

Flad Code Forum Notes

29 October 2015

1. Code Forums
 - a. Notes of past code forums are posted at :
 - i. Flad Home Page / Resources / Codes / Forums / Year / Date of Forum.
 - b. This Code Forum will Discuss :
 - i. **Comparing Fire/Smoke Walls, Barriers, and Partitions**
 - c. Additional information is contained in attached power point slides: **PP-pages**.

Comparing Fire/Smoke Walls, Barriers, and Partitions – Refer to **PP-01** through **PP-77**

2. **References**
 - a. International Building Code - 2012 edition = IBC
3. **Chapter 7 - Fire and Smoke Protection Features : PP-03**
 - a. This chapter outlines different fire-resistant rated (FRR) assemblies (e.g. Fire Walls) and related requirements (e.g. Penetrations) including the following :
 - i. 706 Fire Walls
 - ii. 707 Fire Barriers
 - iii. 708 Fire Partitions
 - iv. 709 Smoke Barriers
 - v. 710 Smoke Partitions
 - vi. 711 Horizontal Assemblies
 - vii. 712 Vertical Openings
 - viii. 713 Shaft Enclosures
 - ix. 714 Penetrations
 - x. 715 F-R Joint Systems
 - xi. 716 Opening Protectives
 - xii. 717 Ducts/Air Openings
 - b. The underlined FRR assemblies will be discussed.
4. Abbreviations used in this presentation : **PP-04**
 - a. Fire Walls : **FW**
 - b. Fire Barriers : **FB**
 - c. Fire Partitions : **FP**
 - d. Smoke Barriers : **SB**
 - e. Smoke Partitions : **SP**
 - f. FB/SB Combo : **FSB**
 - g. Fire-Resistance Ratings
 - i. 0-Hours : **0**
 - ii. 1/3-Hour : **0.3**
 - iii. 1/2-Hour : **0.5**
 - iv. 1-Hour : **1**
 - v. 2-Hours : **2**
 - vi. 3-Hours : **3**
 - vii. 4-Hours : **4**
 - h. Examples :
 - i. 2-HR Fire Barrier = **2FB**
 - ii. 2-HR Fire Barrier + 1-HR Smoke Barrier = **2FSB**
5. Most Restrictive to Less Restrictive = FW – FB – SB – FP – SP : **PP-05**
6. Architecturally, we use the terms “walls” and “partitions” interchangeably in our work : **PP-06**
 - a. “Wall” types reference rated & non-rated “partitions.”
 - b. “Wall” type general notes reference “partitions.”

7. Building industry uses non-code terms : **PP-07**
 - a. G-P Gypsum references "Area Separation Walls."
 - b. Toilet "partitions" and office cubicle "partitions."
 - c. Real Estate Inspection Company references "firewalls."
8. Fire-Resistance Ratings : **PP-08**
 - a. Testing agencies (e.g. UL) describe the FRR assembly types by "Walls & Partitions" and by "Hourly Ratings." These agencies do not differentiate between FW & FB & FP.
9. Fire-Resistance-Rated Legends : **PP-09**
 - a. Flad project teams have used FRR legends which include varying degrees of accuracy.
 - i. Use of "partition" instead of "barrier"
 - ii. Identifying hourly ratings instead of type of FRR assembly (FB, SB, FP, SP)
 - iii. Use of "wall" instead of "barrier"
10. Specifications : **PP-10 through PP-13**
11. Table 601 - Fire-Resistance Rating (FRR) Requirements For Building Elements (Hours) : **PP-14**
 - a. As it pertains to identifying FRR assemblies on Life Safety Plans (LSP), interior walls and partitions are required to be rated by Table 601 only if they are bearing walls.
 - b. Nonbearing interior walls and partitions are not required to be rated per Table 601 unless the walls and partitions are required by other section of the code.
12. Definitions (FW/FB/FP) : **PP-15 through PP-19**
 - a. Fire Wall (FW) : *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.*
 - b. Fire Barrier (FB) : *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.*
 - c. Fire Partitions (FP) : *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.*
 - d. Comparison :
 - i. Similarity : All *restrict the spread of fire*
 - ii. Differences
 - (1) FWs : require *structural stability* & continuity from foundation to/thru the roof
 - (2) FBs : require *continuity* and Horizontal Assemblies (HA) can be FBs
 - (3) FPs : can be vertical and/or horizontal
13. Functionality (FW/FB/FP) : **PP-20 through PP-23**
 - a. Fire Wall (FW)
 - i. FWs separate **buildings** in order to meet maximum allowable areas and/or stories (Table 503) and to separate different types of construction (Table 601).
 - ii. FWs also can separate **occupancies**. When occupancies are required to be separated by a FB, more stringent FW or FB requirements shall apply.
 - iii. Party walls (PW): FW on an interior lot line between (2) adjacent buildings.
 - (1) PW/FW vs. (2) separate exterior walls with 0 fire separation distance.
 - (2) PW/FW : no openings and utilities cannot penetrate.
 - (a) Exception : Openings allowed between anchor building and mall
 - b. Fire Barrier (FB)
 - i. FBs protect areas that require longer (time) levels of safety (e.g. Means of Egress) or are of higher levels of hazards (incidental use areas).
 - (1) Means of Egress
 - (a) Interior Exit Stair/Ramp

- (b) Exit Passageway
 - (c) Horizontal Exit
 - (d) Exit Access Stair/Ramp
 - (2) Hazardous Areas
 - (a) Incidental Use Area
 - (b) Control Area
 - (3) Shaft Enclosure
 - (4) Fire Areas
 - (5) Atrium
 - (6) Occupancy
- c. Fire Partition (FP)
- i. FPs separate dwelling/sleeping units, tenant spaces in malls, elevator lobbies and corridors required to be rated per Table 1008.1.

14. Definitions (SB/SP) : **PP-24 through PP-27**

- a. Smoke Barriers (SB) : *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.*
- b. Smoke Partitions (SP) : *Non-rated walls that resist the spread of fire and the unmitigated movement of smoke for an unspecified period of time.* (This is not an official IBC definition but a description in the IBC Commentary).
- c. Similarities
 - i. Both "address" the spread of smoke
 - (1) SBs restrict the spread of smoke
 - (2) SPs resist the spread of smoke
- d. Differences : SBs can be walls, floors, and/or ceiling assemblies

15. Functionality (SB/SP) : **PP-28 through PP-30**

- a. Smoke Barriers (SB) sole function is to create smoke compartments for I-2 (Hospitals, Nursing Homes, Detox, Foster Care) and for I-3 (Correctional & Detection Centers).
 - i. SBs are also referenced by Smoke Control System, Accessible Means of Egress, Accessible Area of Refuge, and Underground Buildings.
- b. Smoke Partitions (SP) sole function is to protect corridors and suites in I-2.

16. Structural Stability : **PP-31 through PP-34**

- a. FWs allow collapse of construction on either side under fire conditions without collapse of the wall for the FRR duration OR be constructed as double FWs (and meet NFPA 221).
- b. FBs shall be supported by construction (floors, columns, beams) with the same or higher fire-resistance rating (FRR).
- c. FP, SB, & SP : not applicable
- d. Materials
 - i. FW : only non-combustible materials
 - ii. FB/FP/SB/SP : Permitted by Construction Type
 - (1) Noncombustible : Type I & II
 - (2) Combustible : Type II, IV, & V

17. Fire-Resistance Ratings : **PP-35 through PP-38**

- a. FW : based on Occupancy Group and Construction Type
 - (1) 4-HR : H-1, H-2
 - (2) (H-1, H-2 or H-3 see 415.6 and 415.7)
 - (3) 3-HR : A, B, E, H-4, I, R-1, R-2, U (Type I, II, IV)
 - (4) 2-HR : A, B, E, H-4, I, R-1, R-2, U (Type II, V)
 - (5) 3-HR : F-1, H-3, H-5, M, S-1
 - (6) 2-HR : F-2, S-2, R-3, R-4
- b. FB : based on Function and Number of Stories
 - i. 1-HR : Atrium

- ii. 1-HR (min) or equal to stairway : Exit Passageway
- iii. 1-HR (<4) or 2-HR (4 or >)
 - (1) Interior Exit Stair/Ramp*
 - (2) Exit Access Stair/Ramp*
 - (3) Shaft Enclosure*
 - (a) * Not less than floors penetrated & not greater than 2-HR
- iv. 1-HR or 2-HR
 - (1) Incidental Use Area
 - (2) Control Area
- v. 2-HR (min) or FW : Horizontal Exit
- vi. 1-HR, 2-HR, or 3-HR : Occupancy
- vii. 1-HR, 2-HR, 3-HR, or 4-HR : Fire Areas
- c. FP
 - i. 1-HR
 - (1) Exceptions
 - (a) 0.5-HR : Corridor Walls (T1018.1 below)
 - (b) 0.5-HR : Dwelling Units and Sleeping Units
 - (i) (Type IIB/IIIB/VB + sprinkled)
 - d. SB : 1-HR
 - e. SP : 0-HR

18. Continuity : **PP-39 through PP-56**

- a. FW
 - i. Horizontal Continuity
 - (1) Exterior wall to exterior wall
 - (a) Extend at least 18" beyond the exterior surface (see Exceptions)
 - (2) Horizontal Projecting Elements (HPE)
 - (a) FW extend to outer edge of HPE within 4' of FW (see Exceptions)
 - ii. Vertical Continuity
 - (1) Foundation to 30" above roofs (see Exceptions)
 - (2) Stepped buildings + Sloped roofs
- b. FB & FP
 - i. FB : Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above. (See exceptions)
 - ii. FP : Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above or FRR floor/ceiling or roof/ceiling assembly. (See exceptions)
- c. SB & SP
 - i. SB : Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above.
 - ii. SP : Top of the foundation or floor below to the underside of the floor or roof sheathing, slab or deck or underside of smoke-resistant ceiling.

19. Openings : **PP-57 through PP-62**

- a. FW
 - i. Max size : 156 SF & 25% of FW length on any floor
 - (1) No openings in Party Walls.
 - (2) No max size if both buildings sprinkled.
 - ii.
- b. FB
 - i. Max aggregate width = 25% of FB length on any floor
 - ii. Max size = 156 SF (any single opening)
 - (1) No max size if building is sprinkled.
 - (2) See other Exceptions
- c. FP

- i. 0.3-HR Corridor doors
 - ii. 0.5-HR Tenant Dwellings/Sleeping Units
 - iii. 0.3-HR in 0.5-HR assemblies
- d. SB
- i. I-2/Ambulatory Care Facilities
 - (1) Pair of opposite swing doors, 0.3-HR, no positive latching/center mullions/louvers/grilles, vision panel, max 3/4" undercut, astragals/rabbets at leading edges.
 - (2) Horizontal sliding doors
20. Penetrations : **PP-63 through PP-64**
- a. All reference 714 Penetrations, see Exceptions.
21. Joints : **PP-65 through PP-66**
- a. All reference 715 Joints, see Exceptions.
22. Duct/Air Transfer Openings : **PP-67 through PP-69**
- a. FW : not allowed
 - b. FB & FP & SB : reference 717 Duct & Air Transfer Openings
 - i. See specific requirements in 717.5.1-715.5.7
 - c. SP : only required to limit the passage of smoke.
23. Summary **PP-70 through PP-77**

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CH 7: Fire-Resistance-Rated Constructions

Walls + Barriers + Partitions
(2012 IBC)

Fire Barriers (FB) : 707 Egress/Hazardous Separation & Fire Areas		Fire Partitions (FP) : 708 Corridor/Unit Protection	Smoke Barriers (SB) : 709 Smoke Compartmentalization	Smoke Partitions (SP) : 710 Corridor & Suite Protection
Definition (Ch 2)	A fire-resistance-rated wall assembly of materials designed to restrict the spread of fire in which continuity is maintained.	A vertical assembly of materials designed to restrict the spread of fire in which openings are protected.	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.	Not Defined
General	<p>Interior Exit Stair/Ramp (1002.1) : 2-HR (4 or >) or 1-HR (<4) Exit Passageway (1023.3) : 1-HR (min) or equal to stairway Horizontal Exit (1025.1) : 2-HR (min) or FW Exit Access Stair/Ramp (1009.3.1.2) : 2-HR (4 or >) or 1-HR (<4) Incidental Use Area (T509) : 1-HR or 2-HR Control Area (414.2.4) : 2-HR or 1-HR (See Exceptions) Shaft Enclosure (713.4) : 2-HR (4 or >) or 1-HR (<4) Fire Areas (707.3.10) : 1-HR, 2-HR, 3-HR, or 4-HR Atrium (404.6) : 1-HR (See Exceptions) Occupancy (T508.4) : 1-HR, 2-HR, or 3-HR</p>	<p>Dwelling Units (402.2) Sleeping Units (420.2) Tenant Spaces in mall buildings (402.4.2.1) Corridor Walls (1018.1) Elevator Lobby (713.14.1)</p>	<p>Smoke compartments I-2 & I-3 occupancies (407.4 & 408.6) Ambulatory Care Facilities >10K (422.3) Smoke Control System (909.5) Accessible Means of Egress (1007.6.2) Accessible Area of Refuge (1007.6) Underground Buildings (405.4.2)</p>	<p>Corridors & Care Suites (I-2) Elevator Lobby in sprinklered bldgs</p>
Structural Stability	Construction (floors, columns, beams) supporting FB to be same or higher fire-resistance rating (FRR) as FB	NA	N/A	N/A
Materials	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type II, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type II, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type II, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type II, IV, & V)
Fire-Resistance Rating	<p>1, 2, 3, 4-HR Shafts & Stairways : Not less than floors penetrated Not greater than 2-HR</p>	1-HR	1-HR	0-HR
Exterior Walls	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.	N/A	N/A
Continuity	<p>A. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above. Continuous through concealed spaces (e.g. suspended ceiling). B. Hollow vertical spaces fireblocked at every floor level. C. Joints and voids at intersections (top & bottom of FB) shall comply with Sections 707.8 and 707.9.</p>	<p>A. Top of the foundation or floor/ceiling assembly below to the underside of the floor/roof sheathing, deck or deck above or FRR floor/ceiling or roof/ceiling assembly. B. Hollow vertical spaces fireblocked at every floor level. C. Joints and voids at intersections (top & bottom of FP) shall comply with Sections 707.8 and 707.9.</p>	<p>A. Outside wall to outside wall. B. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above. B. Continuous through concealed spaces (e.g. suspended ceiling).</p>	<p>A. Top of the foundation or floor below to the underside of the floor or roof sheathing, deck or deck or underside of smoke-resistant ceiling.</p>
Supporting Construction	<p>1. Equivalent or greater fire-resistance rating (FRR) as FB. 2. FB > 2 stories : If supporting structure is primary, see 704.3 (encasement). If supporting structure is secondary, see 711 (membrane).</p>	Equivalent or greater fire-resistance rating (FRR) as FP.	Equivalent or greater fire-resistance rating (FRR) as SB except for Type IIB/IIIB/VB.	N/A
Openings	<p>Max aggregate width = 25% of FB length on any floor Max size = 156 SF (any single opening) Exit Access Stairs/Ramps, Interior Exit Stair/Ramps, Exit Passageways shall comply w/1022.3 & 1023.5</p>	<p>See 716.4 0.3-HR Corridor doors 0.5-HR Tenant Dwellings/Sleeping Units 0.3-HR in 0.5-HR assemblies</p>	See 716.4	<p>See 710.5.1 & 710.5.2 Windows : resist the free passage of smoke or be automatic closing upon smoke detection. Doors : No louvers & may need to be self/automatic closing by smoke detection.</p>
Penetrations	See 714.3 & 707.7.1 (Exit enclosure or exit passageway) Prohibited penetrations in exit enclosures (exit access stairs/ramps, interior exit stairs/ramps, exit passageways)	See 714	See 714	Limit the free passage of smoke (no prescriptive requirement)
Joints	See 715	See 715	See 715	Limit the free passage of smoke (no prescriptive requirement)
Miscellaneous	Voids at intersections (707.9) : FB and non-FRR roof assembly	N/A	N/A	N/A
Duct/Air Transfer Openings	See 717	See 717	See 717	Limit the free passage of smoke (no prescriptive requirement). Air transfer openings - smoke damper (717.3.2.2)

CH 7: Fire-Resistance-Rated Constructions
Walls + Barriers + Partitions
(2012 IBC)

Fire Walls (FW) : 706		Fire Barriers (FB) : 707		Fire Partitions (FP) : 708		Smoke Barriers (SB) : 709		Smoke Partitions (SP) : 710	
Definition (Ch 2)	Separate Buildings/Occupancies 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.	Egress/Hazardous Separation & Fire Areas A fire-resistance-rated wall assembly of materials designed to restrict the spread of fire in which continuity is maintained.	Corridor/Unit Protection A vertical assembly of materials designed to restrict the spread of fire in which openings are protected.	Smoke Compartmentalization 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.	Corridor & Suite Protection A vertical assembly of materials designed to restrict the spread of fire and the unmitigated movement of smoke for an unspecified period of time. No level of performance required.				
General	Separate buildings : to meet maximum allowable areas and/or stories (Table 503) and different types of construction (Table 601). Separate occupancies : when occupancies are required to be separated by a FB, more stringent FW or FB requirement shall apply. Party walls (PW) : PW on an interior lot line between (2) adjacent buildings. PW/FW vs. (2) separate exterior walls with 0 fire separation distance. PW/FW : no openings and utilities cannot penetrate.	Interior Exit Stair/Ramp (1002.1) : 2-HR (4 or >) or 1-HR (<4) Exit Passageway (1023.3) : 1-HR (min) or equal to stairway Horizontal Exit (1025.1) : 2-HR (min) or FW Exit Access Stair/Ramp (1009.3.1,2) : 2-HR (4 or >) or 1-HR (<4) Incidental Use Area (TS09) : 1-HR or 2-HR Control Area (414.2.4) : 2-HR or 1-HR (See Exceptions) Shaft Enclosure (713.4) : 2-HR (4 or >) or 1-HR (<4) Fire Areas (707.3.10) : 1-HR, 2-HR, 3-HR, or 4-HR Atrium (404.6) : 1-HR (See Exceptions) Occupancy (TS08.4) : 1-HR, 2-HR, or 3-HR	Dwelling Units (402.2) Sleeping Units (420.2) Tenant Spaces in mall buildings (402.4.2.1) Corridor Walls (1018.1) Elevator Lobby (713.14.1)	Smoke compartments I-2 & I-3 occupancies (407.4 & 408.6) Ambulatory Care Facilities >10K (422.3) Smoke Control System (909.5) Accessible Means of Egress (1007.6.2) Accessible Area of Refuge (1007.6) Underground Buildings (405.4.2)	Corridors & Care Suites (I-2) Elevator Lobby in sprinklered bldgs				
Exceptions	Exception : Openings allowed between anchor bldg and mall	N/A	Exception : 713.14.1, 1018.1, 713.14.1	N/A	N/A	N/A	N/A	N/A	N/A
Structural Stability	Allow collapse of construction on either side under fire conditions without collapse of the wall for the FRR duration OR be constructed as double FWs (and meet NFPA 221) Methods : cantilevered or freestanding FWs, laterally supported and tied FW's, double wall construction.	Construction (floors, columns, beams) supporting FB to be same or higher fire-resistance rating (FRR) as FB	N/A	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type II, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type II, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type II, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type II, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type II, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type II, IV, & V)
Materials	Non-combustible materials	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type II, IV, & V)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Exceptions	Exception : Type V (both buildings)	N/A	1-HR	1-HR	1-HR	1-HR	1-HR	0-HR	0-HR
Fire-Resistance Rating	4-HR : H-1, H-2 3-HR : A, B, E, H-4, I, R-1, R-2, U (Type I, II, IV) 2-HR : A, B, E, H-4, I, R-1, R-2, U (Type II, V) 3-HR : F-1, H-3, H-5, M, S-1 2-HR : F-2, S-2, R-3, R-4 (H-1, H-2 or H-3 see 415.6 and 415.7)	Shafts & Stairways : Not less than floors penetrated Not greater than 2-HR	N/A	0.5-HR : Corridor Walls per 1018.1 0.5-HR : Dwelling Units and Sleeping Units (Type IIB/IIIB/VB + sprinklered)	0.5-HR : Corridor Walls per 1018.1 0.5-HR : Dwelling Units and Sleeping Units (Type IIB/IIIB/VB + sprinklered)	0.5-HR : Corridor Walls per 1018.1 0.5-HR : Dwelling Units and Sleeping Units (Type IIB/IIIB/VB + sprinklered)	0.5-HR : Corridor Walls per 1018.1 0.5-HR : Dwelling Units and Sleeping Units (Type IIB/IIIB/VB + sprinklered)	0.10" thick steel walls in I-3	0.10" thick steel walls in I-3
Exceptions	N/A	N/A	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.	N/A	N/A
Exterior Walls	FW terminating into a <180 degree EW : 1-HR EW with 3/4-HR opngs 4' on both sides of FW	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.	A. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above. Continuous through concealed spaces (e.g. suspended ceiling). B. Hollow vertical spaces fireblocked at every floor level. C. Joints and voids at intersections (top & bottom of FB) shall comply with Sections 707.8 and 707.9.	A. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above or FRR floor/ceiling or roof/ceiling assembly. B. Hollow vertical spaces fireblocked at every floor level. C. Joints and voids at intersections (top & bottom of FP) shall comply with Sections 707.8 and 707.9.	Exceptions 1. Crawl space if floor is minimum 1-HR. 2. Shaft enclosures may terminate below floor/ceiling/roof. 3. FB for incidental use areas in Type IIB, IIIB, VB may be on non-rated floor assemblies. 4. Interior exit stair/ramps may terminate below floor/ceiling/roof.	Exceptions 1. Equivalent or greater fire-resistance rating (FRR) as FB. 2. FB > 2 stories : If supporting structure is primary, see 704.3 (encasement). If supporting structure is secondary, see 711 (membrane).	Exceptions 1. Crawl space if floor is minimum 1-HR. 2. Room side to floor/roof, corridor side to 1-HR ceiling. 3. FRR corridor "tunnel" (rated vertical/horizontal FP). 4. Tenant spaces (mall) to underside of non-FRR ceiling. 5. Attic fireblocking/draftstopping not req'd in R-2 (<4 stories). 6. Fireblocking/draftstopping not req'd where sprinklered.	Equivalent or greater fire-resistance rating (FRR) as FP.	Equivalent or greater fire-resistance rating (FRR) as SB except for Type IIB/IIIB/VB.
Continuity	See Horizontal Continuity Horiz Projecting Elements Horiz Projecting Elements Vertical Continuity	A. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above. Continuous through concealed spaces (e.g. suspended ceiling). B. Hollow vertical spaces fireblocked at every floor level. C. Joints and voids at intersections (top & bottom of FB) shall comply with Sections 707.8 and 707.9.	A. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above or FRR floor/ceiling or roof/ceiling assembly. B. Hollow vertical spaces fireblocked at every floor level. C. Joints and voids at intersections (top & bottom of FP) shall comply with Sections 707.8 and 707.9.	A. Outside wall to outside wall. B. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above. B. Continuous through concealed spaces (e.g. suspended ceiling).	Exceptions 1. Interstitial spaces w/a ceiling that resists fire/smoke per the FRR of the SB. 2. Outside wall requirement : elevator lobbies 3. Outside wall requirement : areas of refuge	N/A	N/A	A. Top of the foundation or floor below to the underside of the floor or roof sheathing, deck or deck or underside of smoke-resistant ceiling.	N/A
Exceptions	N/A	N/A	N/A	N/A	Exceptions 1. 2-HR for separation of tank storage. 2. Shaft enclosures may terminate below floor/ceiling/roof. 3. FB for incidental use areas in Type IIB, IIIB, VB may be on non-rated floor assemblies. 4. Interior exit stair/ramps may terminate below floor/ceiling/roof.	Equivalent or greater fire-resistance rating (FRR) as SB except for Type IIB/IIIB/VB.	N/A	N/A	N/A
Supporting Construction	N/A	1. Equivalent or greater fire-resistance rating (FRR) as FB. 2. FB > 2 stories : If supporting structure is primary, see 704.3 (encasement). If supporting structure is secondary, see 711 (membrane).	See 716.4 0.3-HR Corridor doors 0.5-HR Tenant Dwellings/Sleeping Units 0.3-HR in 0.5-HR assemblies	See 716.4	See 716.4	See 716.4	See 716.4	See 710.5.1 & 710.5.2 Windows : resist the free passage of smoke or be automatic closing upon smoke detection. Doors : No louvers & may need to be self/automatic closing by smoke detection.	See 710.5.1 & 710.5.2 Windows : resist the free passage of smoke or be automatic closing upon smoke detection. Doors : No louvers & may need to be self/automatic closing by smoke detection.
Exceptions	N/A	N/A	See 716.4 0.3-HR Corridor doors 0.5-HR Tenant Dwellings/Sleeping Units 0.3-HR in 0.5-HR assemblies	See 716.4	See 716.4	See 716.4	See 716.4	N/A	N/A
Openings	Max size = 156 SF/25% of FW length on any floor	Max aggregate width = 25% of FB length on any floor Max size = 156 SF (any single opening) Exit Access Stairs/Ramps, Interior Exit Stair/Ramps, Exit Passageways shall comply w/1022.3 & 1023.5	See 714.3 & 707.7.1 (Exit enclosure or exit passageway) Prohibited penetrations in exit enclosures (exit access stairs/ramps, interior exit stairs/ramps, exit passageways)	See 714	See 714	See 714	See 714	Limit the free passage of smoke (no prescriptive requirement)	Limit the free passage of smoke (no prescriptive requirement)
Exceptions	Exceptions : 1. No opngs in Party Walls. 2. No max size if both buildings sprinklered.	Exceptions : 1. No max size if sprinklered. 2. No max aggregate width/size for fire doors in Exit Access Stairs/Ramps & Interior Exit Stair/Ramps. 3. No max aggregate width/size for tested opening protectives in Exit Access Stairs/Ramps & Interior Exit Stair/Ramps. 4. No max aggregate width for atrium window assemblies. 5. No max aggregate width/size for fire doors in Exit Access Stairs/Ramps & Interior Exit Stair/Ramps from an Exit Passageway.	See 715	See 715	See 715	See 715	See 715	Limit the free passage of smoke (no prescriptive requirement)	Limit the free passage of smoke (no prescriptive requirement)
Penetrations	See 714.2 & 714.3	See 714.3 & 707.7.1 (Exit enclosure or exit passageway) Prohibited penetrations in exit enclosures (exit access stairs/ramps, interior exit stairs/ramps, exit passageways)	See 714	See 714	See 714	See 714	See 714	N/A	N/A
Joints	See 715	See 715	See 715	See 715	See 715	See 715	See 715	N/A	N/A
Miscellaneous	N/A	Voids at intersections (707.9) : FB and non-FRR roof assembly	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Duct/Air Transfer Openings	Not allowed	See 717	See 717	See 717	See 717	See 717	See 717	Limit the free passage of smoke (no prescriptive requirement). Air transfer openings - smoke damper (717.3.2.2)	Limit the free passage of smoke (no prescriptive requirement). Air transfer openings - smoke damper (717.3.2.2)
CONSIDERATIONS	Sprinkler piping penetration of FW (1 or 2 systems?)	FB's must terminate at the underside of a floor assembly or a roof assembly and not a horizontal assembly (HA)	FP's are not always required to be continuous through concealed spaces.						

FLAD CODE FORUM

Comparing Fire/Smoke
Walls, Barriers, and Partitions

OUTLINE

- Overview
- Definitions
- Functionality
- Structural Stability
- Fire-Resistance Rating
- Continuity
- Penetrations
- Joints
- Duct/Air Transfer Openings
- Summary

IBC 2012

Chapter 7 - Fire and Smoke Protection Features

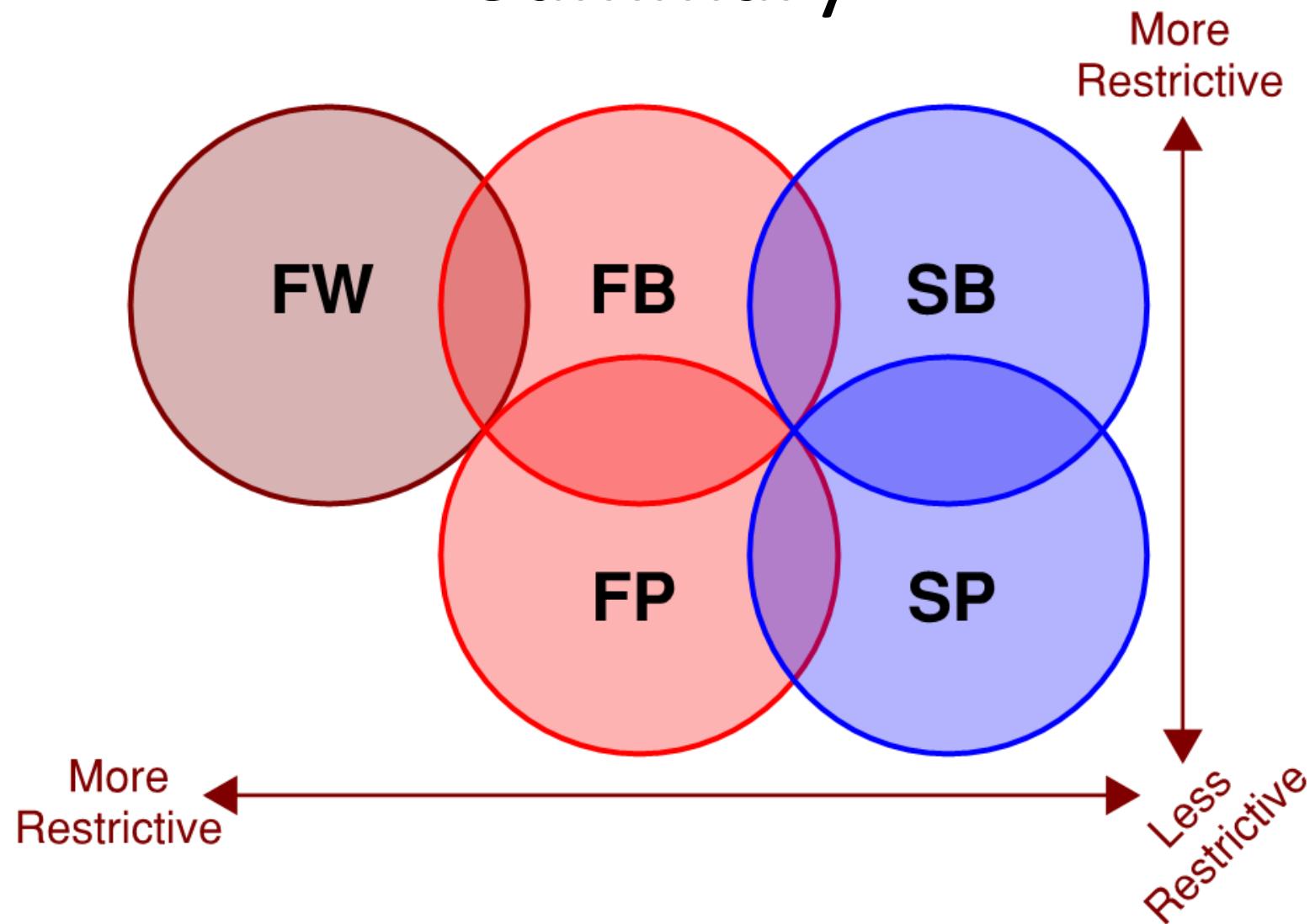
- 706 FIRE WALLS
- 707 FIRE BARRIERS
- 708 FIRE PARTITIONS
- 709 SMOKE BARRIERS
- 710 SMOKE PARTITIONS
- 711 HORIZ ASSEMBLIES
- 712 VERTICAL OPENINGS
- 713 SHAFT ENCLOSURES
- 714 PENETRATIONS
- 715 F-R JOINT SYSTEMS
- 716 OPNG PROTECTIVES
- 717 DUCTS/AIR OPNGS

Abbreviations

- Fire Walls : **FW**
- Fire Barriers : **FB**
- Fire Partitions : **FP**
- Smoke Barriers : **SB**
- Smoke Partitions : **SP**
- FB/SB Combo : **FSB**
- Fire-Resistance Ratings
 - 0-Hours : **0**
 - 1/3-Hour : **0.3**
 - 1/2-Hour : **0.5**
 - 1-Hour : **1**
 - 2-Hours : **2**
 - 3-Hours : **3**
 - 4-Hours : **4**

Examples : 2-HR Fire Barrier = **2FB** ... 2-HR Fire Barrier + 1-HR Smoke Barrier = **2FSB**

Summary



Walls vs. Partitions

- Architecturally, we use the terms “**walls**” and “**partitions**” interchangeably in our work

B

GWB + GWB + stud + GWB + GWB
Two layers of 5/8" GWB on both sides of stud framing. Typical unless noted otherwise by modifier/s.

WALL TYPE		DETAIL	B0...	B1...	B2	B3	B4	B6
Stud Size			-	-	2 1/2"	3 5/8"	4"	6"
Overall Width			-	-	5"	6 1/8"	6 1/2"	8 1/2"
Insulation Thickness - Where called for below.			-	-	1 1/2"	3 1/2"	4"	5"
NON-RATED PARTITIONS								
Non-rated gypsum board to 6" above ceiling braced to structure		SECTION A			B2A	B3A	B4A	B6A
Non-rated gypsum board to 6" above ceiling braced to structure with sound attenuating batt insulation		SECTION A			B2B	B3B	B4B	B6B
Non-rated gypsum board full height		SECTION B			B2C	B3C	B4C	B6C
Non-rated gypsum board full height with sound attenuating batt insulation		SECTION B			B2D STC 45	B3D STC 45	B4D STC 45	B6D STC 45
Non-rated partial height gypsum board		Refer to elevation and details			B2E	B3E	B4E	B6E
RATED PARTITIONS								
2-HR rated gypsum board - full height		SECTION C			B2M UL U419	B3M UL U419	B4M UL U419	B6M UL U419
2-HR rated gypsum board - full height with sound attenuating batt insulation		SECTION C			B2N UL U419	B3N UL U419 STC 45	B4N UL U419	B6N UL U419 STC 45

FIRE RATING

19. UL (UNDERWRITERS LABORATORIES) DESIGN REFERS TO FIRE RESISTANT DIRECTORY'S MOST RECENT USE.

20. ALL RATED **PARTITIONS** SHALL EXTEND TO STRUCTURE ABOVE U.O.N. CONTRACTOR IS RESPONSIBLE TO REVIEW UL DIRECTORY AND FOR ALL SPECIFIC REQUIREMENTS.

21. RATED **PARTITIONS** AT SHAFTS, CORRIDORS, AND AREA SEPARATION WALLS SHALL MAINTAIN CONTINUITY OF RATING AROUND OR THROUGH INTERVENING COLUMN ENCLOSURES AND NON-RATED **PARTITIONS**.

22. WHERE A **PARTITION** MUST COMPLY WITH BOTH FIRE RATINGS AND ACOUSTICAL REQUIREMENTS, FIRE SEALANTS AND /OR FIRE SAFING SHALL BE PROVIDED IN LIEU OF ACOUSTICAL SEALANTS.

Building industry uses non-code terms



Area Separation Walls

Fire Tested and Building Code Approved

The G-P Gypsum 2-hour fire-rated area separation wall assembly, constructed using DensGlass Ultra Shaftliner panels, is listed by Underwriters Laboratory (UL) and Warnock Hersey International (WHI/ITS) and meets the requirements of the 2003 International Building Code (IBC) Section 503.2 "Party Walls", and Section 705, "Fire Walls". The G-P Gypsum Area Separation Wall assembly is listed in the UL Fire Resistance Directory under UL Design U 373 and in the WHI Fire Resistance Directory under WHI 120-04. For copies of these listings, please contact G-P Gypsum Technical Services at 1-800-225-6119.

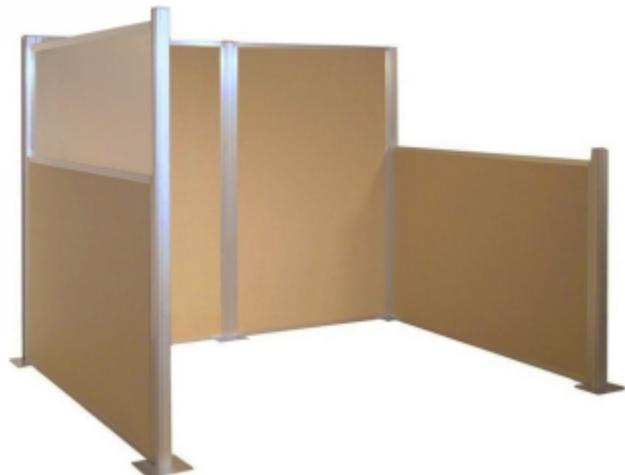
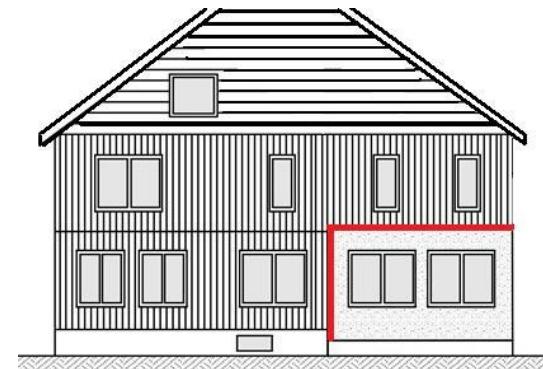


Model Powder Coated Steel Partitions



The Real Estate Inspection Company

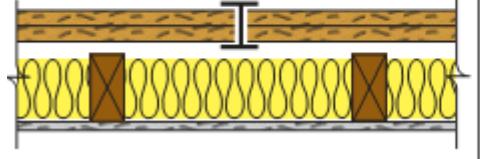
Firewall required at ceiling of garage



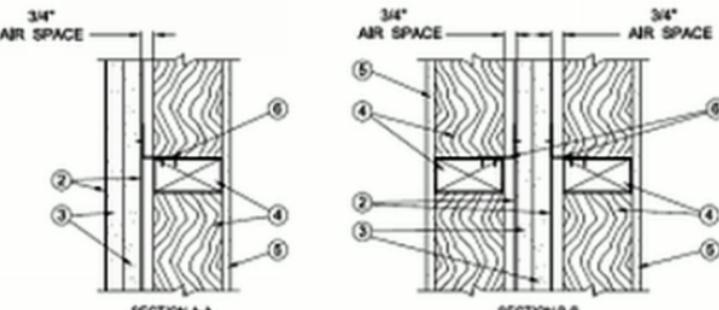
Hush Panel Configurable Cubicle Partition

Fire-Resistance Ratings : Hours

System Assemblies – 2-Hour Ratings

Construction Detail	Assembly Components	Acoustical Testing	
		STC	Reference
	Two layers 1" DensGlass® Ultra Shaftliner™ inserted in H-Studs 24" o.c. Min. 3/4" air space between liner panels and adjacent framing.		UL DESIGN U373

Design No. U373
June 17, 2014
Nonbearing Wall Rating - 2 Hr (See Items 4, 4A and 4B)
Finish Rating - 120 Min (See Item 4)
* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.



UL PRODUCT SPEC™

Quickly find,

1. HOW DO YOU WANT TO SEARCH?

Search with Specific Parameters

Select from the following menus, then click Search.

Assembly type: Walls and Partitions

Construct group:

Hourly ratings:

Please select...
Please select...
Rating < 1 hr
Rating ≥ 1 hr and < 2 hr
Rating ≥ 2 hr and < 3 hr
Rating ≥ 3 hr and < 4 hr
Rating = 4 hr

Manufacturer (optional): Example: "XYZ Co."

Fire-Resistance-Rated Legends

SP SP	0HR SMOKE PARTITION		CORRIDOR WALLS (LIMIT TRANSFER OF SMOKE) - 0 HR
.....	1HR FIRE PARTITION		SMOKE BARRIER - 1 HR or 2 HR + RESTRICT THE MOVEMENT OF SMOKE
— · — · —	1HR SMOKE PARTITION		
· · · · ·	2HR FIRE PARTITION		
— · — · —	2HR SMOKE PARTITION		FIRE RATING - 1 HR
— · — · —	3HR FIRE PARTITION		FIRE RATING - 2 HR
— · — · —	4HR FIRE PARTITION		
—	1/2-HOUR CORRIDOR WALL (EXISTING)		2HR - HORIZONTAL EXIT (SMOKE BARRIER SEPARATION ALSO REQUIRED)
—	0-HOUR SMOKE PARTITION		2HR - OCCUPANCY SEPARATION (SMOKE BARRIER SEPARATION ALSO REQUIRED)
—	1-HOUR FIRE BARRIER		
—	1-HOUR SMOKE BARRIER (SMOKE COMP. SEPARATION)		0HR SMOKE PARTITION
—	2-HOUR FIRE BARRIER		1HR FIRE WALL
—	2-HOUR FIRE BARRIER (OCCUPANCY SEPARATION)		1HR FIRE/SMOKE WALL
			2HR FIRE WALL
			2HR FIRE/SMOKE WALL

Specs : Div 09 Finishes

- **09 20 00 Plaster and Gypsum Board**
 - 09 21 00 Plaster and Gypsum Board Assemblies
 - 09 21 00 Gypsum Board Assemblies
 - **09 21 16 . 23 Gyp Bd Shaft Wall Assemblies**
 - » *Enclosures : Shafts, Chases, Stairs, Horizontal Duct Assemblies*
 - **09 21 16 . 33 Gyp Bd Area Separation Wall Assemblies**
 - » *Enclosures : Shafts, Chases, Stairs, Horizontal Duct Assemblies*
 - 09 22 00 Supports for Plaster and Gypsum Board
 - 09 22 13 Metal Furring
 - **09 22 16 Non-Structural Metal Framing**
 - » *Interior framing systems : partition walls, furred walls, soffits*
 - 09 22 16 . 13 Non-Structural Metal Stud Framing
 - 09 29 00 Gypsum Board
 - **09 29 82 Gypsum Board Fireproofing**

Specs : Other Divisions

- Division 03 Concrete
 - 03 30 00 Cast-in-Place Concrete
 - 03 40 00 Precast Concrete
- Division 04 Masonry
 - 04 20 00 Unit masonry
- Division 05 Metals
 - 05 40 00 Cold-Formed Metal Framing
 - Exterior/Interior load-bearing wall framing
 - Exterior non-load-bearing wall framing
 - 05 41 00 Structural Metal Framing
- Division 06 Wood, Plastics, and Composites
 - 06 10 00 Rough Carpentry

Specs : Other Divisions

- Division 07 Thermal and Moisture Protection
 - 07 80 00 Fire and Smoke Protection
 - 07 84 00 Firestopping
 - 07 86 00 Smoke Seals
 - 07 87 00 Smoke Containment Barriers
 - 07 90 00 Joint Protection
- Division 08 Openings
 - 08 10 00 Door and Frames
 - 08 70 00 Hardware
 - 08 80 00 Glazing

Specs : Consultants

- Division 20 Conveying Equipment
- Division 21 Fire Suppression
- Division 22 Plumbing
- Division 23 HVAC
- Division 26 Electrical
- Division 27 Communications

IBC : TABLE 601

FIRE-RESISTANCE RATING (FRR) REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A ^d	B	A ^d	B	HT	A ^d	B
Primary structural frame ^g (see Section 202)	3 ^a	2 ^a	1	0	1	0	HT	1	0
Bearing walls									
Exterior ^{f,g}	3	2	1	0	2	2	2	1	0
Interior	3 ^b	2 ^b	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions							See Table 602		
Exterior									
Nonbearing walls and partitions							See Section 602.4.6	0	0
Interior ^e	0	0	0	0	0	0			
Floor construction and associated secondary member (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 ^{b,c}	1 ^{b,c}	1 ^{b,c}	0 ^f	1 ^{b,c}	0	HT	1 ^{b,c}	0

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

602.4.6 Partitions.

Partitions shall be of solid wood construction formed by not less than two layers of 1-inch (25 mm) matched boards or laminated construction 4 inches (102 mm) thick, or of **1-hour fire-resistance-rated construction**.

Definitions

Definitions – FIRE WALL (FW)

- 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.

Definitions – FIRE BARRIERS (FB)

- A fire-resistance-rated **wall assembly** of materials designed to **restrict the spread of fire** in which **continuity** is maintained.

Definitions – FIRE PARTITIONS (FP)

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

Comparison : FW-FB-FP Definitions

- Similarities
 - All *restrict the spread of fire*
- Differences
 - FWs
 - Require *structural stability*
 - Require continuity from foundation to/thru the roof
 - FBs
 - Require *continuity*
 - Horizontal Assemblies (HA) can be FBs
 - FPs
 - Can be vertical and/or horizontal

Functionality

Functionality – FIRE WALL (FW)

- Separate buildings : to meet maximum allowable areas and/or stories (Table 503) and different types of construction (Table 601).
- Separate occupancies : when occupancies are required to be separated by a FB, more stringent FW or FB requirement shall apply.
- Party walls (PW): FW on an interior lot line between (2) adjacent buildings.
 - PW/FW vs. (2) separate exterior walls with 0 fire separation distance.
 - PW/FW : no openings and utilities cannot penetrate.
 - Exception : Opngs allowed between anchor bldg and mall

Functionality – FIRE BARRIER (FB)

- Interior Exit Stair/Ramp
- Exit Passageway
- Horizontal Exit
- Exit Access Stair/Ramp
- Incidental Use Area
- Control Area
- Shaft Enclosure
- Fire Areas
- Atrium
- Occupancy

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen cutoff rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
Laboratories and vocational shops, not classified as Group H, located in a Group E or I-2 occupancy	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
Group I-3 cells equipped with padded surfaces	1 hour
Waste and linen collection rooms located in either Group I-2 occupancies or ambulatory care facilities	1 hour
Waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterruptible power supplies	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.

OCCUPANCY	A, E	I-1, I-3, I-4		I-2		R ^a	F-2, S-2 ^b , U		B, F-1, M, S-1		H-1		H-2		H-3, H-4		H-5		
		S	NS	S	NS		S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	
A, E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	NP	
I-1, I-3, I-4	—	—	N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP	
I-2	—	—	—	N	N	2	NP	2	NP	2	NP	NP	NP	NP	3	NP	2	NP	
R ^a	—	—	—	—	—	N	N	1 ^c	2 ^c	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2 ^b , U	—	—	—	—	—	—	N	N	1	2	NP	NP	3	4	2	3	2	NP	
B, F-1, M, S-1	—	—	—	—	—	—	—	—	N	N	NP	NP	2	3	1	2	1	NP	
H-1	—	—	—	—	—	—	—	—	—	—	N	NP	NP	NP	NP	NP	NP	NP	
H-2	—	—	—	—	—	—	—	—	—	—	N	NP	1	NP	1	NP	1	NP	
H-3, H-4	—	—	—	—	—	—	—	—	—	—	—	—	—	1 ^d	NP	1	NP	1	
H-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	1	

Functionality – FIRE PARTITION (FP)

- Dwelling/Sleeping Units
- Tenant Spaces in Malls
- Corridor Walls
- Elevator Lobby

TABLE 1018.1 CORRIDOR FIRE-RESISTANCE RATING

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

Definitions

Definitions – SMOKE BARRIERS (SB)

- 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**.

Definitions – SMOKE PARTITIONS (SP)

- No definition per IBC (?!)
- *Non-rated walls that resist the spread of fire and the unmitigated movement of smoke for an unspecified period of time.*

Comparison : SB-SP Definitions

- Similarities
 - Both “address” *the spread of smoke*
 - SBs restrict *the spread of smoke*
 - SPs resist *the spread of smoke*
- Differences
 - SBs
 - Can be **walls, floors, and/or ceiling** assemblies

Functionality

Functionality – SMOKE BARRIERS (SB)

- **Smoke compartments**
 - I-2 : Hospitals, Nursing Homes, Detox, Foster Care
 - Health care facility providing 24-hour medical supervision
 - Occupants require assistance from others to reach safety
 - I-3 : Correctional & Detection Centers
 - 5 or more confined occupants incapable of self-preservation
- SBs also referenced by :
 - Smoke Control System
 - Accessible Means of Egress
 - Accessible Area of Refuge
 - Underground Buildings

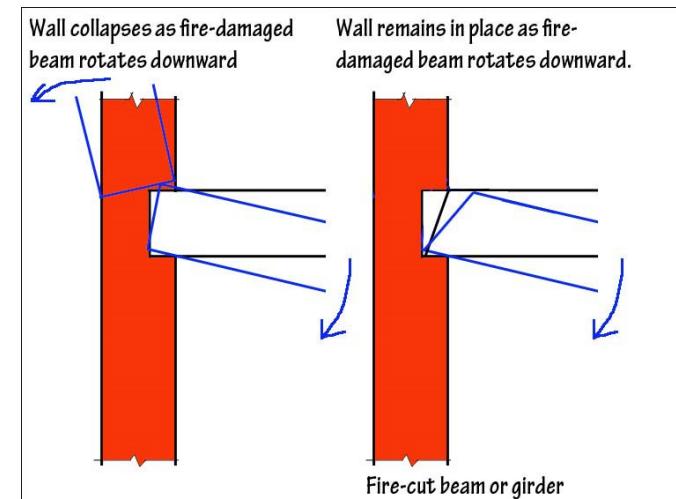
Functionality – SMOKE PARTITION (SP)

- Corridors & Care Suites
 - I-2 : Hospitals, Nursing Homes, Detox, Foster Care
- No level of performance required
 - Light Test : If light “leaks” through a SP, it will not *resist* the passage of smoke

Structural Stability

Structural Stability - FW

- Allow **collapse** of construction on **either side** under fire conditions **without collapse** of the wall for the FRR duration OR be constructed as **double FWs** (and meet NFPA 221)
- Methods
 - Cantilevered or freestanding
 - Laterally supported and tied
 - Double wall construction



Structural Stability - FB

- Construction (floors, columns, beams) supporting FB to be same or higher fire-resistance rating (FRR) as FB
- Structural Stability for FP, SB, & SP
 - Not Applicable

Materials - ALL

- FW : only **non-combustible** materials
- FB/FP/SB/SP : Permitted by **Construction Type**
 - Noncombustible : Type I & II
 - Combustible : Type II, IV, & V

Fire-Resistance Ratings

Fire-Resistance Ratings - FW

- Based on Occupancy Group and Const Type
 - **4-HR** : H-1, H-2
 - (H-1, H-2 or H-3 see 415.6 and 415.7)
 - **3-HR** : A, B, E, H-4, I, R-1, R-2, U (Type I, II, IV)
 - **2-HR** : A, B, E, H-4, I, R-1, R-2, U (Type II, V)
 - **3-HR** : F-1, H-3, H-5, M, S-1
 - **2-HR** : F-2, S-2, R-3, R-4

Fire-Resistance Ratings - FB

- Based on Function and Number of Stories
 - **1-HR** : Atrium
 - **1-HR** (min) or equal to stairway : Exit Passageway
 - **1-HR (<4)** or **2-HR (4 or >)**
 - Interior Exit Stair/Ramp*
 - Exit Access Stair/Ramp*
 - Shaft Enclosure*
 - * Not less than floors penetrated & not greater than 2-HR
 - **1-HR or 2-HR**
 - Incidental Use Area
 - Control Area
 - **2-HR** (min) or FW : Horizontal Exit
 - **1-HR, 2-HR, or 3-HR** : Occupancy
 - **1-HR, 2-HR, 3-HR, or 4-HR** : Fire Areas

Fire-Resistance Ratings – FP & SB & SP

- FP : **1-HR**
 - Exceptions
 - **0.5-HR** : Corridor Walls (T1018.1 below)
 - **0.5-HR** : Dwelling Units and Sleeping Units
 - (Type IIB/IIIB/VB + sprinkled)

TABLE 1018.1 CORRIDOR FIRE-RESISTANCE RATING

- SB : **1-HR**
- SP : **0-HR**

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

Continuity - FW

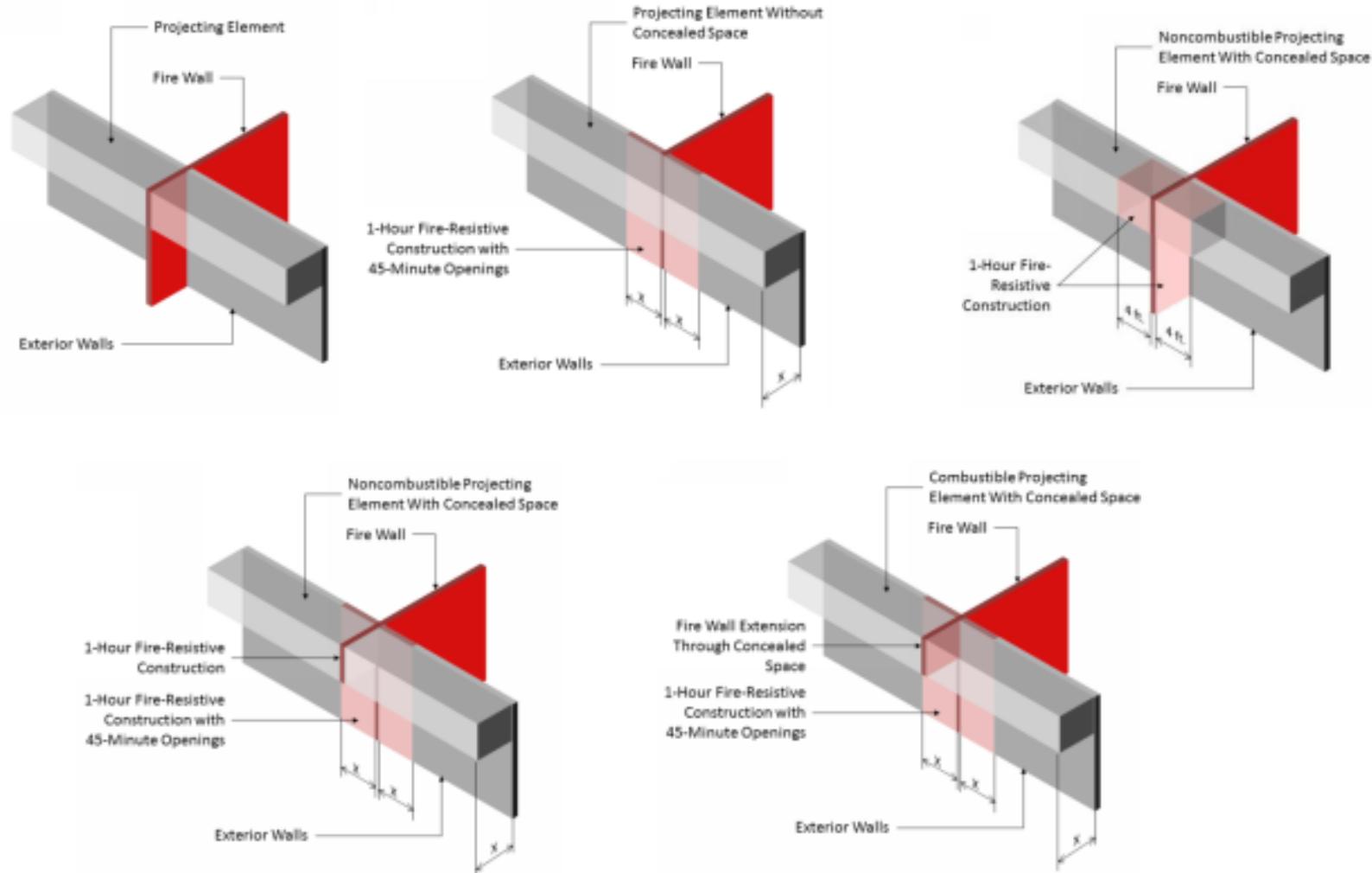
Continuity – FW

- Horizontal Continuity
 - Exterior wall to exterior wall
 - Extend at least **18"** beyond the exterior surface
 - Exceptions
 - » 1. FW may terminate at the **interior surface of combustible exterior sheathing/siding** provided the exterior wall has a fire-resistance rating of at least **1-HR on 4' on both sides** of FW & 3/4-HR openings.
 - » 2. FW may terminate at the **interior surface of noncombustible exterior sheathing, exterior siding or other noncombustible exterior finishes** provided these materials **extends 4' on both sides** of FW.
 - » 3. FW may terminate at the **interior surface of noncombustible exterior sheathing** where the **building on each side** of the FW is protected by an **automatic sprinkler system**.

Continuity – FW

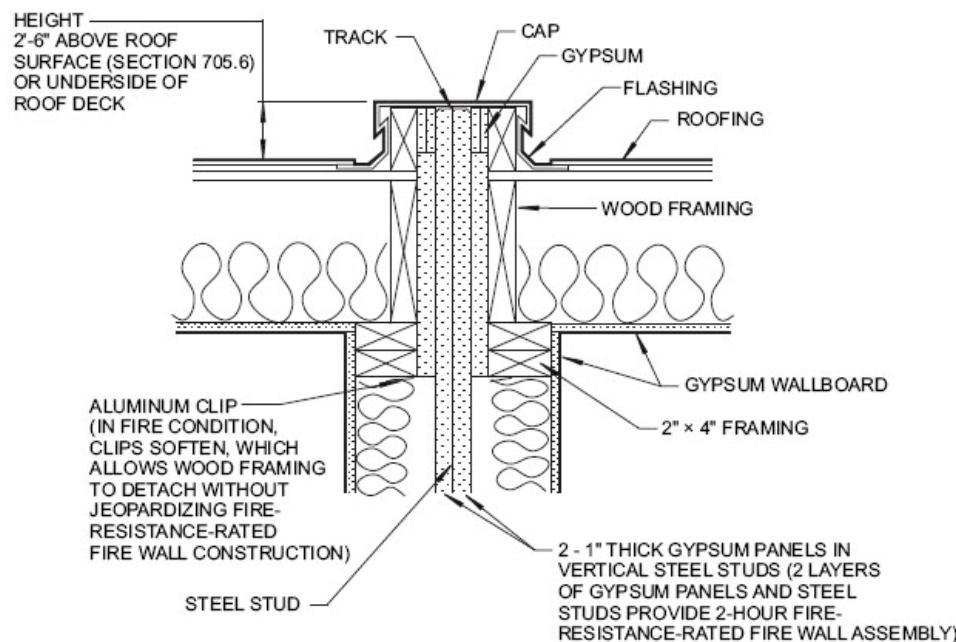
- Horizontal Continuity
 - Horizontal Projecting Elements (HPE)
 - FW extend to outer edge of HPE within 4' of FW
 - Exceptions
 - » 1. HPE w/o concealed spaces w/a 1-HR exterior wall and 3/4-HR openings extending the depth of HPE on both sides of FW.
 - » 2. Noncombustible HPE w/concealed spaces w/a 1-HR exterior wall and 3/4-HR openings.
 - » 3. Combustible HPE w/concealed spaces w/a 1-HR exterior wall and 3/4-HR openings.

Horizontal Projecting Elements – FW



Continuity – FW

- Vertical Continuity
 - Foundation to 30" above roofs



Continuity – FW

- Vertical Continuity
 - Exceptions

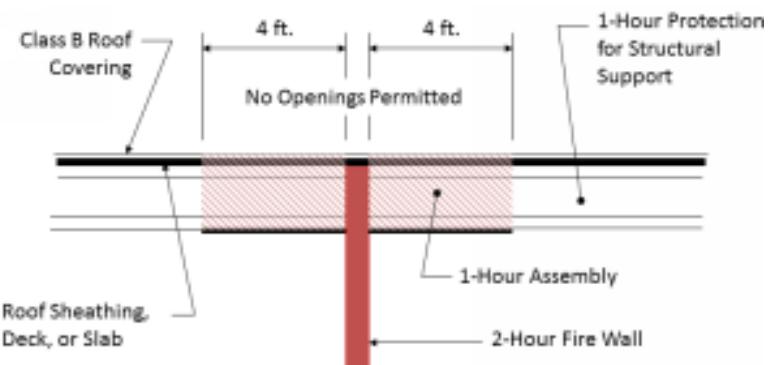
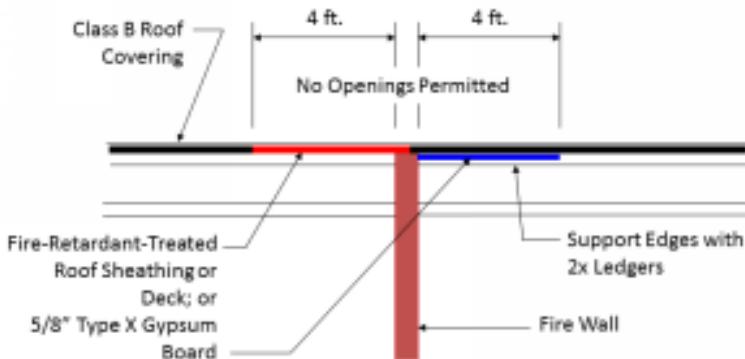
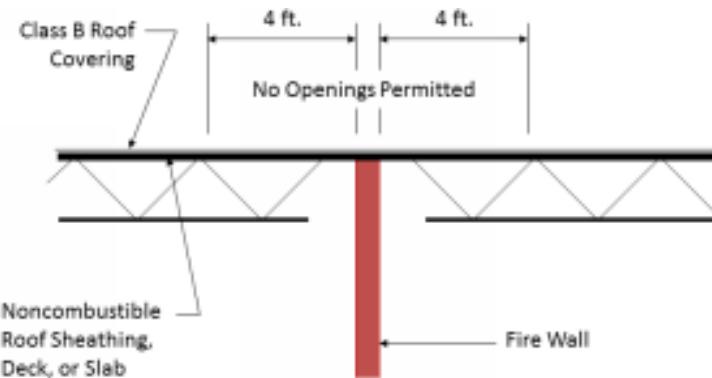
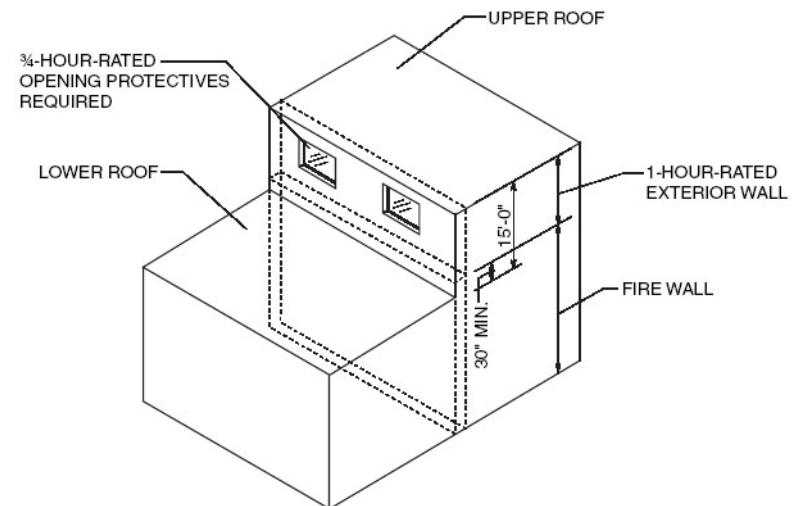
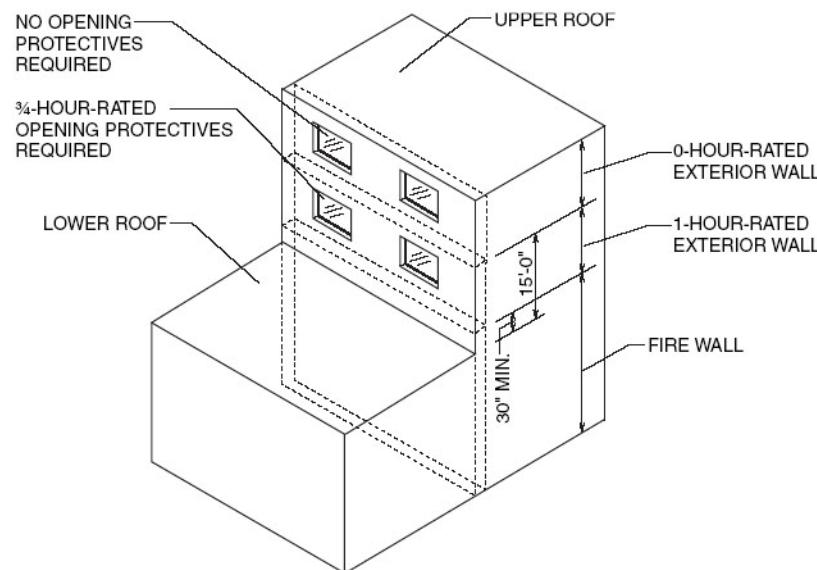
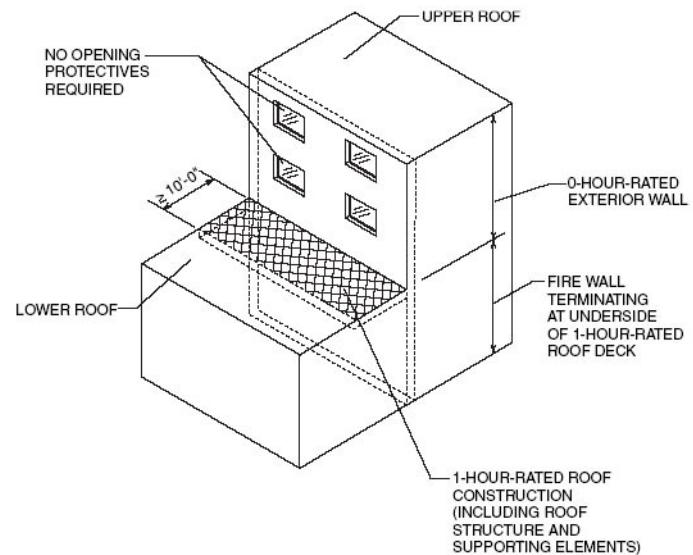


Figure 13 – Fire wall termination at combustible roofs for Type III, IV, and V construction. Left side shows fire-retardant-treated wood option and right side shows gypsum board application method.



Continuity – FW

- Vertical Continuity
 - Stepped Buildings
 - Sloped Roofs

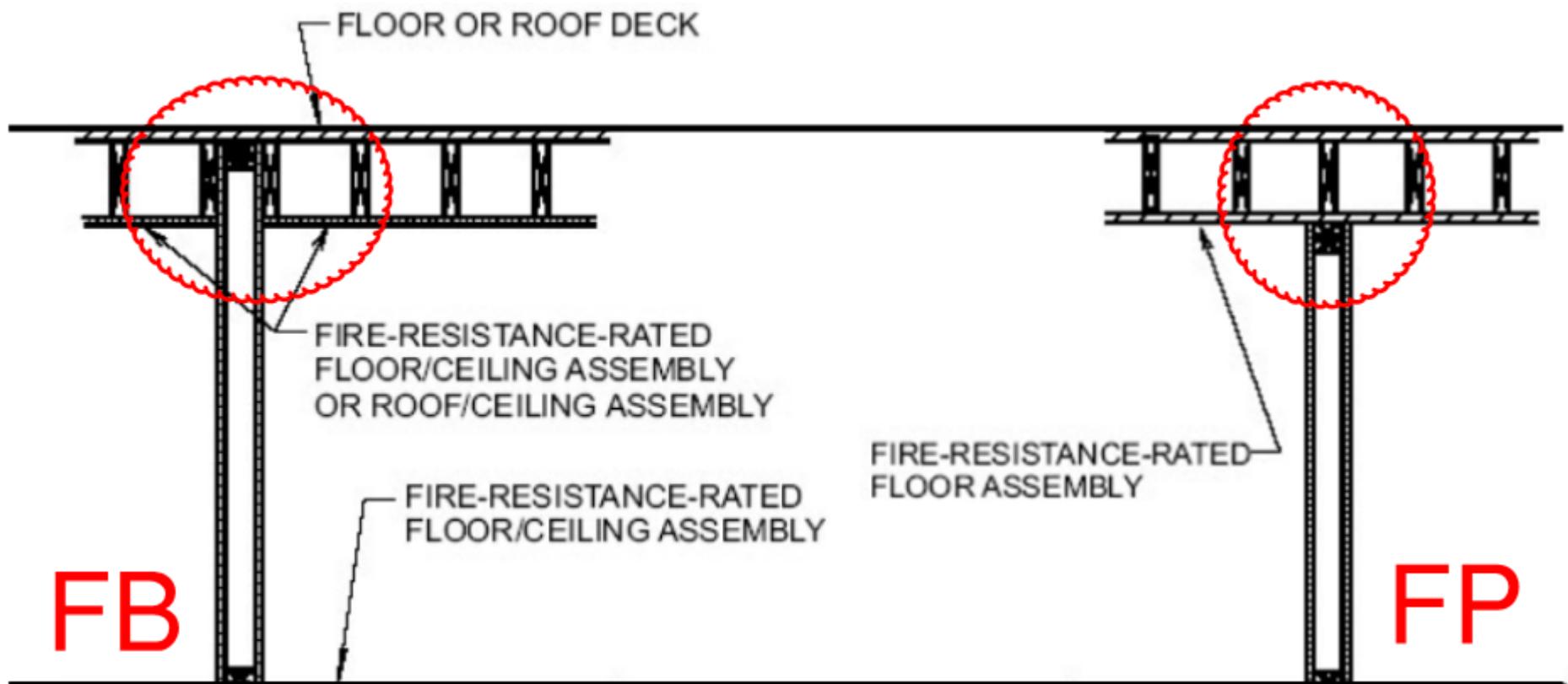


Continuity – FB & FP

Continuity – FB vs. FP

- **FB** : Top of the foundation or floor/ceiling assembly below to the underside of the *floor* or *roof sheathing, deck* or *slab* above.
- **FP** : Top of the foundation or floor/ceiling assembly below to the underside of the *floor* or *roof sheathing, deck* or *slab* above or *FRR floor/ceiling* or *roof/ceiling assembly*.

Continuity – FB & FP



Continuity – FB & FP

- B. **Hollow vertical spaces** fireblocked at every floor level.
- C. **Joints and voids** at intersections (top & bottom of FB/FP) shall comply with Sections 707.8 and 707.9

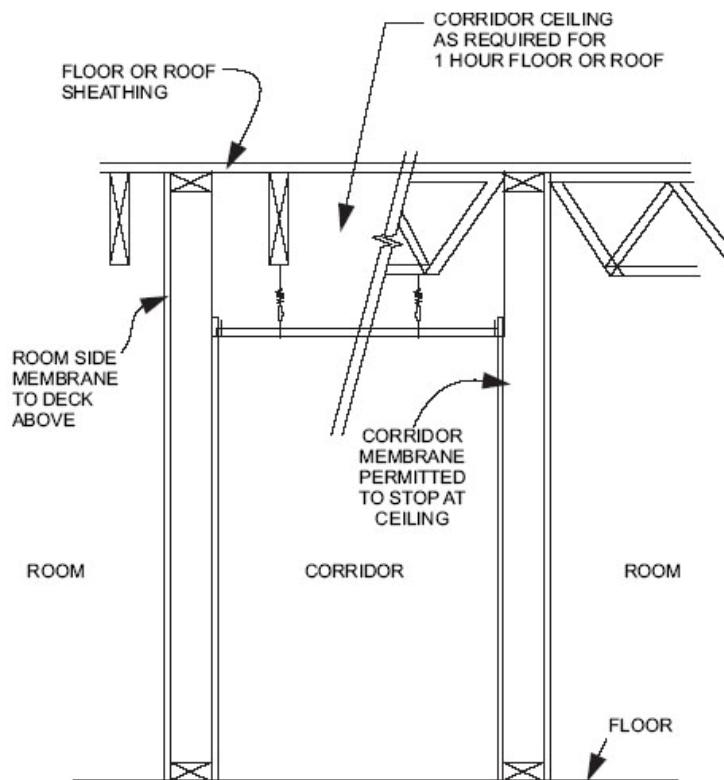
Continuity – FB Exceptions

- 1. 2-HR for separation of tank storage.
- 2. Shaft enclosures may terminate below floor/ceiling/roof.
- 3. FB for incidental use areas in Type IIB, IIIB, VB may be on non-rated floor assemblies.
- 4. Interior exit stair/ramps may terminate below floor/ceiling/roof.

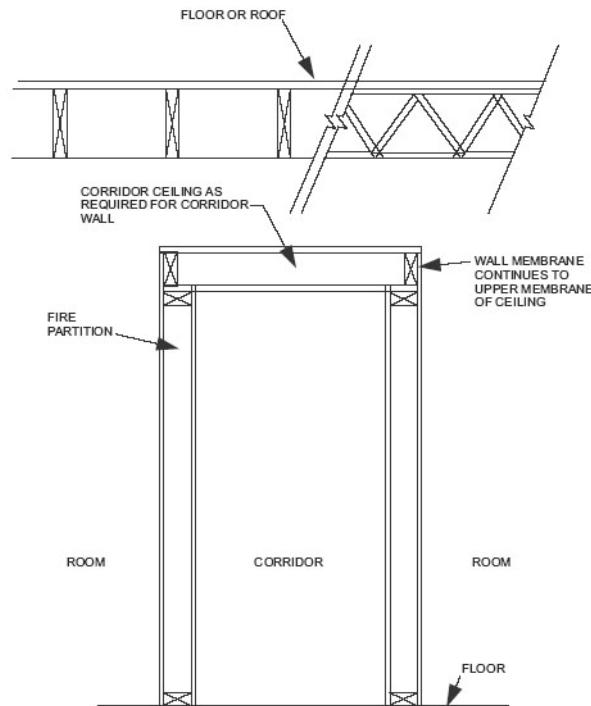
Continuity – FP Exceptions

- 1. Crawl space if floor is minimum 1-HR.
- 2. Room side to floor/roof, corridor side to 1-HR ceiling.
- 3. FRR corridor "tunnel" (rated vertical/horizontal FP).
- 4. Tenant spaces (mall) to underside of non-FRR ceiling.
- 5. Attic fireblocking/draftstopping not req'd in R-2 (<4 stories).
- 6. Fireblocking/draftstopping not req'd where sprinklered.

Continuity – FP Exceptions



Exception #2



Exception #3

Continuity – SB & SP

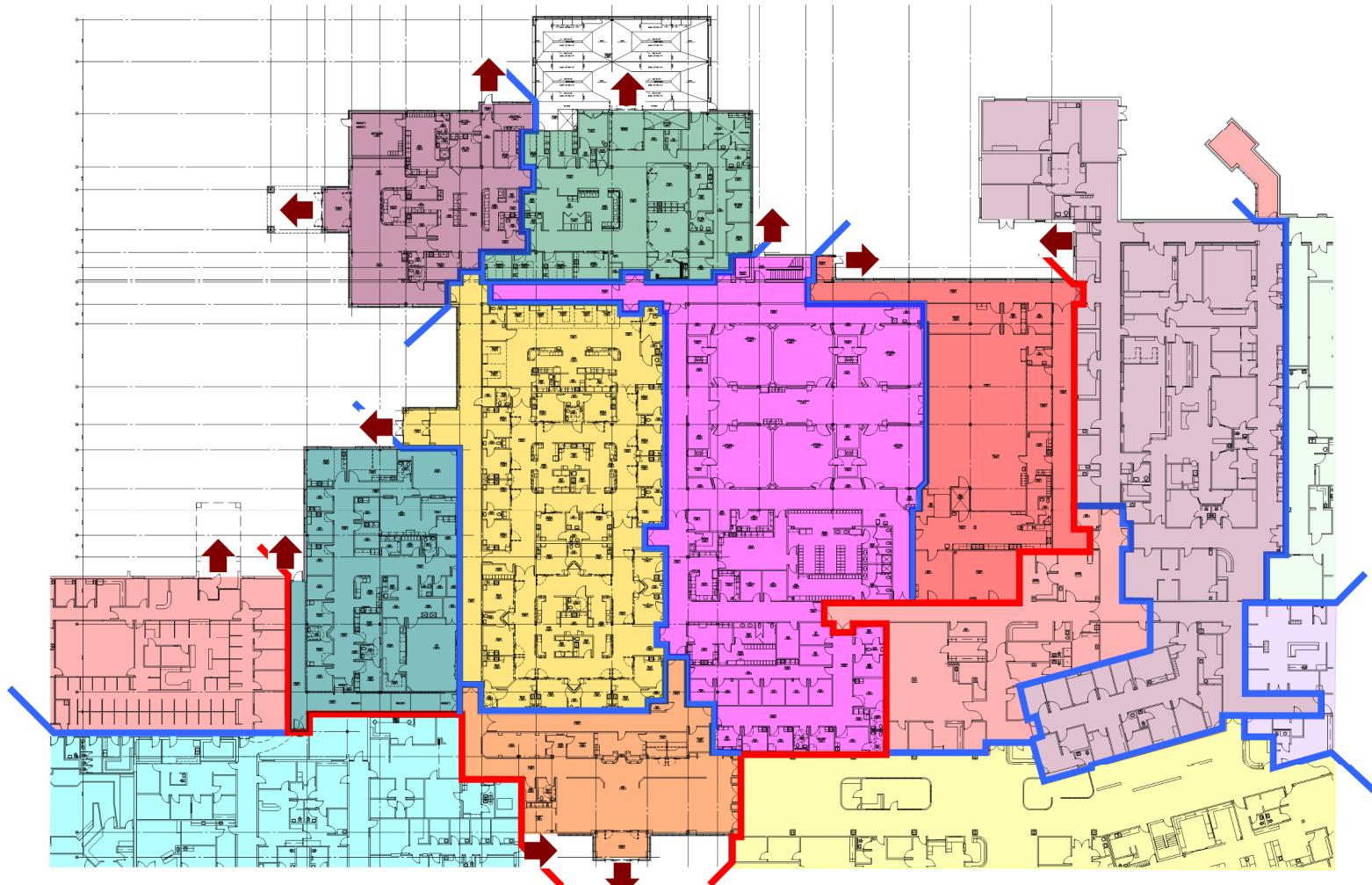
Continuity – SB vs. SP

- **SB** : Top of the foundation or *floor/ceiling assembly* below to the underside of the floor or roof sheathing, slab or deck above.
- **SP** : Top of the foundation or *floor* below to the underside of the floor or roof sheathing, slab or deck or *underside of smoke-resistant ceiling*.

Continuity – SB only

- A. Outside wall to outside wall.
- B. Continuous through concealed spaces (e.g. suspended ceiling).
- Exceptions
 - 1. Interstitial spaces w/a ceiling that resists fire/smoke per the FRR of the SB.
 - 2. Outside wall requirement : elevator lobbies
 - 3. Outside wall requirement : areas of refuge

SB – Smoke Compartments



Openings

Openings – FW & FB

- **FW**
 - Max size
 - 156 SF
 - 25% of FW length on any floor
- **FB**
 - Max aggregate width = 25% of FB length on any floor
 - Max size = 156 SF (any single opening)
 - Exit Access Stairs/Ramps, Interior Exit Stair/Ramps, Exit Passageways shall comply w/1022.3 & 1023.5

Openings – FW & FB Exceptions

- **FW**
 - 1. No opngs in **Party Walls**.
 - 2. **No max size** if both buildings sprinkled.
- **FB**
 - 1. **No max size if sprinklered**.
 - 2. **No max aggregate width/size for fire doors** in Exit Access Stairs/Ramps & Interior Exit Stair/Ramps.
 - 3. **No max aggregate width/size for tested opening protectives** in Exit Access Stairs/Ramps & Interior Exit Stair/Ramps.
 - 4. **No max aggregate width** for atrium window assemblies.
 - 5. **No max aggregate width/size for fire doors** in Exit Access Stairs/Ramps & Interior Exit Stair/Ramps from an **Exit Passageway**.

Openings – FP & SB

- FP
 - See **716.4**
 - 0.3-HR Corridor doors
 - 0.5-HR Tenant Dwellings/Sleeping Units
 - 0.3-HR in 0.5-HR assemblies
- SB
 - See **716.4**
 - Exceptions :
 - 1. I-2/Ambulatory Care Facilities
 - Pair of opposite swing doors, 0.3-HR, no positive latching/center mullions/louvers/grilles, vision panel, max 3/4" undercut, astragals/rabbets at leading edges.
 - Horizontal sliding doors

Openings : Table 716.5

TABLE 716.5 OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL ^e	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)	FIRE-RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
						Fire protection	Fire resistance
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3	Not Permitted	Not Permitted	Not Permitted	4	Not Permitted W-240
	3	3 ^a	Not Permitted	Not Permitted	Not Permitted	3	Not Permitted W-180
	2	1 ^{1/2}	100 sq. in. ^c	≤100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	2	Not Permitted W-120
	1 ^{1/2}	1 ^{1/2}	100 sq. in. ^c	≤100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	1 ^{1/2}	Not Permitted W-90

Openings : Table 716.6

TABLE 716.6 FIRE WINDOW ASSEMBLY FIRE PROTECTION RATINGS

TYPE OF WALL ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)	FIRE-RATED GLAZING MARKING
Interior walls			
Fire walls	All	NP ^a	W-XXX ^b
Fire barriers	>1 1	NP ^a NP ^a	W-XXX ^b W-XXX ^b
Incidental use areas (707.3.6), Mixed occupancy separations (707.3.8)	1	3/4	OH-45 or W-60
Fire partitions	1 0.5	3/4 1/3	OH-45 or W-60 OH-20 or W-30
Smoke barriers	1	3/4	OH-45 or W-60
Exterior walls	>1 1 0.5	1 1/2 3/4 1/3	OH-90 or W-XXX ^b OH-45 or W-60 OH-20 or W-30
Party wall	All	NP	Not Applicable

Penetrations

Penetrations - ALL

- **FW** : **714.2 & 714.3**
 - **FB** : **714.3 & 707.7.1**
 - Prohibited penetrations in Exit Enclosures
 - Exit access stairs/ramps
 - Interior exit stairs/ramps
 - Exit passageways
 - **FP & SB** : **714**
 - **SP**
 - Limit the passage of smoke
 - No prescriptive requirement
-
- **714 PENETRATIONS**
 - 714.1 Scope.
 - 714.2 Installation details.
 - 714.3 Fire-resistance-rated walls.
 - 714.4 Horizontal assemblies.
 - 714.5 Penetrations in smoke barriers.

Joints

Joints - ALL

- FW & FB & FP & SB : 715
- SP
 - Limit the passage of smoke
 - No prescriptive requirement
- 715 JOINTS
 - 715.1 General
 - 715.2 Installation
 - 715.3 Fire test criteria
 - 715.4 Exterior curtain wall/floor intersection
 - 715.5 Spandrel wall
 - 715.6 Fire-resistant joint systems in smoke barriers

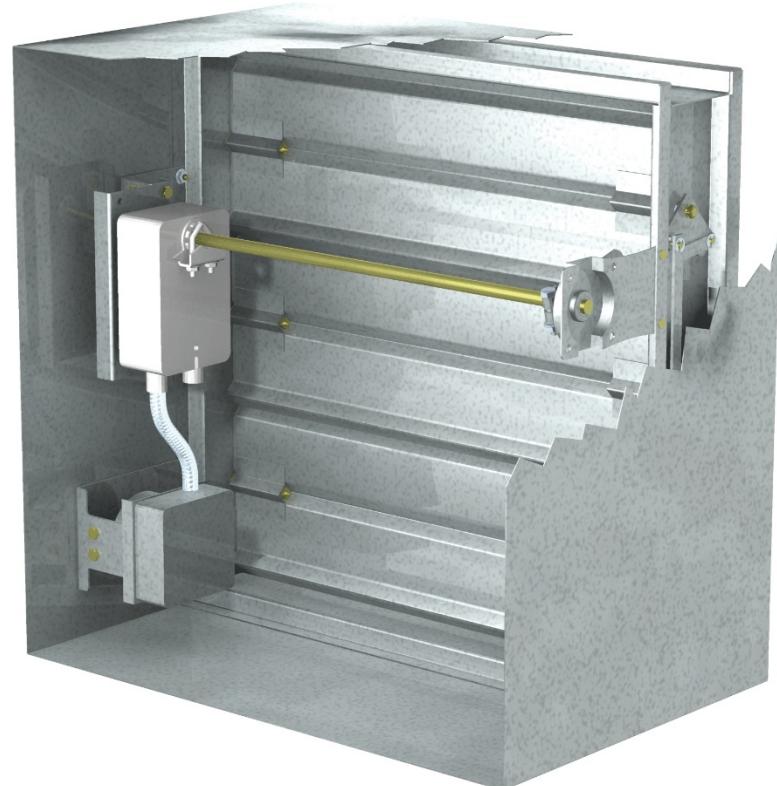
Duct/Air Transfer Openings

Duct/Air Transfer Openings - ALL

- FW : Not Allowed
- FB & FP & SB : **717**
- SP
 - Limit the passage of smoke
 - No prescriptive requirement
- **717 Duct & Air Transfer Openings**
 - 717.1 General
 - 717.2 Installation
 - 717.3 Damper testing, ratings and actuation
 - 717.4 Access and identification
 - **717.5 Where required**
 - 717.6 Horizontal assemblies
 - 717.7 Flexible ducts and air connectors.

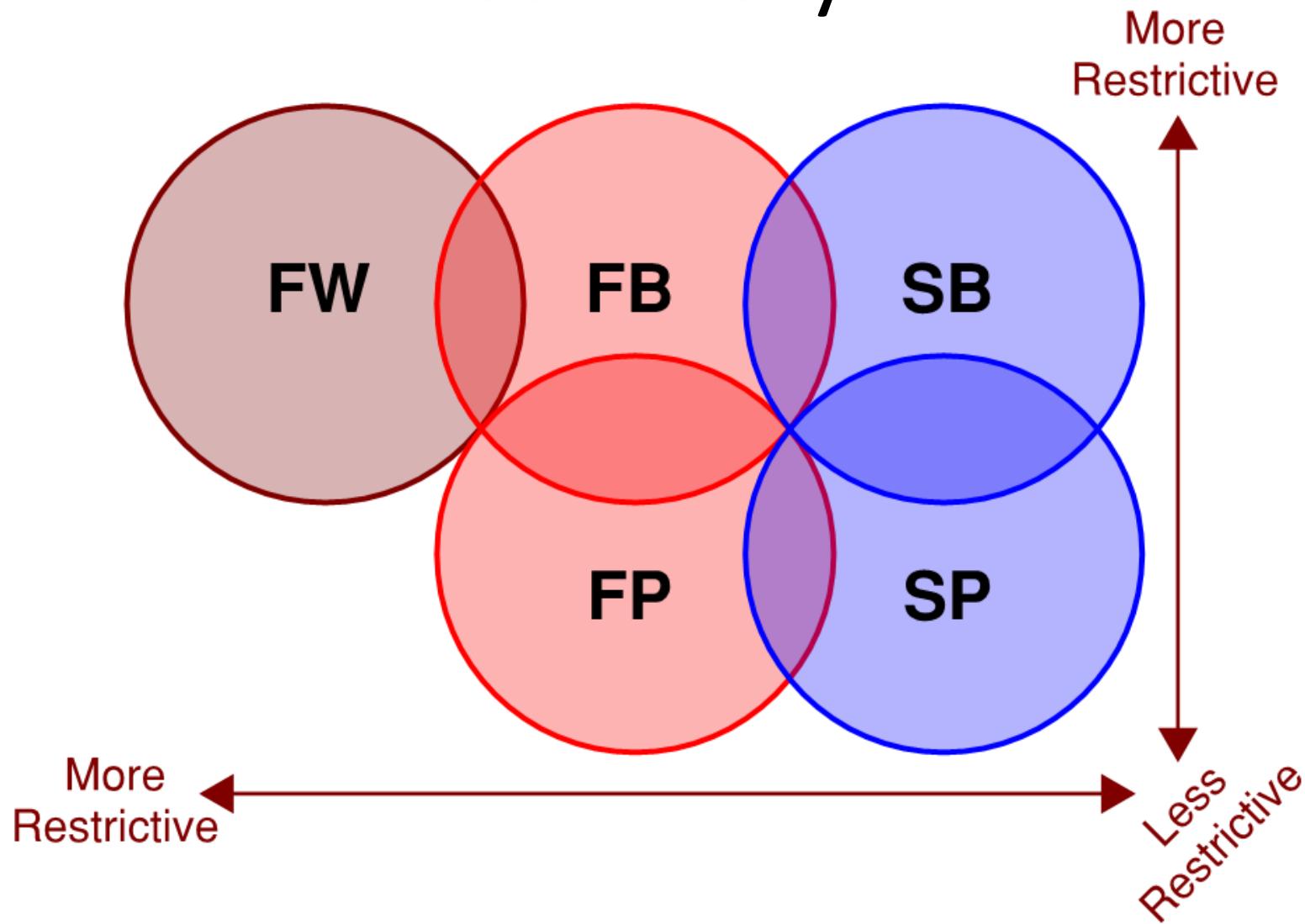
Duct/Air Transfer Openings - 717.5

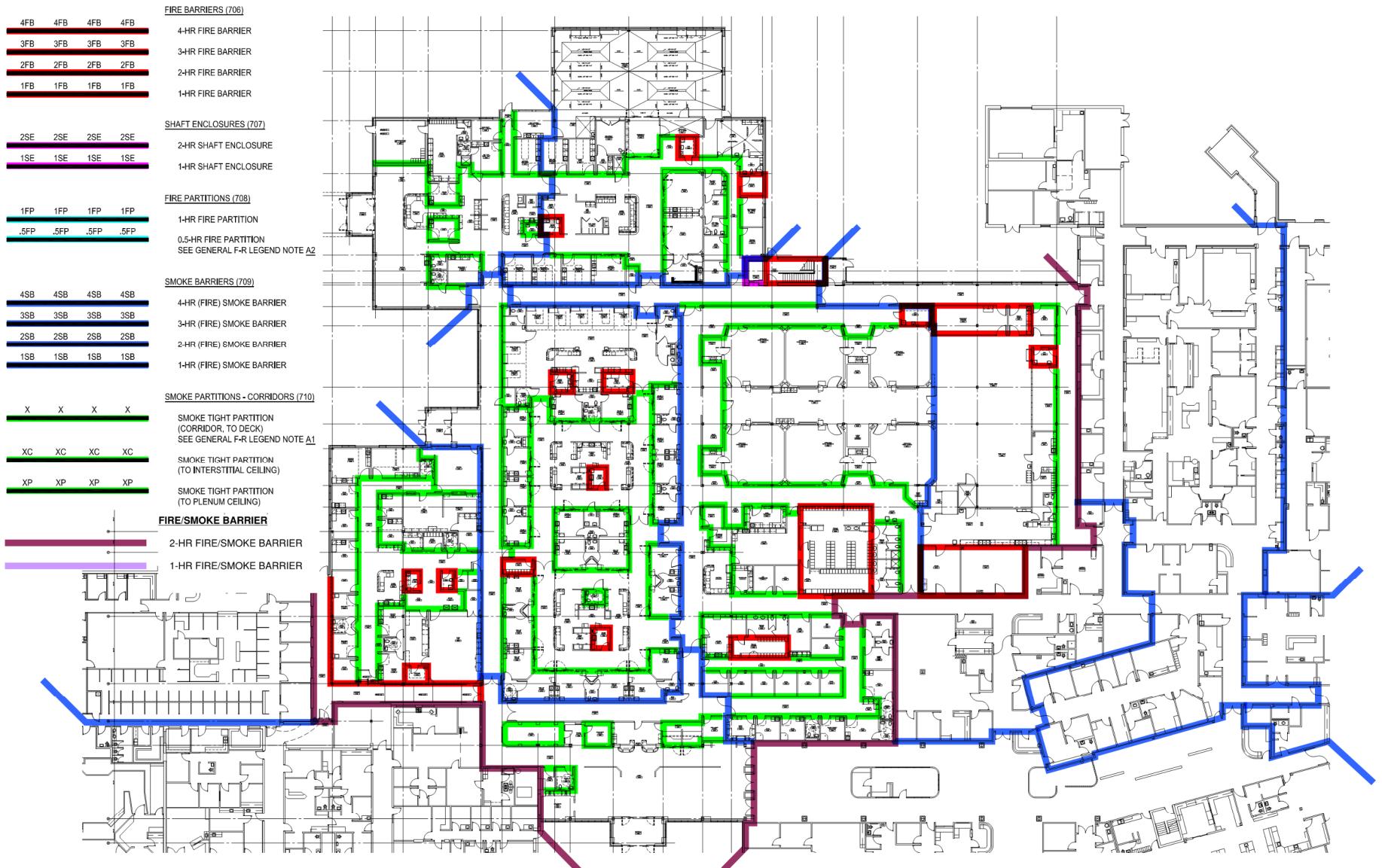
- 717.5.1 Fire walls
 - 717.5.1.1 Horiz exits
- 717.5.2 Fire barriers
 - 717.5.2.1 Horiz exits
- 717.5.3 Shaft enclosures
- 717.5.4 Fire partitions
 - 717.5.4.1 Corridors
- 717.5.5 Smoke barriers
- 717.5.6 Exterior walls
- 717.5.7 Smoke partitions



Summary

Summary





Fire-Resistant Rated Construction

FINAL

	Fire Walls (FW) : 705 Separate Enclosures	Fire Barriers (FB) : 707 Significant Separation & Fire Areas	Fire Partitions (FP) : 708 Corridor/Unit Protection	Smoke Barriers (SB) : 709 Smoke Compartment Protection	Smoke Partitions (SP) : 710 Corridor & Suite Protection
Definitions [Ch 2]	A fire resistance rated wall having protected openings, which restricts the spread of fire from one side of the wall to the other, or through the wall, with sufficient structural integrity under the conditions to allow collapse of construction on either side without collapse of the wall.	A fire resistance rated wall assembly designed to restrict the spread of fire or which continuity is maintained.	A vertical assembly of materials designed to restrict the spread of fire in which openings are protected.	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.	Not defined.
General	Separate Buildings: 1-3 most intensive allowable areas and/or stories (Public Separate Enclosures - when occupancies are required to be separated by a FB, more stringent FRI or D requirement shall apply). Partitions: 1-3 most intensive areas and/or stories (1-3 adjacent buildings, incl/FRI vs. 2D separate exterior walls w/ct of the adjacent buildings). Doors: 1-3R, no openings, and utilities cannot penetrate.	Interior State/Ramp (706.1.1): 3-4H (or 4 or 1-4H) (+0) Partition (Exit 1002.2): 2-4H (interior or FB) Exit Access Stairs/Ramps (1002.1.2.1): 2-4H (4 or 5 or 6-8H) (+0) Control Area (4-6.4.1): 2-4H (+0) or 3-4H (Exception) Bulk Enclosure (713.4): 2-4H (or 4 or 5 or 6-8H) (+0) Room (706.1.1): 2-4H (+0) (non-combustible) Exit Units (706.1.1): 1-3H, 2-3H, or 3-8H	Dividing Units (706.2): 2-4H (interior or FB) Tenant Units in mid buildings (402.4.2): Corridor Walls (1018.1) Stairwell Table (1018.1.1)	Smoke compartment doors (709.4.6): 2-4H (interior or FB) Tenant Units in mid buildings (402.4.2): Corridor Walls (1018.1) Stairwell Table (1018.1.1)	Corridors & Suits (1-2) Stair Units in sprinklered bldgs
Exceptions	Structural Stability: Where required by the building code, the required fire resistance rating of the wall for the FRI or D requirement shall be waived where a double-PFR (double wall construction).	Construction (706.1.1): Interior, exterior, separating 1-3R fire barrier on higher floor, exterior wall (706.1.1.7B)	Exceeds by Construction Type: Non-combustible (Type I, II, III, IV, V)	Exceeded by Construction Type: Non-combustible (Type I, II, III, IV, V)	Exceeded by Construction Type: Non-combustible (Type I & II), Combustible (Type III, IV, V)
Materials	Non-combustible materials: Acoustical Panel (1001.6.1.1)	N/A	N/A	N/A	N/A
Penetrations	N/A	N/A	N/A	N/A	N/A
Fire-Resistance Rating	FW: 1H, 3H, 4H, 5H, 6H, 8H, 12H, 16H, 24H, 32H, 48H, 60H, 72H, 96H, 120H, 144H, 168H, 192H, 216H, 240H, 264H, 288H, 312H, 336H, 360H, 384H, 408H, 432H, 456H, 480H, 504H, 528H, 540H, 576H, 600H, 624H, 648H, 672H, 708H, 732H, 756H, 780H, 804H, 828H, 840H, 864H, 888H, 912H, 936H, 960H, 984H, 1008H, 1032H, 1056H, 1080H, 1104H, 1128H, 1152H, 1176H, 1200H, 1224H, 1248H, 1272H, 1296H, 1320H, 1344H, 1368H, 1392H, 1416H, 1440H, 1464H, 1488H, 1512H, 1536H, 1560H, 1584H, 1608H, 1632H, 1656H, 1680H, 1704H, 1728H, 1752H, 1776H, 1800H, 1824H, 1848H, 1872H, 1900H, 1928H, 1956H, 1984H, 2012H, 2040H, 2068H, 2096H, 2124H, 2152H, 2180H, 2208H, 2236H, 2264H, 2292H, 2320H, 2348H, 2376H, 2404H, 2432H, 2460H, 2488H, 2516H, 2544H, 2572H, 2600H, 2628H, 2656H, 2684H, 2712H, 2740H, 2768H, 2796H, 2824H, 2852H, 2880H, 2908H, 2936H, 2964H, 2992H, 3020H, 3048H, 3076H, 3104H, 3132H, 3160H, 3188H, 3216H, 3244H, 3272H, 3300H, 3328H, 3356H, 3384H, 3412H, 3440H, 3468H, 3496H, 3524H, 3552H, 3580H, 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21776H, 21804H, 21832H, 21860H, 21888H, 21916H, 21944H, 21972H, 21984H, 22012H, 22040H, 22068H, 22096H, 22124H, 22152H, 22180H, 22208H, 22236H, 22264H, 22292H, 22320H, 22348H, 22376H, 22404H, 22432H, 22460H, 22488H, 22516H, 22544H, 22572H, 22600H, 22628H, 22656H, 22684H, 22712H, 22740H, 22768H, 22796H, 22824H, 22852H, 22880H, 22908H, 22936H, 22964H, 22992H, 23020H, 23048H, 23076H, 23104H, 23132H, 23160H, 23188H, 23216H, 23244H, 23272H, 23300H, 23328H, 23356H, 23384H, 23412H, 23440H, 23468H, 23496H, 23524H, 23552H, 23580H, 23608H, 23636H, 23664H, 23692H, 23720H, 23748H, 23776H, 23804H, 23832H, 23860H, 23888H, 23916H, 23944H, 23972H, 23984H, 24012H, 24040H, 24068H, 24096H, 24124H, 24152H, 24180H, 24208H, 24236H, 24264H, 24292H, 24320H, 24348H, 24376H, 24404H, 24432H, 24460H, 24488H, 24516H, 24544H, 24572H, 24600H, 24628H, 24656H, 24684H, 24712H, 24740H, 24768H, 24796H, 24824H, 24852H, 24880H, 24908H, 24936H, 24964H, 24992H, 25020H, 25048H, 25076H, 25104H, 25132H, 25160H, 25188H, 25216H, 25244H, 25272H, 25300H, 25328H, 25356H, 25384H, 25412H, 25440H, 25468H, 25496H, 25524H, 25552H, 25580H, 25608H, 25636H, 25664H, 25692H, 25720H, 25748H, 25776H, 25804H, 25832H, 25860H, 25888H, 25916H, 25944H, 25972H, 25984H, 26012H, 26040H, 26068H, 26096H, 26124H, 26152H, 26180H, 26208H, 26236H, 26264H, 26292H, 26320H, 26348H, 26376H, 26404H, 26432H, 26460H, 26488H, 26516H, 26544H, 26572H, 26600H, 26628H, 26656H, 26684H, 26712H, 26740H, 26768H, 26796H, 26824H, 26852H, 26880H, 26908H, 26936H, 26964H, 26992H, 27020H, 27048H, 27076H, 27104H, 27132H, 27160H, 27188H, 27216H, 27244H, 27272H, 27300H, 27328H, 27356H, 27384H, 27412H, 27440H, 27468H, 27496H, 27524H, 27552H, 27580H, 27608H, 27636H, 27664H, 27692H, 27720H, 27748H, 27776H, 27804H, 27832H, 27860H, 27888H, 27916H, 27944H, 27972H, 27984H, 28012H, 28040H, 28068H, 28096H, 28124H, 28152H, 28180H, 28208H, 28236H, 28264H, 28292H, 28320H, 28348H, 28376H, 28404H, 28432H, 28460H, 28488H, 28516H, 28544H, 28572H, 28600H, 28628H, 28656H, 28684H, 28712H, 28740H, 28768H, 28796H, 28824H, 28852H, 28880H, 28908H, 28936H, 28964H, 28992H, 29020H, 29048H, 29076H, 29104H, 29132H, 29160H, 29188H, 29216H, 29244H, 29272H, 29300H, 29328H, 29356H, 29384H, 29412H, 29440H, 29468H, 29496H, 29524H, 29552H, 29580H, 29608H, 29636H, 29664H, 29692H, 29720H, 29748H, 29776H, 29804H, 29832H, 29860H, 29888H, 29916H, 29944H, 29972H, 29984H, 30012H, 30040H, 30068H, 30096H, 30124H, 30152H, 30180H, 30208H, 30236H, 30264H, 30292H, 30320H, 30348H, 30376H, 30404H, 30432H, 30460H, 30488H, 30516H, 30544H, 30572H, 30600H, 30628H, 30656H, 30684H, 30712H, 30740H, 30768H, 30796H, 30824H, 30852H, 30880H, 30908H, 30936H, 30964H, 30992H, 31020H, 31048H, 31076H, 31104H, 31132H, 31160H, 31188H, 31216H, 31244H, 31272H, 31300H, 31328H, 31356H, 31384H, 31412H, 31440H, 31468H, 31496H, 31524H, 31552H, 31580H, 31608H, 31636H, 31664H, 31692H, 31720H, 31748H, 31776H, 31804H, 31832H, 31860H, 31888H, 31916H, 31944H, 31972H, 31984H, 32012H, 32040H, 32068H, 32096H, 32124H, 32152H, 32180H, 32208H, 32236H, 32264H, 32292H, 32320H, 32348H, 32376H, 32404H, 32432H, 32460H, 32488H, 32516H, 32544H, 32572H, 32600H, 32628H, 32656H, 32684H, 32712H, 32740H, 32768H, 32796H, 32824H, 32852H, 32880H, 32908H, 32936H, 32964H, 32992H, 33020H, 33048H, 33076H, 33104H, 33132H, 33160H, 33188H, 33216H, 33244H, 33272H, 33300H, 33328H, 33356H, 33384H, 33412H, 33440H, 33468H, 33496H, 33524H, 33552H, 33580H, 33608H, 33636H, 33664H, 33692H, 33720H, 33748H, 33776H, 33804H, 33832H, 33860H, 33888H, 33916H, 33944H, 33972H, 33984H, 34012H, 34040H, 34068H, 34096H, 34124H, 34152H, 34180H, 34208H, 34236H, 34264H, 34292H, 34320H, 34348H, 34376H, 34404H, 34432H, 34460H, 34488H, 34516H, 34544H, 34572H, 34600H, 34628H, 34656H, 34684H, 34712H, 34740H, 34768H, 34796H, 34824H, 34852H, 34880H, 34908H, 34936H, 34964H, 34992H, 35020H, 35048H, 35076H, 35104H, 35132H, 35160H, 35188H, 35216H, 35244H, 35272H, 35300H, 3				

Fire Walls (FW) : 706		Fire Barriers (FB) : 707		Fire Partitions (FP) : 708		Smoke Barriers (SB) : 709		Smoke Partitions (SP) : 710	
Definition (Ch 2)	Separate Buildings/Occupancies		Egress/Hazardous Separation & Fire Areas		Corridor/Unit Protection		Smoke Compartmentalization		Corridor & Suite Protection
General	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-resistance-rated wall assembly of materials designed to restrict the spread of fire in which continuity is maintained.		A vertical assembly of materials designed to restrict the spread of fire in which openings are protected.		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.		
Exceptions	Separate buildings : to meet maximum allowable areas and/or stories (Table 503) and different types of construction [Table 601]. Separate occupancies : when occupancies are required to be separated by a FB, more stringent FW or FB requirement shall apply. Party walls (PW) : FW on an interior lot line between (2) adjacent buildings. PW/PW vs. (2) separate exterior walls with 0 fire separation distance. PW/PW : no openings and utilities cannot penetrate.		Interior Exit Stair/Ramp (1020.1) : 2-HR (4 or >) or 1-HR (-4) Exit Passageway (1023.3) : 1-HR (min) or equal to stairway Horizontal Exit (1025.1) : 2-HR (min) or FW Exit Access Stairs (1009.3.1.2) : 2-HR (4 or >) or 1-HR (<4) Individual Room Area (1020.1) : 2-HR (4 or >) or 1-HR (-4) Control Areas (414.2.4) : 2-HR or 1-HR (see Exceptions) Shaft Enclosure (713.4) : 1-HR (4 or >) or 1-HR (-4) Fire Areas (707.3.10) : 1-HR, 2-HR, 3-HR, or 6-HR Atrium (404.6) : 1-HR (See Exceptions) Occupancy (7508.4) : 1-HR, 2-HR, or 3-HR		Dwelling Units (402.2) Sleeping Units (402.2) Tenant Spaces in mall buildings (402.4.2.1) Corridor Walls (103.1) Elevator Lobby (713.14.1)		Smoke compartments I-2 & I-3 occupancies (407.4 & 408.6) Ambulatory Care Facilities >10K (422.3) Smoke Control System (909.5) Accessible Means of Egress (1007.6) Accessible Area of Refuge (1007.6) Underground Buildings (405.2)		Not Defined A vertical assembly of materials designed to restrict the spread of fire and the unmitigated movement of smoke for an unspecified period of time. No level of performance required.
Structural Stability					N/A		N/A		
Materials	Non-combustible materials		Construction (floors, columns, beams) supporting FB to be same or higher fire-resistance rating (FRR) as FB		NA		N/A		
Exceptions	Exception : Type V (both buildings)		Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)		Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)		Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)		Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)
Fire-Resistance Rating	4-HR : H-1, H-2 3-HR : A, B, E, H-4, L, R-1, R-2, U (Type I, II, IV) 2-HR : A, B, E, H-4, L, R-1, R-2, U (Type II, V) 3-HR : F-1, H-3, H-5, M, S-1 2-HR : F-2, S-2, R, S-4 H-1, H-2 or H-3 see 415.6 and 415.7		I, 2, 3, 4-HR Shafts & Stairways : Not less than floors penetrated Not greater than 2-HR		1-HR		1-HR		0-HR
Exceptions	N/A		N/A		0.5-HR : Corridor Walls per 1038.1 0.5-HR : Dwelling Units and Sleeping Units (Type III/III/VIII + sprinklered)		0.5-HR : 0.10" thick steel walls in I-3		N/A
Exterior Walls	FW terminating into a <180 degrees EW : 2-HR EW with 3/4-HR splices 4' on both sides of FW		Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.		Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.		N/A		N/A
Continuity	See: Horizontal Continuity Horiz Projecting Elements Horiz Projecting Elements Vertical Continuity		A. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above. Continuous through concealed spaces (e.g. suspended ceiling). B. Hollow vertical spaces fireblocked at every floor level. C. Joints and voids at intersections (top & bottom of FB) shall comply with Sections 707.8 and 707.9.		A. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above or FRR floor/ceiling or roof/ceiling assembly. B. Hollow vertical spaces fireblocked at every floor level. C. Joints and voids at intersections (top & bottom of FB) shall comply with Sections 707.8 and 707.9.		A. Outside wall to outside wall. B. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above. C. Continuous through concealed spaces (e.g. suspended ceiling).		A. Top of the foundation or floor below to the underside of the floor or roof sheathing, deck or deck or underside of smoke-resistant ceiling.
Exceptions	N/A		Exceptions 1. 2-HR for separation of tank storage. 2. Shaft enclosures may terminate below floor/ceiling/roof. 3. FB for incidental use areas in Type IIB, IIB, VB may be on non-rated floor assemblies. 4. Interior exit stair/ramps may terminate below floor/ceiling/roof.		Exceptions 1. Crawl space if floor is minimum 1-HR. 2. Room side to floor/roof, corridor side to 1-HR ceiling. 3. FRR corridor "tunnel" (rated vertical/horizontal FRR). 4. Tenant spaces (mall) to underside of non-FRR ceiling. 5. Attic fireblocking/draftstopping not req'd in R-2 (<4 stories). 6. Fireblocking/draftstopping not req'd where sprinklered.		Exceptions 1. Interstitial spaces w/a ceiling that resists fire/smoke per the FRR of the SB. 2. Outside wall requirement : elevator lobbies 3. Outside wall requirement : areas of refuge		N/A
Supporting Construction	N/A		N/A		Equivalent or greater fire-resistance rating (FRR) as FP.		Equivalent or greater fire-resistance rating (FRR) as SB except for Type IIB/IIB/VB.		N/A
Exceptions	N/A		N/A		Tenant spaces (mall), dwelling units, sleeping units and corridors (all in Type IIB/IIB/VB) in noncombustible buildings		N/A		N/A
Openings	Max size = 156 SF/25% of FW length on any floor		Max aggregate width = 25% of FB length on any floor Total size = 156 SF (any single opening) Exit Access Stairs/Ramps, Interior Exit Stair/Ramps, Exit Passageways shall comply w/1022.3 & 1023.5		See 714.1 1-HR corridor doors 0.5-HR Tenant dwellings/Sleeping Units 0.3-HR in O.S-HR assemblies		See 716.4		See 716.1 & 710.5.2 Windows : resist the free passage of smoke or be automatic closing upon smoke detection. Doors : No louvers & may need to be self/automatic closing by smoke detection.
Exceptions	Exceptions : 1. No opngs in Party Walls. 2. No max size if both buildings sprinklered.		Exceptions : 1. No max size if sprinklered. 2. No max aggregate width/size for fire doors in Exit Access Stairs/Ramps & Interior Exit Stair/Ramps. 3. No max aggregate width/size for tested opening protectives in Exit Access Stairs/Ramps & Interior Exit Stair/Ramps. 4. No max aggregate width for atrium window assemblies. 5. No max aggregate width/size for fire doors in Exit Access Stairs/Ramps & Interior Exit Stair/Ramps from an Exit Passageways.						
Penetrations	See 714.2 & 714.3		See 714.3 & 707.3 (Exit enclosure or exit passageway) Prohibited penetrations in exit enclosures (exit access stairs/ramps, interior exit stairs/ramps, exit passageways)		See 714		See 714		Limit the free passage of smoke (no prescriptive requirement)
Joints	See 715		See 715		See 715		See 715		Limit the free passage of smoke (no prescriptive requirement)
Miscellaneous	N/A		Voids at intersections (707.5) : FB and non-FRR roof assembly		N/A		N/A		N/A
Duct/Air Transfer Openings	Not allowed		See 717		See 717		See 717		Limit the free passage of smoke (no prescriptive requirement). Air transfer openings - smoke damper (717.3.2)
CONSIDERATIONS	Penitral piping penetration of FW (1 or 2 systems?)		FW's must terminate at the underside of a floor assembly or a roof assembly and not a horizontal assembly (HA)		FP's are not always required to be continuous through concealed spaces.				

	Fire Walls (FW) : 706 Separate Buildings/Occupancies	Fire Barriers (FB) : 707 Egress/Hazardous Separation & Fire Areas	Fire Partitions (FP) : 708 Corridor/Unit Protection	Smoke Barriers (SB) : 709 Smoke Compartmentalization	Smoke Partitions (SP) : 710 Corridor & Suite Protection
Definition (Ch 2)	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-resistance-rated wall assembly of materials designed to restrict the spread of fire in which continuity is maintained.	A vertical assembly of materials designed to restrict the spread of fire in which openings are protected.	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.	Not defined
General	Separate buildings : to meet maximum allowable areas and/or stories (Table 503) and different types of construction (Table 601). Separate occupancies : when occupancies are required to be separated by a FB, more stringent FW or FB requirement shall apply. Party walls (PW) : PW on an interior lot line between (2) adjacent buildings. PW/FW vs. (2) separate exterior walls with 0 fire separation distance. PW/FW : no opening and utilities cannot penetrate.	Interior Exit Stair/Ramp (1002.1) : 2-HR (4 or 5) or 1-HR (4) Exit Passageway (1023.3) : 1-HR (min) or equal to statewide Horizontal Exit (1025.1) : 2-HR (min) or FW Exit Access Stair/Ramp (1009.3.1.2) : 2-HR (4 or 5) or 1-HR (4) Incidental Use Area (TS09) : 1-HR or 2-HR Control Area (414.2.4) : 2-HR or 1-HR (See Exceptions) Shaft Enclosure (713.4) : 2-HR (4 or 5) or 1-HR (4) Fire Alarm (404.4) : 1-HR (min), 2-HR, 3-HR, or 4-HR Auditorium (404.4) : 1-HR (See Exceptions) Occupancy (7508.4) : 1-HR, 2-HR, or 3-HR	Dwelling Units (400.2) Sleeping Units (400.2) Tenant Spaces in mall buildings (402.4.2.1) Corridor Walls (1018.1) Elevator Lobby (713.14.1)	Smoke compartments: I-2 & I-3 occupancies (407.4 & 408.6) Ambulatory Care Facilities >10K (422.3)	Corridors & Care Suites (I-2) Elevator Lobby in sprinklered bldgs
Structural Stability	Allow collapse of construction on either side under fire conditions without collapse of the wall for the FRR duration OR be constructed as double FWs (and meet NFPA 221)	Construction (floors, columns, beams) supporting FB to be same or higher fire-resistance rating (FRR) as FB	N/A	N/A	N/A
Materials	Non-combustible materials	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)
Fire-Resistance Rating	4-HR : H-1, H-2 5-HR : A, B, E, H-4, I, R-1, R-2, U (Type I, II, IV) 2-HR : A, B, E, H-4, I, R-1, R-2, U (Type II, V) 3-HR : F-1, H-3, H-5, M, S-1 2-HR : F-2, S-2, R-3, R-4 (H-1, H-2 or H-3 see 415.6 and 415.7)	1, 2, 3, 4-HR Shuts & Stairways: Not less than floors penetrated Not greater than 2-HR	1-HR	1-HR	0-HR
Exterior Walls	FW terminating into a <180 degree EW : 1-HR EW with 3/4-HR openings on both sides of FW	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.	Exterior wall to outside wall: A. Top of the foundation or floor/ceiling assembly below to the underside of the floor/roof sheathing, deck or deck above. Continuous through concealed spaces (e.g. suspended ceiling). B. Hollow vertical spaces fireblocked at every floor level. C. Joints and voids at intersections (top & bottom of FP) shall comply with Sections 707.8 and 707.9.	A. Top of the foundation or floor/ceiling assembly below to the underside of the floor/roof sheathing, deck or deck above. B. Continuous through concealed spaces (e.g. suspended ceiling).
Continuity	See Horizontal Continuity Horiz Projecting Elements Horiz Projecting Elements Vertical Continuity	1. Equivalent or greater fire-resistance rating (FRR) as FB. 2. FB > 2 stories. If supporting structure is primary, see 704.3 (encasement). If supporting structure is secondary, see 711 (membrane).	Equivalent or greater fire-resistance rating (FRR) as FP.	See 710.4 0.3-HR Corridor doors 0.5-HR Tenant Dwelling/Sleeping Units 0.3-HR in O.5-HR assemblies	See 710.4 A. Top of the foundation or floor below to the underside of the floor or roof sheathing, deck or deck or underside of smoke-resistant ceiling.
Supporting Construction	N/A	See 714.2 & 714.3	See 714	See 714	N/A
Openings	Max size = 156 SF/25% of FW length on any floor	Max aggregate width = 25% of FB length on any floor Max size = 156 SF (any single opening) Exit Access Stairs/Ramps, Interior Exit Stair/Ramps, Exit Passageways shall comply w/1022.3 & 1023.5	See 716.4 0.3-HR Corridor doors 0.5-HR Tenant Dwelling/Sleeping Units 0.3-HR in O.5-HR assemblies	See 710.5.1 & 710.5.2 Windows : resist the free passage of smoke or be automatic closing upon smoke detection. Doors : No louvers & may need to be self/automatic closing by smoke detection.	Limit the free passage of smoke (no prescriptive requirement)
Penetrations	See 714.2 & 714.3	See 714.3 & 707.1 (exit enclosure or exit passageway) Prohibited penetrations in exit enclosures (exit access stairs/ramps, interior exit stairs/champs, exit passageways)	See 715	See 715	Limit the free passage of smoke (no prescriptive requirement)
Joints	See 715	Voids at intersections (707.9) : FB and non-FRR roof assembly	N/A	N/A	N/A
Miscellaneous	N/A	See 717	See 717	See 717	Limit the free passage of smoke (no prescriptive requirement). Air transfer openings - smoke damper (717.3.2.2)
Duct/Air Transfer Openings	Not allowed				

Fire Barriers (FB) : 707		Fire Partitions (FP) : 708		Smoke Barriers (SB) : 709		Smoke Partitions (SP) : 710	
Definition (Ch 2)	Egress/Hazardous Separation & Fire Areas	Corridor/Unit Protection	Smoke Compartmentalization	Corridor & Suite Protection			
General	<p>Interior Exit Stair/Ramp (1002.1) : 2-HR (4 or >) or 1-HR (<4) Exit Passageway (1023.3) : 1-HR (min) or equal to stairway Horizontal Exit (1025.1) : 2-HR (min) or FW Exit Access Stair/Ramp (1009.3.1.2) : 2-HR (4 or >) or 1-HR (<4) Incidental Use Area (509) : 1-HR or 2-HR Control Area (414.2.4) : 2-HR or 1-HR (See Exceptions) Shaft Enclosure (713.4) : 2-HR (4 or >) or 1-HR (<4) Fire Areas (707.3.1.0) : 1-HR, 2-HR, 3-HR, or 4-HR Atrium (404.6) : 1-HR (See Exceptions) Occupancy (T508.4) : 1-HR, 2-HR, or 3-HR</p>	Dwelling Units (402.2) Sleeping Units (420.2) Tenant Spaces in multi buildings (402.4.2.1) Corridor Walls (1018.1) Elevator Lobby (713.14.1)	<p>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.</p>	<p>Not Defined</p> <p>A vertical assembly of materials designed to restrict the spread of fire and the unmitigated movement of smoke for an unspecified period of time. No level of performance required.</p>			
Structural Stability	Construction (floors, columns, beams) supporting FB to be same or higher fire-resistance rating (FRR) as FB	N/A	N/A	Corridors & Cate Suites (I-2) Elevator Lobby in sprinklered bldgs			
Materials	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)	Permitted by Construction Type Noncombustible (Type I & II), Combustible (Type III, IV, & V)			
Fire-Resistance Rating	1, 2, 3, 4-HR Shafts & Stairways : Not less than floors penetrated Not greater than 2-HR	1-HR	1-HR	0-HR			
Exterior Walls	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated.	Exterior walls not req'd to be FRR if part of the FB enclosure unless the exterior walls are required to be rated. A. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above. Continuous through concealed spaces (e.g. suspended ceiling). B. Hollow vertical spaces fireblocked at every floor level. C. Joints and voids at intersections (top & bottom of FB) shall comply with Sections 707.8 and 707.9.	A. Top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or deck above or FRR floor/ceiling or roof/ceiling assembly. B. Hollow vertical spaces fireblocked at every floor level. C. Joints and voids at intersections (top & bottom of FP) shall comply with Sections 707.8 and 707.9.	N/A			
Continuity	1. Equivalent or greater fire-resistance rating (FRR) as FB. 2. If supporting structure is primary, see 704.3 (encasement). If supporting structure is secondary, see 711 (membrane).	Equivalent or greater fire-resistance rating (FRR) as FP.	Equivalent or greater fire-resistance rating (FRR) as SB except for Type IIIB/IIIB/VB.	N/A			
Supporting Construction	Max aggregate width = 25% of FB length on any floor Max size = 156 SF (any single opening) Exit Access Stairs/Ramps, Interior Exit Stair/Ramps, Exit Passageways shall comply w/ 1022.3 & 1023.5	See 716.4 0.3-HR Corridor doors 0.5-HR Tenant Dwellings/Sleeping Units 0.3-HR in 0.5-HR assemblies	See 716.4	See 710.5.1 & 710.5.2 Windows : resist the free passage of smoke or be automatic closing upon smoke detection. Doors : No louvers & may need to be self/automatic closing by smoke detection.			
Openings	See 714.3 & 707.7.1 (Exit enclosure or exit passageway) Prohibited penetrations in exit enclosures (exit access stairs/ramps, interior exit stairs/ramps, exit passageways)	See 714	See 714	Limit the free passage of smoke (no prescriptive requirement)			
Penetrations	See 715	See 715	See 715	Limit the free passage of smoke (no prescriptive requirement)			
Joints	Voids at intersections (707.9) : FB and non-FRR roof assembly	N/A	N/A	N/A			
Miscellaneous	See 717	See 717	See 717	Limit the free passage of smoke (no prescriptive requirement). Air transfer openings - smoke damper (717.3.2.2)			
Duct/Air Transfer Openings							

FLAD CODE FORUM

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