

# SERIES 5600

## SILICONE STRUCTURAL GLAZED

### INSTALLATION INSTRUCTIONS



Part NO. Y306

April 29-2021

WHERE WINDOWS ARE JUST THE BEGINNING®



## **TABLE OF CONTENTS**

<u>SECTION</u>	PAGE
I. General Notes & Guidelines .....	3-4
II. Perimeter Applications .....	5
III. Anchor Installation .....	6-7
IV. Frame Assembly .....	8-9
V. Vertical/Jamb Splice Joint .....	10-11
VI. Glazing Preparation .....	12-21
VII. Glazing Retainer.....	22
VIII. Exterior Weather Seal.....	23
IX. Snap-On Exterior Cover .....	24-25
X. Alternate Perimeter Applications .....	26
XI. Steel Reinforcement .....	27

### **Minimizing Condensation**

Note: Please reference EFCO's "Understanding Condensation" brochure which can be obtained through your EFCO representative.

Condensation will form on any surface when unfavorable conditions (interior temperature and relative humidity and exterior temperature) are present. When the formation of excessive condensation is a concern, it is highly recommended that a design professional is utilized to perform an analysis of the shop drawings to recommend the best possible installation methods. Please contact your EFCO representative for information on EFCO's Thermal Analysis Services.

Many current installation practices lead to an increase in the possibility of the formation of condensation. Though not all inclusive, the list of examples below illustrates conditions under which condensation is likely to occur:

1. Bridging system thermal break with non-thermally broken metal flashing or lintels that are exposed to the exterior
2. System exposure to cold air cavities
3. Interior relative humidity levels not maintained at recommended levels, see EFCO's "Understanding Condensation" brochure
4. Inadequate separation between system and surrounding condition at perimeter
5. Product combinations during the shop drawing stage that result in bridging thermal breaks of one or all products involved

## **Section I: General Notes & Guidelines**

- I. HANDLING / STORING / PROTECTING ALUMINUM** - The following precautions are recommended to assure early acceptance of your products and workmanship.
- A. HANDLE CAREFULLY** - Store with adequate separation between components so the material will not rub together. Store material off the ground. Protect materials against weather elements and other construction trades.
  - B. KEEP MATERIAL AWAY FROM WATER, MUD, AND SPRAY** - Prevent cement, plaster, and other materials from contacting with and damaging the finish. Do not allow moisture to be trapped between the finished surface and the wrapping material.
  - C. PROTECT MATERIALS AFTER ERECTION** - Wrap or erect screens with plastic sheeting over material. Cement, plaster, terrazzo, and other alkaline materials are very harmful to the finish and are to be removed with soap and water before hardening. Under no circumstances should these materials be allowed to dry or permanent staining will occur.
- II. GENERAL GUIDELINES** - The following practices are recommended for all installations:
- A. REVIEW APPROVED SHOP DRAWINGS** – Become thoroughly familiar with the project. Shop drawings govern when conflicting information exists in these installation instructions.
  - B. INSTALL ALL FRAMING MATERIAL PLUMB, LEVEL, AND TRUE** – Proper alignment and relationships to benchmarks and column centerlines, as established by the architectural drawings and the general contractor, must be maintained.
  - C.** The sequence of erection should be coordinated with the project superintendent to prevent delays and minimize the risk of material damage.  
**Note: If preset anchors are required, coordinate and supervise anchor placement with the general contractor.**
  - D.** Verify that all job site conditions and accompanying substrates receiving the installation are in accordance with the contract documents. If deviations occur, notification must be given **IN WRITING** to the general contractor and differences resolved before proceeding further with the installation in the questionable area.
  - E.** Prevent all aluminum from coming in direct contact with masonry or dissimilar materials by means of an appropriate primer.

## Section I: General Notes & Guidelines

- F. Follow EFCO framing installation and glazing instructions.
- G. Verify contents of all material shipments received upon arrival. Verify quantities and correct finishes. **NOTIFY EFCO IMMEDIATELY OF ANY DISCREPANCIES OR DAMAGE, THAT MAY HAVE OCCURRED.**
- H. Throughout these instructions the term "**SEALANT**" will appear. For the purposes of these instructions, sealant is to be defined as the following:

SEALANT - A weather resistant, gunnable liquid filler which when cured provides a resilient, flexible ( $\pm 50\%$  movement capability) air and water seal between similar and dissimilar materials.

All sealant must meet **ASTM C 920, CLASS 50.**

**BUTYL SEALANT-** A non-skinning, non-hardening material (**NAAMM Reference Standard 5C-1**)

**NOTE:** All sealant must be compatible with all surfaces where adhesion is required, including other sealant surfaces. All frame surfaces should be clean, dry, dust, and frost free. If a primer is required, it must be applied to clean surfaces. All perimeter substrates shall be clean and properly treated to receive sealant.

This system is designed and has been tested to utilize butyl or silicone sealants at all internal joineries, i.e., joint plugs, gasket intersections, etc.

Regardless of the sealant used, the customer should contact the sealant manufacturer to determine compatibility and adhesion. Follow sealant manufacturer's proper application procedures and quality assurance programs for weather sealing.

Maintain caulk joints as shown in the approved shop drawings. Unless specified otherwise, most sealant manufacturers recommend a 3/8" minimum perimeter caulk joint. A 3/4" minimum joint is recommended at the head condition to accommodate thermal expansion and contraction.

Anchoring surfaces of perimeter construction must be level and plumb within the adjustable limits of the head, jamb, and sill framing.

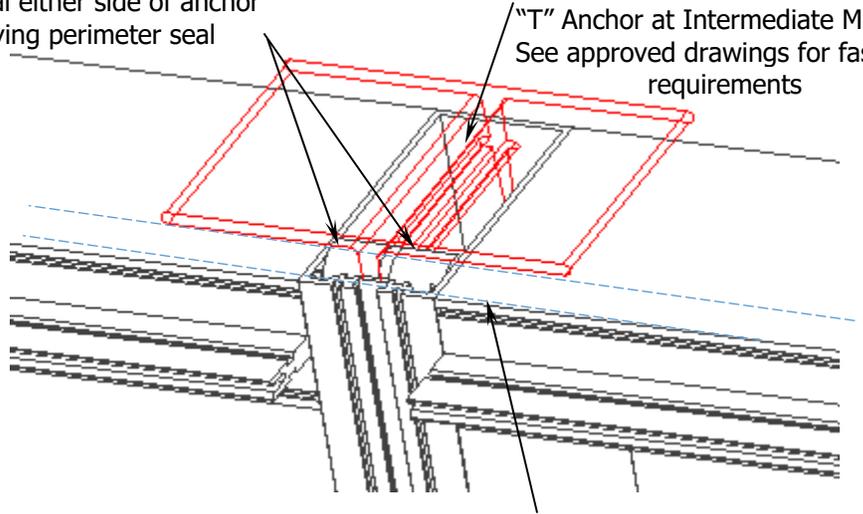
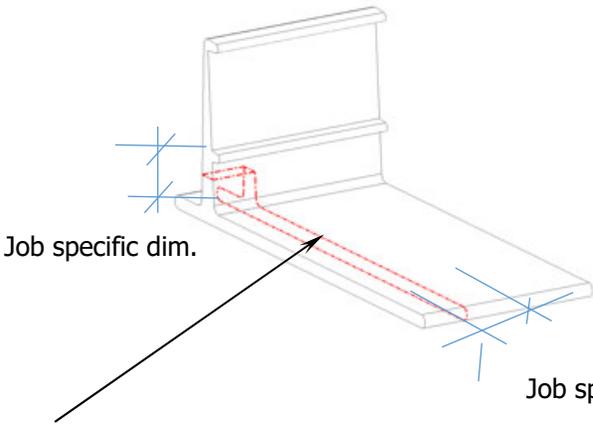
## **Section II: Perimeter Applications**

### **Perimeter Applications**

- A.) Maintain caulk joint as shown in the "APPROVED" shop drawings. Unless specified otherwise, a 3/8" minimum perimeter caulk joint is recommended by most sealant manufacturers.

Plug open end of vertical either side of anchor stem to assist with carrying perimeter seal across the verticals.

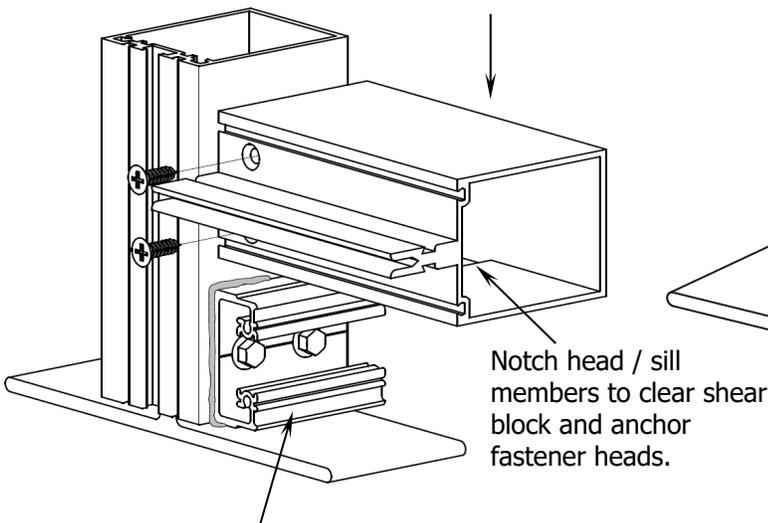
"T" Anchor at Intermediate Mullion. See approved drawings for fastener requirements



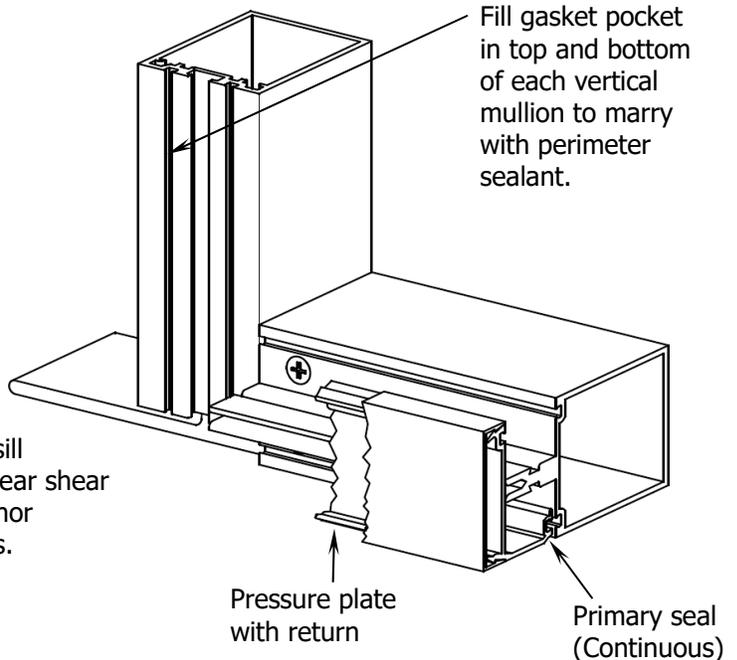
Critical perimeter sealant is shown with two dotted lines.

The erector must supply and apply bond breaker tape across the face of the anchor to prevent three-sided adhesion.

— Custom notch of F and T anchors for aiding sealant application shown with dashed line above is available (by request only) and subject to additional fabrication charge. Notch dimensions are not standard and job specific dimensions must be supplied.



Notch head / sill members to clear shear block and anchor fastener heads.



Fill gasket pocket in top and bottom of each vertical mullion to marry with perimeter sealant.

Pressure plate with return

Primary seal (Continuous)

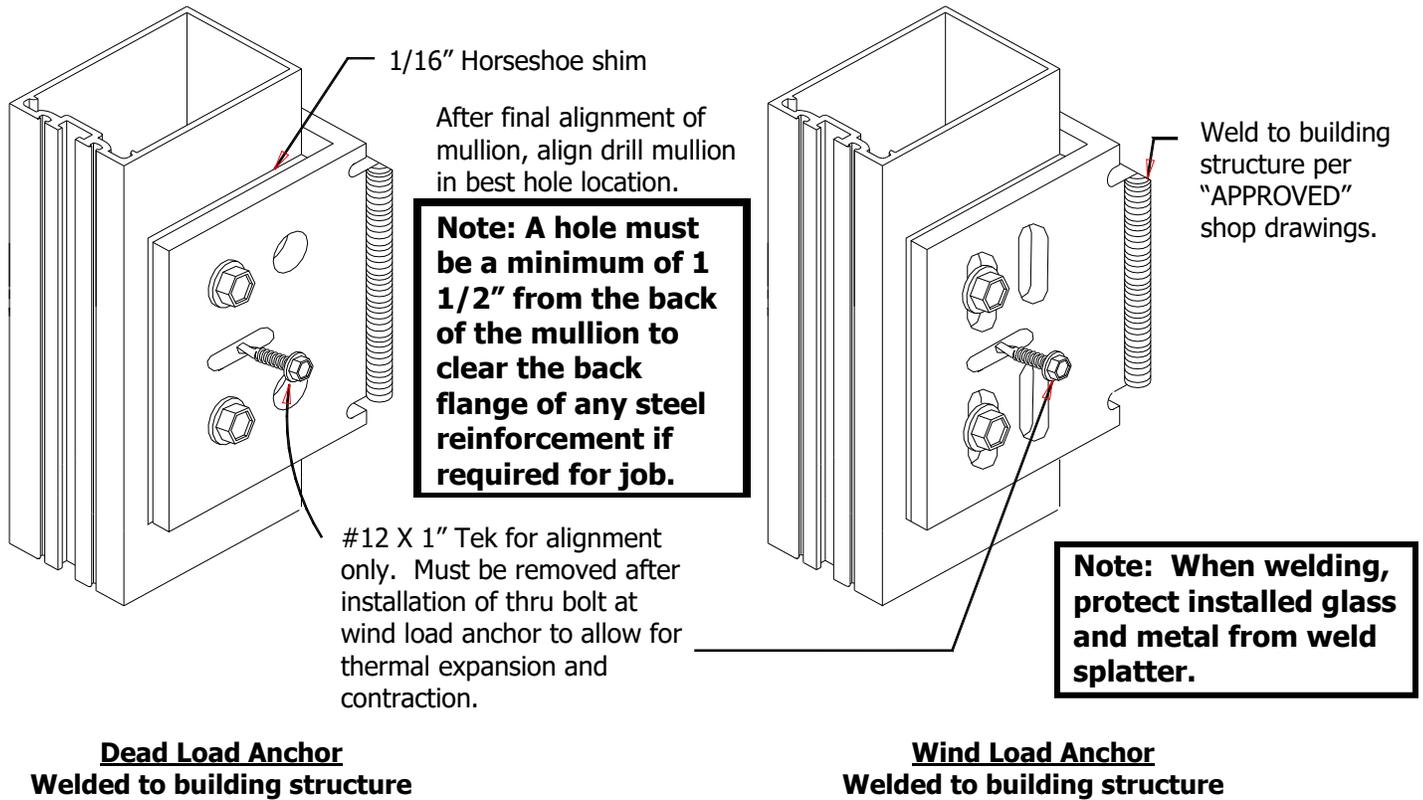
Notching of shear block may be required to avoid interference with perimeter fasteners, see shop drawings. (Notching not by EFCO)

**Note: The perimeter caulking must be done prior to glazing.**

## Section III: Anchor Installation

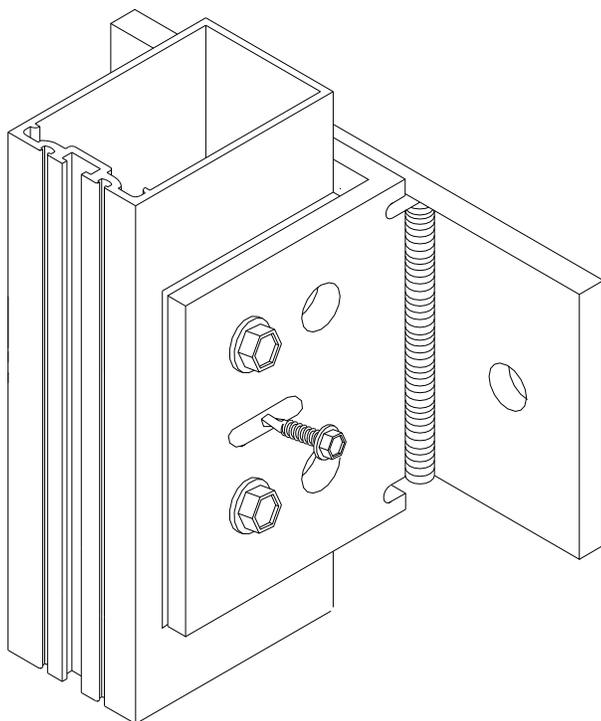
### Anchor Installation

- Note: A.) Attach anchors to mullions with temporary screws as shown below.**
- B.) Install vertical mullions in position and attach anchors to building structure per "APPROVED" shop drawings.**

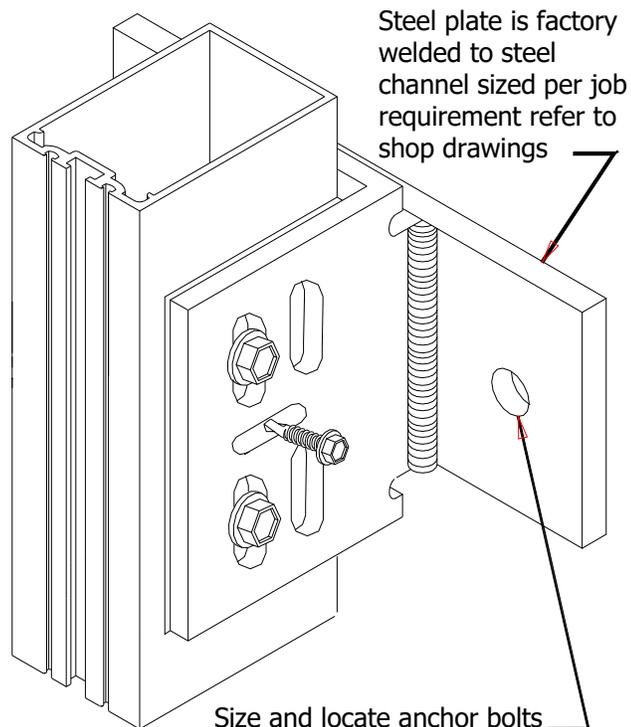


## **Section III: Anchor Installation**

### **Anchor Installation**



**Dead Load Anchor**  
**Bolted to building structure**



**Wind Load Anchor**  
**Bolted to building structure**

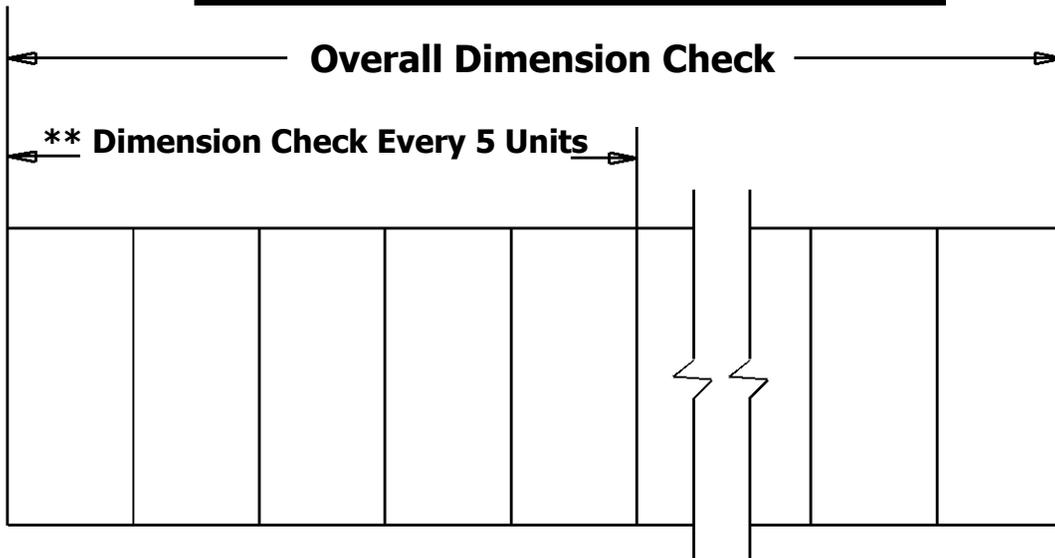
**Note: Elevations of slab must be within adjustments of anchoring system. See "APPROVED" shop drawings for allowable adjustments.**

## Section IV: Frame Assembly

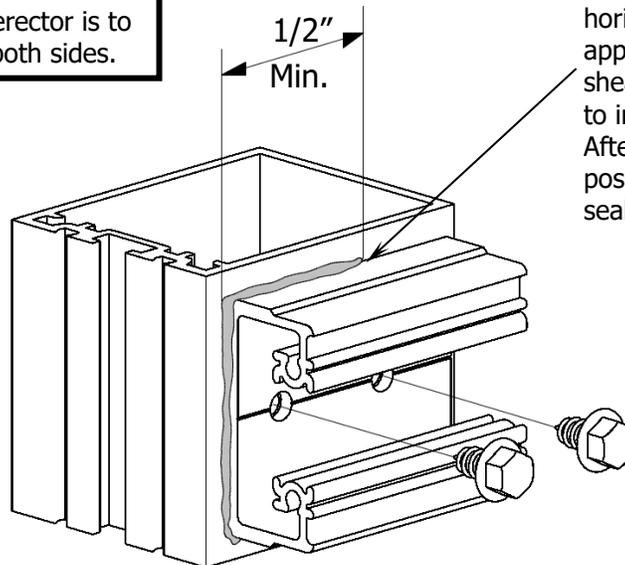
### Frame Assembly

- A.) Assemble shear blocks, sleeves, anchors, etc., to mullions as required. Attach horizontals to form the frames or sections per "APPROVED" shop drawings.
- B.) Attach horizontal rails to shear blocks.

**Note:** On long runs, check overall frame dimensions at every fifth opening to avoid dimensional build-up.



Interior tubular horizontals are cut **D.L.O. – 1/32"**. The erector is to split this difference on both sides.



In order to insure a good horizontal to vertical seal, apply sealant along edge of shear block as shown prior to installation of horizontal. After horizontal is in position, wipe away excess sealant.

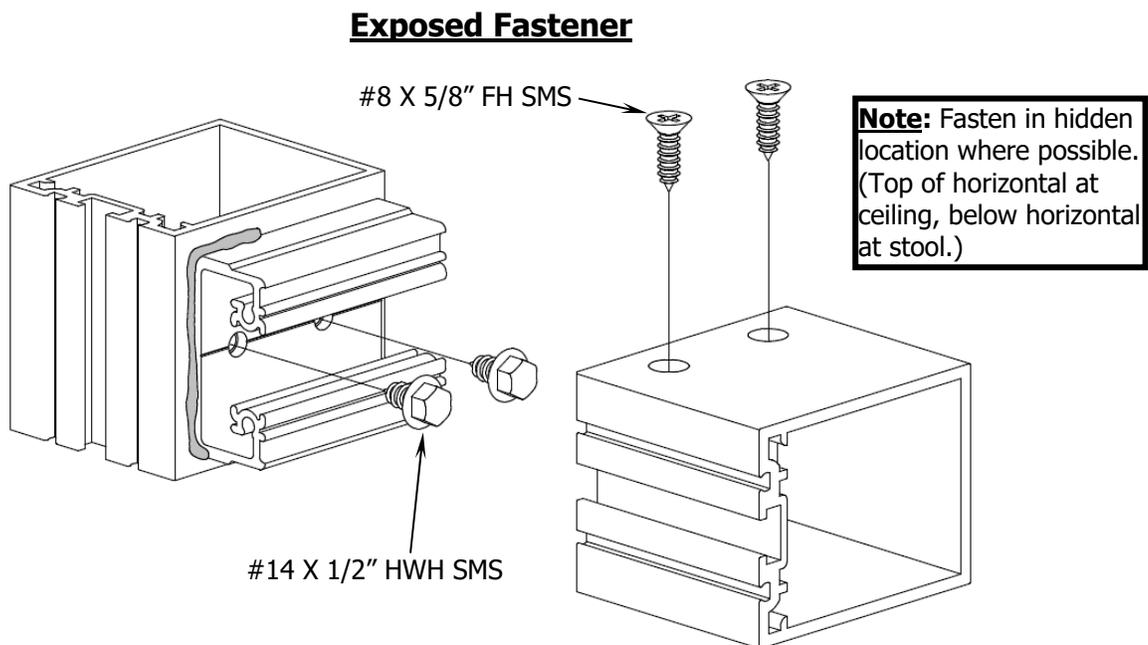
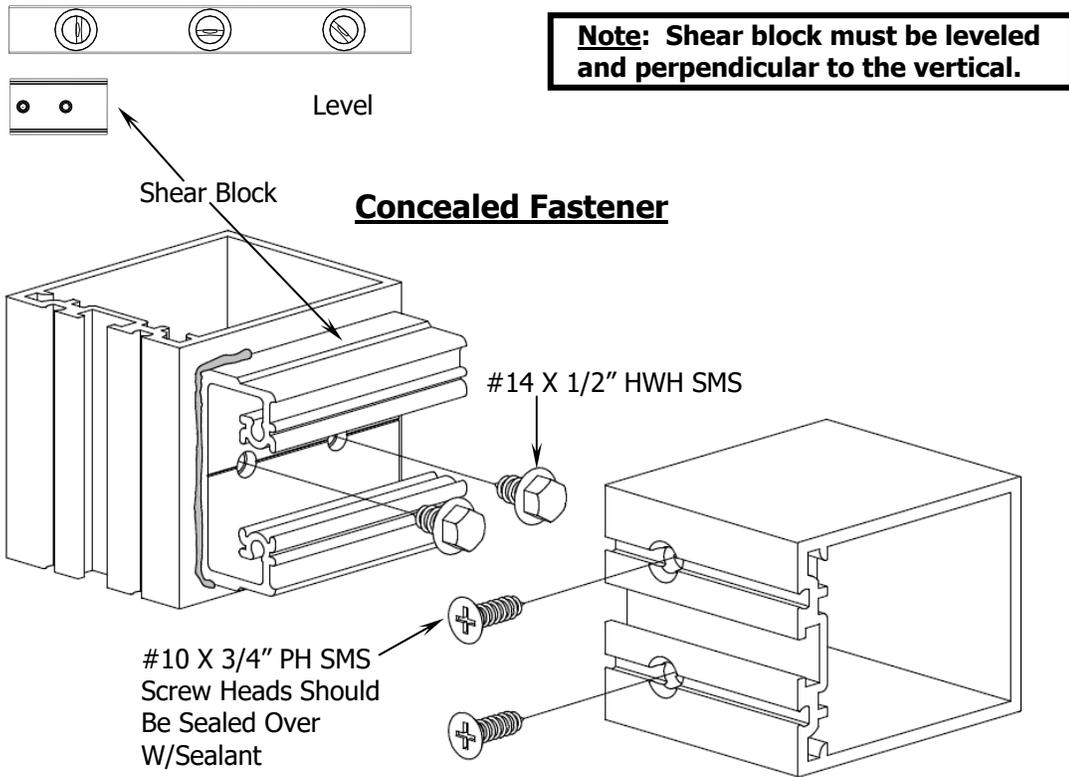
**Note:** The shear block must be leveled, perpendicular to the verticals, before the #14 attachment screws are tightened.

**Note:** The commercial cut to length tolerance is +/- 1/16". It is critical to check every fifth unit for location.

## **Section V: Frame Assembly**

### **Step #2 Install Frame Components**

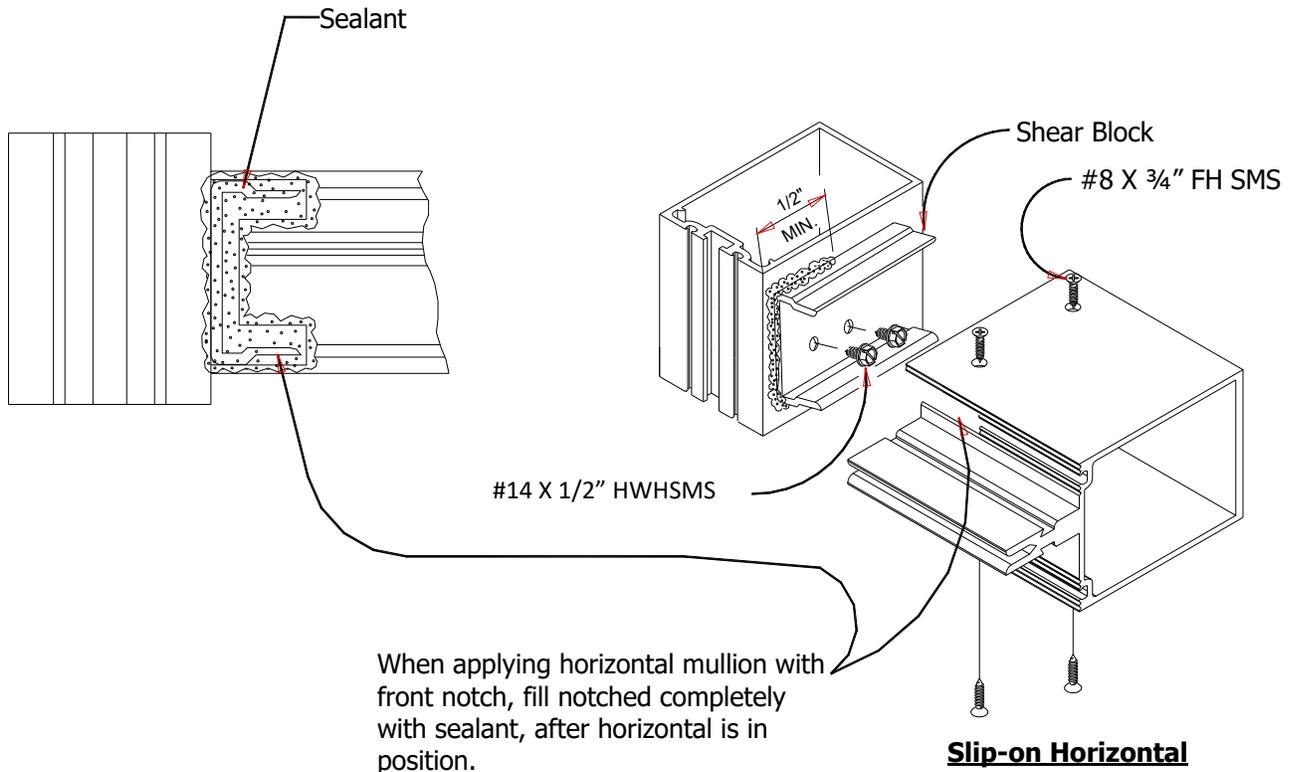
- A.) Refer to the approved shop drawings for job conditions. Install assembled frames according to the approved shop drawings.



## Section IV: Frame Assembly

### Frame Assembly

- C.) Refer to "APPROVED" shop drawings for job conditions. Install assembled frames according to "APPROVED" shop drawings. "APPROVED" shop drawings will also indicate location of horizontal slip-on rails.



**Note: When using slip-on horizontal, 2 screws are required on top and bottom of horizontal into the shear block.**

- D.) Properly support horizontal until securely fastened.
- E.) Space vertical mullion expansion joints per "APPROVED" shop drawings.

Keeping in mind that spacing is theoretical and will vary with job site temperature, on multiple stacked applications, key horizontals must be installed to establish grades regardless of expansion joint dimension.

## **Section V: Vertical Jamb Splice Joints**

### **Vertical Jamb Splice Joints**

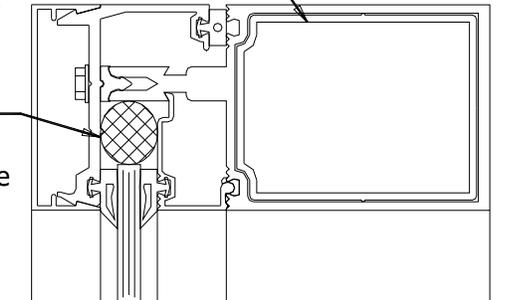
- A.) Splice joints should occur at spandrel areas. Mullion splice joints for this system are not designed to compensate for varying floor levels. (Reference "APPROVED" shop drawings for allowable adjustment, i.e., anchors.)
- B.) Splice joint width should be based on sealant movement capabilities and the following formula.

Linear expansion for aluminum, in inches =  
**[Length] X [F degrees difference in temperature] X [.0000129]**

- C.) Where head clearance is insufficient to allow top mullions to be lifted over sleeve. A retractable sleeve will be used. The sleeve is taped into top mullion and dropped to stop screw in mullion below.
- D.) Do not match drill anchors until a check of expansion joints and wall installation is made.

Mullion splice sleeve with bond breaker tape.

Field install backer rod at pressure plate joint to back up sealant.

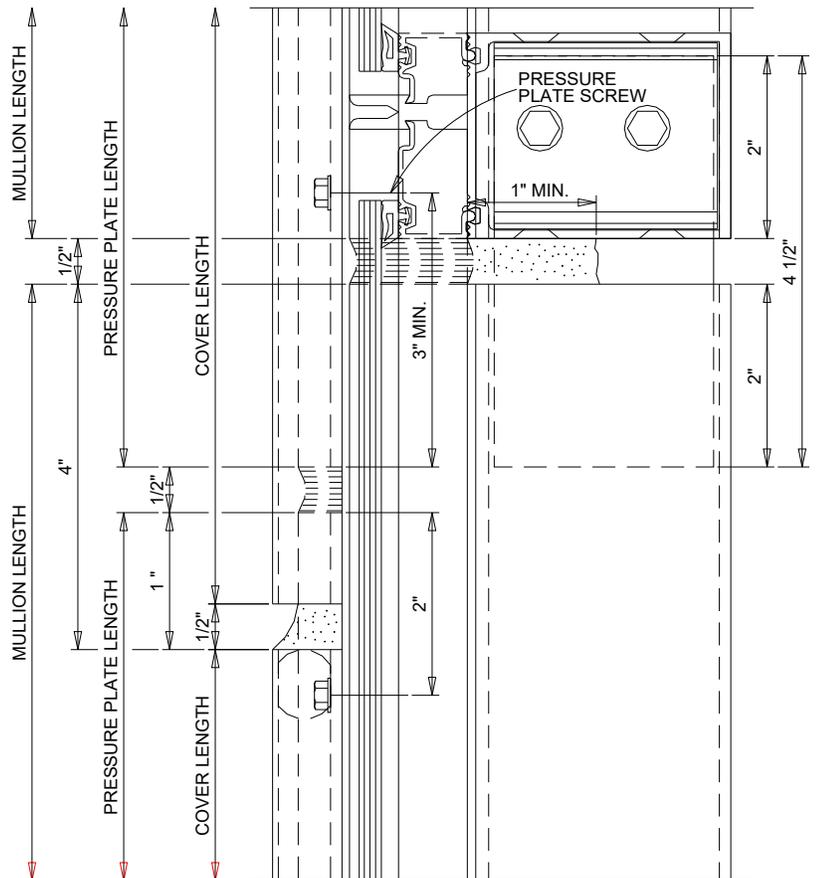


### **Slip-in Horizontal**

**Note: SSG Vertical Splice Locations** EFCO recommends that **Vertical Splice Line** should be below the **Intermediate Horizontal Member**, this will **Minimize Shear Stress at the Structural Seal Line.**

**Note: All anchors must be fixed before glazing begins.**

**Note: When mull splice is shop installed into lower mullion, shear block screws will be used in standard locations, as shown dotted.**



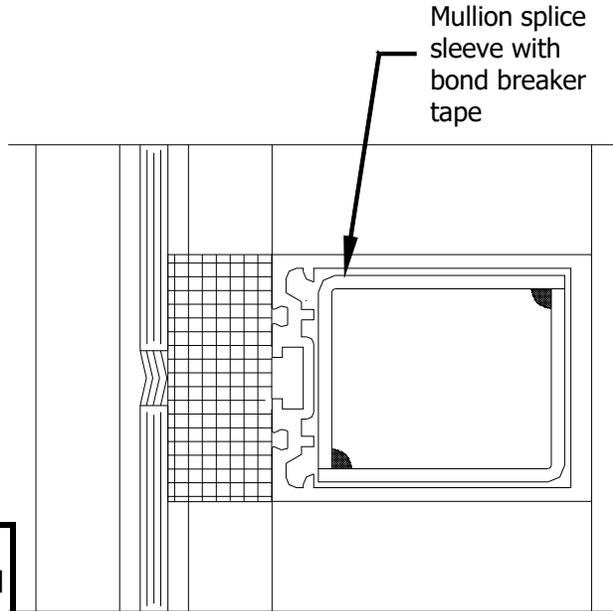
## **Section V: Vertical Jamb Splice Joints**

### **Vertical Splice Joints**

**Note: Butt glazed mullion splice joints should occur at spandrel areas.**

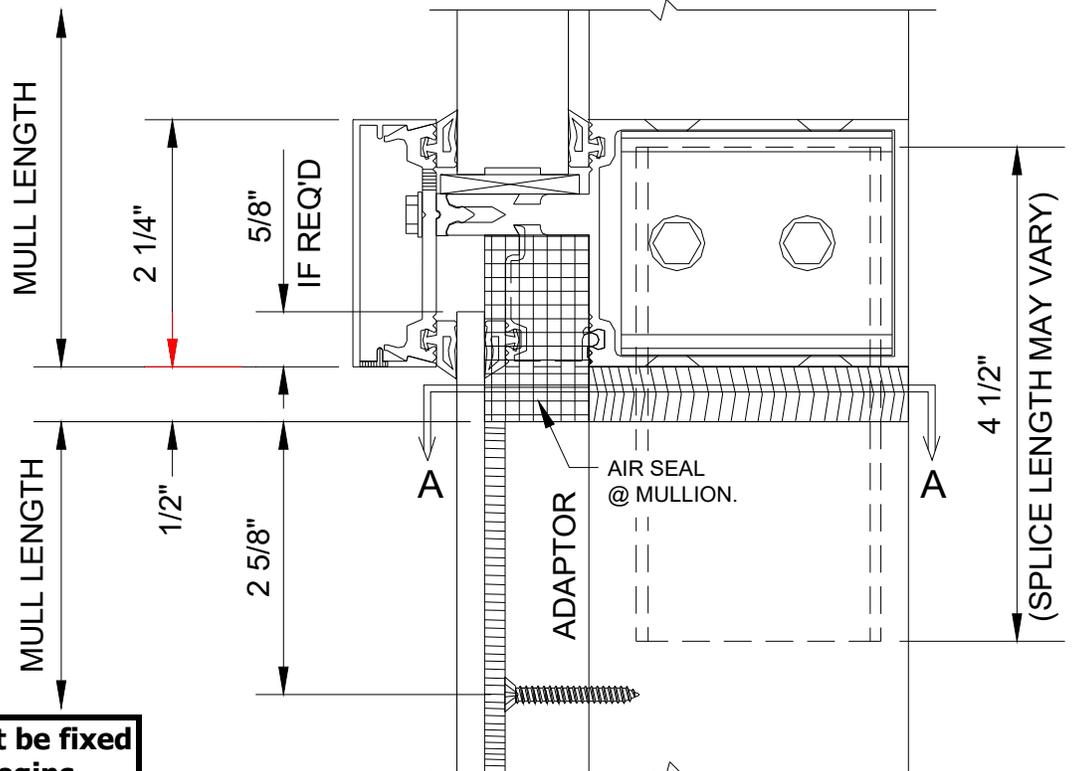
E.) Where head clearance is insufficient to allow top mullions to be lifted over sleeve. A retractable sleeve will be used. The sleeve is taped in the top mullion and dropped to stop screw in mullion below.

F.) Do not match drill anchors until a check of expansion joints and wall installation is made.



**"A-A" Section Thru Splice**

**Note: SSG Vertical Splice Locations EFCO recommends that Vertical Splice Line should be below the Intermediate Horizontal Member, this will Minimize Shear Stress at the Structural Seal Line.**



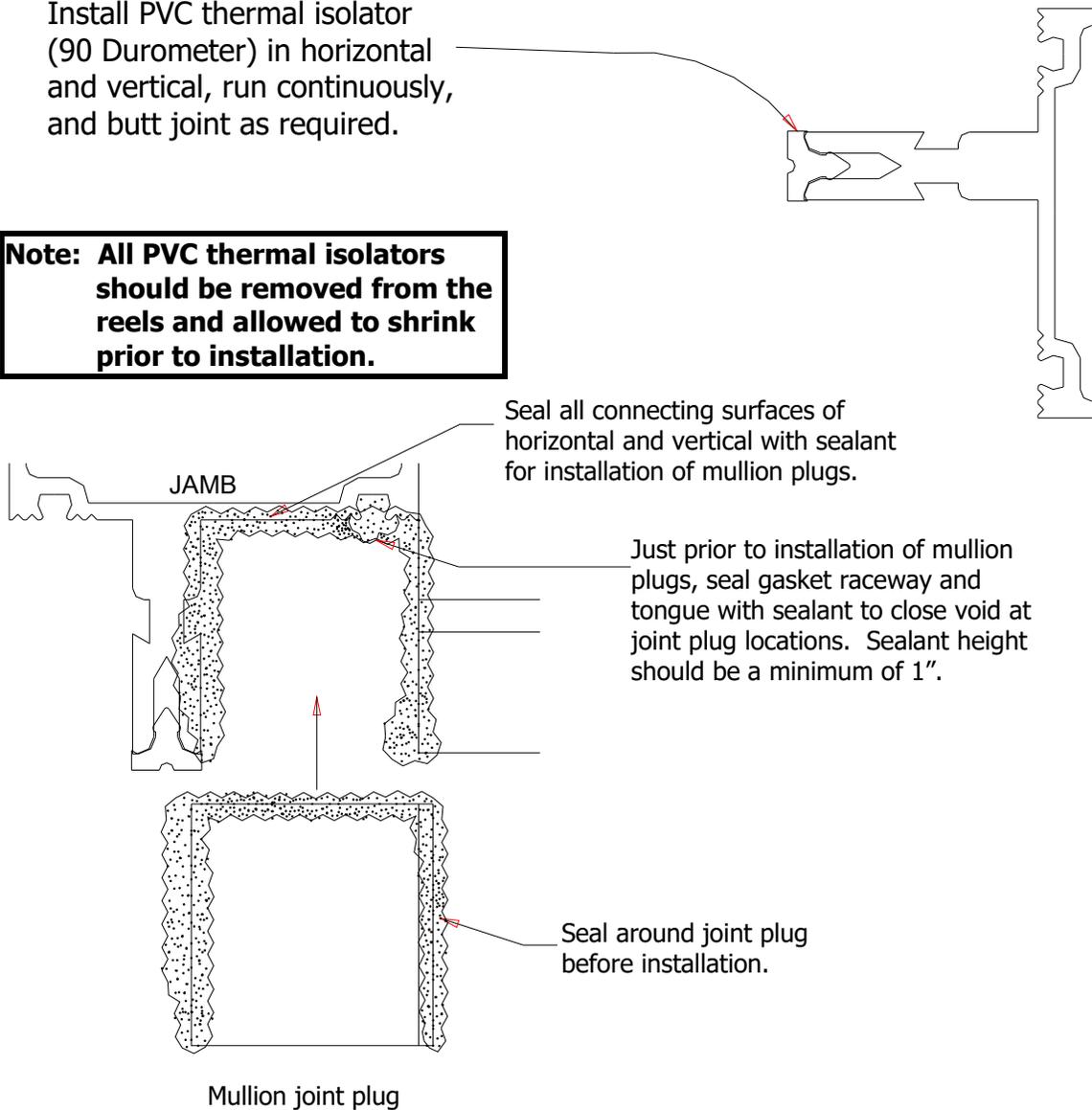
**Note: All anchors must be fixed before glazing begins.**

## Section VI: Glazing Preparation

### Glazing Preparation

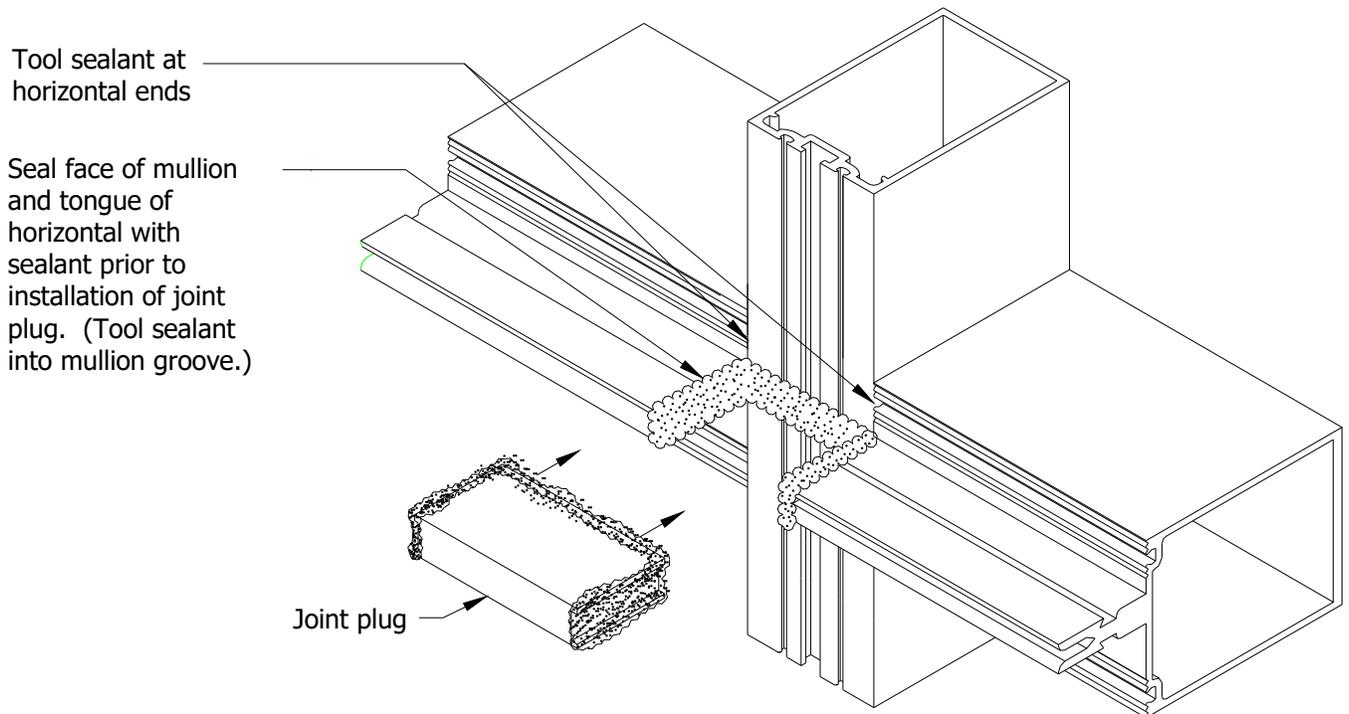
- A.) Install PVC thermal isolator (90 Durometer) in horizontal and vertical, run continuously, and butt joint as required.

**Note: All PVC thermal isolators should be removed from the reels and allowed to shrink prior to installation.**



## Section VI: Glazing Preparation

### Glazing Preparation

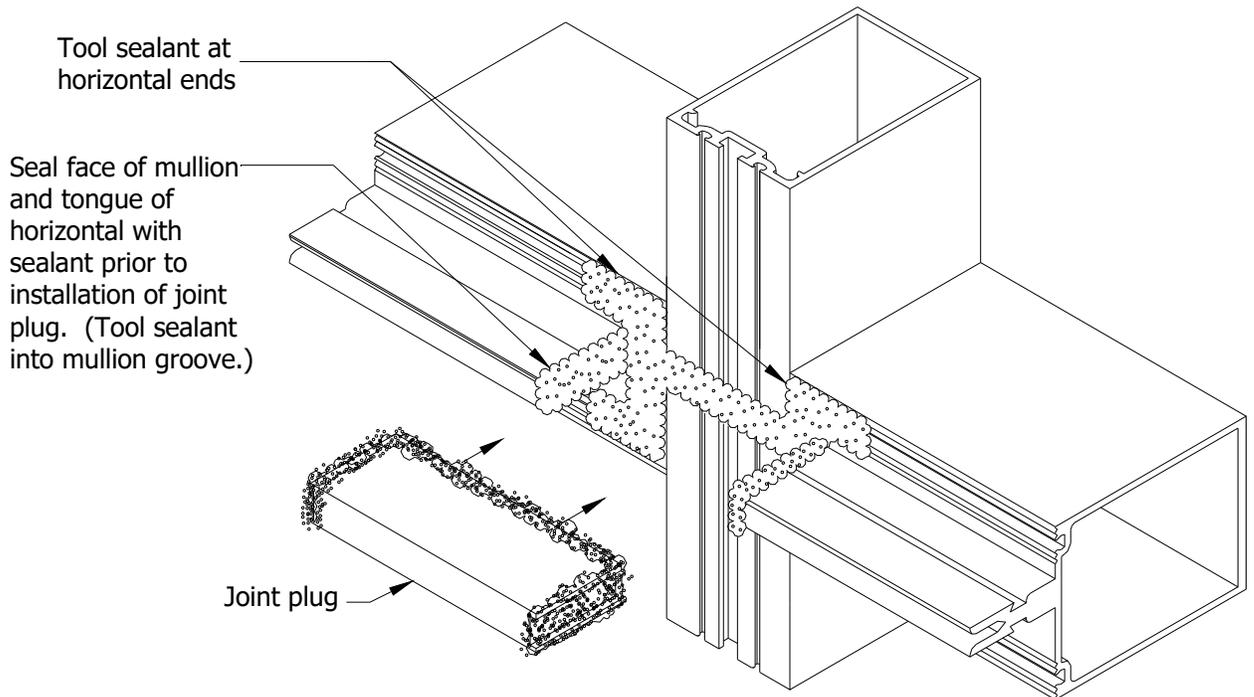


**Note: All sealant shown on this detail must be done just prior to installation of joint plug. Keep free from loose debris.**

**Seal of Horizontal to Mullion and Joint Plug at "Stack" Horizontals**

## Section VI: Glazing Preparation

### Glazing Preparation



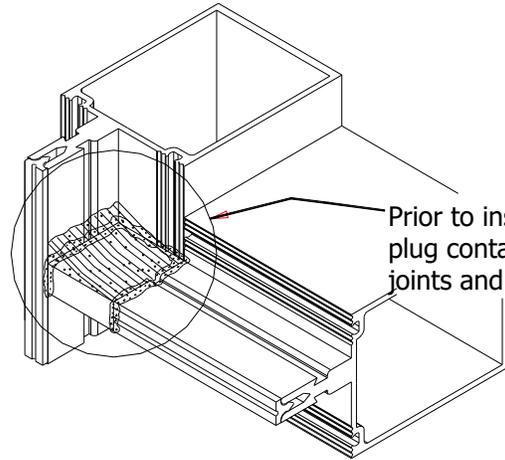
**Note: All sealant shown on this detail must be done just prior to installation of joint plug. Keep free from loose debris.**

**Seal of Horizontal to Mullion and Joint Plug at "Slip-on" Horizontals**

## Section VI: Glazing Preparation

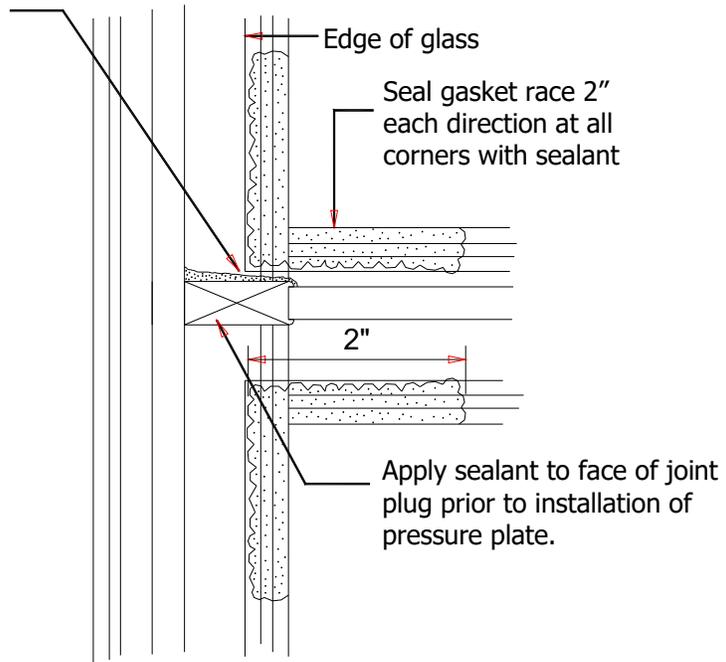
### Glazing Preparation

### Seal at Captured Vertical Jamb

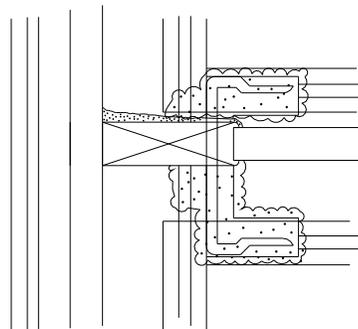


Prior to installation of the joint plug, apply sealant on all joint plug contact surfaces. After installation of the plugs, reseal joints and tool excess sealant to provide a smooth surface

Provide downward slope with sealant without interfering with edge of glass, to allow drainage of condensation.



**Elevation of Joinery Prior to Setting Glass**



**Elevation of Joinery at Slip-on Horizontal Prior to Setting Glass**

## Section VI: Glazing Preparation

### Installation of Glazing Adaptors at Openings for 1/4" Infill

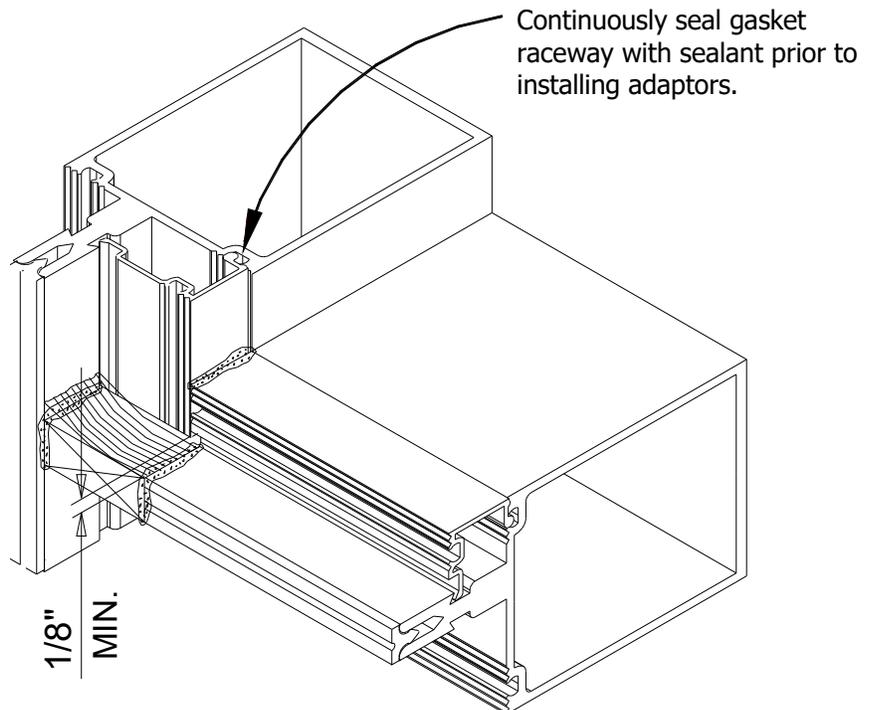
- A.) Position vertical adaptor as shown. Place horizontal adaptors between verticals. Seat adaptors by applying sealant to all four corners.

#### Seal at Captured Glazing Adaptors

##### **Cut Formula**

**Vertical = D.L.O. + 1"**

**Horizontal = D.L.O. - 1/16"**



**Note: Vertical adaptors will need a minimum of 1/8" clearance above joint plug, free FROM sealant.**

## Section VI: Glazing Preparation

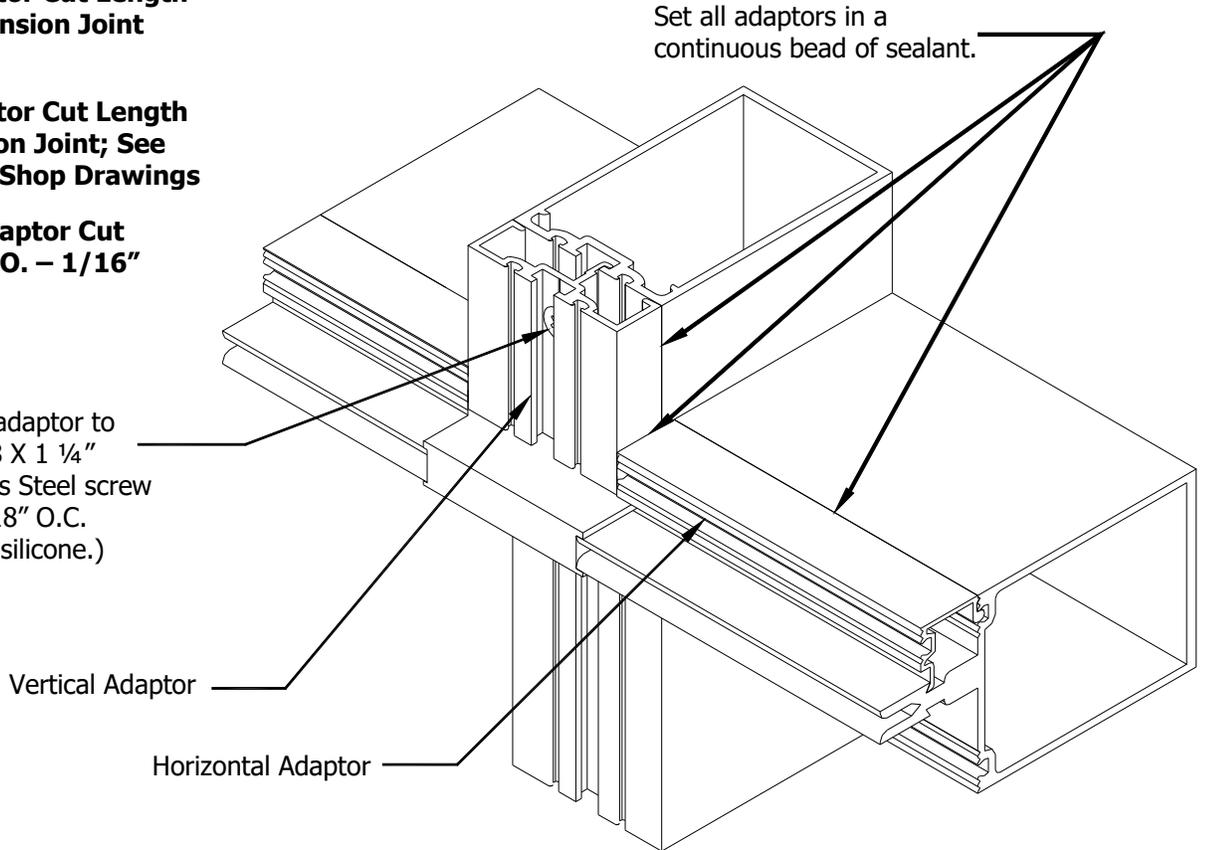
### Installation of Spandrel Glazing Adaptors

**Vertical Adaptor Cut Length  
Without Expansion Joint  
= D.L.O. + 1"**

**Vertical Adaptor Cut Length  
With Expansion Joint; See  
"APPROVED" Shop Drawings**

**Horizontal Adaptor Cut  
Length = D.L.O. - 1/16"**

Attach vertical adaptor to  
mullion with #8 X 1 1/4"  
FHSMS Stainless Steel screw  
at a minimum 18" O.C.  
(Seal heads w/ silicone.)



## GLAZING

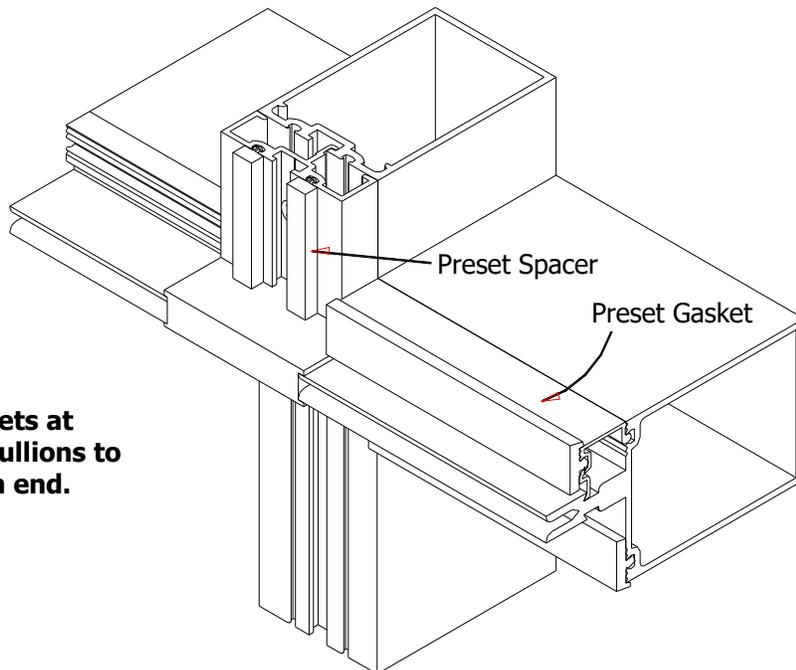
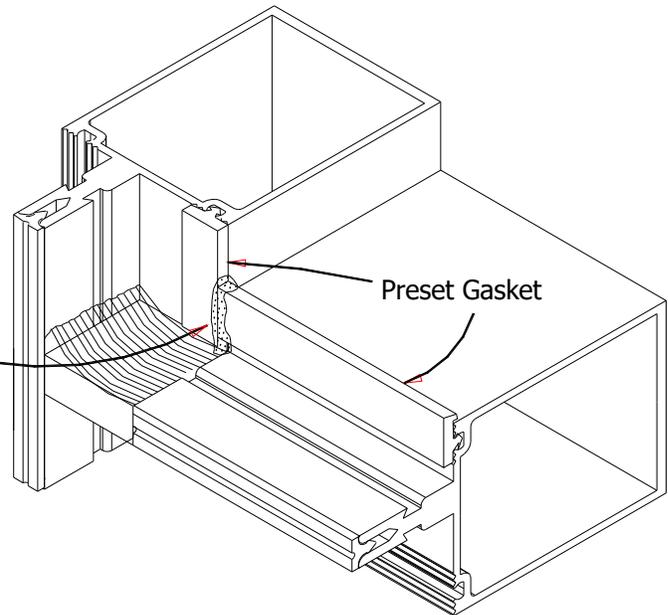
Glazing	Horizontal Adaptors			Exterior	Interior
	Center Tongue	Shallow Pocket	Deep Pocket	Dense Preset	Sponge Preset
1/4"	X	X	X	X	X
1"				X	X

## Section VI: Glazing Preparation

### Apply Preset Glazing Gaskets to Mullions

**Note:**

- A.) Apply sealant in raceway a minimum of 2" each way at all corners. (Ref. to page 16)
- B.) Remove glazing gaskets from reel and allow to shrink.
- C.) Cut vertical D.L.O. + 1 3/4".
- D.) Cut horizontal D.L.O. + 1/2".
- E.) Seal all gasket corners; pull horizontal gasket back, seal end and jam into vertical gasket to insure a snug fit. See detail at right.

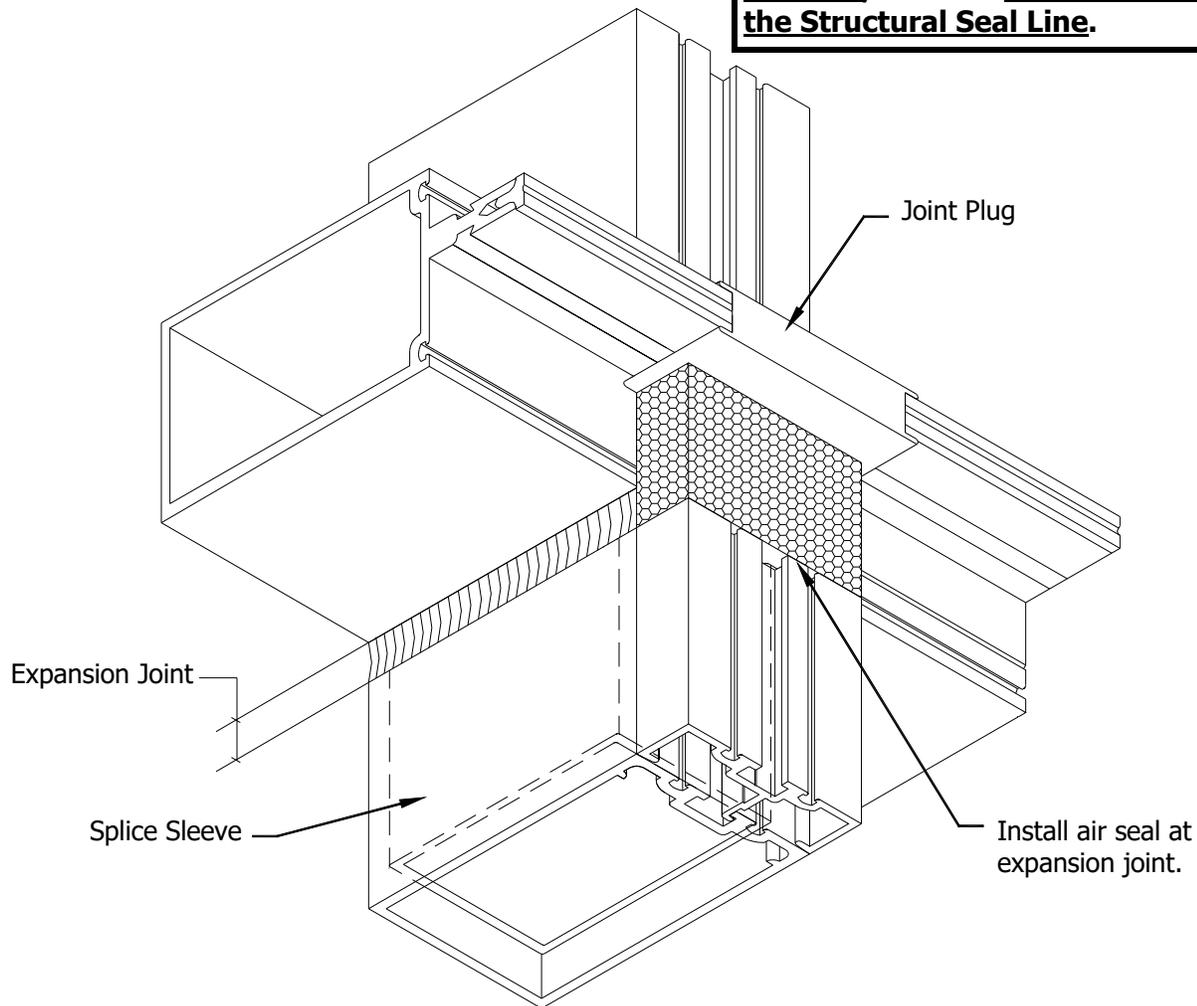


**Cut horizontal gaskets at structural glazed mullions to D.L.O. + 1/4" at each end.**

## Section VI: Glazing Preparation

### Air Seal at Expansion Joint

**Note: SSG Vertical Splice Locations EFCO recommends that Vertical Splice Line should be below the Intermediate Horizontal Member, this will Minimize Shear Stress at the Structural Seal Line.**



**Note: At corners, use more than one air seal as required. Miter to fit corner.**

### Clean

- A.) Clean all metal and infill that will contact silicone with proper cleaner, and then apply silicone primer, if required, as recommended by silicone sealant manufacturer.

### Setting Blocks

- A.) 1" Glazing & 1/4" Glazing - Position and install setting blocks as directed on "APPROVED" shop drawings.

## Section VI: Glazing Preparation

### Position Glass Infill

- A.) Set glass in framing opening, tight against interior gaskets, and position squarely on setting blocks.

**Customer / Installer Note:** EFCO setting blocks are typically 4" in length with different depths. If the glazing infill is "NOT BY EFCO" and glazing sizes are larger than 40 square feet, then the glazing details must be reviewed by the glazing manufacturer for proper setting block size.

### Attach Pressure Plates

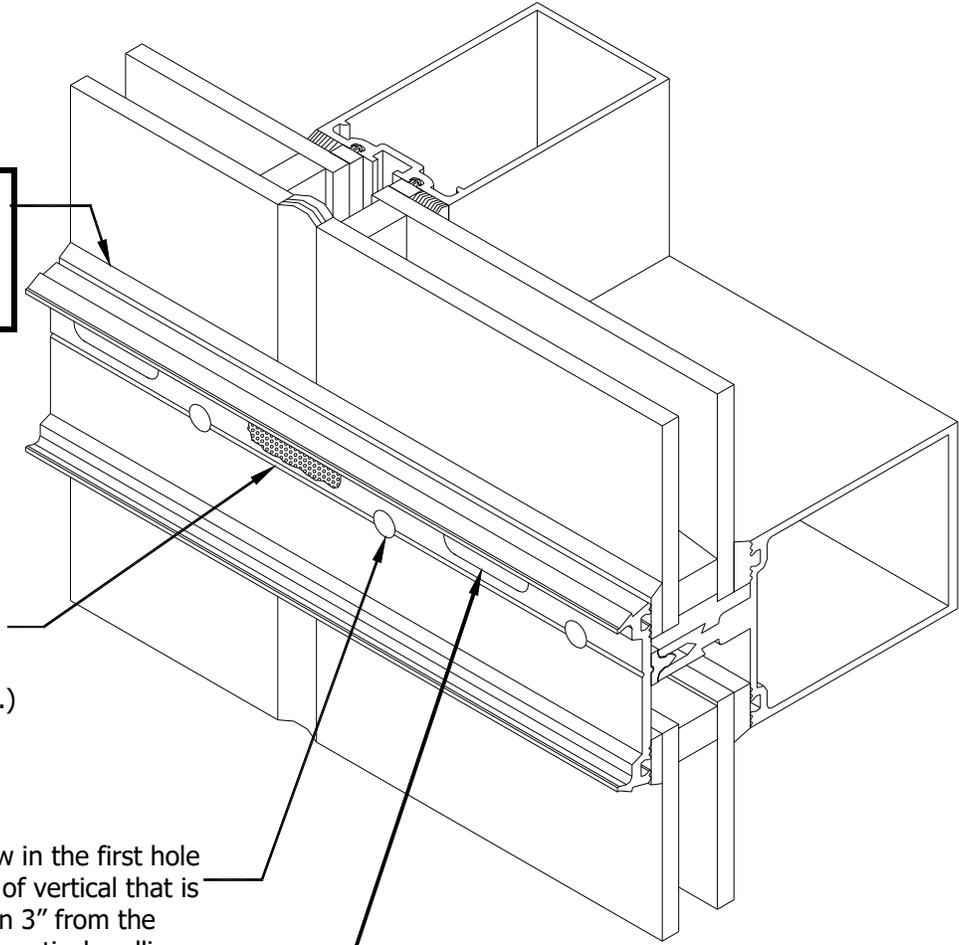
- A.) Install all pressure plate screws at 6" O.C. When possible, work from the center outward. Torque all screws to 80 inch pounds after both sides of opening have been secured. Fasteners must not be any more than 3" from each end and 6" O.C.

**Note:** Preapply exterior gasket in pressure plates. Cut gaskets 1/4" long at each end.

Just prior to installing the pressure plate, apply sealant to the face of all joint plugs. (Intermediates and Jambs.)

Insert a screw in the first hole on each side of vertical that is no closer than 3" from the center of the vertical mullion.

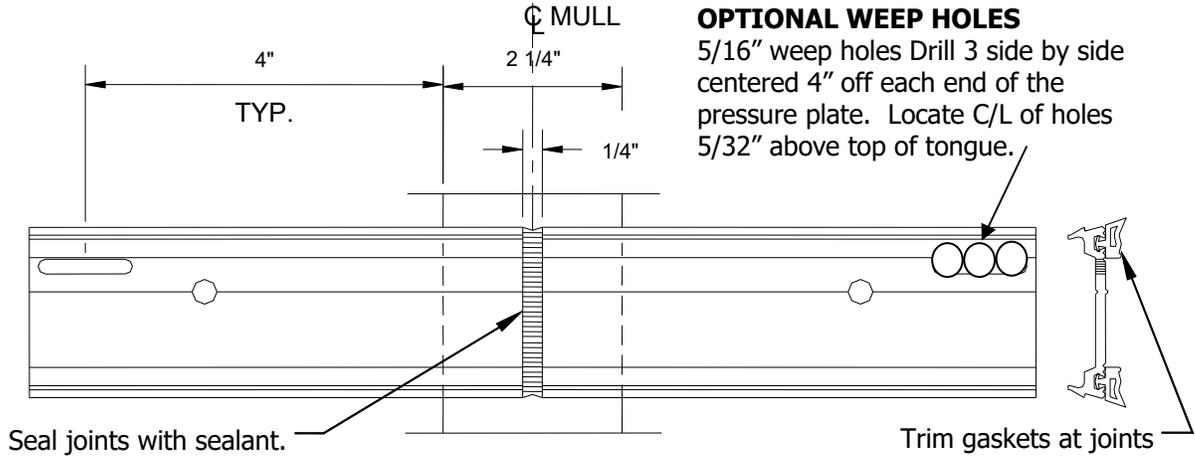
3/16" X 1" weep slots  
2 per lite- 4" off the edge of the mullion.



## **Section VI: Glazing Preparation**

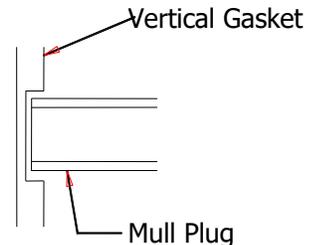
### **Attach Pressure Plates**

- A.) Apply glazing gaskets to pressure plates.
- B.) Gaskets applied to vertical pressure plates must be cut flush at both ends, except in multi-story applications, gaskets must extend 1" beyond the end at expansion joints.

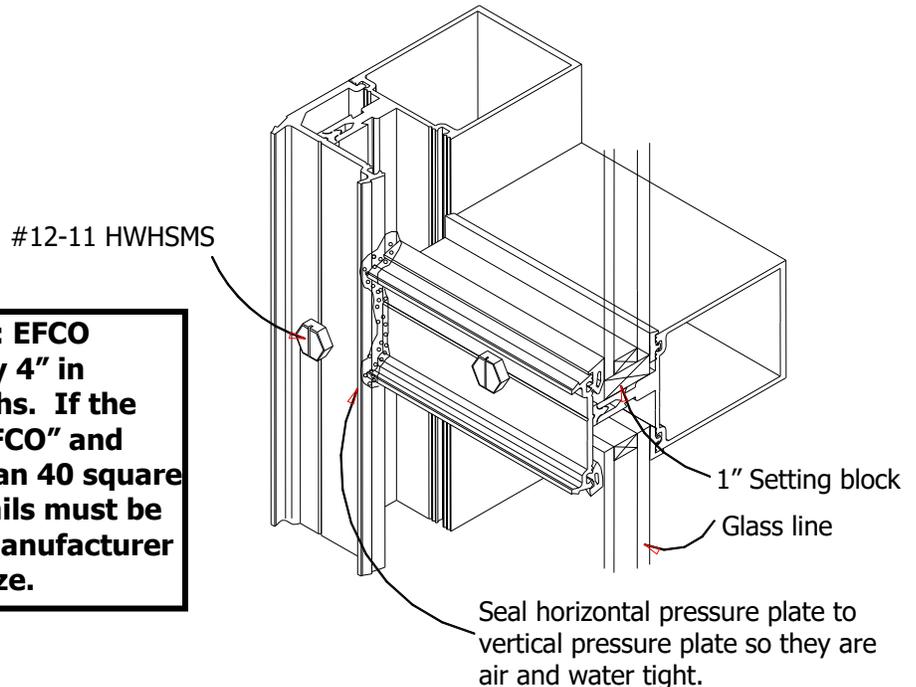


- C.) Gaskets applied to horizontal pressure plates; cut 1/4" long both ends maximum.
- D.) Attach pressure plates with #12-11 SS HWHSMS pressure plate screws.

**Note: Field notch vertical gasket to clear joint plugs at horizontal location. Seal all corners of gaskets with sealant.**

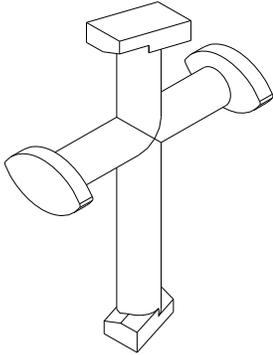


**Customer / Installer Note: EFCO setting blocks are typically 4" in length with different depths. If the glazing infill is "NOT BY EFCO" and glazing sizes are larger than 40 square feet, then the glazing details must be reviewed by the glazing manufacturer for proper setting block size.**



## Section VII: Glazing Retainer

### Temporary Retainers



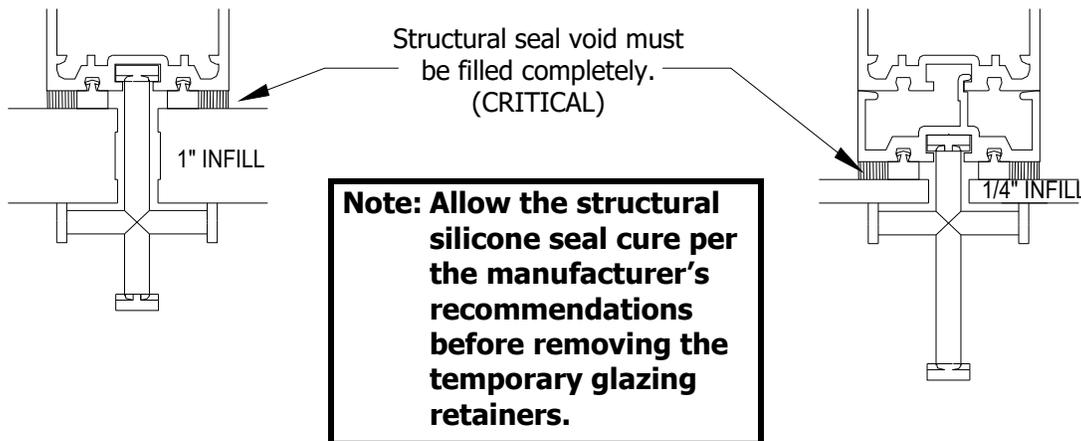
Silicone Structural Glazed Temporary Retainer

- A.) Temporary retainers are available from EFCO. The location of temporary exterior infill retainers should be at a maximum spacing of 24" on center, or two per lite. \* If high wind conditions are anticipated, additional retainers may be required; erector should consult the sealant and/or infill supplier for spacing recommendations.



### Apply Silicone Structural Sealant

- A.) EFCO does not supply sealant.  
B.) Apply silicone at structural seal as recommended by the sealant manufacturer.  
C.) Infill and metal must be cleaned per manufacturer's recommendations.

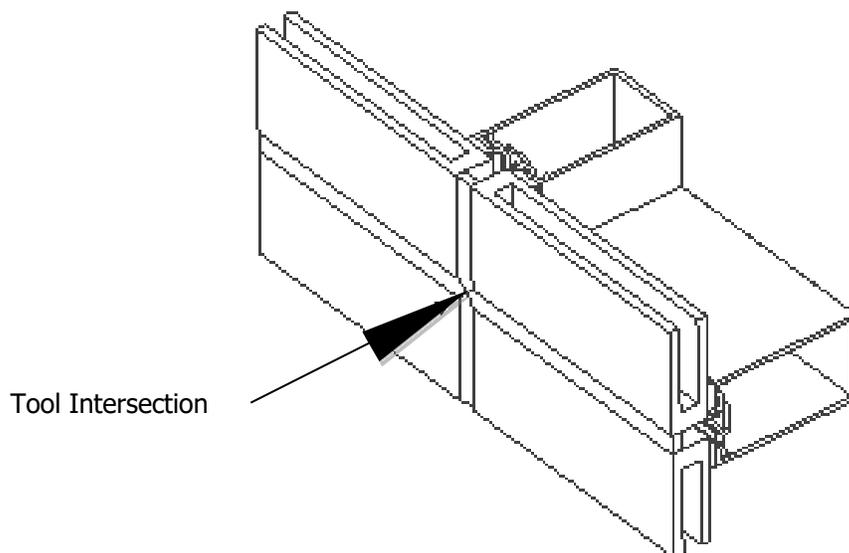
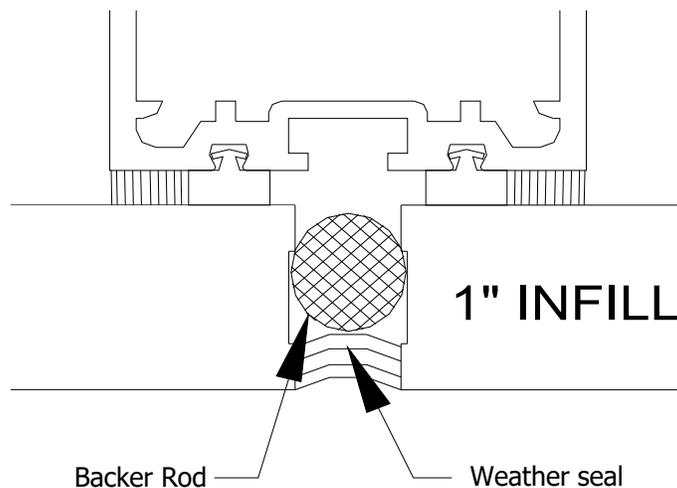


## Section VIII: Exterior Weather Seal

### Apply Exterior Weather Seal

- A.) Install backer rod (horizontal and vertical similar) between the two infill units (insulated and monolithic).
- B.) Apply exterior weather (horizontal and vertical similar) seal as recommended by the sealant manufacturer.
  - a. At a 4-side SSG intersection, be sure and tool vertical and horizontal weather seals together.

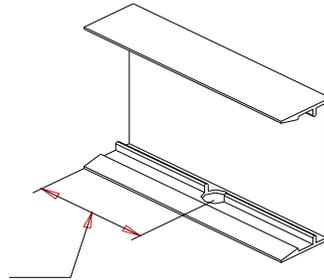
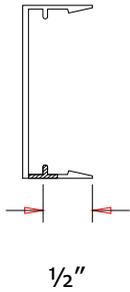
**Note: Seal up to temporary retainers. After the structural sealant cures, remove the temporary retainers and seal remaining gaps.**



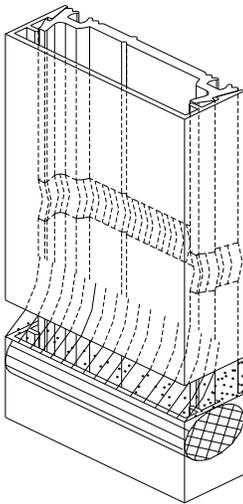
## Section IX: Snap-On Exterior Covers

### Snap-On Exterior Cover

- A.) Set horizontal covers as shown on "APPROVED" shop drawings.

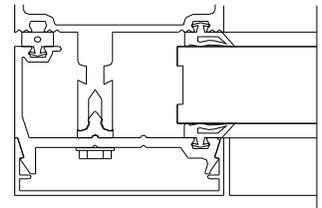


Drill 5/16" diameter weep holes in horizontal covers at 2" from vertical covers.

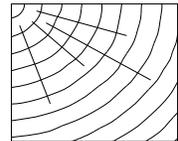


Backer Rod at splice.

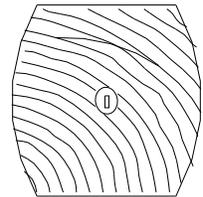
**Caution: Care must be taken to avoid damage to covers during installation. Use a nominal 12" long, 2" X 4" block, and mallet or hammer to seat cover.**



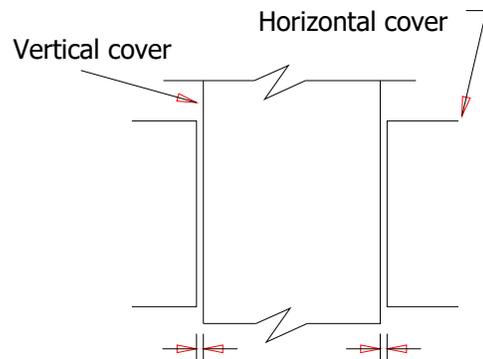
Approx. 12" long wood block.



Mallet or Hammer



- B.) Center horizontal snap cover in opening, engage one side, then using a mallet to engage opposite side. Gaps at ends should be equalized and are provided to allow installation, to allow for thermal movement, and provide weepage.
- C.) Exterior horizontal snap covers are cut D.L.O. – 1/16". Erector must split the difference on both ends.

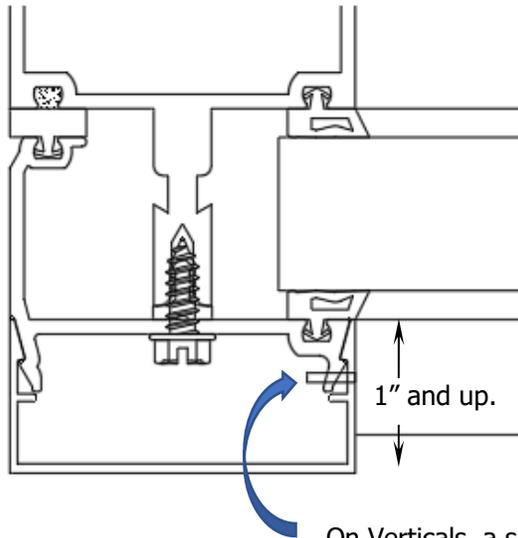


Equal space both ends of horizontal cover

## Section IX: Snap-On Exterior Covers

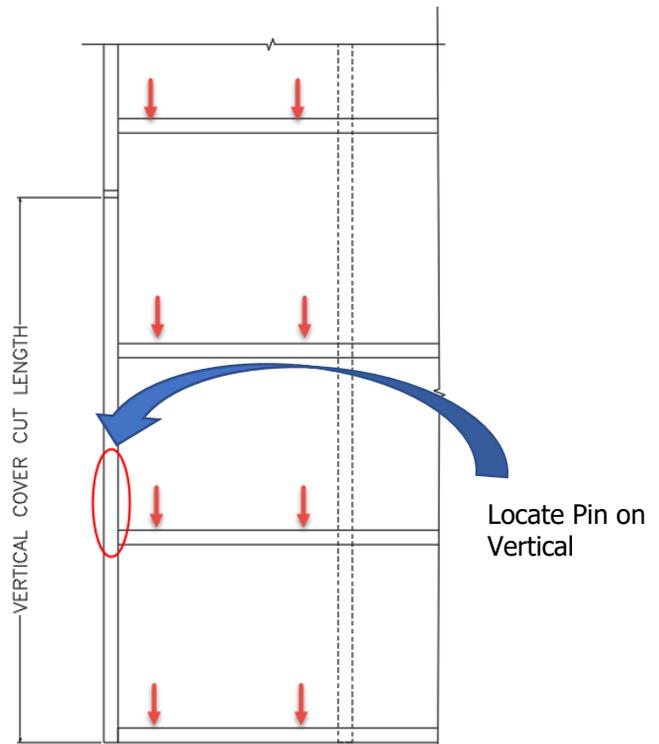
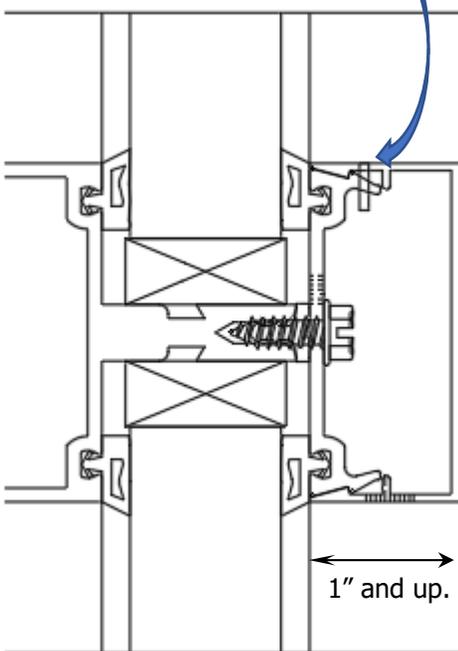
### Secure Exterior Covers

Snap covers of 1" and greater in depth needs to be mechanically attach to the pressure plate to guard against disengagement and/or slippage.



On Verticals, a single 1/16" X 5/16" Roll Pin is to be used in order to prevent vertical slippage and is recommended to be located at center of cover's cut length (or as near as possible) but can be located at a horizontal to eliminate exposure.

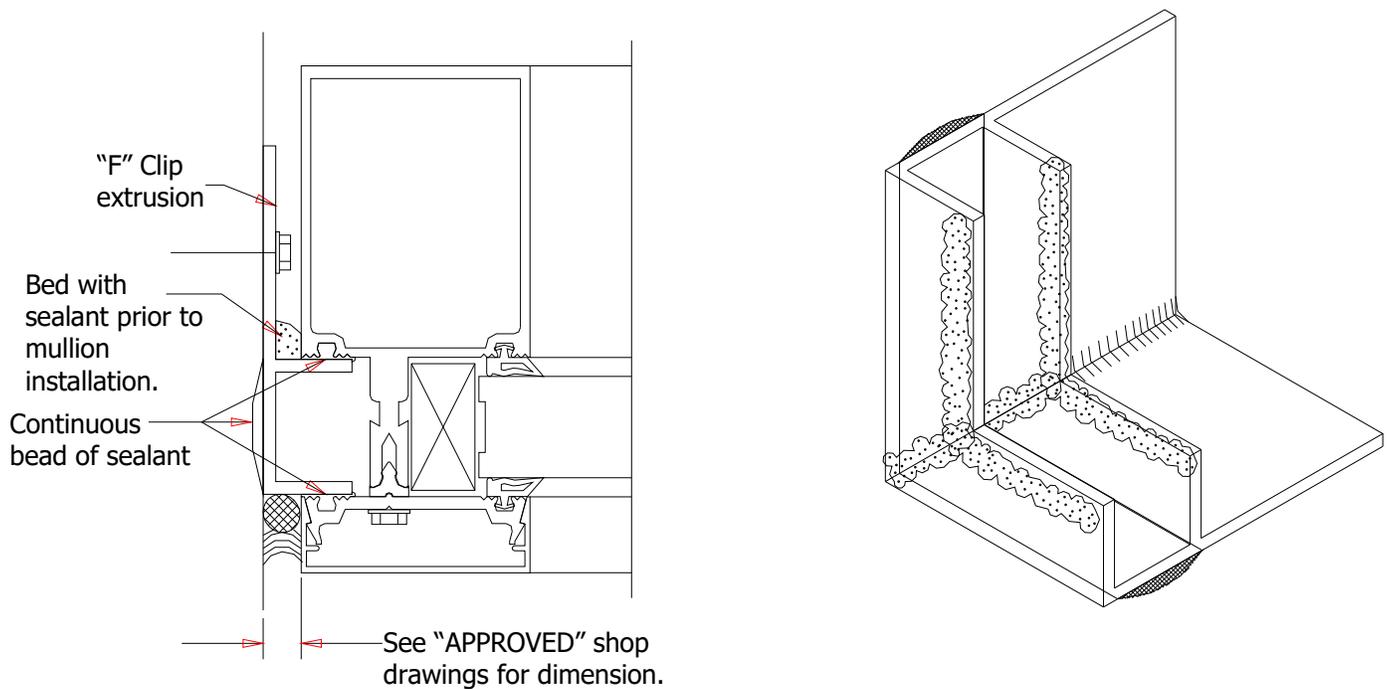
On horizontals, (2) 1/16" X 5/16" Roll Pins need to be located on top side (when possible) of horizontal and place between 1/4 and 1/3 points of D.L.O.



## Section X: Alternate Perimeter Applications

### Alternate Perimeter Applications

- A.) Installation of perimeter "F" extrusion for anchoring of perimeters, at head, jamb, and sill.
- B.) Install and thoroughly seal the perimeter "F" extrusion as shown on "APPROVED" shop drawings.

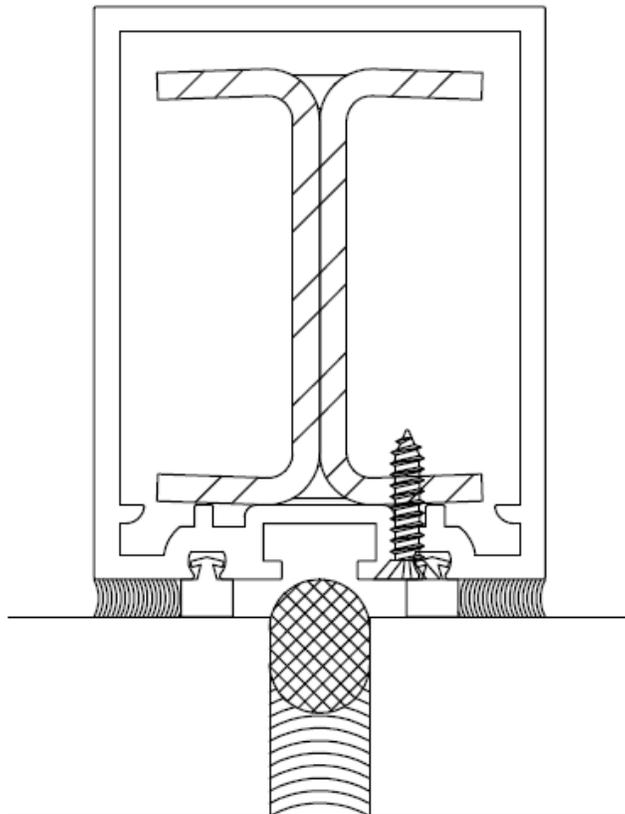


**Perimeter With Continuous "F" Extrusion.**

## **Section XI: Steel Reinforcement**

### **Steel Reinforcement Application**

- A.) At Large spans or high wind load areas, steel reinforcement may be necessary.
- B.) Reinforcement requirements will vary job to job.
- C.) Reference the "APPROVED" shop drawings for steel requirements.



- D.) When steel reinforcement is factory installed in mullions, fasteners will be used to prevent damage or slippage of steel during shipment