



**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

National Institute of Building Sciences

Provider Number: G168

Considerations for Selecting a Glazed Wall System

Course Number --

Xiu T. Li, P.E. (CA)

Date 1/10/18





BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

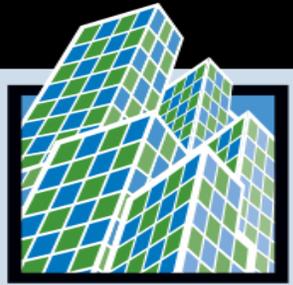
CONFERENCE & EXPO

Credit(s) earned on completion of this course will be reported to **AIA CES** for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with **AIA CES** for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.





BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Course Description

Most building have a variety of facade cladding systems. Selection of the glazed wall system should be performed in conjunction with the facade cladding system for a complete approach to the exterior skin. The speaker will review facade cladding and glazed system transition and integration from an air, water, vapor and thermal perspective. In this presentation, the speaker will give an overview of typical details for windows, storefronts, window wall and curtain wall assemblies; show representative transition details for each glazed system to various exterior facade systems to illustrate the potential challenges, advantages and disadvantages of each glazed wall system as it relates to these different details; and present case studies that follow the design details through shop drawings, mock-ups and construction.





**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Objective: Select the Glazing System



Source: <https://philly.curbed.com/2017/2/6/14520520/hamilton-tower-project-logan-square-groundbreaking>



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

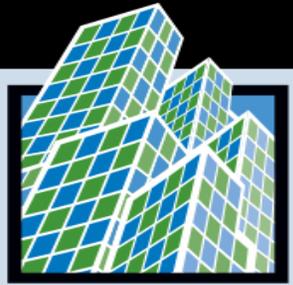
CONFERENCE & EXPO

Learning Objectives

At the end of the this course, participants will be able to:

1. Incorporate the structure in the glazing system selection.
2. Integrate the air, water, vapor and thermal barriers of glazing systems at the transition to facade cladding system.
3. Identify the advantages and disadvantages of different glazing systems based on transitions to adjacent facade cladding
4. Improve glazing system details based on lessons learned.



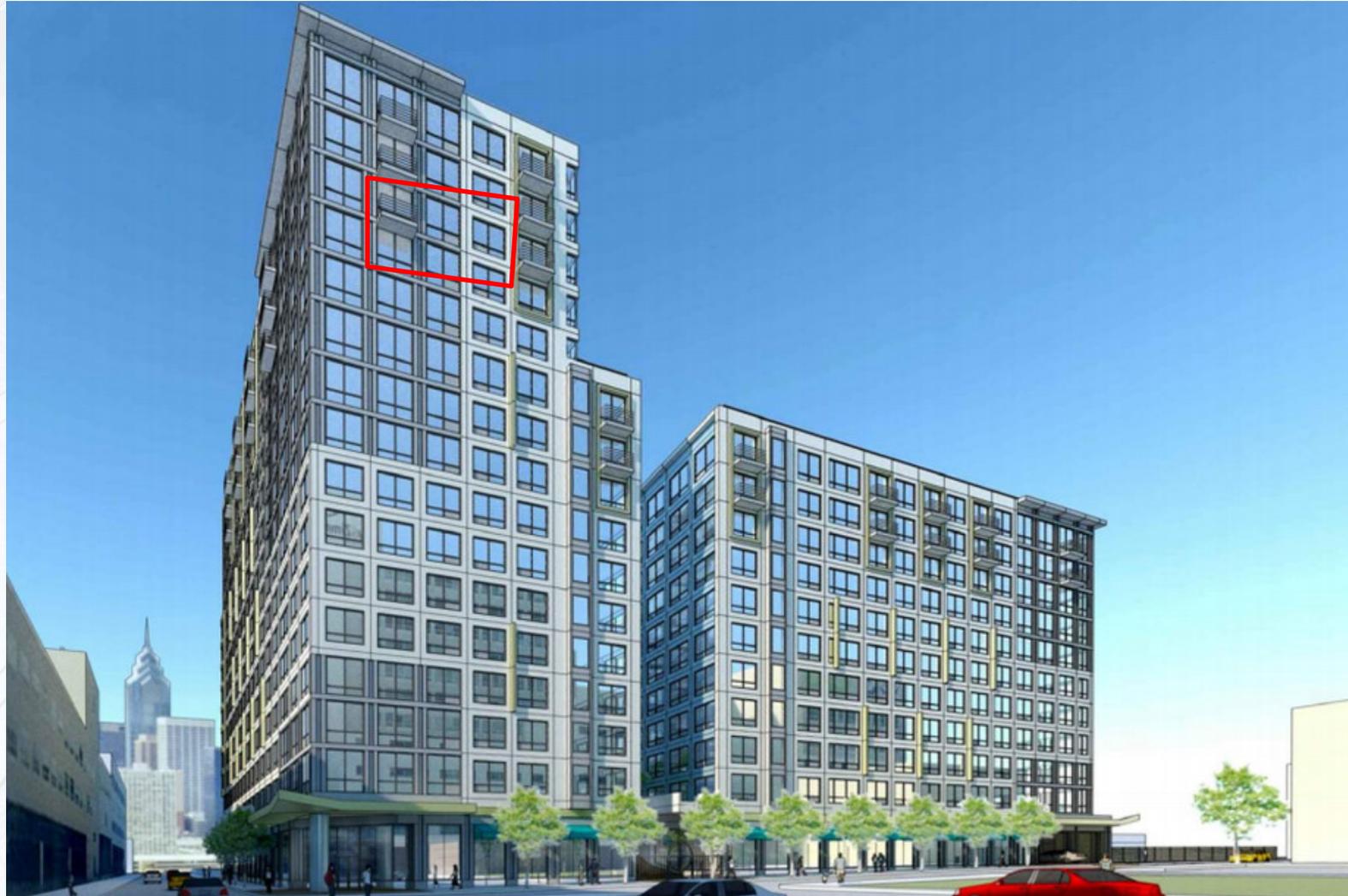


**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Objective: Select the Glazing System



Source: <https://philly.curbed.com/2017/2/6/14520520/hamilton-tower-project-logan-square-groundbreaking>



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Structural Considerations of Glazing System Selection

1. Movement joint is located at perimeter of the glazing system – (depends on exterior framing).
2. Position of glazing system relative to the structure.
3. Whether glazing system spans multiple floors.

		Glazing System Type		
		<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>
Structural Consideration	1. Deflection Joint			
	2. Glazing System Position Relative to Structure	Recessed		
		Flush		
		Projected		
	3. Slab-to-Slab			



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Exterior Cladding Design Requirements Based on Exterior Framing

- Shear wall
- Balloon framed
- Platform framed



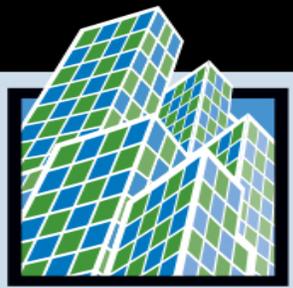
**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Exterior Cladding Design Requirements Based on Exterior Framing

- Shear wall
 - No movement joint.
- Balloon framed
 - May need to design for deflection joints.
- Platform framed
 - Design for deflection joints.



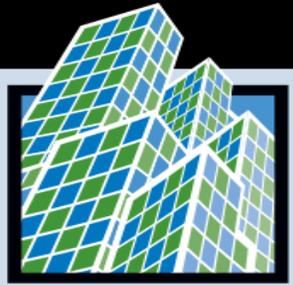
**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Exterior Cladding Design Requirements Based on Exterior Framing

- Shear wall
 - No movement joint.
- Balloon framed
 - May need to design for deflection joints.
- Platform framed
 - Design for **deflection joints**.



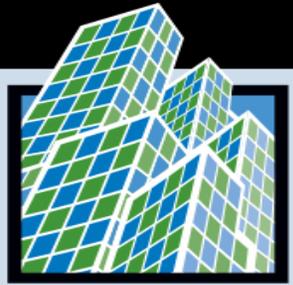
**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Methods of Accommodating Deflection

- Option 1
 - “Large Joint”
 - Slip connection between glazing system and the framing.
- Option 2
 - Receptor System (storefront systems).



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

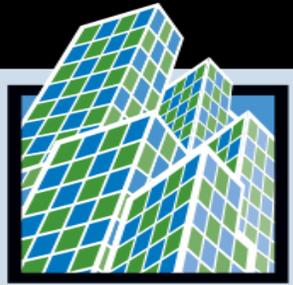
CONFERENCE & EXPO

Considerations of Glazing System Selection

1. Movement joint present at perimeter of the glazing system.

		Glazing System Type		
		<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>
Structural Consideration	1. Deflection Joint	Limited manufacturers	Yes.	Yes.
	2. Glazing System Position Relative to Structure	Recessed		
		Flush		
		Projected		
	3. Slab-to-Slab			

2. Position of glazing system relative to the structure.
3. Exterior framing and slab construction.



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Considerations of Glazing System Selection

1. Movement joint present at perimeter of the glazing system.
2. Position of glazing system relative to the structure.

		Glazing System Type		
		<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>
Structural Consideration	1. Deflection Joint	Limited Manufacturers	Yes.	Yes.
	2. Glazing System Position Relative to Structure	Recessed		
		Flush		
		Projected		
	3. Slab-to-Slab			

3. Exterior framing and slab construction.

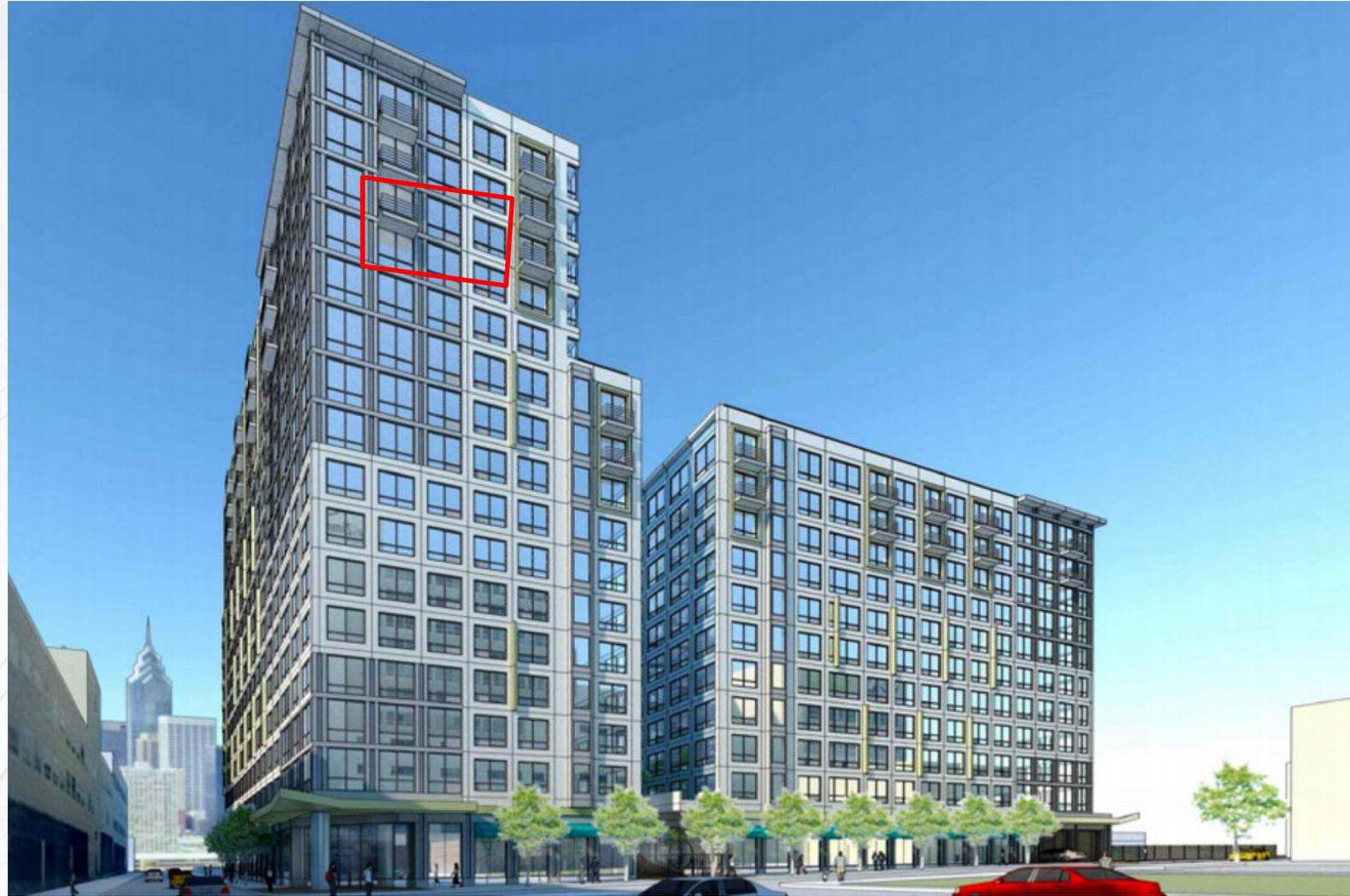


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Objective: Select the Glazing System



Source: <https://philly.curbed.com/2017/2/6/14520520/hamilton-tower-project-logan-square-groundbreaking>



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

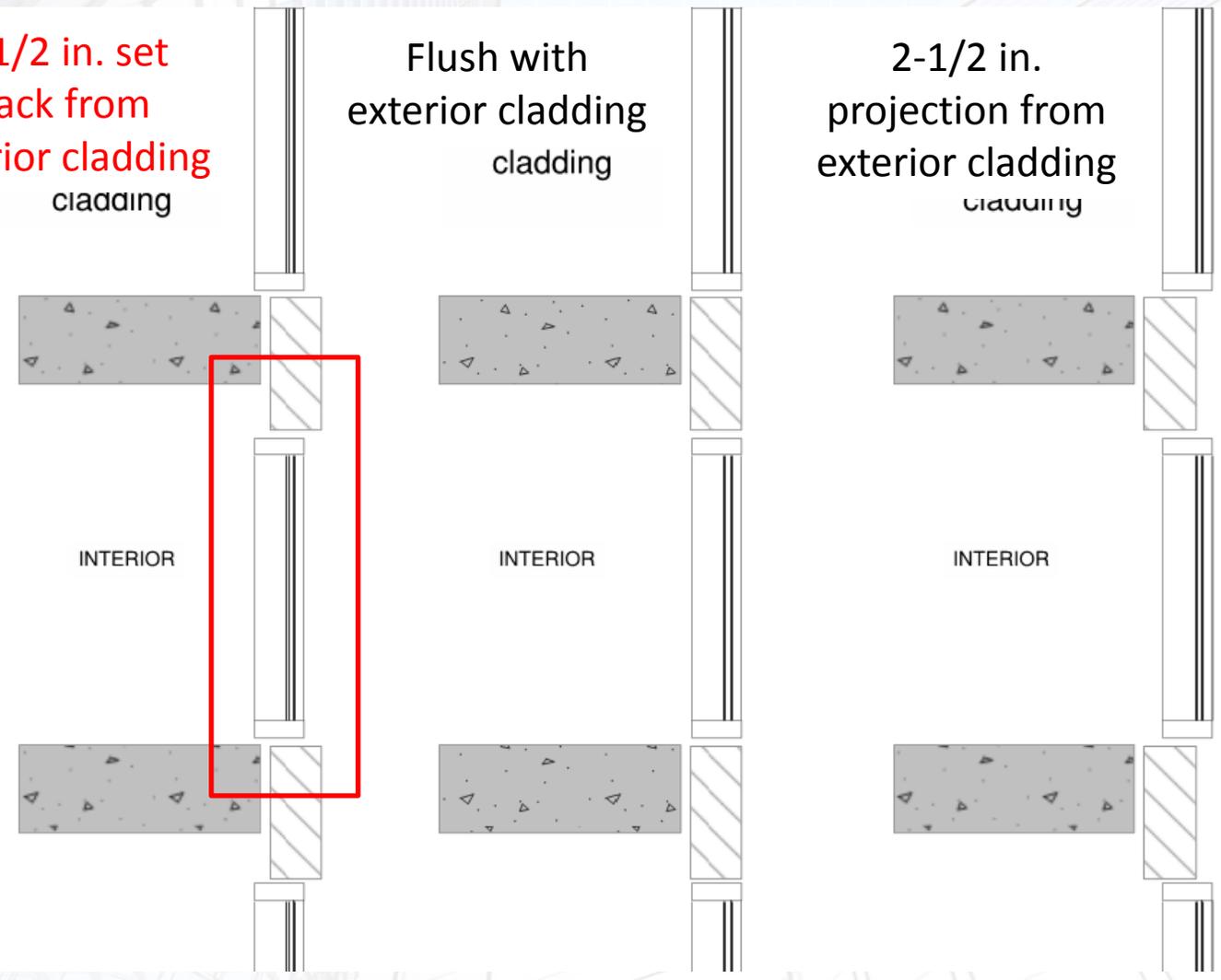
CONFERENCE & EXPO

Position of glazing system relative to the structure

2-1/2 in. set back from exterior cladding

Flush with exterior cladding

2-1/2 in. projection from exterior cladding





BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

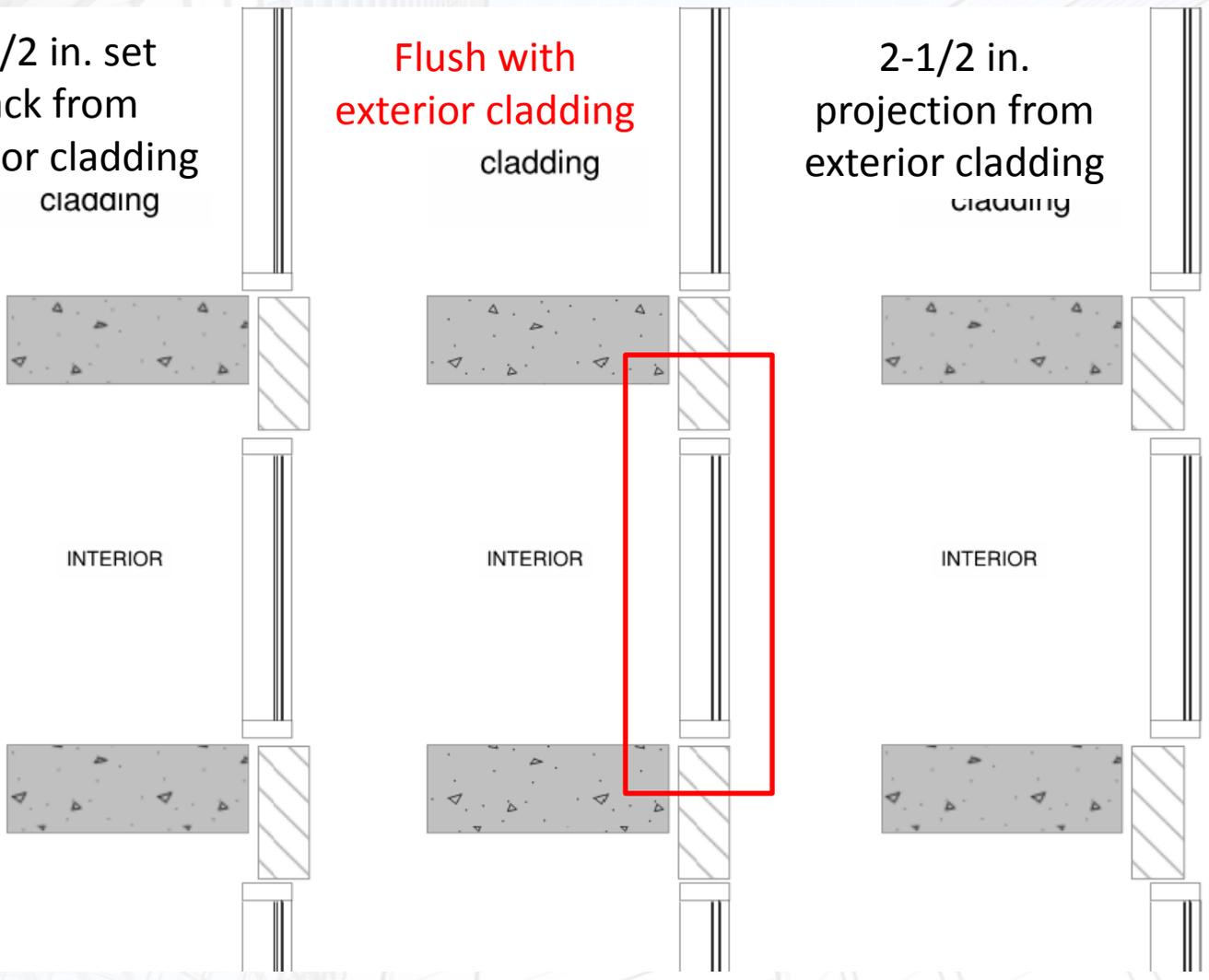
CONFERENCE & EXPO

Position of glazing system relative to the structure

2-1/2 in. set back from exterior cladding

Flush with exterior cladding

2-1/2 in. projection from exterior cladding



INTERIOR

INTERIOR

INTERIOR



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

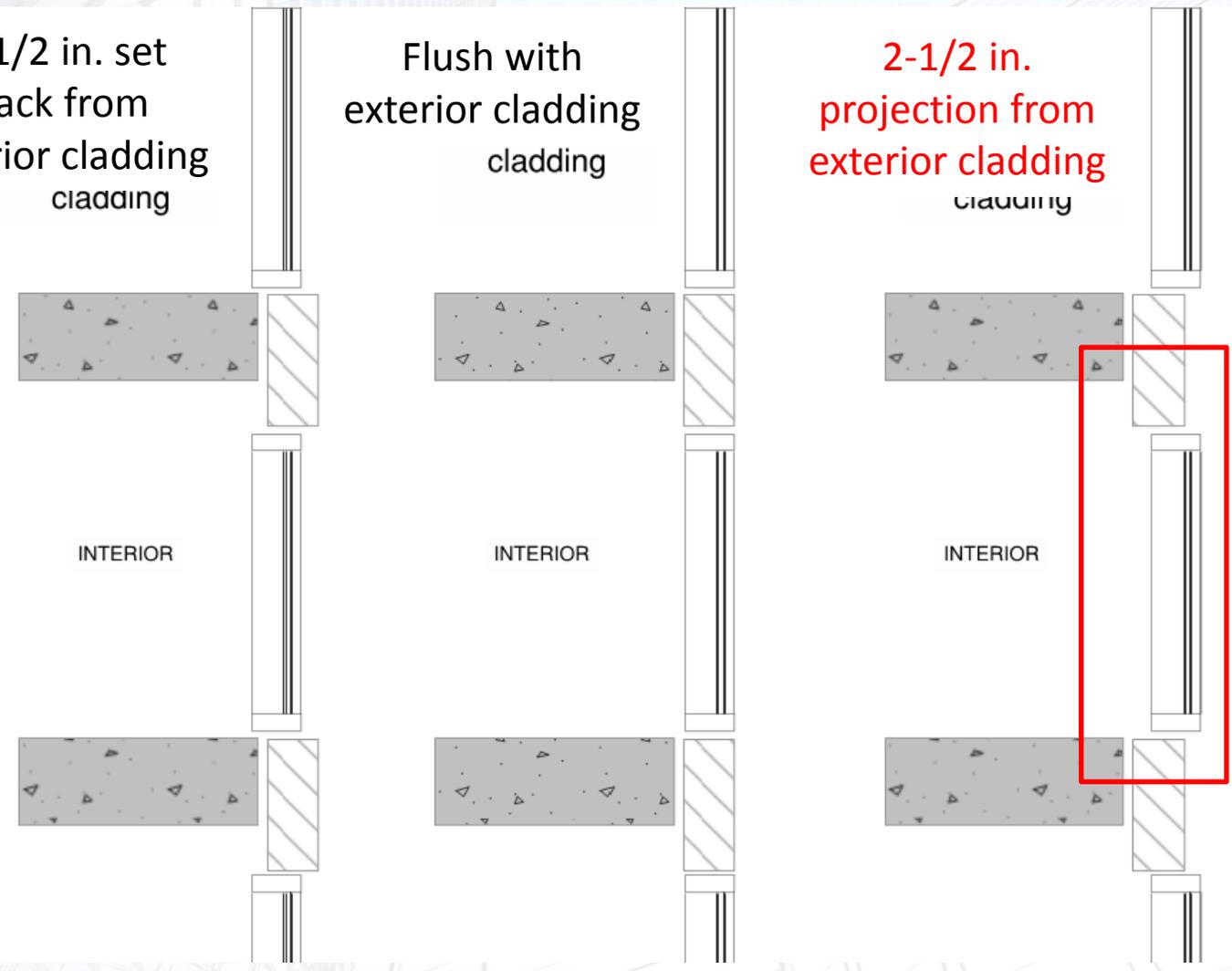
CONFERENCE & EXPO

Position of glazing system relative to the structure

2-1/2 in. set back from exterior cladding

Flush with exterior cladding

2-1/2 in. projection from exterior cladding



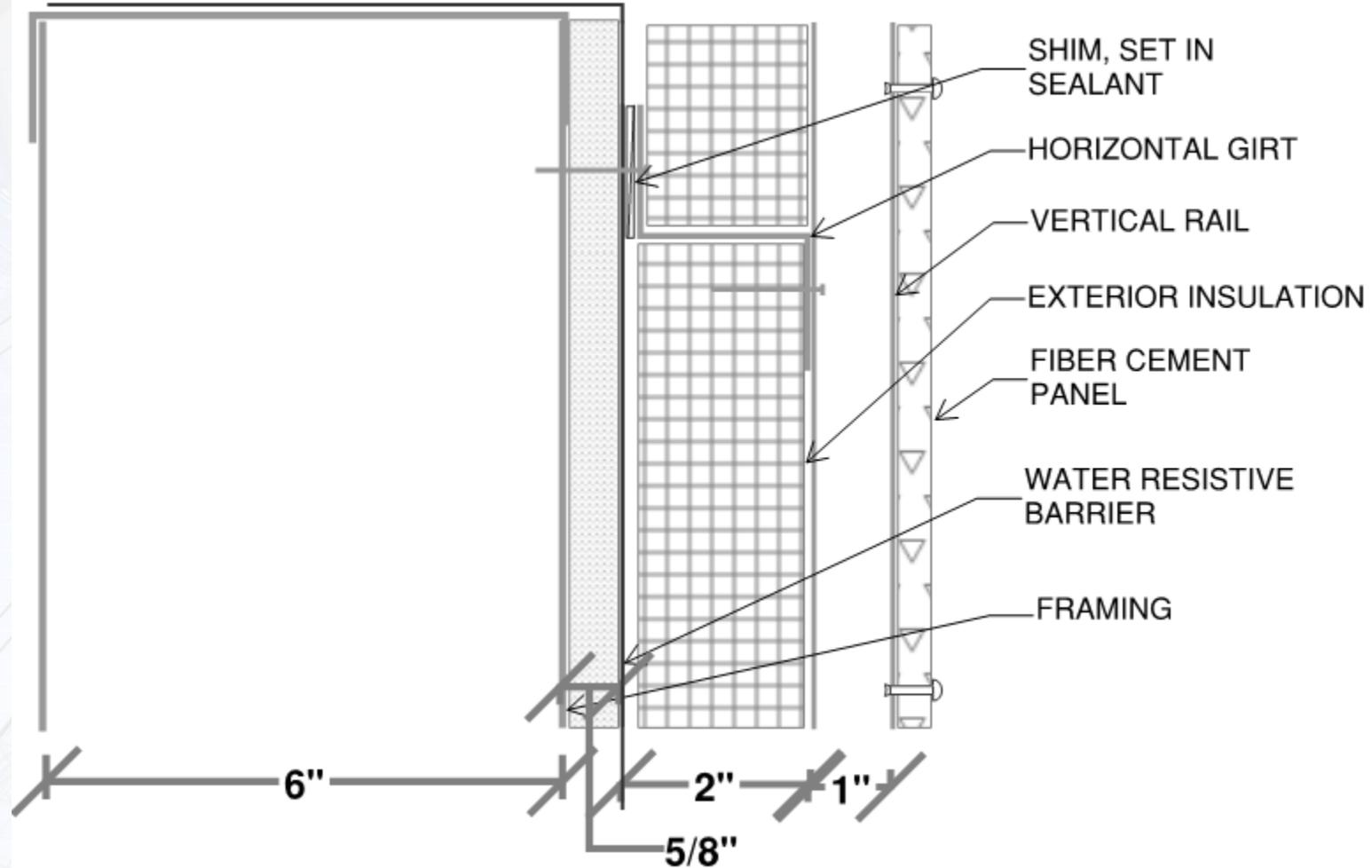


**BUILDING
INNOVATION** 2018

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Exterior Cladding = Fiber Cement Panels





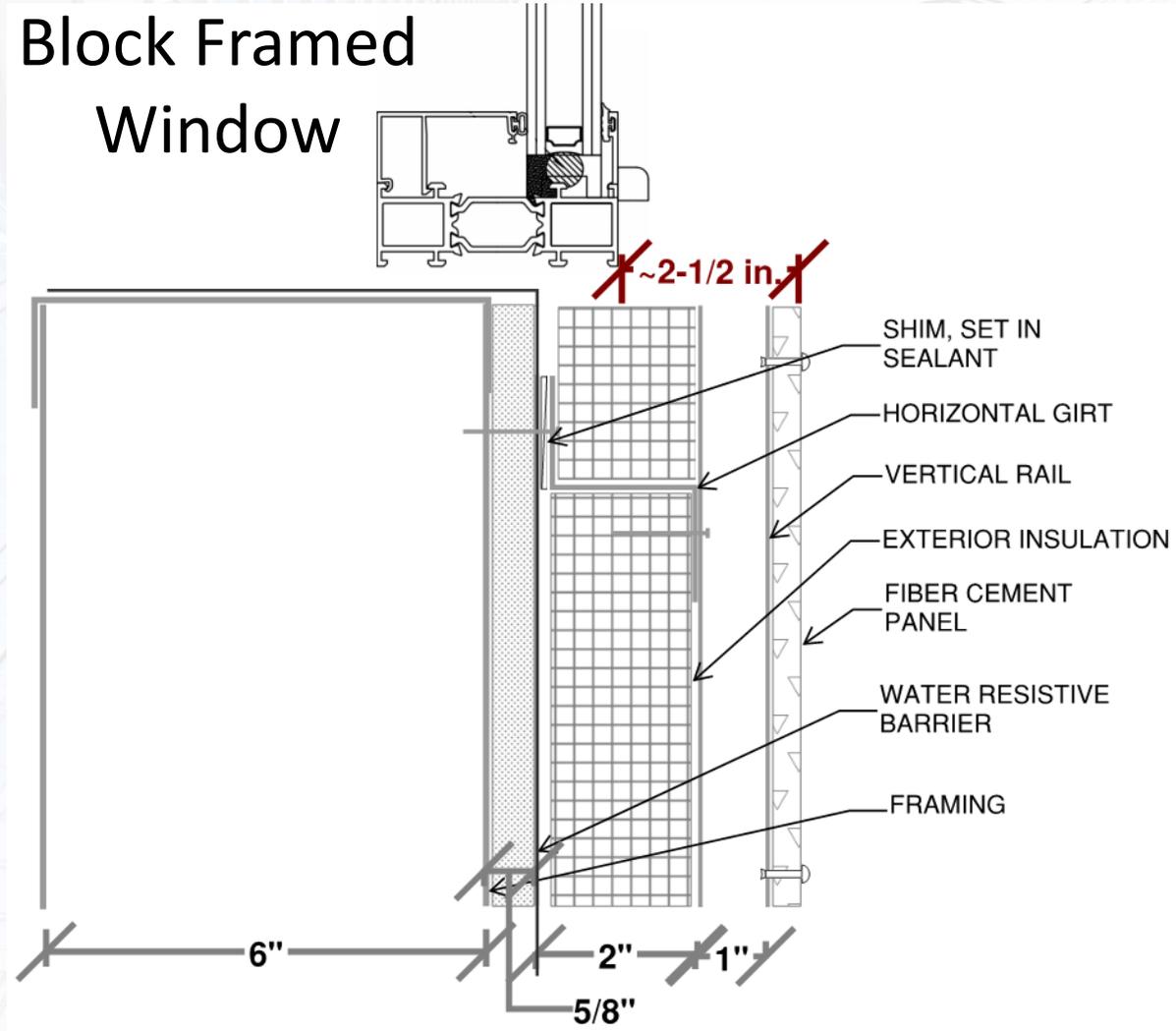
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

~2-1/2 in. Setback from Exterior Cladding

Block Framed Window





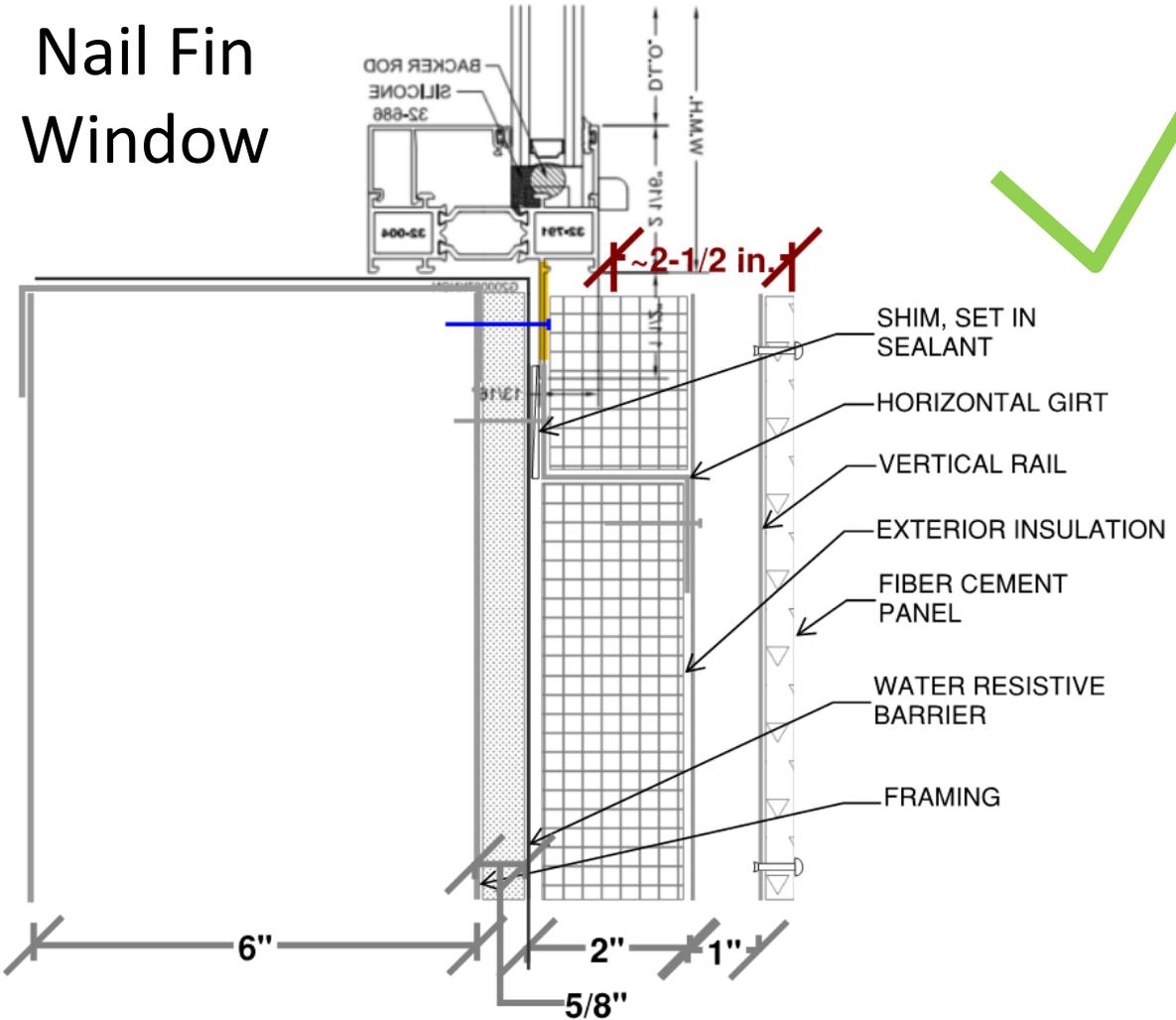
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

~2-1/2 in. Setback from Exterior Cladding

Nail Fin Window





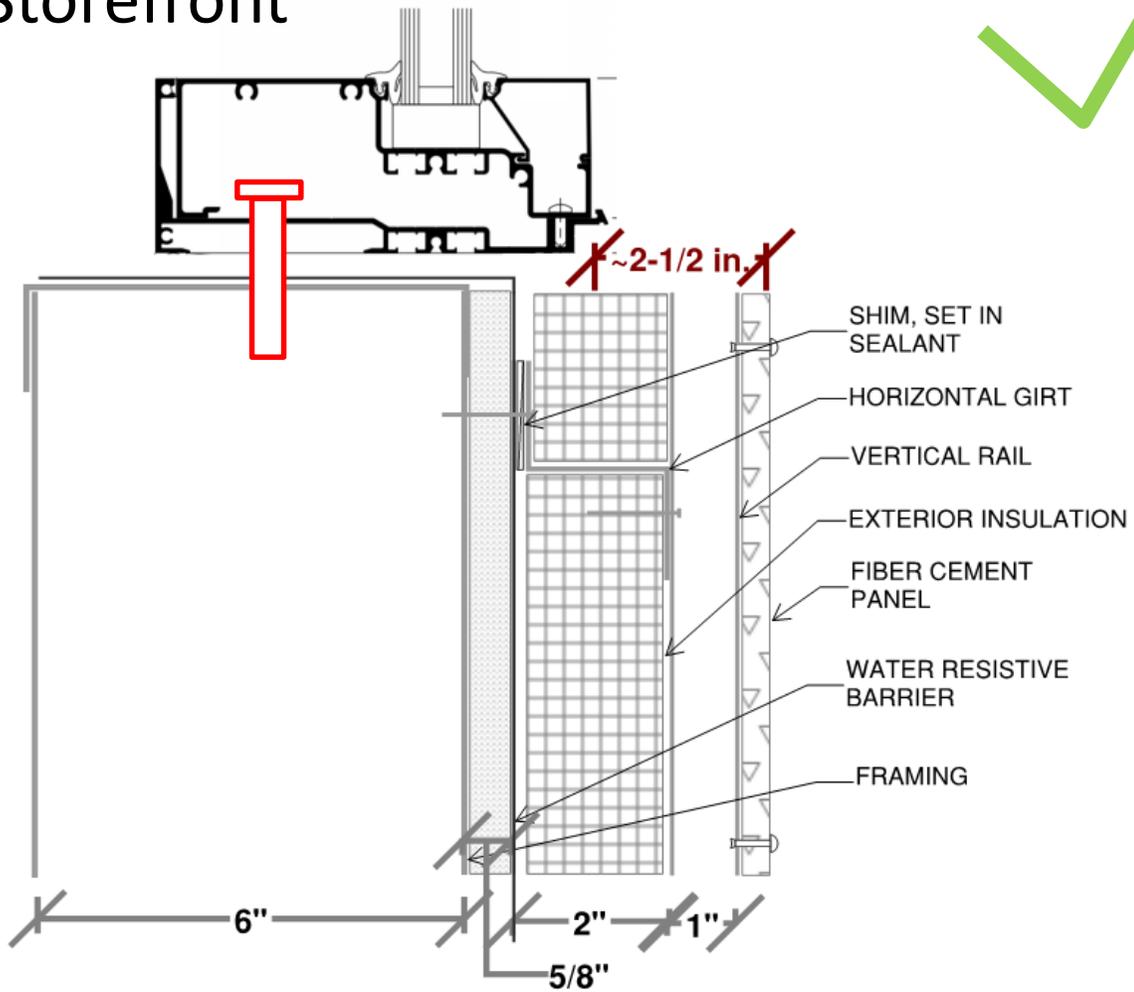
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

~2-1/2 in. Setback from Exterior Cladding

Storefront





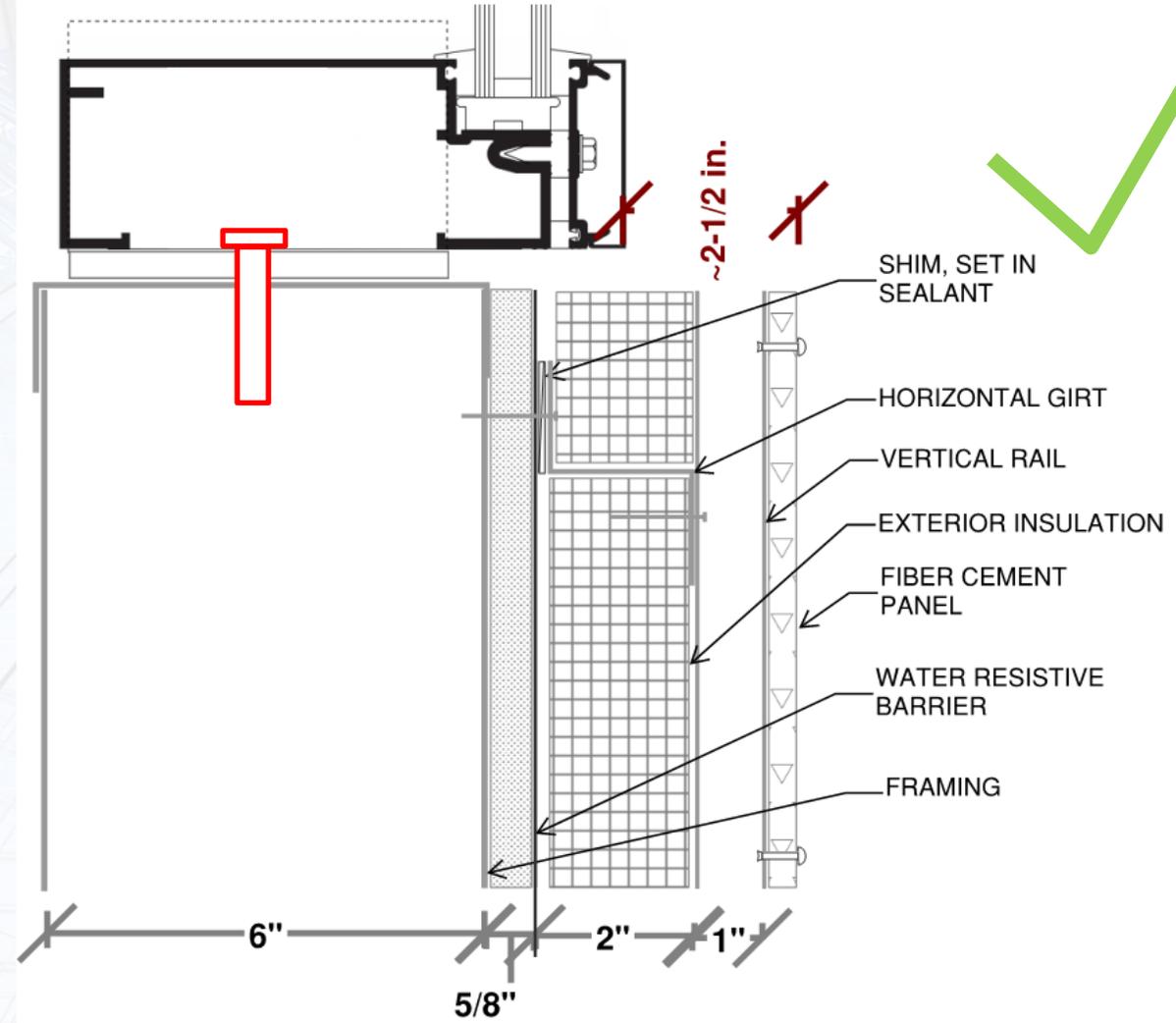
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

~2-1/2 in. Setback from Exterior Cladding

Curtain Wall





BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Considerations of Glazing System Selection

1. Movement joint present at perimeter of the glazing system.
2. Position of glazing system relative to the structure.

		Glazing System Type			
		<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>	
Structural Consideration	1. Deflection Joint	Limited Manufacturers	Yes.	Yes.	
	2. Glazing System Position Relative to Structure	Recessed	Yes.	Yes.	Yes.
		Flush			
		Projected			
	3. Slab-to-Slab				

3. Exterior framing and slab construction.



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Considerations of Glazing System Selection

1. Movement joint present at perimeter of the glazing system.
2. Position of glazing system relative to the structure.

		Glazing System Type			
		<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>	
Structural Consideration	1. Deflection Joint	Limited Manufacturers	Yes.	Yes.	
	2. Glazing System Position Relative to Structure	Recessed	Yes.	Yes.	Yes.
		Flush			
		Projected			
	3. Slab-to-Slab				

3. Exterior framing and slab construction.



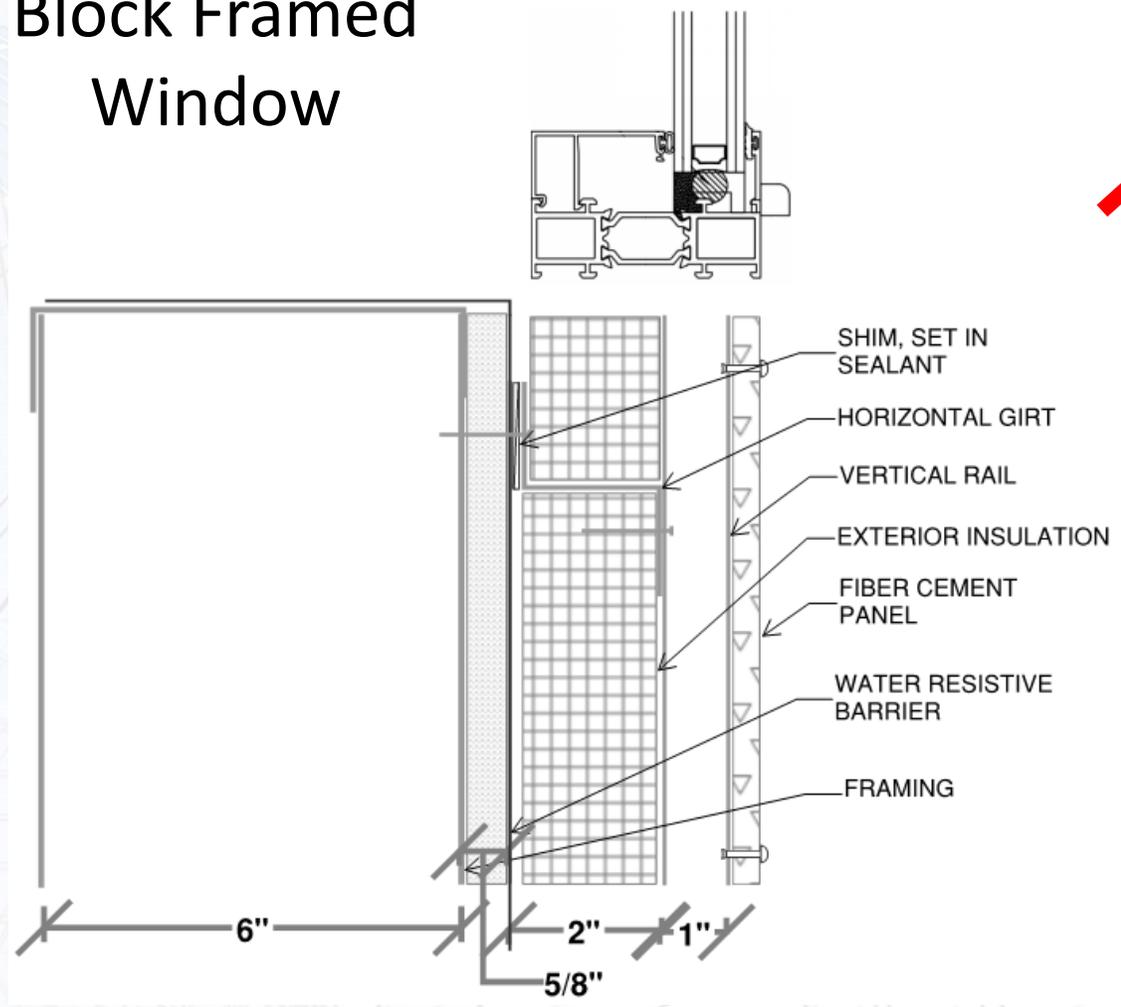
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Flush with Exterior Cladding

Block Framed Window



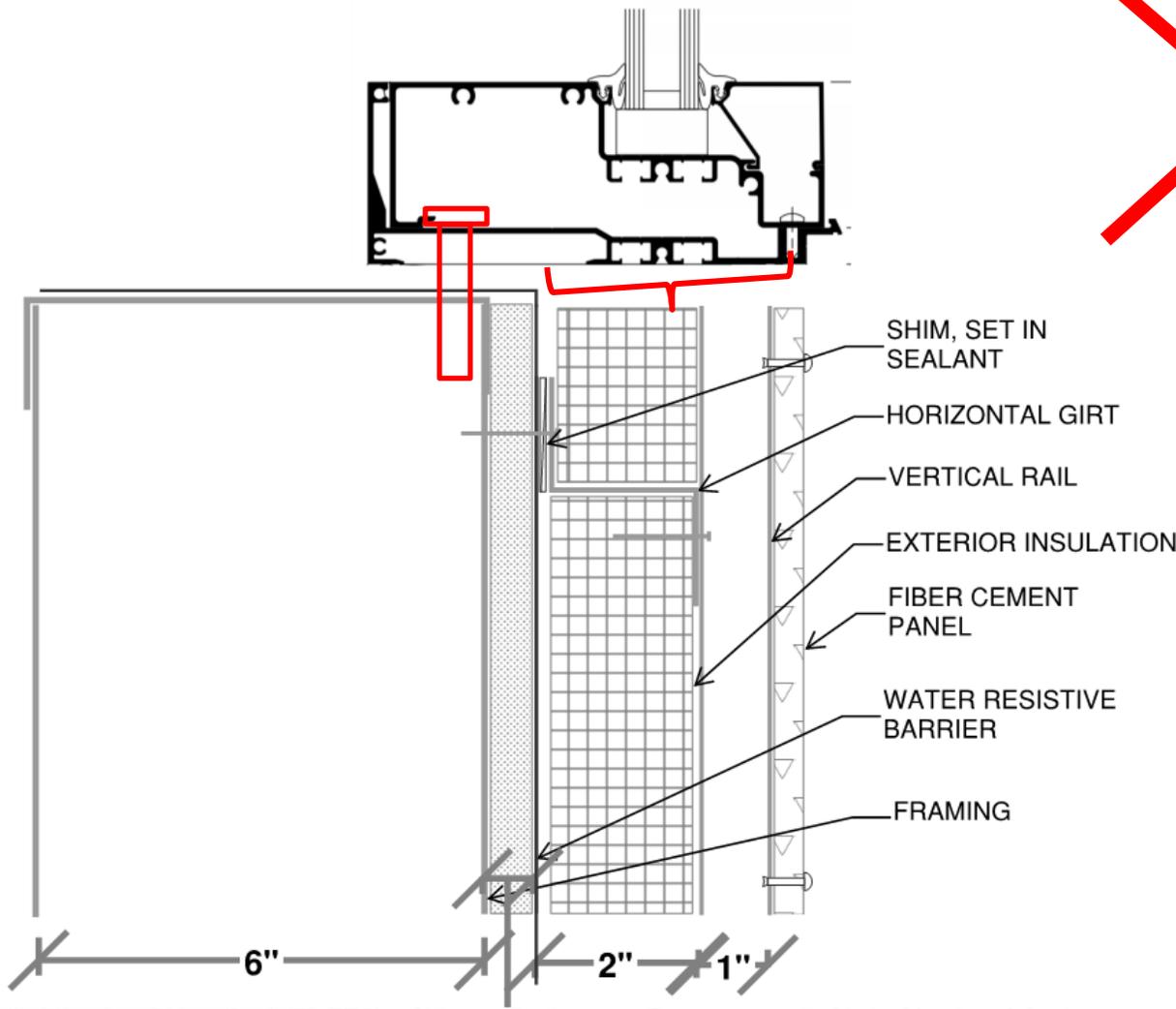


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Flush with Exterior Cladding



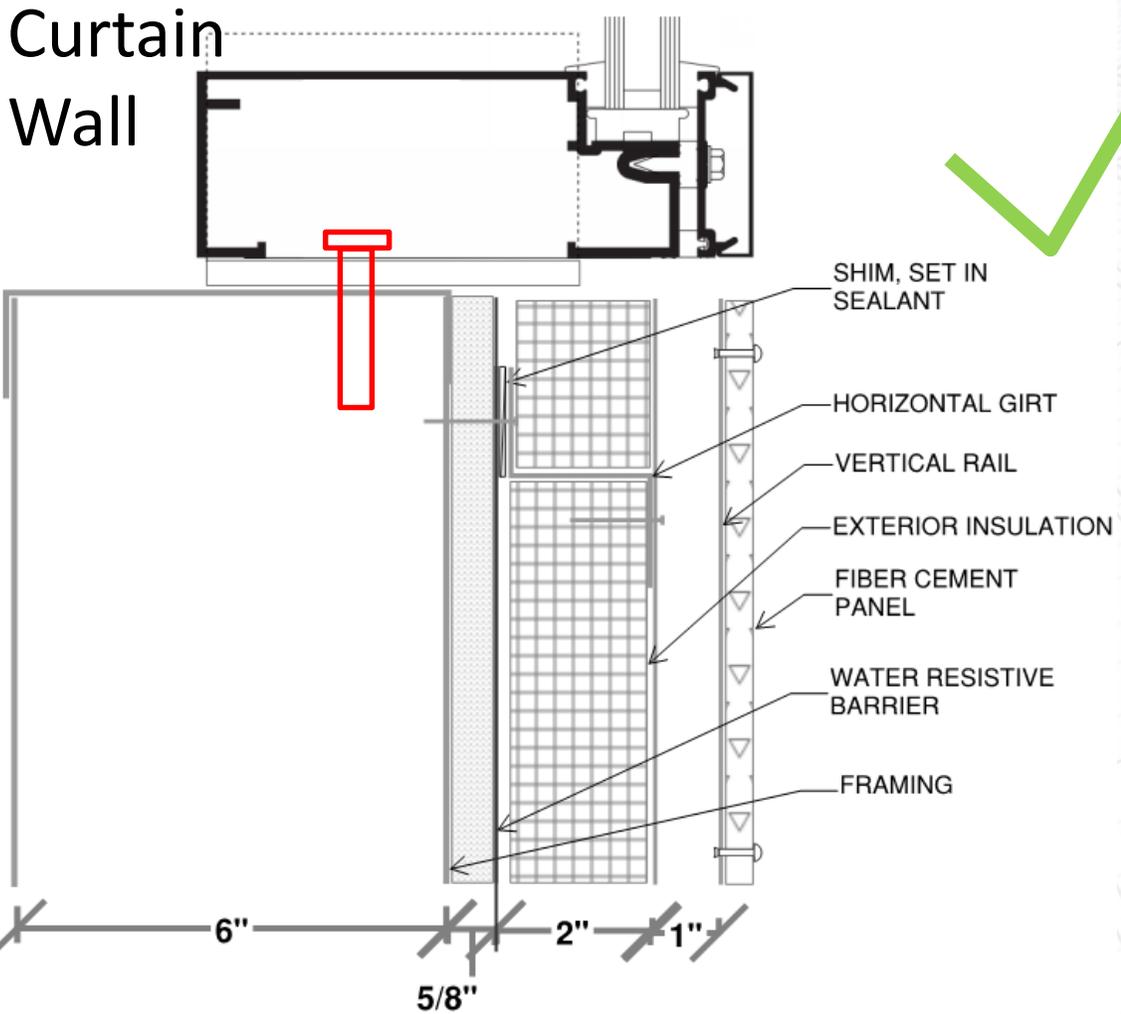


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Flush with Exterior Cladding





BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

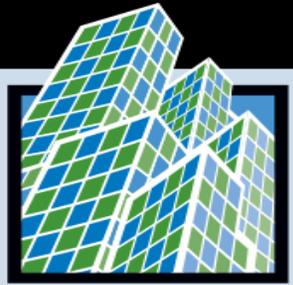
CONFERENCE & EXPO

Considerations of Glazing System Selection

1. Movement joint present at perimeter of the glazing system.
2. Position of glazing system relative to the structure.

		Glazing System Type			
		<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>	
Structural Consideration	1. Deflection Joint	Limited Manufacturers	Yes.	Yes.	
	2. Glazing System Position Relative to Structure	Recessed	Yes.	Yes.	Yes.
		Flush	No.	No.	Yes.
		Projected			
	3. Slab-to-Slab				

3. Exterior framing and slab construction.



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Considerations of Glazing System Selection

1. Movement joint present at perimeter of the glazing system.
2. Position of glazing system relative to the structure.

		Glazing System Type			
		<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>	
Structural Consideration	1. Deflection Joint	Limited Manufacturers	Yes.	Yes.	
	2. Glazing System Position Relative to Structure	Recessed	Yes.	Yes.	Yes.
		Flush	No.	No.	Yes.
		Projected			
	3. Slab-to-Slab				

3. Exterior framing and slab construction.



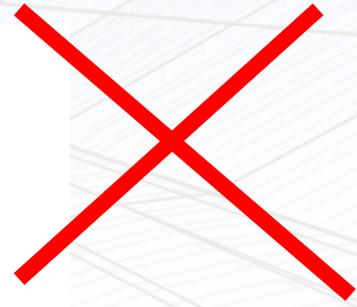
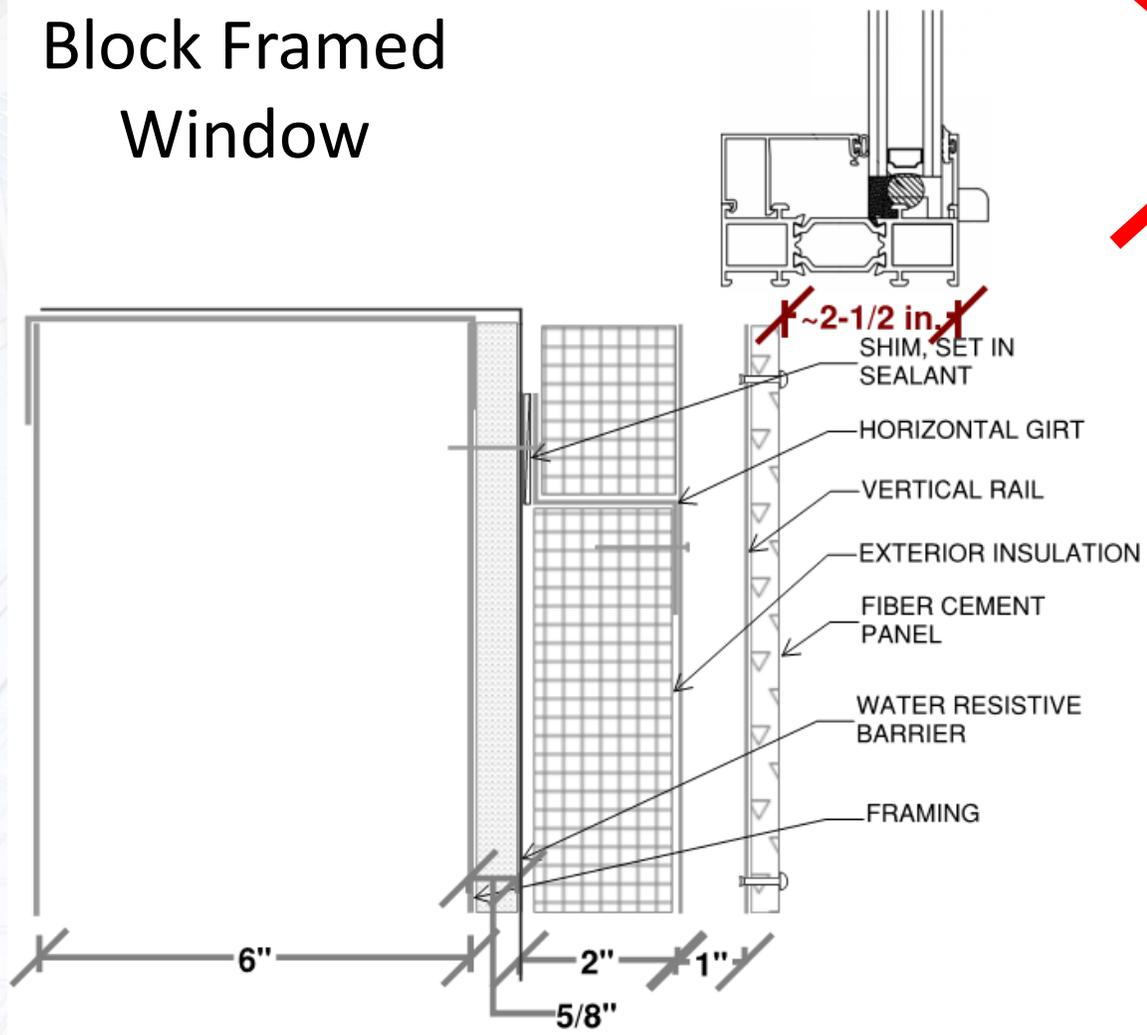
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

~2-1/2 in. Projection from Exterior Cladding

Block Framed Window





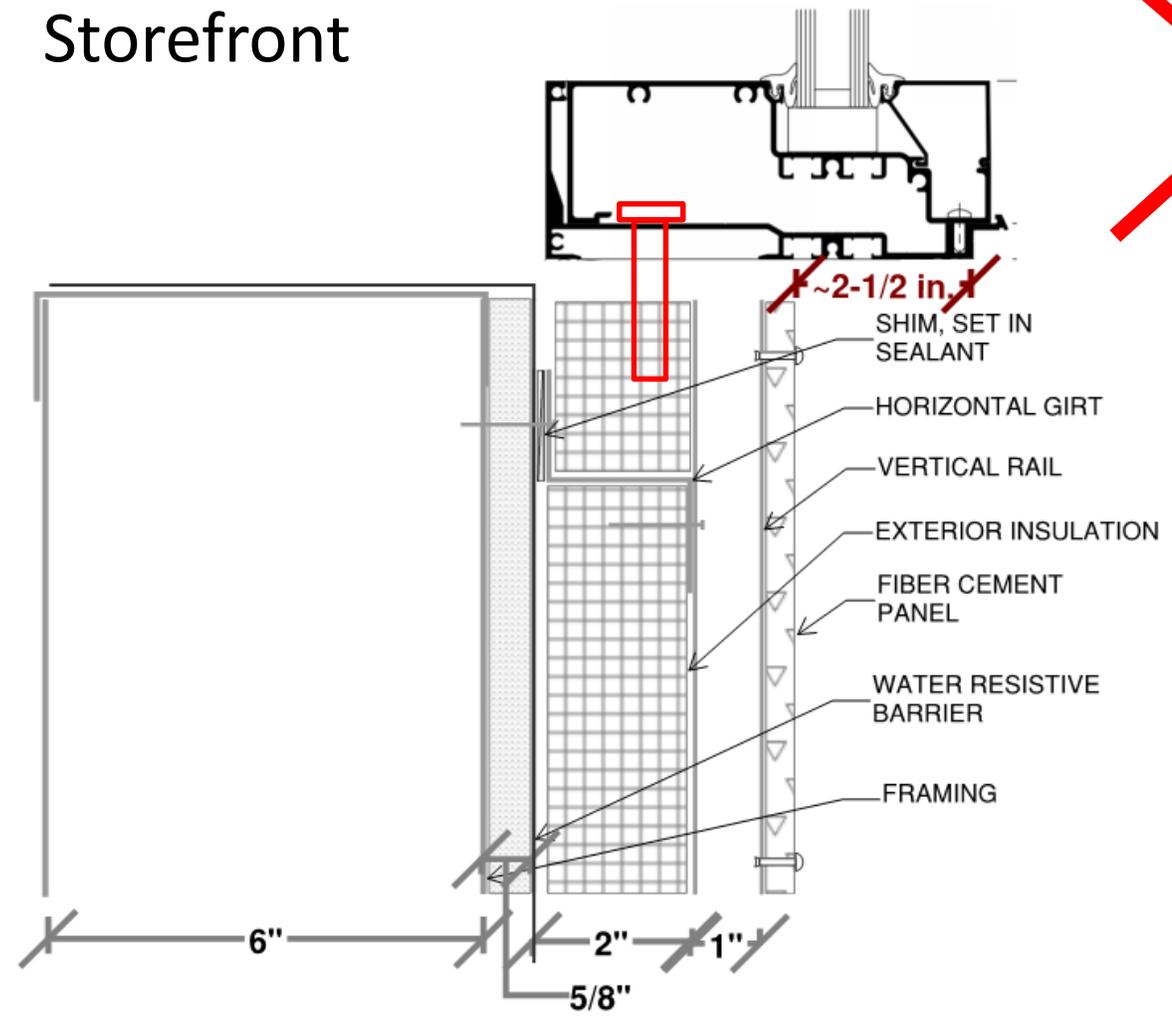
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

~2-1/2 in. Projection from Exterior Cladding

Storefront





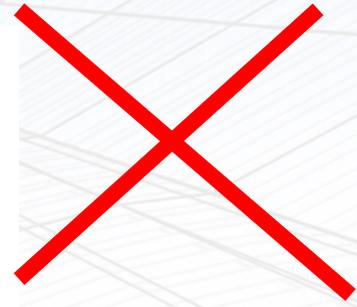
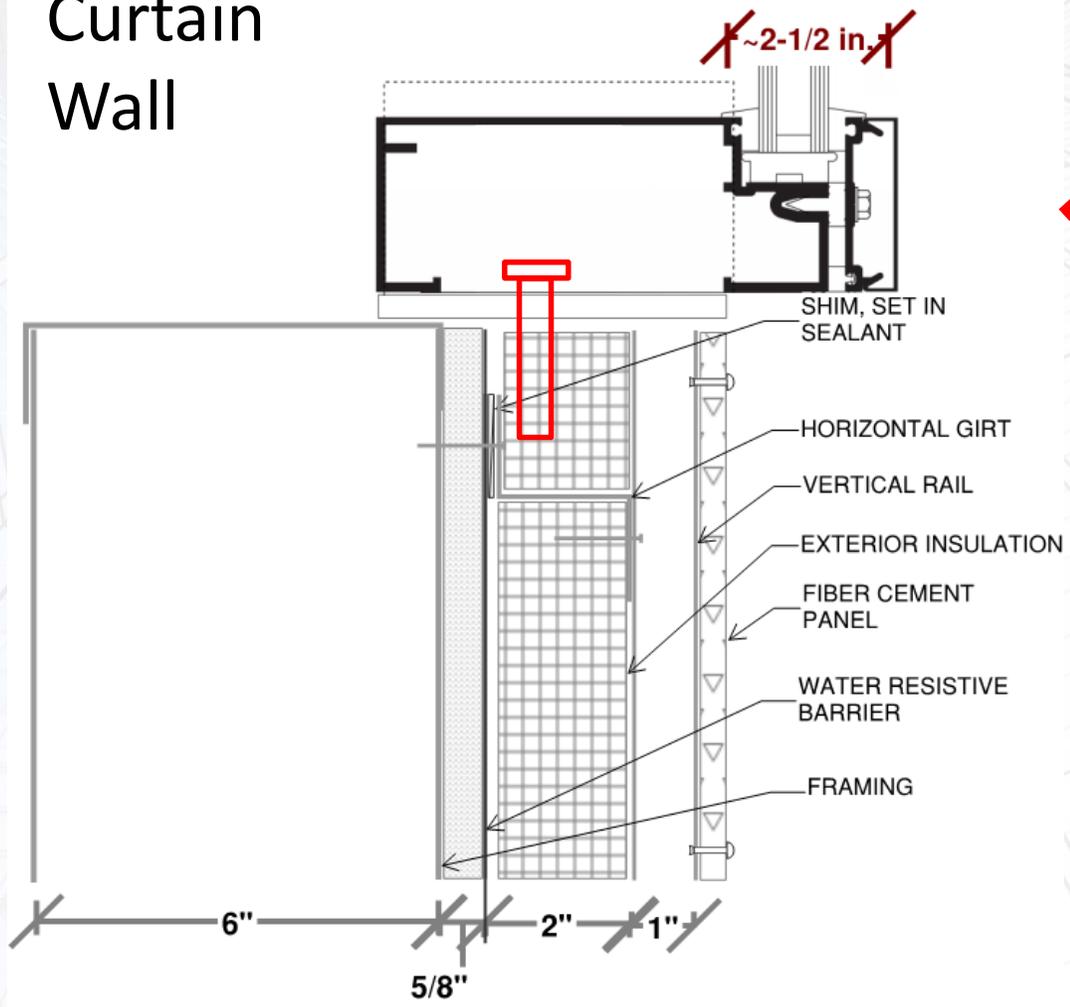
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

~2-1/2 in. Projection from Exterior Cladding

Curtain Wall





BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

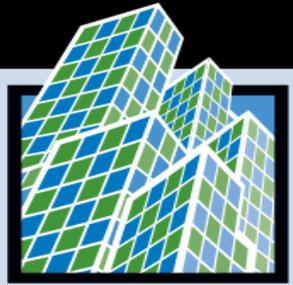
CONFERENCE & EXPO

Considerations of Glazing System Selection

1. Movement joint present at perimeter of the glazing system.
2. Position of glazing system relative to the structure.

		Glazing System Type			
		<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>	
Structural Consideration	1. Deflection Joint	Limited Manufacturers	Yes.	Yes.	
	2. Glazing System Position Relative to Structure	Recessed	Yes.	Yes.	Yes.
		Flush	No.	Yes.	Yes.
		Projected	No.	No.	No.
	3. Slab-to-Slab				

3. Exterior framing and slab construction.



BUILDING INNOVATION 2018

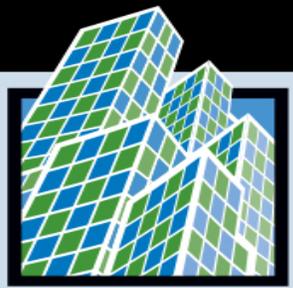
National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Considerations of Glazing System Selection

1. Movement joint present at perimeter of the glazing system.
2. Position of glazing system relative to the structure.
- 3. Exterior framing and slab construction.**

		Glazing System Type		
		<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>
Structural Consideration	1. Deflection Joint	Limited Manufacturers	Yes.	Yes.
	2. Glazing System Position Relative to Structure	Recessed	Yes.	Yes.
		Flush	No.	Yes.
		Projected	No.	No.
	3. Slab-to-Slab			



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Considerations of Glazing System Selection

1. Movement joint present at perimeter of the glazing system.
2. Position of glazing system relative to the structure.
- 3. Exterior framing and slab construction.**

		Glazing System Type		
		<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>
Structural Consideration	1. Deflection Joint	Limited Manufacturers	Yes.	Yes.
	2. Glazing System Position Relative to Structure	Recessed	Yes.	Yes.
		Flush	No.	Yes.
		Projected	No.	No.
	3. Slab-to-Slab		No*	Yes.



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Glazing system span multiple floors – in 1 slide

Window Wall vs. Curtain Wall

Window Wall	Curtain Wall
Generally cheaper (as a glazing system compared to curtain wall).	Provides continuous 4 barriers (to be discussed later.)
Able to seal the system watertight at each floor.	Anchors generally are adjustable for construction tolerances.

Wood Construction

1. UL Listing at Slab Edge.
 - Is there anything for wood framing?
2. Embed plates to the wood structure.
 - Whose scope is this?
3. Wood shrinkage



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Summary

- Incorporate the structure in the glazing system selection.

		Glazing System Type			
		<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>	
Structural Consideration	1. Deflection Joint	Limited Manu.	Yes.	Yes.	
	2. Glazing System Position Relative to Structure	Recessed	Yes.	Yes.	Yes.
		Flush	No.	No.	Yes.
		Projected	No.	No.	No.
	3. Slab-to-Slab	No*.	Yes.	Yes.	



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Summary

- Incorporate the structure in the glazing system selection.

		Glazing System Type			
			<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>
Structural Consideration	1. Deflection Joint		Limited Manu.	Yes.	Yes.
	2. Glazing System Position Relative to Structure	Recessed	Yes.	Yes.	Yes.
		Flush	No.	No.	Yes.
		Projected	No.	No.	No.
	3. Slab-to-Slab		No*.	Yes.	Yes.



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Objective

- Incorporate the structure in the glazing system selection.
- Define the air, water, vapor and thermal barriers of glazing systems at the transition to facade cladding system.
- Identify the advantages and disadvantages of different glazing systems based on transitions to adjacent façade cladding assemblies.
- Lessons learned from case studies.



BUILDING INNOVATION 2018

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Four Barriers



BUILDING INNOVATION 2018

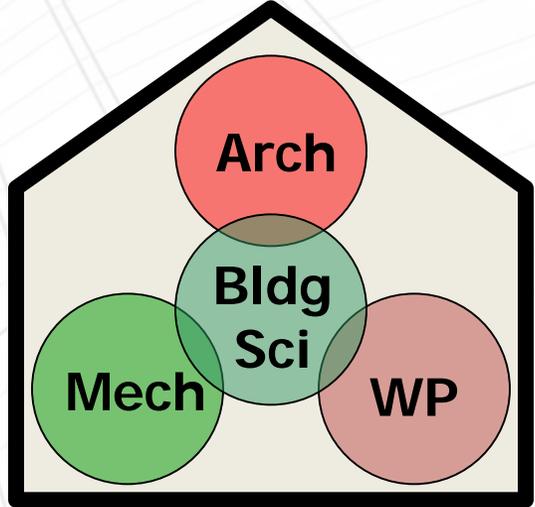
National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

The Four Barriers

- Principles of Building Envelope Performance
- Rainwater Control [Waterproofing]
 - Barrier 1 = Cladding/Waterproofing
- Condensation Control [Building Science]
 - Barrier 2 = Thermal Barrier
 - Barrier 3 = Vapor Retarders
 - Barrier 4 = Air Barrier

Will not be discussed in this presentation.



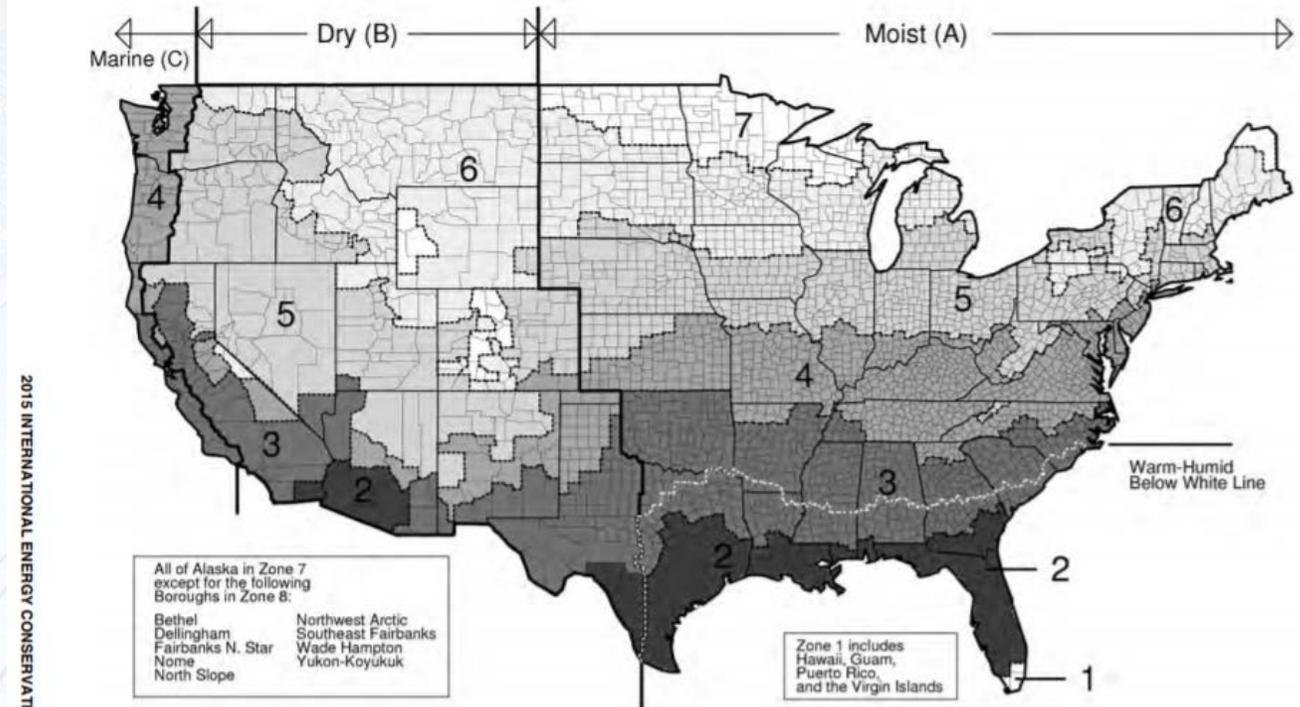


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Air Barrier Requirement



2015 INTERNATIONAL ENERGY CONSERVATION CODE® COMMENTARY

FIGURE C301.1 CLIMATE ZONES

C402.5.1 Air barriers. A continuous air barrier shall be provided throughout the building thermal envelope. The air barriers shall be permitted to be located on the inside or outside of the building envelope, located within the assemblies composing the envelope, or any combination thereof. The air barrier shall comply with Sections C402.5.1.1 and C402.5.1.2.

Exception: Air barriers are not required in buildings located in *Climate Zone 2B*.



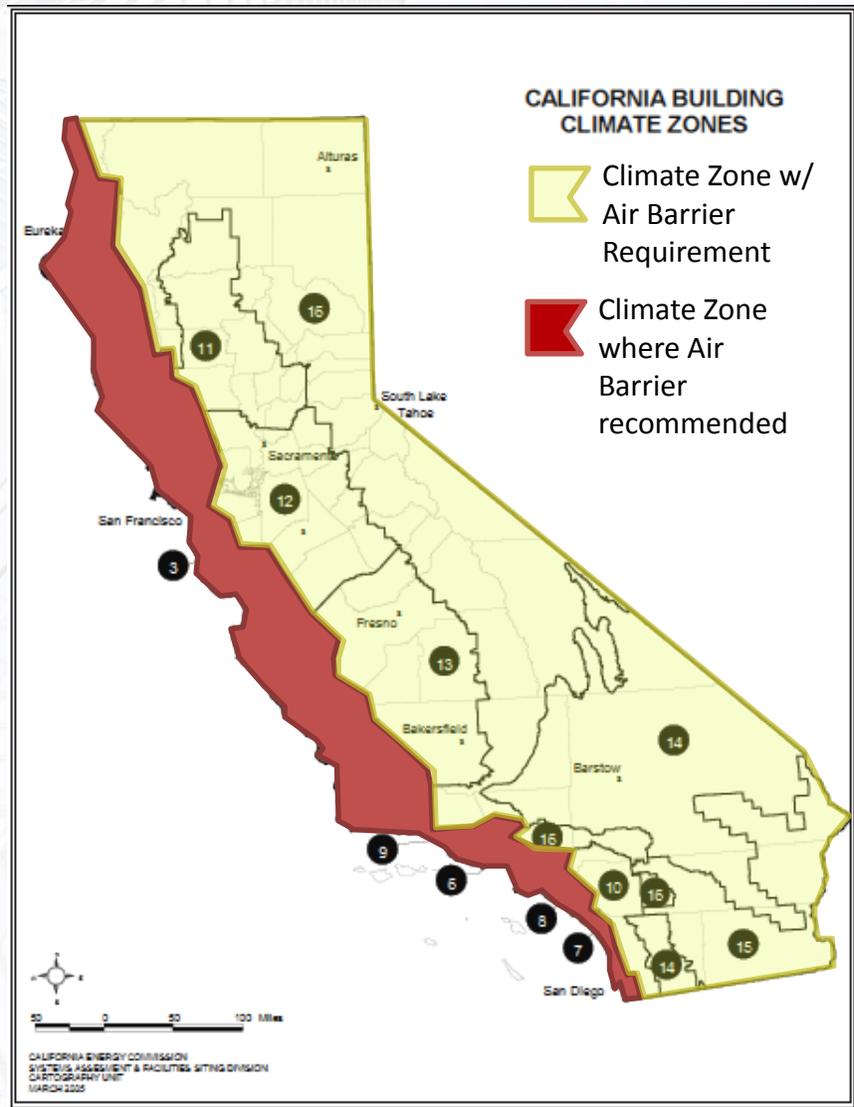
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Air Barriers Required in CZ 10-16

Section 140.3





BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Glazing System Transition to Exterior Cladding

	Transition at Sill to Fiber Cement Panels	
	Window	Storefront
Water Barrier		
Air Barrier		
Thermal Barrier		
Vapor Barrier	Vapor retarder will not be considered in this presentation.	



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Glazing System Transition to Exterior Cladding

	Transition at Sill to Fiber Cement Panels	
	Window	Storefront
Water Barrier		
Air Barrier		
Thermal Barrier		
Rainscreen		

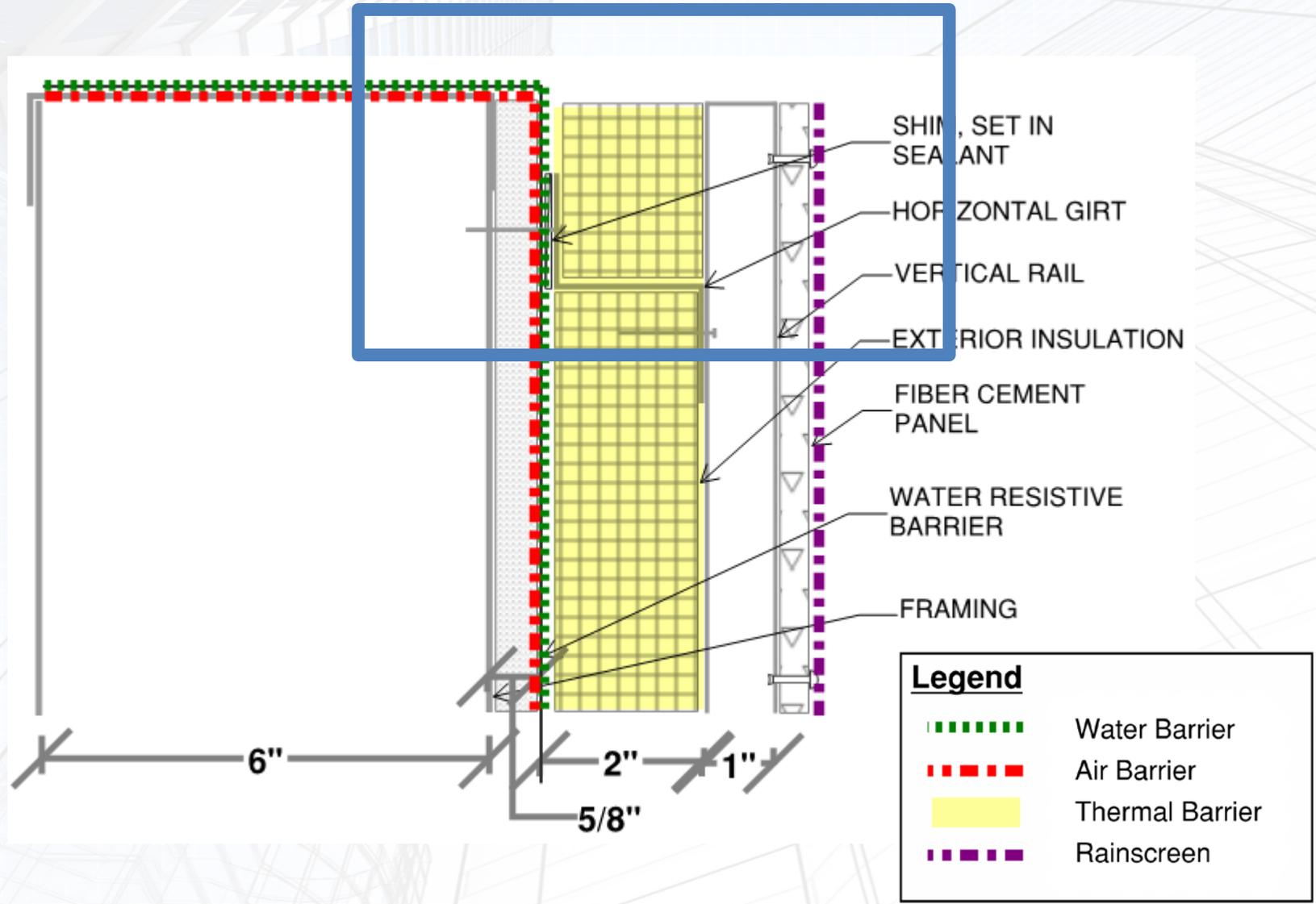


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Fiber Cement Panels – In Section



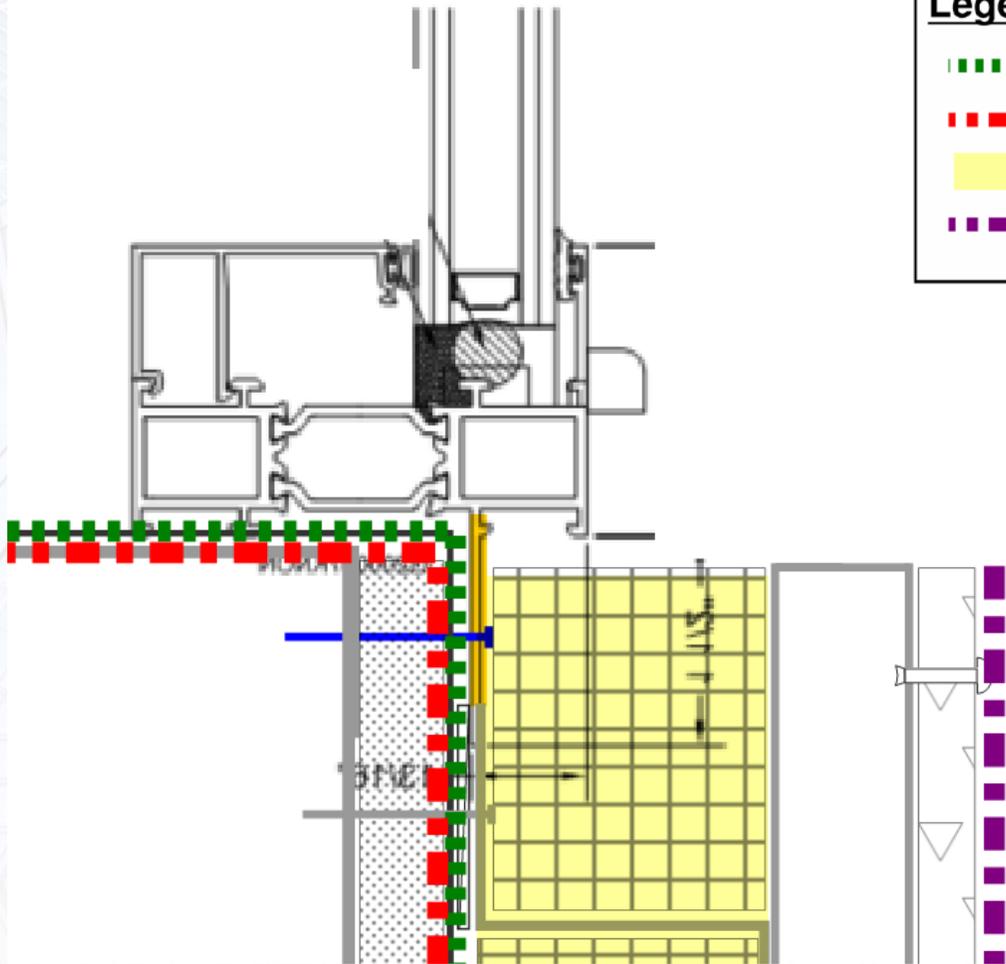


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Recessed Nail Fin Window in Fiber Cement Panels – In Section



Legend

- Water Barrier
- Air Barrier
- Thermal Barrier
- Rainscreen

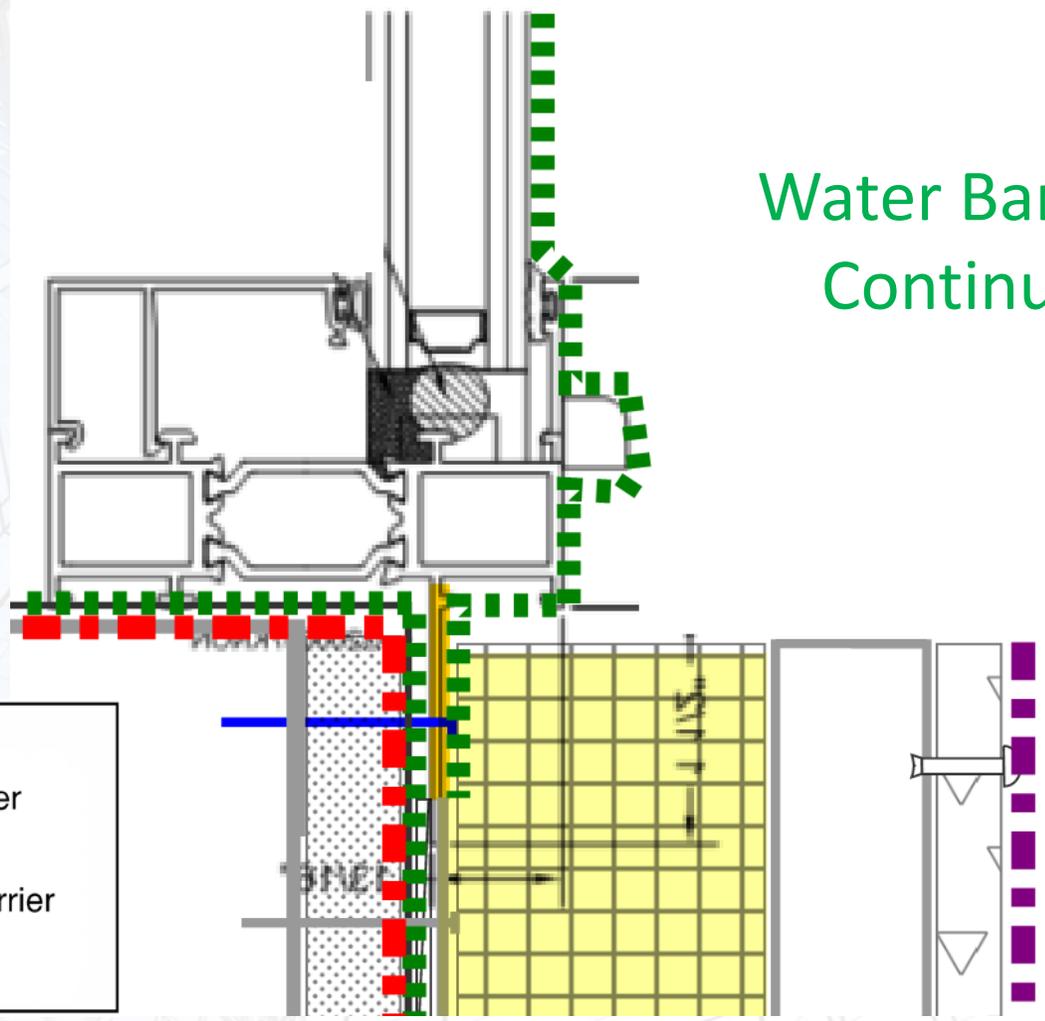


BUILDING INNOVATION 2018

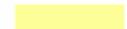
National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Recessed Nail Fin Window in Fiber Cement Panels – In Section



Water Barrier is Continuous

Legend	
	Water Barrier
	Air Barrier
	Thermal Barrier
	Rainscreen



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Glazing System Transition to Exterior Cladding

	Transition at Sill to Fiber Cement Panels	
	Window	Storefront
Water Barrier	Continuous @ Nail Fin Window	
Air Barrier		
Thermal Barrier		
Rainscreen		



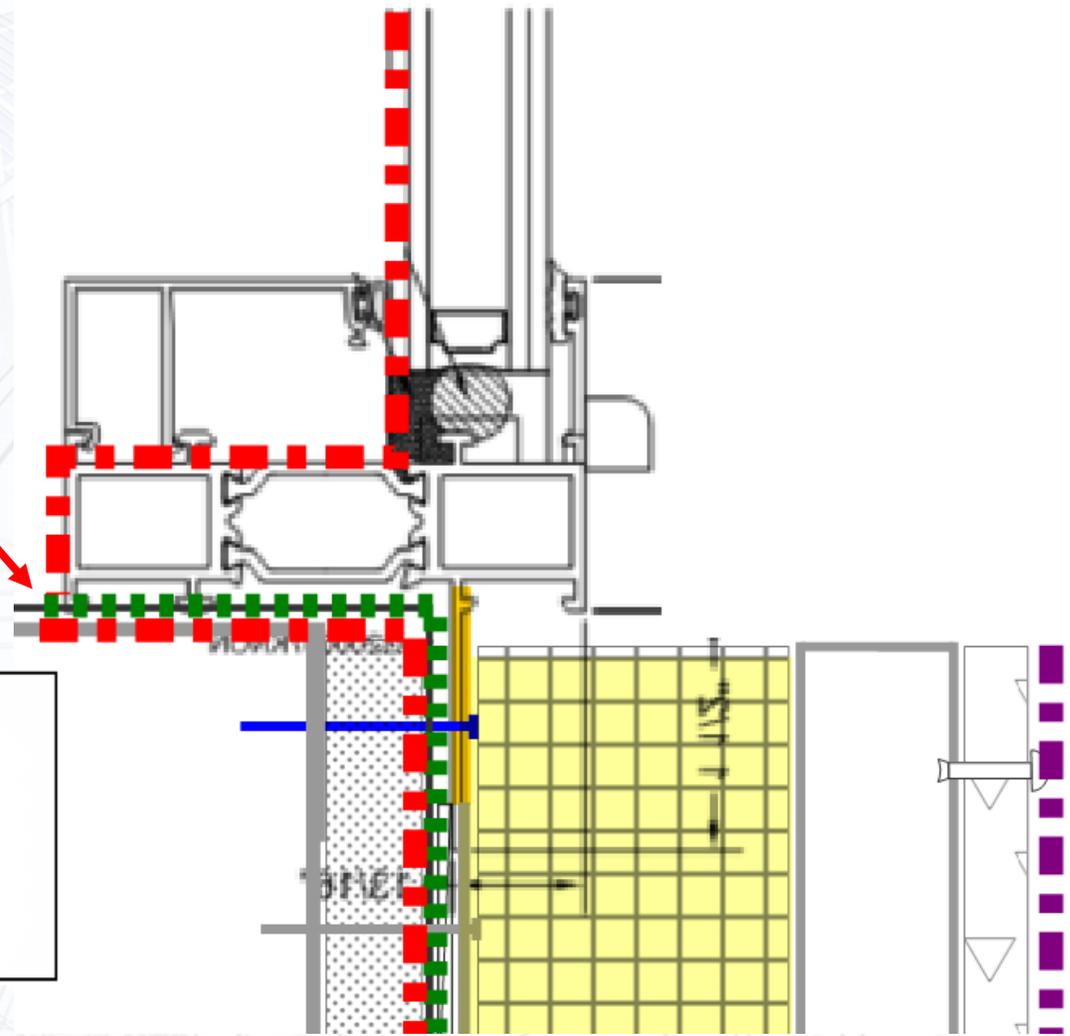
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Recessed Nail Fin Window in Fiber Cement Panels – In Section

Need An Air Seal



Legend	
.....	Water Barrier
.....	Air Barrier
.....	Thermal Barrier
.....	Rainscreen

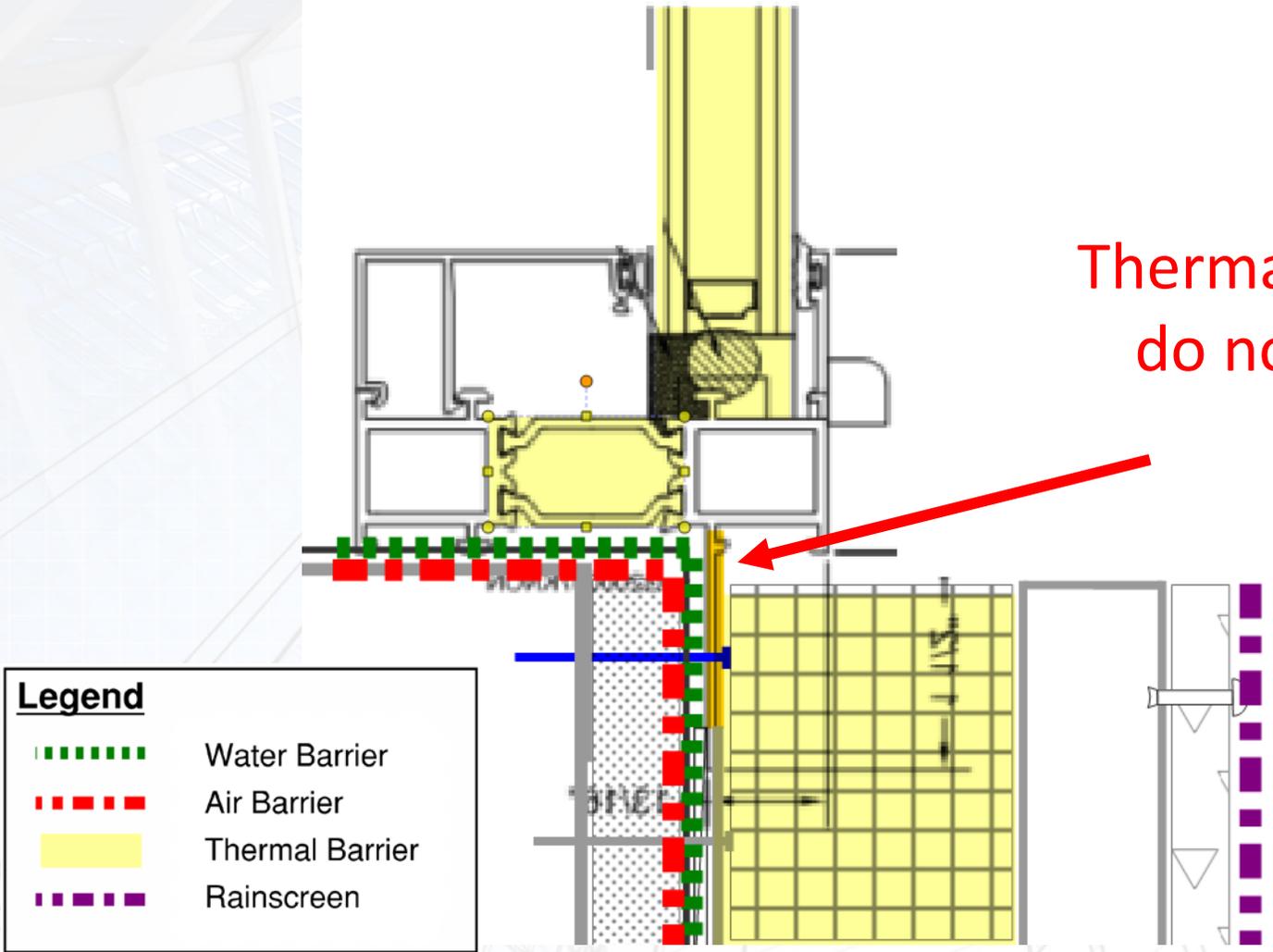


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Recessed Nail Fin Window in Fiber Cement Panels – In Section



Thermal Barriers do not align.

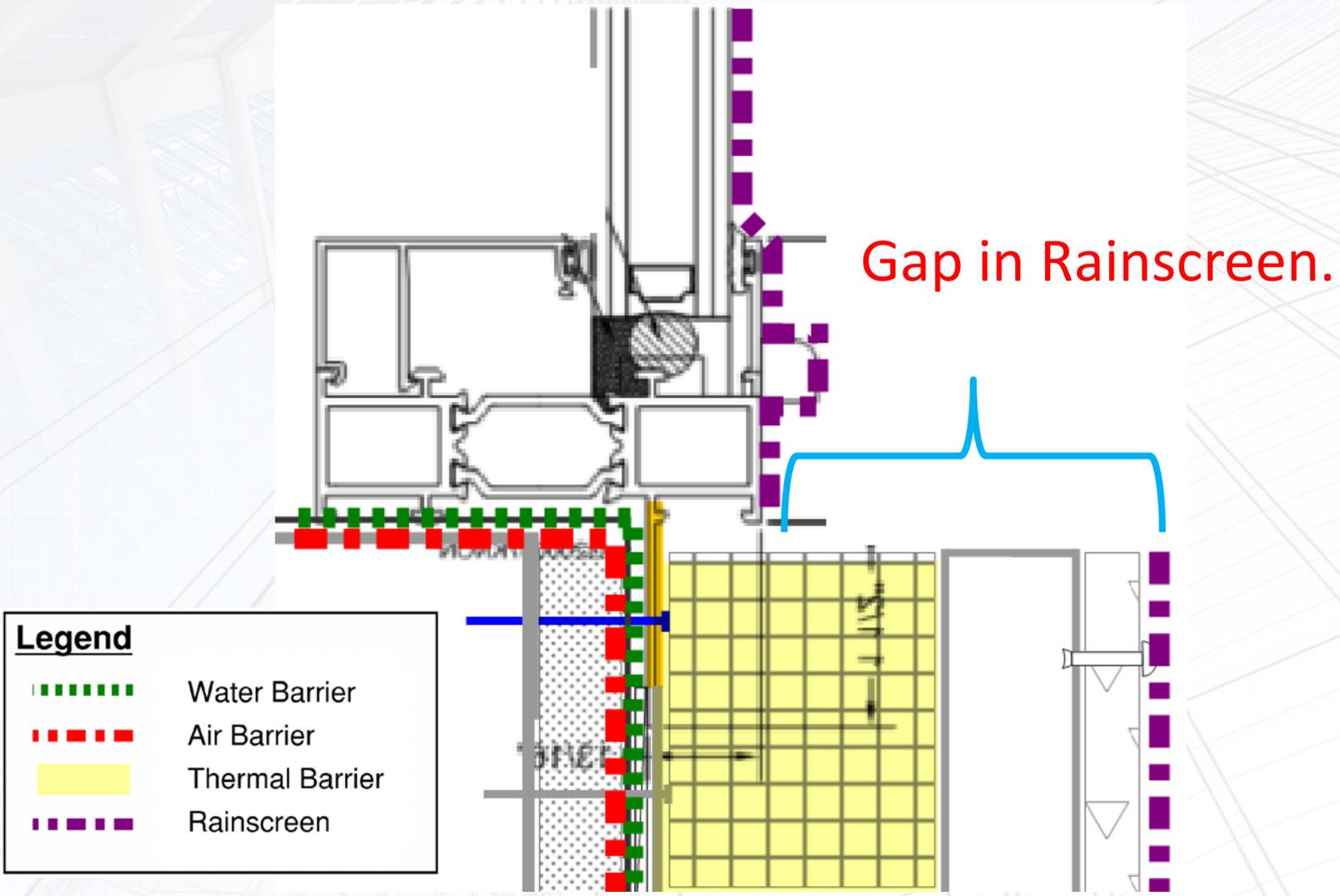


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Recessed Nail Fin Window in Fiber Cement Panels – In Section



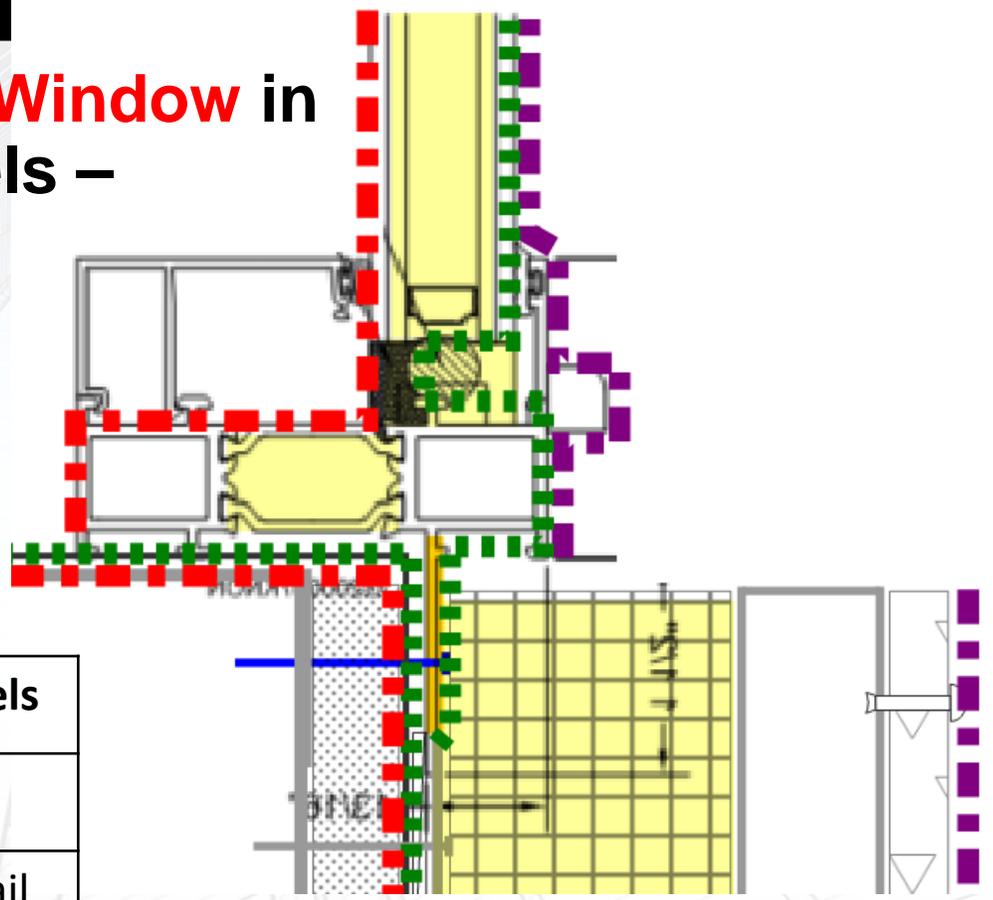


BUILDING INNOVATION 2018

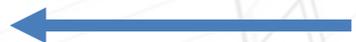
National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Recessed Nail Fin Window in Fiber Cement Panels – In Section



Transition at Sill to Fiber Cement Panels	
	Window
Water Barrier	Continuous @ Nail Fin Window
Air Barrier	Need an Air Seal
Thermal Barrier	Not Aligned
Rainscreen	Gap



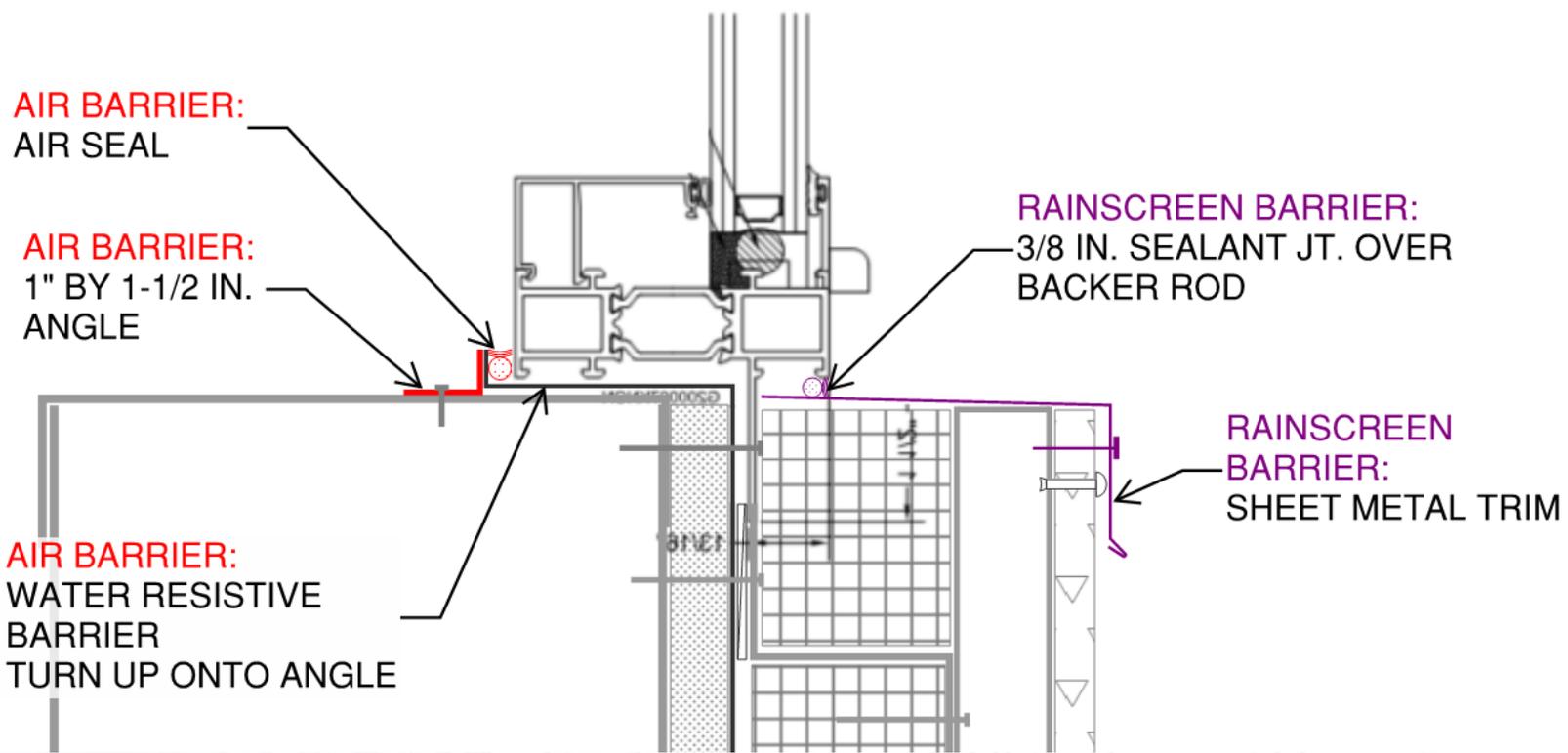


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Recessed Nail Fin Window in Fiber Cement Panels – In Section



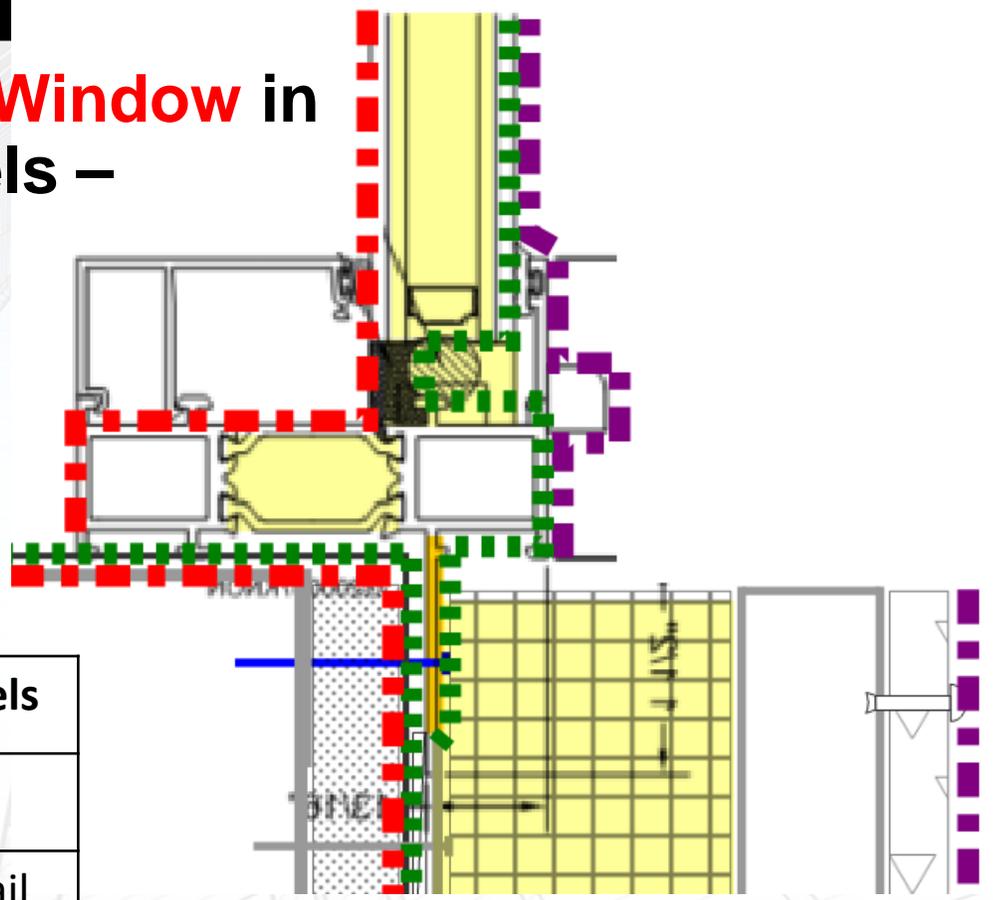


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Recessed Nail Fin Window in Fiber Cement Panels – In Section



Transition at Sill to Fiber Cement Panels	
	Window
Water Barrier	Continuous @ Nail Fin Window
Air Barrier	Need an Air Seal
Thermal Barrier	Not Aligned
Rainscreen	Gap





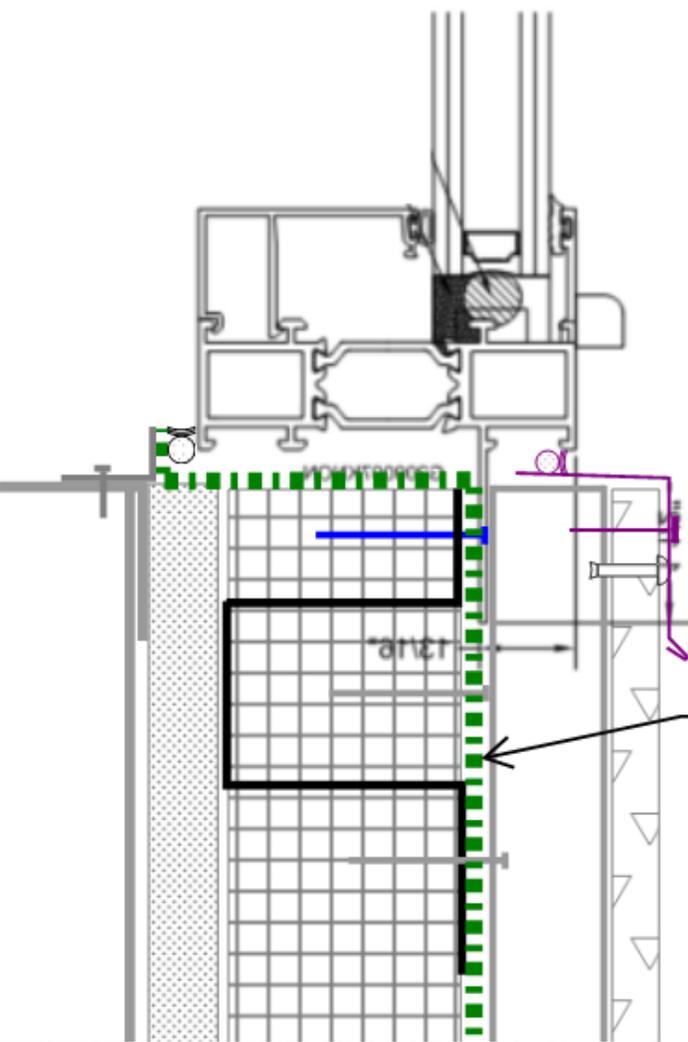
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

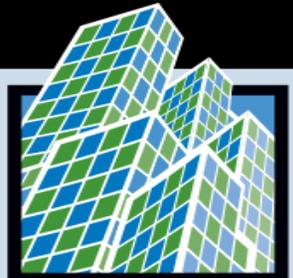
CONFERENCE & EXPO

Nail Fin Window in Fiber Cement Panels – In Section

Legend	
	Water Barrier
	Air Barrier
	Thermal Barrier
	Rainscreen



WRB OVER EXTERIOR INSULATION PROVIDE RIGID INSULATION



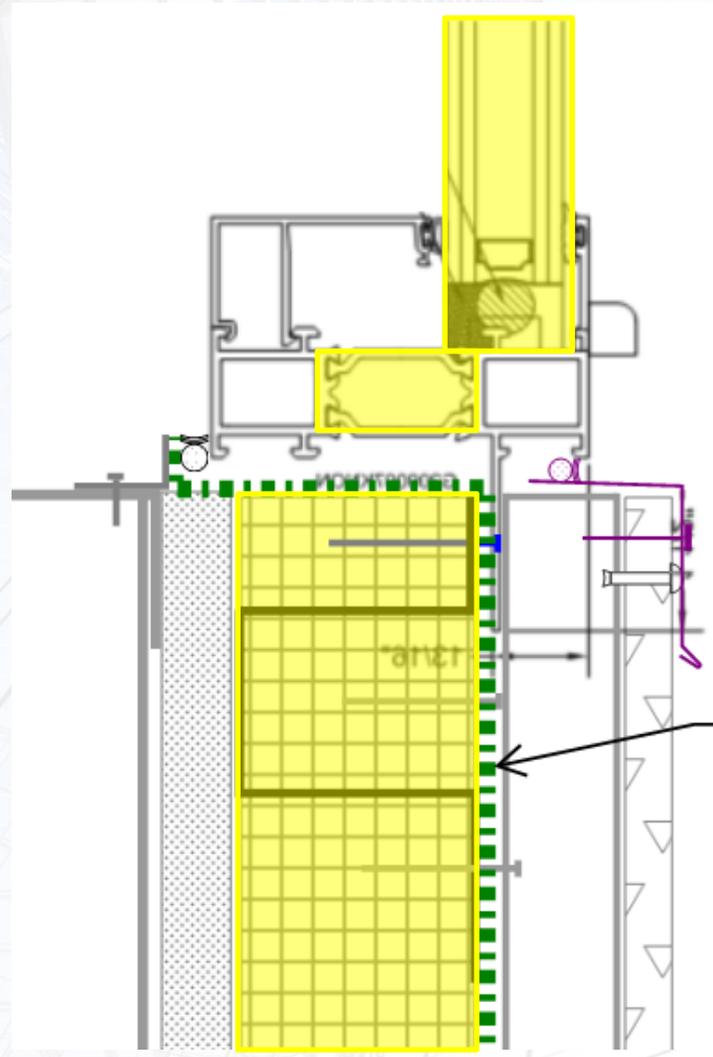
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Nail Fin Window in Fiber Cement Panels – In Section

Legend	
	Water Barrier
	Air Barrier
	Thermal Barrier
	Rainscreen



WRB OVER EXTERIOR INSULATION PROVIDE RIGID INSULATION



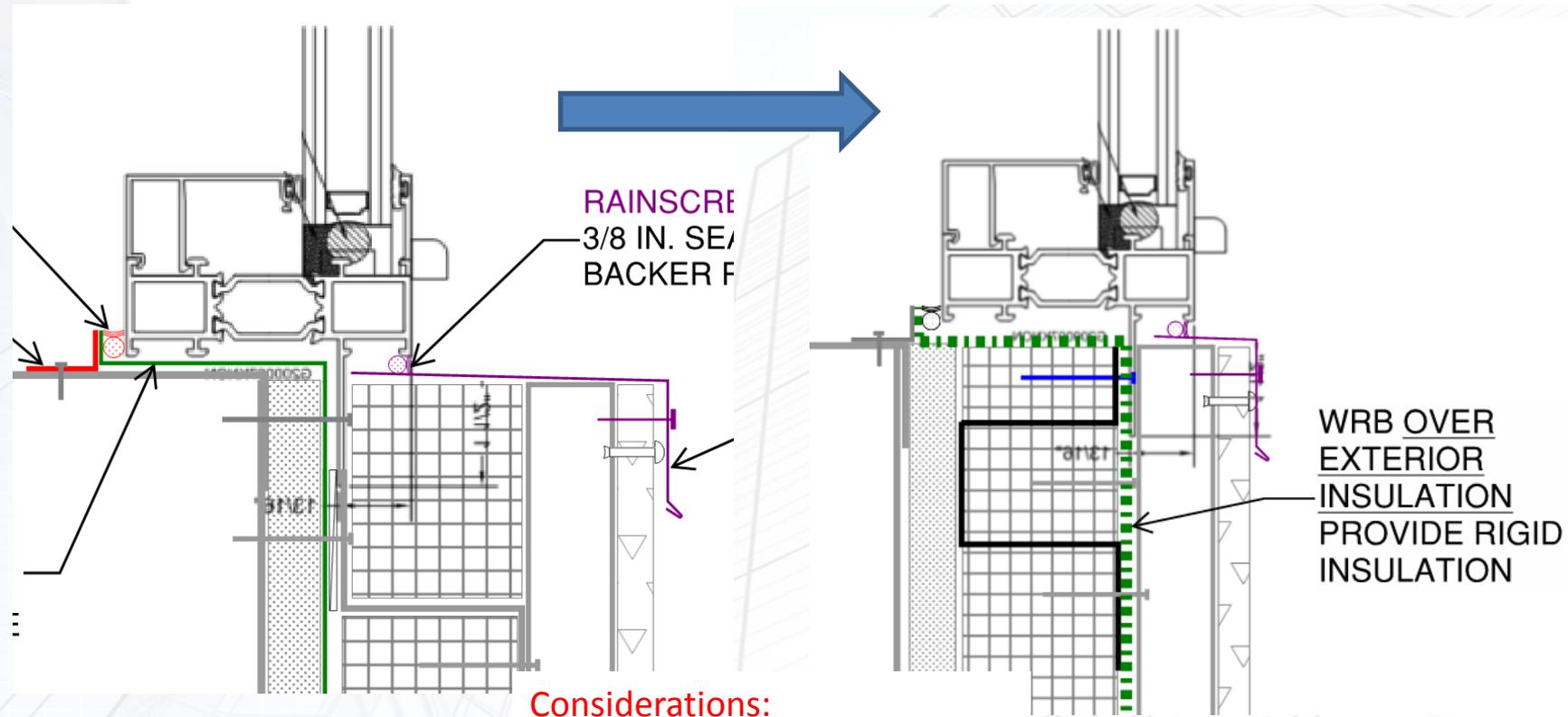
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Nail Fin Window in Fiber Cement Panels – In Section

- Moved window so it is no longer 2-1/2 in. recessed (see extra framing).
- Apply WRB over Exterior Insulation instead of the Exterior Sheathing.



Considerations:

1. Type of Insulation
2. Type of Air Barrier
3. Framing at rough openings
4. Further modelling



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Glazing system span multiple floors – in 1 slide

Window Wall vs. Curtain Wall

Window Wall	Curtain Wall
Generally cheaper (as a glazing system compared to curtain wall).	Provides continuous 4 barriers (to be discussed later.)
Able to seal the system watertight at each floor.	Anchors generally are adjustable for construction tolerances.

Wood Construction

1. UL Listing at Slab Edge.
 - Is there anything for wood framing?
2. Embed plates to the wood structure.
 - Whose scope is this?
3. Wood shrinkage



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Glazing system span multiple floors – in 1 slide

Window Wall vs. Curtain Wall

Window Wall	Curtain Wall
Generally cheaper (as a glazing system compared to curtain wall).	Provides continuous 4 barriers (to be discussed later.)
Able to seal the system watertight at each floor.	Anchors generally are adjustable for construction tolerances.

Wood Construction

1. UL Listing at Slab Edge.
 - Is there anything for wood framing?
2. Embed plates to the wood structure.
 - Whose scope is this?
3. Wood shrinkage



BUILDING INNOVATION 2018

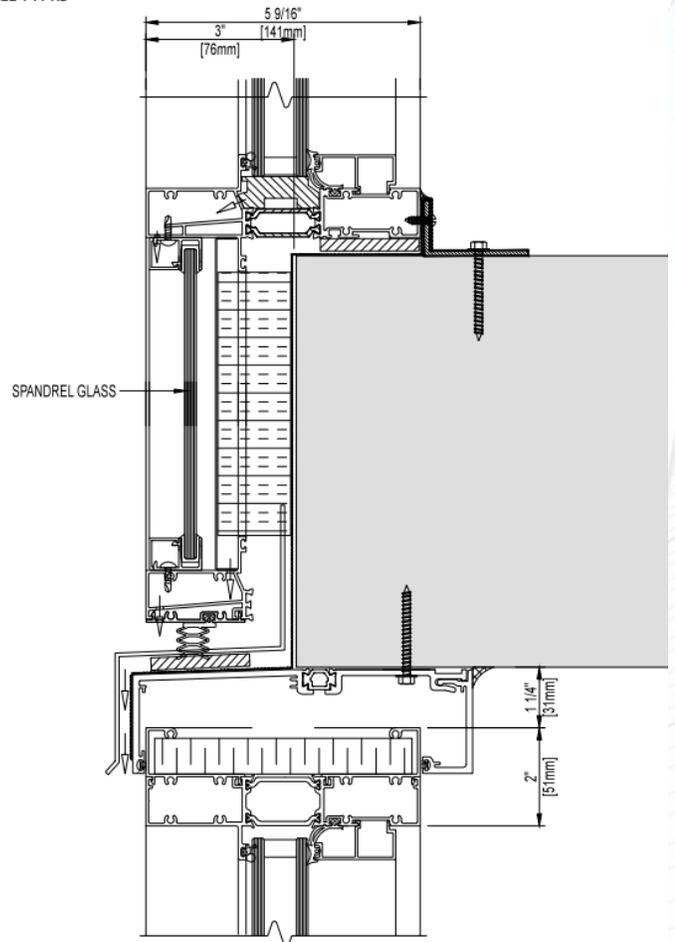
National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Window Wall

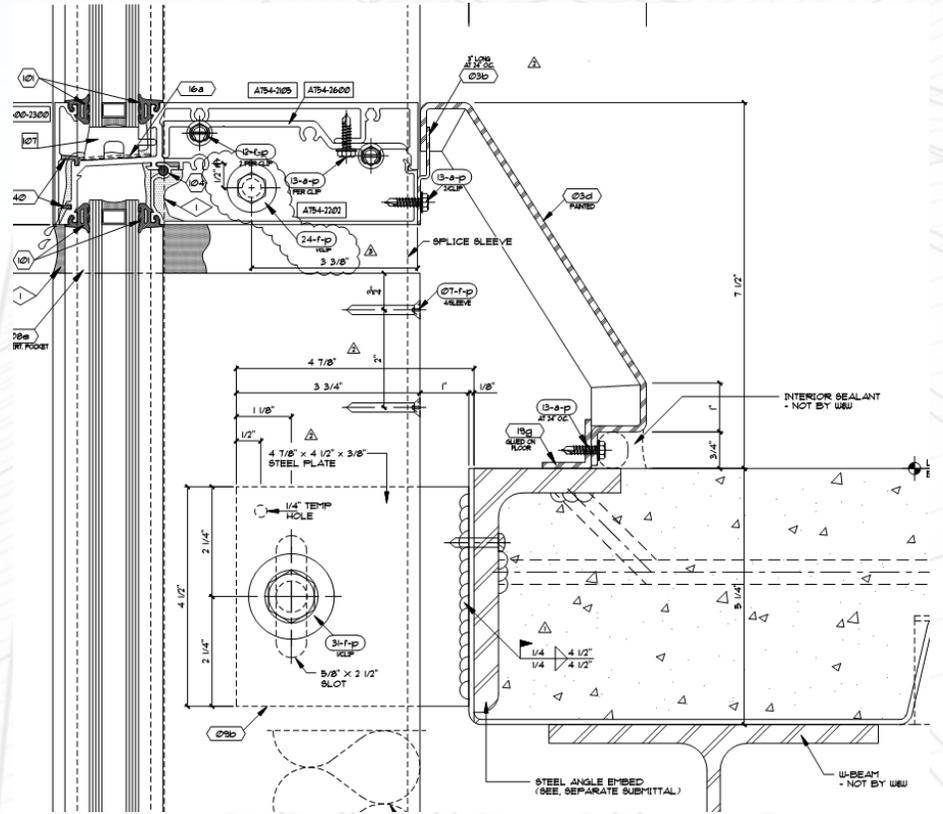
Typical Details

ECOWALL 141 RS



Spandrel Bypass Section at Slab Edge

Curtain Wall



STEEL ANGLE EMBED (SEE SEPARATE SUBMITTAL)

U-BEAM - NOT BY U&W

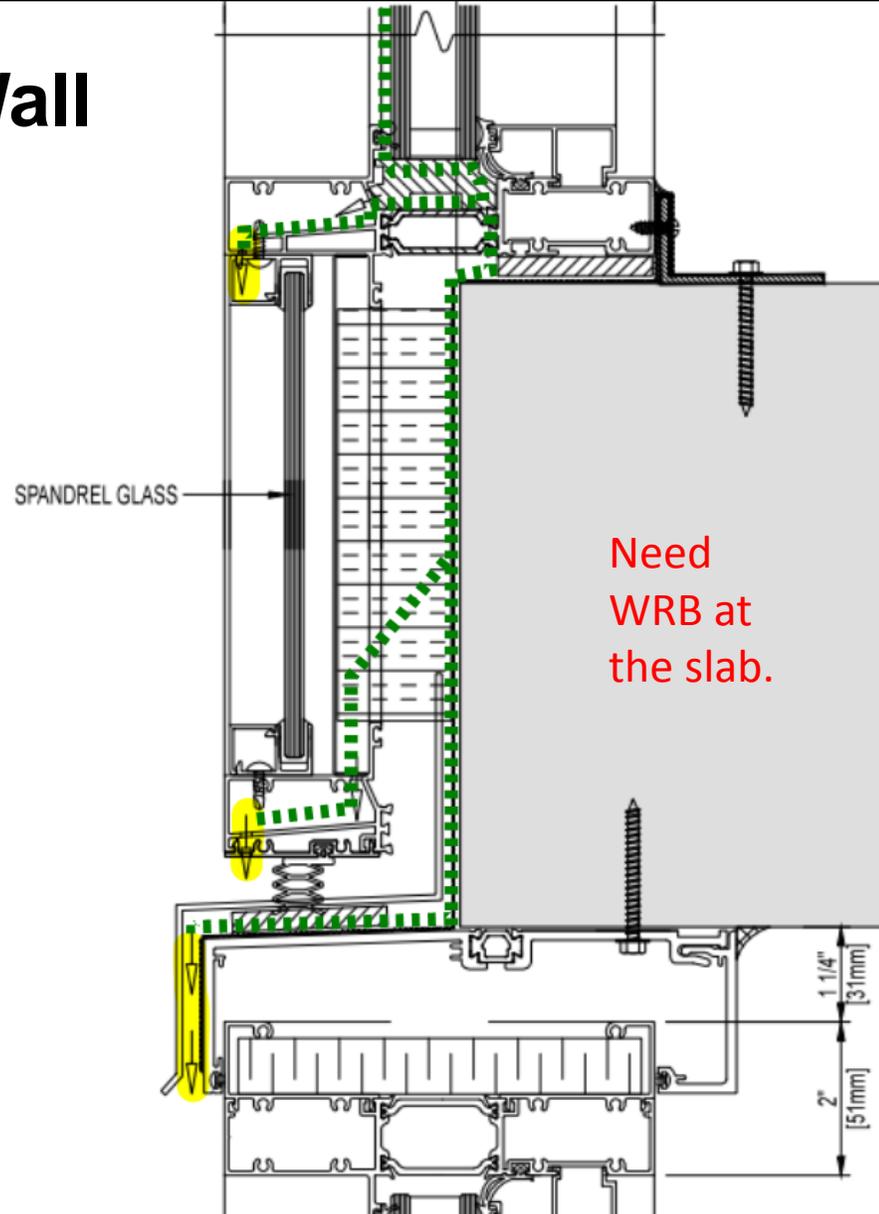


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Window Wall



Need WRB at the slab.

Legend	
	Water Barrier
	Air Barrier
	Thermal Barrier
	Rainscreen

Numerous Drainage Paths

Water Barrier is Continuous

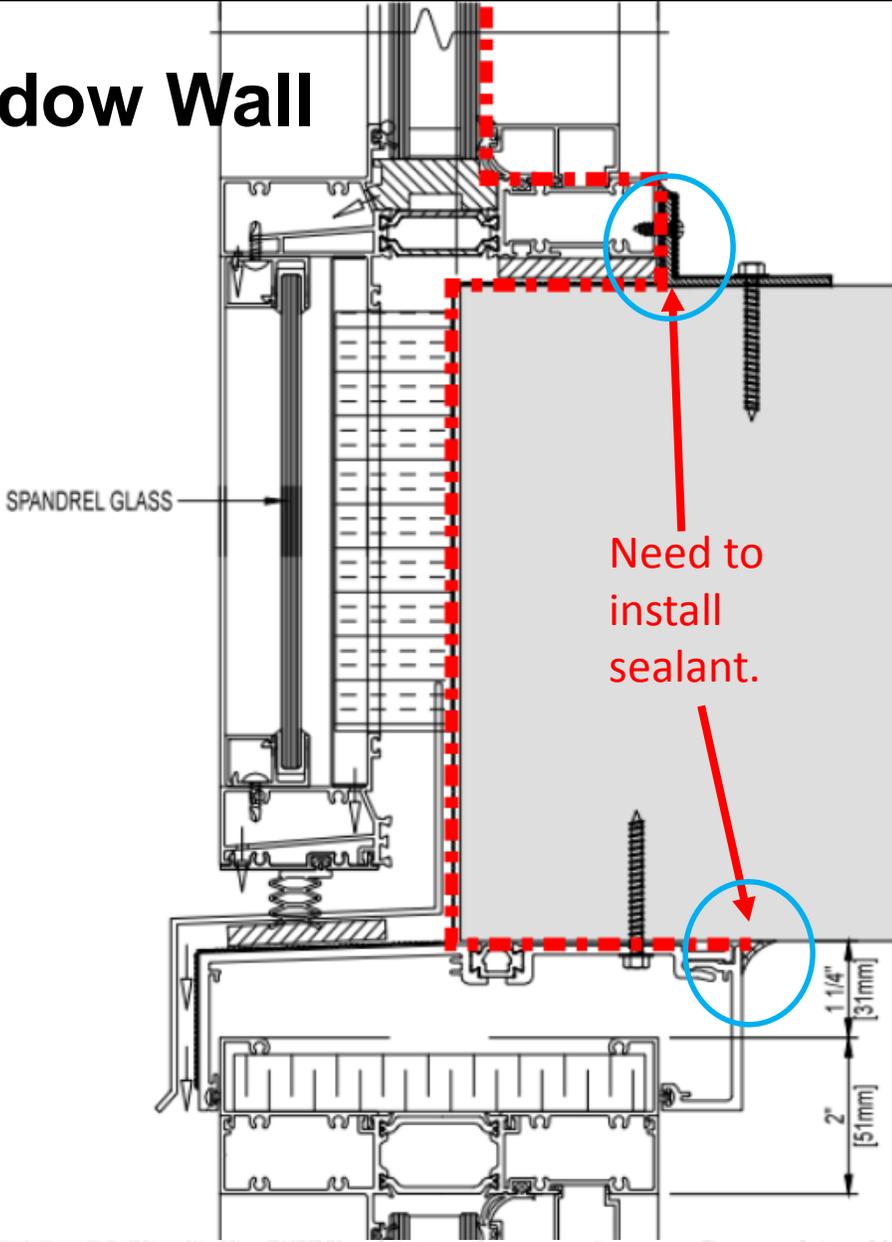


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Window Wall



Legend	
	Water Barrier
	Air Barrier
	Thermal Barrier
	Rainscreen

Air Barrier is Continuous

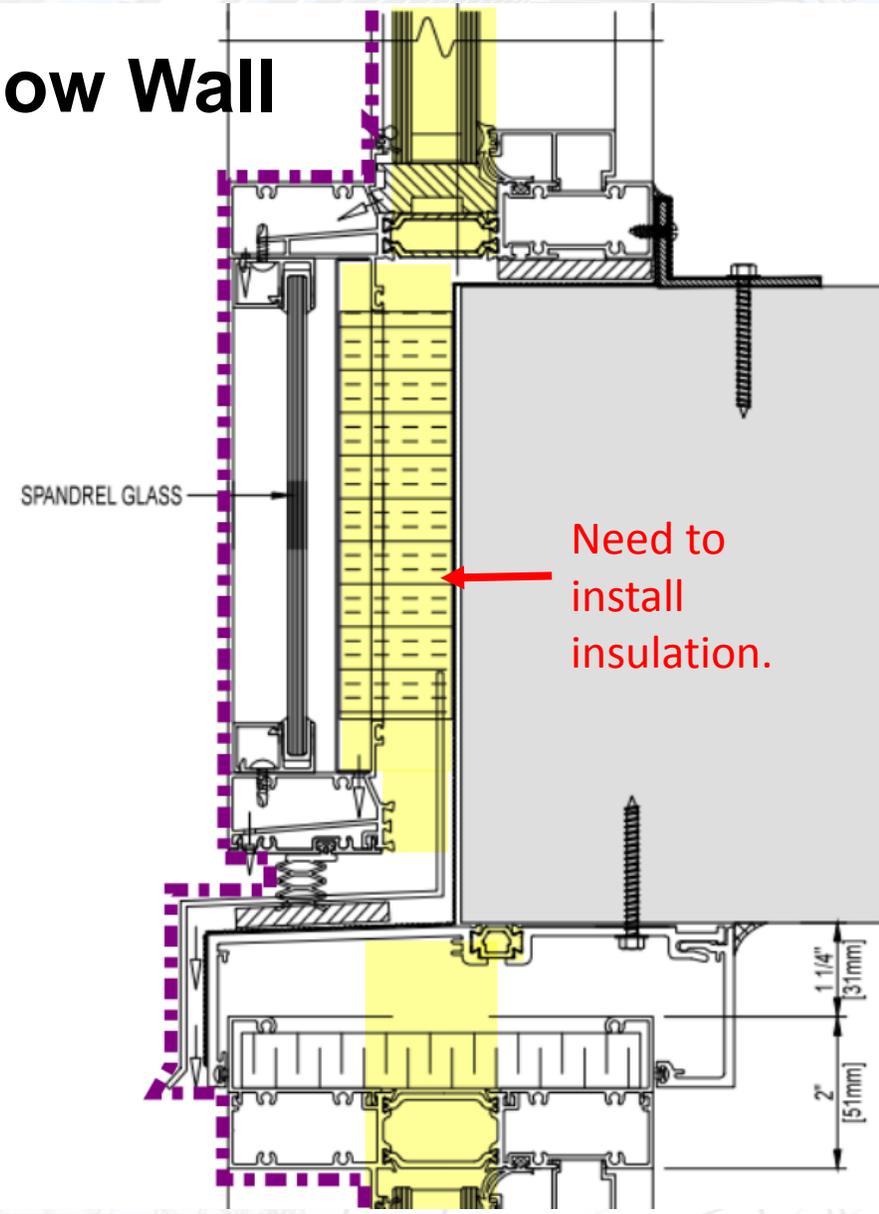


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Window Wall



Legend	
.....	Water Barrier
.....	Air Barrier
.....	Thermal Barrier
.....	Rainscreen

Thermal Barrier Aligns

Continuous Rainscreen System

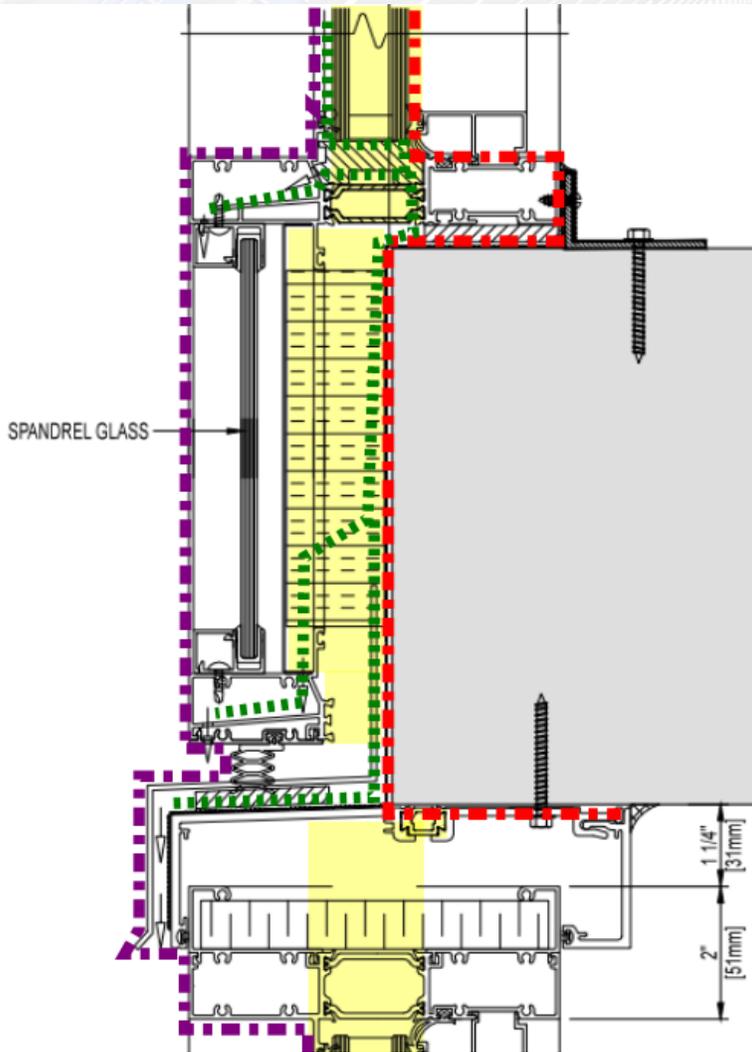


BUILDING INNOVATION 2018

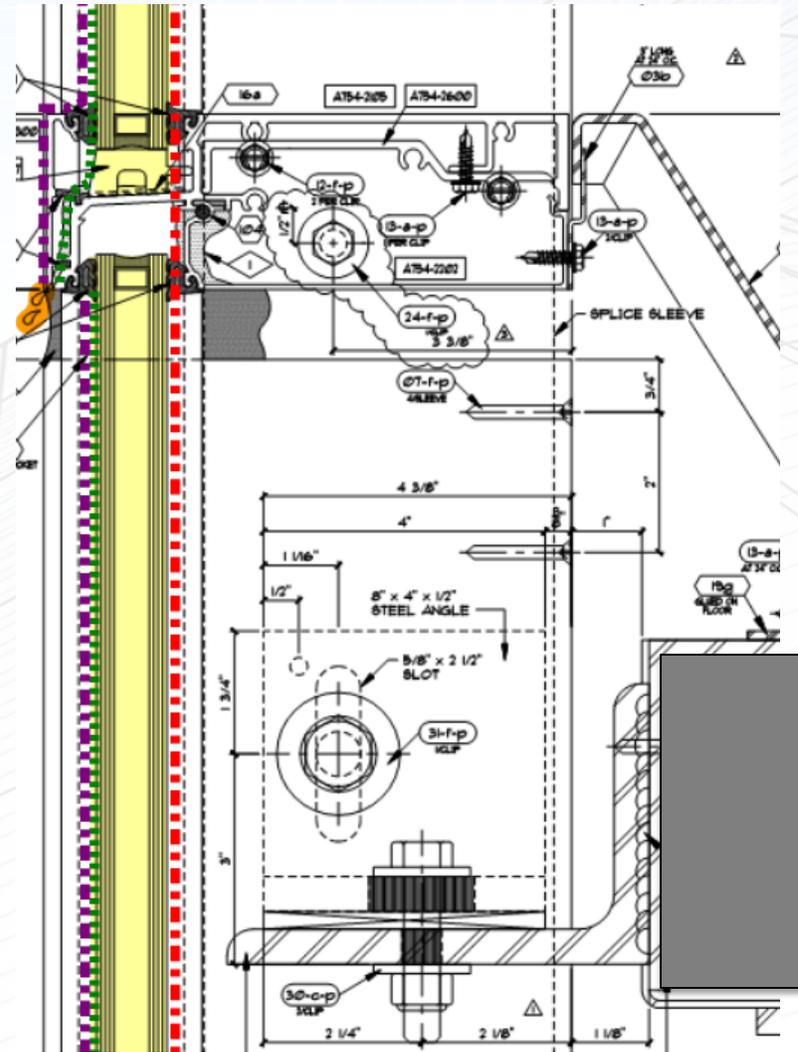
National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Window Wall



Curtain Wall





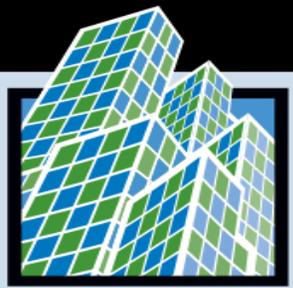
**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Barriers

	Detail at Slab	
	Window Wall	Curtain Wall
Water Barrier	Need to install WRB at the slab.	Part of CW system.
Air Barrier	Seals to slab.	Part of CW system.
Thermal Barrier	Need to install insulation at slab.	Part of CW system.
Rainscreen	Part of window wall system.	Part of CW system.



**BUILDING
INNOVATION** 2018

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Learning Objective

- How to incorporate the structure in the glazing system selection.
- How to integrate the air, water, vapor and thermal barriers of glazing systems at the transition to facade cladding system.
- How to identify the advantages and disadvantages of different glazing systems based on transitions to adjacent facade cladding assemblies.
- How to continuously improve glazing system details based on lessons learned.



BUILDING INNOVATION 2018

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Case Study #1

Glazing System Flush with Cladding



BUILDING INNOVATION 2018

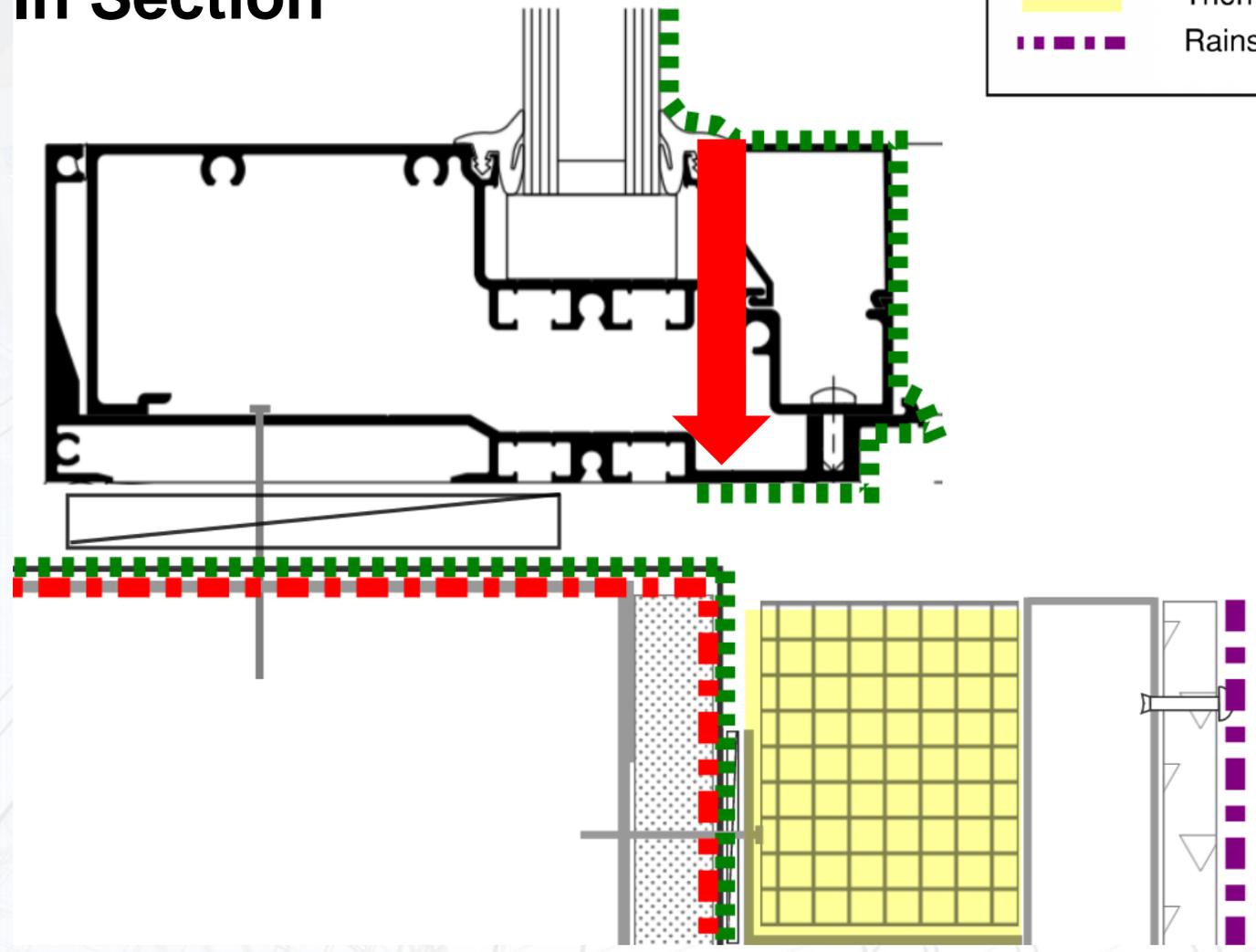
National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Fiber Cement Panels – In Section

Legend

- Water Barrier
- Air Barrier
- Thermal Barrier
- Rainscreen



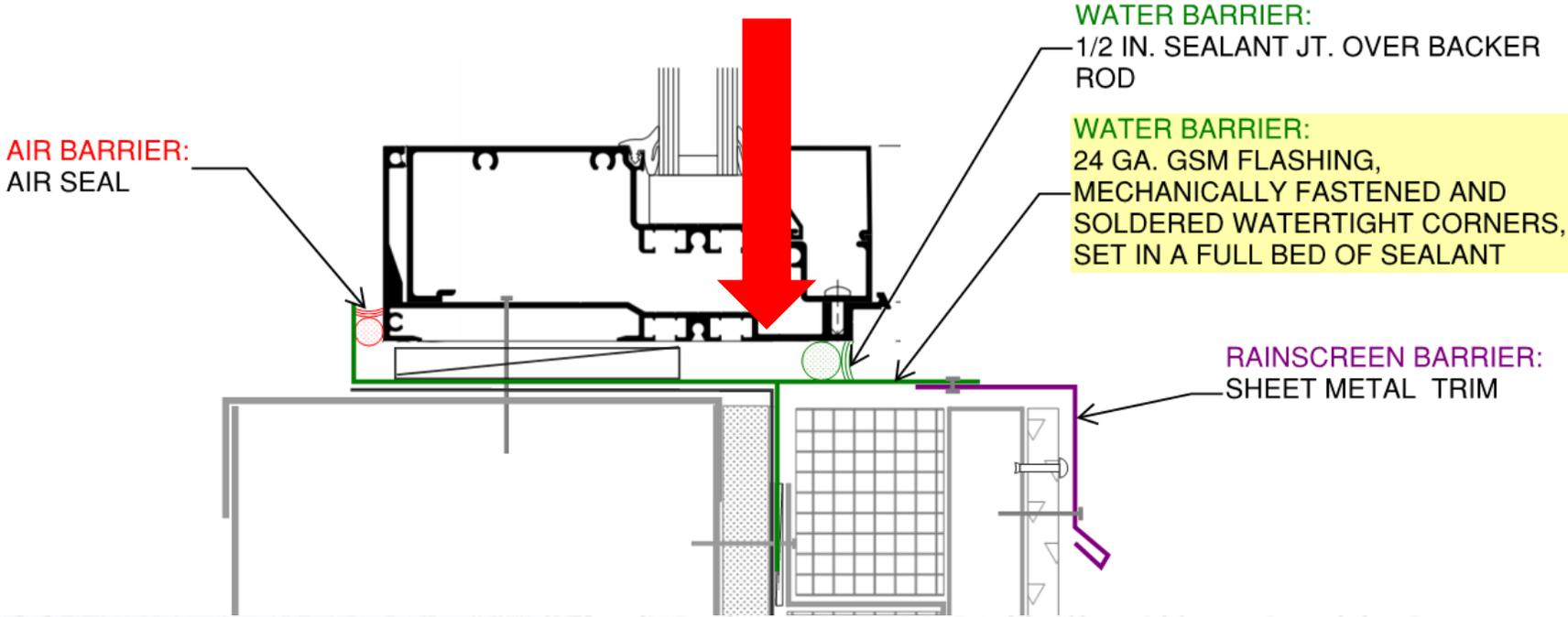
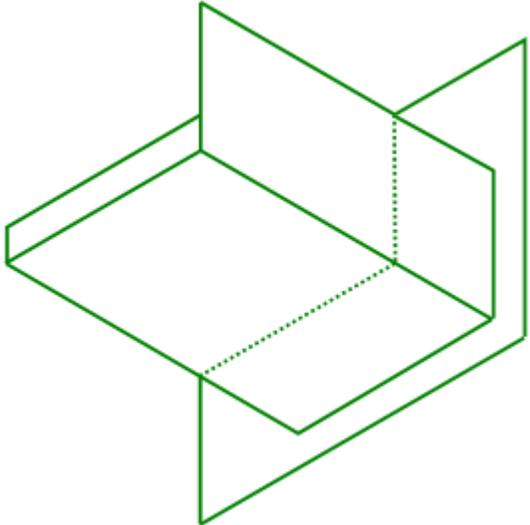


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Fiber Cement Panels



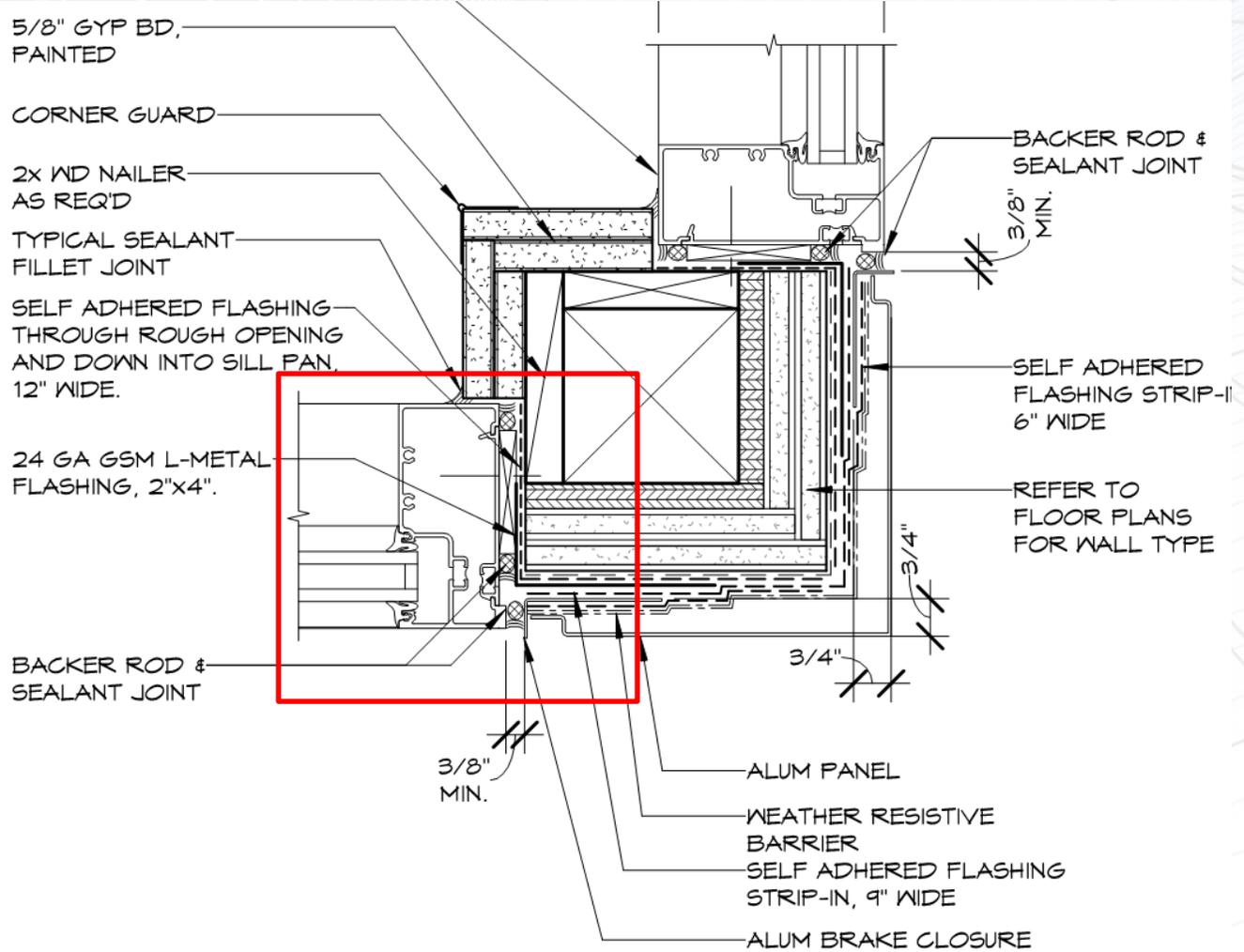


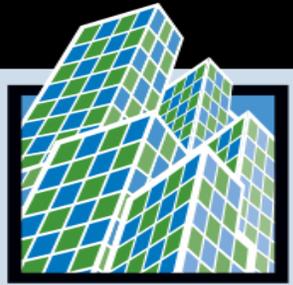
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Architectural Detail - Jamb



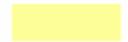


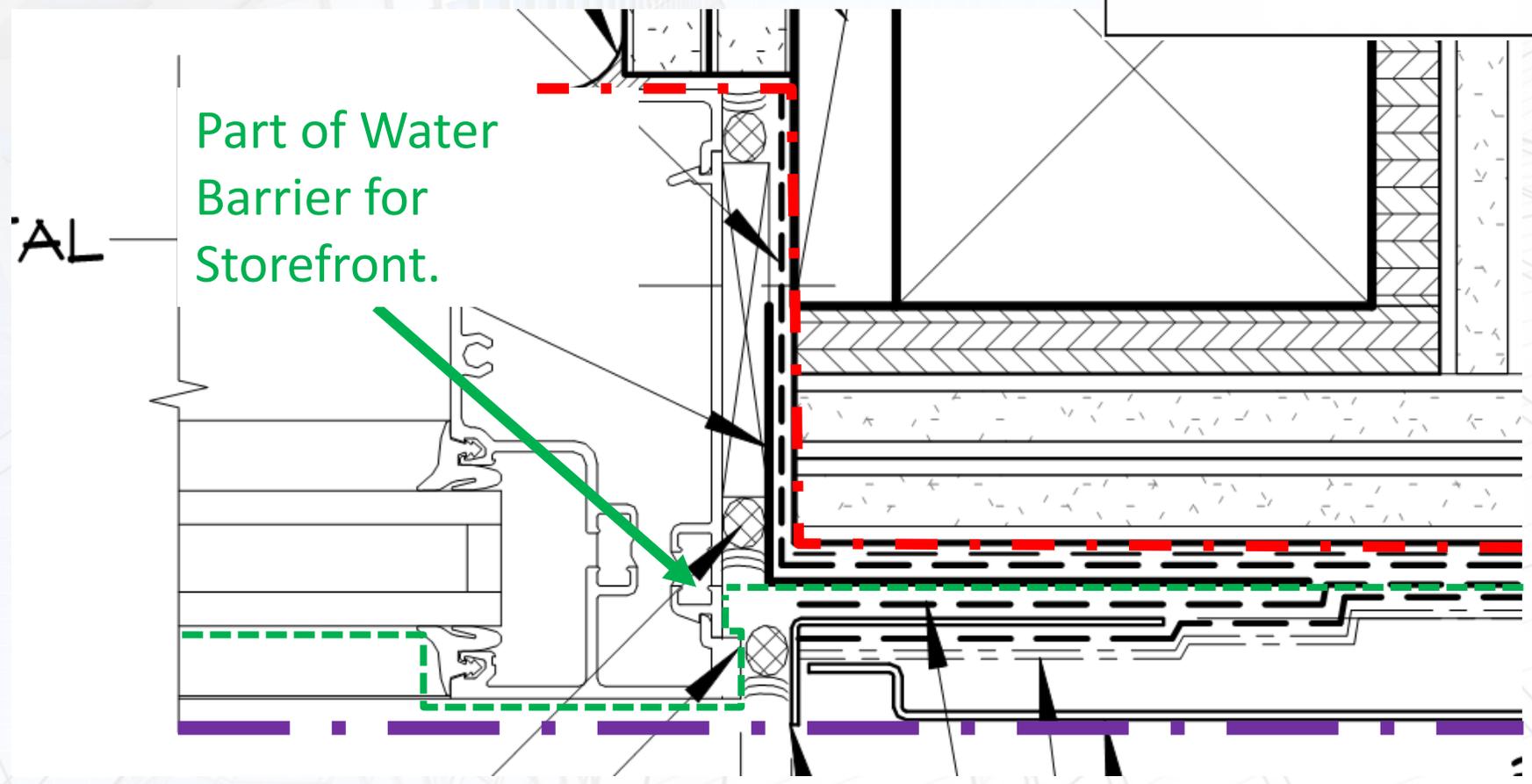
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Architectural Detail - Jamb

Legend	
	Water Barrier
	Air Barrier
	Thermal Barrier
	Rainscreen



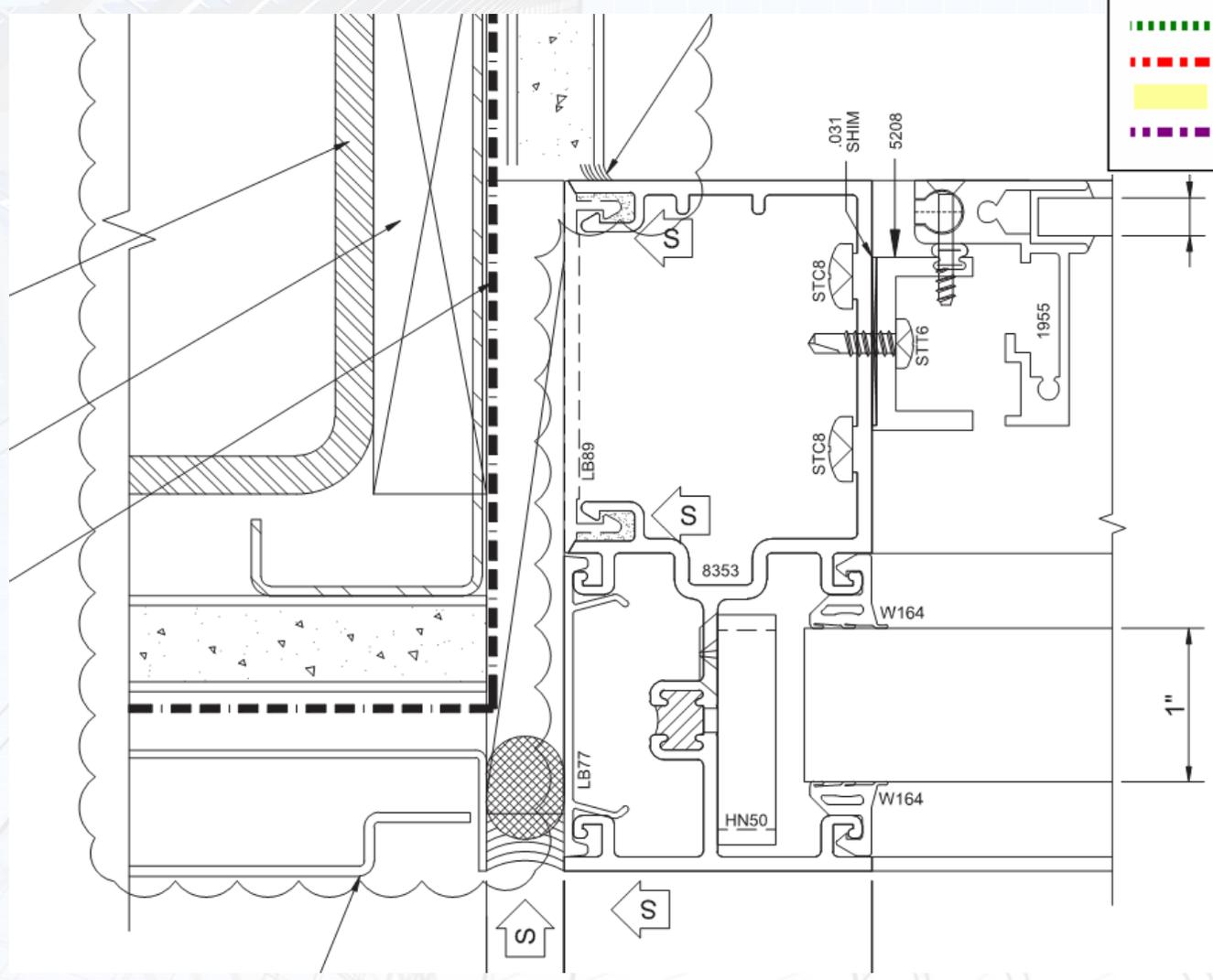


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Storefront Shop Drawing – Jamb Detail



Legend	
	Water Barrier
	Air Barrier
	Thermal Barrier
	Rainscreen

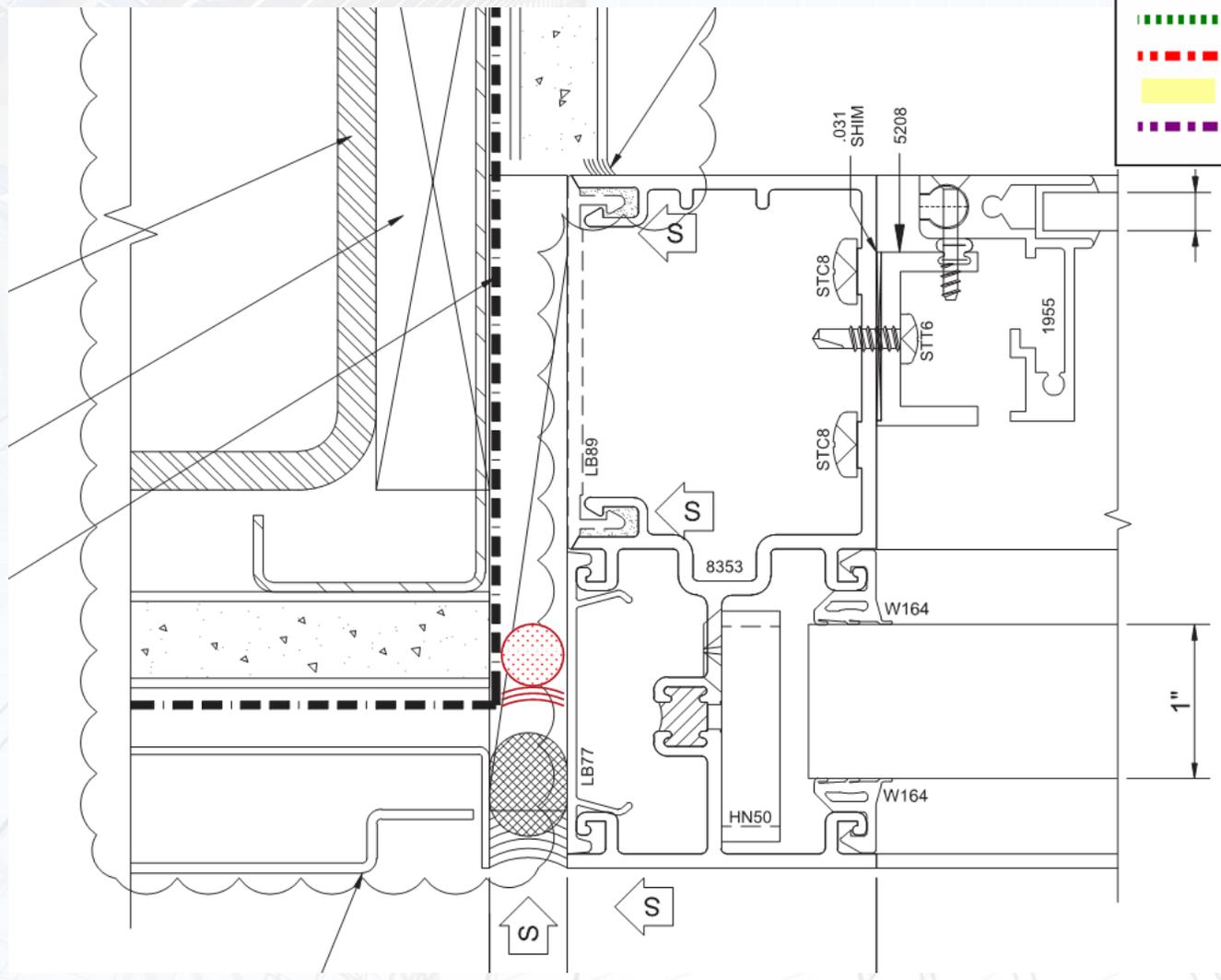


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Storefront Shop Drawing – Jamb Detail



Legend

- Water Barrier
- Air Barrier
- Thermal Barrier
- Rainscreen



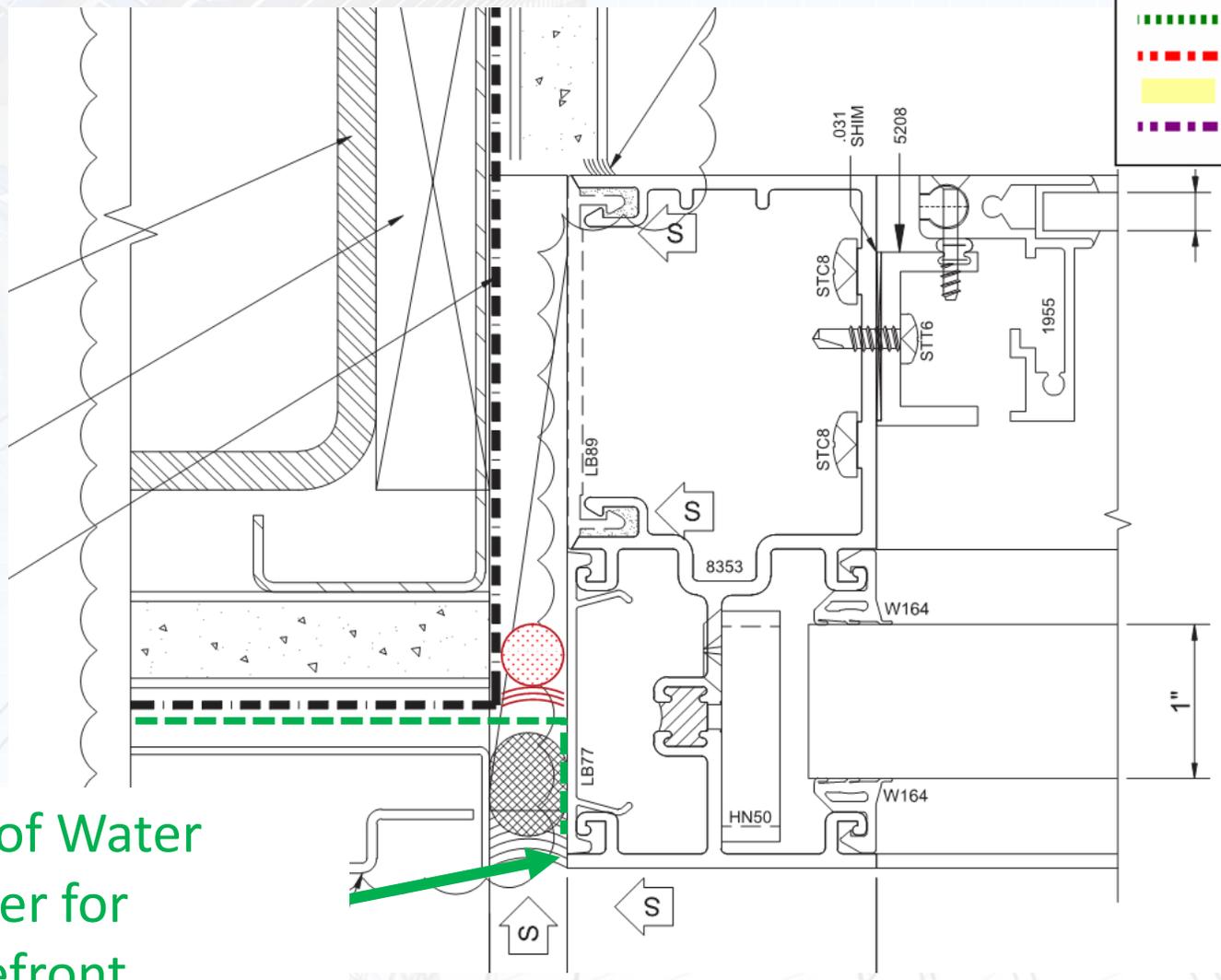
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Storefront Shop Drawing – Jamb Detail

Legend	
	Water Barrier
	Air Barrier
	Thermal Barrier
	Rainscreen



Part of Water Barrier for Storefront.



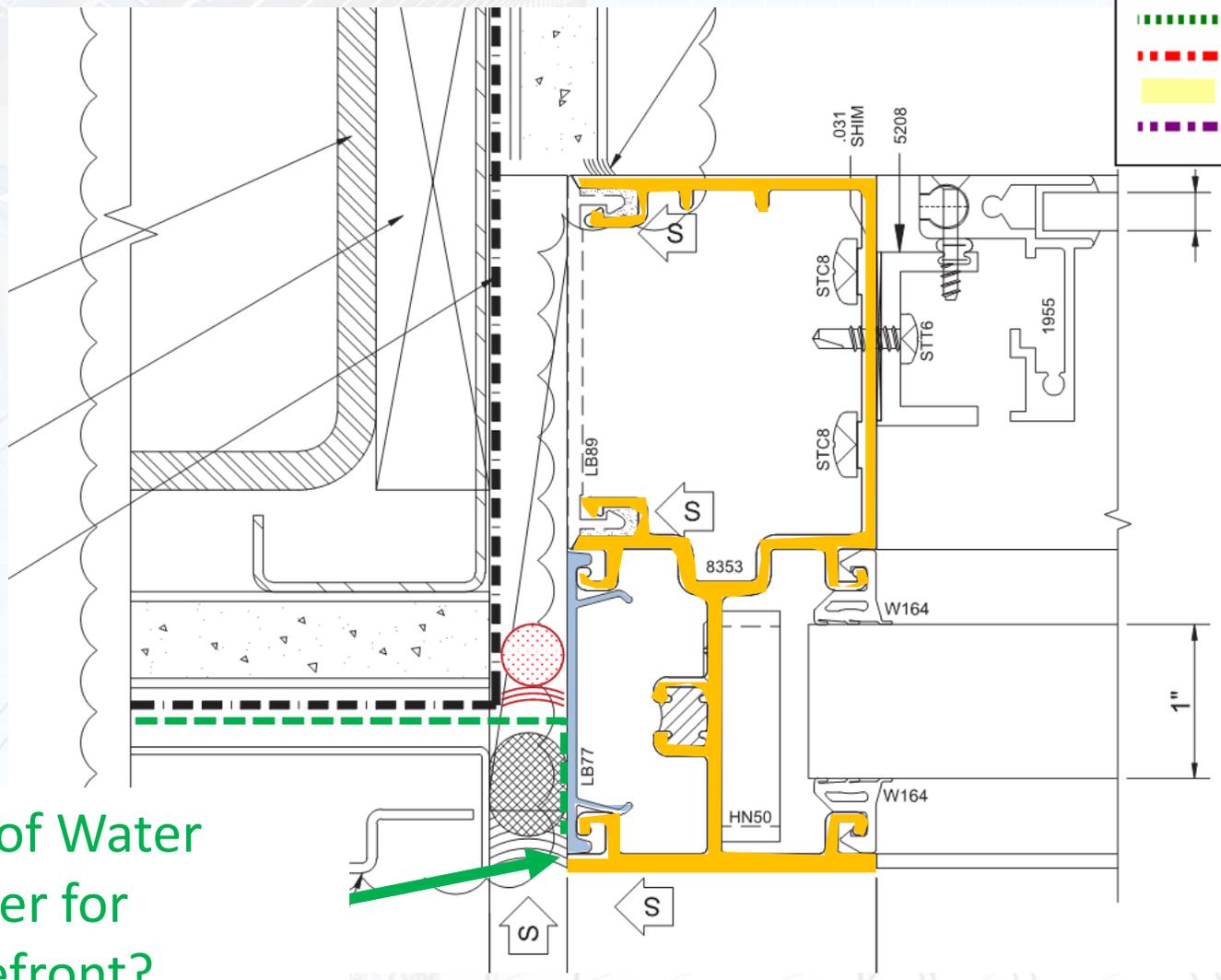
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Storefront Shop Drawing – Jamb Detail

Legend	
	Water Barrier
	Air Barrier
	Thermal Barrier
	Rainscreen



Part of Water Barrier for Storefront?



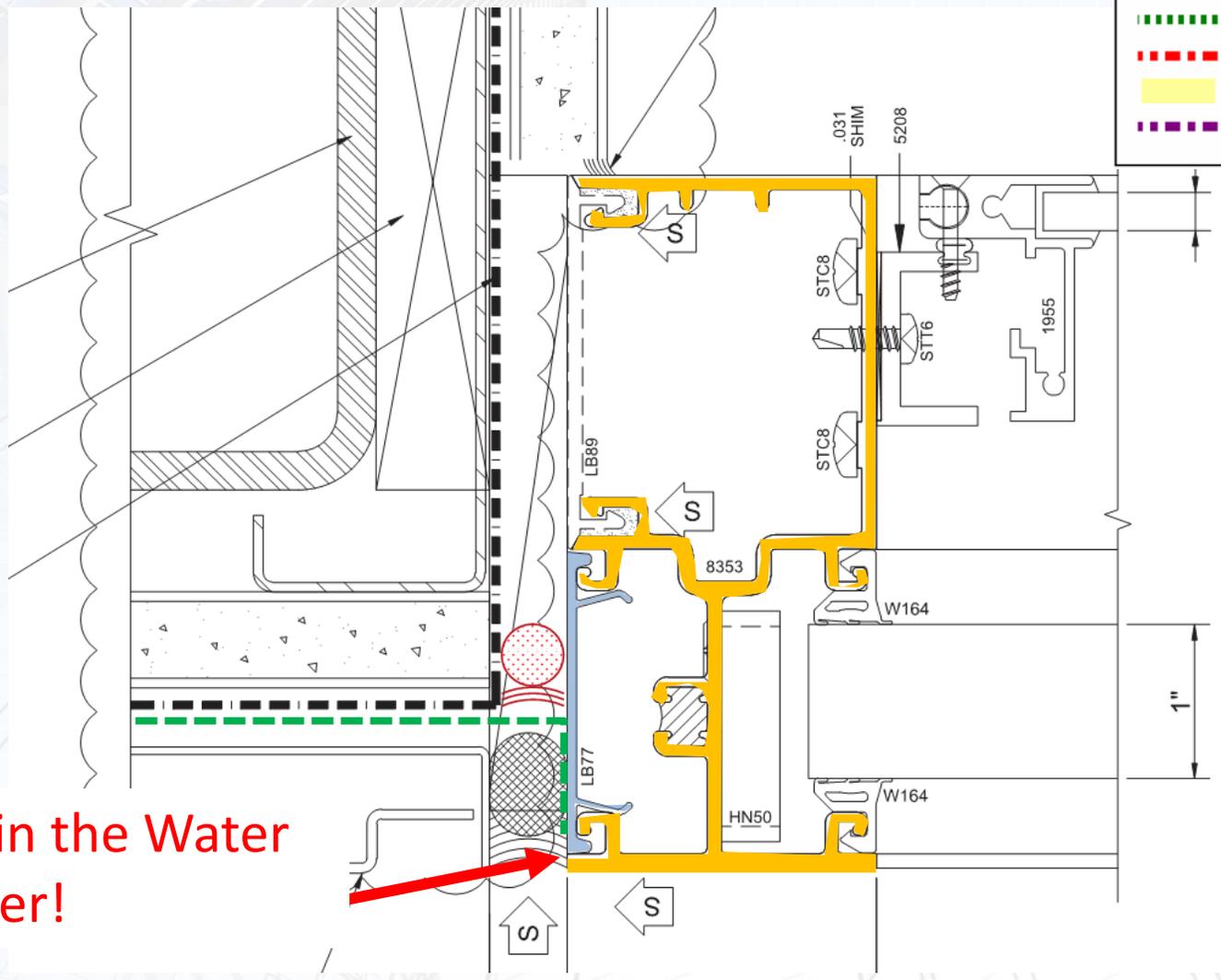
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Storefront Shop Drawing – Jamb Detail

Legend	
	Water Barrier
	Air Barrier
	Thermal Barrier
	Rainscreen



Gap in the Water Barrier!

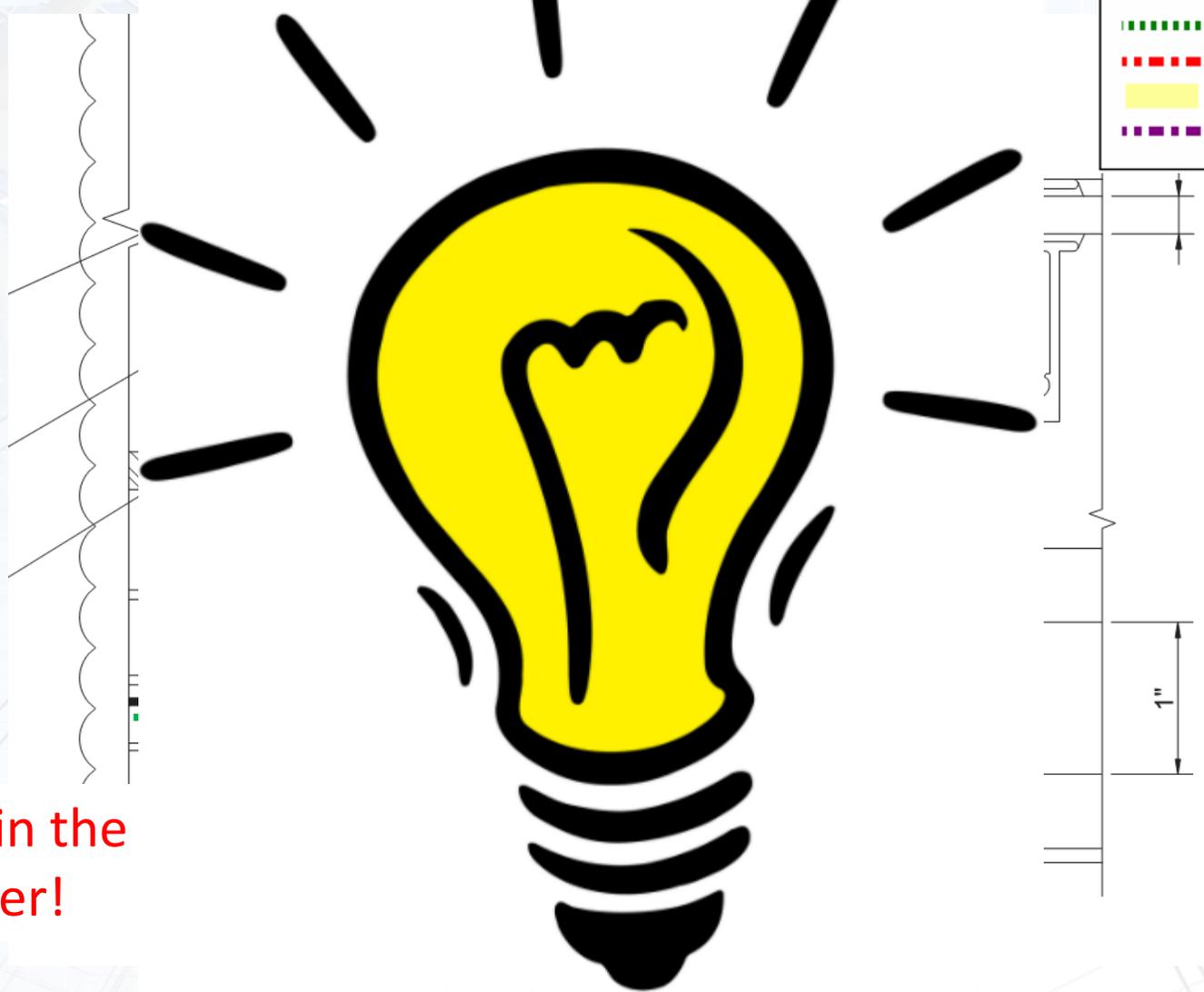


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Storefront Shop Drawing – Jamb Detail



Legend

- Water Barrier
- Air Barrier
- Thermal Barrier
- Rainscreen

Gap in the Barrier!



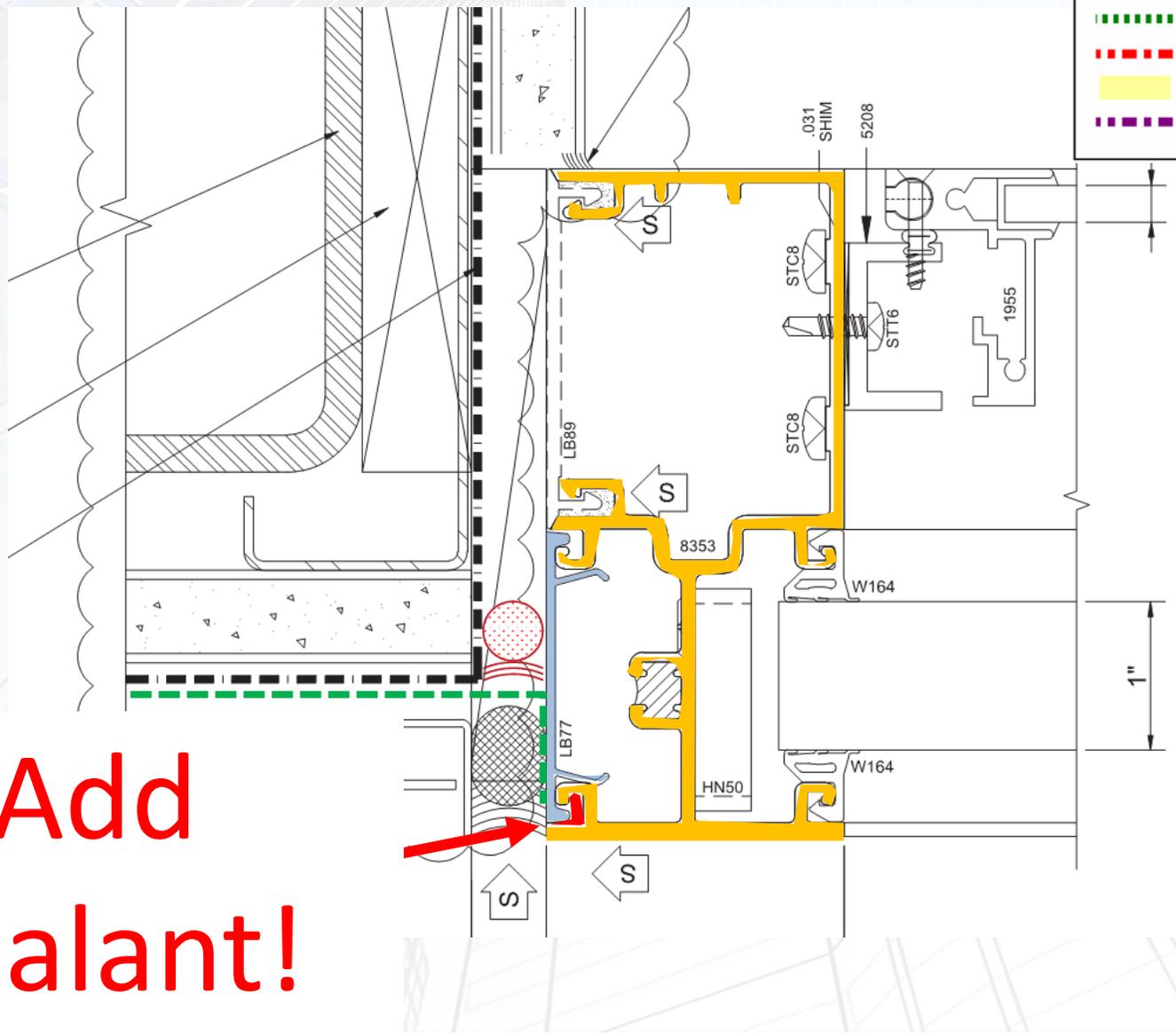
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Storefront Shop Drawing – Jamb Detail

Legend	
	Water Barrier
	Air Barrier
	Thermal Barrier
	Rainscreen



Add Sealant!



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

During Construction



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

During Construction

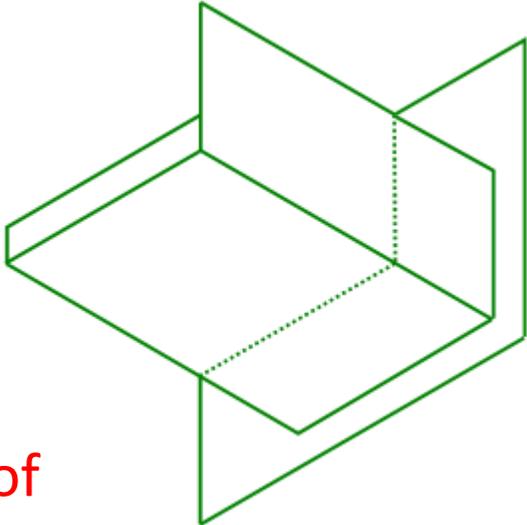




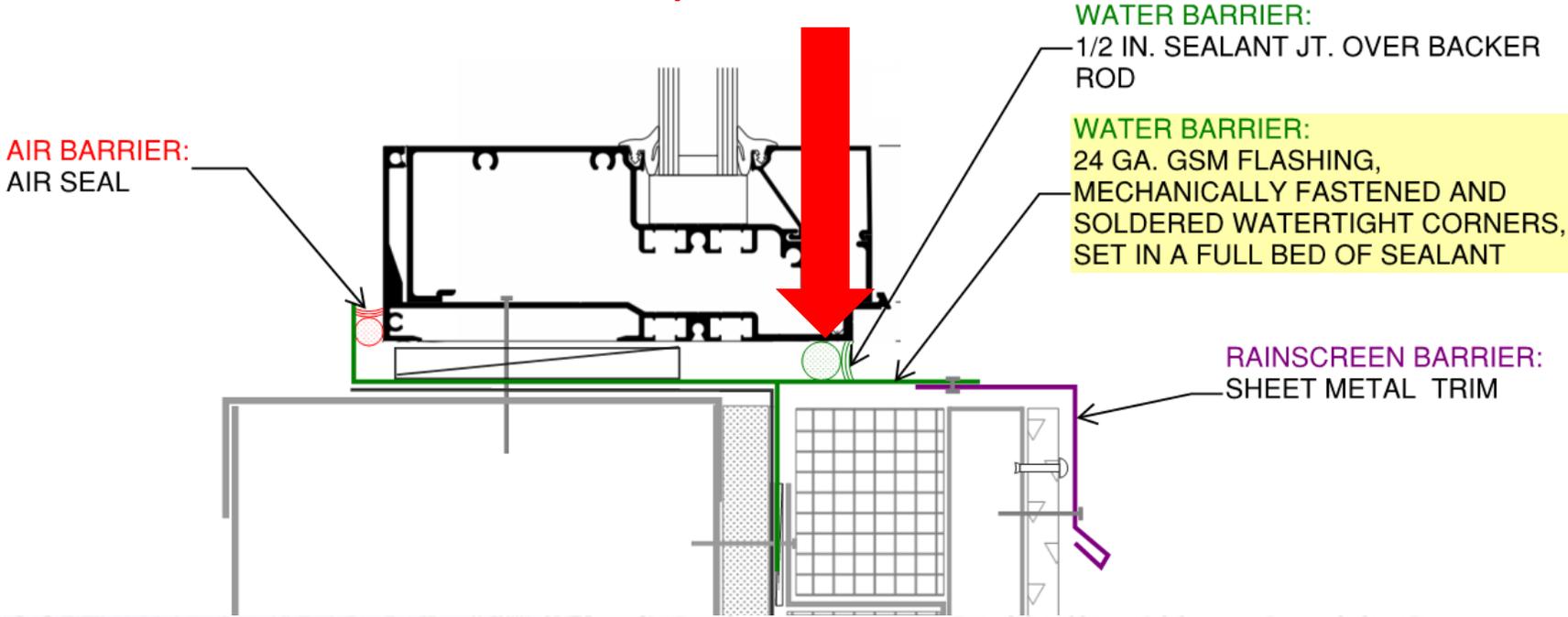
BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO



Sealant Jt. To the Face of Storefront Systems





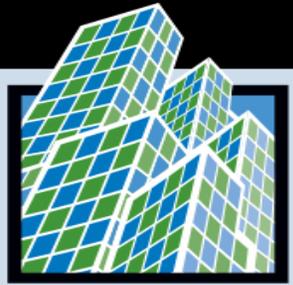
BUILDING 2018
INNOVATION

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Learning Objective

- How to incorporate the structure in the glazing system selection.
- How to integrate the air, water, vapor and thermal barriers of glazing systems at the transition to facade cladding system.
- How to identify the advantages and disadvantages of different glazing systems based on transitions to adjacent facade cladding assemblies.
- How to continuously improve glazing system details based on lessons learned.
 - Learn typical characteristics of glazing system.



**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Learning Objective

- How to incorporate the structure in the glazing system selection.
- How to integrate the air, water, vapor and thermal barriers of glazing systems at the transition to facade cladding system.
- How to identify the advantages and disadvantages of different glazing systems based on transitions to adjacent facade cladding assemblies.
- How to continuously improve glazing system details based on lessons learned.
 - Learn typical characteristics of glazing system.



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Case Study #2

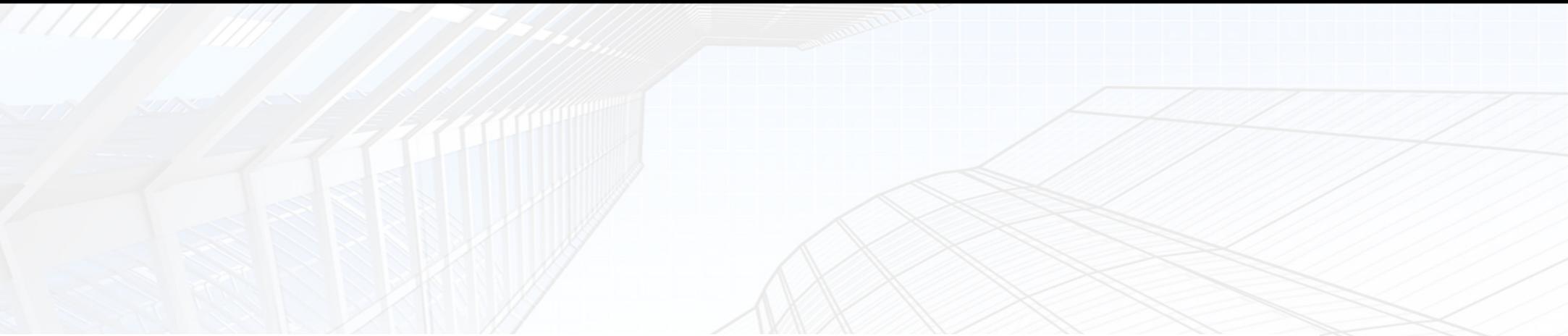
Deflection Joints



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO



The exterior will be composed of brick, metal panels, fiber cement panels, and cedar siding.





BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

Considerations of Glazing System Selection

1. Movement joint present at perimeter of the glazing system.
2. Position of glazing system relative to the structure.
3. Exterior framing and slab construction.

			Glazing System Type		
			<u>Window</u>	<u>Storefront</u>	<u>Curtain Wall</u>
Structural Consideration	1. Deflection Joint		Limited Manu.	Yes.	Yes.
	2. Glazing System Position Relative to Structure	Recessed	Yes.	Yes.	Yes.
		Flush	No.	No.	Yes.
		Projected	No.	No.	No.
	3. Slab-to-Slab		No.	Yes.	Yes.



BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

During Construction



Photo 6

Silicone sheet flashing required at deflection joint along window head.

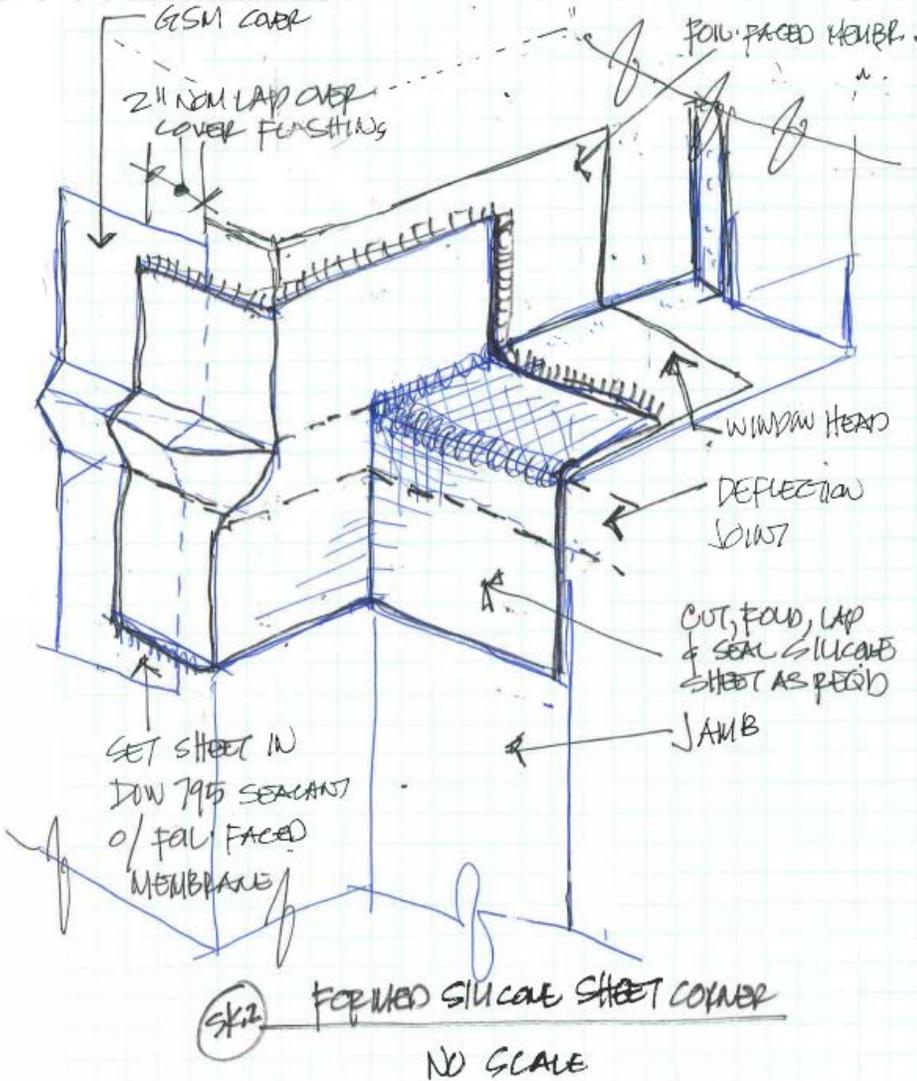


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

During Construction





BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

During Construction





BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

During Construction



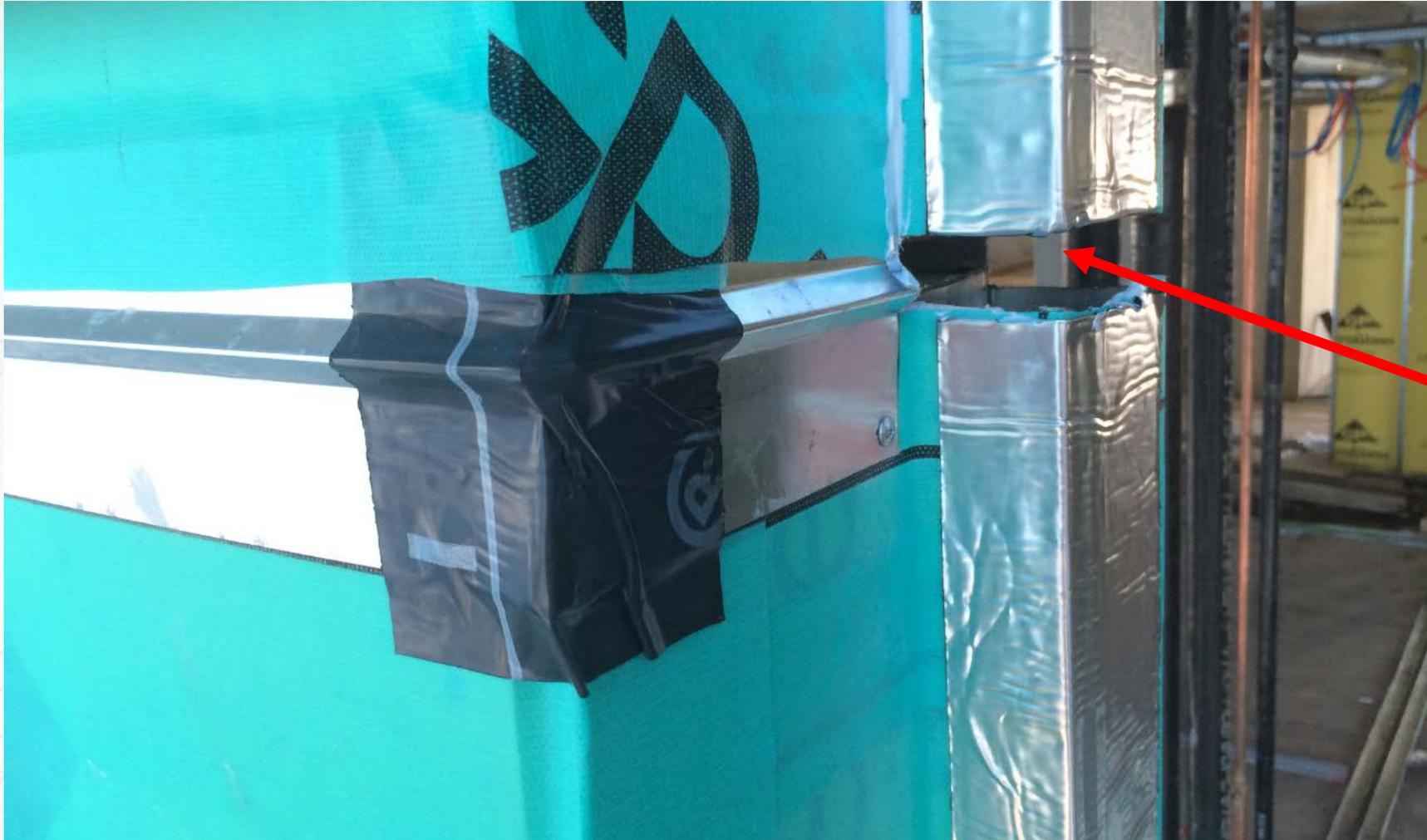


BUILDING INNOVATION 2018

National Institute of BUILDING SCIENCES

CONFERENCE & EXPO

During Construction





**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

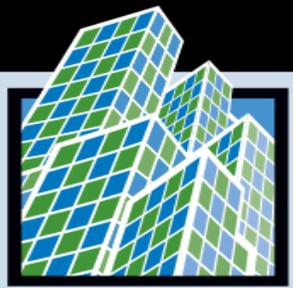
CONFERENCE & EXPO

During Construction

Seal is not at the exterior
face.

Exterior cladding and
curtain wall system are
seismically compatible.





**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Learning Objective

- How to incorporate the structure in the glazing system selection.
- How to integrate the air, water, vapor and thermal barriers of glazing systems at the transition to facade cladding system.
- How to identify the advantages and disadvantages of different glazing systems based on transitions to adjacent facade cladding assemblies.
- How to continuously improve glazing system details based on lessons learned.
 - Learn typical characteristics of system.
 - **“Every section turns or terminates.”**



**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Learning Objective

- How to incorporate the structure in the glazing system selection.
- How to integrate the air, water, vapor and thermal barriers of glazing systems at the transition to facade cladding system.
- **How to identify the advantages and disadvantages of different glazing systems based on transitions to adjacent facade cladding assemblies.**
- How to continuously improve glazing system details based on lessons learned.
 - Learn typical characteristics of system.
 - **“Every section turns or terminates.”**



**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

Summary

- How to incorporate the structure in the glazing system selection.
 - Exterior Wall Construction
 - Movement Joint, Position of Glazing System, Slab-to-Slab.
- How to integrate the air, water, vapor and thermal barriers of glazing systems at the transition to facade cladding system.
- How to identify the advantages and disadvantages of different glazing systems based on transitions to adjacent facade cladding assemblies.
- How to continuously improve glazing system details based on lessons learned.
 - Learn typical characteristics of system.
 - “Every section turns or terminates.”



**BUILDING
INNOVATION 2018**

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

This concludes The American Institute of Architects Continuing Education Systems Course

Xiu T. Li, P.E. (CA)

Senior Staff II - Building Technology

SIMPSON GUMPERTZ & HEGER

| Engineering of Structures and Building Enclosures

100 Pine Street, Suite 1600
San Francisco, CA 94111

415.495.3700 main
415.343.3003 direct
415.312.2730 mobile
415.495.3550 fax
www.sgh.com

