400TU SERIES
ULTRA - THERMAL CURTAIN WALL
● SHEAR CLIP CONSTRUCTION

INSTALLATION INSTRUCTIONS
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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.

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

1. Make sure the opening is square and the caulk joints are ½” 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.
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 overtorque 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. 48.1.**

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 ¾"

- **SSG Vertical Mullion Adjacent to Captured Jamb**
  
  = D.L.O. + 1 ½" (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 ½" (¾" glass bite)

- **Corner Mullions**
  
  = See Approved Shop Drawings
### Typical Framing Extrusions

<table>
<thead>
<tr>
<th>SHAPE</th>
<th>DESCRIPTION</th>
<th>3¾&quot; Member</th>
<th>5¼&quot; Member</th>
<th>7¾&quot; Member</th>
<th>DUAL GLAZE</th>
<th>TRIPLE GLAZE</th>
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<tbody>
<tr>
<td><img src="image1" alt="Captured Mullion" /></td>
<td>Captured Mullion</td>
<td>AT010420</td>
<td>AT010520</td>
<td>AT010820</td>
<td>E432TU</td>
<td>E432TU</td>
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<tr>
<td><img src="image2" alt="SSG Mullion" /></td>
<td>SSG Mullion</td>
<td>AT010460</td>
<td>AT010560</td>
<td>AT010860</td>
<td>A010460</td>
<td>A010560</td>
</tr>
<tr>
<td><img src="image3" alt="SSG Horizontal" /></td>
<td>SSG Horizontal</td>
<td>AT010481</td>
<td>AT010581</td>
<td>AT010881</td>
<td>E488TU</td>
<td>E488TU</td>
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<tr>
<td><img src="image4" alt="Horizontal" /></td>
<td>Horizontal (Optional Roll Over)</td>
<td>AT010466</td>
<td>AT010566</td>
<td>AT010866</td>
<td>A010466</td>
<td>A010566</td>
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<tr>
<td><img src="image5" alt="SSG Horizontal (Optional Roll Over)" /></td>
<td>SSG Horizontal (Optional Roll Over)</td>
<td>E464TU</td>
<td>E564TU</td>
<td>E864TU</td>
<td>AT010486</td>
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<td><img src="image6" alt="Closure Plate" /></td>
<td>Closure Plate for A010461, A010561, A010861, E464TU, E864TU &amp; E564TU</td>
<td>AT011486</td>
<td>AT011586</td>
<td>AT011886</td>
<td>E162TU</td>
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<tr>
<td><img src="image7" alt="Upper Expansion Horizontal" /></td>
<td>Upper Expansion Horizontal</td>
<td>AT011486</td>
<td>AT011586</td>
<td>AT011886</td>
<td>A011486</td>
<td>A011586</td>
</tr>
<tr>
<td><img src="image8" alt="Lower Expansion Horizontal" /></td>
<td>Lower Expansion Horizontal</td>
<td>AT010480</td>
<td>AT010580</td>
<td>AT010880</td>
<td>A010480</td>
<td>A010580</td>
</tr>
<tr>
<td><img src="image9" alt="Head/Sill/Jamb" /></td>
<td>Head/Sill/Jamb</td>
<td>AT010480</td>
<td>AT010580</td>
<td>AT010880</td>
<td>A010480</td>
<td>A010580</td>
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# Corner Extrusions

<table>
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<th>SHAPE</th>
<th>DESCRIPTION</th>
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<th>5⅛&quot; Member</th>
<th>7¾&quot; Member</th>
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<tbody>
<tr>
<td>![](90° Outside Corner for Captured and SSG Glazing)</td>
<td>90° Outside Corner for Captured and SSG Glazing</td>
<td>E445TU</td>
<td>E455TU</td>
<td>E545TU</td>
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<tr>
<td>![](90° Inside Corner for SSG Glazing)</td>
<td>90° Inside Corner for SSG Glazing</td>
<td>E455TU</td>
<td>E555TU</td>
<td>E545TU</td>
</tr>
<tr>
<td>![](90° Outside Corner Adapter for Captured and SSG Glazing)</td>
<td>90° Outside Corner Adapter for Captured and SSG Glazing</td>
<td>E145TU</td>
<td>E146TU</td>
<td>E545TU</td>
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<td>![](90° Inside Corner Adapter for SSG Glazing)</td>
<td>90° Inside Corner Adapter for SSG Glazing</td>
<td>E145TU</td>
<td>E146TU</td>
<td>E555TU</td>
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<tr>
<td>![](90° Outside Corner Nose Adapter for Captured Glazing)</td>
<td>90° Outside Corner Nose Adapter for Captured Glazing</td>
<td>A140326</td>
<td>AT140326</td>
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<tr>
<td>![](90° Outside Corner Adapter for SSG Glazing)</td>
<td>90° Outside Corner Adapter for SSG Glazing</td>
<td>E148TU</td>
<td>E148TU</td>
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</table>

Contact Tubelite for additional system extrusions for enhanced project applications. Or, visit our web site at: [http://www.tubeliteinc.com/400tu-high-performance-thermal-curtain-wall/](http://www.tubeliteinc.com/400tu-high-performance-thermal-curtain-wall/)
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<th>SHAPE</th>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
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<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>Intermediate Pressure Plate</td>
<td>M300TU</td>
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<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>Polyamide Pressure Plate</td>
<td>P4633</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>Thermal Pressure Plate</td>
<td>PTB120</td>
</tr>
<tr>
<td><img src="image4.png" alt="Image" /></td>
<td>Perimeter Pressure Plate</td>
<td>M301TU</td>
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<tr>
<td><img src="image5.png" alt="Image" /></td>
<td>Face Cover (Standard) for Aluminum Pressure Plate only</td>
<td>E4TB64</td>
</tr>
<tr>
<td><img src="image6.png" alt="Image" /></td>
<td>Face Cover for Thermal Pressure Plate only</td>
<td>E3193</td>
</tr>
<tr>
<td><img src="image7.png" alt="Image" /></td>
<td>Face Cover for Polyamide Pressure Plate only</td>
<td>E031TU</td>
</tr>
<tr>
<td><img src="image8.png" alt="Image" /></td>
<td>Face Cover for Thermal Pressure Plate only</td>
<td>E325TU</td>
</tr>
<tr>
<td><img src="image9.png" alt="Image" /></td>
<td>Pressure Plate for Expansion Horizontal</td>
<td>M305TU</td>
</tr>
<tr>
<td><img src="image10.png" alt="Image" /></td>
<td>Face Cover for Expansion Horizontal</td>
<td>E032TU</td>
</tr>
<tr>
<td><img src="image11.png" alt="Image" /></td>
<td>Interior Trim for Expansion Horizontal</td>
<td>E040TU</td>
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<tr>
<td><img src="image12.png" alt="Image" /></td>
<td>Interior Trim Clip for Expansion Horizontal</td>
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<tr>
<td><img src="image13.png" alt="Image" /></td>
<td>Setting Chair</td>
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# Anchors and Shear Clips

<table>
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<tr>
<th>Shape</th>
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<th>Dual Glaze</th>
<th>Triple Glaze</th>
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<tr>
<td><img src="image1" alt="Shear Clip Diagram" /></td>
<td>Shear Clip (for 3 3/4&quot; Horizontal)</td>
<td>P5194</td>
<td>P5194</td>
</tr>
<tr>
<td><img src="image2" alt="Shear Clip Diagram" /></td>
<td>Shear Clip (for 5 1/4&quot; Horizontal)</td>
<td>P5122</td>
<td>P5122</td>
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<tr>
<td><img src="image3" alt="Shear Clip Diagram" /></td>
<td>Shear Clip (for 7 3/4&quot; Horizontal)</td>
<td>P5151</td>
<td>P5151</td>
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<tr>
<td><img src="image4" alt="Shear Clip Diagram" /></td>
<td>Shear Clip (for 3 3/4&quot; Expansion Horizontal)</td>
<td>P5192</td>
<td>P5192</td>
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<tr>
<td><img src="image5" alt="Shear Clip Diagram" /></td>
<td>Shear Clip (for 5 1/4&quot; Expansion Horizontal)</td>
<td>P5193</td>
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<tr>
<td><img src="image6" alt="Shear Clip Diagram" /></td>
<td>Shear Clip (for 7 3/4&quot; Expansion Horizontal)</td>
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<tr>
<td><img src="image7" alt="Shear Clip Diagram" /></td>
<td>Shear Clip for 90° Outside Corner (Expansion Horizontal)</td>
<td>P4673</td>
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<td><img src="image8" alt="Shear Clip Diagram" /></td>
<td>Shear Clip for 90° Inside Corner (Expansion Horizontal)</td>
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<tr>
<td><img src="image9" alt="Shear Clip Diagram" /></td>
<td>Shear Clip for 90° Outside Corner</td>
<td>P4676</td>
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<tr>
<td><img src="image10" alt="Shear Clip Diagram" /></td>
<td>Shear Clip for 90° Inside Corner</td>
<td>P4678</td>
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<tr>
<td><img src="image11" alt="Drill Fixture Diagram" /></td>
<td>Drill Fixture</td>
<td>P4644</td>
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## MULLION SPLICE SLEEVE and ANCHORS

<table>
<thead>
<tr>
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<tr>
<td><img src="image1" alt="Splice Sleeve for 90° Outside Corner" /></td>
<td>3¾&quot; Member.</td>
<td>P4670</td>
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</tr>
<tr>
<td></td>
<td>5¼&quot; Member.</td>
<td>P4647</td>
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</tr>
<tr>
<td></td>
<td>7¾&quot; Member.</td>
<td>P4647</td>
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<tr>
<td><img src="image2" alt="Splice Sleeve for 90° Inside Corner" /></td>
<td>3¾&quot; Member.</td>
<td>P4671</td>
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<td>5¼&quot; Member.</td>
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<td>7¾&quot; Member.</td>
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<tr>
<td><img src="image3" alt="Splice Sleeve for Captured Vertical" /></td>
<td>3¾&quot; Member.</td>
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<td>5¼&quot; Member.</td>
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<tr>
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<td>7¾&quot; Member.</td>
<td>P5161</td>
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<tr>
<td><img src="image4" alt="Splice Sleeve for SSG Vertical" /></td>
<td>3¾&quot; Member.</td>
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<td>5¼&quot; Member.</td>
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<td>7¾&quot; Member.</td>
<td>P4659</td>
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<tr>
<td><img src="image5" alt="Splice Sleeve for Open Back Jamb" /></td>
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<td>5¼&quot; Member.</td>
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<td>7¾&quot; Member.</td>
<td>P5210</td>
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<td><img src="image6" alt="Face Cover Splice" /></td>
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<tr>
<td><img src="image7" alt="F Anchor for Jambs" /></td>
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<td>7¾&quot; Member.</td>
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<td><img src="image8" alt="T Anchor for Typical Mullions (Captured &amp; SSG)" /></td>
<td>3¾&quot; Member.</td>
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<td>7¾&quot; Member.</td>
<td>P4701</td>
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<td><img src="image9" alt="T Anchor for 90° Outside Corners" /></td>
<td>3¾&quot; Member.</td>
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### ACCESSORIES

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<td>PVC Perimeter Filler Tube</td>
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<td>Thermal Isolator Gasket</td>
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<td>Glazing Gasket</td>
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<td>Spacer Gasket for SSG</td>
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<td>Exterior Wedge Gasket for Lower Expansion Horizontal</td>
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<td>Wiper Gasket for Pressure Plate at Expansion Horizontal</td>
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<td>Water Dam for Captured</td>
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<td>Water Dam for SSG</td>
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<td>Water Dam for 90° Inside Corner / SSG</td>
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<td>Setting Block</td>
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## MISCELLANEOUS EXTRUSIONS

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<th>SHAPE</th>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
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<tr>
<td></td>
<td>Glazing Horn for SSG Vertical</td>
<td>A010149, AT010149</td>
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<tr>
<td></td>
<td>Thermal Door Jamb</td>
<td>A626667, A626667</td>
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<tr>
<td></td>
<td>Door Stop for Thermal Door Jamb</td>
<td>E6268, E6268</td>
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<td>Pocket Filler</td>
<td>T311TU, T310TU</td>
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<tr>
<td><img src="image1" alt="Temp Retainer" /></td>
<td>Temporary Glazing Retainer</td>
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<td><img src="image2" alt="Nylatron Slip Pad" /></td>
<td>Nylatron Slip Pad for Steel Anchor Locations</td>
<td>P4608</td>
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<td><img src="image3" alt="End Cap Mullion" /></td>
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<td><img src="image5" alt="End Cap Outside Corner" /></td>
<td>End Cap for 90° Outside Corner</td>
<td>P4610</td>
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<tr>
<td><img src="image6" alt="End Cap Inside Corner" /></td>
<td>End Cap for 90° Inside Corner</td>
<td>P4611</td>
<td>P4669</td>
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<td>#10 x 5/8&quot; PH type 'B' Attachment of A010140 to Corner Mullion</td>
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<td>#12-24 x 1&quot; HH Door Frame Attachment</td>
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<td><img src="" alt="1/4-20 x 11/2&quot; HWH type 'F'" /></td>
<td>1/4-20 x 11/2&quot; HWH type 'F' Attachment of Shear Clip to Mullion</td>
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<td><img src="" alt="#12-14 x 11/2&quot; HWH 18-8 TEK" /></td>
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<td>#10-16 x 3/4&quot; HWH TEK Interior Trim at Expansion Horizontal</td>
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<td><img src="" alt="1&quot; O.D. Flat Washer 18-8" /></td>
<td>1&quot; O.D. Flat Washer 18-8 Use at Polyamide Pressure Plate Screws</td>
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<td><img src="" alt="Drill Jig for PTB120 Thermal Pressure Plate" /></td>
<td>Drill Jig for PTB120 Thermal Pressure Plate</td>
<td>PTB138</td>
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ELEVATION TYPES

TYPES OF CURTAIN WALL INSTALLATION

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

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

Fig. 15.1
ELEVATION and WALL SECTIONS

Fig. 16.1
HORIZONTAL DETAILS

1. Head
2. SSG Horizontal (Optional)
3. Expansion Horizontal (Optional)
4. Standard Intermediate Horizontal
5. Sill

ROLL-OVER HORIZONTALS
(Optional at Intermediates; Standard at Head and Sill)

TUBULAR HORIZONTALS

D.L.O. 2½”
OPENING DIMENSION
FRAME HEIGHT
4½” (Nominal)

2½”
2½”
2½”
½”
CORNER DETAILS

FRAME WIDTH
OPENING DIMENSION

9A

FRAME WIDTH
OPENING DIMENSION

9B

Optional
CORNER DETAILS

Frame Width

Opening Dimension

D.L.O.

CL (SYM)

7 1/8"

2 1/2"

5 1/8"

VARIES

45°
(Shown)

D.L.O.

Frame Width

Opening Dimension

VARIES

2 1/2"
Anchor details on pages 21 and 22 represent one of several methods of anchoring. Refer to approved shop drawings for job specific applications.
MID-SPAN ANCHOR DETAILS

Fig. 22.1
Mullion Anchor Side View

Fig. 22.2
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. 23.1.
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. 23.2.
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 ½” at sill and head for shim and caulking. SEE Fig. 23.3.
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. 23.1 Dimension “A” = “B”

Measure
Measure
Measure

Fig. 23.2

Measure
Measure
Measure

Fig. 23.3
**FRAME FABRICATION**

**Step 2: Cut Materials to Size**

![Diagram of Framing Members]

**Framing Members**

- **Verticals**: Frame Height *
- **Tubular Head, Horizontal & Sill**: D.L.O.
- **Rollover Head, Horizontal & Sill**: D.L.O. – 1/16”
- **Rollover Horizontal Snap in Filler**: D.L.O. – 1/16”
- **Vertical Pressure Plates**: Frame Height * At the vertical pressure plates below an expansion horizontal joint, cut 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.
- **Vertical Face Covers**: Frame Height * At the vertical face cover below an expansion horizontal joint, cut face cover 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.
- **Horizontal Pressure Plates**: D.L.O. – 3/8”
- **Horizontal Pressure Plates @ SSG Vert**: 3 Lites Wide Maximum *
- **Horizontal Face Covers**: D.L.O. – 1/16”
- **Horizontal Face Covers @ SSG Vert**: 3 Lites Wide Maximum *
- **Expansion Horizontal Trim**: Frame Width (Splice as needed)
- **Horizontal Glazing Adaptors**: D.L.O. – 1/16”
- **Vertical Glazing Adaptors**: D.L.O. + 1”
- **Pocket Filler at Perimeter**: D.L.O. – 1/16”

(for use with PTB120 thermal or P4633 polyamide pressure plate)

**Accessories**

- **Exterior Vertical Gasket**: Pressure Plate Length + Allowance*
- **Interior Vertical Gasket**: D.L.O. + 1” + Allowance*
- **Interior Horizontal Gasket**: D.L.O. + Allowance*
- **Silicone Spacer Gasket (SSG Vert)**: D.L.O. + 1” + Allowance*

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

**Note:** For splicing cutting allowances see: step 5, page 27; step 12, page 32; step 20, page 51.

**Note:** Door framing material is cut to size from the factory.
Step 3: **Drill Holes in Vertical Members for Shear Clips** *(Typical Horizontal)*

A. Drill .201” diameter pilot holes for #14 screws in the vertical members according to holes labeled on the P4644 drill fixture:

a. **Head, Intermediate Horizontal & Sill members** – A,D for 3¾” and 5¼” back members; A,F for 7¾” back members. **NOTE:** Holes B,C (3¾” and 5¼” back members) and E,G (7¾” back members) are optional and can be utilized for high load applications or as noted on approved shop drawings. See **Fig. 25.2** through **Fig. 25.4**.

**NOTE:** Two screws per clip is typical, refer to approved shop drawings for project requirements.
Step 3: Drill Holes in Vertical Members for Shear Clips (Continued)

b. Expansion Horizontals – EA,ED for 3¾” and 5¼” back members; EA,EF for 7¾” back members. See Fig. 26.1 through Fig. 26.3.

Step 4: Drill Holes in Horizontal for Attachment to Shear Clips

A. Drill (2) .201” diameter clearance holes for #10 screws in the horizontal sections for attachment to the shear clips. Use the P4644 drill fixture to locate holes.
Step 5: Fabricate Pressure Plates

A. Drill two 5/16” diameter weep holes per horizontal pressure plate at 1/4 points at each end. Locate the holes on the V-groove above the center line of the pressure plate. See Fig. 27.3 & Fig. 27.4.

B. Aluminum, polyamide, and thermal pressure plates are factory punched on center for pressure plate screws. For polyamide pressure plates 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. 48.1 for instructions regarding polyamide pressure plate plate anchor holes at these intersections. For pressure plates at OS 90 deg corners and expansion horizontals, .228” diameter screw holes must be drilled at 8” O.C..

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.
Step 6: **Fabricate Weep Holes in Horizontal Face Covers**

A. At captured glazing: Fabricate (1) 5/16" weep hole on the bottom center of each horizontal face cover.

B. At structural silicone glazing: Fabricate (1) 5/16" weep hole on the bottom center of each D.L.O. of horizontal face cover.

![Fig. 28.1](image)

Step 7: **Notch Heads and Sills to Clear Shear 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 clips. See **Fig. 28.2** for proper notch size.

![Fig. 28.2](image)

**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. 28.3**.
Step 8: End Bay Horizontals

A. **Optional end bay roll-over horizontals/open back perimeter:** An open back roll-over horizontal may be used at the head, horizontal and sill locations. Follow step 4 for fabrication of attachment holes. See details 1 and 5 on page 17.

Step 9: Add 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 clips.
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 clips if possible. Anchor the steel to the vertical using fasteners and spacing per approved shop drawings (not supplied by Tubelite).

**TYPICAL APPLICATION**

*Fig. 29.1*
Step 10: Fasten Shear Clips

A. Fasten the shear clips to the verticals using S359 fasteners.

**NOTE:** If steel reinforcement is required, it must be installed prior to shear clip attachment.

![Shear Clip Diagram](image_url)

**Fig. 30.1**
Step 11: 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 rollover horizontals, all verticals can be erected first.

Single Span Installations
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 T or 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
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.
E. Refer to Step 12, pages 32 and 33 to complete the splice sleeve installation.

Fig. 31.1
Head conditions shown, head condition similar.

Fig. 31.2
Shim between anchor and Mullion AT SILL ONLY to required caulking space height (1/2" min.)

Captured Verticals shown, SSG verticals are similar.
FRAME INSTALLATION

Step 12: 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.
C. Slide the splice sleeve into the upper vertical mullion. Tape the sleeve into position temporarily until verticals are erected. See Fig. 32.2.
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. 32.3.
E. Apply bond breaker tape to the face of the splice sleeve between the lower and upper verticals, returning back 1" on each side.

Install (1) S426 screw on back of mullion to stop splice in proper position.

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<thead>
<tr>
<th>Dim</th>
<th>Mid-Lite</th>
<th>Exp. Horizontal</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>3/4&quot;</td>
<td>1 1/2&quot;</td>
</tr>
<tr>
<td>B</td>
<td>1&quot;</td>
<td>2 9/16&quot;</td>
</tr>
<tr>
<td>C</td>
<td>4 9/16&quot;</td>
<td>5 19/32&quot;</td>
</tr>
</tbody>
</table>

Fig. 32.1

Vertical Expansion Splice
FRAME INSTALLATION

**Fig. 33.1**

Install (1) S426 screw on back of mullion to stop splice in proper position.

**Fig. 33.2**

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

**Fig. 33.3**

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

**Vertical Fixed Splice**

<table>
<thead>
<tr>
<th>Dim</th>
<th>Back Member Depth</th>
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<tbody>
<tr>
<td>D</td>
<td>2 7/8&quot;&quot;</td>
</tr>
<tr>
<td></td>
<td>3 7/8&quot;&quot;</td>
</tr>
<tr>
<td></td>
<td>5 3/4&quot;&quot;</td>
</tr>
</tbody>
</table>

**Table: Back Member Depth**

- Dim: D
- Back Member Depth: 2 7/8", 3 7/8", 5 3/4"
Step 12: Splice Sleeve Attachment (continued)

F. Apply sealant over bond breaker tape at joint and screw heads. Tool sealant. See Fig. 34.2.

Insert backer rod into large voids and apply sealant to splice joint. See Fig. 34.1

Seal all sides of splice joint and tool sealant. See Fig. 34.2
**FRAME INSTALLATION**

**Step 13: Install Vertical End Caps**

A. Install top and bottom end caps on mullions. Tool sealant. See Fig. 35.1 and Fig. 35.2.

![Fig. 35.1](image1)

**Fig. 35.1**

Mullion end caps must be cleaned and primed prior to installing onto the mullions.

![Apply sealant to mullion ends as shown](image2)

**Fig. 35.2**

Seal around all contact edges between mullion and mullion caps. Sealant must cover front contact areas as shown. (Sill shown, head similar)

![Sealant](image3)
FRAME INSTALLATION

Step 13: Attach Horizontals to Shear Clips

A. Seal shear clip prior to installing the horizontal member. See Fig. 36.1.
B. Seal the ends of the horizontal back member and attach to the shear clip using S426 screws. Seal the heads of the screws.
C. Tool sealant at the horizontal/vertical intersection.
D. When P4633 polyamide and PTB120 thermal pressure plate is used, install the P4607 PVC pocket filler tube into perimeter members. See Fig. 35.1 through Fig. 35.4.

NOTE: Tubular horizontal installation is similar.
Step 13: Attach Horizontals to Shear Clips and Anchor Clips (Continued)

F. When P4633 polyamide or PTB120 thermal pressure plates are used, install P4607 pocket filler into perimeter members. See Fig. 37.1 and Fig. 37.2. Do not overtorque polyamide pressure plate fasteners.

---

**Fig. 37.1**

**Fig. 37.2**

JAMB at ALTERNATE PRESSURE PLATES
Step 14: Install Water Dams

A. Seal the end of the horizontal member across the vertical member. This sealant should be applied liberally. See Fig. 38.1 and Fig. 38.2.

B. NOTE: Both upper and lower expansion horizontals are to receive water dams.

C. Push the water dam into the void between the horizontal member and the vertical tongue. This is a pressure fit.

D. 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.

E. For vertical SSG applications, follow the same sealing procedures as with a captured system noted above. See Fig. 38.2.
Step 15: 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:** When using thermal or polyamide pressure plates, install perimeter seal as shown in step 13, page 35.

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

**Fig. 39.1**
GLAZING

Step 16: 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.

Step 17: 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. 40.1.
B. Install P4606 gasket into vertical mullions. See Fig. 40.2. 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 P4605 isolator gasket into vertical and horizontal tongues. Run the isolator through the vertical splice joints.
E. For SSG vertical applications, install the P4631 gasket into vertical mullion with equal overlap into each horizontal pocket. See Fig. 40.2 and Fig. 41.1.

Fig. 40.1
Typical with vertical and horizontal gaskets.

Fig. 40.2
Press gaskets into reglets and crowd excess gasket length toward the middle of extrusion.

Press gaskets into reglets
Crowd excess gasket length toward the middle of pressure bar extrusion

See pages 27 & 28 for gasket cut lengths
Step 17: **Install Gaskets** (Continued)

Extend interior vertical gasket 5/8" beyond DLO at each end.

**Fig. 41.1**
Step 18: Installing Glass

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. Pull interior horizontal gaskets away from vertical gaskets and seal corners where gaskets abut. Release horizontal gasket back to its original position. See Fig. 42.1.

NOTE: This operation should take place just prior to glazing. Sealant must be wet when glass is being set.
Step 18: Installing Glass (Continued)

B. Install two setting chairs onto the horizontal at quarter points or as indicated on approved shop drawings. Place one setting block centered on each setting chair. See Fig. 43.3.

Note: Consult glass manufacturer for correct length and location for glass size over 40 sq.ft.

C. Install glass onto setting block, 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.
GLAZING

Step 18: Installing Glass (Continued)

E. Hold the glass in place using P4634 temporary glazing retainers at SSG and at captured applications. 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.**

E. Hold the glass in place using P4634 temporary glazing retainers at SSG and at captured applications. 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. 44.1](image1.png)

![Fig. 44.2](image2.png)

![Fig. 44.3](image3.png)

**NOTE:** Optional rollover horizontal is shown; standard tubular horizontal is similar.
GLAZING

Step 18: **Installing Glass** (Continued)

F. 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.
Step 19: 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:
   - Aluminum: S425 screws
   - Thermal (PTB120): S425 screws
   - Polyamide (P4633): S425 screws w/(1) S437 one inch dia flat washer
   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.
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:
   - Aluminum: S425 screws
   - Thermal (PTB120): S425 screws
   - Polyamide (P4633): S425 screws w/(1) S437 one inch dia. flat washer

NOTE: Optional rollover horizontal is shown; standard tubular horizontal is similar.

Also see Fig. 49.1 and Fig. 50.1.
Step 19: 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. 48.1

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 over torque 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.
Step 19: **Install Pressure Plates and Face Covers** (Continued)

- **GLAZING**

  **Fig. 48.1**

- **S425 #12-14 X 1½” HWH TEK @ 8” O.C. w/(1) S437 flatwasher.**
  - **NOTE:** Add two (2) S425 at each horiz/vert intersection, 3” apart.

- **Vertical**
  - 2 @ 3”
  - 8” typ.
  - Same for vertical

- **Horizontal**
  - Per installation instructions

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May 2020
GLAZING

Step 19: Install Pressure Plates and Face Covers (Continued)

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.

K. Seal the tops of all vertical face covers as shown in Fig. 49.4.

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

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

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

* See page 27 for pressure plate anchor spacing chart

Fig. 49.1

SSG PRESSURE BAR INSTALLATION
GLAZING

Step 19: **Install Pressure Plates and Face Covers** (Continued)

**Fig. 50.1**

**Fig. 50.2**

**Fig. 50.3**

**Fig. 50.4**

Ensure weep holes are on top side of horizontal pressure bar.

Glazing not shown for detail clarity

Caulk top of vertical face cover

Backer rod at top of vert face

E4TB64 (Shown)

TYPICAL WEEP HOLE

(Location at bottom of horizontal Face Caps)
GLAZING

Step 19: Install Pressure Plates and Face Covers (Continued)

Use wood block and mallet to prevent denting face caps.

Installs horizontal caps between vertical caps

Install vertical caps first.

Fig. 51.1
CAPTURED FACE CAP INSTALLATION

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

Fig. 51.2

Glazing Gasket
Horizontal Pressure Bar
Seal between vertical face cap and horizontal pressure bar

Fig. 51.3
GLAZING

Step 19: Install Pressure Plates and Face Covers (Continued)

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

CAUTION: Do not install pressure plate screws for the upper mullion pressure plate onto the lower vertical mullion.

See Step 13 for mullion splice procedure.
Step 19: **Install Pressure Plates and Face Covers** (Continued)

Pressure Bar and Face Cap at optional expansion horizontal splice. (Also see page 32 for splice installation)

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**Fig. 53.1**

- **Note:** Seal any exposed vertical pressure plate fasteners.
- **Note:** Upper vertical face cap at expansion horizontal may need minor notching at the bottom where it intersects the lower expansion horizontal mullion.
GLAZING

Step 19: Install Pressure Plates and Face Covers (Continued)

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

Fig. 54.1

Fig. 54.2
Step 19: **Install Pressure Plates and Face Covers** (Continued)

Pressure Face Cap at SSG splice.

**Fig. 55.1**
SSG FACE CAP at SPLICE
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. 56.1 for possible anchoring method. Always refer to approved shop drawings for specific requirements.

Fig. 56.1

Mullion at door jamb runs through to substrate. Apply sealant around base of mullion and tool prior to subframe installation.

Sealant to fully cover door frame jamb area.

Sealant at foot print of threshold area.

Apply liberal amount of sealant at interior and exterior of threshold.

Fig. 56.2

Modified ‘F’ or ‘T’ anchor

Legs removed

Fig. 56.3
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. 57.2 and Fig. 57.3.
- Install subframe onto curtain wall mullion, shimming equally from side to side. Attach subframe per approved shop drawings. Cap seal all fasteners and seal joint between subframe and curtain wall.
- Seal the top of the jamb subframe as shown in Fig. 57.3.
- Attach threshold to building per approved shop drawings.
- Install door per Tubelite’s Entrances and Frames Installation Manual.

![Diagram of subframe installation](image-url)
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 19, page 43. 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 17-20, pages 40 through 53.
CORNER CONDITIONS

CAPTURED OUTSIDE CORNER

A. Attach shear clips and mull caps to the corner mullion.
B. Set corner mullions per Step 11 and 12, pages 31 through 33.
C. Install horizontals to corner mullion.
D. Install water dams as noted in Step 14, page 38.
E. Attach glazing gaskets and isolator gaskets and seal as noted in step 17, page 38.
F. Install glass, pressure plates and face covers per Step 19 and 20, pages 41 through 48.

Fig. 59.1

Fig. 59.2

NOTE:
Rollover horizontal shown as optional at corners. Standard tubular horizontal is similar.
SSG OUTSIDE CORNER

A. Attach shear clips and mull caps to the corner mullion.
B. Set corner mullions per Step 11 and 12, pages 31 through 33.
C. Install horizontals to corner mullion.
D. Install water dams as noted in Step 14, page 38.
E. Install the P4631 SSG spacers into the corner mullion.
F. Install the glass at the corner.
G. Apply structural sealant between the glass and the mullion.
H. Insert a foam rod to fill the void between the two corner lites of glass.
I. Apply sealant between the lites of glass.
CORNER CONDITIONS

SSG INSIDE CORNER

A. Attach shear clips and mull caps to the corner mullion.
B. Set corner mullions per Step 11 and 12, pages 31 through 33.
C. Install horizontals to corner mullion.
D. Install water dams as noted in Step 14, page 38.
E. Install the P4631 SSG spacers into the corner mullion.
F. Install the glass at the corner.
G. Apply structural sealant between the glass and the mullion.
H. Insert a foam rod to fill the void between the two corner lites of glass.
I. Apply sealant between the lites of glass.

NOTE:
Rollover horizontal shown as optional at corners. Standard tubular horizontal is similar.