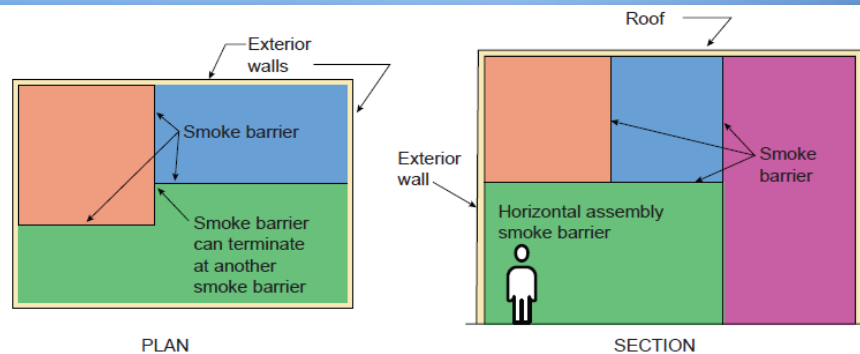


Smoke Barriers

- **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



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.

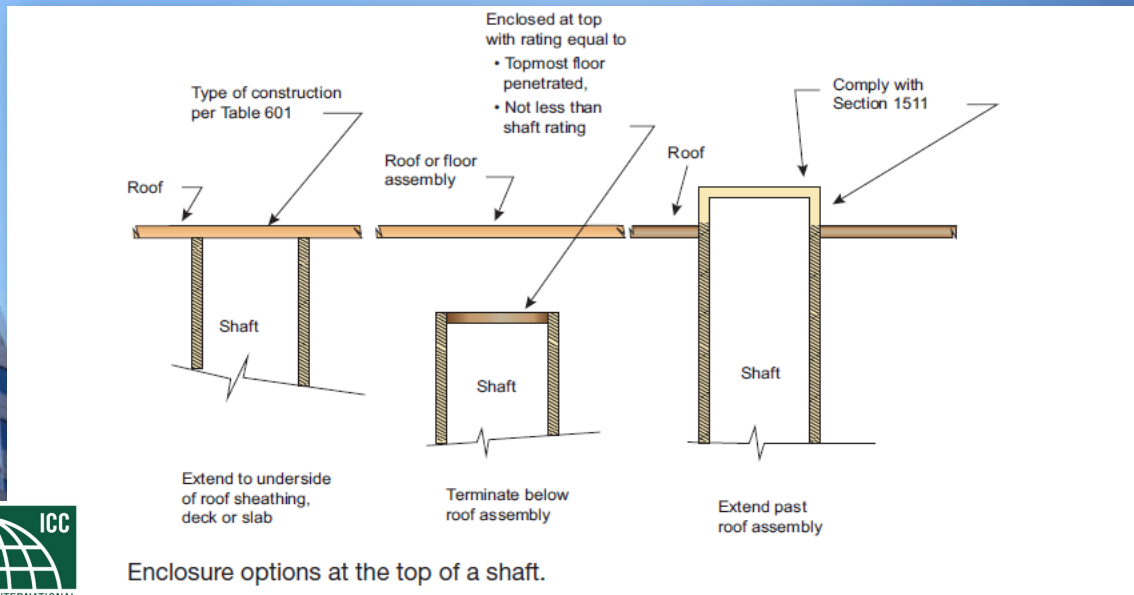


Shaft Enclosures

- **713.12 Enclosure at top.** The top of shaft enclosures shall comply with one of the following:
 1. Extend to the underside of the roof sheathing, deck or slab of the building, and the roof assembly shall comply with the requirements for the type of construction as specified in Table 601.
 2. Terminate below the roof assembly and be enclosed at the top with construction of the same fire-resistance rating as the topmost floor penetrated by the shaft, but not less than the fire-resistance rating required for the shaft enclosure.
 3. Extend past the roof assembly and comply with the requirements of Section 1511.



Shaft Enclosures



Shaft Enclosures

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



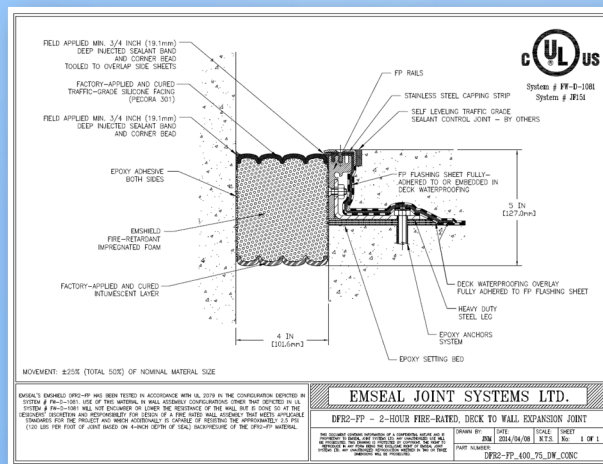
Shaft Enclosures

- Section 713.12.1 recognizes that not every penetration or opening that pierces a roof requires protection. The CBC typically does not address conditions where a fire spreads from the interior of the building to the exterior. Examples include unprotected roof openings for penetrations (Section 714.5), ducts (Section 717.6), and skylights (Section 712.1.15).
- Where a mechanical penthouse provides an extension of a shaft enclosure from below, neither a fire nor a smoke damper is required at such penetrations provided all ductwork in the shaft enclosure is directly connected to heating, ventilation and air-conditioning (HVAC) equipment.



Joints & Voids

- 715.1 General.** The provisions of this section shall govern the materials and methods of construction used to protect *joints* and voids in or between horizontal and vertical assemblies.

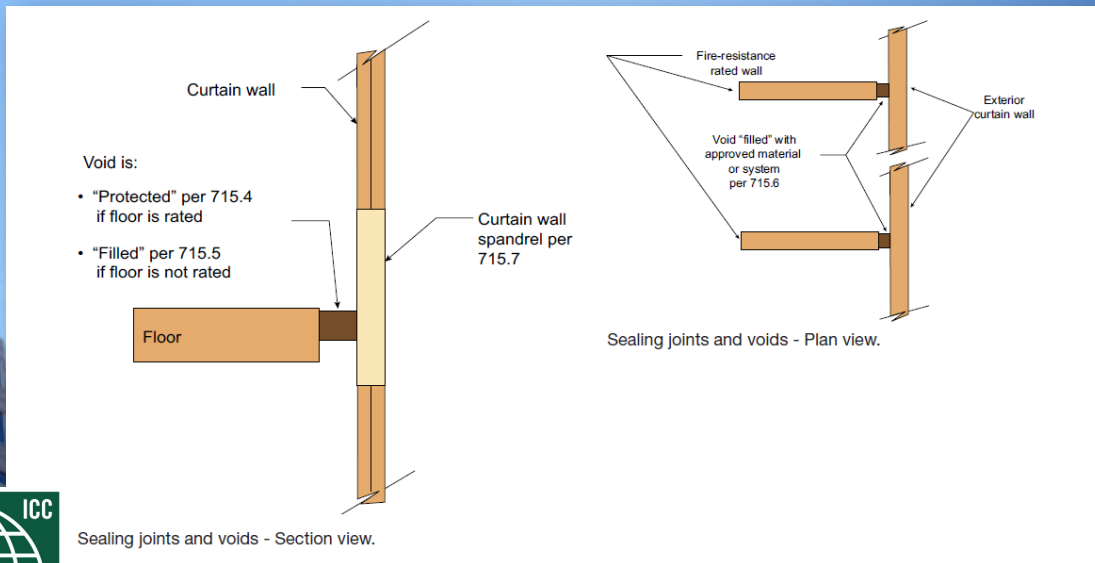


Joins & Voids

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



Joins & Voids



Joins & Voids

- **715.4 Exterior curtain wall/fire-resistance-rated floor intersections.** Voids created at the intersection of exterior curtain wall assemblies and fire-resistance-rated floor or floor/ceiling assemblies shall be protected with an *approved perimeter fire containment system* to prevent the interior spread of fire. Such systems shall provide an *F rating* for a time period not less than the *fire-resistance rating* of the floor or floor/ceiling assembly.
- Applies to both fire-resistance-rated floor and floor-ceiling systems. L rating is also required for smoke barriers. See Section 715.8.



Joins & Voids

- **715.4.1 Fire test criteria.** Perimeter fire containment systems shall be tested in accordance with the requirements of ASTM E2307.

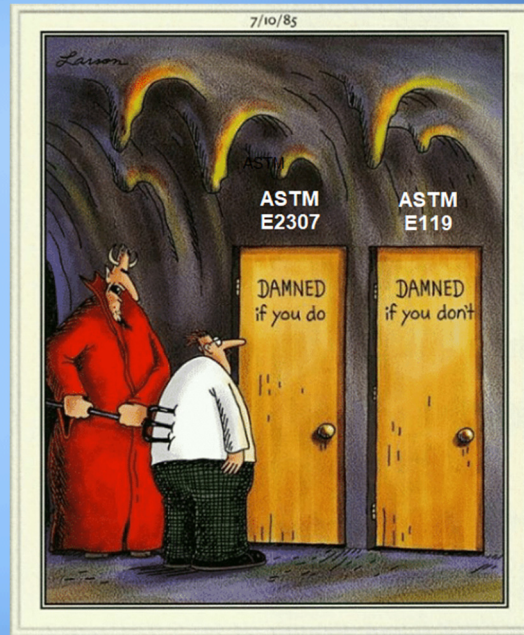
Exception: Voids created at the intersection of the exterior curtain wall assemblies and floor assemblies where the vision glass extends to the finished floor level shall be permitted to be protected with an approved material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period not less than the fire-resistance rating of the floor assembly.

Ignition temperature of cotton waste? 410°F



Joins & Voids

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



Joins & Voids

- **715.6 Exterior curtain wall/vertical fire barrier intersections.** Voids created at the intersection of nonfire-resistance rated exterior curtain wall assemblies and vertical fire barriers shall be filled with an approved material or system to retard the interior spread of fire and hot gases.
- Void must only be filled, not protected. A common occurrence where a fire-resistance rated wall is not required.



Joins & 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.

Joins & 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.



Joins & 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.



Joins & 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.



Smoke & Draft Control

- **716.2.2.1.1 Smoke and draft control.** The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot ($0.01524 \text{ m}^3/\text{s} \times \text{m}^2$) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature and elevated temperature tests. Louvers shall be prohibited. Terminated stops shall be prohibited on doors required by Section 405.4.3 to comply with Section 716.2.2.1 and prohibited on doors required by Item 3 of Section 3006.3, or Section 3007.6.3 or 3008.6.3 to comply with this section.



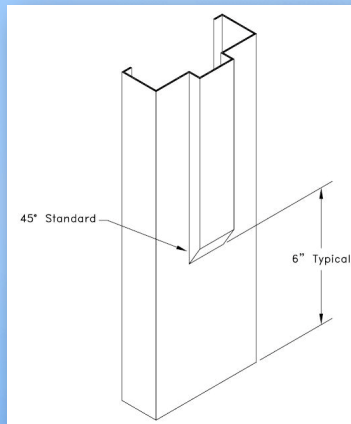
Smoke & Draft Control

- The use of terminated stops is specifically prohibited at four locations. The prohibited locations are all related to protecting elevator hoistways and limiting the potential for smoke movement to other parts of the building. Locations where terminated stops cannot be used include:
 - (a) an elevator serving multiple smoke compartments in an underground building,
 - (b) additional doors providing smoke and draft control for elevator hoistway openings,
 - (c) lobby doors serving a fire service access elevator, and
 - (d) lobby doors serving occupant evacuation elevators.



Smoke & Draft Control

- In all other locations, door assemblies that are required to meet smoke and draft control requirements are permitted to use a terminated stop.



Double Doors in Fire Walls/Fire Partitions

- **TABLE 716.1(2) OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS**
 - d. Two doors, each with a fire protection rating of 1 1/2 hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.
 - i. Two doors, each with a fire rating of 20 minutes, installed on opposite sides of the same opening in a fire partition, shall be deemed equivalent in fire protection rating to one 45-minute fire door.

Two footnotes in Table 716.1(2) provide provisions for fire rated double doors at some locations.



Double Doors in Fire Walls/Fire Partitions

- **TABLE 716.1(2) OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS**

Double fire walls construction per NFPA221

Rating of overall assembly (Hours)	Rating of each individual wall (Hours)	Min. Fire door rating (Hours)
4	3	3
3	2	1 1/2
2	1	1

Door rating based on each individual wall's rating (See separate entry in Table 716.1(2) for single fire walls)

Doors in double fire walls using NFPA 221.



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.



Ceiling Radiation Dampers

- **717.6.2.1 Ceiling radiation dampers testing and installation.**
- **717.6.2.1.1 Dynamic systems.** Only *ceiling radiation dampers labeled* for use in dynamic systems shall be installed in heating, *ventilation* and air conditioning systems designed to operate with fans on during a fire.
- Well, maybe not...there are exceptions.



Ceiling Radiation Dampers

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

Exceptions:

1. Where a static ceiling radiation damper is installed at the opening of a duct, a smoke detector shall be installed inside the duct or outside the duct with sampling tubes protruding into the duct. The detector or tubes in the duct shall be within 5 feet (1524 mm) of the damper. Air outlets and inlets shall not be located between the detector or tubes and the damper. The detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.



Ceiling Radiation Dampers

- **717.6.2.1.2 Static systems.**

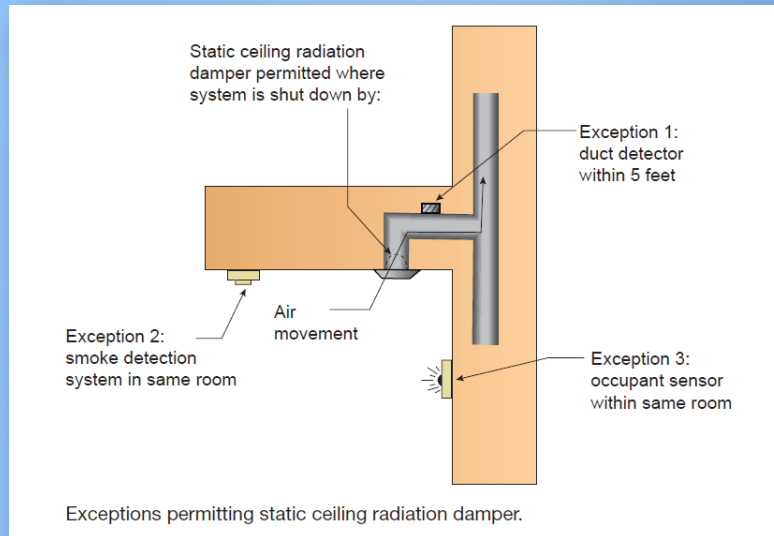
Exceptions (continued):

2. Where a static ceiling radiation damper is installed in a ceiling, the ceiling radiation damper shall be permitted to be controlled by a smoke detection system installed in the same room or area as the ceiling radiation damper.
3. A static ceiling radiation damper shall be permitted to be installed in a room where an occupant sensor is provided within the room that will shut down the system.

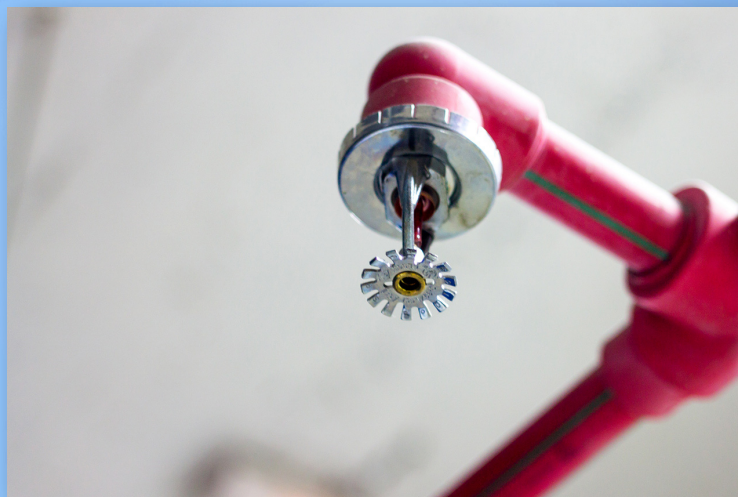


Ceiling Radiation Dampers

- Exceptions allowing a static ceiling damper:



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.



Fire Sprinklers in Parking Garages



Sprinklered open parking garage.

International Code Council



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.



Fire Sprinkler Exemptions

- **903.3.1.1 NFPA 13 sprinkler systems.** Where the provisions of this code require that a building or portion thereof be equipped throughout with an *automatic sprinkler system* in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Sections 903.3.1.1.1 through 903.3.1.1.3.
 - **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.



Fire Sprinkler Exemptions

- **903.3.1.1.1 Exempt locations(continued)**
 6. *Elevator hoistways, machine rooms, machinery spaces, control spaces, and control rooms in accordance with Section 3005.4.1 of the California Building Code.*
- **When in accordance with CBC Section 3005.4.1, sprinkler protection is not required for passenger and freight elevators.**



Fire Sprinkler Exemptions

- **903.3.1.1.3 Solar photovoltaic power systems.** Automatic sprinklers shall not be required in the following areas:
 1. Solar photovoltaic panel structures with no use underneath. Signs may be provided, as determined by the enforcing agency prohibiting any use underneath including storage.
 2. Solar photovoltaic (PV) panels supported by framing that have sufficient uniformly distributed and unobstructed openings throughout the top of the array (horizontal plane) to allow heat and gases to escape, as determined by the enforcing agency.

There is no requirement to substitute smoke detection for sprinkler protection in these outdoor areas.



Portable Fire Extinguishers



Portable Fire Extinguishers

906.1 Where required. Portable fire extinguishers shall be installed in all of the following locations:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

Exception:

In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.

2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-2 and R-2 college dormitory occupancies.



Portable Fire Extinguishers

- California Health and Safety Code, Division 12, Part 2, Chapter 1.5, Section 13160, et seq. authorizes the State Fire Marshal to adopt and enforce portable fire extinguisher regulations.
- These regulations are extensive and are published in Title 19, CCR, Division 1, Chapter 3.
- When using the California Building Code or the California Fire Code, the adoption matrix should be consulted to determine if a provision regulating fire extinguishers is adopted by the State Fire Marshal.



Fire Alarm



Fire Alarm

- **907.5.1.1 Pre-signal feature.** A pre-signal feature shall be installed only where *approved*. The presignal shall be annunciated at an approved, constantly attended location, having the capability to activate the occupant notification system in the event of fire or other emergency.

Exception: A pre-signal feature shall not be permitted to be installed in a Group I-2, I-2.1 or R-2.1 occupancy.

A California State Fire Marshal amendment prohibits using a pre-signal feature in a Group I-2, I-2.1 or R-2.1 occupancy.



Fire Alarm

- *Just what is a pre-signal feature?*
- NFPA 72
- 23.8.1.1.2 A presignal feature shall meet the following conditions:
 - (1) The initial fire alarm signals sound only in department offices, control rooms, fire brigade stations, or other constantly attended central locations.
 - (2) Where there is a connection to a remote location, the transmission of the fire alarm signal to the supervising station activates upon the initial alarm signal.
 - (3) Subsequent system operation is by either of the following means:
 - (a) Human action that activates the general fire alarm
 - (b) A feature that allows the control equipment to delay the general alarm by more than 1 minute after the start of the alarm processing



Fire Alarm

- **[F] 907.5.2.1 Audible alarms.** Audible alarm notification appliances shall be provided and emit a distinctive sound that is not to be used for any purpose other than that of a fire alarm. *In Group I-2 occupancies, audible appliances located in patient areas shall be only chimes or similar sounding appliances for alerting staff. See Section 907.5.2.5.*

Exceptions:

1. Audible alarm notification appliances are not required in critical care areas of Group I-2 occupancies that are in compliance with Section 907.5.2.5.
2. A visible *alarm notification appliance* installed in a nurses' control station or other continuously attended staff location in a Group I-2 care suite shall be an acceptable alternative to the installation of audible alarm notification appliances throughout a care suite in Group I-2 occupancies that are in compliance with Section 907.5.2.5.



Fire Alarm

- [F] 907.5.2 Alarm notification appliances.
 - [F] 907.5.2.1 Audible alarms.
 - [F] 907.5.2.1.3 Audible signal frequency in Group R-1 and R-2 sleeping rooms. Audible signal frequency in Group R-1 and R-2 occupancies shall be in accordance with Sections 907.5.2.1.3.1 and 907.5.2.1.3.2.
 - [F] 907.5.2.1.3.1 Fire alarm system signal. In sleeping rooms of Group R-1 and R-2 occupancies, the audible alarm activated by a fire alarm system shall be a 520-Hz low-frequency signal complying with NFPA 72.



Fire Alarm

- [F] 907.5.2 Alarm notification appliances.
 - [F] 907.5.2.1 Audible alarms.
 - [F] 907.5.2.1.3 Audible signal frequency in Group R-1 and R-2 sleeping rooms.
 - [F] 907.5.2.1.3.2 Smoke alarm signal in sleeping rooms. In sleeping rooms of Group R-1 and R-2 occupancies that are required by Section 907.2.8 or 907.2.9 to have a fire alarm system, the audible *alarm signal* activated by single- or multiple-station smoke alarms in the *dwelling unit* or *sleeping unit* shall be a 520-Hz signal complying with NFPA 72. Where a sleeping room smoke alarm is unable to produce a 520-Hz signal, the 520-Hz *alarm signal* shall be provided by a *listed* notification appliance or a smoke detector with an integral 520-Hz sounder.



Fire alarm

- Where a fire alarm system is required in Group R-1 and R-2 occupancies, the fire alarm system signal in the sleeping area must be a 520 Hz low-frequency signal that complies with NFPA 72.



Fire Alarm

- 907.5.2.1.4 Audible alarm signal.** *The audible signal shall be the standard fire alarm evacuation signal, ANSI S3.41 Audible Emergency Evacuation Signal, “three pulse temporal pattern,” as described in NFPA 72.*

Exception: *The use of the existing evacuation signaling scheme shall be permitted where approved by the enforcing agency.*

This SFM amendment is renumbered.



Fire Alarm

- [F] 907.5.2.3 Visible alarms. Visible alarm notification appliances shall be provided in accordance with Sections 907.5.2.3.1 through 907.5.2.3.4.

Exceptions:

1. *In other than Group I-2 and I-2.1*, visible alarm notification appliances are not required in *alterations*, except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.
2. Visible alarm notification appliances shall not be required in enclosed *exit stairways*, *enclosed exit ramps*, *exterior exit stairs and exterior exit ramps*.
3. Visible alarm notification appliances shall not be required in elevator cars.



Fire Alarm

- [F] 907.5.2.3 Visible alarms.

Exceptions (continued)

4. Visual alarm notification appliances are not required in critical care areas of Group I-2 occupancies that are in compliance with Section 907.5.2.5.
5. A visible *alarm notification appliance* installed in a nurses' control station or other continuously attended staff location in a Group I-2 *care suite* shall be an acceptable alternative to the installation of visible alarm notification appliances throughout the *care suite* in Group I-2 occupancies that are in compliance with Section 907.5.2.5.



Fire Alarm

- State Fire Marshal amendments to audible and visible alarm notification appliance requirements limit the application of exceptions permitting omissions to care suites in Group I-2 occupancies.



Means of Egress

CHAPTER 10

Means of Egress

**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 Sprinkler System (feet)		With Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
I-2 ^d , I-2.1, I-4	10	NP ⁱ	NP ⁱ	75 ^a

i. In accordance with Health and Safety Code Section 13113(d), there is no requirement for automatic sprinkler protection in an existing Group I-2 located in Type IA construction.



Means of Egress

- Table 1006.2.1 indicates unsprinklered Group I-2 occupancies are not permitted. Footnote i indicates that in accordance with Health & Safety Code Section 13113(d), existing unsprinklered Group I-2 occupancies of Type I construction are permitted.
- At the time that unsprinklered Group I-2 occupancies were permitted, maximum common path of egress travel distance requirements were not a requirement of the building code.
- Such facilities are to be considered in compliance with the code that they were required to comply with at the time of construction. CBC Section 102.6



Means of Egress

- **102.6 Existing structures.** The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as otherwise specifically provided in this code, the California Existing Building Code, the International Property Maintenance Code, the California Fire Code, or as is deemed necessary by the building official for the general safety and welfare of the occupants and the public.
 - **102.6.2 Buildings previously occupied.** The legal occupancy of any building existing on the date of adoption of this code shall be permitted to continue without change, except as otherwise specifically provided in this code, the *International Fire Code* or *International Property Maintenance Code*, or as is deemed necessary by the *building official* for the general safety and welfare of the occupants and the public.

Means of Egress

- **1006.2.2.2 Refrigeration machinery rooms.** Machinery rooms larger than 1,000 square feet (93 m²) shall have not less than two *exits* or *exit access doorways*. Where two *exit access doorways* are required, one such doorway is permitted to be served by a fixed ladder or an *alternating tread device*. *Exit access doorways* shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of the room.
 - All portions of machinery rooms shall be within 150 feet (45 720 mm) of an *exit* or *exit access doorway*.
 - *Exit* and *exit access doorways* shall swing in the direction of egress travel and shall be equipped with *panic hardware*, regardless of the *occupant load* served. *Exit* and *exit access doorways* shall be tight fitting and *self-closing*.



Means of Egress

- **1006.2.2.2 Refrigeration machinery rooms.**
- A State Fire Marshal amendment deletes an IBC provision allowing for an increase in the exit access travel distance in a refrigeration machinery room.
- An ICC revision requires the exit and exit access doors swing in the direction of egress travel and be provided with panic or fire exit hardware.



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."



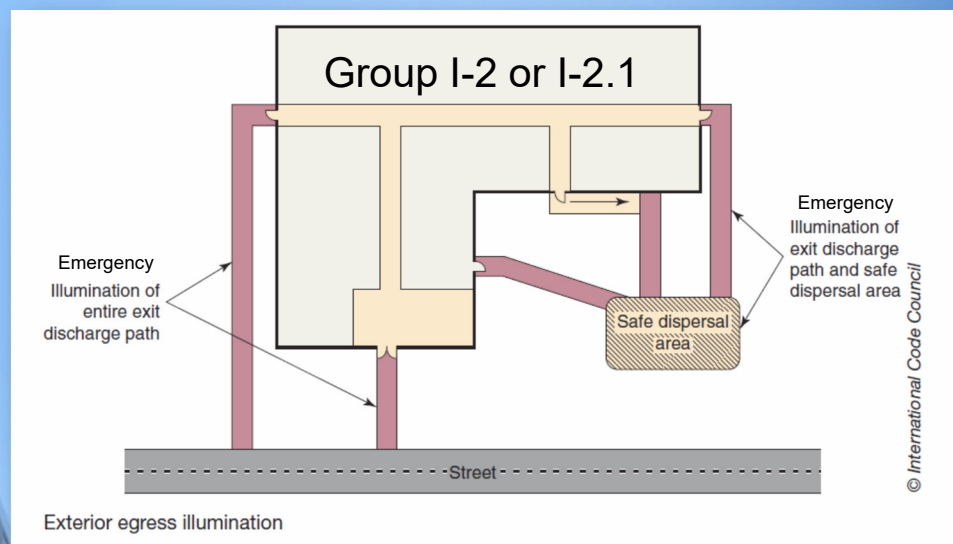
Illumination of the Exit Discharge

- 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.



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).

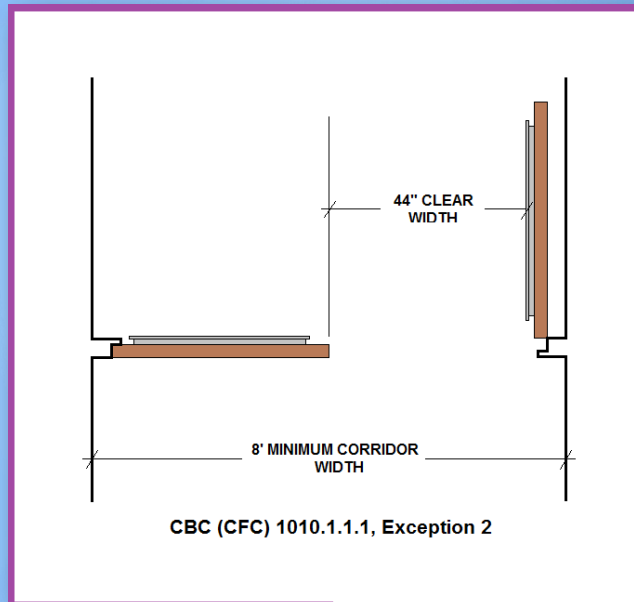


Size of Doors

- 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



Size of Doors

- 1010.1.1 Size of doors.

Exceptions:

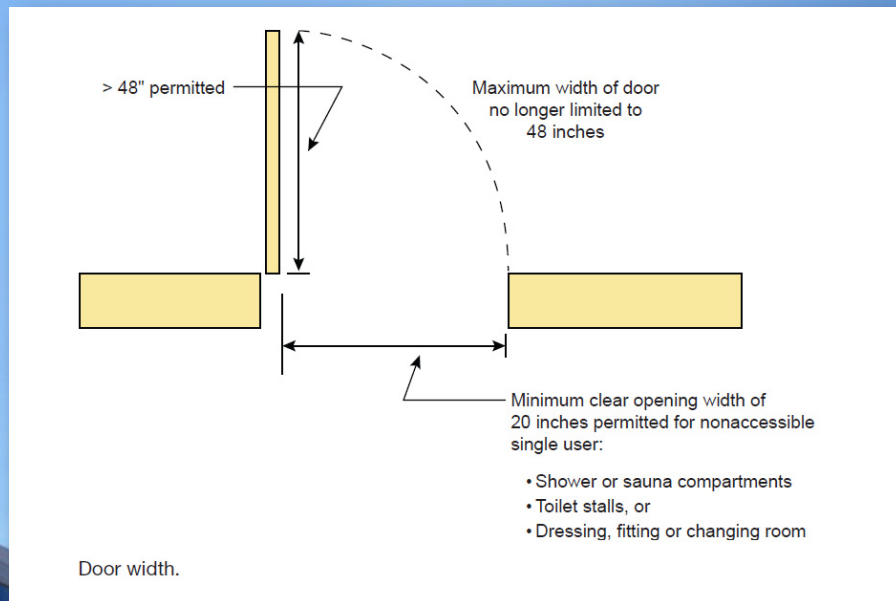
11. Doors serving nonaccessible single-user shower or sauna compartments, toilet stalls or dressing, fitting or changing rooms shall have a minimum clear opening width of 20 inches (508 mm).

There is no limit on the maximum dimension of a swinging door.

Doors serving nonaccessible single-user spaces identified in Exception 11 need only be 20" clear width.



Size of Doors



Means of Egress

- **1010.1.1.1 Projections into clear opening.** There shall not be projections into the required clear opening width lower than 34 inches (864 mm) above the floor or ground. Projections into the clear opening width between 34 inches (864 mm) and 80 inches (2032 mm) above the floor or ground shall not exceed 4 inches (102 mm).

Exceptions:

1. Door closers, overhead door stops, power door operators, and electromagnetic door locks shall be permitted to be 78 inches (1980 mm) minimum above the floor.
2. *In a Group I-2 or I-2.1 occupancy, there shall be no projections into the clear width of doors used for the movement of beds and stretcher patients in the means of egress.*



Means of Egress

- **1010.1.1.1 Projections into clear opening.**
- **Power door operators and electromagnetic locks are permitted to extend down into the clear opening height.** Door stops are the overhead stops that are a part of the door frame and not some other type of device mounted on the wall, ceiling or other part of the egress path that in some manner restricts how far the door can open.



Means of Egress

- **1010.1.3 Forces to unlatch and open doors.** The forces to unlatch doors shall comply with the following:
 1. Where door hardware operates by push or pull, the operational force to unlatch the door shall not exceed 15 pounds (67 N).
 2. Where door hardware operates by rotation, the operational force to unlatch the door shall not exceed 28 inch-pounds (315 N-cm).
- The force to open doors shall comply with the following:
 1. For interior swinging egress doors that are manually operated, other than doors required to be fire rated, the force for pushing or pulling open the door shall not exceed 5 pounds (22 N).
 2. For other swinging doors, sliding doors or folding doors, and doors required to be fire rated, the door shall require not more than a 30-pound (133 N) force to be set in motion and shall move to a full open position when subjected to not more than a 15-pound (67 N) force.



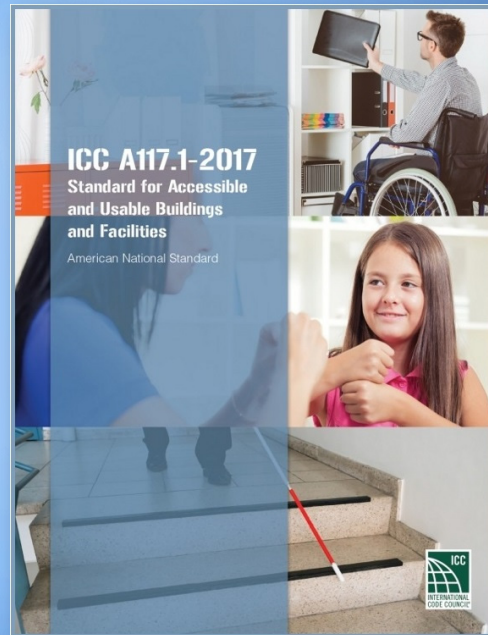
Means of Egress

- Operational force required to operate rotating hardware is expressed in inch-pounds.
- Requirements in building code are coordinated with ICC A117.1



Means of Egress

What is ICC A117.1?



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

- 1010.2.5 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. The 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

- **1010.2.9.1 Refrigeration machinery room.** Refrigeration machinery rooms larger than 1,000 square feet (93 m²) shall have not less than two exit or exit access doorways that swing in the direction of egress travel and shall be equipped with *panic hardware* or *fire exit hardware*.

Requirements for refrigeration machinery room panic or fire exit hardware are located in the Panic and Exit Hardware Section 1010.2.9. This requirement also appears in Section 1006.2.2.2.



Means of Egress

- **1010.2.9.2 Rooms with electrical equipment.** Exit or exit access doors serving transformer vaults, rooms designated for batteries or energy storage systems, or modular data centers shall be equipped with panic hardware or fire exit hardware. Rooms containing electrical equipment rated 800 amperes or more that contain overcurrent devices, switching devices or control devices and where the exit or exit access door is less than 25 feet (7620 mm) from the equipment working space as required by NFPA 70, such doors shall not be provided with a latch or lock other than *panic hardware* or *fire exit hardware*. The doors shall swing in the direction of egress travel.

Requirements for electrical equipment room panic or fire exit hardware are located in the Panic and Exit Hardware Section 1010.2.9.



Means of Egress

- **1017.3.2 Atriums.** Exit access travel distance for areas open to an *atrium* shall comply with the requirements of Sections 1017.3.2.1 through 1017.3.2.3.
 - **1017.3.2.1 Egress not through the atrium.** Where required access to the exits is not through the *atrium*, exit access travel distance shall comply with Section 1017.2.
 - **1017.3.2.2 Exit access travel distance at the level of exit discharge.** Where the path of egress travel is through an *atrium* space, exit access travel distance at the *level of exit discharge* shall be determined in accordance with Section 1017.2.



Means of Egress

- 1017.3.2 Atriums (continued).
 - 1017.3.2.3 Exit access travel distance at other than the level of exit discharge. Where the path of egress travel is not at the *level of exit discharge* from the *atrium*, that portion of the total permitted exit access travel distance that occurs within the *atrium* shall be not greater than 200 feet (60 960 mm).
 - 1017.3.2.4 Group I and R-2.1 occupancy means of egress. Required means of egress from sleeping rooms in Group I and R-2.1 occupancies shall not pass through the atrium.
- Means of egress provisions for atriums are located in Section 1017.3.2.



Means of Egress

**TABLE 1020.2
CORRIDOR FIRE-RESISTANCE RATING**

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system
I-2 ^a , I-2.1	Greater than six	1	1

- State Fire Marshal amendments require 1 hour fire-resistance rated corridor construction.



Means of Egress

**[BE] TABLE 1020.3
MINIMUM CORRIDOR WIDTH**

OCCUPANCY	MINIMUM WIDTH (inches)
<i>Corridors in Group I-2 and I-3 occupancies serving any area caring for one or more <u>nonambulatory</u> persons. ^a</i>	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.

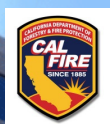


Means of Egress

- 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:

- 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 (9144 mm).



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.



Means of Egress

- **1024.8 Exit passageway exterior walls.** Exterior walls of the exit passageway shall comply with Section 705. Where nonrated walls or unprotected openings enclose the exterior of the exit passageway and the walls or openings are exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), the building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a fire-resistance rating of not less than 1 hour. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the floor of the exit passageway, or to the roof line, whichever is lower.



Means of Egress

- Protection of construction adjacent to the exterior walls of exit passageways requires protection in a manner similar to that required for the exterior walls of interior exit stairs and ramps.



Exterior Walls

- Metal Composite Panels



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.



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.



Roof Assemblies

- **1503.3 Parapet walls.** Parapet walls shall be coped or covered in accordance with Sections 1503.3.1 and 1503.3.2. The top surface of the parapet wall shall provide positive drainage.
 - **1503.3.1 Fire-resistance-rated parapet walls.** *Parapet walls* required by Section 705.11 shall be coped or covered with weatherproof materials of a width not less than the thickness of the *parapet wall* such that the *fire resistance rating* of the wall is not decreased.
 - **1503.3.2 Other parapet walls.** *Parapet walls* meeting one of the exceptions in Section 705.11 shall be coped or covered with weatherproof materials of a width not less than the thickness of the *parapet wall*.



Roof Assemblies

- There is no requirement that coping on a parapet be noncombustible. The coping or covering of a parapet must be weatherproof, be the same thickness of the parapet and not decrease the fire-resistance rating.



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.



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

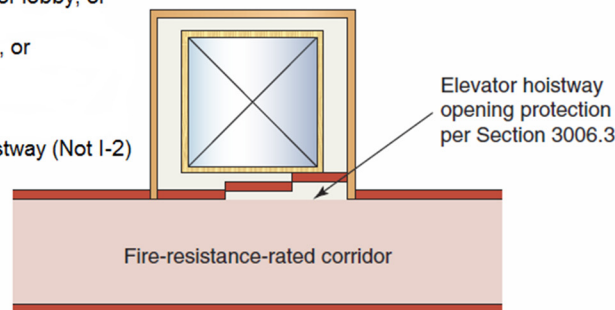
- **3006.3 Hoistway opening protection.** Where Section 3006.2 requires protection of the elevator hoistway door opening, the protection shall be provided by one of the following:
 - 5. *[SFM] Enclosed elevator lobbies are not required where the hoistway door has a fire-protection rating as required 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.



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 72-2016, 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.



