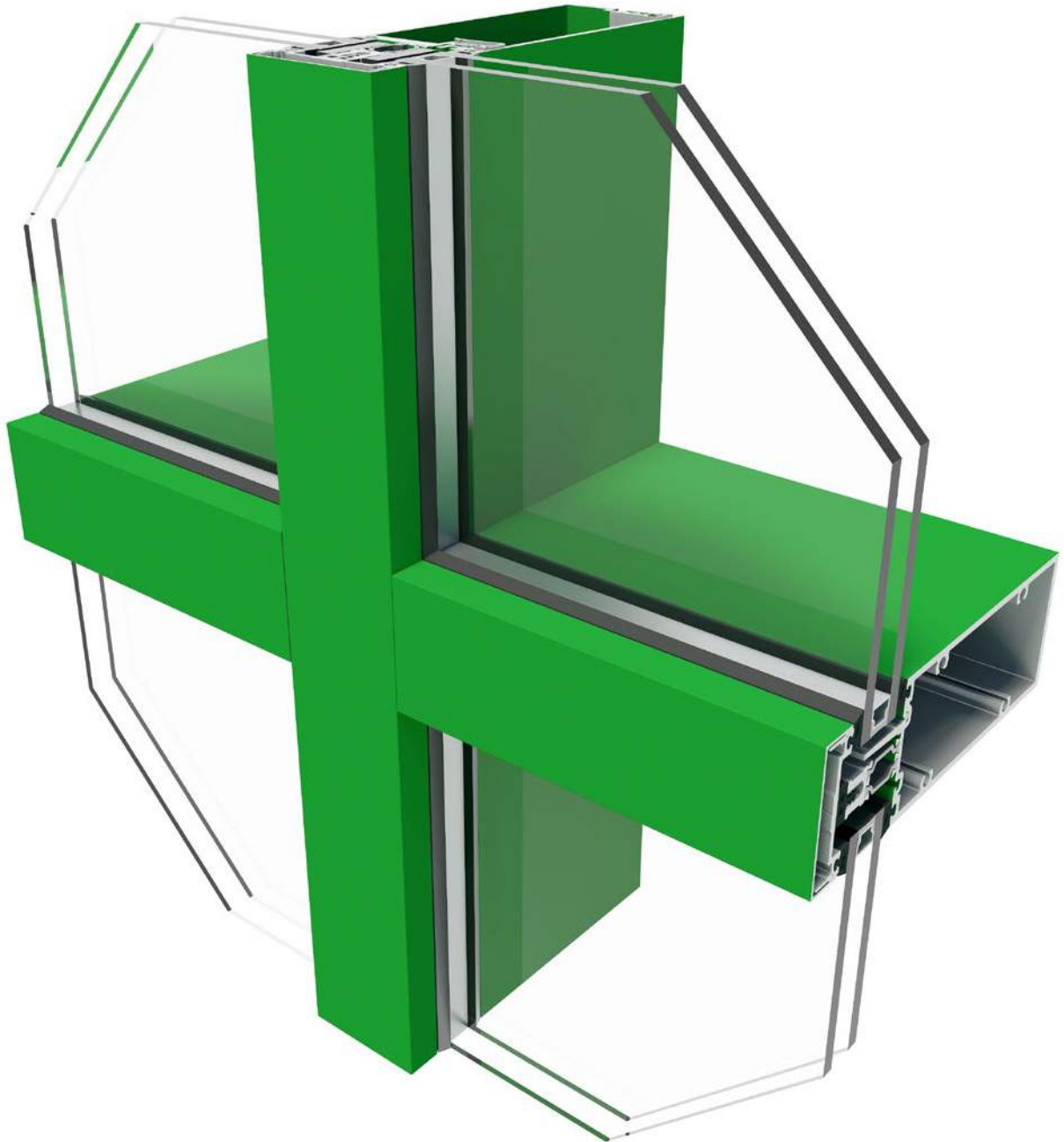


TUBELITE®

DEPENDABLE

LEADERS IN ECO-EFFICIENT STOREFRONT,
CURTAINWALL AND ENTRANCE SYSTEMS



400TU SERIES ULTRA - THERMAL CURTAIN WALL • SCREW SPLINE CONSTRUCTION •

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.
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 1/2" 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. Care must be taken when assembling aluminum framing components. Over tightening any fastener may cause stripping or fastener failure. Tubelite recommends the use of drill motors with clutches engaged to provide satisfactory tightening of the screw while preventing over torque. The use of impact drill motors is not recommended due to the absence of a clutch device.
16. Check 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 two alternate standard size pressure plates 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.
- 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.

QUICK REFERENCE CHECKLIST

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 (optional, 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 to system performance. Check installation against instructions to ensure conformity.
6. Apply sealant between all corner gasket joints.
7. Glass bites must be equal on all sides except as noted below.
8. Double check anchor size and location against installation instructions or approved shop drawings.
9. Ensure pressure plate fasteners are torqued to 90 in-lbs. Do not over torque polyamide pressure plate fasteners.
10. When polyamide pressure plates are used add two additional fasteners on each side of a vertical/horizontal intersection. See Fig. 50.2.

GLASS SIZE CALCULATION

Captured Mullions	= D.L.O. + 1" (1/2" glass bite)
SSG Vertical Mullions	= D.L.O. + 2" (1" glass bite)
SSG Horizontal Mullions	= D.L.O. + 1 3/4"
SSG Vertical Mullion Adjacent to Captured Jamb	= D.L.O. + 1 1/2" (width only)
Sunshade Brackets at Captured Mullions	= D.L.O. + 1" (1/2" glass bite)
Sunshade Brackets at SSG Vertical Mullions	= D.L.O. + 1 1/2" (3/4" glass bite)
Corner Mullions	= See Approved Shop Drawings

CAUTION

Mandatory Installer Requirements for Structural Glazed Applications

The performance and structural integrity of a structural sealant glazed (SSG) framing system is dependent upon proper sealant selection and installation procedures.

Structural sealant selection and application 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 sealant manufacturer's instructions and applied only by trained personnel to surfaces that have been properly prepared.

The structural sealant affixes the glazing infill to the framing system and must not experience adhesive or cohesive failures from structural or environmental project design requirements. The sealant's ability to perform depends on many factors including but not limited to proper sealant selection, surface preparation, infill type, frame finish type, environmental conditions at application and curing, horizontal and vertical system movements, sealant shelf life, cure time, handling, and compatibility of other materials in contact.

Proper adhesion to infill and framing is critical. Structural sealant must be compatible with all materials in contact, including frame finish (paint, anodize, power coating, etc.), glazing materials (gaskets, tapes, sealants, etc.), infill surface (glass, panel, etc.), and cleaning materials. Consult the sealant manufacturer for compatibility assessment, application instructions, and adhesion testing. Special surface preparations such as priming may be required by the sealant manufacturer.

It is the responsibility of the installer to ensure all glazing infills be reviewed and approved by the infill manufacturer for use in SSG applications. Infills include but are not limited to glass, metal panels, stone, etc. Design modifications of the infill may be required for use in SSG applications.





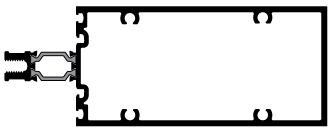
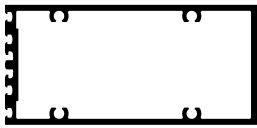
Mandatory Installer Certification Required for 3M VHB Tape Applications

The performance and structural integrity of a VHB tape glazed framing system is dependent upon proper VHB tape selection and installation procedures.



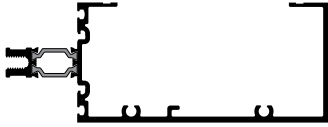
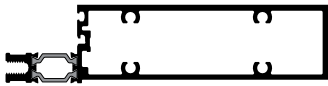
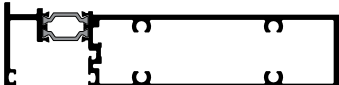
Installers are required to be trained and certified by qualified 3M personnel prior to VHB tape procurement, application, and glass installation. See 3M website (<https://www.3m.com/>) for contact information.

In addition to training and certification, approved shop drawings including design loads, infill type, frame finish, frame sizes, frame installation, and finished sections of the framing must be sent to 3M for approval.

TYPICAL FRAMING EXTRUSIONS



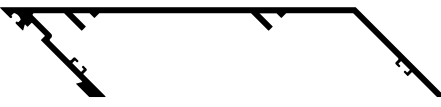
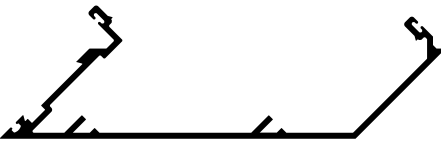
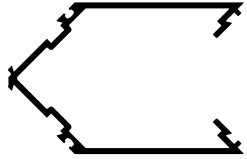
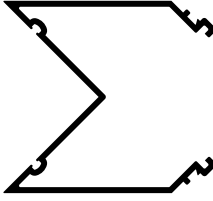
SHAPE	DESCRIPTION	PART No.		
		Dual Glaze	Triple Glaze	
	Captured Mullion Male	3¾" Back Member	A010410	AT010410
		5¼" Back Member	A010510	AT010510
		7¾" Back Member	A010810	AT010810
	Captured Mullion Female	3¾" Back Member	E411TU	E411TU
		5¼" Back Member	E511TU	E511TU
		7¾" Back Member	E811TU	E811TU
	SSG Mullion Male	3¾" Back Member	E430TU	E430TU
		5¼" Back Member	E530TU	E530TU
		7¾" Back Member	E830TU	E830TU
	SSG Mullion Female	3¾" Back Member	E431TU	E431TU
		5¼" Back Member	E531TU	E531TU
		7¾" Back Member	E831TU	E831TU
	Captured Horizontal	3¾" Back Member	A010483	AT010483
		5¼" Back Member	A010583	AT010583
		7¾" Back Member	A010883	AT010883
	SSG Horizontal	3¾" Back Member	E488TU	E488TU
		5¼" Back Member	E588TU	E588TU
		7¾" Back Member	E888TU	E888TU

TYPICAL FRAMING EXTRUSIONS




SHAPE	DESCRIPTION	PART No.		
		Dual Glaze	Triple Glaze	
	Head/Sill	3¾" Back Member	A010481	AT010481
		5¼" Back Member	A010581	AT010581
		7¾" Back Member	A010881	AT010881
	Head/Sill Filler	3¾" Back Member	E162TU	E162TU
		5¼" Back Member	E161TU	E161TU
		7¾" Back Member	E163TU	E163TU
	Open Back Jamb	3¾" Back Member	A010480	AT010480
		5¼" Back Member	A010580	AT010580
		7¾" Back Member	A010880	AT010880
	Upper Expansion Horizontal	3¾" Back Member	A010486	AT010486
		5¼" Back Member	A010586	AT010586
		7¾" Back Member	A010886	AT010886
	Lower Expansion Horizontal	3¾" Back Member	A011486	AT011486
		5¼" Back Member	A011586	AT011586
		7¾" Back Member	A011886	AT011886

**Contact Tubelite for additional system extrusions for enhanced project applications.
Or, visit our web site at: www.tubeliteinc.com/400TU-series-curtainwall .**




CORNER EXTRUSIONS

SHAPE	DESCRIPTION	PART No.		
		Dual Glaze	Triple Glaze	
	90° Outside Female Corner For Captured & SSG Glazing	3¾" Back Member	E440TU	E440TU
		5¼" Back Member	E540TU	E540TU
		7¾" Back Member	E540TU	E540TU
	90° Outside Male Corner For Captured & SSG Glazing	3¾" Back Member	E441TU	E441TU
		5¼" Back Member	E541TU	E541TU
		7¾" Back Member	E541TU	E541TU
	90° Inside Female Corner For SSG Glazing	3¾" Back Member	E451TU	E451TU
		5¼" Back Member	E551TU	E551TU
		7¾" Back Member	E551TU	E551TU
	90° Inside Male Corner For SSG Glazing	3¾" Back Member	E450TU	E450TU
		5¼" Back Member	E550TU	E550TU
		7¾" Back Member	E550TU	E550TU
	90° Outside Corner Adaptor For 10" System Depth Use at E540TU/E541TU corner	E145TU	E145TU	
	90° Inside Corner Adaptor For 10" System Depth Use at E551TU/E550TU corner	E146TU	E146TU	

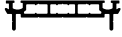





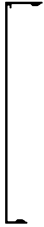


CORNER EXTRUSIONS

SHAPE	DESCRIPTION	PART No.	
		Dual Glaze	Triple Glaze
	90° Outside Corner Adaptor For SSG Glazing	E147TU	E147TU
	90° Inside Corner Adaptor For SSG Glazing	E150TU	E150TU
	90° Outside Corner Adaptor	A140326	AT140326

PRESSURE PLATES and COVERS

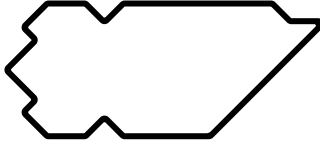
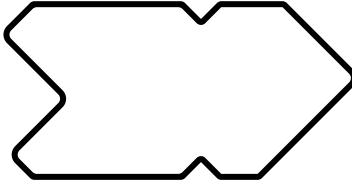
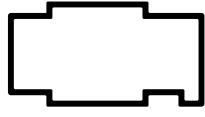

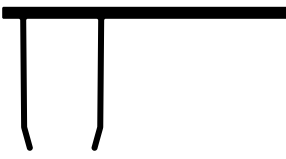
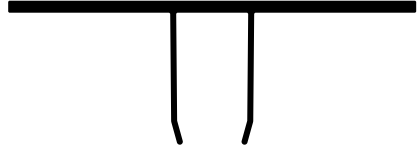
SHAPE	DESCRIPTION	PART No.	
		Dual Glaze	Triple Glaze
	Typical Pressure Plate Aluminum	M300TU	M300TU
	Perimeter Pressure Plate Aluminum	M301TU	M303TU
	Exp Horizontal Pressure Plate Aluminum	M305TU	M305TU

PRESSURE PLATES and COVERS









SHAPE	DESCRIPTION	PART No.	
		Dual Glaze	Triple Glaze
	Typical Pressure Plate Polyamide	P4633	P4633
	Typical Pressure Plate Thermal	PTB120	PTB120
	Standard Face Cover Aluminum Pressure Plate Only	E4TB64	E4TB64
	Face Cover Thermal Pressure Plate Only	E3193	E3193
	Face Cover Polyamide Pressure Plate Only	E031TU	E031TU
	Face Cover Thermal Pressure Plate Only	E325TU	E330TU
	Face Cover Expansion Horizontal	E032TU	E032TU
	Interior Trim Expansion Horizontal	E040TU	E040TU
	Interior Trim Clip Expansion Horizontal	P4646	P4646

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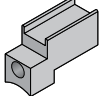
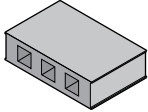
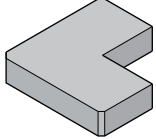
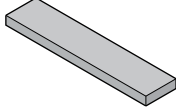
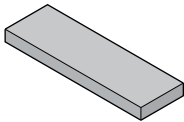

SPLICE SLEEVES and MULLION ANCHORS

SHAPE	DESCRIPTION	PART No.		
		Dual Glaze	Triple Glaze	
	90° Outside Corner Splice	3 ³ / ₄ " Back Member	P4697	P4697
		5 ¹ / ₄ " Back Member	P4625	P4625
		7 ³ / ₄ " Back Member	P4625	P4625
	90° Inside Corner Splice	3 ³ / ₄ " Back Member	P4698	P4698
		5 ¹ / ₄ " Back Member	P4624	P4624
		7 ³ / ₄ " Back Member	P4624	P4624
	Captured & SSG Vertical Splice	3 ³ / ₄ " Back Member	P4695	P4695
		5 ¹ / ₄ " Back Member	P4626	P4626
		7 ³ / ₄ " Back Member	P4696	P4696
	Face Cover Splice	3 ³ / ₄ " Back Member	P1628A	P1628A
		5 ¹ / ₄ " Back Member	P1628A	P1628A
		7 ³ / ₄ " Back Member	P1628A	P1628A
	F Anchor at Jamb	3 ³ / ₄ " Back Member	P4653	P4653
		5 ¹ / ₄ " Back Member	P4617	P4617
		7 ³ / ₄ " Back Member	P4654	P4654
	T Anchor for Captured & SSG Verticals	3 ³ / ₄ " Back Member	P4704	P4704
		5 ¹ / ₄ " Back Member	P4619	P4619
		7 ³ / ₄ " Back Member	P4656	P4656
	T Anchor 90° Outside Corner	3 ³ / ₄ " Back Member	P4702	P4702
		5 ¹ / ₄ " Back Member	P4618	P4618
		7 ³ / ₄ " Back Member	P4618	P4618
	T Anchor 90° Inside Corner	3 ³ / ₄ " Back Member	P4703	P4703
		5 ¹ / ₄ " Back Member	P4620	P4620
		7 ³ / ₄ " Back Member	P4620	P4620

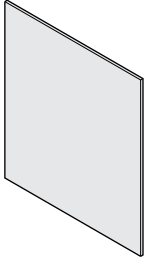
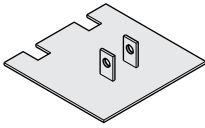
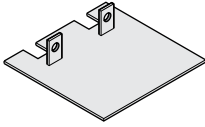
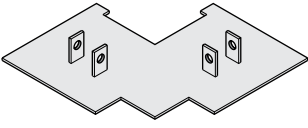
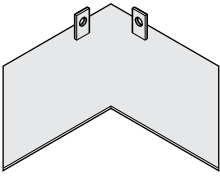
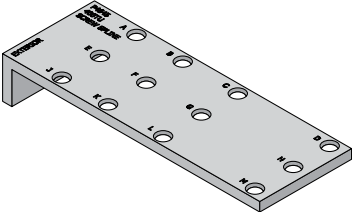
MISCELLANEOUS EXTRUSIONS

SHAPE	DESCRIPTION	PART No.	
		Dual Glaze	Triple Glaze
	Glazing Horn SSG Vertical	A010149	AT010149
	Pocket Filler Dual Glaze	T311TU	
	Pocket Filler Triple Glaze		T310TU
	Thermal Door Jamb	A626667	A626667
	Thermal Door Jamb Stop	E6268	E6268
	Female Mullion Glazing Fin (Pre-Glazing Only)	E111TU	E131TU
	Setting Chair	P5123	P5136
	4" Lg Anti-Buckling Clip	P4615	P4615











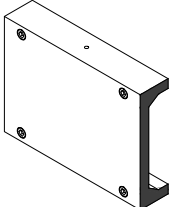
ACCESSORIES

SHAPE	DESCRIPTION	PART NUMBER		
		DUAL GLAZE	TRIPLE GLAZE	
	PVC Perimeter Filler Tube	P4607	P4622	
	Thermal Isolator Gasket	P4605	P4605	
	Glazing Gasket for Captured	P4606	P4606	
	Spacer Gasket for SSG	P4631	P4631	
	Exterior Wedge Gasket for Expansion Horizontal	P2501	P2501	
	Wiper Gasket for Pressure Plate at Expansion Horizontal	P4630	P4630	
	Water Dam for Captured	P4601	P4613	
	Pre-Glaze Water Dam	P4600	P4691	
	Water Dam for SSG	P4602	P4633	
	Water Dam for 90° Inside Corner / SSG	P4614	P4664	
	Setting Block	Silicone	P5103S	P5112S
		EPDM	P5103	P5112
	Edge Block	Silicone	P4629	P4629
		EPDM	P4628	P4628
	OS 90 Deg SSG Corner Glazing Tape for 1" & 1 3/4" Glass	P4648	P4648	

ACCESSORIES

SHAPE	DESCRIPTION	PART NUMBER	
		DUAL GLAZE	TRIPLE GLAZE
	Nylatron Slip Pad for Steel Anchor Locations	P4608	P4608
	End Cap for Captured Mullion	P4609	P4666
	End Cap for SSG Mullion	P4635	P4667
	End Cap for 90° Outside Corner	P4610	P4668
	End Cap for 90° Inside Corner	P4611	P4669
	Drill Guide	P4645	P4645

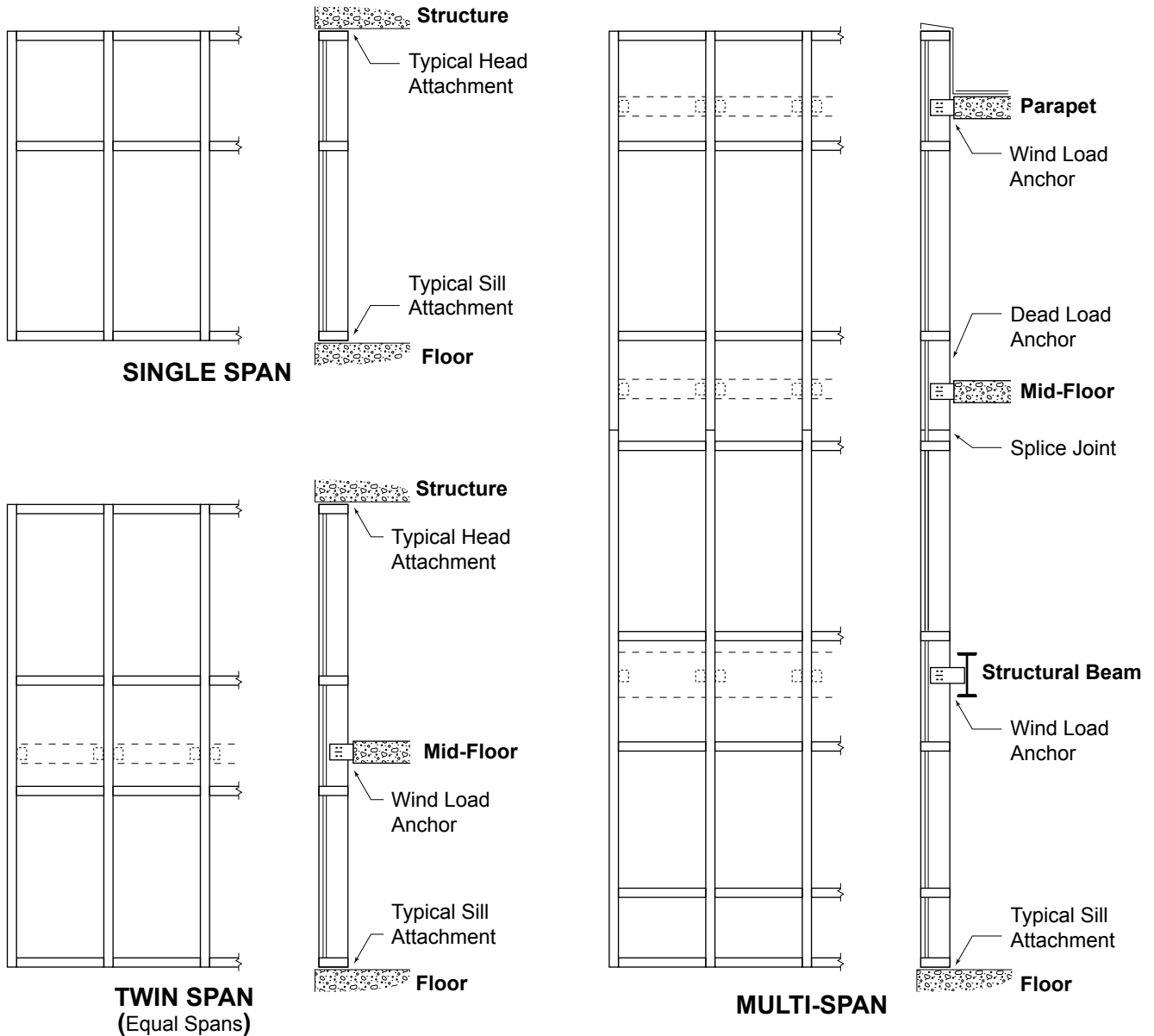
FASTENERS

SHAPE	DESCRIPTION	PART No.
	#10 x 5/8" PH type 'B' Attachment of A010140 to Corner Mullion	S017
	#10 x 5/8" FH type 'B' Attachment of E148TU to Corner Mullion	S192
	#12-24 x 1" HH Door Frame Attachment	S204
	#10-24 x 3/4" PH type '23' Attachment of Glazing Horn to SSG Mullion	S270
	1/4-20 x 1 1/2" HWH type 'F' Attachment of Shear Clip to Mullion	S359
	1/4-20 x 3/4" HWH type 'CA' Attachment of Shear Clip to Corner Mullion	S369
	1/4-20 x 1" HWH 18-8 TEK Pressure Plate Screw	S403
	#12-14 x 1 1/2" HWH 18-8 TEK Pressure Plate Screw	S425
	#10-16 x 3/4" HWH TEK Interior Trim at Expansion Horizontal	S441
	1" O.D. Flat Washer 18-8 Use at Polyamide Pressure Plate Screws	S437
	Drill Jig for PTB120 Thermal Pressure Plate	PTB138

ELEVATION TYPES

TYPES OF CURTAIN WALL INSTALLATION

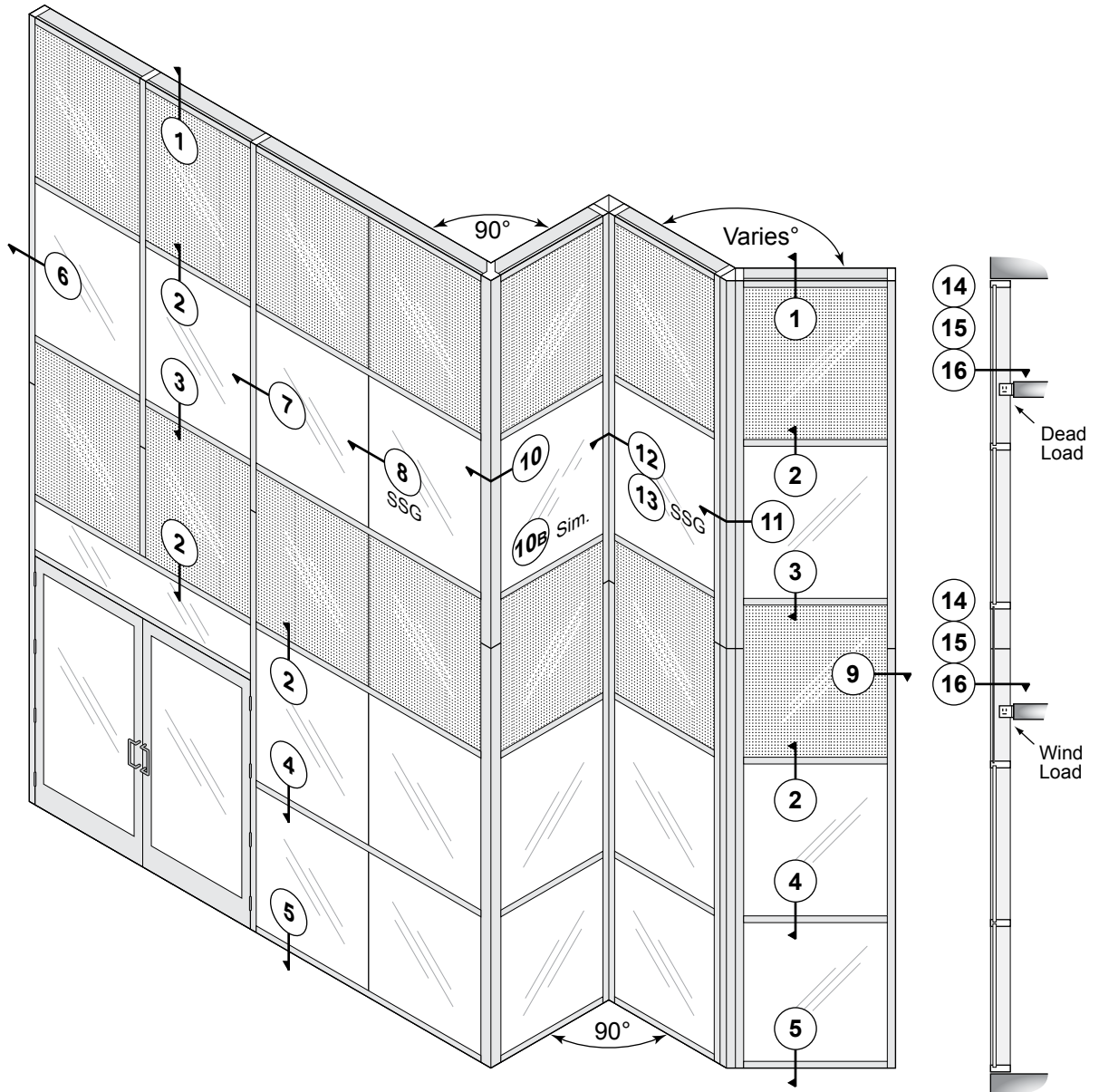
The 400TU Series Screw Spline curtain wall system can be constructed a variety of ways. The most common are single span, twin span and multi-span as illustrated below. Refer to approved shop drawings for specific guidance on splicing and anchoring. Each bay can be assembled and pre-sealed in the shop, with 'ladder' frames for erection on the jobsite.



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

Fig. 16.1

ELEVATION and WALL SECTIONS



ELEVATION

WALL SECTION

Fig. 17.1

HORIZONTAL DETAILS



Fig. 18.1

VERTICAL DETAILS

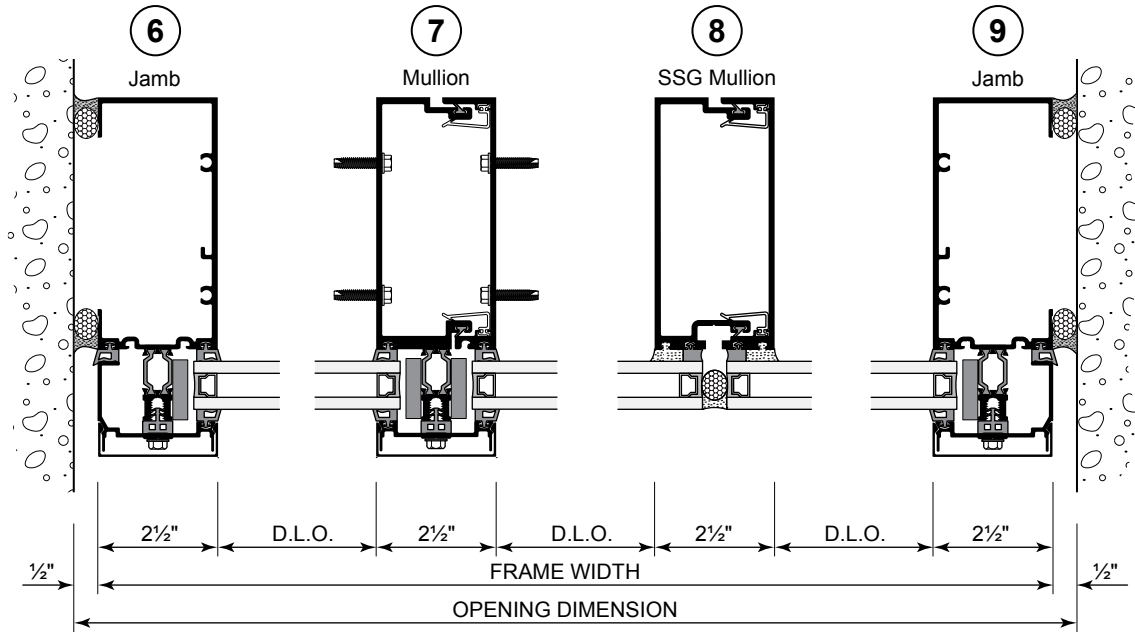
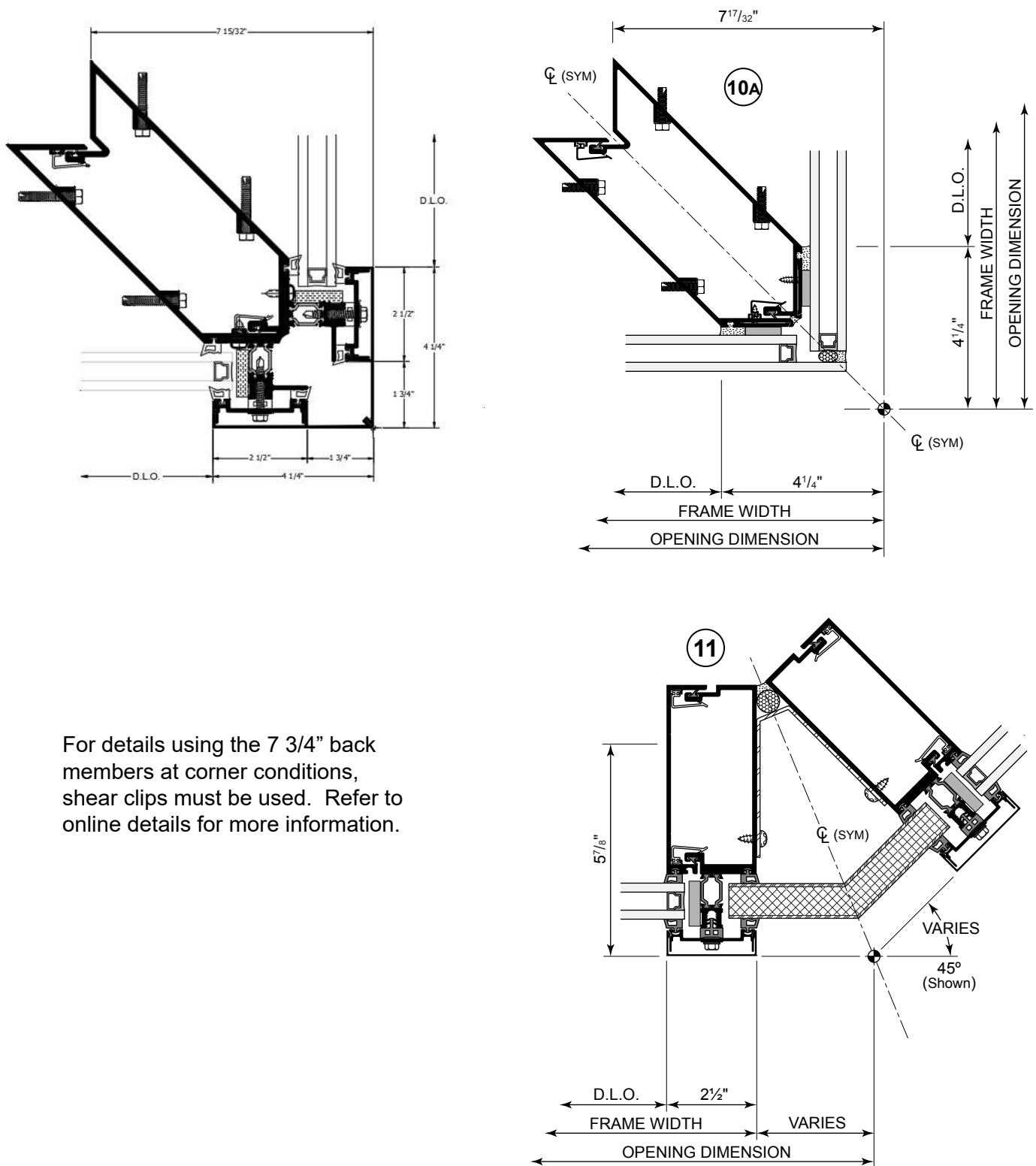


Fig. 19.1

CORNER DETAILS



For details using the $7\frac{3}{4}$ " back members at corner conditions, shear clips must be used. Refer to online details for more information.

Fig. 20.1

CORNER DETAILS

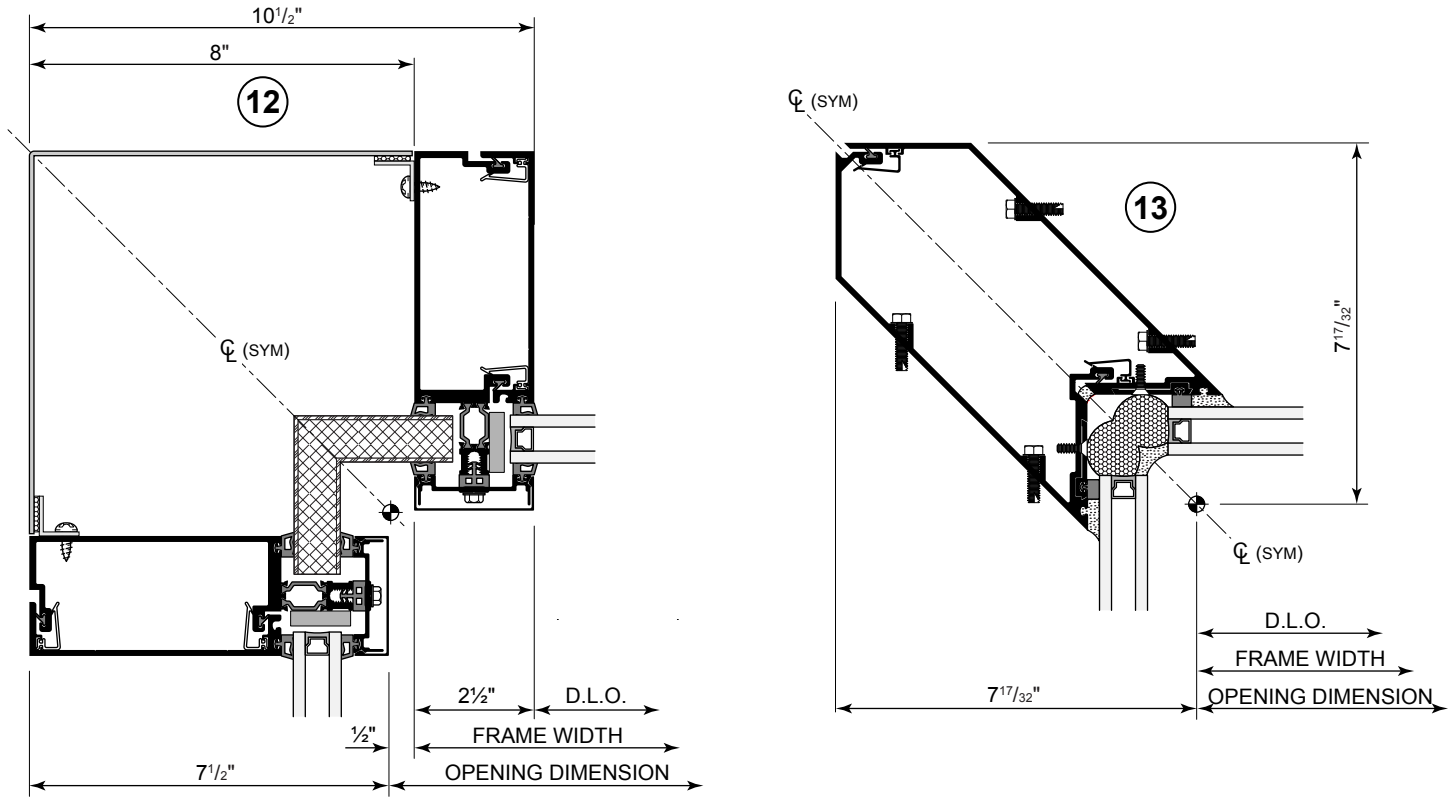


Fig. 21.1

For details using the 7 3/4" back members at corner conditions, shear clips must be used. Refer to online details for more information.

MID-SPAN ANCHOR DETAILS

Anchor details on pages 19 through 21 represent one of several methods of anchoring. Refer to approved shop drawings for job specific applications.

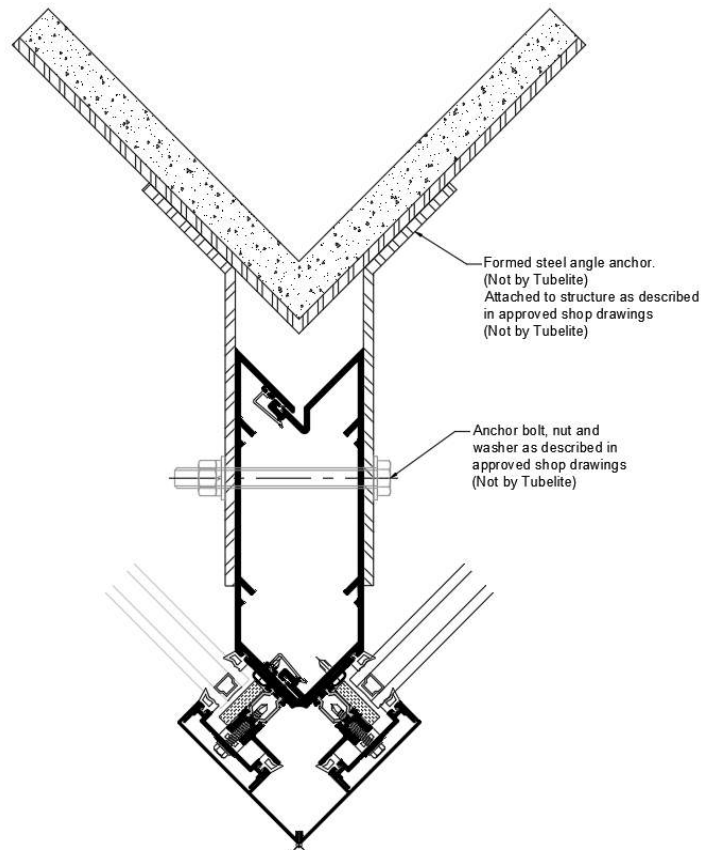
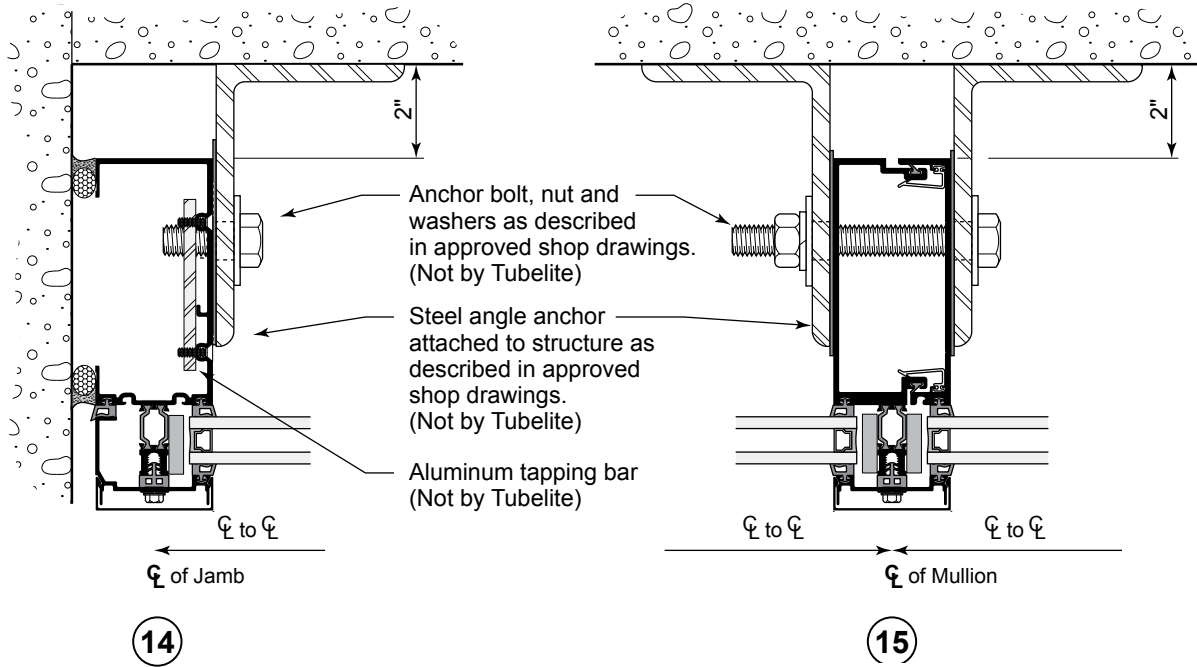


Fig. 22.1

MID-SPAN ANCHOR DETAILS

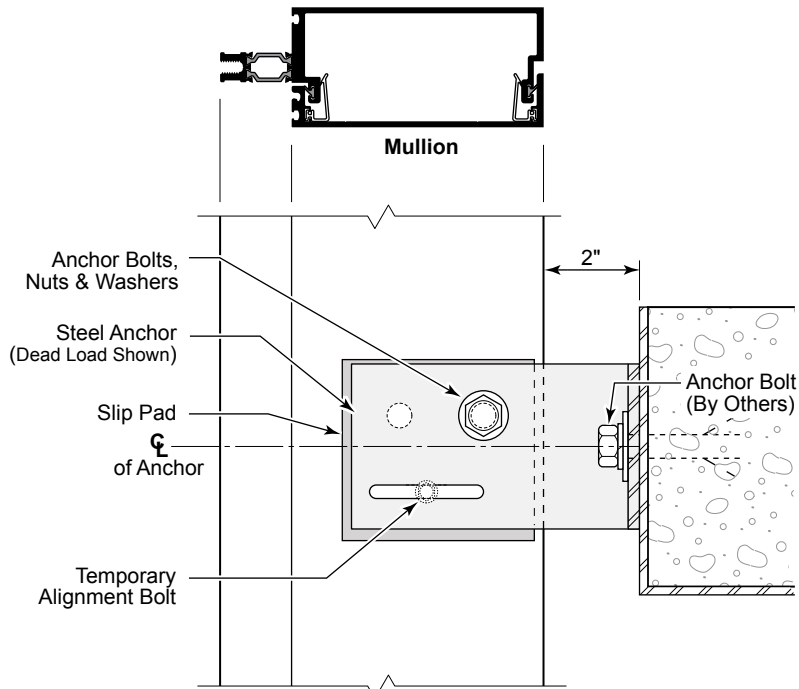


Fig. 23.1

Mullion Anchor Side View

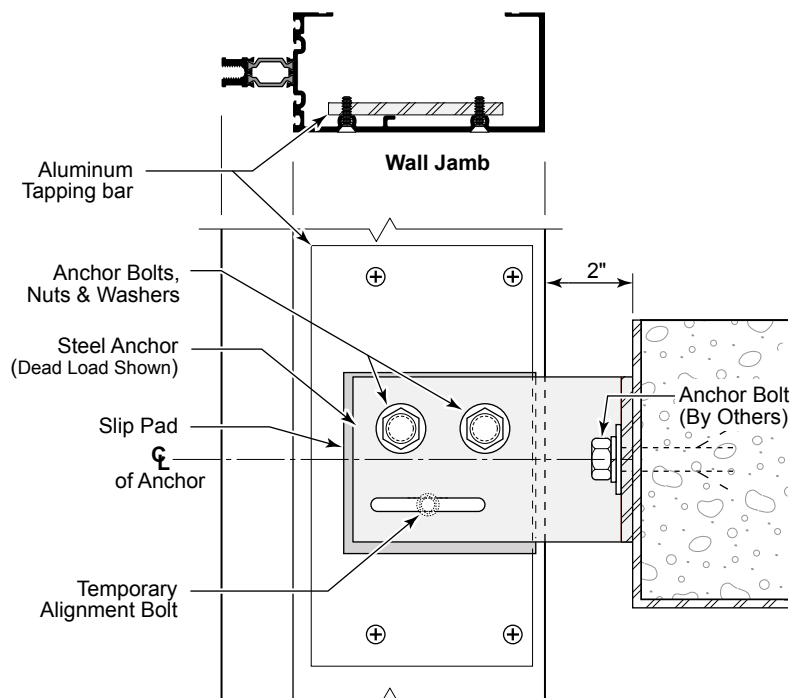


Fig. 23.2

Jamb Anchor Side View

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.

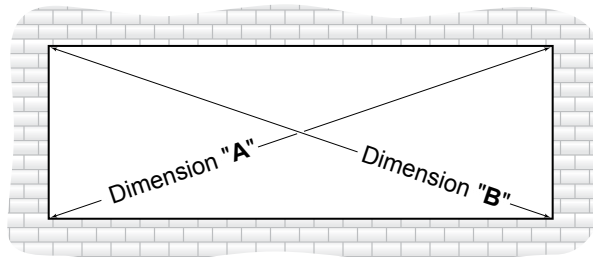


Fig. 24.1 Dimension "A" = "B"

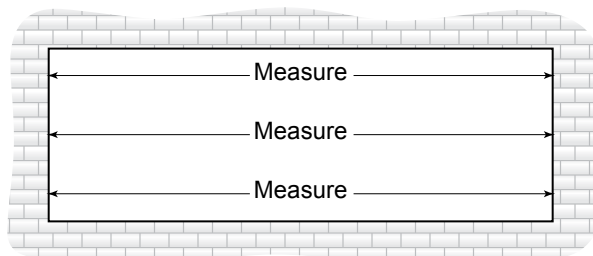


Fig. 24.2

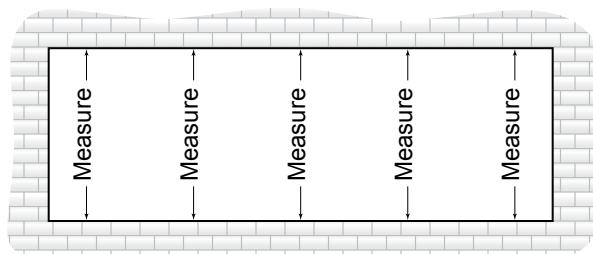


Fig. 24.3

FRAME FABRICATION

Step 2: Cut Materials to Size

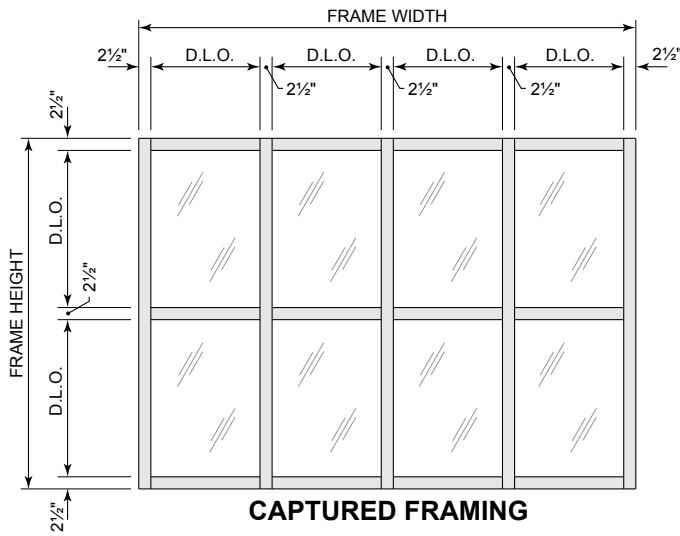


Fig. 25.1

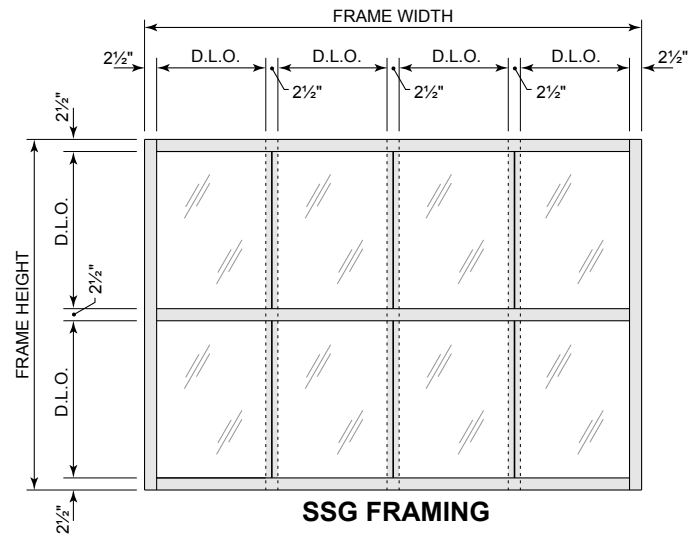


Fig. 25.2

Framing Members

Verticals
 Head, Horizontal & Sill
 Vertical Pressure Plates

Vertical Face Covers

Horizontal Pressure Plates
 Horizontal Pressure Plates @ SSG Vert
 Horizontal Face Covers
 Horizontal Face Covers @ SSG Vert
 Expansion Horizontal Trim
 Horizontal Glazing Adaptors
 Vertical Glazing Adaptors
 Pocket Filler at Perimeter
 (for use with P4633 polyamide and PTB120 thermal pressure plate)

Frame Height *

D.L.O.

Frame Height *

Note: At the vertical pressure plates below an expansion horizontal joint, cut the pressure plate 1" below the D.L.O. At the vertical pressure plates above an expansion horizontal joint, cut the pressure plate to be flush with the bottom of the lower expansion horizontal.

Frame Height *

Note: At the vertical pressure plates below an expansion horizontal joint, cut the pressure plate 15/16" below the D.L.O. At the vertical face cover above an expansion horizontal joint, cut the face cover to be flush with the bottom of the lower expansion horizontal.

D.L.O. – 3/8"

3 Lites Wide Maximum *

D.L.O. – 1/16"

3 Lites Wide Maximum *

Frame Width (Splice as Needed)

D.L.O. – 1/16"

D.L.O. + 1"

D.L.O. – 1/16"

Accessories

Exterior Vertical Gasket
 Interior Vertical Gasket
 Interior Horizontal Gasket
 Silicone Spacer Gasket (SSG Vert)

Pressure Plate Length + Allowance*

D.L.O. + 1" + Allowance*

D.L.O. + Allowance*

D.L.O. + 1" + Allowance*

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

* Note: For splicing cutting allowances see: step 7, page 31; step 14, page 53.

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

FRAME FABRICATION

Step 3: Drill Holes in Vertical Members for Assembly Screws

- A. Drill .258" diameter clear holes for 1/4" screws in the vertical members according to holes labeled on the P4645 drill fixture:
- a. Head & Sill members – A, J for sill and G, L for head at 3 3/4" back members
 A, B for sill and G, H for head at 5 1/4" back members
 A, C for sill and G, I for head at 7 3/4" back members
 - b. Intermediate Horizontals – A, J, G, L at 3 3/4" back members
 A, B, G, H for 5 1/4" back members
 A, C, G, I for 7 3/4" back members
 - c. Expansion Horizontals – A, J, D, K for 3 3/4" back members
 A, B, D, E for 5 1/4" back members
 A, C, D, F for 7 3/4" back members

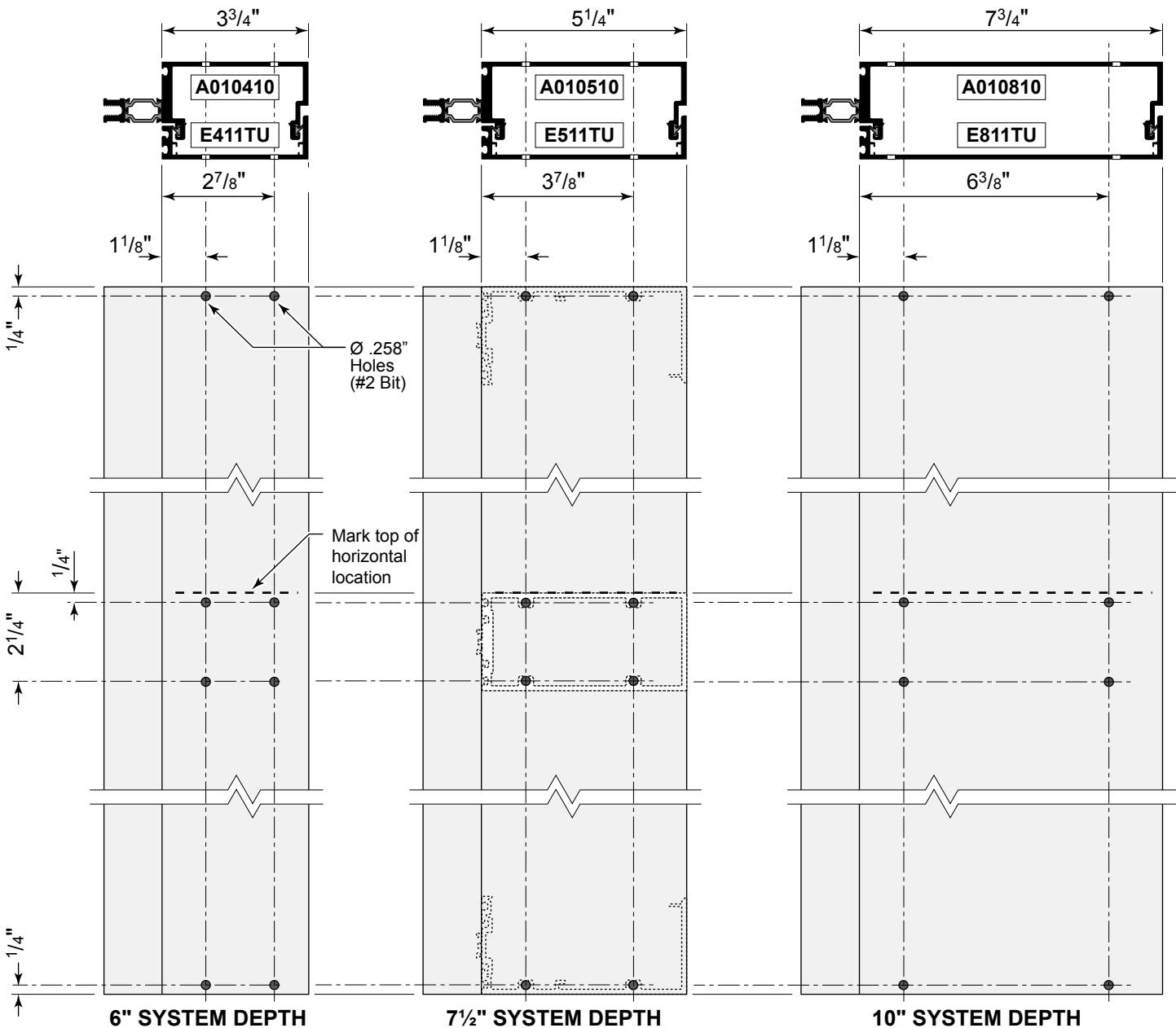


Fig. 26.1

FRAME FABRICATION

Step 4: Fabricate Horizontal Pressure Plates

- Drill two 5/16" diameter weep holes per horizontal pressure plate at 1/8 points at each end. Locate the holes on the V-groove above the center line of the pressure plate. See **Fig. 27.1**
- Aluminum pressure plates are factory punched on center for pressure plate screws. POLYAMIDE PRESSURE PLATES DO COME FROM THE FACTORY PRE-PUNCHED. Drill additional hole(s) as required to ensure a maximum of 2" from the ends of the plates and at horizontal/vertical intersections. See **Fig. 49.1** for instructions regarding polyamide pressure plate anchor holes at these intersections.
- 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.

Step 5: Fabricate Weep Holes in Horizontal Face Covers

- Fabricate (1) 5/16" weep hole on the bottom center of each horizontal face cover.

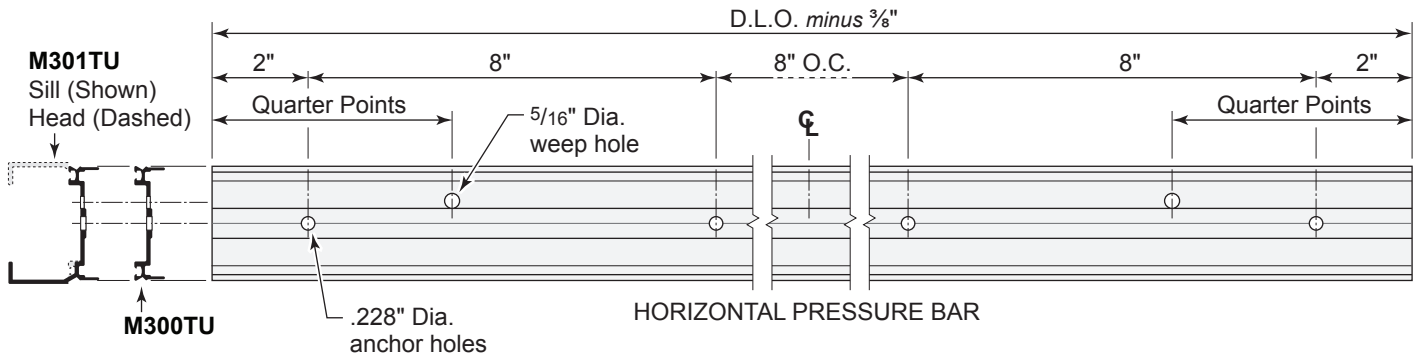


Fig. 27.1

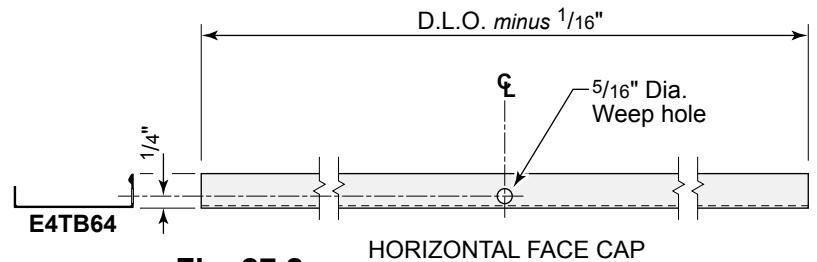
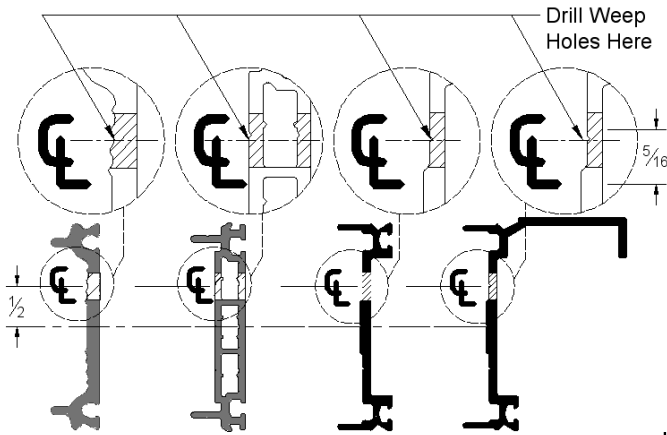


Fig. 27.2

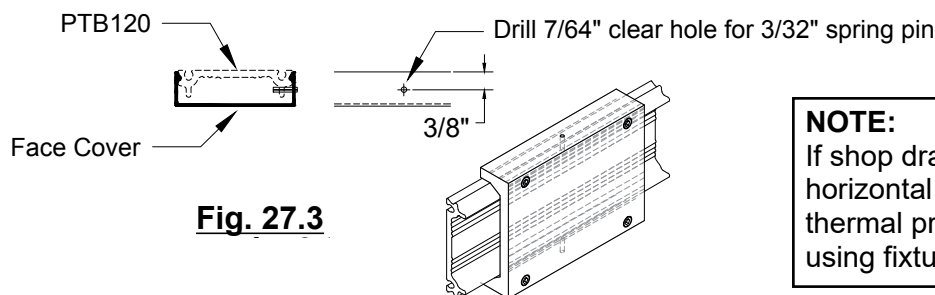


Fig. 27.3

NOTE:

If shop drawings call for pinning the horizontal and/or vertical face covers to the thermal pressure plate PTB120, drill holes using fixture PTB138 shown in **Fig. 27.3**

FRAME ASSEMBLY

Step 6: Assemble Bays

- A. Starting with the left jamb of the opening, lay out the verticals and horizontals for correct assembly of the bay.
- B. Seal ends of the horizontals prior to attaching to the verticals.
- C. Assemble the horizontals to the verticals with S403, 1/4-20 x 1" HWH. Tool excess sealant at the joints.

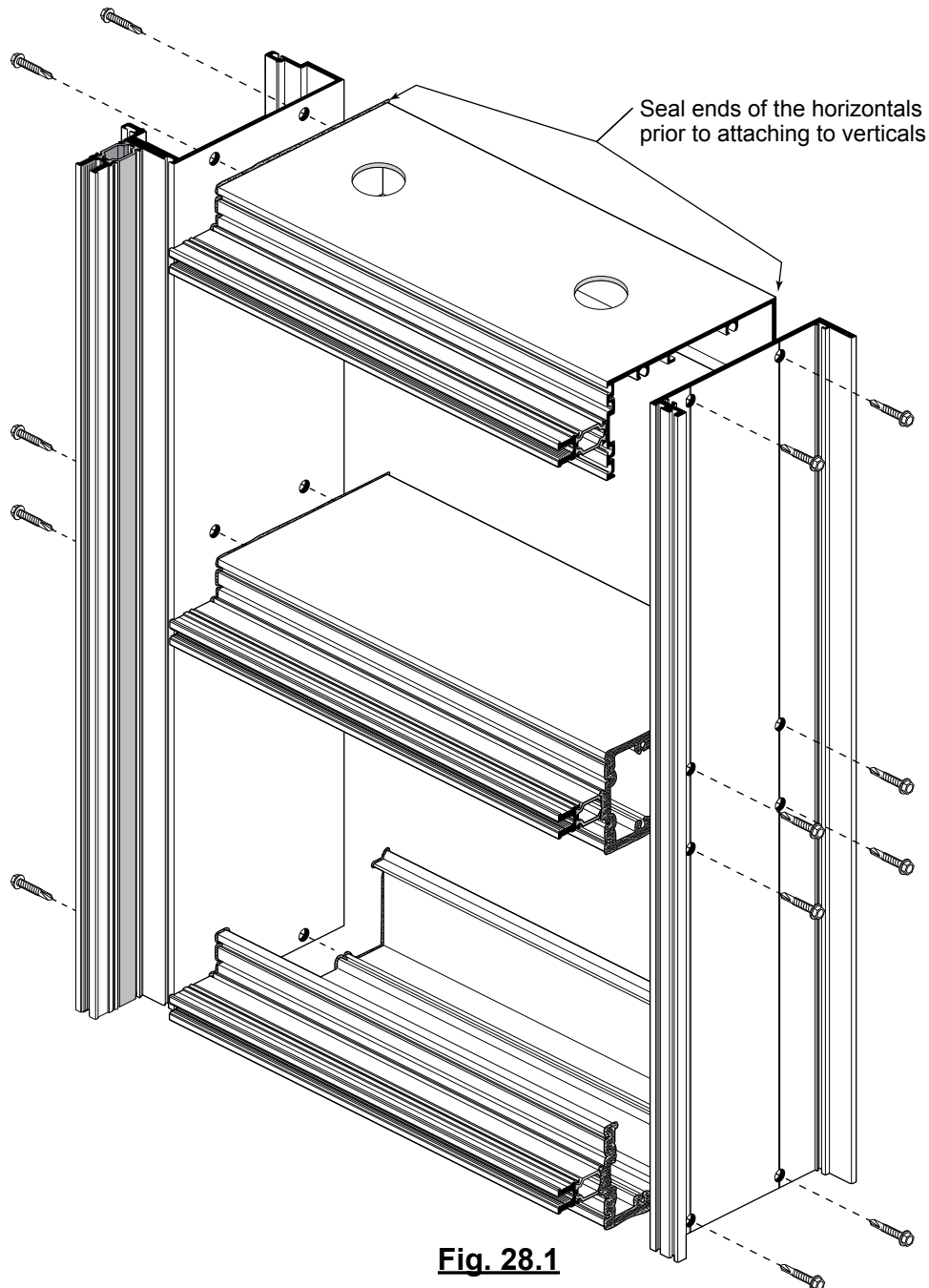


Fig. 28.1

FRAME ASSEMBLY

- D. Install P4630 wiper gasket continuous into the front and back of each male vertical member. Crimp ends of mullion at wiper gasket to lock into place. See **Fig. 29.1**.
- E. Install P4615 anti-buckling clips into female vertical members. Crimp in place at locations per approved shop drawings. See **Fig. 29.2**.
- F. If steel reinforcing is required, install per approved shop drawings. If T and F anchors are utilized, cut steel short at the top and bottom of the vertical for clearance. Locate and prep for attachment of steel at the horizontals where possible. Fasteners and spacing per approved shop drawings (not by Tubelite). See **Fig. 29.3**.

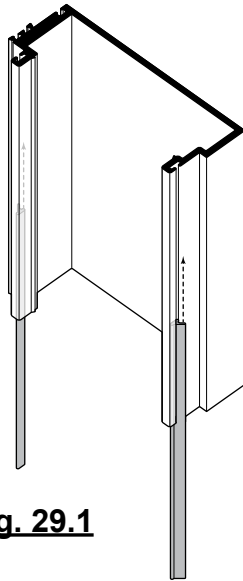
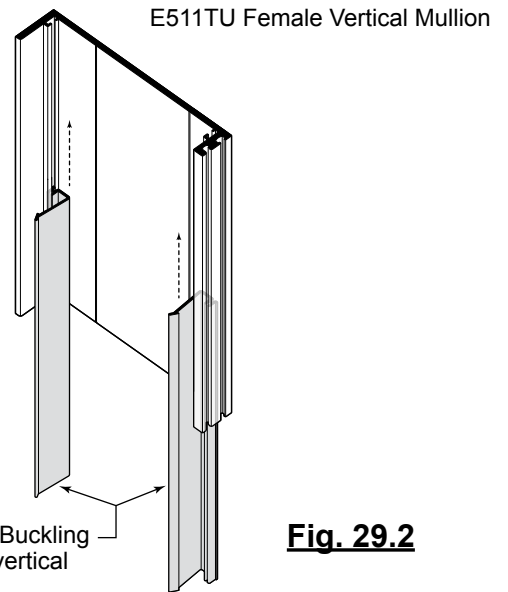


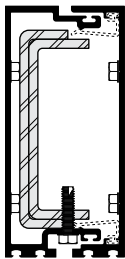
Fig. 29.1



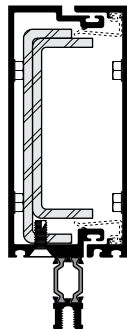
Insert P4615 Anti-Buckling Clips into female vertical members

Fig. 29.2

SSG Mullion

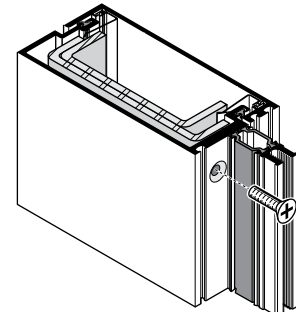
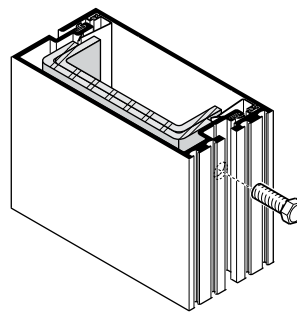


Captured Mullion



Drill and tap for fastener as required. Countersink for flat head screw at Captured Mullion.

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



Locate fasteners per approved shop drawings. Fasteners can also be located at the centerline of the horizontals.

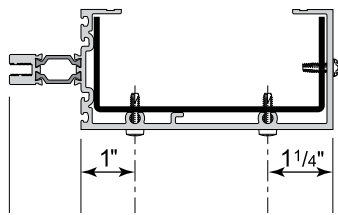
TYPICAL APPLICATION

Fig. 29.3

FRAME ASSEMBLY

Step 7: Splice Sleeve Attachment

- Consult approved shop drawings for number and size of fasteners required to attach the splice sleeve to the verticals.
- Drill holes on both sides of the lower vertical in the locations shown on the approved shop drawings.
- Slide the splice sleeve into the upper vertical mullion. Tape the sleeve into position temporarily until verticals are erected. See **Fig. 30.2**.
- When using the expansion horizontal, a 1 1/2" joint can be accommodated between the upper and lower verticals. See above for application of splice sleeves. See **Fig. 30.3**.



Note: Locate anti-buckling clips so as not to interfere with the splice sleeves

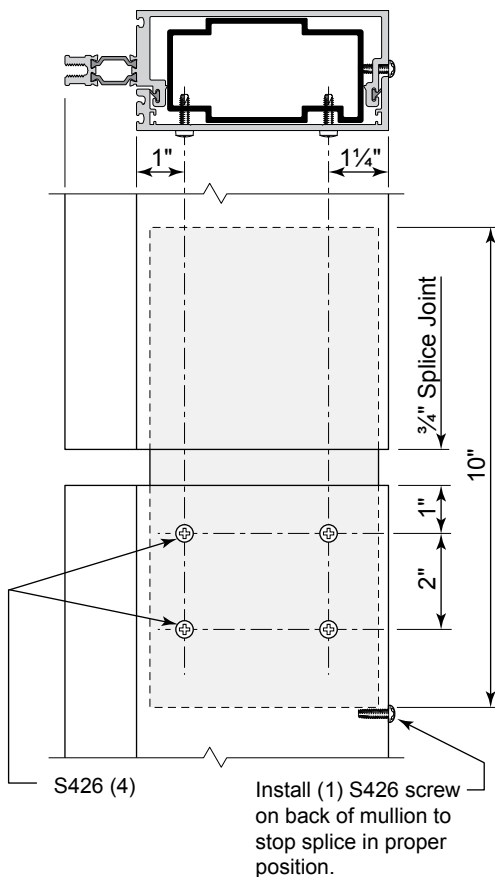
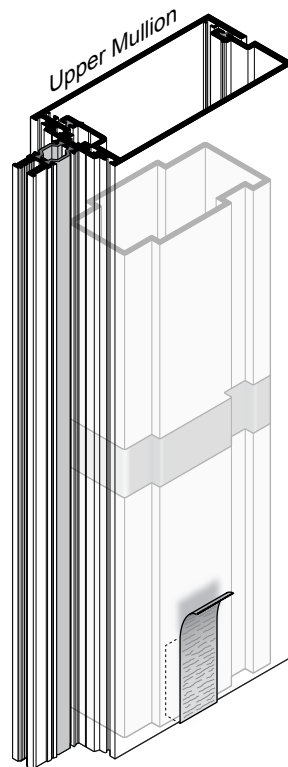
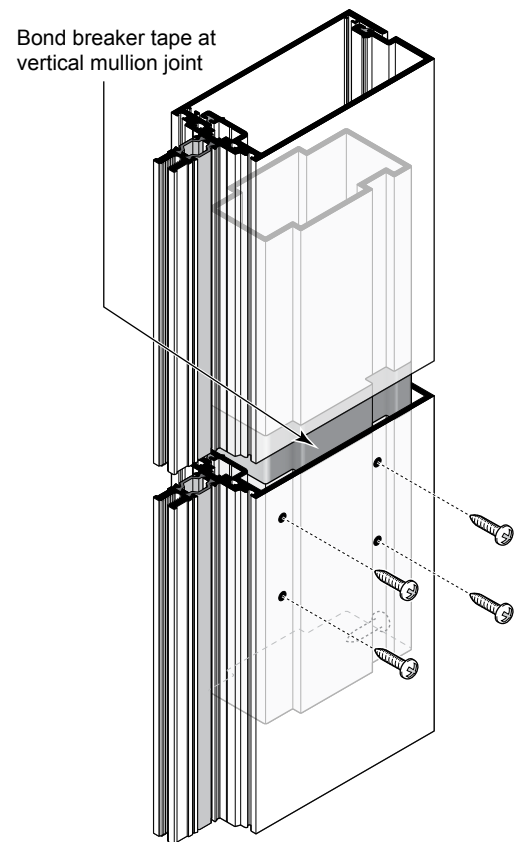


Fig. 30.1



Slide splice sleeve assembly into bottom of upper mullion and tape in place.

Fig. 30.2



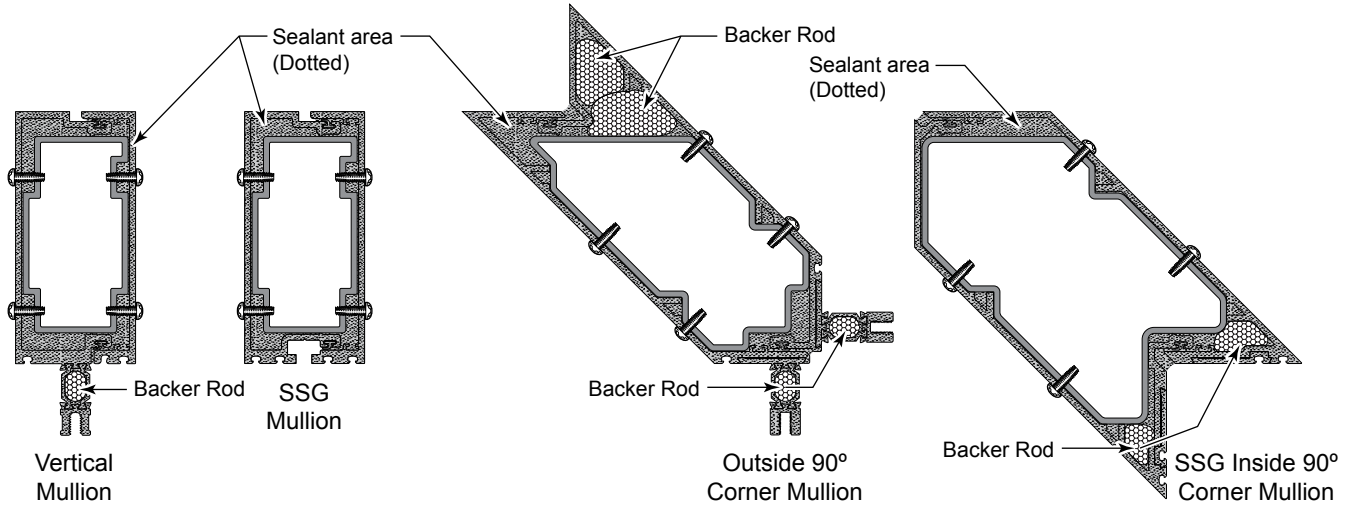
Remove tape to allow splice sleeve to drop into lower mullion and fasten in place.

Fig. 30.3

FRAME ASSEMBLY

Step 7: Splice Sleeve Attachment (continued)

F. Apply sealant over bond breaker tape at joint and screw heads. Tool sealant. See **Fig. 31.2**.



Insert backer rod into large voids and apply sealant to splice joint over bond breaker tape.

Fig. 31.1

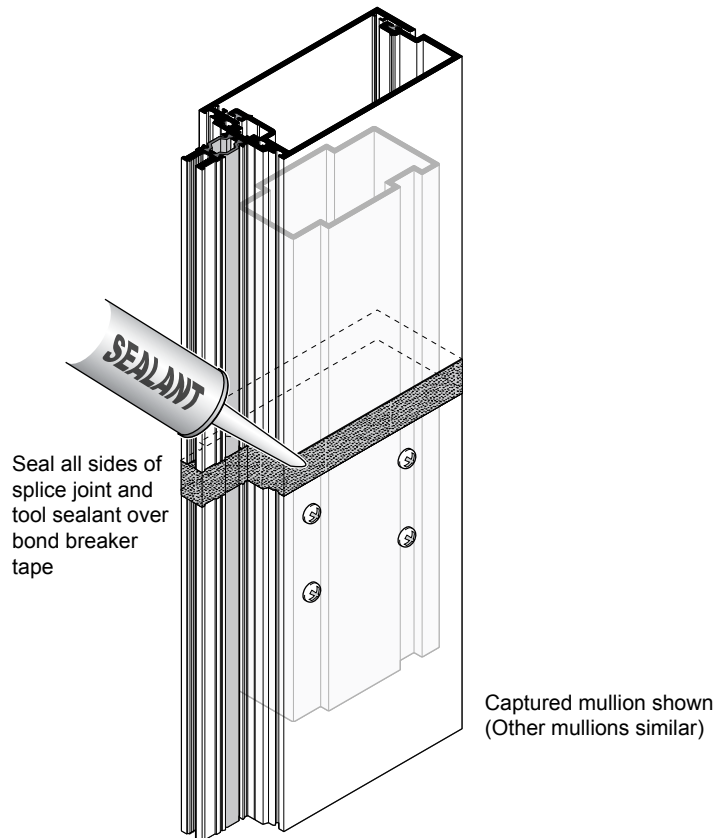
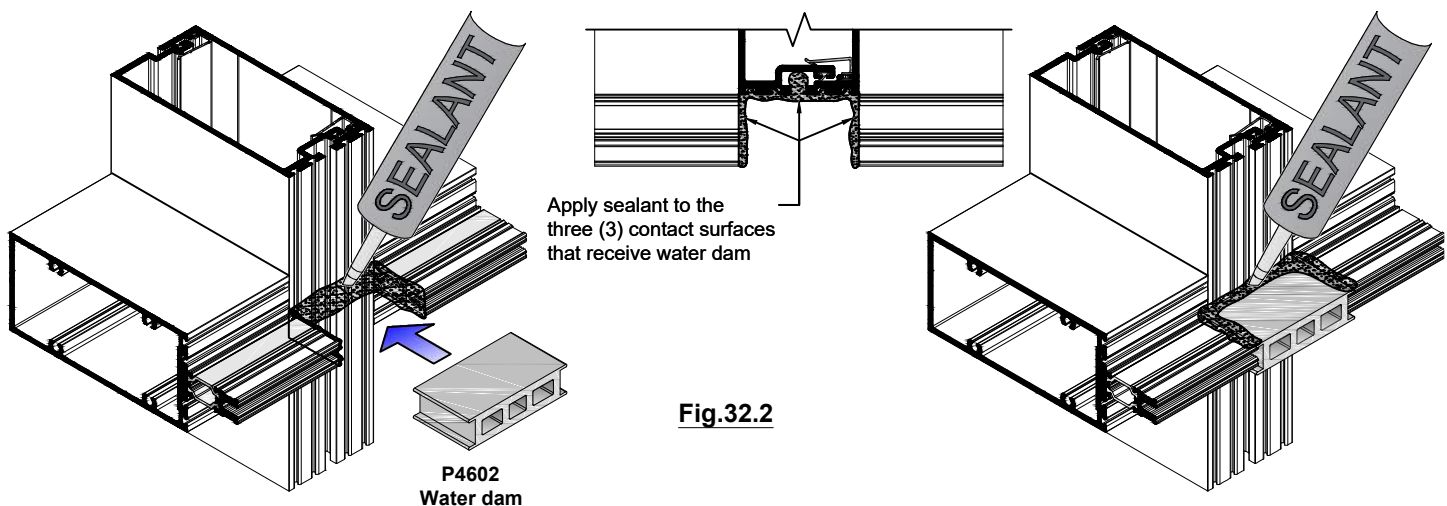
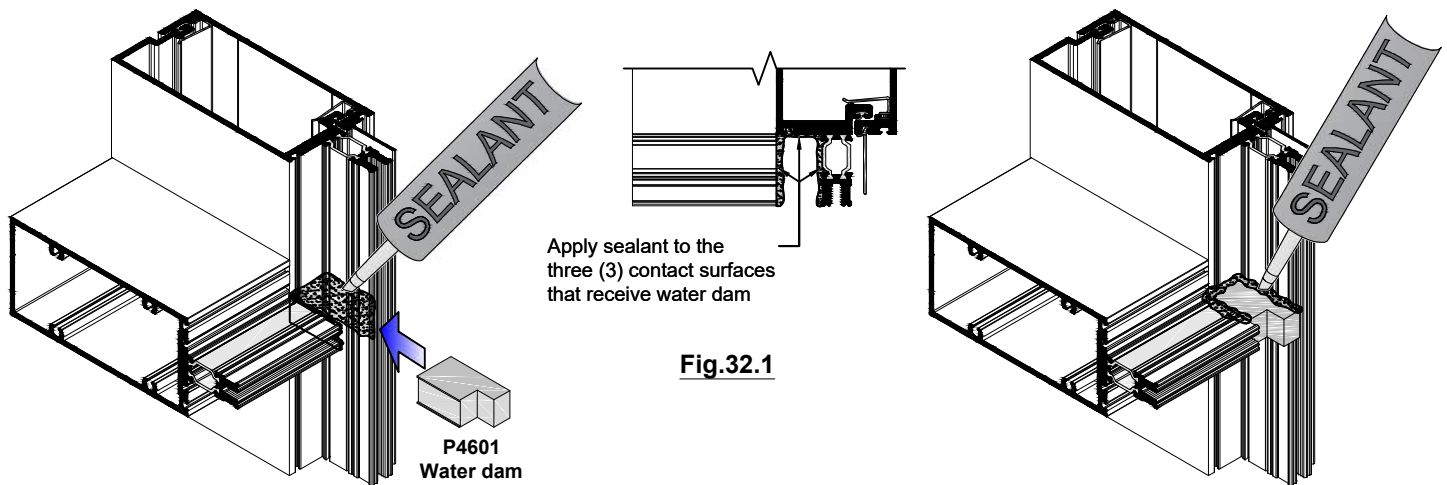


Fig. 31.2

FRAME ASSEMBLY

Step 8: Install Water Dams

- Seal the end of the horizontal member across the vertical member. This sealant should be applied liberally. See **Fig. 32.1** & **Fig. 32.2**. Note: Both upper and lower horizontals at expansion horizontal are to receive water dams.
- Push the water dam into the void between the horizontal member and the vertical tongue. This is a pressure fit.
- After the water dam is in place, apply silicone between the top of the dam and end of horizontal, tooling over the end dam for a water tight seal. Seal over the top of the water dam onto the horizontal tongue, damming the end of the horizontals. **THIS IS A CRITICAL SEAL.**
- For vertical SSG applications, water dams must be installed after frames are erected. Follow the same sealing procedures as with a captured system noted above. See **Fig. 32.2**.



FRAME ASSEMBLY

Step 8: Install Water Dams (continued)

- E. For pre-sealing captured mullion frames: Water dams can be pre-applied to each bay in the shop before transporting to the jobsite. Follow the same sealing procedures as with a captured system noted above. See Fig. 34.1.

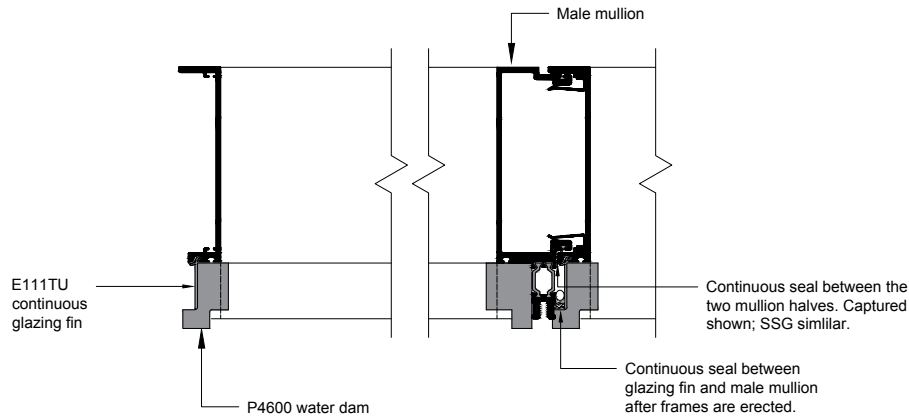


Fig. 33.1

Step 9: Installing Gaskets

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

- Remove any debris from the glazing pockets and reglets.
- Install P4606 gasket into vertical mullions. See Fig. 33.2 and Fig. 34.3. Vertical mullion gaskets run beyond the horizontals. The vertical gasket will run through the vertical splice joint, set in fresh sealant at the splice. Notch darts off the gasket as required for proper fit.
- Install P4606 gasket into the horizontals.
- Install P4605 isolator gasket into vertical and horizontal tongues. The isolator will run through the vertical splice joints.

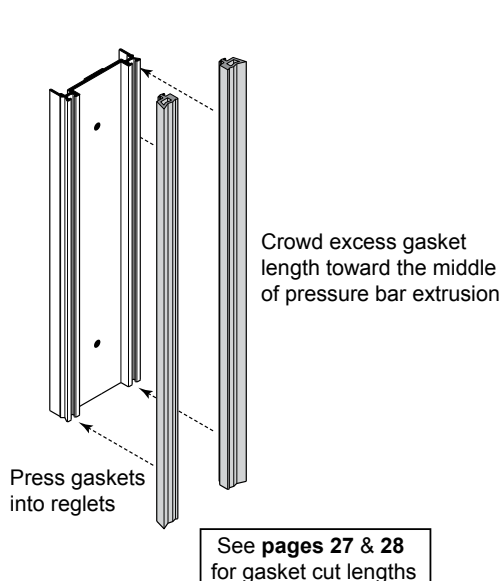


Fig. 33.2

Typical with vertical and horizontal gaskets.

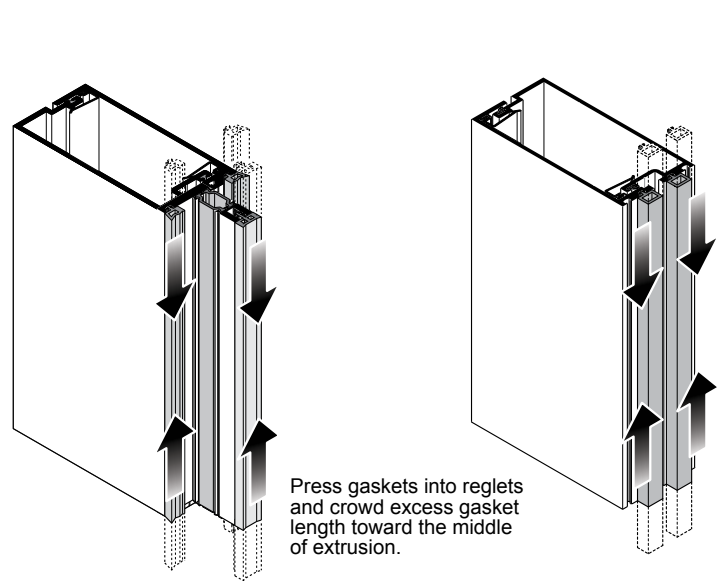


Fig. 33.3

FRAME ASSEMBLY

Step 9: Installing Gaskets (continued)

- E. For SSG vertical applications, install the P4631 SSG spacer gasket into vertical mullion with equal overlap into each horizontal pocket. See **Fig. 34.2** and **Fig. 35.1**.
- F. For pre-glazing applications, install P4631 SSG spacer gasket at the interior reglet of all captured and SSG mullions. See **Fig. 35.1**. **Note:** The 400TU Screw Spline system is designed for limited pre-glazing and is not intended to be a fully unitized system. Consider weight, staging and handling issues when determining whether pre-glazing is the correct method for a given application.

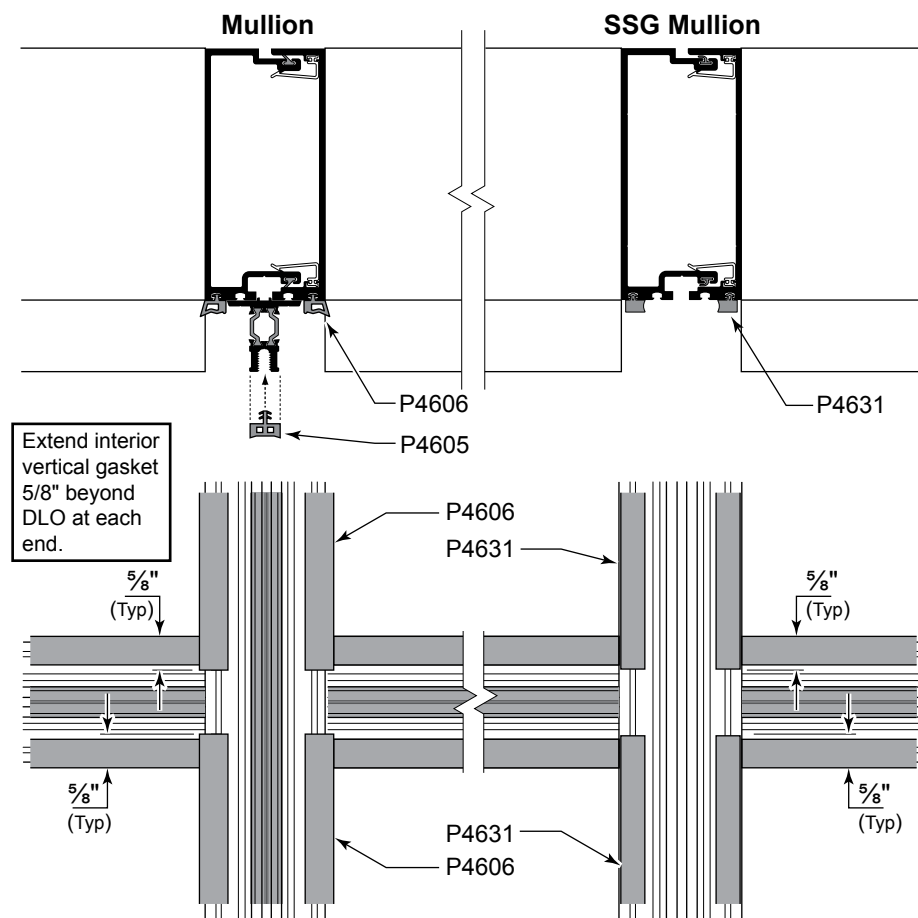


Fig. 34.1

FRAME ASSEMBLY

Step 9: Installing Gaskets (continued)

Optional Pre-Glazing Procedure:

- A. Set frame on a horizontal surface, glass side up. Frame must be square.
- B. Thoroughly clean edges of glass and frame where silicone will be contacting.
- C. Install glazing fin (E111TU, dual glaze; E131TU triple glaze) full length of the female vertical mullion. Crimp in place as required. See **Fig. 35.2**.

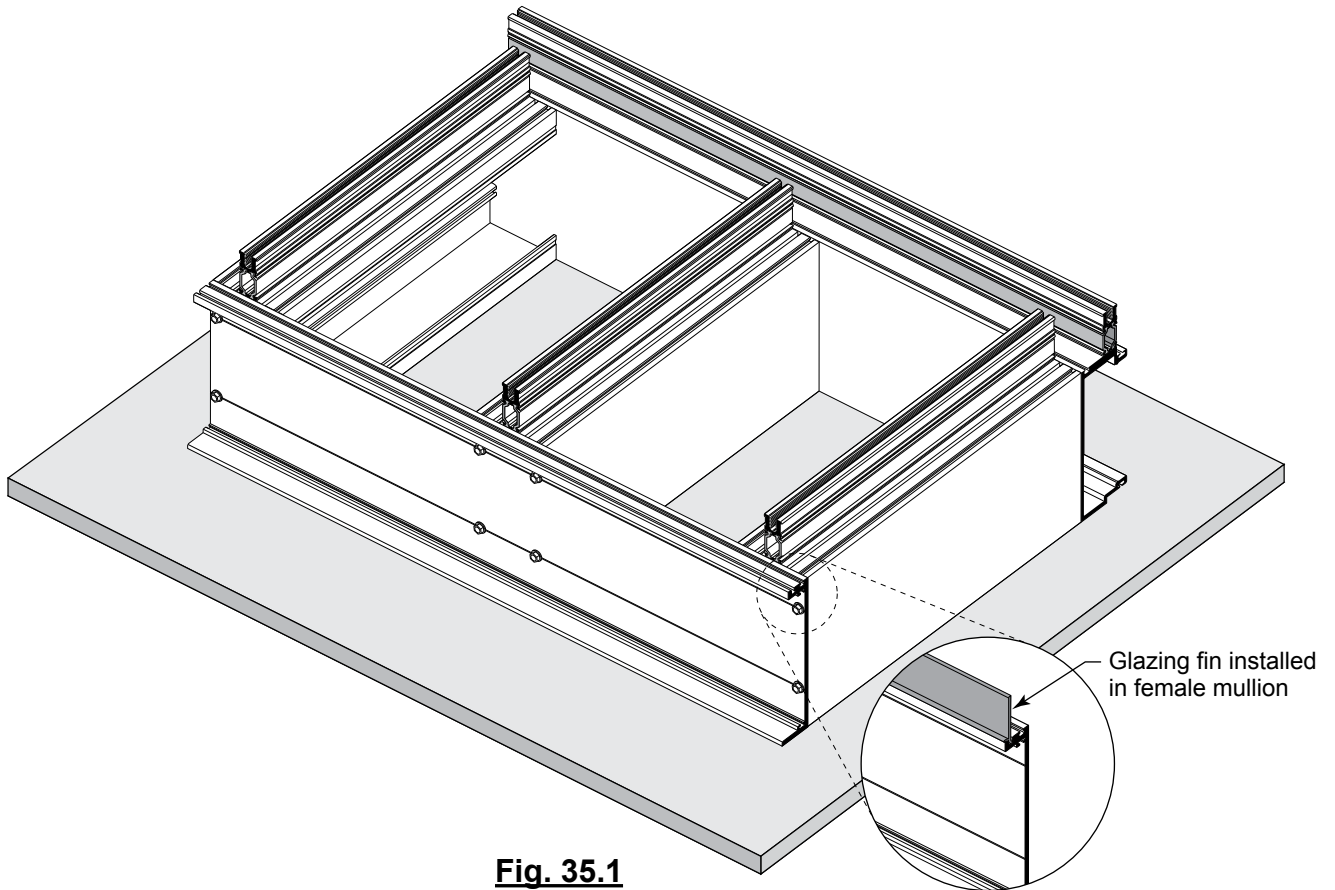


Fig. 35.1

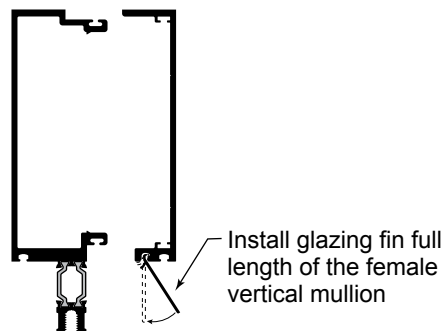


Fig. 35.2

FRAME ASSEMBLY

Step 9: Installing Gaskets (continued)

Optional Pre-Glazing Procedure (continued):

- D. Install SSG spacer gaskets on outside (interior) edge of frame.
- E. Install setting chairs into horizontal members at 1/4 points or per approved shop drawing.
- F. Set glass into opening.
- G. Install setting blocks onto setting chairs.

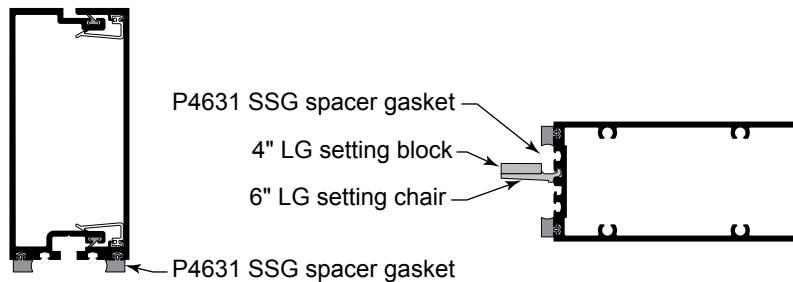


Fig. 36.1

- H. Seal around edges of glass. At glazing fins on the female vertical mullions, seal the back (interior) edges of the glass. Apply a secondary seal between the end of the fin and glass edge. See **Fig. 36.3**.
- I. Tool sealant and set frame aside for curing. Follow sealant manufacturer's recommendations for cure time before moving and installing frames.

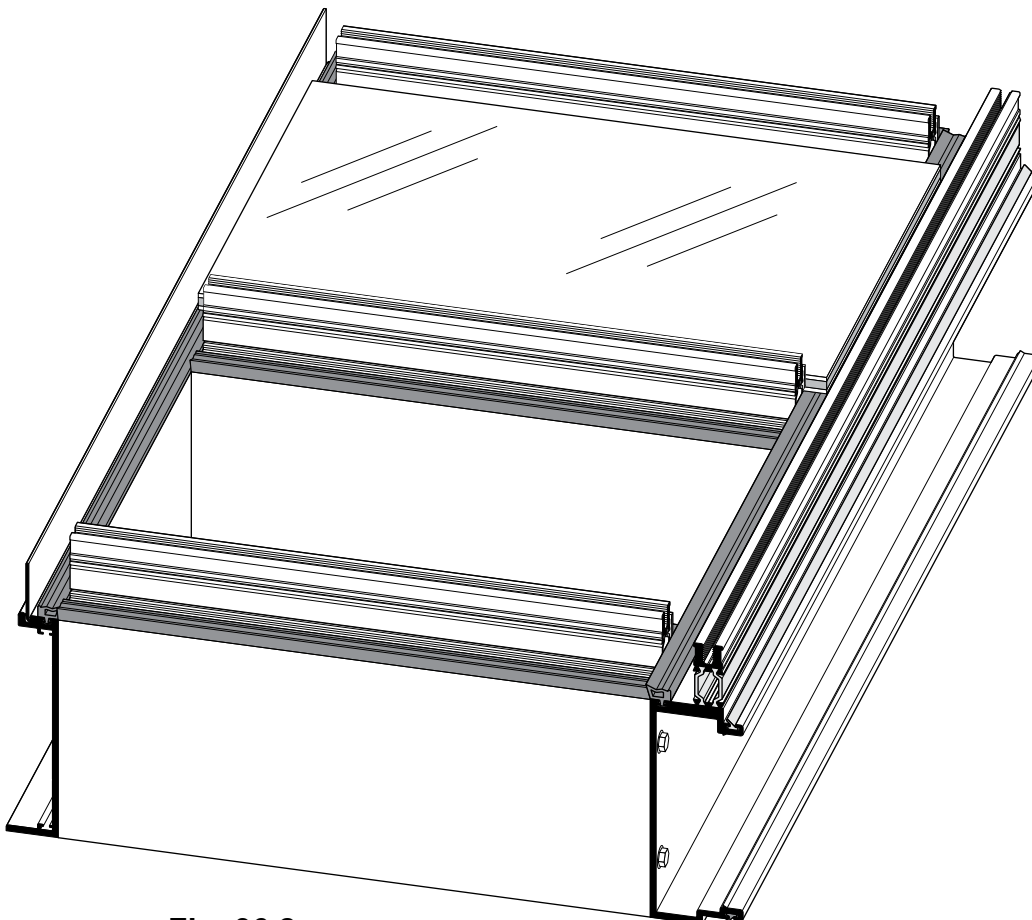


Fig. 36.2

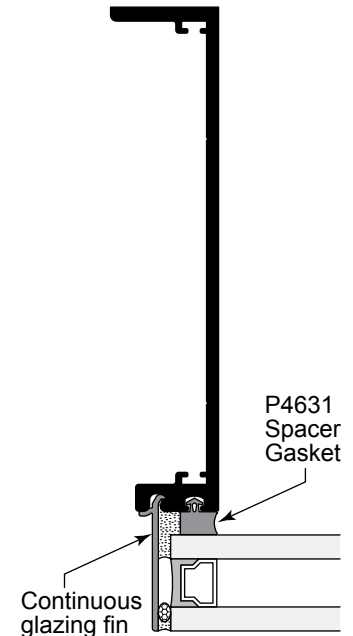


Fig. 36.3

FRAME INSTALLATION

Step 10: Installing Assembled Bays

NOTE: Check D.L.O. and diagonal dimensions every four bays to ensure correct spacing and frame squareness.

Single Span Installations

- i. Pre-load F anchor and T anchor into first bay, top and bottom. Temporarily tape in place as required.
- ii. Install first bay plumb and level and anchor T and F anchors to building per approved shop drawings. Use access hole in head/sill members.
- iii. Shim between the bottom of the vertical and T/F anchors for proper dead load distribution. See **Fig. 38.1**.
NOTE: Do not shim the top of the verticals to allow for thermal and live load movement.
- iv. Load T anchor into the next bay verticals, top and bottom and repeat steps above.
- v. At the final bay of the elevation, the F anchor will need to be pre-loaded at top and bottom of the jamb. Use the access holes in the head and sill to secure the F anchor to the building condition when bay is plumb and level.

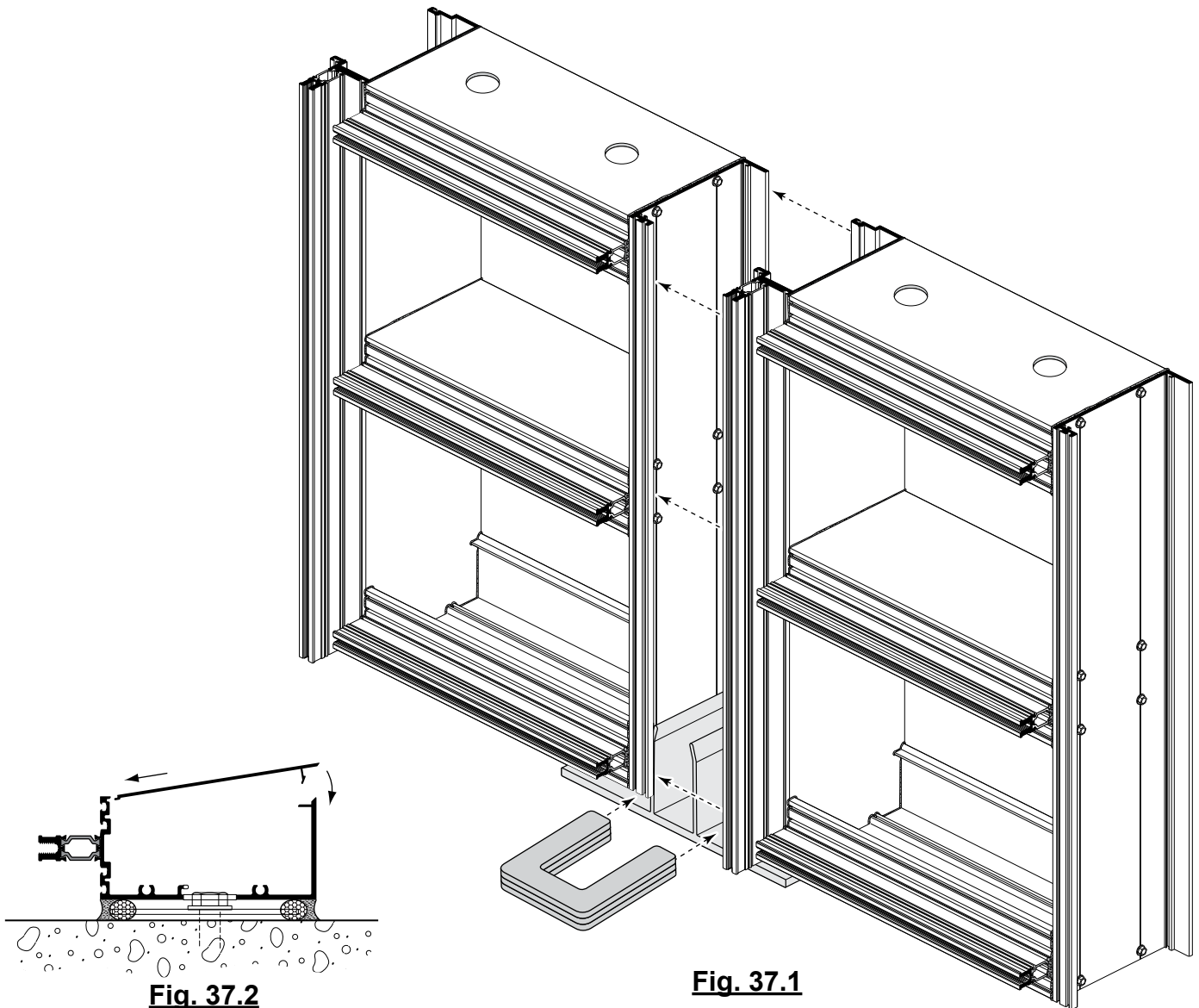


Fig. 37.2

Fig. 37.1

FRAME INSTALLATION

Step 10: Installing Assembled Bays (continued)

Multi-Span Installations

- i. Pre-load F anchor and T anchor into first bay, top and bottom. Temporarily tape in place as required.
- ii. Install first bay plumb and level and anchor T and F anchors to building per approved shop drawings. Use access hole in head/sill members.
- iii. Shim between the bottom of the vertical and T/F anchors for proper dead load distribution. See **Fig. 38.1**.
NOTE: Do not shim the top of the verticals to allow for thermal and live load movement.
- iv. At the mid-span anchor, temp the verticals in place, ensuring they are plumb and level. Use a shim at the vertical mullion splice, if applicable, to maintain the correct joint size. See **Fig. 39.1**
- v. Load T anchor into the next bay verticals and repeat steps above.
- vi. At the final bay of the elevation, the F anchor will need to be pre-loaded into the jamb. Use the access holes in the head and sill to secure the F anchor to the building condition when bay is plumb and level.
- vii. When the entire elevation is installed and securely anchored, remove the shims from the vertical mullion splices, if applicable. Back off the anchor bolt nut 1/4 turn at all wind load anchor connections and stake the bolts. Be sure any temporary screws are removed from wind load anchors.
- viii. Refer to Step 14, p. 53 to complete the splice sleeve installation.

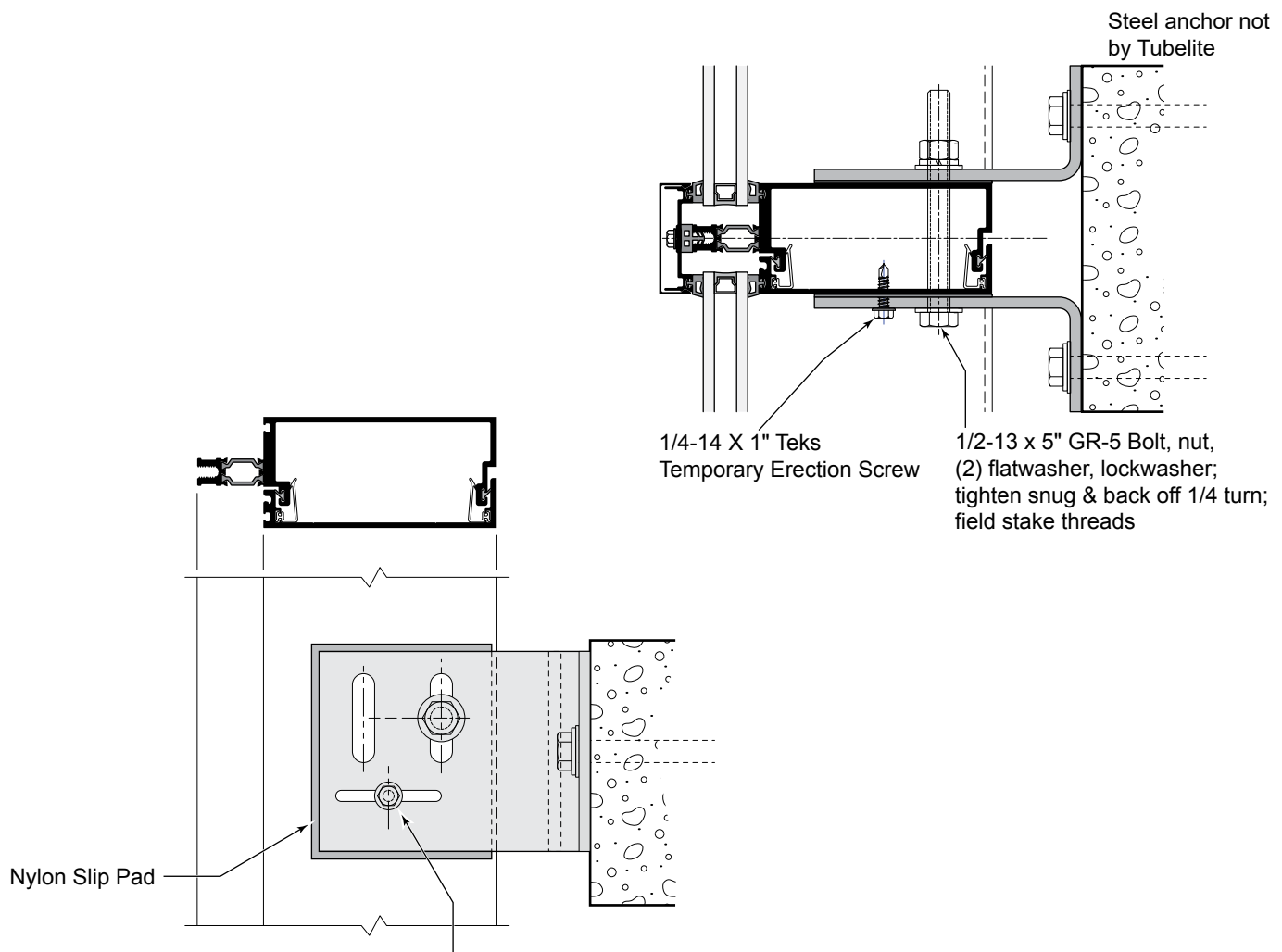


Fig. 38.1

Temporary alignment bolt for ladder panel erection. Remove at expansion anchor after bolts, nuts and washer are installed. Okay to leave at Dead Load anchor.

FRAME INSTALLATION

Step 10: Installing Assembled Bays (continued)

- A. Install the next bay by engaging the mullion halves together, ensuring that the bottom of the mullion halves align. Anchor bay to structure as noted above when plumb and level. See **Fig. 39.1**.
- B. Repeat until all bays are installed in the opening.

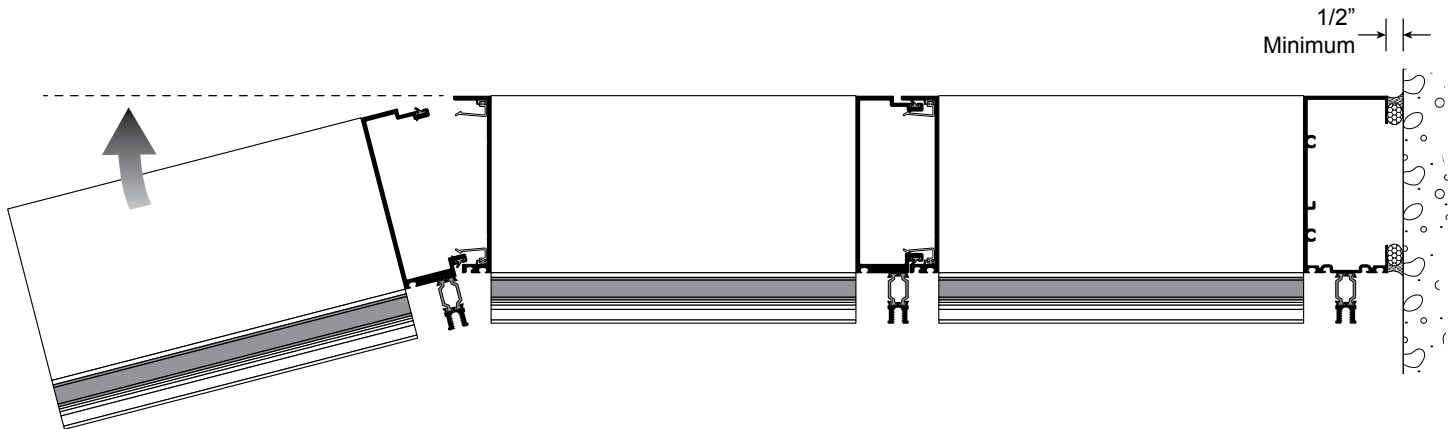


Fig. 39.1

- C. Seal the front vertical mullion seam continuously and tool sealant.
- D. For pre-glazed units, apply a continuous seal between the glazing fin and the mullion tongue on the male vertical mullion half. See **Fig. 39.2**.

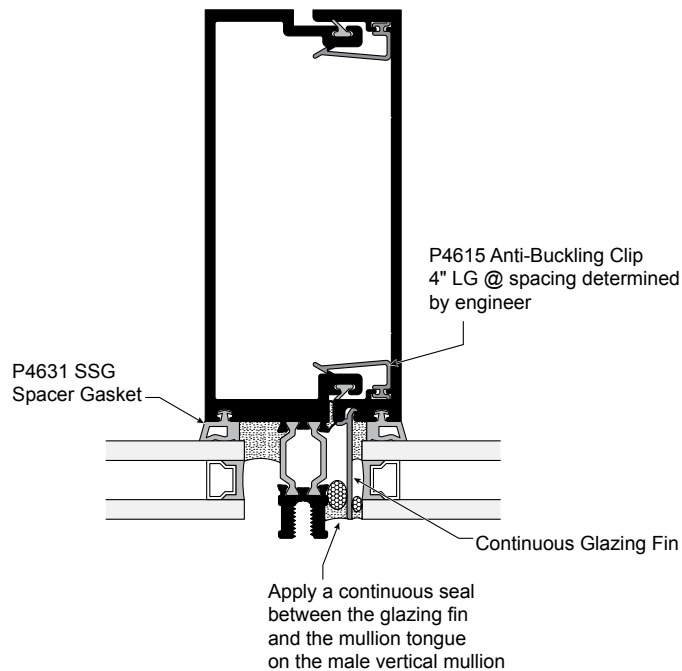


Fig. 39.2

FRAME INSTALLATION

Step 10: Installing Assembled Bays (continued)

- E. After the lower and upper bays 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. 31.2 & 31.3**.
- F. Apply bond breaker tape to the face of the splice sleeve between the lower and upper verticals, returning back 1" on each side. Apply sealant over bond breaker tape at joint. Tool sealant. See **Fig. 32.2**.
- G. At SSG verticals, refer to Step 8 to apply the water dams. See **Fig. 33.2**.
- H. Seal mullion end caps prior to installing onto verticals. Install onto mullions with S293, #10 x 3/8" TH screw. Tool sealant and cap seal all screw heads. **CRITICAL SEAL**. Marry the wiper gasket seal (Step 10.A) with the end cap seal. See **Fig. 41.1 & 41.2**.

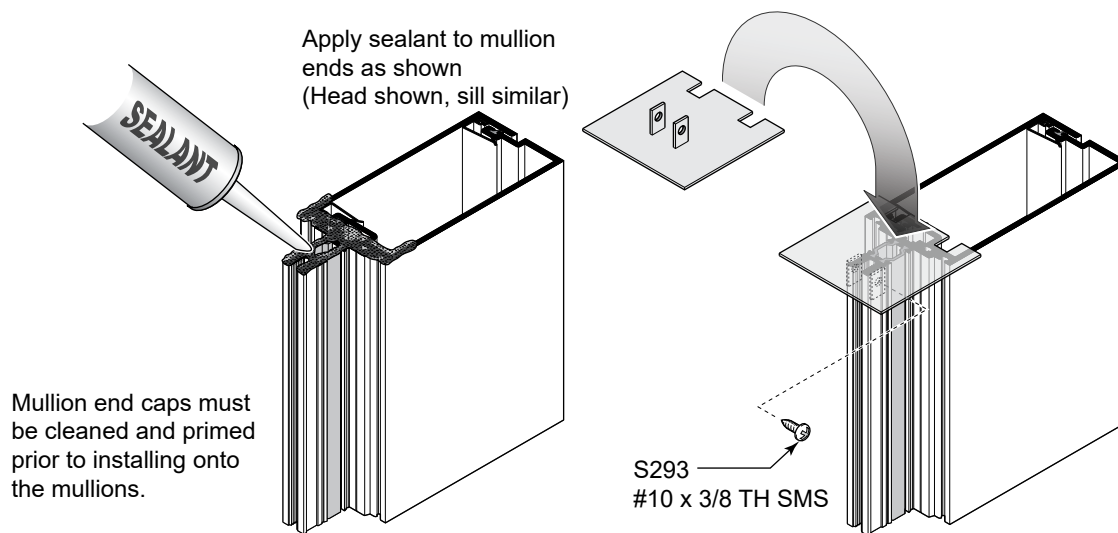


Fig. 40.1

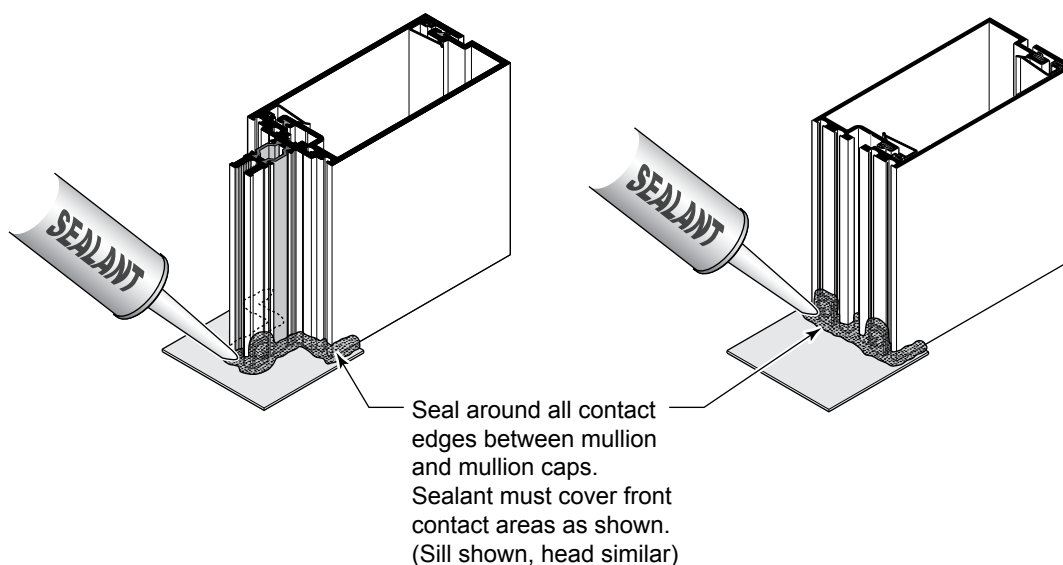
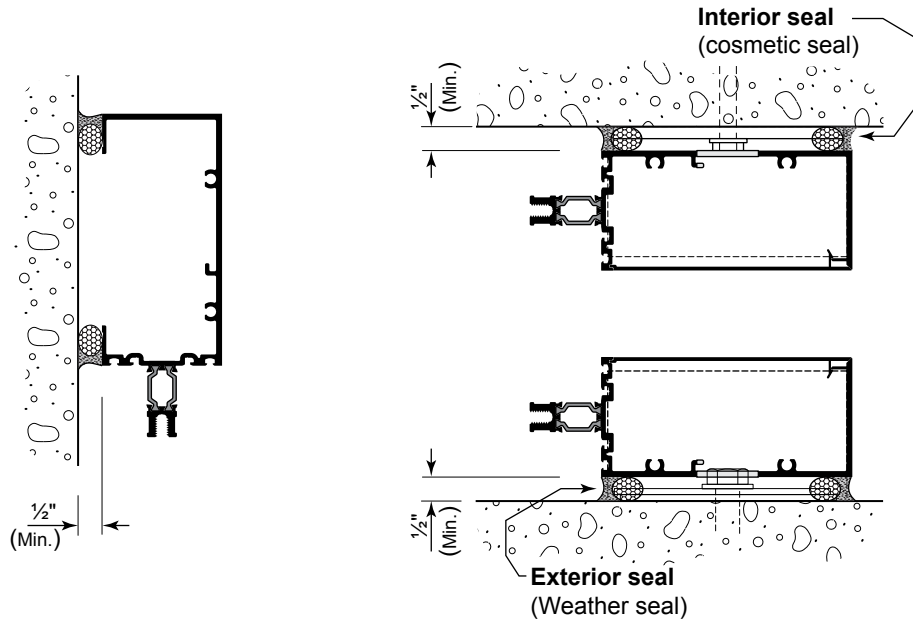


Fig. 40.2

FRAME INSTALLATION

Step 11: 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.



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

Fig. 41.1

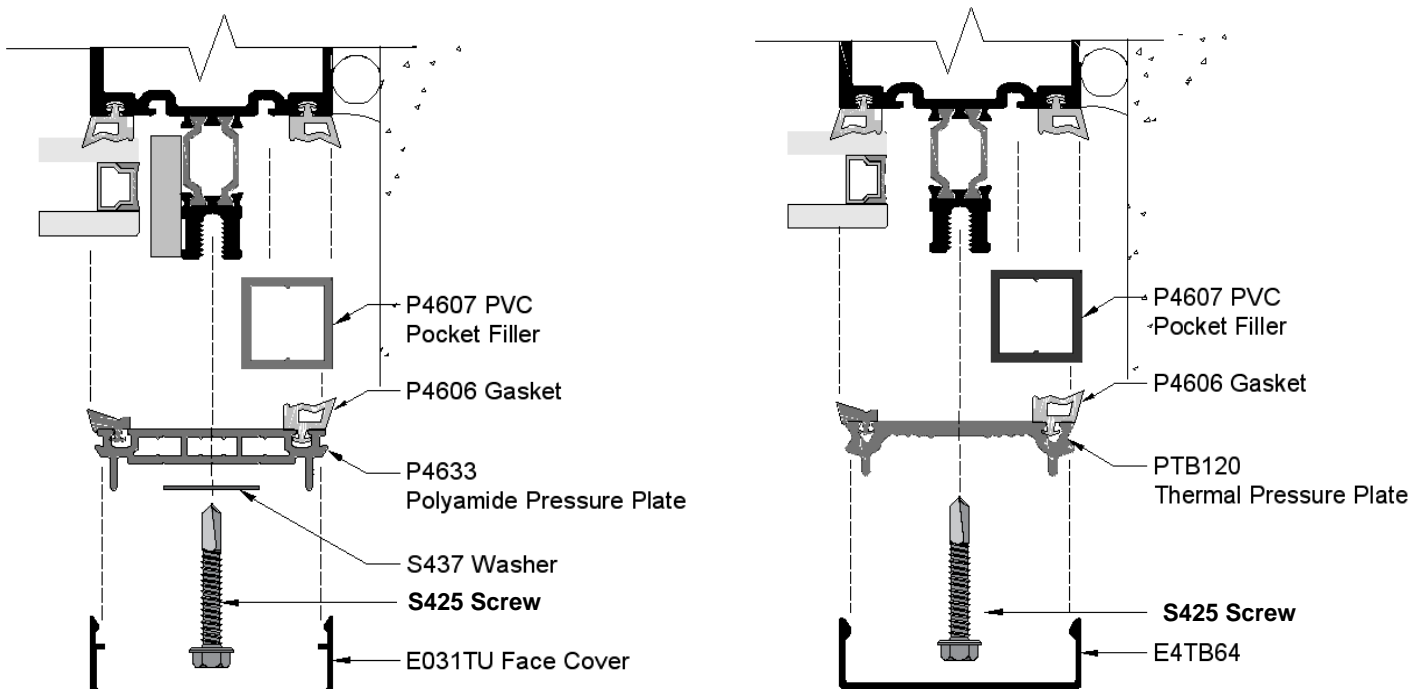


Fig. 41.2

FRAME INSTALLATION

Step 12: Perimeter Conditions

- A. When the P4633 polyamide, or PTB120 thermal pressure plates are used, install the P4607 PVC pocket filler tube into the perimeter members. Do not overtorque polyamide pressure plate fasteners. See **Fig. 42.1**.

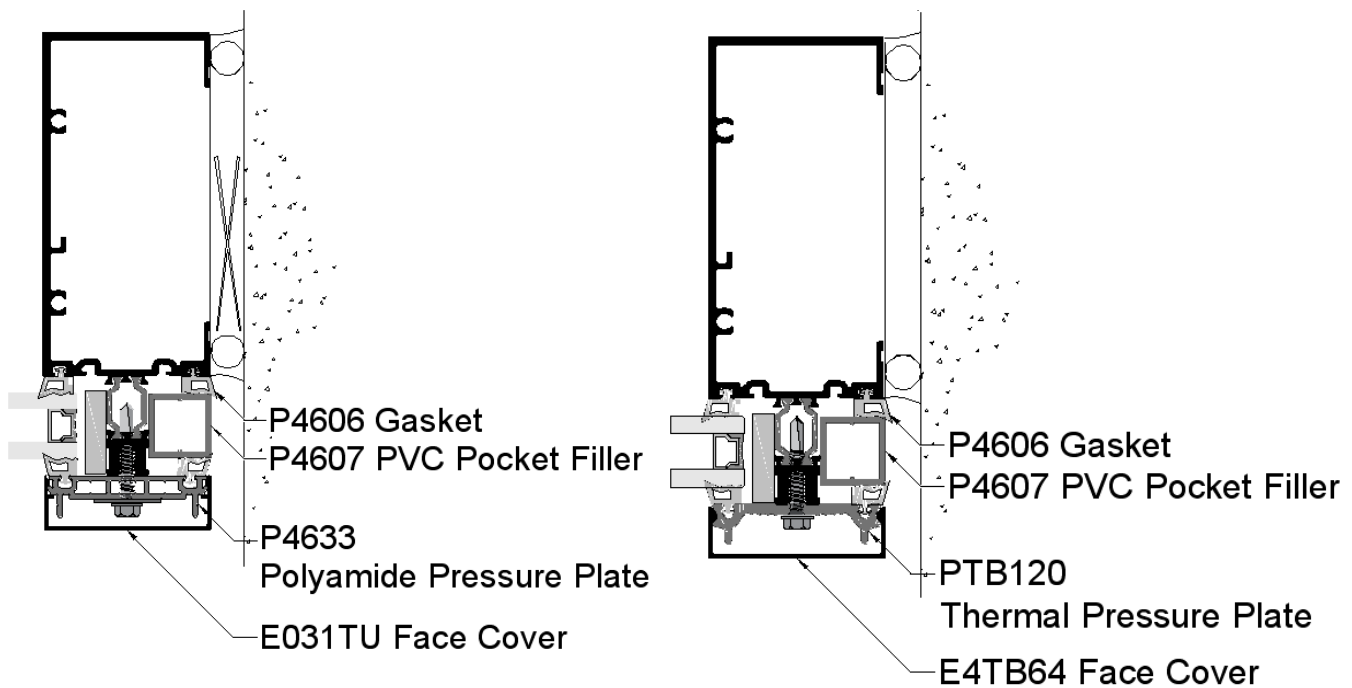


Fig. 42.1

JAMB at ALTERNATE PRESSURE BARS

GLAZING

Step 13: Installing Glass (Field Glazing)

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

- A. Trim excess silicone from edges of glazing units to allow for maximum glazing clearance.
- B. Pull interior horizontal gaskets away from vertical gaskets and seal corners where gaskets abut. Release horizontal gasket back to its original position. See **Fig. 43.1**.

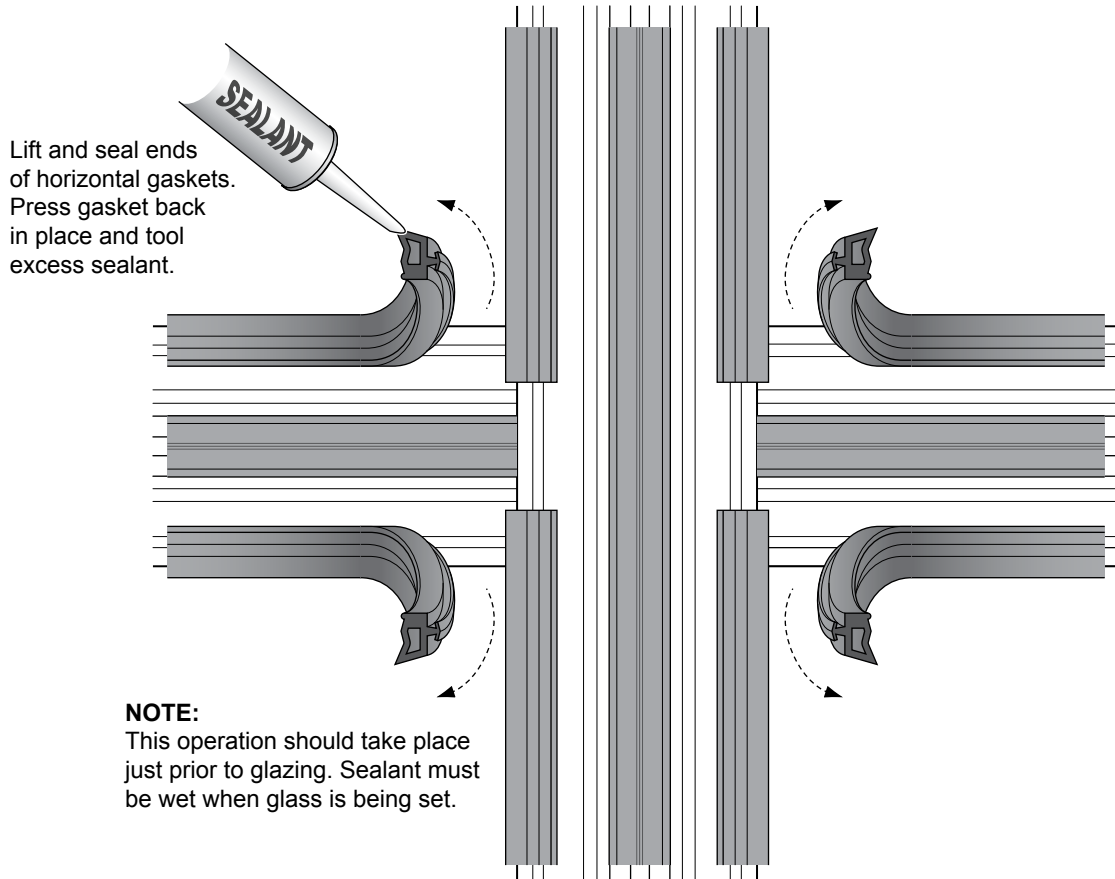


Fig. 43.1

GLAZING

Step 13: Installing Glass (Continued)

- C. Install two P5123 setting chairs onto the horizontal at quarter points or as indicated on approved shop drawings. Place one P5103 setting block (for 1" glass) centered on each setting chair.
- Fig. 44.1.**
- Note: Consult glass manufacturer for correct length and location for glass size over 40 sq.ft.**
- D. Install glass onto setting chairs, 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.
- E. Make sure sealant is not bridging or blocking the water flow area between the edges of the glass and the framing system.

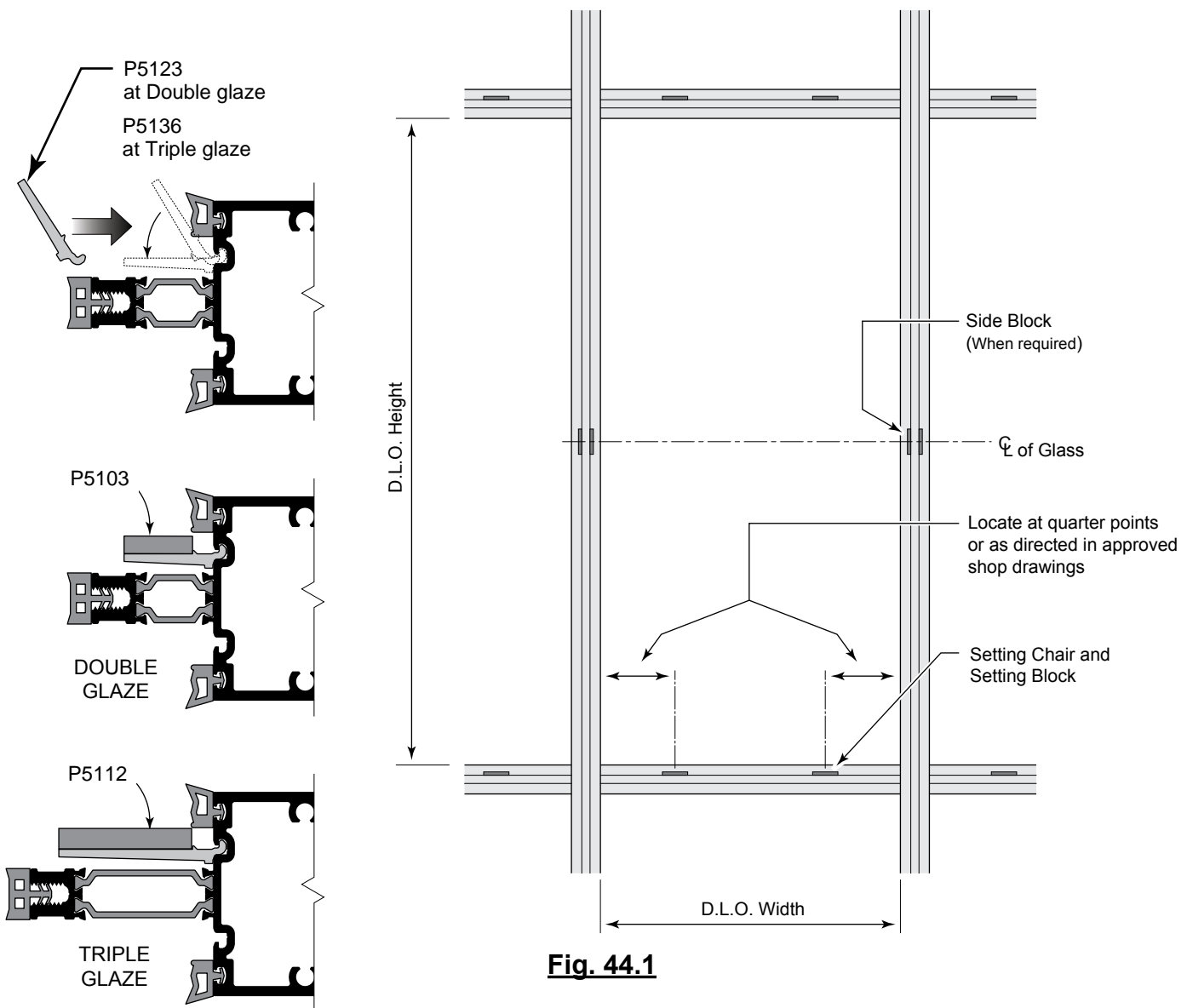


Fig. 44.1

GLAZING

Step 14: Installing Glass (Continued)

- F. Hold the glass in place using P4634 temporary glazing retainers at SSG and captured applications. Locate retainers near each corner of the glass and at mid points. Locate retainers 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.**

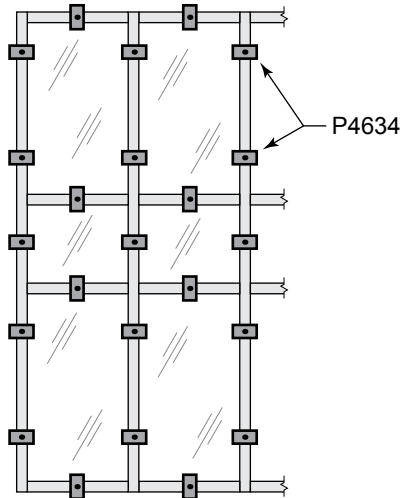


Fig. 45.1

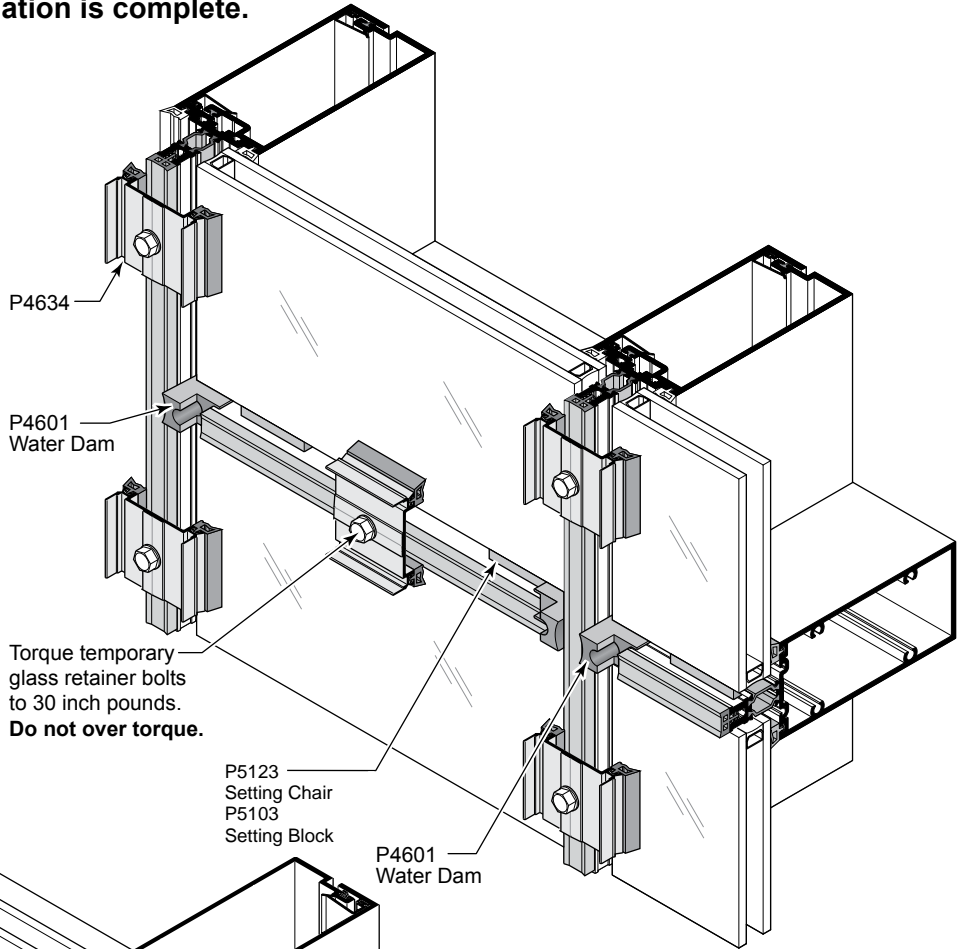


Fig. 45.2

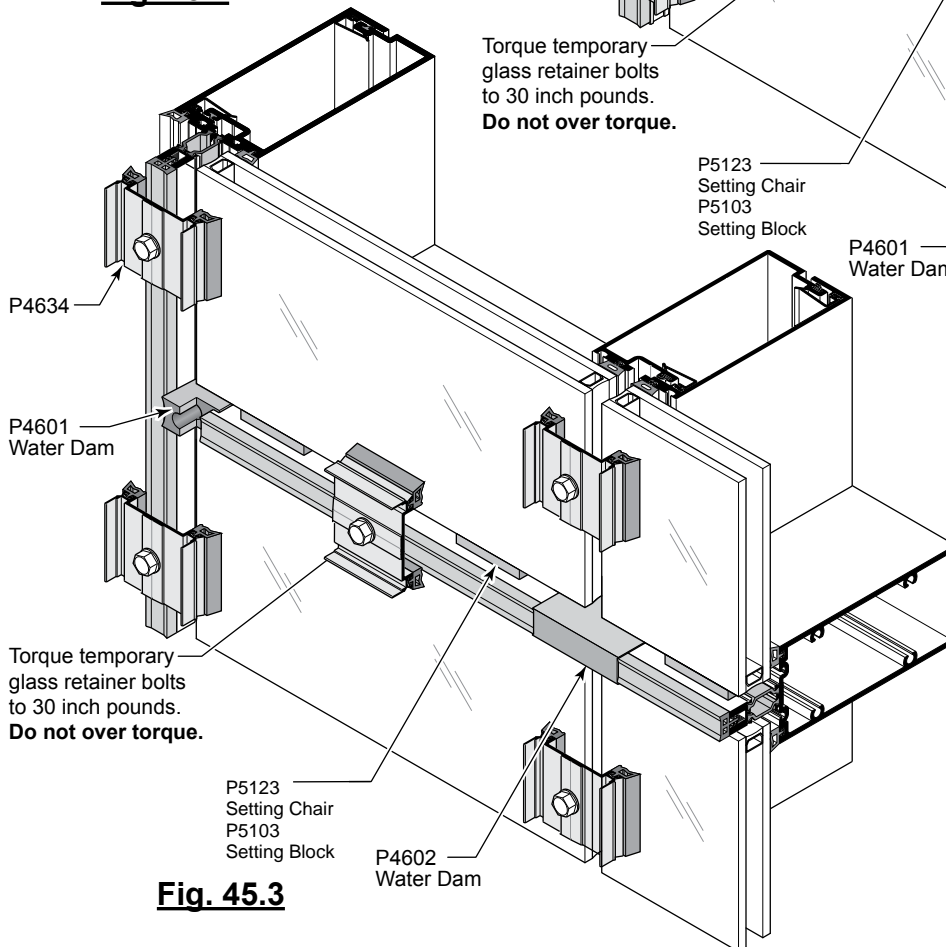
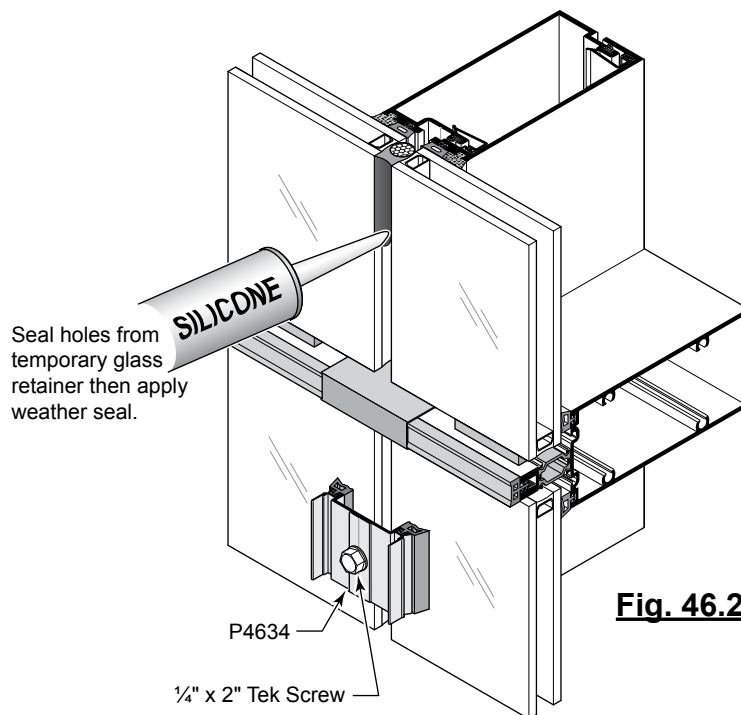
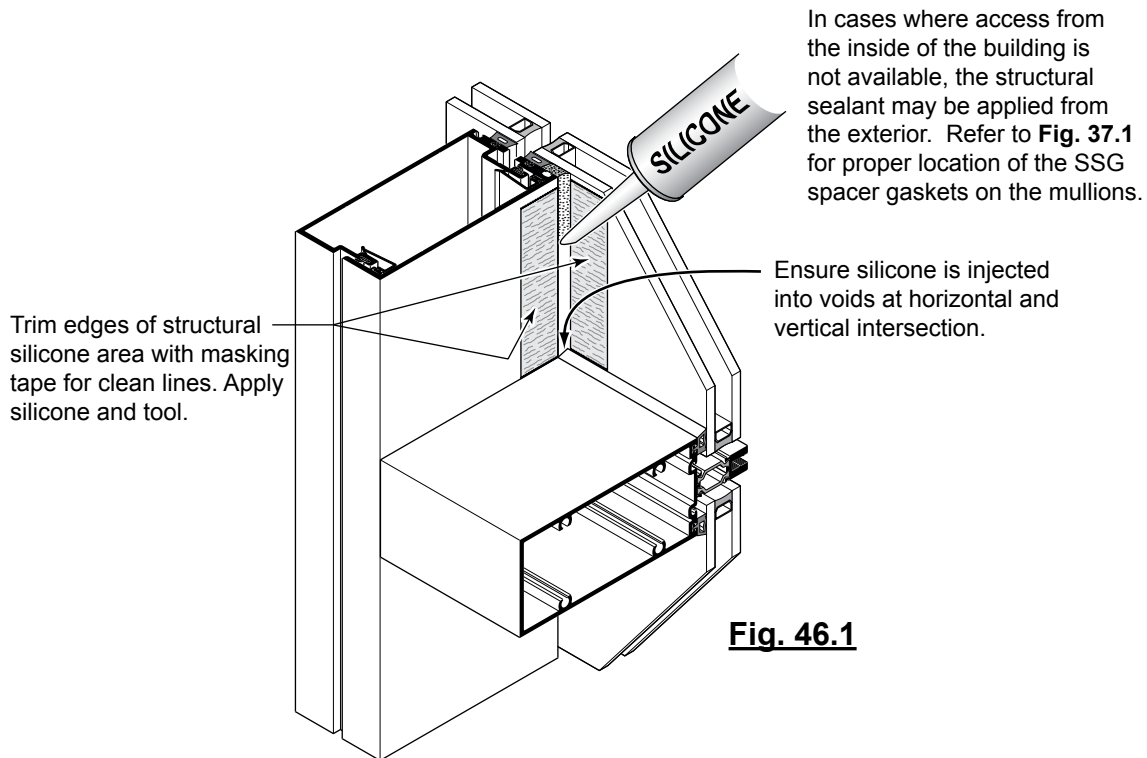


Fig. 45.3

GLAZING

Step 14: Installing Glass (Continued)

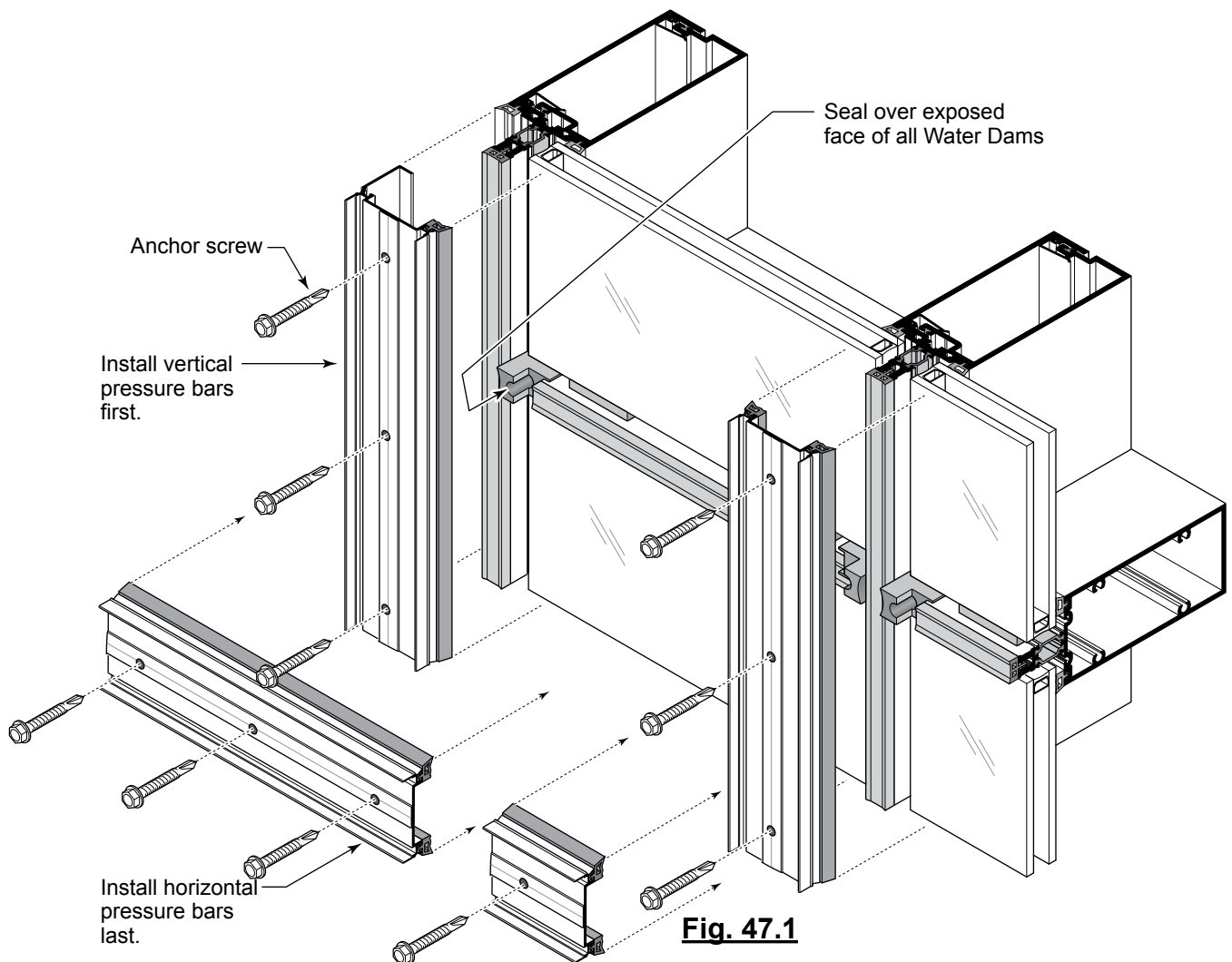
- G. For SSG applications, tape off the side of SSG mullion and glass prior to applying structural silicone. After structural silicone has cured per silicone manufacturer's recommendations, remove the temporary glazing retainers and apply a weatherseal between the lites of glass.



GLAZING

Step 14: 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. For vertical pressure plates below expansion horizontals, maintain a 1" joint between the bottom of the expansion horizontal and the top of the pressure plate.
- C. Install the vertical pressure plates using the following:
 - o Aluminum: S425 screws
 - o Thermal (PTB120): S425 Screw
 - o Polyamide (P4633): S425 screws w/(1) S437 one inch dia flatwasher
 For applications using SSG verticals, captured vertical mullions adjacent to an SSG vertical must have weep holes drilled into the face of the vertical pressure plate. See **Fig. 51.2**, page 51.
- D. Remove temporary glazing retainers from horizontals as required.
- E. Install the horizontal pressure plates using the following, ensuring that weep holes are on the top side of the pressure plate:
 - o Aluminum: S425 screws
 - o Thermal (PTB120): S425 Screw
 - o Polyamide (P4633): S425 screws w/(1) S437 one inch dia. flatwasher



Also see **Fig. 49.1** and **Fig. 50.1**.

GLAZING

Step 14: Install Pressure Plates and Face Covers (Continued)

- F. At the expansion horizontal, make sure the P4630 wiper gasket is installed continuously into the pressure plate and crimped in place at each end.
- G. 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. When using polyamide pressure plates, add two additional fasteners on each side of a vertical/horizontal intersection. See **Fig. 49.1**.
- H. Torque all pressure plate screws to 90 in-lbs. When using a cordless drill with a torque limiter, check torque periodically against a torque wrench. Do not overtorque polyamide pressure plate fasteners.
- I. Remove short pieces of P2501 wedge gasket at the top of the lites at the expansion horizontal. Install P2501 wedge gasket at the top of this lite, sealing the ends of the gasket to the vertical gaskets.

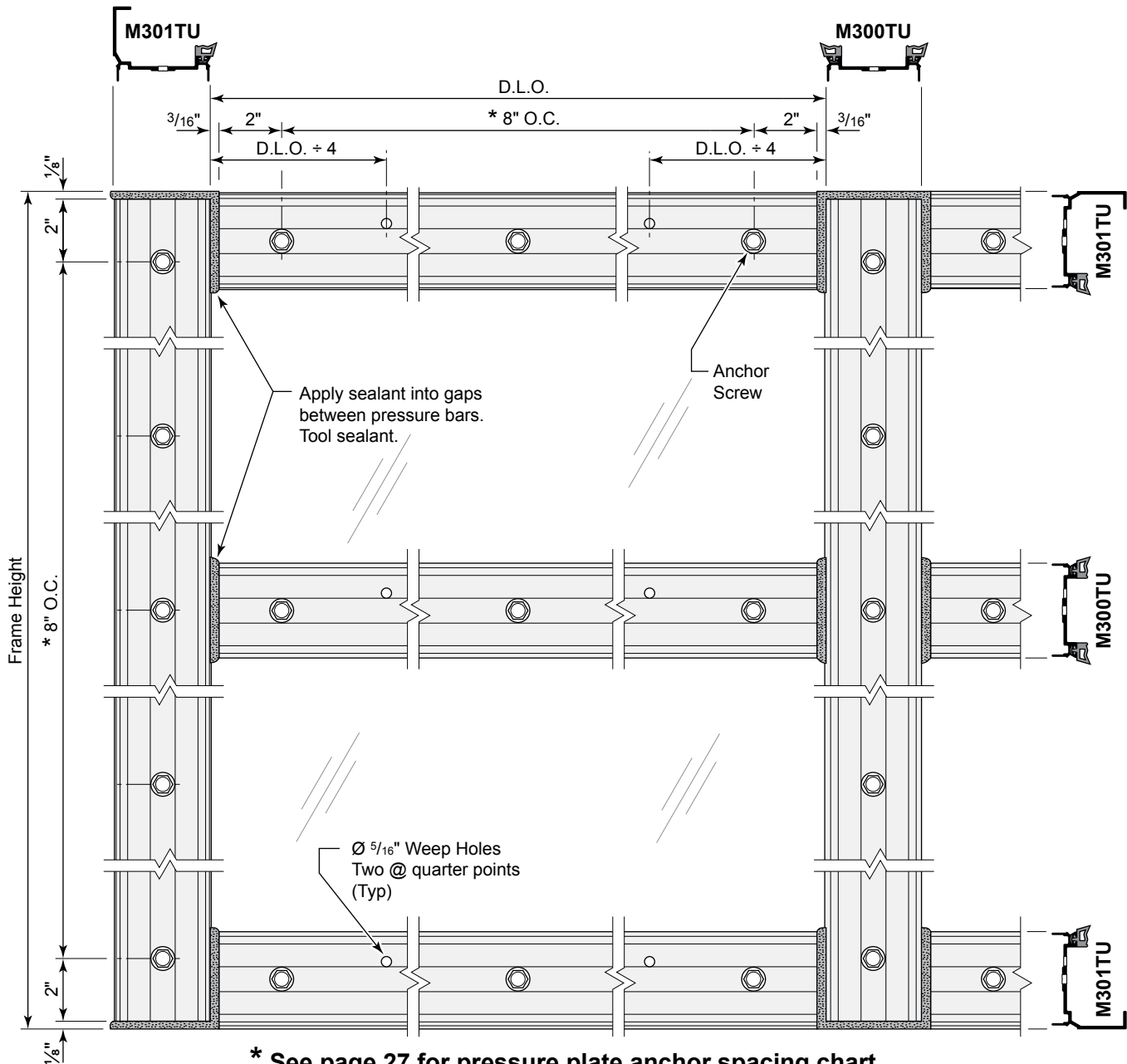


Fig. 48.1

CAPTURED PRESSURE BAR INSTALLATION

GLAZING

Step 14: Install Pressure Plates and Face Covers (Continued)

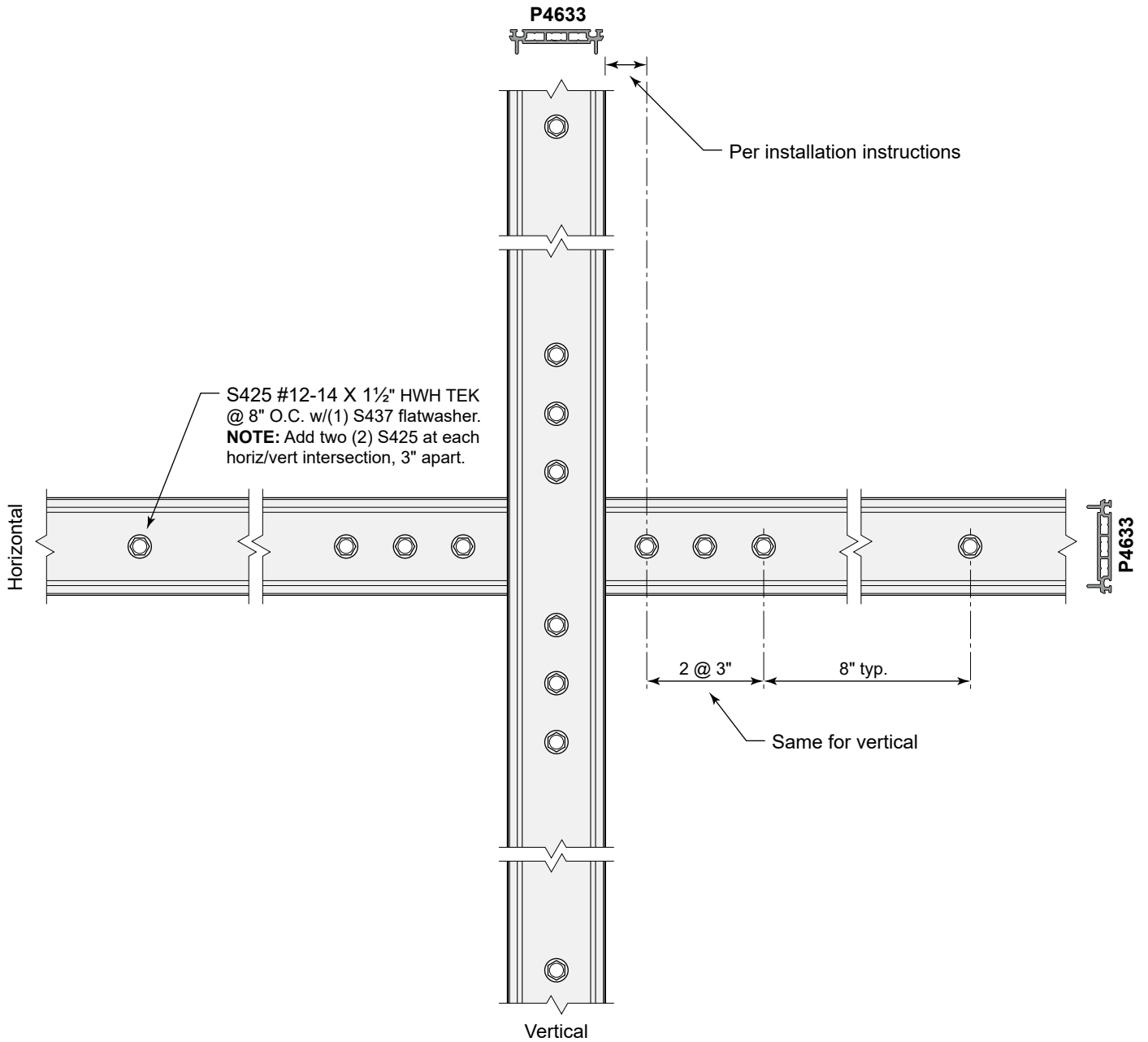
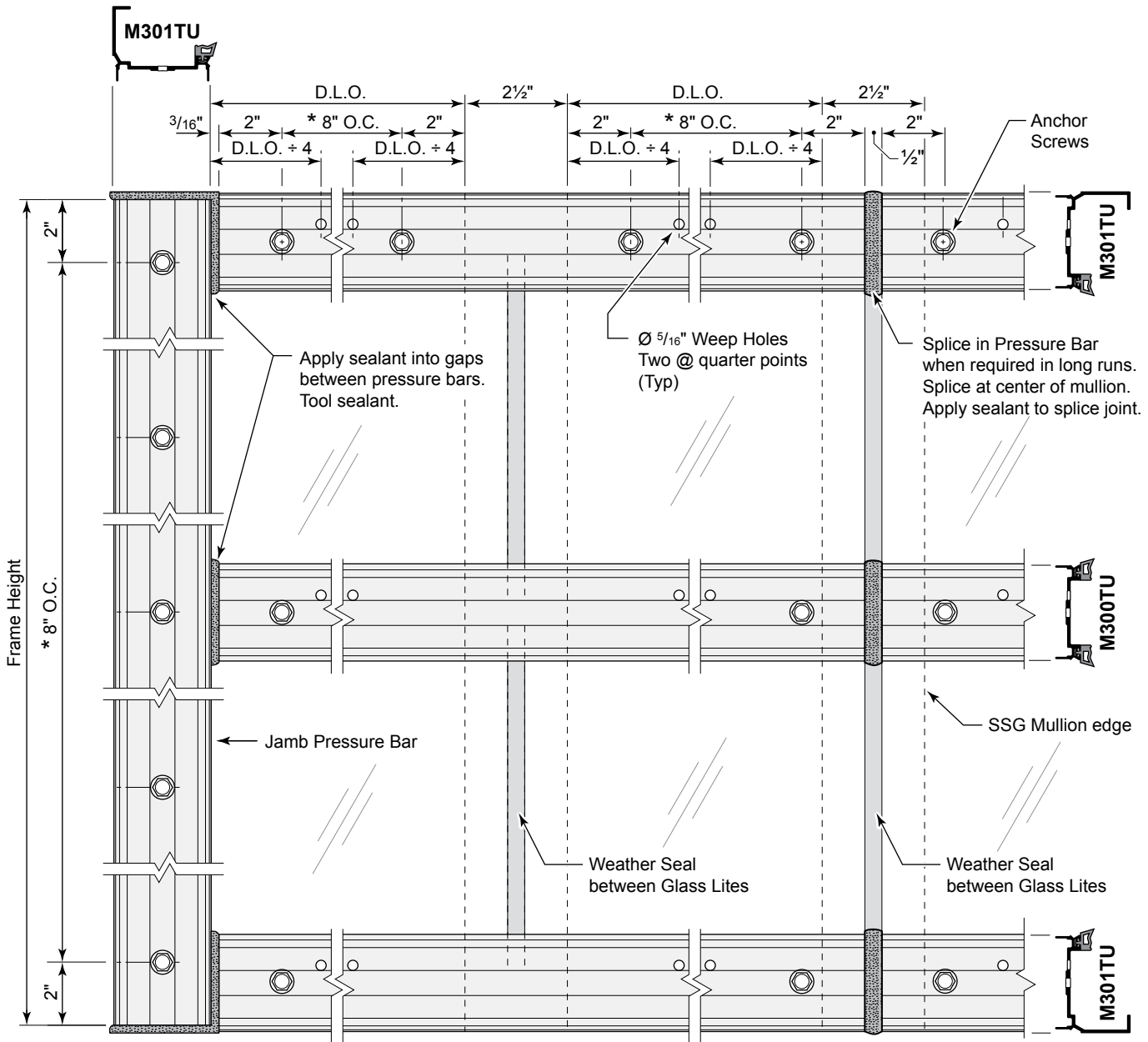


Fig. 49.1

GLAZING

Step 14: Install Pressure Plates and Face Covers (Continued)



* See page 27 for pressure plate anchor spacing chart

Fig. 50.1

SSG PRESSURE BAR INSTALLATION

GLAZING

Step 14: Install Pressure Plates and Face Covers (Continued)

THERMAL PRESSURE BAR

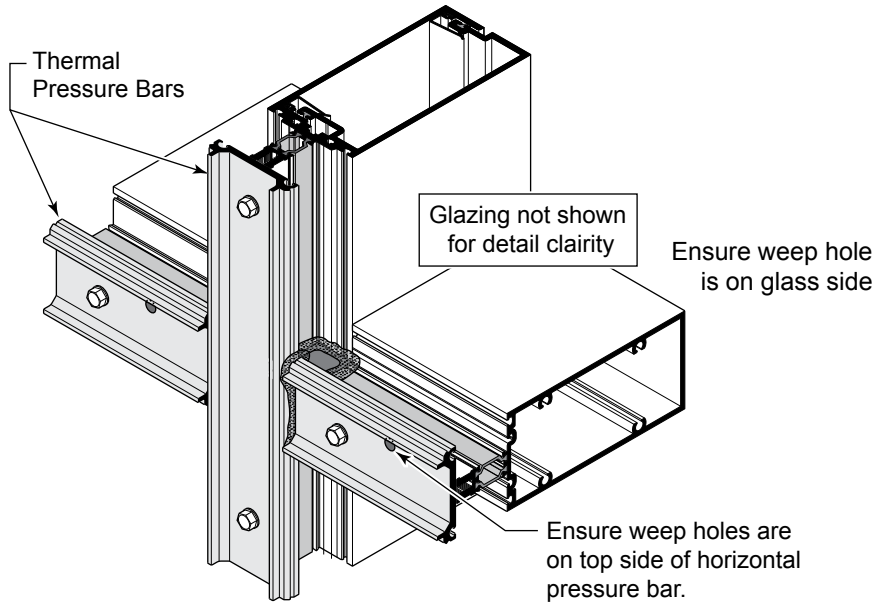


Fig. 51.1

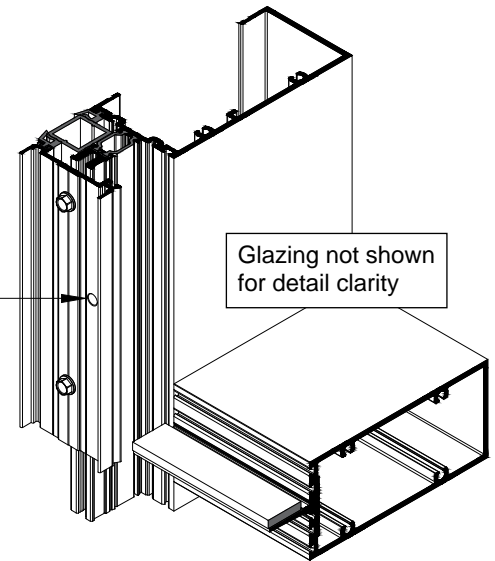


Fig. 51.2

J. Install the vertical face covers using a wood block to protect the face cover. Seal the tops of the vertical face covers below an expansion horizontal using backer rod. Slope the sealant away from the glass, creating a watershed. See **Fig. 52.1** and **Fig 55.2**.

K. Seal the tops of all vertical face covers as shown in **Fig 51.4**.

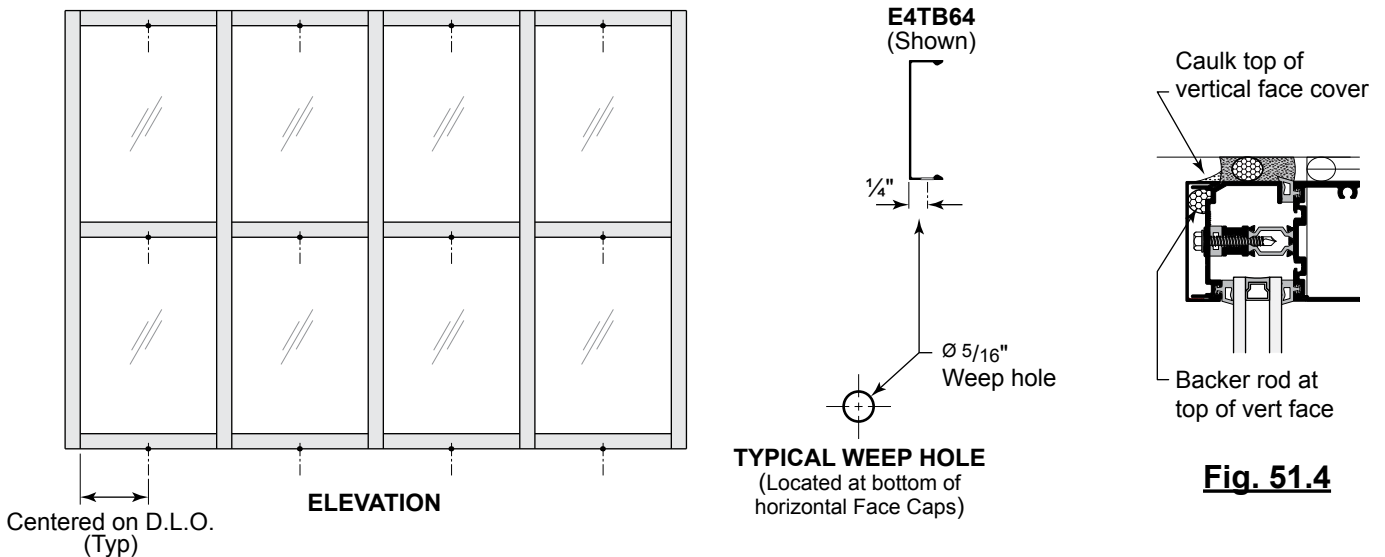


Fig. 51.4

Fig. 51.3

GLAZING

Step 14: Install Pressure Plates and Face Covers (Continued)

L. Pinning requirements(See Fig 53.2):

- 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.

L. Seal the horizontal pressure plates to the vertical face covers, tooling the sealant into the joint. See **Fig. 53.3** and **Fig. 53.4**.

M. Install the horizontal face covers with equal gaps on each end. Make sure the weep slots in the face cover are pointing down. See **Fig. 51.3**.

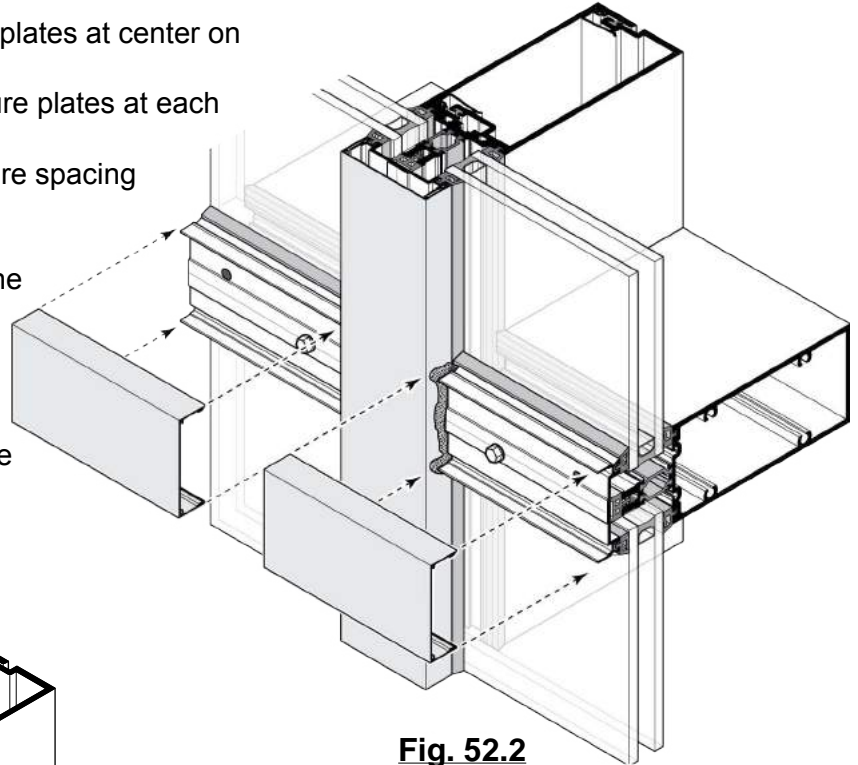
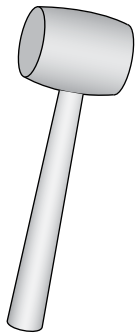


Fig. 52.2

Use wood block and mallet to prevent denting face caps.



NOTE:
Always place horizontal caps with weep hole at bottom side.

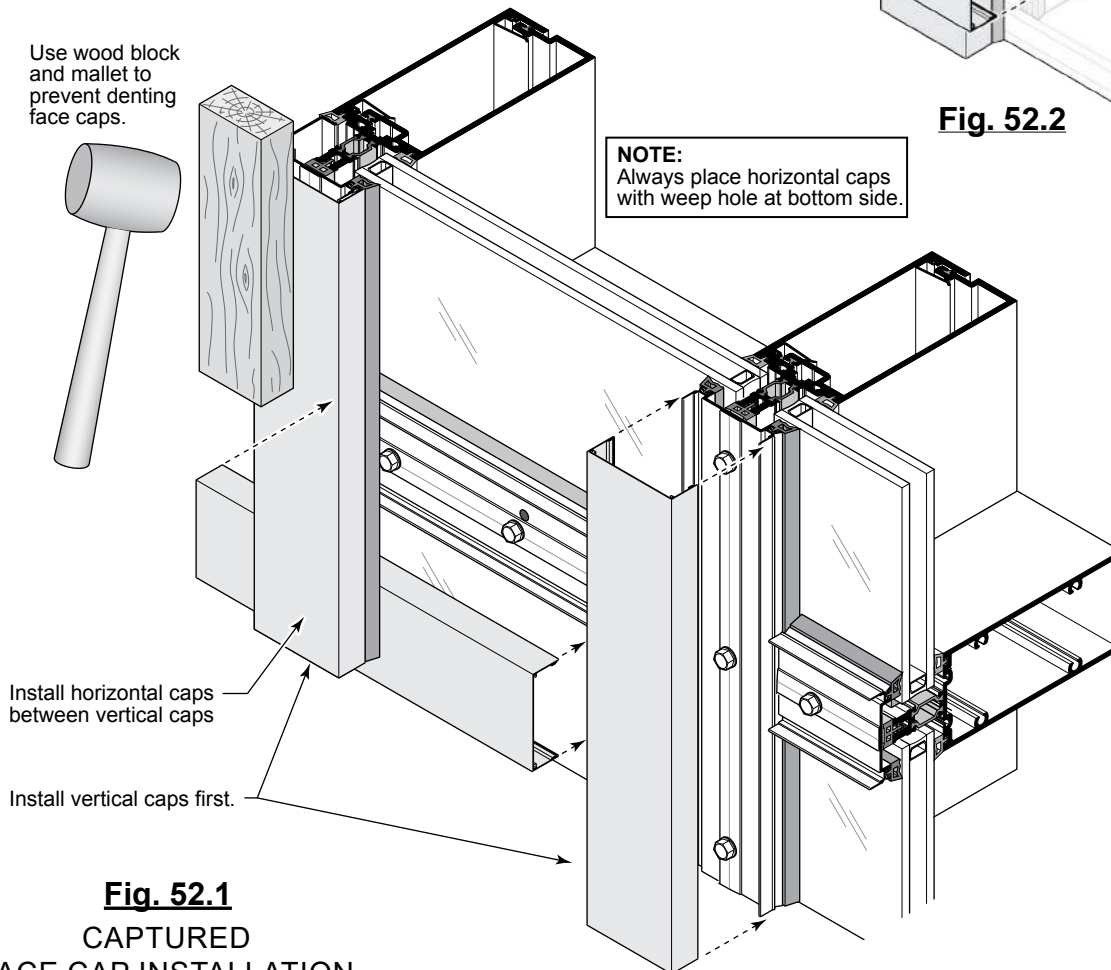


Fig. 52.1

CAPTURED FACE CAP INSTALLATION

GLAZING

Step 14: Install Pressure Plates and Face Covers (Continued)

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

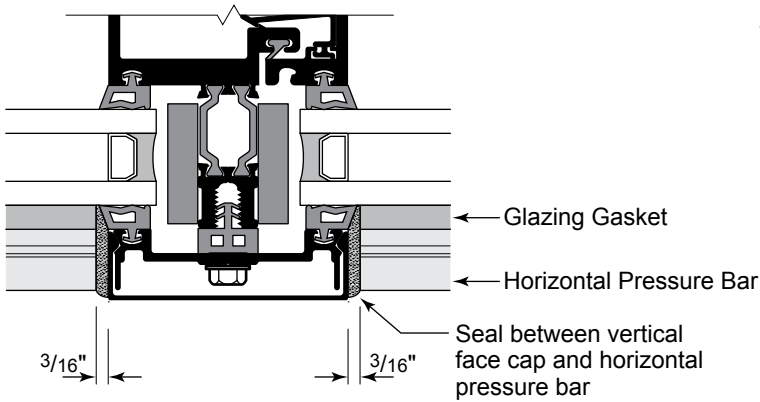


Fig. 53.1

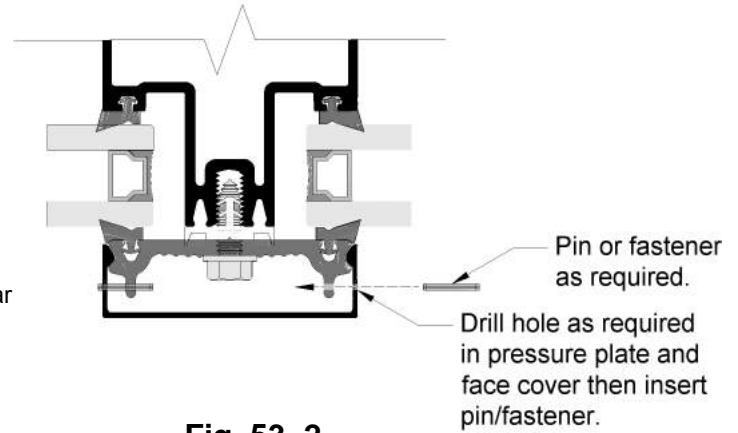


Fig. 53.2

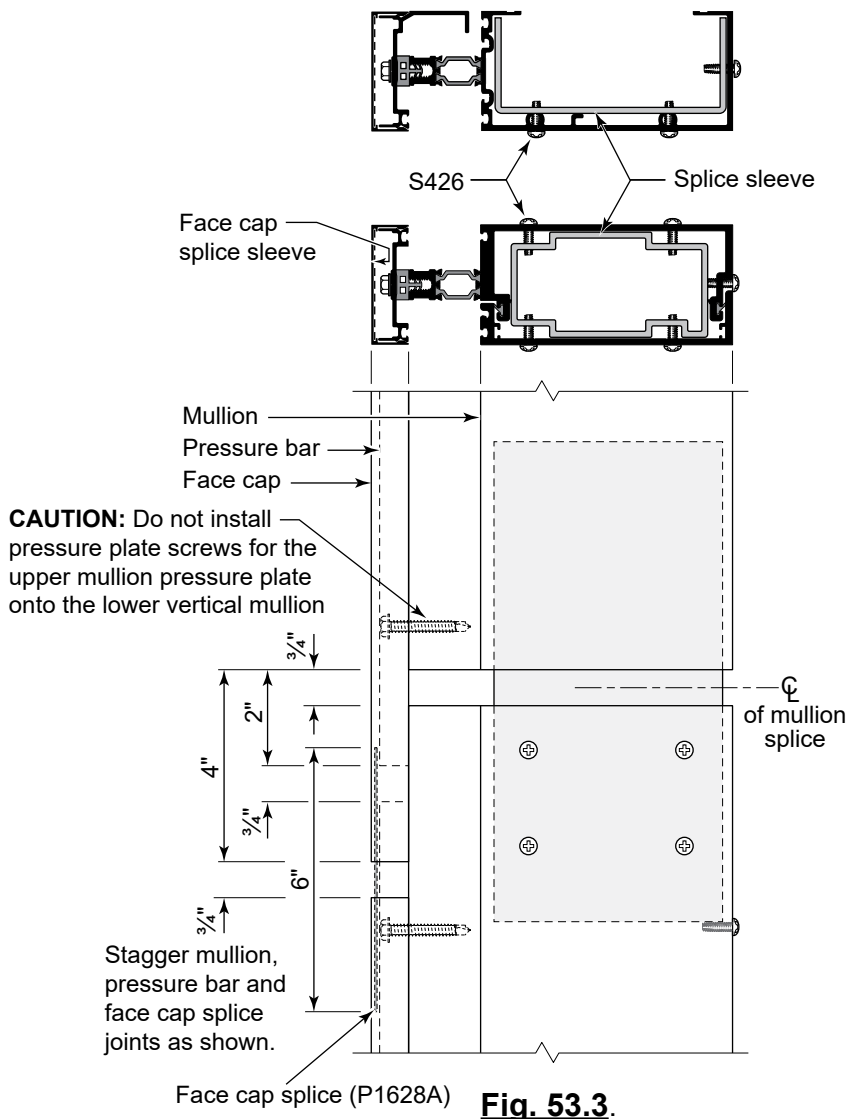


Fig. 53.3

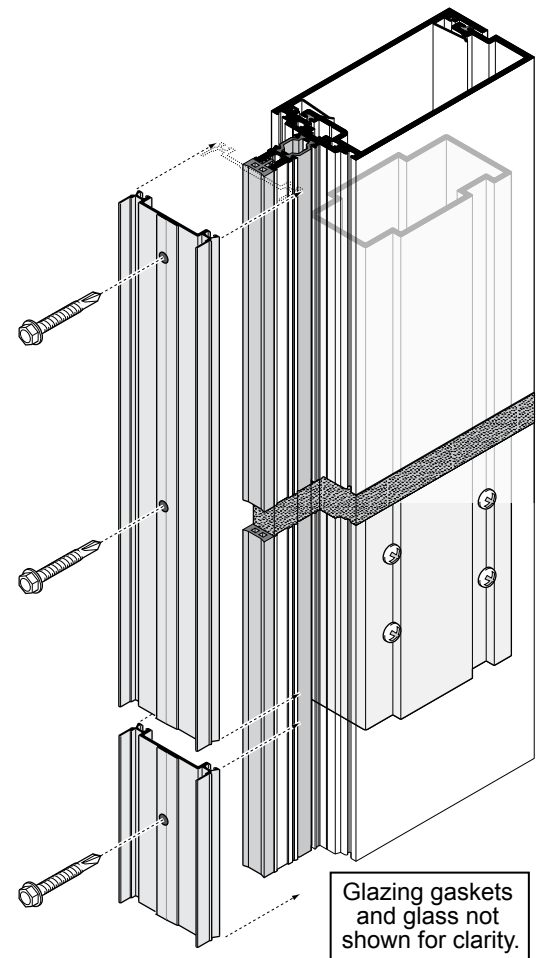


Fig. 53.4

GLAZING

Step 14: Install Pressure Plates and Face Covers (Continued)

Pressure Bar and Face Cap at optional expansion horizontal splice.
 (Also see page 31 for splice installation)

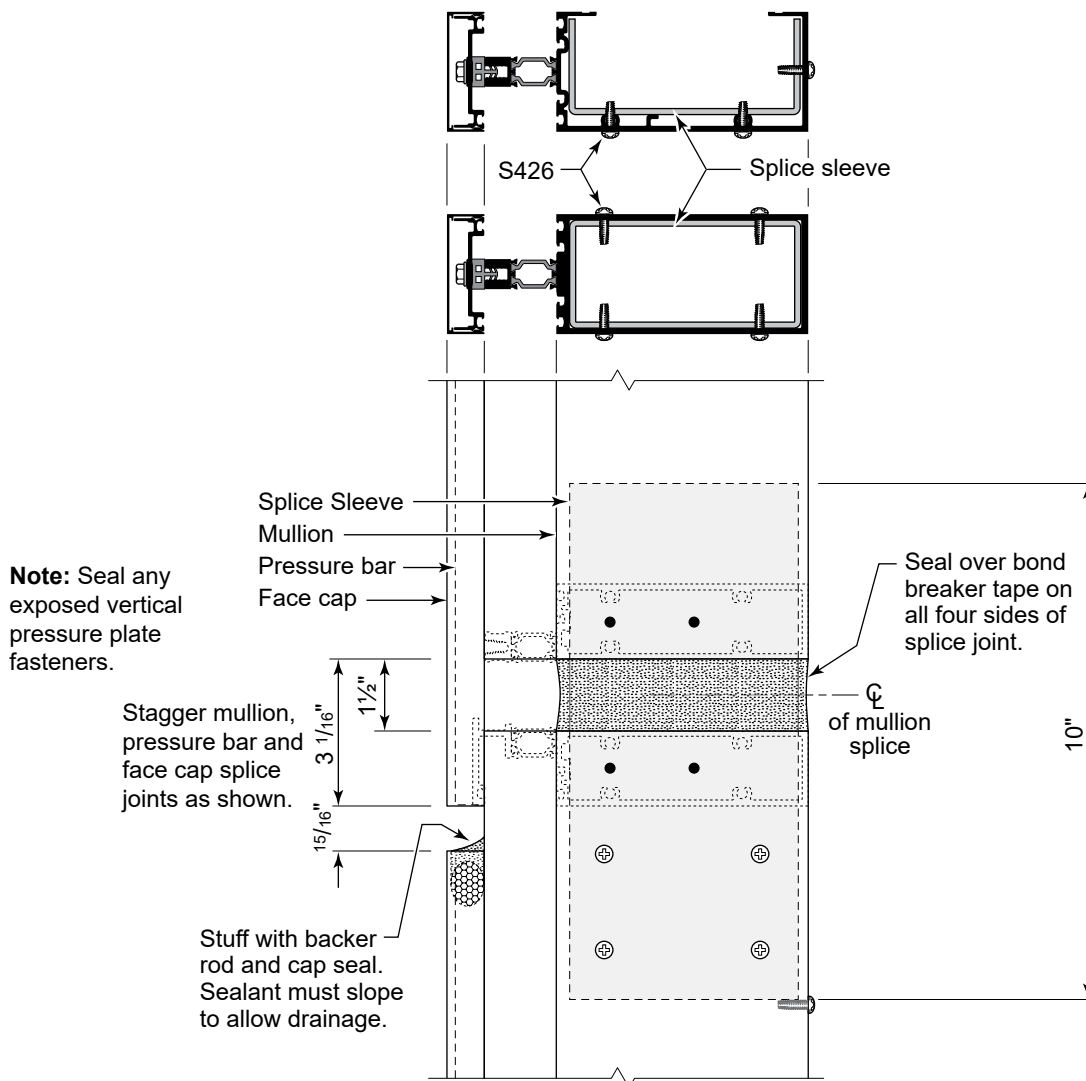


Fig. 54.1

GLAZING

Step 14: Install Pressure Plates and Face Covers (Continued)

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

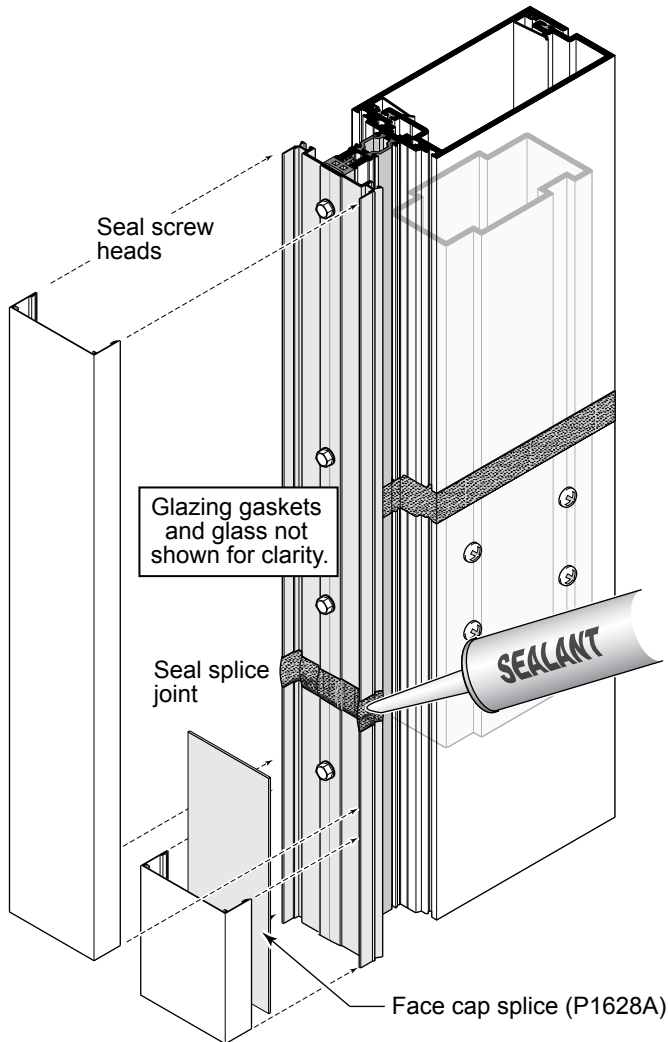


Fig. 55.1

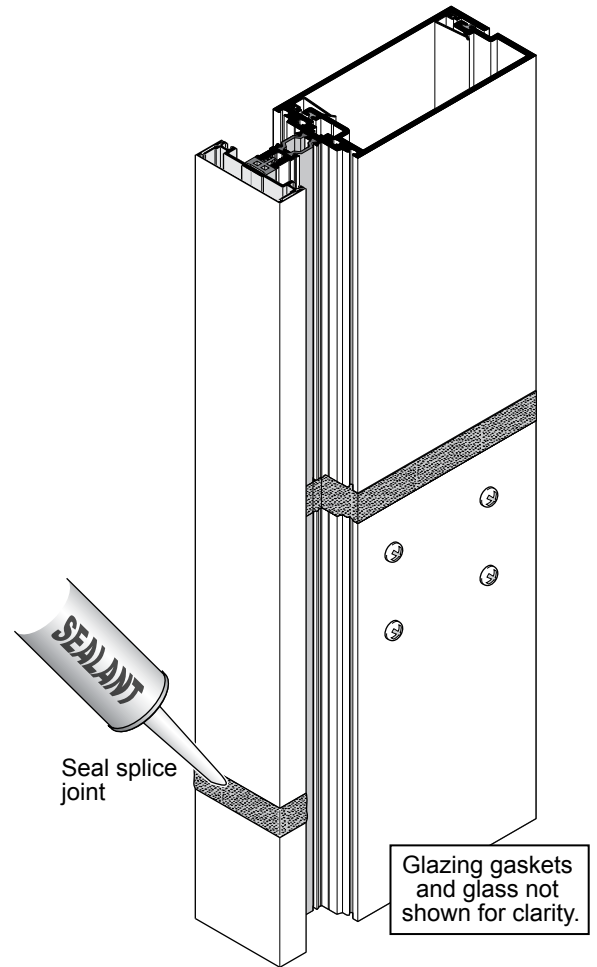


Fig. 55.2

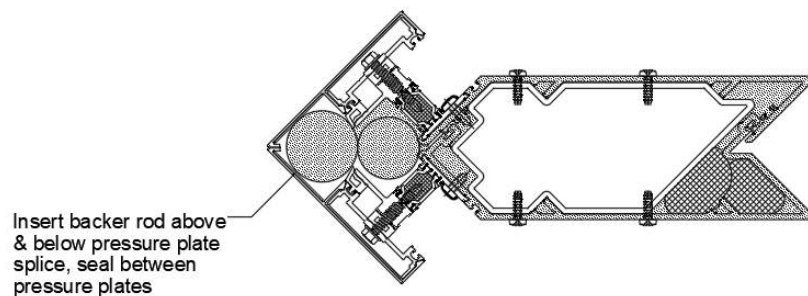


Fig. 55.3

GLAZING

Step 14: Install Pressure Plates and Face Covers (Continued)

Pressure Face Cap at SSG splice.

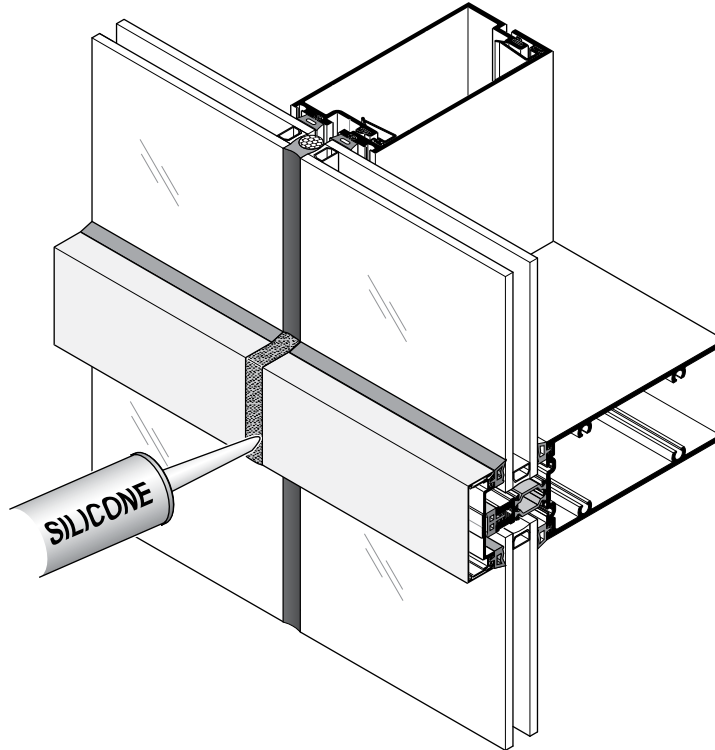


Fig. 56.1
 SSG FACE CAP
 at SPLICE

M. At expansion horizontals, install interior trim (E040TU) with trim clip (P4646) as required.

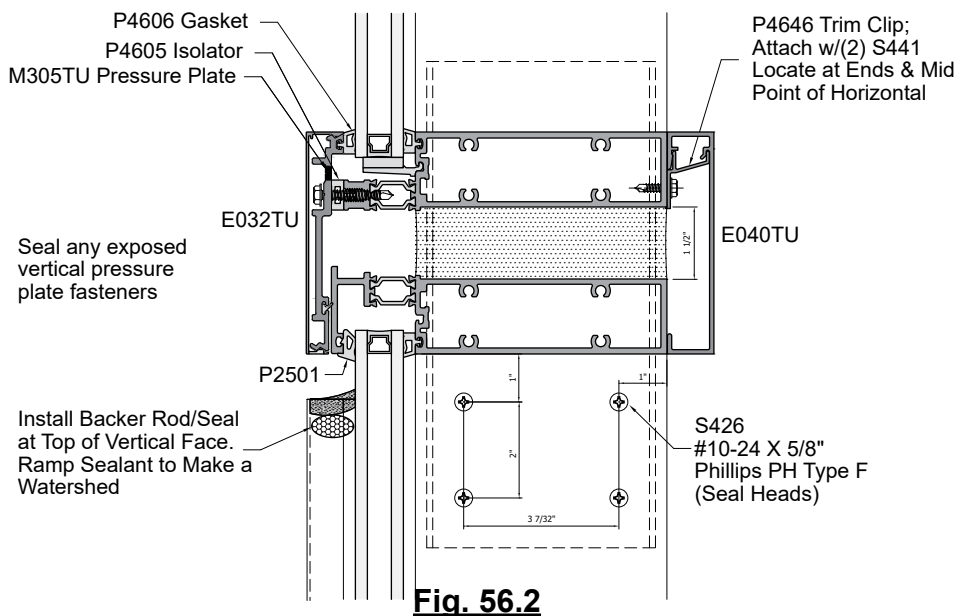
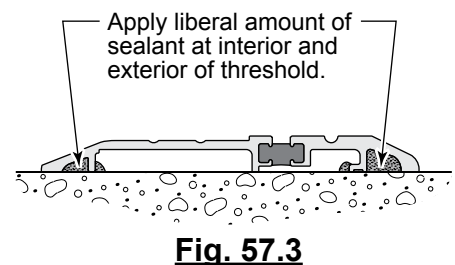
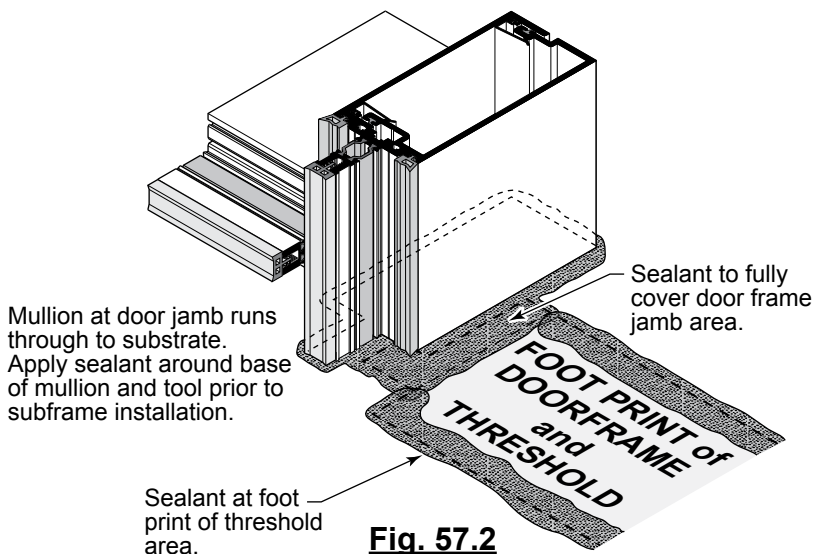
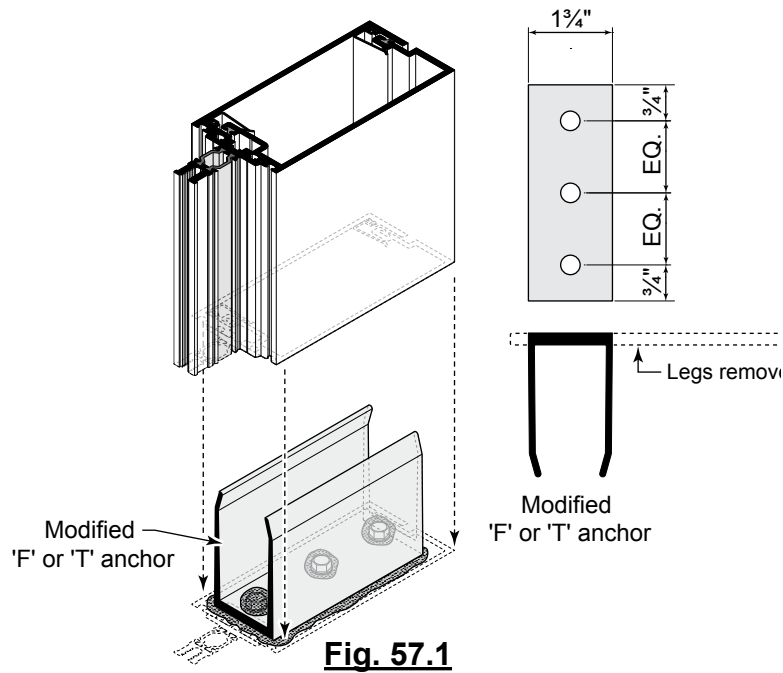


Fig. 56.2

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 sub frames run to floor. Bed verticals in sealant and anchor to building per approved shop drawings. See **Fig. 57.1** for possible anchoring method.
Always refer to approved shop drawings for specific requirements.



ENTRANCE FRAMING

ENTRANCE FRAMING (Continued)

C. SUBFRAME INSTALLATION

- o Prep the curtain wall frame with pocket closures or as detailed on approved shop drawings.
- o Prior to installing the sub frame, lay down a bed of sealant where the threshold will be installed. See **Fig. 56.2** and **Fig. 56.3**.
- o Install sub frame onto curtain wall mullion, shimming equally from side to side. Attach sub frame per approved shop drawings. Cap seal all fasteners and seal joint between sub frame and curtain wall.
- o Seal the top of the jamb sub frame as shown in **Fig. 58.3**.
- o Attach threshold to building per approved shop drawings.
- o Install door per Tubelite's Entrances and Frames Installation Manual.

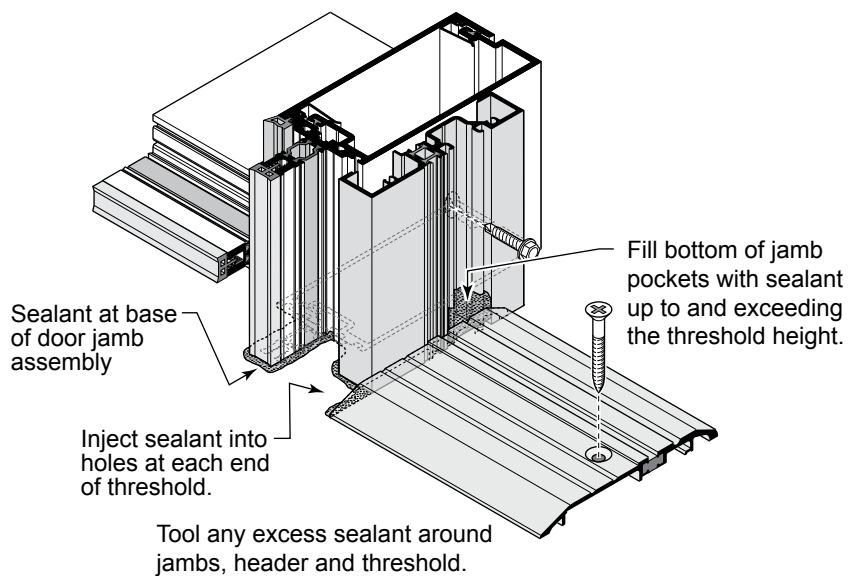


Fig. 58.1

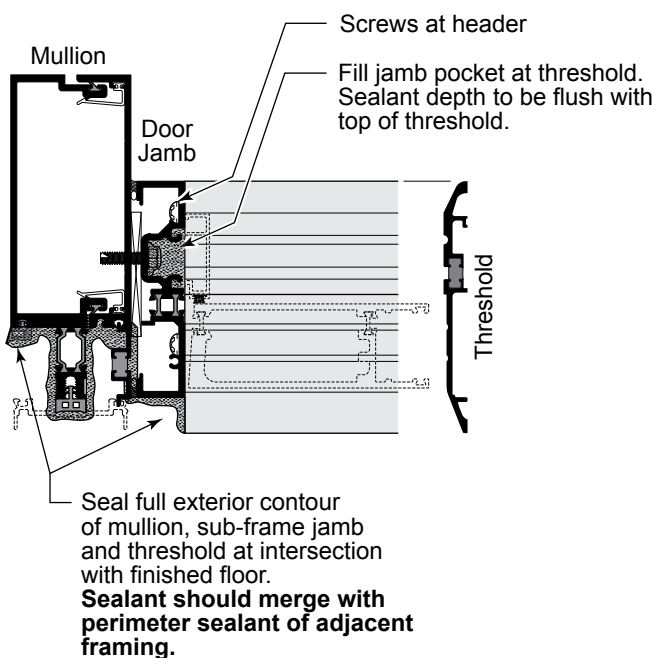


Fig. 58.2

Install end dams and seals as shown in step 14 on pages 36.

Seal interior and exterior shim space.

Seal intersection of jamb to head joint

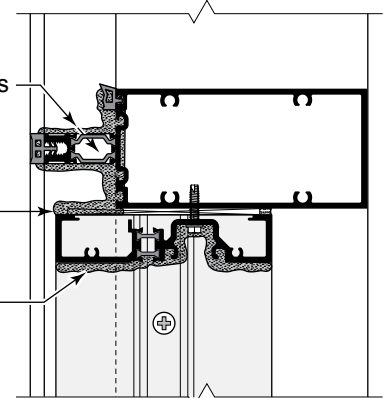


Fig. 58.3

REGLAZING

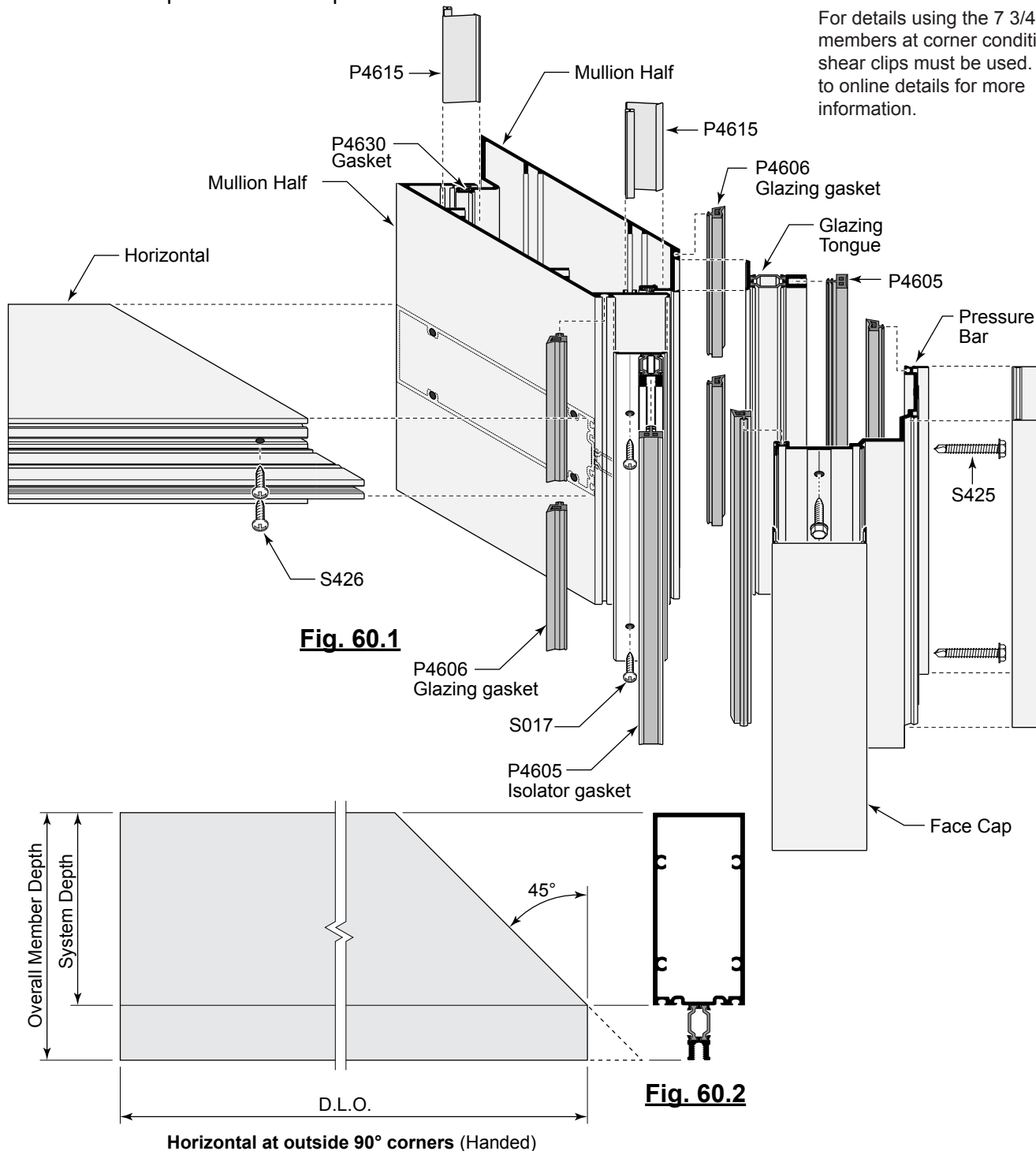
REGLAZING

- 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 P4634 temporary retainers per Step 14, page 46. Remove lite of glass and gaskets from opening. Clean debris and sealant from the glass pocket and glazing reglets.
- E. Install new glass in opening per Step 13-14, pages 44 through 56.

CORNER CONDITIONS

CAPTURED OUTSIDE CORNER

- A. Captured outside corners require a special cut on the horizontal members. See Fig. 59.2 for illustration.
- B. Follow the procedures set forth in Step 6 & 7 to assemble the horizontals to the corner vertical halves and install splice sleeves.
- C. Water dams can be pre-installed and sealed on the captured outside 90 degree corner. Refer to Step 8, Page 33 for instructions.
- D. Install gaskets per Step 9, Page 34-37.
- E. Refer to Steps 10-14 to complete the installation of the corner.



CORNER CONDITIONS

SSG OUTSIDE CORNER

- A. Follow the procedures set forth in Step 6 & 7 to assemble the horizontals to the corner vertical halves and install splice sleeves.
- B. Water dams must be installed and sealed after bay assembly. Refer to Step 8 for instructions.
- C. Install gaskets per Step 9.
- D. Refer to Steps 10-14 to complete the installation of the corner.

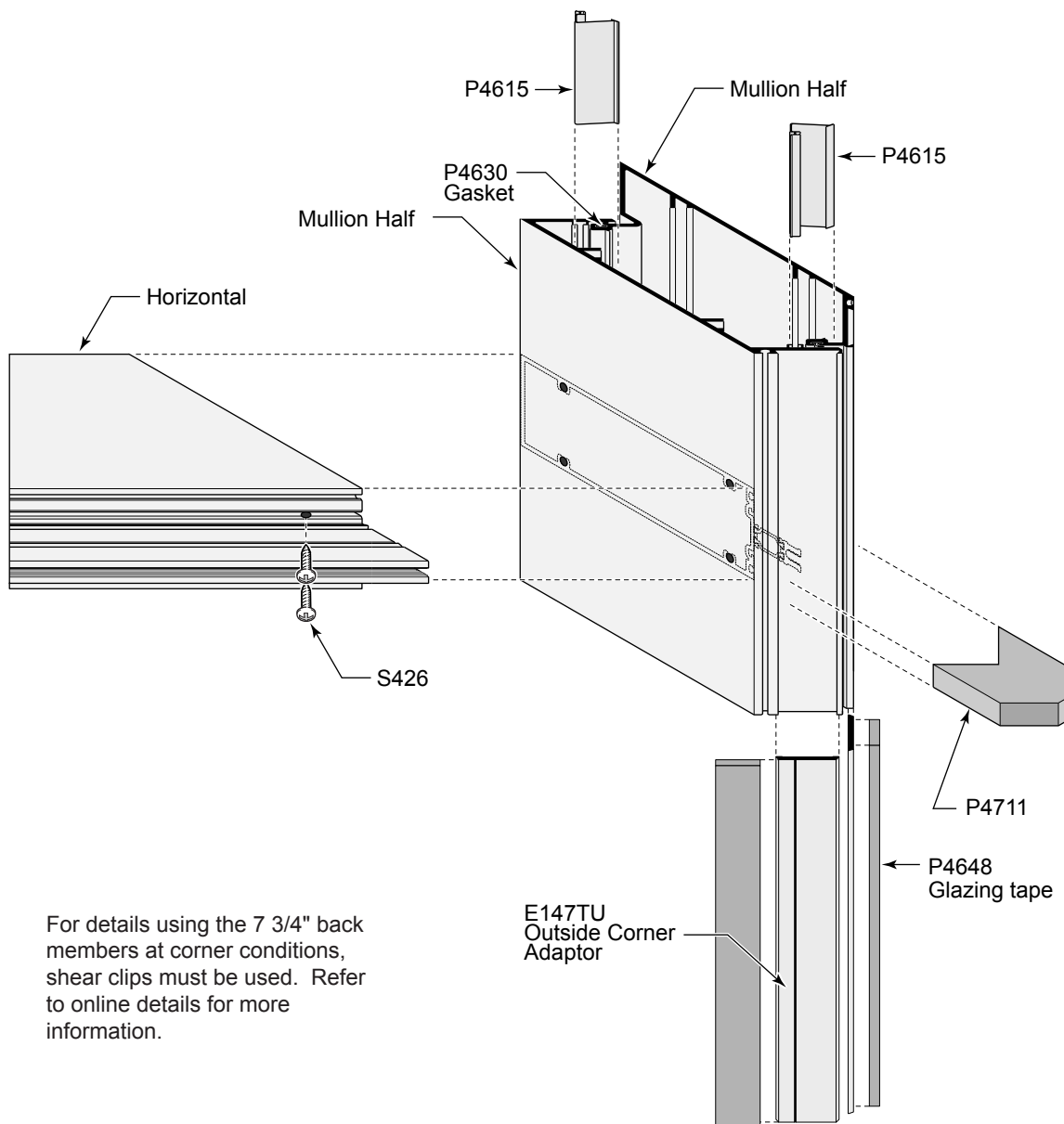


Fig. 61.1

CORNER CONDITIONS

SSG INSIDE CORNER

- A. Follow the procedures set forth in Step 6 & 7 to assemble the horizontals to the corner vertical halves and install splice sleeves.
- B. Water dams must be installed and sealed after bay assembly. Refer to Step 8 for instructions.
- C. Install gaskets per Step 9.
- D. Refer to Steps 10-14 to complete the installation of the corner.

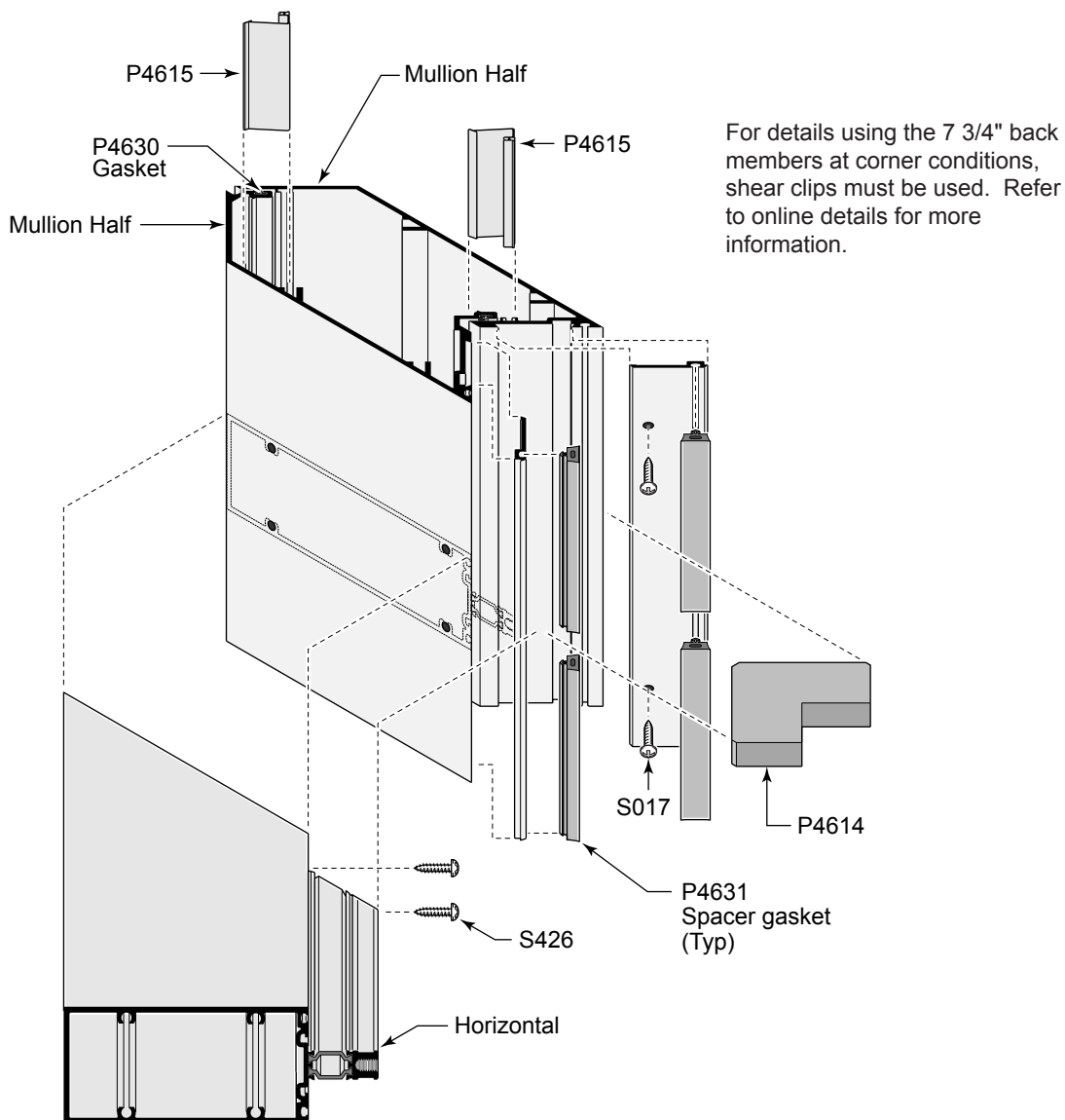


Fig. 62.1