abaa 2026 building enclosure conference

AIR BARRIERS – THEY MIGHT BE CONTINUOUS, BUT STILL IN DANGER OF ALLOWING BUILDING COMPONENT DAMAGE

Ryan Krug
Lerch Bates

Ryan Kohl
Lerch Bates

AIA Continuing Education Provider

abaa EDUCATION

Ryan Krug

National Practice Leader
Lerch Bates

Ryan Kohl

Director
Lerch Bates

Let’s begin by…

Definitions

International Energy Conservation Code Definition

AIR BARRIER – One or more materials joined together in a continuous manner to restrict or prevent the passage of air through the building thermal envelope and its assemblies.

International Energy Conservation Code Definition

BUILDING THERMAL ENVELOPE – The basement walls, exterior walls, floor, roof and any other building elements assemblies that enclose conditioned space or provide a boundary between conditioned space and exempt or conditioned space.

International Energy Conservation Code Definition

INFILTRATION – The uncontrolled inward air leakage into a building caused by the pressure effects of wind or the effect of differences in the indoor and outdoor air densities or both.


QUIZ
TIME

Based on the IBC definitions, one could expect:

A. No air flow is allowed through the thermal envelope.

B. Some air flow is allowed through the thermal envelope.

C. Who cares about airflow?

D. Answers B & C

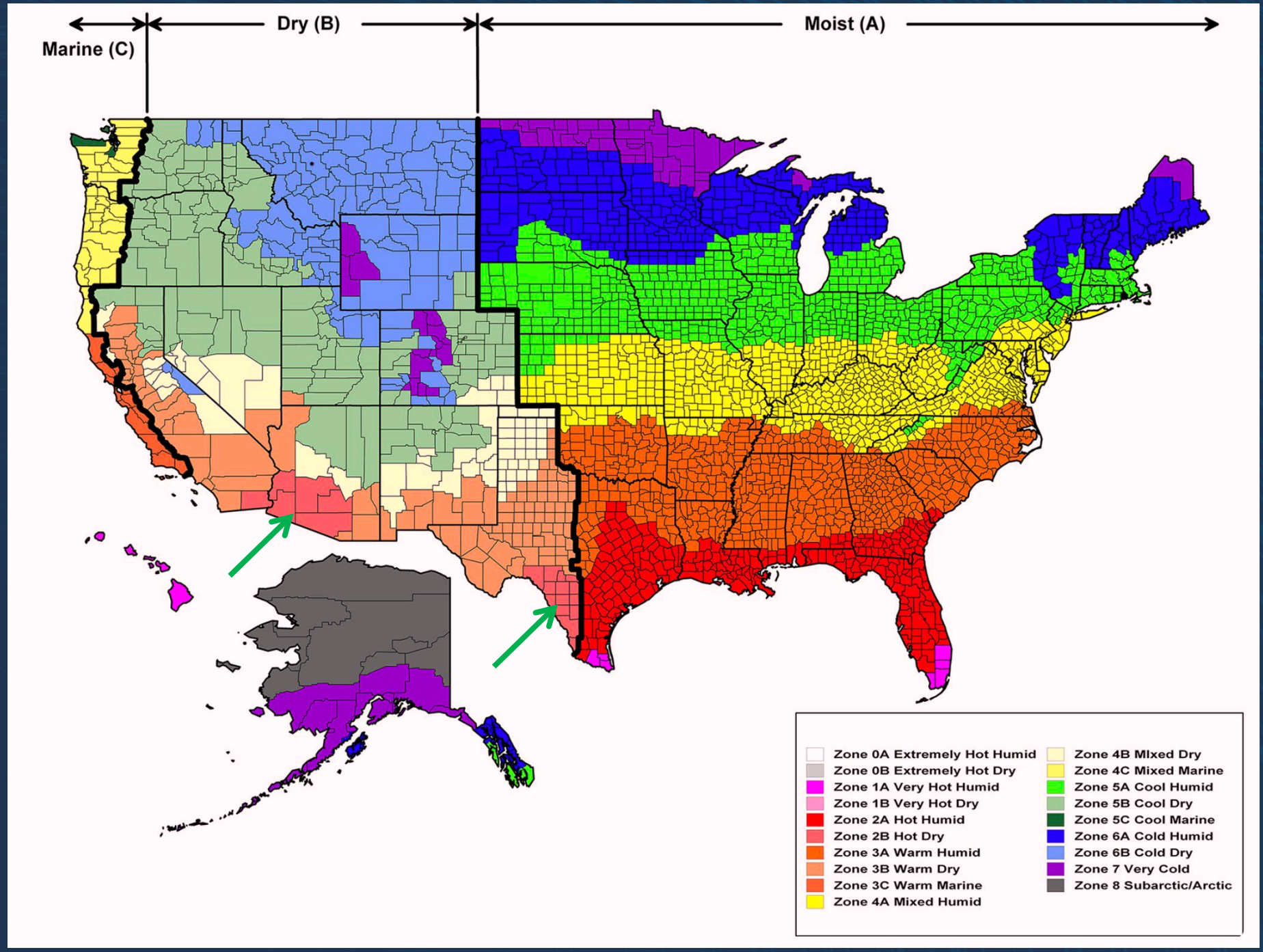
Code Requirements

Air barriers are required except for when they're not.

Air barriers are not required in Climate Zone 2B.

Air barriers are required everywhere else.

Geographic location has an impact on the importance of air barriers.


Marine (C)
Dry (B)
Moist (A)
Zone 0A Extremely Hot Humid
Zone 0B Extremely Hot Dry
Zone 1A Very Hot Humid
Zone 1B Very Hot Dry
Zone 2A Hot Humid
Zone 2B Hot Dry
Zone 3A Warm Humid
Zone 3B Warm Dry
Zone 3C Warm Marine
Zone 4A Mixed Humid
Zone 4B Mlxed Dry
Zone 4C Mixed Marine
Zone 5A Cool Humid
Zone 5B Cool Dry
Zone 5C Cool Marine
Zone 6A Cold Humid
Zone 6B Cold Dry
Zone 7 Very Cold
Zone 8 Subarctic/Arctic

Air barriers are not completely airtight.

0.004 cfm/ft^2 – Air leakage through materials.

0.04 cfm/ft^2 – Air leakage through assemblies.

0.35 cfm/ft^2 – Air leakage through building envelope.

Air barriers are not completely airtight.

Fenestration is part of the air barrier and have air leakage rates.

TABLE C402.6.3 MAXIMUM AIR LEAKAGE RATE FOR FENESTRATION ASSEMBLIES

FENESTRATION ASSEMBLY	MAXIMUM RATE (cfm/ft^2)	TEST PROCEDURE
Windows	0.20[a]	AAMA/WDMA/CSA101/I.S.2/A440 or NFRC 400
Sliding doors	0.20[a]	
Swinging doors	0.20[a]	
Skylights—with condensation weepage openings	0.30	
Skylights—all other	0.20[a]	
Curtain walls	0.06	NFRC 400 or ASTM E283 at 1.57 psf (75 Pa)
Storefront glazing	0.06	
Commercial glazed swinging entrance doors	1.00	
Power-operated sliding doors and power operated folding doors	1.00	
Revolving doors	1.00	
Garage doors	0.40	ANSI/DASMA 105, NFRC 400, or ASTM E283 at 1.57 psf (75 Pa)
Rolling doors	1.00	
High-speed doors	1.30	

For SI: 1 cubic foot per minute = 0.47 L/s, 1 square foot = 0.093 m^2.

a. The maximum rate for windows, sliding and swinging doors, and skylights is permitted to be 0.3 cfm per square foot of fenestration or door area when tested in accordance with AAMA/WDMA/CSA101/I.S.2/A440 at 6.24 psf (300 Pa).

Example:

8-Story Office Building

290,000 SF of Building Envelope

0.35 CFM/ft^2 for Building Leakage Rate

87,000 CFM at 75 Pa (0.3 in H_2O)

Equivalent to a 77 ft^2 Opening in the Façade

Testing History shows leakage rates of 0.15-0.2 CFM/ft^2 are typical.

Equivalent to a 35-38 ft^2 Opening in the Facade

The location of the air barrier within the envelope is not defined. It can be:

On the inside or outside of the assembly.

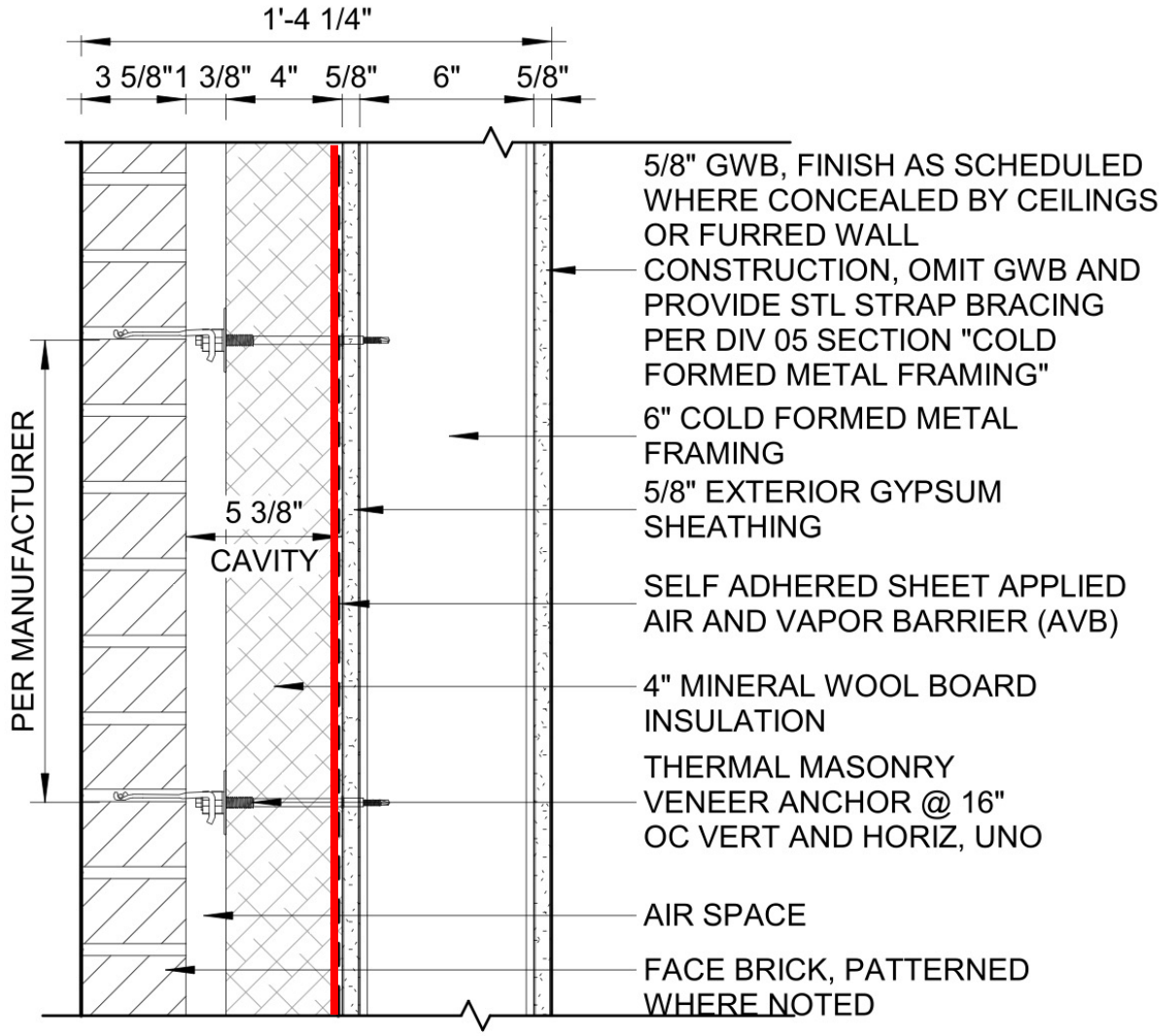
Located within the assemblies composing the envelope.

Or any combination thereof.

Code does not provide guidance as to where within the envelope the air barrier is to occur.

Commercial Construction

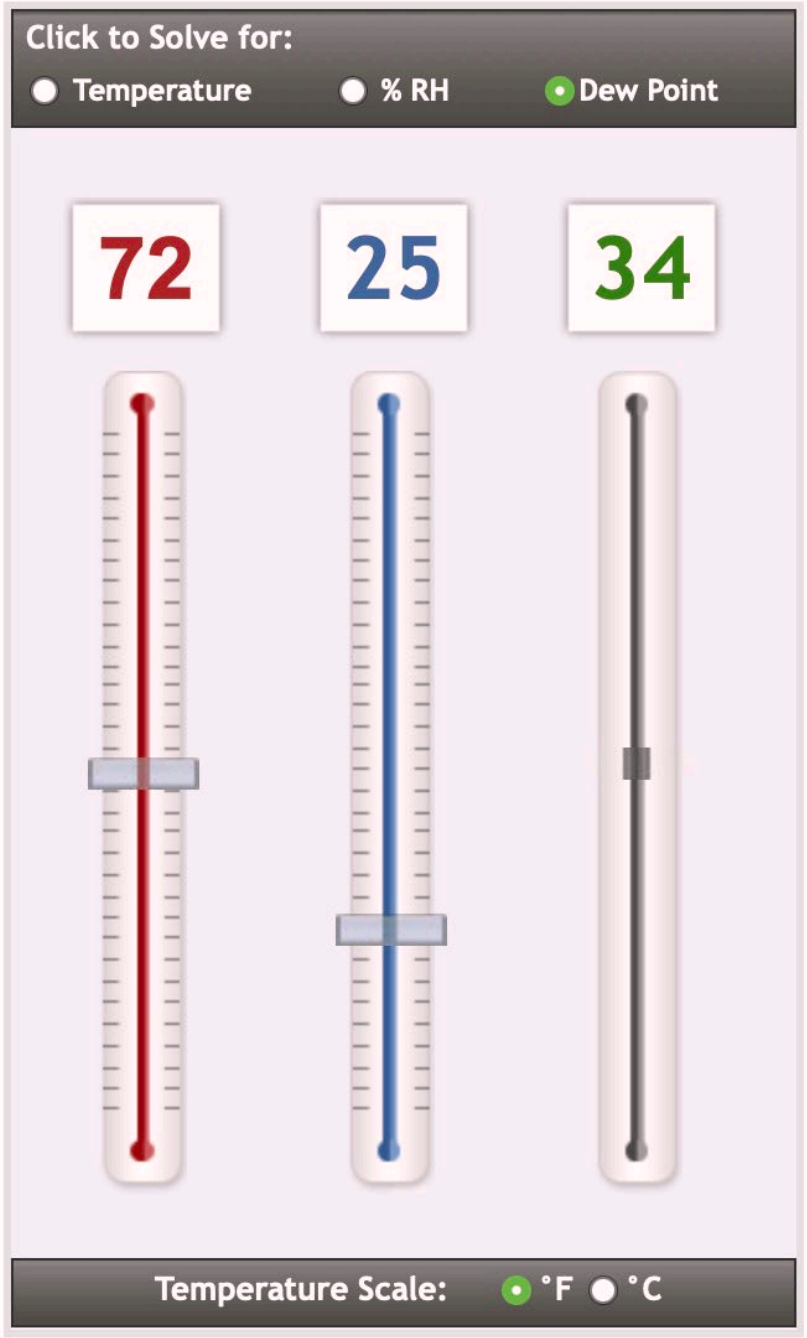
Typical Commercial Wall Assembly



1 MV-1 - MASONRY VENEER ASSEMBLY - FACE BRICK

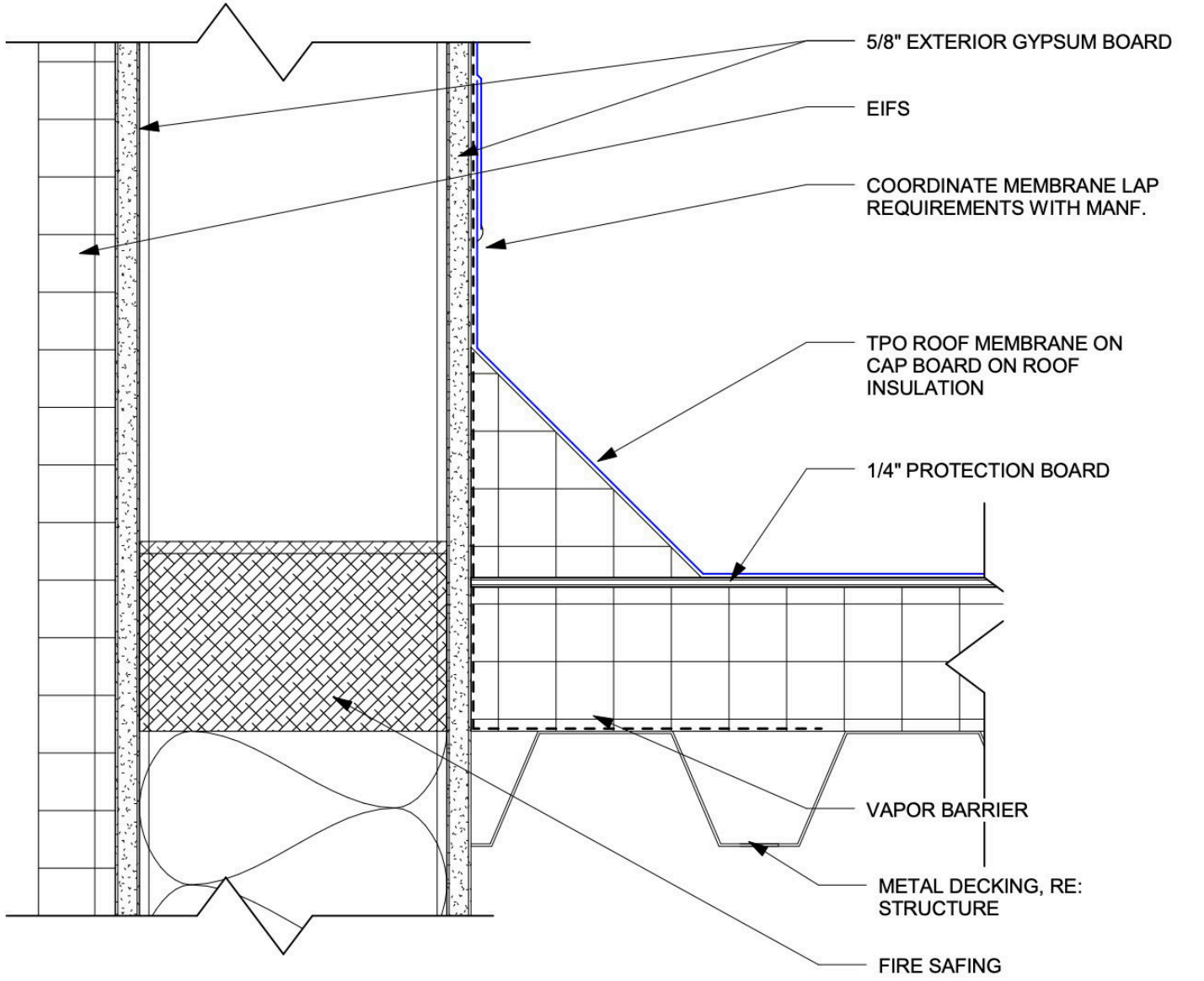
SCALE: 1 1/2" = 1'-0"

Standard Interior Conditions

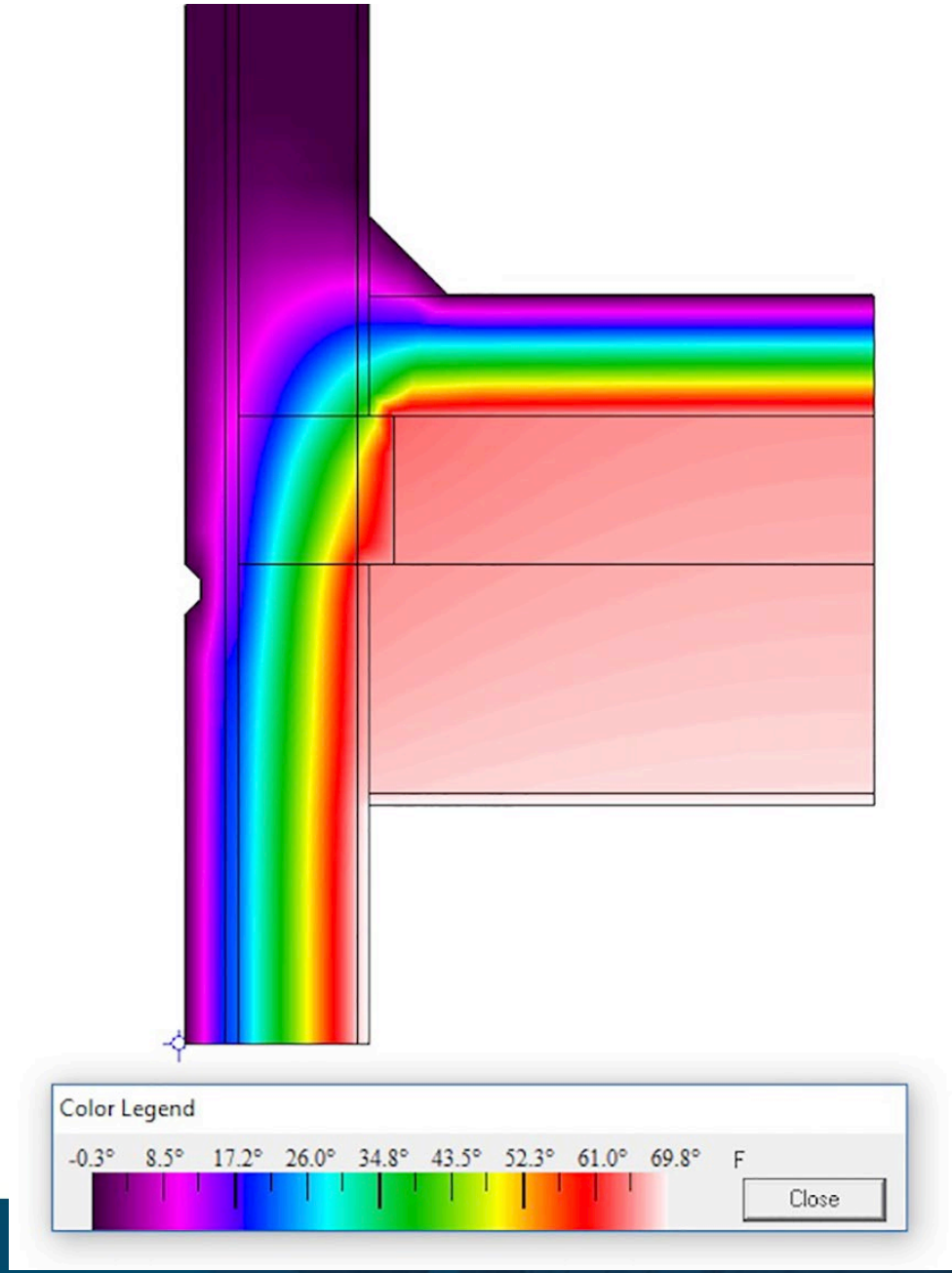


Parapets

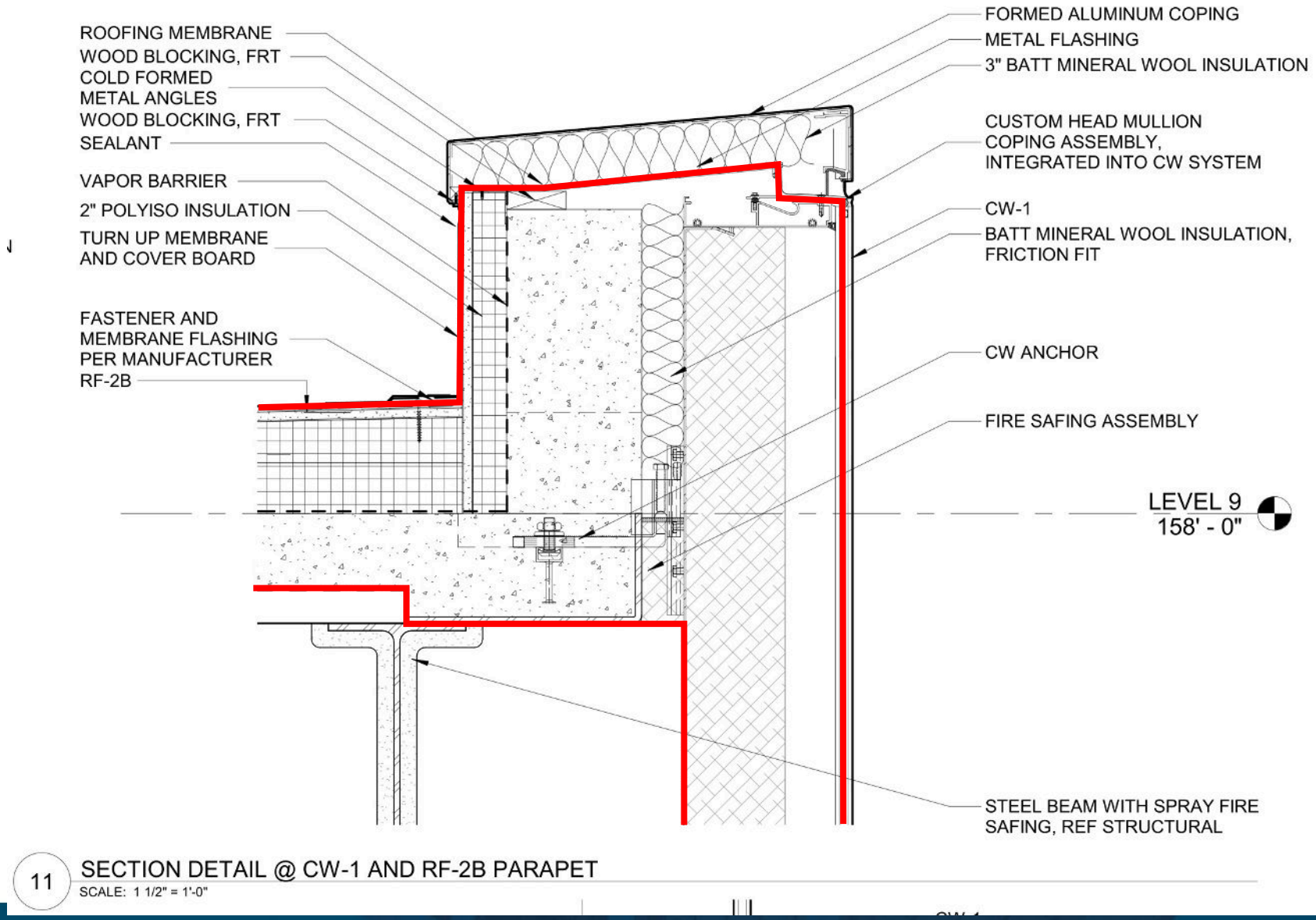
Parapet Condition



Thermal Model of Parapet to Roof

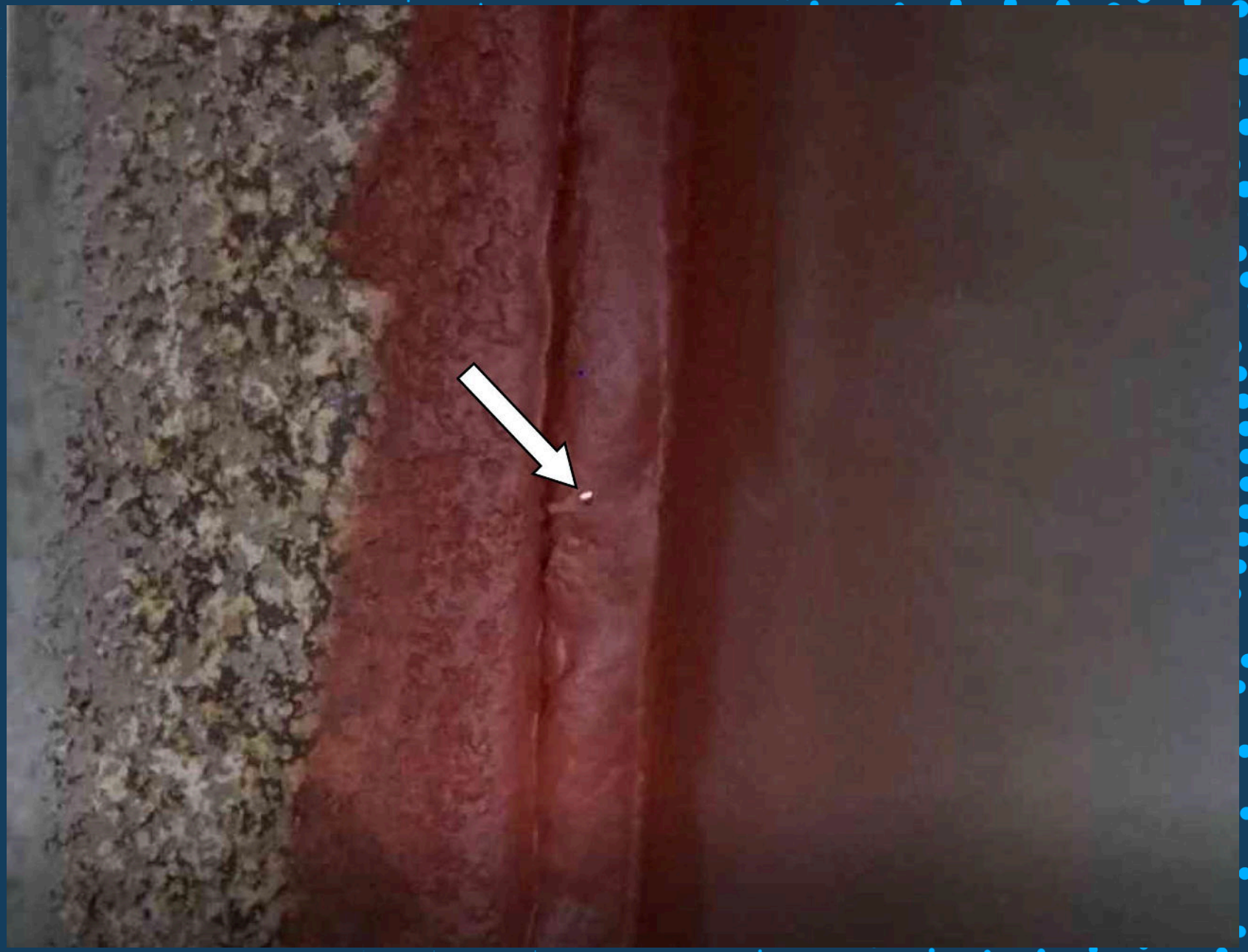


Condensation & Frost in Parapet Cavity



Condensation &Frost in Parapet Cavity

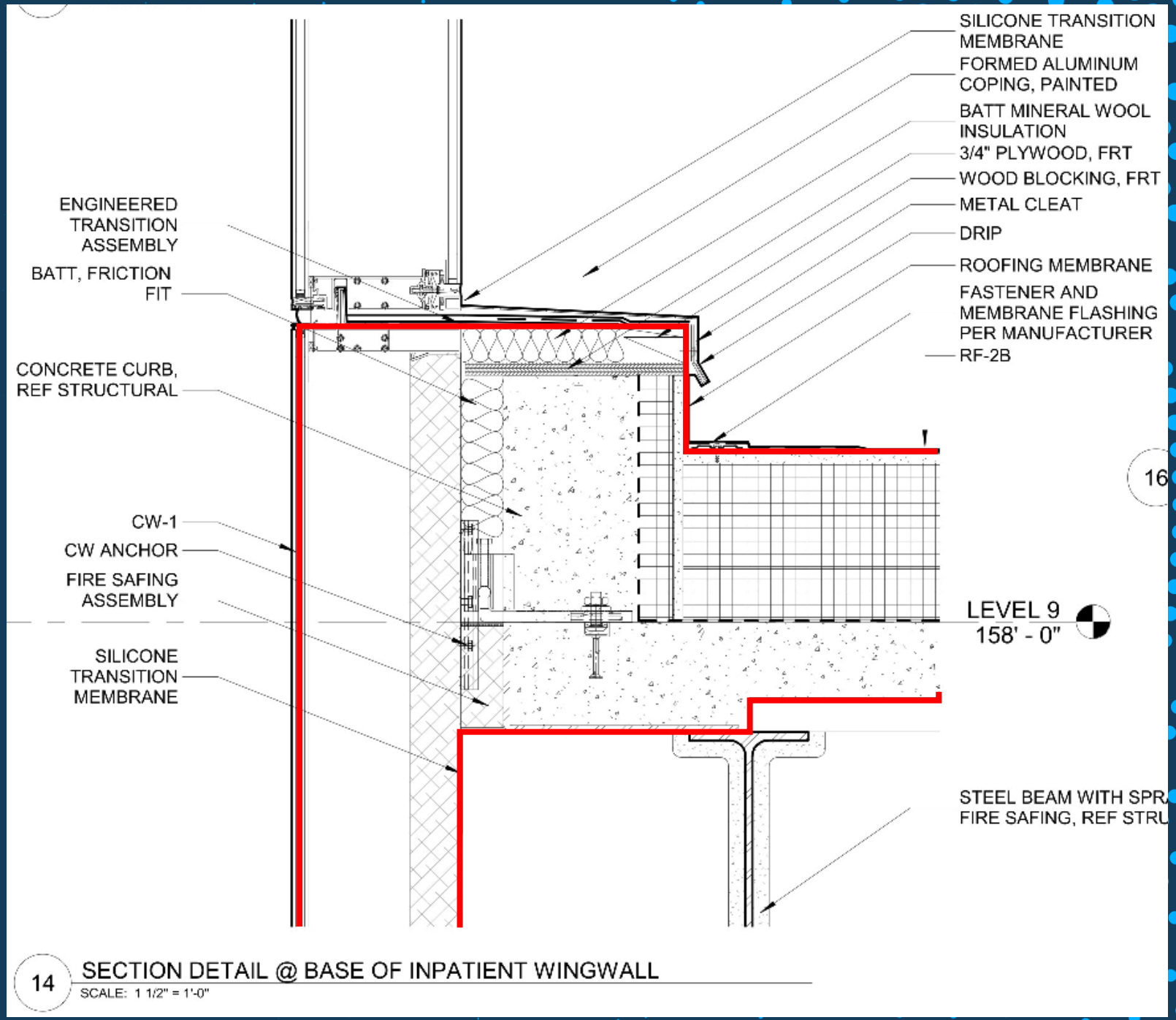
Location of an Air Leak in Interior Air Barrier



Parapet Damage of Similar Condition

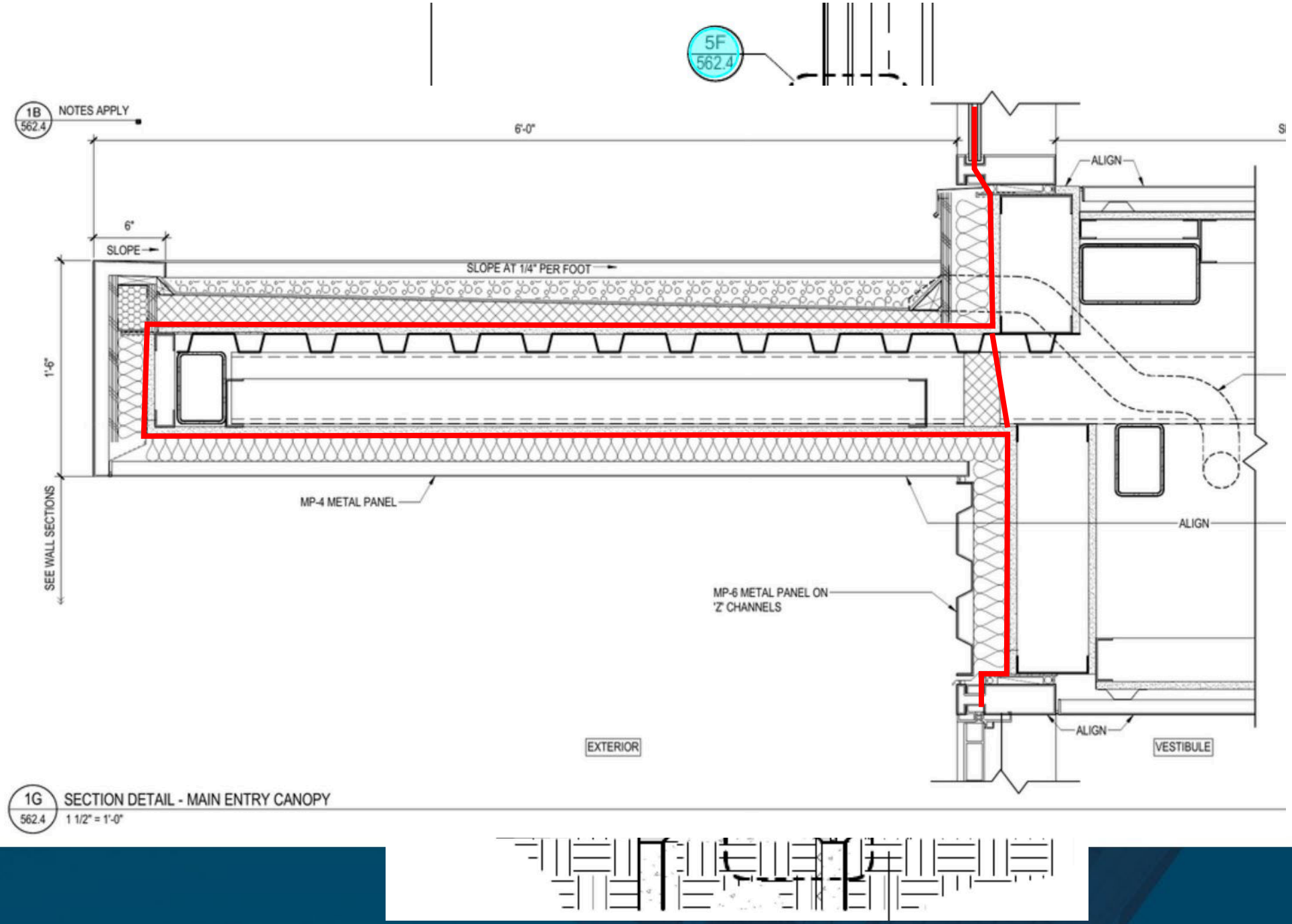
Air Barrier Installation at Parapet

Parapet Condition



Canopies

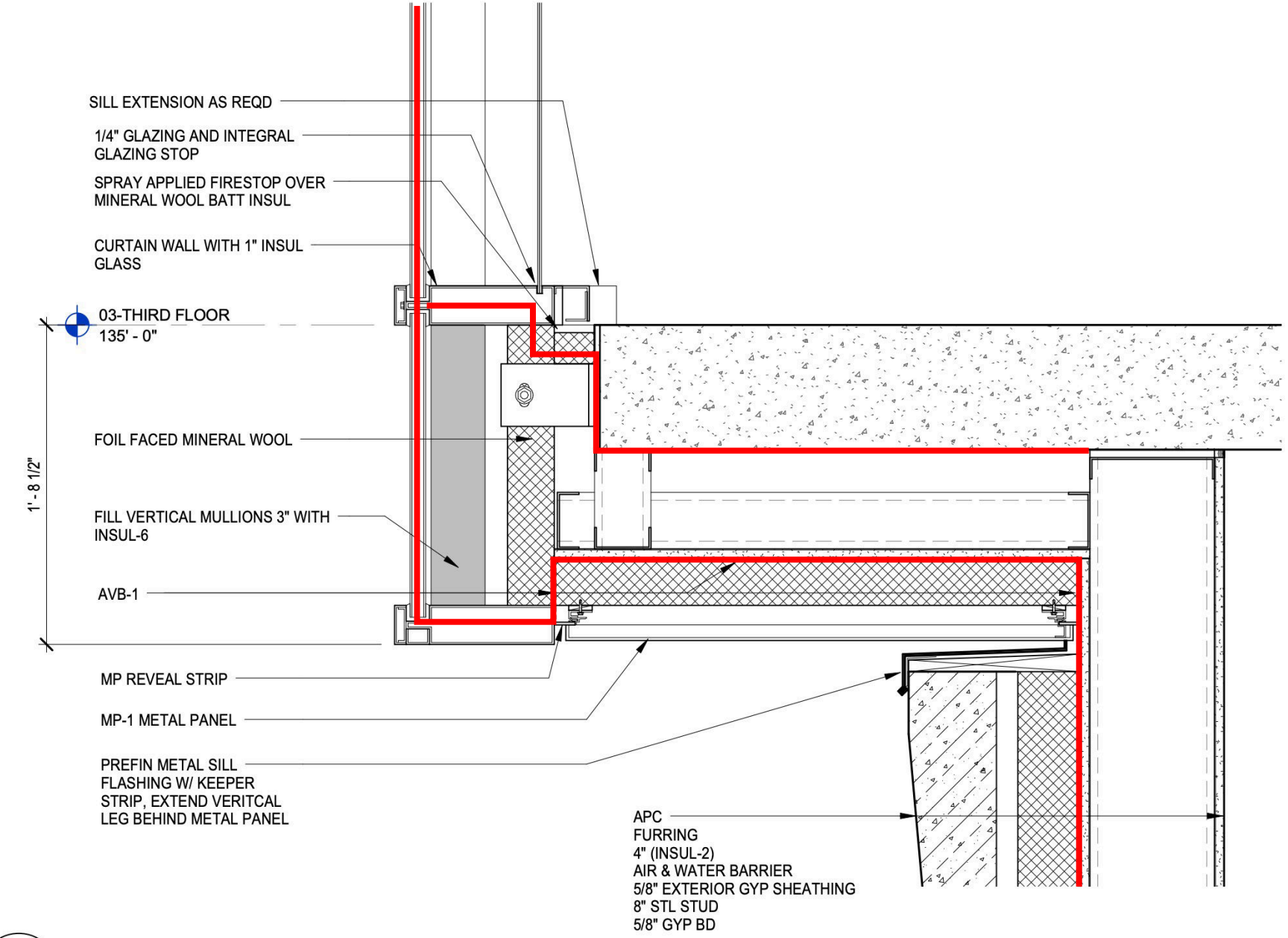
Canopy Condition



Canopy Condition

Soffits

Soffit Condition

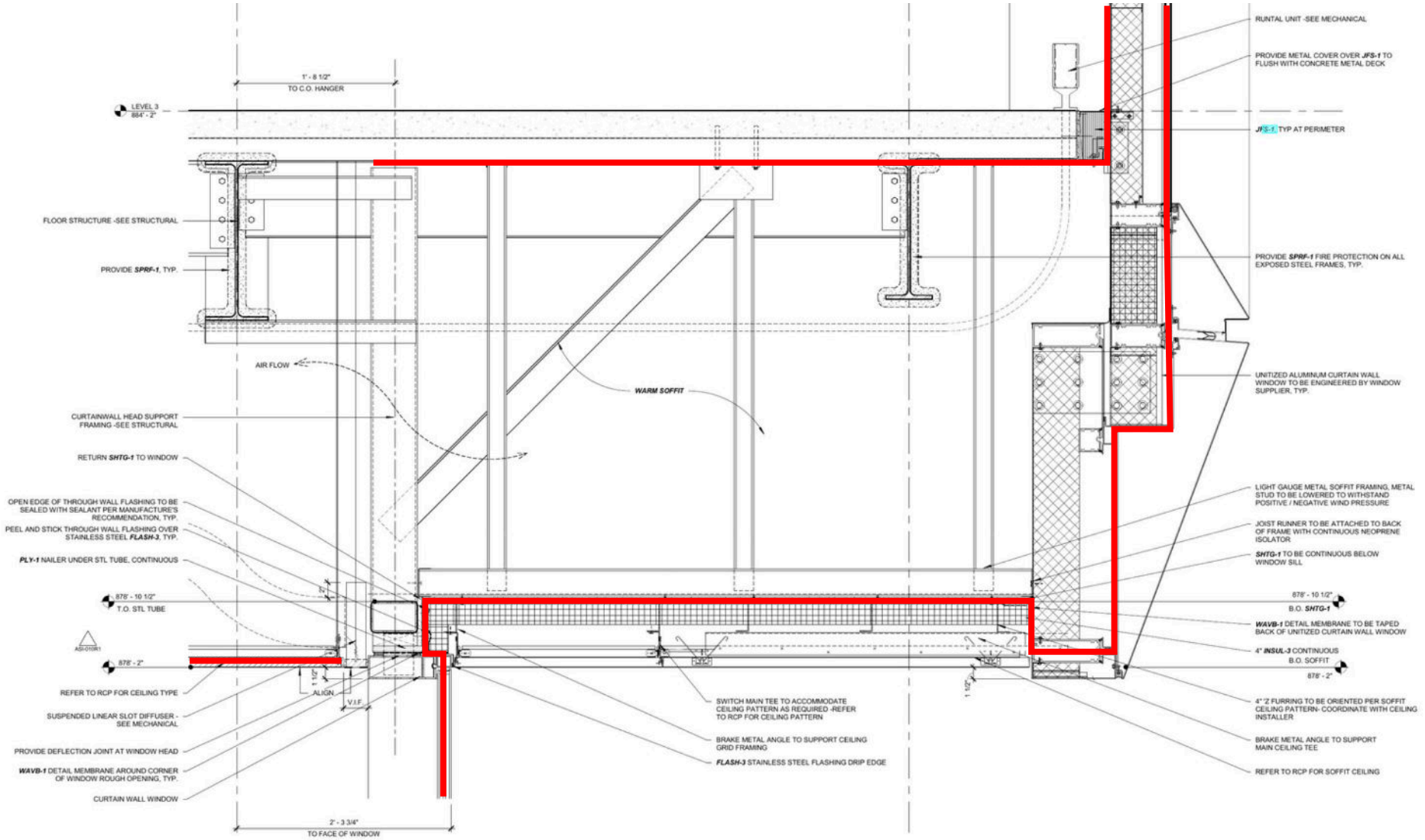


6 SECTION DETAIL - SOFFIT

1 1/2" = 1'-0"

Soffit Condition

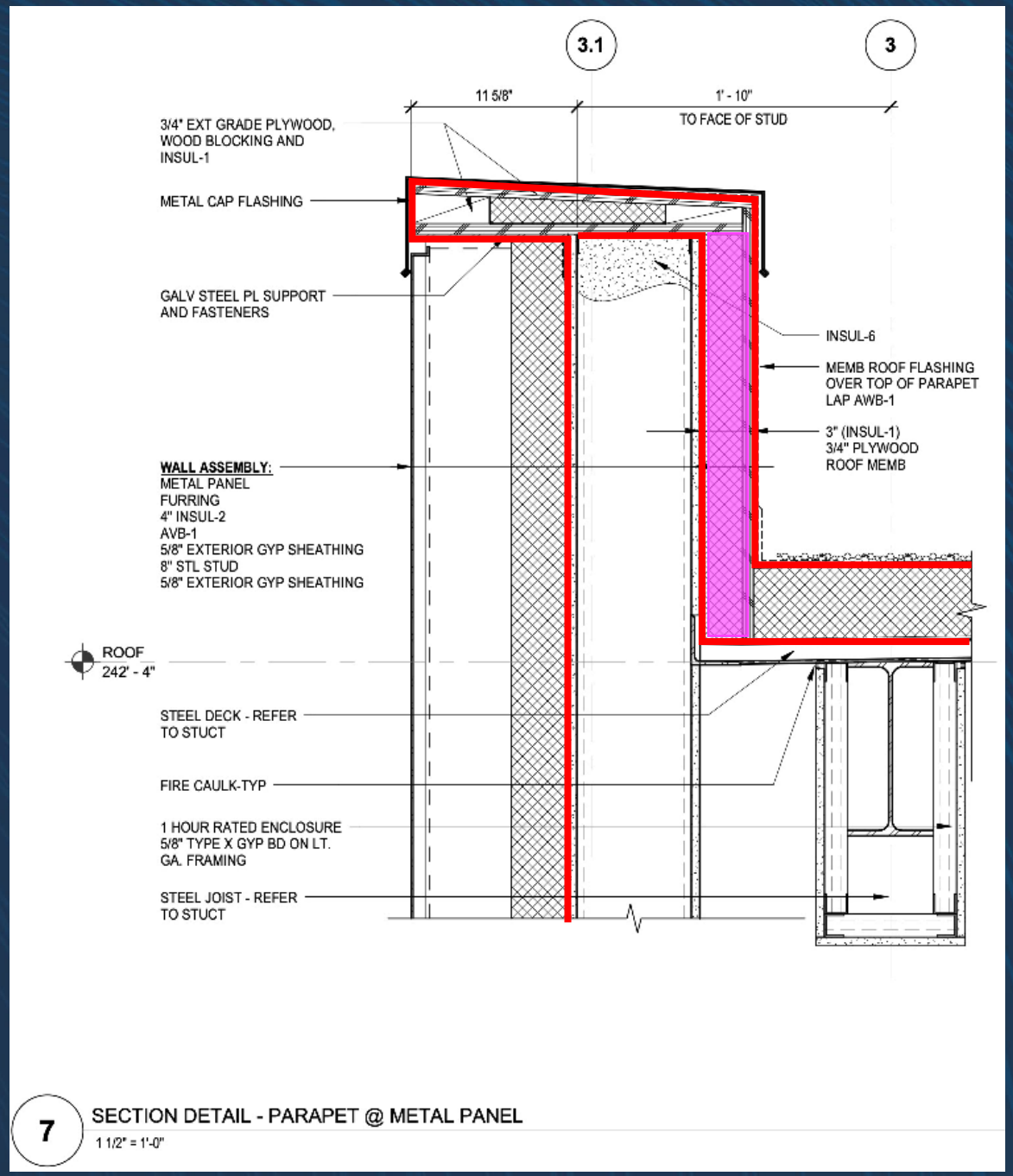
Soffit Condition



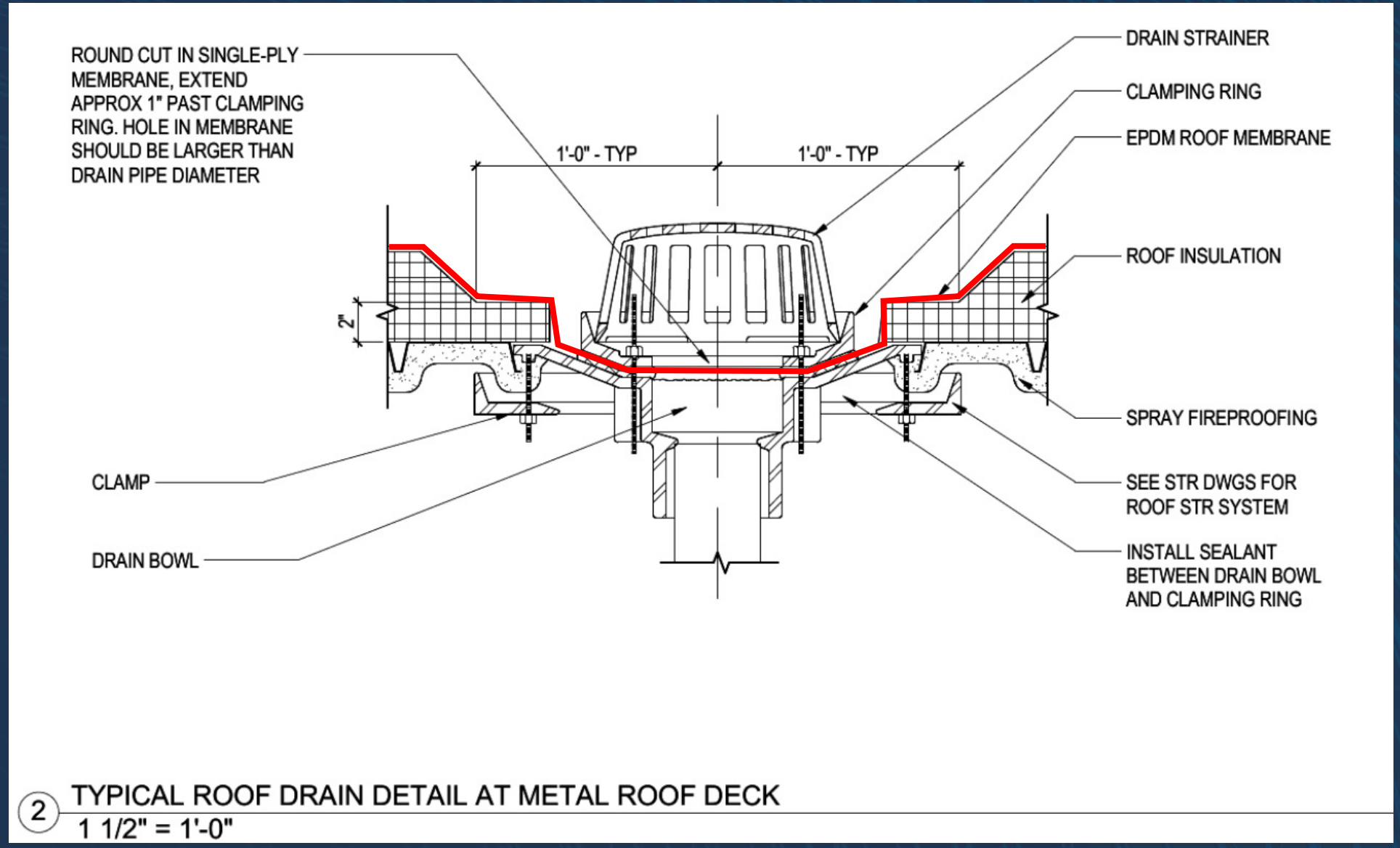
2 EXT WALL SECTION - TYPICAL SOFFIT AT LEVEL 3
A356 1 1/2" = 1'-0"

Roofs

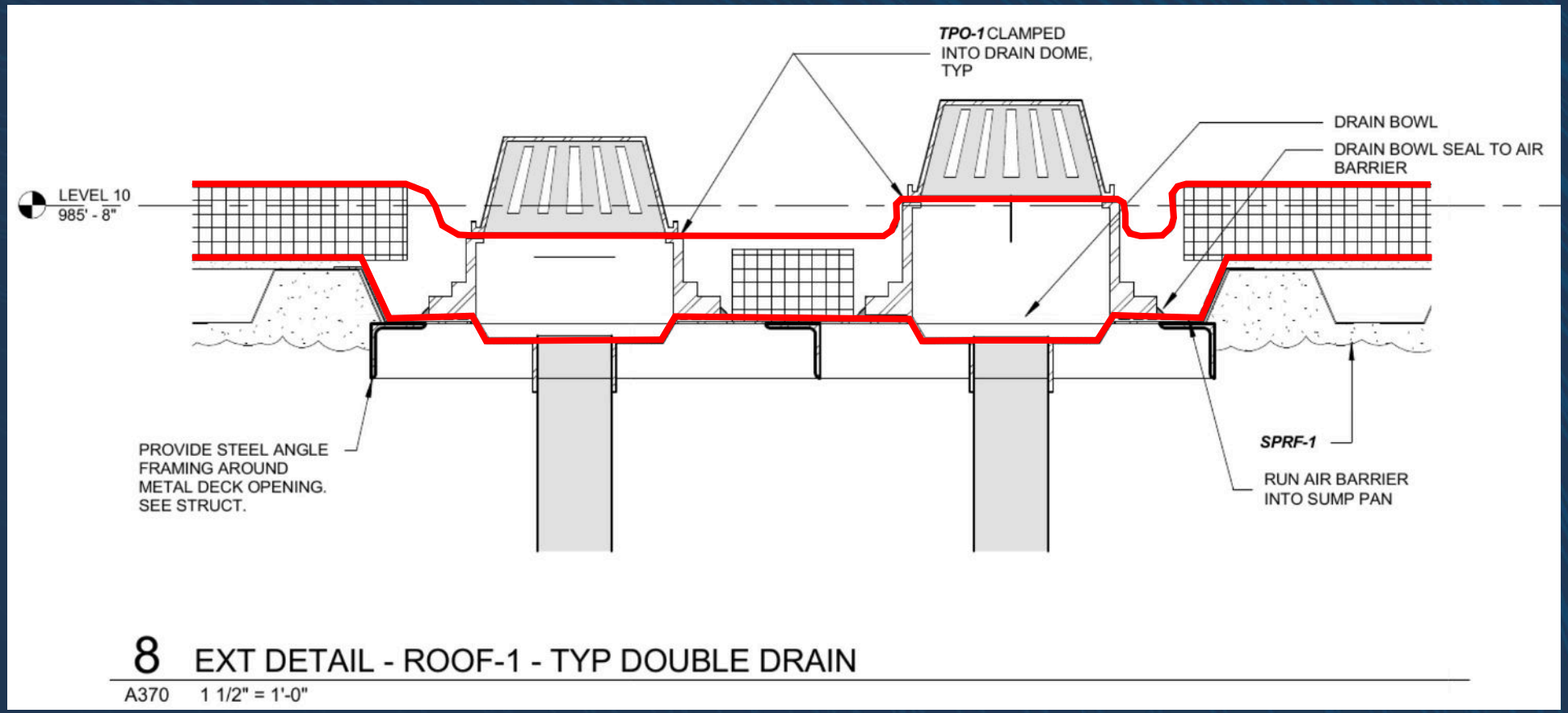
Parapet Condition



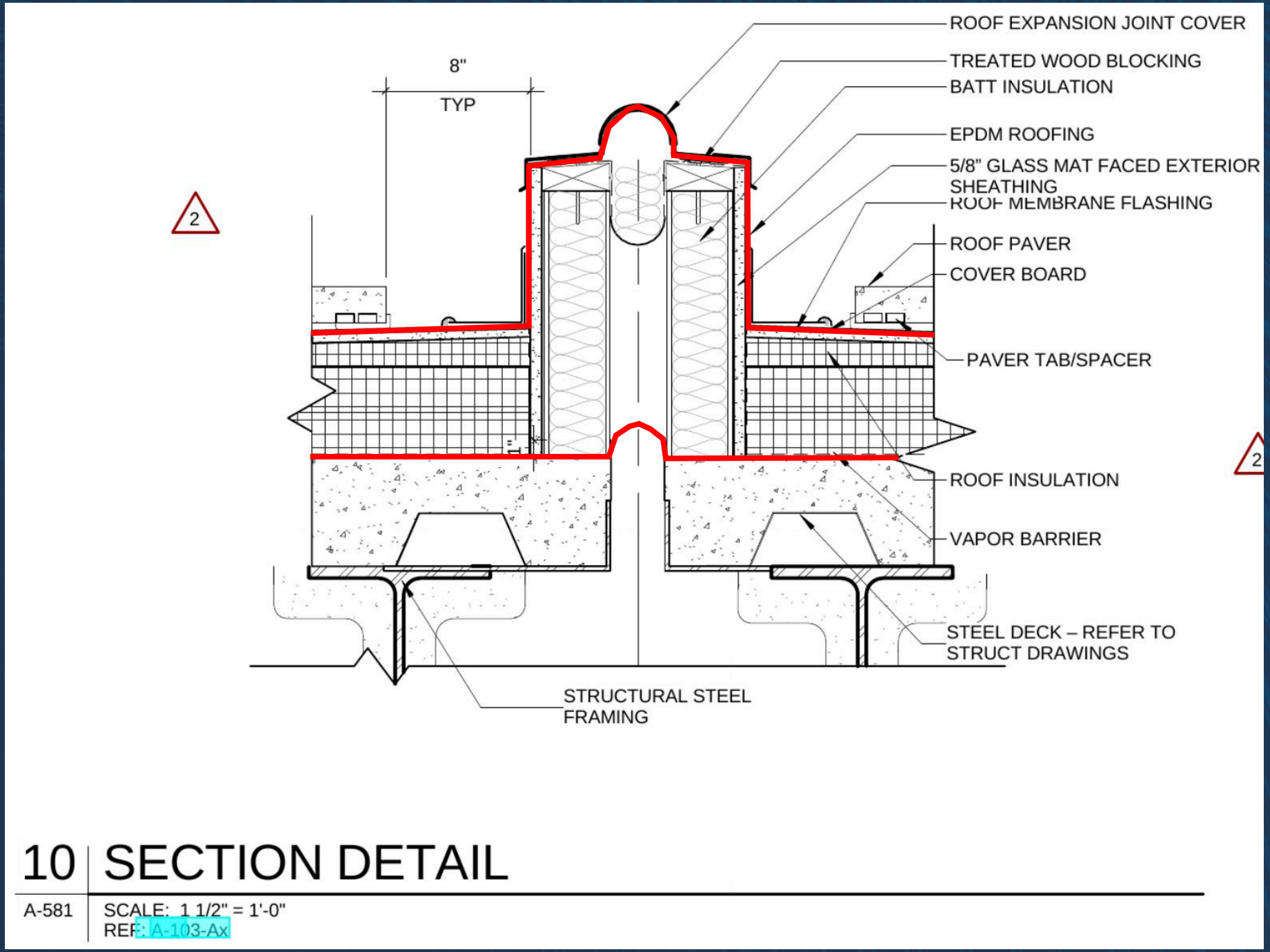
Drain Bowl Location



Drain Bowl Location

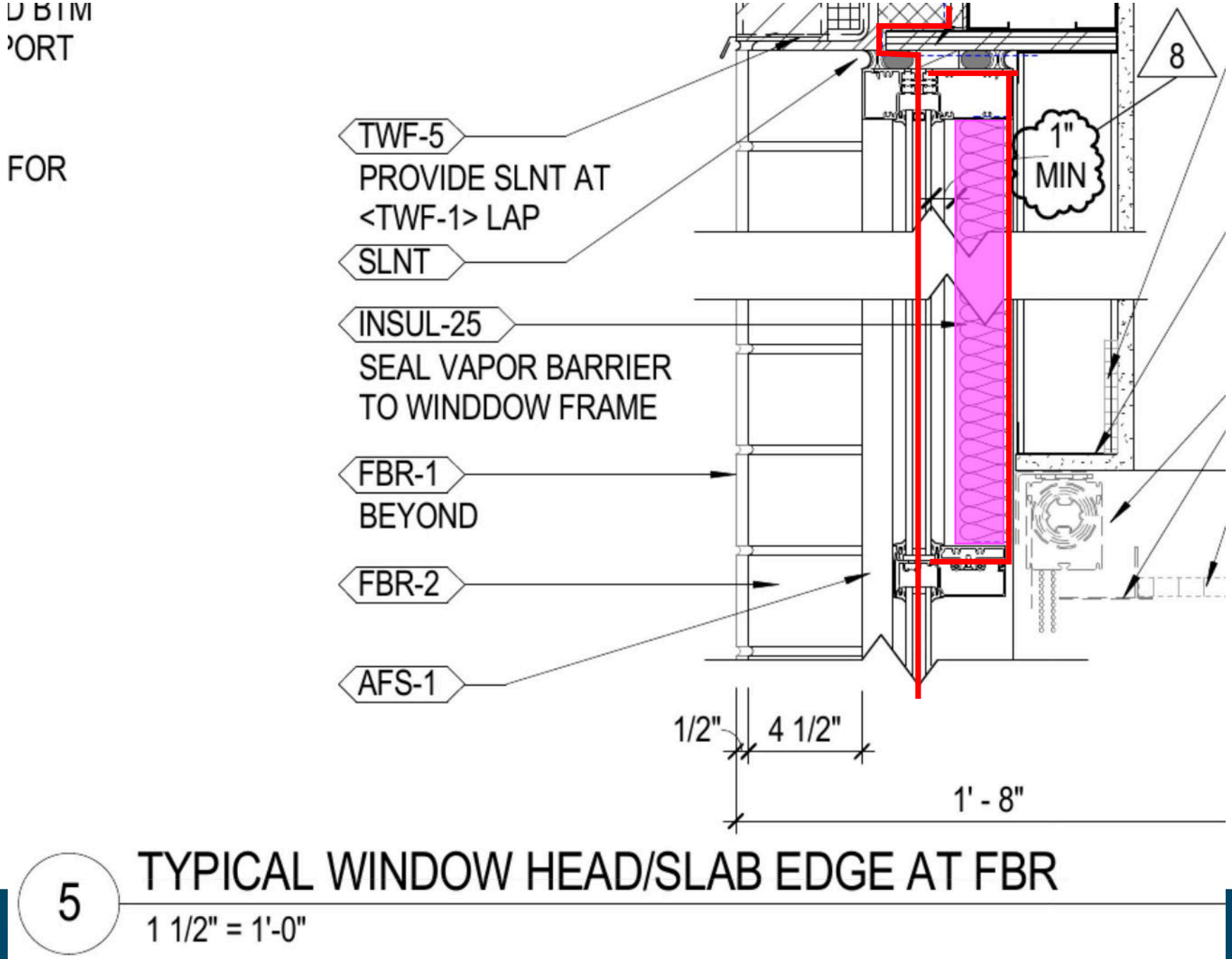


Expansion Joint



Glazing Assemblies

Spandrel Insulation

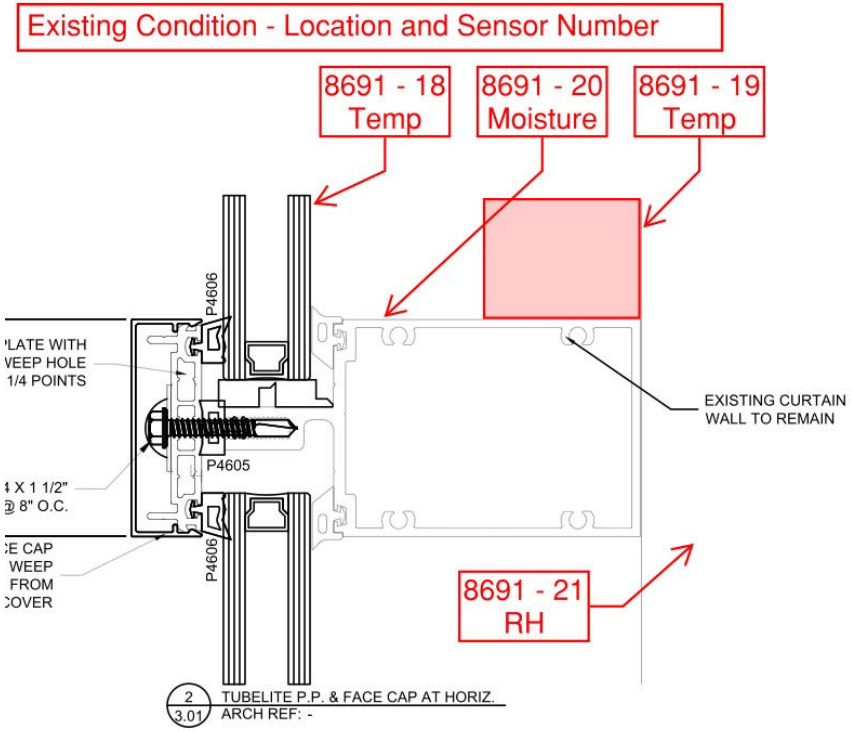


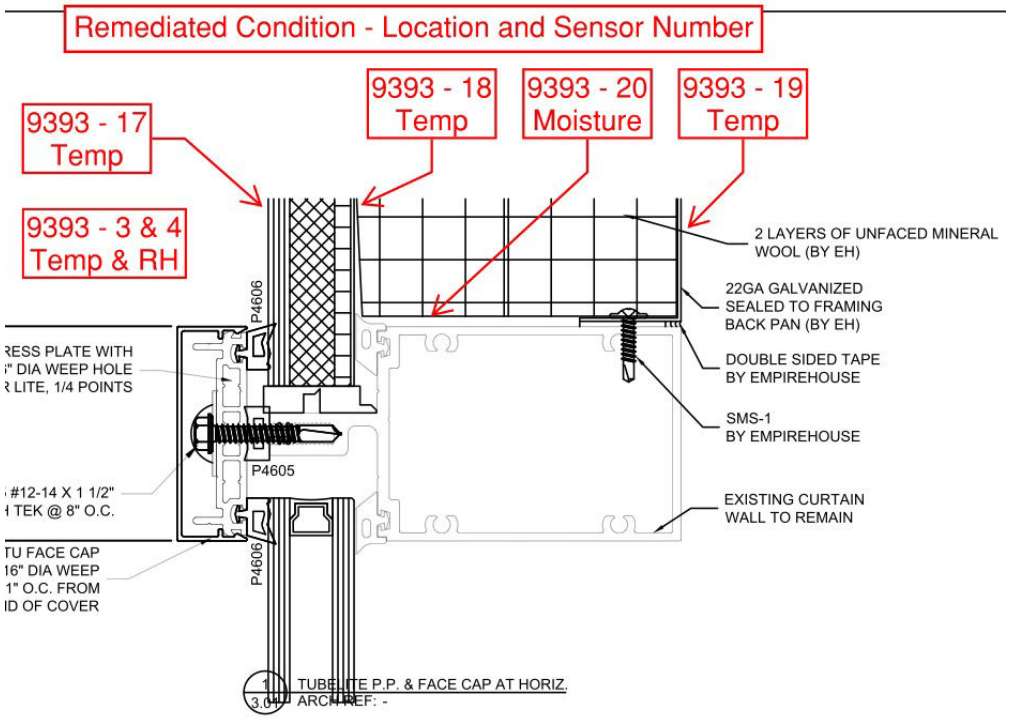
Spandrel Insulation

Spandrel Insulation

Spandrel Insulation

Spandrel Insulation

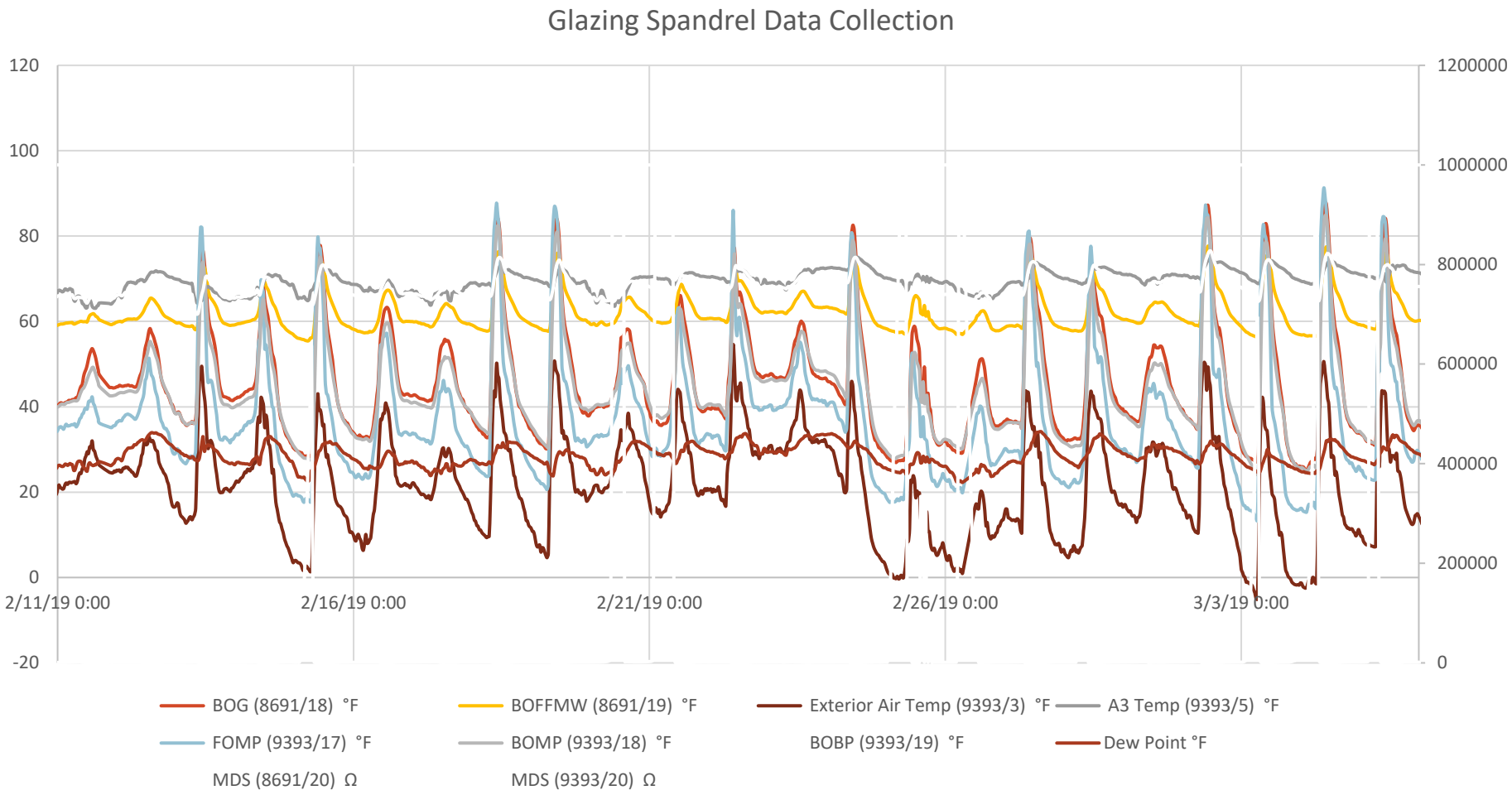




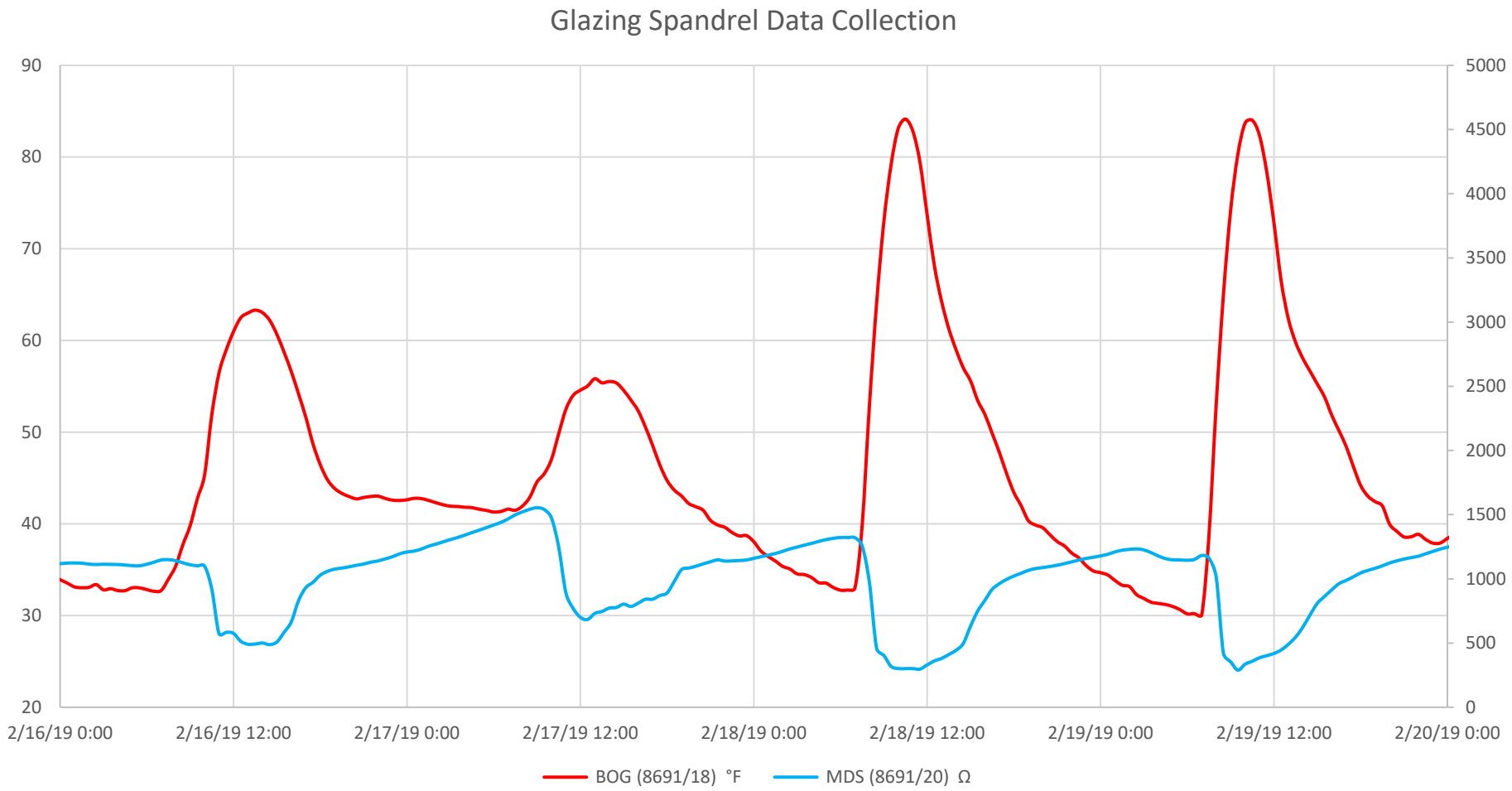
Spandrel Insulation

Spandrel Insulation

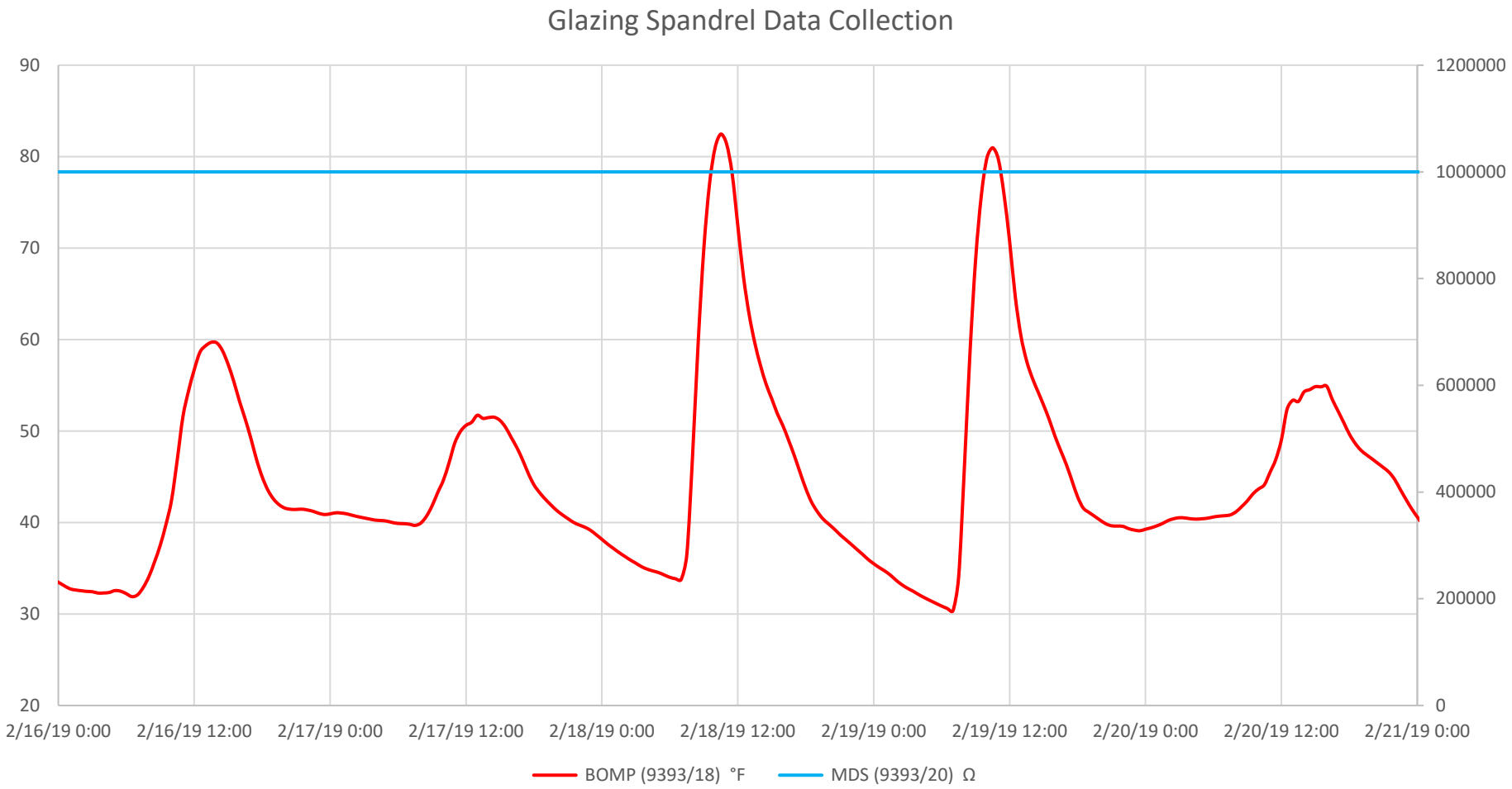
Spandrel Insulation



Data at Existing Condition

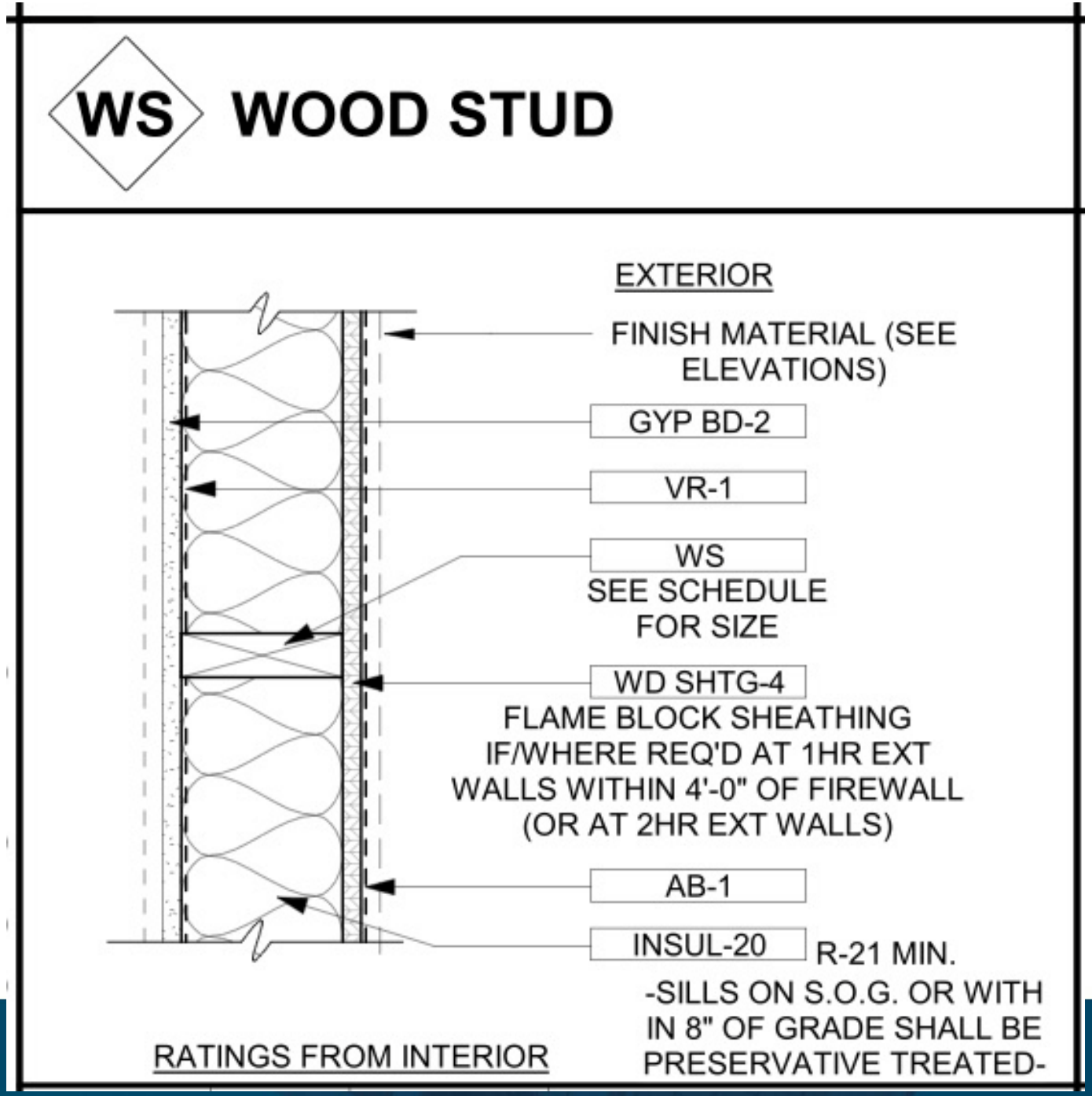


Data at Remediated Condition



Wood Framed Construction

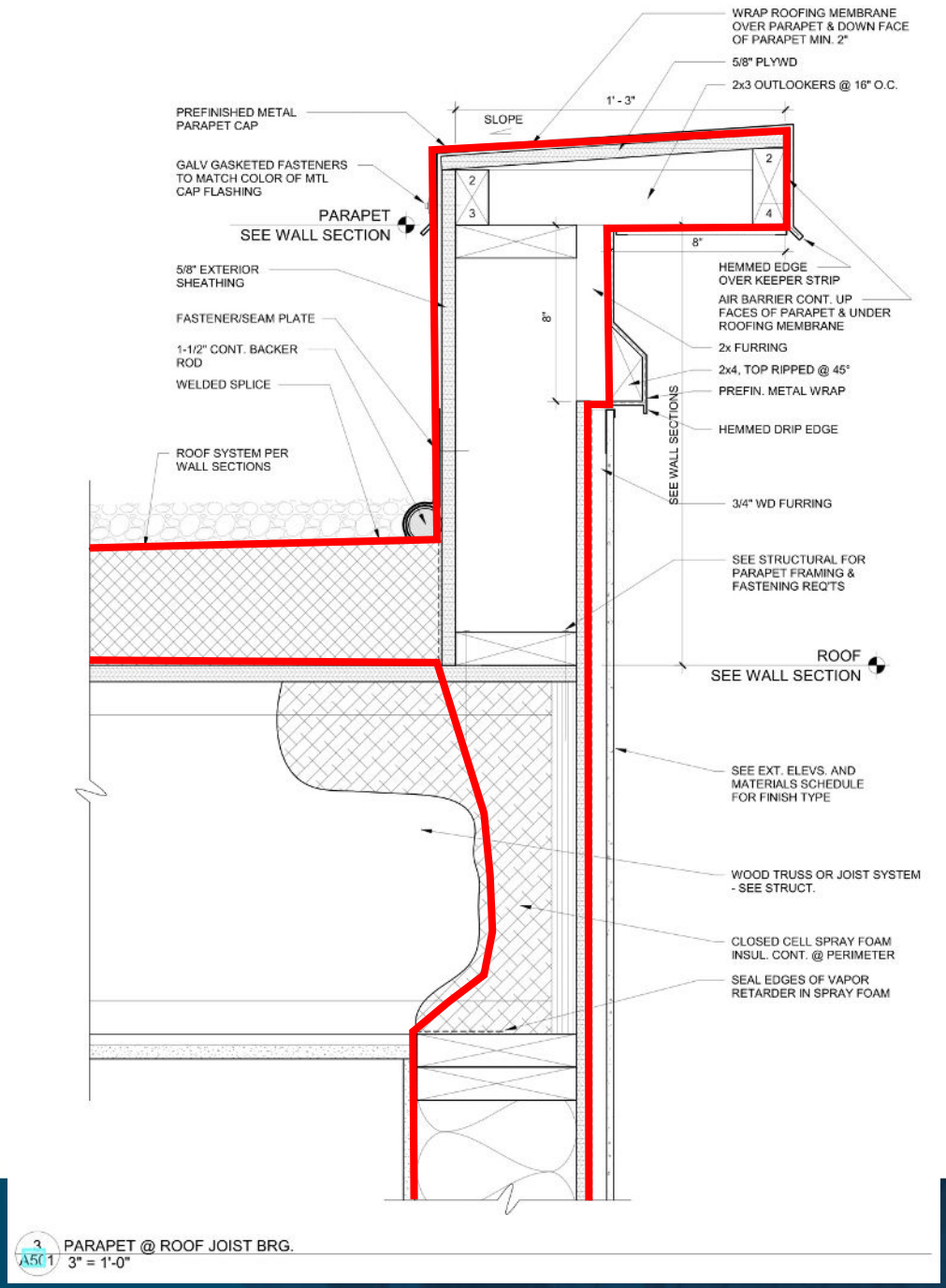
Typical Wood Framed Wall Assembly



Parapets

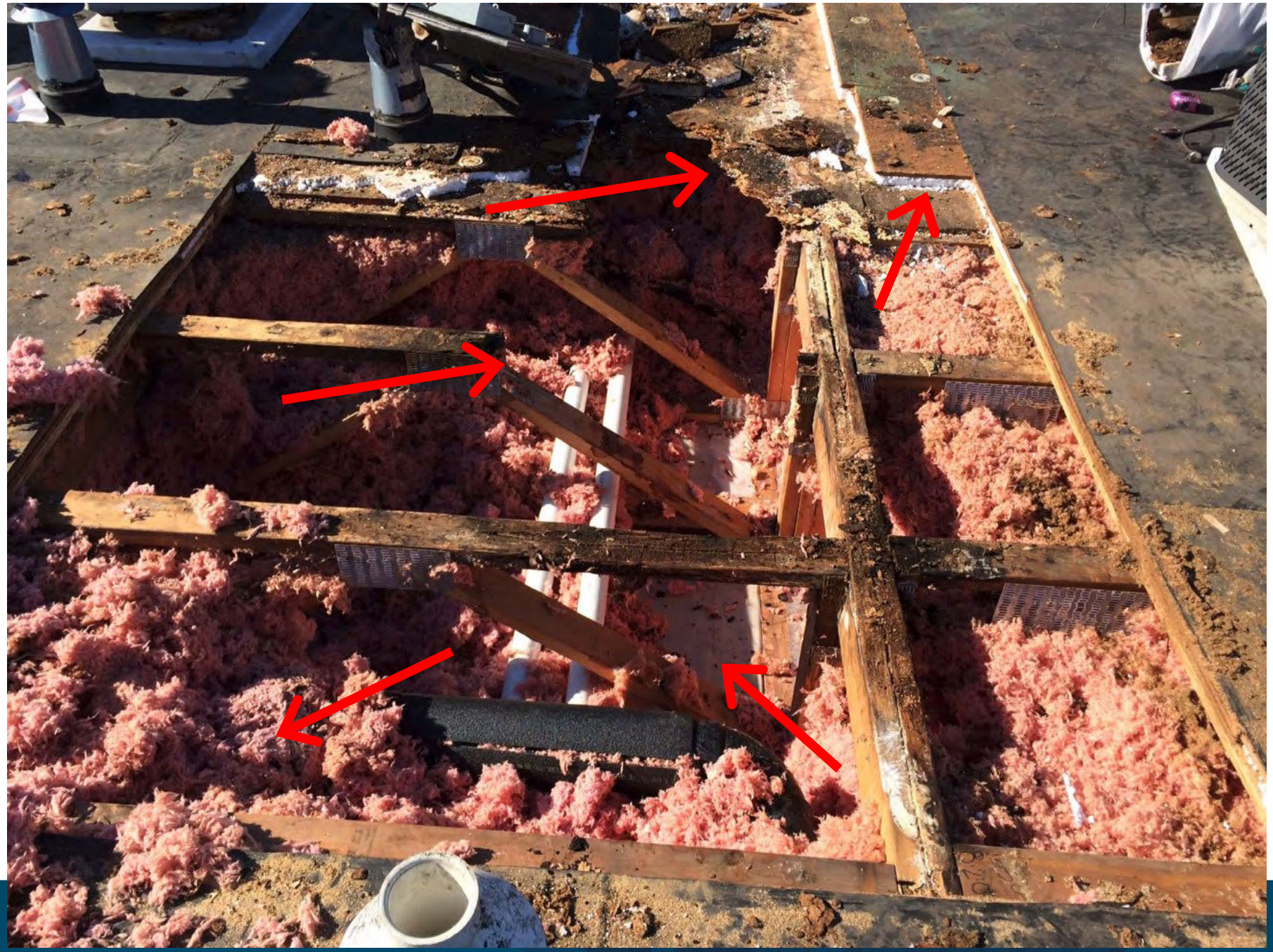
Parapet Condition

Parapet Condition

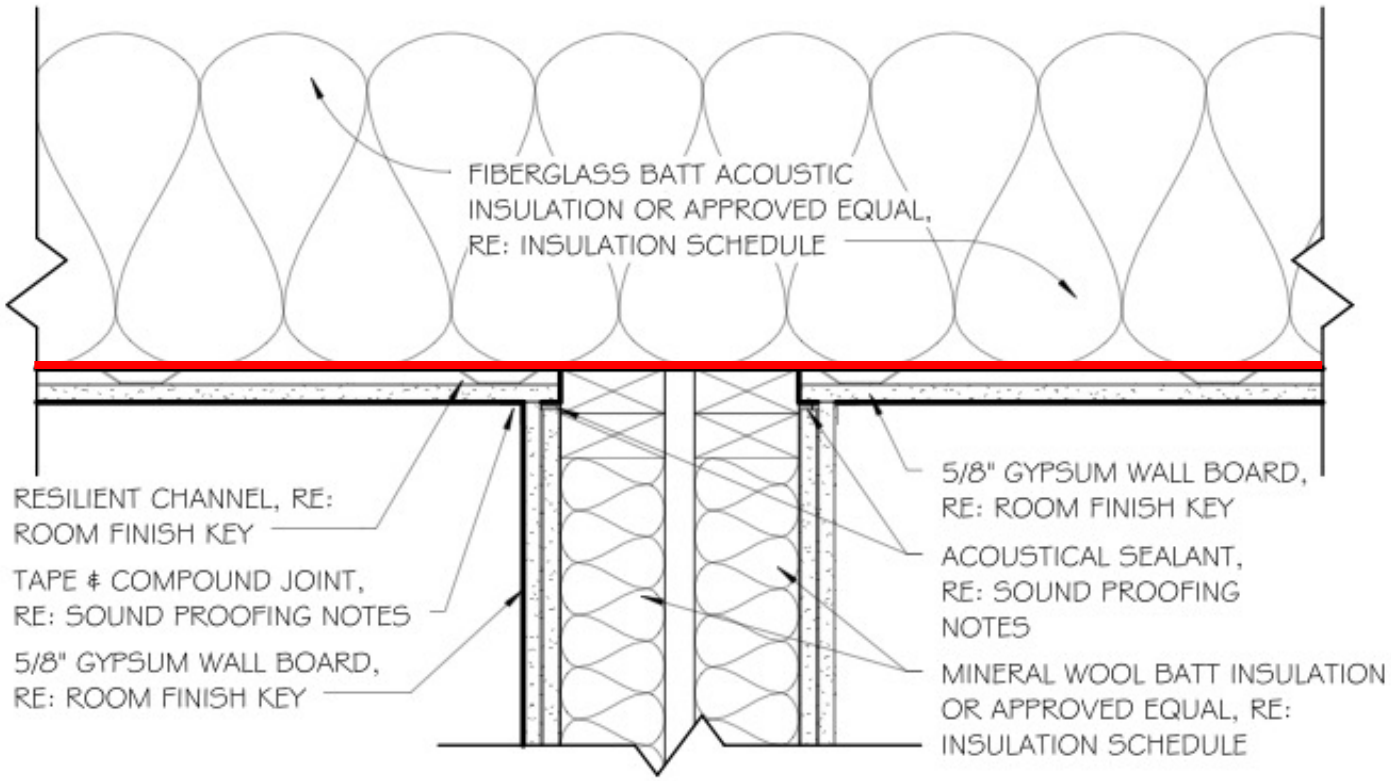


Roofs

Roof Assemblies



Roof Assemblies



6 / A7.1 Sound Proof Seperation Wall @ Ceiling

1 1/2" = 1'-0"

Summary

Summary

Air barriers are required except for Climate Zone 2B.

Building Code does not identify where in the assembly the air barrier is to be installed.

The distance of assembly components from the heat source impacts the surface temperatures of assembly components and must be considered in design.

Interior air barriers should be utilized in cold climates in most instances to minimize the potential for condensation in assemblies.

Code Changes

Code Changes

Air leakage rates must be tighter for colder climates.

Distance from interior conditioned space space considerations

Thermal breaks must be installed at penetrations of the envelope when temperatures below the dew point are expected (varies based on occupancy usage).

Questions?


abaa 2026
building
enclosure
conference