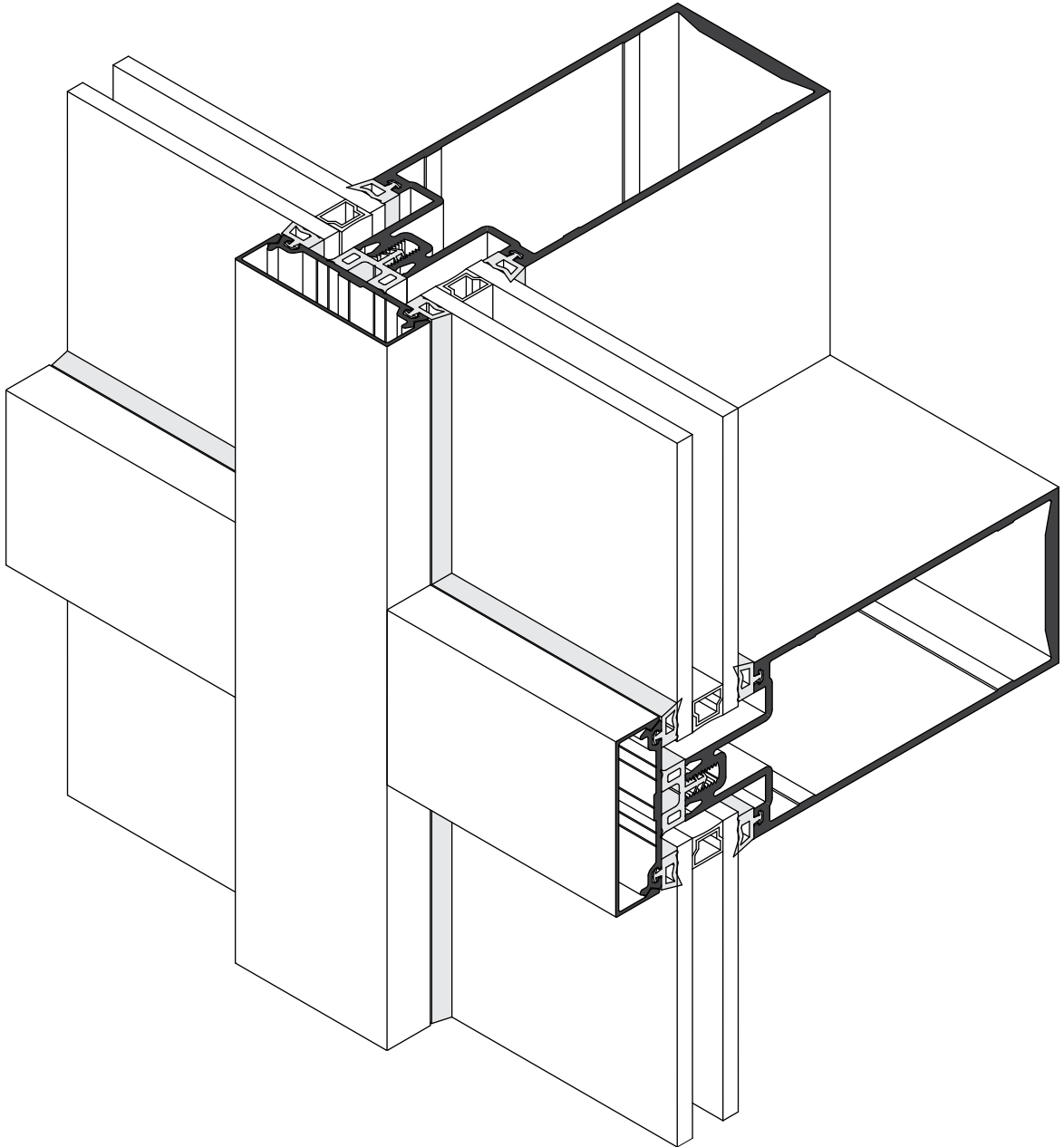


# TUBELITE®

**DEPENDABLE**

LEADERS IN ECO-EFFICIENT STOREFRONT,  
CURTAINWALL AND ENTRANCE SYSTEMS



## 400T SERIES CURTAIN WALL INSTALLATION INSTRUCTIONS

3056 Walker Ridge Dr. NW, Suite G • Walker, MI 49544 • 800-866-2227

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## GENERAL CONSTRUCTION NOTES

1. These instructions cover typical product application, fabrication, installation and standard conditions and are general in nature. They provide useful guidelines, but the final shop drawings may include additional details specific to the project. Any conflict or discrepancies must be clarified prior to execution.
2. Materials stored at the job site must be kept in a safe place protected from possible damage by other trades. Stack with adequate separation so materials will not rub together and store off the ground. Cardboard or paper wrapped materials must be kept dry. Check arriving materials for quantity and keep a record of where various materials are stored.
3. All field welding must be done in accordance with AISC guidelines. All aluminum and glass should be shielded from field welding to avoid damage from weld splatter. Results will be unsightly and may be structurally unsound. Advise general contractor and other trades accordingly.
4. Coordinate protection of installed work with general contractor and/or other trades.
5. Coordinate sequence of other trades which affect framing installation with the general contractor (e.g. fire proofing, back up walls, partitions, ceilings, mechanical ducts, HVAC, etc.).
6. General contractor should furnish and guarantee bench marks, offset lines and opening dimensions. These items should be checked for accuracy before proceeding with erection. Make certain that all adjacent substrate construction is in accordance with the contract documents and/or approved shop drawings. If not, notify the general contractor in writing before proceeding with installation because this could constitute acceptance of adjacent substrate construction by others.
7. Isolate all aluminum to be placed directly in contact with masonry or other incompatible materials with a heavy coat of zinc chromate or bituminous paint. Fasteners attaching framing to building structure are typically not provided by Tubelite, nor specified in these instructions due to varying perimeter conditions and job performance requirements. Consult approved shop drawings.
8. Sealant selection is the responsibility of the erector, installer and/or glazing contractor and must be approved by the sealant manufacturer with regard to application and compatibility for its intended use. All sealants must be used in strict accordance with the manufacturer's instructions and applied only by trained personnel to surfaces that have been properly prepared.
9. Sealant must be compatible with all materials with which they have contact, including other sealant surfaces. Consult the sealant manufacturer for recommendations relative to shelf life, compatibility, cleaning of substrate, priming, tooling adhesion, etc. Recommend sealant manufacturer perform adhesion "pull test" at "wet" glazing for quality assurance.
10. Drainage gutters and weep holes must be kept clean at all times. Tubelite will not accept responsibility for improper drainage as a result of clogged gutters and weep holes.
11. This product requires clearances at the head, sill and jambs to allow for thermal expansion and contraction as well as construction tolerances. Refer to final distribution drawings for joint sizes. Joints smaller than 1/4" may be subject to failure. Consult the sealant manufacturer for proper sizing of joints.
12. All framing members, entrances and other materials are to be installed plumb, level and true with regard to established bench marks, column center lines or other working points established by the general contractor and checked by the erector, installer and/or glazing contractor.
13. After sealant is set and a representative amount of the wall has been glazed (500 square feet or more), run a water hose test to check installation. On large projects, a hose test should be repeated during glazing operation. This testing should be conducted in accordance with AAMA 501.2 specifications.
14. Cleaning of exposed aluminum surfaces should be done per AAMA recommendations.
15. Check [www.tubeliteinc.com](http://www.tubeliteinc.com) for any installation instruction updates.

## GENERAL CONSTRUCTION NOTES

### THERMAL PRESSURE PLATE INSTALLATION

Tubelite's POLYAMIDE (P4633) and THERMAL (PTB120) pressure plates can be used in place of the standard aluminum pressure plate for improved thermal performance. Please note the following important information while planning your project.

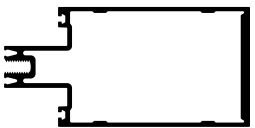


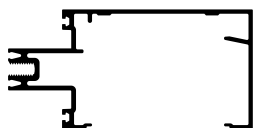


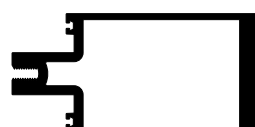
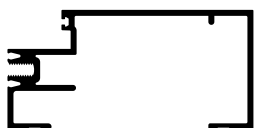
- Tubelite offers one standard polyamide pressure plate as noted above. The polyamide pressure plate is extruded in black and the thermal pressure plates are extruded in white with both available at 24'-2".
- Polyamide and Thermal pressure plate anchor screw holes are pre-machined. Weep holes must be drilled in the shop. Anchor holes are 8" o/c and weeps are 5/16" diameter holes. When installing screws in the polyamide pressure plate, use S437 washer under screw head.
- ALL anchor holes must be utilized for proper load distribution.
- Polyamide pressure plates do not require special tooling for cutting and drilling, however, carbide tipped blades are recommended for cutting or diamond tip blades for better longevity.
- The same protective wear (i.e. gloves, safety goggles, etc.) worn to fabricate aluminum pressure plates can be worn to fabricate polyamide and thermal pressure plates. Protective wear guidelines for PTB120 thermal pressure plates can be found online in the MSDS.
- Tubelite offers one typical vertical and horizontal face cover (E031TU) that is specifically designed to engage with the polyamide pressure plates. Nominal dimension from face of glass to face of cover measures 13/16". Typical face covers can be used with the thermal pressure plates.
- Tubelite offers one typical aluminum corner cover (E4TB57) that is designed for the corner aluminum pressure plate. Nominal dimension from face of glass to face of cover measures 3/4".
- A PVC pocket filler (P3967) has been designed to be used at perimeter members where a return leg pressure plate is not available.


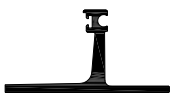
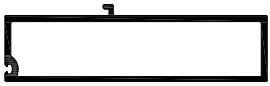
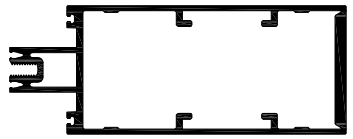
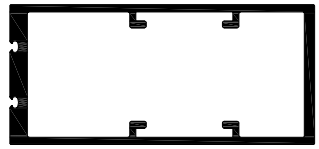


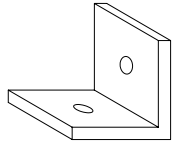
1. Make sure the opening is square and the caulk joints are 1/2" minimum around the frame.
2. Ensure surfaces that will be sealed are free of contaminants that can lead to adhesion issues.
3. Check that all weeps and baffles (if required) conform to the locations and sizes called out in these instructions.
4. Butter seal ends of horizontal frame members that are joined to vertical members.
5. Water dam installation and sealing is critical. Check installation against instructions to ensure conformity.
6. Apply sealant between all corner gasket joints.
7. Glass bites must be equal on all sides.
8. Double check anchor size and location against installation instructions or approved shop drawings.
9. Ensure pressure plate fasteners are torqued to **60 in-lbs**.

### GLASS SIZE CALCULATION
















Captured Mullions	= D.L.O. + 1"
SSG Vertical Mullions	= D.L.O. + 2"
SSG Horizontal Mullions	= D.L.O. + 1 3/4"
SSG Vertical Mullion at Captured Jamb	= Width <b>ONLY</b> D.L.O. + 1 1/2"
Corner Mullions	= See Approved Shop Drawings

## TYPICAL FRAMING EXTRUSIONS





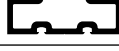

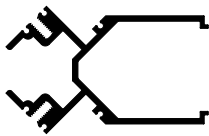
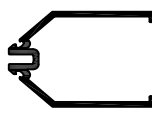
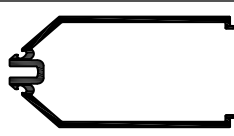
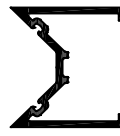
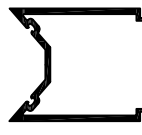
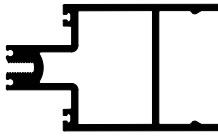

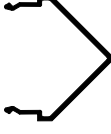
SHAPE	DESCRIPTION	PART No.
	4" Tubular Captured Mullion/Horizontal	<b>E4TB223</b>
	4" Vertical SSG Mullion (Interior/Exterior Structural Seal)	<b>E4TB140</b>
	SSG Setting Chair	<b>P4623</b>
	4" Roll-Over Horizontal	<b>E4TB173</b>
	4" Roll-Over Horizontal for Live Load	<b>E4TB182</b>
	4" Roll-Over Filler	<b>E4TB175</b>
	4" HD Vertical	<b>E4TB302</b>
	4" Open Back Perimeter Head, Sill & Jamb	<b>E4TB245</b>

SHAPE	DESCRIPTION	PART No.
	5 1/2" Back Member Upper Expansion Horizontal	<b>E55TB264</b>
	Expansion Plate (Chicken head)	<b>E4200</b>
	5 1/2" Back Member Lower Expansion Horizontal	<b>E55TB265</b>
	5 1/2" Back Member Captured Expansion Vertical to be used with Expansion Horizontal	<b>E55TB266</b>
	5 1/2" Back Member SSG Expansion Vertical to be used with Expansion Horizontal	<b>E55TB267</b>
	Expansion Shear clip 4" long Sill of Expansion Horizontal	<b>PTB118A</b>
	Expansion Shear Clip 4 7/8" long Head of Expansion Horizontal	<b>PTB118B</b>
	Horizontal Expansion angle	<b>PTB133</b>

## PRESSURE BARS & FACE CAPS

SHAPE	DESCRIPTION	PART No.
	Intermediate Pressure Bar	<b>M4TB224</b>
	Pressure Bar (for use with Live Load Roll-Over Horizontal only)	<b>M4TB324</b>
	Perimeter Pressure Bar with Return Leg	<b>M4TB325</b>
	Pressure Plate - 5/16" offset Use with alternate glazing options	<b>E4TB102</b>
	Pressure Plate - 1/8" offset Use with alternate glazing options	<b>E4TB72</b>
	Thermal Pressure Plate	<b>PTB120</b>
	3/4" Depth Face Cap (Standard)	<b>E4TB64</b>
	Captured Corner Face Cover	<b>E4TB304</b>
	Pressure Plate Use with E1587 Face Cover	<b>M2411</b>
	4" x 3/4" Face Cover	<b>E1587</b>
	Pressure Plate Use with E2439 Face Cover	<b>M2289</b>
	5" x 3/4" Face Cover	<b>E2439</b>
	3" x 3/4" Face Cover	<b>E4133</b>
	Pressure Bar for Expansion Horizontal	<b>M4TB94</b>
	Interior Closure Expansion Horizontal	<b>E4201</b>

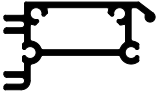
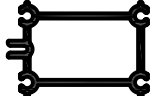



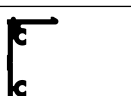
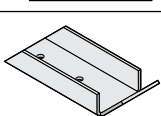
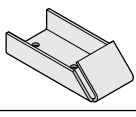
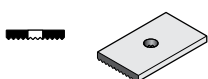
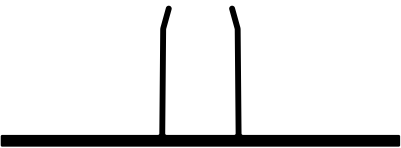
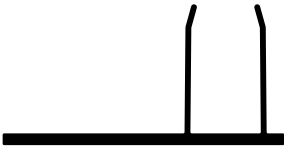

## GLAZING ADAPTOR EXTRUSIONS

SHAPE	DESCRIPTION	PART No.
	Glazing Pocket Filler	<b>E4TB278</b>
	PVC Glazing Pocket Filler	<b>P3967</b>
	¼" Glass Adaptor for Captured Glazing	<b>E4TB69</b>
	½" Glass Adaptor for Captured Glazing	<b>E4TB80</b>
	¼" Glass Adaptor for SSG Glazing	<b>E4TB129</b>
	Screw Applied Horn for 1" Glazing	<b>E4TB45</b>
	90° Outside Corner Adaptor for Captured Glazing	<b>E4TB52</b>
	90° Outside Corner Adaptor for SSG Glazing	<b>E4TB46</b>
	90° Outside Corner Adaptor for SSG Glaze ¼" Spandrel Glass	<b>E4TB48</b>
	90° Inside Corner Adaptor for SSG Glaze	<b>E4TB47</b>
	90° Inside Corner Adaptor for SSG Glaze ¼" Spandrel Glass	<b>E4TB49</b>
	4" Back Member Outside/Inside Corner Verticals Use with E4TB50 & E4TB51	<b>E4TB88</b>
	90° Outside Corner Interior Closure	<b>E4TB50</b>
	90° Inside Corner Interior Closure	<b>E4TB51</b>

Contact Tubelite for additional system extrusions for enhanced project applications.











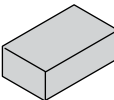
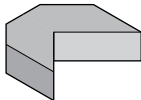
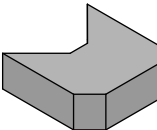




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## ANCHORS and CLIPS

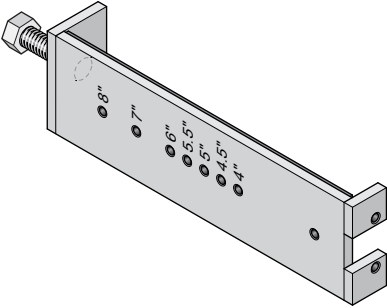












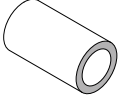

SHAPE	DESCRIPTION	PART No.
	Shear Clip for E4TB128 Roll-Over Horizontal	<b>PTB110</b>
	Shear Clip for E4TB140 SSG Horizontal	<b>PTB130</b>
	Shear Block for Tubular Horizontals	<b>PTB58</b>
	Shear Block for Tubular SSG Horizontals	<b>PTB96A</b>
	Shear Block/Anchor for Head	<b>P2056</b>
	Shear Block/Anchor for Sill	<b>PTB47</b>
	Inside Corner Shear Clip	<b>P4745</b>
	Outside Corner Shear Clip	<b>P4739</b>
	Locking Lug for PTB47 Sill Anchor Clips	Hole Size 5/16" <b>P1265</b>
		3/8" <b>P1266</b>
		7/16" <b>P1267</b>
	'T' Anchor for Mullions	Captured <b>PTB84M</b>
		SSG <b>PTB84Y</b> at E4TB262
		SSG <b>PTB87B</b> at E4TB128
		Corner <b>PTB119</b>
	'F' Anchor for Jamb	Captured <b>PTB83M</b>
		SSG <b>PTB83Y</b> at E4TB262
		SSG <b>PTB88B</b> at E4TB128
	'F' Anchor 4" x 1" Extrusion For Jamb	<b>E3162</b>

Anchors and Clips shown here are for 4" back members. Contact Tubelite for additional parts and back member depths or visit our website, <https://www.tubeliteinc.com/400t-thermal-curtain-wall/>

## ACCESSORIES

SHAPE	DESCRIPTION	PART No.
	Glazing Gasket	<b>P4606</b>
	Glazing Gasket	<b>PTB33</b>
	Glazing Gasket	<b>PTB31</b>
	Thermal Isolator	<b>P2064</b>
	Isolator Gasket	<b>PTB108</b>
	Spacer Gasket for SSG	<b>P4631</b>
	Setting Block for 1" Glazing	<b>P946</b> (EPDM) <b>P947</b> (Silicone)
	Setting Block for 1/4" Glazing	<b>P948</b>
	Temporary Glass Retainer	<b>P1194</b>
	Water Dam for Captured Glazing	<b>PTB103</b>
	Water Dam for SSG Glazing	<b>PTB123</b>
	Water Dam for SSG Inside Corner	<b>PTB122</b>
	Water Dam for SSG Outside Corner	<b>PTB121</b>
	Sweep Gasket 3" Aluminum Pressure Bar Horizontal Exp.	<b>PTB115</b>
	Gasket Expansion Plate (Chicken Head)	<b>PTB116</b>
	PVC Rod Interior Expansion Plate (Chicken Head) 120" long	<b>PTB117C</b>
	Reticulated Foam 3" length	<b>P4810</b>

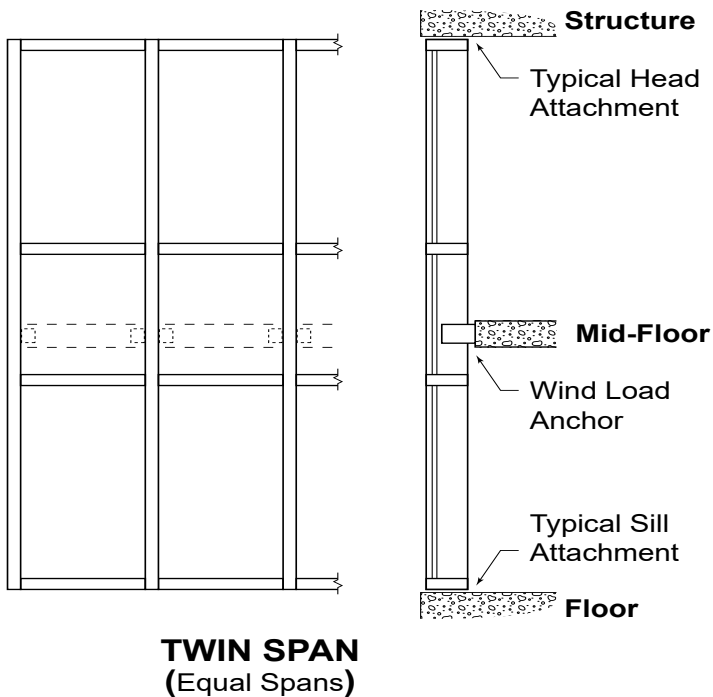
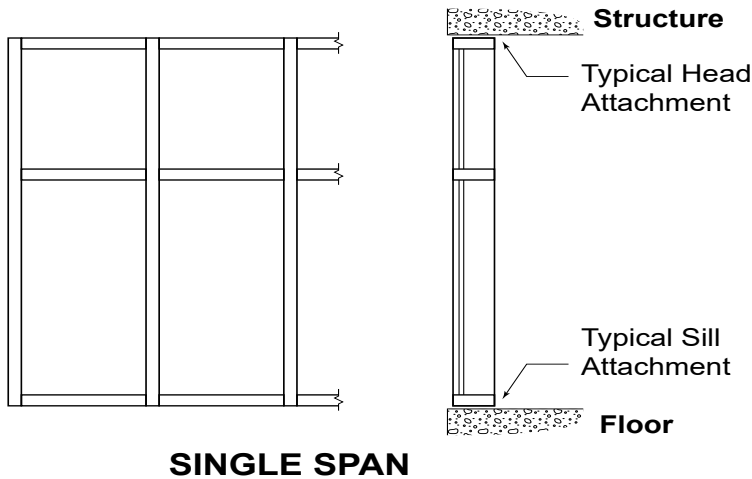
## FASTENERS

SHAPE	DESCRIPTION	PART No.
	Drill Fixture	<b>P2091</b>
	#10-24 x 1/2" PH TYPE 'F'	<b>S128</b>
	#14-14 x 1/2" HH TYPE 'F'	<b>S139</b>
	#8 x 3/8" PH Pan Head Type A	<b>S196</b>
	#10-24 x 3/4" PH Self Tapping	<b>S270</b>
	1/4 - 20 x 1 1/2" HWH TYPE 'F'	<b>S359</b>
	1/4 - 20 x 3/4" IND HWH TYPE 'F' 18-8SS	<b>S369</b>
	1/4 - 20 x 1 1/2" HWH Bolt for Corner Mullion Nose at E4TB172	<b>S427</b>
	1/4 - 20 x 2" HWH Bolt for Corner Mullion Nose at E4TB110	<b>S428</b>
	1/4 - 20 x 1" IND HWH TYPE 'F' 18-8SS	<b>S469</b>
	1/4 - 20 x 1 3/16" IND HWH TYPE 'F' 18-8SS	<b>S470</b>
	#12-14 X 1-1/2 HWH TEK 18-8 SS	<b>S400</b>
	1/4-20 x 2-1/2" PH PAN HD STEEL ZINC	<b>S473</b>
	3/8" x 1" Pipe Sleeve	<b>P2028</b>
	Washer for P4633 PA Pressure Plate	<b>S437</b>

## ELEVATION TYPES

### TYPES OF CURTAIN WALL INSTALLATION

The 400T Series curtain wall system can be constructed a variety of ways. The most common are single span, twin span and multi-span as illustrated below. Refer to approved shop drawings for specific guidance on splicing and anchoring.



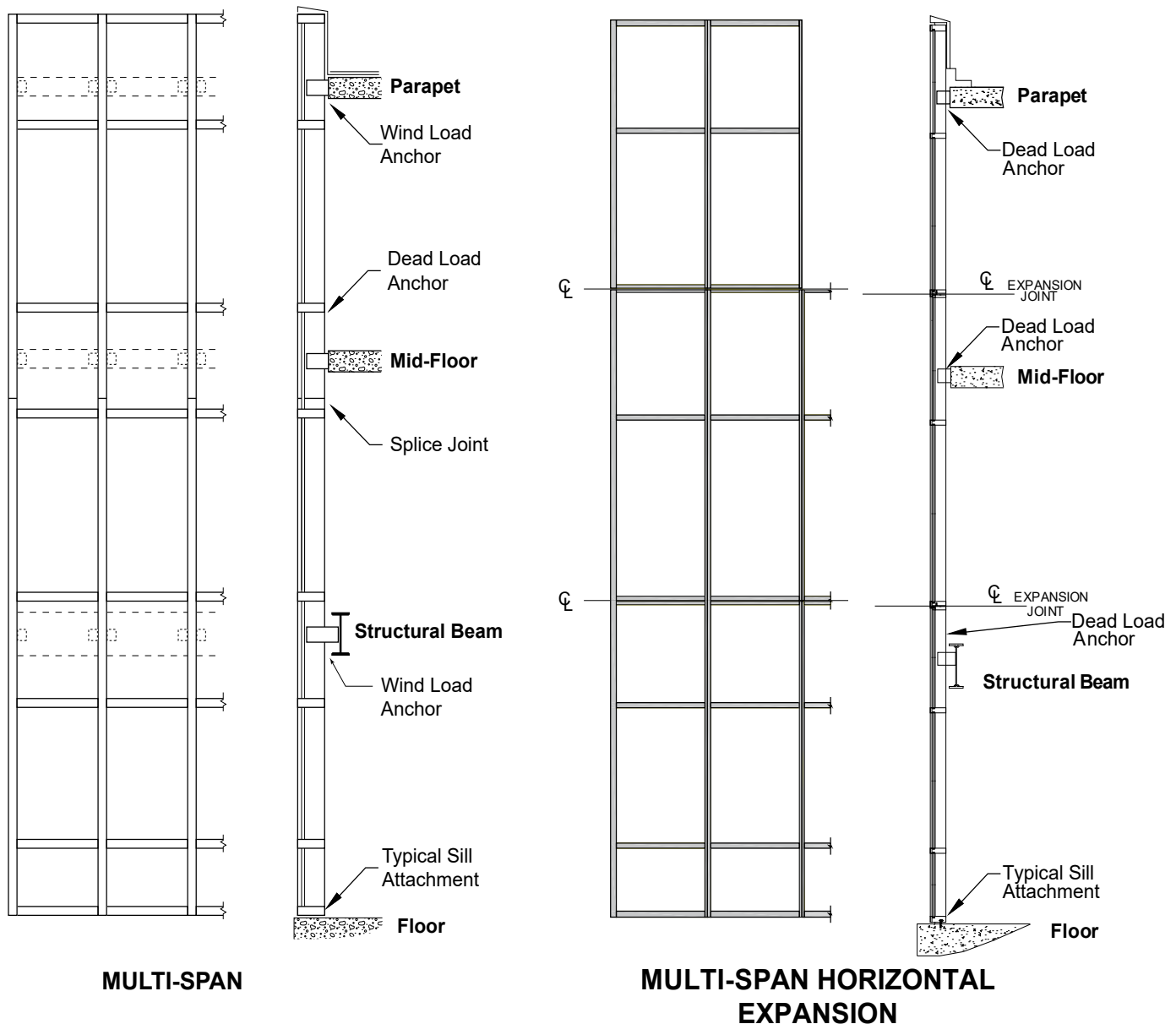
Span configurations will vary per project requirements.  
 Conditions must be approved by engineer calculations.

**Fig. 13.1**

## ELEVATION TYPES

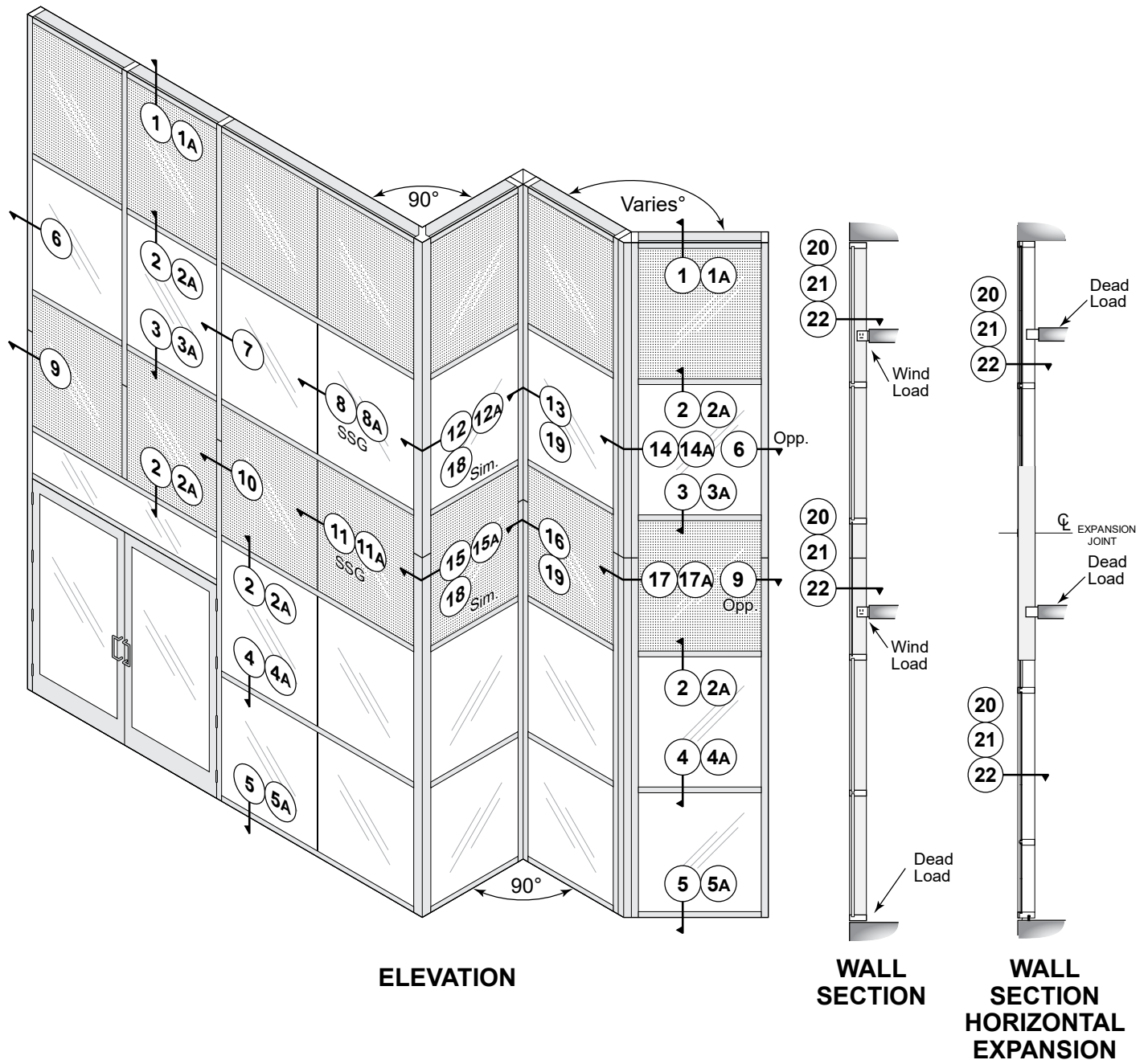
### TYPES OF CURTAIN WALL INSTALLATION

The 400T Series curtain wall system can be constructed a variety of ways. The most common are single span, twin span and multi-span as illustrated below. Refer to approved shop drawings for specific guidance on splicing and anchoring.



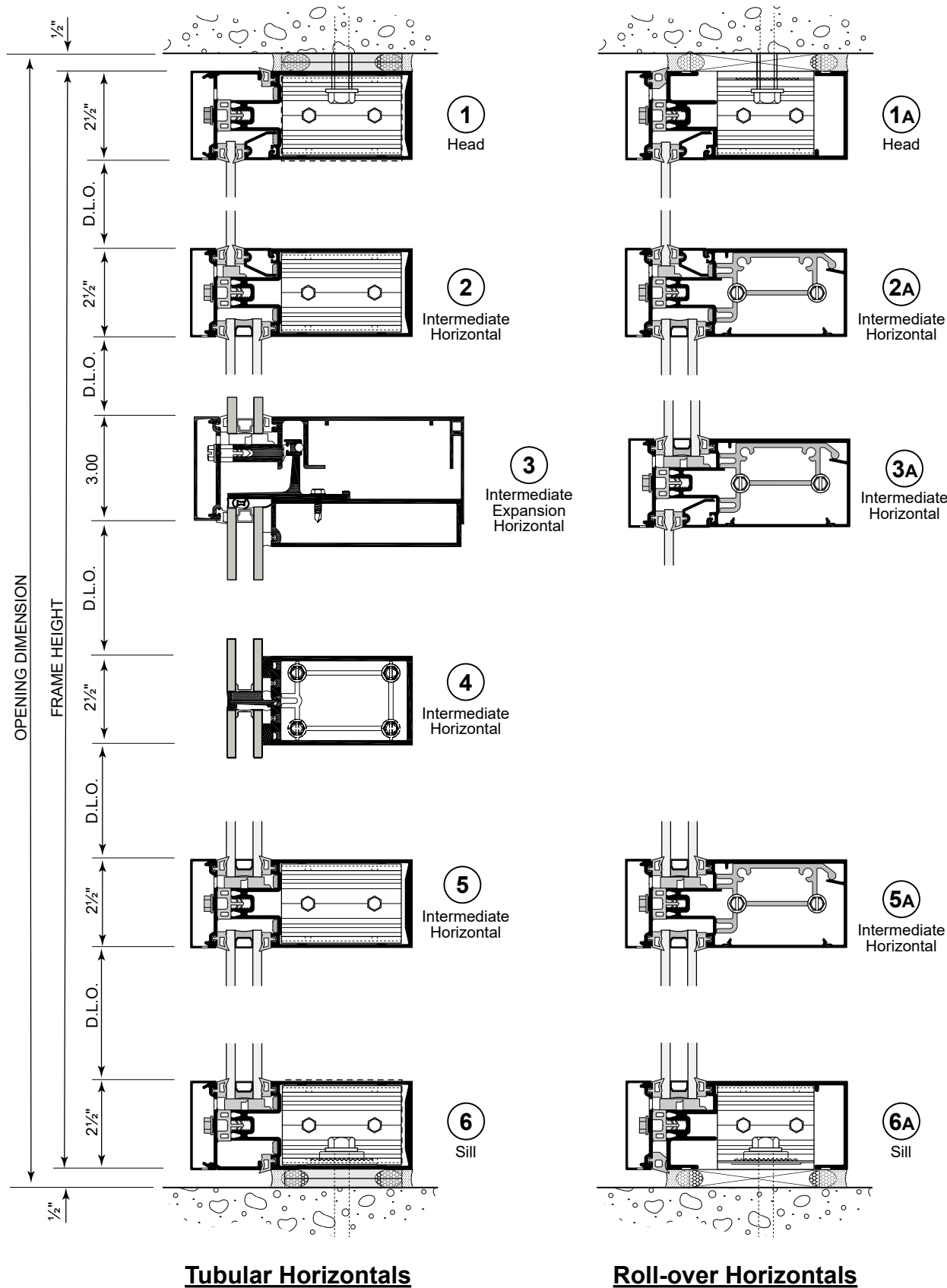
Span configurations will vary per project requirements.  
 Conditions must be approved by engineer calculations.

## ELEVATION and WALL SECTIONS



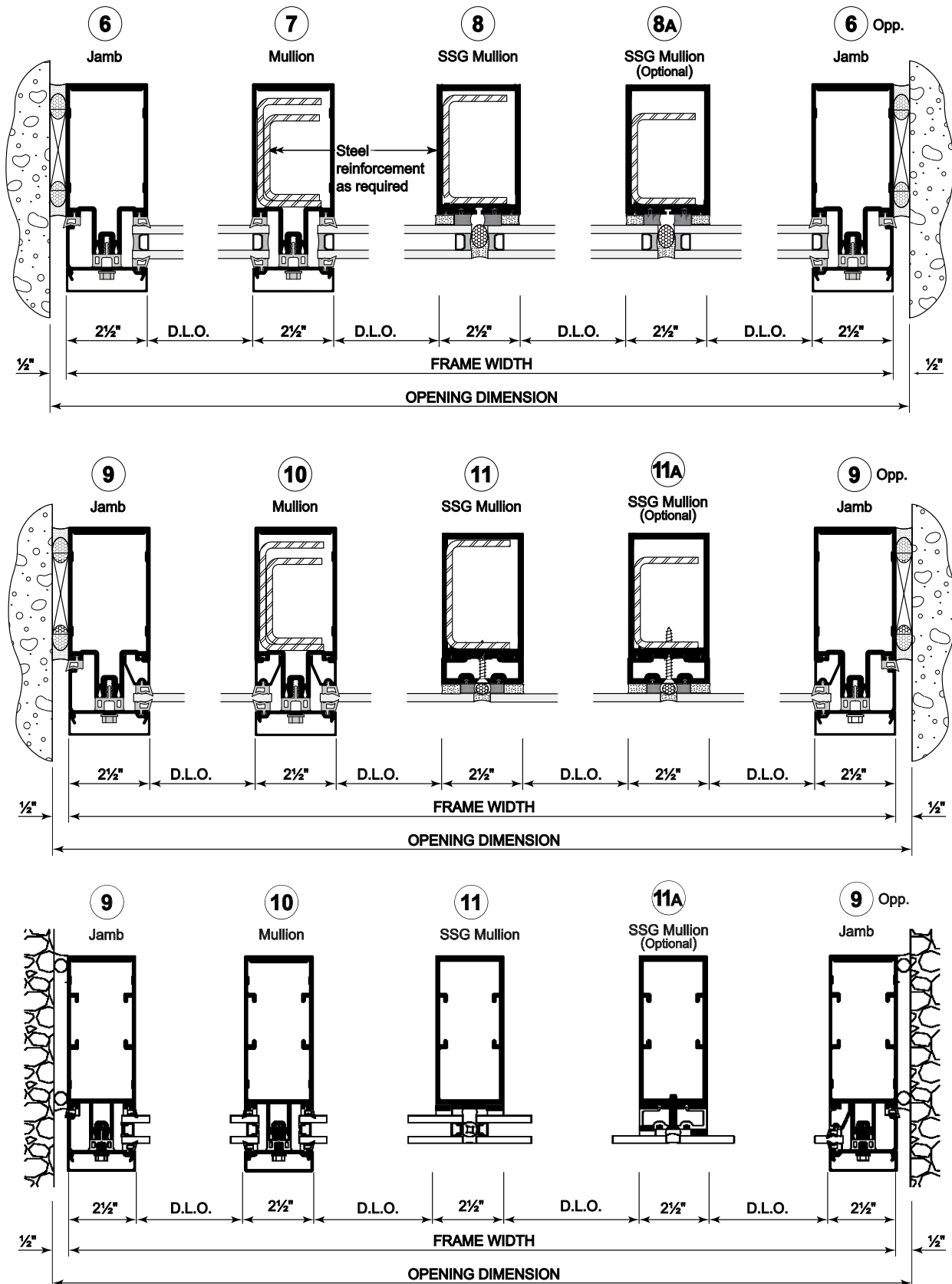
**Fig. 15.1**

**HORIZONTAL DETAILS**



**Fig. 16.1**

## VERTICAL DETAILS



Bottom row of details is for 5 1/2" vertical mullions for horizontal expansion.

**Fig. 17.1**

CORNER DETAILS

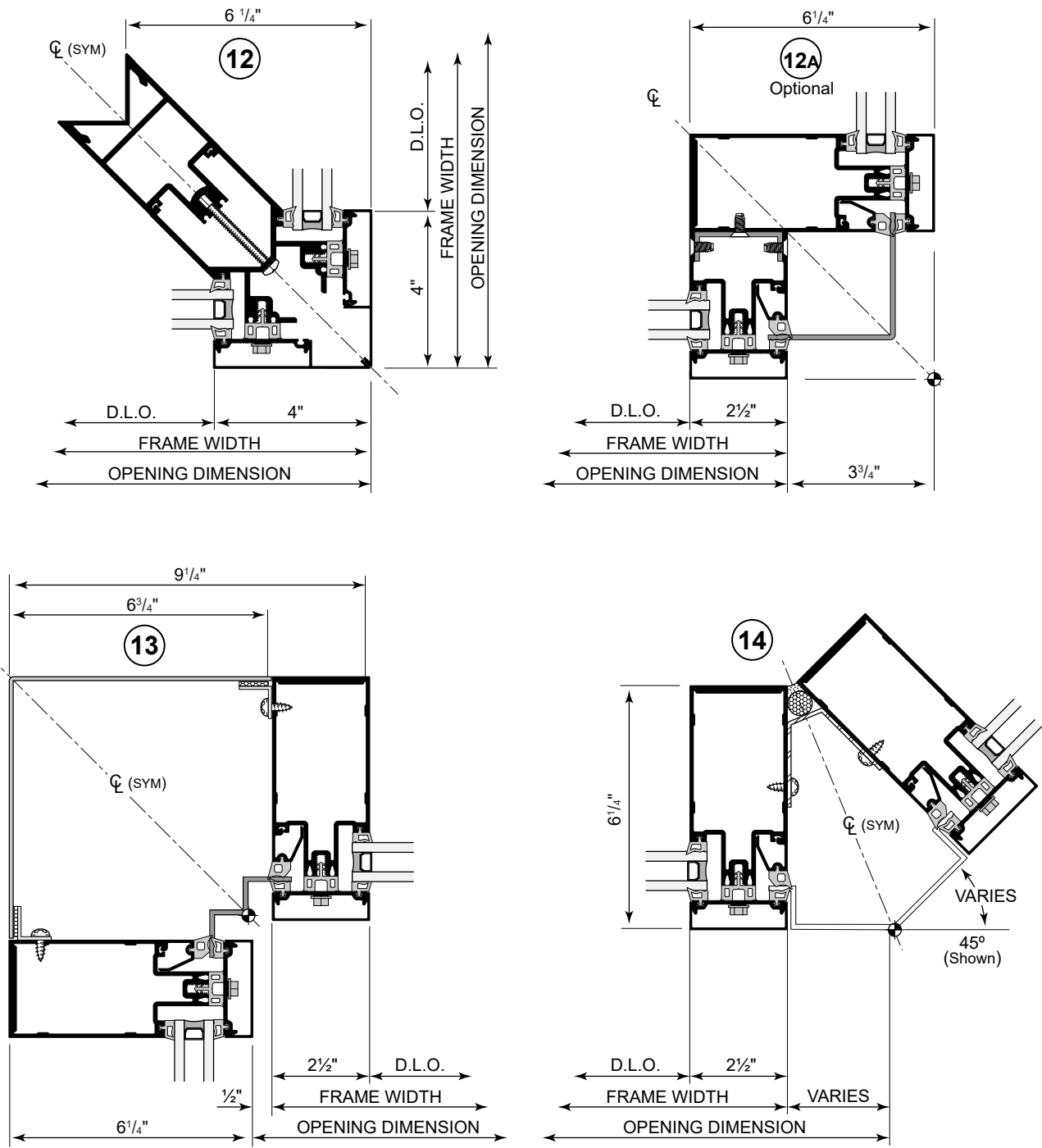
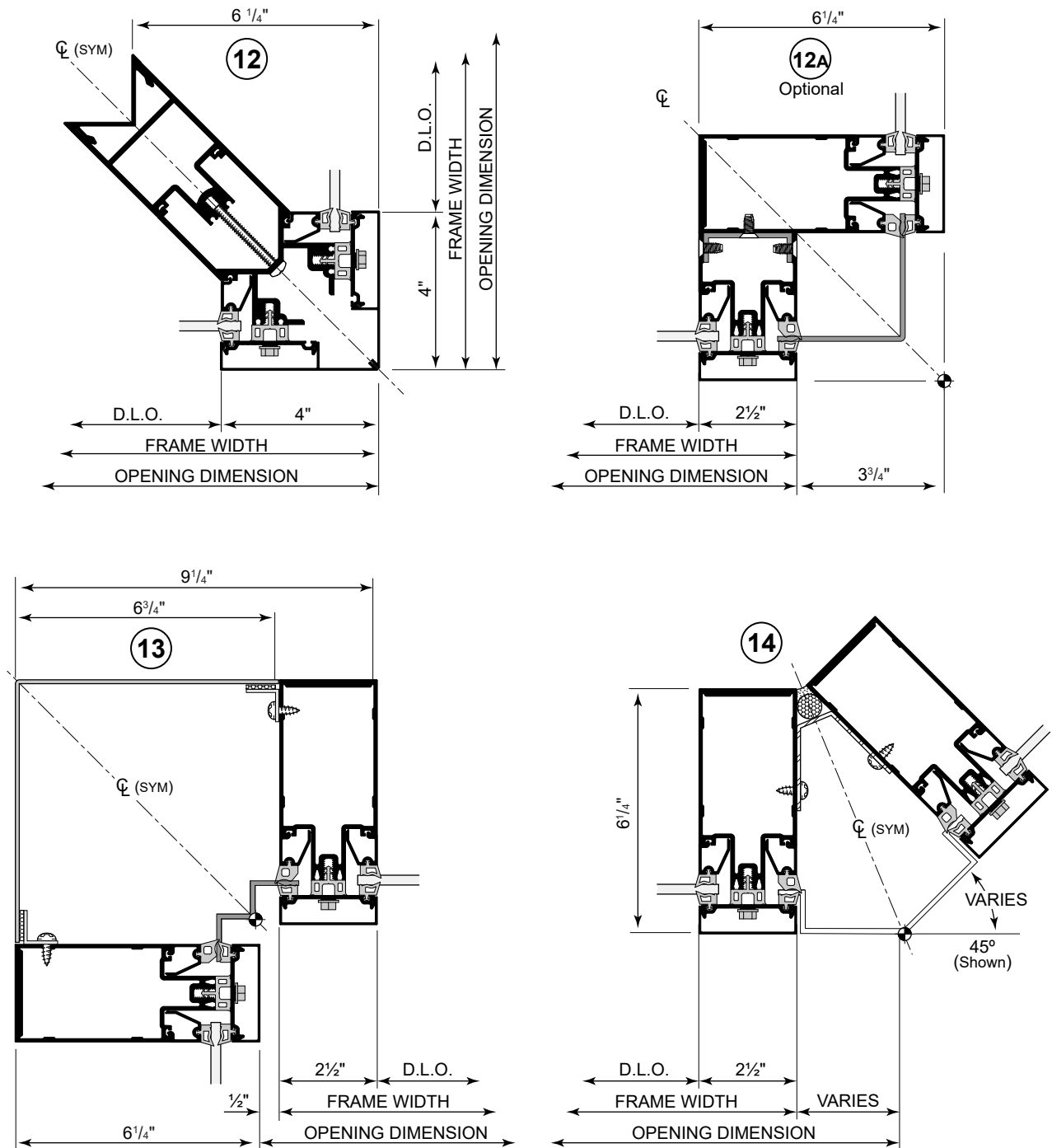


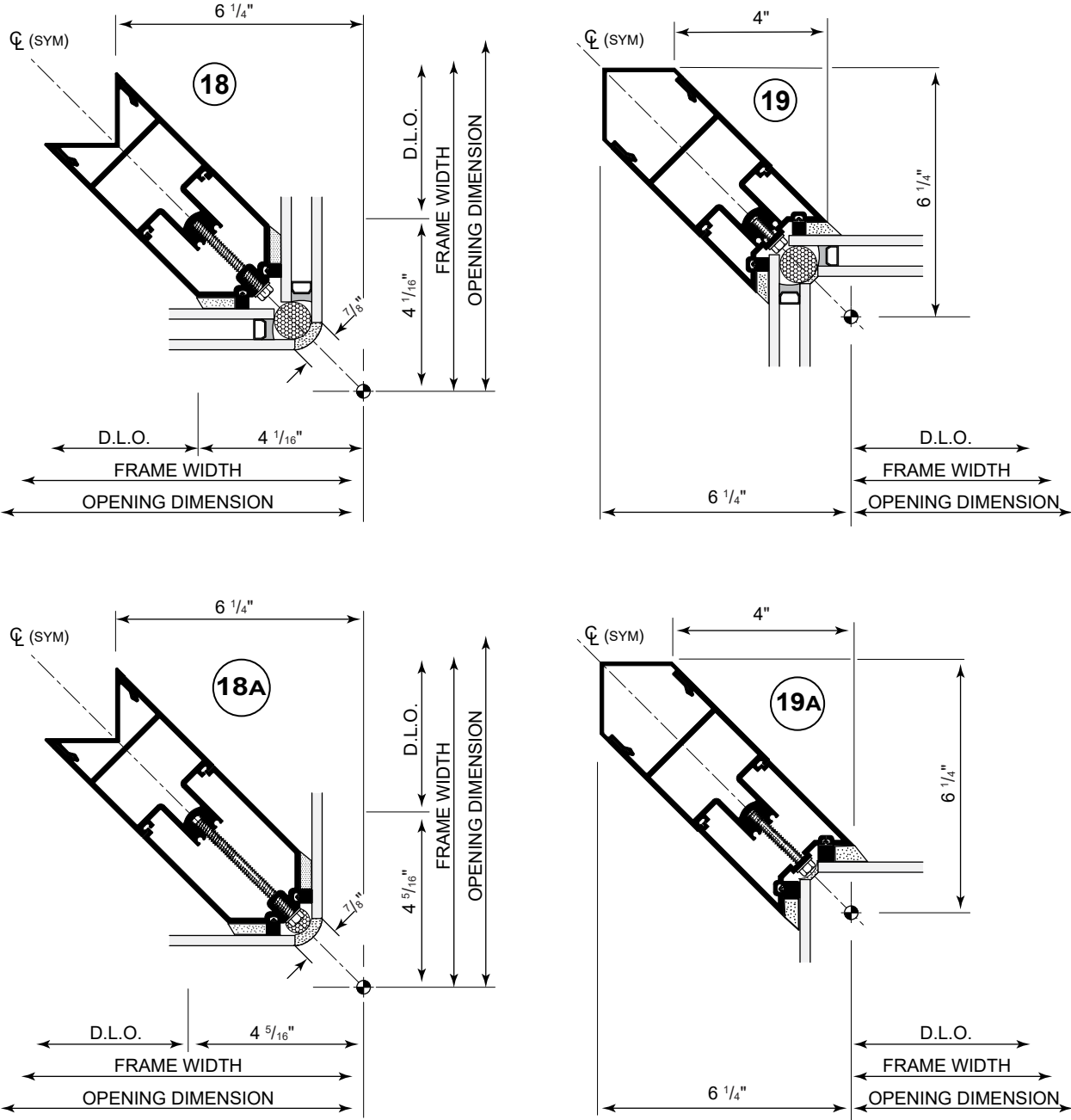
Fig. 18.1

## CORNER DETAILS



**Fig. 19.1**

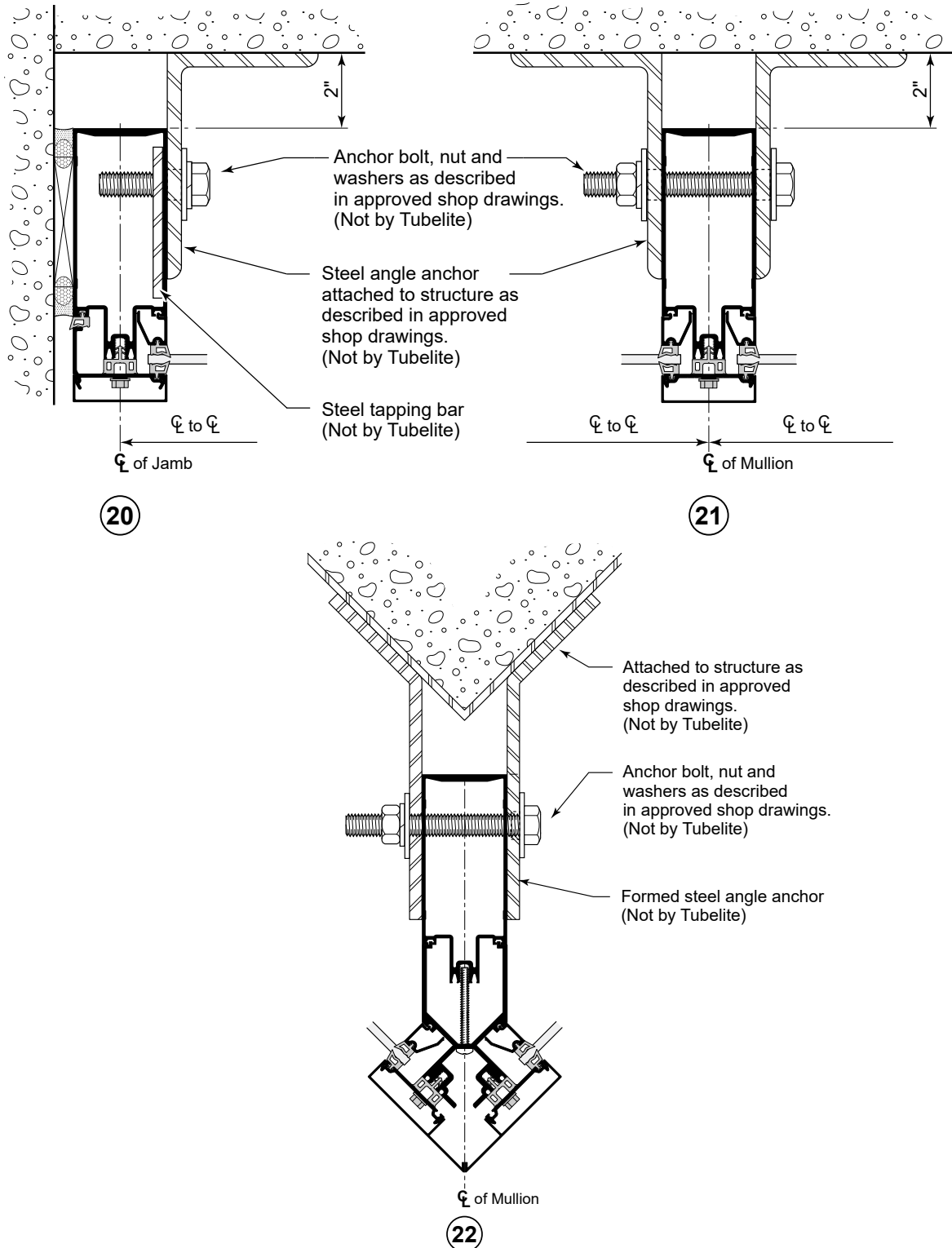
**CORNER DETAILS**



**Fig. 20.1**

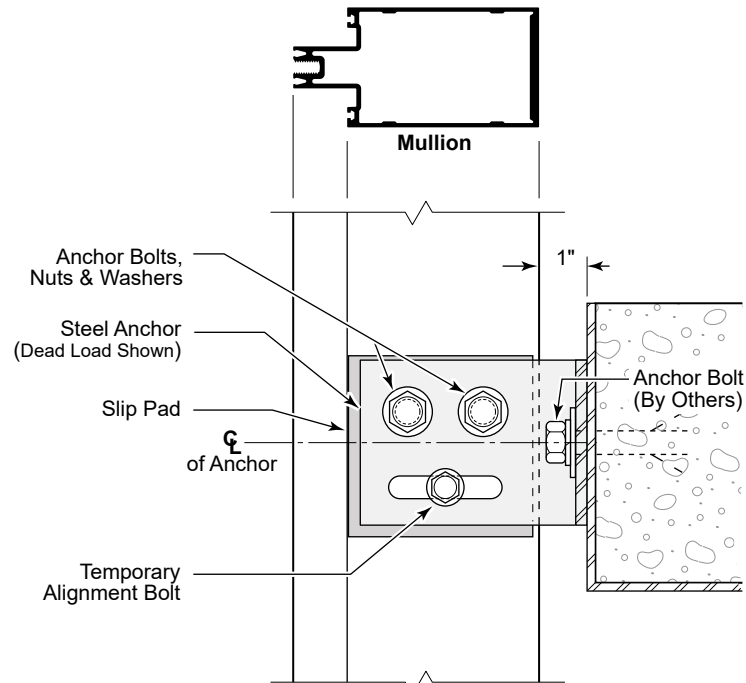
## MID-SPAN ANCHOR DETAILS

Anchor details on pages 21 through 23 represent one of several methods of anchoring. Refer to approved shop drawings for job specific applications.



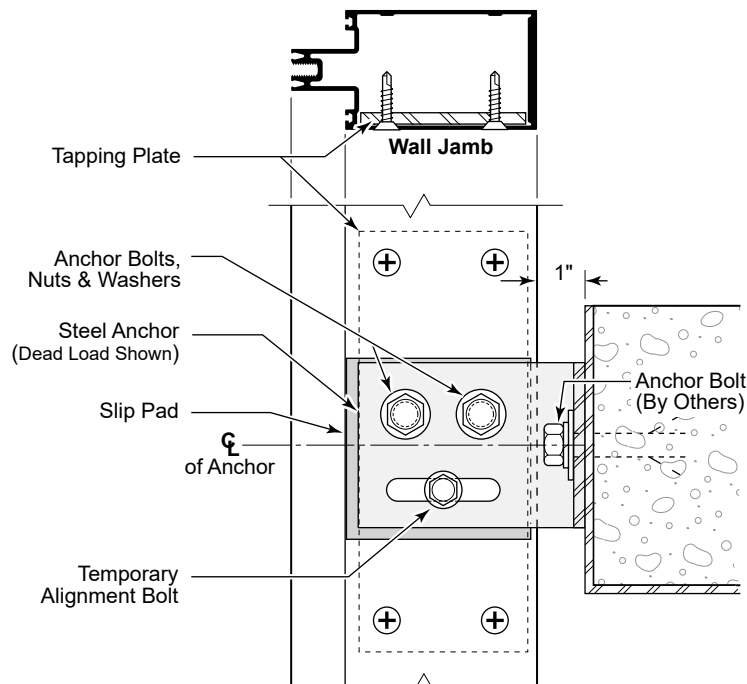
**Fig. 21.1**

## MID-SPAN ANCHOR DETAILS



**Fig. 22.1**

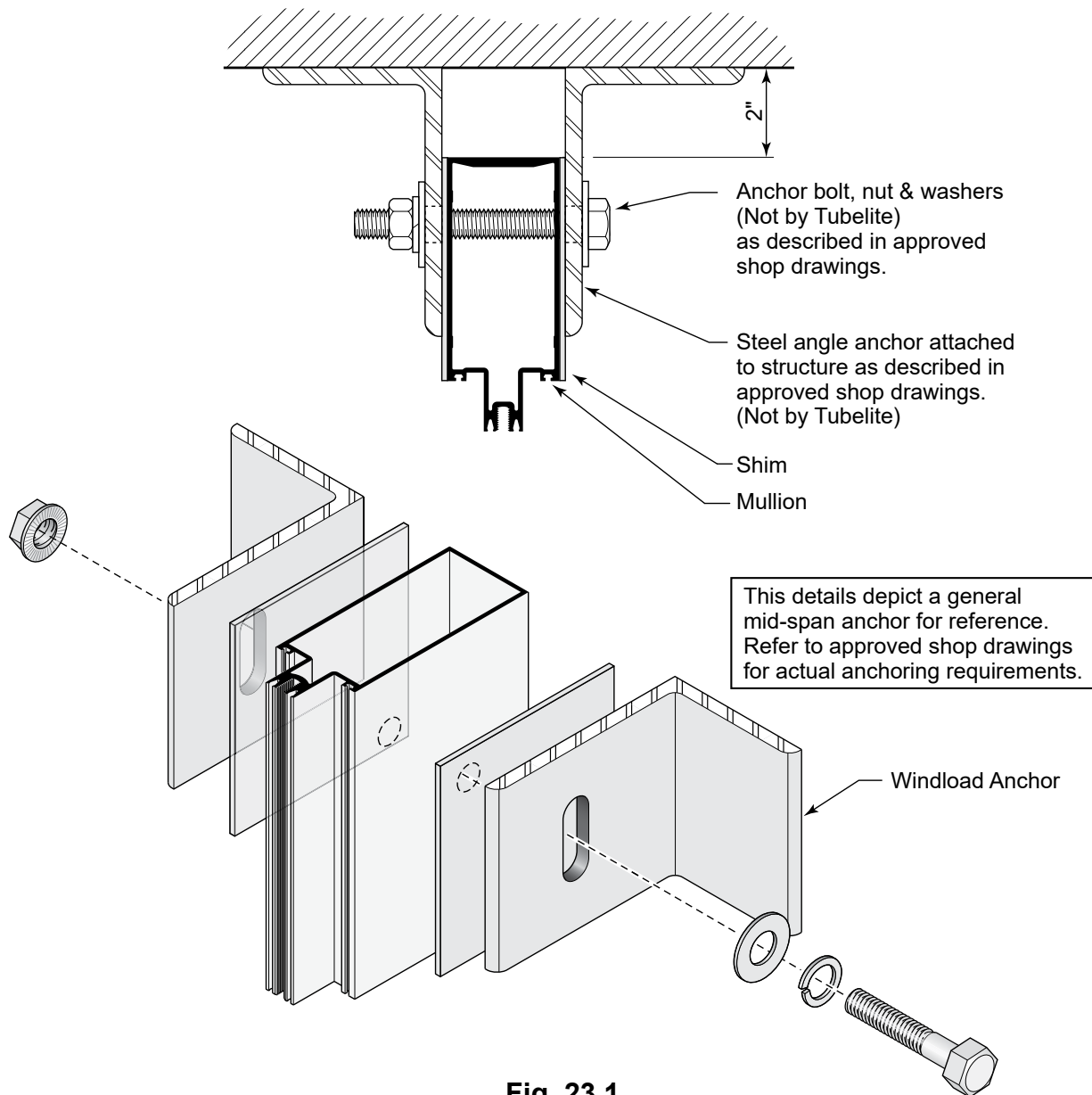
**Fig. 1 Intermediate Mullion**



**Fig. 22.2**

**Jamb Mullion**

## MID-SPAN ANCHOR DETAILS



**Fig. 23.1**

## FRAME FABRICATION

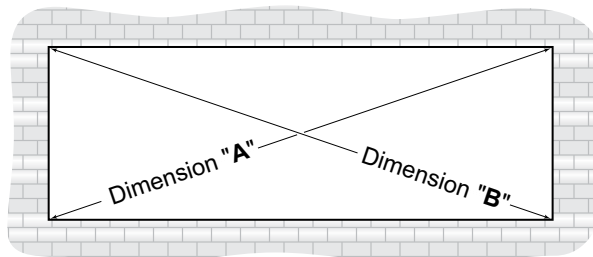
### Step 1: Determine Frame Size

#### Frame Width

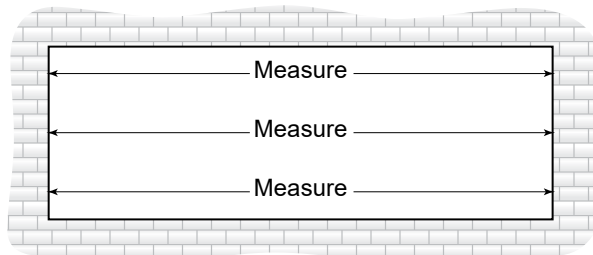
- A. Make sure the opening is square and plumb. Measure each diagonal of the opening. **SEE Fig. 24.1.**
- B. Measure the width of the opening (Rough Opening) at the top, middle and bottom. Select the smallest of these dimensions and subtract the left and right caulk joint width per approved shop drawing (1/2" minimum caulk joint at jambs). **SEE Fig. 24.2.**
- C. Allow a larger clearance to accommodate building tolerances, an out-of-square opening, anticipated thermal expansion within the unit or as required by shop drawings.

#### Frame Height

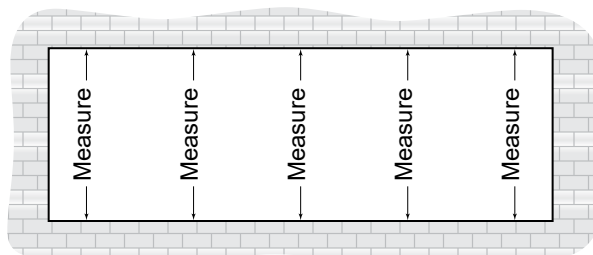
- D. Measure the height of the opening (Rough Opening) at several points along the entire width of the opening. Select the smallest of these dimensions and subtract 1" to allow a minimum of 1/2" at sill and head for shim and caulking. **SEE Fig. 24.3.**
- E. Allow a larger clearance to accommodate building tolerances, an out-of-square opening, anticipated thermal expansion within the unit or as required by shop drawings.



**Fig. 24.1** Dimension "A" = "B"



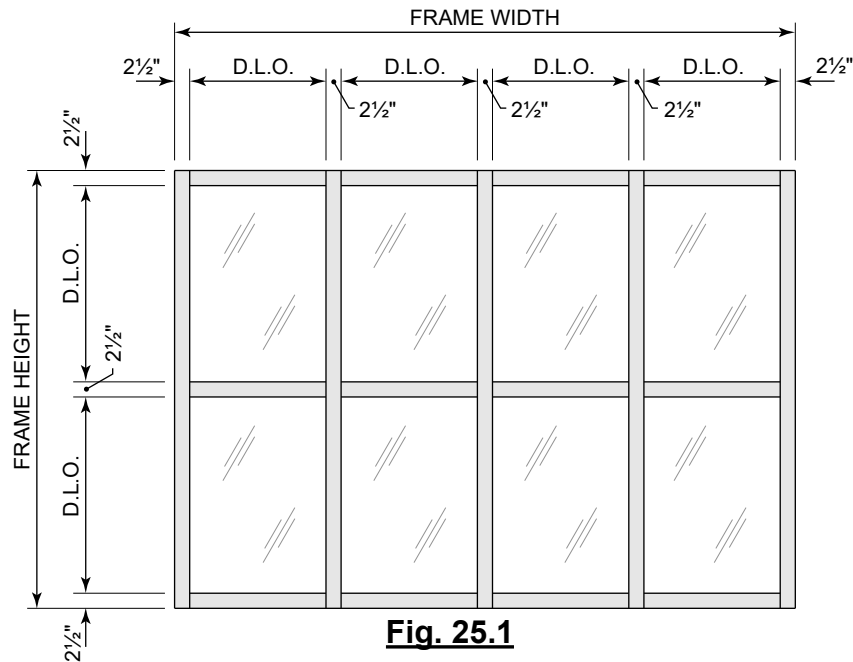
**Fig. 24.2**



**Fig. 24.3**

## FRAME FABRICATION

### Step 2: Captured Framing - Cut Materials to Size



**Fig. 25.1**

Cut extrusions to lengths as shown below:

#### Vertical Profiles:

Vertical Mullion	= Frame Height	For frames that receive vertical splicing, see step 20, page 53.
Pressure Plates	= Frame Height	
Face Caps	= Frame Height	
Glazing Adaptors	= D.L.O. <i>PLUS</i> (+) 1"	
Pocket Filler at Perimeter	= D.L.O. <i>MINUS</i> (-) 1/16" (used with PTB120 thermal pressure plate)	

#### Horizontal Profiles:

Tubular Head, Sill & Horizontal	= D.L.O.
Open Back Head, Sill & Horizontal	= D.L.O. <i>MINUS</i> (-) 1/32"
Pressure Plates	= D.L.O. <i>MINUS</i> (-) 3/8"
Face Caps	= D.L.O. <i>MINUS</i> (-) 1/32"
Glazing Adaptors	= D.L.O. <i>MINUS</i> (-) 1/32"

#### Accessories:

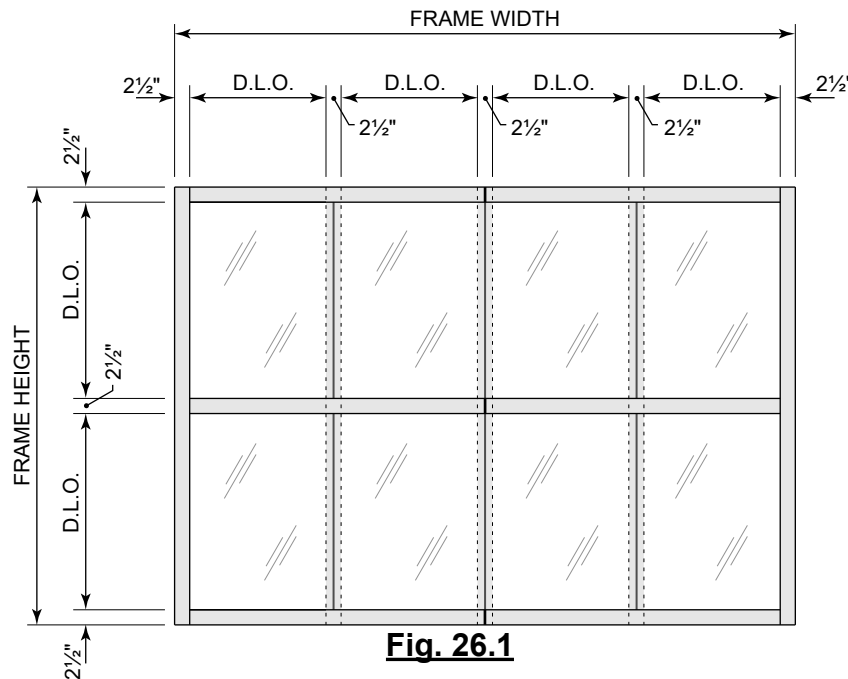
Exterior Vertical Gasket	= Pressure Plate Length <i>PLUS</i> (+) Allowance*
Exterior Horizontal Gasket	= Pressure Plate Length <i>PLUS</i> (+) Allowance*
Interior Vertical Gasket	= D.L.O. <i>PLUS</i> (+) 1" <i>PLUS</i> (+) Allowance*
Interior Horizontal Gasket	= D.L.O. <i>PLUS</i> (+) Allowance*

**\*Allowance = 1/8" extra length per foot of D.L.O. or aluminum length**

**Note:** Door framing material is cut to size from the factory.

## FRAME FABRICATION

### Step 2: Structural Silicone Framing - Cut Materials to Size



Cut extrusions to lengths as shown below:

#### Vertical Profiles:

Vertical Mullion	= Frame Height	For frames that receive vertical splicing, see step 20, page 53.
Pressure Plates (at Jamb)	= Frame Height	
Face Caps (at Jamb)	= Frame Height	
Glazing Adaptors	= D.L.O. <i>PLUS</i> (+) 1"	
Pocket Filler at Perimeter	= D.L.O. <i>MINUS</i> (-) 1/16" (used with PTB120 thermal pressure plate)	

#### Horizontal Profiles:

Tubular Head, Sill & Horizontal	= D.L.O.	For frames that receive vertical splicing, see step 20, page 50.
Open Back Head, Sill & Horizontal	= D.L.O. <i>MINUS</i> (-) 1/32"	
Pressure Plates	= 3 Lites Wide Maximum	
Face Caps	= 3 Lites Wide Maximum	
Glazing Adaptors	= D.L.O. <i>MINUS</i> (-) 1/32"	

#### Accessories:

Exterior Vertical Gasket (at Jamb)	= Pressure Plate Length <i>PLUS</i> (+) Allowance*
Exterior Horizontal Gasket	= Pressure Plate Length <i>PLUS</i> (+) Allowance*
Interior Vertical Gasket	= D.L.O. <i>PLUS</i> (+) 1" <i>PLUS</i> (+) Allowance*
Interior Horizontal Gasket	= D.L.O. <i>PLUS</i> (+) Allowance*
Silicone Spacer Gasket (SSG)	= D.L.O. <i>PLUS</i> (+) 1" <i>PLUS</i> (+) Allowance*

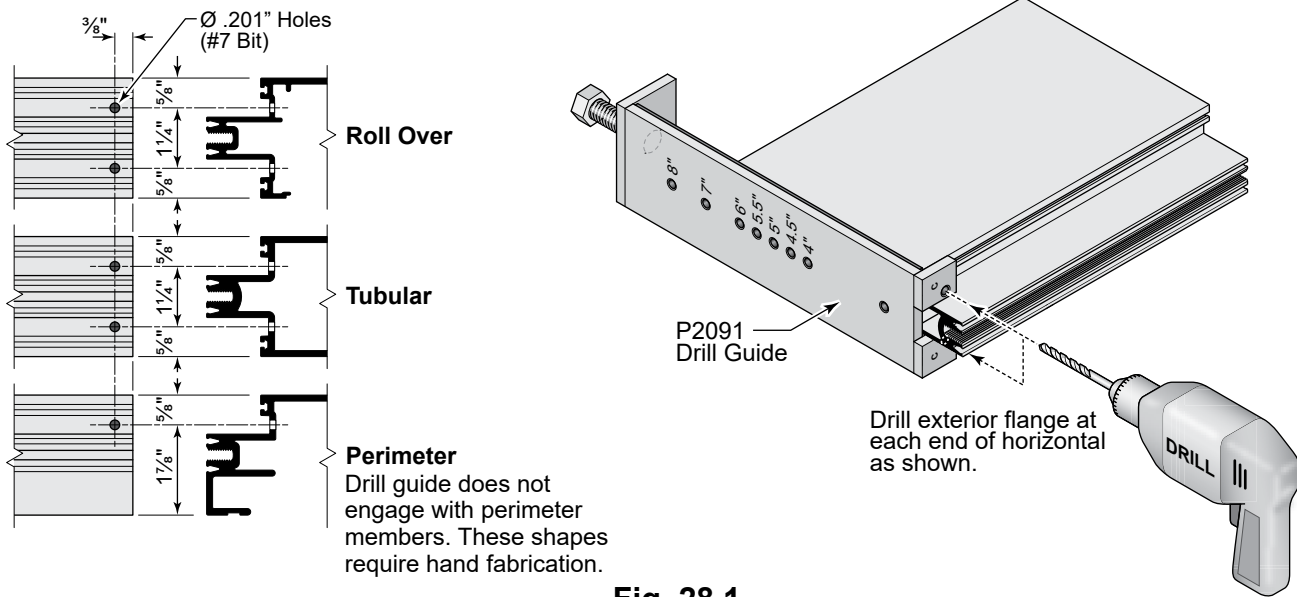
**\*Allowance = 1/8" extra length per foot of D.L.O. or aluminum length**



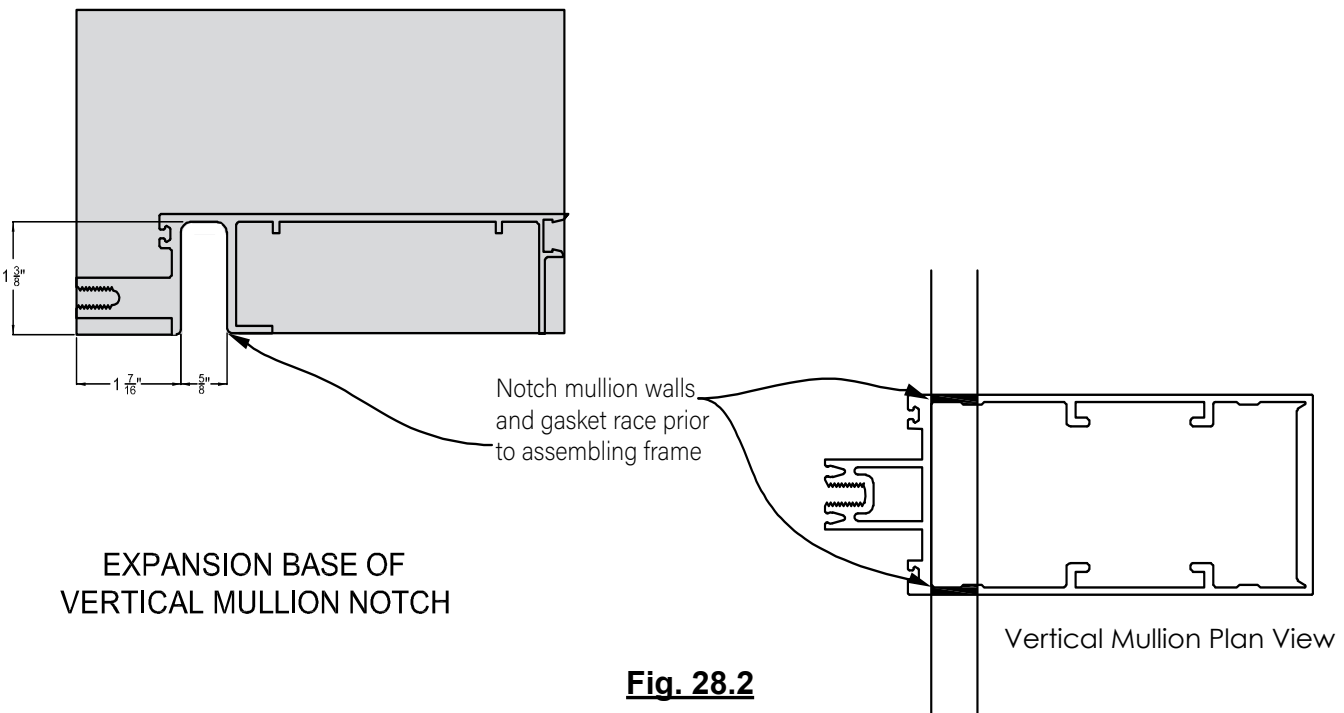
## FRAME FABRICATION

### Step 4: Drill Holes in Horizontal for Attachment to Shear Blocks

- A. Drill (2) .201" diameter clearance holes for #10 screws in the horizontal sections for attachment to the shear blocks. Use the P2091 drill fixture to locate holes. Only the top hole is needed in open back head or sill sections.



**Fig. 28.1**



**Fig. 28.2**

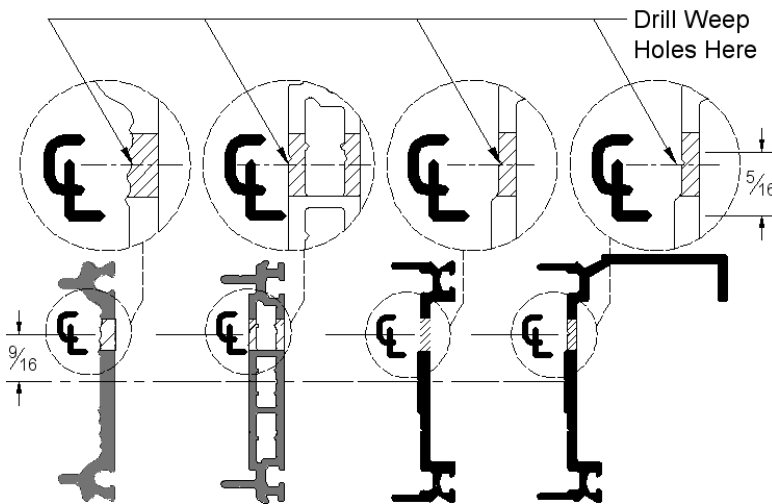
## FRAME FABRICATION

### Step 5: Drill Weep Holes in Horizontal Pressure Plates

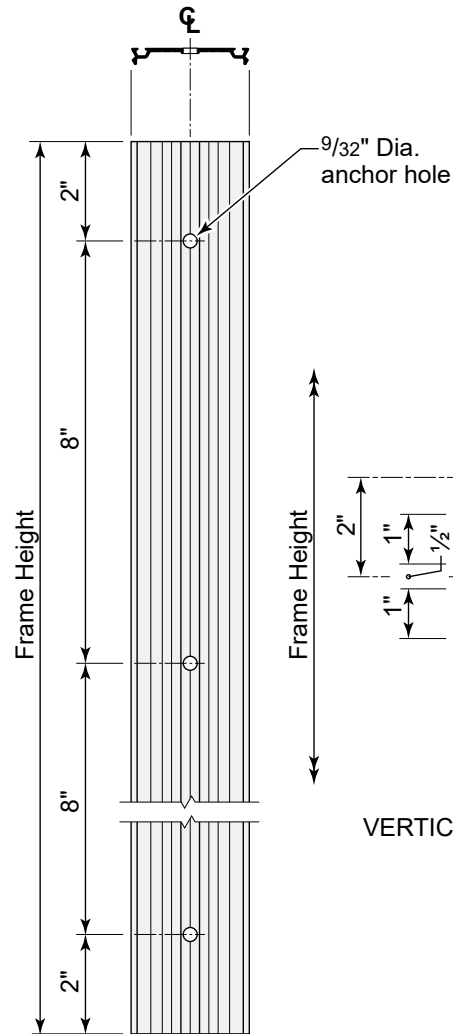
- A. Drill (3) three  $\frac{5}{16}$ " diameter weep holes per horizontal pressure plate, one at the midpoint and one at 4" at each end as shown on **Fig. 29.3 & 29.4**.
- B. Pressure plates are factory punched on center for pressure plate screws. Drill additional hole(s) as required to ensure a maximum of 2" from the ends of the plates.

NOTE: Each pre-punched anchoring hole must have a fastener.

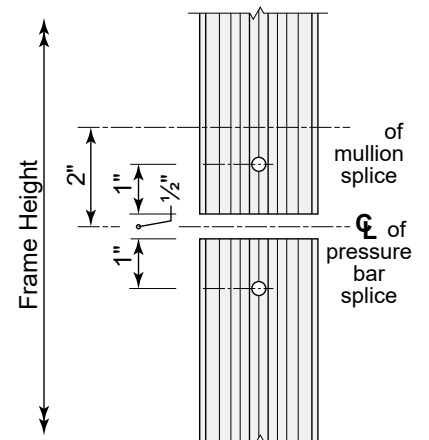
- C. When SSG verticals are used in the elevation, horizontal pressure plates can run up to 3 lites wide maximum. Additional weep holes must be drilled in these cases.



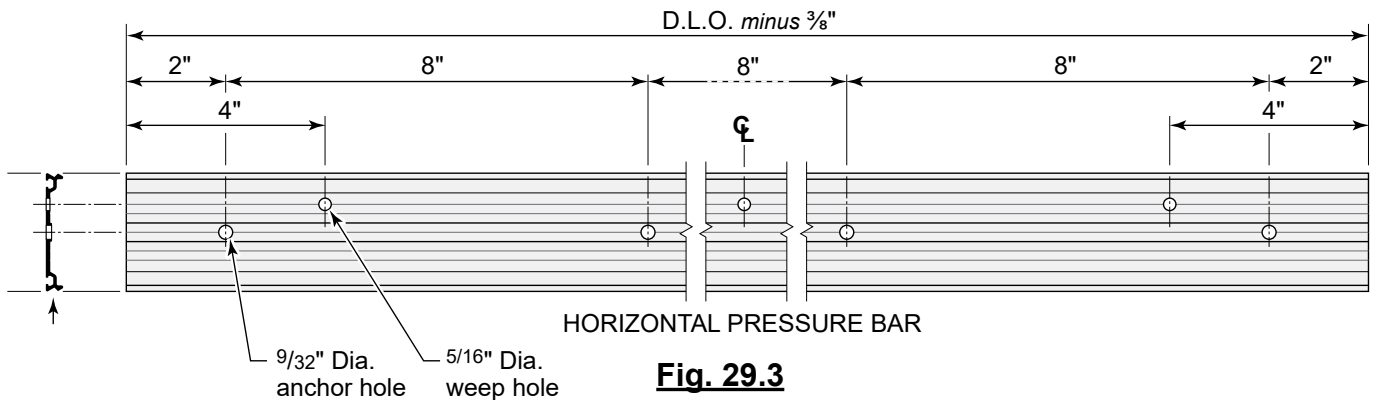
**Fig. 29.4**



VERTICAL PRESSURE BAR  
**Fig. 29.1**



VERTICAL PRESSURE BAR  
at SPLICE  
**Fig. 29.2**

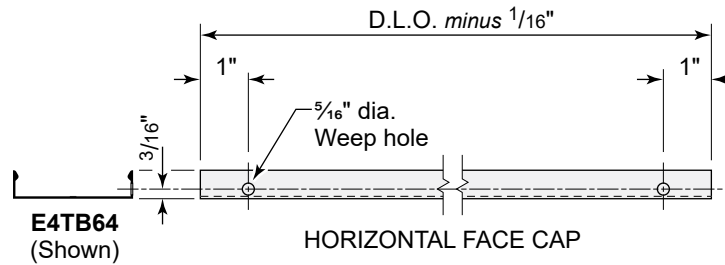


**Fig. 29.3**

## FRAME FABRICATION

### Step 6: Fabricate Weep Slots in Horizontal Face Covers

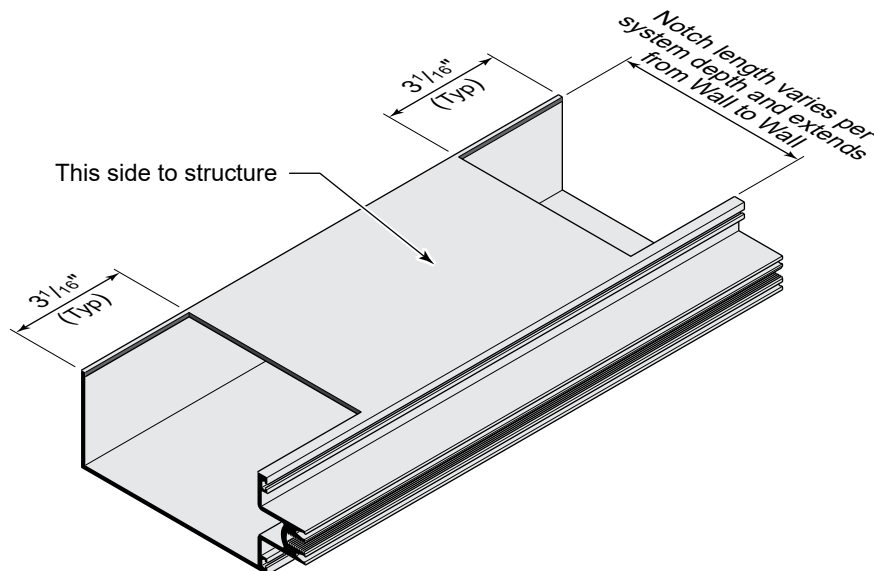
- A. Drill a  $\frac{5}{16}$ " diameter weep hole on the bottom of each horizontal face cover a maximum of 1" from each end of the cover.



**Fig. 30.1**

### Step 7: Notch Heads and Sills to Clear Anchor Clips (Applies to Tubular Head/Sill Members Only)

- A. Notches must be cut in the head and sill members to provide clearance for the shear blocks. See **Fig. 30.2** for proper notch size.



**Fig. 30.2**

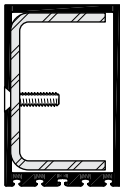
## FRAME FABRICATION

### Step 8: Install Steel Reinforcement As Required

- A. Refer to approved shop drawings to determine where steel reinforcing may be required.
- B. Steel should be installed prior to the attachment of shear blocks.
- C. If 'T' and 'F' anchors are used, steel should be sized to stop short of the top and bottom of the vertical for clearance.
- D. Locate and prep for attachment of the steel located under the horizontal shear blocks if possible. Otherwise, steel can be secured to the vertical mullion through the tongue. Anchor the steel to the vertical using fasteners and spacing per approved shop drawings (not supplied by Tubelite).
- E. Steel to be prime painted.

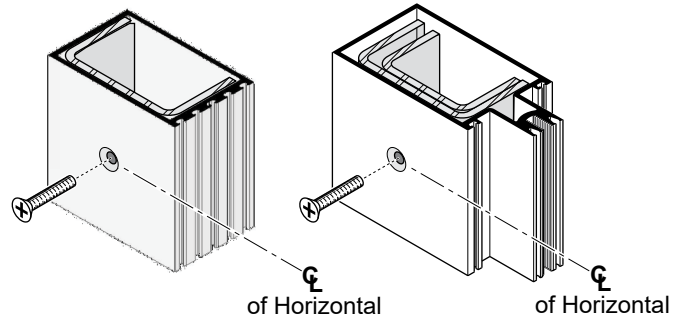
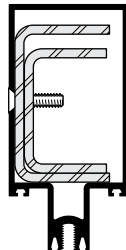
Steel reinforcement shown is for reference only.  
See approved shop drawing for steel requirements.

**SSG Mullion**



Drill and tap for fastener as required.  
Countersink for Flat Head screw.

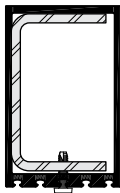
**Captured Mullion**



Located fasteners centered  
on horizontal location when possible.  
See approved shop drawing for requirements.

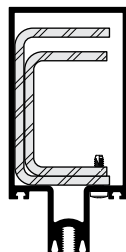
### TYPICAL APPLICATION

**SSG Mullion**

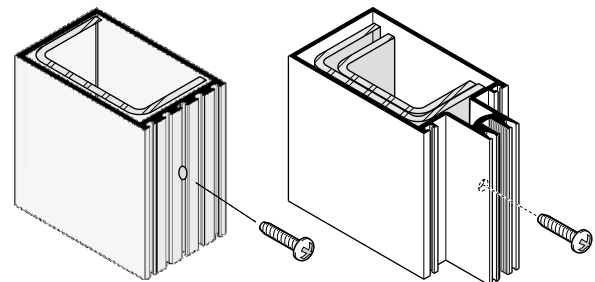


Drill and tap for fastener as required.  
Countersink for Flat Head screw.

**Captured Mullion**



Steel reinforcement shown is for reference only.  
See approved shop drawing for steel requirements.



Located fasteners as directed  
in approved shop drawings

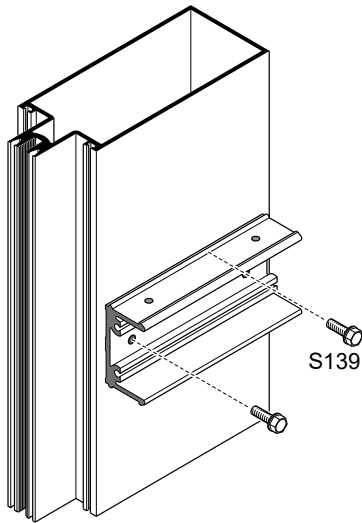
### OPTIONAL APPLICATION

**Fig. 31.1**

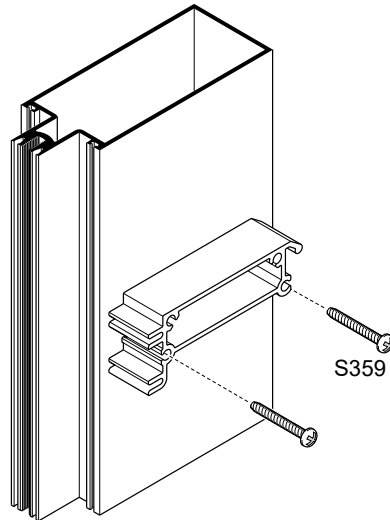
## FRAME FABRICATION

### Step 9: Fasten Shear Blocks

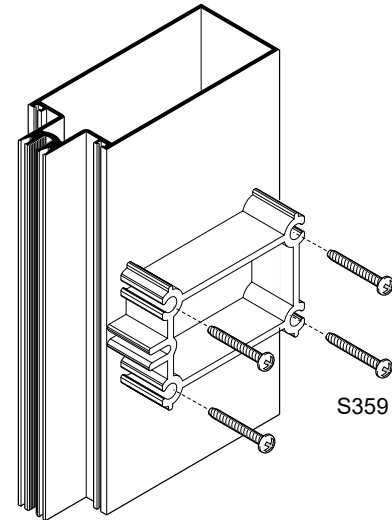
- A. Fasten the shear blocks for tubular horizontals to the verticals using S139 fasteners.
  - B. Fasten the shear blocks for roll-over and SSG horizontals to the verticals using S359 fasteners.
- NOTE:** If steel reinforcement is required, it must be installed prior to shear block attachment.



Shear Block for  
Tubular Horizontals  
**Fig. 32.1**



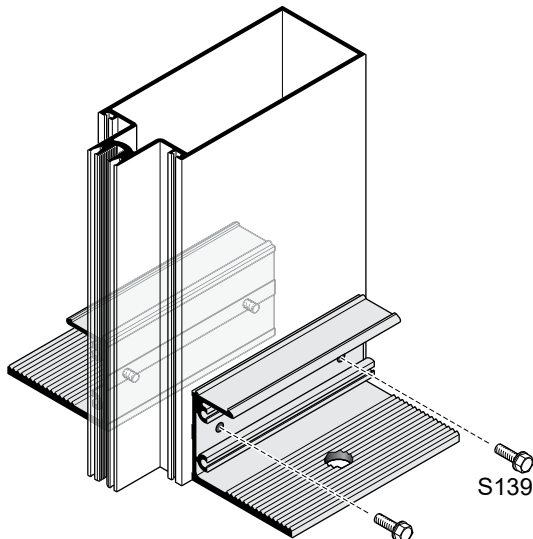
Shear Clip for  
Roll-Over Horizontals  
**Fig. 32.2**



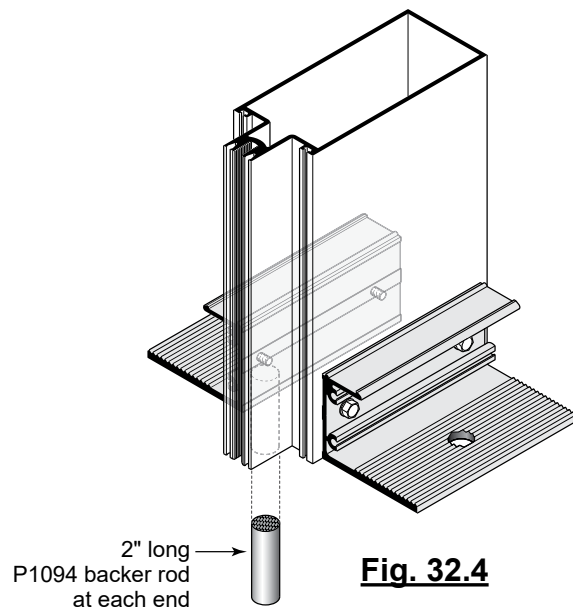
Shear Clip for  
SSG Horizontals  
**Fig. 32.3**

### Step 10: Fasten Head or Sill Anchor Clips

- A. Fasten the head and sill anchor clip to the vertical mullions using S139 fasteners.
- NOTE:** 'T' and 'F' anchors can be used in place of anchor clips. See Step 11 for shear block application when 'T' and 'F' anchors are used.
- B. Insert P1094 ethafoam rod into the void of the tongue at top and bottom of each vertical mullion so that it is flush with the end of the mullion.



**Fig. 32.3**

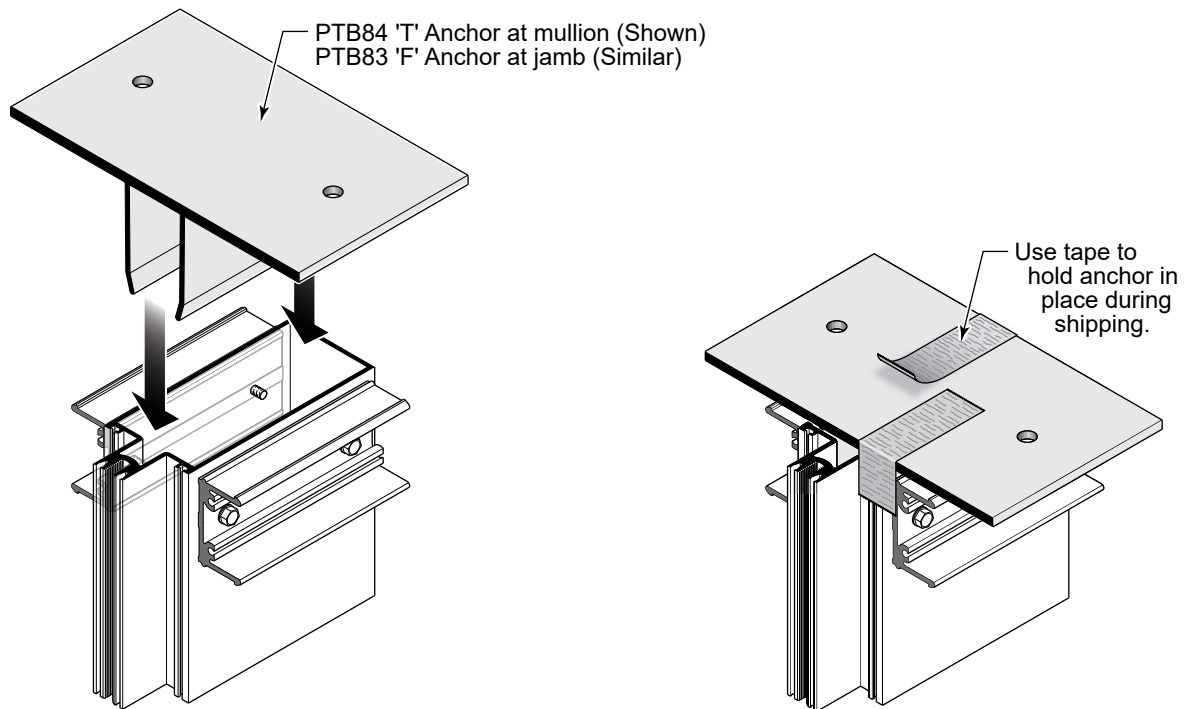


**Fig. 32.4**

## FRAME FABRICATION

### Step 11: Fasten Head or Sill Shear Block at F and T Anchor Conditions

- A. Fasten a shear block to the vertical mullion using S139 screws at the head or sill in place of an anchor clip. Refer to Step 9 for shear block installation.
- B. F and T anchors can be pre-loaded into the top and bottom of the verticals and temporarily secured with tape for transit to the job site.



**Fig. 33.1**

## Fig. 1 FRAME INSTALLATION

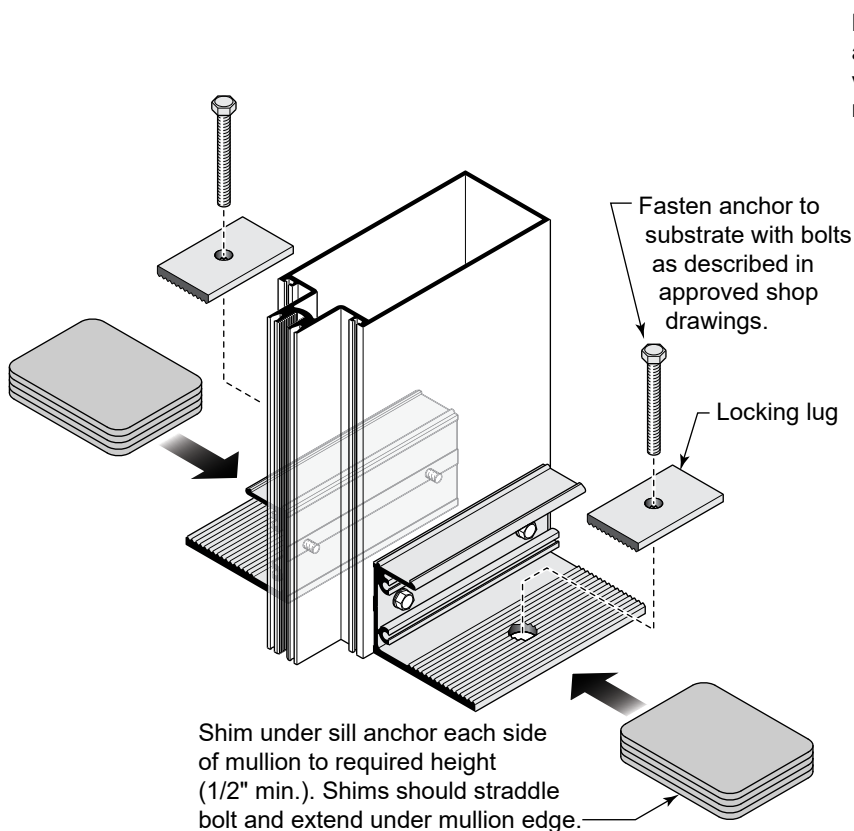
### Step 12: Installing Vertical Mullions

**NOTE:** Check D.L.O. and diagonal dimensions every four bays to ensure correct spacing and frame squareness. When installing tubular horizontals, frame must be stick erected. When installing roll-over horizontals, all verticals can be erected first.

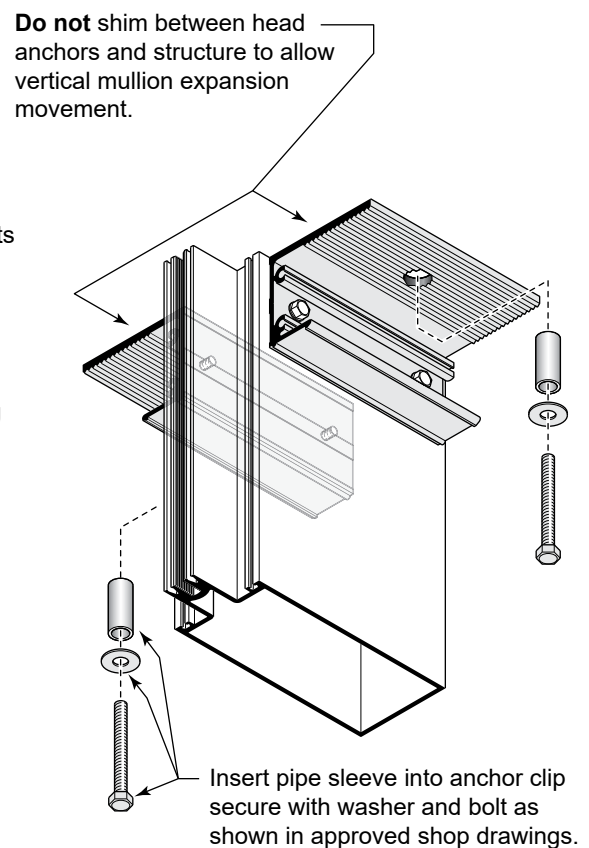
#### Single Span Installations

##### Anchor Clip Installation

- Install vertical mullions plumb and level, shimming under the verticals at the sill for proper deadload distribution.
- Attach the locking lug to the sill anchor clip using a washer and anchor bolt per approved shop drawings (not by Tubelite).
- Insert the pipe sleeve at the head anchor clip using a washer and anchor bolt per approved shop drawings (not by Tubelite). NOTE: Do not shim at the head anchor clip to allow for thermal and liveload movement.



**Fig. 34.1**



**Fig. 34.2**

## Fig. 1 FRAME FABRICATION

### Step 12: Installing Vertical Mullions (Continued)

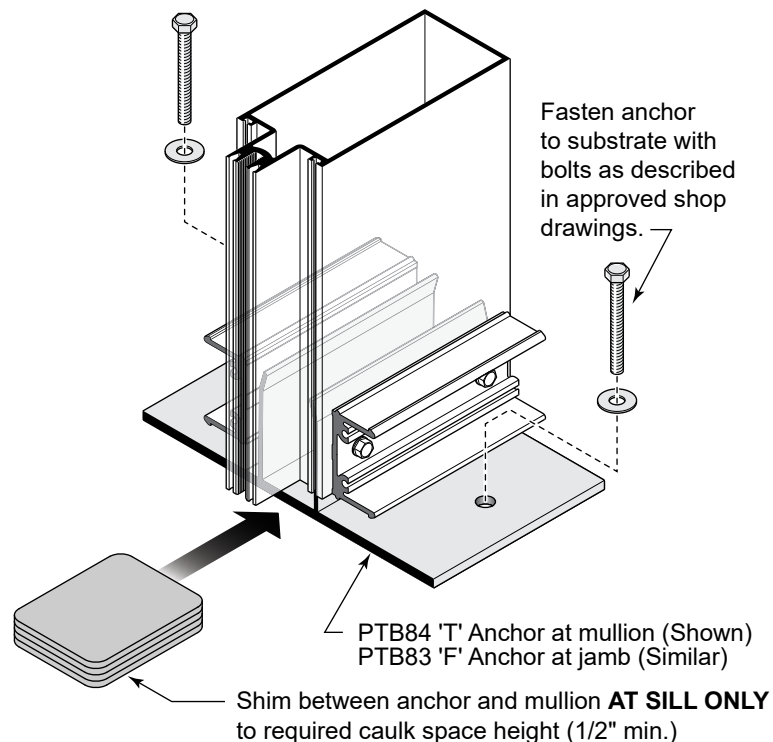
#### *T or F Anchor Installation*

- A. Install vertical mullions plumb and level, shimming between the bottom of the vertical and T or F anchor for proper deadload distribution.
  - B. Anchor Top F anchor to building per approved shop drawings.
- NOTE:** Do not shim the top of the vertical to allow for thermal and liveload movement.

#### Multi-Span Installations

**NOTE:** Tubelite recommends the use of T and F anchors for multi-span installations

- A. Install lower vertical mullion plumb and level, shimming between the bottom of the vertical and T or F anchor for proper deadload distribution.
- B. Anchor T or F anchor to building per approved shop drawings.
- C. At the mid-span anchor, temp the vertical in place plumb and level. Check joint at the mullion splice and use a shim to hold joint at the correct size.
- D. When the entire frame is installed and securely anchored to the mid-span anchor(s), remove shims from the vertical mullion splices and back off nut 1/4 turn at all windload anchor connections and stake the bolts. Be sure any temporary screws are removed from windload anchors.



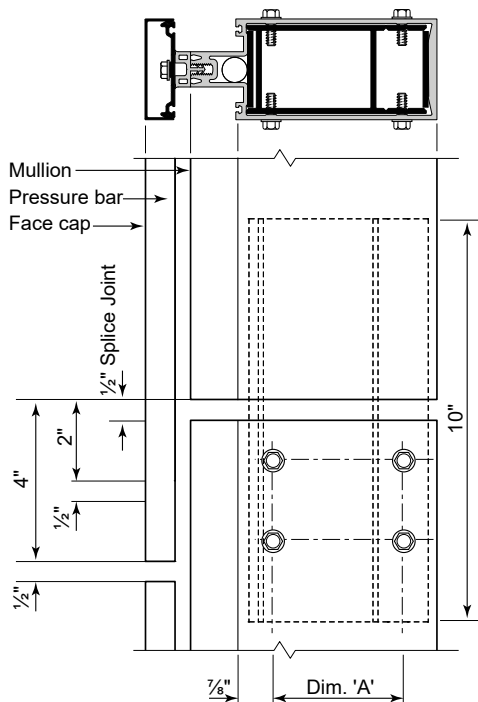
**Fig. 35.1**

Sill condition shown, head condition similar.

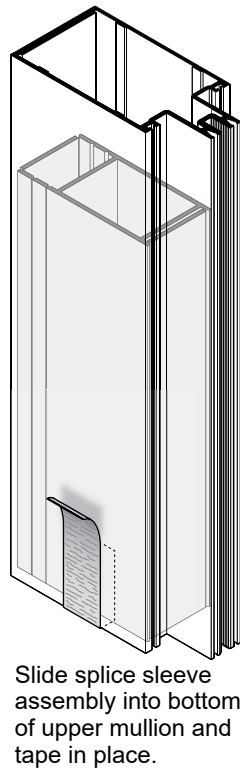
## FRAME INSTALLATION

### Step 13: Splice Sleeve Attachment

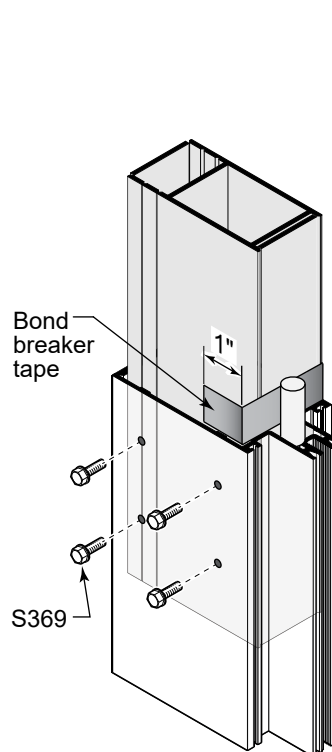
- A. Consult approved shop drawings for number and size of fasteners required to attach the splice sleeve to the verticals.
- B. Drill holes on both sides of the lower vertical in the locations shown on the approved shop drawings.  
**NOTE:** Figure **36.1** shows typical hole pattern.
- C. Slide the splice sleeve into the upper vertical mullion. Tape the sleeve into position temporarily until verticals are erected. See **Fig. 36.2**.
- D. After the lower and upper verticals are erected, remove the tape holding the splice sleeve and slide into place, securing to the lower mullion as shown on approved shop drawings. See **Fig. 36.3**.
- E. Apply bond breaker tape to the face of the splice sleeve between the lower and upper verticals, returning back 1" on each side.
- F. Apply sealant over bond breaker tape at joint. Tool sealant. See **Fig. 36.4**.



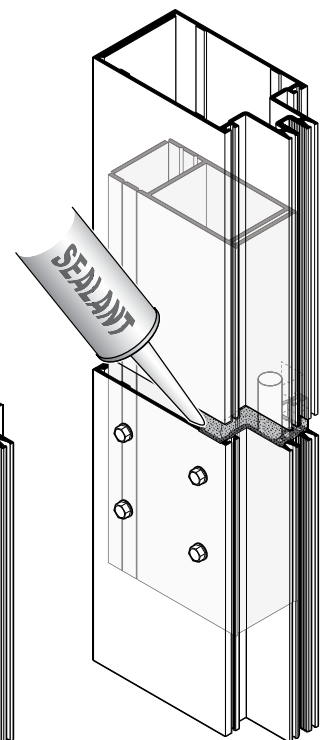
**Fig. 36.1**



**Fig. 36.2**



**Fig. 36.3**



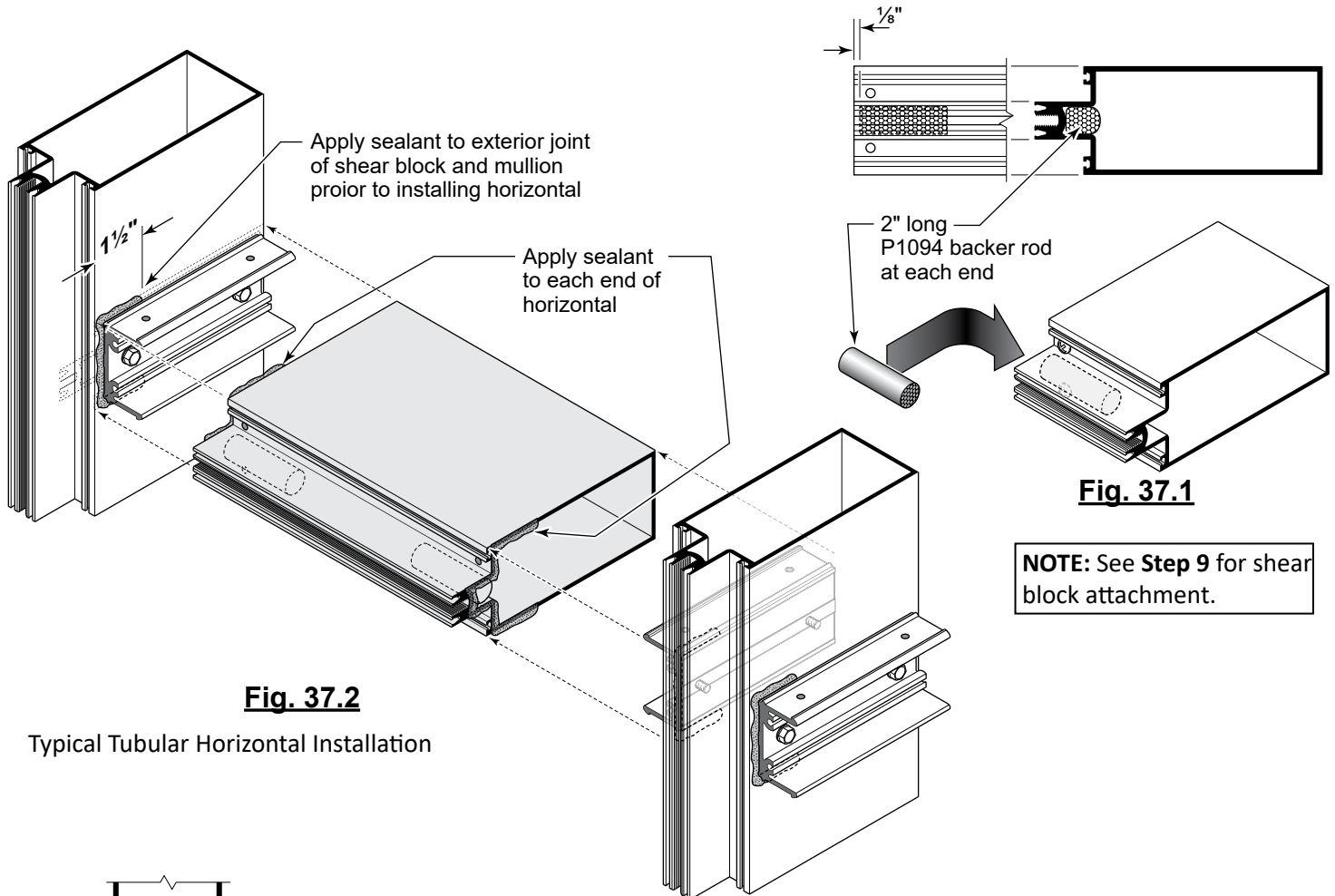
**Fig. 36.4**

**NOTE:**  
 Flat head screws may be  
 used in vision areas.

## FRAME FABRICATION

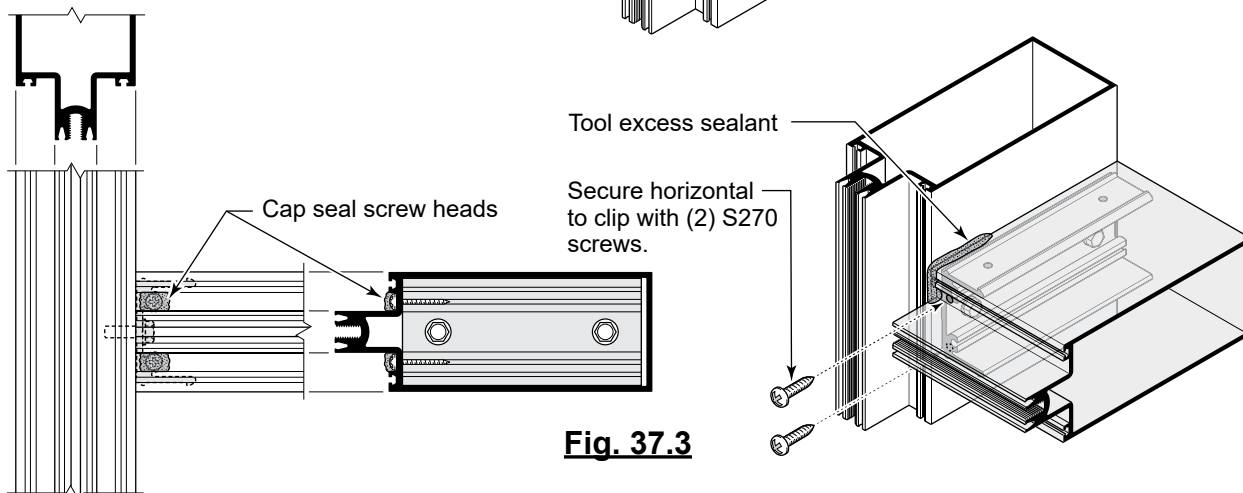
### Step 14: Attach Horizontals to Shear Blocks and Anchor Clips

- Insert a P1094 ethafoam rod into the void of the tongue of the horizontal members, pushing it about 1/8" past flush to allow room for sealant. See **Fig. 37.1**.
- Seal shear block prior to installing the horizontal member. See **Fig. 37.2**.
- Seal the ends of the horizontal back member and attach to the shear block using S270 screws. Seal the heads of the screws.
- Tool sealant at the horizontal/vertical intersection. See **Fig. 37.3**.



**Fig. 37.2**

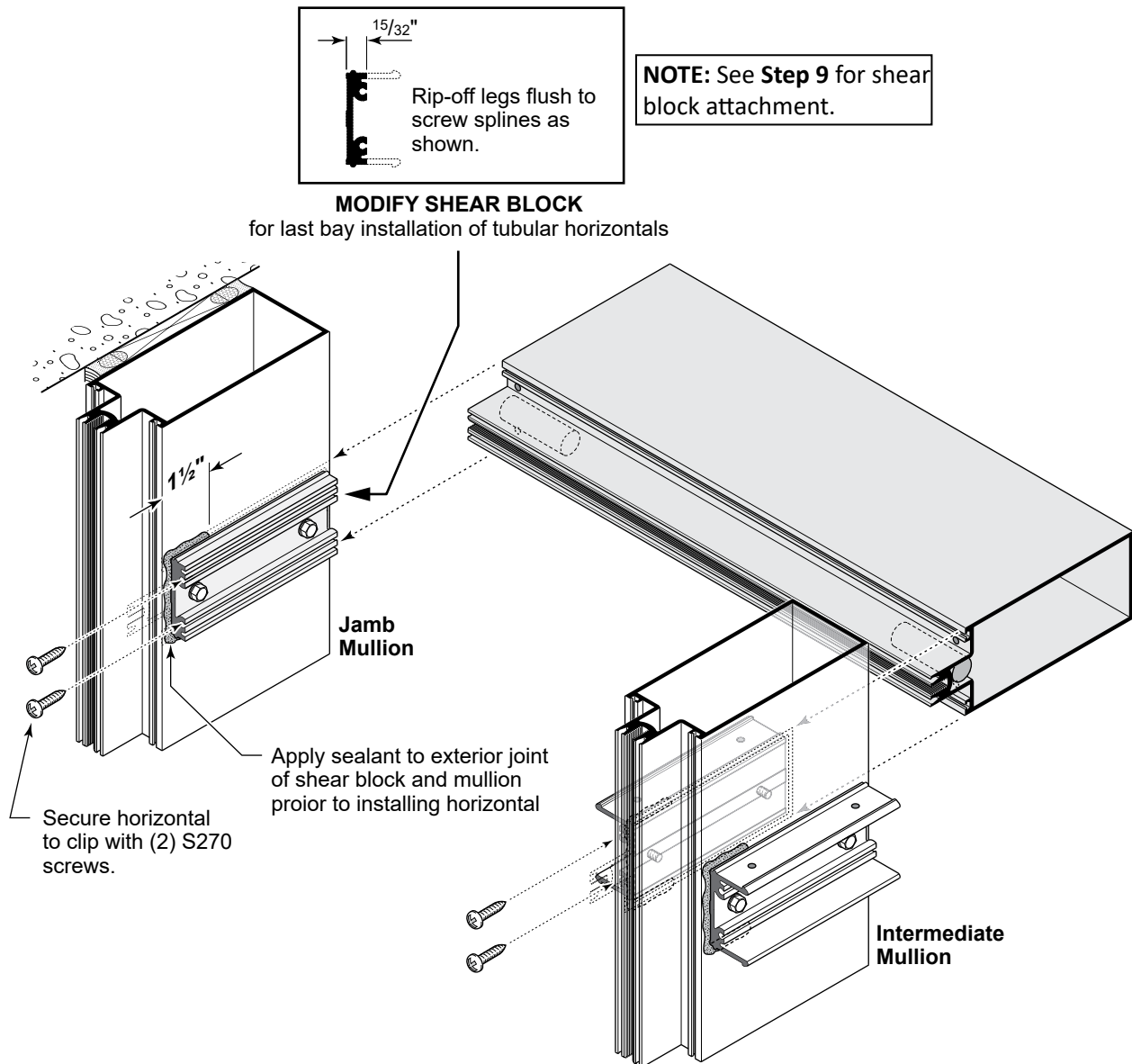
Typical Tubular Horizontal Installation



## FRAME INSTALLATION

### Step 14: Attach Horizontals to Shear Blocks and Anchor Clips (Continued)

#### LAST BAY TUBULAR HORIZONTAL INSTALLATION

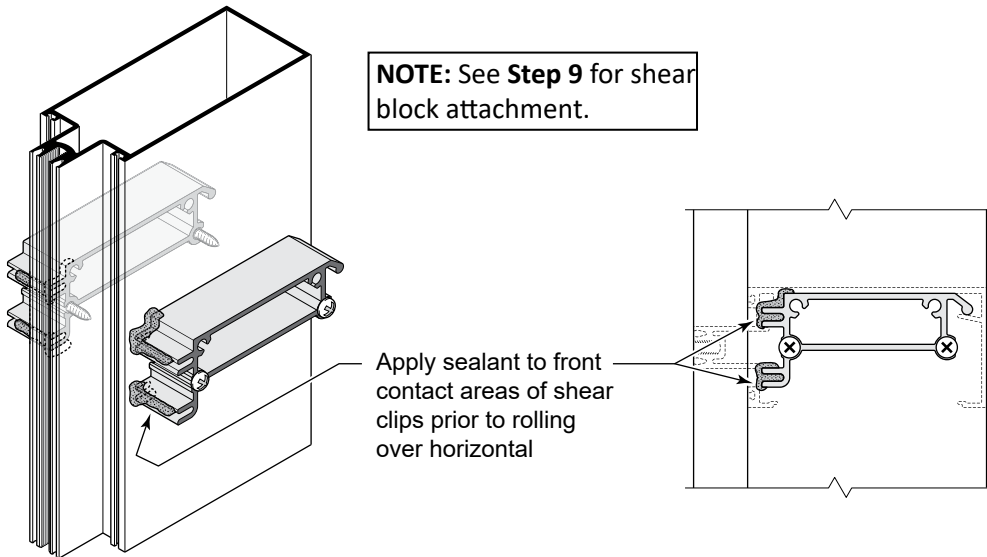


**Fig. 38.1**

## FRAME FABRICATION

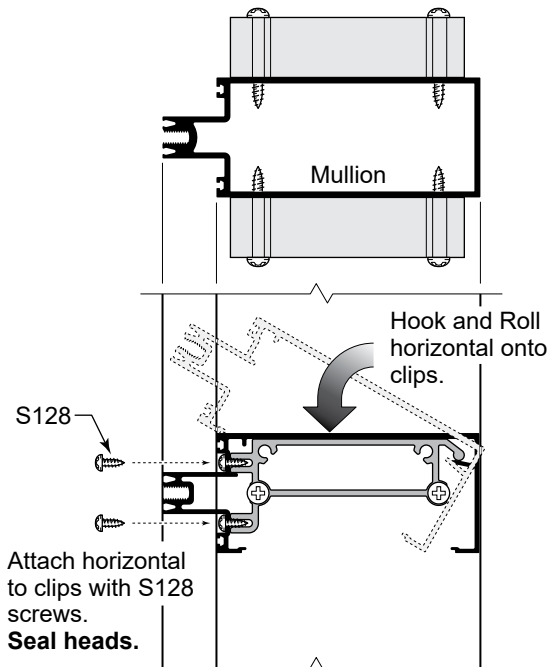
### Step 14: Attach Horizontals to Shear Blocks and Anchor Clips (Continued)

- E. When roll-over horizontal is used, seal face of clip, horizontal ends and screw heads.  
 See **Fig. 39.1**, **Fig. 39.2** and **Fig. 39.3**.

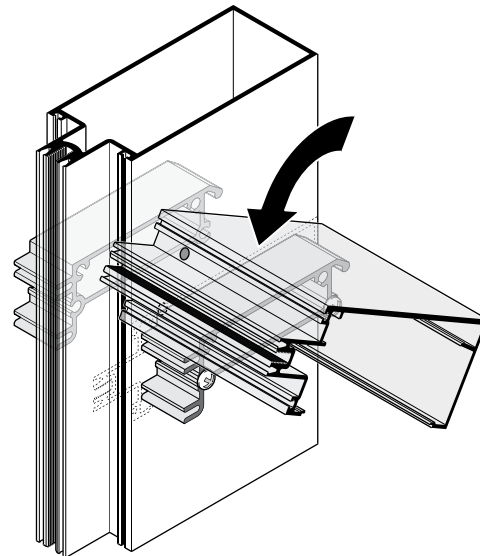


**Shear Clip for  
Open Back Horizontals**

**Fig. 39.1**



**Fig. 39.2**

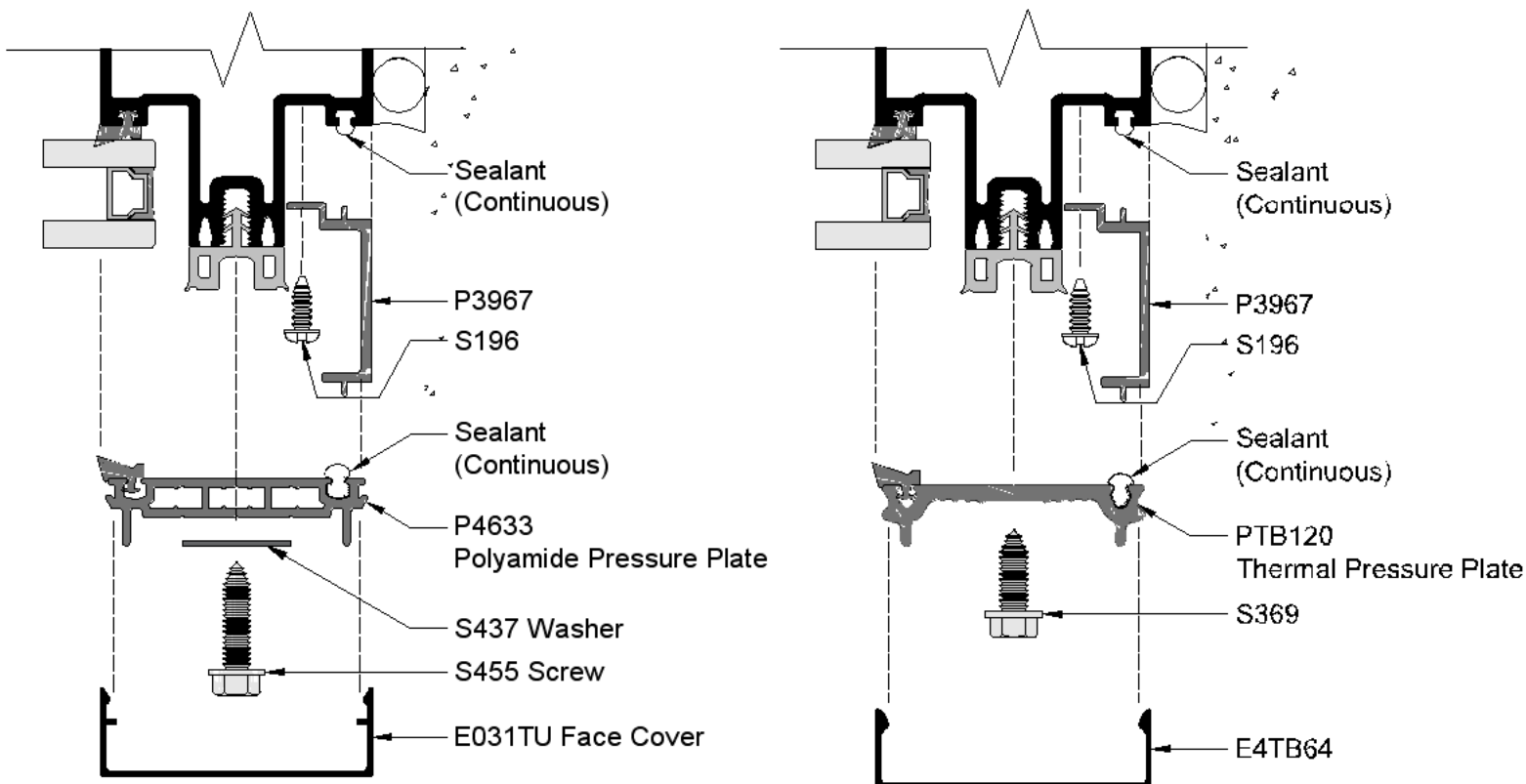


**Shear Clip for  
Open Back Horizontals**

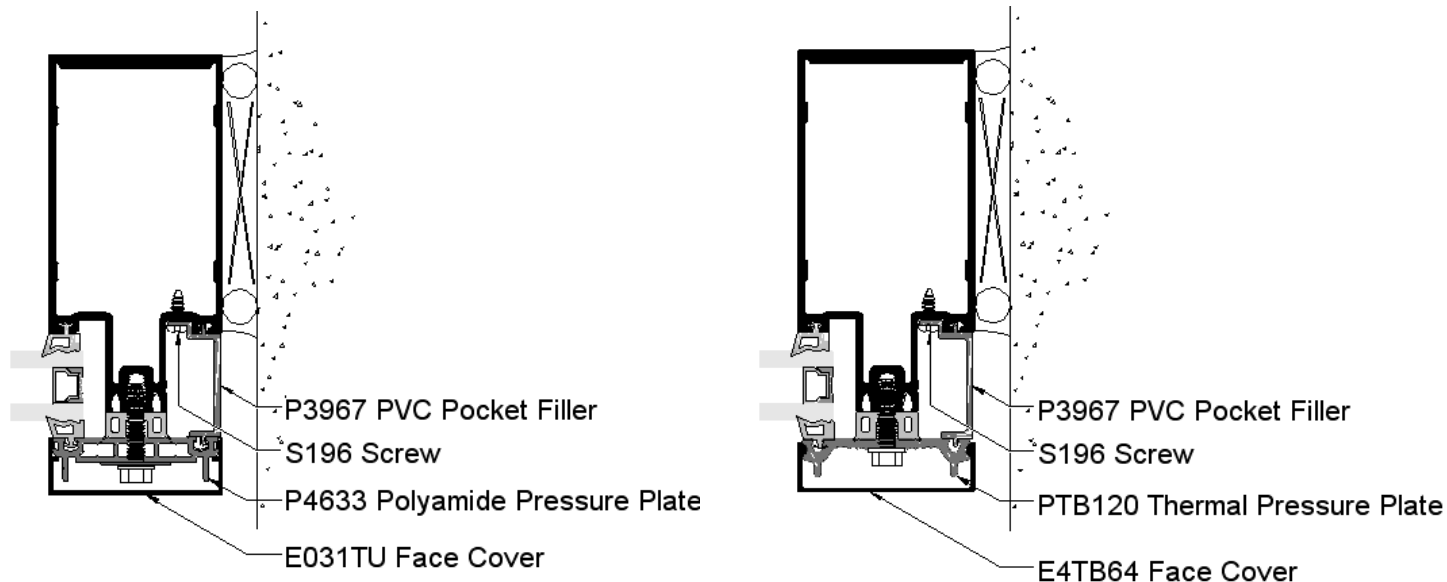
**Fig. 39.3**

## FRAME INSTALLATION

Reference: When installing a Polyamide or Thermal Pressure plate, use the sequence shown below:



**Fig. 40.1**



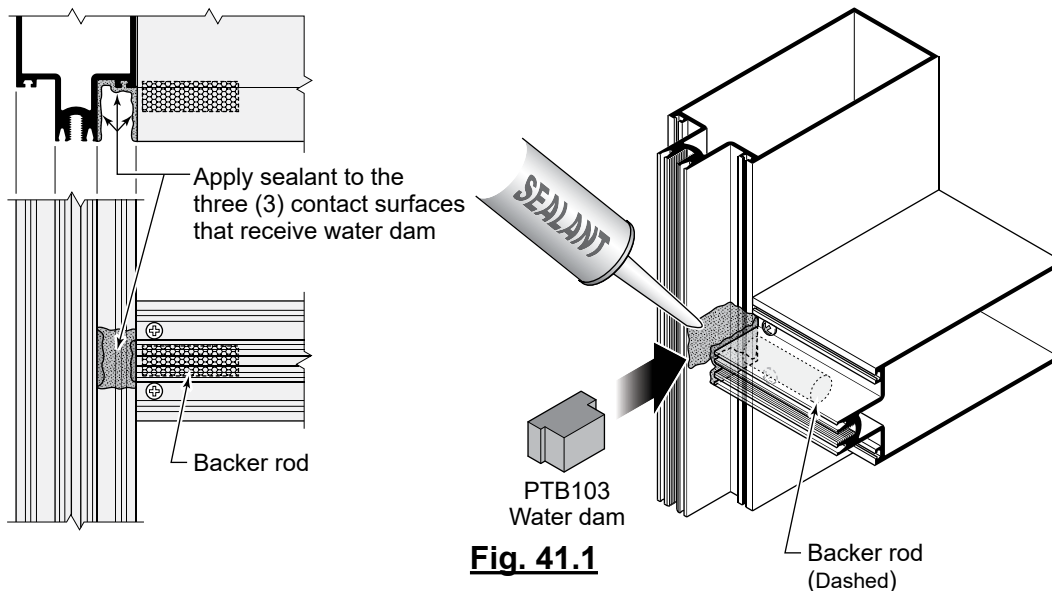
**Fig. 40.2**

JAMB AT ALTERNATE PRESSURE PLATES

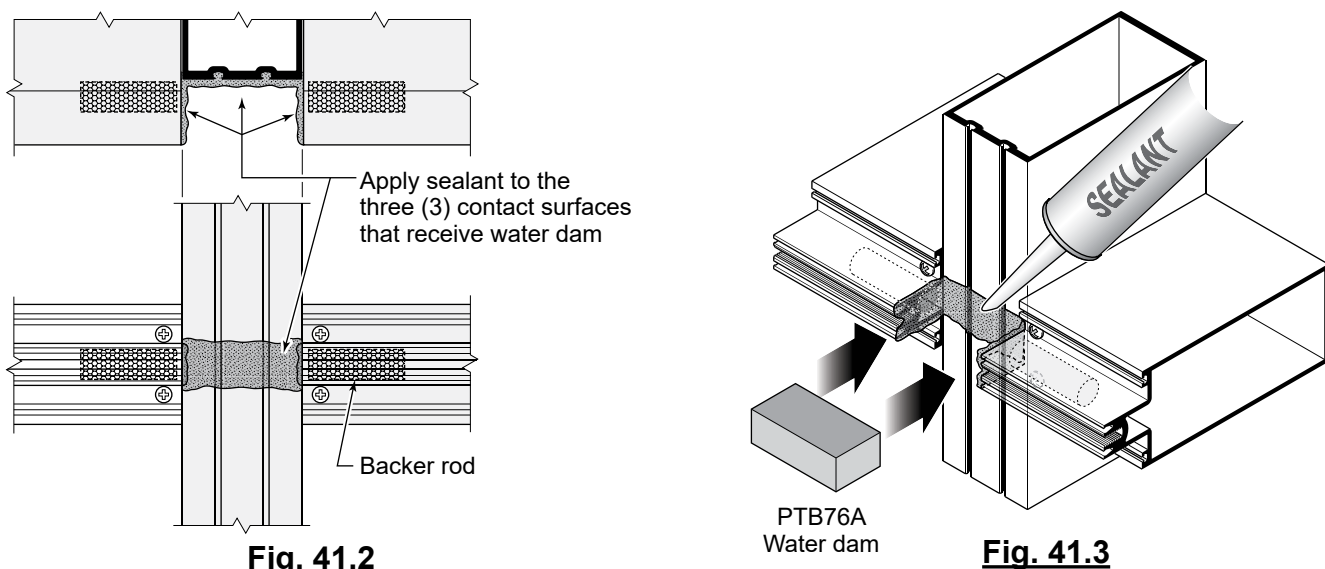
## FRAME INSTALLATION

### Step 15: Install Water Dams

- A. Seal the end of the horizontal member across the vertical member, including the P1094 ethafoam rod in the tongue of the horizontal. This sealant should be applied liberally.
- B. Push the PTB103 water dam into the void between the horizontal member and the vertical tongue. This is a pressure fit; the water dam should be level with the top of the horizontal tongue.
- C. Seal over the top of the PTB103 onto the horizontal tongue, damming the end of the horizontals. **THIS IS A CRITICAL SEAL.**
- D. For vertical SSG applications, follow the same sealing procedures as with a captured system noted above.
- E. When using open back perimeter extrusions (eg E4TB245) stack two PTB103 water dams to seal the ends of the extrusion and form a backer for the perimeter seal. Seal between the PTB103 water dams.



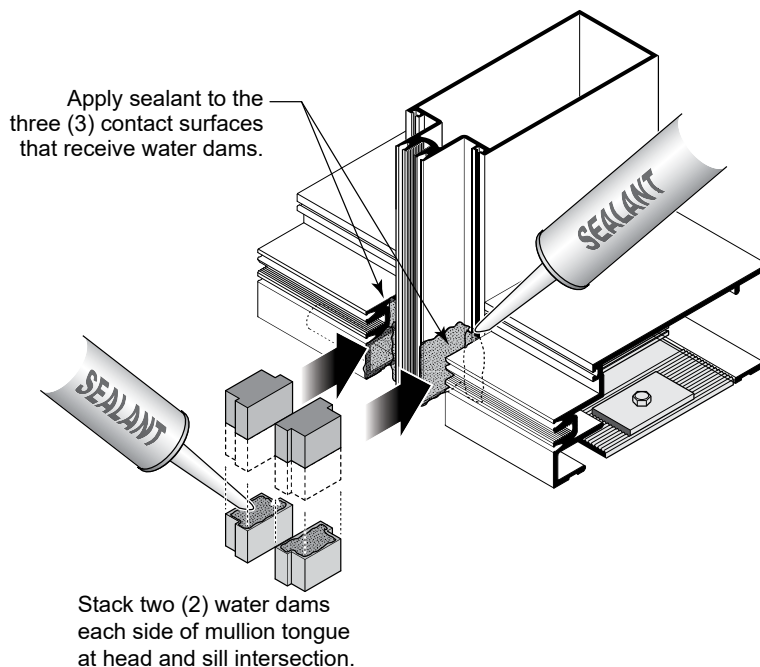
**Fig. 41.1**



**Fig. 41.2**

## FRAME INSTALLATION

### Step 15: Install Water Dams (Continued)



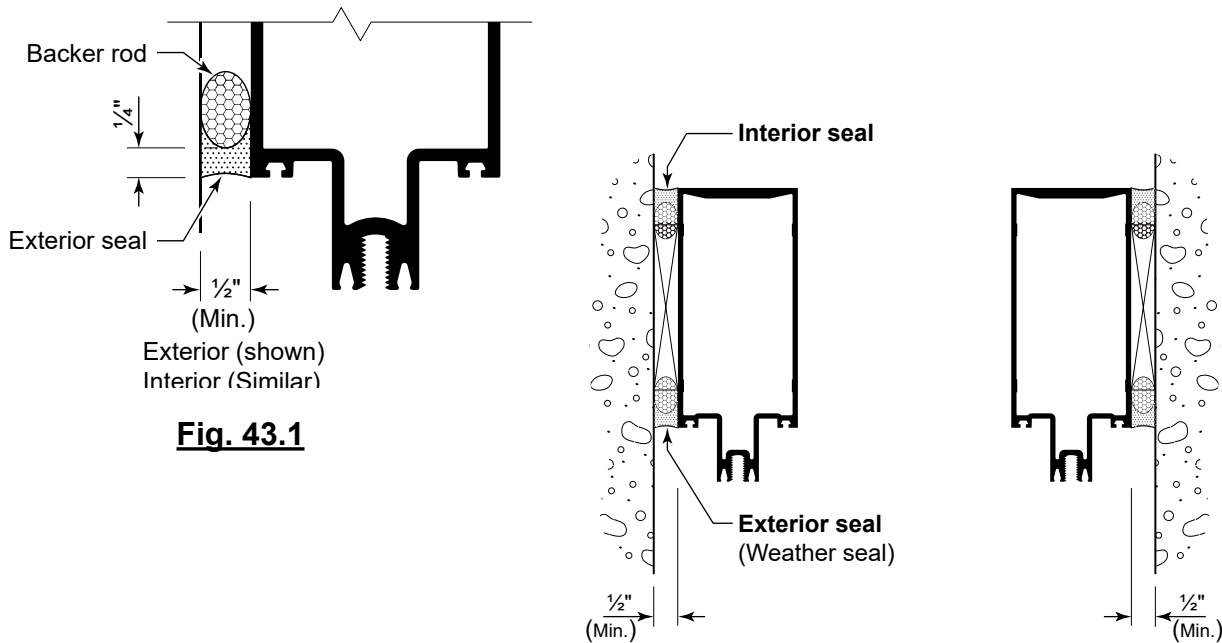
**Fig. 42.1**

## FRAME INSTALLATION

### Step 16: Seal Perimeter of Installation

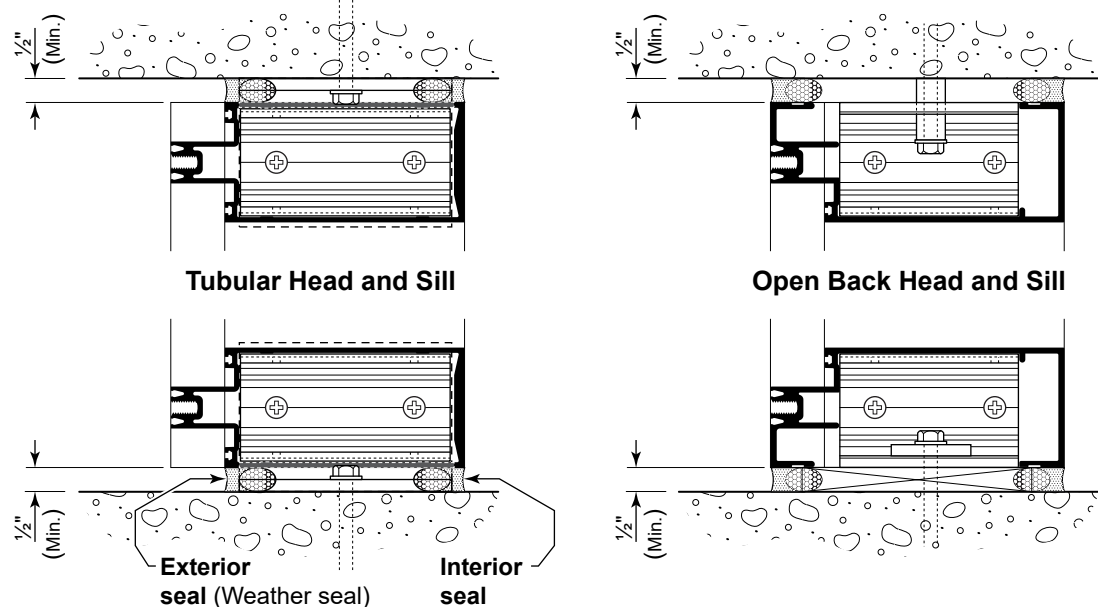
- A. Insert backer rod into the gap between the building substrate and curtain wall frame.
- B. Apply sealant around the perimeter of the frame and tool the sealant. See **Fig. 43.1** and **Fig. 43.2**.

**NOTE:** When using polyamide pressure plate, install exterior seal as shown in **Fig. 42.1** and **Fig. 42.2**.



**Fig. 43.1**

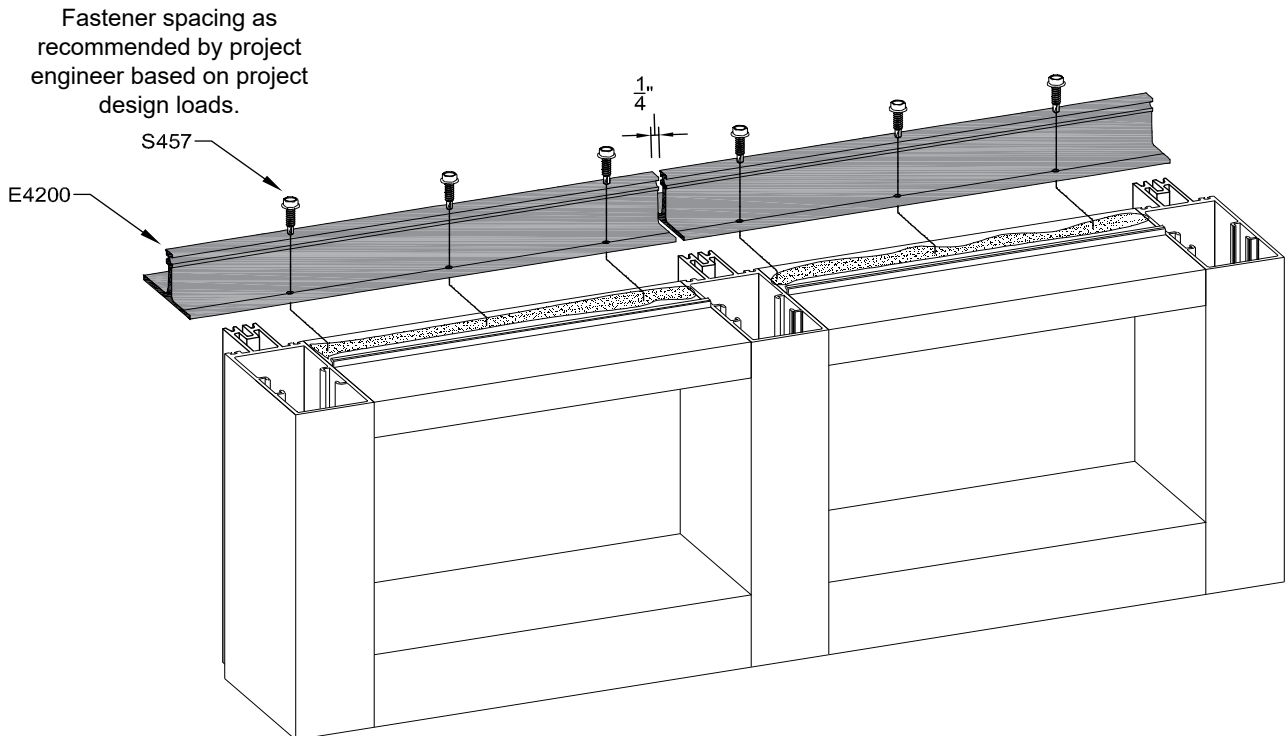
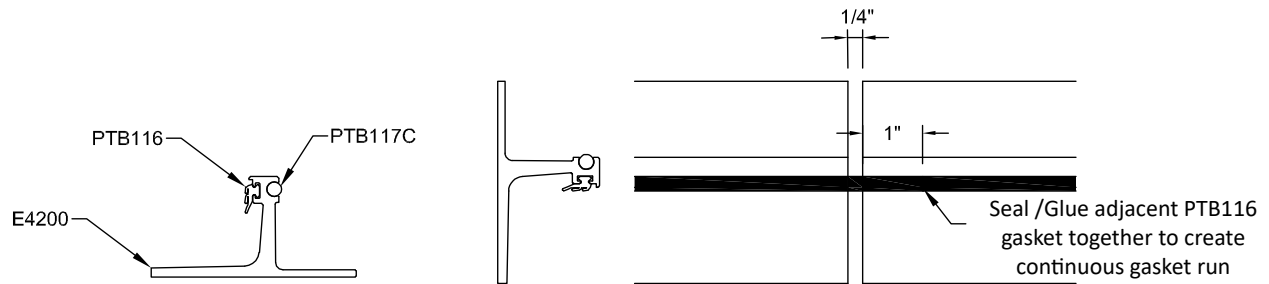
**NOTE:** Exterior and Interior perimeter seals must run continuous full perimeter of framing.



**Fig. 43.2**

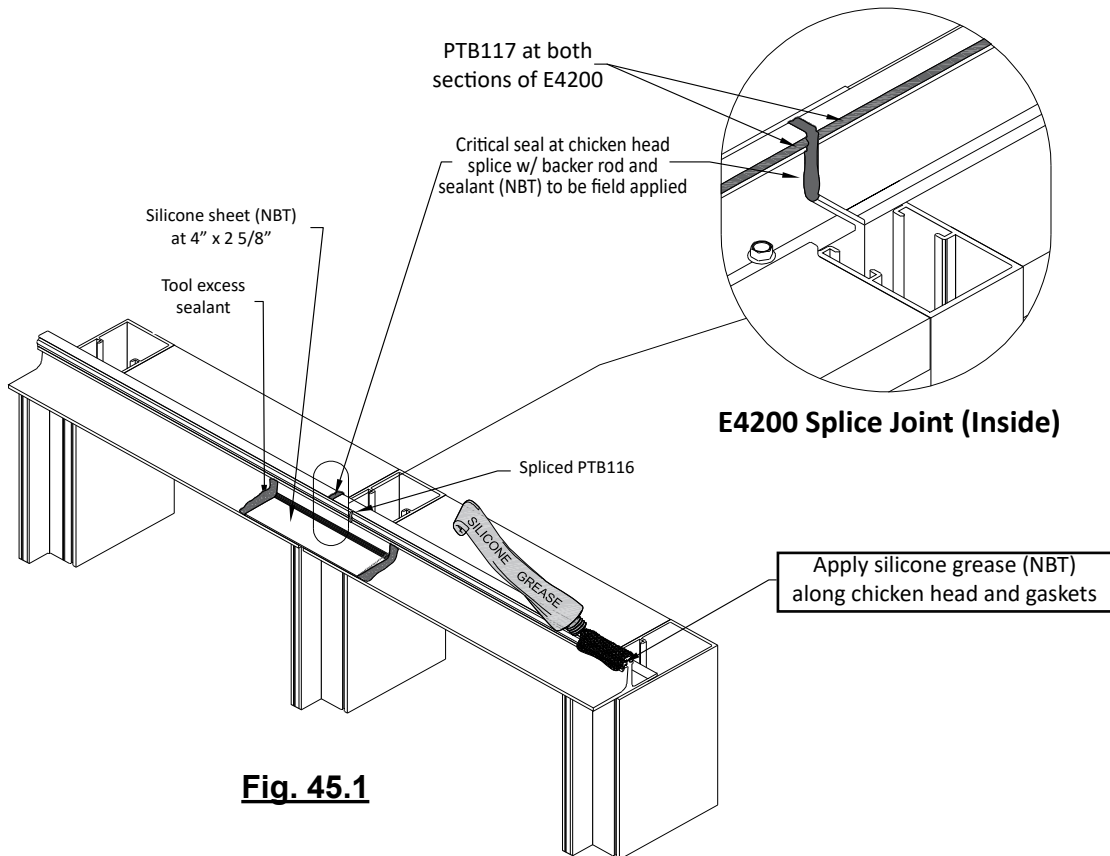
### Step 16: Optional Installation of E4200 profile

- A. Prior to installing the E4200, install gasket PTB116 and PVC rod PTB117C.
- B. Leave gasket PTB116 one inch on one end to run past E4200 splice and seal to adjacent PTB116 to create a continuous gasket.
- C. After the lower units are installed and anchored in place, set the E4200 in a bead of sealant and attach to head with S457 1/4" x 1" HWH self-drilling screws at spacing per approved shop drawings.
- D. When a splice of the E4200 is required, leave a 1/4" joint at the centerline of the lower frame unit.

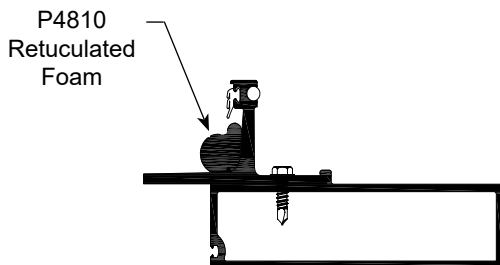


**Step 16: Optional installation Expansion plate (continued)**

- A. At E4200 splice locations, set a silicone sheet in a bed of silicone over the splice joint.
- B. Press sheet into the silicone and tool excess around perimeter. See **Fig 45.2**.
- C. Use backer rod and sealant on the interior side of the E4200 splice. See **Fig 45.2**.

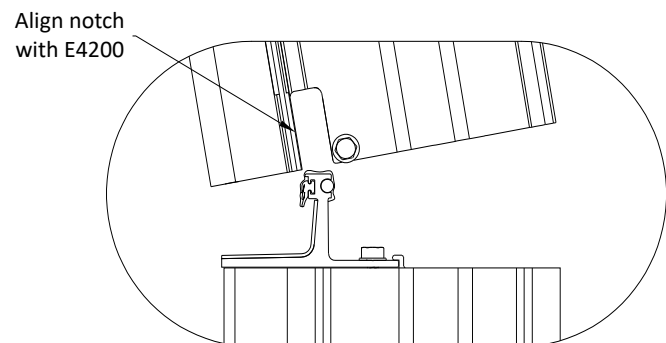


Install articulated foam, set in sealant and span across vertical mullion width



Set the next row of frame units above the first row from the floor above, aligning mullion notch over the E4200.

Set the frame expansion joint to the correct height before anchoring the upper frame unit



## GLAZING

### Step 17: Glazing Preparation

- Remove any debris from the glazing pockets.
- Trim excess silicone from edges of glazing units to allow for maximum glazing clearance.

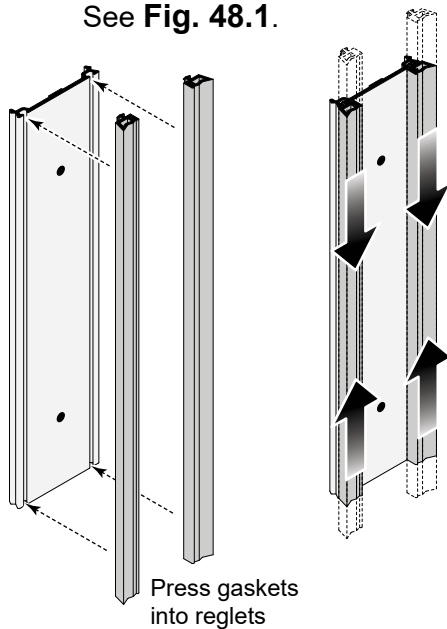
Glazing pockets are designed to accept a variety of infill thicknesses. Refer to our online System Glazing Chart for a full list of glazing size options for this system:

[http://www.tubeliteinc.com/wp-content/uploads/2014/05/Tubelite\\_Glazing\\_Chart.pdf](http://www.tubeliteinc.com/wp-content/uploads/2014/05/Tubelite_Glazing_Chart.pdf)

### Step 18: Install Gaskets

**NOTE:** Crowd gaskets toward the center of the member during installation to avoid gaps caused by relaxation of the gasket material.

- Install P4606 gasket into vertical and horizontal pressure plates. See **Fig. 46.1**.
- Install P4606 or P4631 gasket into vertical mullions. See **Fig. 46.2** and **Fig. 43.1**. Vertical mullion gaskets run beyond the horizontals. Run the vertical gasket through the vertical splice joint, setting in fresh sealant at the splice. Notch darts off the gasket as required for proper fit.
- Install P4606 gasket into the horizontals.
- Install PTB108 isolator gasket into vertical and horizontal tongues. Run the isolator through the vertical splice joints.
- For SSG vertical applications, install into vertical mullion with equal overlap into each horizontal pocket. See **Fig. 48.1**.

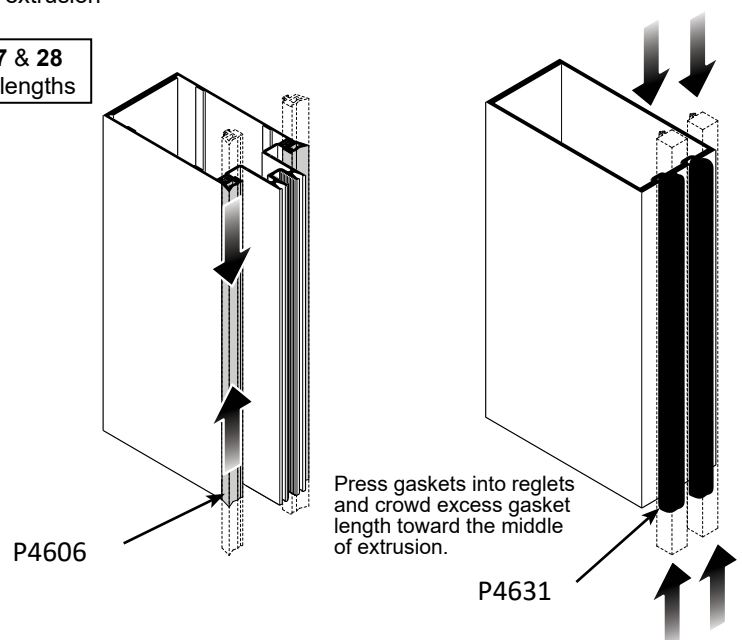


**Fig. 46.1**

Typical with vertical and horizontal gaskets.

Crowd excess gasket length toward the middle of pressure bar extrusion

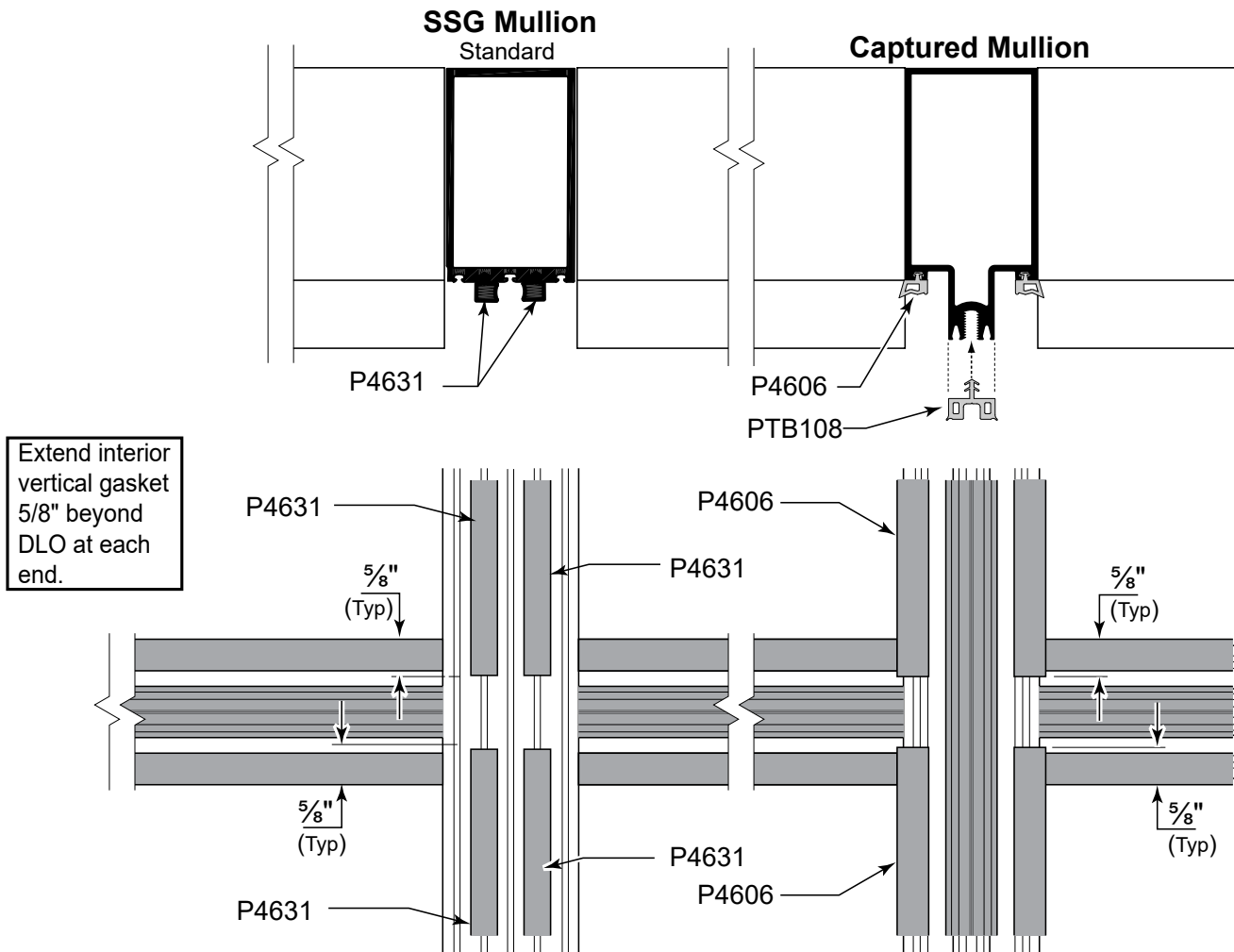
See pages 27 & 28 for gasket cut lengths



**Fig. 46.2**

## GLAZING

### Step 18: Install Gaskets (Continued)



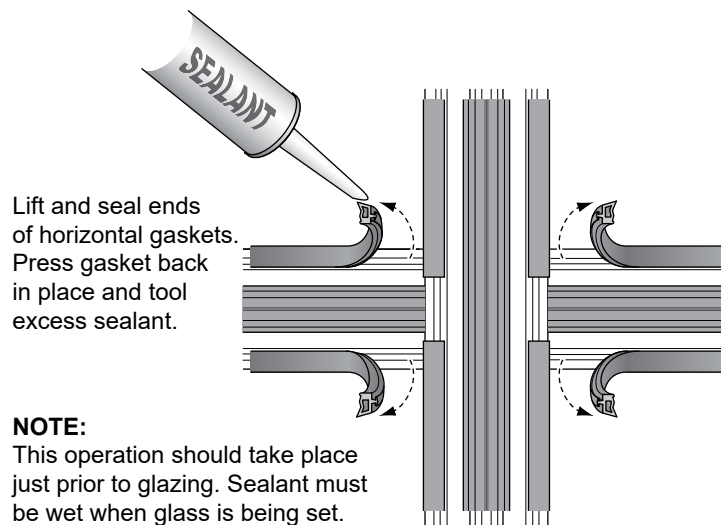
**Fig. 47.1**

## GLAZING

### Step 19: Installing Glass

**NOTE:** Pre-seal gaskets only in the opening to be glazed to avoid sealant curing and contamination before glass is set in place.

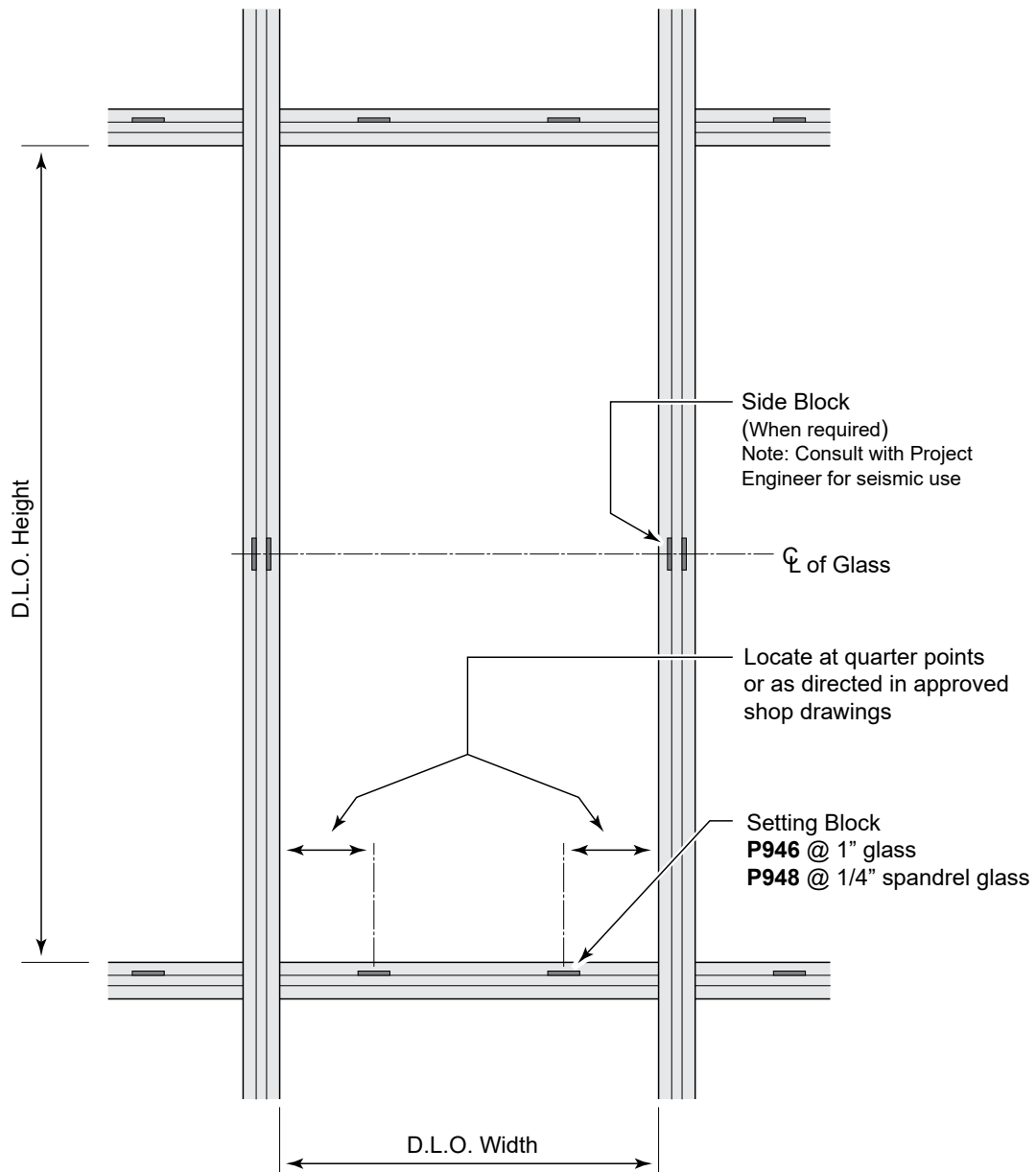
- A. Pull interior horizontal gaskets away from vertical gaskets and seal corners where gaskets abut. Release horizontal gasket back to its original position. See **Fig. 48.1**.
- B. Install two P946 setting blocks for 1" glass at quarter points or as indicated on approved shop drawings.  
**Note: Consult glass manufacturer for correct length and location for glass size over 40 sq.ft.**  
See **Fig 45.1**
- C. Install glass onto setting blocks, positioning glass for proper glass bite into vertical mullions. Make sure the glass is firmly against interior gaskets before installing temporary glazing clips or pressure plates.
- D. Make sure sealant is not bridging or blocking the water flow area between the edges of the glass and the framing system.
- E. Hold the glass in place using P1194 temporary glazing clips. Locate clips near each corner of the glass and at mid points. **Temporary glazing retainers are intended for short term use only. Additional retainers or full length pressure plates may be required if high windload pressures are anticipated before the installation is complete.**
- F. For SSG vertical applications, hold the glass in place at the vertical with P1194 temporary glazing clips and a ¼" x 2" TEK screw. Tape off side of SSG vertical and glass prior to applying structural silicone. After structural silicone has cured per silicone manufacturer's recommendations, remove P1194 temporary glazing clips, seal hole in the SSG vertical from the P1194 screw and apply a weatherseal between the lites of glass.



**Fig. 48.1**

## GLAZING

### Step 19: Installing Glass (Continued)

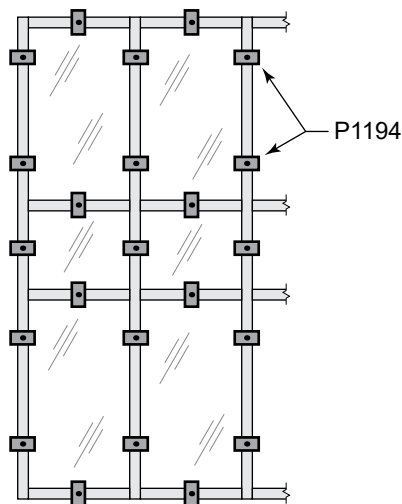


**Fig. 49.1**

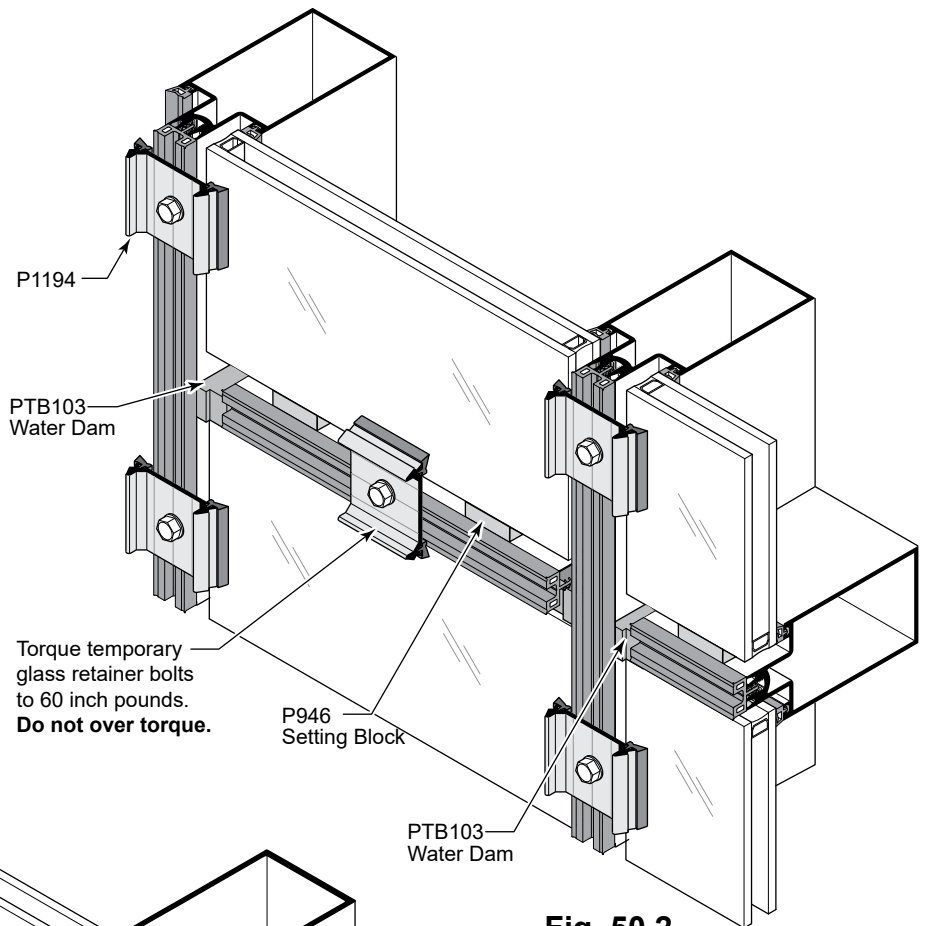
## GLAZING

### Step 19: Installing Glass (Continued)

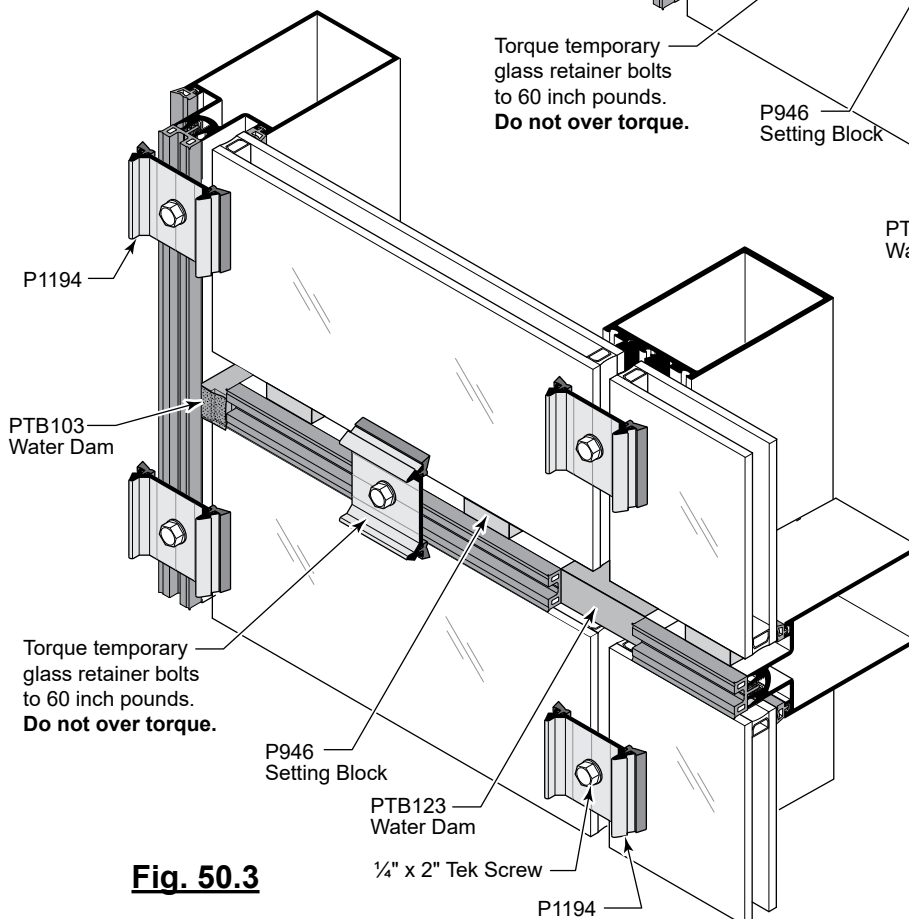
- E. Hold the glass in place using P1194 temporary glazing clips. Locate clips near each corner of the glass and at mid points. **Temporary glazing retainers are intended for short term use only. Additional retainers or full length pressure plates may be required if high windload pressures are anticipated before the installation is complete.**



**Fig. 50.1**



**Fig. 50.2**

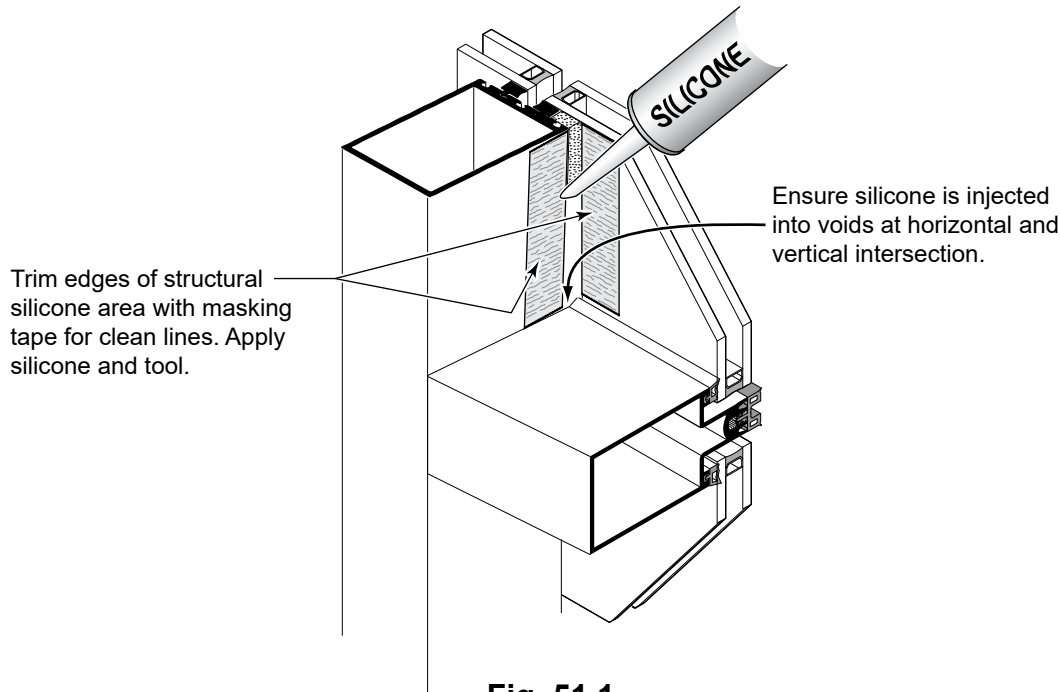


**Fig. 50.3**

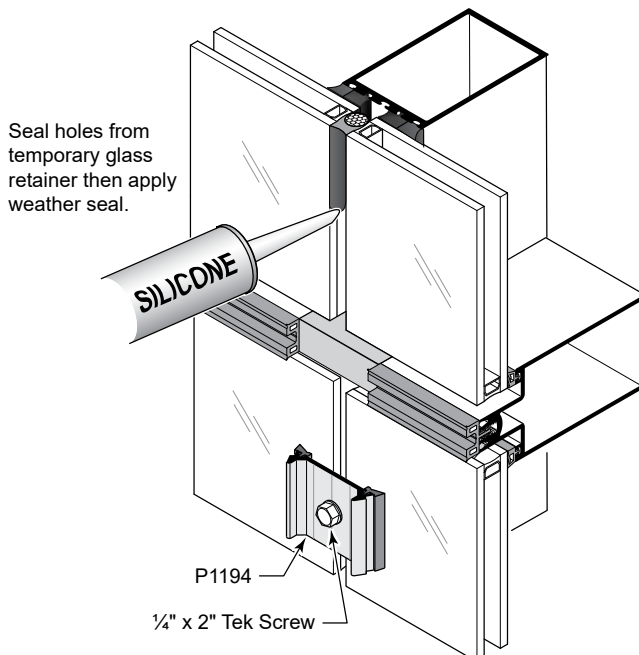
## GLAZING

### Step 19: Installing Glass (Continued)

- F. For SSG vertical applications, where structural silicone is applied from interior, hold the glass in place at the vertical with P1194 temporary glazing clips and a 1/4" x 2" TEK screw. Tape off side of SSG vertical and glass prior to applying structural silicone. After structural silicone has cured per silicone manufacturer's recommendations, remove P1194 temporary glazing clips, seal hole in the SSG vertical from the P1194 screw and apply a weatherseal between the lites of glass.



**Fig. 51.1**

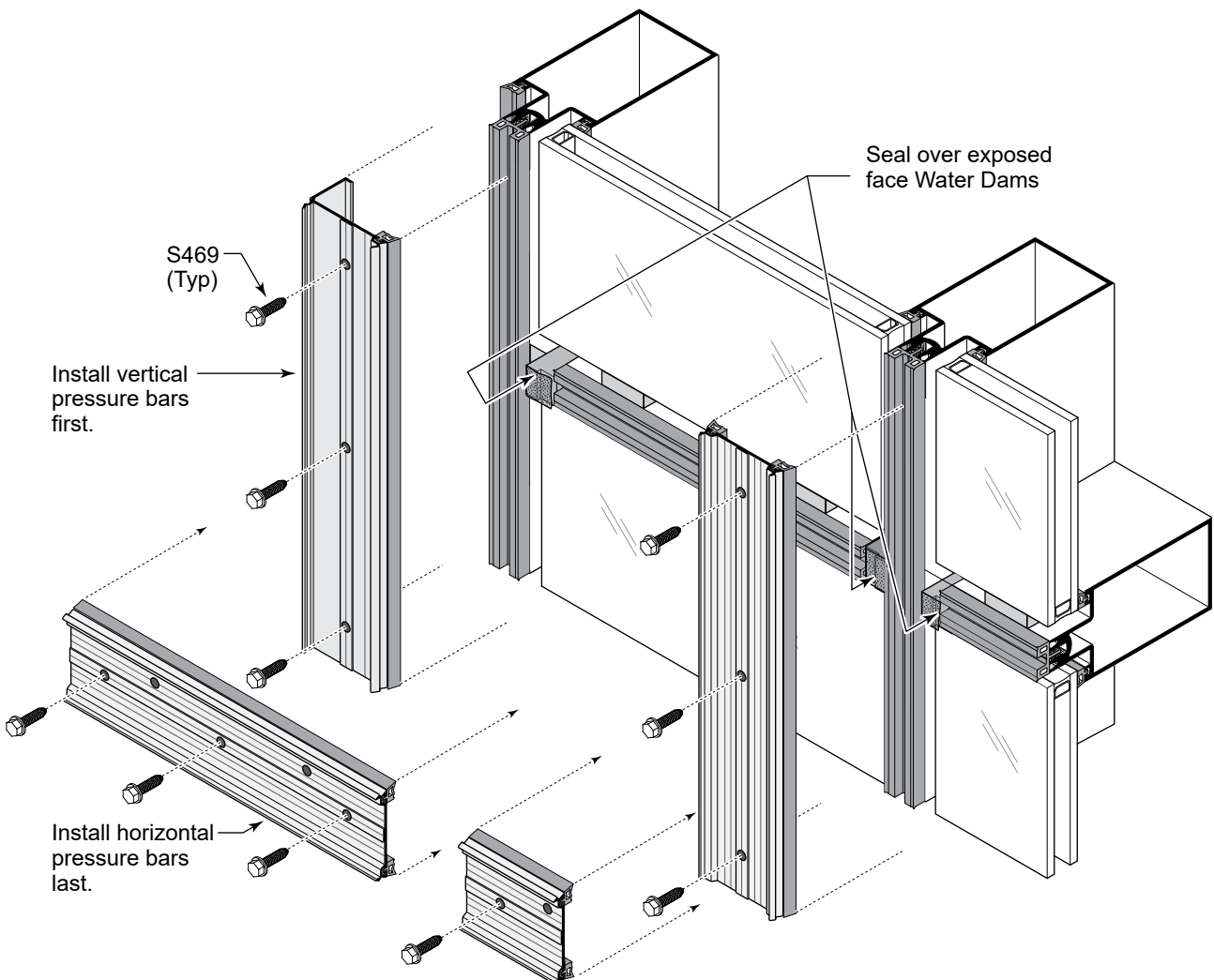


**Fig. 51.2**

## GLAZING

### Step 20: Install Pressure Plates and Face Covers

- A. Remove temporary glazing retainers from verticals as required.
- B. Vertical pressure plates must be installed first. Prior to installing, apply sealant to the face of each water dam.
- C. Install the vertical pressure plates using S469 screws.
- D. Remove temporary glazing retainers from horizontals as required.
- E. Install the horizontal pressure plates using S469 screws, ensuring that weep holes are on the top side of the pressure plate.
- F. Ensure there are anchor holes in the pressure plates 2" max from the ends and 2" max from each horizontal/vertical intersection to maintain proper compression on the glass.
- G. Torque all pressure plate screws to 60 in-lbs. When using a cordless drill with a torque limiter, check torque periodically against a torque wrench.
- H. Install the vertical face covers using a wood block to protect the face cover.
- I. Seal the horizontal pressure plates to the vertical face covers, tooling the sealant into the joint.
- J. Install the horizontal face covers with equal gaps on each end. Make sure the weep holes in the face cover are pointing down.

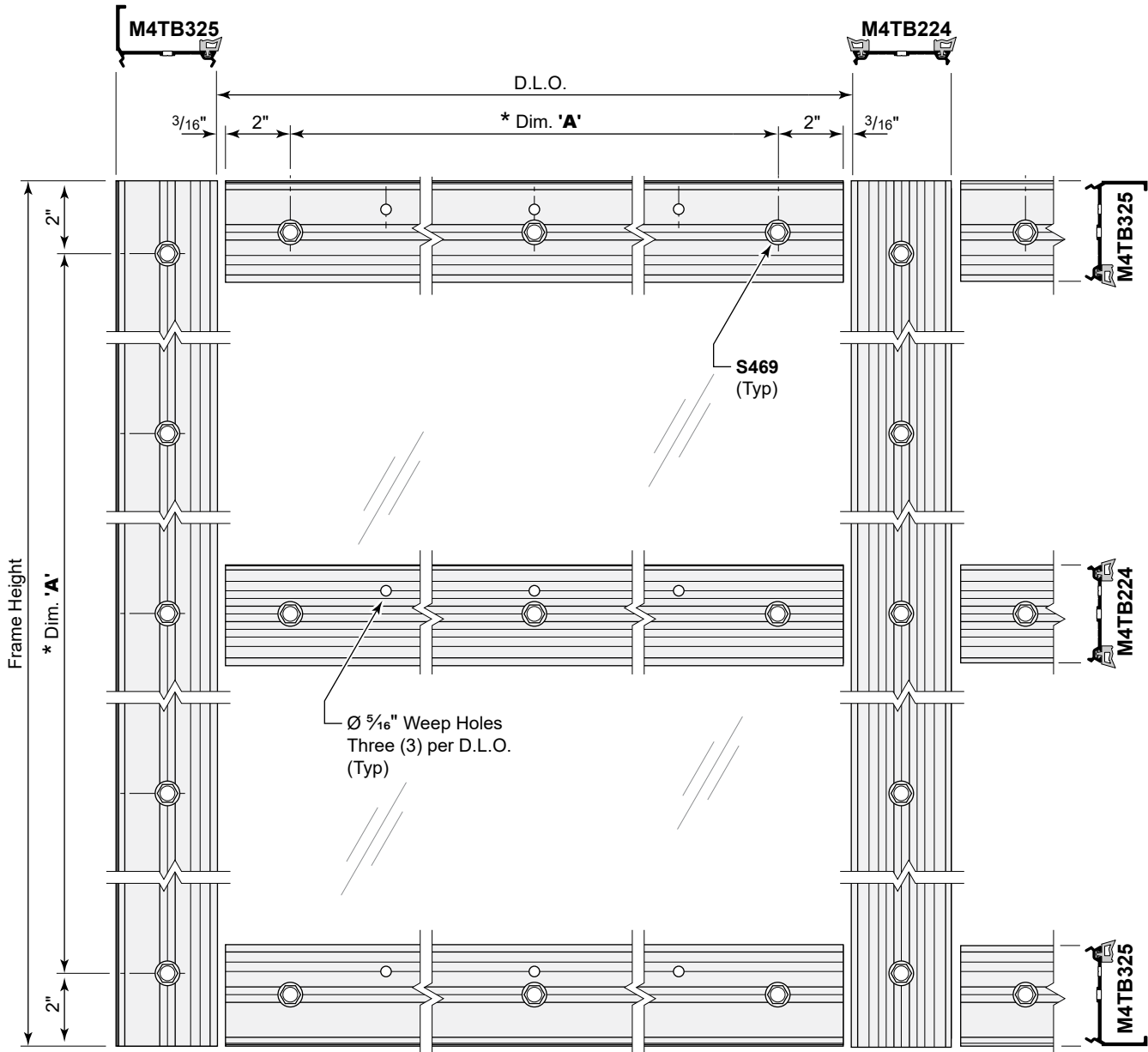


**Fig. 52.1**

Also see Fig. 49.1 and Fig. 50.1.

## GLAZING

### Step 20: Install Pressure Plates and Face Covers (Continued)

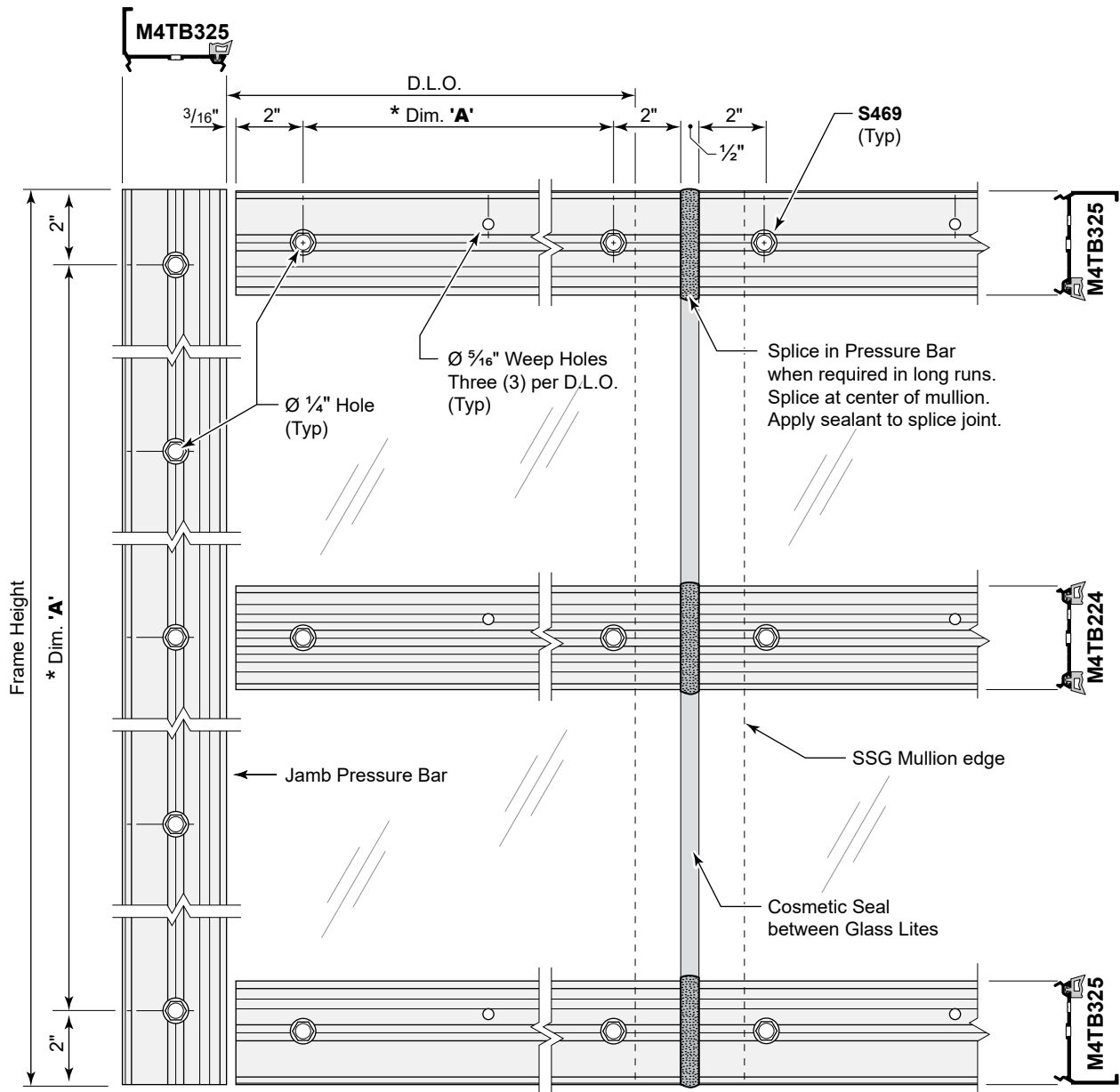


\* See page 29 for pressure plate anchor spacing chart

**Fig. 53.1**  
 CAPTURED PRESSURE BAR INSTALLATION

## GLAZING

### Step 20: Install Pressure Plates and Face Covers (Continued)



\* See page 29 for pressure plate anchor spacing chart

**Fig. 54.1**  
SSG PRESSURE BAR INSTALLATION

## GLAZING

### Step 20: Install Pressure Plates and Face Covers (Continued)

H. Install the vertical face covers using a wood block to protect the face cover.

I. Pinning requirements for all pressure plates:

Cover depth less than 1": Pin to pressure plate as required

Cover depth 2" or more:

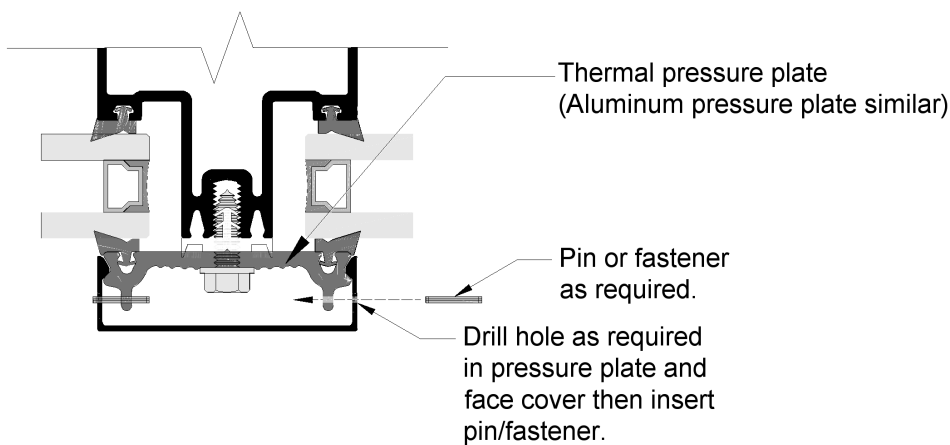
Less than 6 ft long: Pin to pressure plates at center on each side

Greater than 6 ft long: Pin to pressure plates at each end and 3 ft O.C.

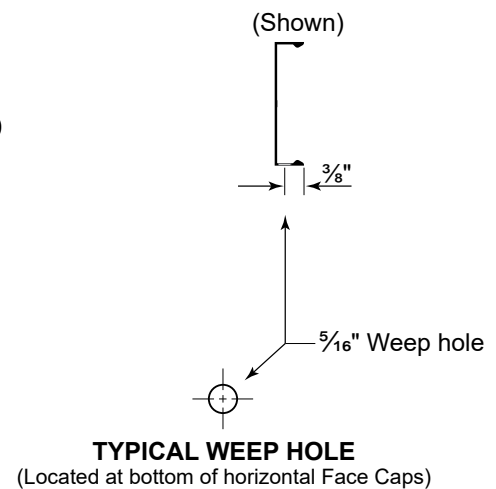
Building specific conditions may require spacing different than this. Consult Tubelite Engineering for recommendations.

J. Seal the horizontal pressure plates to the vertical face covers, tooling the sealant into the joint.

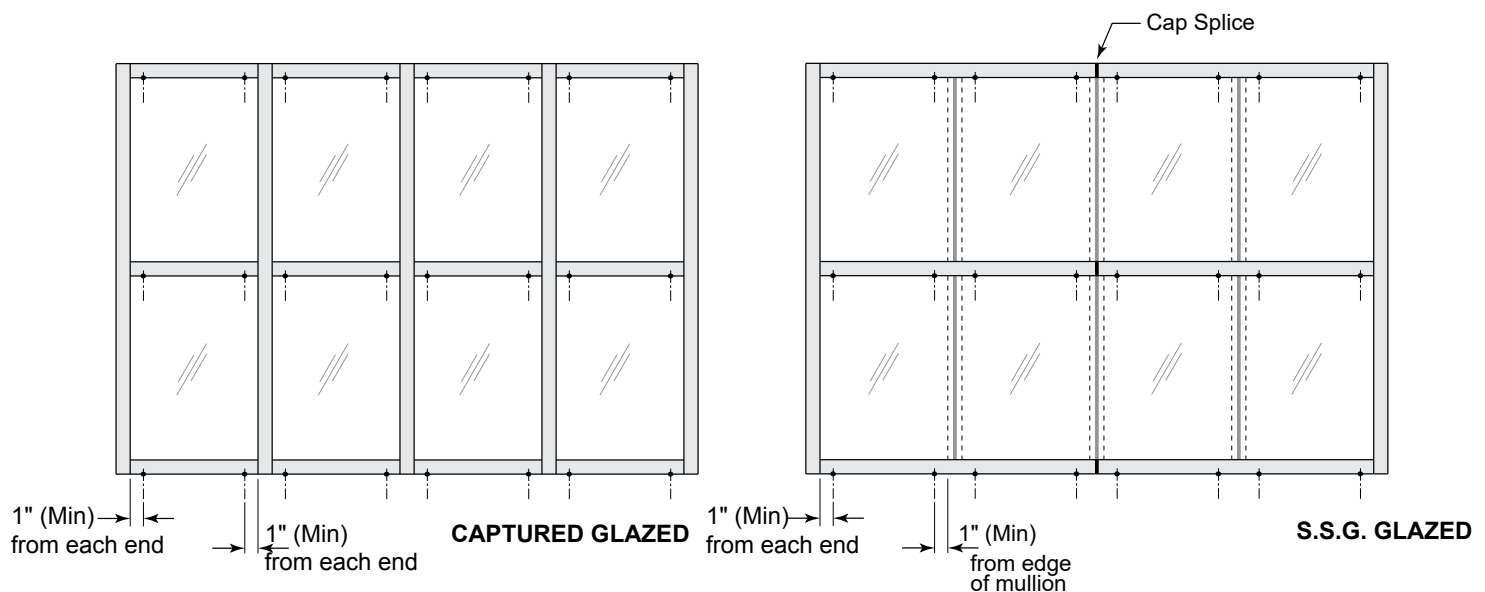
K. Install the horizontal face covers with equal gaps on each end. Make sure the weep holes in the face cover are pointing down.



**Fig. 55.1**  
**Face Cover Pinning**



**CUSTOM EXTENDED FACE CAPS**  
 (Available upon request)

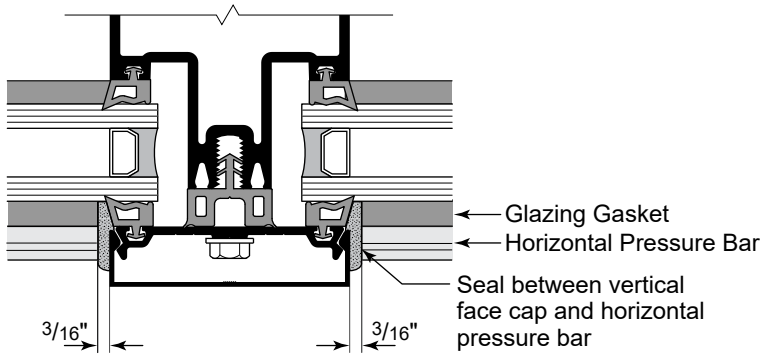


**Fig. 55.2**

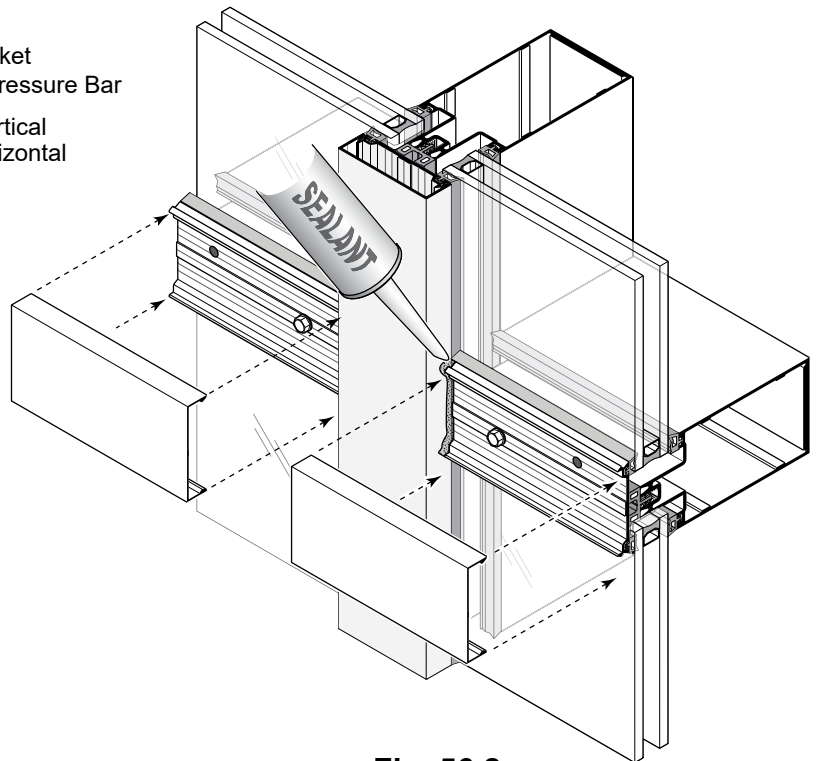
## GLAZING

### Step 20: Install Pressure Plates and Face Covers (Continued)

Seal horizontal pressure bar end gaps.



**Fig. 56.1**

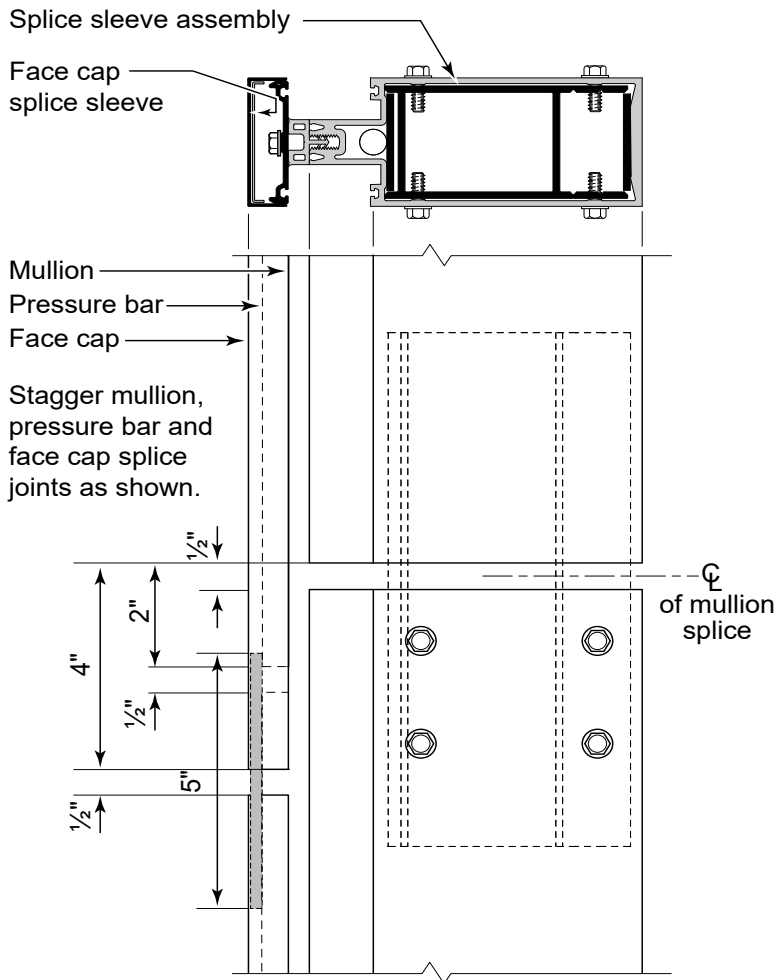


**Fig. 56.2**

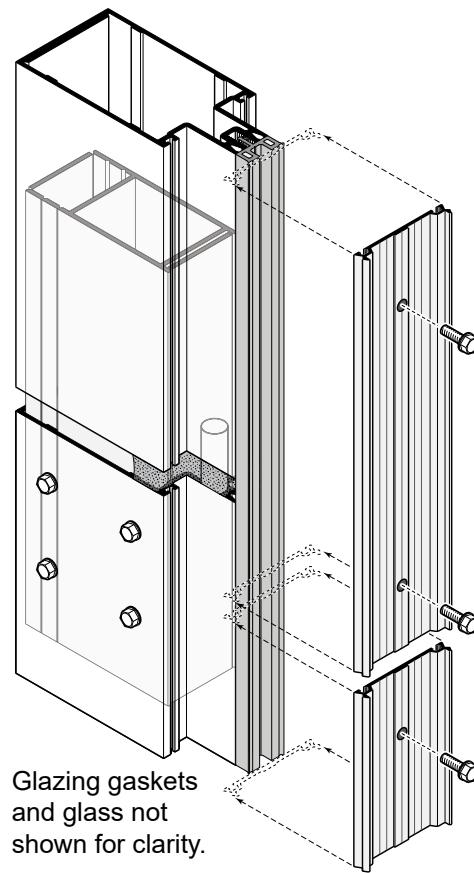
## GLAZING

### Step 20: Install Pressure Plates and Face Covers (Continued)

Pressure Bar and Face Cap at multi-span mullion splice.



**Fig. 57.1**



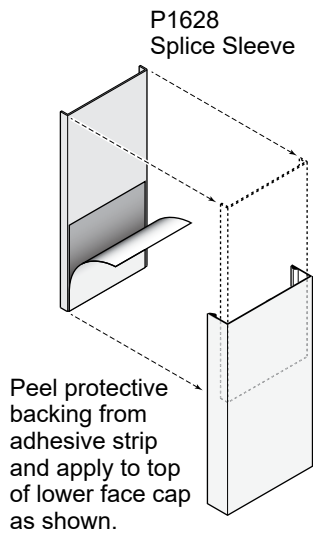
**Fig. 57.2**

See **Step 13** for mullion splice procedure.

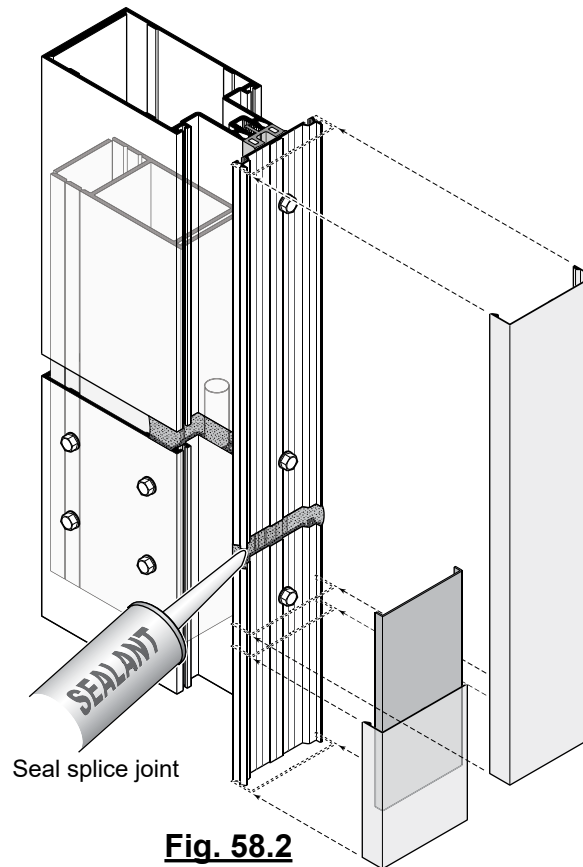
## GLAZING

### Step 20: Install Pressure Plates and Face Covers (Continued)

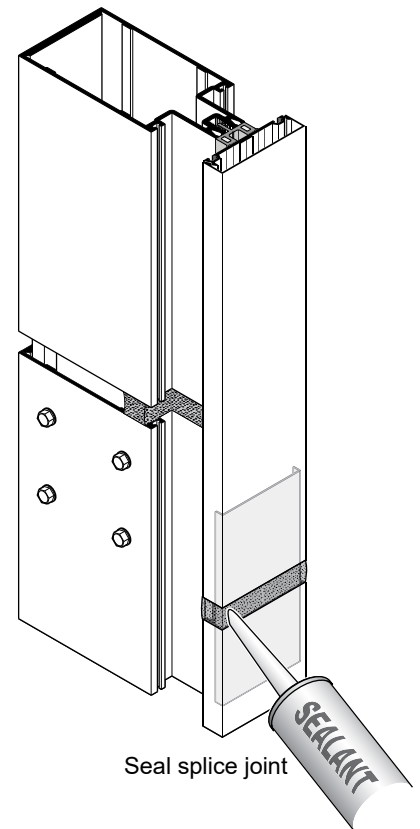
Pressure Bar and Face Cap at multi-span mullion splice.



**Fig. 58.1**



**Fig. 58.2**

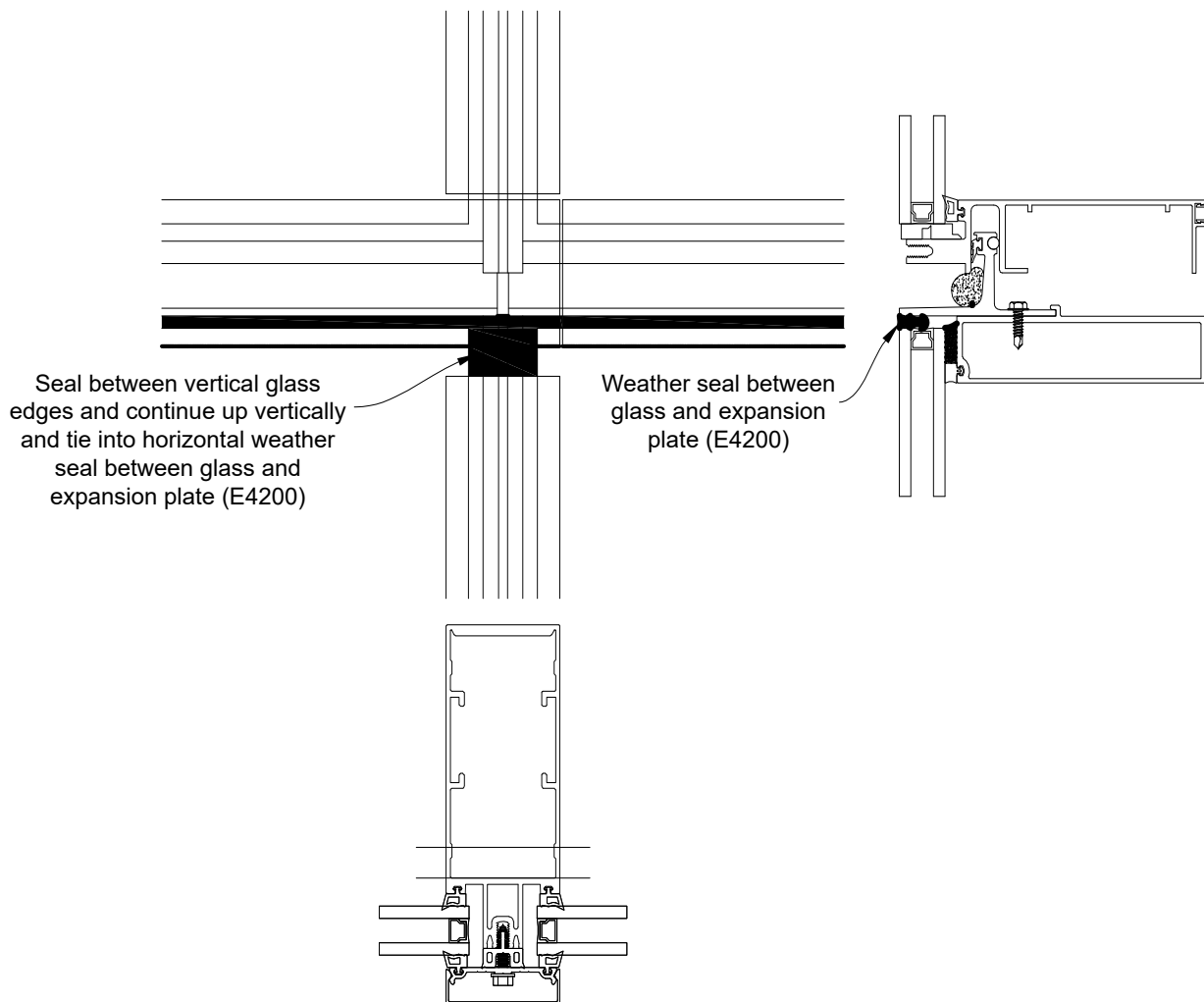


**Fig. 58.3**

## GLAZING

### Step 20: Installing seals for SSG

Prior to pressure plate installation seal between vertical glass edges and tie into horizontal weather seal running horizontally between glass and expansion plate.

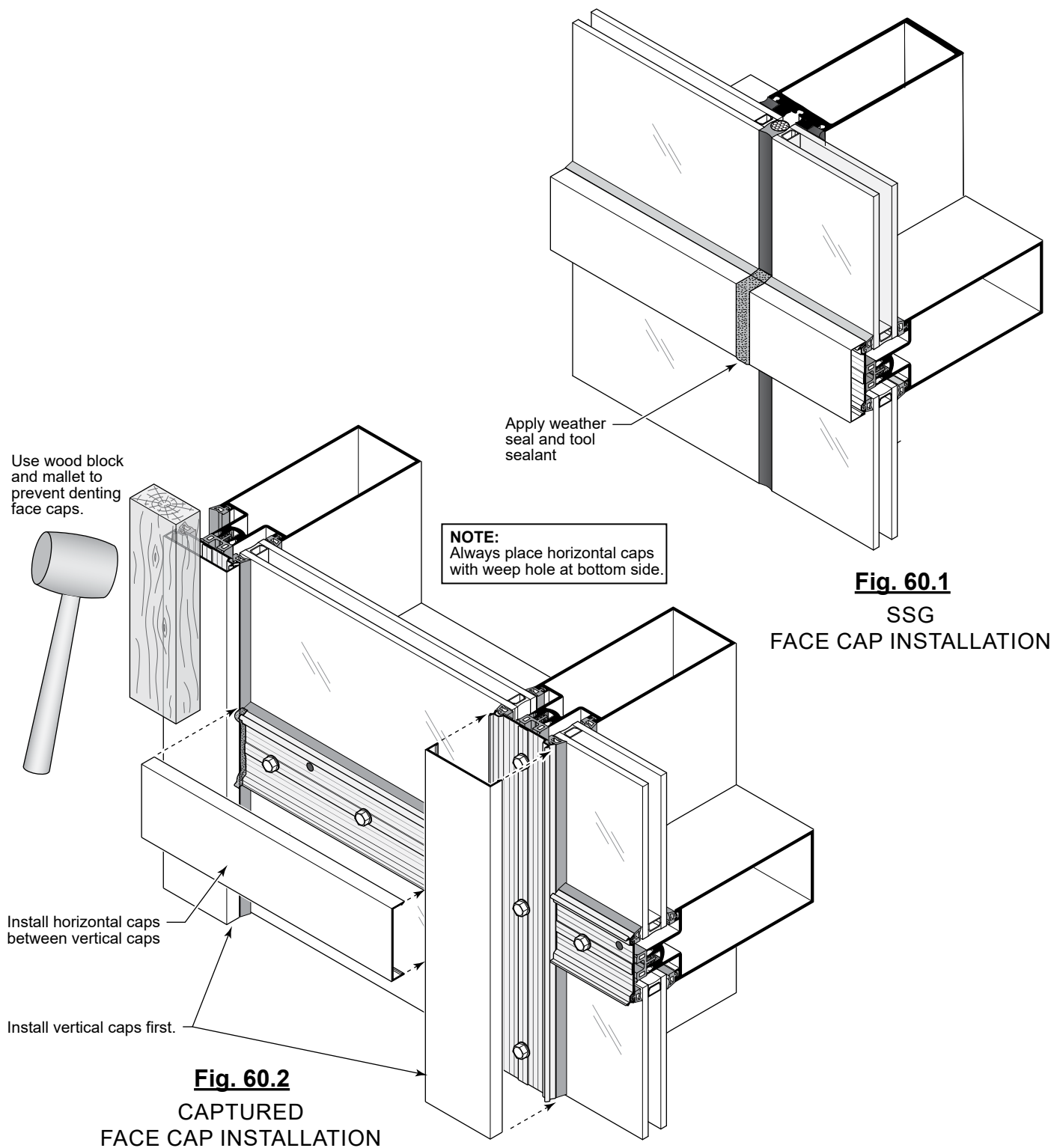


**Fig. 59.2**

## GLAZING

### Step 20: Install Pressure Plates and Face Covers (Continued)

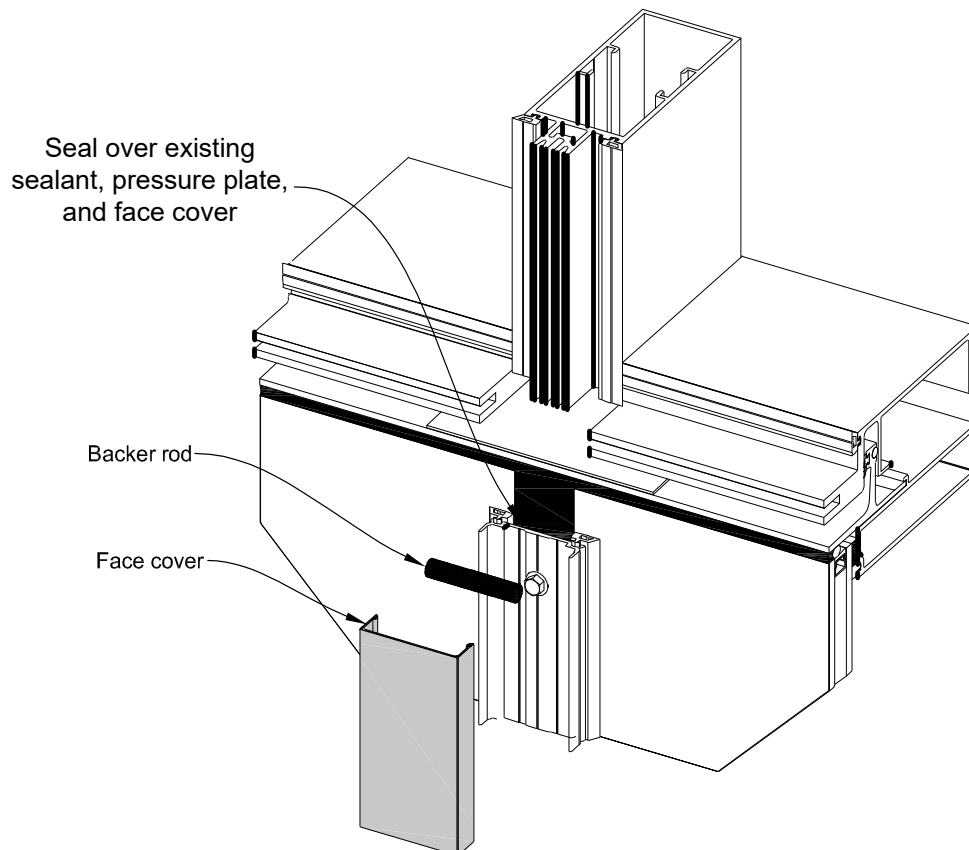
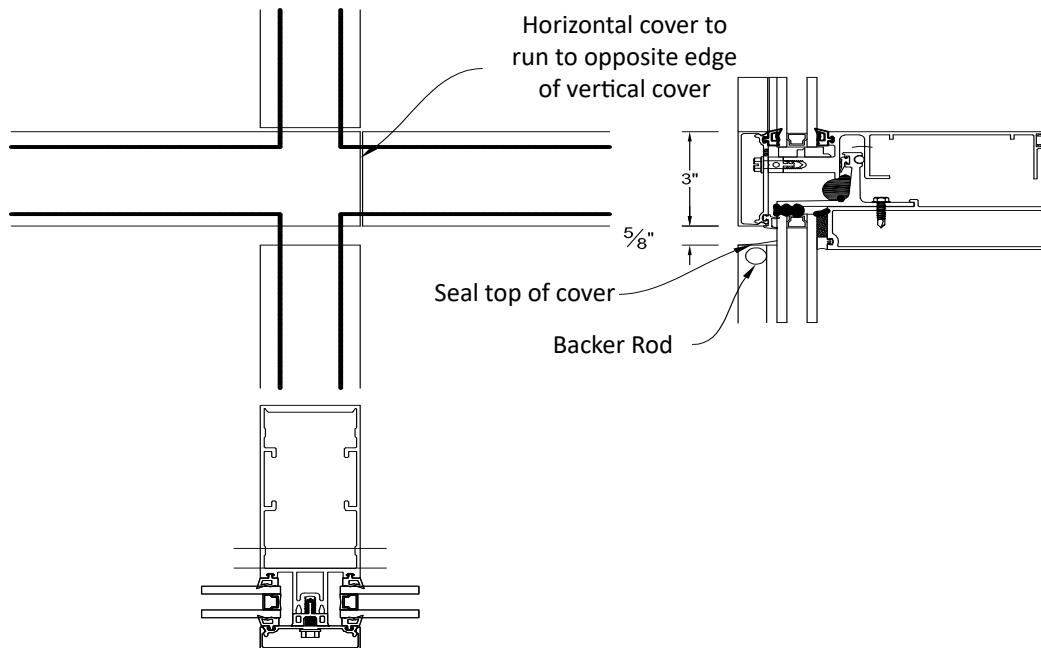
Pressure Bar and Face Cap at multi-span mullion splice.



## GLAZING

### Step 20: Installing Face Covers (Continued)

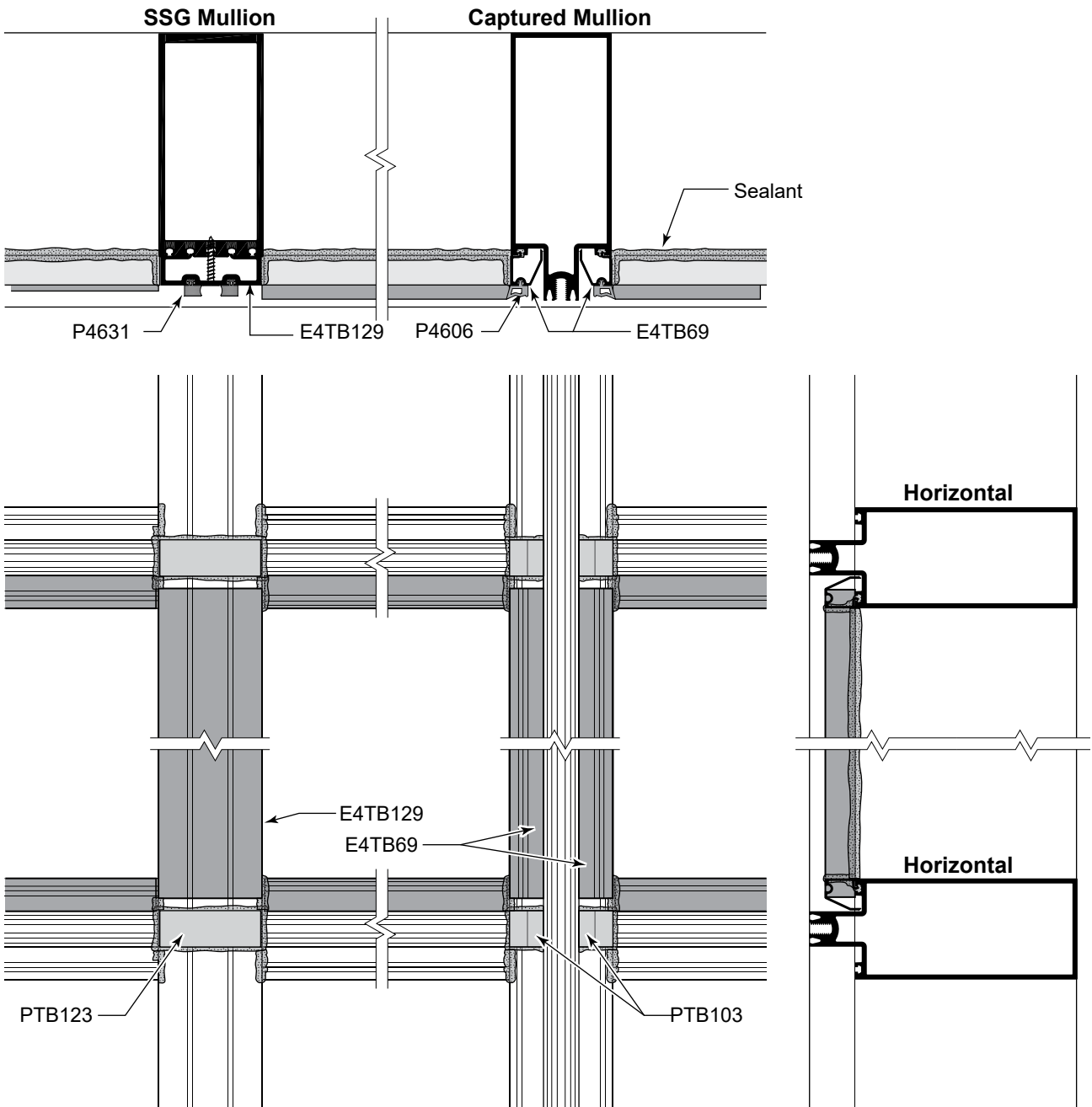
Install vertical covers maintaining 5/8" space between bottom of horizontal cover. Upper vertical cover to stop at top of horizontal cover location. Horizontal cover to run to opposite edge of vertical cover.



## TRANSITION GLAZING

### TRANSITION GLAZING

- Install vertical adaptors first, overlapping an equal amount into each glazing pocket. When adaptors are located at vertical mullion splices, discontinue adaptor at the splice. Insert a backer rod into the gap and seal thoroughly.
- Install horizontal adaptors with equal gaps on each end. Notching around shear block screws may be required.
- Seal all joints between the vertical and horizontal adaptors.

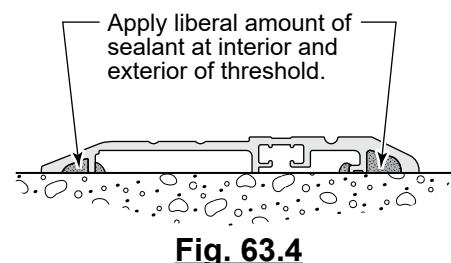
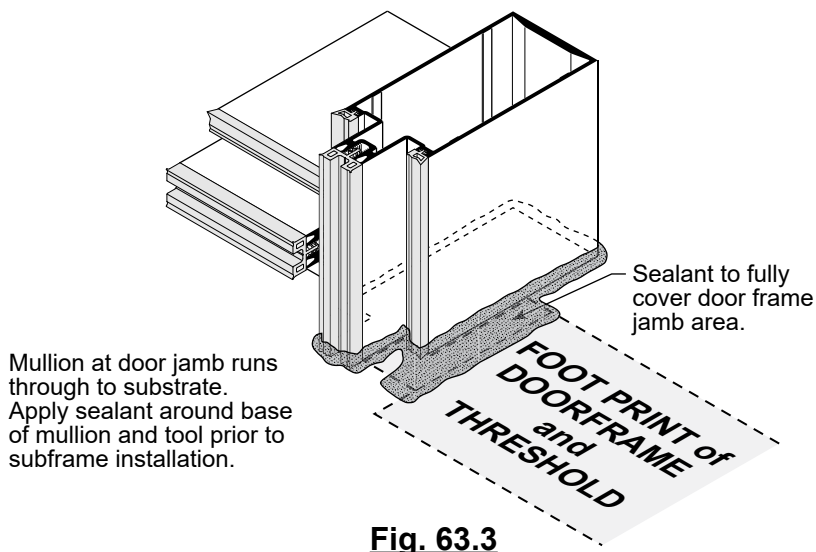
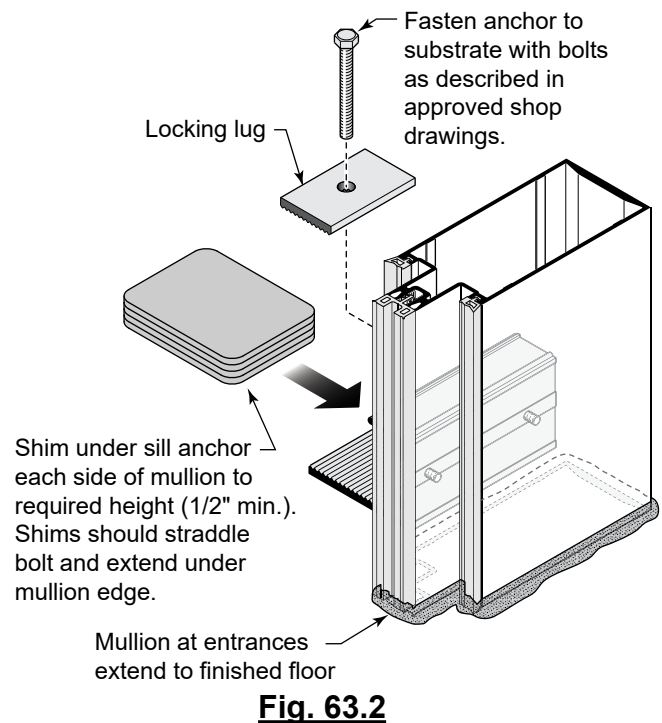
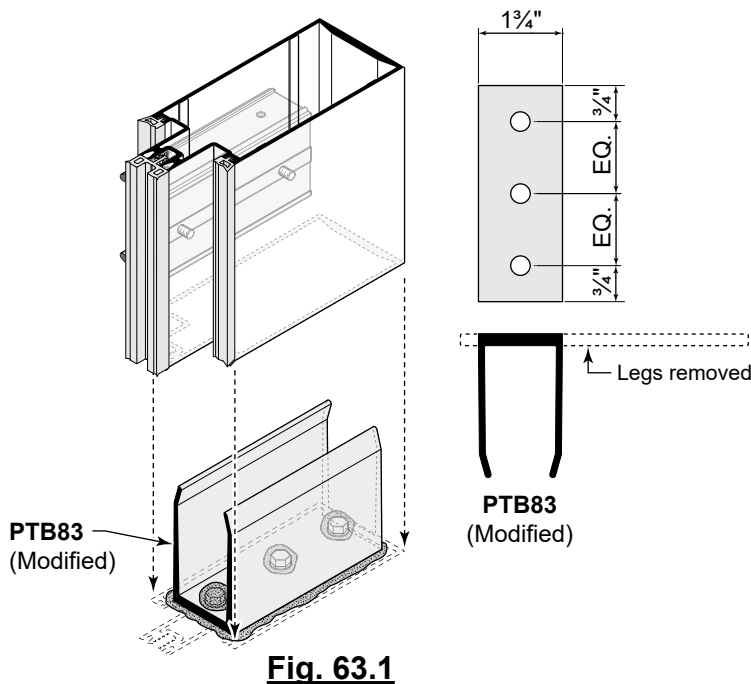


**Fig. 62.1**

## ENTRANCE FRAMING

### ENTRANCE FRAMING

- A. All door framing is shipped fabricated from the factory. Curtain wall frames can be installed in the field prior to installing the doors.
- B. Curtain wall verticals and door subframes run to floor. Bed verticals in sealant and anchor to building per approved shop drawings. See **Fig. 63.1** and **Fig. 63.2** for possible anchoring methods.  
**Always refer to approved shop drawings for specific requirements.**

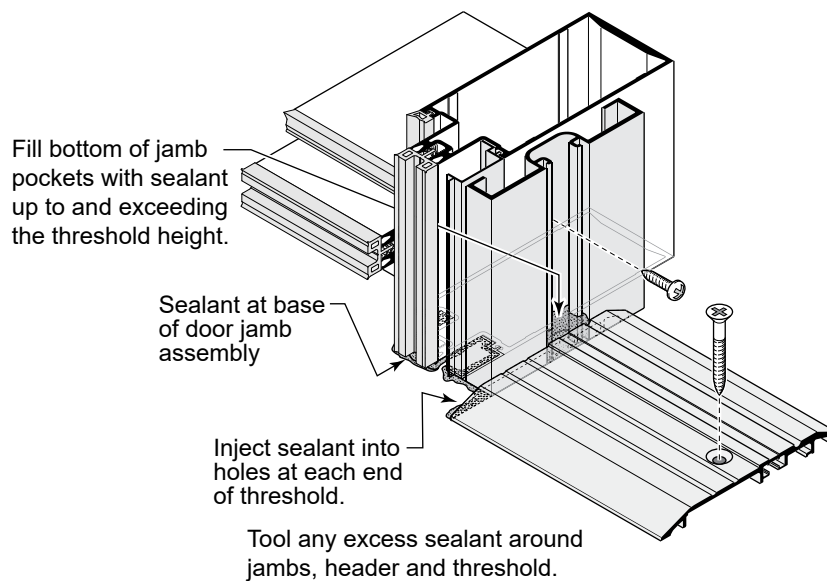


## ENTRANCE FRAMING

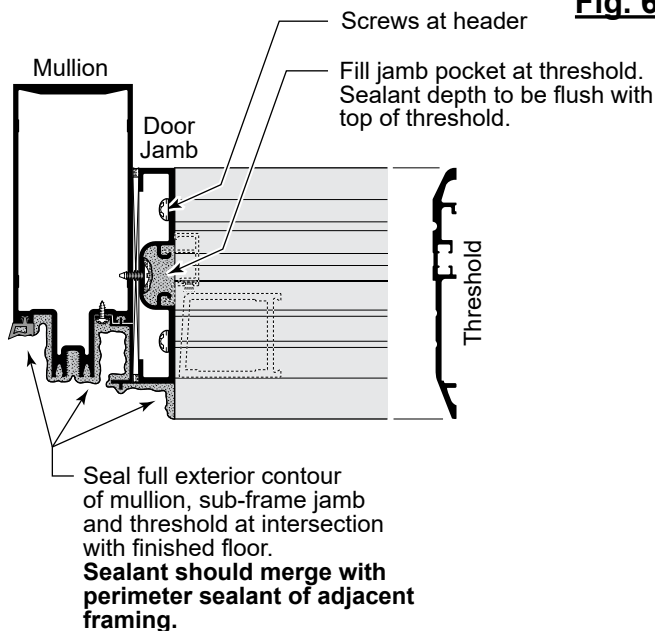
### ENTRANCE FRAMING (Continued)

#### C. SUBFRAME INSTALLATION

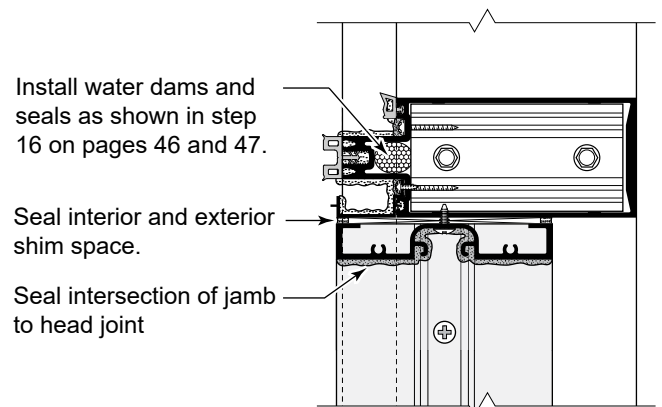
- Prep the curtain wall frame with pocket closures or as detailed on approved shop drawings.
- Prior to installing the subframe, lay down a bed of sealant where the threshold will be installed.  
See **Fig. 63.3** and **Fig. 63.4**.
- Install subframe onto curtain wall mullion, shimming equally from side to side. Attach subframe per approved shop drawings. Seal joint between subframe and curtain wall.
- Seal the top of the jamb subframe as shown in **Fig. 64.3**.
- Attach threshold to building per approved shop drawings.
- Install door per Tubelite's Entrances and Frames Installation Manual.



**Fig. 64.1**



**Fig. 64.2**



**Fig. 64.3**

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## REGLAZING

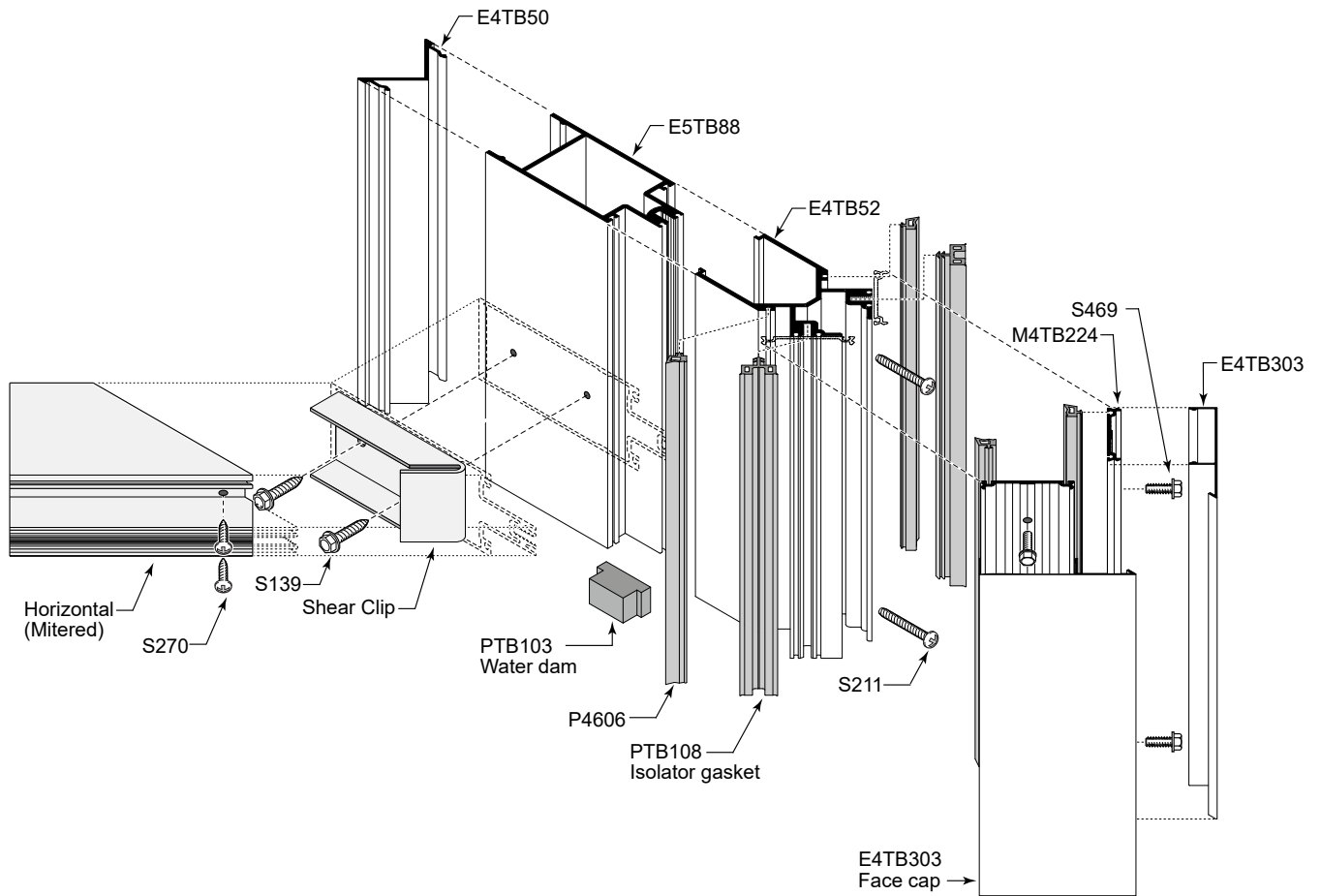
### REGLAZING

- A. Reglazing is done from the exterior.
- B. Carefully remove face covers surrounding the lite to be removed.
- C. Remove vertical and horizontal pressure plates adjacent to affected lite.
- D. Temp surrounding glass in place with P1194 temporary clips per Step 19, pages 50-51.
- E. Remove lite of glass and gaskets from opening. Clean debris and sealant from the glass pocket and glazing reglets.
- F. Install new glass in opening per Steps 19 through 20, pages 48 through 61.

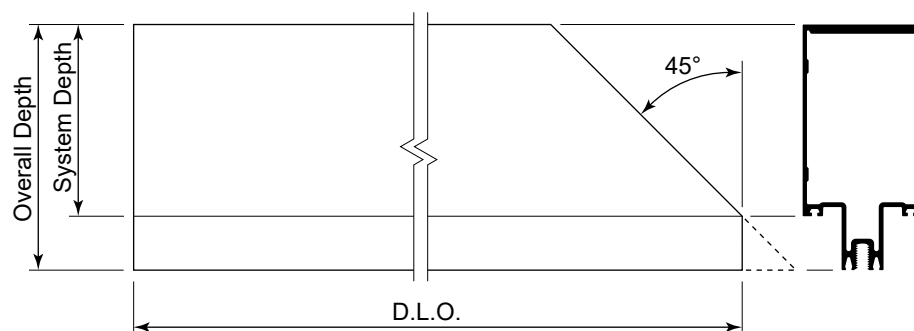
## CORNER CONDITIONS

### CAPTURED OUTSIDE CORNER

- A. Attach E4TB52 captured corner adaptor to the back member using "S211", spaced 18" on center.
- B. Install horizontals to corner mullion.
- C. Install water dams as noted in Step 15, pages 41 and 42.
- D. Attach glazing gaskets and isolator gaskets and seal as noted in steps 19 and 20, page 46 - 48.
- E. Install glass, pressure plates and face covers per Steps 18 and 21, pages 48 through 61.



**Fig. 66.1**



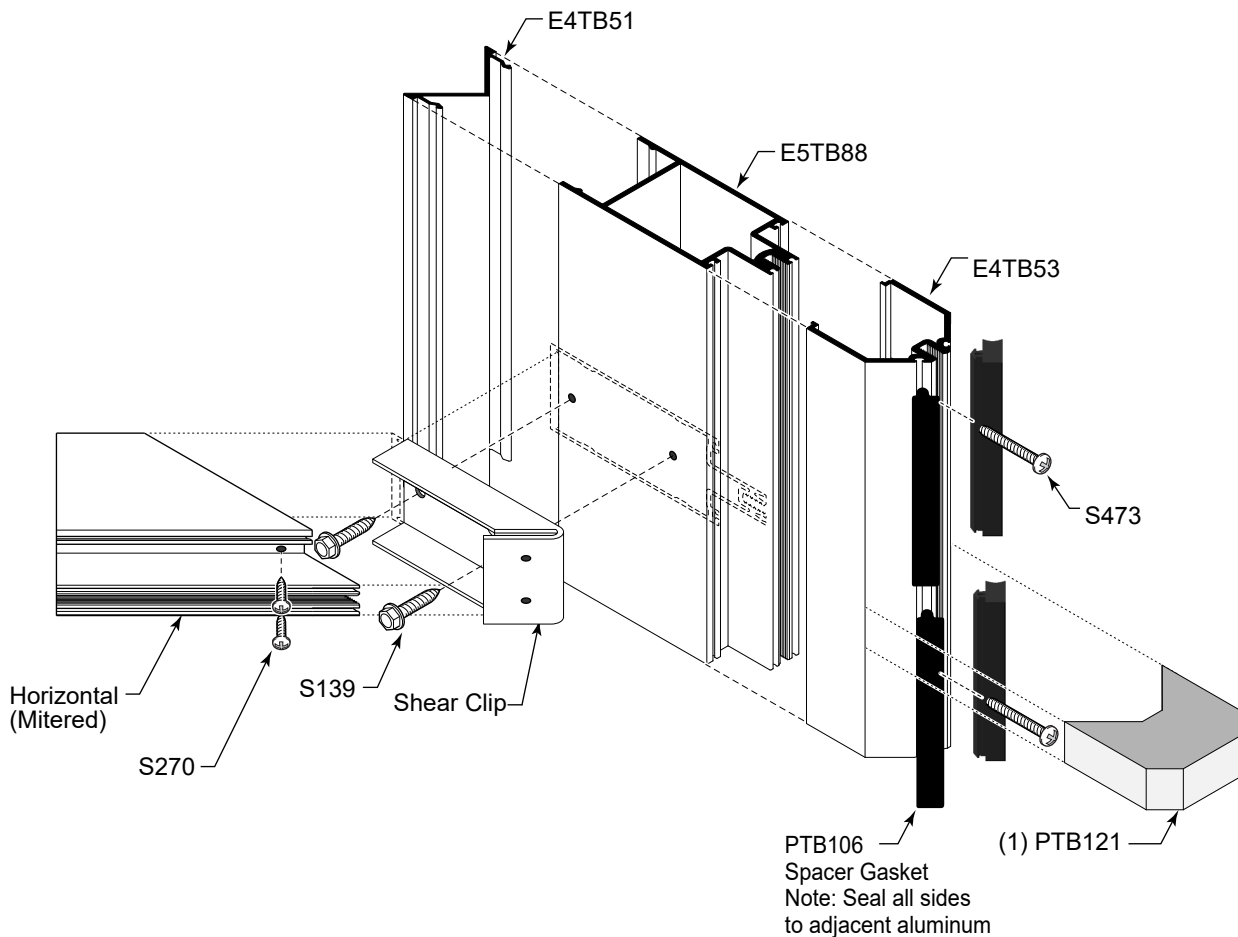
Horizontal at outside 90° corners (Handed)

**Fig. 66.2**

## CORNER CONDITIONS

### SSG OUTSIDE CORNER

- A. Attach SSG glazed corner adaptor to the back member using “S453”, spaced 18” on center.
- B. Push the PTB121 water dam into the void between horizontals. The PTB121 dam should be sealed over onto the tongue of the horizontals.
- C. Install the P4631 SSG spacers into the vertical adaptor.
- D. Install the glass at the corner.
- E. Apply structural sealant between the glass and the mullion.
- F. Insert a foam rod to fill the void between the two corner lites of glass.
- G. Apply sealant between the lites of glass.

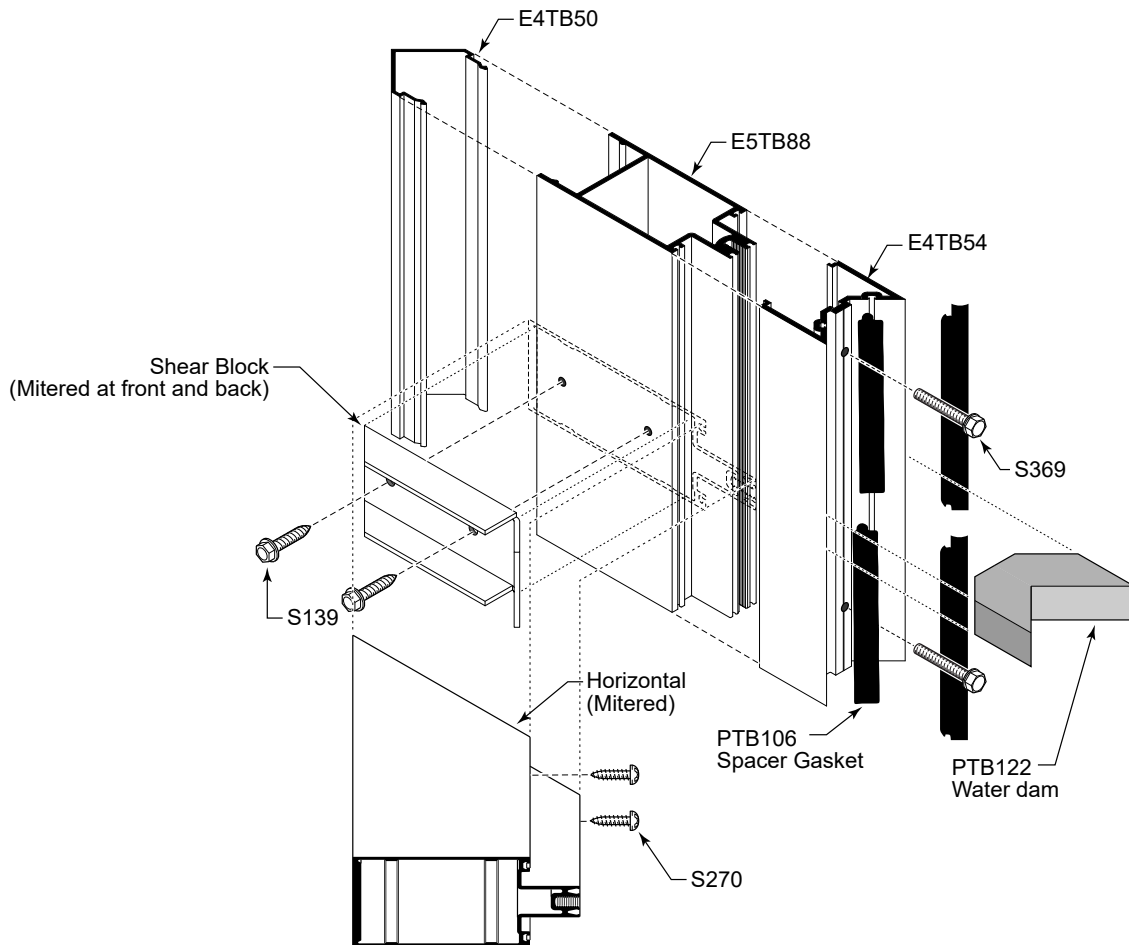


**Fig. 67.1**

## CORNER CONDITIONS

### SSG INSIDE CORNER

- A. Attach SSG glazed corner adaptor to the back member using “S369” screws spaced 18” on center.
- B. Push the PTB97 water dam into the void between horizontals. The PTB97 dam should be sealed over onto the tongue of the horizontals.
- C. Install the glass at the corner.
- D. Apply structural sealant between the glass and the mullion.
- E. Insert a foam rod to fill the void between the two corner lites of glass.
- F. Apply sealant between the lites of glass.



**Fig. 68.1**