



Firestopping The Good The Bad The Ugly

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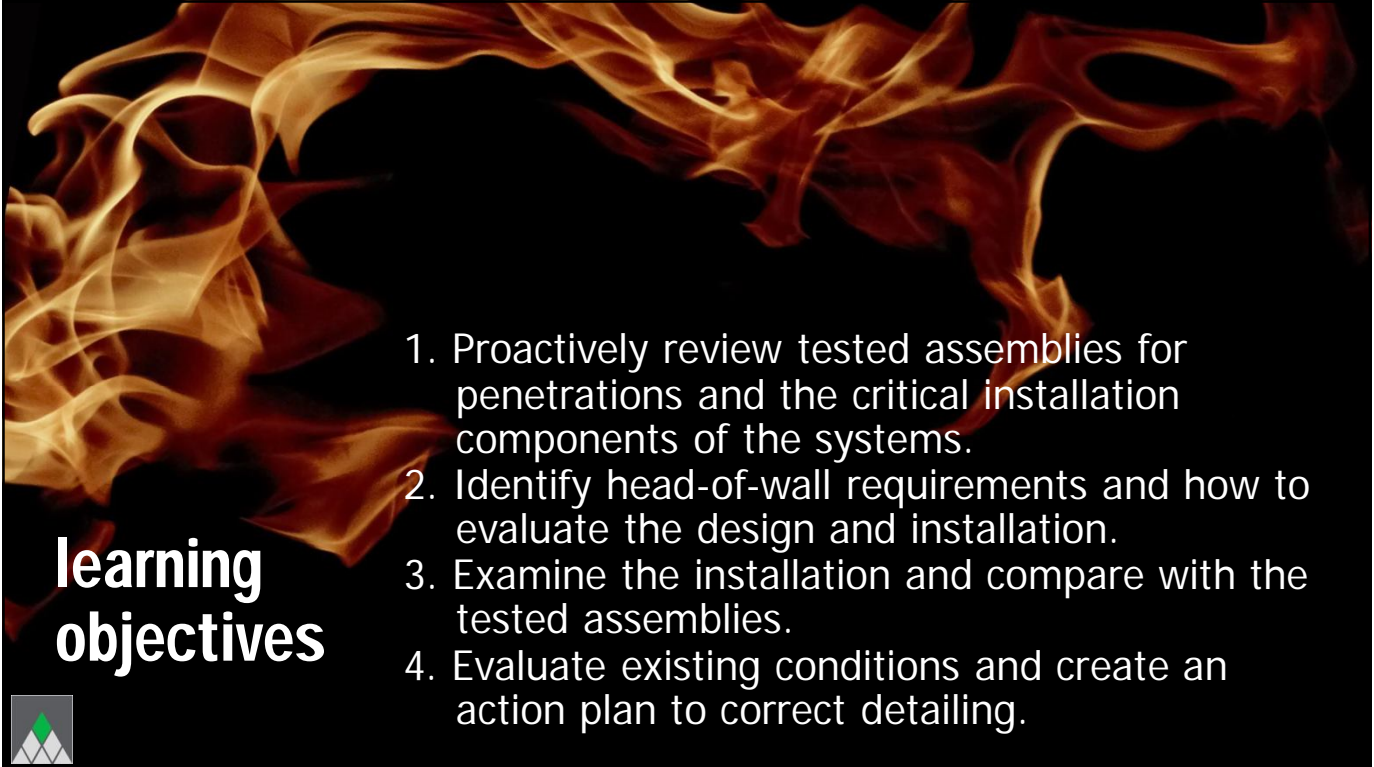
course description

Firestopping is an essential component of passive fire protection systems that involves the installation of materials to seal gaps and openings in a building, preventing the spread of fire, smoke, and toxic gases. Firestop installation is a meticulous process that demands careful planning and execution to ensure effectiveness and compliance with the tested system.

The success of firestop installations hinges on adherence to details, specifications, tested assembly requirements, and manufacturer guidelines. Responsibility for coordination is shared among all stakeholders, extending beyond the individuals directly involved in the physical installation of firestop components. It is a collective effort to ensure that the installations not only meet immediate specifications but also integrate seamlessly with other building systems. Verification and review play a pivotal role in this process. It is essential to scrutinize the locations of installation and confirm that each component is correctly placed. This comprehensive approach mitigates risks and reinforces the integrity of the firestop system. In essence, the commitment to precision and collaboration is a shared responsibility, underscoring the importance of meticulous planning and execution in firestop installations




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learning objectives

1. Proactively review tested assemblies for penetrations and the critical installation components of the systems.
2. Identify head-of-wall requirements and how to evaluate the design and installation.
3. Examine the installation and compare with the tested assemblies.
4. Evaluate existing conditions and create an action plan to correct detailing.

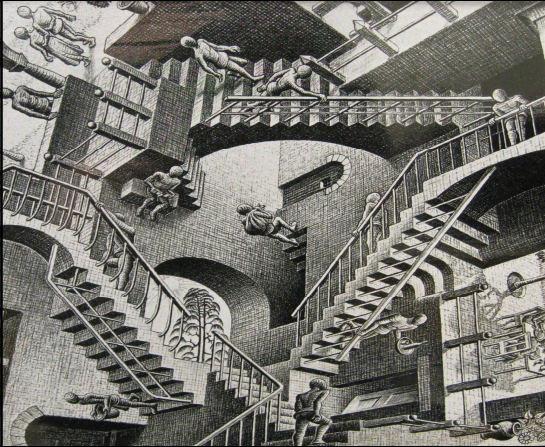


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A FEW QUESTIONS TO START WITH:



WHAT IS FIRESTOPPING?

WHY IS IT IMPORTANT?

IS INSTALLATION OF FIRE STOPPING A SKILL?

*SHOULD FIRE STOPPING BE CONSIDERED
"ENGINEERED" AND/OR "DESIGNED"?*

**WHO IS IN A POSITION TO GIVE PROPER GUIDANCE ON THE
COMPLEXITIES OF FIRE STOPPING INSTALLATION?**



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THE SIX STAGES OF FIRE STOPPING CONSTRUCTABILITY

- 1. PRECONSTRUCTION*
- 2. BIDDING*
- 3. COORDINATION – BIM PHASE*
- 4. PRE-INSTALLATION – SUBMITTAL & REVIEW*
- 5. MOCK-UP & INSTALLATION*
- 6. VERIFICATION*

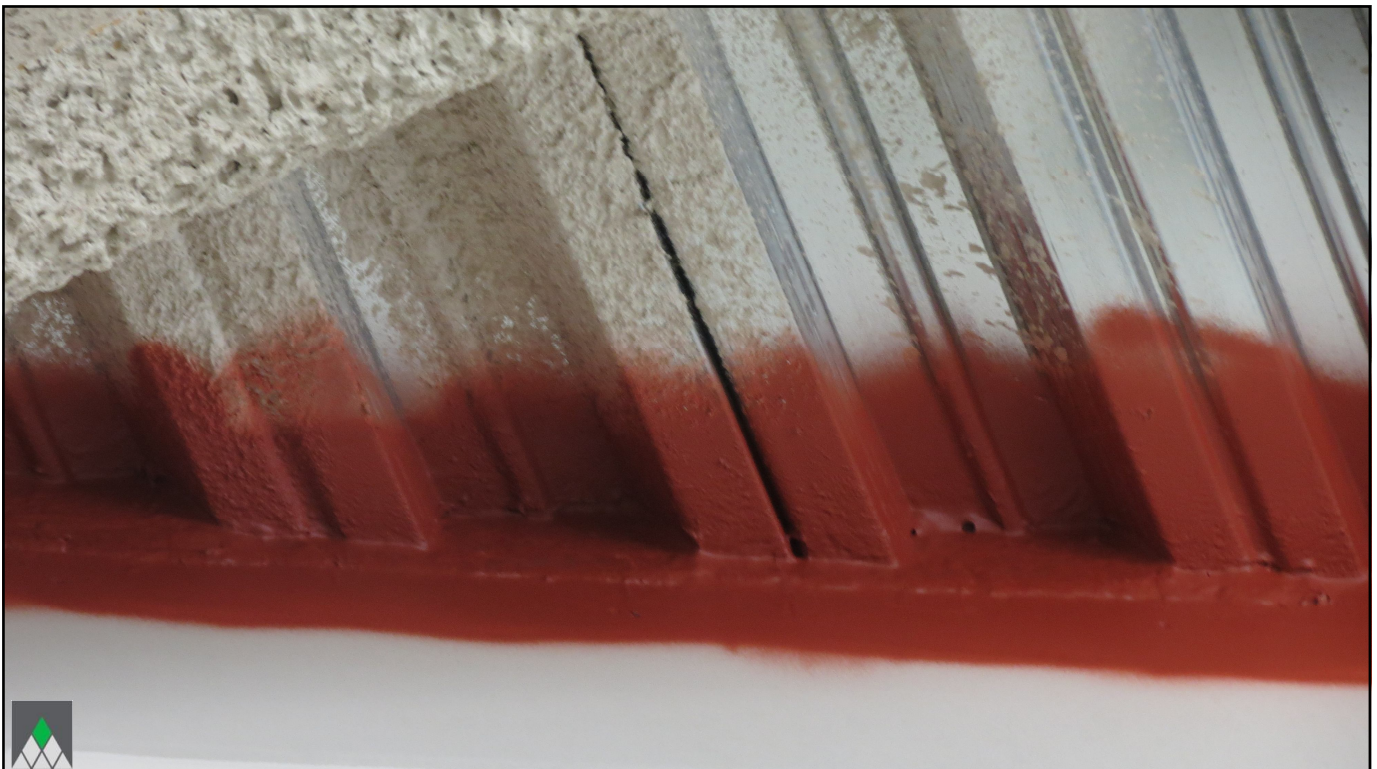


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☺ GOOD
☹ BAD
☹ UGLY

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Checklist for firestopping

- *ITEMS NEEDED TO DETERMINE HEAD OF WALL*
- *IDENTIFICATION OF NO-FLY ZONES*
- *IDENTIFICATION OF WALL AND FLOOR SYSTEMS*
- *TYPES OF PENETRANTS*
- *ONE SIDED PENETRATIONS*
- *DISCUSS CLUSTERING OF PENETRANTS*
- *DISCUSS SPACE NEEDED AGAINST WALLS*



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Reveal the complexities



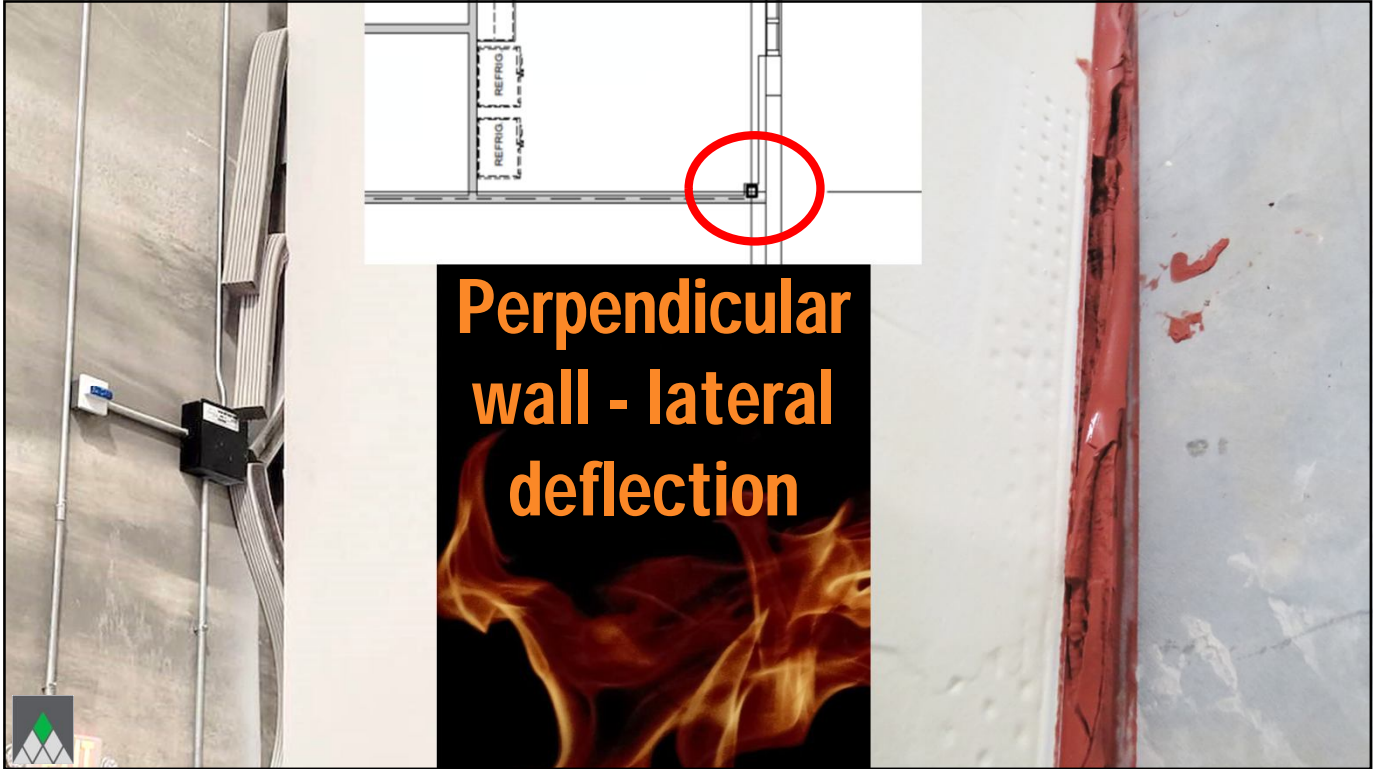
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Lateral Deflection Concerns



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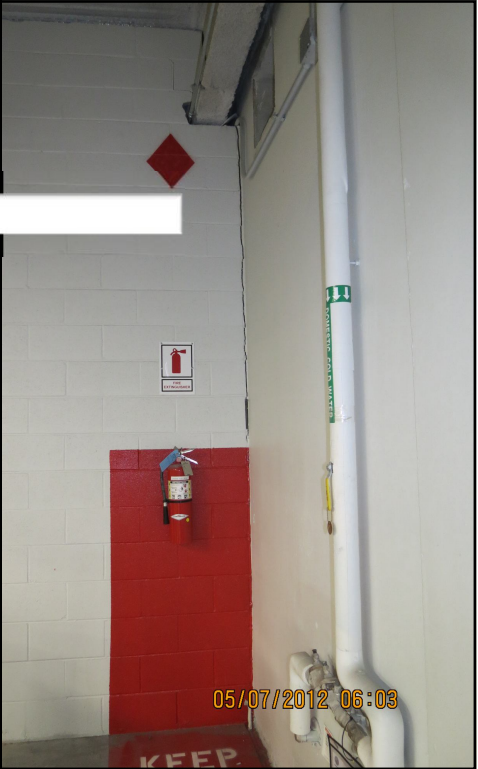
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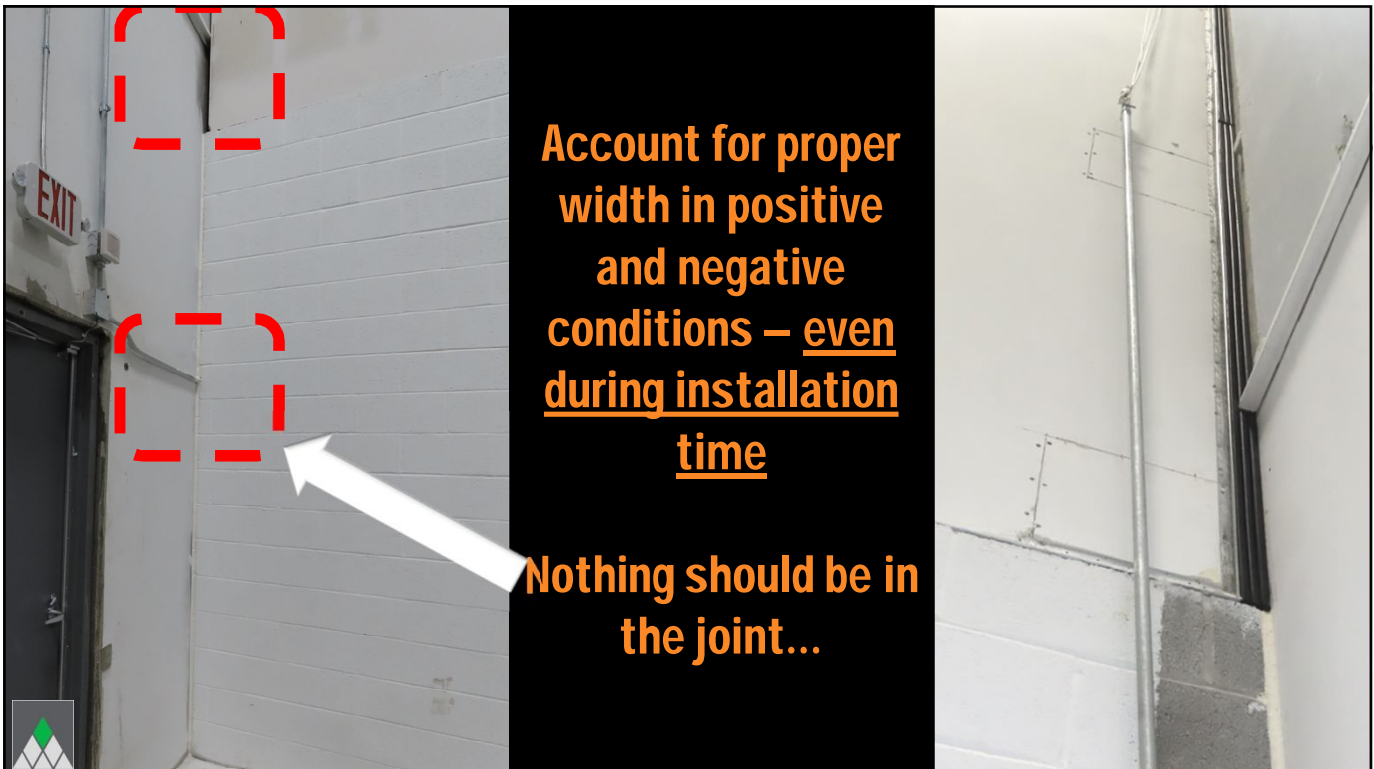
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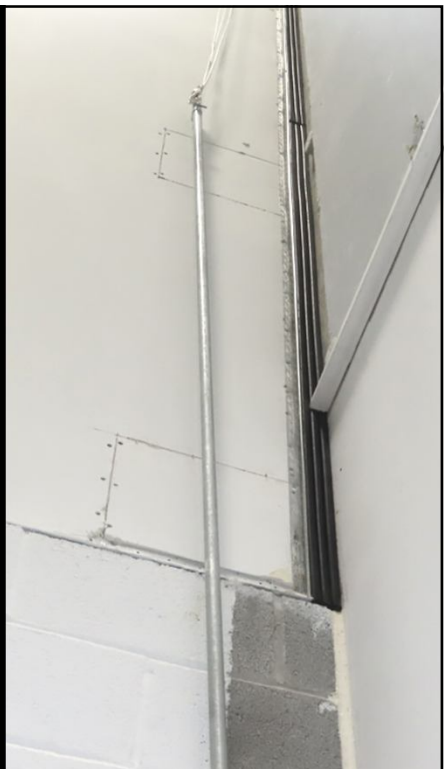
Lateral Deflection
Need to ask the question!



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Account for proper width in positive and negative conditions – even during installation time
Nothing should be in the joint...



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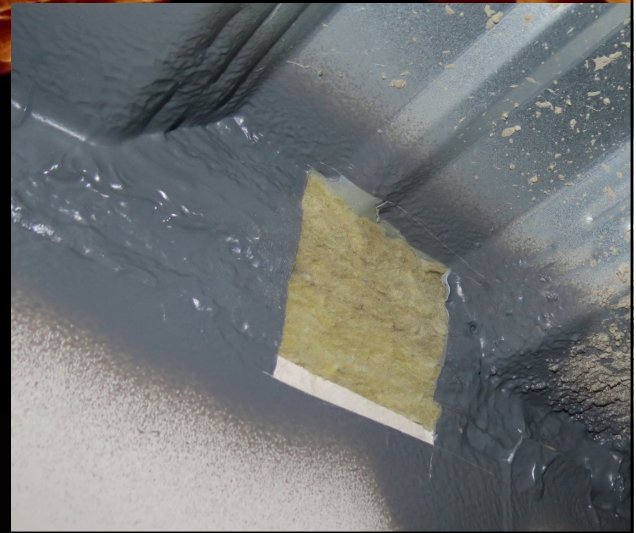
DYNAMIC OR STATIC

UNDERSTAND THE LIMITATIONS OF THE SYSTEM

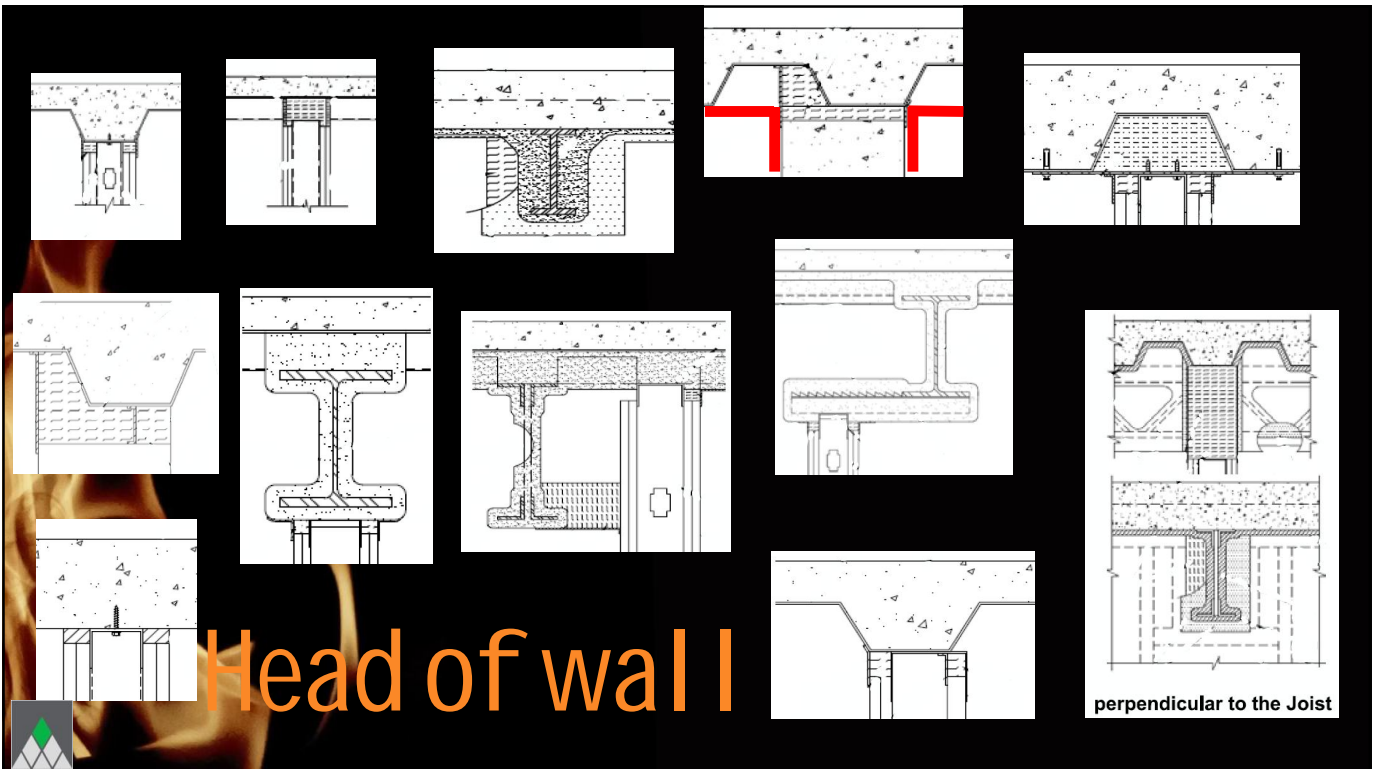
UNDERSTAND WHAT INFORMATION IS NEEDED FROM THE DESIGN PROFESSIONS TO MAKE A DECISION ON DESIGN

TYPICALLY, VERY EXPENSIVE WHEN NOT PROPERLY COORDINATED AHEAD OF TIME – REWORK ISSUES, SCHEDULE ISSUES – MUST BE COORDINATED IN BIM

Head of wall



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Head of wall



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Head of wall

What is the Live Load deflection

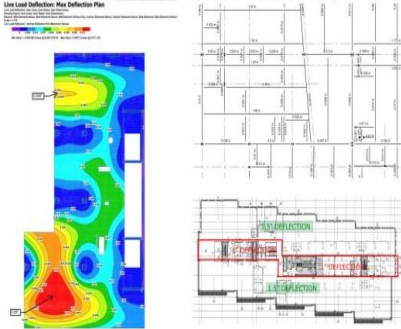
What does the actual dimension mean and include

Live Load Deflection affects many components in the building and has cost implications if not determined prior or during bidding.

The following is most likely affected (cost and possibly time):

- ✓ Head track size for typical partitions
- ✓ Head track size for fire rated walls
- ✓ Curtainwall detailing
- ✓ Precast detailing
- ✓ Air/vapor barrier detailing

Typical Live Load Deflection Plans given by the structural engineer:
(This is what to request in the RFI / Clarification)



The structural code maximum that the deflection could be...however, we would expect/hope that the number would be less than that...for example, a 30'-0" beam span would be $(30 \times 12) / 360 = 1"$...

Head of wall

LL Deflection Dimension

Verify head-of-wall type

- Deep Deflection Track
- Mechanical Type (Most Restrictive)
- Sealant or Spray
- Intumescent Type

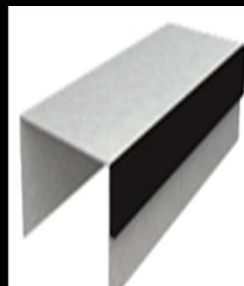


Beam detailing

Confirm locations of horizontal conditions

Locations of restrictive rooms

Stairways, Electrical & IT Rooms, Etc.





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*Some manufacturers have tested assemblies for penetrations in flutes of metal deck, not requiring or limiting a "no fly zone" – **however, always review the movement capacity and penetrant of the system...***



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What is a NO-FLY ZONE

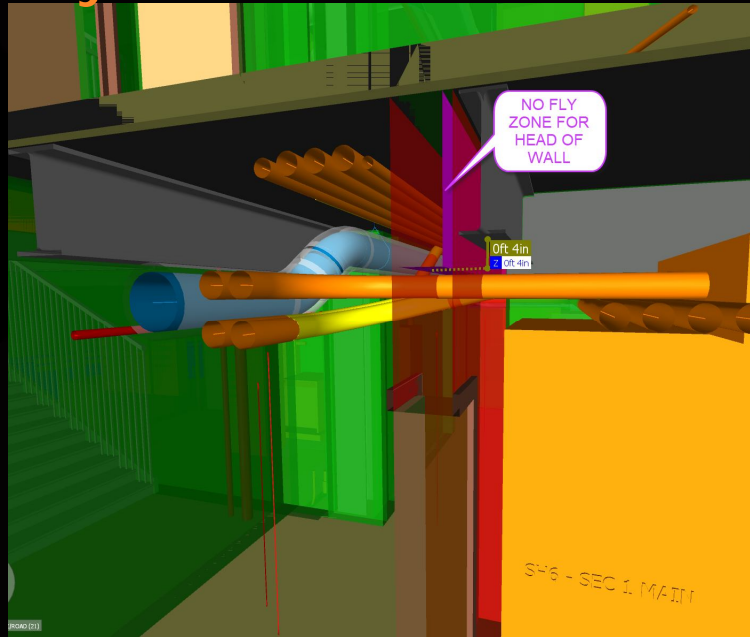
Where are they typically located

What is affected

Top of Wall, Curtainwall
Precast, CFMF, Etc.

Routing and attachment Concerns of MEP-FP

No fly zone – BIM Coordination



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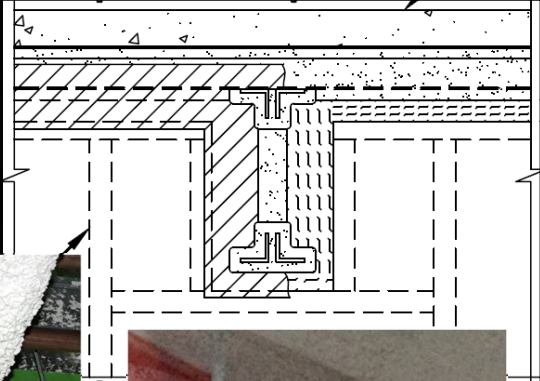

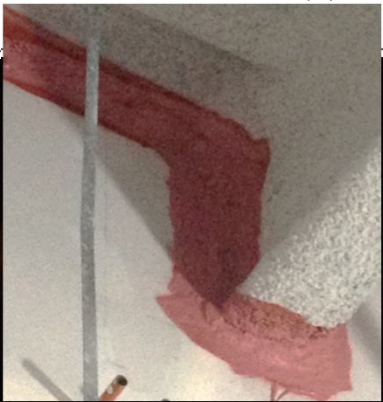
No fly zone

A mechanical type system which is a drywall overlapping system that is typically larger than the spray type?


The distance for this system could be as much as 12"-15"...the area under the overlapping system should be about 3-4".

This system also includes the sides of the beam, joist, etc.

Review beam or joist penetration locations...the head of wall no fly zone extends below the penetration and for the full width of the beam or joist.

No fly zone

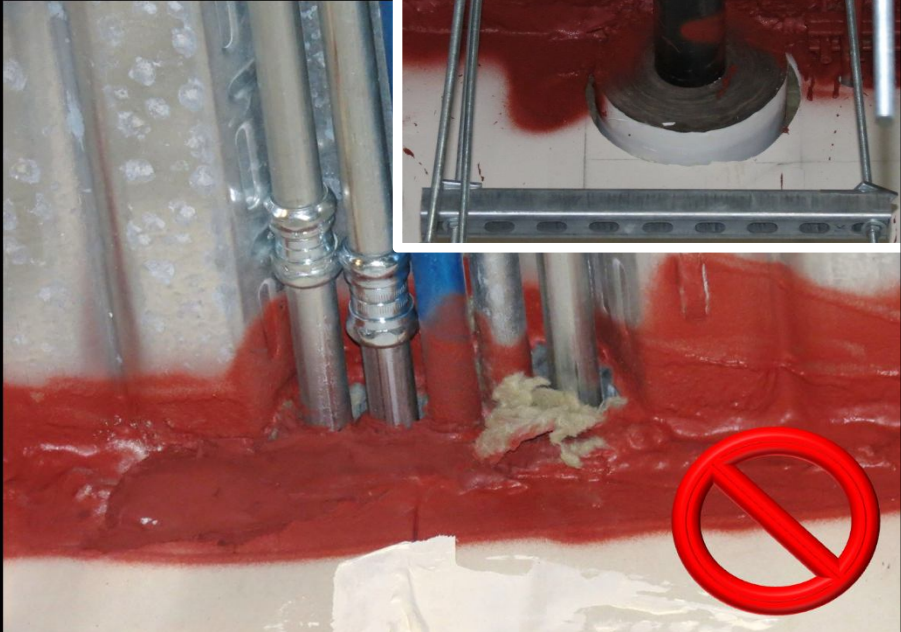
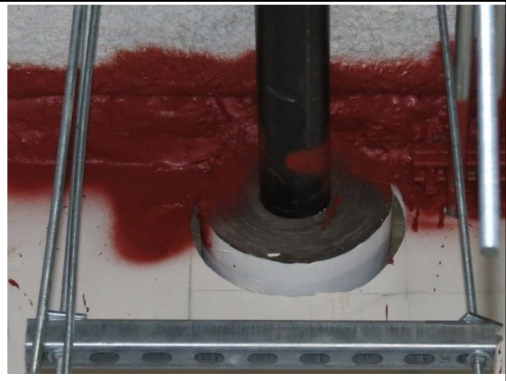



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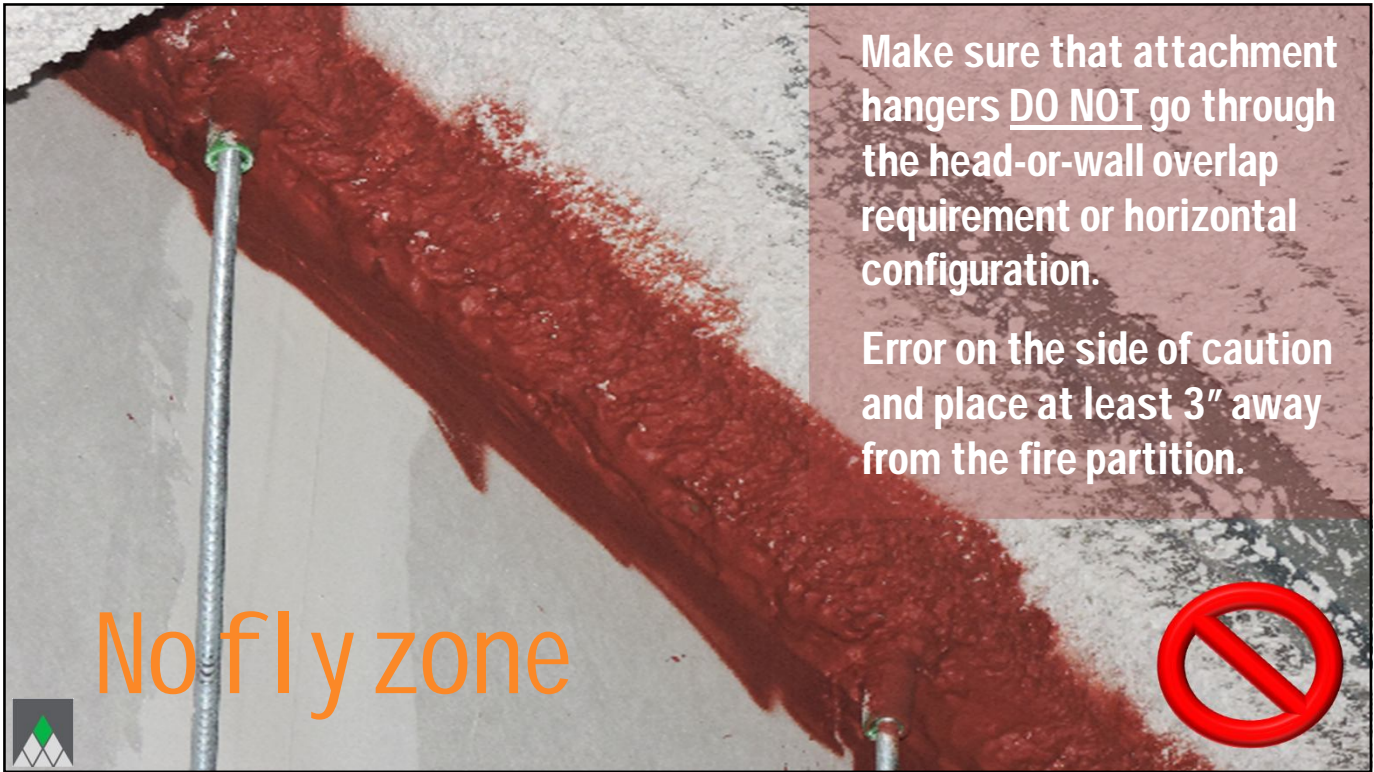
No fly zone

Make sure that MEP-FP does NOT go through the head-of-wall of a rated partition...

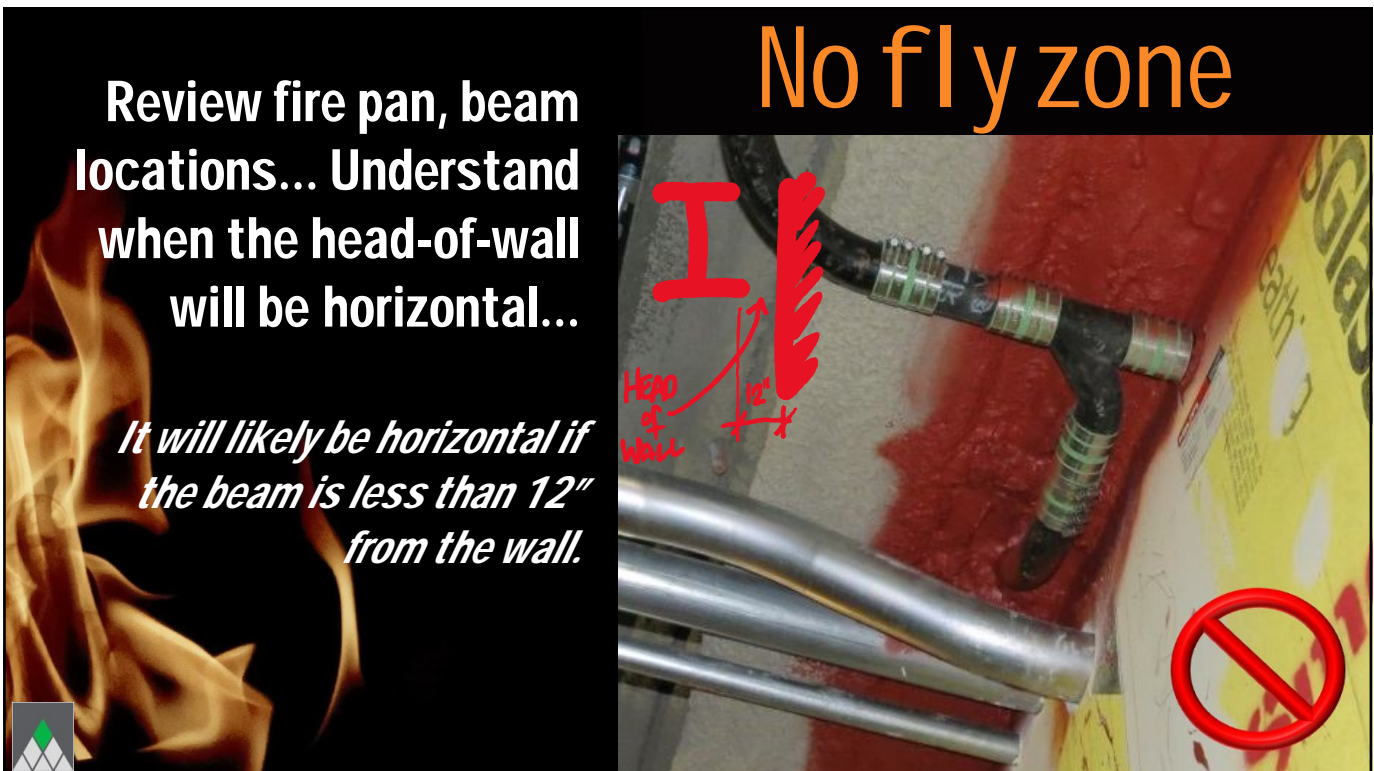
Stay at least 3-5" from the bottom of the deck or steel beam(s) or joist(s) depending on the system type

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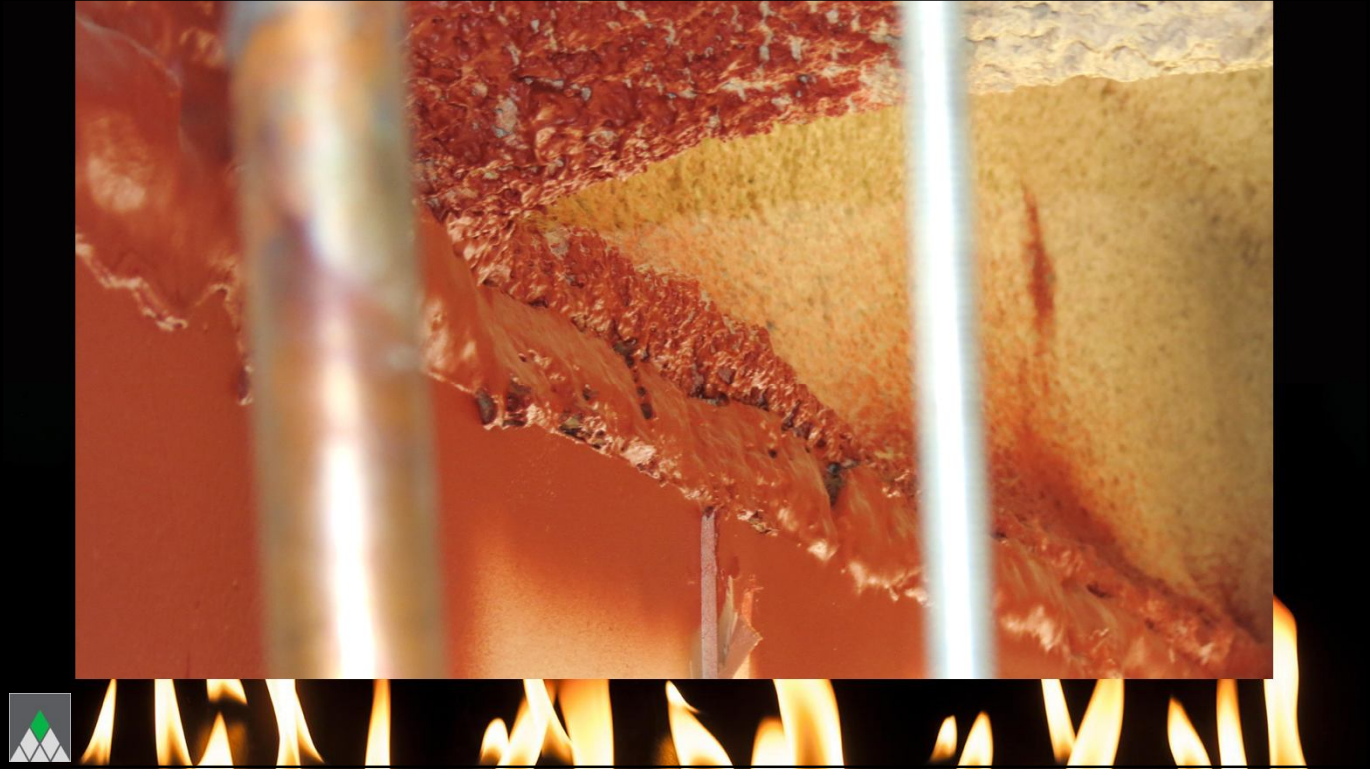
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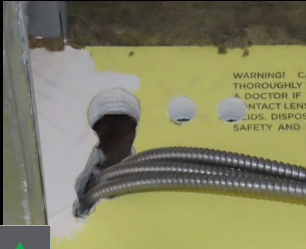
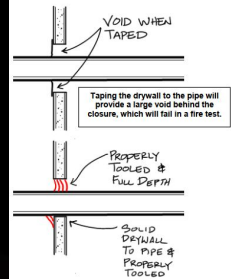


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COORDINATION WITH OTHER TRADES



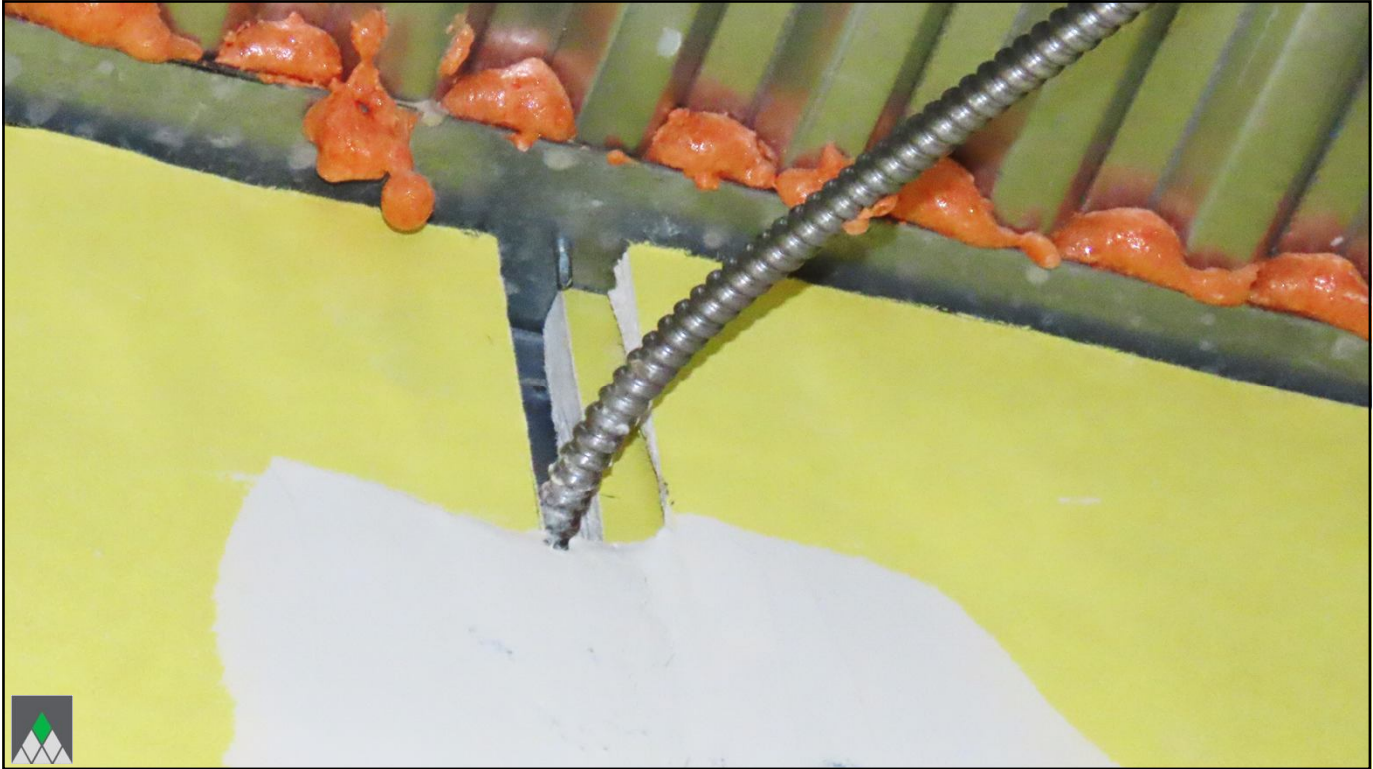
- *DRYWALL ANNULAR SPACE*
- *WIDTH LIMITATIONS OF SYSTEM*
- *ADDITIONAL NEED TO SUPPORT PENETRATES*
- *PROPER PENETRATION PREPARATION OF THE DRYWALL*
- *SEISMIC REQUIREMENTS*



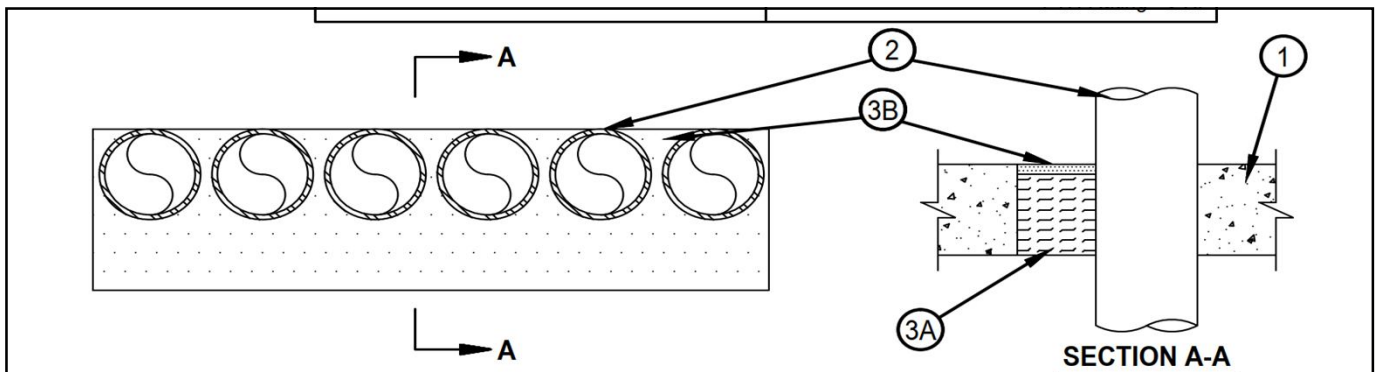
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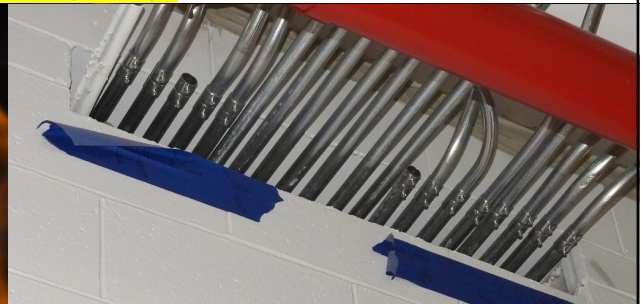


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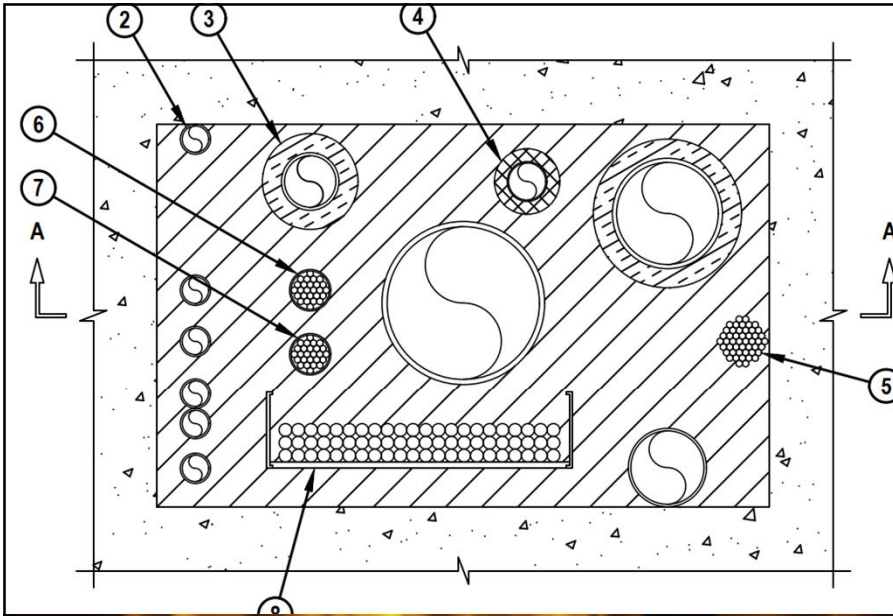


1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete floor. Min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks*. Max size of opening is 8 in. (203 mm) by 30 in. (763 mm).

COORDINATE OPENING SIZES WITH THE TESTED ASSEMBLY CMU, CONCRETE, & FRAMING



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**RE-SUBMITTED
SYSTEM WITH
CORRECT OPENING
SIZE – NOW THE
REMAINING ITEMS
IN THE TESTED
ASSEMBLY MUST
BE INCLUDED**



NOTES : 1. MAXIMUM AREA OF OPENING = 1440 SQ. IN. WITH A MAXIMUM DIMENSION OF 48".

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**TESTED SYSTEM NOW REQUIRES MINERAL WOOL IN
BETWEEN EACH PIPE... THAT WAS NOT INSTALLED BASED
ON THE INCORRECTLY SUBMITTED SYSTEM WITH REGARD
TO THE MAXIMUM OPENING SIZE.**



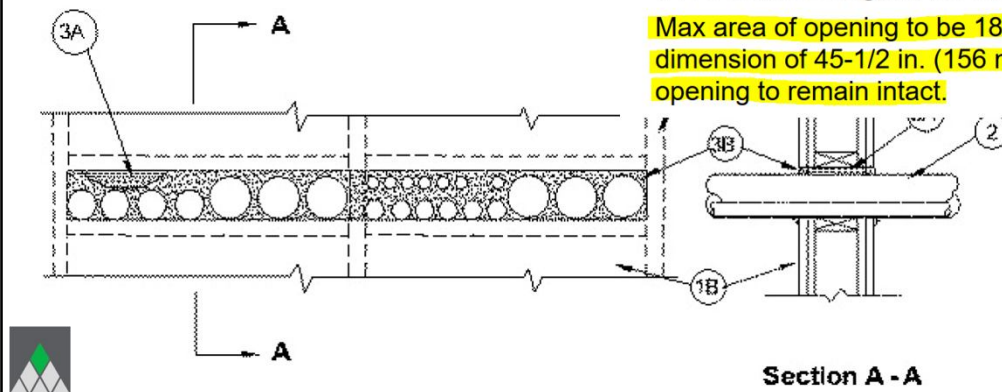
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Always review the detail requirements

This tested assembly has a maximum opening, vertical stud requirements, and stud frame around the opening requirements.

B. Gypsum Board* — The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U400 or V400 Series Design in the UL Fire Resistance Directory.

Max area of opening to be 182 in.2 (1174 cm²) with a max dimension of 45-1/2 in. (156 mm). All vertical studs in opening to remain intact.



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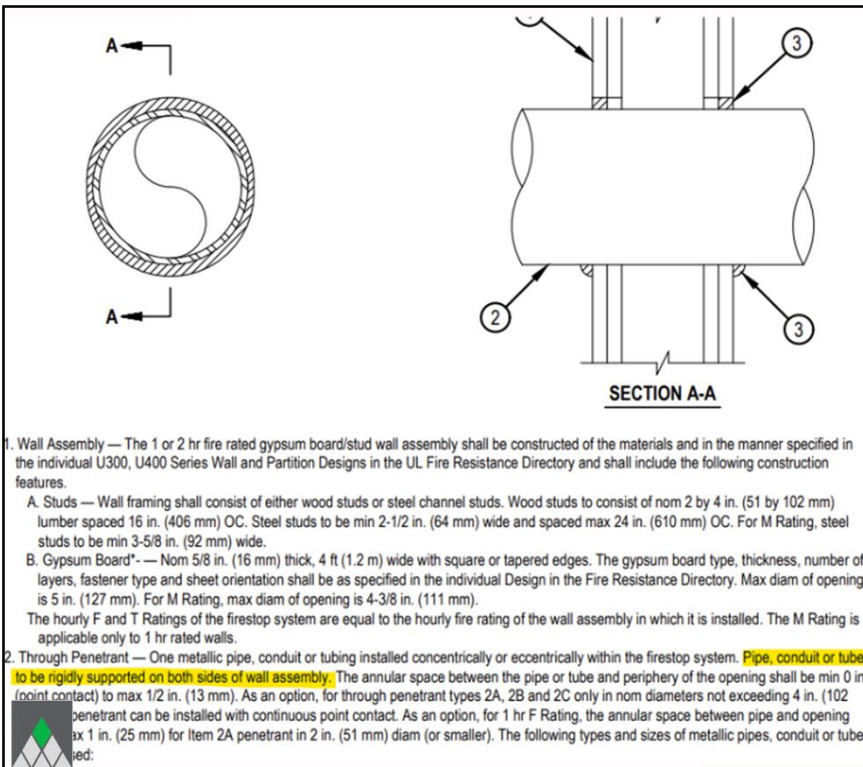


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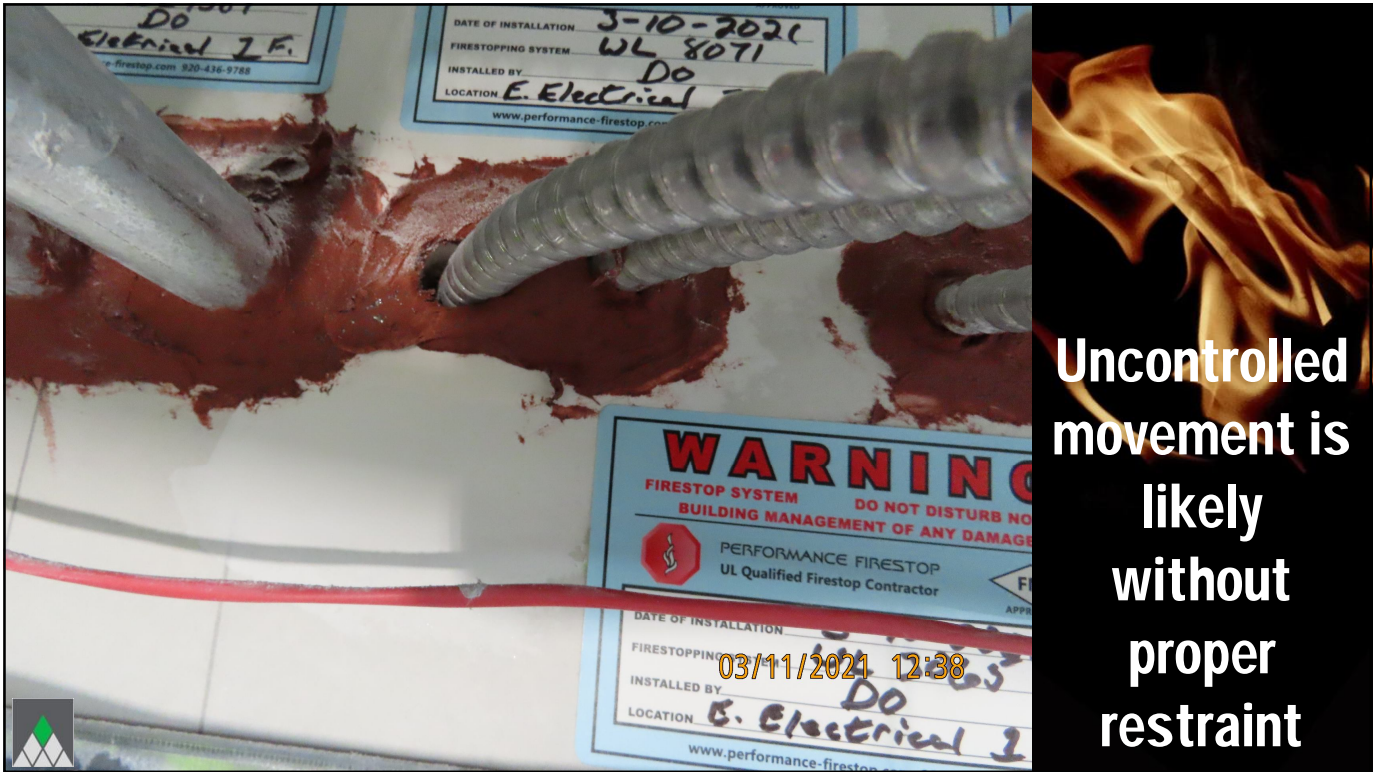
TYPICALLY, THE THROUGH PENETRATING ITEM NEEDS TO BE SUPPORTED ON BOTH SIDES OF THE WALL

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TYPICALLY, THE THROUGH PENETRATING ITEM NEEDS TO BE SUPPORTED ON BOTH SIDES OF THE WALL

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Uncontrolled movement is likely without proper restraint

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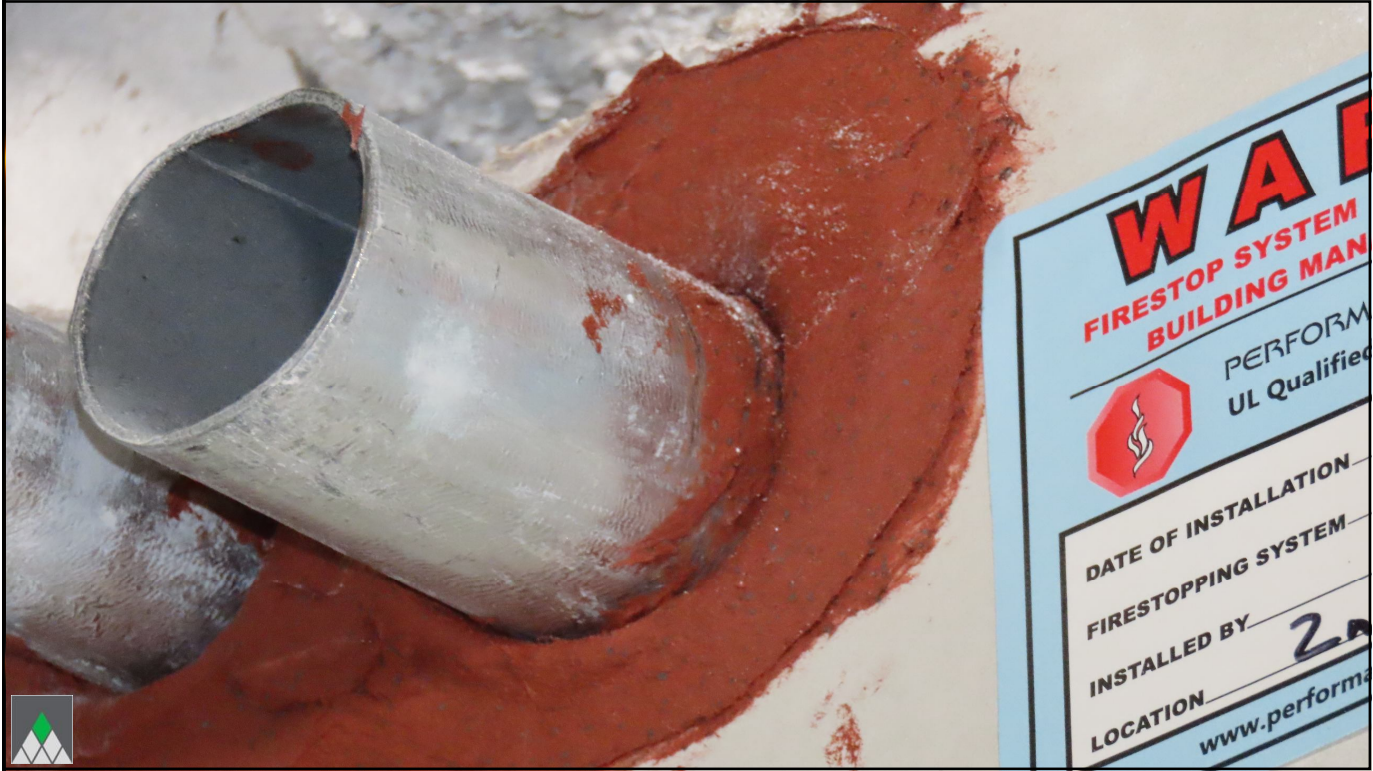
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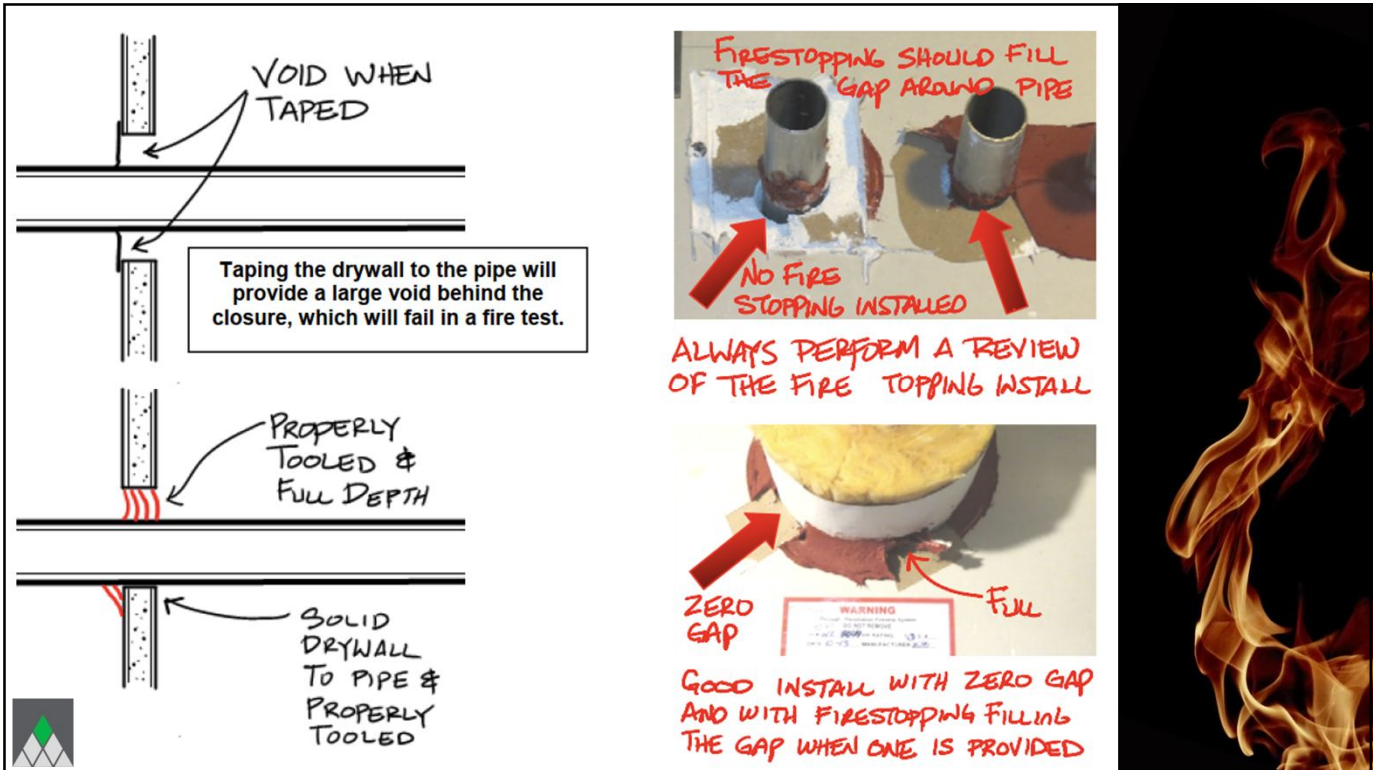


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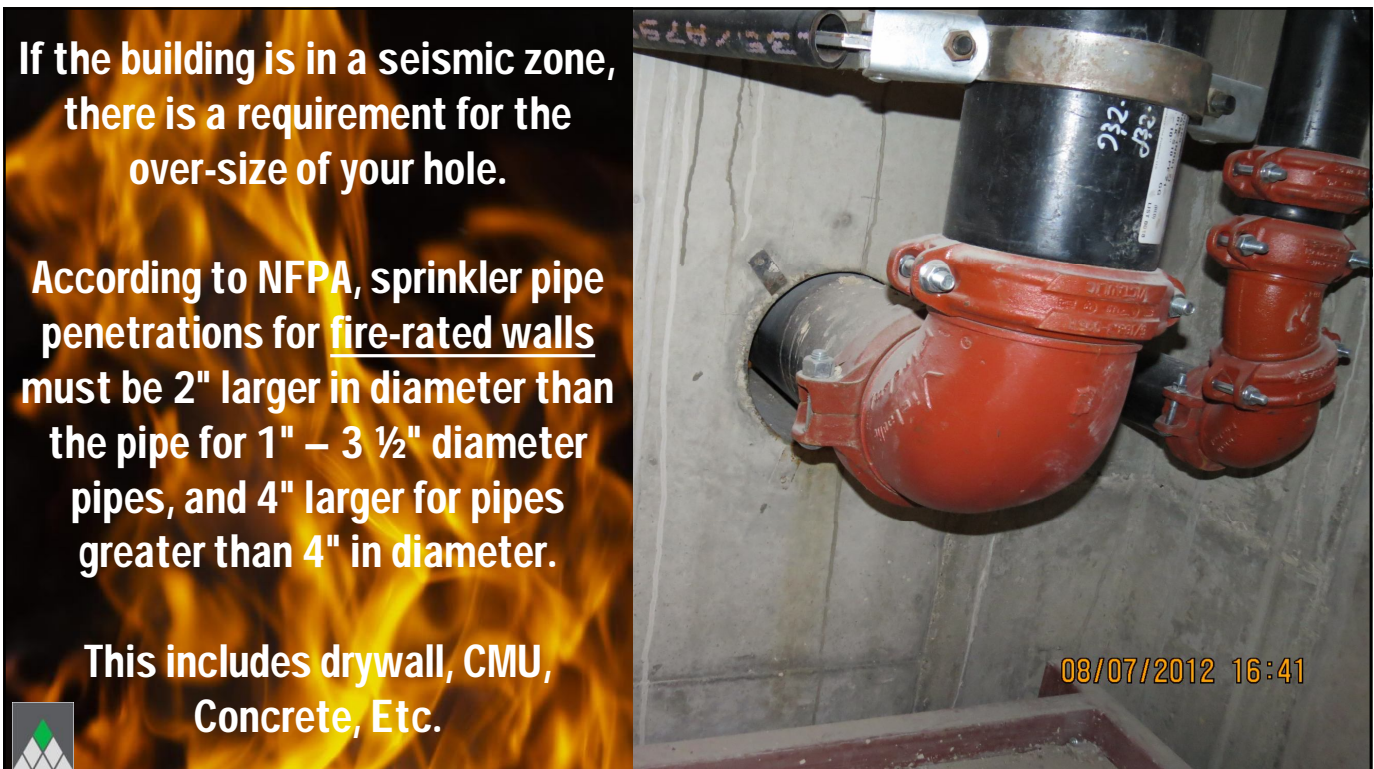


WHEN WE HAVE A RATED PARTITION, THE DRYWALL INSTALLER SHOULD NOT BE TAPING THE DRYWALL TO THE PENETRATING ITEM.

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coordination between trades

Projects that have spray fireproofing that only protect the beams or joists, the overspray onto the metal deck needs to be cleaned off prior to the installation of the Head of Wall spray fire stopping.



DO NOT APPLY SPRAY FIRE STOPPING TO OVERSPRAY!

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coordination between trades



The UL assembly is tested with bare metal. By applying the spray fire stopping onto the overspray, the adhesion is likely compromised by the spray fireproofing.



Typical overlap requirements of spray fire stopping per tested assembly:
 $\frac{1}{2}$ " onto drywall & metal...2" onto Spray Fireproofing)

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Specific penetrations with Materials



- *SUPPORT OUTSIDE OF THE WALL*
- *FIRE SEALANT DETAILING
(WITHIN THE ANNULAR SPACE
AND DEPTH OF THE DRYWALL)*



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COORDINATION WITH design / T-rating



*PIPE PENETRATIONS - TO EACH OTHER & THE WALL
MUST ACCOUNT FOR WIDTH OF FIRE STOPPING COLLARS*



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Coordination with MEP trades and wall layouts



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Wrong size sleeves



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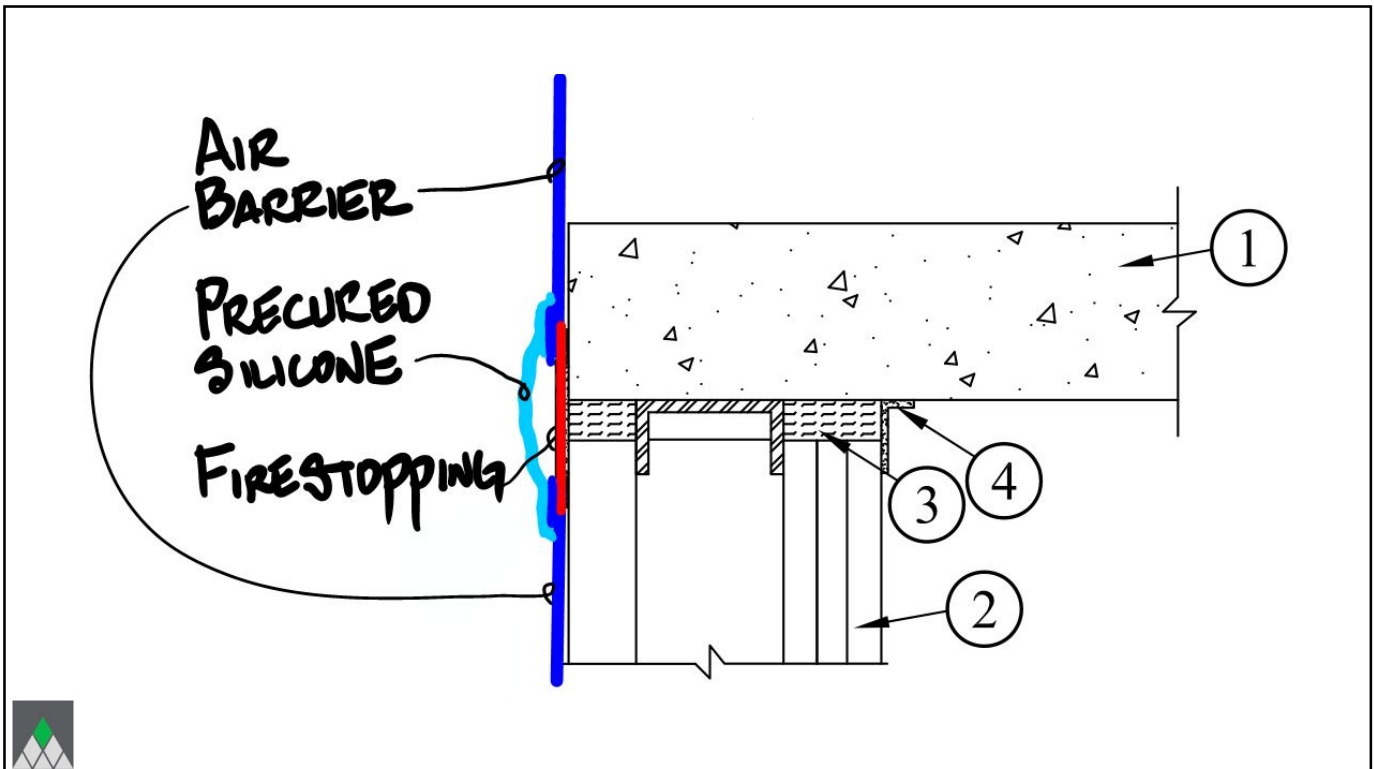


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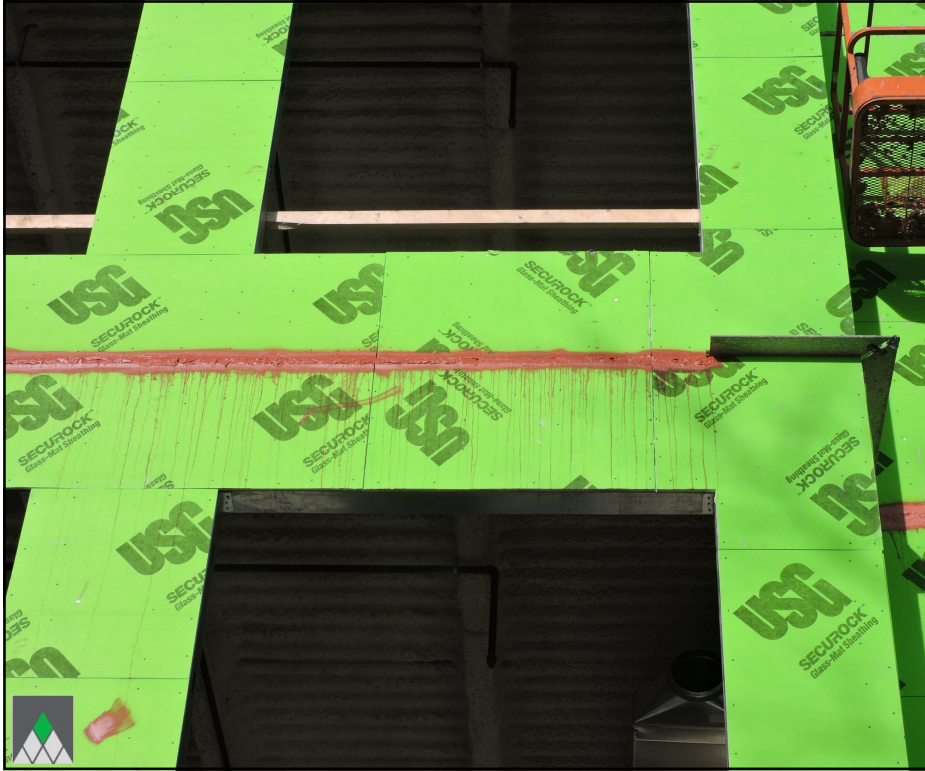
Exterior air barrier & Fire Stopping



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Must review installation with the manufacturer – temperature concerns

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Coordination - joints must have proper support for mineral wool installation

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A QUALITY PRODUCT/ACT IS NOT NECESSARILY CONVENIENT

“EXCELLENCE IS IN THE DETAILS.

GIVE ATTENTION TO THE DETAILS AND EXCELLENCE WILL COME”

PERRY PAXTON

It takes commitment, dedication, and it is a team effort to succeed

This concludes The American Institute of Architects Continuing Education Systems Course



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