

# Successful Air Barrier Installation – A Case Study

**Michael Repka**

Hoffman Construction Company

## Successful Air Barrier Installation – A Case Study

The mass timber Founders Hall project at the University of Washington stands as an exemplary model for air barrier performance in design and construction. This presentation will delve into the innovative strategies and collaborative approach that led to the project's exceptional success, with a focus on how attendees can apply these lessons to their own projects.



### Michael Repka, AIA, LEED AP

At Hoffman Construction, Michael leads the firm's QA/QC process, ensuring quality execution in the field. With 19 years of experience, he takes a proactive approach to preconstruction, leading drawing and detail reviews for constructability, and then working with subcontractors to review mock-ups to ensure details work. He tracks quality issues to their resolutions and has a keen understanding of the best way to resolve issues in all stages of construction.



## Learning Objectives

1. Understand how early preconstruction activities can impact later installations.
2. Describe three approaches to achieving good air barrier testing outcomes.
3. Understand air barrier testing criteria and codes.
4. How to define, construct and evaluate mockups for maximum benefit of the building envelope execution.

**Thank You Exhibitors  
and Sponsors!**

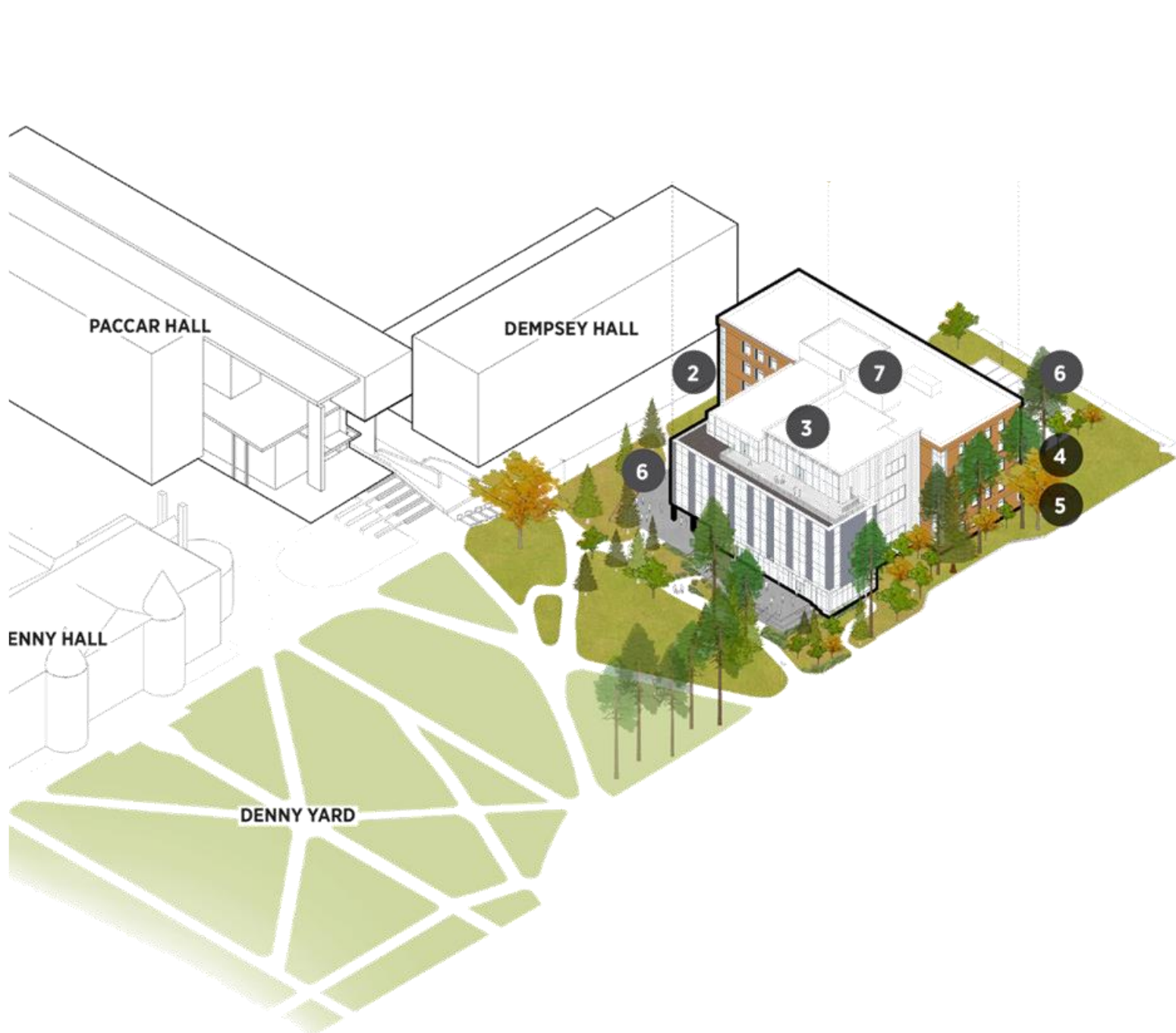
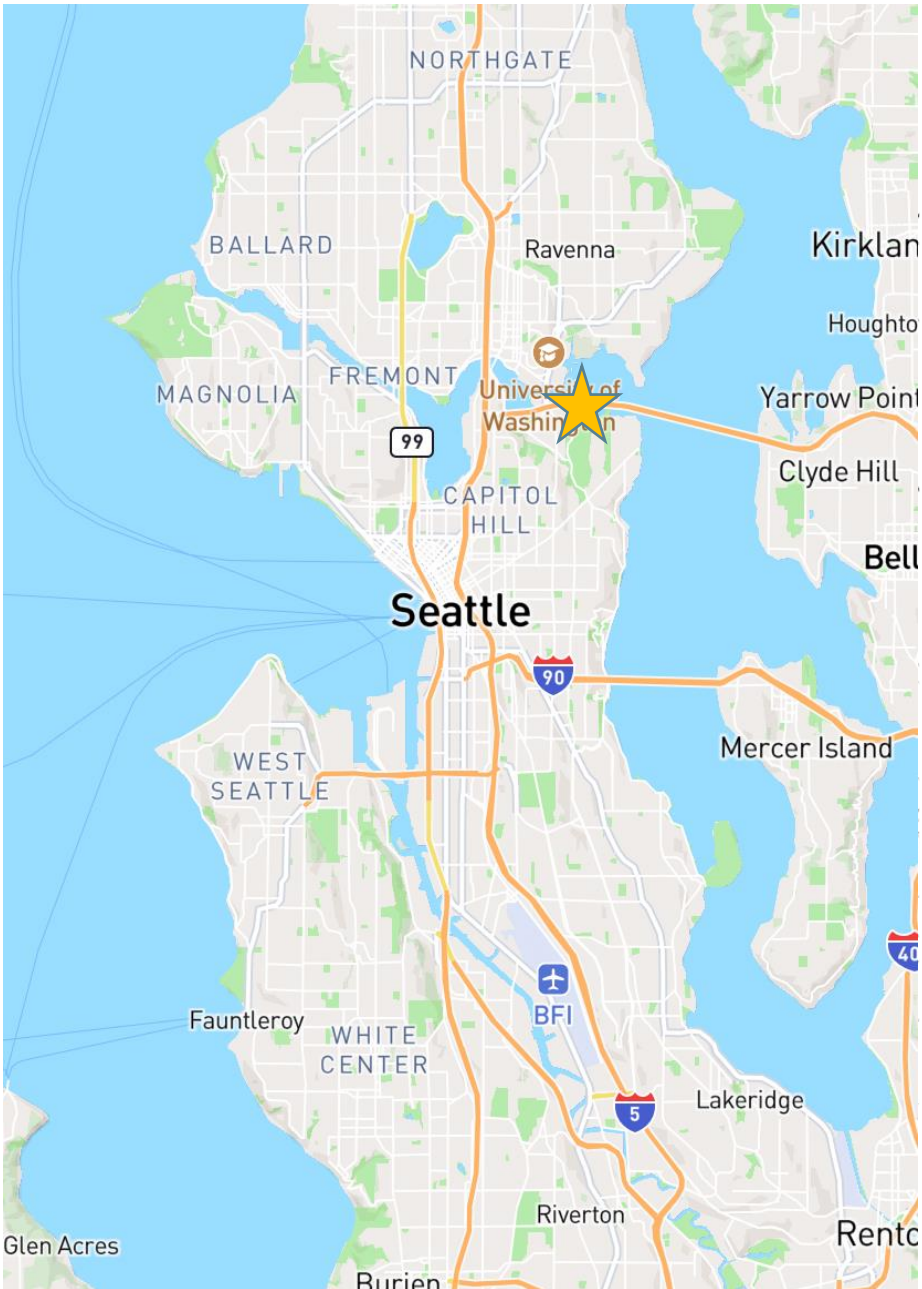
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## Agenda

1. Project Background
2. Seattle Air Barrier
3. Preconstruction Review
4. Mockup Execution
5. Testing and Inspection





**W** UNIVERSITY *of* WASHINGTON

 **HOFFMAN  
CONSTRUCTION  
COMPANY**

**LMN**



 **PCI**  
PERFORMANCE  
CONTRACTING INC

  
**HERZOG GLASS**



  
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**Naturally Ventilated Offices**

-  Operable Windows + Ceiling Fans
-  Automated Night Flush

**High-Performance Building Envelope**


- Low Air Infiltration
- Highly Insulated Envelope

**Optimized Daylight and Views**


**Maximized Connectivity to Outdoor Landscapes**

**LEED NC v4.1 Gold**


**79% Energy Use Reduction**

-  DOAS (Dedicated Outdoor Air System) with 90% Efficient Heat Recovery Ventilation (HRV)
- Fossil Fuel Free Operations
- Target Performance Energy Use Monitoring
- Solar Ready Roof
- Disconnected from Campus Steam

**58% Embodied Carbon Reduction**

-  Mass Timber Structure
  - Reduced Embodied Carbon Materials

**53% Water Use Reduction**

-  Native and Drought-Resistant Planting
- Stormwater Collection to Bioretention Swales

-  Low-Flow Plumbing Fixtures

**Bike Commuting Racks and Showers**

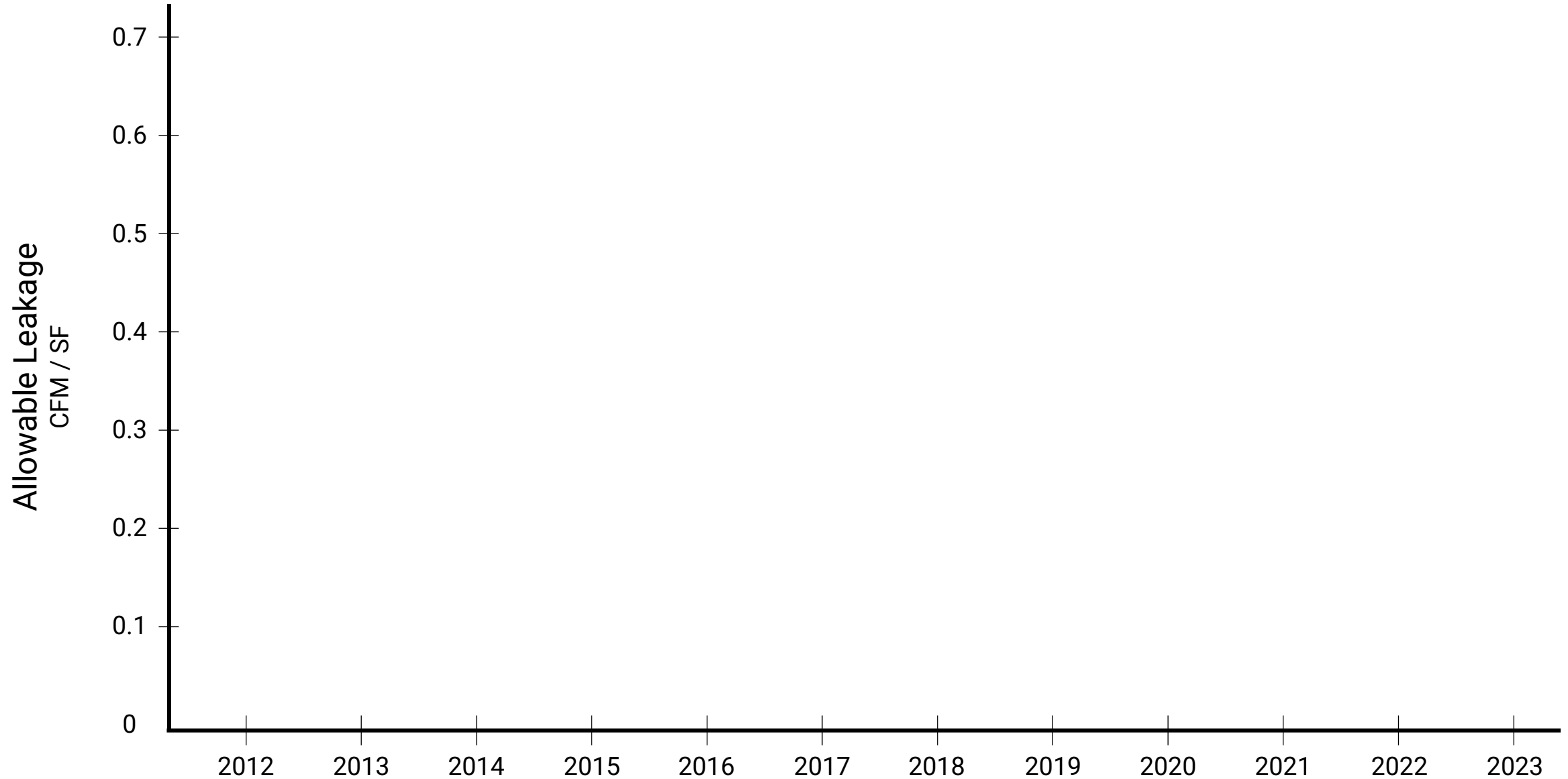






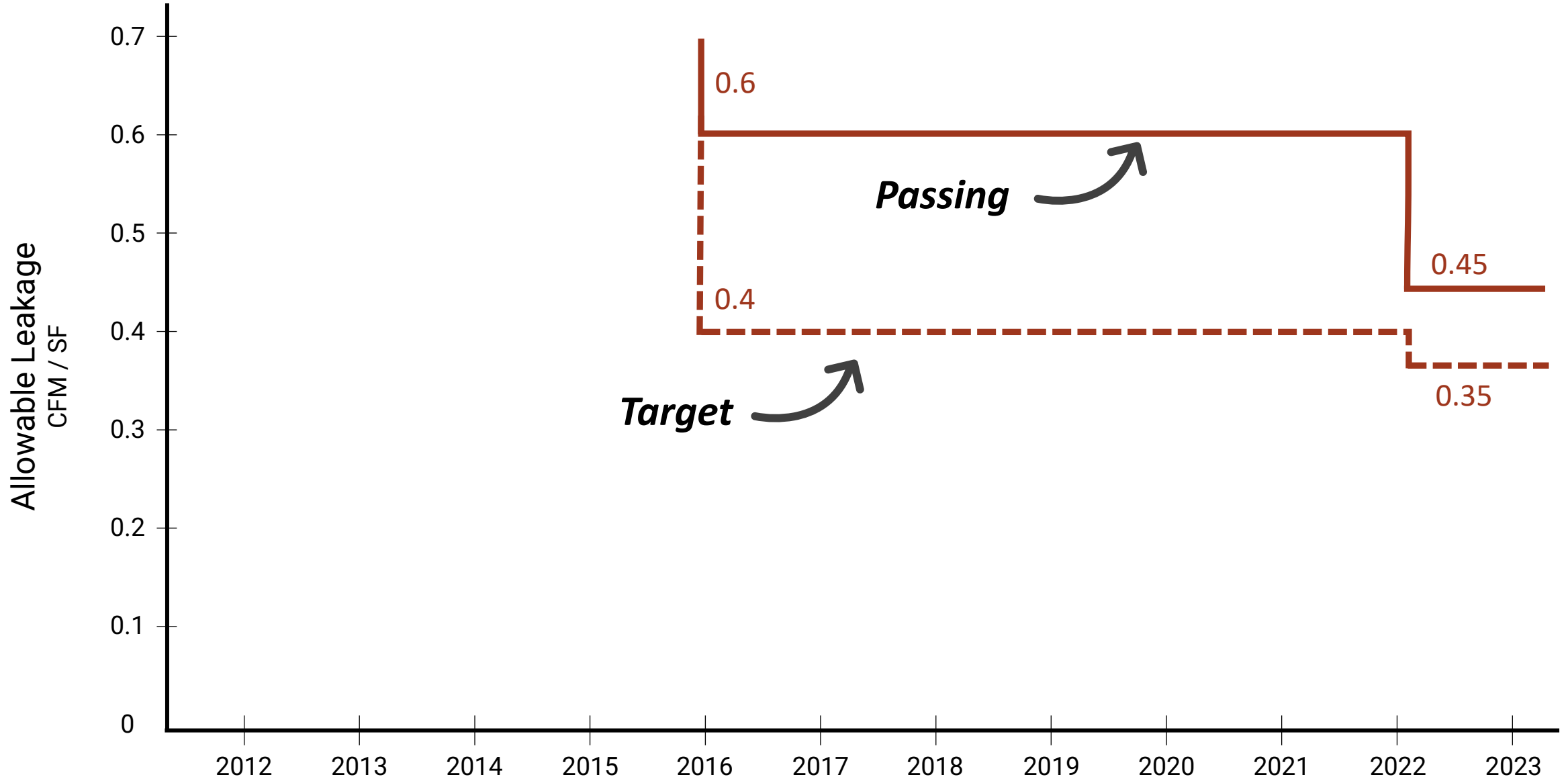
FOUNDERS HALL

# Whole Building Air Testing



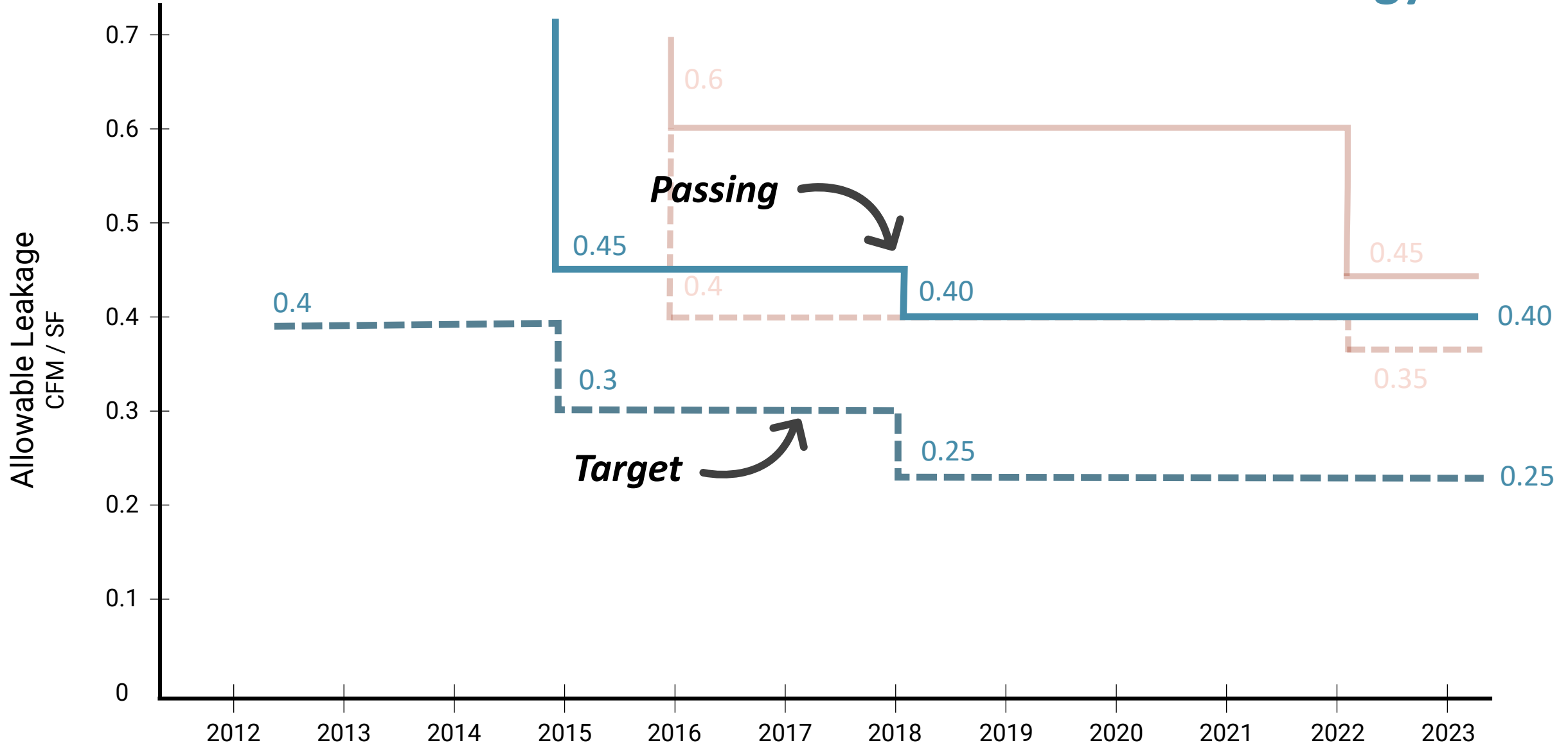
# Whole Building Air Testing

ASHREA 90.1



# Whole Building Air Testing

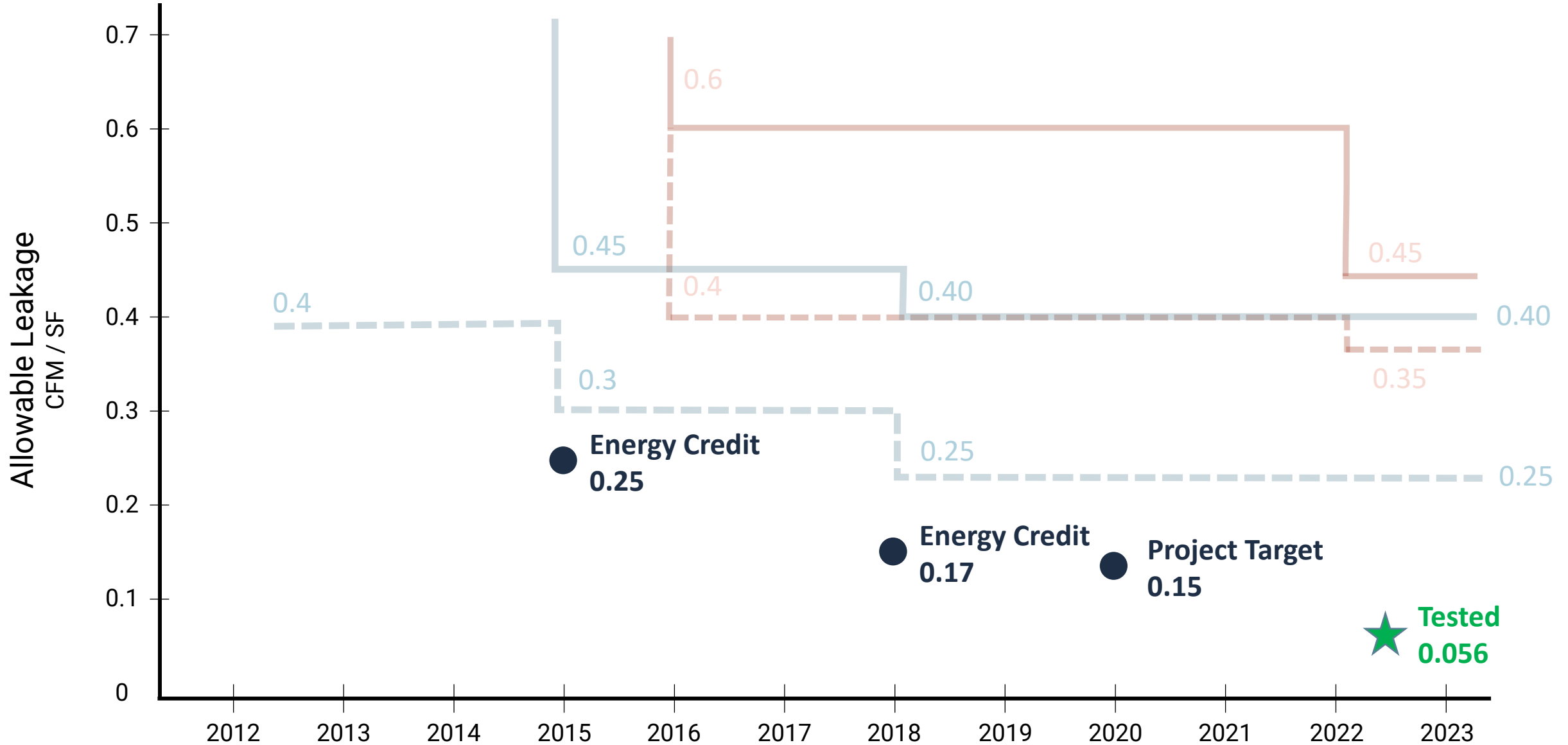
# Seattle Energy Code



**Passing**

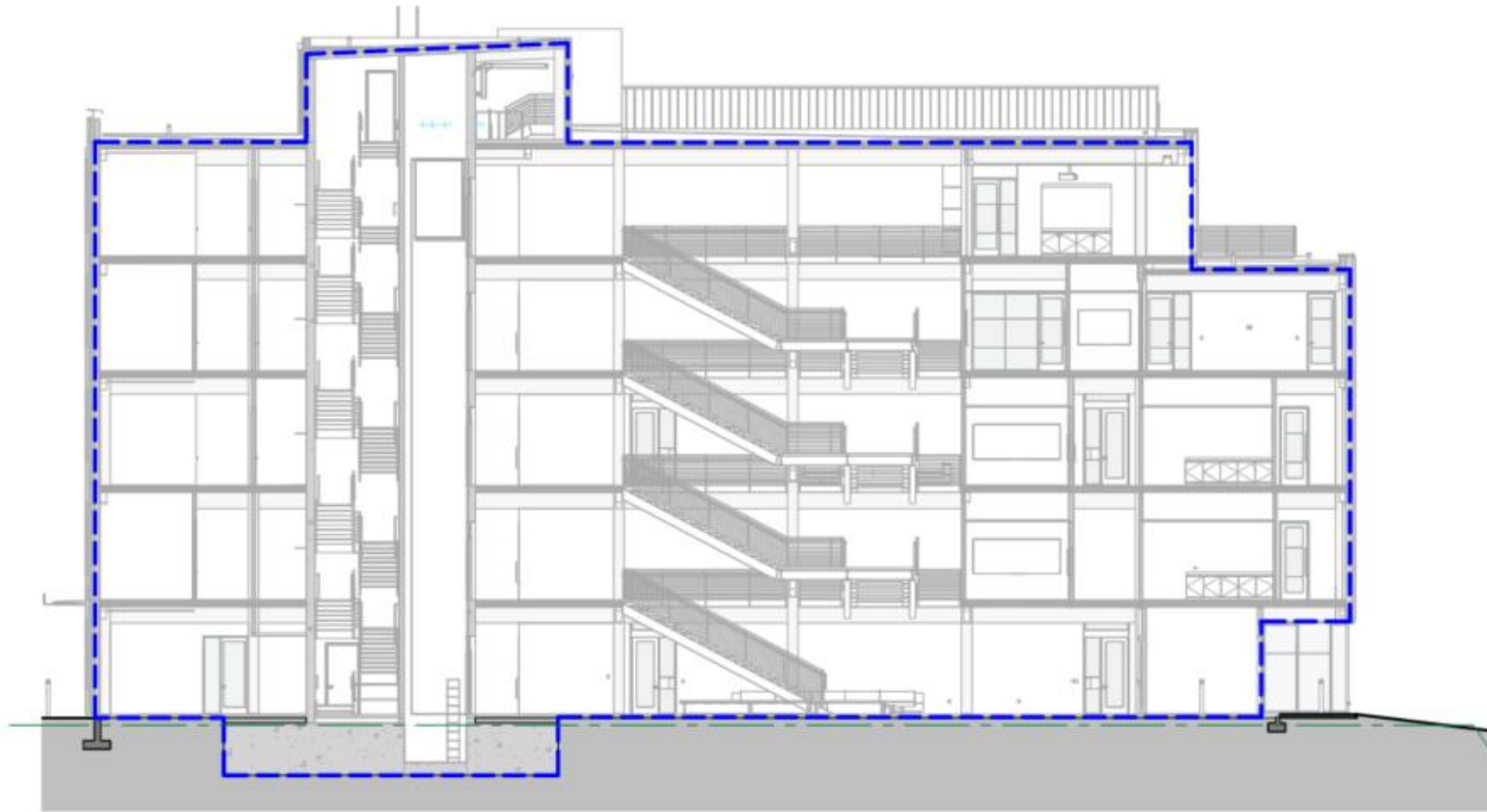
**Target**

# Whole Building Air Testing

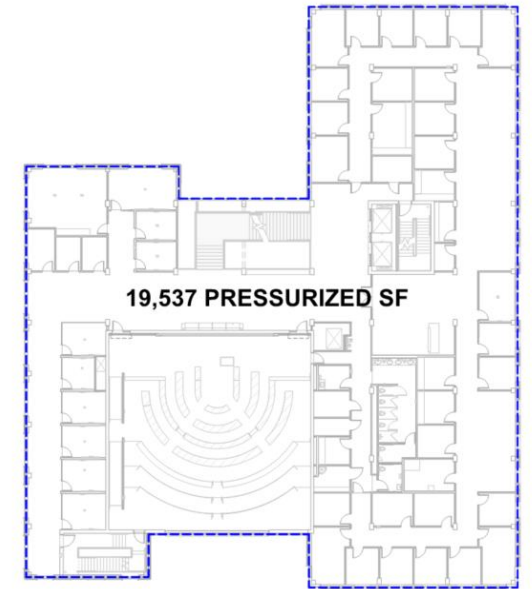




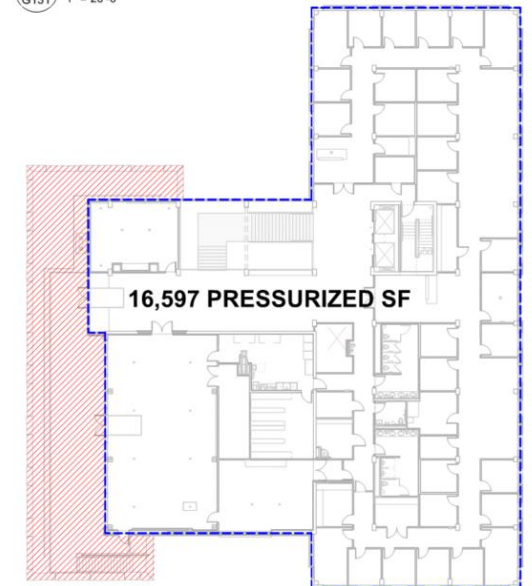




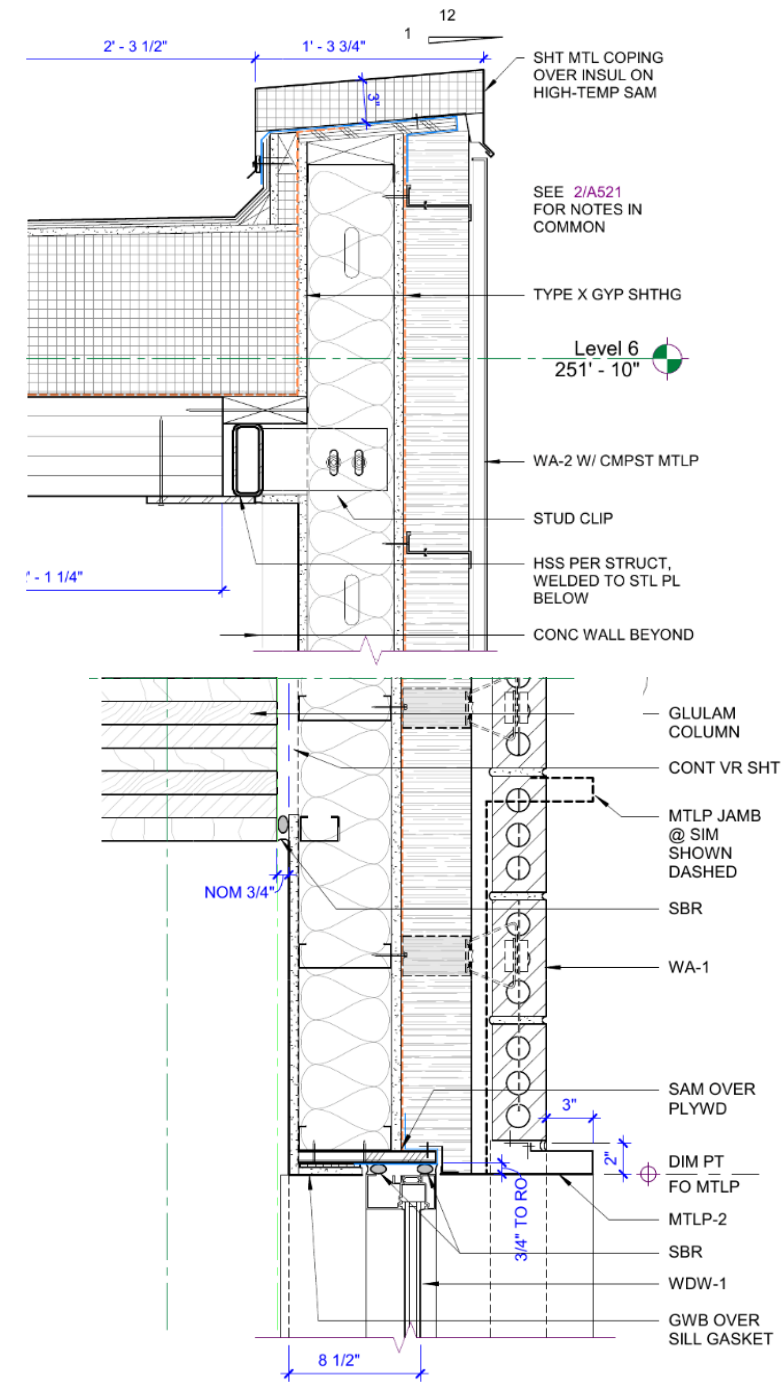
**9** PRESSURE BOUNDARY SECTION @ D.3  
G131 1" = 20'-0"



**3** Level 3 Pressure Boundary Plan  
G131 1" = 20'-0"



**5** Level 5 Pressure Boundary Plan  
G131 1" = 20'-0"







# Preconstruction Review

- Design - Foster Review #4
  - Design - PEC #2
  - Design - Interim UW (L)AC Review #1
- Design - Foster Review #5
  - | Design - Emergency Power for FACNET Aggregates (MDF / IDF)
    - | Design - Confirm final Program Room Data Sheet
      - Design - Foster Review #6
      - Design - Wish List - Additional Area
  - Design - PEC #3
    - Design - Foster Review #7
      - Design - Foster Review #8
      - Design - Wish List - Optional Window Control Enhancements
      - Design - UW (L)AC Review #2
      - Design - Foster Review #9

# Preconstruction Review

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- Design - Foster Review #7

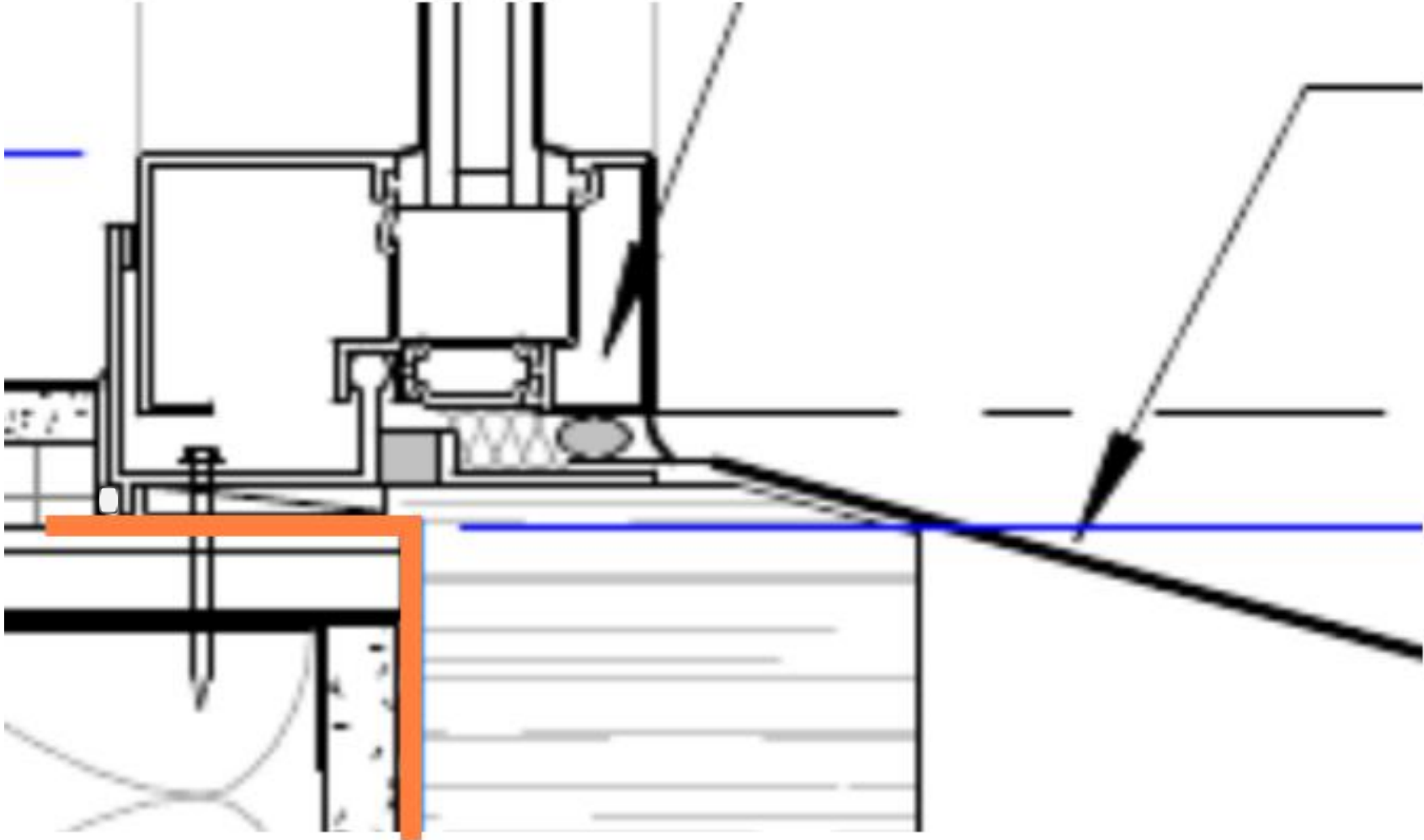
- Design - Foster Review #8

- Design - Wish List - Optional Window Control Enhancements

- Design - UW (L)AC Review #2

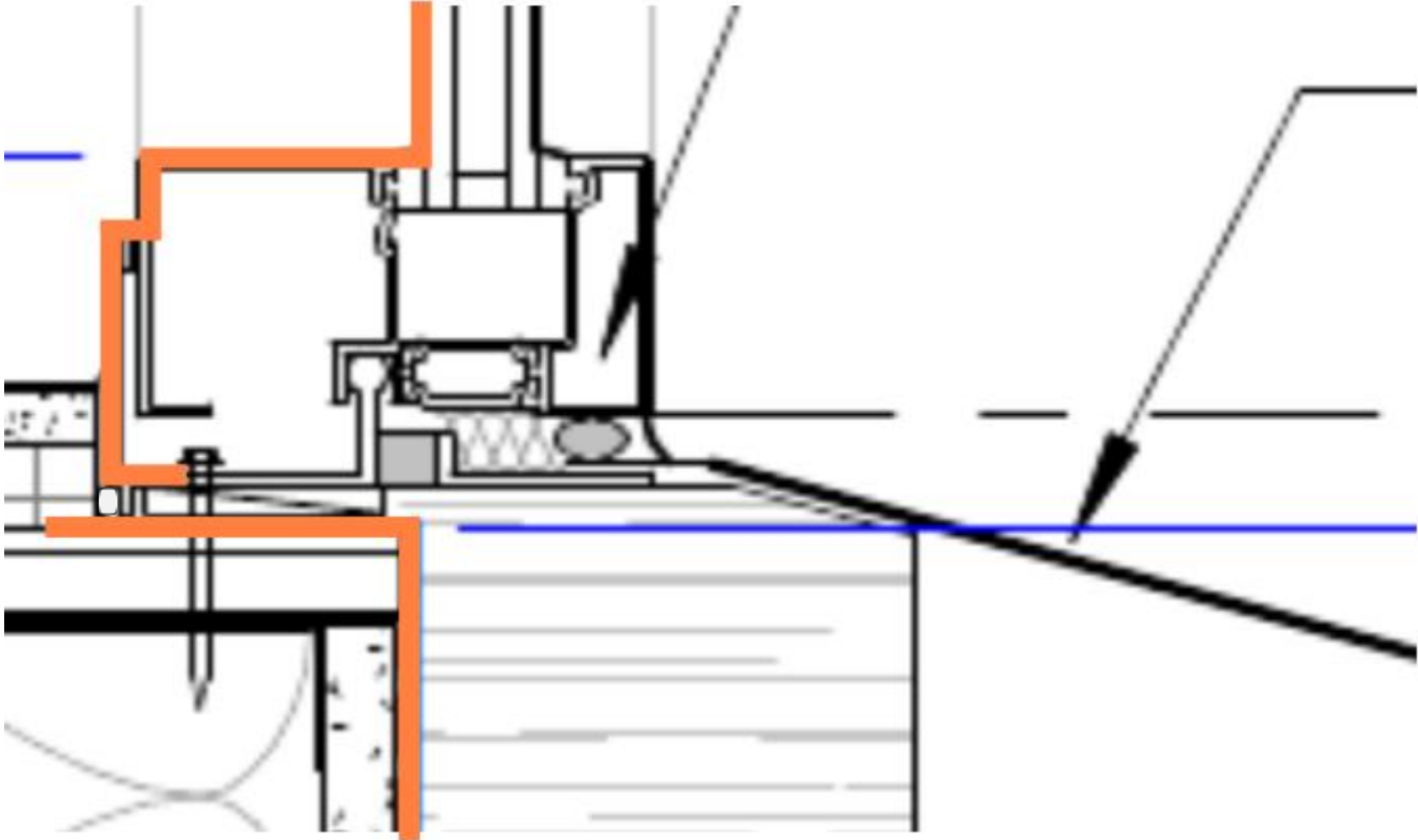
- Design - Foster Review #9

# Windowsill at Punched Opening

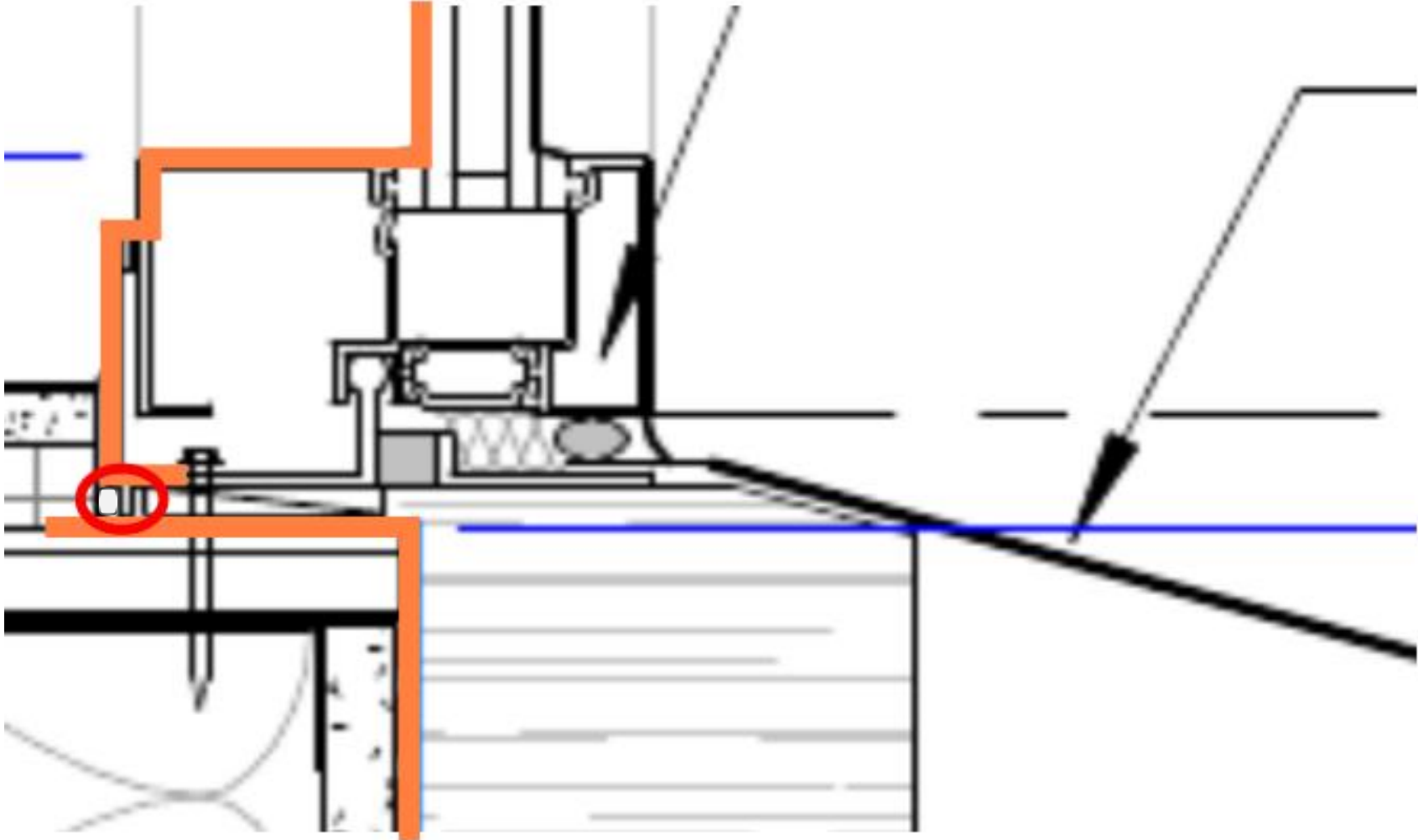




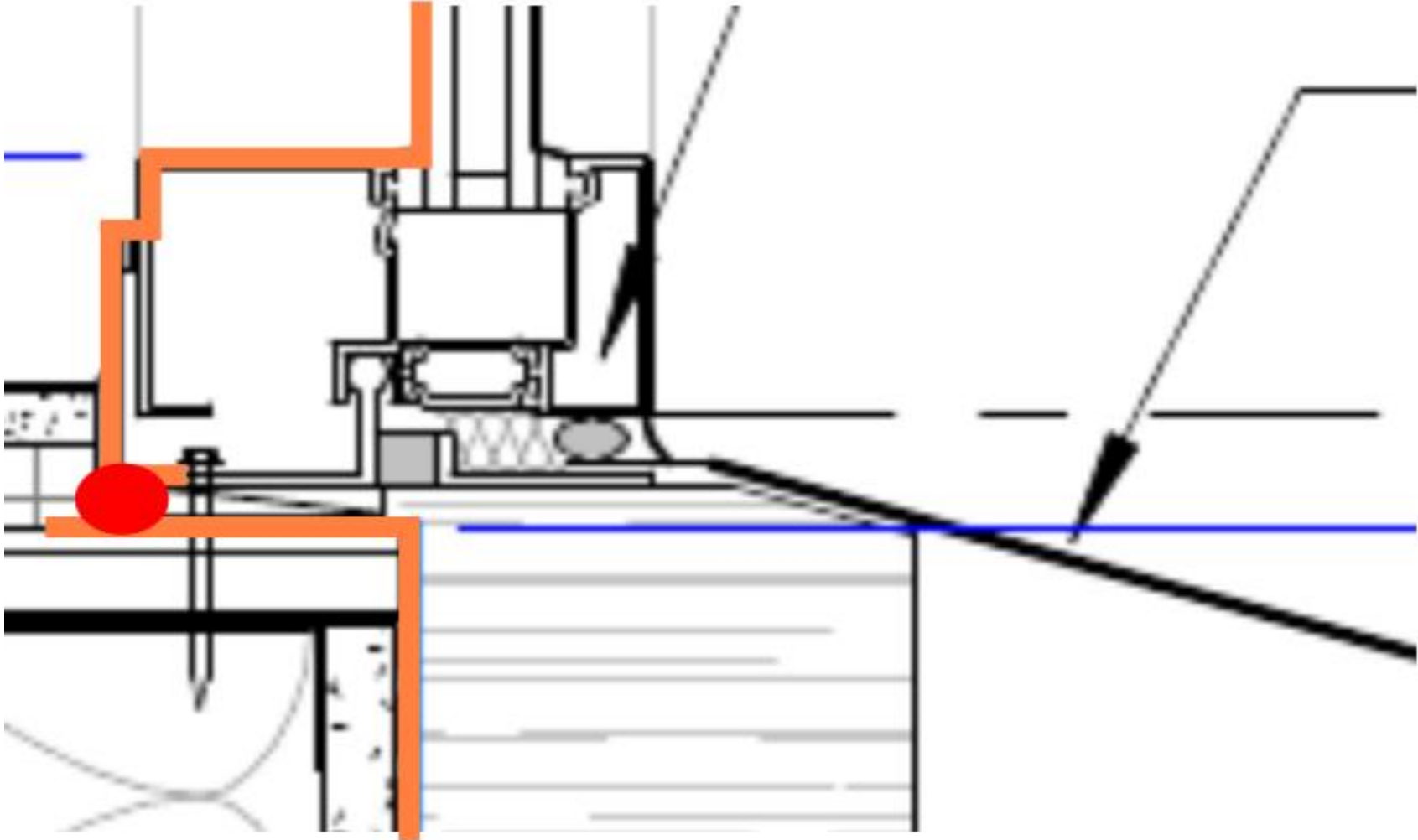
# Windowsill at Punched Opening



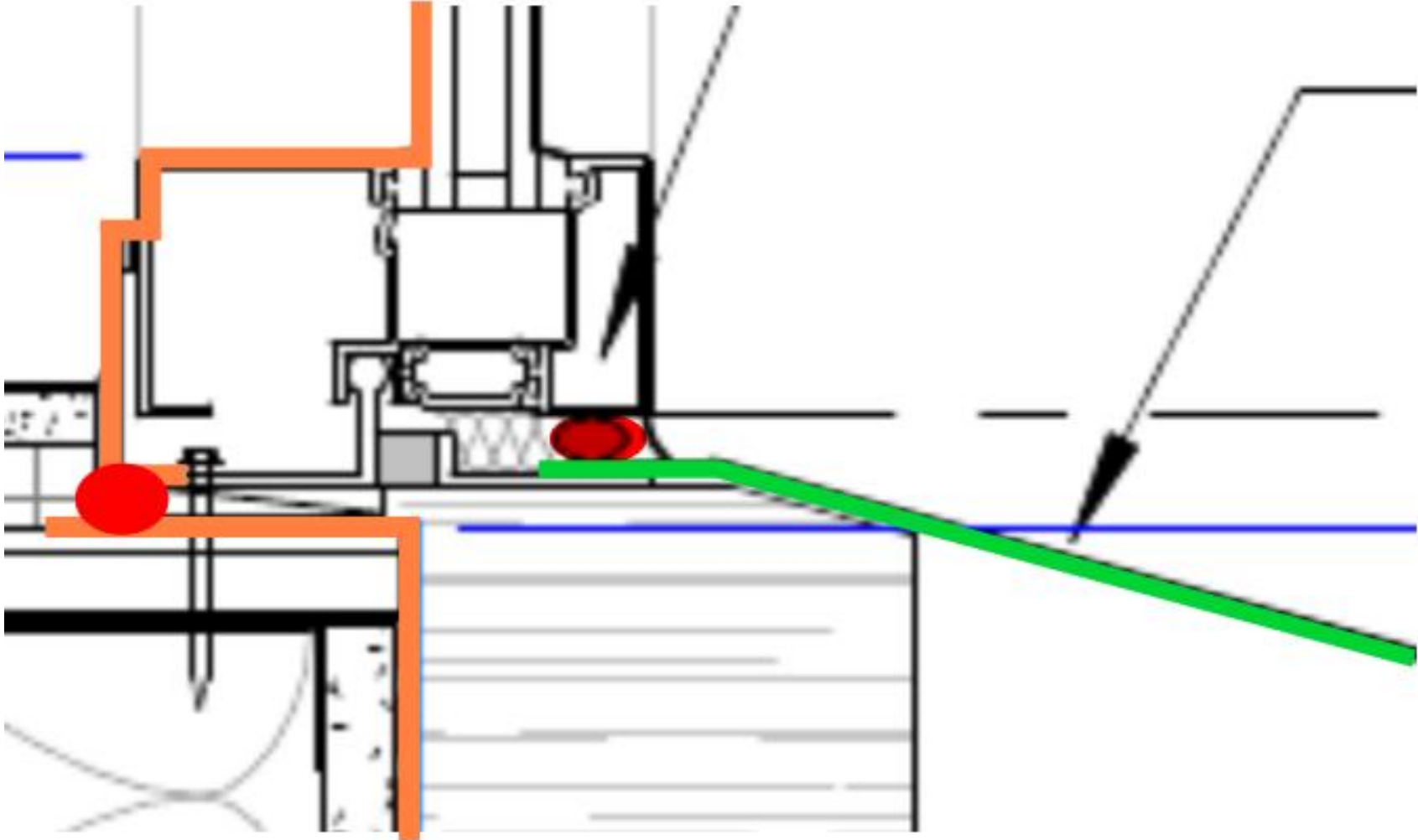
# Windowsill at Punched Opening



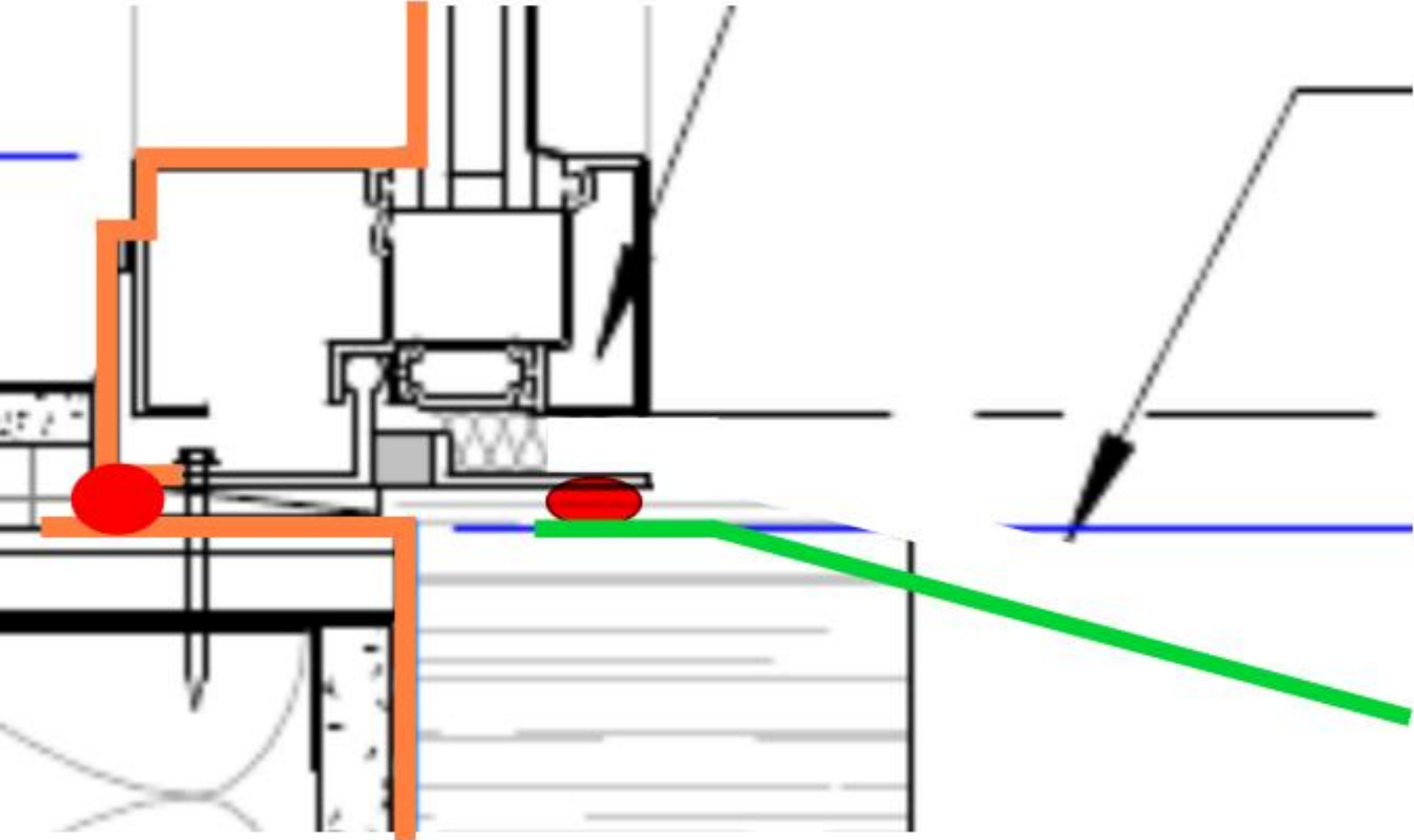
# Windowsill at Punched Opening



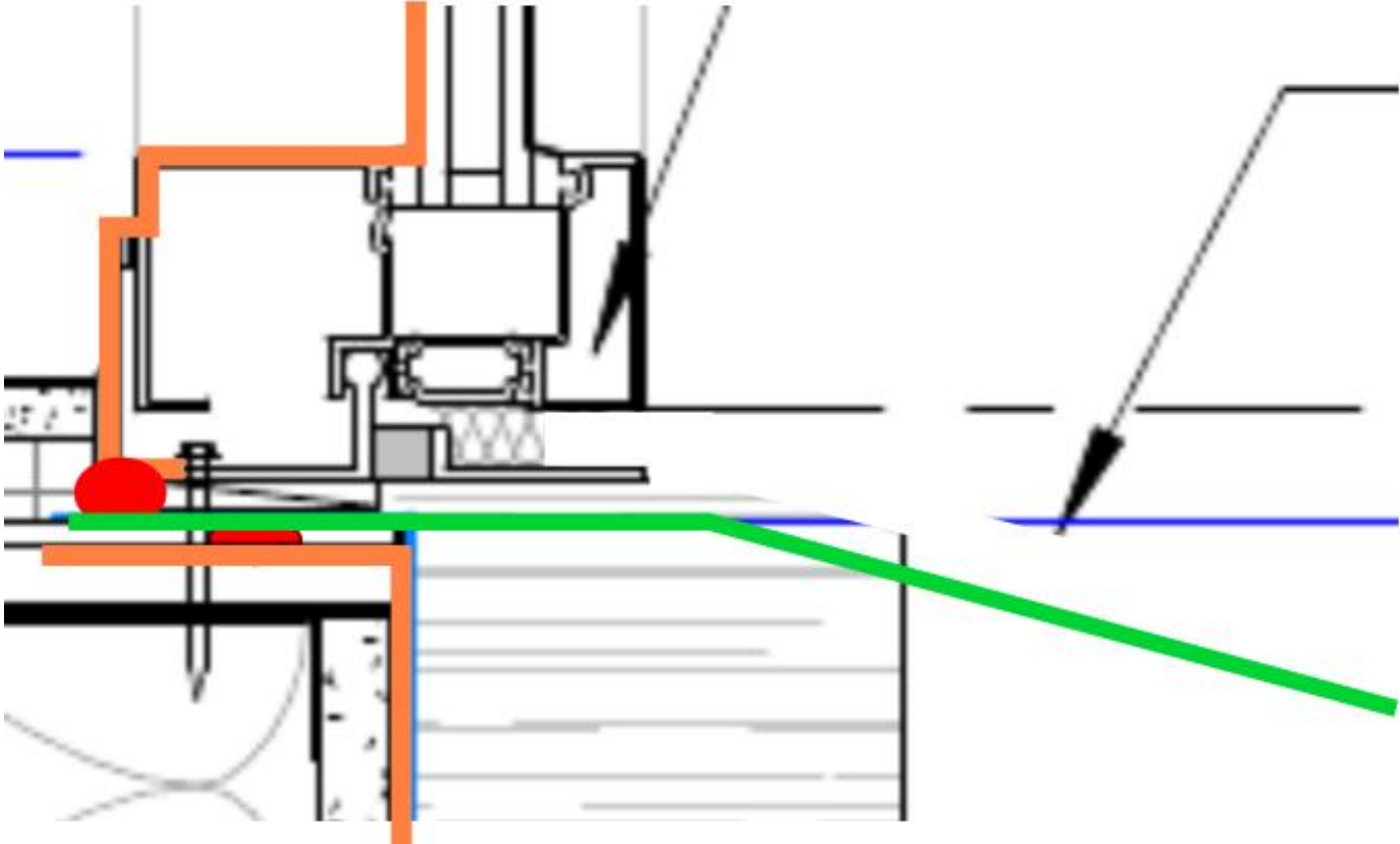
# Windowsill at Punched Opening



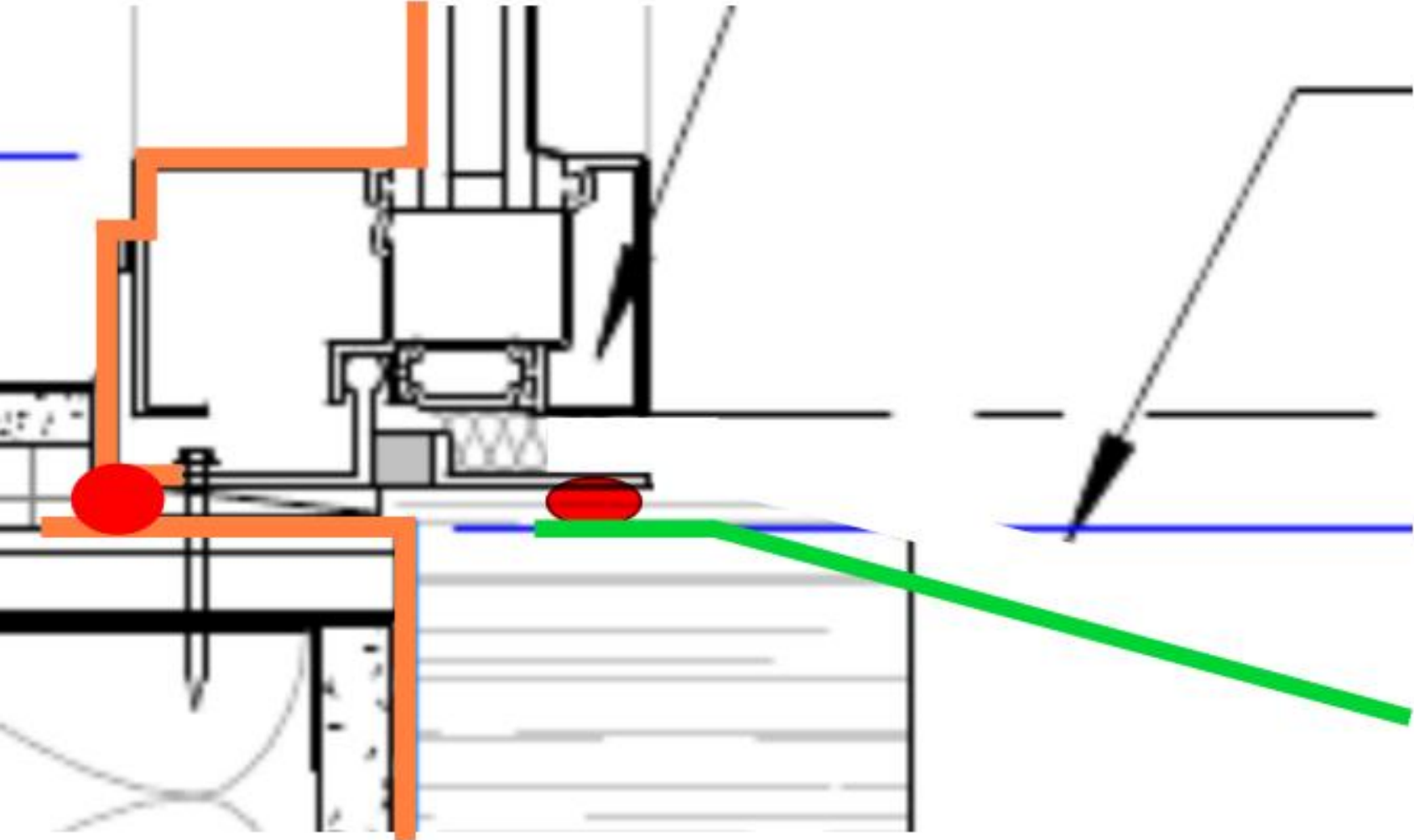
# Windowsill at Punched Opening



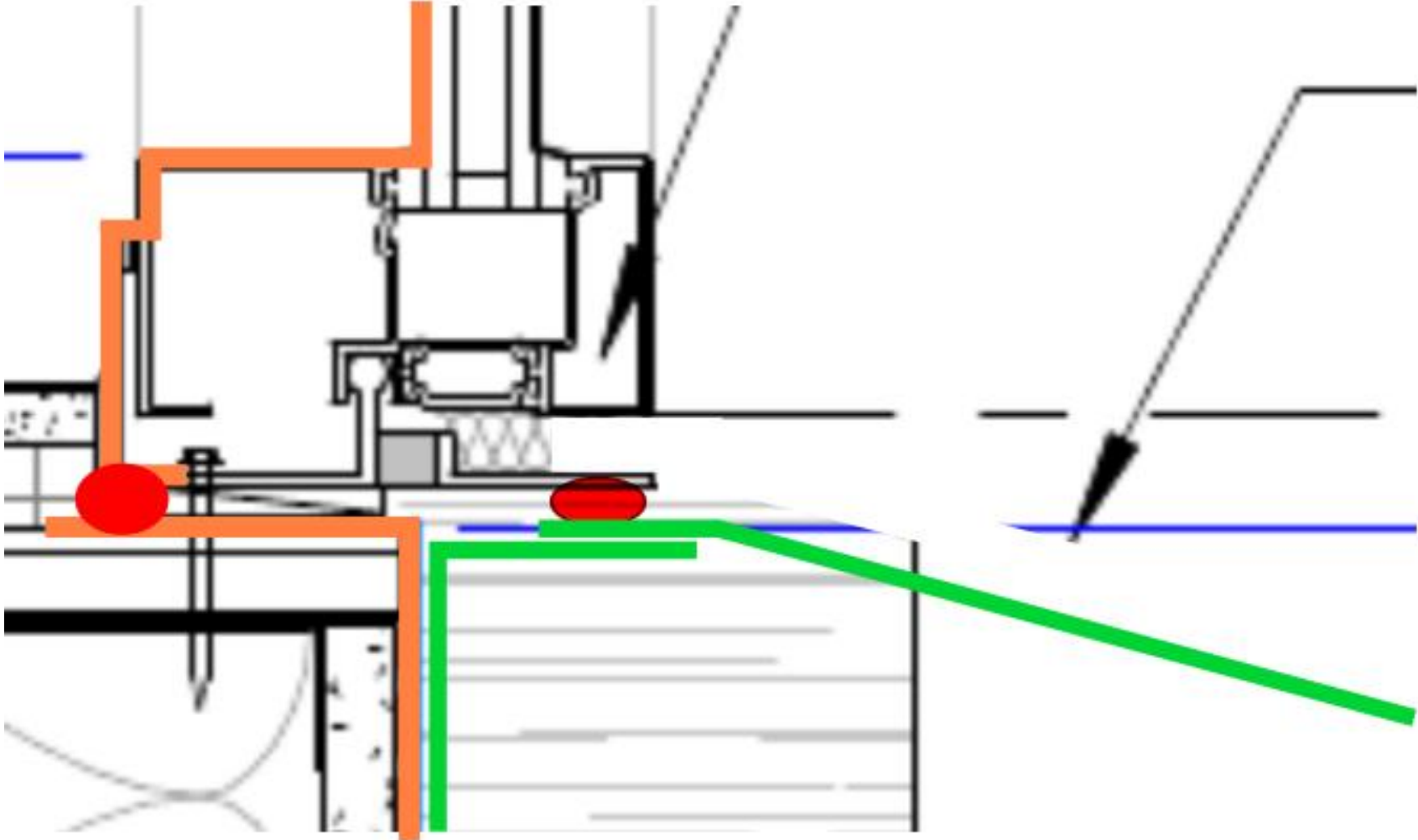
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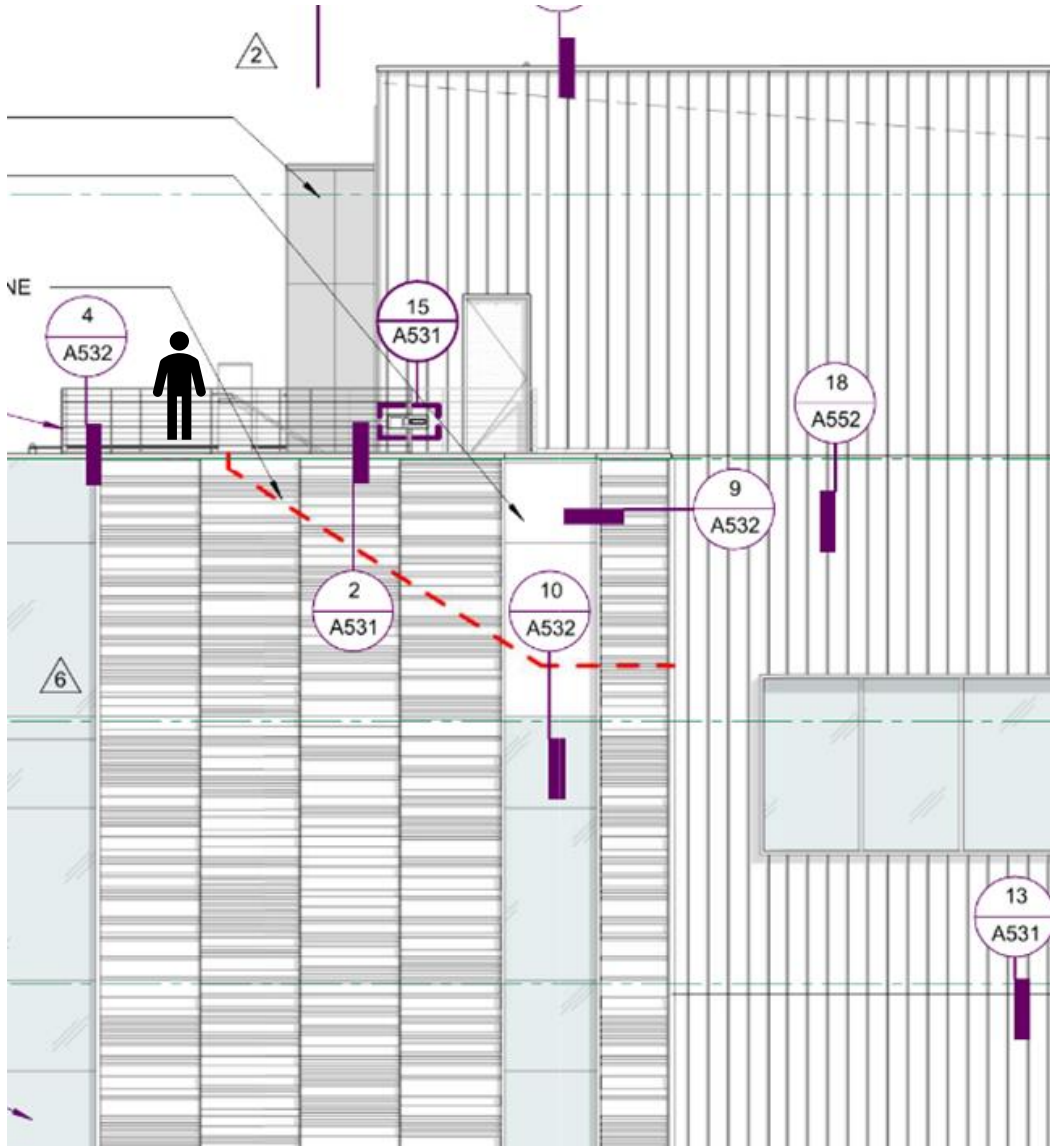


# Windowsill at Punched Opening

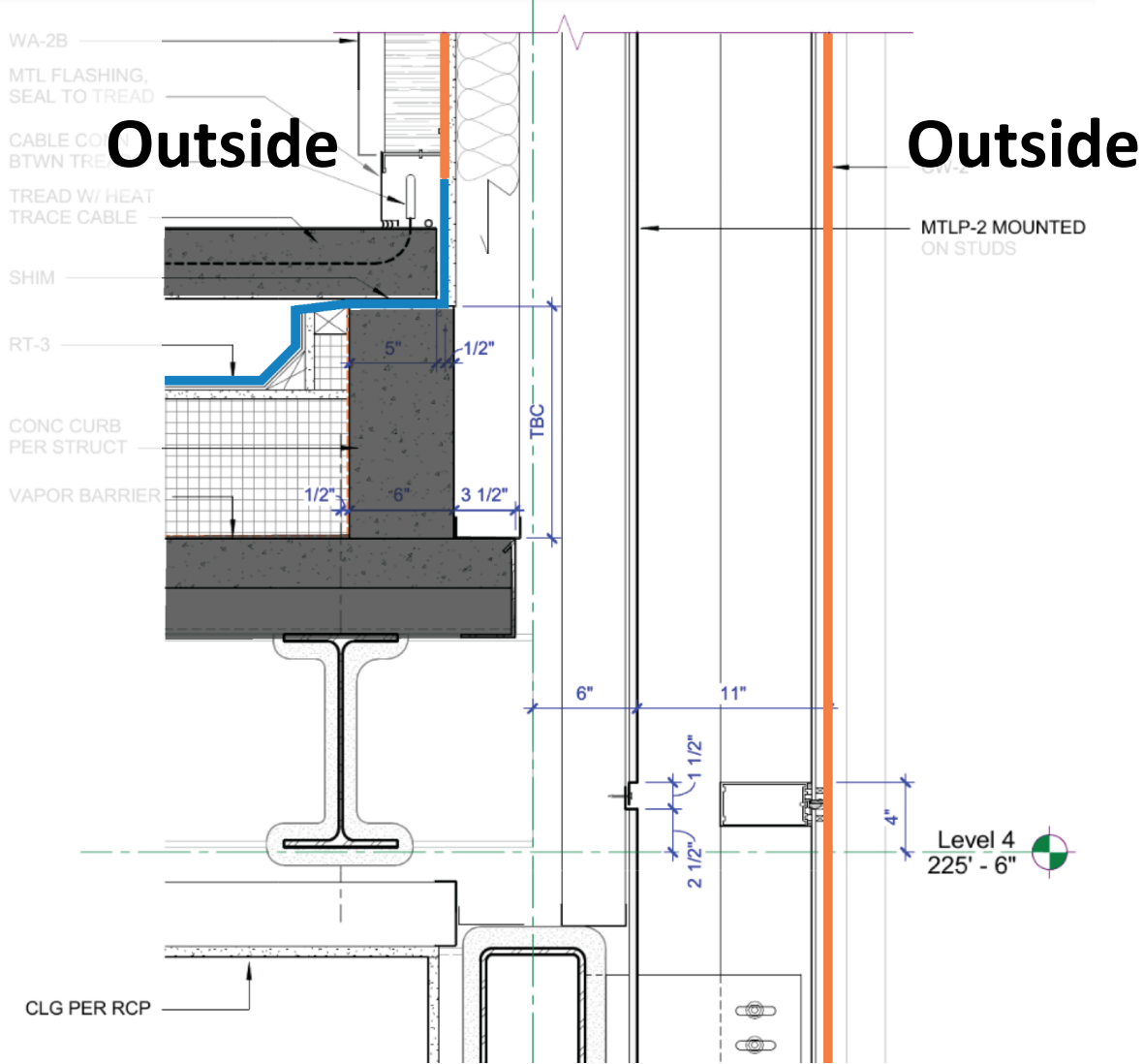




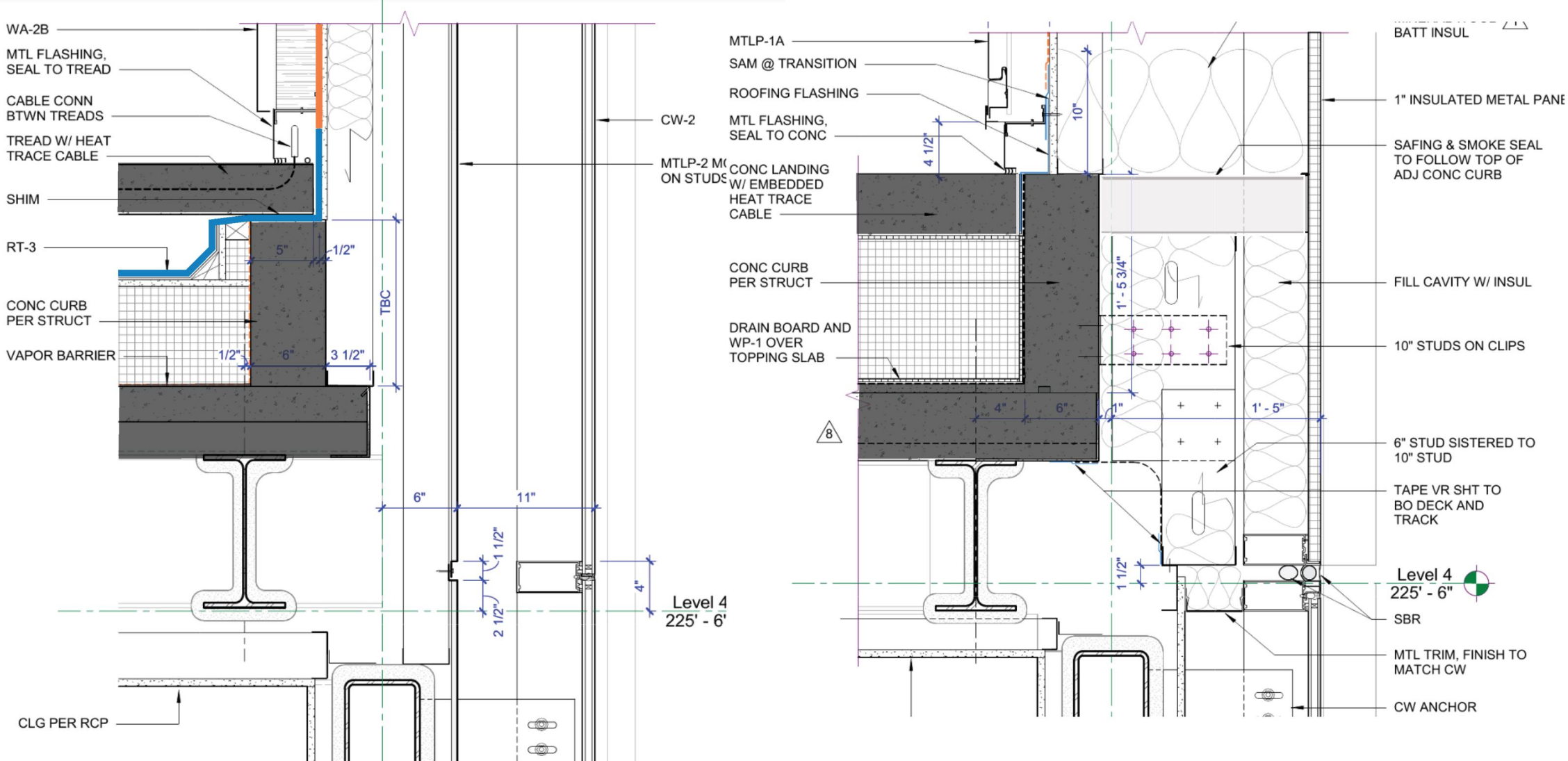
# Curtainwall at Exterior Stair



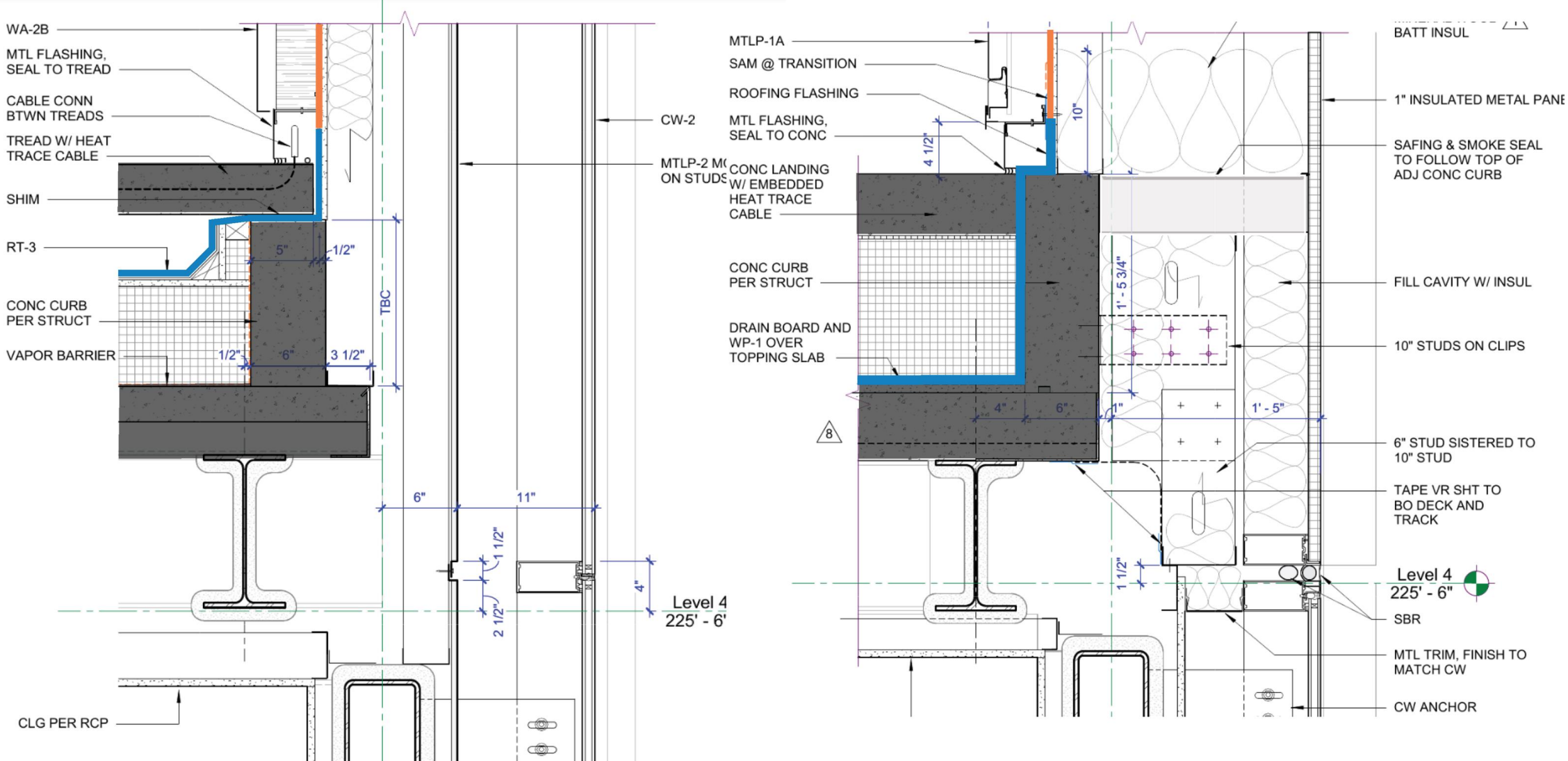
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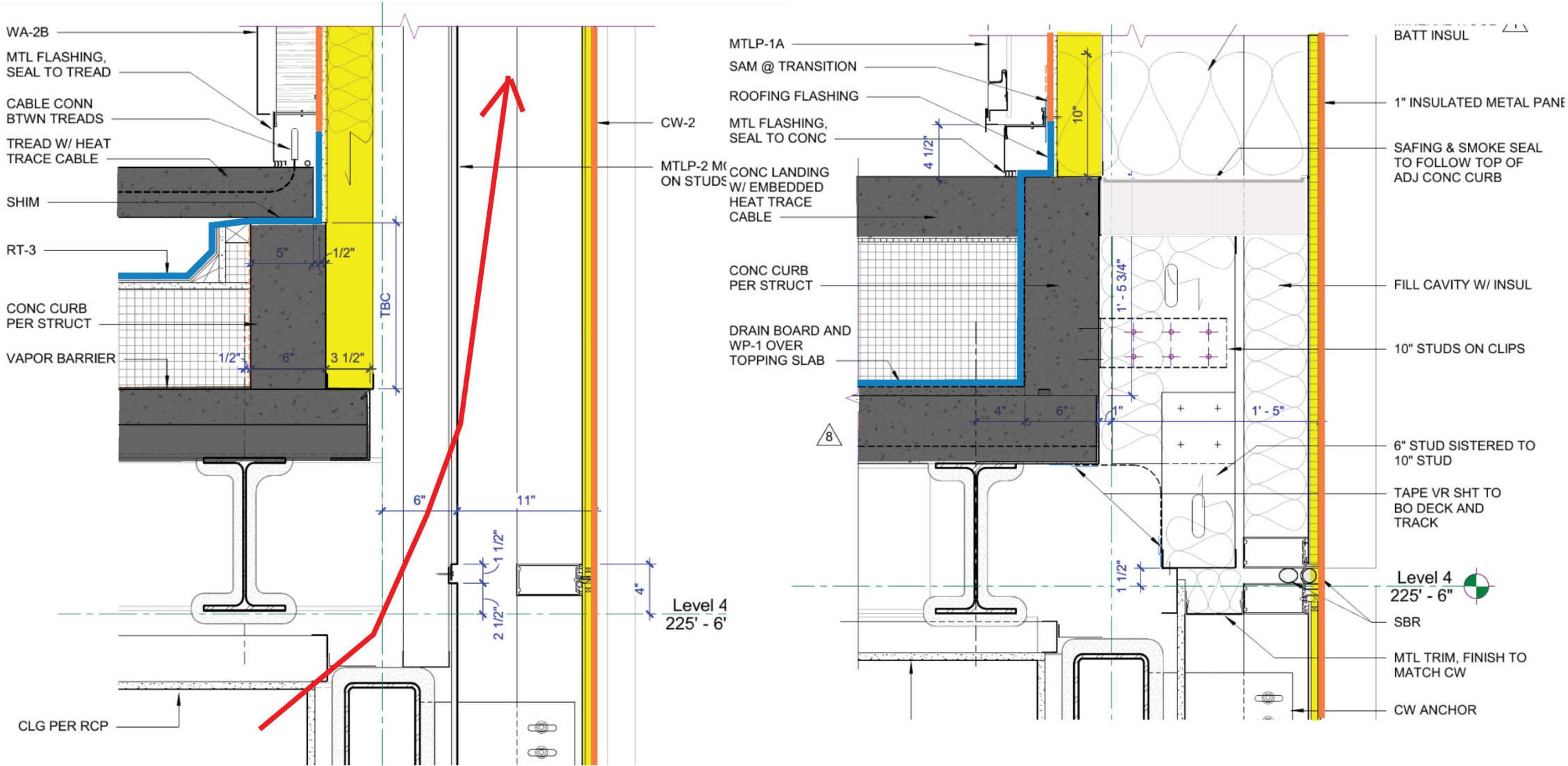
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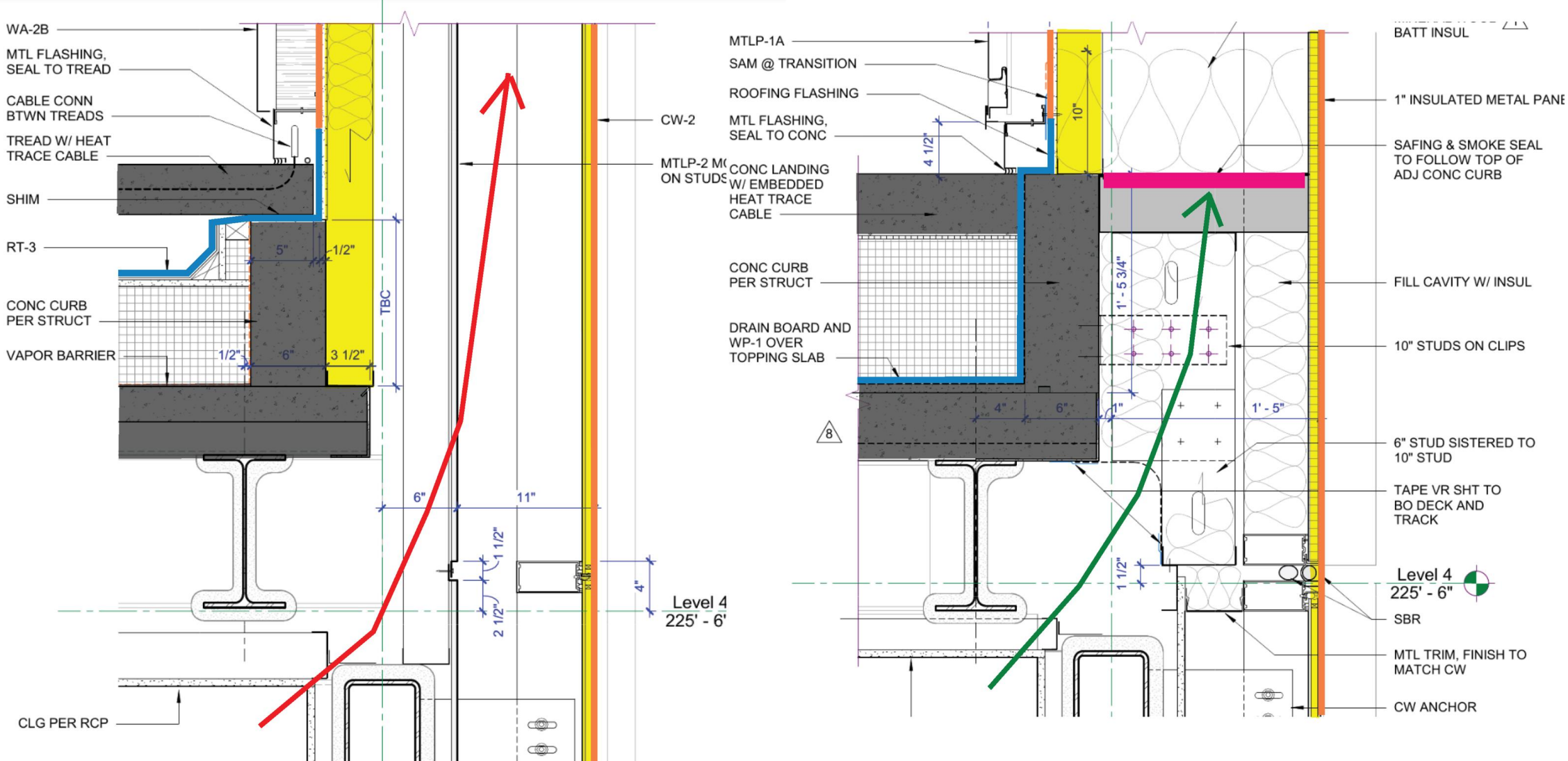
# Curtainwall at Exterior Stair



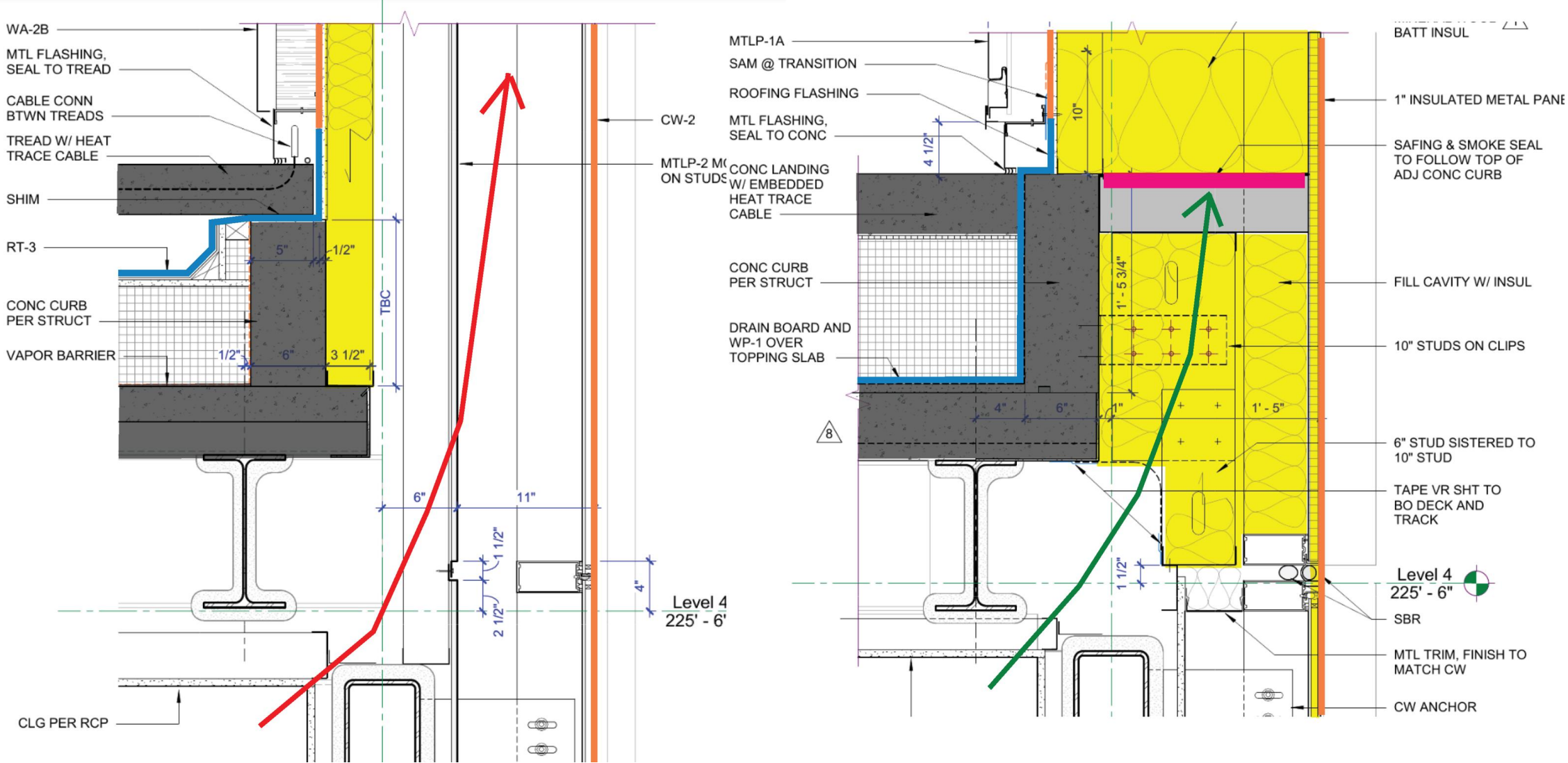
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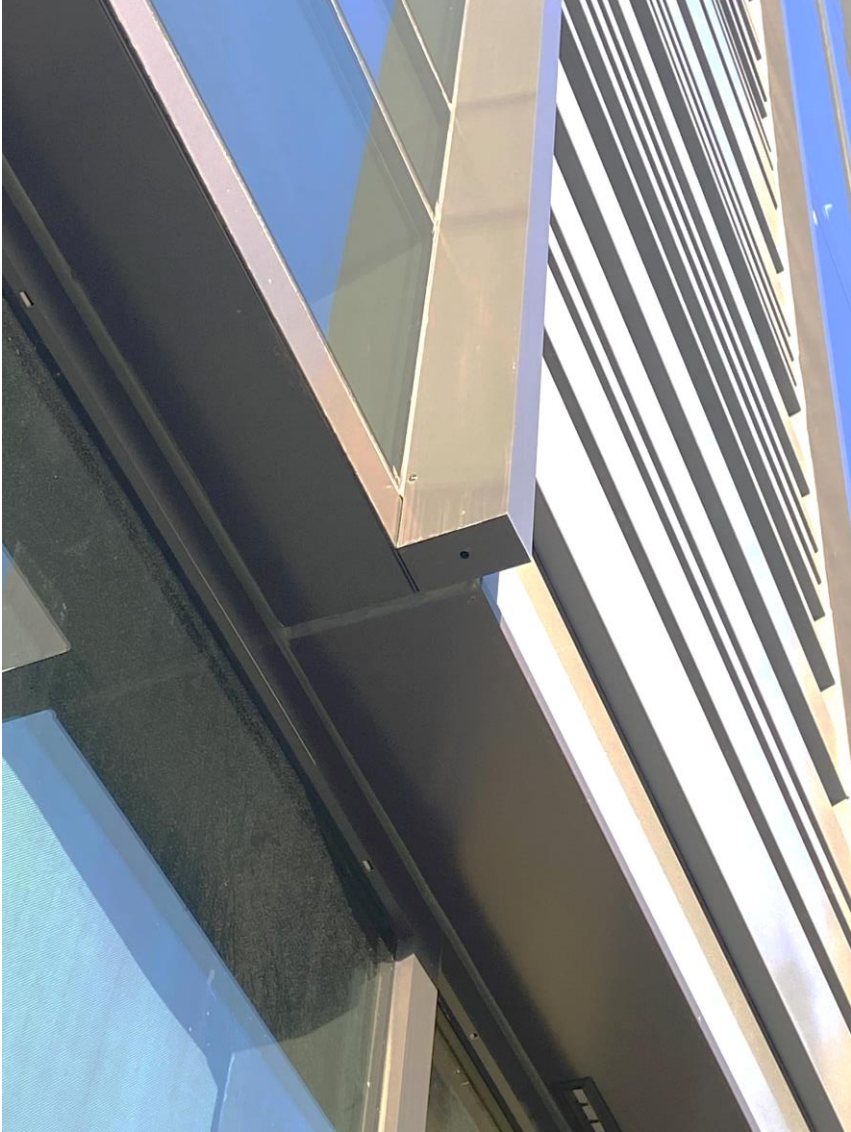
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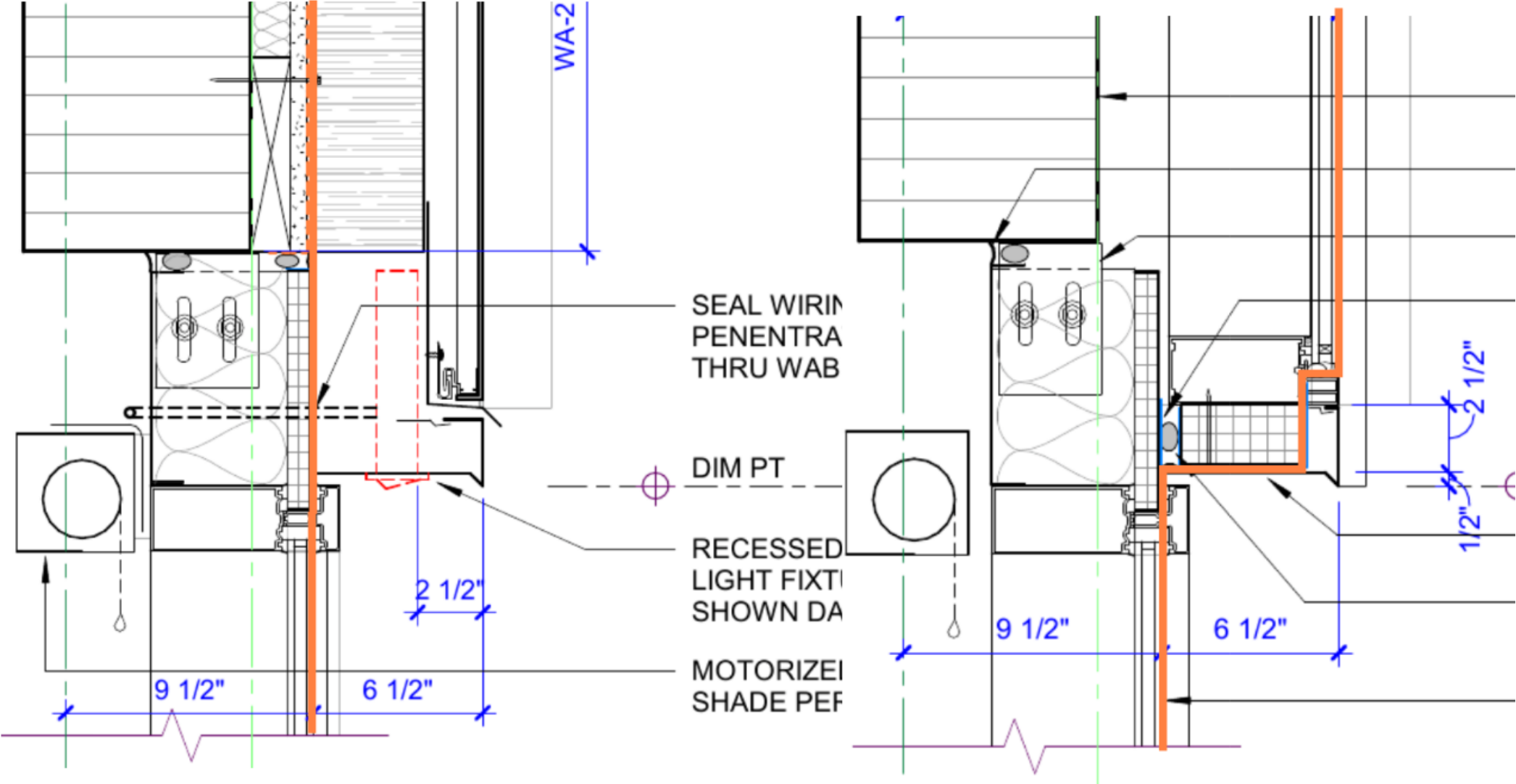


# Curtainwall Metal Siding Transition

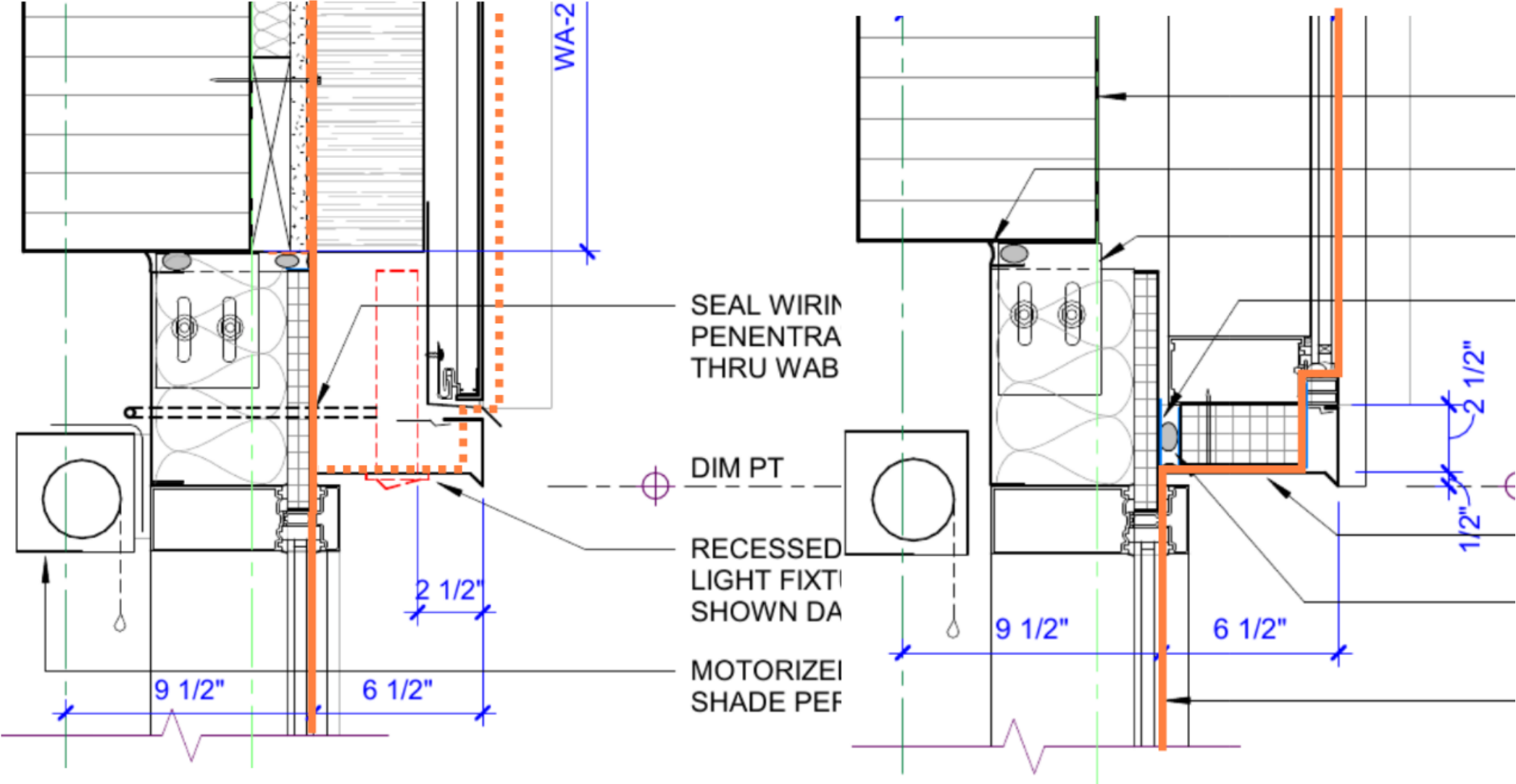




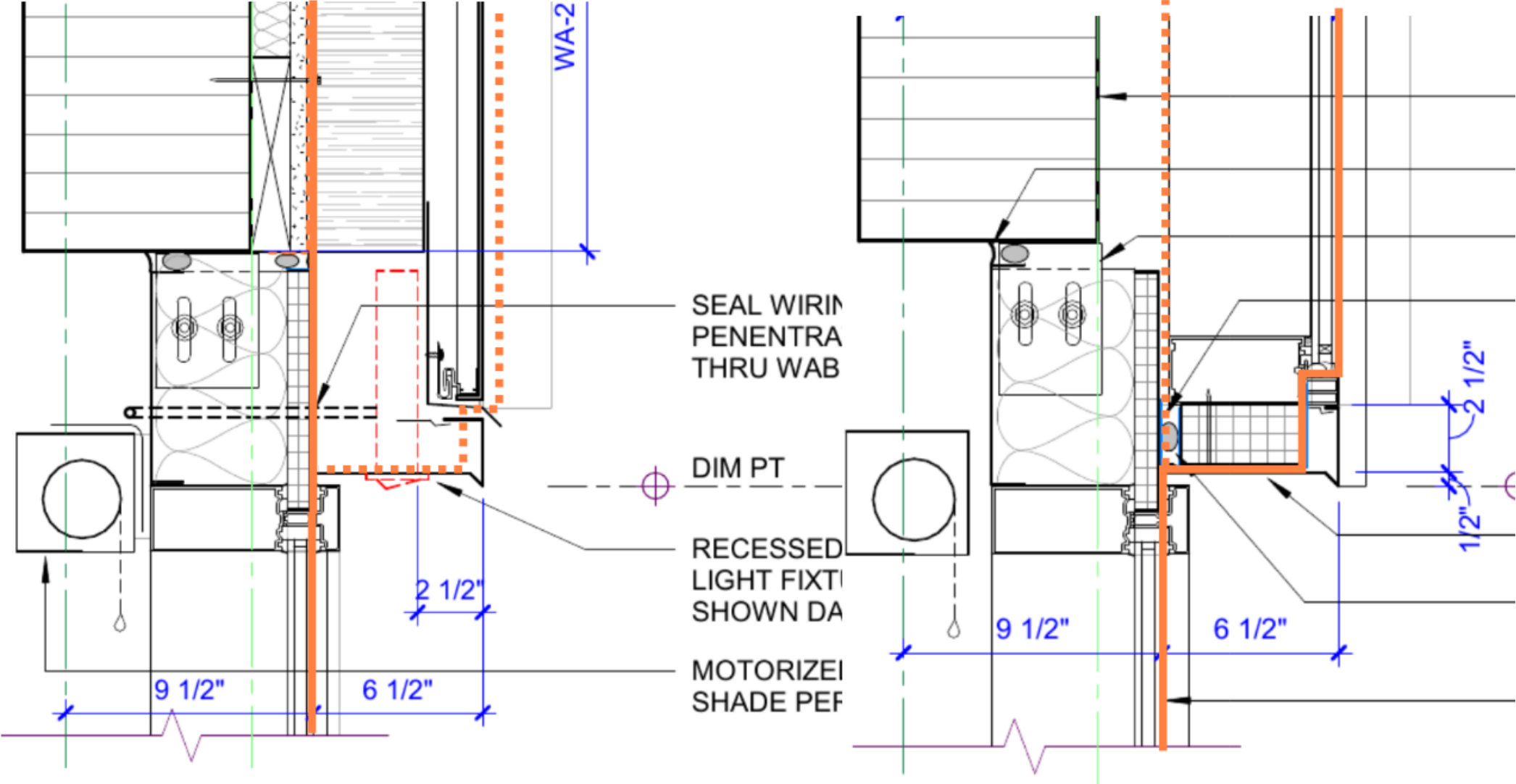
# Curtainwall Metal Siding Transition



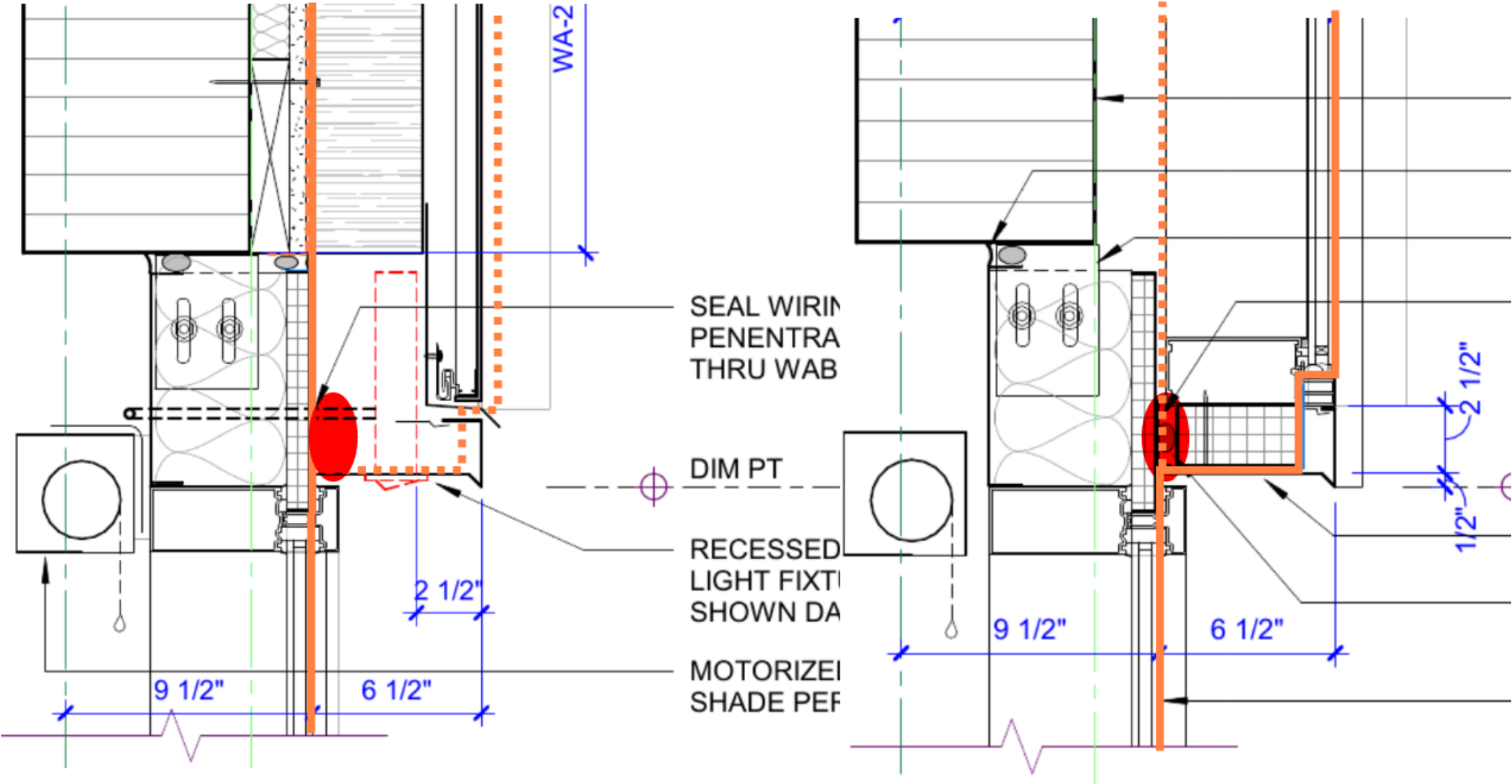
# Curtainwall Metal Siding Transition



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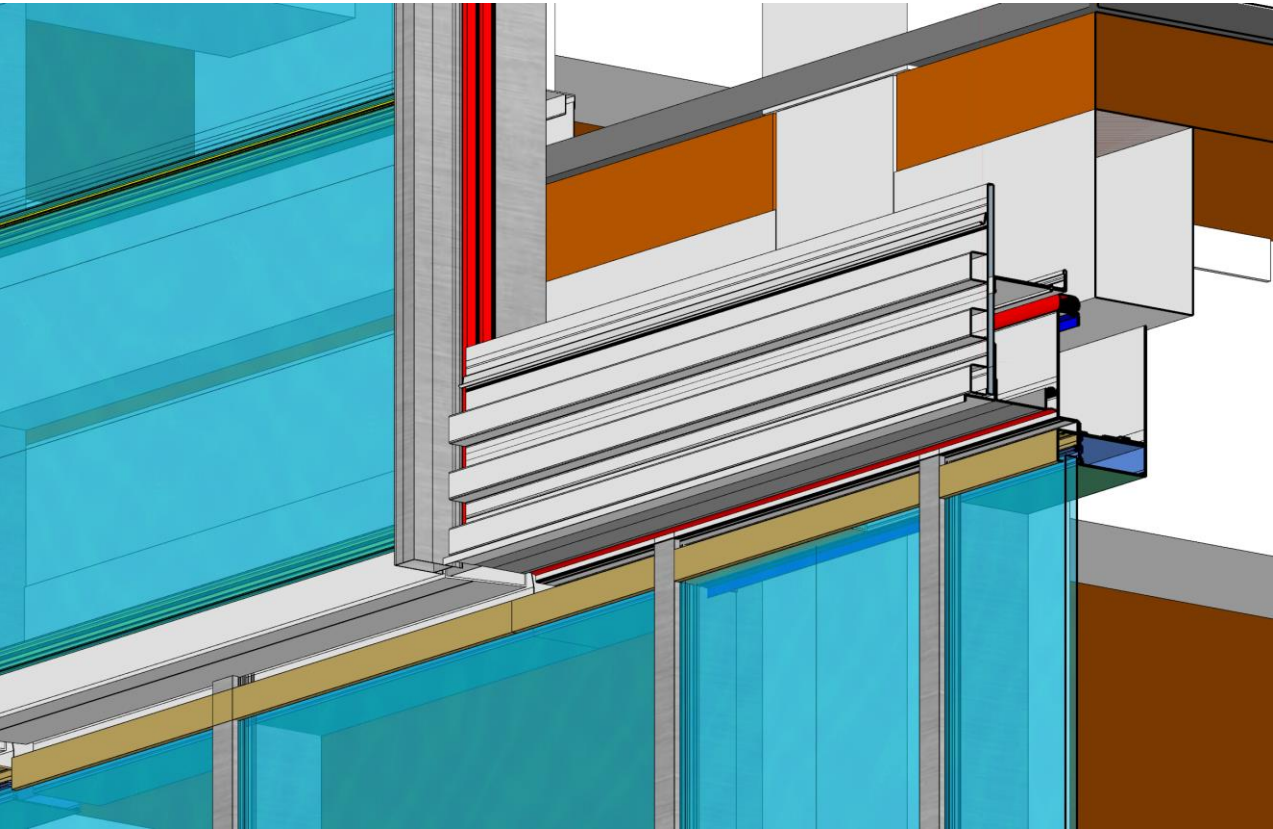
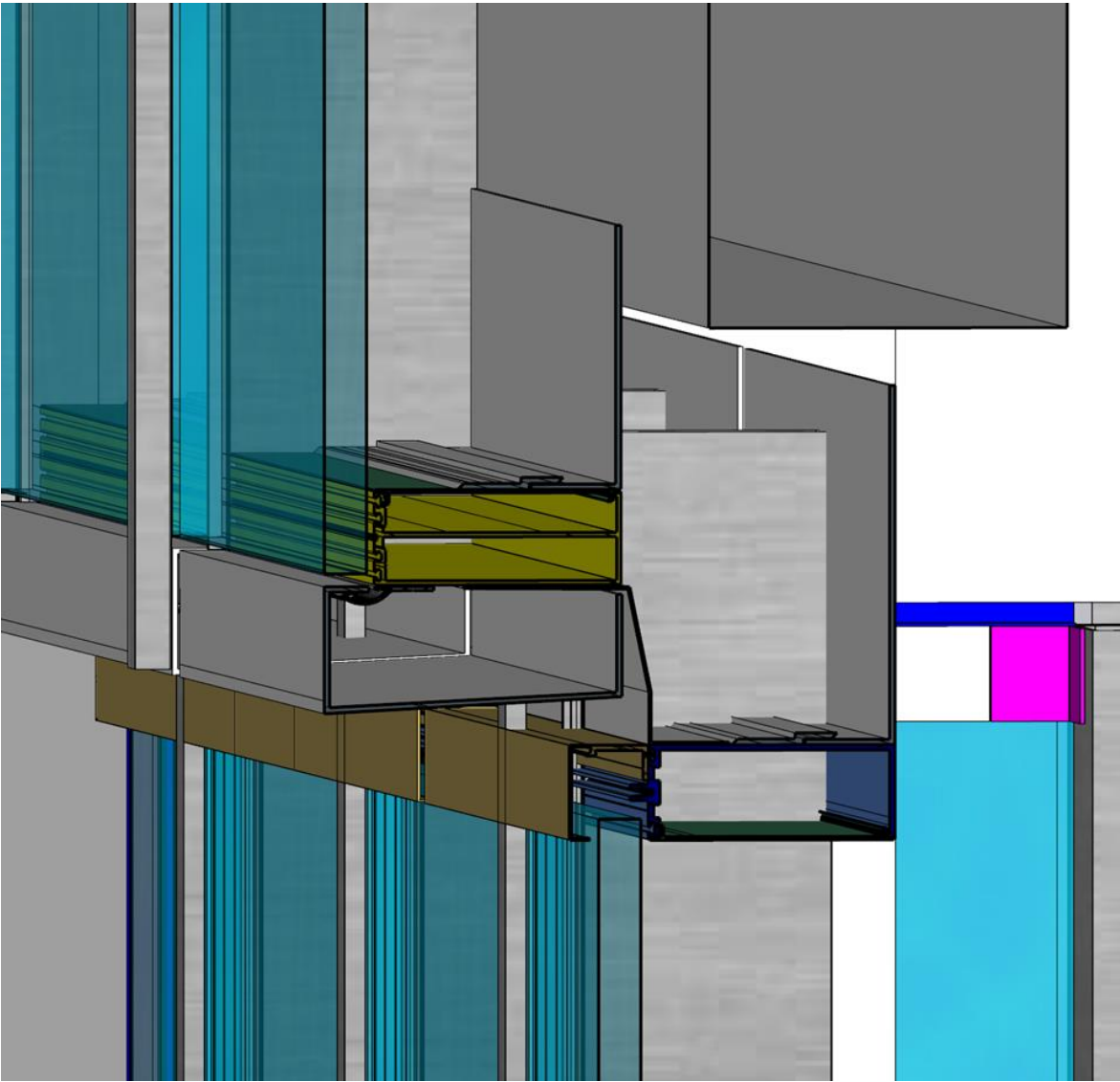


# Curtainwall Metal Siding Transition

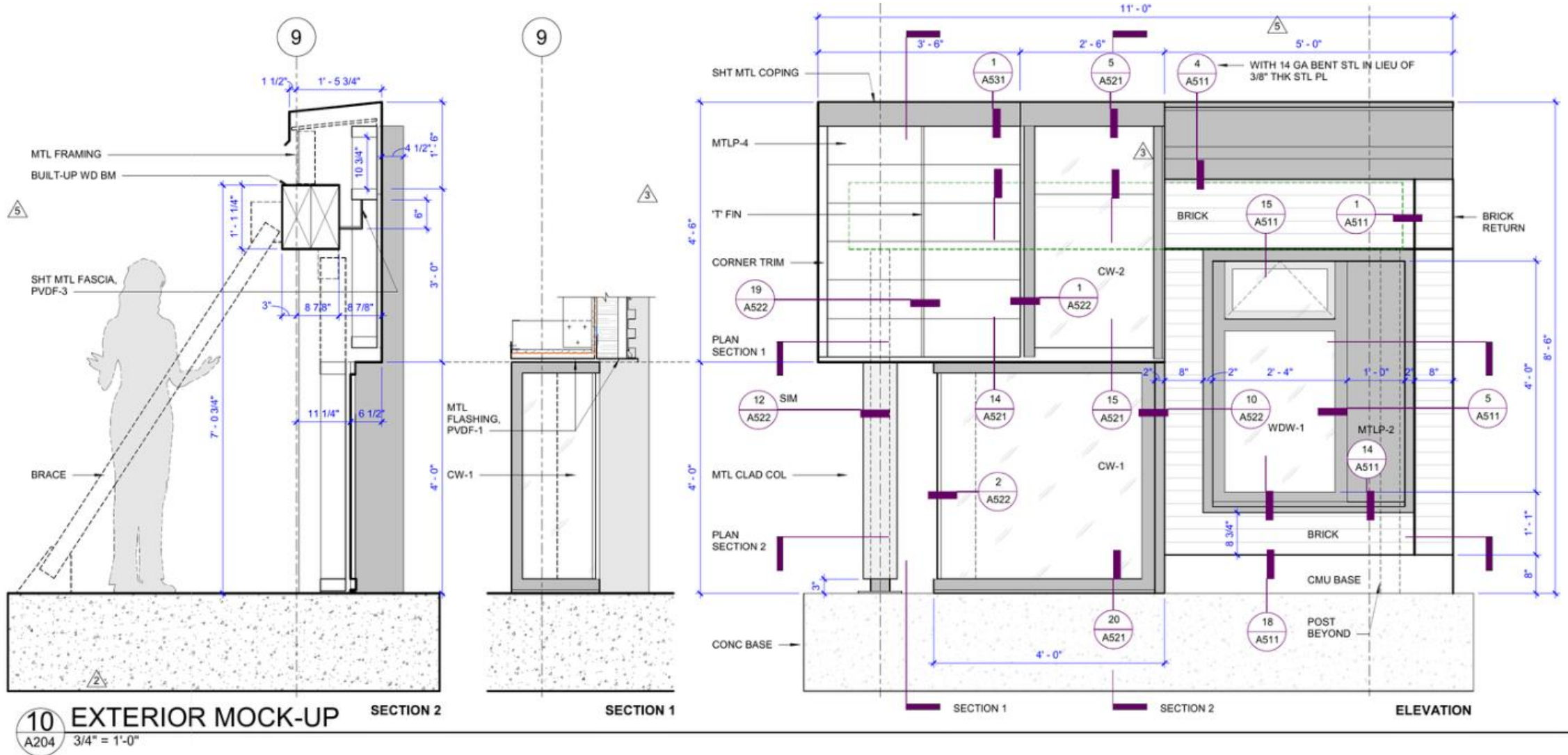




# Curtainwall Metal Siding Transition



# Exterior Mockup













- Confirm that exposed edge of Securock ExoAir 430 at inside and outside wall corners was covered with a thin uniform coat of primer, ExoAir Primer.
- Confirm why there was not sufficient adhesion between Dymonic 100 sealant and ExoAir 430 panels at the field installation. This issue should be reviewed with Tremco.
- Ensure Dymonic 100 sealant apply and tool properly around the knife penetrations to avoid holes and gaps.
- Confirm how the manufacturer requires the 3D corner Proglaze ETA detail be installed per manufacturer recommendations.
- Verify what if any additional sealant is required a masonry and cladding clip screw fasteners.



SV.01.02.A - Fasteners covered with Dymonic 100.



SV.01.02.B - Sheathing joint tooled with Dymonic 100. A min. 3/4" sealant was measured at each



SV.01.02.D - MH observed insufficient adhesion between Dymonic 100 and ExoAir 430 panel.



SV.01.02.E - View of tooled sealant around the knife penetrations on the sheathing.



SV.01.02.F - MH observed multiple holes at one knife through tooled sealant.



# Preinstallation Meetings

- Weather barrier
- Roofing
- Curtainwall / window installation





SV.05.01.C - Sealant over fastener heads appears abraded.



SV.05.02.B - Thru wall flashing installed over base of wall flashing. Termination bar installed at top of thru-wall flashing.

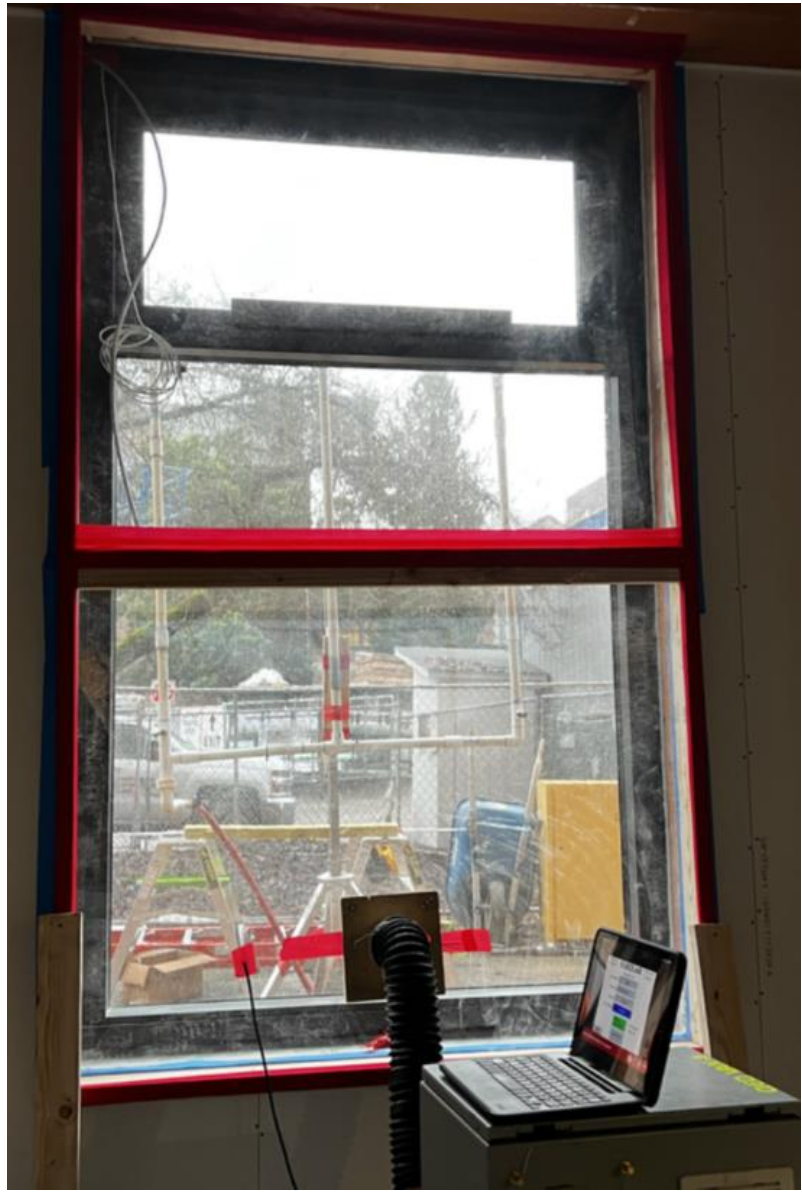


SV.07.02.C - The setting blocks had been placed at the curtain wall sill.



SV.07.02.D - The gap between the horizontal mullion and the concrete surface was measured at 3/4".







BUILDING ENVELOPE ASSEMBLY LEAKAGE RATE:

**UW FOSTER SCHOOL OF BUSINESS:  
FOUNDERS HALL  
NEW CONSTRUCTION  
PERFORMANCE ASSESSMENT**

<b>STRUCTURE:</b>	UW FOSTER SCHOOL OF BUSINESS: FOUNDERS HALL
<b>LOCATION:</b>	SEATTLE, WASHINGTON
<b>ADDRESS:</b>	4215 E STEVENS WAY NE
<b>TEST DATE:</b>	JULY 18, 2022
<b>REPORT ISSUED:</b>	JULY 25, 2022

**TEST ASSESSMENT METHOD:**

ASTM E 779

*Standard Test Method for Determining Air Leakage Rate by Fan Pressurization*

BUILDING FOOTPRINT AREA (SQUARE FEET): 19,230

BUILDING VOLUME (CUBIC FEET): 1,230,196

BUILDING HEIGHT/STORIES (FT): 78 / 6 STORIES

CALCULATED ENCLOSURE AREA (EXCLUDING EXTERIOR UTILITY ROOMS) (SQUARE FEET): 85,254

**6-Sided Air Barrier Evaluation**

**Enclosure Area:** 85,254 square feet  
**Estimated Flow Volume @ 75 Pa:**

**(+) 4,889 CFM (0.057 CFM/SF) PASS**

**(-) 4,793 CFM (0.056 CFM/SF) PASS**

**Target Leakage Rate: 0.150 CFM/SF**

Allowable Leakage Rate  
Not to Exceed:

**12,788 CFM**

**SUMMARY OF TESTING AND RESULTS:**

On July 18, 2022, QED LAB performed a computer automated air exfiltration assessment at UW Foster School of Business: Founders Hall. The project is located at 4215 E Stevens Way NE in Seattle, Washington.

QED LAB performed airflow measurement on the new structure. Not all areas of the building were included within the test area. Testing methodology was in conformance with ASTM E 779: Standard Test Method for Determining Air Leakage Rate by Fan Pressurization and Depressurization per the Seattle Energy Code.



## Hoffman Construction

Bob Vincent  
Eric Sparwasser  
Lisa Tillis  
Michael Repka

## LMN Architects

John Lim

## Morrison-Hershfield

Medgar Marceau  
Sadie Mansour

## Performance Contracting

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Freddy Altamirano-Estrada  
Saul Amaya  
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Dmitriy Andreyev  
Roger Angel-Sanabria  
Dallin Asuega  
Dominic Bauer  
Bryan Berryman  
Tyler Braunbeck  
Austin Bundy  
Marco Carrillo-Altamirano  
Carlos Castillo  
Luis Castillo  
Samphan Chen  
Jana Chev  
Charles Coleman  
Shaun Cross  
Jerry Custer  
Garret D-Ambra  
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Kenneth Pitts  
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Diego Rosales-Guadalupe  
Jose Rubio  
Martin Ruiz-Guadalupe  
Juan Santamaria-Textucucano  
Takoda Savoy  
Micah Sleeper  
Randal Sloan  
Douglas Snyder  
Danny Solorzano-Lievano  
Ryon Spitzenberg

Charles Thomas  
Casey Torres  
Travis VanVleck  
Jesus Villa-Lopez  
Brandon Watson  
Joseph Wilson  
Claude Wren  
Emmanuel Zuniga  
Ricardo Zuniga

## Snyder Roofing

Michael Adame  
Lamarcus Callender  
Morakat Chanthaphanith  
Walter Cribbe  
Eric Delgado-Rodriguez  
Justin Detweiler  
Cory Garcia  
Marco Garcia  
Michael Hall  
Edgar Hernandez Meza  
Ricardo Hernandez Meza  
Roberto Israel  
Joseph Jones  
Jayden Lassic  
Nathan Linder  
Alan McPherson  
Avery Meyer  
Daniel Mitchell  
Martin Morrow  
Jose Ochoa-Becerra  
Juan Ochoa-Hernandez  
Israel Pedroza Rojas  
Felipe Sanchez Padilla

## Herzog Glass

Pedro Telles  
Alexander Till  
John Till  
Abel Torres  
Joshua Whited  
Colin Adams  
Blaze Barber  
Justin Barton  
Joseph Benson  
Patrick Benson  
Jason Bisbee  
Joshua Blomberg  
Evan Cataline  
Chris Cory  
Brandon Dunham  
Jeffrey Ford  
Sean Hopkins  
Corey Kerrigan  
Brian Korrell  
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Andrew Minor  
Mark Nigh

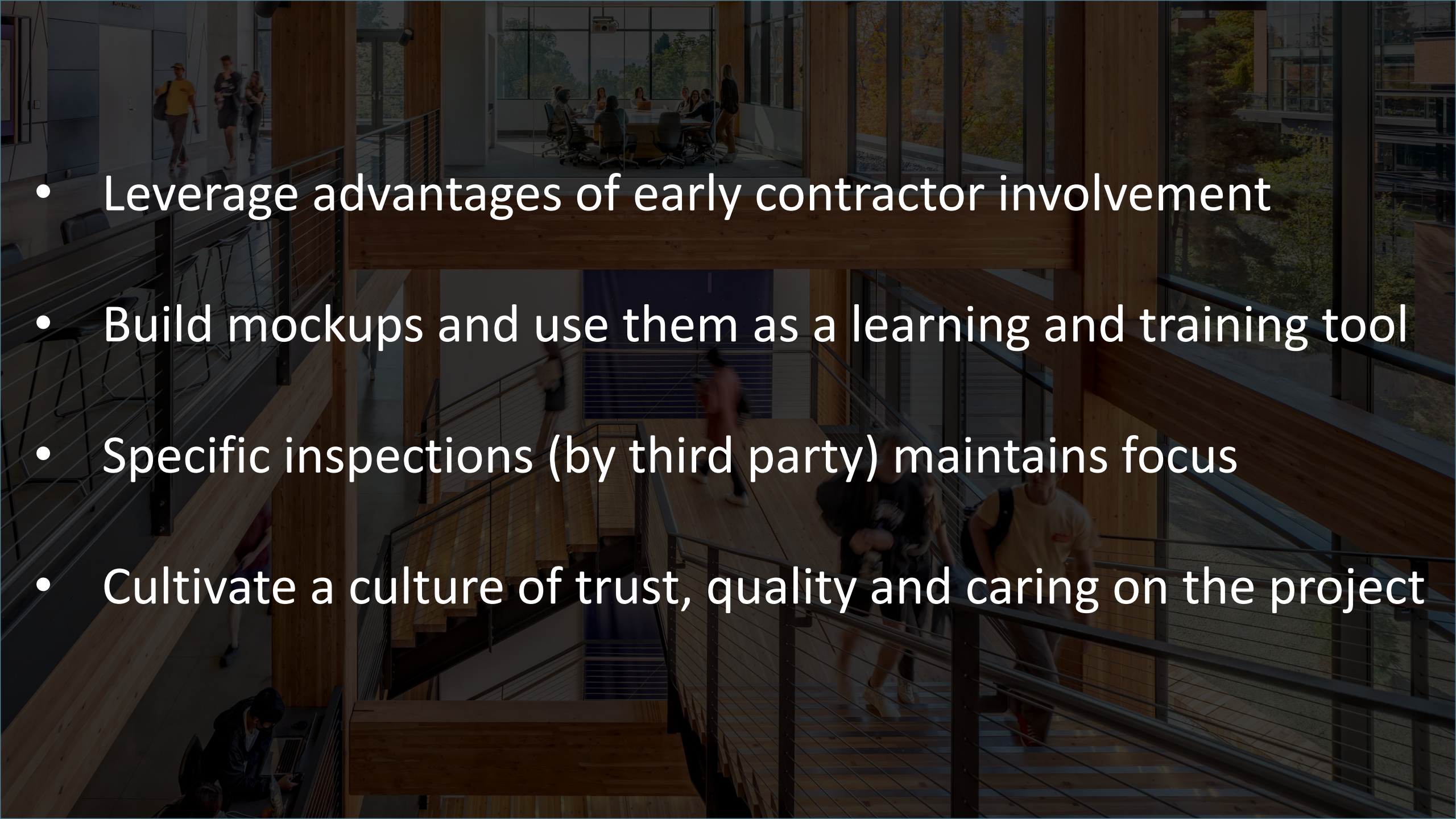
## UniPro Sealants

Christopher Albert  
Austin Gregory  
Fernando Hernandez-Govea  
Maurice Reed

Adam O'Bannon  
Edgar Ortiz  
Nicholas Paul  
Brett Reynolds  
Kyle Ribail  
Khae Saelor  
San Saelor  
Juan Salinas  
Jeremy Samley  
Robert Sharff  
Tyler Torell  
JP Martin  
Brett Reynolds





- 
- The background image shows a modern, multi-level office building interior. The space is characterized by large windows, wooden accents, and a clean, professional atmosphere. People are seen working at desks, walking on upper levels, and meeting in a conference room. The overall design is bright and open, with a focus on collaboration and productivity.
- Leverage advantages of early contractor involvement
  - Build mockups and use them as a learning and training tool
  - Specific inspections (by third party) maintains focus
  - Cultivate a culture of trust, quality and caring on the project



FOUNDERS HALL

FOSTER



