



Preventable Curtain Wall Failures

Kawneer AIA-CES

Course: K_ILFF_12_114

Credit: (1) CEH/HSW



Kawneer Company
Technology Park / Atlanta
555 Guthridge Court
Norcross, Georgia 30092

Architectural Services Team **1-877-767-9107**
kawneer.com
kawneergreen.com

Preventable Curtain Wall Failures

Best Practices:

Kawneer is registered as an Approved AIA CES Provider (J204) and this course has been approved by AIA in accordance with their guidelines. This course is not designed to promote any particular product or manufacturer during the educational portion of the presentation. AIA members will earn 1 hour CEH /HSW after completing the online quiz following this presentation.



Preventable Curtain Wall Failures

Copyright

This presentation is protected by US and International Copyright laws. Reproduction, distribution, display and use of the presentation without written permission of the speaker is prohibited.

Preventable Curtain Wall Failures

Learning Objectives:

1. Influence of Wind Load on Curtain Wall Design/Selection
2. Importance of Properly Securing Curtain Wall to Surround Condition
3. Importance of Following Manufacturer's Installation Instructions Addressing Internal Seals
4. Understanding How Curtain Wall Performs and Installation for Proper Performance

Preventable Curtain Wall Failures

Curtain Wall:

- **Building Envelope**
 - Thermal Barrier
 - Weather Barrier
 - Air Pressure Barrier
- **Exterior to Structure**
 - Anchored at Slab Edge
 - Moves Independently
- **Performs as:**
 - System
 - Individual Lites



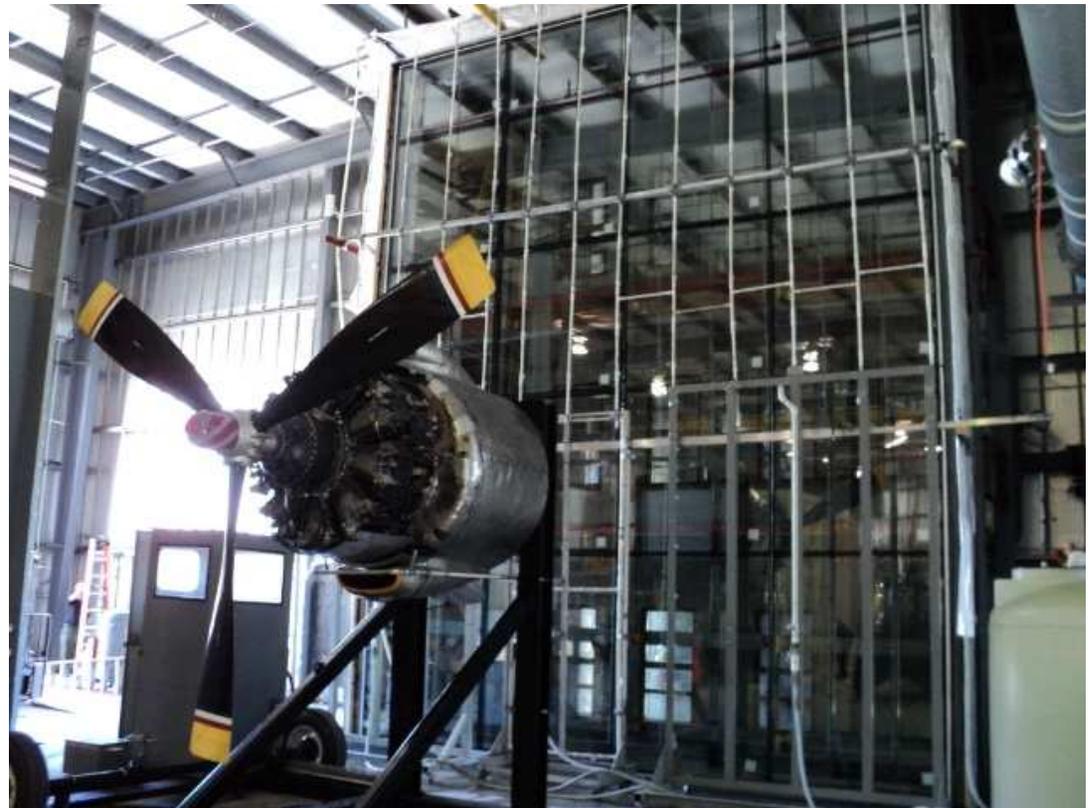
Preventable Curtain Wall Failures

Failure Is When Curtain Wall Systems Do Not Meet Expectations

*With proper understanding of curtain wall systems,
most failures are PREVENTABLE!*

Main Causes of CW Failures:

- *Wind Load Issues*
- *Improper Perimeter Anchoring*
- *Improper Critical Seals*
- *System Performance Restricted*



Preventable Curtain Wall Failures



- ***Ensure System Will Withstand Project Conditions***

Preventable Curtain Wall Failures

Proper System for Project Conditions



Design Load Drivers Include:

- **Wind Load**
- **Dead Load**
- **Hurricane Conditions**
- **Blast Mitigation**
- **Seismic**

Preventable Curtain Wall Failures

Proper System for the Project Conditions



Façade- Components & Cladding

- IBC Structural section 1600
- Provide Wind Load in PSF
(not MPH)

Components and Cladding

- Design wind pressures in terms
of Positive and Negative PSF

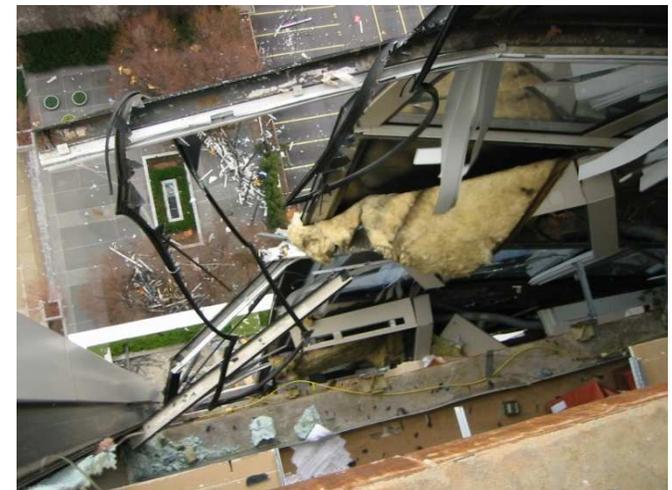
Preventable Curtain Wall Failures

Proper System for the Project Conditions

Architect & Structural

1603.1.4 Wind design data. The following information related to wind loads shall be shown, regardless of whether wind loads govern the design of the lateral-force-resisting system of the building:

1. Basic wind speed (3-second gust), miles per hour (km/hr).
2. Wind importance factor, *I*, and *occupancy category*.
3. Wind exposure. Where more than one wind exposure is utilized, the wind exposure and applicable wind direction shall be indicated.
4. The applicable internal pressure coefficient.
5. Components and cladding. The design wind pressures in terms of psf (kN/m²) to be used for the design of exterior component and cladding materials not specifically designed by the registered design professional.

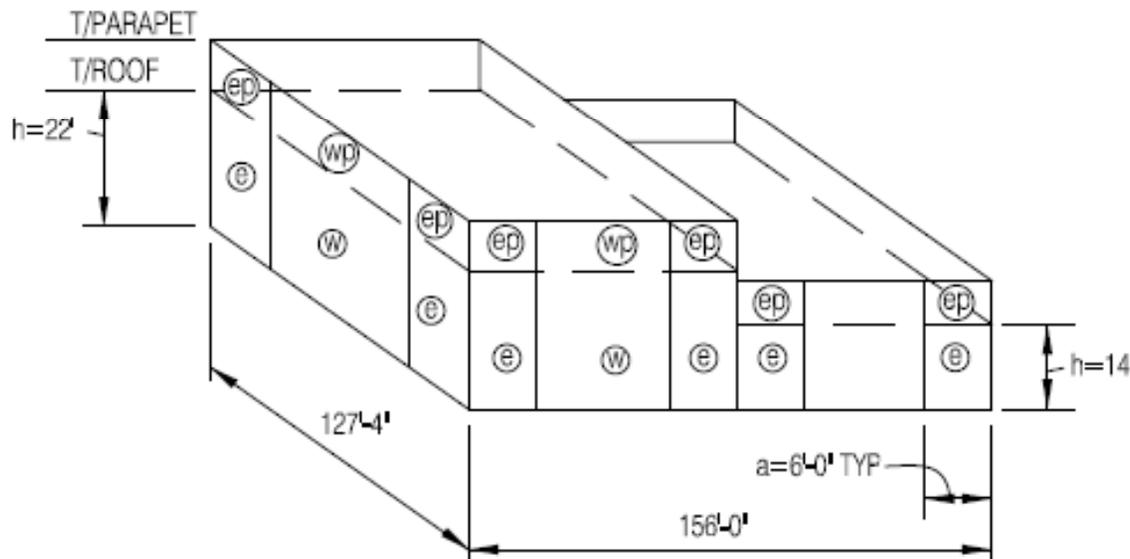


Preventable Curtain Wall Failures

Proper System for the Project Conditions

Architect & Structural

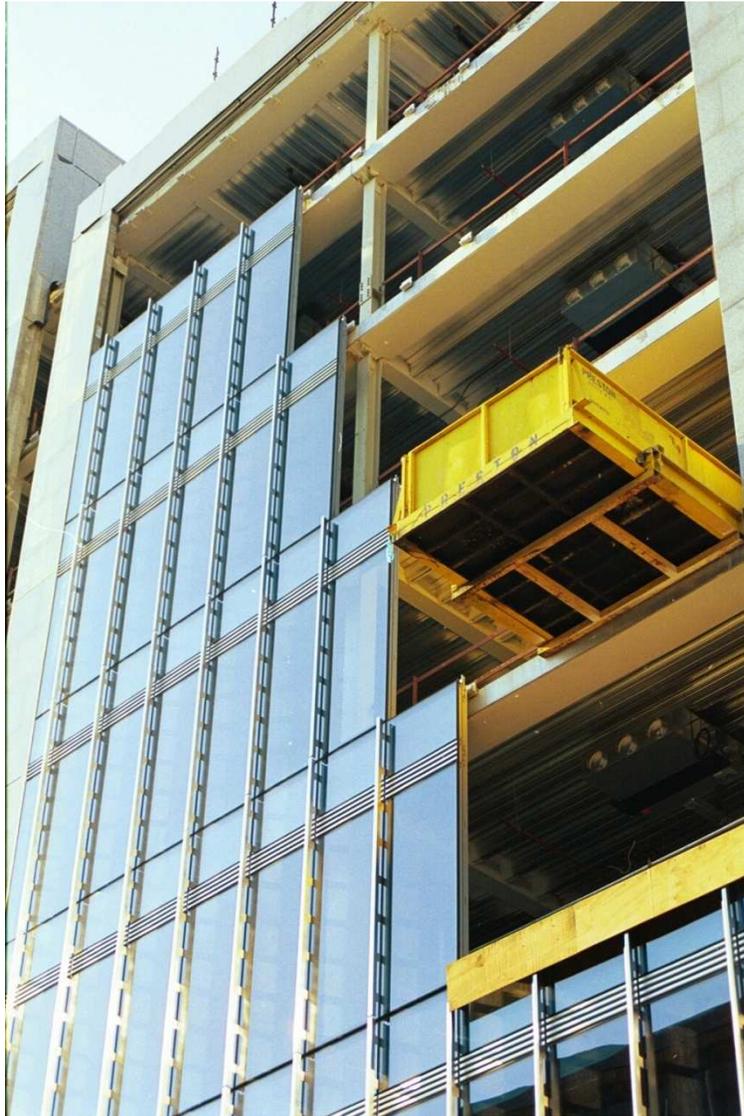
- PSF



GENERIC ELEVATION

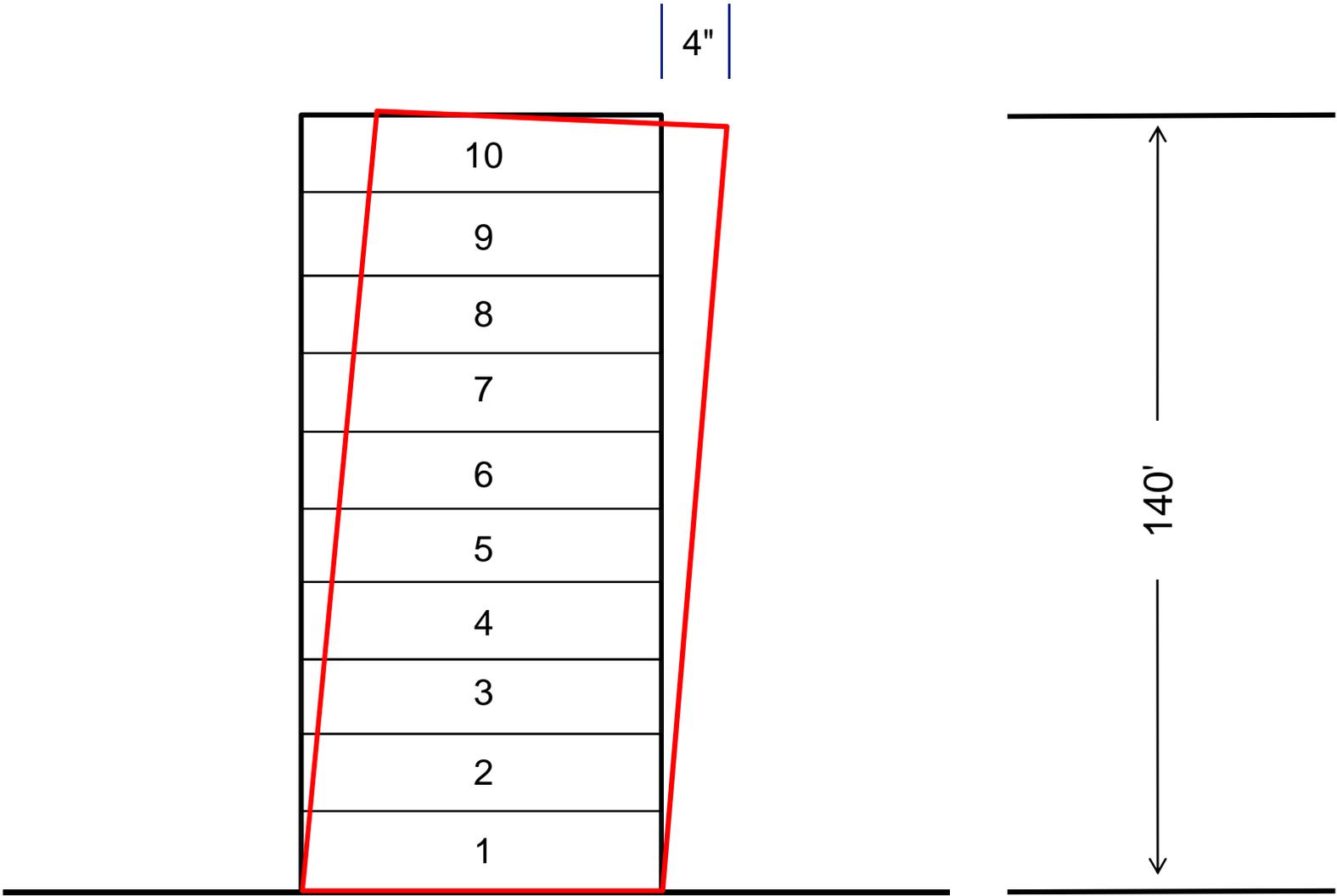
| COMPONENT & CLADDING DESIGN GROSS WIND PRESSURES | |
|---|--------------------|
| WALL | |
| ZONE | PRESSURE |
| w | +17 psf -19 psf |
| e | +17 psf -21 psf |
| wp | +26 psf -29 psf |
| ep | +26 psf -32 psf |

Preventable Curtain Wall Failures



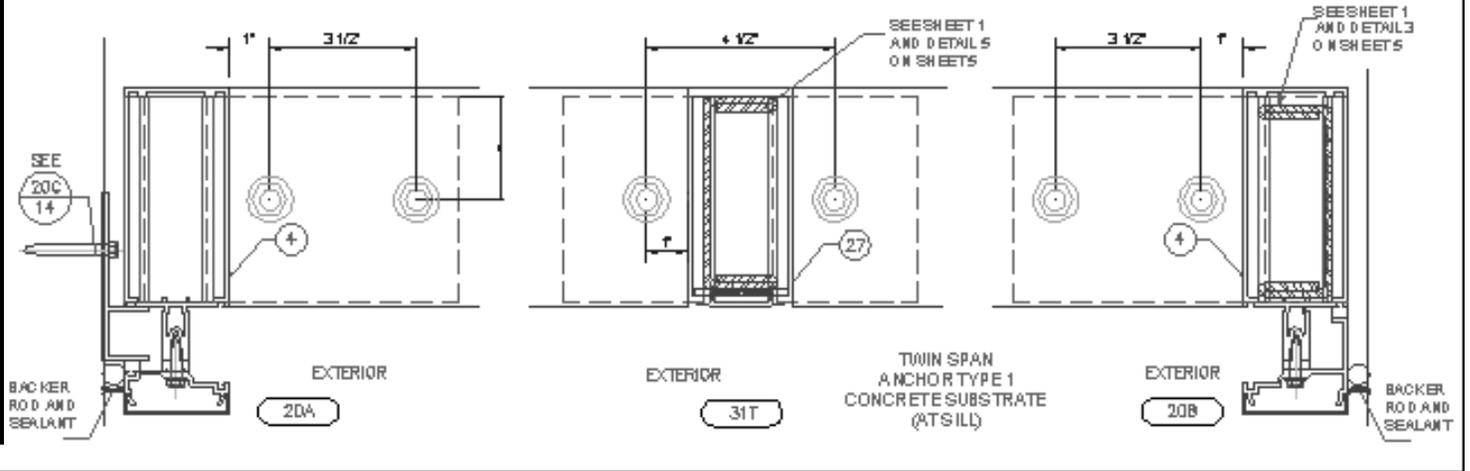
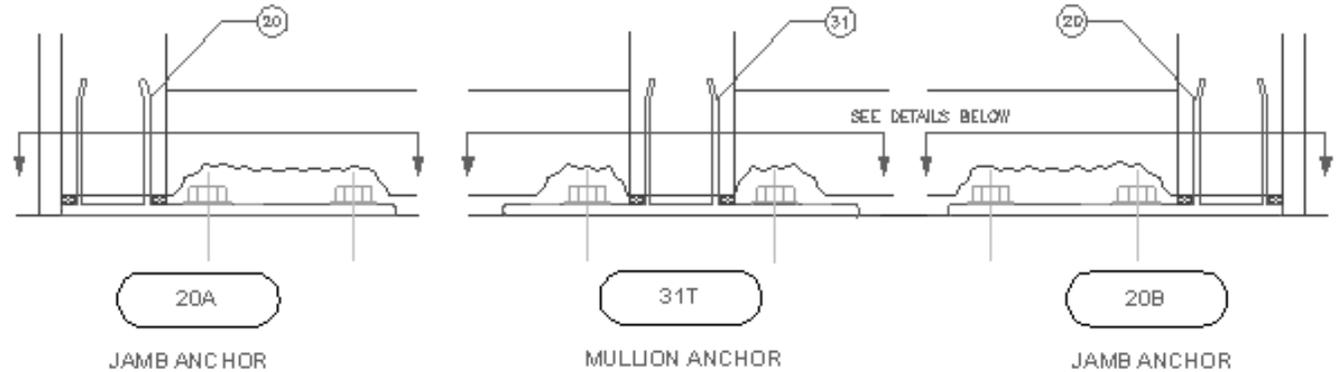
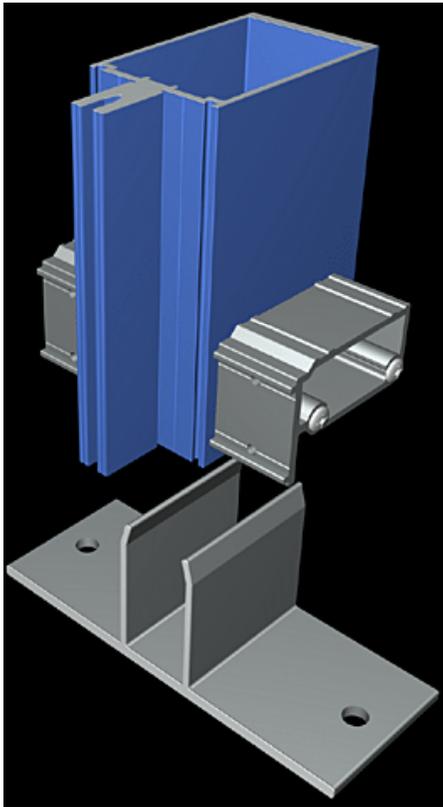
- ***Ensure System Will Withstand Project Conditions***
- ***Ensure System is Properly Secured to Surround Condition***

Preventable Curtain Wall Failures



Preventable Curtain Wall Failures

Use Perimeter Anchors Engineered for System



TWIN SPAN ANCHOR TYPE 1 CONCRETE SUBSTRATE (ATS-ILL)

Preventable Curtain Wall Failures

Use Perimeter Anchors Engineered for System



***Consider
Possible End
Reaction!***

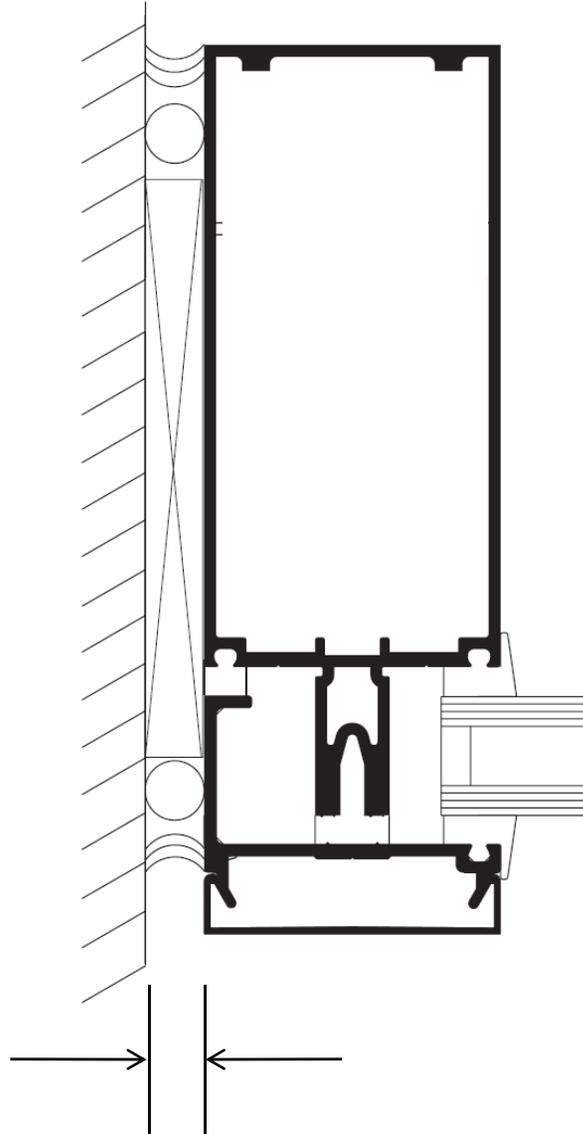
Preventable Curtain Wall Failures

Use Perimeter Anchors Engineered for System

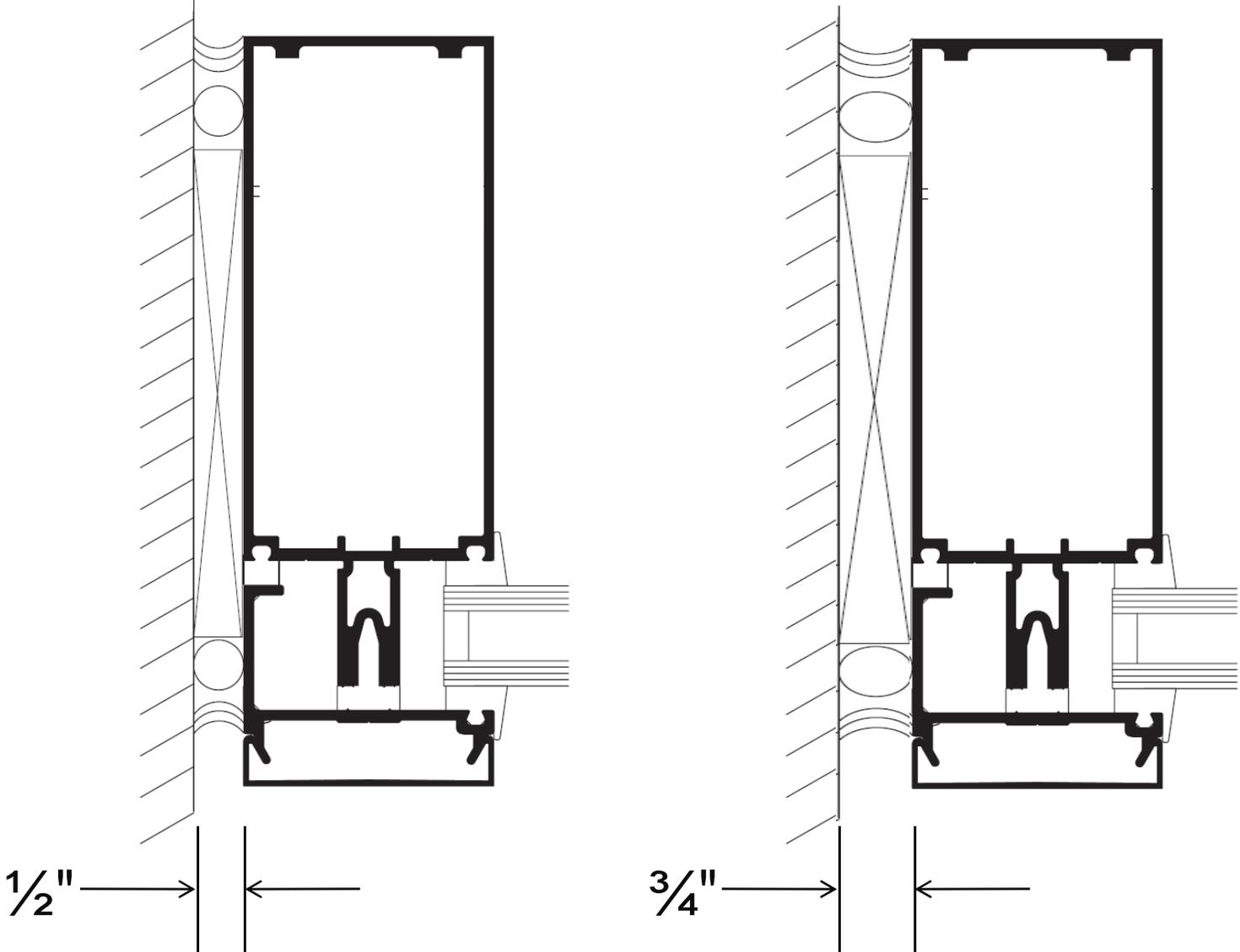


How will this anchor handle live load deflection?

Preventable Curtain Wall Failures



Preventable Curtain Wall Failures



Preventable Curtain Wall Failures

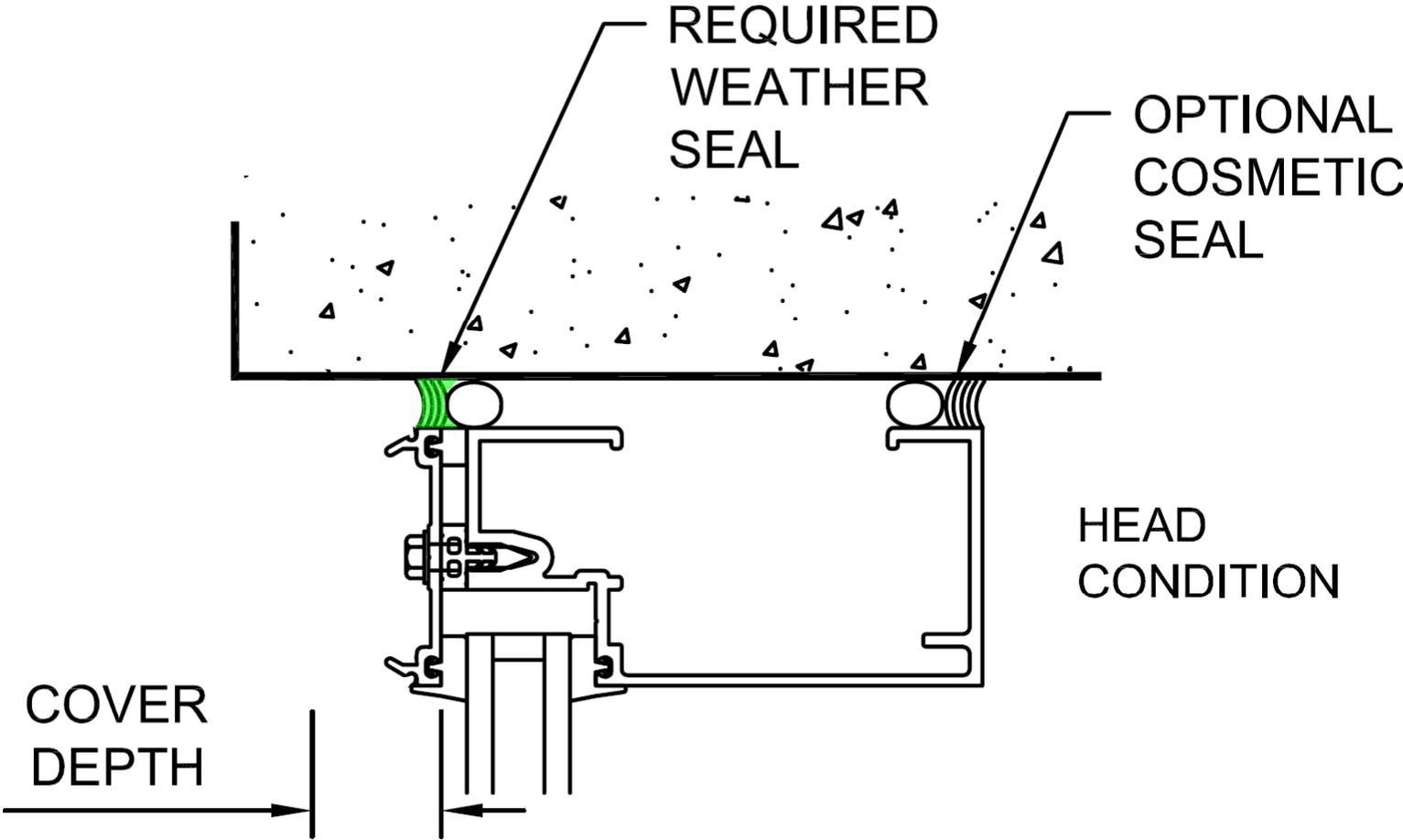


Preventable Curtain Wall Failures



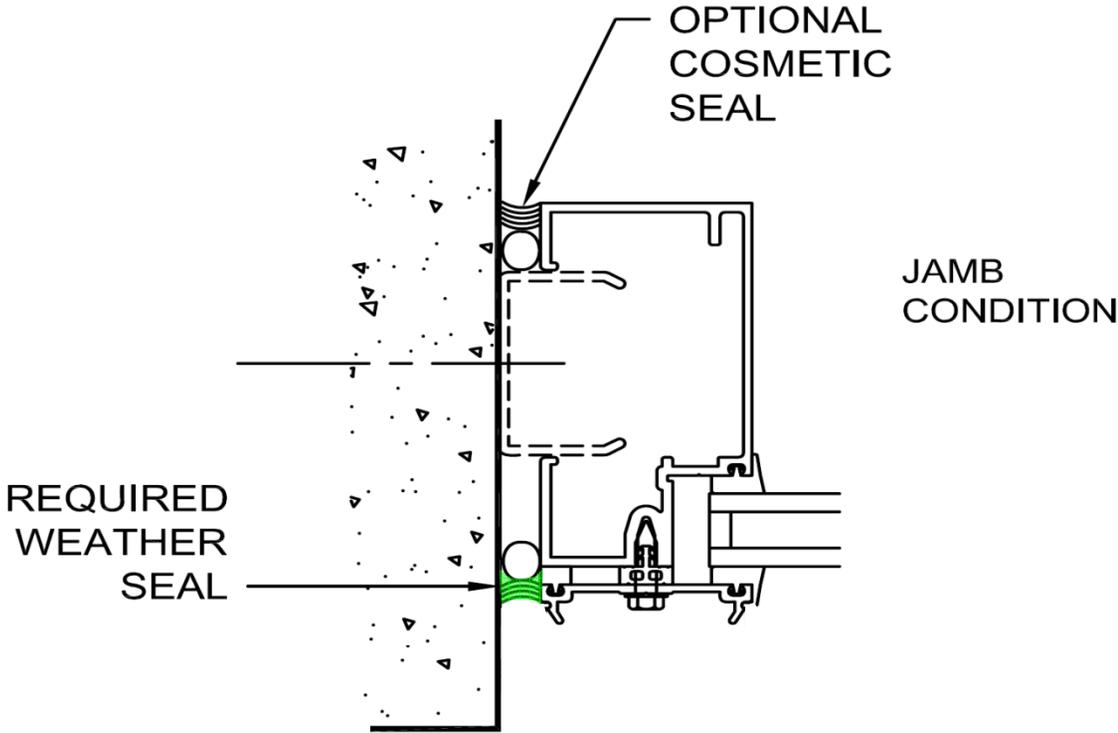
Preventable Curtain Wall Failures

Maintain Continuity of Perimeter Seals



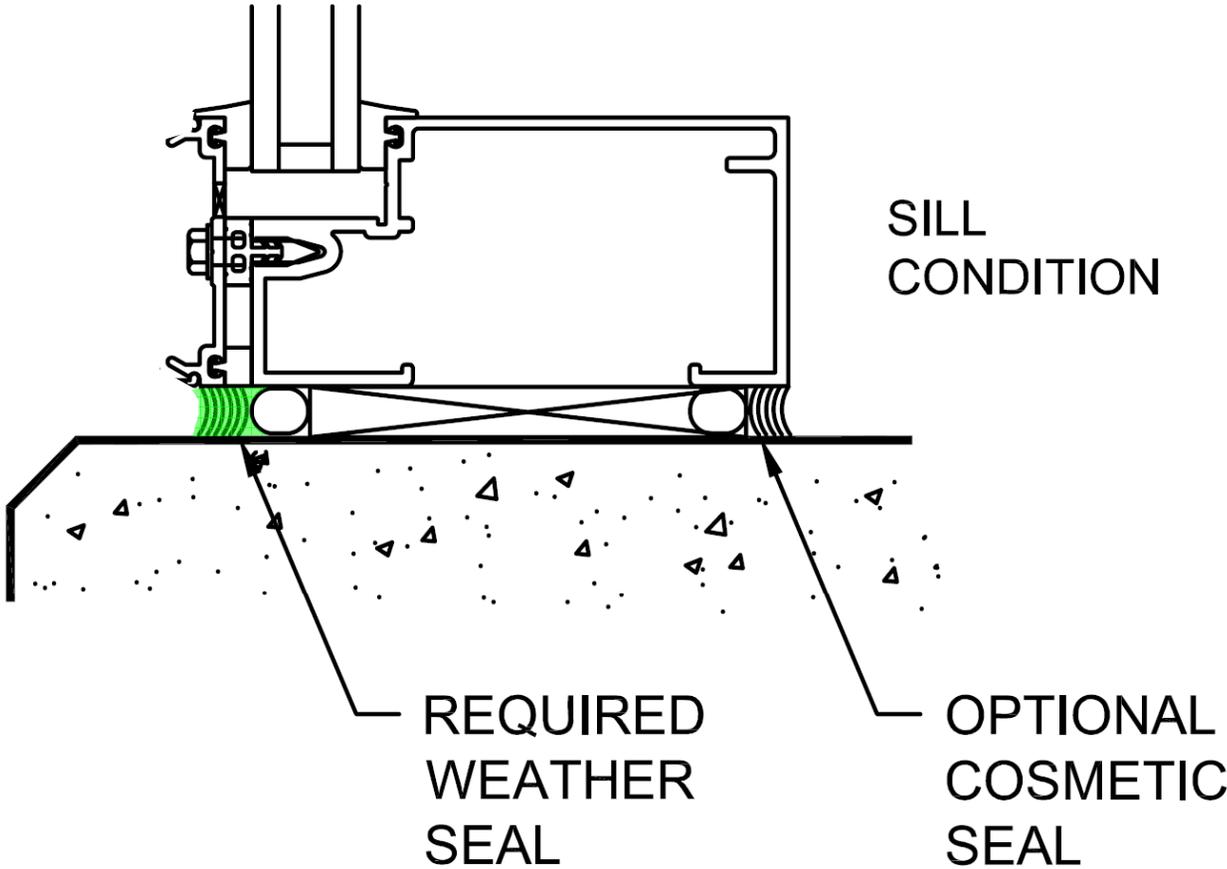
Preventable Curtain Wall Failures

Maintain Continuity of Perimeter Seals



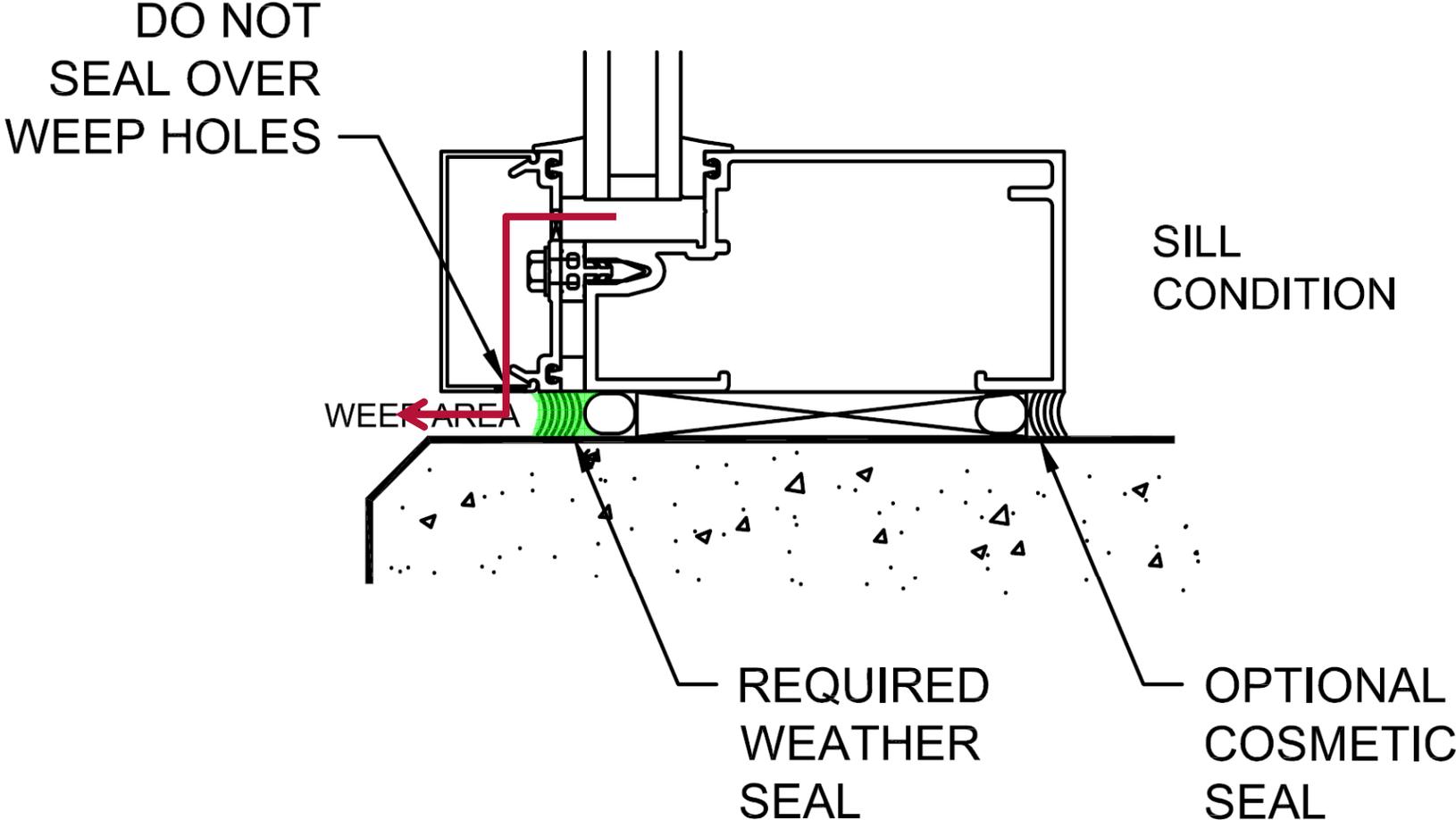
Preventable Curtain Wall Failures

Maintain Continuity of Perimeter Seals



Preventable Curtain Wall Failures

Maintain Continuity of Perimeter Seals

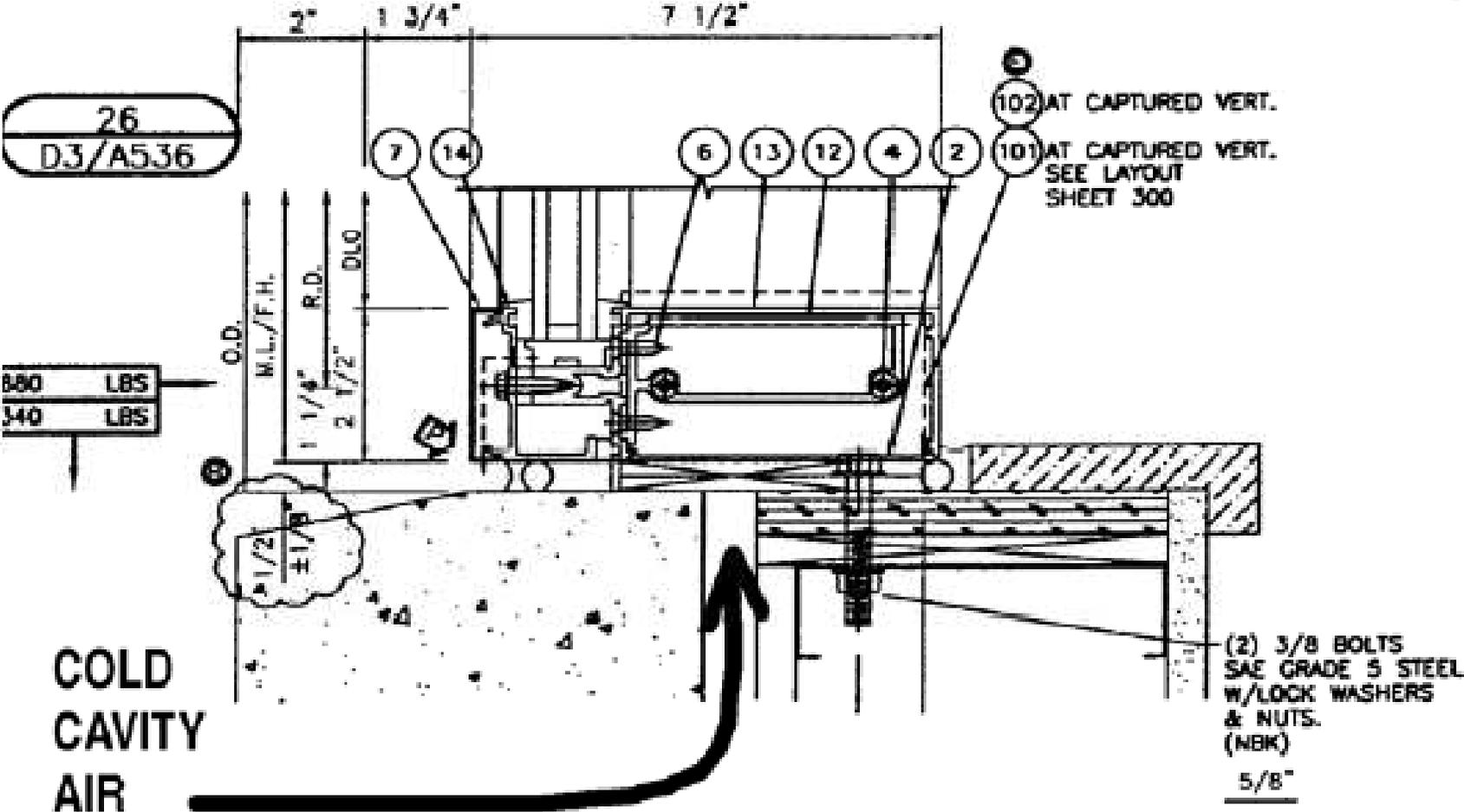


Preventable Curtain Wall Failures

Maintain Continuity of Perimeter Seals



Preventable Curtain Wall Failures



Preventable Curtain Wall Failures

Proper Shimming is Critical to Curtain Wall Performance

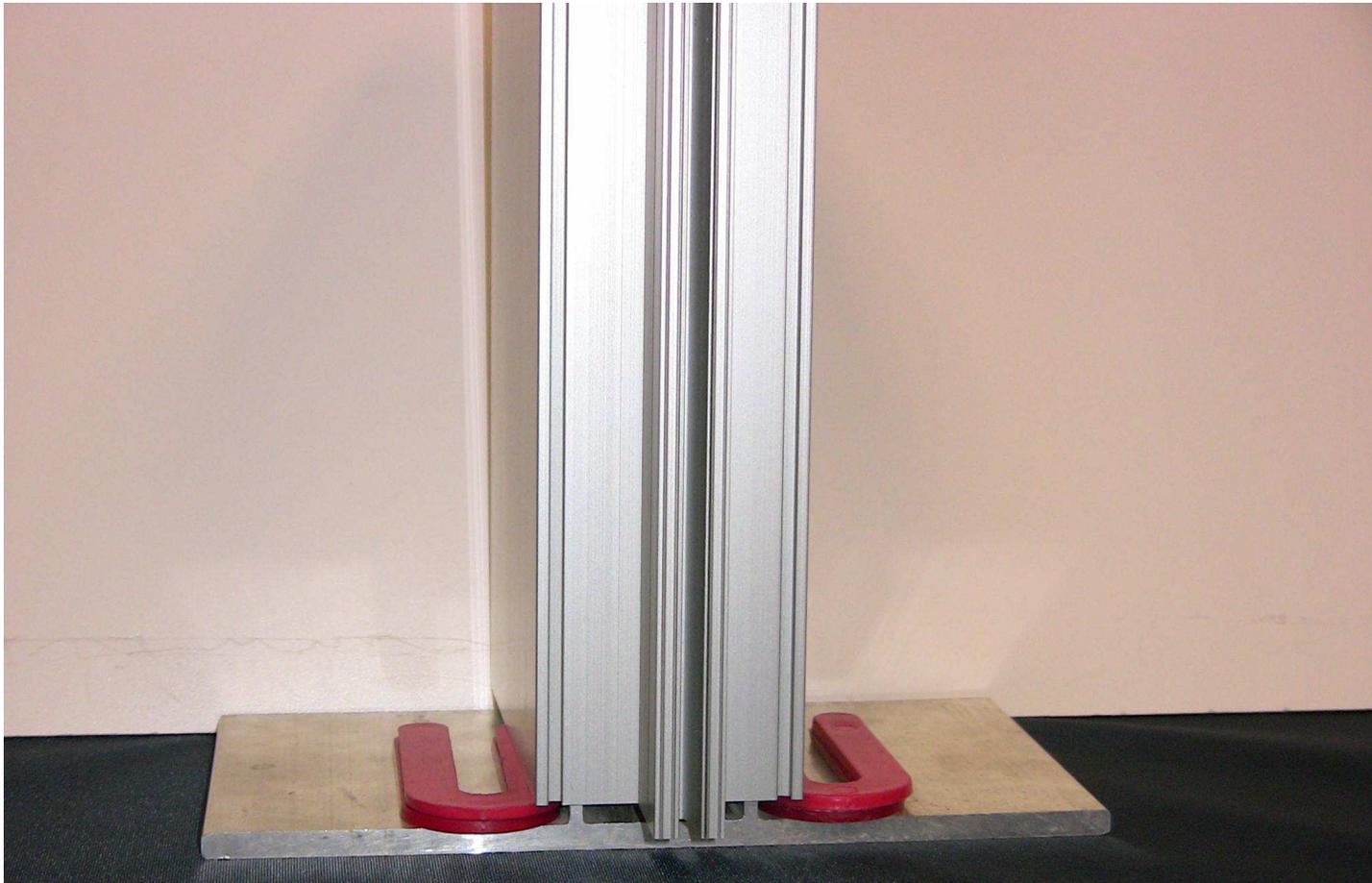
Proper Use and Location of Shims is **Critical**

- Load-Bearing
- Non-Compression
- High-Durability



Preventable Curtain Wall Failures

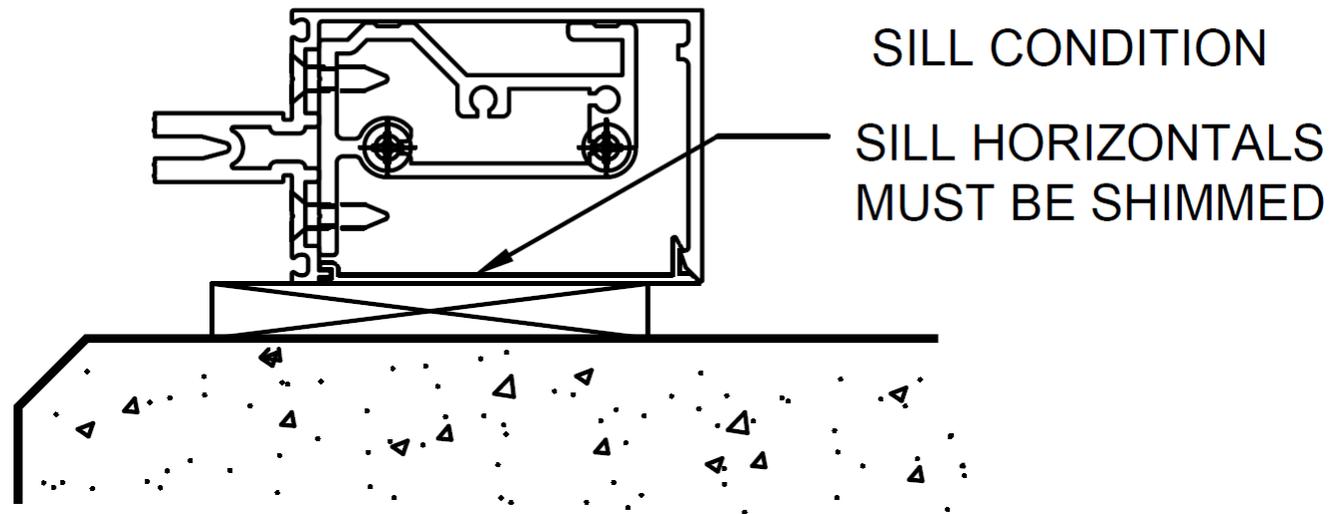
Proper Shimming is Critical to Curtain Wall Performance



Locate Shims Properly Above Anchor (as shown)

Preventable Curtain Wall Failures

Proper Shimming is Critical to Curtain Wall Performance



Shim at Setting Block Locations

Preventable Curtain Wall Failures

Proper Shimming is Critical to Curtain Wall Performance



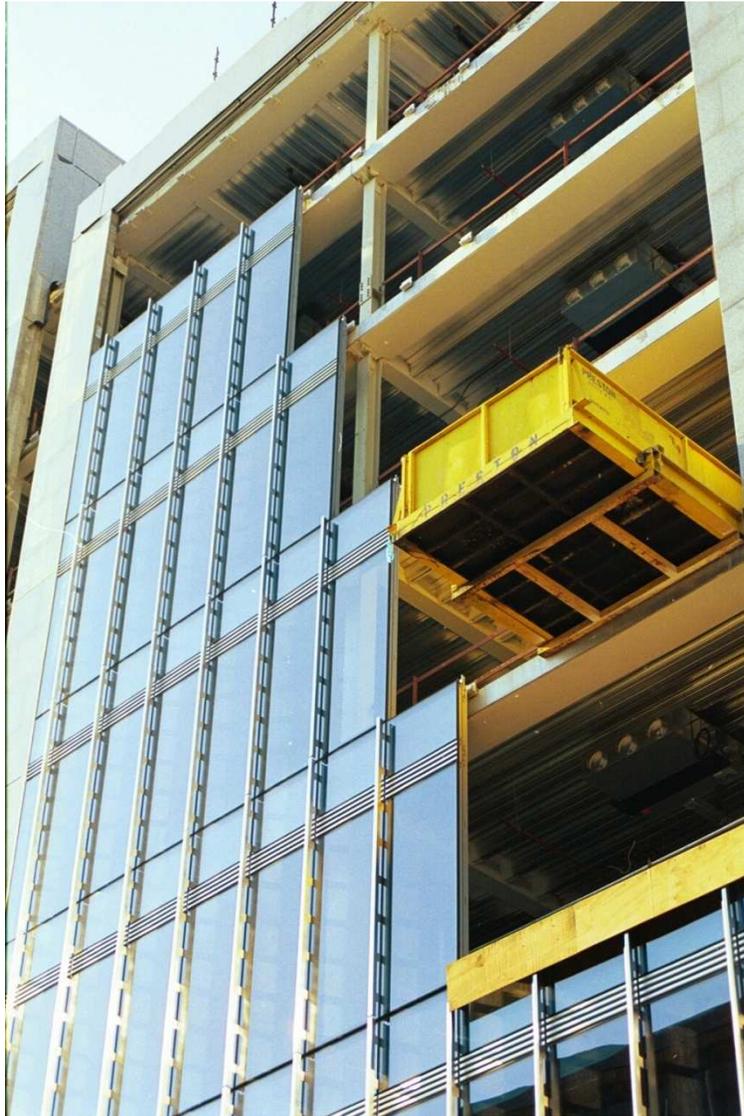
Potential Fastener Shear

Preventable Curtain Wall Failures

Proper Shimming is Critical to Curtain Wall Performance



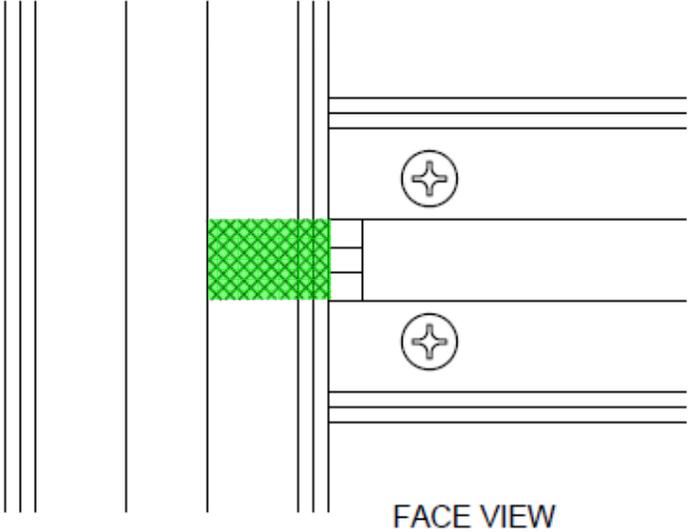
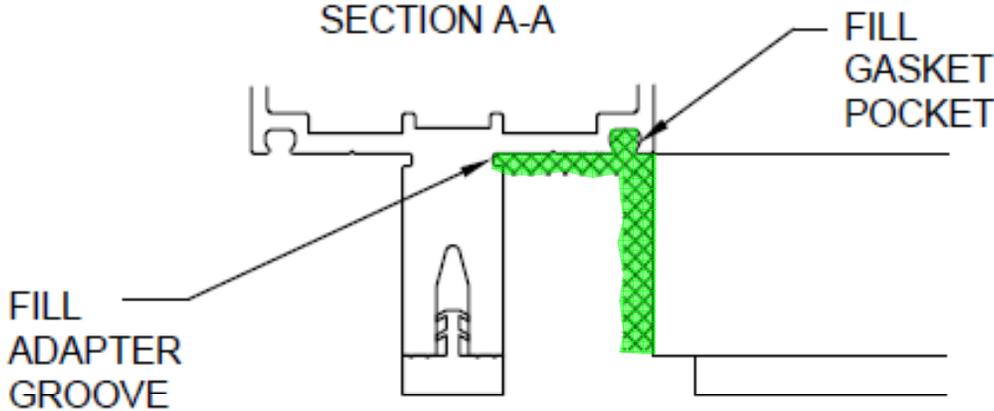
Preventable Curtain Wall Failures



- ***Ensure System Will Withstand Project Conditions***
- ***Ensure System is Properly Secured to Surround Condition***
- ***Ensure All Internal Critical Seals are Per Manufacturer's Recommendations***

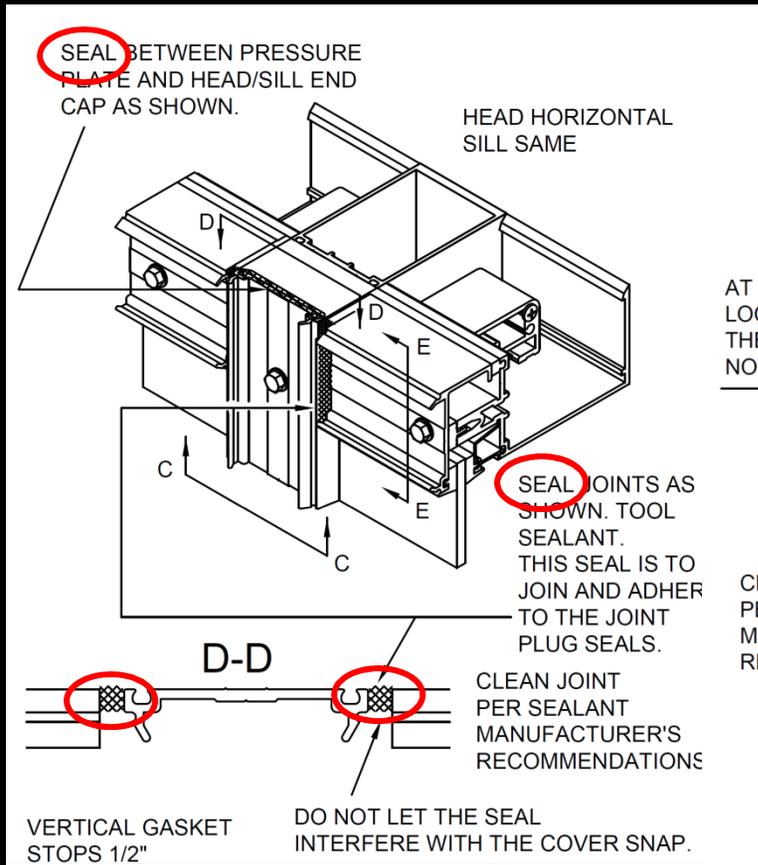
Preventable Curtain Wall Failures

Proper Attention to Critical Internal Seals



Clean All Surfaces Prior To Application of Sealant

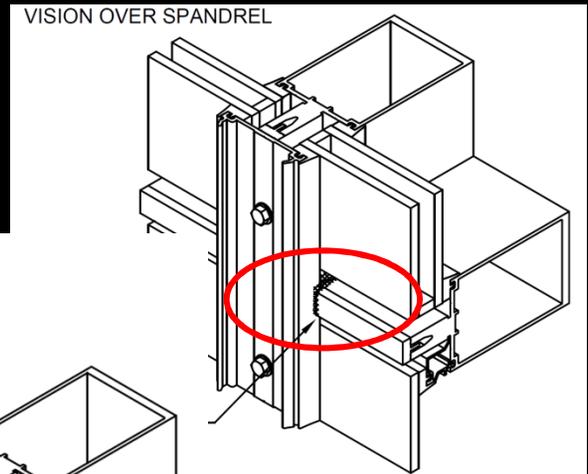
Preventable Curtain Wall Failures



AT TOP PRESSURE PLATE LOCATE SCREW CLOSE TO THE MULLION JOINT BUT NOT BELOW THE JOINT.

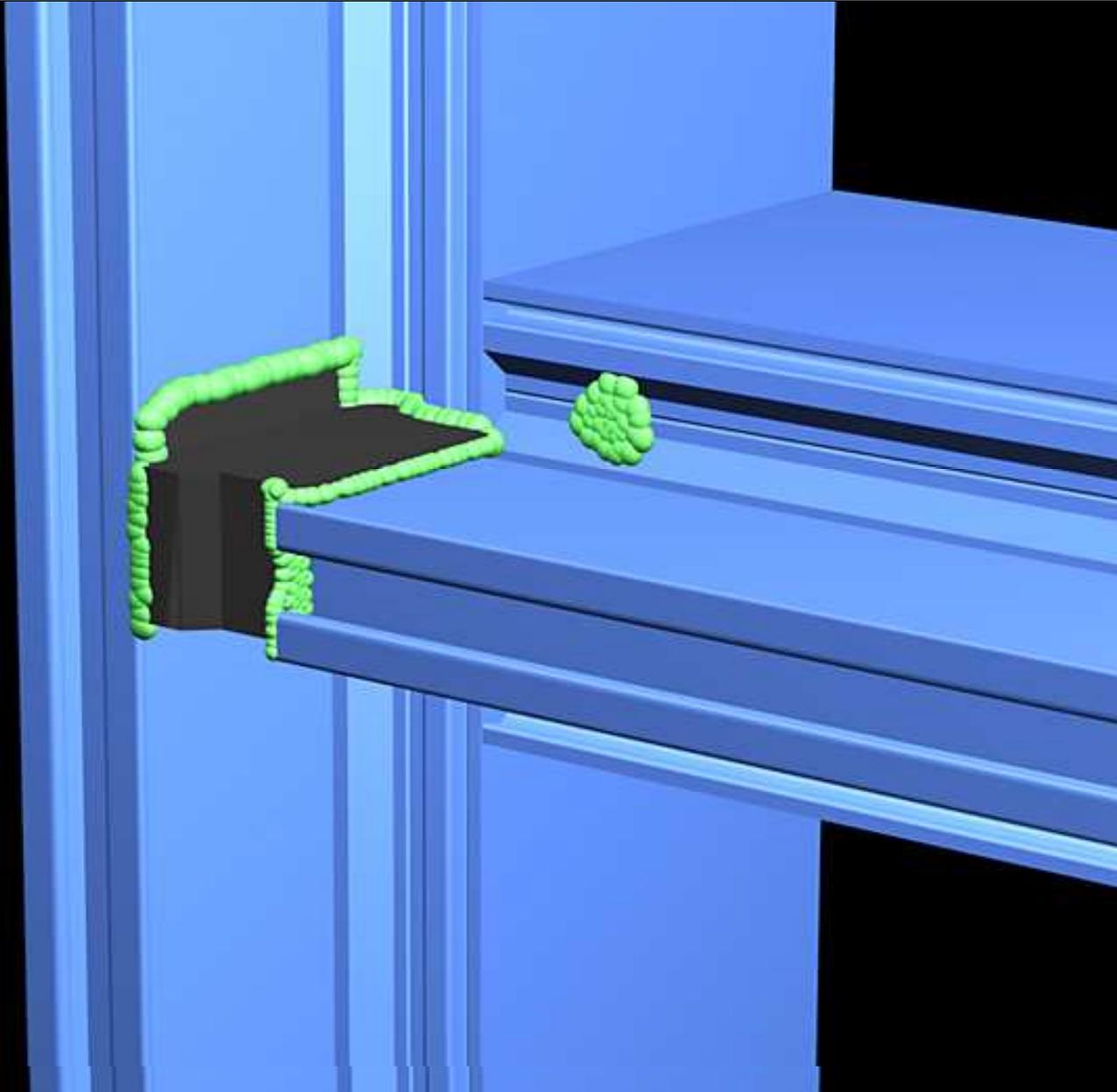
CLEAN JOINT PER SEALANT MANUFACTURER'S RECOMMENDATIONS

COMPLETELY SEAL JOINT. DO NOT LET SEALANT INTERFERE WITH COVER SNAP. OVERLAP PRESSURE PLATE FACE CREATING A BAND-AID SEAL.



Apply Manufacturer's Critical Seals

Preventable Curtain Wall Failures



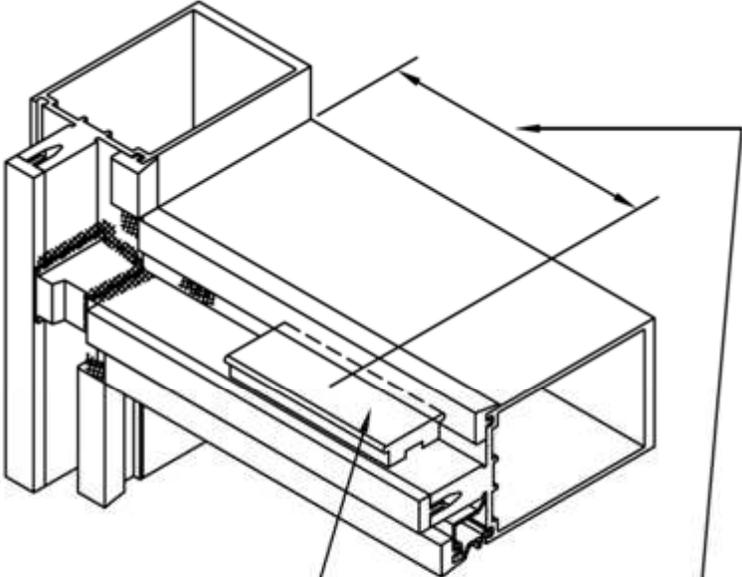
Preventable Curtain Wall Failures

Proper Attention to Critical Internal Seals

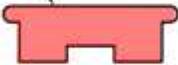


Preventable Curtain Wall Failures

Proper Attention to Critical Internal Seals



1" SETTING
BLOCKS

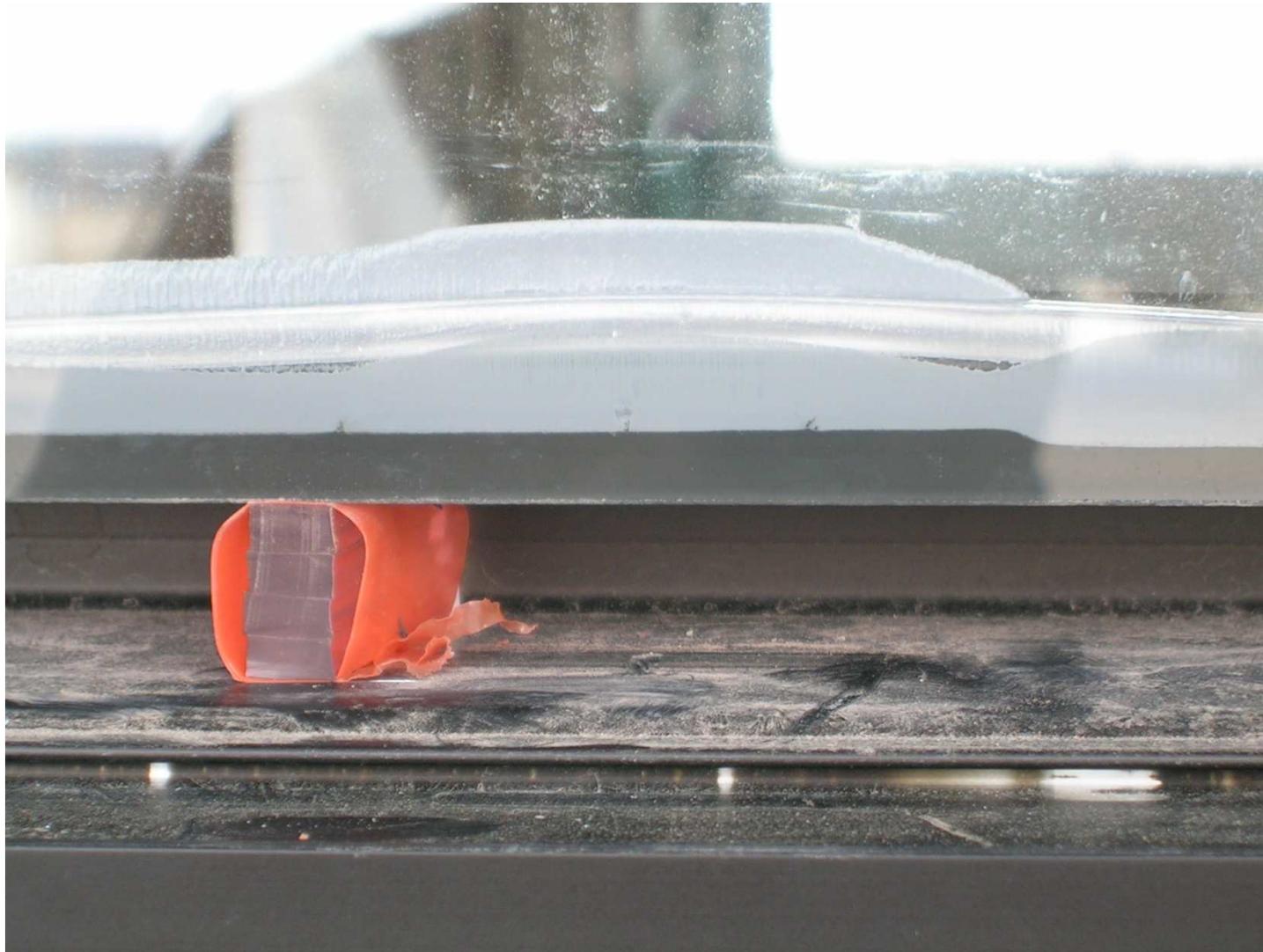


LOCATE SETTING BLOCKS
PER APPROVED SHOP DRAWINGS
OR DEADLOAD CHARTS

**Glass Setting
Blocks Must be at
Proper Locations**

Preventable Curtain Wall Failures

Proper Attention to Critical Internal Seals



**Use
Proper
Setting
Blocks**

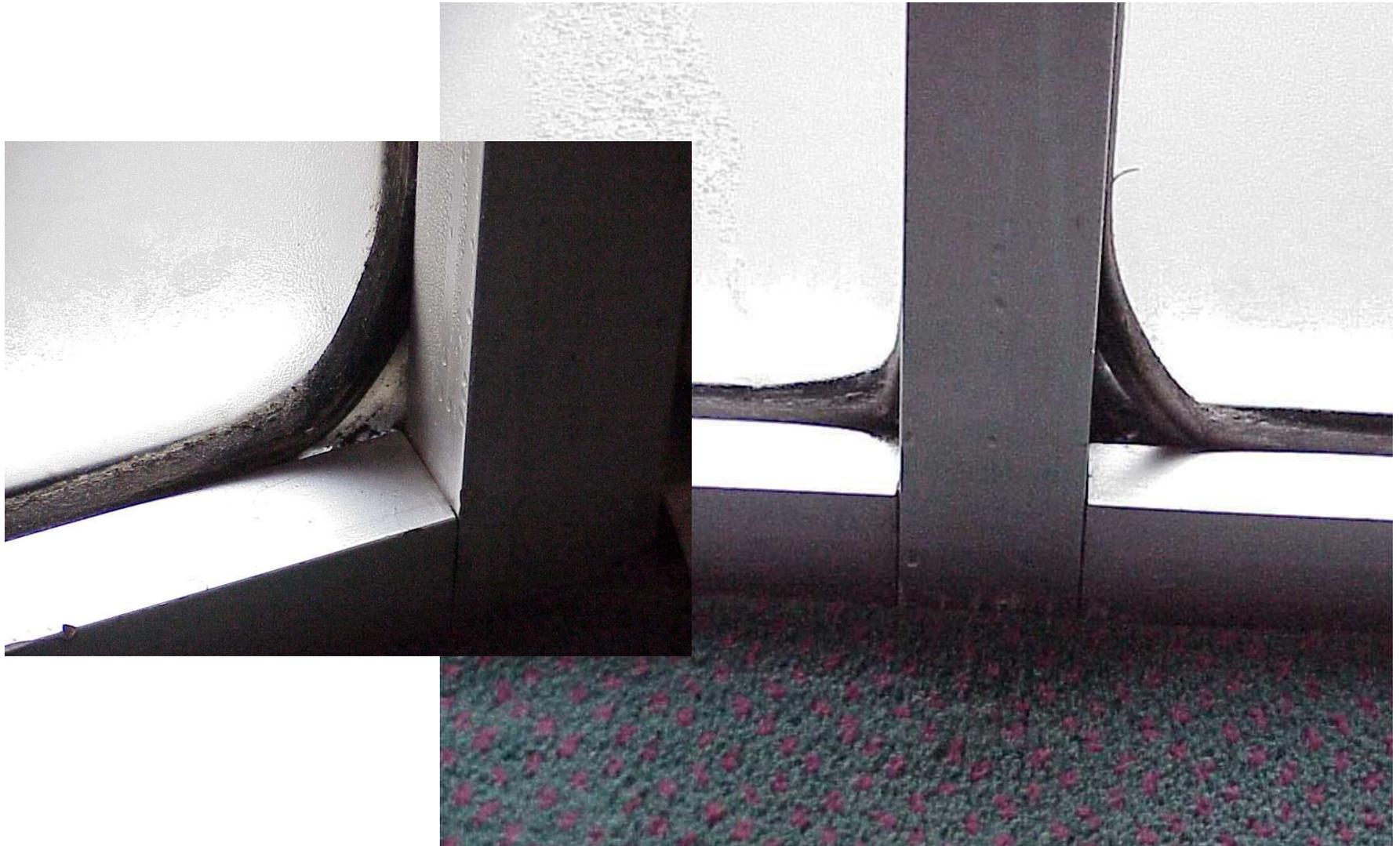
Preventable Curtain Wall Failures

Gaskets Must be Properly Installed

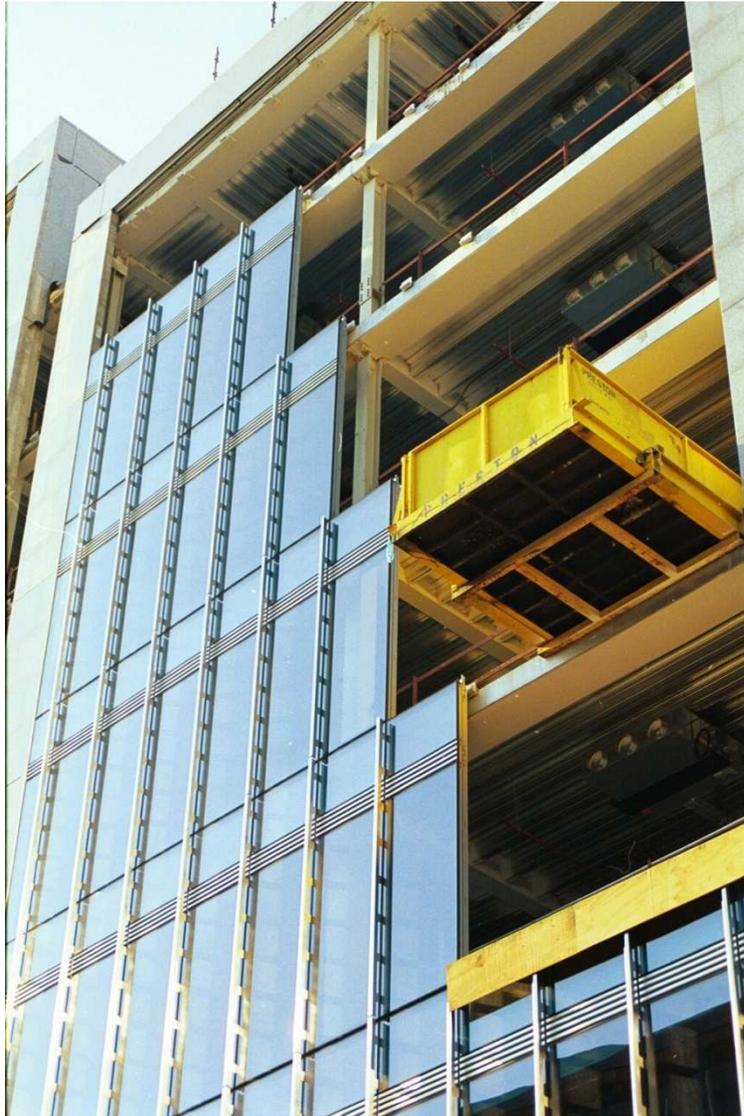


Preventable Curtain Wall Failures

Gaskets Must be Properly Installed



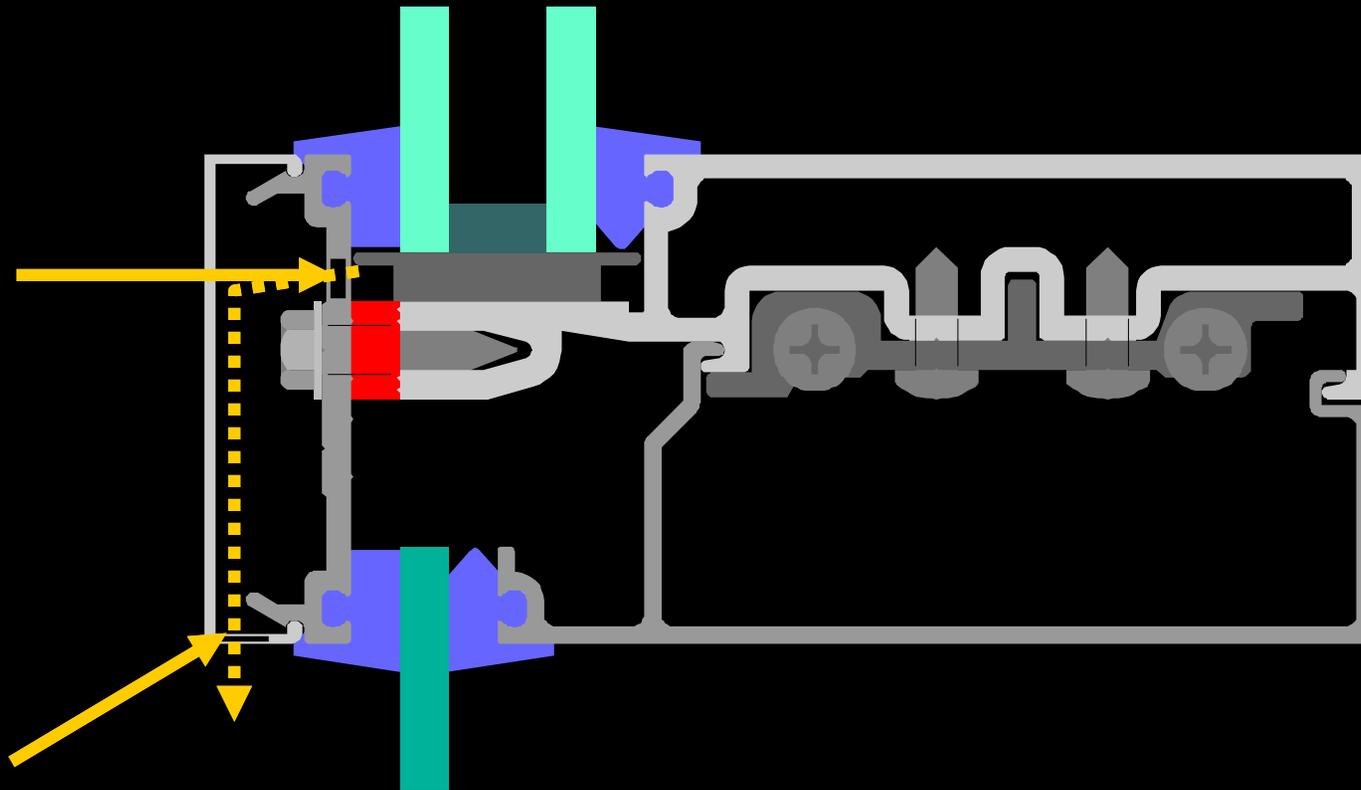
Preventable Curtain Wall Failures



- ***Ensure System Will Withstand Project Conditions***
- ***Ensure System is Properly Secured to Surround Condition***
- ***Ensure All Internal Critical Seals are Per Manufacturer's Recommendations***
- ***Ensure System is Installed Properly for Intended Performance***

Preventable Curtain Wall Failures

Size & Locate Weep Holes Properly



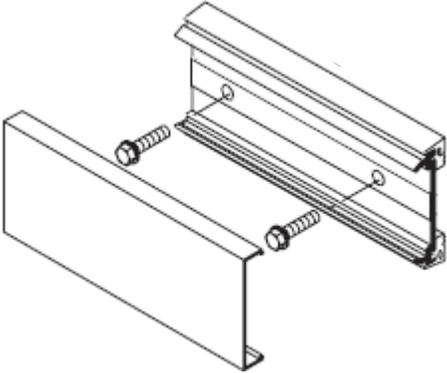
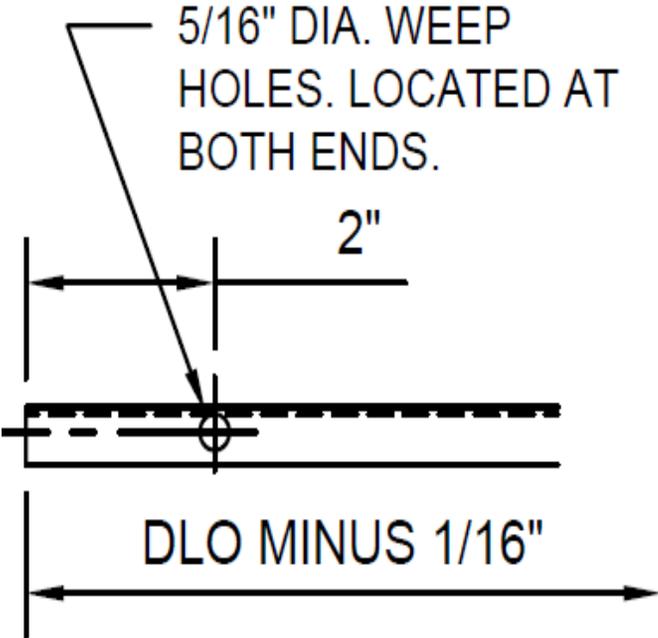
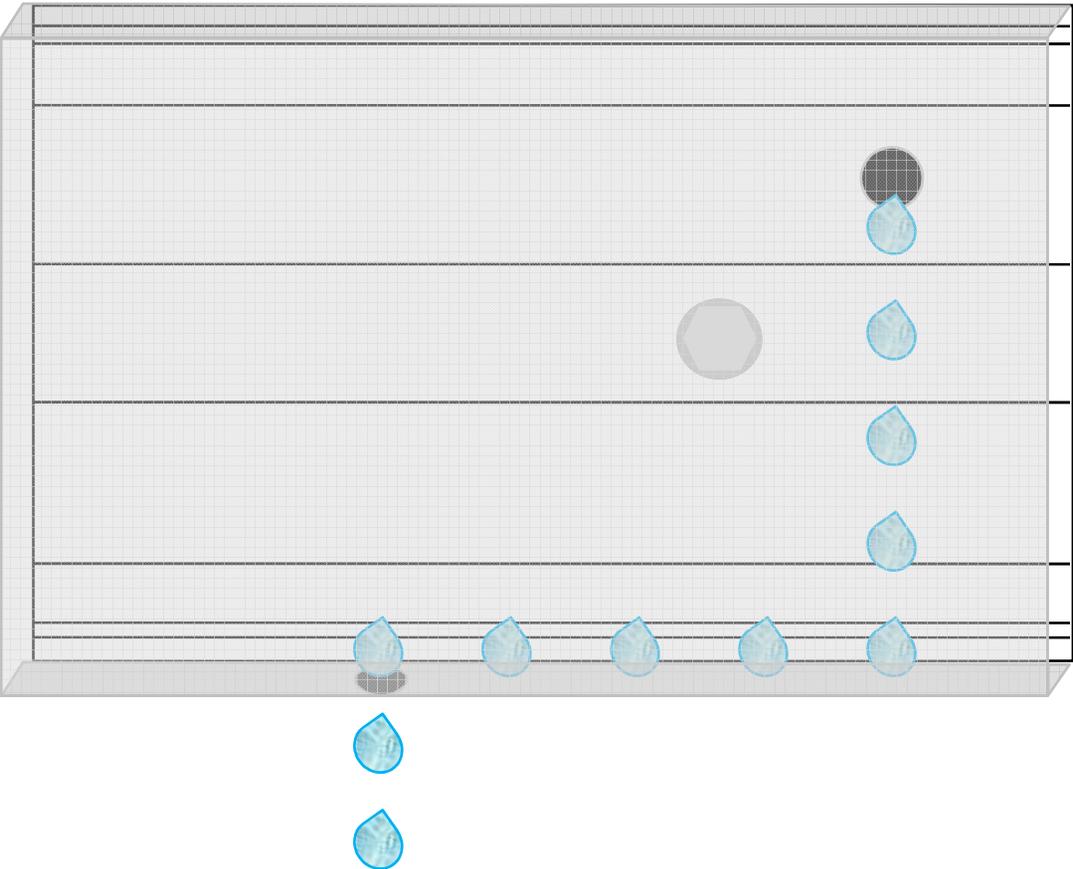
Preventable Curtain Wall Failures

This Is Not How You Weep A Curtain Wall



Preventable Curtain Wall Failures

Size & Locate Weep Holes Properly



Preventable Curtain Wall Failures

Size & Locate Weep Holes Properly



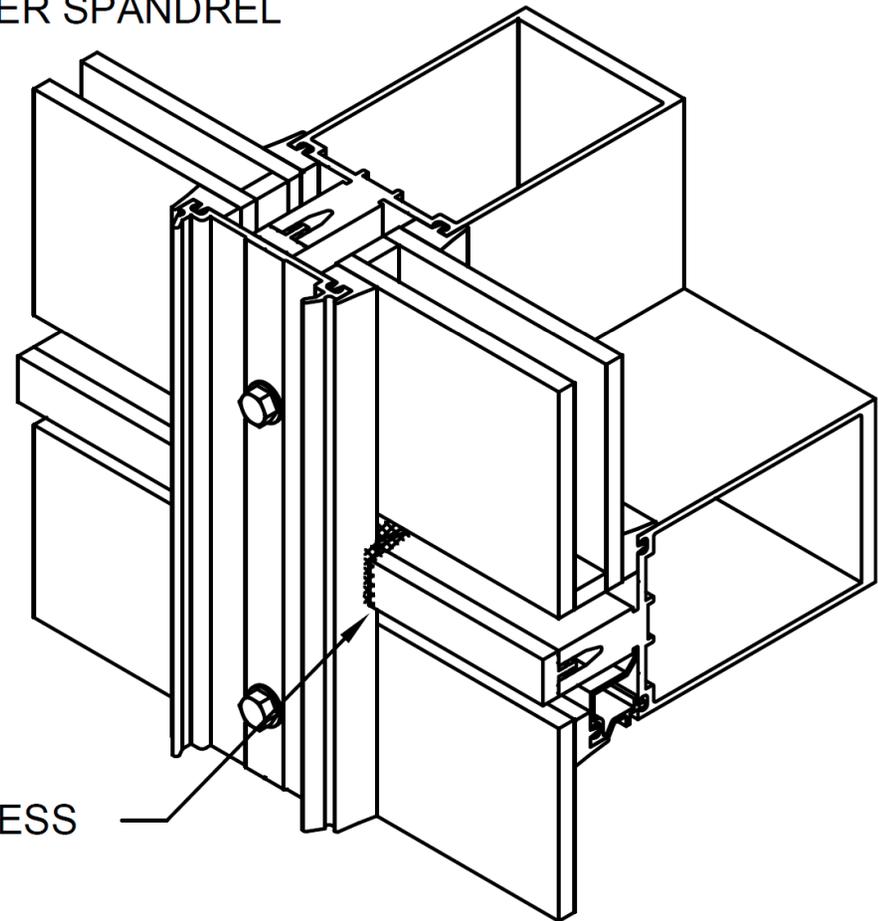
Preventable Curtain Wall Failures

Locate & Torque Pressure Plate Screws Properly

Locate Screws 9" On Center And As Close To The Horizontal Joint As Possible.

Torque Screws To 95 to 100 Inch Pounds

VISION OVER SPANDREL



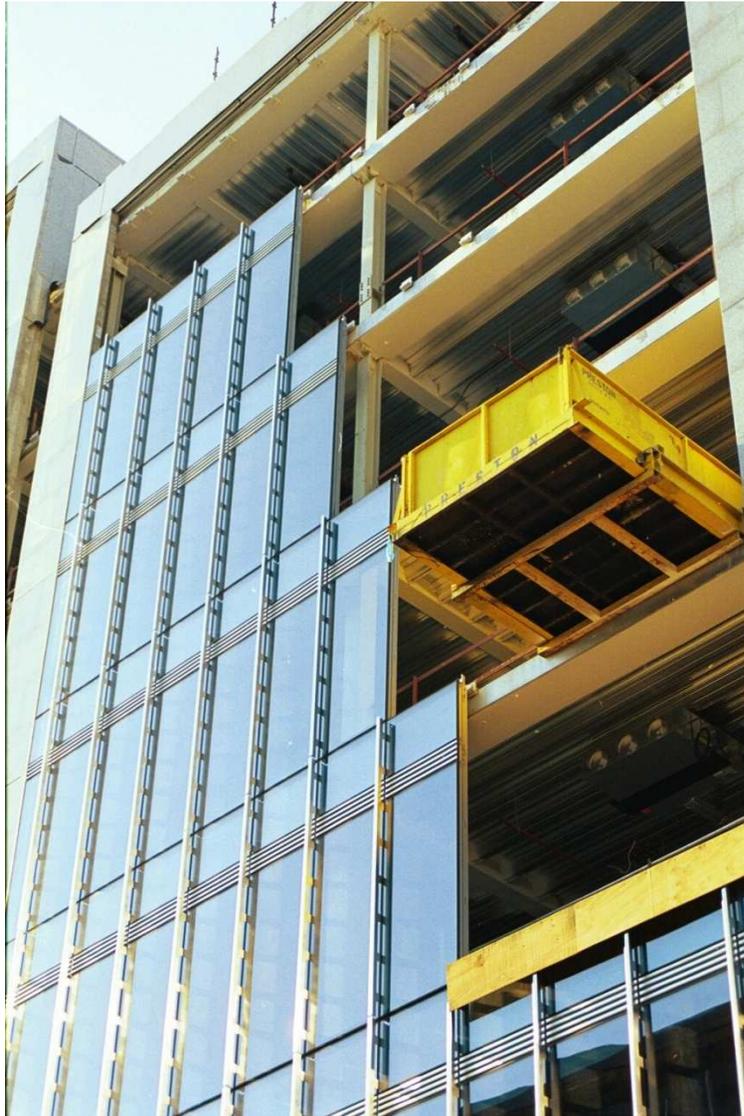
TOOL EXCESS SEALANT

Preventable Curtain Wall Failures

Torque Pressure Plate Screws to Proper Levels



Preventable Curtain Wall Failures



Use Correct System

- ***Ensure System Will Withstand Project Conditions***

Secure Properly to Surround Condition

- ***Ensure System is Properly Secured to Surround Condition***

Attention to Critical Seals

- ***Ensure All Internal Critical Seals are Per Manufacturer's Recommendations***

Allow System to Perform

- ***Ensure System is Installed Properly for Intended Performance***



Kawneer Company
Technology Park / Atlanta
555 Guthridge Court
Norcross, Georgia 30092

Architectural Services Team **1-877-767-9107**
kawneer.com
kawneergreen.com