



Fire Resistive Rated Assemblies

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Chief Fire and Life Safety Officer



PART 1 FIRE AND SMOKE PROTECTION FEATURES

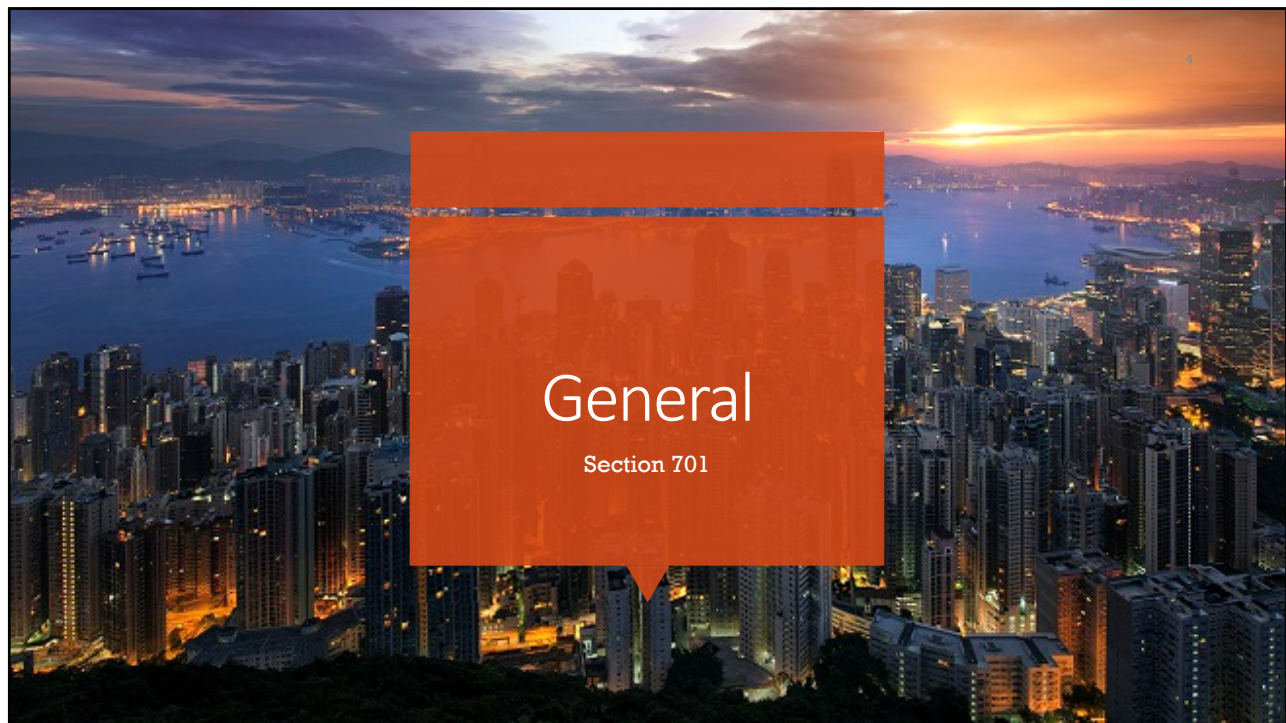
Chapter 7



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Fire & Smoke Protection Features

- Chapter 7 provides detailed requirements for fire-resistance-rated **construction**, including structural members, walls, partitions and horizontal assemblies.
- Other portions of the code describe **where** certain fire-resistance-rated elements are required.
- Chapter 7 specifies **how** these elements are constructed, **how** openings in walls and partitions are protected and **how** penetrations of such elements are protected.



General

Section 701

General




- **701.1 Scope.** The provisions of this chapter shall govern the materials and assemblies used for structural fire resistance and fire-resistance-rated construction separation of adjacent spaces to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings.



Multiple Use Fire Assemblies

Section 702

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Multiple Use Fire Assemblies

- **702.1 Multiple use fire assemblies.** Fire assemblies that serve multiple purposes in a building shall comply with all of the requirements that are applicable for each of the individual fire assemblies.

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Multiple Use Fire Assemblies

Multiple uses:

- Corridor Wall + Occupancy Separation
- Occupancy Separation + Smoke Barrier
- Exit Enclosure + Occupancy Separation
- Corridor Wall + Incidental Use

Must comply with the most restrictive requirements of each fire assembly

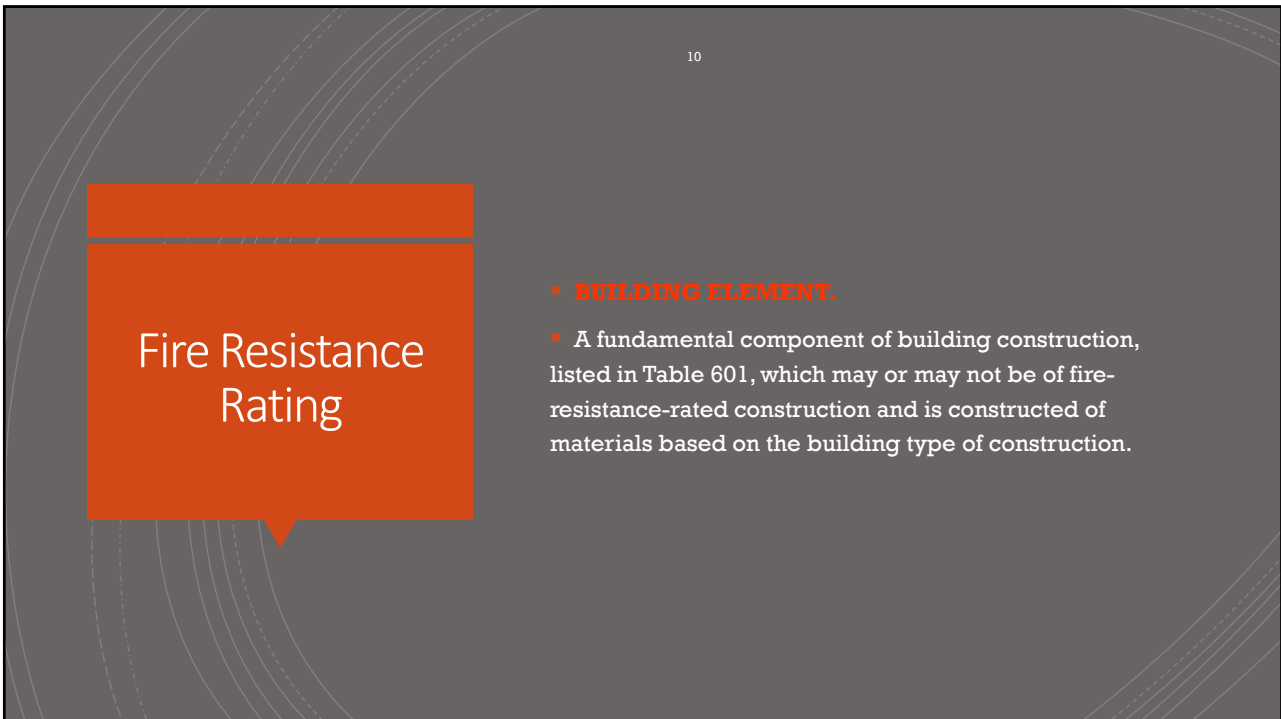
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Fire Resistance Rating

- **FIRE-RESISTANCE RATING.** The period of time a building element, component or assembly maintains the ability to confine a fire, continues to perform a given structural function, or both, as determined by the tests, or the methods based on tests, prescribed in Section 703.
- Not to be confused with fire protection rating.

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Fire Resistance Rating

- **BUILDING ELEMENT.**
- A fundamental component of building construction, listed in Table 601, which may or may not be of fire-resistance-rated construction and is constructed of materials based on the building type of construction.

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

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE
	A	B	A	B	A	B	HT	A
Primary structural frame ^e (see Section 202)	3 ^b	2 ^b	1 ^b	0	1 ^b	0	HT	1 ^b
Bearing walls								
Exterior ^{e, f}	3	2	1	0	2	2	2	1
Interior	3 ^a	2 ^a	1	0	1	0	1/HT	1
Nonbearing walls and partitions	See Table 602							
Exterior	See Table 602							
Interior ^d	0	0	0	0	0	0	See Section 2304.11.2	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1
Roof construction and associated secondary members (see Section 202)	1 1/2 ^b	1 ^{b,c}	1 ^{b,c}	0 ^c	1 ^{b,c}	0	HT	1 ^{b,c}

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof or other structure.

b. 1. Except in Group A, E, F-1, H, I, L, M, R-1, R-2, R-2.1 and S-1 occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

b. 2. For Group A, E, L, L, R-1, R-2, and R-2.1 occupancies, high-rise buildings, and other applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, fire protection of members other than the primary structural frame shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed for such unprotected members.

b. 3. One-story portions of Group A and E assembly occupancies the roof-framing system of Type II A or Type III A construction may be of unprotected construction when such roof-framing system is open to the assembly area and does not contain concealed spaces.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

Fire Resistance Rating

Fire Protection Rating









- **FIRE PROTECTION RATING.** The period of time that an opening protective will maintain the ability to confine a fire as determined by tests prescribed in Section 716. Ratings are stated in hours or minutes.
- Not to be confused with fire resistance rating.



Fire Protection Rating

OPENING PROTECTIVE









A fire door assembly, fire shutter assembly, fire window assembly or glass-block assembly in a fire-resistance-rated wall or partition.

-  EXISTING WALL
-  EXISTING 1 HOUR RATED WALL
-  NEW 2 HOUR RATED WALL
-  EXISTING 2 HOUR RATED WALL
-  NEW 2 HOUR RATED WALL
-  EXISTING 3 HOUR RATED WALL

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What we receive

15

-  3 HOUR FR WALLS
-  2 HOUR FR WALLS
-  4 HOUR FR BARRIERS
-  3 HOUR FR BARRIERS
-  2 HOUR FR BARRIERS
-  1 HOUR FR BARRIERS
-  1 HOUR FR PARTITIONS
-  SMOKE BARRIERS


Tip: Showing fire-rated walls on all architectural, mechanical, electrical, and deferred approval drawings will facilitate the plan review process.


What the code says and what we need


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Special Rated Wall Designations


- For Fire Barrier walls which have special functions that need to be identified in plans, the following may be used:


Horizontal Exit or Exit Passage (Two-Hour) 
- Smoke Partitions which enclose Elevator Lobbies and Smoke Barrier Walls which separate Smoke Compartments should use a unique graphic:

Non-Rated Smoke Partition 

One-Hour Smoke Barrier 
- Fire Walls (CBC 706) where separations create Separate Buildings and have limited, or no penetrations, and must be continuous from exterior wall to exterior wall should use the following graphic:

Two-Hour Fire Wall 

Three-Hour Fire Wall 

Four-Hour Fire Wall 

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Provisions of CBC Chapter 7

Fire and Smoke Protection Features Drawings should include details of fire resistance requirements for the following:

- Provisions for fire-resistance ratings of structural members exterior walls, fire walls and fire barriers
- Location and construction of shaft enclosures
- Provisions for the fire-resistance ratings of fire partitions, smoke barriers, smoke partitions and horizontal assemblies
- Provisions for the fire-resistance protection of penetrations and fire-resistant joint systems
- Details and locations of opening protective, ducts and air transfer openings
- Provisions for fire blocking and draft stopping concealed spaces
- References to the prescriptive fire-resistance tables in the CBC, fire tests from approved laboratories or fire resistance calculations

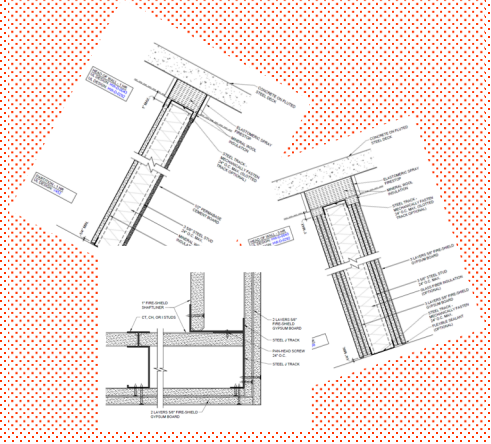
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Wall Priority

DATE: 11/05/13
SCALE: 2"=1'-0"

INTERSECTIONS OF RATED PARTITIONS
DETAIL: SS 505

National Gypsum
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Wall Priority

WALL/PARTITION PRIORITY LEGEND*	
WALL/PARTITION DESCRIPTION	PRIORITY
4 HR FIRE BARRIER OR FIRE WALL	1 (Highest)
3 HR FIRE BARRIER OR FIRE WALL	2
2 HR FIRE WALL	3
2 HR FIRE BARRIER SHAFT WALL	4
2 HR FIRE BARRIER EXIT CONSTRUCTION INTERIOR EXIT STAIR INTERIOR EXIT RAMP EXIT PASSAGEWAY HORIZONTAL EXIT	5
2 HR FIRE BARRIER & SMOKE BARRIER	6
2 HR FIRE BARRIER	7
1 HR FIRE BARRIER EXIT CONSTRUCTION INTERIOR EXIT STAIR INTERIOR EXIT RAMP EXIT PASSAGEWAY	8
1 HR FIRE BARRIER	9
1 HR SMOKE BARRIER	10
1 HR FIRE PARTITION	11
NONRATED SMOKE PARTITION	12
NONRATED PARTITION	13 (Lowest)

* See CBC Section 705 for Exterior Walls.

Fire Wall
CBC 706

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- **FIRE WALL.** A fire-resistance-rated wall having protected openings, which restricts the spread of fire and extends continuously from the foundation to or through the roof, with sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall.
- A fire wall, unlike a fire barrier or a fire partition, must be constructed so it will remain in place if the construction on either side of it collapses.
- The code applies the term "fire wall" to vertically constructed assemblies only and not to horizontal assemblies. No horizontal offsets are permitted.

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A graphic with a background of a brick wall and flames. On the left, an orange speech bubble contains the text "Fire Wall Types". On the right, there are two icons: a flame icon above the text "Fire Walls" and a party balloon icon above the text "Party Walls".

Fire Wall Types

Fire Walls Party Walls

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Fire Walls

A photograph showing a fire wall in a demolition site. The wall is made of brick and is partially destroyed, with debris scattered around it. A blue tarp is visible in the background.

■ **706.1 General.** Fire walls shall be constructed in accordance with Sections 706.2 through 706.11. The extent and location of such fire walls shall provide a complete separation. Where a fire wall also separates occupancies that are required to be separated by a fire barrier wall, the most restrictive requirements of each separation shall apply.

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Fire Walls

When are they required?

- Separating two different types of construction
- To allow for area and height increase
- Two adjacent walls of buildings that share lot line

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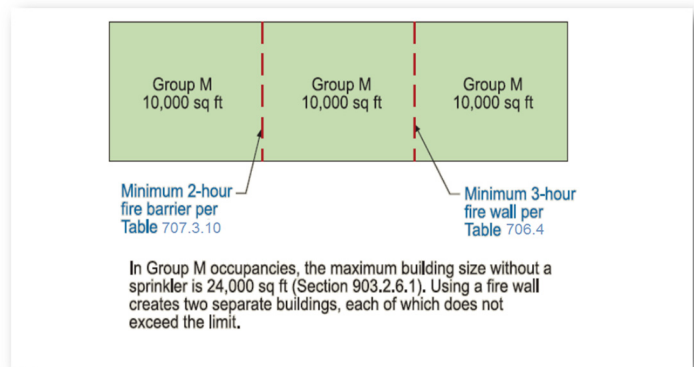
Group M
Type VB

Group B
Type IIB

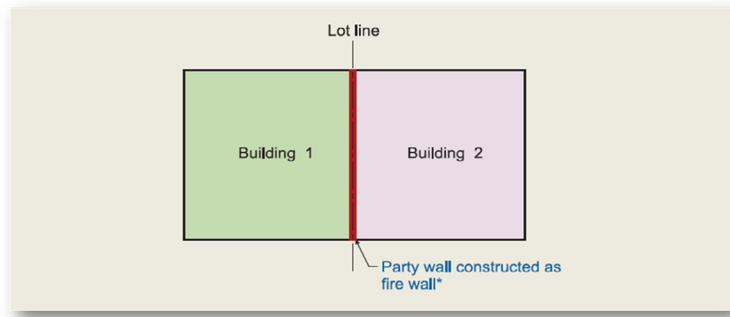
Minimum 3-hour fire wall
per Table 706.4

Fire wall creates two buildings,
permitting independent construction
types in each building

Two different types of construction



Area and height increase



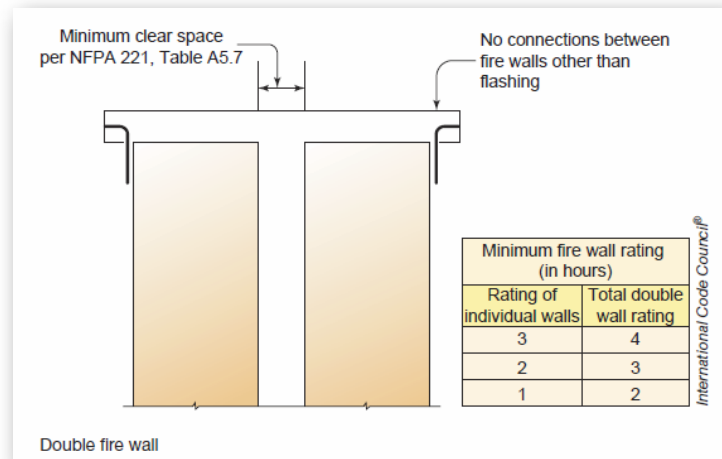
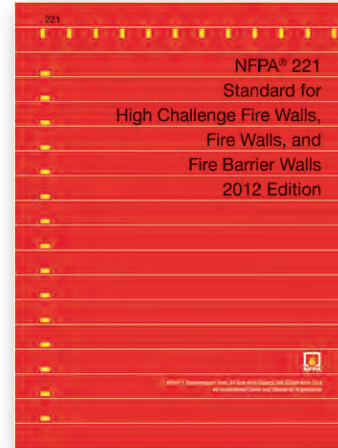
Fire Wall (Party Wall CBC 706.1.1)

- *Occupancy classifications and construction types of both buildings 1 and 2 determine fire-resistance rating of fire wall. See Table 706.4.

Fire Walls

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



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While acceptable for use in a new structure, double fire walls are most advantageous where an addition is being constructed adjacent to an existing building and the intent is to regulate the addition as a separate building under the fire wall provisions.

Fire Walls

For masonry walls, the NCMA TEK Bulletin 5-8B contains helpful information.

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Length of bay perpendicular to fire wall, ft (m)	Minimum clearance "A" for steel frame exposure, in. (mm)
20 (6.10)	2 1/2 (64)
25 (7.62)	3 1/2 (89)
30 (9.14)	3 1/2 (89)
35 (10.67)	4 1/2 (114)
40 (12.19)	5 (127)
45 (13.72)	5 1/2 (140)
50 (15.24)	6 1/2 (165)
55 (16.76)	7 (178)
	7 1/2 (191)

Figure 706.2(1)
DETAILS OF MASONRY FIRE WALL FOR STABILITY
(Compliments of NCMA)

Fire Walls

The Gypsum Association's Fire Resistance Design Manual contains construction details for area separation walls (party wall/fire walls) which have been accepted as fire walls.

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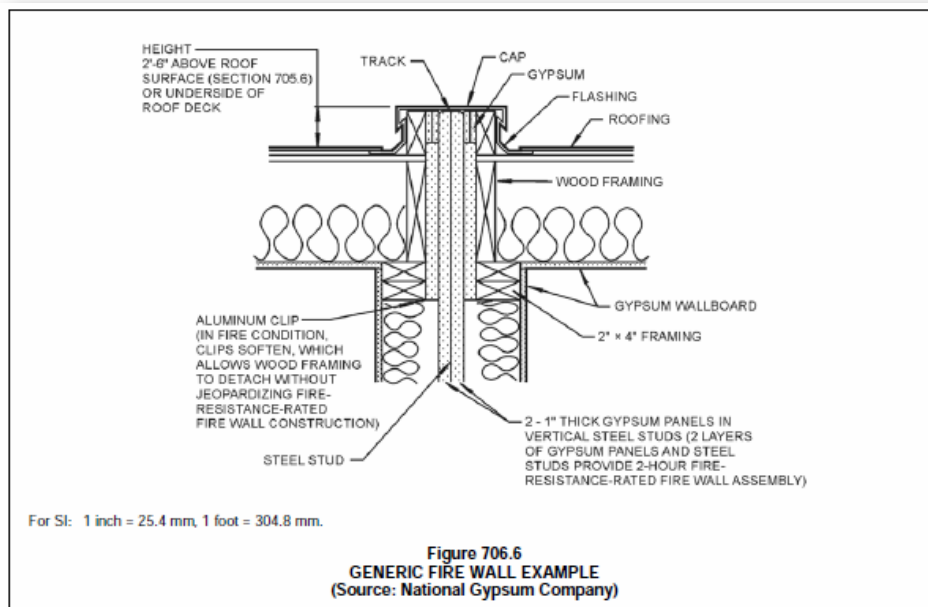
Figure 706.2(2)
DETAILS OF GYPSUM BOARD AREA SEPARATION WALLS (FIREWALL)
(Compliments of Gypsum Association)

Fire Walls

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Fire



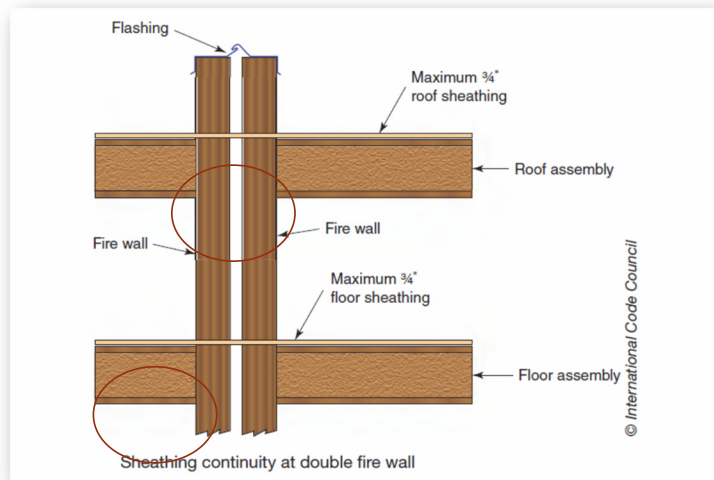
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Fire Walls

- **...706.2 Structural stability.**
- **Exception:** In Seismic Design Categories D through F, where double fire walls are used in accordance with NFPA 221, floor and roof sheathing not exceeding 3/4 inch thickness shall be permitted to be continuous through the wall assemblies of light frame construction.

These Seismic Design Categories are applicable to structures regulated by OSHPD.

706.2 Structural stability
What the exception looks like





Fire Walls

- **706.3 Materials.** Fire walls shall be of any approved noncombustible materials.
Exception: Buildings of Type V construction.
- **706.4 Fire-resistance rating.** Firewalls shall have a fire-resistance rating of not less than that required by Table 706.4

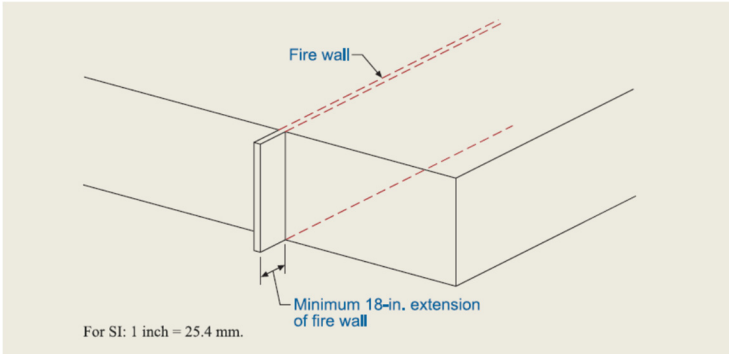
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**TABLE 706.4
FIRE WALL FIRE-RESISTANCE RATINGS**

GROUP	FIRE-RESISTANCE RATING (hours)
A, B, E, H-4, I, R-1, R-2, R-2.1, R-2.2, U, L	3 ^a
F-1, H-3 ^b , H-5, M, S-1	3
H-1, H-2	4 ^b
F-2, S-2, R-3, R-4	2

a. In Type II or V construction, walls shall be permitted to have a 2-hour fire-resistance rating.
b. For Group H-1, H-2 or H-3 buildings, also see Sections 415.7 and 415.8.

Fire Walls



The diagram shows a 3D perspective of a fire wall assembly. A vertical fire wall is shown on the left, with a dashed red line extending horizontally from its exterior surface to the right. A dimension line below the wall indicates a "Minimum 18-in. extension of fire wall". A note at the bottom left states "For SI: 1 inch = 25.4 mm.".

Fire Walls

- **706.5 Horizontal continuity.** Fire walls shall be continuous from exterior wall to exterior wall and shall extend at least 18 inches beyond the exterior surface of exterior walls.

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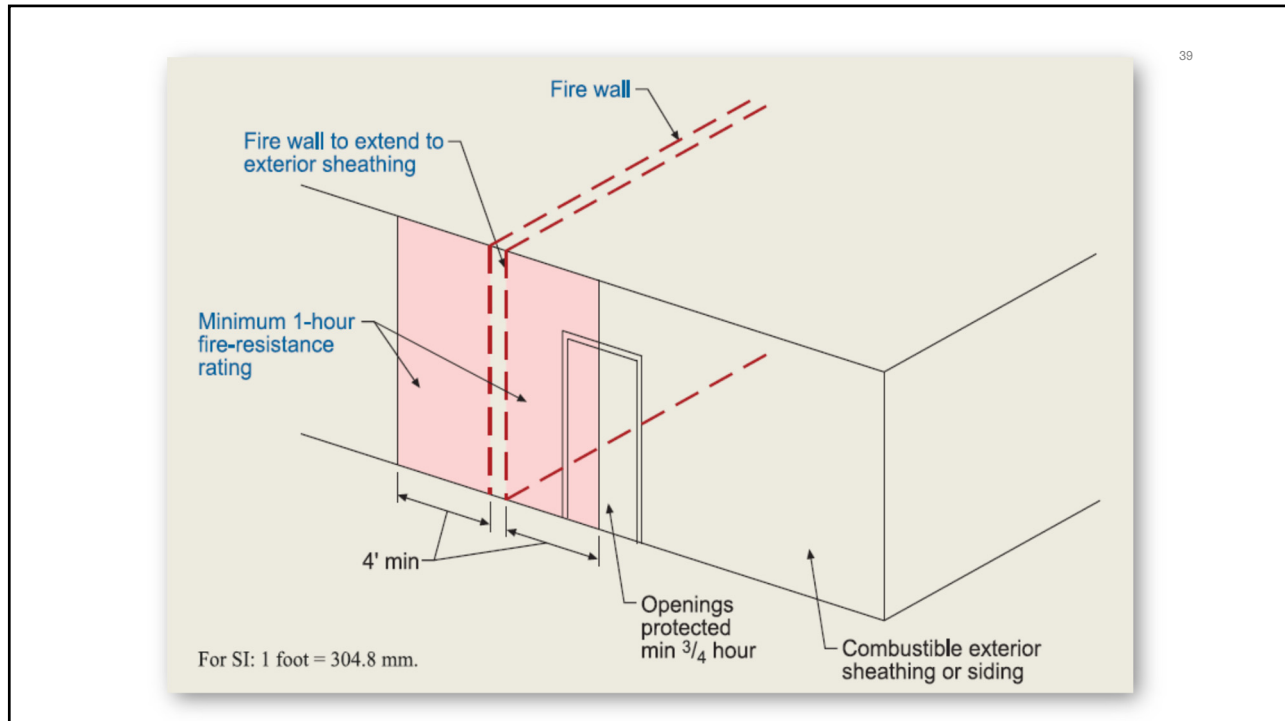
Fire Walls

Of course there are:

706.5 Horizontal continuity.

Exceptions:

1. Fire walls shall be permitted to terminate at the interior surface of combustible exterior sheathing or siding provided the exterior wall has a fire-resistance rating of at least 1 hour for a horizontal distance of at least 4 feet on both sides of the fire wall. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour.



706.5 Horizontal continuity.

Exceptions:

2. Fire walls shall be permitted to terminate at the interior surface of noncombustible exterior sheathing, exterior siding or other noncombustible exterior finishes provided the sheathing, siding, or other exterior noncombustible finish extends a horizontal distance of at least 4 feet on both sides of the fire wall.
3. Fire walls shall be permitted to terminate at the interior surface of noncombustible exterior sheathing where the building on each side of the fire wall is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

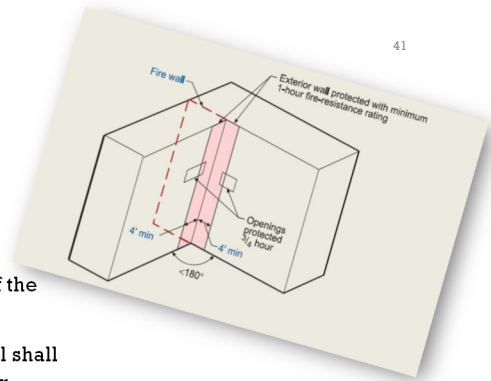
Fire Walls

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Fire Walls

- 706.5.1 Exterior walls.** Where the fire wall intersects exterior walls, the fire-resistance rating and opening protection of the exterior walls shall comply with **one** of the following:

- The exterior walls on both sides of the fire wall shall have a 1-hour fire-resistance rating with 3/4-hour protection where opening protection is required by Section 705.8. The fire-resistance rating of the exterior wall shall extend a minimum of 4 feet on each side of the intersection of the fire wall to exterior wall. Exterior wall intersections at fire walls that form an angle equal to or greater than 180 degrees do not need exterior wall protection.

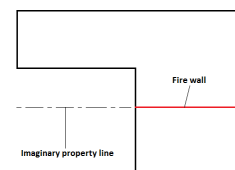
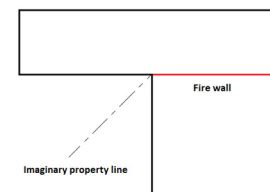
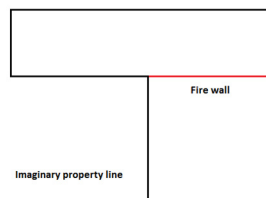


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Fire Walls

- 706.5.1 Exterior walls.**
- Or:**

- Buildings or spaces on both sides of the intersecting fire wall shall assume to have an imaginary lot line at the fire wall and extending beyond the exterior of the fire wall. The location of the assumed line in relation to the exterior walls and the fire wall shall be such that the exterior wall and opening protection meet the requirements set forth in Sections 705.5 and 705.8. Such protection is not required for exterior walls terminating at fire walls that form an angle equal to or greater than 180 degrees.



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Fire Walls

- **706.5.2 Horizontal projecting elements.** Fire walls shall extend to the outer edge of horizontal projecting elements such as balconies, roof overhangs, canopies, marquees and similar projections that are within 4 feet of the fire wall.

Exceptions:

1. Horizontal projecting elements without concealed spaces, provided the exterior wall behind and below the projecting element has not less than 1-hour fire-resistance-rated construction for a distance not less than the depth of the projecting element on both sides of the fire wall. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour.

Fire Walls

- **706.5.2 Horizontal projecting elements.**

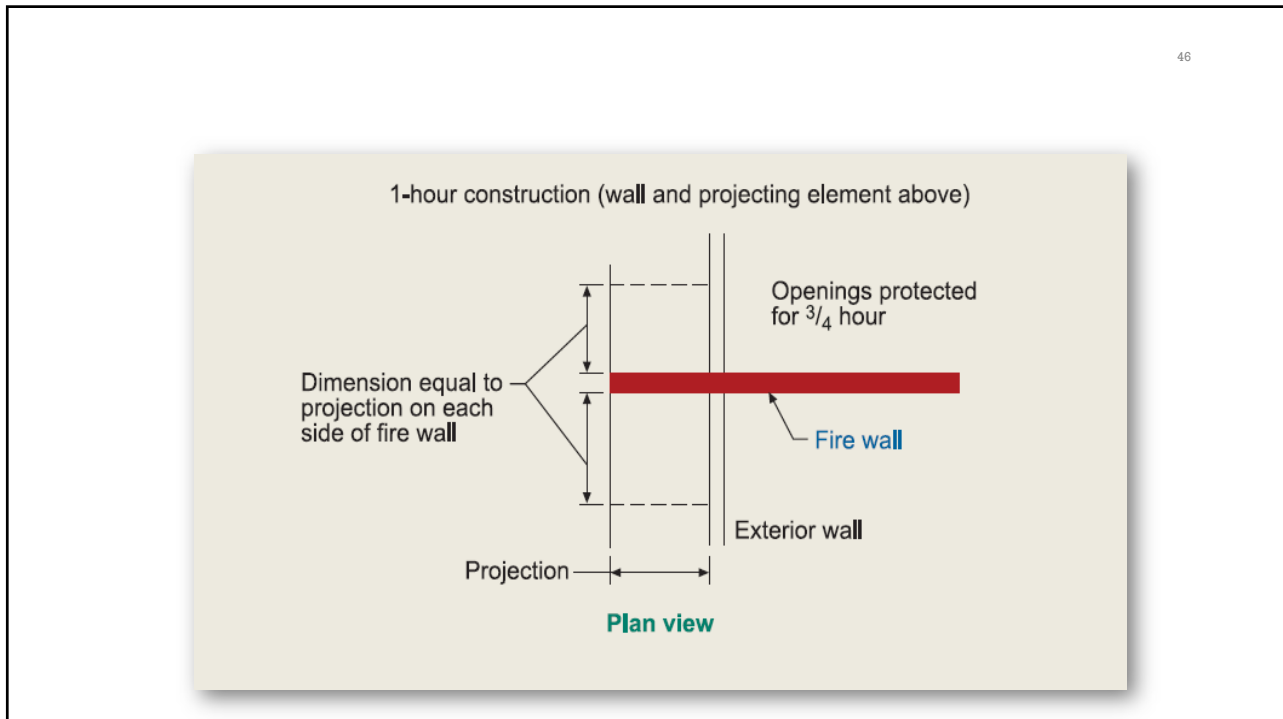
Exceptions continued:

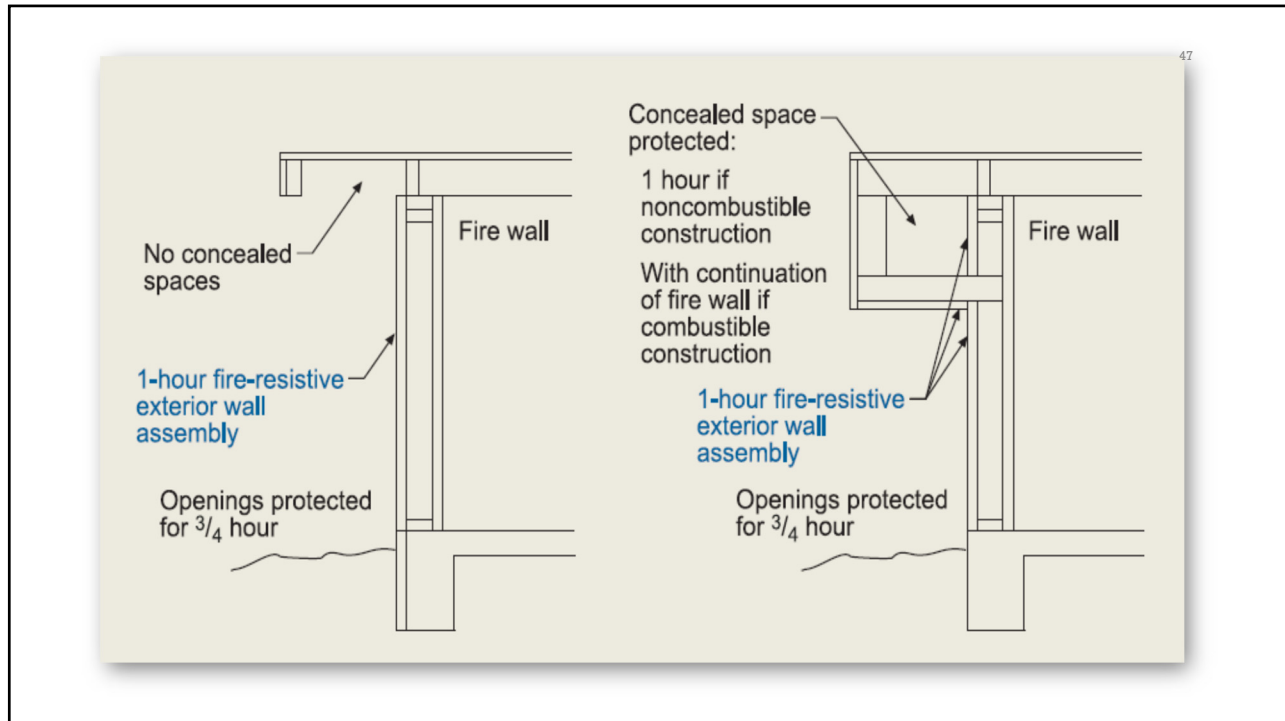
2. Noncombustible horizontal projecting elements with concealed spaces, provided a minimum 1-hour fire-resistance-rated wall extends through the concealed space. The projecting element shall be separated from the building by a minimum of 1-hour fire-resistance-rated construction for a distance on each side of the firewall equal to the depth of the projecting element. The wall is not required to extend under the projecting element where the building exterior wall is not less than 1-hour fire-resistance rated for a distance on each side of the fire wall equal to the depth of the projecting element. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour.

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Fire Walls

- **706.5.2 Horizontal projecting elements.**
 - Exceptions:**
 3. For combustible horizontal projecting elements with concealed spaces, the fire wall need only extend through the concealed space to the outer edges of the projecting elements. The exterior wall behind and below the projecting element shall be of not less than 1-hour fire-resistance-rated construction for a distance not less than the depth of the projecting elements on both sides of the fire wall. Openings within such exterior walls shall be protected by opening protectives having a fire-protection rating of not less than 3/4 hour.





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Fire Walls

- **706.6 Vertical continuity.**
- **706.6 Vertical continuity.** Fire walls shall extend from the foundation to a termination point at least 30 inches above both adjacent roofs.

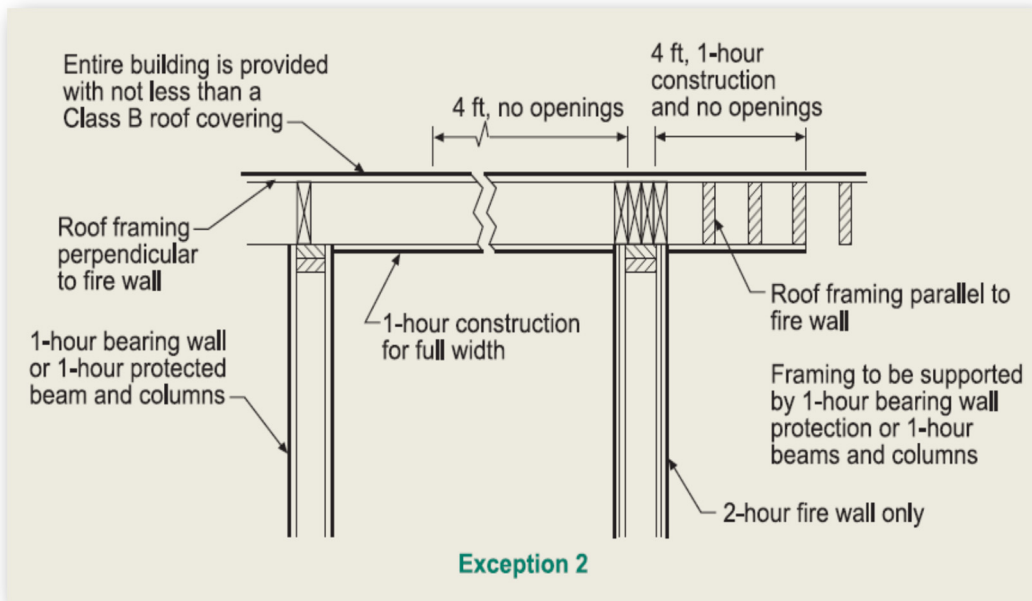
Exceptions:

1. Stepped buildings in accordance with Section 706.6.1
2. Two-hour fire-resistance-rated walls shall be permitted to terminate at the underside of the roof sheathing, deck or slab provided:
 - 2.1. The lower roof assembly within 4 feet of the wall has not less than a 1-hour fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.
 - 2.2. Openings in the roof shall not be located within 4 feet of the fire wall.
 - 2.3. Each building shall be provided with not less than a Class B roof covering.

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Fire Walls

- **706.6 Vertical continuity.**
 - Exceptions:**
 3. Walls shall be permitted to terminate at the underside of noncombustible roof sheathing, deck, or slabs where both buildings are provided with not less than a Class B roof covering. Openings in the roof shall not be located within 4 feet of the fire wall.

For SI: 1 foot = 304.8 mm. **Exception 3**

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Fire Walls

- **706.6 Vertical continuity.**
 - **Exceptions:**
 4. In buildings of Type III, IV and V construction, walls shall be permitted to terminate at the underside of combustible roof sheathing or decks provided:
 - 4.1. There are no openings in the roof within 4 feet of the fire wall,
 - 4.2. The roof is covered with a minimum Class B roof covering, and
 - 4.3. The roof sheathing or deck is constructed of fire-retardant-treated wood for a distance of 4 feet on both sides of the wall or the roof is protected with 5/8 inch Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of 2-inch nominal ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet on both sides of the fire wall.

Another version of the butterfly.

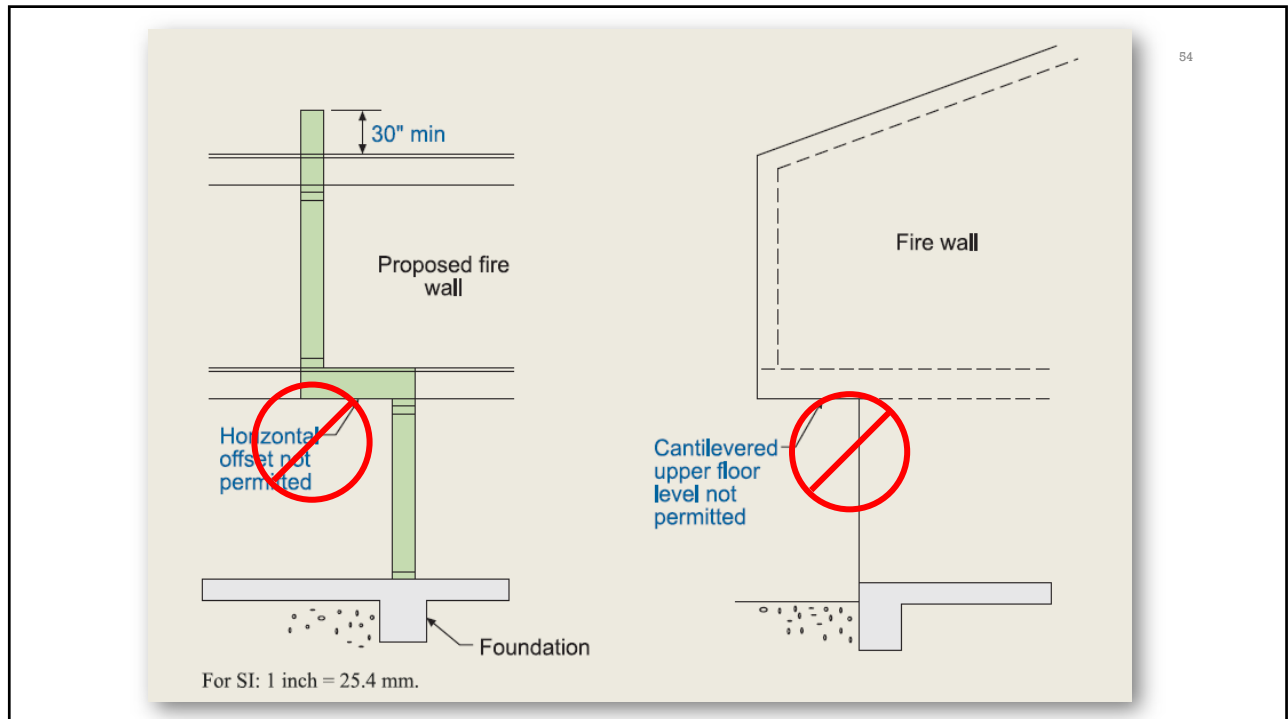
Fire Walls

- 706.6 Vertical continuity.

Exceptions:

5. In buildings designed in accordance with Section 510.2, fire walls located above the 3-hour horizontal assembly required by Section 510.2, Item 1 shall be permitted to extend from the top of this horizontal assembly.

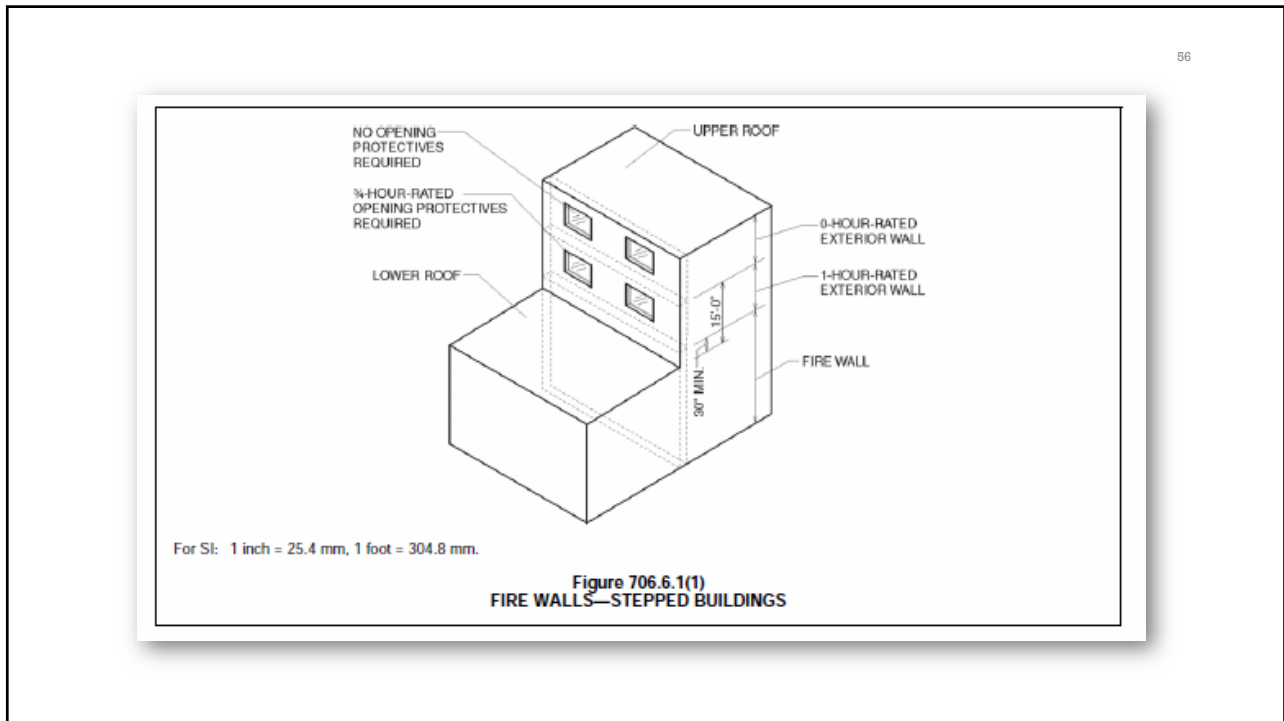
6. Buildings with sloped roofs in accordance with Section 706.6.2.

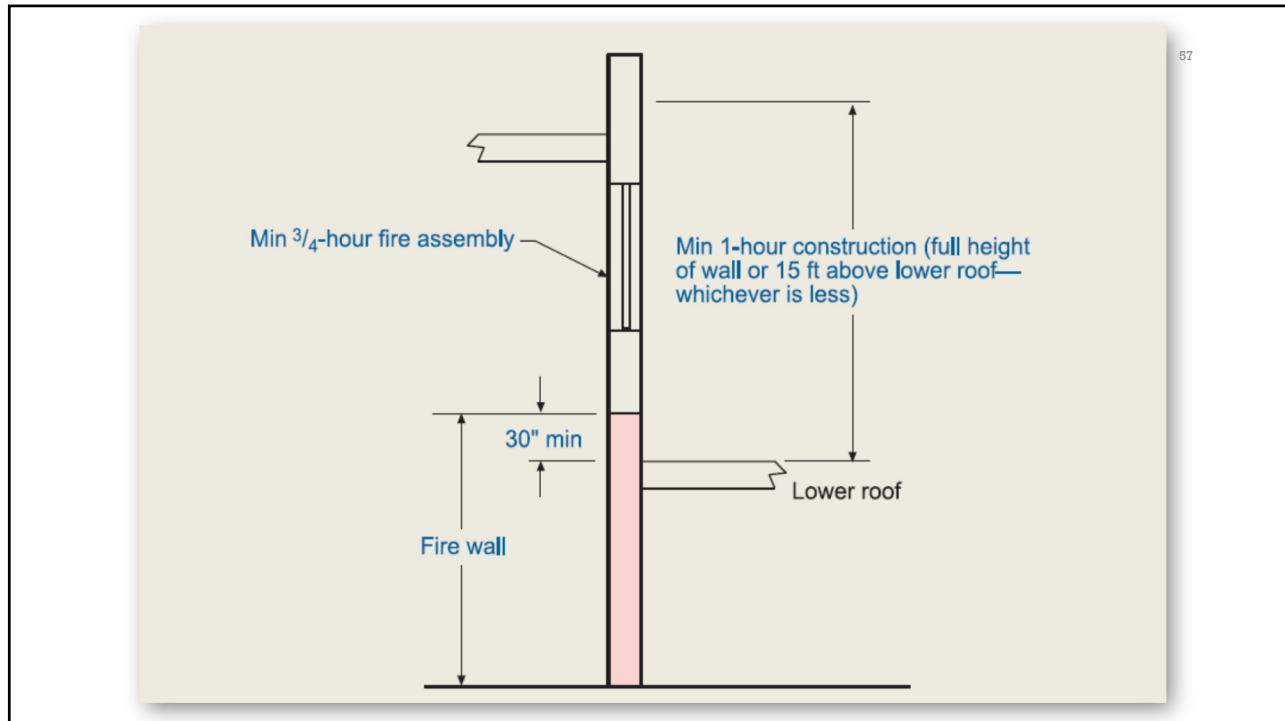


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706.6.1 Stepped buildings. Where a fire wall serves as an exterior wall for a building and separates buildings having different roof levels, such wall shall terminate at a point not less than 30 inches above the lower roof level, provided the exterior wall for a height of 15 feet above the lower roof is not less than 1-hour fire-resistance-rated construction from both sides with openings protected by fire assemblies having a fire protection rating of not less than 3/4 hour.

Fire Walls





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Fire Walls

For SI: 1 foot = 304.8 mm.

706.6.1 Stepped buildings

But yes, of course there is an exception:

Exception: Where the fire wall terminates at the underside of the roof sheathing, deck or slab of the lower roof, provided:

1. The lower roof assembly within 10 feet of the wall has not less than a 1-hour fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.
2. Openings in the lower roof shall not be located within 10 feet of the fire wall.

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Fire Walls

706.6.2 Buildings with sloped roofs. Where a fire wall serves as an interior wall for a building, and the roof on one side or both sides of the fire wall slopes toward the fire wall at a slope greater than two units vertical in 12 units horizontal (2:12), the fire wall shall extend to a height equal to the height of the roof located 4 feet from the fire wall plus 30 inches. In no case shall the extension of the fire wall be less than 30 inches.

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International Code Council®

Plan view

All hollow spaces to be solidly filled with noncombustible fireblocking materials

Section view

706.7 Combustible framing in fire walls. Adjacent combustible members entering into a concrete or masonry firewall from opposite sides shall not have less than a 4-inch distance between embedded ends. Where combustible members frame into hollow walls or walls of hollow units, hollow spaces shall be solidly filled for the full thickness of the wall and for a distance not less than 4 inches above, below and between the structural members, with noncombustible materials approved for fire blocking.

Fire Walls

Fire Barrier CBC 707



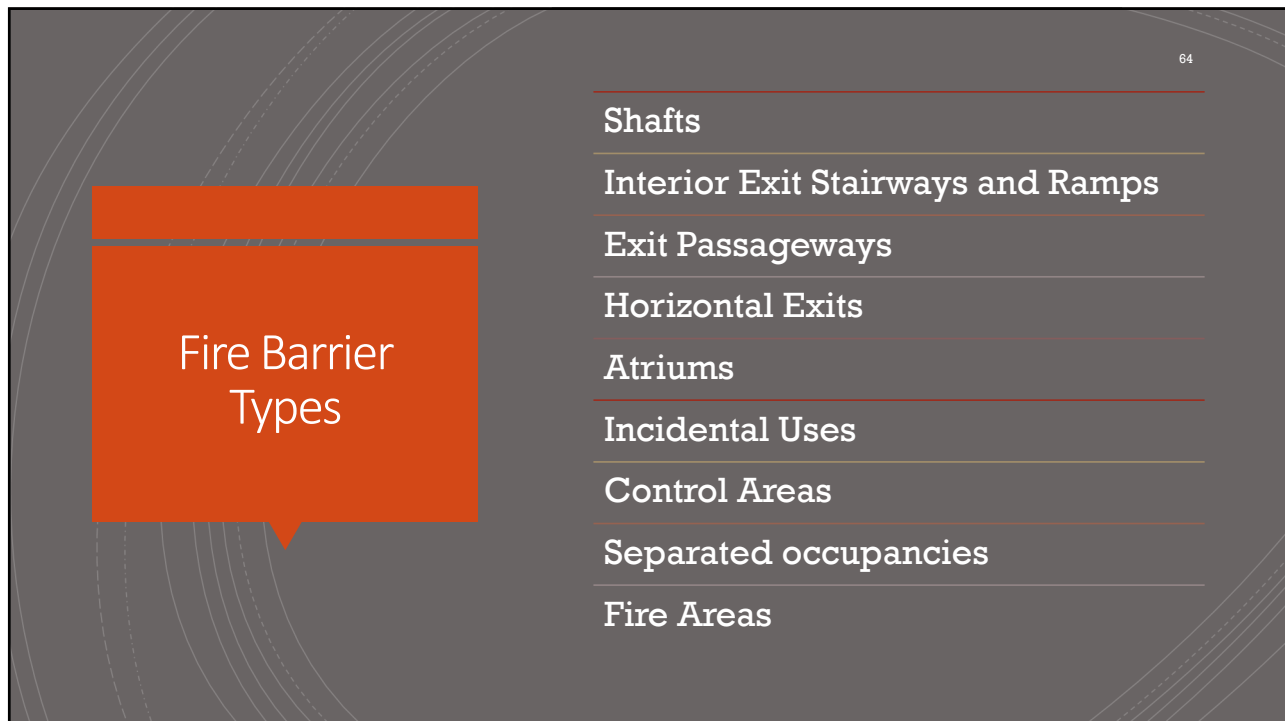
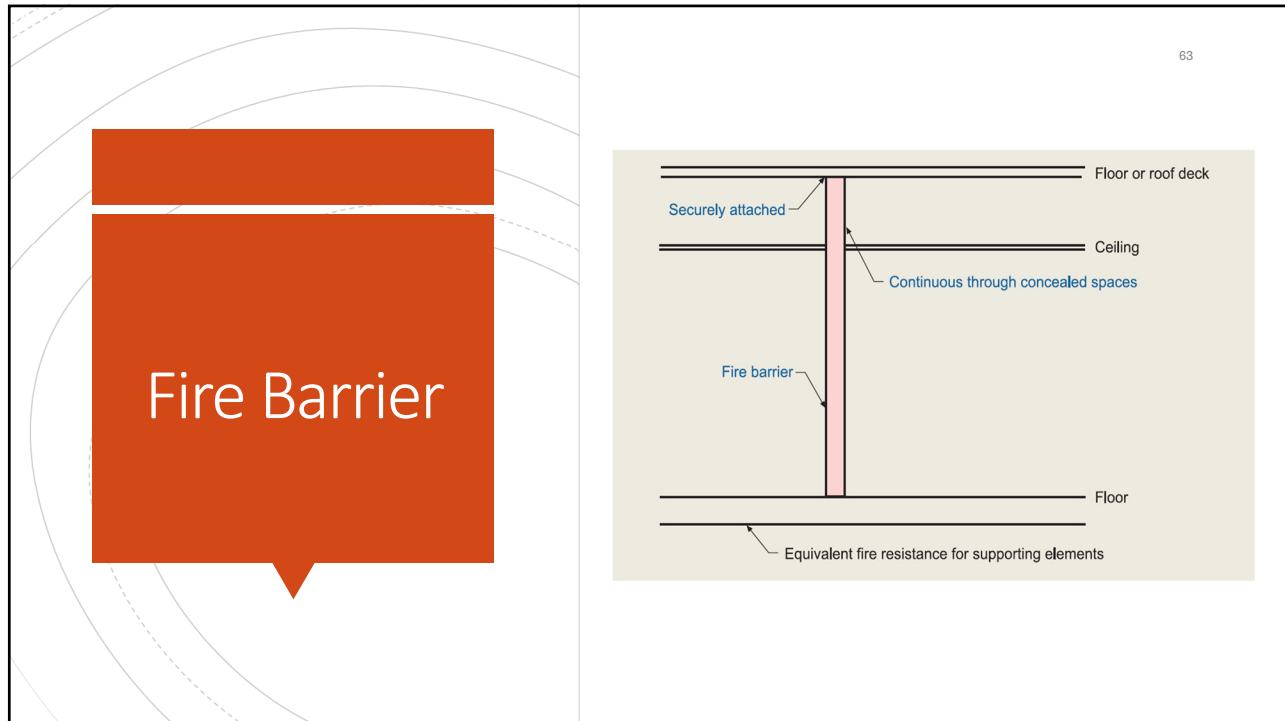
- **FIRE BARRIER.** A fire-resistance-rated wall assembly of materials designed to restrict the spread of fire in which continuity is maintained.
- The term represents wall assemblies with a fire-resistance rating that are constructed in accordance with Section 707. Even though the definition applies to walls, horizontal assemblies also can be fire barriers.

Fire Barrier

- **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:

1. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 713.12.
2. Interior exit stairway and ramp enclosures required by Section 1023 and exit access stairway and ramp enclosures required by Section 1019 shall be permitted to terminate at a top enclosure complying with Section 713.12.



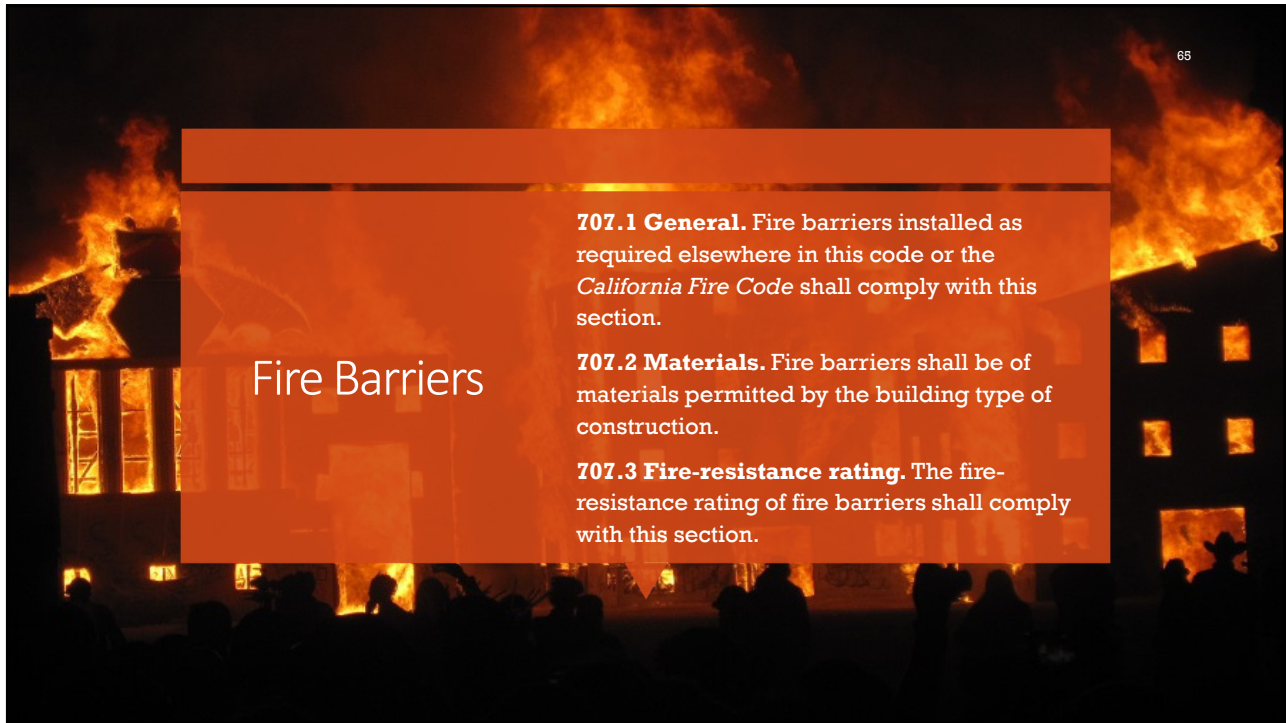
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Fire Barriers

707.1 General. Fire barriers installed as required elsewhere in this code or the *California Fire Code* shall comply with this section.

707.2 Materials. Fire barriers shall be of materials permitted by the building type of construction.

707.3 Fire-resistance rating. The fire-resistance rating of fire barriers shall comply with this section.



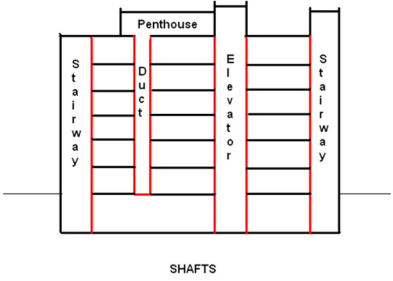
66

Fire Barriers


707.3.1 Shaft enclosures. The fire-resistance rating of the fire barrier separating building areas from a shaft shall comply with Section 713.4.

707.3.2 Interior exit stairway and ramp construction. The fire-resistance rating of the fire barrier separating building areas from an interior exit stairway or ramp shall comply with Section 1023.1.

707.3.3 Enclosures for exit access stairways. The fire resistance rating of the fire barrier separating building areas from an exit access stairway or ramp shall comply with Section 713.4.



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An orange graphic consisting of two stacked rectangular boxes. The top box is smaller and the bottom box is larger. The text "Fire Barriers" is centered in the larger bottom box.


Fire Barriers

707.3.4 Exit passageway. The fire-resistance rating of the fire barrier separating building areas from an exit passageway shall comply with Section 1024.3.

707.3.5 Horizontal exit. The fire-resistance rating of the separation between building areas connected by a horizontal exit shall comply with Section 1026.1.

707.3.6 Atriums. The fire-resistance rating of the fire barrier separating atriums shall comply with Section 404.6.

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An orange graphic consisting of two stacked rectangular boxes. The top box is smaller and the bottom box is larger. The text "Fire Barriers" is centered in the larger bottom box.

Fire Barriers

707.3.7 Incidental uses. The fire barrier separating incidental uses from other spaces in the building shall have a fire-resistance rating of not less than that indicated in Table 509.

707.3.8 Control areas. Fire barriers separating control areas shall have a fire-resistance rating of not less than that required in Section 414.2.4.

707.3.9 Separated occupancies. Where the provisions of Section 508.4 are applicable, the fire barrier separating mixed occupancies shall have a fire-resistance rating of not less than that indicated in Table 508.4 based on the occupancies being separated.

Fire Barriers

Table 509 Incidental uses
CBC 414.2.4 Control Areas
CBC 508.4 Separated Occupancies




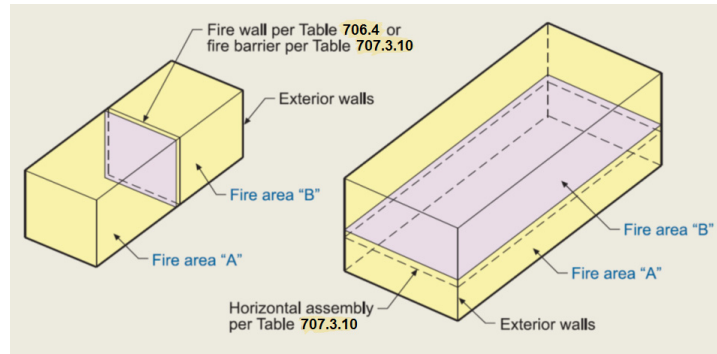




TABLE 707.3.10
FIRE-RESISTANCE RATING REQUIREMENTS FOR
FIRE BARRIERS, FIRE WALLS OR HORIZONTAL
ASSEMBLIES BETWEEN FIRE AREAS

OCCUPANCY GROUP	FIRE-RESISTANCE RATING (hours)
H-1, H-2	4
F-1, H-3, S-1	3
A, B, E, F-2, H-4, H-5, I, L, M, R, S-2	2
U	1

Fire Barriers

- 707.3.10 Fire areas.** The fire barriers, fire walls or horizontal assemblies, or combination thereof, separating a single occupancy into different fire areas shall have a fire resistance rating of not less than that indicated in Table 707.3.10. The fire barriers, fire walls or horizontal assemblies, or combination thereof, separating fire areas of mixed occupancies shall have a fire-resistance rating of not less than the highest value indicated in Table 707.3.10 for the occupancies under consideration.



Definitions

- **FIRE AREA.** The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or fire-resistance-rated horizontal assemblies of a building.

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Fire Barriers

- **707.4 Exterior walls.** Where exterior walls serve as a part of a required fire-resistance-rated shaft or stairway or ramp enclosure, or separation, 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 and Section 1027.6 for exterior exit stairways and ramps.
- Exterior walls required to be fire-resistance rated in accordance with Section 1206 of the California Fire Code for enclosure of energy storage systems.

Fire Barriers

If an area is required to be enclosed by fire barriers and an exterior wall constitutes part of the enclosure, the exterior wall is only required to comply with the fire-resistance-rating requirements in Section 705, unless the exterior wall is protecting part of an exterior egress balcony, an exit enclosure or an exterior stairway or ramp or an energy storage system.

The intent of the fire barrier requirements is to subdivide or enclose areas *within* a building to protect them from a fire *in* the building.

Fire Barriers

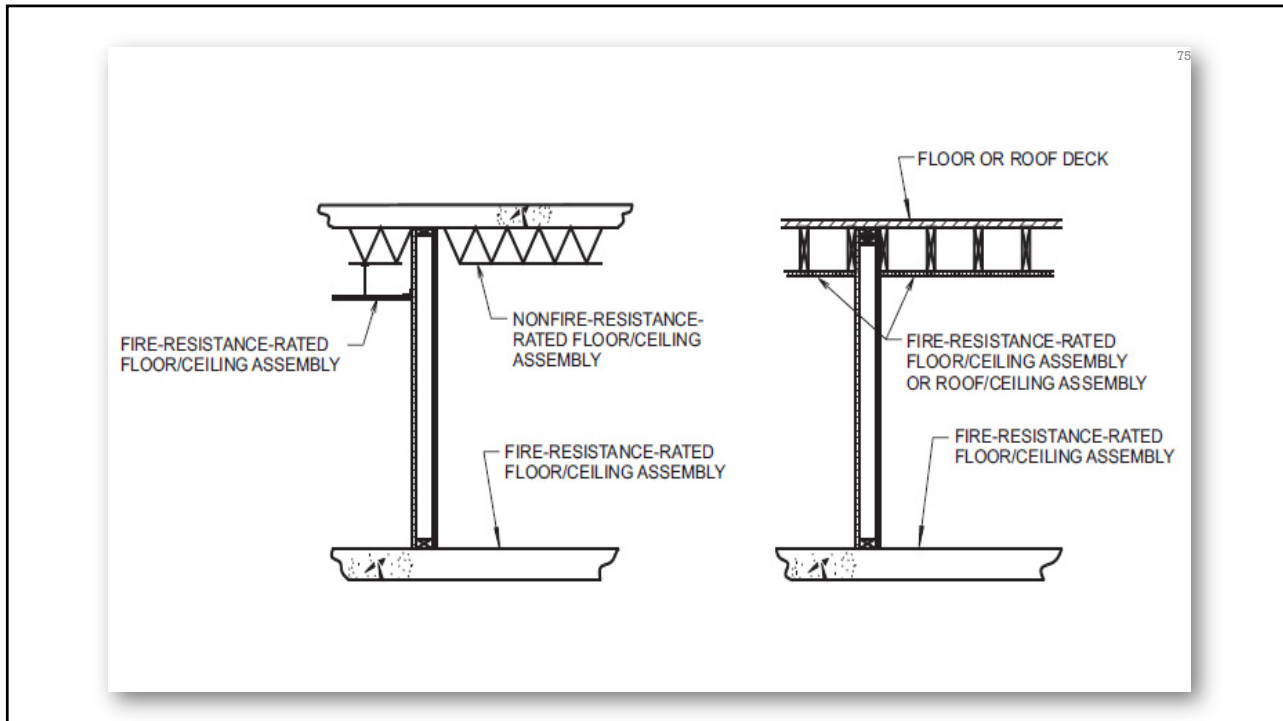
- 707.5 Continuity.** Fire barriers shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed space, such as the space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

Exceptions:

- Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 713.12.
- Interior exit stairway and ramp enclosures required by Section 1023 and exit access stairway and ramp enclosures required by Section 1019 shall be permitted to terminate at a top enclosure complying with Section 713.12.

Exceptions 1 and 2 are applicable to shafts that do not terminate at or above the roof.

When a shaft terminates above a roof, the exterior shaft walls shall comply



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Fire Barriers

707.5.1 Supporting construction. The supporting construction for a fire barrier shall be protected to afford the required fire-resistance rating of the fire barrier supported. Hollow vertical spaces within a fire barrier shall be fire blocked in accordance with Section 718.2 at every floor level.

Exceptions:

1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided for in Section 415.9.1.2 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Supporting construction for 1-hour fire barriers required by Table 509 in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.



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- **FIRE PARTITION.** A vertical assembly of materials designed to restrict the spread of fire in which openings are protected.

Fire partitions are used as wall assemblies to separate adjacent tenant spaces in covered and open mall buildings, to separate dwelling units, to separate sleeping rooms, to enclose corridors and to enclose elevator lobbies.


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Fire Partition Types

Corridors

79




- **708.2 Materials.** The walls shall be of materials permitted by the building type of construction.
- **708.3 Fire-resistance rating.** Fire partitions shall have a fire-resistance rating of not less than 1 hour.
Exceptions:
 1. Corridor walls permitted to have a 1/2 hour fire-resistance rating by Table 1020.1.

↑

Don't bother looking. There are no $\frac{1}{2}$ hour corridor partitions in California.

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



Fire Partitions

■ **708.3 Fire-resistance rating.**

Exceptions:

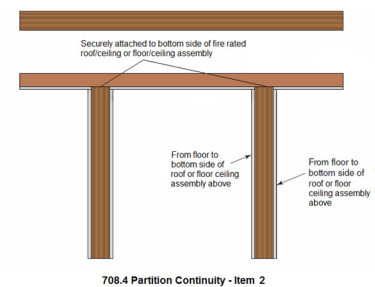
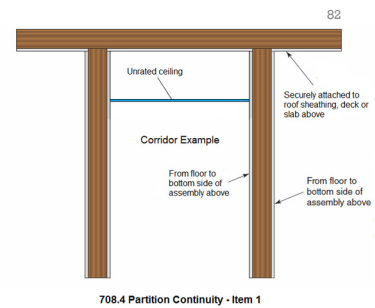
3. Walls separating enclosed tenant spaces in Group B high-rise buildings of Type I and II construction equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

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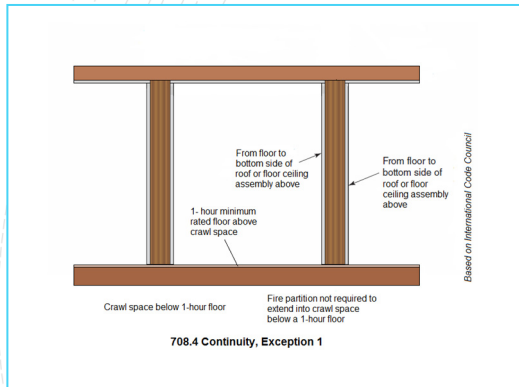
Fire Partitions

708.4 Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below and be securely attached to one of the following:

1. The underside of the floor or roof sheathing, deck or slab above.
2. The underside of a floor/ceiling or roof/ceiling assembly having a fire-resistance rating that is not less than the fire resistance rating of the fire partition.



Fire Partitions



- 708.4 Continuity.

- Exceptions:

1. *Fire partitions* shall not be required to extend into a crawl space below where the floor above the crawl space has a minimum 1-hour *fire-resistance rating*.

Fire Partitions

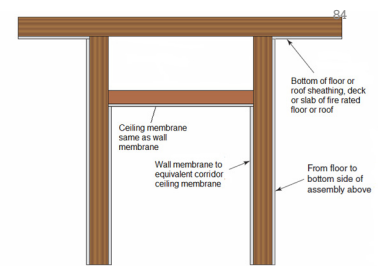
- 708.4 Continuity.

Exceptions:

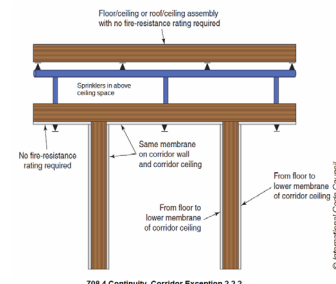
2. *Fire partitions* serving as a corridor wall shall not be required to extend above the lower membrane of a corridor ceiling provided that the corridor ceiling membrane is equivalent to corridor wall membrane, and either of the following conditions is met:

2.1. The room-side membrane of the corridor wall extends to the underside of the floor or roof sheathing, deck or slab of a fire-resistance-rated floor or roof above.

2.2. The building is equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, including automatic sprinklers installed in the space between the top of the *fire partition* and underside of the floor or roof sheathing, deck or slab above.



708.4 Continuity, Corridor Exception 2.1



708.4 Continuity, Corridor Exception 2.2

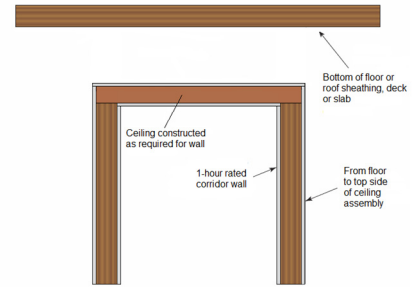
Fire Partitions

708.4 Continuity.

Exceptions (continued)

3. *Fire partitions* serving as a corridor wall shall be permitted to terminate at the upper membrane of the corridor ceiling assembly where the corridor ceiling is constructed as required for the corridor wall.

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708.4 Continuity, Corridor, Exception 3

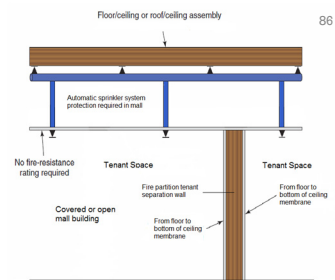
Fire Partitions

708.4 Continuity.

Exceptions (continued)

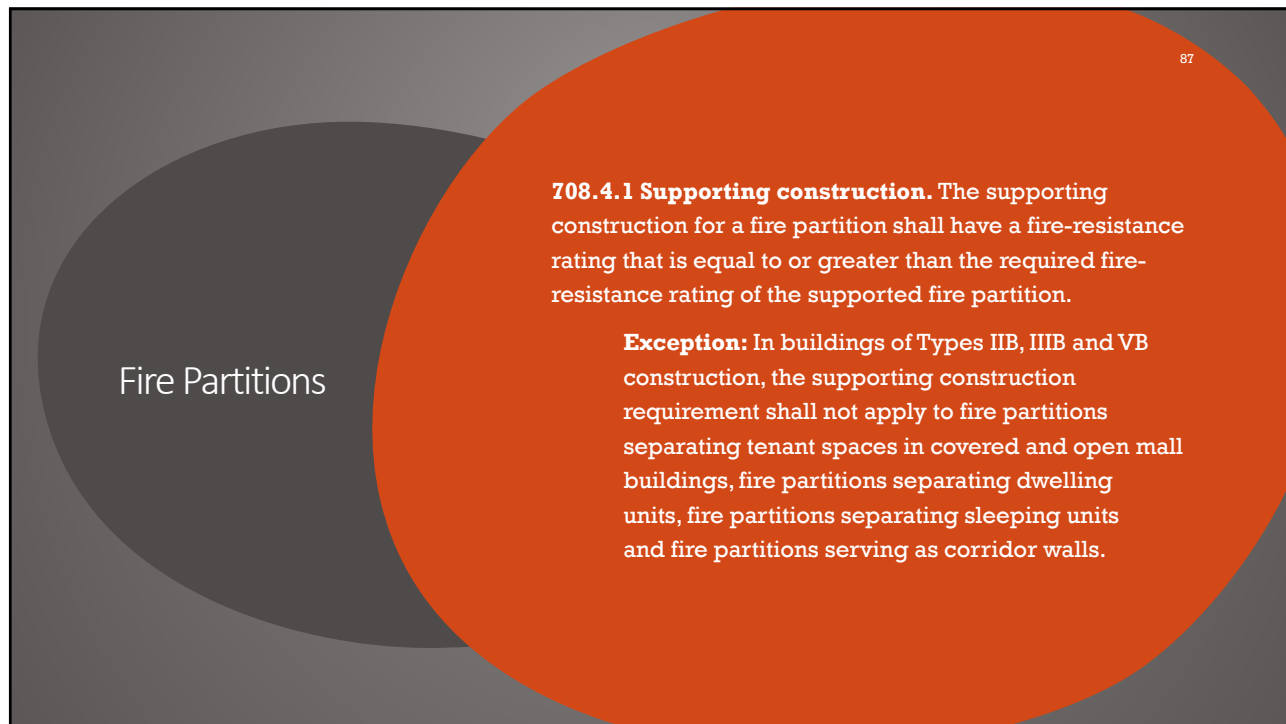
4. *Fire partitions* separating tenant spaces in a covered or open mall building complying with Section 402.4.2.1 shall not be required to extend above the underside of a ceiling. Such ceiling shall not be required to be part of a fire-resistance-rated assembly, and the attic or space above the ceiling at tenant separation walls shall not be required to be subdivided by *fire partitions*.

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708.4 Continuity, Exception 4



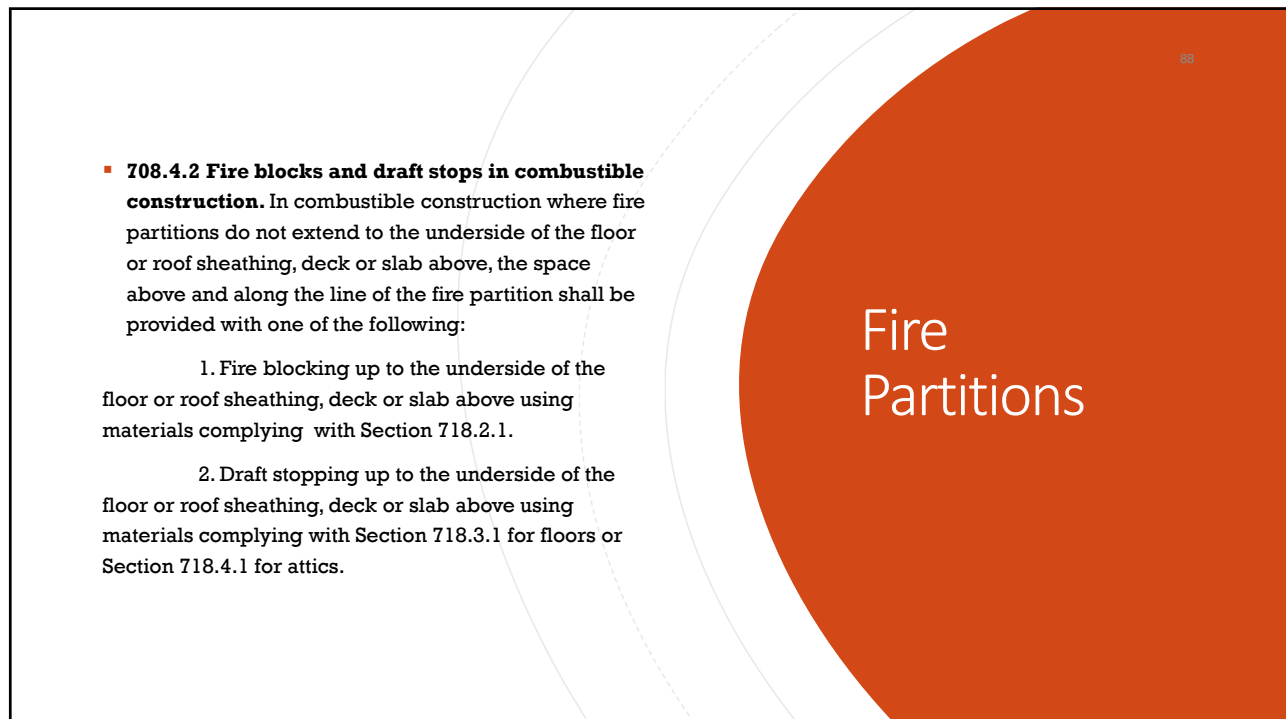


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Fire Partitions

708.4.1 Supporting construction. The supporting construction for a fire partition shall have a fire-resistance rating that is equal to or greater than the required fire-resistance rating of the supported fire partition.

Exception: In buildings of Types IIB, IIIB and VB construction, the supporting construction requirement shall not apply to fire partitions separating tenant spaces in covered and open mall buildings, fire partitions separating dwelling units, fire partitions separating sleeping units and fire partitions serving as corridor walls.



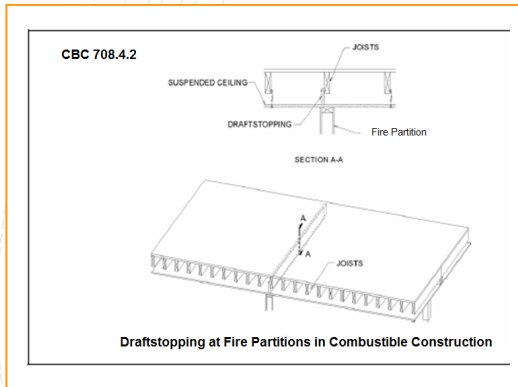
88

Fire Partitions

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

1. Fire blocking up to the underside of the floor or roof sheathing, deck or slab above using materials complying with Section 718.2.1.
2. Draft stopping up to the underside of the floor or roof sheathing, deck or slab above using materials complying with Section 718.3.1 for floors or Section 718.4.1 for attics.

Fire Partitions



■ **708.4.2 Fire blocks and draft stops in combustible construction.**

Exceptions:

1. Buildings equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1, or in accordance with Section 903.3.1.2 provided that protection is provided in the space between the top of the *fire partition* and underside of the floor or roof sheathing, deck or slab above as required for systems complying with Section 903.3.1.1.
2. Where corridor walls provide a sleeping unit or dwelling unit separation, draft stopping shall only be required above one of the corridor walls.

Fire Partitions



- Relative to fire blocking and fire stopping requirements for fire partitions and corridor construction, because a Group I-2, Type V-A building will have automatic fire sprinkler protection in the attic space, Exception 1 will be applicable therefore, for the purposes of fire blocking and draft stopping fire partitions and corridor construction, such fire blocking and draft stopping is not required.

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FIREBLOCKING. Building materials installed to resist the free passage of flame to other areas of the building through concealed spaces.



Fire Partitions

• **708.4.2 Fire blocks and draft stops in combustible construction.**

Exceptions continued:

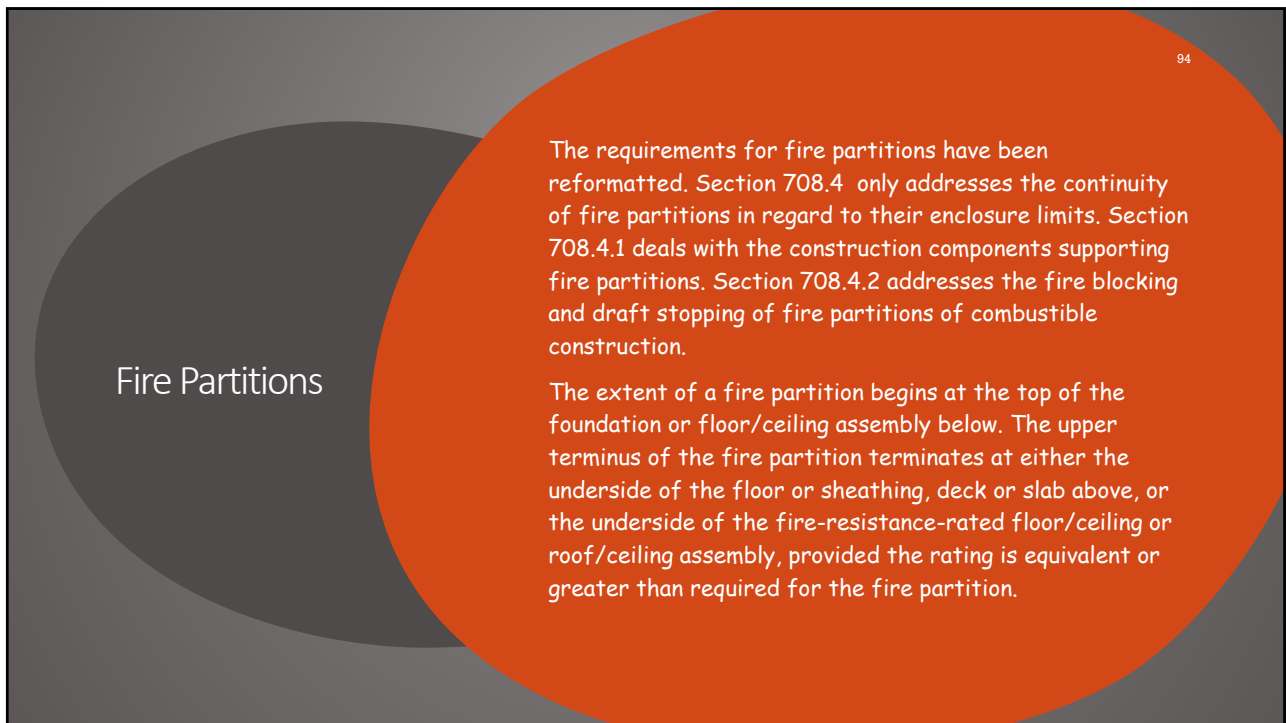
3. In Group R-2 occupancies with fewer than four dwelling units, fire blocking and draft stopping shall not be required.
4. In Group R-2 occupancies up to and including four stories in height in buildings not exceeding 60 feet in height above grade plane, the attic space shall be subdivided by draft stops into areas not exceeding 3,000 square feet or above every two dwelling units, whichever is smaller.
5. In Group R-3 occupancies with fewer than three dwelling units, fire-blocking and draft stopping shall not be required in



Fire Partitions

- **708.4.2 Fire blocks and draft stops in combustible construction.**
- Exceptions 3, 4 and 5 are relocated from Section 718. These exceptions pertain to Group R-2 (apartments) and Group R-3 (one and two family dwellings). As such these exceptions are not relevant to Group I-2 facilities.

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Fire Partitions

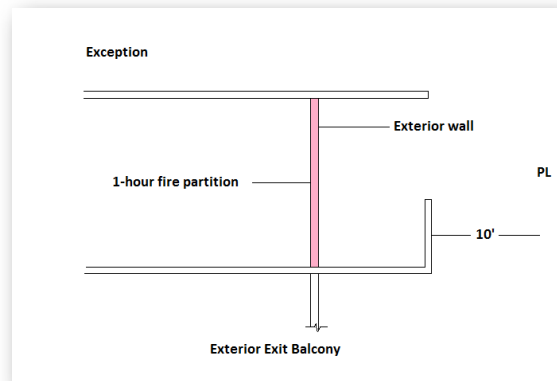
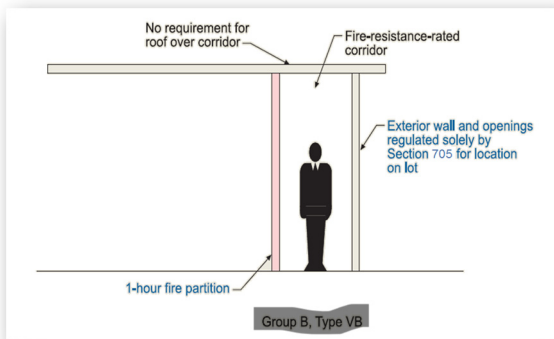
The requirements for fire partitions have been reformatted. Section 708.4 only addresses the continuity of fire partitions in regard to their enclosure limits. Section 708.4.1 deals with the construction components supporting fire partitions. Section 708.4.2 addresses the fire blocking and draft stopping of fire partitions of combustible construction.

The extent of a fire partition begins at the top of the foundation or floor/ceiling assembly below. The upper terminus of the fire partition terminates at either the underside of the floor or sheathing, deck or slab above, or the underside of the fire-resistance-rated floor/ceiling or roof/ceiling assembly, provided the rating is equivalent or greater than required for the fire partition.

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Fire Partitions

- **708.5 Exterior walls.** Where exterior walls serve as a part of a required fire-resistance-rated separation, such walls shall comply with the requirements of Section 705 for exterior walls, and the fire-resistance-rated separation requirements shall **not** apply.
 - **Exception:** Exterior walls required to be fire-resistance rated in accordance with Section 1021.2 for exterior egress balconies, Section 1023.7 for interior exit stairways and ramps and Section 1027.6 for exterior exit ramps and stairways.

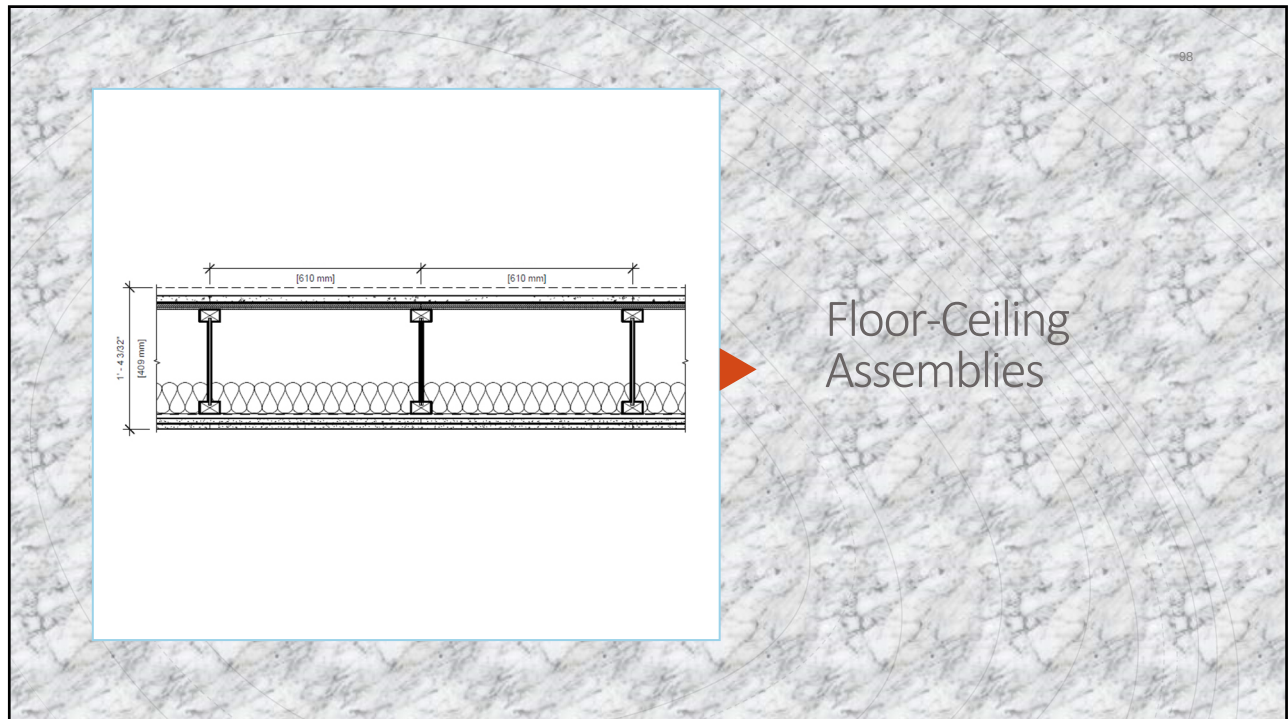


Floor and Roof Assemblies CBC 711

- **711.1 General.** Horizontal assemblies shall comply with Section 711.2. Nonfire-resistance-rated floor and roof assemblies shall comply with Section 711.3.
- **HORIZONTAL ASSEMBLY.** A fire-resistance-rated floor or roof assembly of materials designed to restrict the spread of fire in which continuity is maintained.

A horizontal assembly is a component for completing compartmentation. Horizontal assemblies have all openings and penetrations protected equal to the rating for the fire-resistance-rated floor or roof assembly.

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Floor and Roof Assemblies

711.1 General. Horizontal assemblies shall comply with Section 711.2. Nonfire-resistance-rated floor and roof assemblies shall comply with Section 711.3.

711.2 Horizontal assemblies. Horizontal assemblies shall comply with Sections 711.2.1 through 711.2.6.

711.2.1 Materials. The floor and roof assemblies shall be of materials permitted by the building type of construction.

711.2.2 Continuity. Assemblies shall be continuous without vertical openings, except as permitted by this section and Section 712.

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Floor and Roof Assemblies

- **711.2.3 Supporting construction.** The supporting construction shall be protected to afford the required fire resistance rating of the horizontal assembly supported.

Exception: In buildings of Type IIB, IIIB or VB construction, the construction supporting the horizontal assembly is not required to be fire-resistance rated at the following:

 1. Horizontal assemblies at the separations of incidental uses as specified by Table 509 provided the required fire-resistance rating does not exceed 1 hour.
 2. Horizontal assemblies at the separations of dwelling units and sleeping units as required by Section 420.3.
 3. Horizontal assemblies at smoke barriers constructed in accordance with Section 709.

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Floor and Roof Assemblies

711.2.4 Fire-resistance rating. The fire-resistance rating of horizontal assemblies shall comply with Sections 711.2.4.1 through 711.2.4.6 but shall be not less than that required by the building type of construction.

711.2.4.1 Separating mixed occupancies. Where the horizontal assembly separates mixed occupancies, the assembly shall have a fire-resistance rating of not less than that required by Section 508.4 based on the occupancies being separated.

711.2.4.2 Separating fire areas. Where the horizontal assembly separates a single occupancy into different fire areas, the assembly shall have a fire-resistance rating of not less than that required by Section 707.3.10.

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Floor and Roof Assemblies

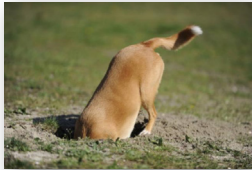
- **711.2.4.3 Dwelling units and sleeping units.** Horizontal assemblies serving as dwelling or sleeping unit separations in accordance with Section 420.3 shall be not less than 1-hour fire-resistance-rated construction.

Exception: Horizontal assemblies separating dwelling units and sleeping units shall be not less than 1/2-hour fire-resistance-rated construction in a building of Type IIB, IIIB and VB construction, where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

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Floor and Roof Assemblies

- **711.2.4.4 Separating smoke compartments.** Where the horizontal assembly is required to be a smoke barrier, the assembly shall comply with Section 709.
- **Regardless of the number of stories connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 3006.2. Openings through horizontal assemblies shall be protected by shaft enclosures complying with Section 713. Horizontal assemblies shall not be allowed to have unprotected vertical openings.**
- **Buried code:**
 - **Elevator lobby and shaft enclosure requirements**
 - Where required, smoke barrier protection overrules all elevator lobby exceptions. You just need to know where to look.

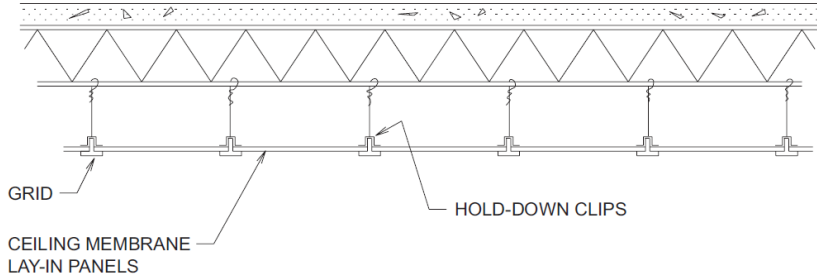


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Floor and Roof Assemblies

711.2.4.5 Separating incidental uses. Where the horizontal assembly separates incidental uses from the remainder of the building, the assembly shall have a fire-resistance rating of not less than that required by Section 509.

711.2.4.6 Other separations. Where a horizontal assembly is required by other sections of this code, the assembly shall have a fire-resistance rating of not less than that required by that section.



GRID

CEILING MEMBRANE LAY-IN PANELS

HOLD-DOWN CLIPS

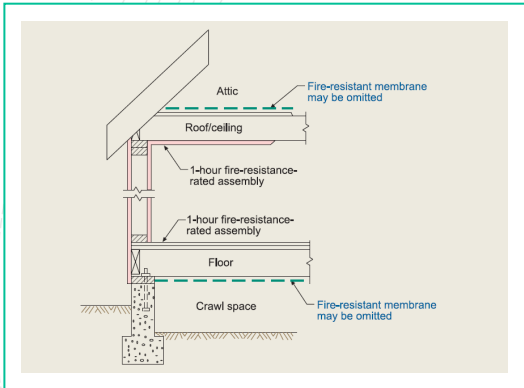
NOTE: HOLD-DOWN CLIPS OR WIRES REQUIRED IF PANELS WEIGH LESS THAN 1 POUND/SQ.FT.

Floor and Roof Assemblies

- 711.2.5 Ceiling panels.** Where the weight of lay-in ceiling panels, used as part of fire-resistance-rated floor/ceiling or roof/ceiling assemblies, is not adequate to resist an upward force of 1 lb/ft^2 , wire or other approved devices shall be installed above the panels to prevent vertical displacement under such upward force.

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Floor and Roof Assemblies



Attic

Roof/ceiling

1-hour fire-resistance-rated assembly

1-hour fire-resistance-rated assembly

Floor

Crawl space

Fire-resistant membrane may be omitted

Fire-resistant membrane may be omitted

- 711.2.6 Unusable space.** In 1-hour fire-resistance-rated floor construction, the ceiling membrane is not required to be installed over unusable crawl spaces. In 1-hour fire-resistance-rated roof construction, the floor membrane is not required to be installed where unusable attic space occurs above.
- Also included as footnote 'n' to Table 721.1.(3), Minimum Protection for Floor and Roof Systems.**

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711.3 Nonfire-resistance-rated floor and roof assemblies. Nonfire-resistance-rated floor, floor/ceiling, roof and roof/ceiling assemblies shall comply with Sections 711.3.1 and 711.3.2.

711.3.1 Materials. Assemblies shall be of materials permitted by the building type of construction.

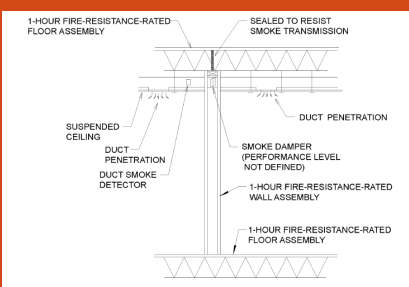
711.3.2 Continuity. Assemblies shall be continuous without vertical openings, except as permitted by Section 712.

Floor and Roof Assemblies

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Smoke Barrier
CBC 709

SMOKE BARRIER. A continuous membrane, either vertical or horizontal, such as a wall, floor or ceiling assembly, that is designed and constructed to restrict the movement of smoke.



1-HOUR FIRE-RESISTANCE-RATED FLOOR ASSEMBLY

SEALED TO RESIST SMOKE TRANSMISSION

SUSPENDED CEILING

DUCT PENETRATION

DUCT PENETRATION

DUCT SMOKE DETECTOR

SMOKE DAMPER (PERFORMANCE LEVEL NOT DEFINED)

1-HOUR FIRE-RESISTANCE-RATED WALL ASSEMBLY

1-HOUR FIRE-RESISTANCE-RATED FLOOR ASSEMBLY

Smoke Barriers

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Fire barrier for:
• Interior exit stairway enclosure
• Elevator hoistway shaft

Smoke barrier termination per Section 709.4.2

Smoke barrier

Smoke and draft control door assembly required

Elevator lobby

Smoke and draft control door not required

Section 709.4.1 does not permit smoke compartments to terminate at other than outside wall

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Smoke Compartment

▪ **SMOKE COMPARTMENT.** A space within a building enclosed by smoke barriers on all sides, including the top and bottom.

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SC:4.1

SC:4.2

S1

S2

Comprehensive life safety plans should include fire protection features of the building

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Smoke Barriers

709.1 General. Vertical and horizontal smoke barriers shall comply with this section.

709.2 Materials. Smoke barriers shall be of materials permitted by the building type of construction.

709.3 Fire-resistance rating. A 1-hour fire-resistance rating is required for smoke barriers.

- **Exception:** Smoke barriers constructed of minimum 0.10-inch-thick steel in Group I-3 buildings.

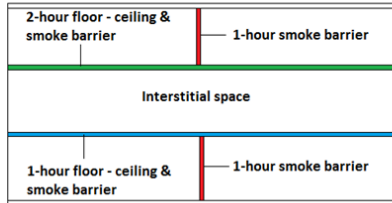
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Smoke Barriers

- **709.4 Continuity.** Smoke barriers shall form an effective membrane continuous from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required fire-resistance rating of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction. Smoke barrier walls used to separate smoke compartments shall comply with Section 709.4.1. Smoke-barrier walls used to enclose areas of refuge in accordance with Section 1009.6.4 or to enclose elevator lobbies in accordance with Section 405.4.3, 3007.6.2, or 3008.6.2 shall comply with Section 709.4.2.

Smoke Barriers

Exception



709.4 Continuity

Exception:

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings or exterior walls that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.

Smoke Barriers

- **709.4.1 Smoke-barrier walls separating smoke compartments.** Smoke-barrier walls used to separate smoke compartments shall form an effective membrane continuous from outside wall to outside wall.
- Although the basic intent of smoke compartments is to form two completely separated spaces where smoke does not spread from one to the other, the text requires that the floor level must be divided from outside wall to outside wall, even though allowing a smoke barrier to terminate at another smoke barrier or back to itself may also create two adequately separated compartments.

Smoke Barriers

709.4.2 Smoke-barrier walls enclosing areas of refuge or elevator lobbies. Smoke-barrier walls used to enclose areas of refuge in accordance with Section 1009.6.4, or to enclose elevator lobbies in accordance with Section 405.4.3, 3007.6.2, or 3008.6.2, shall form an effective membrane enclosure that terminates at a fire barrier wall having a level of fire protection rating not less than 1 hour, another smoke barrier wall or an outside wall. A smoke and draft control door assembly as specified in Section 716.2.2.1.1 shall not be required at each elevator hoistway door opening or at each exit doorway between an area of refuge and the exit enclosure.

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Labels in diagram: Fire barrier for: Interior exit stairway enclosure, Elevator hoistway shaft; Smoke barrier termination per Section 709.4.2; Smoke barrier; Smoke and draft control door assembly required; Elevator lobby; Smoke and draft control door not required; Smoke barrier separating smoke compartments (Section 709.4.1); Section 709.4.1 does not permit smoke compartments to terminate at other than outside wall.

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Smoke Partition CBC 710

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- **SMOKE PARTITION.** A wall assembly that extends from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke.

Smoke Partitions

710.1 General. Smoke partitions installed as required elsewhere in the code shall comply with this section.

No list is provided but here it is:

1. Corridors in Group I-2 but **not** in California. Section 407.3.
2. Elevator lobbies in sprinklered buildings. Section 3006.3, Item 2.
3. There seems to be something similar to a smoke partition identified in Section 509.4.2 for the separation of incidental uses not protected by fire sprinklers. This separation however is different.

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Vertical Openings	Penetrations and Firestopping	Fire Resistant Joint Systems	Opening Protectives- Doors, Windows, Glazing, ratings, size allowances, Temp Rise, etc
Ducts and Dampers	Concealed Spaces	F, T, and L Ratings	Continuity
	Supporting Structure	...and more	




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