

## 400T SERIES CURTAIN WALL

INSTALLATION INSTRUCTIONS











# TABLE OF CONTENTS

GENERAL CONSTRUCTION NOTE	4-5
QUICK REFERENCE CHECKLIST	5
PARTS LIST	6-13
ELEVATION TYPES and DETAILS	14-24
FRAME FABRICATION	
Step 1 Determine Frame Size	25
Step 2 Cut Material to length	26-27
Step 3 Drill Verticals for Shear Blocks	28
Step 4 Drill Horizontals for Shear Block Attachment	29
Step 5 Fabricate Pressure Bars	30
Step 6 Fabricate Weep Slots in Face Covers	31
Step 7 Notch Head & Sill for Anchor Clearance	31
Step 8 Install Steel Reinforcement as Required	32
Step 9 Fasten Shear Clip to Vertical	33
Step 10 Fasten Head and Sill Anchor Clips	
Step 11 Fasten Head and Sill Anchor Clips at "F" and "T" Anchor Conditions	34
FRAME INSTALLATION	
Step 12 Installing Vertical Mullions	35-36
Step 13 Splice Sleeve Installation	
Step 14 Attach Horizontals to Shear Blocks and Anchor Clips	38-40
Installing Polyamide Pressure plate	41
Step 15 Install Water Dams	42-43
Step 16 Apply Perimeter Seal to Installation	44
Step 16 Optional Installation of E4200	45-46
GLAZING	
Step 17 Glazing Preparation	
Step 18 Installing Gaskets	
Step 19 Installing Glass	
Step 20 Install Pressure Plates and Face Covers	53-62
TRANSITION GLAZING	63
ENTRANCE FRAMING	64-65
REGLAZING	66
CORNER CONDITIONS	
Captured Outside Corner	67
SSG Outside Corner	
SSG Inside Corner	





## GENERAL CONSTRUCTION NOTES

- 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, off set 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"(6.3mm) 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 sq. feet (46.5 sq.m.)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 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 you 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"(7366mm).
- Polyamide an Thermal pressure plate anchor screw holes are pre-machined. Weep holes must be drilled in the shop. Anchor holes are 8"(203.2mm) o/c and weeps are 5/16"(7.9mm) 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"(20.6mm). typical face covers can be used with the thermal pressure plates.
- Tubelite offers one typical aluminum corner cover (E4TB57) that is designed for de corner aluminum pressure plate. Nominal dimension from face of glass to face of cover measures 3/4"(19mm).
- A PVC pocket filler (P3967) has been designed to be used at perimeter members where a return leg pressure plates is not available.
- 1. Make sure the opening is square and the caulk joints are 1/2"(12.7mm) 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"(25.4mm)
SSG Vertical Mullions	=	D.L.O. + 2"(50.8mm)
SSG Horizontal Mullions	=	D.L.O. + 1¾"(44.5mm)
SSG Vertical Mullion at Captured Jamb	=	Width ONLY D.L.O. + 1 <sup>1</sup> / <sub>2</sub> "(38.1mm)
Corner Mullions	=	See Approved Shop Drawings





## TYPICAL FRAMING EXTRUSIONS

SHAPE	DESCRIPTION	PART No.
	4"[101.6mm] Tubular Captured Mullion/Horizontal	E4TBC223
۵ ۶ ۶	4"[101.6mm] Vertical SSG Mullion (Interior/Exterior Structural Seal)	E4TB140
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	SSG Setting Chair	P4623
	4"[101.6mm] Roll-Over Horizontal	E4TBC173
	4"[101.6mm] Roll-Over Horizontal for Live Load	E4TB182
<u>Ak</u>	4"[101.6mm] Roll-Over Filler	E4TB175
	4"[101.6mm] HD Vertical	E4TBC302
	4"[101.6mm] Open Back Perimeter Head, Sill & Jamb	E4TBC245





SHAPE	DESCRIPTION	PART No.
	5 1/2"[139.7mm] Back Member Upper Expansion Horizontal	E55TB264
	Expansion Plate (Chicken head)	E4200
	5 1/2"[139.7mm] Back Member Lower Expansion Horizontal	E55TB265
	5 1/2"[139.7mm] Back Member Captured Expansion Vertical to be used with Expansion Horizontal	E55TB266
	5 1/2"[139.7mm] Back Member SSG Expansion Vertical to be used with Expansion Horizontal	E55TB267
	Expansion Shear clip 4"[101.6mm] long Sill of Expansion Horizontal	PTB118A
	Expansion Shear Clip 4 7/8"[123.8mm] long Head of Expansion Horizontal	PTB118B
•	Horizontal Expansion angle	PTB133
<u>ي</u>	Intermediate Pressure Plate	M4TB224
<u>پ</u>	Pressure Plate (for use with Live Load Roll-Over Horizontal only)	M4TB324





## PRESSURE PLATE & FACE CAPS

SHAPE	DESCRIPTION	PART No.
	Perimeter Pressure Plate with Return Leg	M4TB325
{~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Thermal Perimeter Pressure Plate with Return Leg	PTB240
8-L_A	Pressure Plate - 5/16"[7.9mm] offset Use with alternate glazing options	E4TB102
₩	Pressure Plate - 1/8"[3.2mm] offset Use with alternate glazing options	E4TB72
<i>ұ</i> гұ	Thermal Pressure Plate	PTB120
	Polyamide Pressure Plate	P4633
	3/4"[19mm] Depth Face Cap (For P4633)	E031TU
	3/4"[19mm] Depth Face Cap (Standard)	E4TB64
	Captured Corner Face Cover (For Aluminum Pressure Plate)	E4TB303
	Captured Corner Face Cover (For P4633 Pressure Plate)	E4TB304
<del>ب</del>	Pressure Plate Use with E4TB285 Face Cover	M4TB290
	4" x 3/4"[101.6mm x 19mm] Face Cover	E4TB285
¥¥	Pressure Plate Use with E2439 Face Cover	M2289
	5" x 3/4"[127mm x 19mm] Face Cover	E2439
	3" x 3/4"[76.2mm x 19mm] Face Cover For Expansion Horizontal	E4133
ş	Pressure Plate for Expansion Horizontal	M4TB94
<u>a k</u>	Interior Closure Expansion Horizontal	E4201





## GLAZING ADAPTOR EXTRUSIONS

SHAPE	DESCRIPTION	PART No.
	Glazing Pocket Filler	E4TB278
	PVC Glazing Pocket Filler	P3967
r V	1/4"[6.3mm] Glass Adaptor for Captured Glazing	E4TB69
R	1/2"[12.7mm] Glass Adaptor for Captured Glazing	E4TB80
	1/4"[6.3mm] Glass Adaptor for SSG Glazing	E4TB129
	Screw Applied Horn for 1"[25.4mm] Glazing	E4TB45
	90º Outside Corner Adaptor for Captured Glazing	E4TB52
	90º Outside Corner Adaptor for SSG Glazing	E4TB46
The second se	90º Outside Corner Adaptor for SSG Glaze 1/4"[6.3mm] Spandrel Glass	E4TB48
	90º Inside Corner Adaptor for SSG Glaze	E4TB47
	90º Inside Corner Adaptor for SSG Glaze ¼"(6.3mm) Spandrel Glass	E4TB49
	4"[101.6mm] Back Member Outside/Inside Corner Verticals Use with E4TB50 & E4TB51	E4TBC88
	90º Outside Corner Interior Closure	E4TB50
	90º Inside Corner Interior Closure	E4TB51
Sector Car	PRESSURE PLATE FOR 135° OS CORNER	E4TB361





### ANCHORS and CLIPS

SHAPE	DESCRIPTION		PART No.
			PART NO.
	Shear Clip for E4TB128 Roll-Over Horizontal		PTB110
	Shear Clip for E4TB140 SSG Horizontal		PTB130
La contraction de la contracti	Shear Block for Tubular Horizontals		PTB58
	Shear Block for Tubular SSG Horizontals		PTB96A
Le la	Shear Block/Anchor for Head		P2056
June 199	Shear Block/Anchor for Sill		PTB47
	Inside Corner Shear Clip		P4745
	Outside Corner Shear Clip		P4739
	l l l l l l l l l l l l l l l l l l l	g 5/16"[7.	9mm] P1265
	Locking Lug for PTB47 Sill Anchor Clips	3/8"[9.5	
	for PTB47 Sill Anchor Clips	7/16"[12	I.1mm] P1267
		Captured	
	'T' Anchor for Mullions	SSG	PTB84Y at E4TB262
		SSG	PTB87B at E4TB128
	Corn		PTB119
	Capi		PTB83M
	'F' Anchor for Jambs	SSG	PTB84Y at E4TB262
			PTB88B at E4TB128
	'F' Anchor 4" x 1"[101.6mm x 25.4mm] Extrusion For Jambs		E3162

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





## ACCESSORIES

SHAPE	DESCRIPTION	PART No.
	Typical Glazing Gasket	P4606
	Optional Glazing Gasket	PTB33
	Optional Glazing Gasket	PTB31
	Thermal Isolator At Liveload Horizontal	P2064
	Thermal Isolator at Typical Mullions	PTB148
	Spacer Gasket for SSG	P4631
	Setting Block for 1" [25.4mm] Glazing	P946
	Setting Block for 1/4"[6.3mm] Glazing	P948
	Temporary Glass Retainer	PTB194
	Water Dam for Captured Glazing	PTB103
	Water Dam for SSG Glazing	PTB76A
	WATER DAM SSG VERTICAL 1/4"[6.3mm] GLASS	PTB123
	Water Dam for SSG Inside Corner 1" OA GLASS	PTB122
	Water Dam for SSG Outside Corner 1" OA GLASS	PTB121
	WATER DAM SSG OS CORNER 1/4"[6.3mm] GLASS	PTB124
	WATER DAM SSG IS CORNER 1/4"[6.3mm] GLASS	PTB125





## ACCESSORIES

SHAPE	DESCRIPTION	PART No.
Ĩ	Sweep Gasket 3"[76.2mm] Aluminum Pressure Plate Horizontal Exp.	PTB115
J. J	Gasket Expansion Plate (Chicken Head)	PTB116
0	PVC Rod Interior Expansion Plate (Chicken Head) 120" [3048mm] long	PTB117C
	Reticulated Foam 3"[76.2mm] length	P4810
	E4TB223 SPLICE SLEEVE	P1627B
	SPLICE SLEEVE FOR E4TB52	PTB352
	SPLICE SLEEVE FOR E4TB46	PTB346
	SPLICE SLEEVE FOR E4TB51	PTB351
	SPLICE SLEEVE FOR E4TB88	PTB17B
	SPLICE SLEEVE FOR E4TB50	PTB350
	SPLICE SLEEVE FOR E4TB47	PTB347
0 0 0 0	MULLION END CAP USE AT JAMB, INT MULLION, IS 90 CORNER	P4834
0 0 0 0	MULLION END CAP USE AT OS 90 CORNERS	P4835





## FASTENERS

SHAPE	DESCRIPTION	PART No.
	Drill Fixture	P2091
•	#10-24 x 1/2" PH TYPE 'F'	S128
O ]==	#14-14 x 1/2" HH TYPE 'F'	S139
\$	#8 x 3/8" PH Pan Head Type A	S196
• ( <b>***</b> *	#10-24 x 3/8" PH Self Tapping	S270
	1/4- 20 x 11/2" HWH TYPE 'F'	S359
	1/4 - 20 x 3/4" IND HWH TYPE 'F' 18-8SS	S369
	1/4-20 X 1 3/16" HWH TYPE F	S470
	1/4 - 20 x 1 1/2" HWH Bolt for Corner Mullion Nose at E4TB172	S427
	1/4 - 20 x 2" HWH Bolt for Corner Mullion Nose at E4TB110	S428
© [	1/4 - 20 x 1" IND HWH TYPE 'CA' SS (Typical Pressure Plate Fastener)	S455
	#12-14 X 1-1/2" HWH 8-18 SELF-DRILL #4 PT (Typical Pressure Plate Fastener)	S400
	1/4 - 20 x 1 3/16" IND HWH TYPE 'F' 18-8SS W/ FLAT WASHER (Used W/ P4633)	S308
	1/4 -20 x 2-1/2" PH PAN HD STEEL ZINC	S473
	3/8 x 1" Pipe Sleeve	P2028
	1" O.D. Washer (Use with S470 Screw)	S437

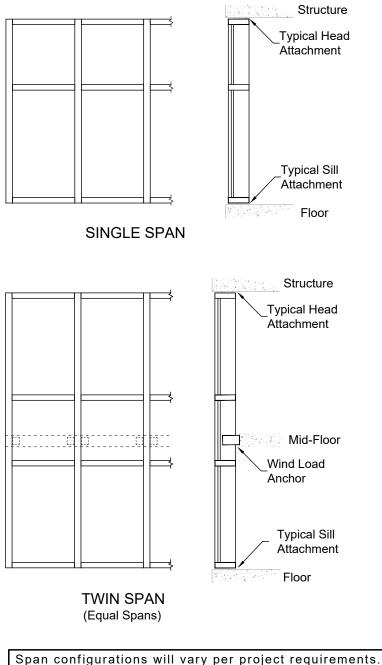




## **ELEVATION TYPES**

TYPES OF CURTAIN WALL INSTALLATION

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



Conditions must be approved by engineer calculations.

## Fig. 14.1

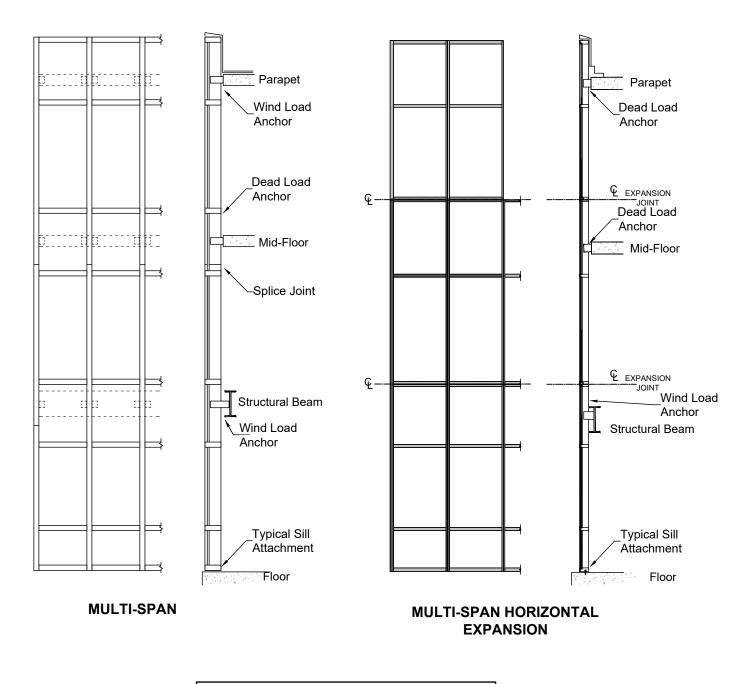




## **ELEVATION TYPES**

#### 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.

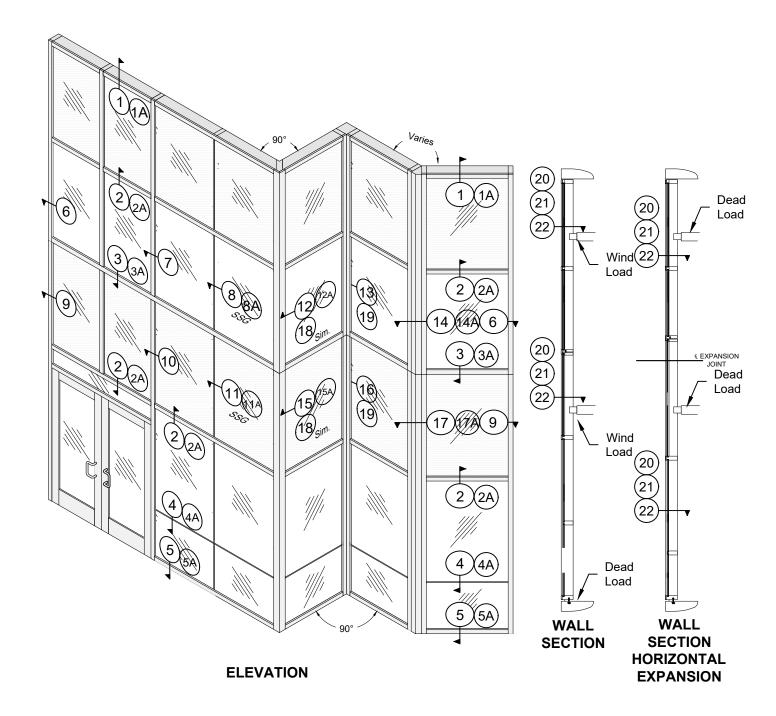


Span configurations will vary per project requirements. Conditions must be approved by engineer calculations.





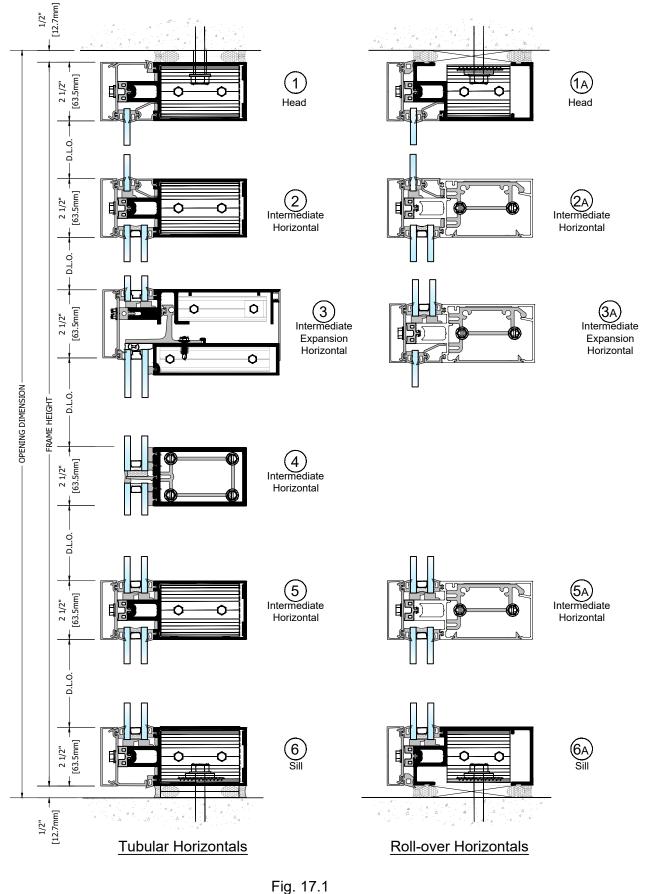
## **ELEVATION and WALL SECTIONS**

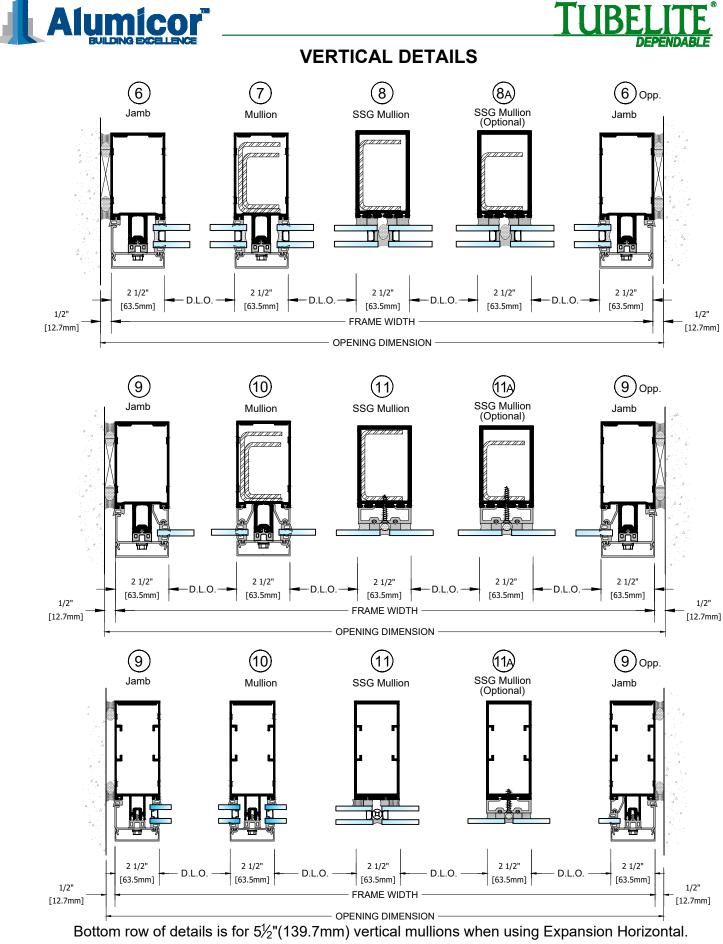




# TUBELITE<sup>®</sup>

## HORIZONTAL DETAILS



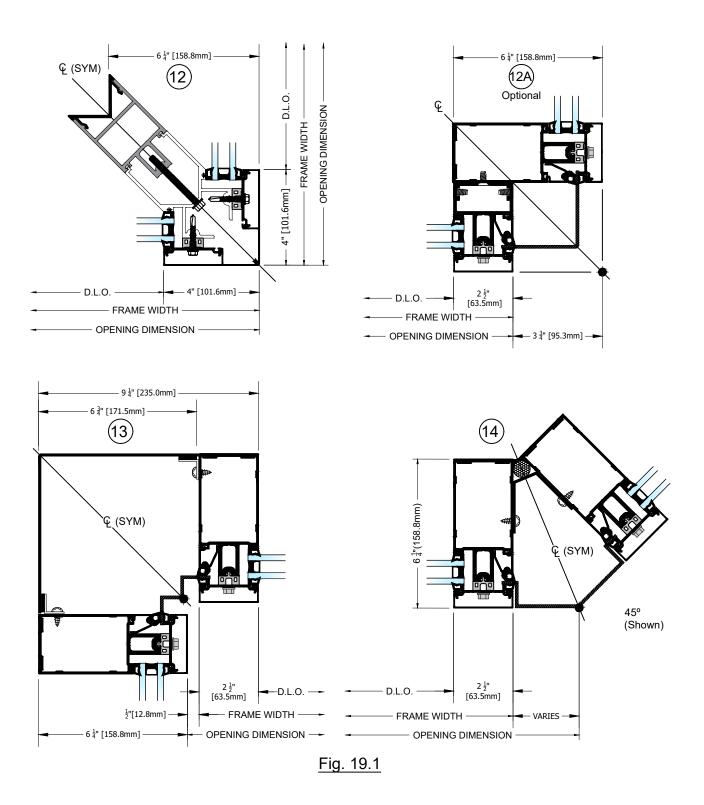


<u>Fig. 18.1</u>





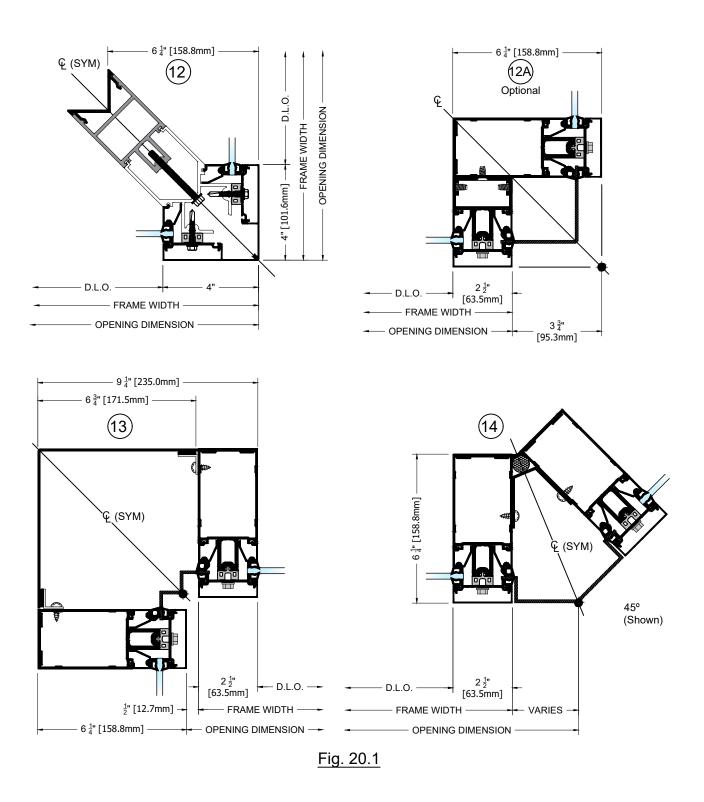
## CORNER DETAILS







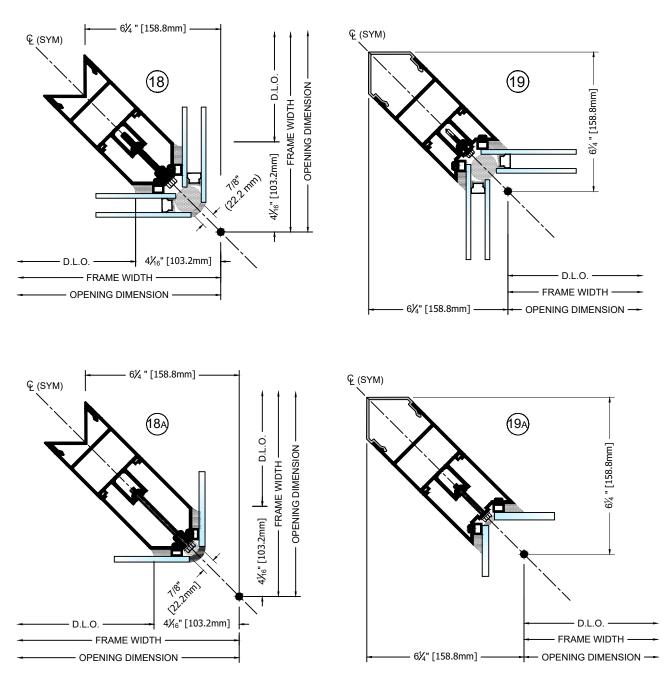
## CORNER DETAILS







## CORNER DETAILS

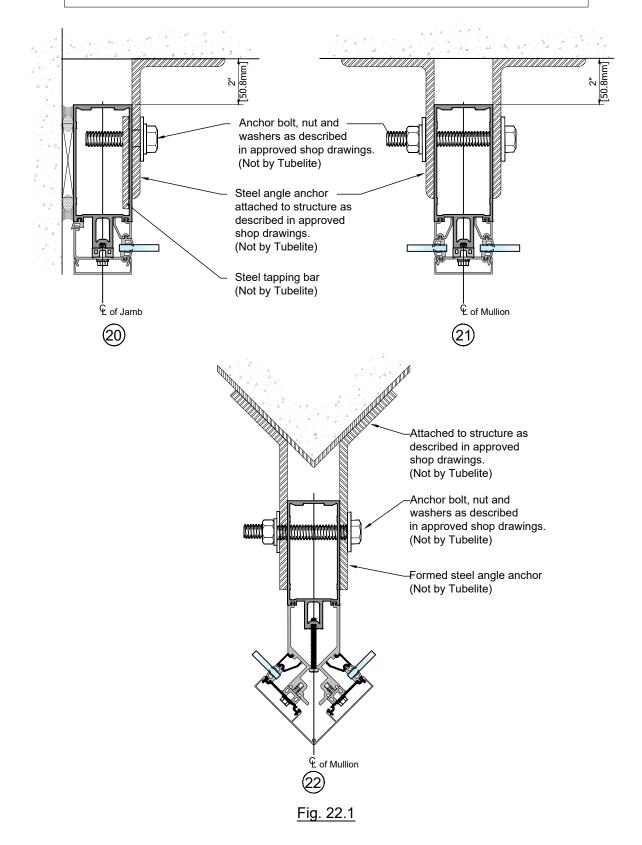








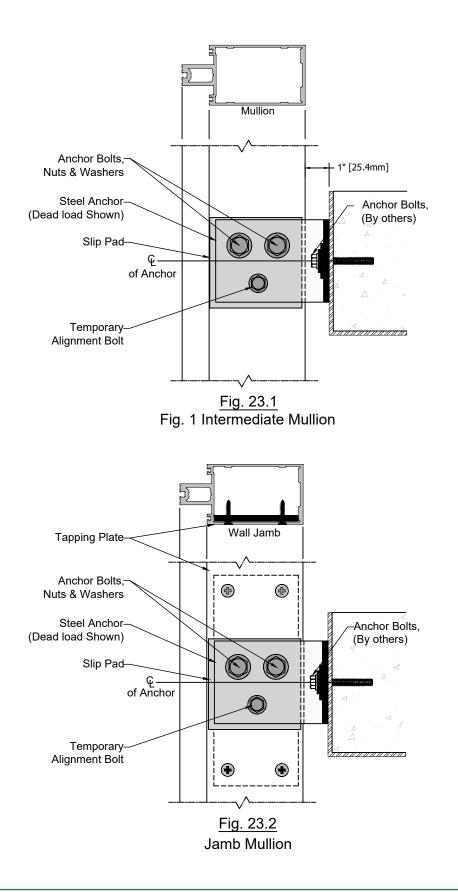
Anchor details on pages 22 through 24 represent one of several methods of anchoring. Refer to approved shop drawings for job specific applications.







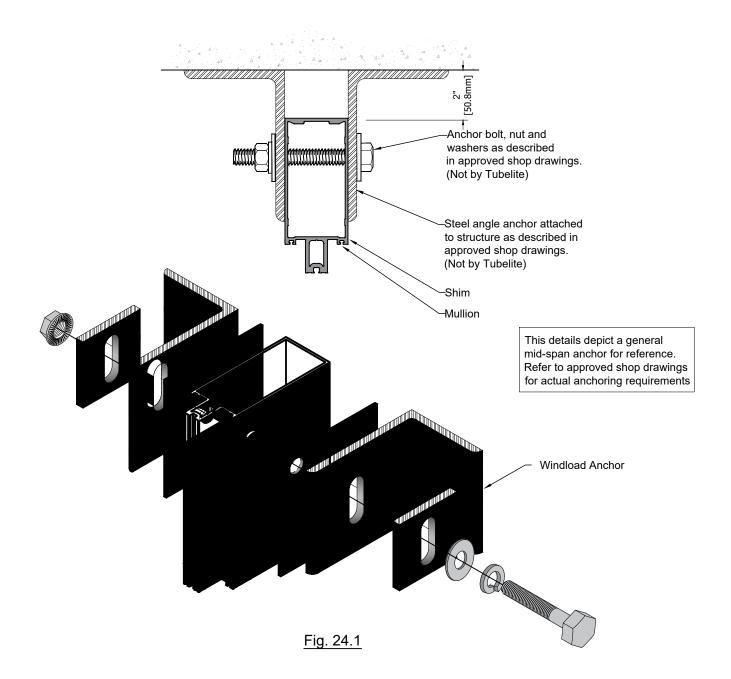
### MID-SPAN ANCHOR DETAILS







## MID-SPAN ANCHOR DETAILS







#### Step 1: Determine Frame Size

#### Frame Width

- A. Make sure the opening is square and plumb. Measure each diagonal of the opening. **SEE Fig. 25.1.**
- 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"(12.7mm) minimum caulk joint at jambs). **SEE Fig. 25.2.**
- 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"(25.4mm) to allow a minimum of ½"(12.7mm) at sill and head for shim and caulking. <u>SEE Fig. 25.3.</u>
- 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.

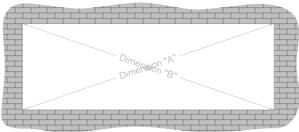
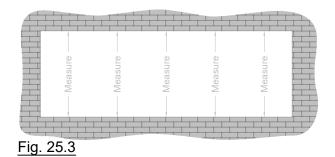


Fig. 25.1 Dimension "A" = "B"

Measure	
Measure	
Measure	
	<b>F</b>

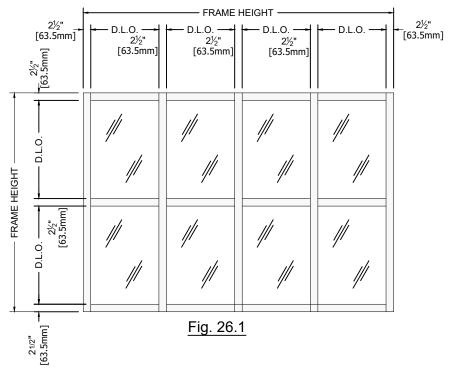








#### Step 2: Captured Framing - Cut Materials to Size



Cut extrusions to lengths as shown below:

#### **Vertical Profiles:**

Vertical Mullion Pressure Plates Face Caps	=Frame Height =Frame Height =Frame Height	For frames that receive vertical splicing, see step 20, page 58.
Glazing Adaptors Pocket Filler at Perimeter	=Plane Height =D.L.O. <i>PLUS</i> (+)1"(25.4mm) =D.L.O. <i>MINUS</i> (-)1/16"(1.6mm) (used with PTB120 thermal pre-	
Horizontal Profiles:		

l ubular Head, Sill & Horizontal	=D.L.O.
Open Back Head, Sill & Horizontal	=D.L.O. <i>MINUS</i> (-)1/32"(0.8mm)
Pressure Plates	=D.L.O. <i>MINUS</i> (-)3/8" (9.5mm)
Face Caps	=D.L.O. <i>MINUS</i> (-)1/32"(0.8mm)
Glazing Adaptors	=D.L.O. <i>MINUS</i> (-)1/32"(0.8mm)
•	

#### Accessories:

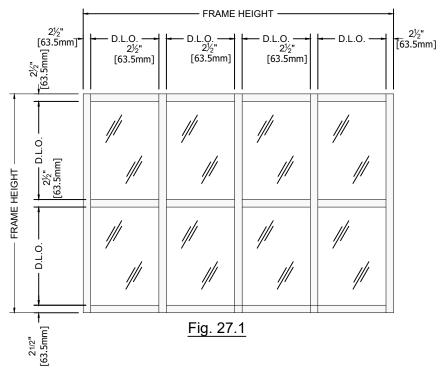
Exterior Vertical Gasket	=Pressure Plate Length <i>PLUS</i> (+)Allowance*
Exterior Horizontal Gasket	=Pressure Plate Length PLUS (+)Allowance*
Interior Vertical Gasket	=D.L.O. PLUS (+)1"(25.4mm) PLUS(+)Allowance*
Interior Horizontal Gasket	=D.L.O. PLUS (+)Allowance

\*Allowance = 1/8" (3.2mm) extra length per foot of D.L.O. or aluminum length

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



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



Cut extrusions to lengths as shown below:

#### **Vertical Profiles:**

Vertical Mullion Pressure Plates (at Jambs) Face Caps (at Jambs)	=Frame Height =Frame Height =Frame Height	For frames that receive vertical splicing, see step 20, page 58.
Glazing Adaptors	=D.L.O. <i>PLUS</i> (+)1"(25.4mm)	
Pocket Filler at Perimeter	=D.L.O. <i>MINUS</i> (-)1/16"(1.6mm) (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"(0.8mm)
Pressure Plates	=3 Lites Wide Maximum
Face Caps	=3 Lites Wide Maximum
Glazing Adaptors	=D.L.O. <i>MINUS</i> (-)1/32"(0.8mm)

#### Accessories:

Exterior Vertical Gasket (at Jambs)	=Pressure Plate Length PLUS (+)Allowance*
Exterior Horizontal Gasket	=Pressure Plate Length PLUS (+)Allowance*
Interior Vertical Gasket	=D.L.O. PLUS (+)1"(25.4mm) PLUS(+)Allowance*
Interior Horizontal Gasket	=D.L.O. <i>PLUS</i> (+)Allowance
Silicone Spacer Gasket (SSG)	=D.L.O. PLUS (+)1"(25.4mm) PLUS(+)Allowance*

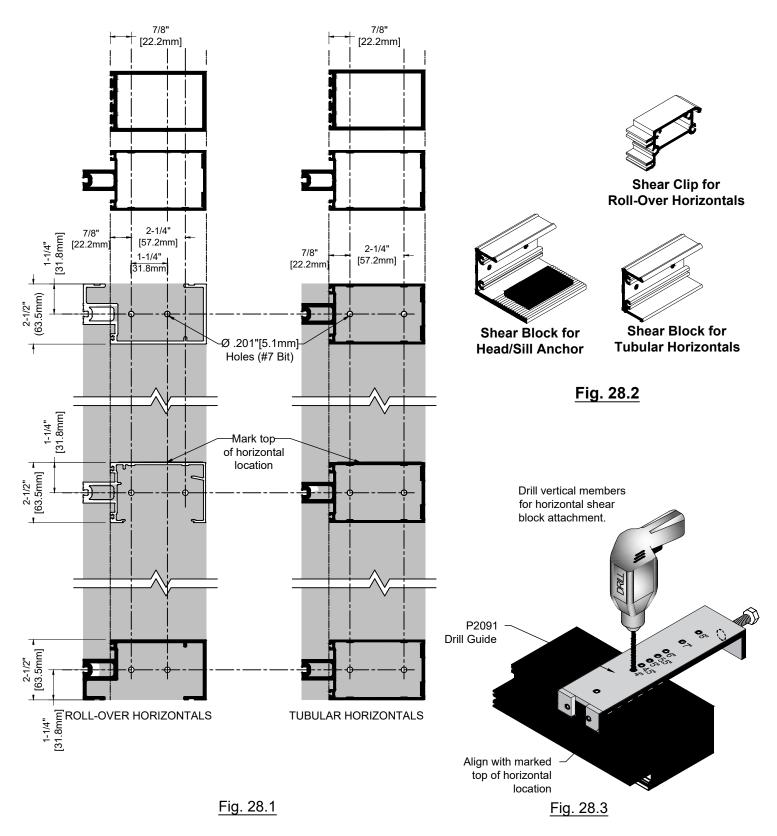
\*Allowance = 1/8"(3.2mm) extra length per foot of D.L.O. or aluminum length





#### Step 3: Drill Holes in Vertical Members for Shear Blocks

A. Drill .201"[5.1mm] diameter pilot holes for #14 screws in the vertical members. Use the P2091 drill fixture to locate these holes.

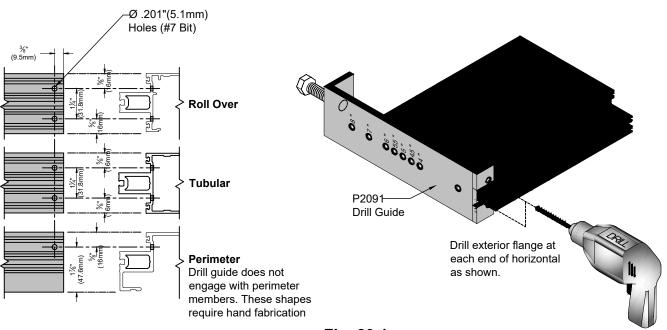




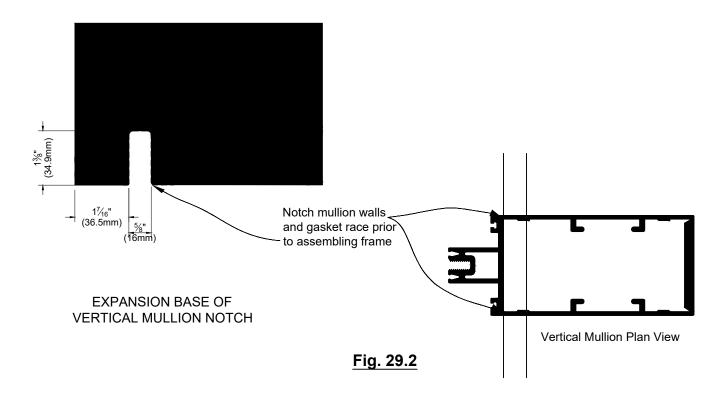


#### Step 4: Drill Holes in Horizontal for Attachment to Shear Blocks

A. Drill (2) .201"(5.1mm) 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.











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

- A. Drill (3) three  $\frac{5}{16}$ "[7.9mm]diameter weep holes per horizontal pressure plate, one at the midpoint and one at 4"[101.6mm] at each end as shown on Fig. 30.3 & 30.4.
- B. Pressure plates are factory punched on center for pressure plate screws. Drill additional hole(s) as required to ensure a maximum of 2"[50.8mm] 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. 30.4

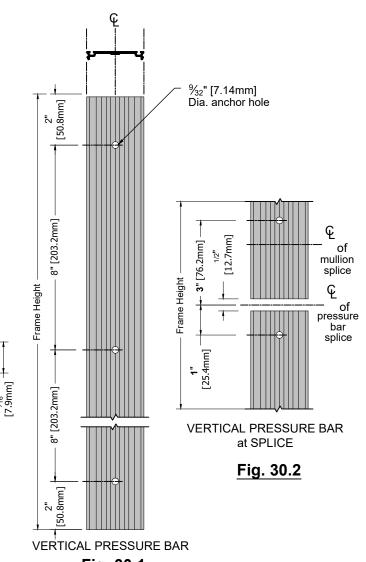
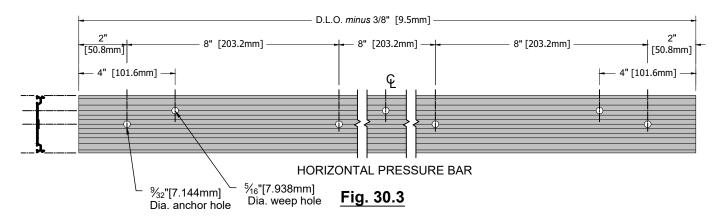


Fig. 30.1



Drill Weep

Holes Here

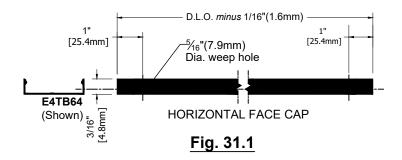
%₀" [14.3mm]



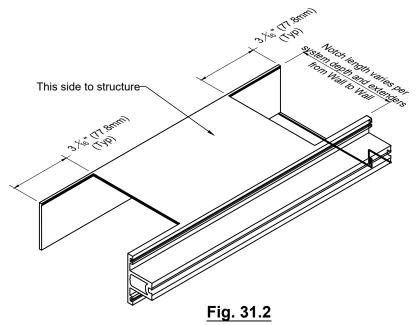


#### Step 6: Fabricate Weep Slots in Horizontal Face Covers

A. A. Drill a  $\frac{5}{16}$ "(7.9mm) diameter weep hole on the bottom of each horizontal face cover a maximum of 1"(25.4mm) from each end of the cover.



- 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. 31.2 for proper notch size.

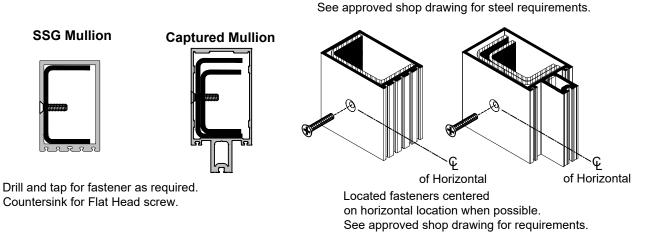






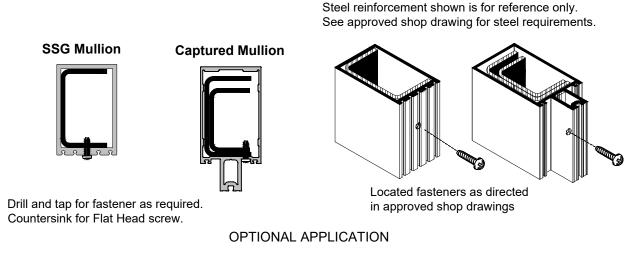
#### Step 8: Install Steel Reinforcement As Required

- 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.

TYPICAL APPLICATION



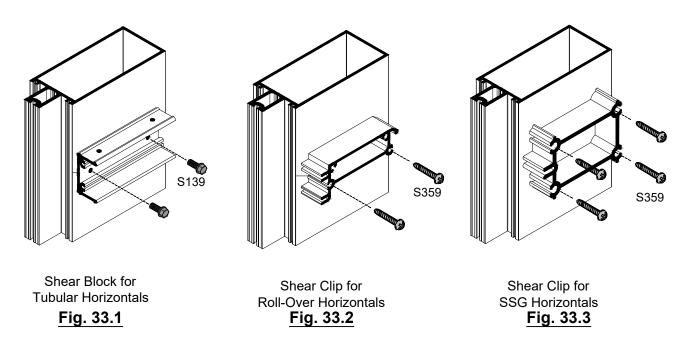
## Fig. 32.1





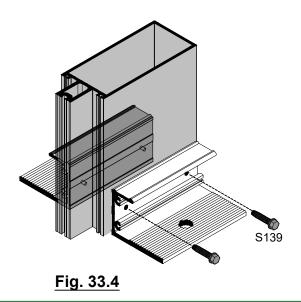
#### Step 9: Fasten Shear Blocks

- 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.



#### 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.

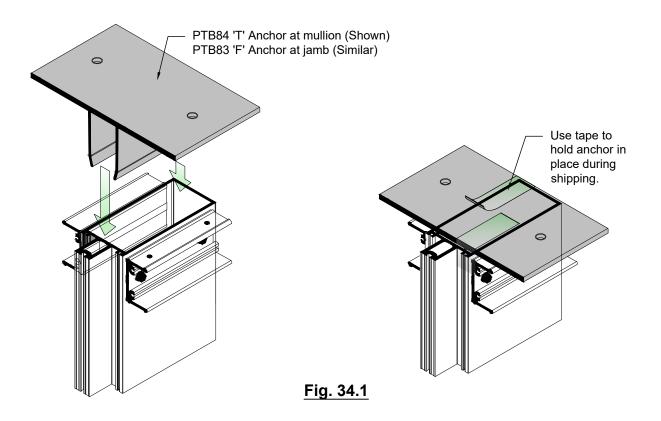






#### Step 11: Fasten Head or Sill Shear Block at F and T Anchor Conditions

- 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.







#### 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

- A. Install vertical mullions plumb and level, shimming under the verticals at the sill for proper deadload distribution.
- B. Attach the locking lug to the sill anchor clip using a washer and anchor bolt per approved shop drawings (not by Tubelite).
- C. 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.

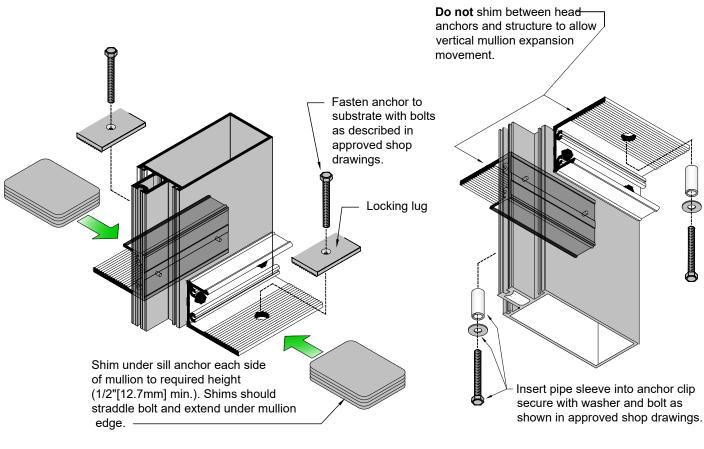


Fig. 35.1

Fig. 35.2





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

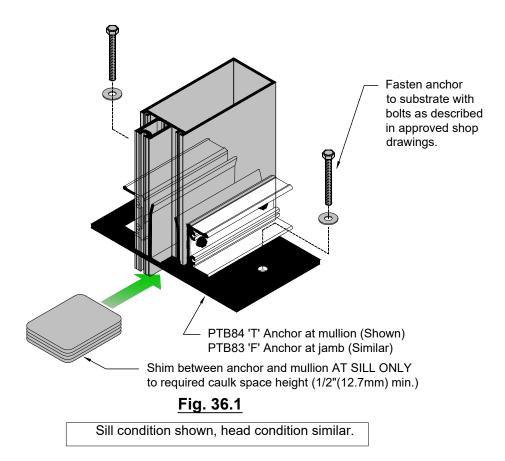
#### T or F Anchor Installation

- 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.



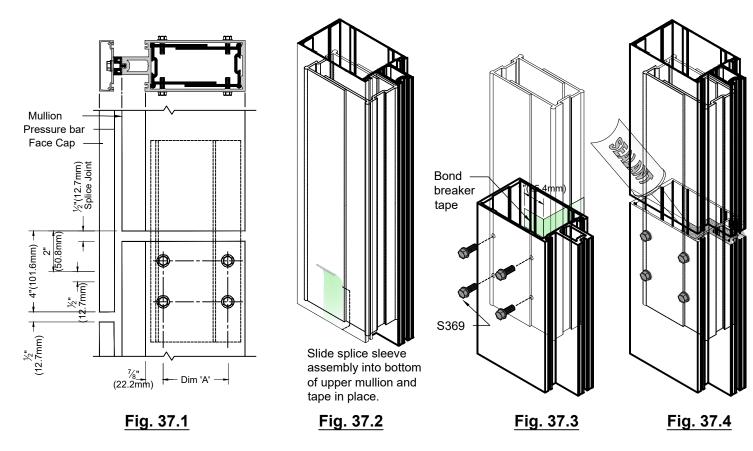




### FRAME FABRICATION

#### 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 **37.1** 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. 37.2**.
- 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. 37.3**.
- E. Apply bond breaker tape to the face of the splice sleeve between the lower and upper verticals, returning back 1"(25.4mm) on each side.
- F. Apply sealant over bond breaker tape at joint. Tool sealant. See Fig. 37.4.



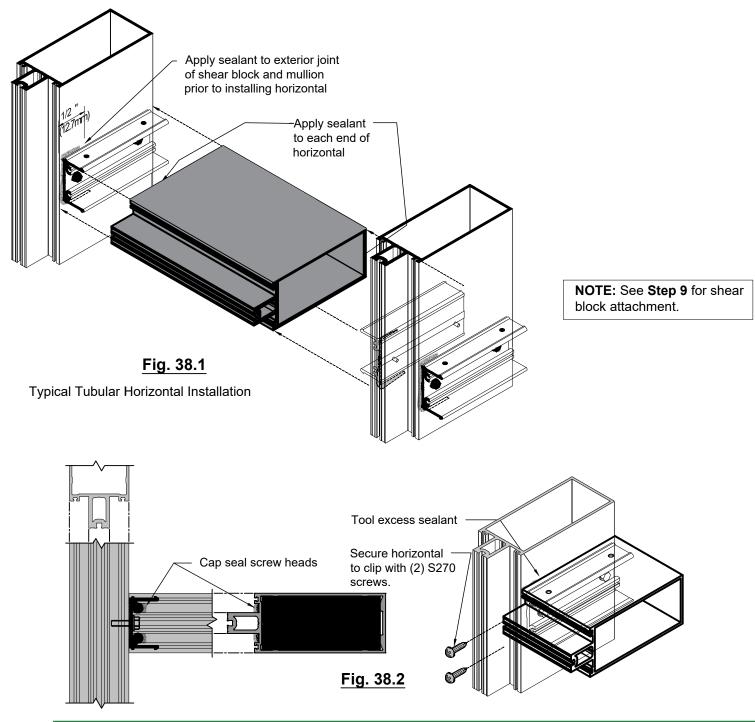




# FIG. 1 FRAME FABRICATION

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

- A. Seal shear block prior to installing the horizontal member. See Fig. 38.1.
- B. Seal the ends of the horizontal back member and attach to the shear block using S270 screws. Seal the heads of the screws.
- C. Tool sealant at the horizontal/vertical intersection. See Fig. 38.2.

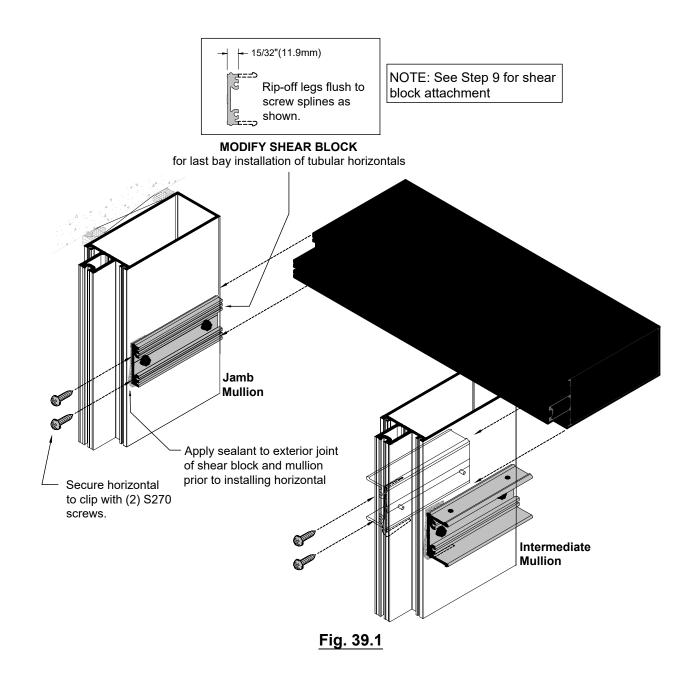






#### Step 14: Attach Horizontals to Shear Blocks and Anchor Clips (Continued)

LAST BAY TUBULAR HORIZONTAL INSTALLATION

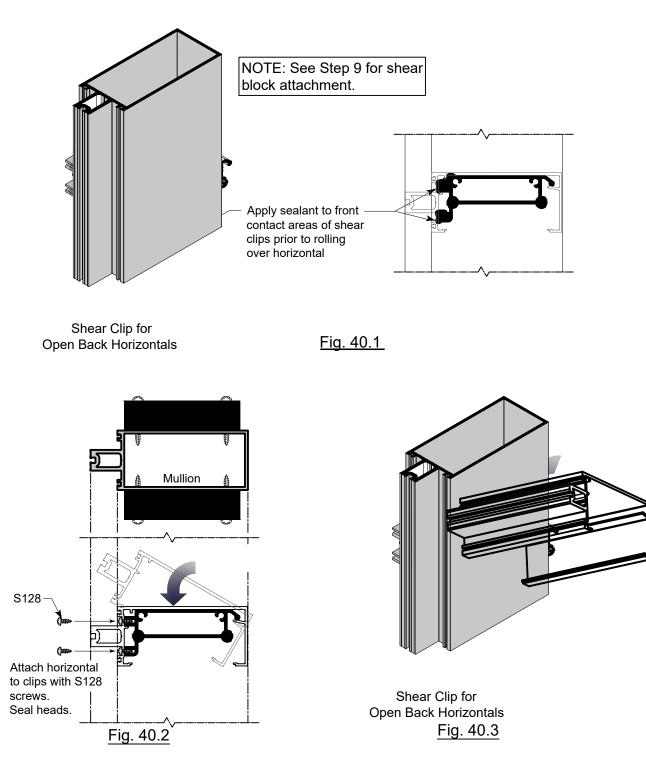






# FRAME FABRICATION

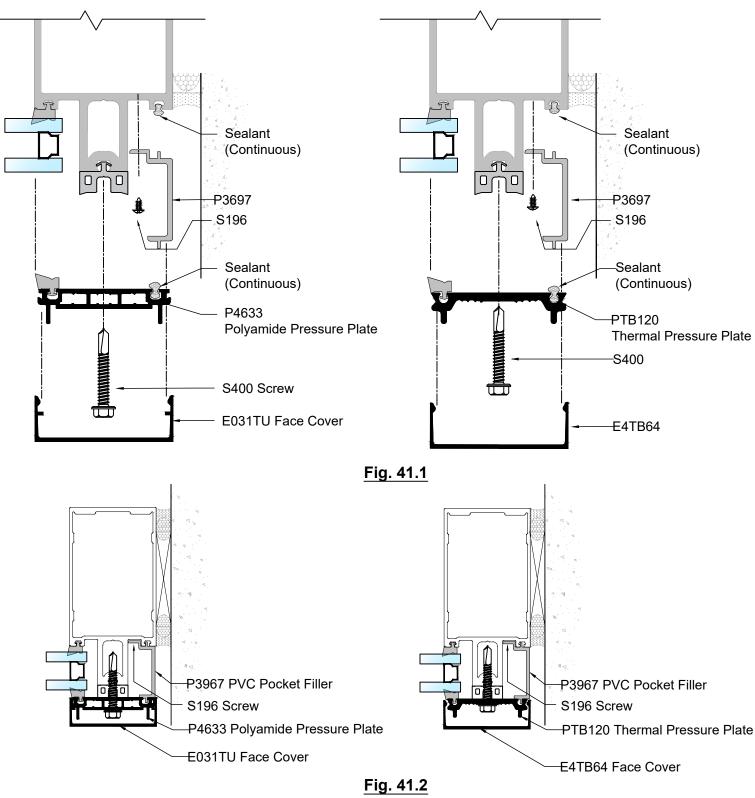
E. When roll-over horizontals are used, seal face of clip, horizontal ends and screw heads. See Fig. 40.1, Fig. 40.2 and Fig. 40.3.







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



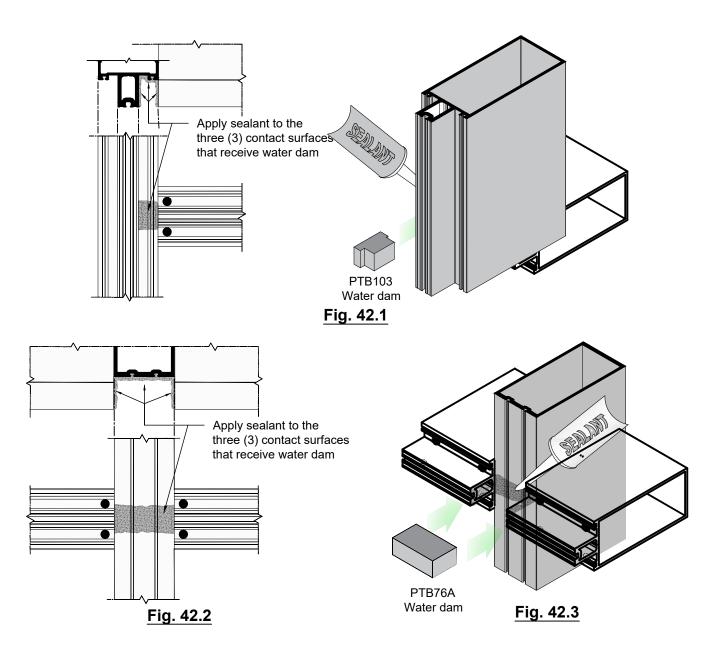
JAMB AT ALTERNATIVE PRESSURE PLATES





#### Step 15: Install Water Dams

- A. Seal the end of the horizontal member across the vertical member. 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 E4TBC245) 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.







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

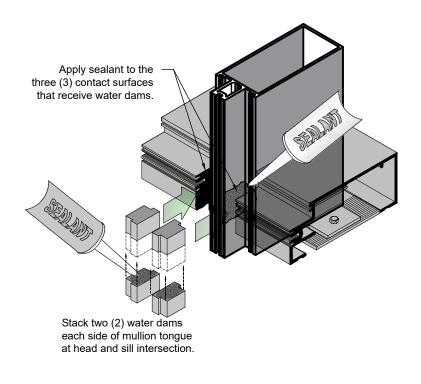


Fig. 43.1

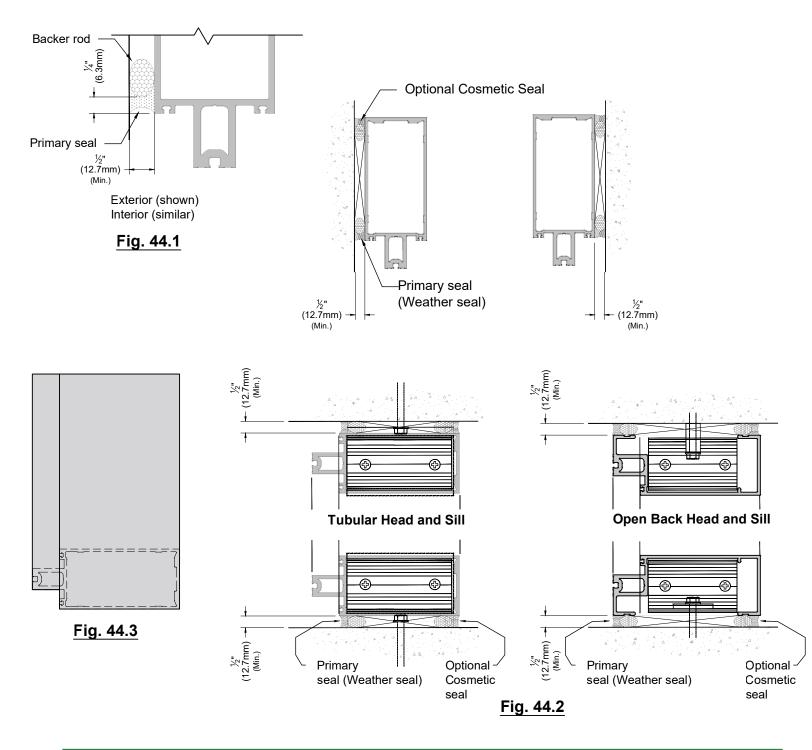




#### Step 16: Seal Perimeter of Installation

- 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. 44.1 and Fig. 44.2.

**NOTE**: When using polyamide pressure plate, install exterior seal as shown in **Fig. 41.1** and **Fig. 41.2**. **NOTE**: When using tubular head and sill members, the vertical tongue can be notched to make the perimeter sealing easier. SEE FIG 44.3

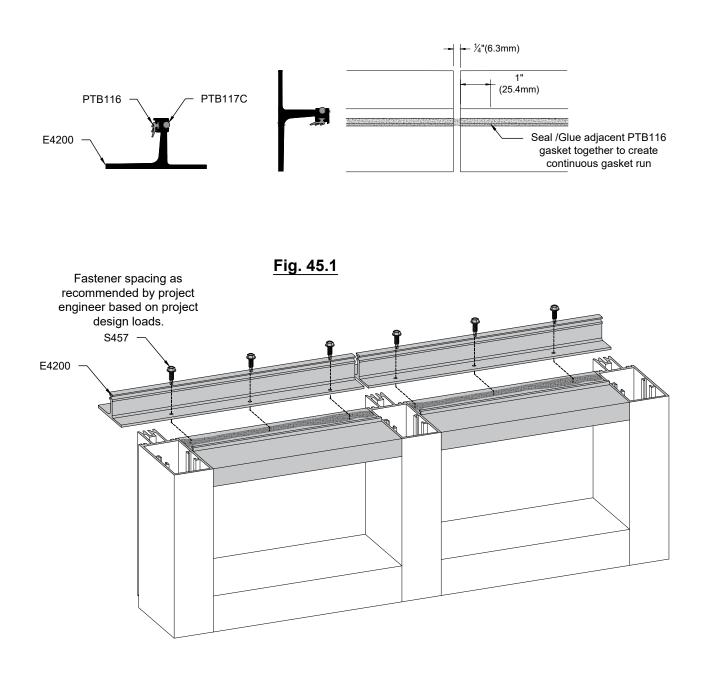






#### Step 16: Optional Installation of E4200 profile

- 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"(6.3mm) joint at the centerline of the lower frame unit.

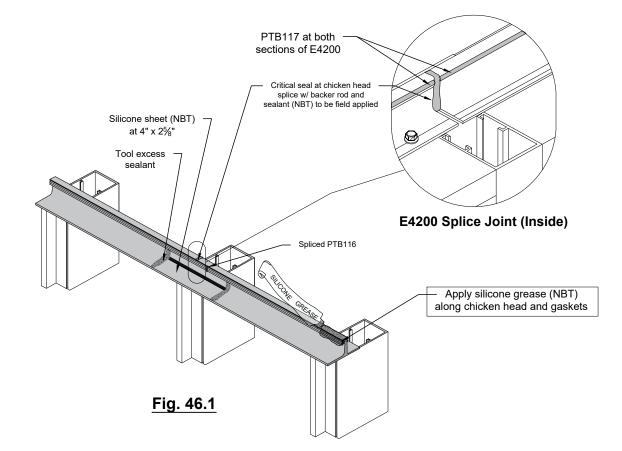




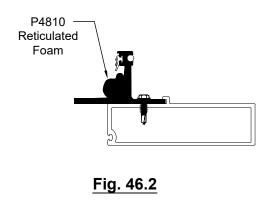


#### Step 16: Optional Installation Expansion Plate (Continued)

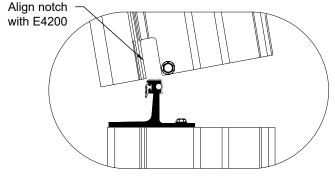
- A. At E4200 splice locations, set a silicone sheet in a bed of silicone over the splice joint.
- B. Press sheet into the silicone and tool excess around perimeter. See Fig 46.2.
- C. Use backer rod and sealant on the interior side of the E4200 splice. See Fig 46.2.



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



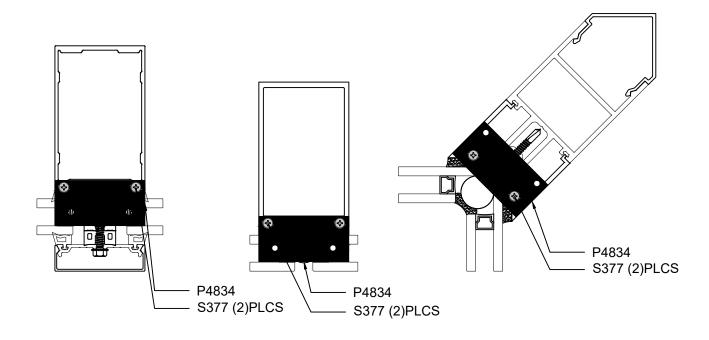
Set the next row of frame units above the first row from the floor above, aligning mullion notch over the E4200. Set the frame expansion joint to the correct height before anchoring the upper frame unit

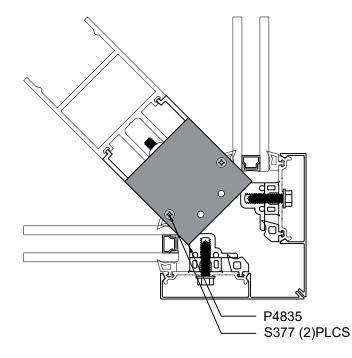


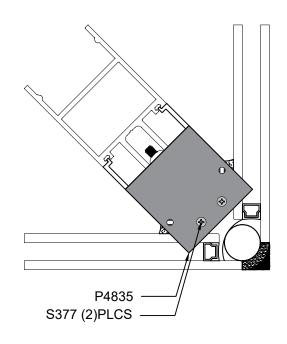




# **Mullion Cap Installation**











#### Step 17: Glazing Preparation

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

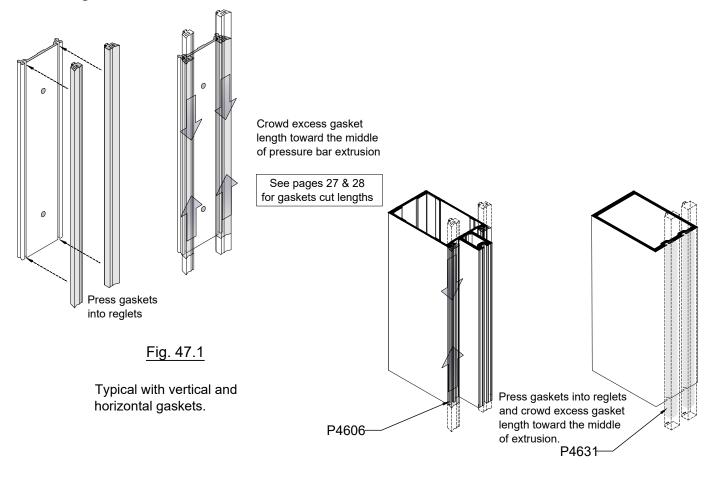
Glazing pockets are designed to accept a variety of infill thicknesses. Refer to online details for a list of glazing size options for this system.

#### 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.

A. Install P4606 gasket into vertical and horizontal pressure plates. See **Fig. 47.1**.When **PTB28** Gasket is used with **PTB120** thermal pressure plate seal in place with 1" of sealant on ends, and every 18"

- B. Install P4606 or P4631 gasket into vertical mullions. See **Fig. 47.2**. 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 .
- C. Install P4606 gasket into the horizontals.
- D. Install PTB108 isolator gasket into vertical and horizontal tongues. Run the isolator through the vertical splice joints.
- E. For SSG vertical applications, install into vertical mullion with equal overlap into each horizontal pocket. See **Fig. 49.1**.



### Fig. 47.2





### Step 18: Install Gaskets (Continued)

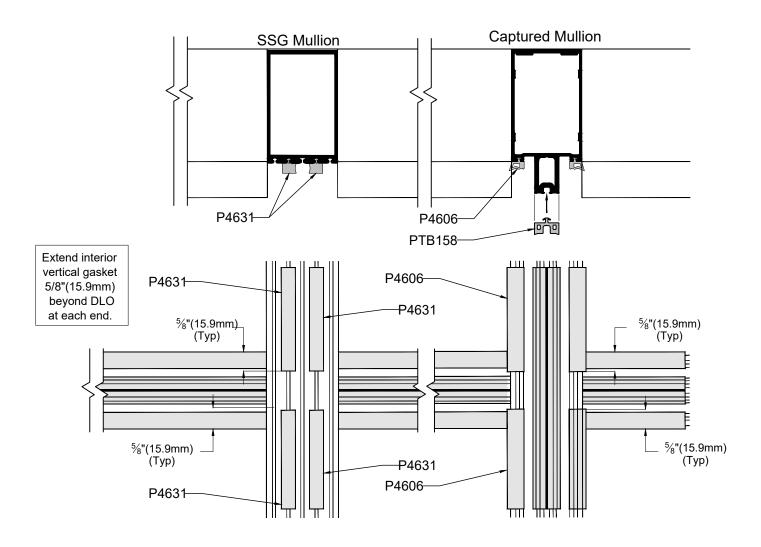


Fig. 48.1



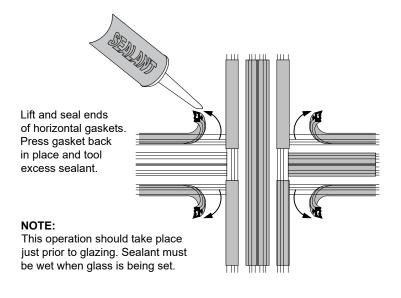


**NOTE**: Pre-seal gaskets only in the opening to be glazed to avoid sealant curing and contamination before glass is set in place.

- 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. 49.1**.
- B. Install two P946 setting blocks for 1"(25.4mm) 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. (3.72sq.m) See Fig 50.1

- 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.

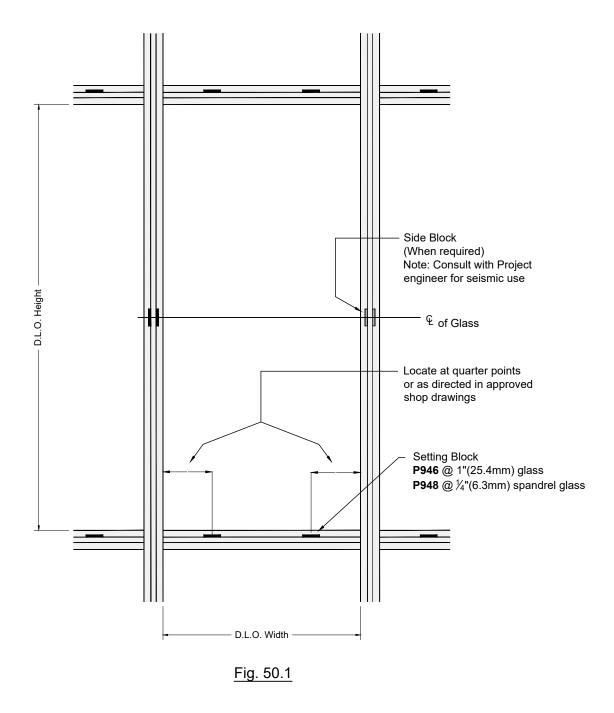








#### Step 18: Install Gaskets (Continued)

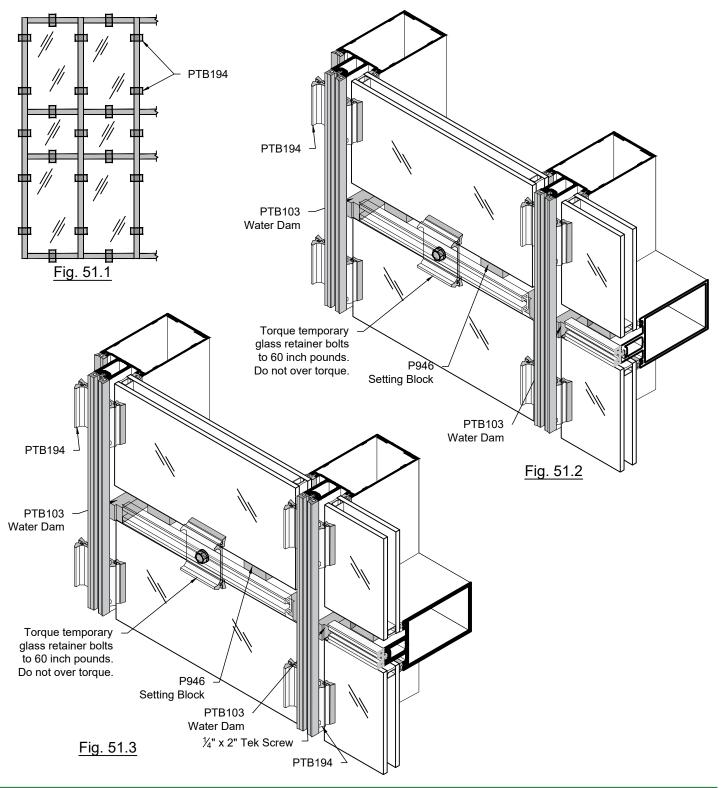






#### Step 19: Install Gaskets (Continued)

E: Hold the glass in place using PTB194 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.

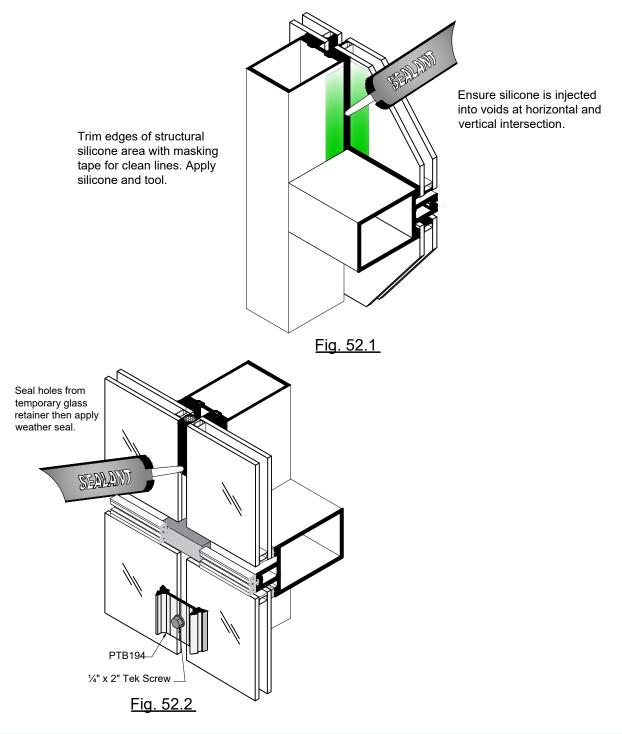






#### Step 19: Installing Glass (Continued)

F. For SSG vertical applications, where structural silicone is applied from interior, hold the glass in place at the vertical with PTB194 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 PTB194 temporary glazing clips, seal hole in the SSG vertical from the PTB194 screw and apply a weatherseal between the lites of glass.

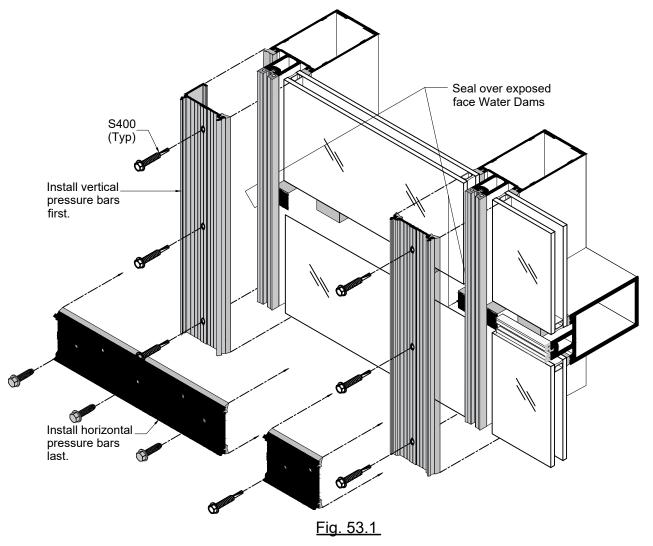






Step 20: Install Pressure Plates and Face Covers

- 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 S400 screws.
- D. Remove temporary glazing retainers from horizontals as required.
- E. Install the horizontal pressure plates using S400 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"(50.8mm) max from the ends and 2"(50.8mm) 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.

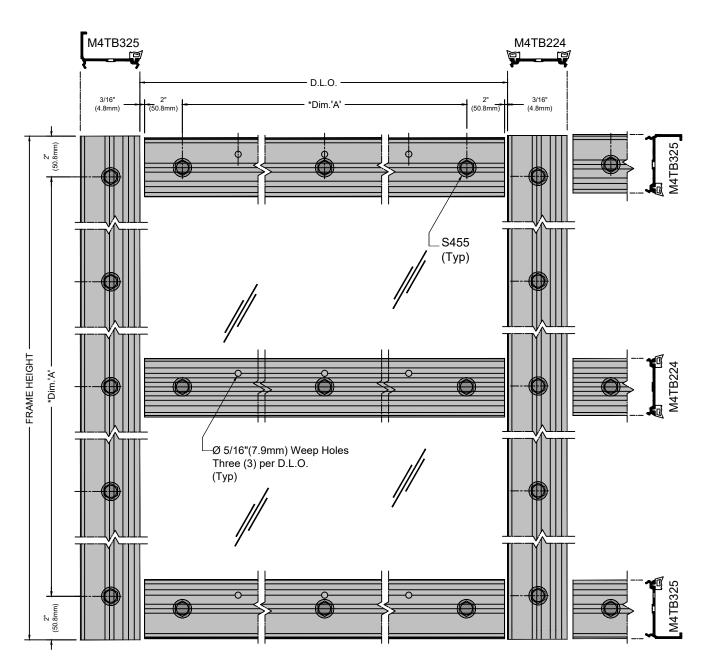


Also see Fig. 54.1 and Fig. 55.1.





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



\* See page 30 for pressure plate anchor spacing chart

Fig. 54.1 CAPTURED PRESSURE PLATE INSTALLATION







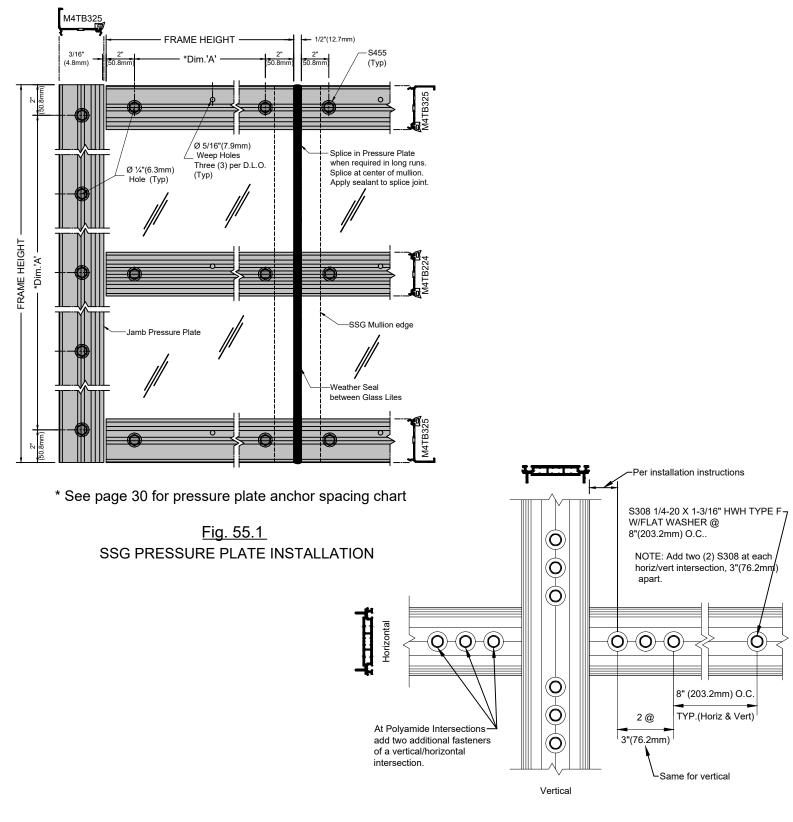


Fig. 55.2 POLYAMIDE PRESSURE PLATE INSTALLATION





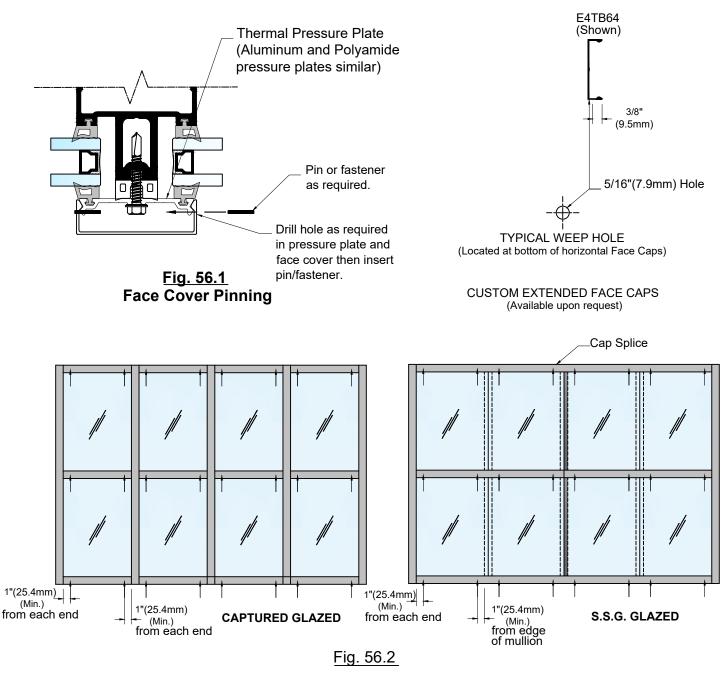
### Step 20: Install Pressure Plates and Face Covers (Continued)

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"(25.4mm) deep: Pin to pressure plate as required Cover depth 2"(50.8mm) to 6"(152.4mm) deep: Pin to pressure plate at center on each side of the cover Covers greater than 6"(152.4mm) deep: Pin to pressure plates at each end and 3 ft (914mm)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.







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

Seal horizontal pressure bar end gaps.

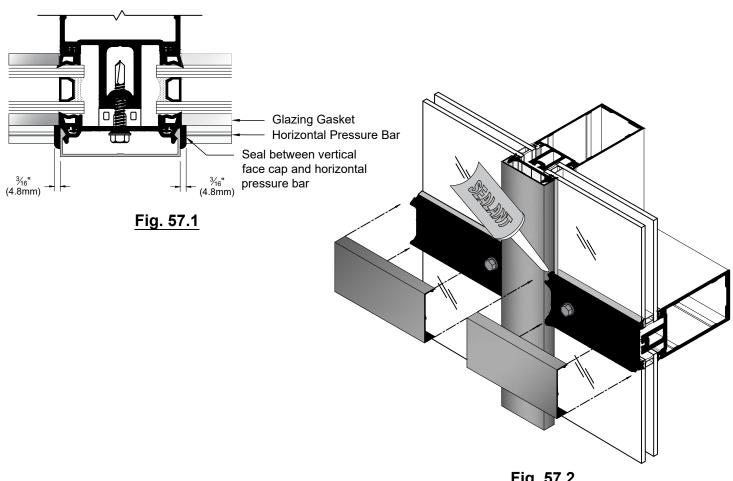


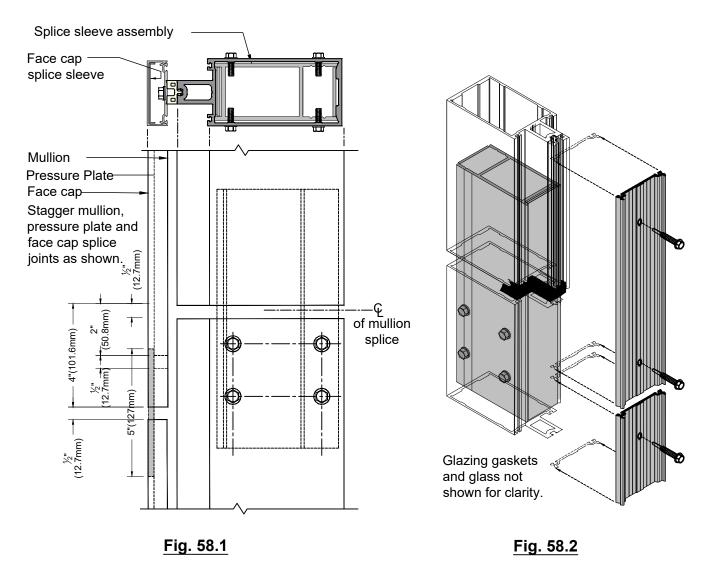
Fig. 57.2





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

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



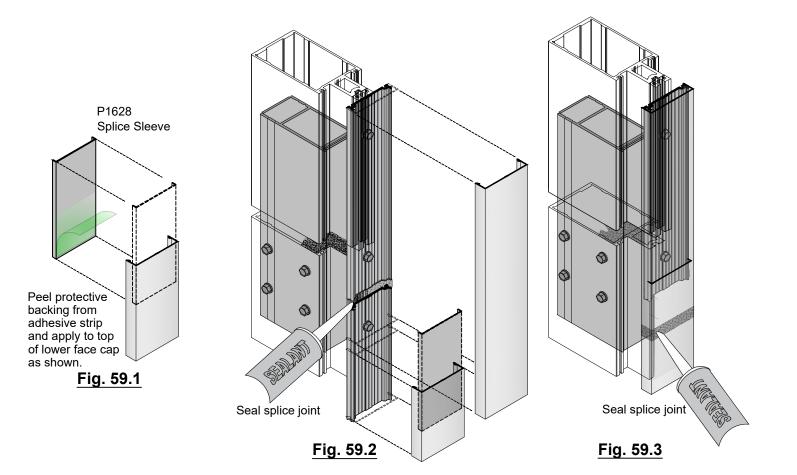
See Step 13, page 37, for mullion splice procedure.





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

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

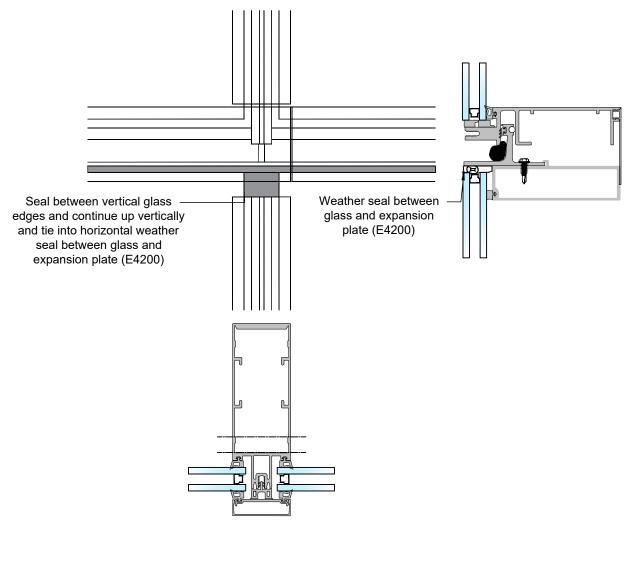






#### Step 20: Installing seals for SSG

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

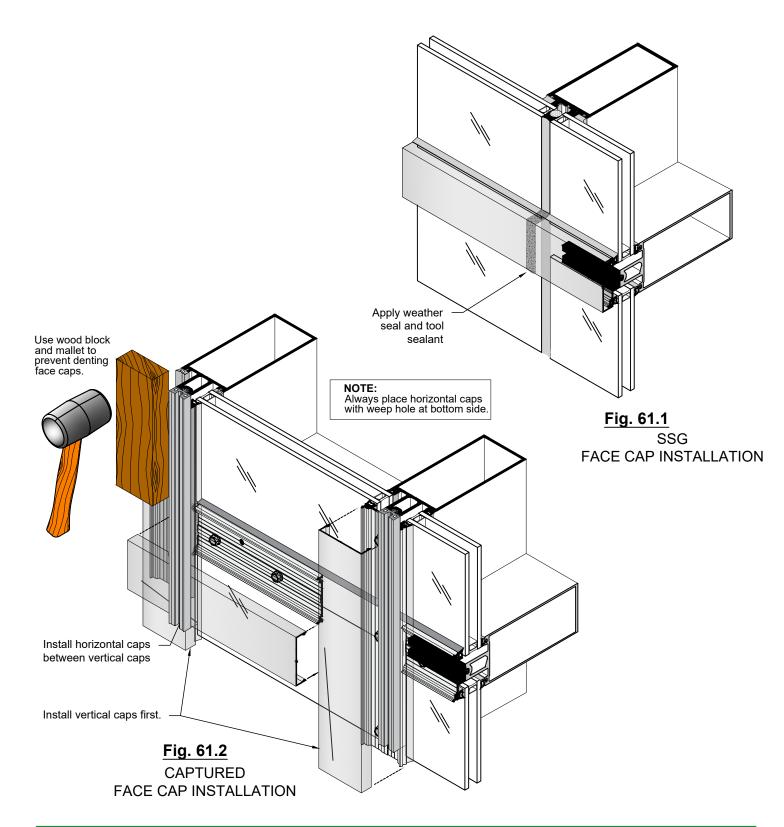






#### Step 20: Install Pressure Plates and Face Covers (Continued)

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

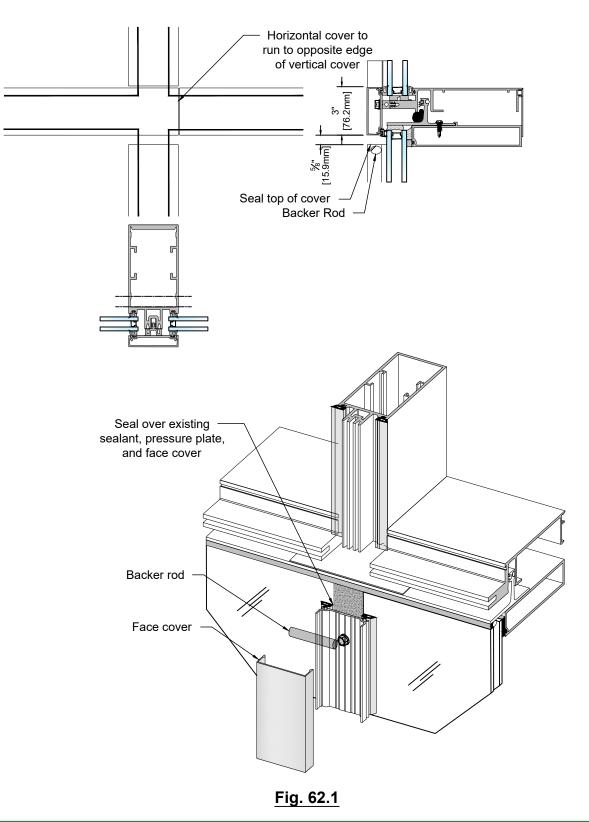






#### Step 20: Installing Face Covers (Continued)

Install vertical covers maintaining 5/8"[15.9mm] 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.

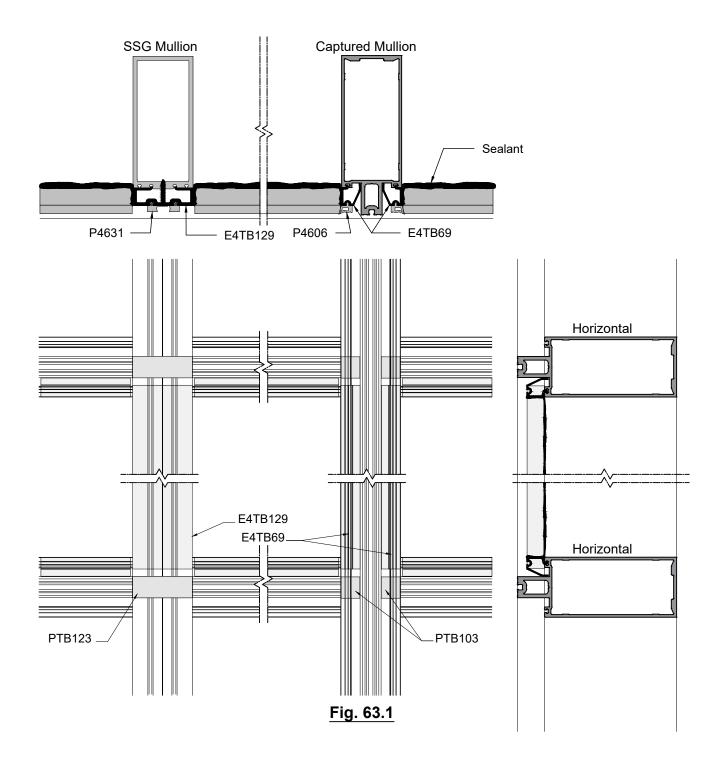




# TRANSITION GLAZING

#### TRANSITION GLAZING

- A. 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.
- B. Install horizontal adaptors with equal gaps on each end. Notching around shear block screws may be required.
- C. Seal all joints between the vertical and horizontal adaptors.



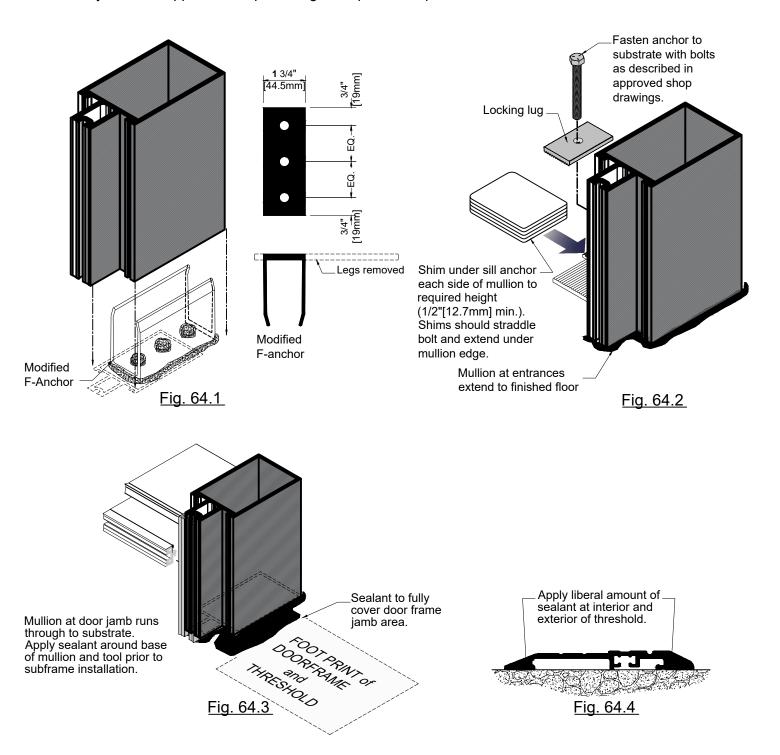




# ENTRANCE FRAMING

#### 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. 64.1 and Fig. 64.2 for possible anchoring methods. Always refer to approved shop drawings for specific requirements.



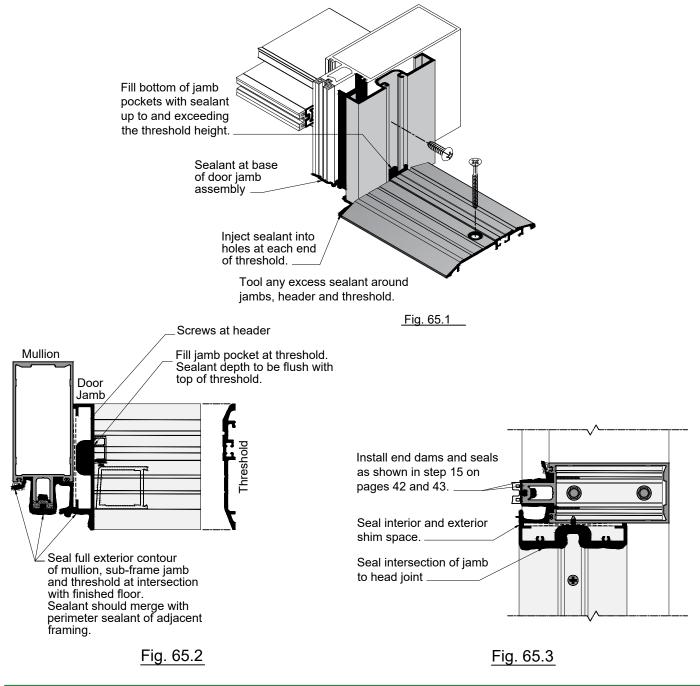




# ENTRANCE FRAMING

#### 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. 64.3 and Fig. 64.4.
  - 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. 65.3.
  - Attach threshold to building per approved shop drawings.
  - Install door per Tubelite's Entrances and Frames Installation Manual.







# 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 PTB194 temporary clips per Step 19, pages 51-52.
- 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 51 through 62.





# CORNER CONDITIONS

#### SSG OUTSIDE CORNER

- A. Attach SSG glazed corner adaptor to the back member using "S437", spaced 18"(457mm) 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.

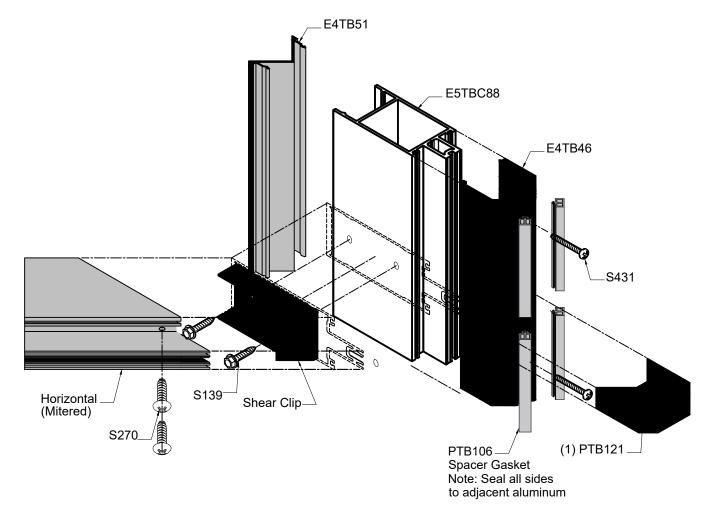


Fig. 68.1





### CORNER CONDITIONS

#### SSG INSIDE CORNER

- A. Attach SSG glazed corner adaptor to the back member using "S369" screws spaced 18"(457mm) on center.
- B. Push the PTB122 water dam into the void between horizontals. The PTB122 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.

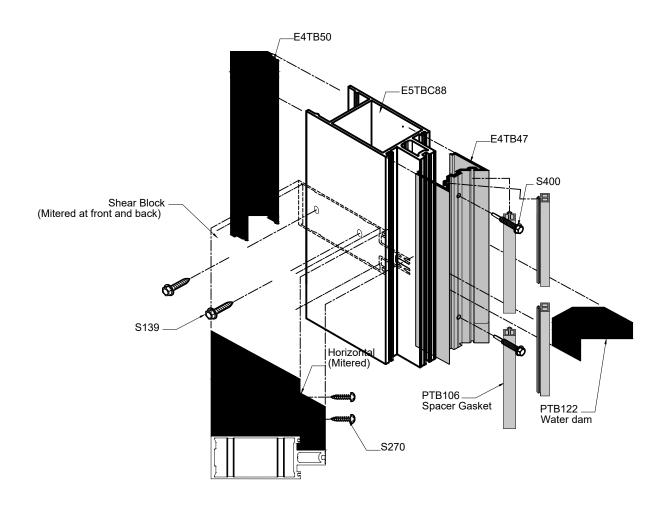


Fig. 69.1