Determining and Maintaining Rated Assemblies

Building Fire Separations

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About EUA and me

- 115-year history
- Full-service Architecture, Engineering and Interior Design Firm
- Offices in Milwaukee, Madison, Green Bay, Denver and Atlanta

- 10 years within the healthcare market
- Projects of varying size
- Surveyed over 5M sqft of healthcare building within the state
- Serve on the Plan Commission for the City of South Milwaukee

Introduction

- History
- Rated Assembly Specifics
- Penetrations and Openings
- Detailed requirements
- Whoops!
  - When it’s time to put down the firestopping

History

- 64 AD – The Great Roman Fire
  - Created the first known building restrictions for height, non-combustible materials in common walls and wider streets for access
- 1631 – First American Building Code created in Boston
  - Concerned wooden chimneys and roofing materials
- 1666 – Great London Fire
- 1871 – Great Chicago Fire
  - Same day as the Peshtigo Fire (deadliest in American history)
- 1872 – Great Boston Fire
- 1812-1890 – Sprinkler System Conception

https://www.clevescene.com/cleveland/23-vintage-photos-of-the-deadly-cleveland-clinic-fire-of-1929/Slideshow/38343432/38235578

- 1929 – Cleveland Clinic Hospital Fire
  - Deadliest hospital fire in American history
  - Toxic fumes from X-ray film (stored in the basement), entered stairwells and passed through the ventilation system
  - 121 lives lost, mostly due to toxic gas
- Multiple other incidents have occurred, and each has influenced building code changes

Passive fire separation systems and what they are

Reasons for providing Fire Separations

- Allowable Building Area
- Classification of Construction
- Fire Area/Compartmentation
- Mixed Use Occupancies
- Incidental Uses

Fire Walls

- Party Wall – between two buildings that share a common lot line and are separately owned without joint service
- Provides fire separation for the prescribed hourly requirement
- Structurally stable – remains in place should the building on one side of wall collapse for the duration listed in IBC 706.4
- Used to reduce a buildings footprint
- Can be used to separate occupancies

SECTION 706
FIRE WALLS

706.1 General. Each portion of a building separated by one or more *fire walls* that comply with the provisions of this section shall be considered a separate building. The extent and location of such *fire walls* shall provide a complete separation. Where a *fire wall* separates occupancies that are required to be separated by a *fire barrier* wall, the most restrictive requirements of each separation shall apply.

TABLE 706.4
FIRE WALL FIRE-RESISTANCE RATINGS

GROUP	FIRE-RESISTANCE RATING (hours)
A, B, E, H-4, I, R-1, R-2, U	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 cont.

- Fire Wall Separation and extension
  - Walls shall be continuous horizontally from exterior to exterior
  - Once the fire wall reaches the exterior of the building, an imaginary lot line can be utilized to determine the amount of openings with ‘x’ feet of the intersecting buildings
  - The further from the line, the more opening percentage can be provided
  - The angle of the line can be altered, and does not have to be equal between the two buildings
  - Opening Limitations
    - Openings in party walls are not permitted between non-joined buildings
    - 156 sqft per opening
    - 25% of aggregate width per floor

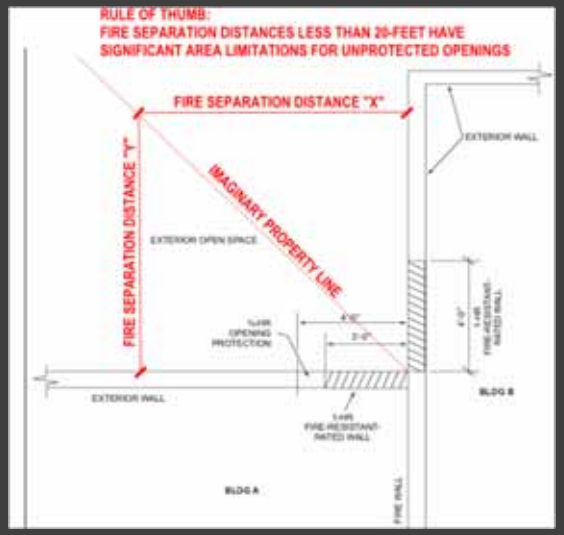
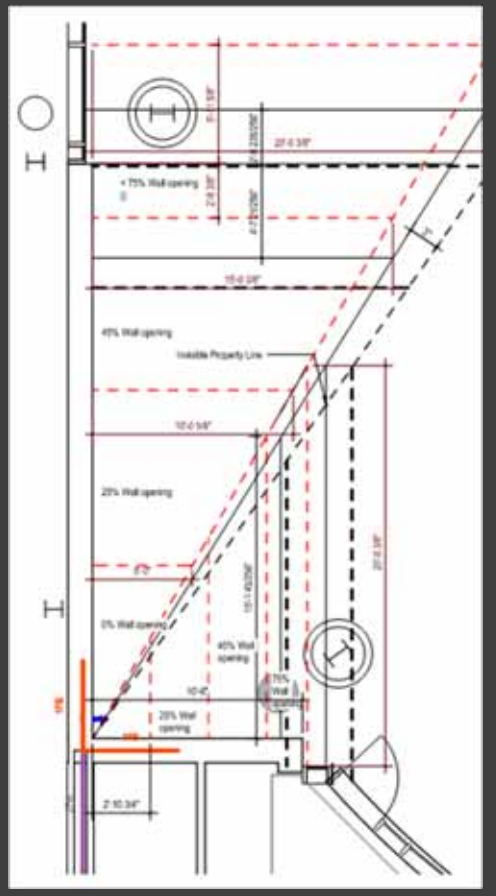


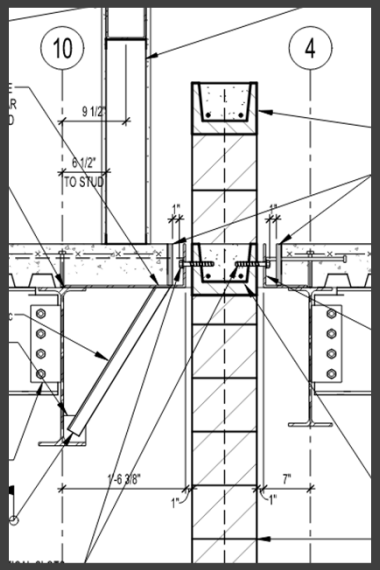
TABLE 705.8
MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION

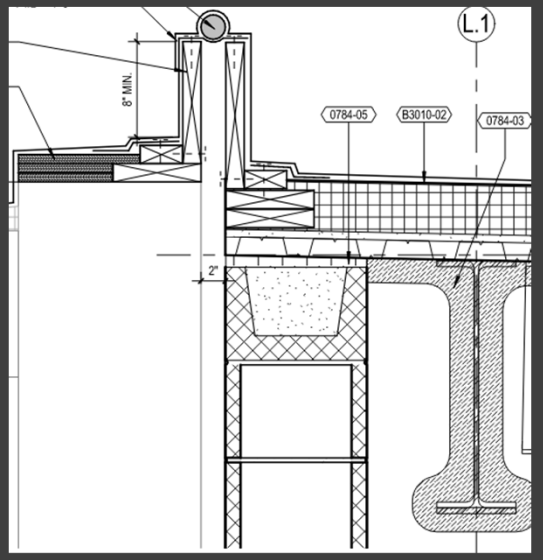
FIRE SEPARATION DISTANCE (feet)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA[a]
0 to less than 3[b, c, k]	Unprotected, Nonsprinklered (UP, NS)	Not Permitted[k]
	Unprotected, Sprinklered (UP, S)[i]	Not Permitted[k]
	Protected (P)	Not Permitted[k]
3 to less than 5[d, e]	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S)[i]	15%
	Protected (P)	15%
5 to less than 10[e, f, j]	Unprotected, Nonsprinklered (UP, NS)	10%[h]
	Unprotected, Sprinklered (UP, S)[i]	25%
	Protected (P)	25%
10 to less than 15[e, f, g, j]	Unprotected, Nonsprinklered (UP, NS)	15%[h]
	Unprotected, Sprinklered (UP, S)[i]	45%
	Protected (P)	45%



Fire Walls cont.

- Fire Wall Separation and extension
  - Walls must be continuous vertically through the building and terminate above, or at, the roof depending on the hourly rating and building classification
    - The roof construction also plays a role
  - Typically constructed of masonry or concrete
    - Gypsum board assemblies are possible depending on the building construction type
  - Depending on upper floors of the building, additional requirements may exist for providing fire rated openings and portions of the roof
    - This can also reduce the number of penetrations through the roof within a certain distance of the fire wall

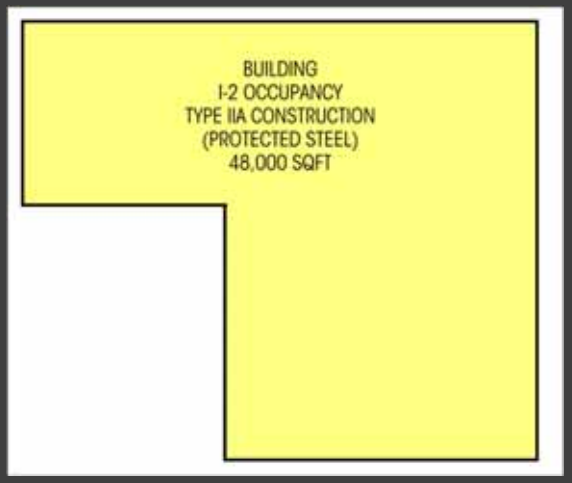




Fire Walls cont.

- Effectively shrinking building footprint
- Classification of building structure has significant cost impact
  - i.e., steel vs concrete, fireproofing vs unprotected steel, install time, etc.

- The adjacent image represents the following scenarios:
  - 1. Multi-story building, 48,000sqft footprint – not compliant
  - 2. Multi-story building, two separated buildings at 24,000sqft – compliant!



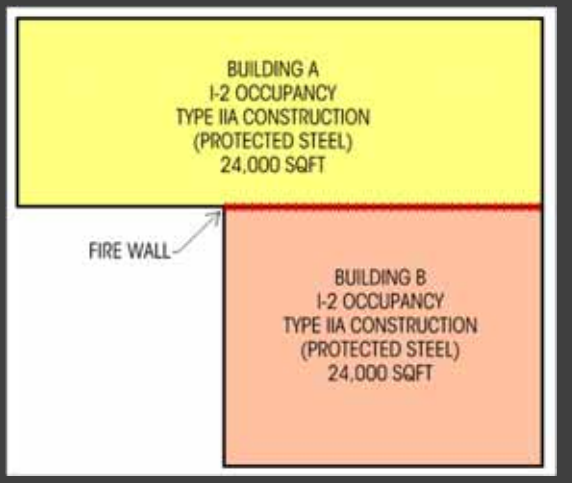


TABLE 506.2[a, b]—continued
ALLOWABLE AREA FACTOR (A_t = NS, S1, S13R, or SM, as applicable) IN SQUARE FEET

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
I-1	NS[d, e]	UL	55,000	19,000	10,000	16,500	10,000	18,000	10,500	4,500
	S1	UL	220,000	76,000	40,000	66,000	40,000	72,000	42,000	18,000
	SM	UL	165,000	57,000	30,000	49,500	30,000	54,000	31,500	13,500
I-2	NS[d, f]	UL	UL	15,000	11,000	12,000	NP	12,000	9,500	NP
	S1	UL	UL	60,000	44,000	48,000	NP	48,000	38,000	NP
	SM	UL	UL	45,000	33,000	36,000	NP	36,000	28,500	NP
I-3	NS[d, e]	UL	UL	15,000	10,000	10,500	7,500	12,000	7,500	5,000
	S1	UL	UL	45,000	40,000	42,000	30,000	48,000	30,000	20,000
	SM	UL	UL	45,000	30,000	31,500	22,500	36,000	22,500	15,000
I-4	NS[d, g]	UL	60.500	26,500	13,000	23,500	13,000	25,500	18,500	9,000
	S1	UL	121,000	106,000	52,000	94,000	52,000	102,000	74,000	36,000
	SM	UL	181,500	79,500	39,000	70,500	39,000	76,500	55,500	27,000

NS = Buildings not equipped throughout with an automatic sprinkler system; S1 = Buildings a maximum of one story above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; SM = Buildings two or more stories above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

Fire Barriers

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

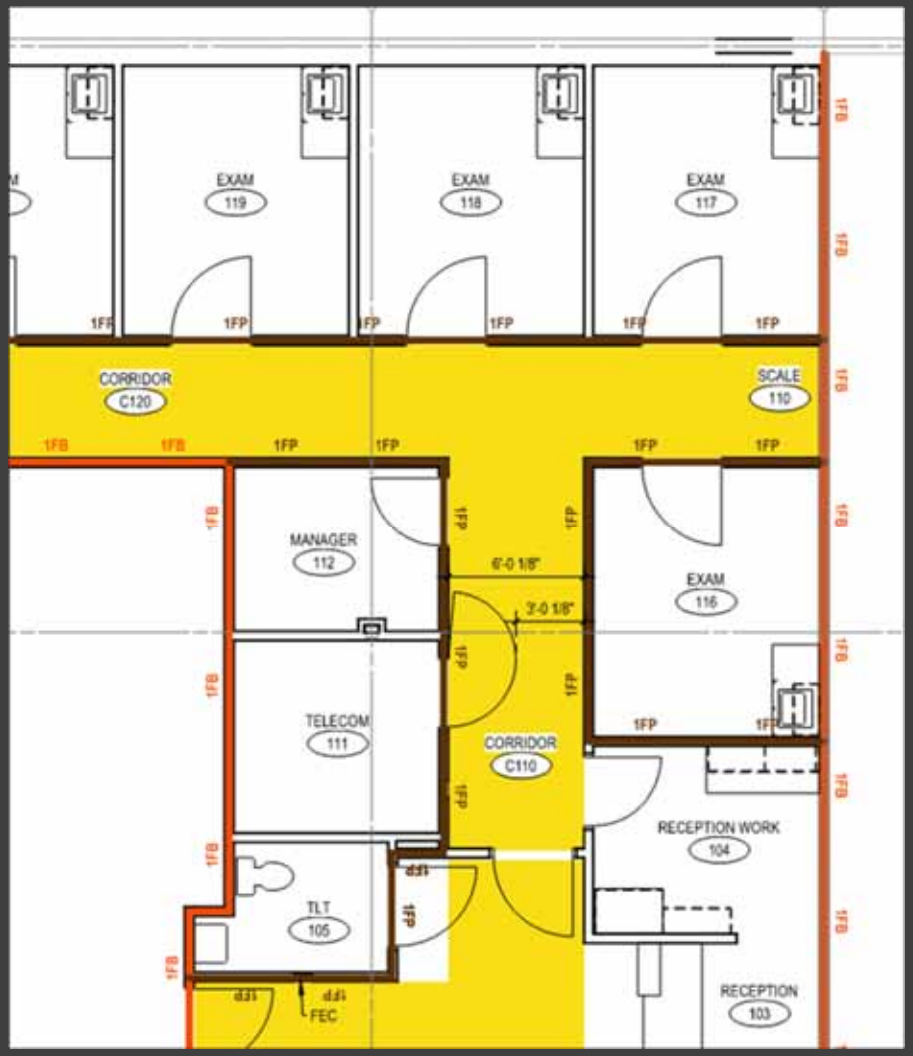
- Provides fire resistance for the following types of systems:
  - Shaft enclosures
  - Stairwells and Exit passageways
  - Horizontal Exits
  - Atriums*
  - Incidental uses
    - Hazardous uses (storage)
  - Control Areas
    - Combustible and Flammable fuel locations
  - Occupancy Separation
  - Fire Areas

Shaft Enclosures

- Constructed to meet the requirements of fire barriers for separating vertical openings from adjacent stories
  - Smoke resistance also applies in certain applications
- Additional opening protections apply to doors, windows and penetrations
- Terminology for Shaft Enclosures only exists in the IBC. NFPA 101 references vertical openings needed to be enclosed by fire barriers
  - Knowing which codes apply and showing the most restrictive is always the most conservative option
- Shafts also can ensure a compliant design regarding quantity of penetrations through a floor assembly
  - The adjacent image would not have been possible with traditional cored penetrations

Fire Partitions

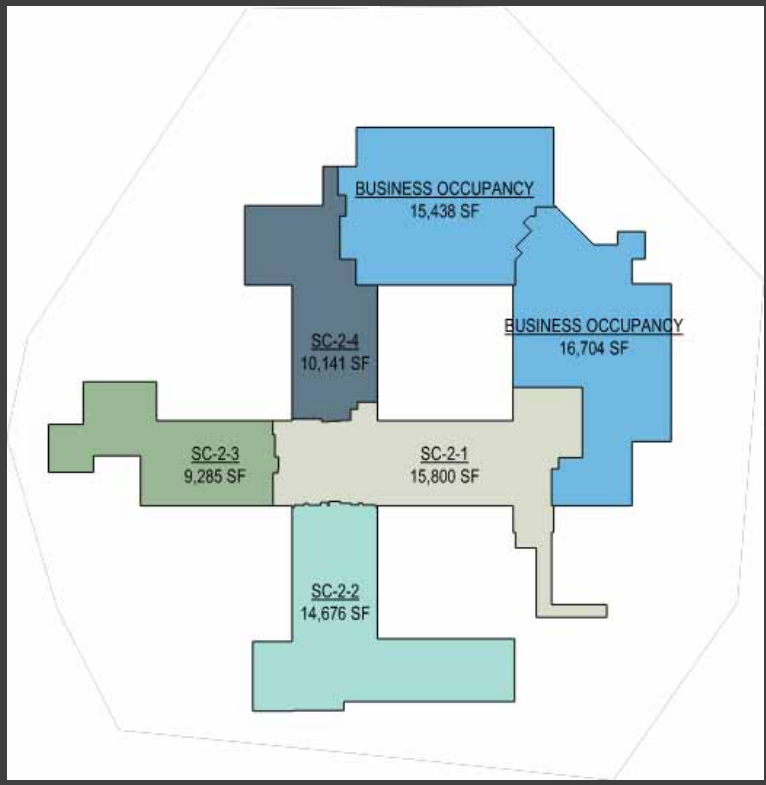
- Common in residential, shopping malls, education and hotel occupancies
  - Most of the time their usage comes into play when a building is not sprinklered
- Certain business occupancies may require the use of fire partitions at corridors in non-sprinklered buildings
  - This would also include fire dampers, fire rated door assemblies with appropriate hardware and firestopping
  - *In most cases, the install cost and long-term maintenance for fire partitions can be removed with the higher upfront cost of adding a fire suppression system



Smoke Barriers

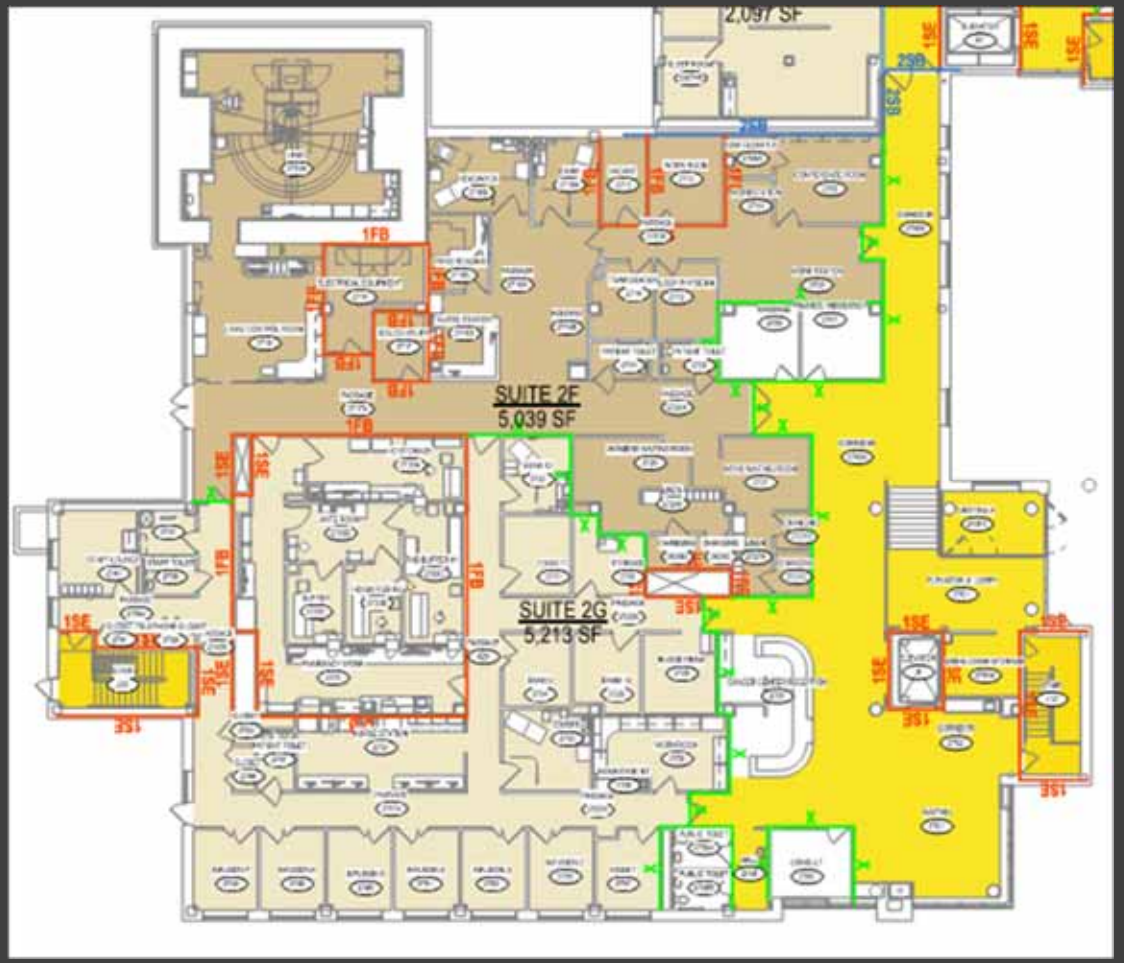
- Commonly constructed as 1-hour fire barriers with additional requirements to limit smoke transmission
- Smoke barriers are installed when a building requires compartmentation to ensure effective egress when occupants may not be able to exit on their own
  - This applies to I-1 (Condition 2)and I-2 occupancies as well as ambulatory care facilities.
  - NFPA 101 has additional occupancies that apply
- Certain elevator lobby configurations also require smoke barriers to limit the amount of smoke from hoistways
  - Also for areas of refuge
- Floors are also required to be treated as smoke barriers; specific exceptions exist when this does not need to apply
- Currently limited to 22,500 sqft per compartment
  - Future editions increase this to 40,000 sqft

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.



Smoke Partitions

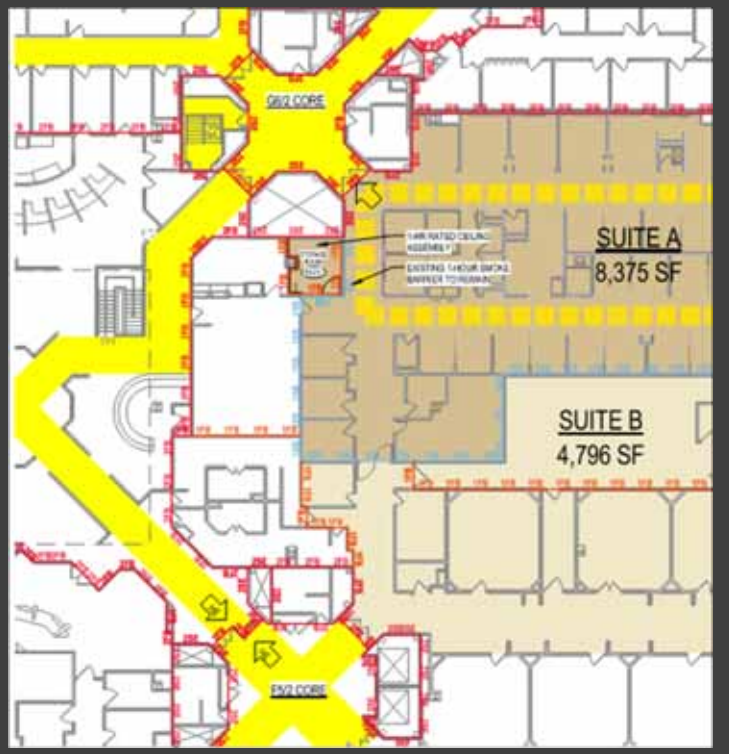
- Commonly referred to as “Smoke Tight”, these walls are non-fire rated and permitted to be constructed of building materials allowable to the class of construction
- Uses include:
  - Corridor walls (depends on occupancy)
  - Tenant separation (Business and Ambulatory Care)
    - Dependent on fire suppression
  - Suite separation (I-2 Only)
  - Incidental Use (Hazardous Storage)
    - Business Occupancy when the building is fully sprinklered
    - Certain conditions in Healthcare Occupancies for existing construction only



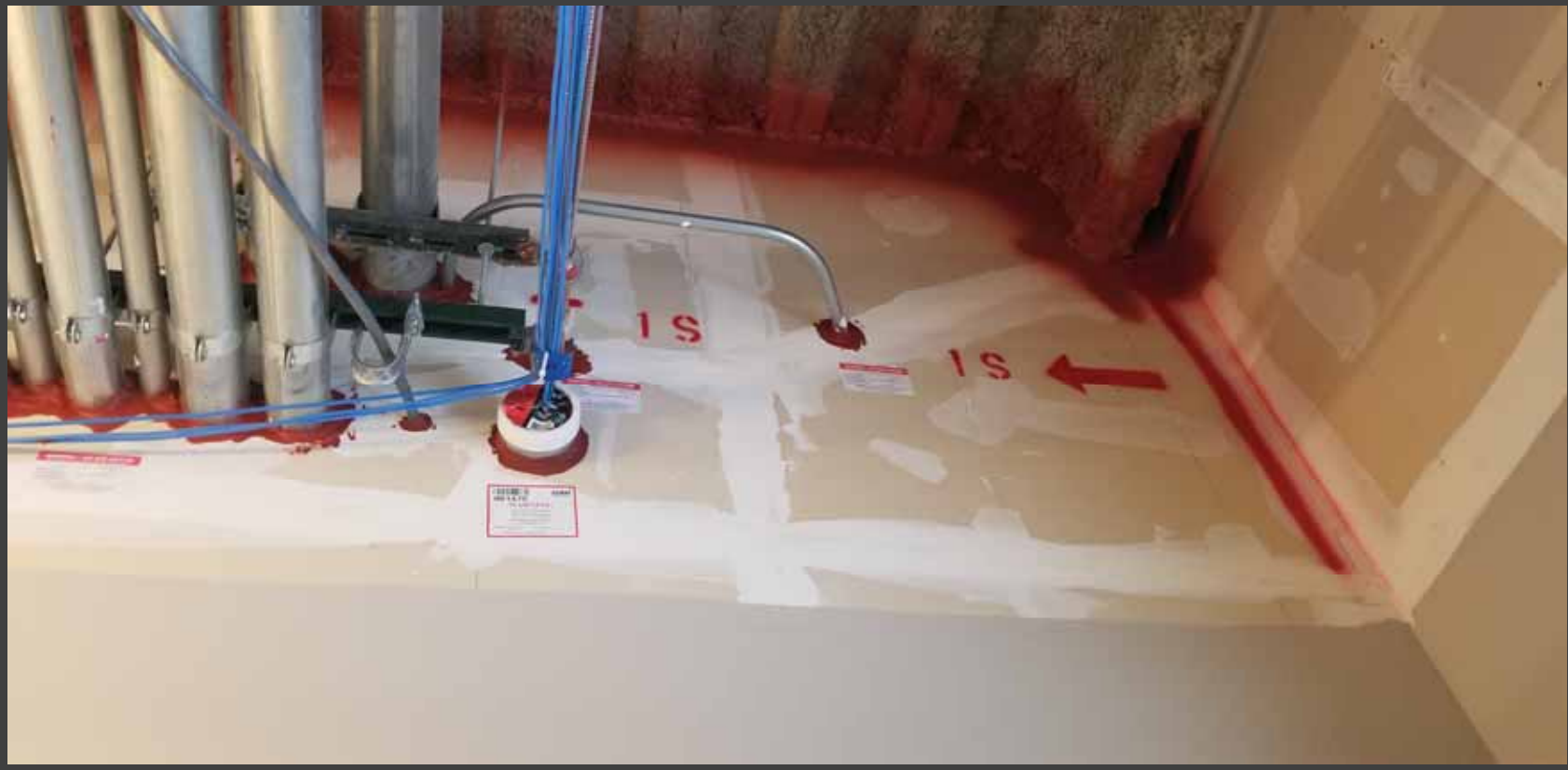
Horizontal Exits

- Means of egress component that effectively increases the maximum distance to an exit
- Typically used when occupants cannot reach a stairwell or exterior exit within the maximum travel distance
- 2-hour fire barrier the connects from exterior wall to exterior wall
  - Also is aligned and continuous through all floors a building
    - Except when the floor assembly is at least 2-hour fire rated, then the horizontal exit may jog as desired
  - Additional fire suppression requirements apply for standpipes

HORIZONTAL EXIT. An *exit* component consisting of fire-resistance-rated construction and opening protectives intended to compartmentalize portions of a building thereby creating refuge areas that afford safety from the fire and smoke from the area of fire origin.

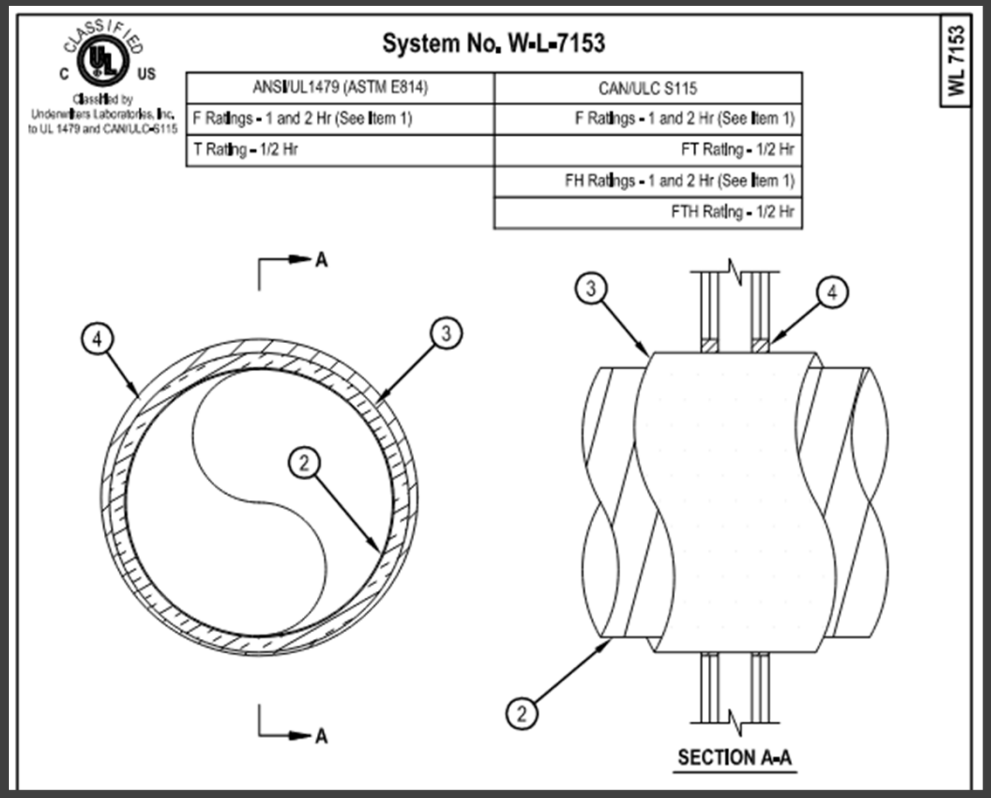


Barriers are nice, but what about the stuff that goes through them?



Penetrations

- Refers to any item that passes through the membrane of a fire resistive assembly
- Must be sealed in accordance with an approved and tested system per ASTM E814 or UL 1479
  - Typical example of a tested and approved system for ductwork through a fire resistive assembly
- Depending on the type of device/item penetrating the assembly, additional measures may need to be taken to effectively limit the transfer of fire and hot gases to adjacent space or floors
  - But what are all those rating designations?

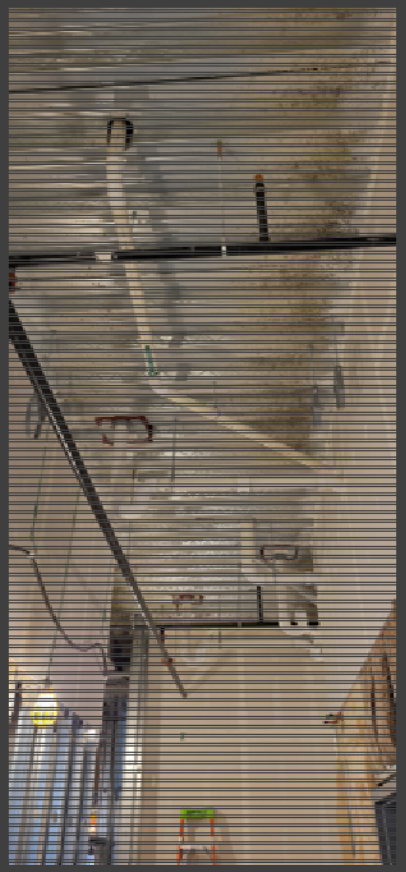


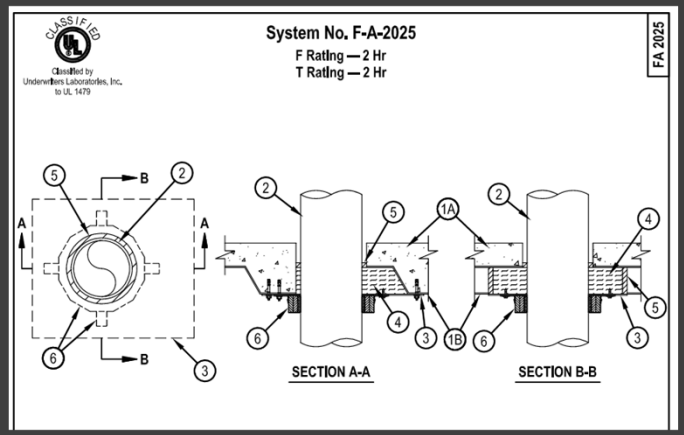
F-Rating

- The F-rating is the number of hours that a specific firestopping system can be expected to withstand fire before being consumed and permitting the passage of fire and hot gases
- Many tested and approved systems can achieve this requirement with nothing more than a bead of firestopping around the penetrating item

T-Rating

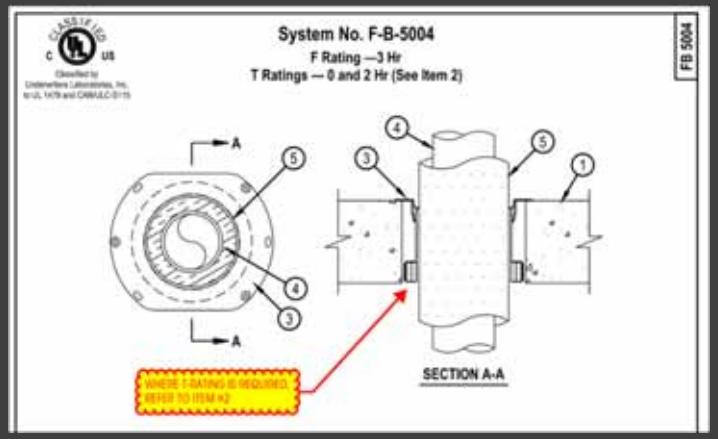
- Per the IBC 714.4.1.2, any through penetration in a horizontal assembly (like a floor) will require a T-Rating equal to that of the F-Rating
- The T-Rating is the amount of time it takes for the penetration, on the non-fire side, to reach a temperature 325 F above the ambient temperature of the device
- There are exceptions to where a T-Rating is not required:
  - Penetrations through the floor that are within a wall cavity on the floor above or below the penetration
  - Floor, tub and shower drains within a horizontal assembly
    - This means a fire rated floor/ceiling assembly with structural space utilities and ceiling assembly
    - A fire rated floor with a simple suspended ceiling system does not apply, unless it is a tested assembly – this is uncommon in healthcare, but can arise in Assisted Living facilities where wood framing is present
  - 4” nominal diameter penetration directly into an electrical power switchgear





T-Rating Cont.

- Popular install devices may need additional intervention to meet these requirements
- The “Drop-in” device shown in the adjacent image can serve problematic if a T-Rating is required
  - There are provisions that may be given in the tested assembly report, but in other instances an Engineering Judgement may be needed from the material supplier
  - This is nota guarantee that the system will perform to the listed requirements, but rather an assumption that it should behave similar to other assemblies with similar pieces
    - This is generally approved by the designer of record and reviewed with the AHJ’s on the project for acceptance



L-Rating

- Notes the amount of air or cold-smoke that can leak through a penetration
  - The number indicates the amount of air in cubic feet per minute
  - Differential pressure of 0.30” WC
- Applicable areas within the code are:
  - Smoke Barrier Walls – 5.0 CFM/Sqft or 50CFM for any 100sqft of wall or floor area
  - Floor assembly joint systems that is also a smoke barrier (ex. Edge of slab)
    - 5CFM/Lf @ 0.30 inch
- Cable bunches are a common areas where L-Ratings are more difficult to achieve through smoke barriers

W-Rating

- Refers to a systems ability to resist the passage of water in a floor assembly
- To qualify, a system must resist 36” head of water for 72 hours
  - This is not available in all tested assemblies
- W-Ratings are not mandated by code but can be extremely beneficial when constructing new buildings. Areas of value include:
  - Roofs before water-tight
  - Floors when the building is not enclosed
  - Floors to avoid significant damage in the event of a sprinkler being set off

Fire-Resistant Joint Systems

- Joint Systems refer to any location in or between fire resistive walls, floor to floor/ceiling assemblies and roofs or roof/ceiling assemblies
- This also includes any joint between a floor assembly and a curtain wall assembly (glass or cold formed metal framing)
- Specific testing requirements may apply depending on the situation including F and L Ratings

Opening Protectives, Ducts and Air Transfer Openings

- Doors, Windows, Shutters, Dampers and more!
- There is enough information within this area for another entire webinar
- Areas the require attention:
  - Door labels
    - Ensuring the proper labeled door is within the appropriate barrier
    - Maintaining the appropriate hardware, i.e. closers and latching lever sets on fire rated applications
  - Dampers
    - Installed properly with angles as required
    - Firestopping is only present if required by the manufacturer
    - Tested and inspected at code required intervals

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[b]	FIRE-RATED GLAZING MARKING DOOR VISION PANEL[c]	MINIMUM SIDELIGHT/ TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELIGHT/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3	See Note b	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3[a]	See Note b	D-H-W-180	Not Permitted	3	Not Permitted	W-180
	2	1 1/2	100 sq. in.	≤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.	≤100 sq. in. = D-H-90 >100 sq. in.= D-H-W-90	Not Permitted	1 1/2	Not Permitted	W-90
Enclosures for shafts, interior exit stairways and interior exit ramps.	2	1 1/2	100 sq. in.	≤100 sq. in. = D-H-90 > 100 sq. in.= D-H-T-W-90	Not Permitted	2	Not Permitted	W-120
Horizontal exits in fire walls[e]	4	3	100 sq. in.	≤100 sq. in. = D-H-180 > 100 sq. in.= D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3[a]	100 sq. in.	≤100 sq. in. = D-H-180 > 100 sq. in.= D-H-W-180	Not Permitted	3	Not Permitted	W-180
Fire barriers having a required fire-resistance rating of 1 hour: Enclosures for shafts, exit access stairways, exit access ramps, interior exit stairways and interior exit ramps; and exit passageway walls	1	1	100 sq. in.[c]	≤100 sq. in. = D-H-60 >100 sq. in.= D-H-T-W-60	Not Permitted	1	Not Permitted	W-60
					Fire protection			
Other fire barriers	1	3/4	Maximum size tested	D-H	3/4		D-H	
Fire partitions: Corridor walls	1	1/3[h]	Maximum size tested	D-20	3/4[h]		D-H-OH-45	
	0.5	1/3[h]	Maximum size tested	D-20	1/3		D-H-OH-20	
Other fire partitions	1	3/4	Maximum size tested	D-H-45	3/4		D-H-45	
	0.5	1/3	Maximum size tested	D-H-20	1/3		D-H-20	

(continued)

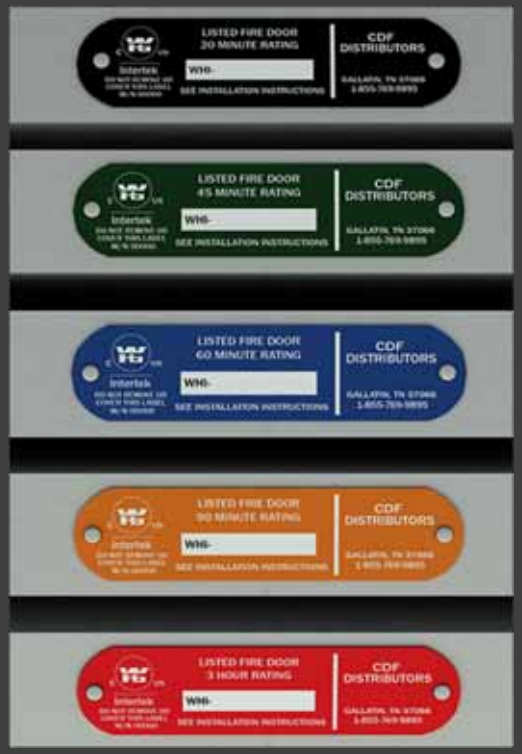
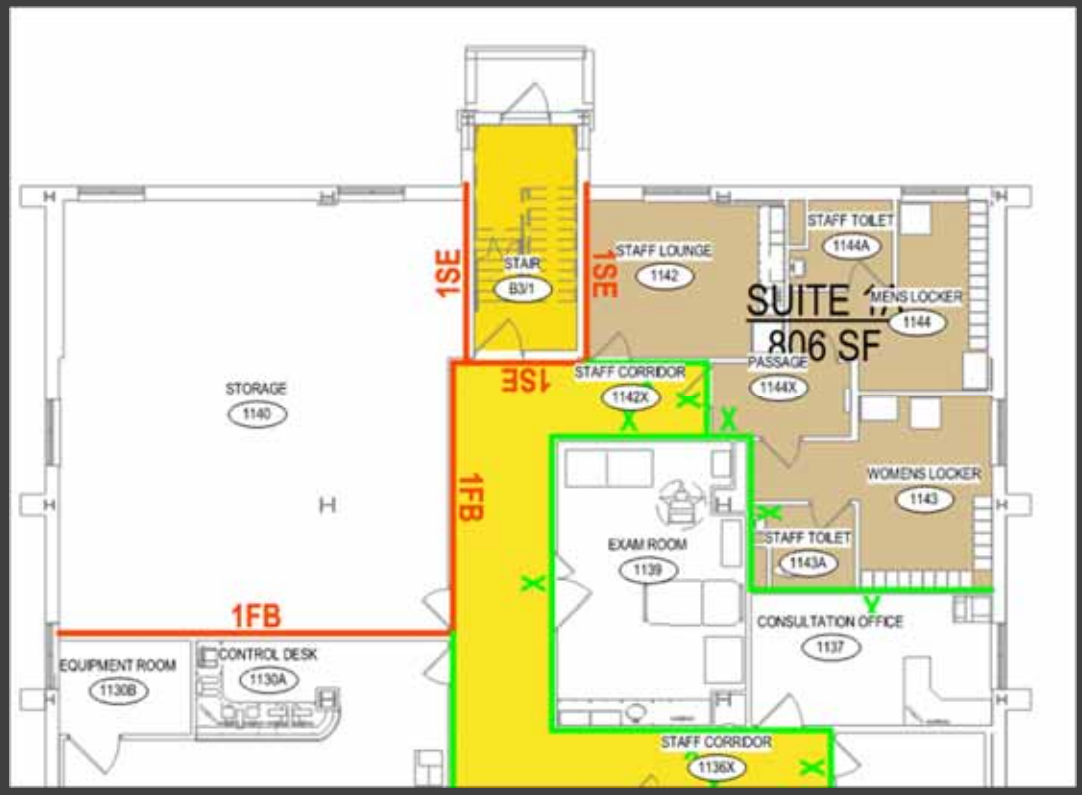


Photo from CDF Distributors

Complicated Scenario

- Installing a new door into the 1-hour stairwell and replacing the in-wall fire damper that supplies air to the shaft, what so they require?
- Door and Frame
  - Being a 1-hour shaft enclosure, IBC table 716.5 requires the door to be a **60-Minute assembly**, not the traditional 45-minute assembly that you would typically see in a 1-hour fire barrier
- Fire Damper
  - The fire damper follows a similar notion, but not because the wall requires a different rating, but rather because of the hourly ratings fire dampers are manufactured to. In this case, a **90-minute fire damper** would be provided as the only other option is a 45-minute damper, which would be too low of a rating



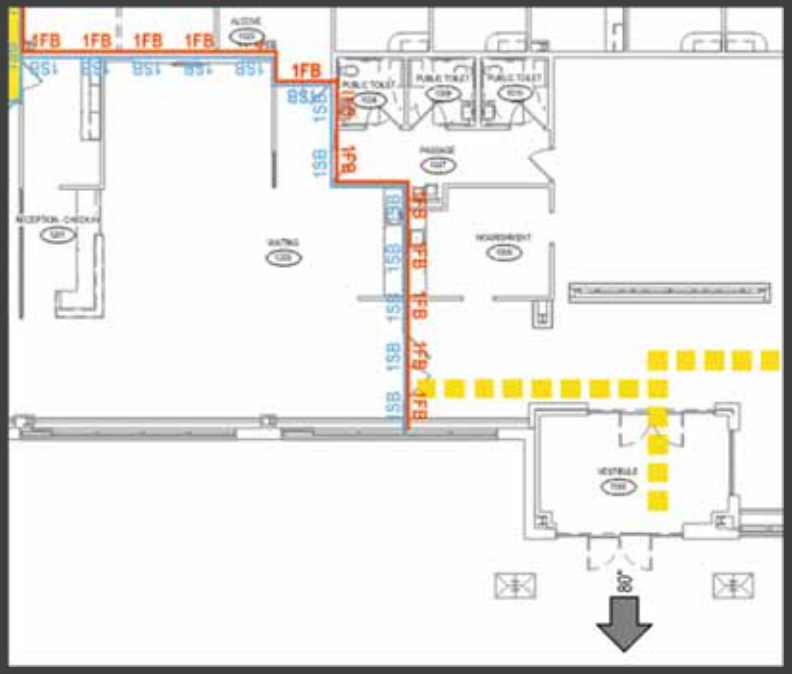
Wall Stenciling

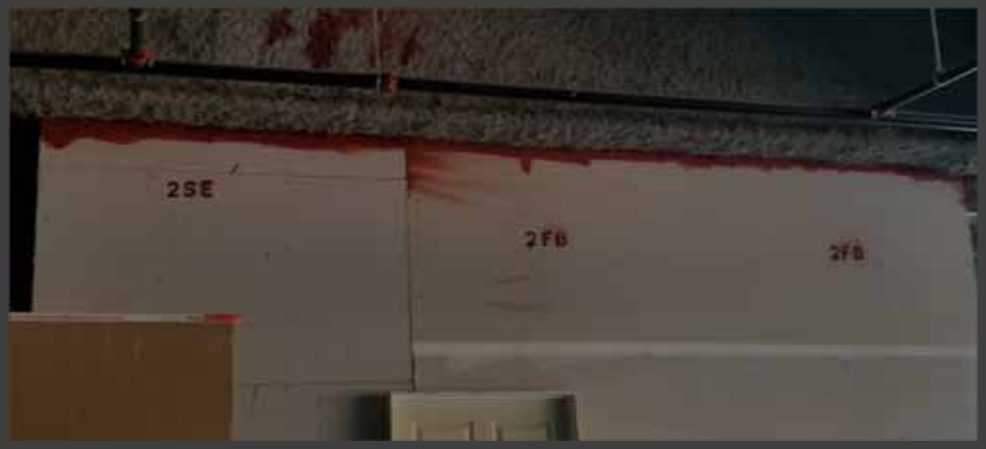
- Wall applications, as listed in the IBC 703.7 are required to be provided with permanent identification markings
  - Code dictates the size of the wording, stroke of the letter and intervals
  - It leaves the actual color and wording up to the designer
- Keep in mind that walls can have more than one rating, the most restrictive applies
- Keeping the identification simple is the best way to ensure that barriers are maintained
- Staff education is key in making sure everyone knows what these markings mean and why they are important

703.7 Marking and identification. Where there is an accessible concealed floor, floor-ceiling or *attic* space, *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling in the concealed space. Such identification shall:

1. Be located within 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144 mm) measured horizontally along the wall or partition.
2. Include lettering not less than 3 inches (76 mm) in height with a minimum $^{3}/_{8}$-inch (9.5 mm) stroke in a contrasting color incorporating the suggested wording, "FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS," or other wording.

Wall Stenciling Cont.





Storage (that word that makes everyone cringe)

- Start with the knowns, which code applies and what rating is needed
  - IBC Table 509 (top)
  - NFPA 101-Chapeter 18 (Healthcare) (lower left)
  - NFPA 101-Chapter 8 (General) (lower right)
- For Healthcare, the requirements are straight forward – most of the time, 1-hour fire barriers are required
- Business occupancies are less restrictive, and allow no wall ratings for general storage, provided a fire suppression system is provided
  - Keep in mind, this only applies is NFPA 101 is not applicable
  - NFPA 101 would require a smoke partition surrounding the room in addition to fire suppression

In Group I-2, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour
In Group I-2, physical plant maintenance shops	1 hour
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet	1 hour

Rooms with soiled linen in volume exceeding 64 gal (242 L)	1 hour
Storage rooms larger than 50 ft² (4.6 m²) but not exceeding 100 ft² (9.3 m²) and storing combustible material	See 18.3.6.3.11.
Storage rooms larger than 100 ft² (9.3 m²) and storing combustible material	1 hour
Rooms with collected trash in volume exceeding 64 gal (242 L)	1 hour

8.7 Special Hazard Protection.

8.7.1 General.

8.7.1.1* Protection from any area having a degree of hazard greater than that normal to the general occupancy of the building or structure shall be provided by one of the following means:

(1) Enclosing the area with a fire barrier without windows that has a 1-hour fire resistance rating in accordance with Section 8.3

(2) Protecting the area with automatic extinguishing systems in accordance with Section 9.7

(3) Applying both 8.7.1.1(1) and (2) where the hazard is severe or where otherwise specified by Chapters 11 through 43

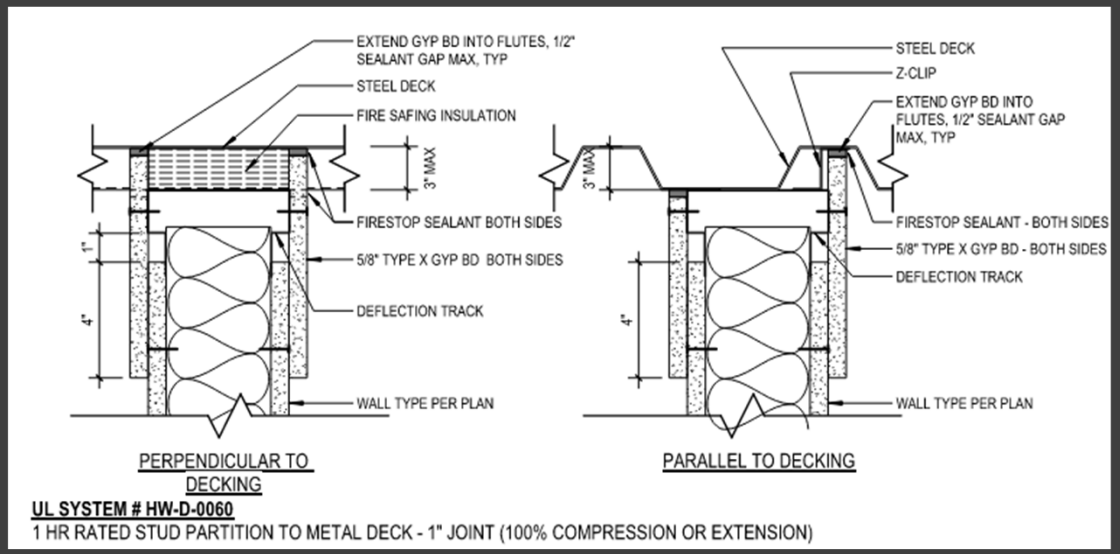
8.7.1.2 In new construction, where protection is provided with automatic extinguishing systems without fire-resistive separation, the space protected shall be enclosed with smoke partitions in accordance with Section 8.4, unless otherwise permitted by one of the following conditions:

Storage Cont.

- If you've been through a Joint Commission survey recently, then chances are you already know what the red crosshatching indicates
- Over the last few years, TJC has been requiring facilities to graphically show where hazardous spaces are located on life safety plans
  - Part of the reason is due to spaces that require fire resistive construction do not always qualify for hazardous spaces (i.e. fire pump room, elevator equipment, etc.)

Deflection matters

- No matter the age of the building, every structure moves
- Wall types, whether gypsum board or masonry, will need a gap at the top of the wall to allow for movement
  - This means penetrating items cannot pass through the upper portion of the wall where movement will occur or the wall will become pinned and can result in damage to fire rated assemblies

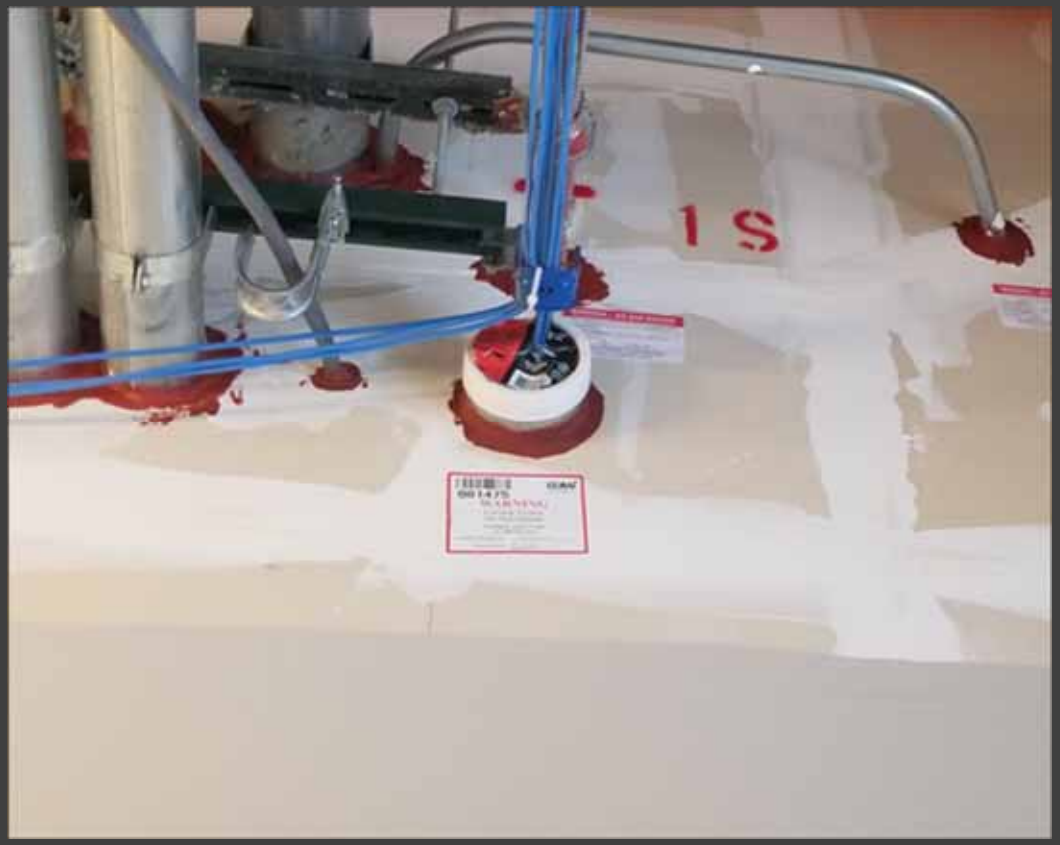


Deflection Cont.

- This is exactly what you don’t want to see!

Wall Patching

- A common occurrence in any facility when work is being done
- Not all wall patches are created equal
- In an ideal situation we would come to expect that the adjacent image would be done on every job…
  - But that is seldom the case

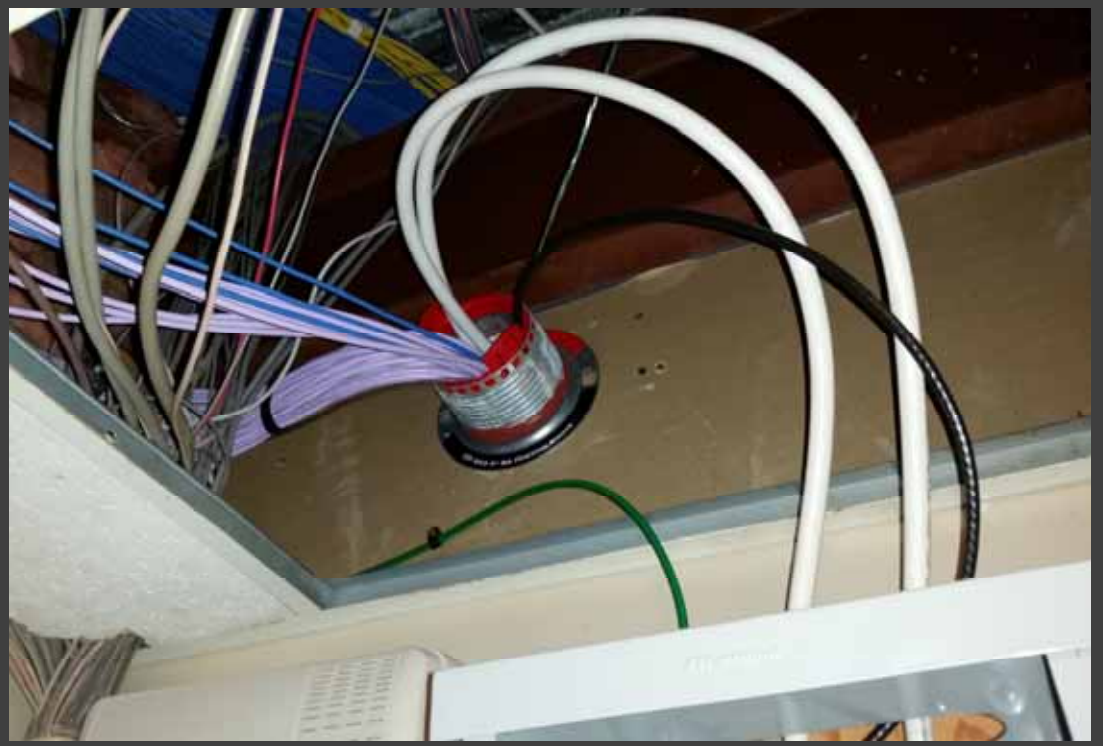


Wall Patching Cont.

- Unfortunately, our expectation isn't always upheld…

Wall Patching Cont.

- Or you start to feel really good about that new fire rated sleeve assembly…
- Only to look up above and realize the wall doesn't continue to deck
  - And there are 5 times more cables going above the wall



Doors and Openings

- Aside from improperly installed penetrations, doors have the highest opportunity for potential citations, when it comes to fire rated assemblies
- How many times have you seen this?
  - Last I checked UL did not have a test for a combustible door stop

Doors Cont.

- Areas to inspect to ensure a compliant opening in a fire rated assembly:
  - Appropriate fire rating
    - Smoke Partition = non-rated
    - 1-hr SB = 20 min
    - 1-hr FB = 45 min
    - 1-hr SE = 60 min
    - 2-hr FB/SB = 90 min
    - 3-hr or 4-hr FB/SB = 180 min
      - *Keep in mind, doors can be rated higher than the minimum required rating but not lower
      - **If a fire rated door is utilized in a location that does not require a rating, the door must be maintained as a fire rated assembly, requiring the appropriate inspection intervals
        - This is addressed in future editions of NFPA 80
  - Self-closing or automatic closing
  - Positive latching
  - GAPS!

Doors Cont.

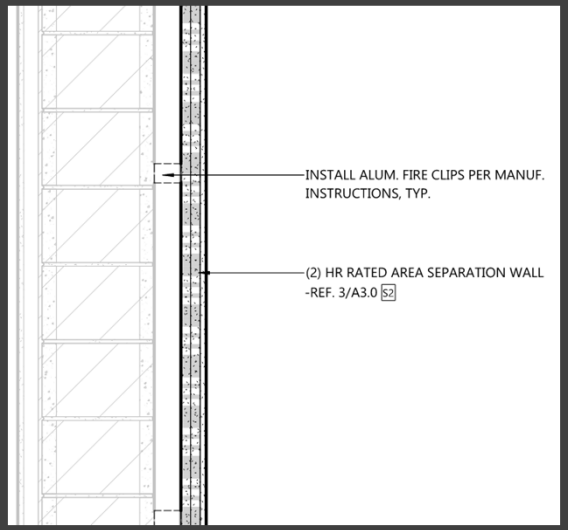
- Gaps are an easy citation point
- As previously mentioned, buildings move. It may not seem like a lot, but it doesn't take much to shift an 1/8" gap out of compliance
  - 1/8" gap at meeting edges of doors
    - 3/16" gap on hollow metal doors
  - 3/4" undercut (fire rated)
    - 1" at smoke partitions (non-rated)
  - Doors with gaps that exceed the maximum requirements can be retrofitted with appropriately tested and rated seals
    - This includes overlapping astragals at meeting edges and excessive undercuts
    - It's important to note that the NFPA allows meeting edges to be outfitted with rabbets, bevels or astragals, while the IBC only allows rabbets or astragals

Let’s have a little fun…

- The next series of images will showcase some of the best efforts in fire separation installations
  - And also some of the shortcomings

This was about to be covered by drywall!

- The door is in a 2-hour fire wall that is separating an Assembly hall from an existing Education occupancy
- The fire wall is a gypsum board assembly, beyond the CMU, that is seated into the frame
- However, the door frame cannot be anchored into a gypsum board only assembly as shown in the adjacent image
  - The installer used metal framing to attach the frame to the adjacent CMU, inherently pinning the opening to the incorrect building and compromising the fire walls integrity



Firestopping is great, but…

- Firestopping is not a substitute for a drywall assembly or tape and mud
- Out of sequence work resulted in the electrical installer cutting a long slit to install a longer piece of rigid conduit to get through the horizontal assembly cavity and out the other side
  - The problem is the slit was sealed with firestopping (poorly at that) and the EMT is partially in plane with the gypsum board

Sometimes the fix isn’t better

- The pipe half embedded in the wall was shown to be relocated
- The installer felt it was fine where it was
  - Then insulation was added
- The resulting firestopping is not an approved system and had to be remedied

But wait, there’s more

- Just when you think relocating the pipe will solve the issue, in comes the drywall
- The patch does not have any fasteners holding the gypsum board to the framing
- The too was removed and a larger section of drywall was taken out to ensure a proper patch

Parting thoughts

- Know the barriers
- Understand why they are there
- How to address openings
- Parts and complicated pieces
- What to watch for

- Thank you

Thank you

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