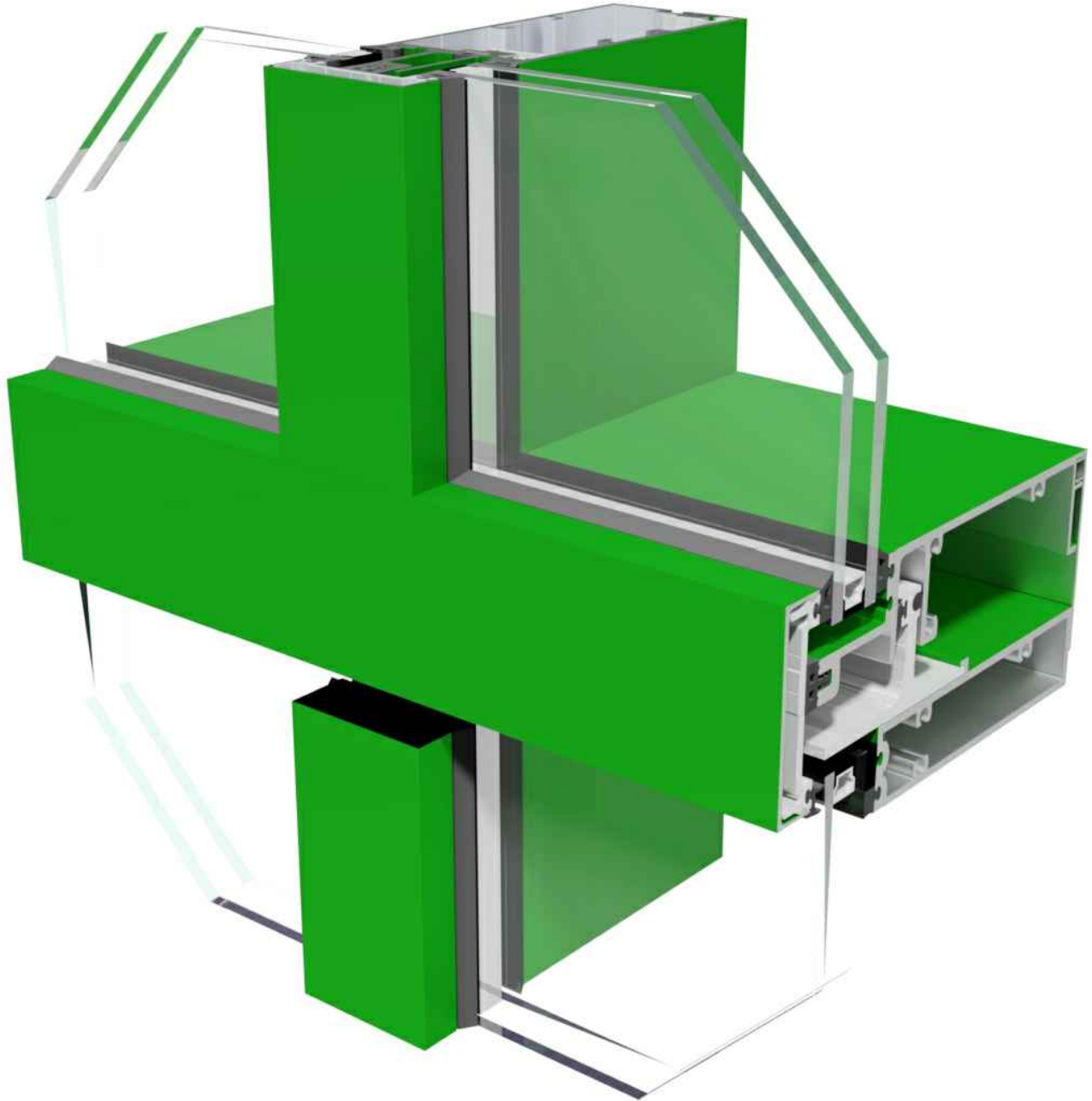


TUBELITE®

DEPENDABLE

LEADERS IN ECO-EFFICIENT STOREFRONT,
CURTAINWALL AND ENTRANCE SYSTEMS

S H O P G L A Z E D



400SS SERIES SCREW SPLINE CURTAIN WALL

INSTALLATION INSTRUCTIONS

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

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TABLE OF CONTENTS

GENERAL CONSTRUCTION NOTES	4-5
QUICK REFERENCE CHECKLIST	5
PARTS LIST	6-18
ELEVATION TYPES and DETAILS	19-27
FRAME FABRICATION	
Step 1 Determine Frame Size	28
Step 2 Cut Material to Size	29
Step 3 Drill Holes in Verticals for Assembly Screws	30-31
Step 4 Fabricate Horizontal Pressure Plates	32
Step 5 Fabricate Weep Holes in Horizontal Face Covers	32
Step 6 Attach Anti-Buckling Clips to Verticals	33
Step 7 Attach Anchor Clips to Verticals	34
Step 8 Attach Lifting Lugs	35-36
Step 9 Assemble Bays	37-39
Step 10 Install Water Dams	40-41
Step 11 Installing Gaskets	41-42
Step 12 Shop Glazing - Blocking & Wet Seal Methods.....	43-44
FRAME INSTALLATION	
Step 13 Installing Frame Units	45-52
Step 14 Seal Perimeter of Installation	53
GLAZING	
Step 15 Install Pressure Plates and Face Covers	54-60
ENTRANCE FRAMING	61-62
REGLAZING	63
CORNER CONDITIONS	
Captured Outside 90° Corner	64
SSG Outside 90° Corner	65
SSG Inside 90° Corner	66

GENERAL CONSTRUCTION NOTES

1. These instructions cover typical product application, fabrication, installation and standard conditions and are general in nature. They provide useful guidelines, but the final shop drawings may include additional details specific to the project. Any conflict or discrepancies must be clarified prior to execution.
2. Materials stored at the job site must be kept in a safe place protected from possible damage by other trades. Stack with adequate separation so materials will not rub together and store off the ground. Cardboard or paper wrapped materials must be kept dry. Check arriving materials for quantity and keep a record of where various materials are stored.
3. All field welding must be done in accordance with AISC guidelines. All aluminum and glass should be shielded from field welding to avoid damage from weld splatter. Results will be unsightly and may be structurally unsound. Advise general contractor and other trades accordingly.
4. Coordinate protection of installed work with general contractor and/or other trades.
5. Coordinate sequence of other trades which affect framing installation with the general contractor (e.g. fire proofing, back up walls, partitions, ceilings, mechanical ducts, HVAC, etc.).
6. General contractor should furnish and guarantee bench marks, offset lines and opening dimensions. These items should be checked for accuracy before proceeding with erection. Make certain that all adjacent substrate construction is in accordance with the contract documents and/or approved shop drawings. If not, notify the general contractor in writing before proceeding with installation because this could constitute acceptance of adjacent substrate construction by others.
7. Isolate all aluminum to be placed directly in contact with masonry or other incompatible materials with a heavy coat of zinc chromate or bituminous paint. Fasteners attaching framing to building structure are typically not provided by Tubelite.
8. Sealant selection is the responsibility of the erector, installer and/or glazing contractor and must be approved by the sealant manufacturer with regard to application and compatibility for its intended use. All sealants must be used in strict accordance with the manufacturer's instructions and applied only by trained personnel to surfaces that have been properly prepared.
9. Sealant must be compatible with all materials with which they have contact, including other sealant surfaces. Consult the sealant manufacturer for recommendations relative to shelf life, compatibility, cleaning of substrate, priming, tooling adhesion, etc. Recommend sealant manufacturer perform adhesion "pull test" at "wet" glazing for quality assurance.
10. Drainage gutters and weep holes must be kept clean at all times. Tubelite will not accept responsibility for improper drainage as a result of clogged gutters and weep holes.
11. This product requires clearances at the head, sill and jambs to allow for thermal expansion and contraction as well as construction tolerances. Refer to final distribution drawings for joint sizes. Joints smaller than 1/2" may be subject to failure. Consult the sealant manufacturer for proper sizing of joints.
12. All framing members, entrances and other materials are to be installed plumb, level and true with regard to established bench marks, column center lines or other working points established by the general contractor and checked by the erector, installer and/or glazing contractor.
13. After sealant is set and a representative amount of the wall has been glazed (500 square feet or more), run a water hose test to check installation. On large projects, a hose test should be repeated during glazing operation. This testing should be conducted in accordance with AAMA 501.2 specifications.
14. Cleaning of exposed aluminum surfaces should be done per AAMA recommendations.
15. Care must be taken when assembling aluminum framing components. Over tightening any fastener may cause stripping or fastener failure. Tubelite recommends the use of drill motors with clutches engaged to provide satisfactory tightening of the screw while preventing over torque. The use of impact drill motors is not recommended due to the absence of a clutch device.
16. Check www.tubeliteinc.com for any installation instruction updates.

GENERAL CONSTRUCTION NOTES

ALTERNATE PRESSURE PLATE INSTALLATION

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



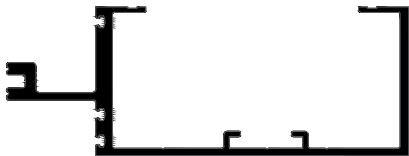
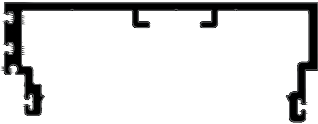

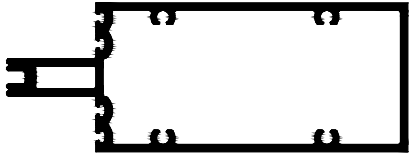
- Tubelite offers one standard polyamide pressure plate as noted above. The polyamide pressure plate is extruded in black and the Thermal pressure plates are extruded in white with both available at 24'-2".
- Polyamide and Thermal pressure plate anchor screw holes are pre-machined. Weep holes must be drilled in the shop. Anchor holes are 8" o/c and weeps are 5/16" diameter holes. When installing screws in the polyamide pressure plate, use S437 washer under screw head.
- ALL anchor holes must be utilized for proper load distribution.
- Polyamide pressure plates do not require special tooling for cutting and drilling, however, carbide tipped blades are recommended for cutting or diamond tip blades for better longevity.
- Tubelite offers one typical vertical and horizontal face cover (E031TU) that is specifically designed to
- 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.

QUICK REFERENCE CHECKLIST

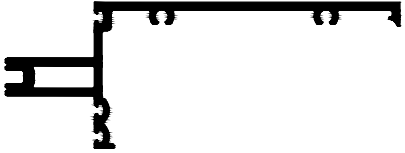

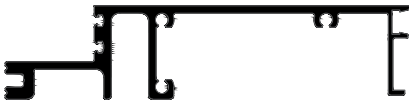


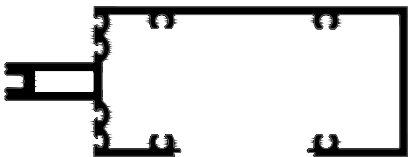
1. Make sure the opening is square and the caulk joints are 1/2" minimum around the frame.
2. Ensure surfaces that will be sealed are free of contaminants that can lead to adhesion issues.
3. Check that all weeps and baffles (optional, if required) conform to the locations and sizes called out in these instructions.
4. Butter seal ends of horizontal frame members that are joined to vertical members.
5. Water dam installation and sealing is critical to system performance. Check installation against instructions to ensure conformity.
6. Apply sealant between all corner gasket joints.
7. Glass bites must be equal on all sides except as noted below.
8. Double check anchor size and location against installation instructions or approved shop drawings.
9. Ensure aluminum pressure plate fasteners are torqued to 90 in-lbs. Do not overtorque Thermal pressure plate fasteners (78 in-lbs required).
10. When polyamide pressure plates are used add two additional fasteners on each side of a vertical/horizontal intersection. See Fig. 64.1.

Condition	GLASS SIZE CALCULATION	Field Glaze
Captured Mullions		D.L.O.+ 1" (1/2" glass bite)
SSG Vertical Mullions		D.L.O.+ 2" (1" glass bite)
SSG Horizontal Mullions		D.L.O.+ 1-3/4" (7/8" bite)
SSG Vertical Mullion Adjacent to Captured Jamb		D.L.O.+ 1-1/2" (width only)
Sunshade Brackets at Captured Mullions		D.L.O.+ 1" (1/2" glass bite)
Sunshade Brackets at SSG Vertical Mullions		D.L.O.+ 1-1/2" (3/4" glass bite)
Corner Mullions		See Approved Shop Drawings


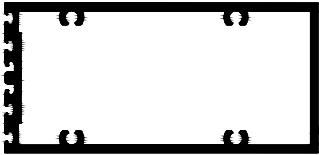
TYPICAL FRAMING EXTRUSIONS

SHAPE	DESCRIPTION	Part No.	Back Member
	Male Captured Vertical	E4140	3-3/4"
		E4150	5-1/4"
		E4170	7-3/4"
	Female Captured Shop Glaze Vertical	E4142	3-3/4"
		E4152	5-1/4"
		E4172	7-3/4"
	Jamb	E4143	3-3/4"
		E4153	5-1/4"
		E4173	7-3/4"
	SSG Vertical - Male	E4244	3-3/4"
		E4254	5-1/4"
		E4274	7-3/4"
	SSG Vertical - Female	E4245	3-3/4"
		E4255	5-1/4"
		E4275	7-3/4"
	Horizontal	E4144	3-3/4"
		E4154	5-1/4"
		E4174	7-3/4"

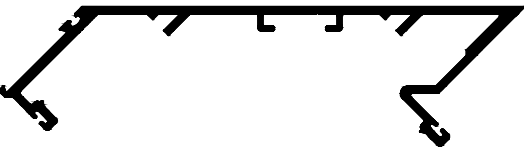
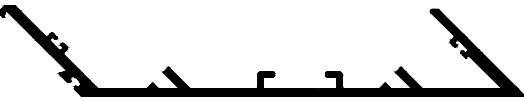

TYPICAL FRAMING EXTRUSIONS

SHAPE	DESCRIPTION	Part No.	Back Member
	Head / Sill	E4145	3-3/4"
		E4155	5-1/4"
		E4175	7-3/4"
	Head / Sill Cover	E4164	3-3/4"
		E4165	5-1/4"
		E4167	7-3/4"
	Upper Expansion Horizontal	E4103	3-3/4"
		E4116	5-1/4"
		E4107	7-3/4"
	Expansion Plate (Chicken Head)	E4200	3-3/4"
		E4200	5-1/4"
		E4200	7-3/4"
	Lower Expansion Horizontal	E4193	3-3/4"
		E4196	5-1/4"
		E4197	7-3/4"
	Shadow Box Horizontal	E4147	3-3/4"
		E4157	5-1/4"
		E4177	7-3/4"

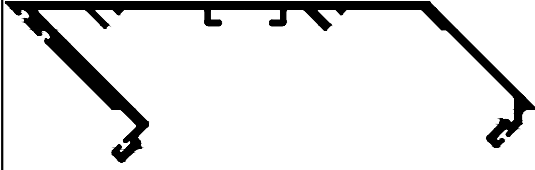
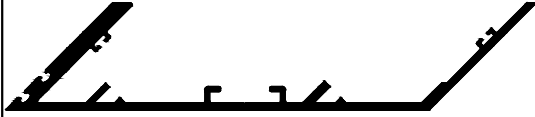


TYPICAL FRAMING EXTRUSIONS

SHAPE	DESCRIPTION	Part No.	Back Member
	Shadow Box Horizontal Closer	E4162	3-3/4"
		E4162	5-1/4"
		E4163	7-3/4"
	SSG Horizontal	E468TU	3-3/4"
		E568TU	5-1/4"
		E868TU	7-3/4"











CORNER EXTRUSIONS

SHAPE	DESCRIPTION	Part No.	Back Member
	OS 90 Half - Male	E4240	3-3/4"
		E4250	5-1/4"
	OS 90 Half - Female	E4241	3-3/4"
		E4251	5-1/4"
	OS 90 SSG 7-3/4" Corner Adaptor - Attach to back of 5-1/4" Back Member	E4270	5-1/4"


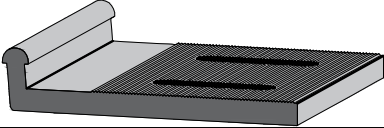
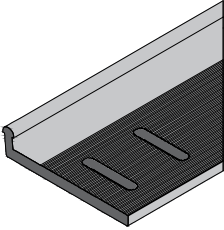
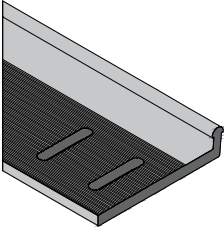
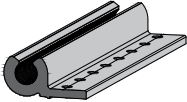
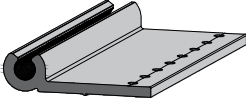
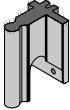
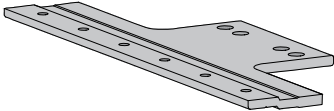
CORNER EXTRUSIONS

SHAPE	DESCRIPTION	Part No.	Back Member
	IS 90 Half - Male	E4242	3-3/4"
		E4252	5-1/4"
	IS 90 Half - Female	E4243	3-3/4"
		E4253	5-1/4"
	IS 90 SSG 7-3/4" Corner Adaptor - Attach to back of 5-1/4" Back Member	E4272	5-1/4"
	OS 90 SSG Corner Adaptor	E147TU	3-3/4"
		E147TU	5-1/4"
		E147TU	7-3/4"

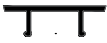










PRESSURE PLATES AND COVERS

SHAPE	DESCRIPTION	PART No.
	Typical Pressure Plate	M300TU
	Perimeter Pressure Plate	M301TU
	Pressure Plate for Alternate Infills	M4TB224
	Polyamide Pressure Plate	P4633
	Thermal Pressure Plate	PTB120
	Expansion Horizontal Pressure Plate	M4106
	Typical Face Cover	E4TB64
	Face Cover for OS 90 Corner	E4205
	Face Cover For Polyamide Pressure Plate	E031TU
	Face Cover For Expansion Horizontal Pressure Plate	E4133



SPLICE SLEEVES and MULLION ANCHORS

SHAPE	DESCRIPTION	PART No.
	Top of Slab Anchor Lug	P4762
	Top of Slab Anchor Plate	P4763
	Top of Slab OS 90 Anchor Plate - Right	P4773
	Top of Slab OS 90 Anchor Plate - Left	P4774
	Top of Slab Vertical/IS 90 Anchor Clip	P4764
	Top of Slab OS 90 Anchor Clip	P4775
	Top of Slab Anchor Shoe	P4765
	Sunshade Anchor Bracket	P4776


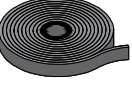
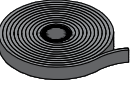
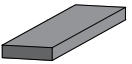






MISCELLANEOUS EXTRUSIONS

SHAPE	DESCRIPTION	PART No.
	Pocket Filler (use with E4TB11 and E4TB111)	E4011
	Captured Glazing Adaptor, OS 90	E4148
	1/4" Glazing Reducer	E4161
	Glazing Reducer OS 90 Corner	E4181
	Glazing Reducer IS 90 Corner	E4191
	Expansion Horizontal Interior Trim	E4201
	Vertical Reinforcement Adapter	E4207
	1/2" Door Stop (use with P1098A weathering)	E4531
	Door Jamb Sub-Frame	E4TB11
	Door Header Sub-Frame	E4TB111
	1-3/4" X 4-1/2" Tube (Door Header for OHCC)	E0041

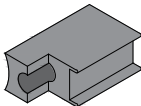
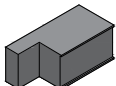
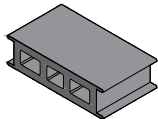

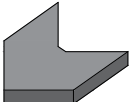
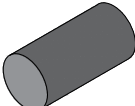

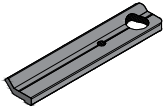
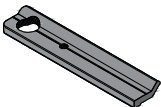


ACCESSORIES

SHAPE	DESCRIPTION	PART No.
	Typical Glazing Gasket	P4606
	SSG Gasket	P4631
	Pressure Plate Isolator	P4605
	1/4" Glazing Reducer Gasket	P4718
	Wiper Gasket	P4730
	Air Seal Gasket	P4788
	Sweep Gasket at 3" Aluminum Pressure Plate	PTB115
	Chicken Head Gasket	PTB116
	PVC Rod Interior Chicken Head - 120" Length (Optional)	PTB117C
	Alternate Gasket	PTB28
	Alternate Gasket	PTB31




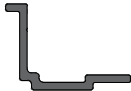
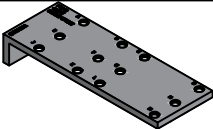
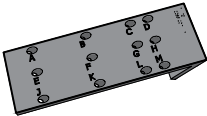
ACCESSORIES

SHAPE	DESCRIPTION	PART No.
	Alternate Gasket	PTB33
	1/4" x 1" Glazing Tape	P4648
	1/4" X 1/2" Glazing Tape	P4725
	Silicone Setting Block at SSG Horizontal	P4603
	Silicone Edge Block	P4629
	Setting Chair at SSG Horizontal - For 1" Infill	P4623
	EPDM Edge Block	P4628
	EPDM Setting Block, 1-5/16"	P4719
	Shop Glaze EPDM Setting Block, 1"	P4720
	Shop Glazed EPDM Setting Block, Over 1" Infill	P4721




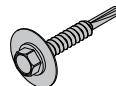



ACCESSORIES

SHAPE	DESCRIPTION	PART No.
	Captured Water Dam - Male Vertical	P4601
	Captured Water Dam - Female Shop Glazed Vertical	P4726
	SSG Water Dam	P4602
	IS 90° SSG Corner Water Dam	P4614
	OS 90° SSG Corner Water Dam	P4711
	Reticulated Foam - 3" Length	P4810
	Lifting/Alignment Lug	P4789
	Lifting Lug 3 3/4" Corner - Right	P4806
	Lifting Lug 3 3/4" Corner - Left	P4806A
	Anti-Buckling Clip	P4615
	Temp Glazing Retainer -Shop Glaze	P4790

ACCESSORIES

SHAPE	DESCRIPTION	PART No.
	1 3/4" X 1 3/8" Applied Door Stop (use with P1098A weathering)	E2298
	Pile Weathering with Vinyl Fin (use with E4531 & E2298 stops)	P1098A
	1" X 1" X 24'2" PVC Perimeter Tube	P4607
	Head/Sill Reinforcement (Optional)	P4766
	Drill Fixture	P4645
	Corner Drill Fixture	P4729

FASTENERS

SHAPE	DESCRIPTION	Part No.
	#10-16 X 5/8" Phillips Pan Head Corner Adaptor Assembly Screw	S017
	#10 X 5/8" Phillips Flat Head SSG Corner Adaptor Assembly Screw	S192
	#12-24 X 1" Hex Washer Head Door Frame Attachment Screw	S204
	1/4-20 X 1-1/2" HWH Frame Assembly Screw at Corners & 3-3/4" Back Members at Lifting Lug	S359
	#12-14 x 1-1/2" HWH 18-8 Self-Drill #4 PT - Aluminum Pressure Plate Fastener	S400
	#12-14 x 1-1/2" Hex Head Washer Faced 18-8 Self-Drill #4 PT - Polyamide Pressure Plate Fastener	S401
	1/4-20 X 1" HWH Frame Assembly Screw	S403
	1/4" X 1" HWH TEK	S457
	#12 X 3/8" U-Drive	S458
	3/8"-16 Hex Head Bolt Lifting Lug Bolt (use with S301)	S6502
	3/8"-16 Hex Nut	S301
	3/8" Flat Washer	S302

FASTENERS

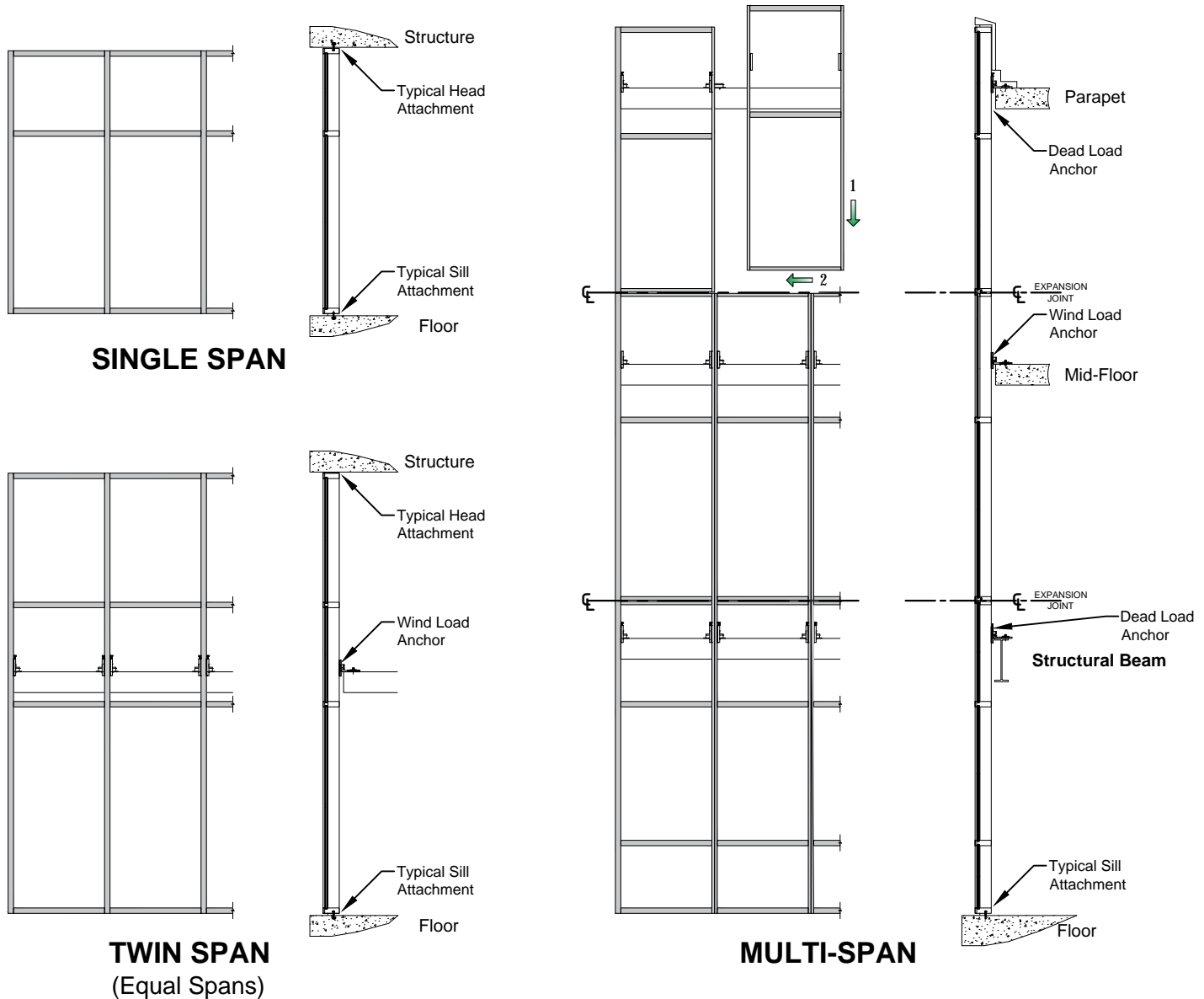
SHAPE	DESCRIPTION	Part No.
	1/2-13 X 4" GR-5 HH Bolt	S460
	1/2-13 X 1-1/2" GR-5 HH Bolt	S461
	1/2-13 Hex Nut	S462
	1/2" Flat Washer	S463
	1/2" Lock Washer	S464
	#10 X 2 1/2" Phillips FH Glazing Horn Screw	S465
	9/16-12 X 3-1/2" Hex Bolt Jack Screw - Top of Slab Deadload Anchor	S468

ELEVATION TYPES

TYPES OF CURTAIN WALL INSTALLATION

The 400SS Series Screw Spline curtain wall system can be constructed and glazed in a variety of ways. For erecting the frame the most common installations are single span, twin span or multi-span as illustrated below. Refer to approved shop drawings for specific guidance on splicing and anchoring.

Shop glazing can be achieved by either blocking the glass in place or applying structural silicone around the corners of each lite of glass. The frames can be assembled and pre-sealed as frame units for erection on the jobsite. See illustrations below.



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

Fig. 19.1

ELEVATION and WALL SECTION

For shadow box installations please refer to approved shop drawings for proper venting and sealing.

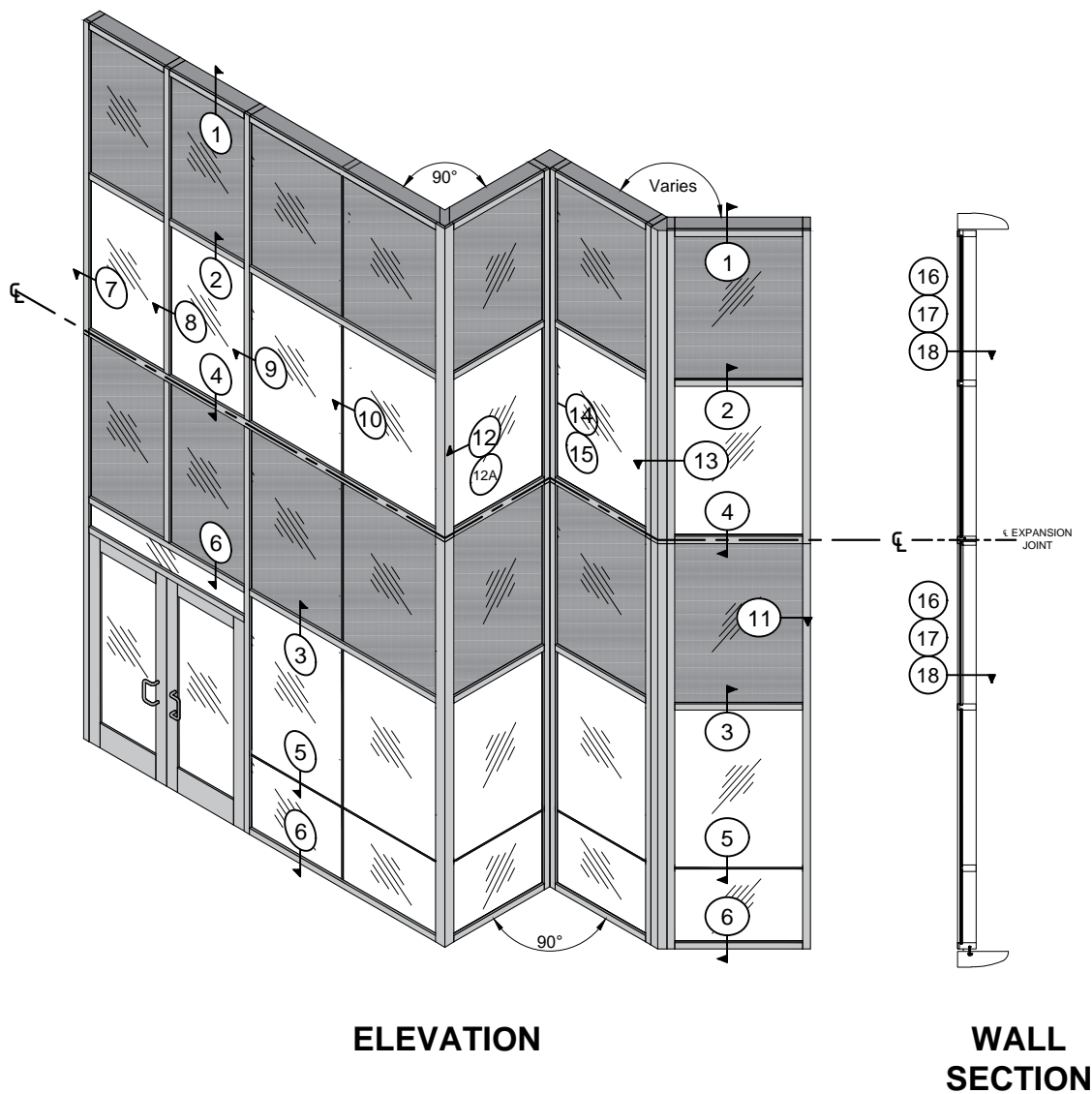


Fig. 20.1

HORIZONTAL DETAILS

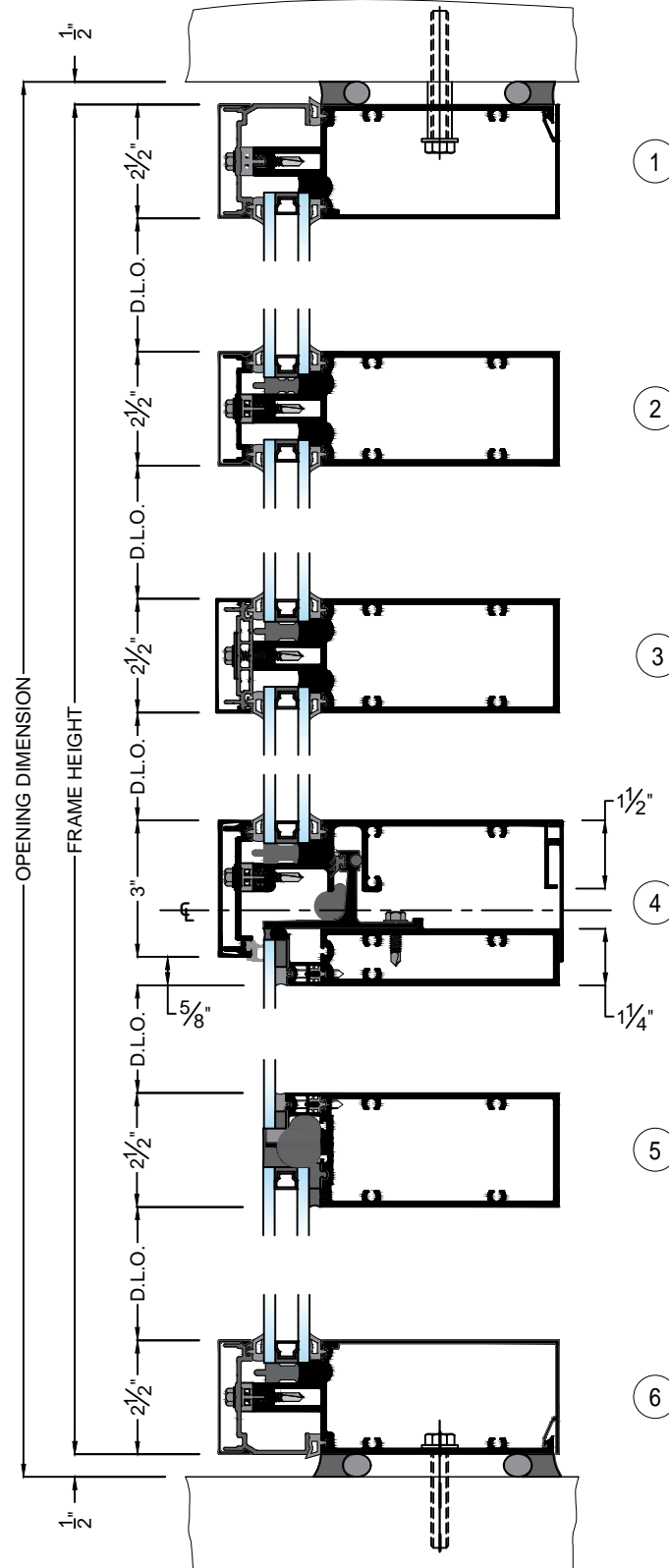


Fig. 21.1

VERTICAL DETAILS

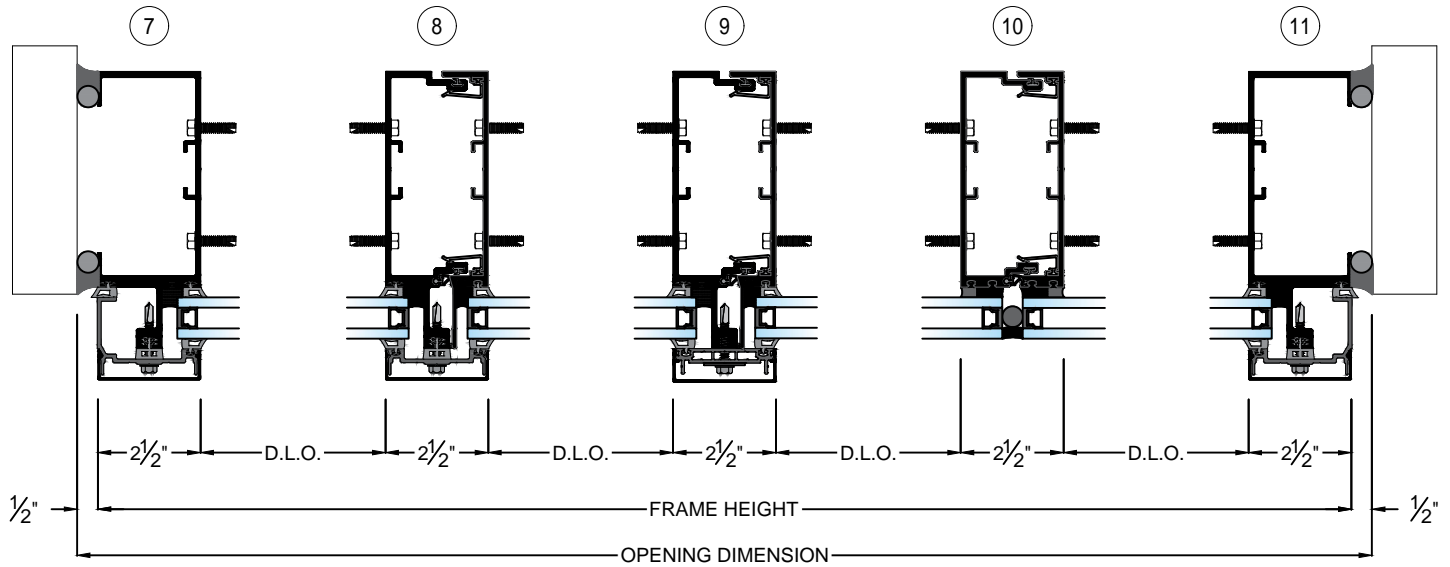


Fig. 22.1

CORNER DETAILS

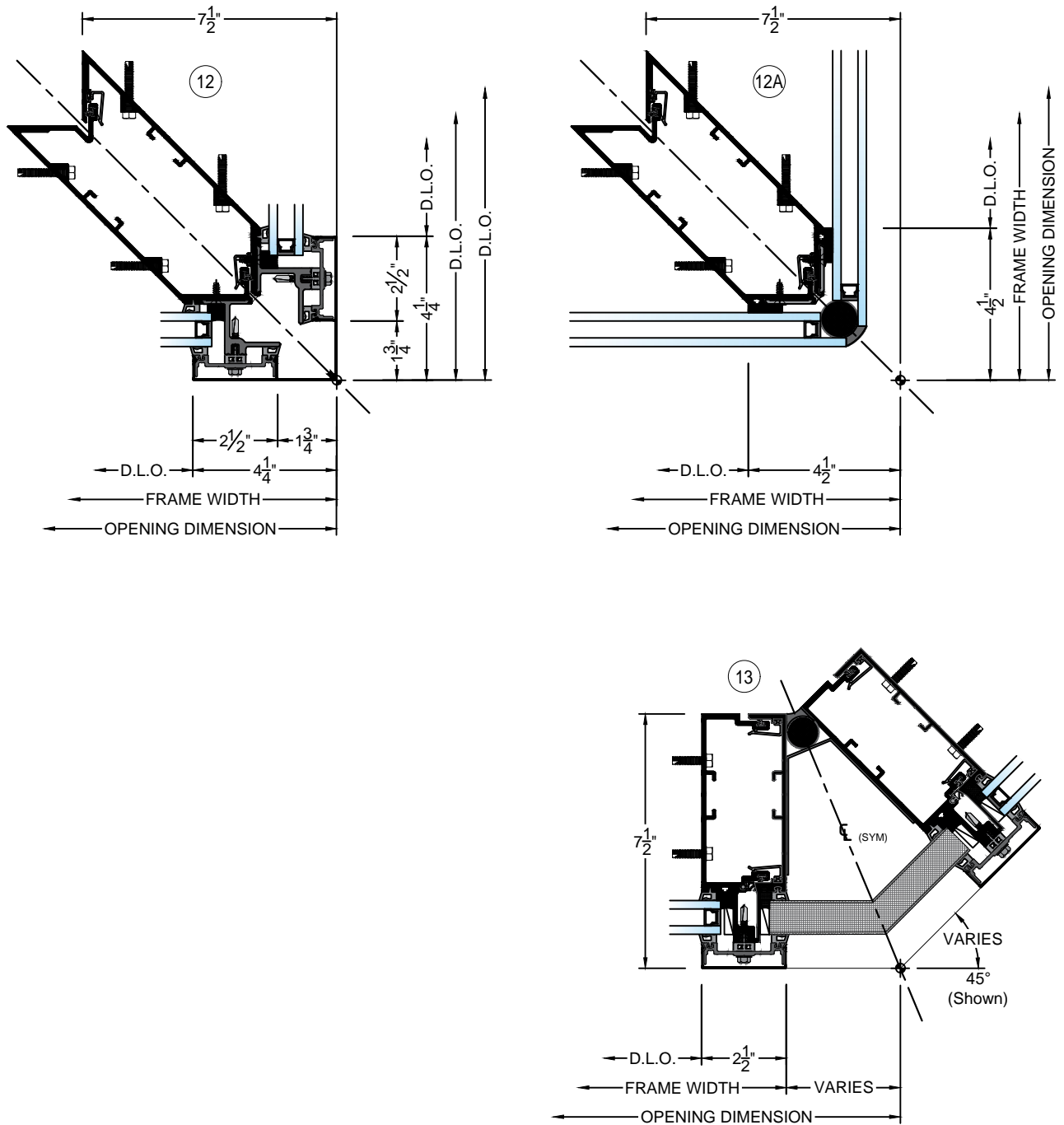


Fig. 23.1

CORNER DETAILS

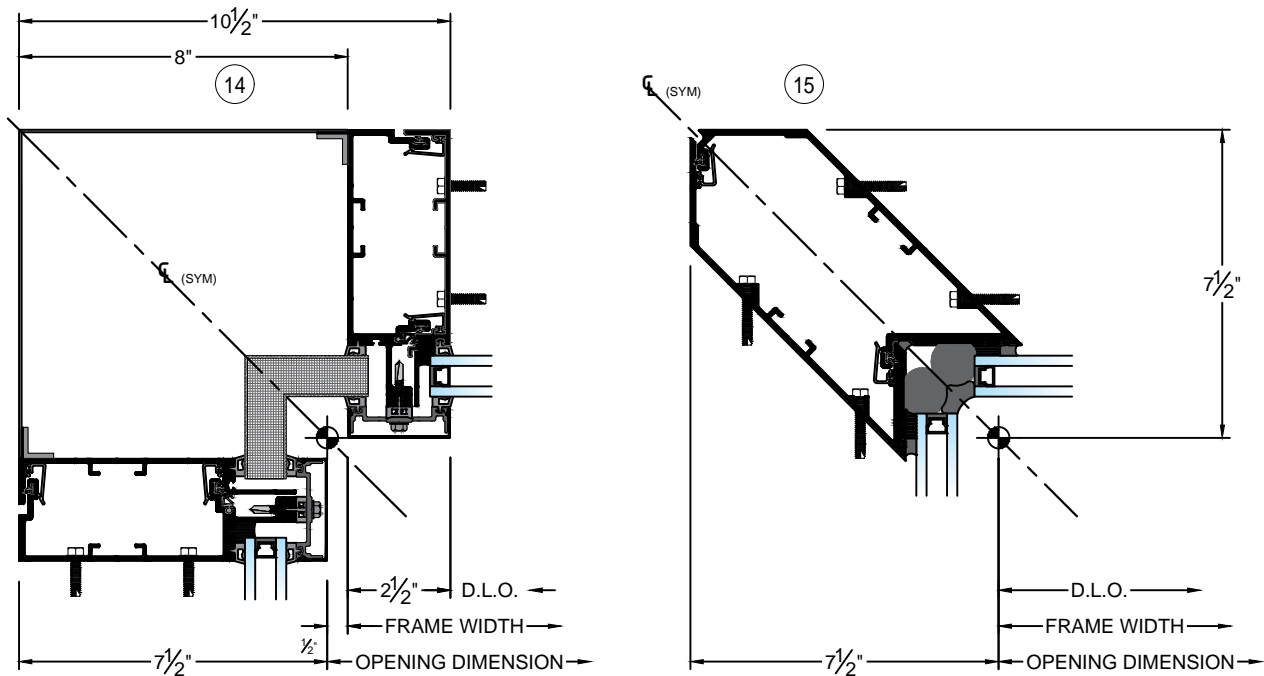


Fig. 24.1

MID-SPAN ANCHOR DETAILS

Anchor details on pages 25 through 27 represent methods of anchoring. Refer to approved shop drawings for job specific applications.

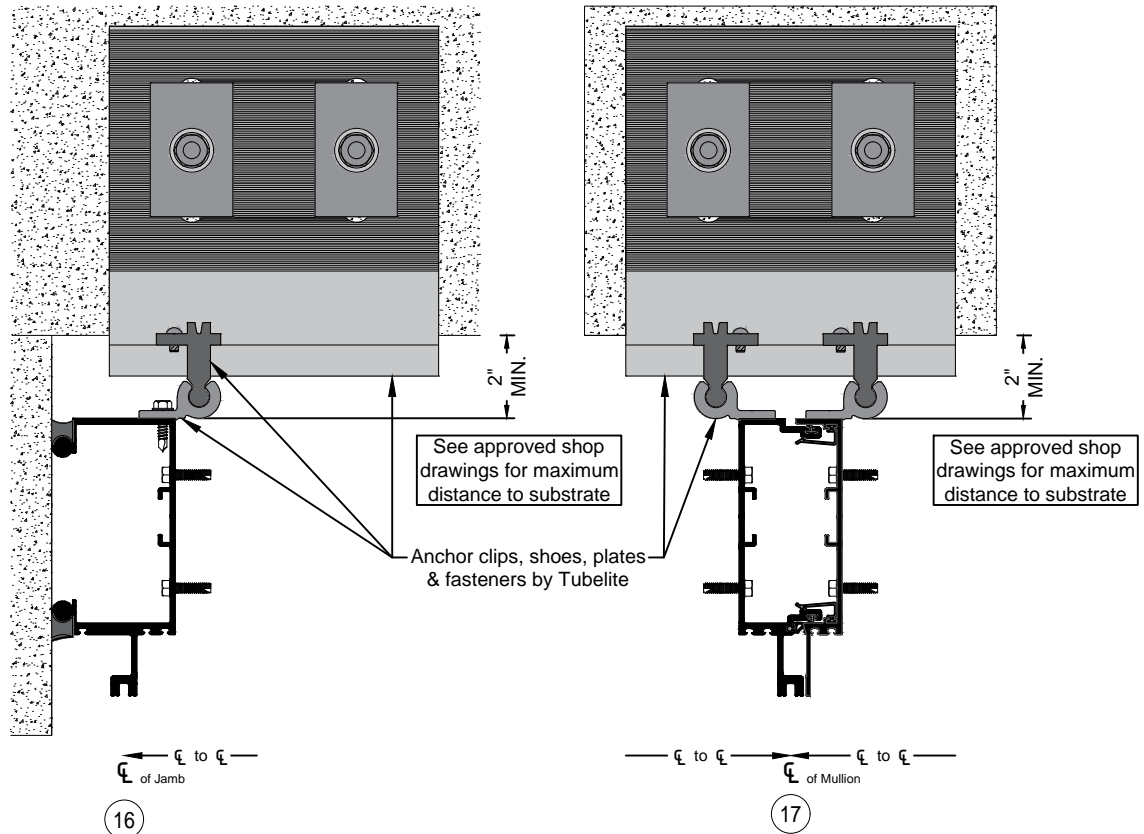


Fig. 25.1

MID-SPAN ANCHOR DETAILS

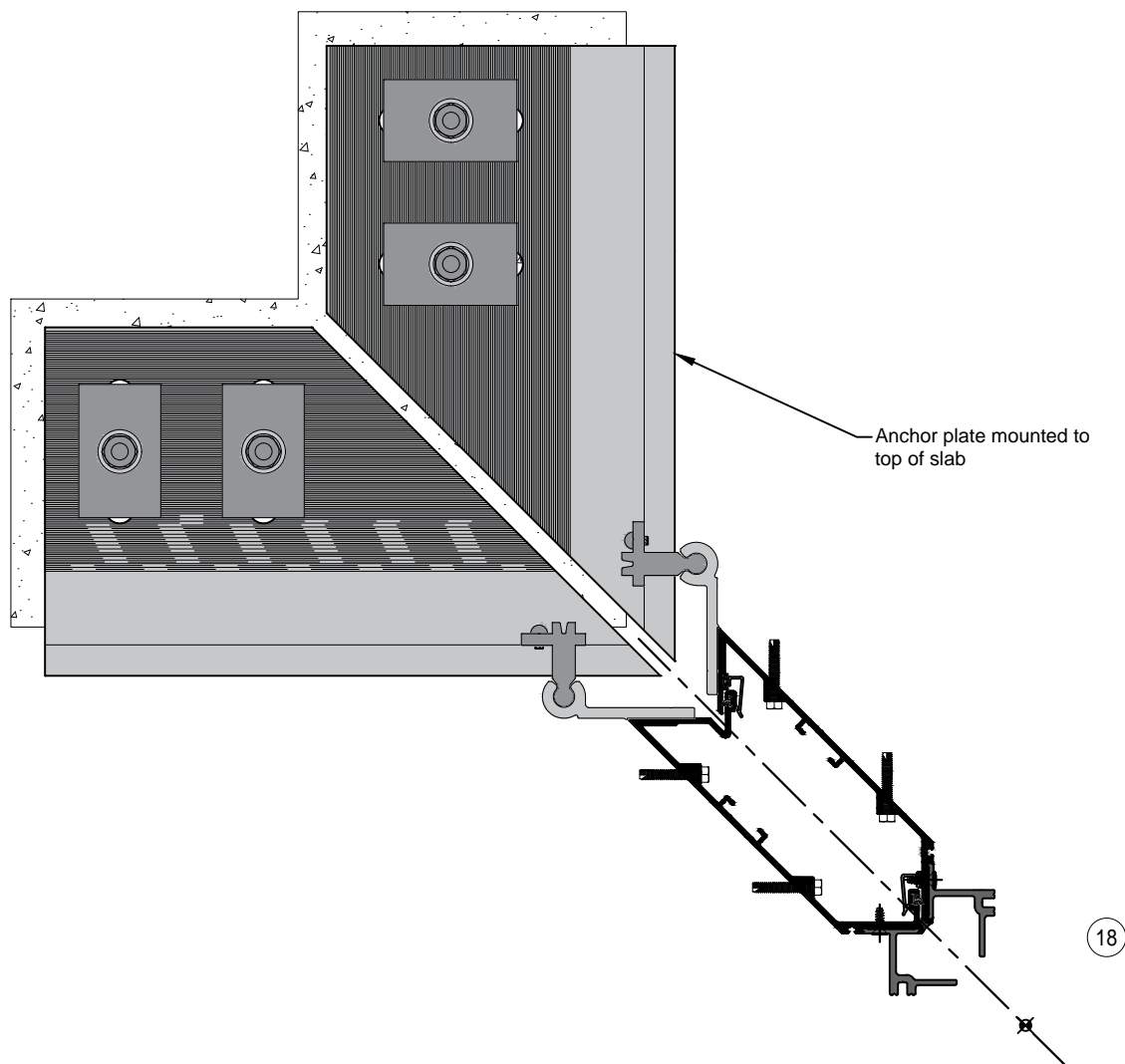


Fig. 26.1

MID-SPAN ANCHOR DETAILS

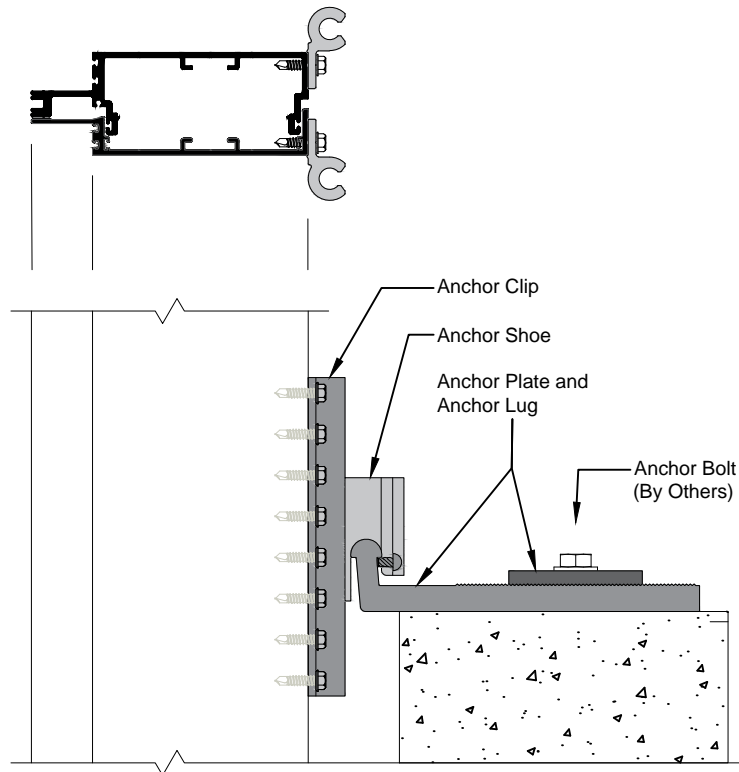


Fig. 27.1

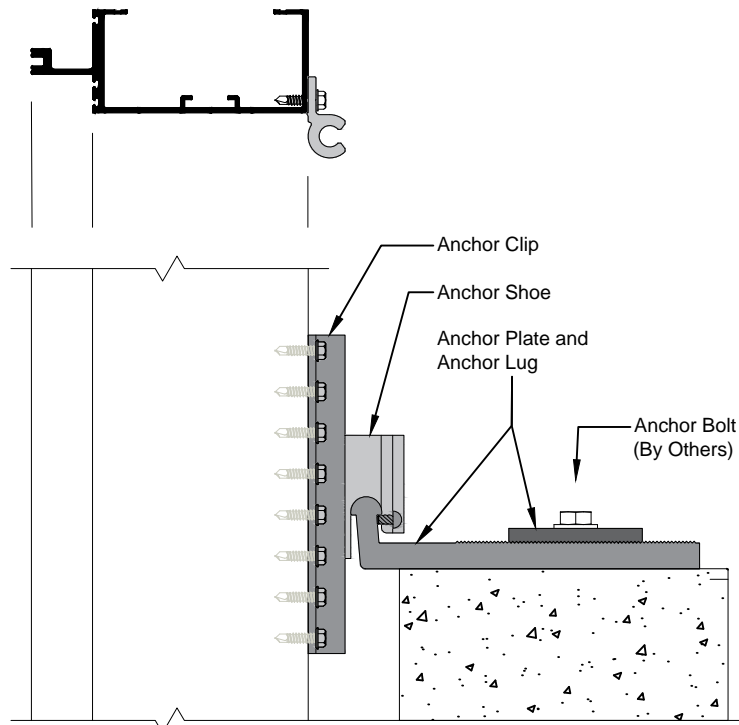


Fig. 27.2

FRAME UNIT 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. 28.1.**
- 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. 28.2.**
- C. Allow a larger clearance to accommodate building tolerances, an out-of-square opening, anticipated thermal expansion within the unit or as required by shop drawings.

Frame Height

- D. Measure the height of the opening (Rough Opening) at several points along the entire width of the opening. Select the smallest of these dimensions and subtract 1" to allow a minimum of 1/2" at sill and head for shim and caulking. **SEE Fig. 28.3.**
- 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.

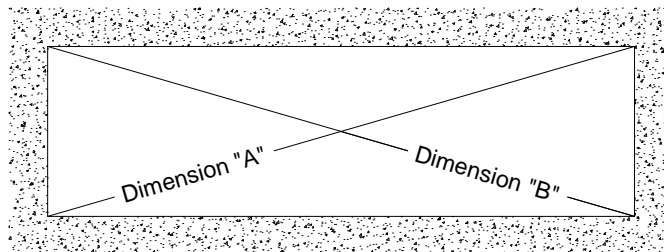


Fig. 28.1

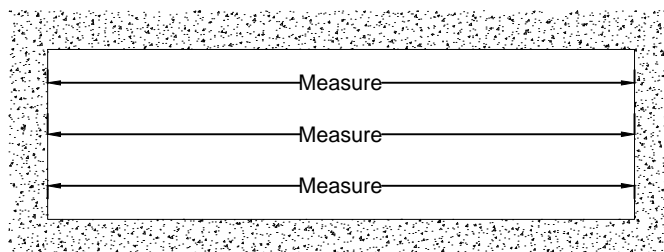


Fig. 28.2

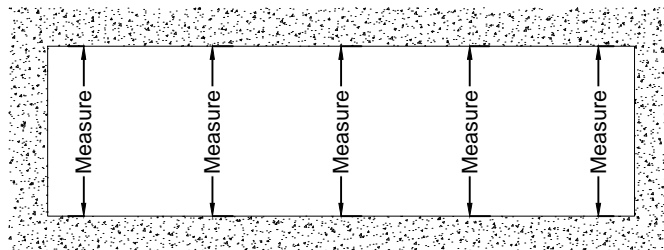
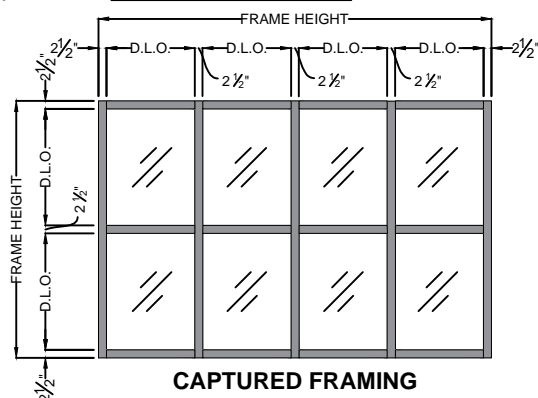


Fig. 28.3

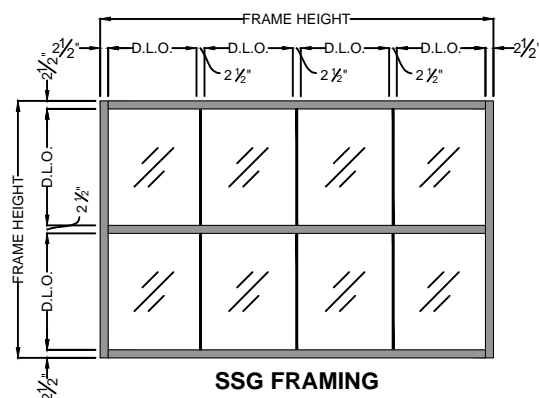
FRAME UNIT FABRICATION

Step 2: Cut Materials to Size



CAPTURED FRAMING

Fig. 29.1



SSG FRAMING

Fig. 29.2

Framing Members

Verticals
Head, Horizontal & Sill
Vertical Pressure Plates

Vertical Face Covers

Horizontal Pressure Plates
Horizontal Pressure Plates @ SSG Vert
Horizontal Face Covers
Horizontal Face Covers @ SSG Vert
Expansion Horizontal Trim
Horizontal Glazing Adaptors
Vertical Glazing Adaptors

Accessories

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

Chicken Head PVC Rod

Cut Size

Frame Height
D.L.O.
Frame Height

Note: At the vertical pressure plates below an expansion horizontal joint, cut the pressure plate so that it starts 13/16" below the D.L.O. See page 62. At the vertical pressure plates above an expansion horizontal joint, cut the pressure plate to be 1/4" above the D.L.O. (top of horizontal) bottom of the upper horizontal. See page 62.

Frame Height

Note: At the vertical pressure plates below an expansion horizontal joint, cut the pressure plate so that it starts 13/16" below the D.L.O. See page 62. At the vertical pressure plates above an expansion horizontal joint, cut the pressure plate to be 1/4" above the D.L.O. (top of horizontal) bottom of the upper horizontal. See page 62.

D.L.O. – 3/8"
3 Lites Wide Maximum
D.L.O. – 1/16"
3 Lites Wide Maximum
Frame Width (Splice as Needed)
D.L.O. – 1/16"
D.L.O. + 1"

Pressure Plate Length + Allowance**

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

D.L.O. + Allowance**

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

Frame Width

Note: Run gasket through a chicken head splice. If gasket splice is required, locate at least 1" from a chicken head splice joint.

Chicken Head Length

Note: Splice rod at chicken head splice location

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

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

FRAME UNIT FABRICATION

Step 3: Drill Holes in Vertical Members for Assembly Screws

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

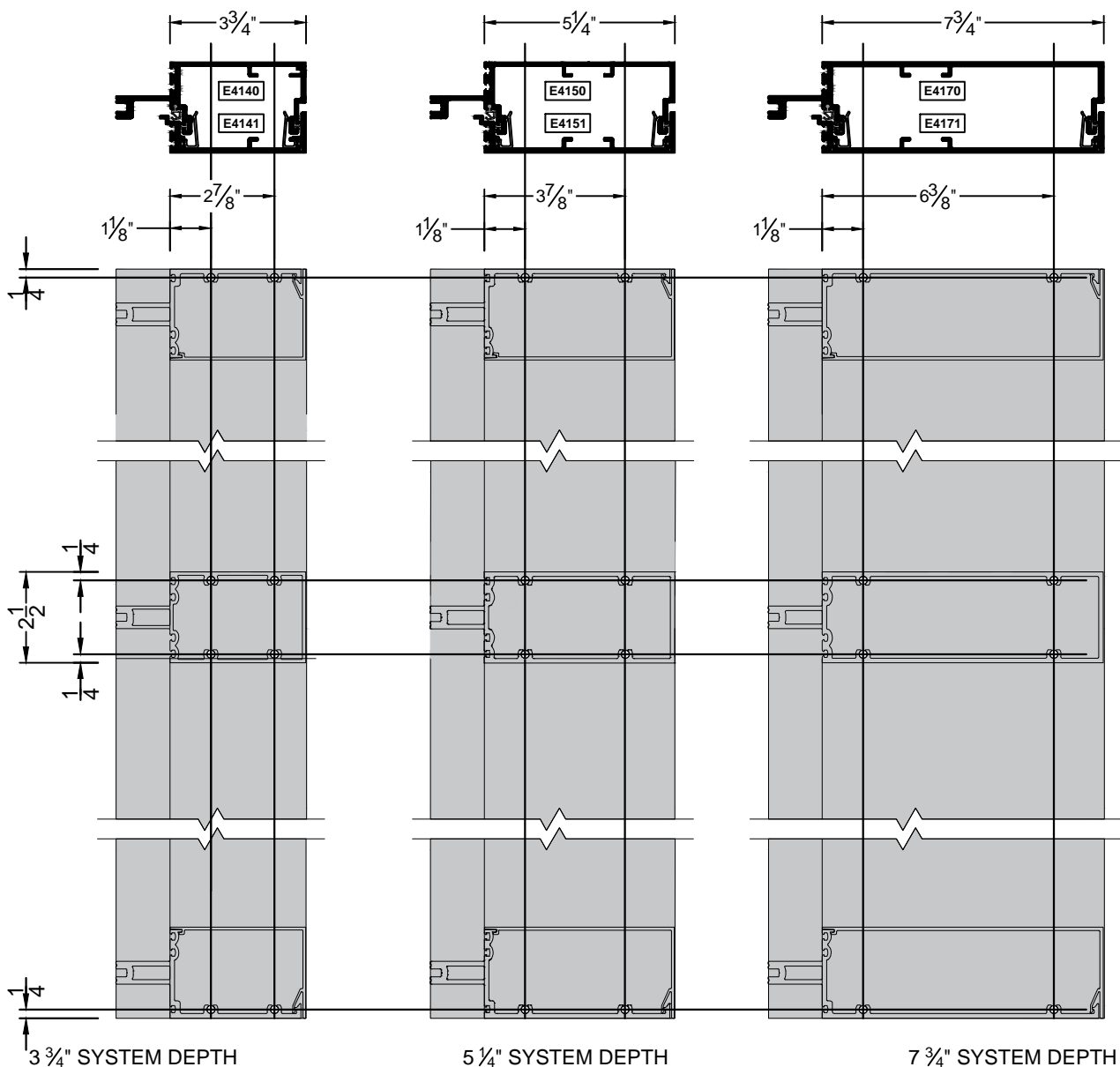


Fig. 30.1

Step 3: Drill Holes in Vertical Members for Assembly Screws (continued)

- B. At an expansion joint using E4200 the top mullion needs to be notched to fit over the expansion plate. See Fig. 31.2 for notching dimensions.

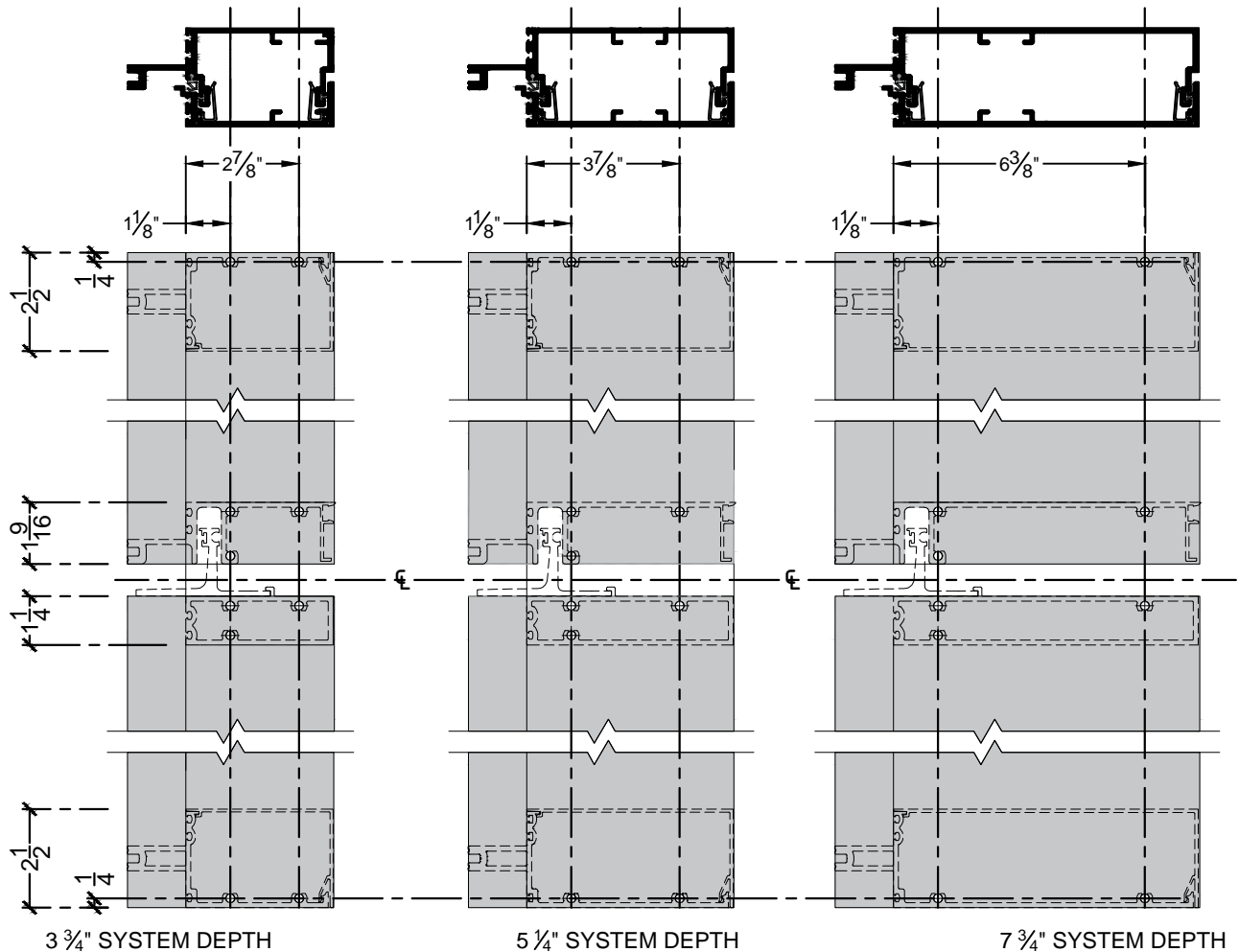


Fig. 31.1

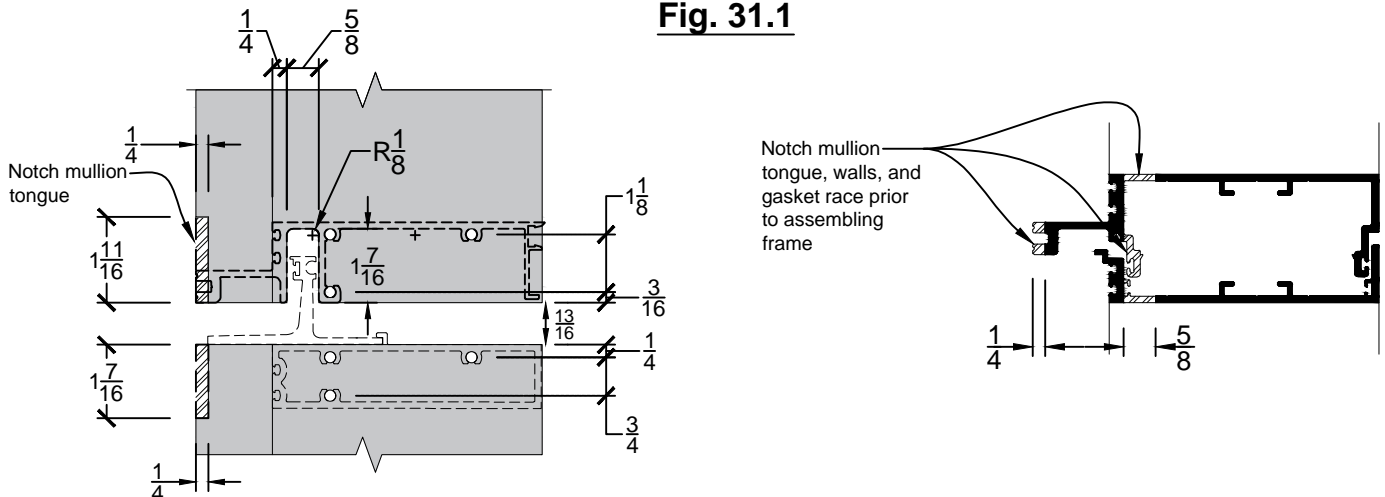


Fig. 31.2
EXPANSION PLATE NOTCHES

Step 4: Fabricate Horizontal Pressure Plates

- Drill two 5/16" diameter weep holes per horizontal pressure plate at 4" from each end. Locate the holes on the V-groove above the center line of the pressure plate.
- Aluminum pressure plates are factory punched on center for pressure plate screws. POLYAMIDE PRESSURE PLATES DO NOT COME FROM THE FACTORY PRE-PUNCHED. Prepare holes for pressure plate screws at 8" O.C.. 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. 56.1** for instructions regarding polyamide pressure plate anchor holes at these intersections.
- When SSG verticals are used in the elevation, horizontal pressure plates can run up to 3 lites wide maximum. Additional weep holes must be drilled in these cases.

Step 5: Fabricate Weep Holes in Horizontal Face Covers

- Fabricate (1) 5/16" weep hole on the bottom center of each horizontal face cover.
- Aluminum and polyamide pressure plates are factory punched on center for pressure plate screws. Drill additional hole(s) as required to ensure a maximum of 2" from the ends of the plates and at horizontal/vertical intersections. See **Fig. 56.1** for instructions regarding polyamide pressure plate anchor holes at these intersections.

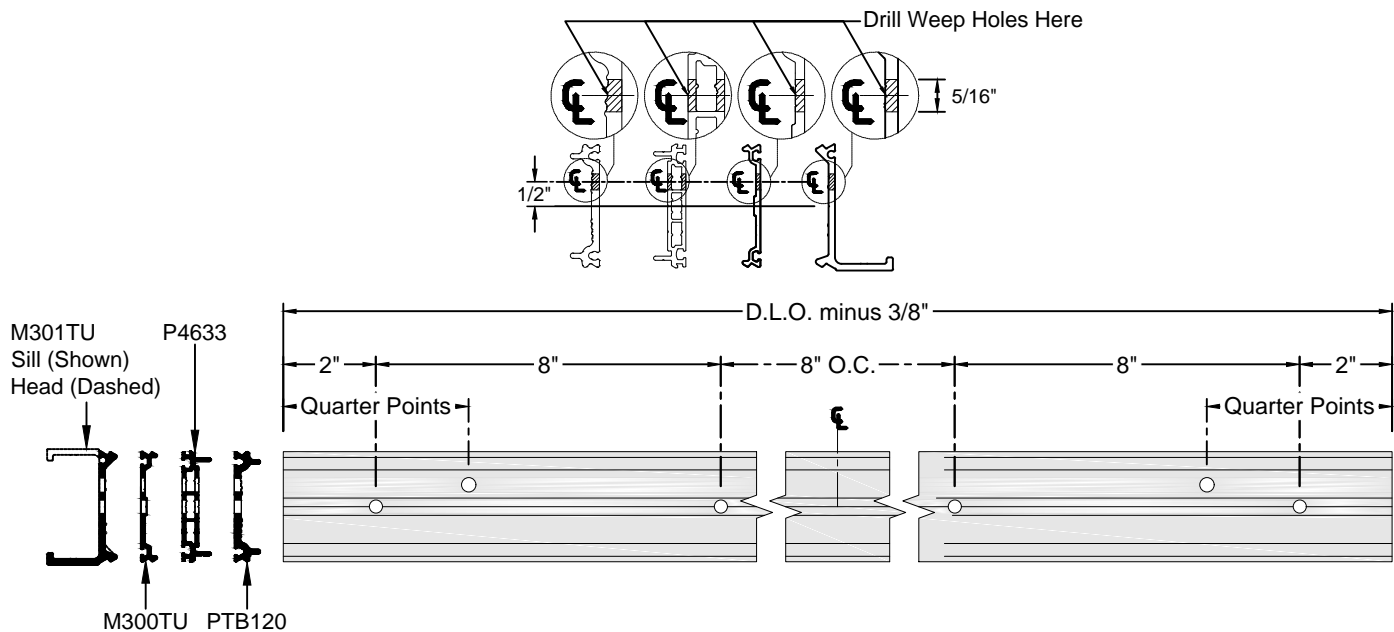


Fig. 32.1

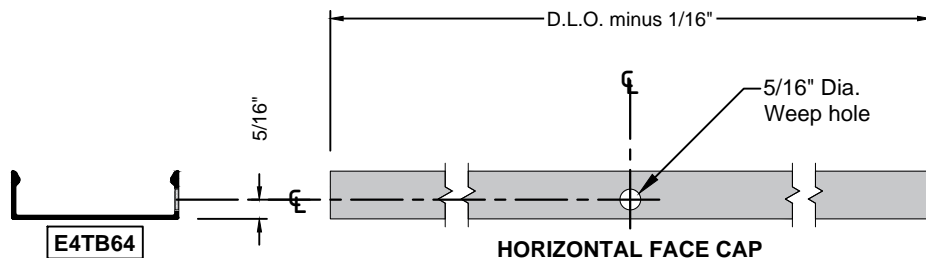


Fig. 32.2

FRAME UNIT FABRICATION

Step 6:

Attach Anti-Buckling Clips to Verticals

- A. Slide P4615 anti-buckling clips into location on the female verticals. Refer to approved shop drawings for correct number and location. Note that it is best to locate clips at the top, bottom and mid-point of each frame unit for best results. Crimp clips into place. See Fig. 33.1.

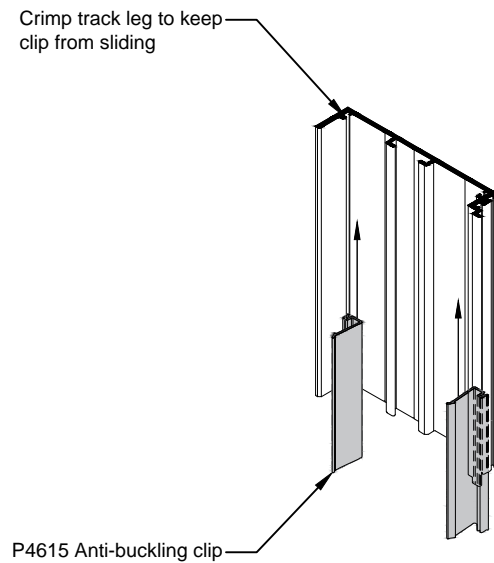


Fig. 33.1

FRAME UNIT FABRICATION

Step 7: Attach Anchor Clips to Verticals

- A. Locate the anchor clips for each vertical so the center line of the clip aligns with the top of the anchor plate ball. Attach to the vertical with (8) S457 ¼" x 1" HWH self-drilling screw per approved shop drawings. See Fig. 34.1.

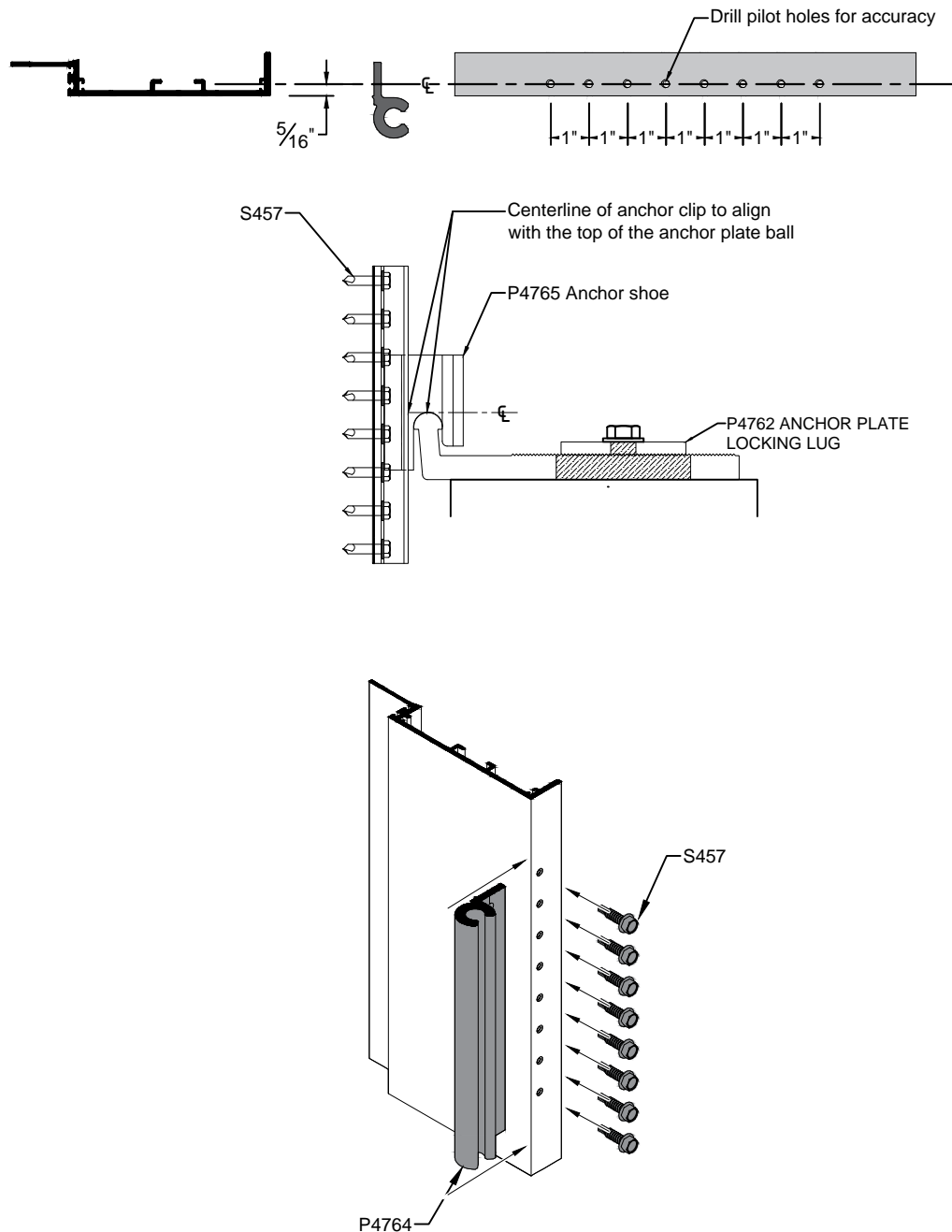


Fig. 34.1

FRAME UNIT FABRICATION

Step 8: Attach Lifting (Alignment) Lugs to Verticals

- A. For multi-span applications or shop glazed frames requiring lifting lugs, attach the lifting (alignment) lugs to the tops of the verticals on each side per approved shop drawings. See Fig. 35.1 & 36.1

Note: Each project must be reviewed by an Engineer to determine loading limits on the lugs for job specific conditions. Glass and frame sizes as well as the method of installing frames can affect loading limitations on the lugs. Clearances in the building opening also need to be factored in as well.

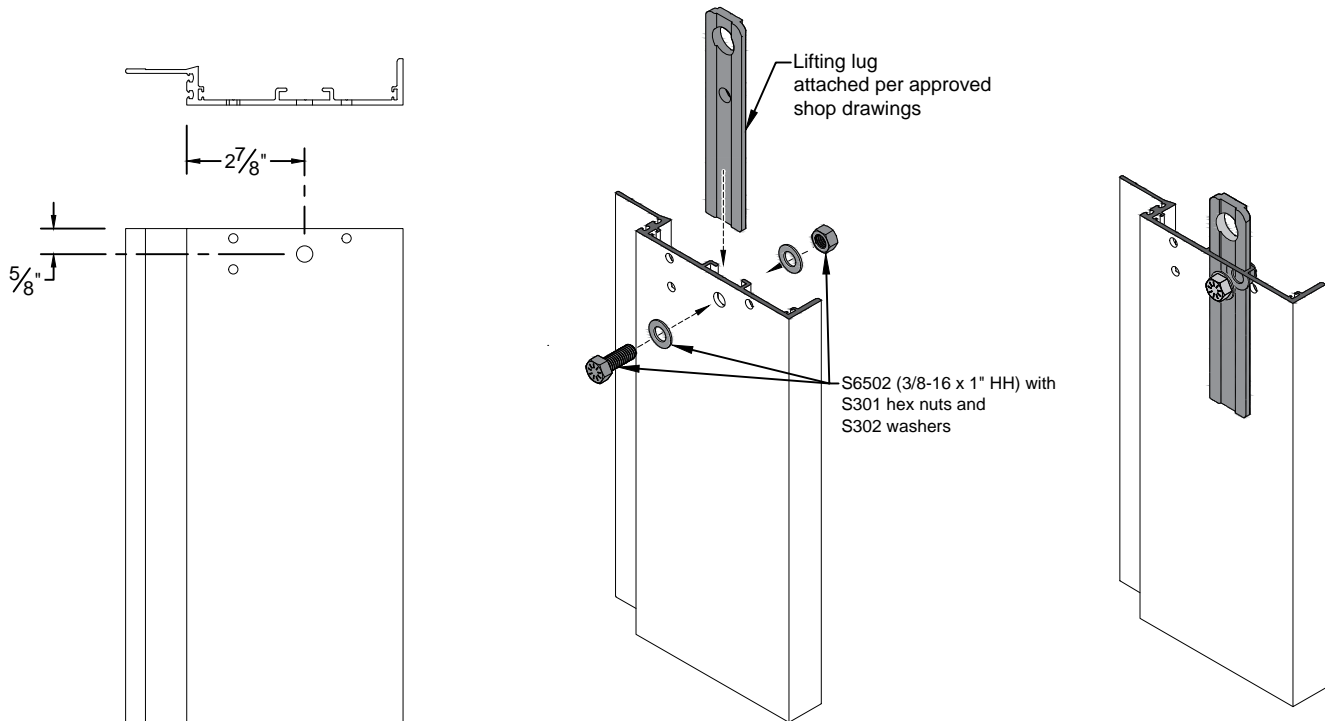


Fig. 35.1

5-1/4" Back Member Shown, 7-3/4" similar

Step 8: Attach Lifting (Alignment) Lugs to Verticals (continued)

Note: Each project must be reviewed by an Engineer to determine loading limits on the lugs for job specific conditions. Glass and frame sizes as well as the method of installing frames can affect loading limitations on the lugs. Clearances in the building opening also need to be factored in as well.

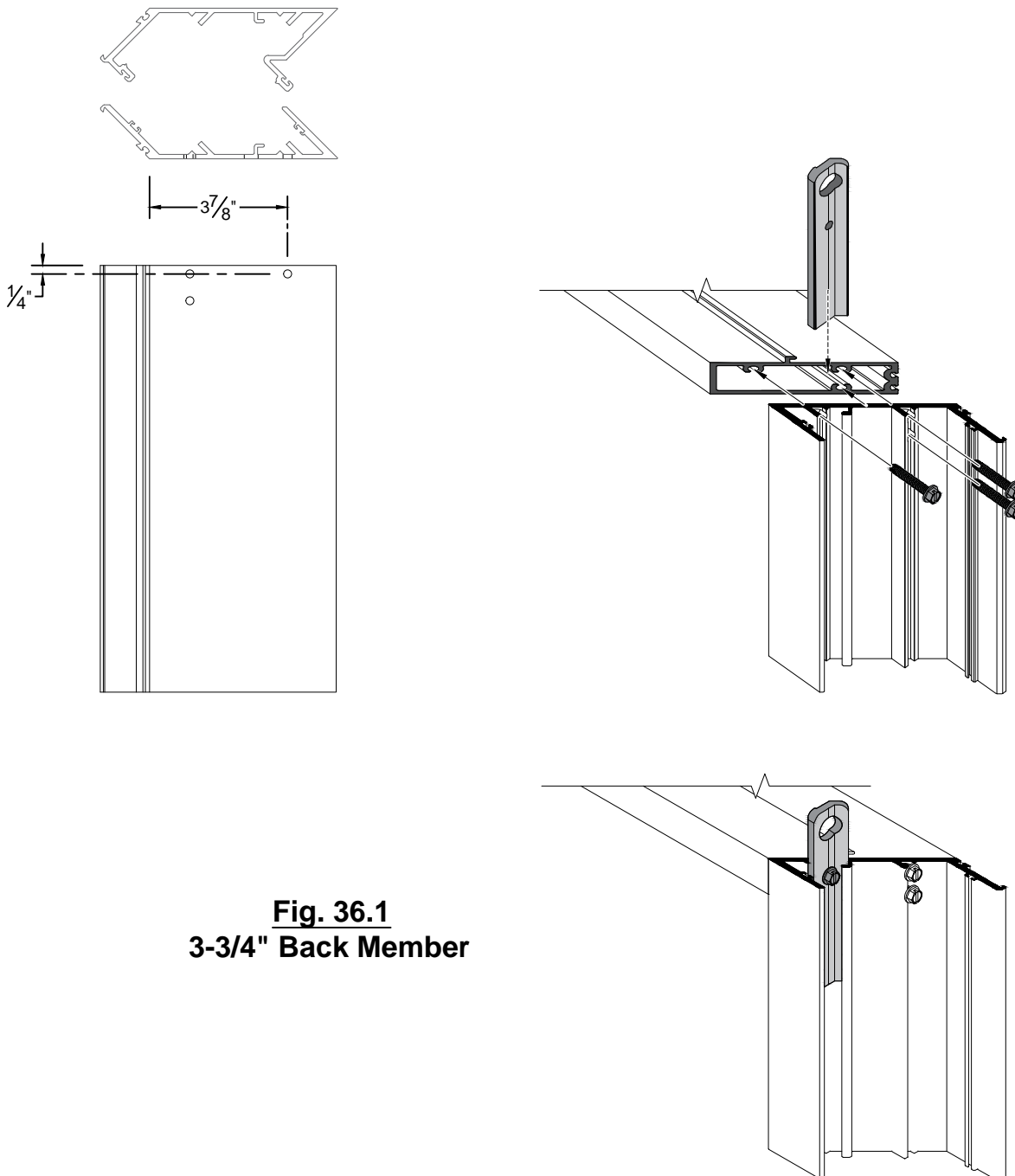


Fig. 36.1
3-3/4" Back Member

FRAME UNIT ASSEMBLY

Step 9: Assemble Bays

- A. Starting at the jamb of the opening, lay out the verticals and horizontals for correct assembly of each bay.
 NOTE: The orientation of the corner mullions will determine the direction of installation (left-to-right or right-to-left).
- B. De-bur and clean the ends of all horizontals with IPA to ensure a tight joint with good sealant adhesion. Seal ends of horizontal prior to attaching to the verticals. See Fig. 37.1 for sealant locations.
- C. Assemble the horizontals to the verticals with S403, 1/4-20 x 1" HWH, or S359 at 3-3/4" back members. Tool excess sealant at the joints. At all two-piece corner mullions, use S359 to assemble the horizontals to the corner mullions.

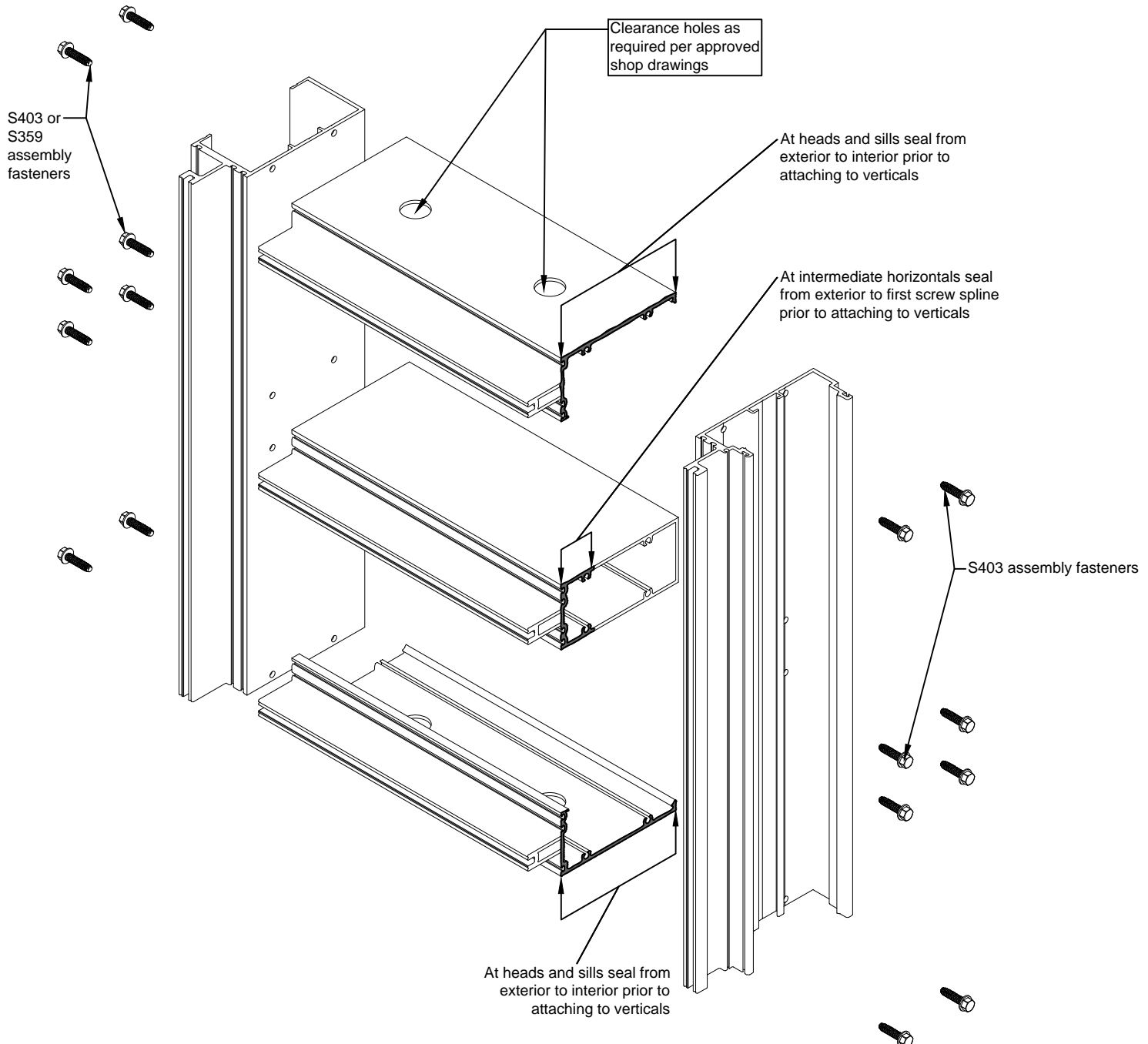


Fig. 37.1

FRAME UNIT ASSEMBLY

Step 9: Assemble Bays (continued)

- A. Install P4730 wiper gasket continuous into the front and back of each male vertical member. Crimp the ends of the mullion to lock the wiper gasket in place. See Fig. 38.1.
- B. Install P4788 air seal gasket continuous in the front of each male intermediate vertical. 'Ping' metal to crimp gasket in place. See Fig. 38.1.
- C. If steel reinforcing is required, install per approved shop drawings. Steel reinforcing can be attached to frame units in different ways. See Fig. 38.2 for examples at 5-1/4" and 7-3/4" back members. See Fig. 38.3 for 3-3/4" back members.
- D. For conditions requiring 1/4" spandrel glass, install the P4718 reducer gasket into the pocket reducer.
 Note: Tubelite offers three (3) pocket reducers: A typical vertical/horizontal reducer, a reducer for an outside corner and a reducer for an inside corner. Reference parts list for part numbers.
- E. Position reducers in the pocket (vertical reducers run beyond horizontal reducers) and engage in back member reglet. See Fig. 39.1. For glass that is structurally glazed, attach the pocket reducer to the mullion 2" from each end and at the mid-point with S207 #10-24 x 1-1/4" FH.

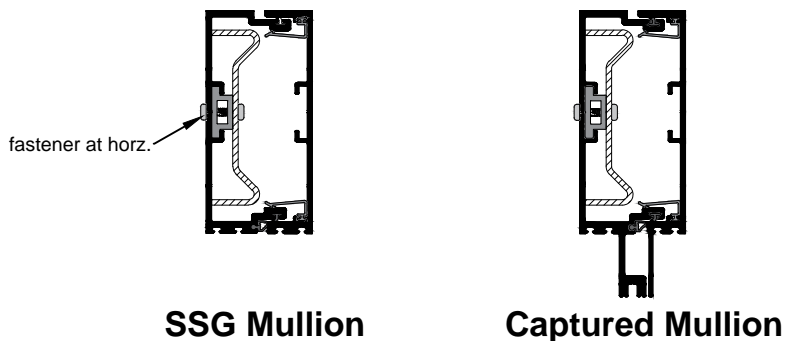
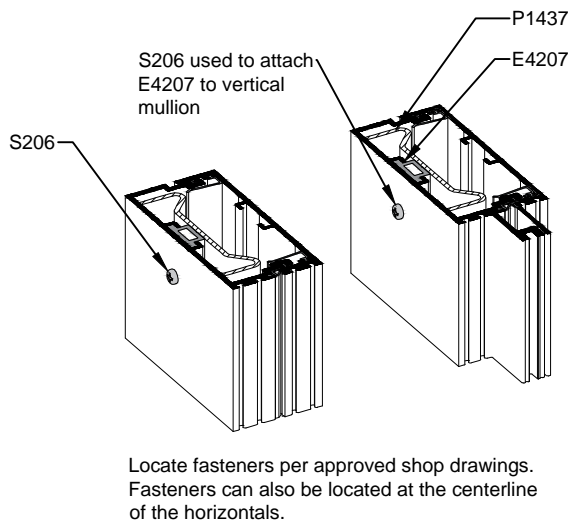


Fig. 38.2
 TYPICAL APPLICATION AT
 5-1/4" & 7-3/4" BACK MEMBERS

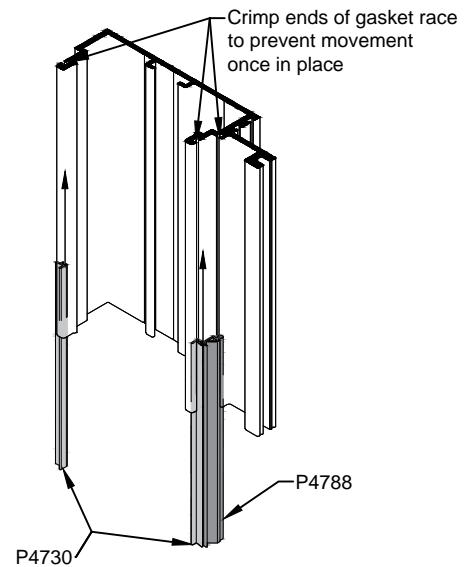


Fig. 38.1

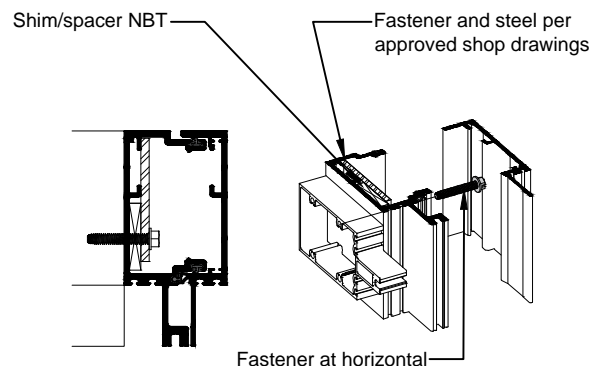


Fig. 38.3
 TYPICAL APPLICATION AT
 3-3/4" BACK MEMBERS

FRAME UNIT ASSEMBLY

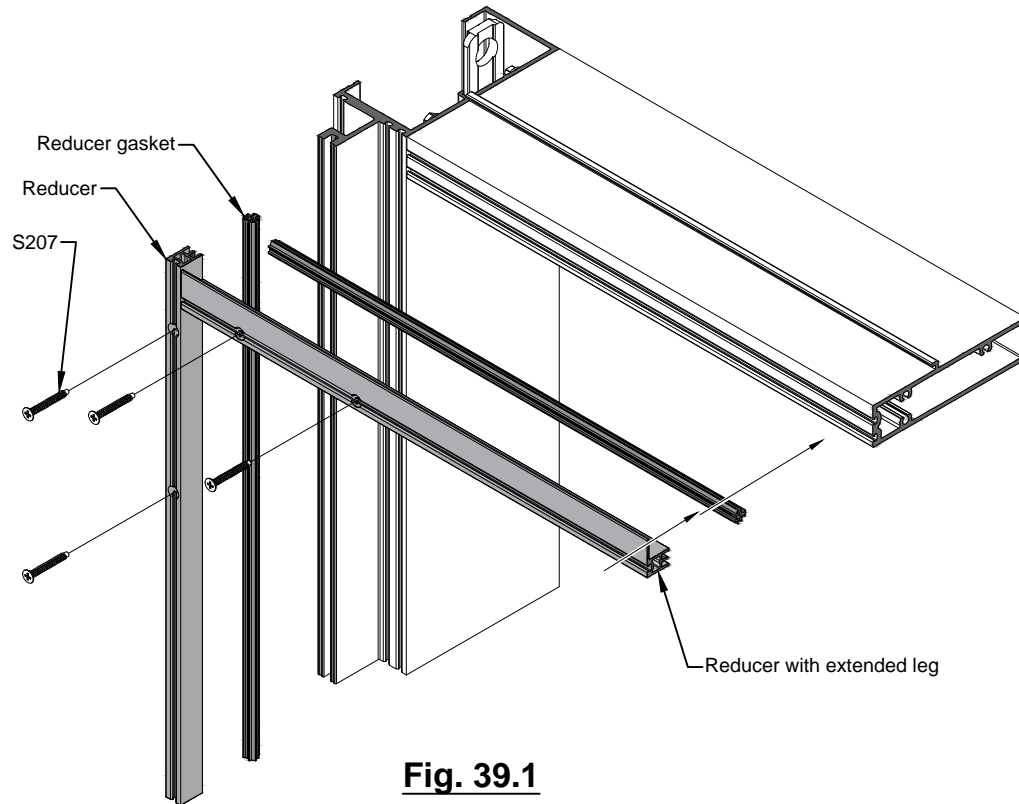
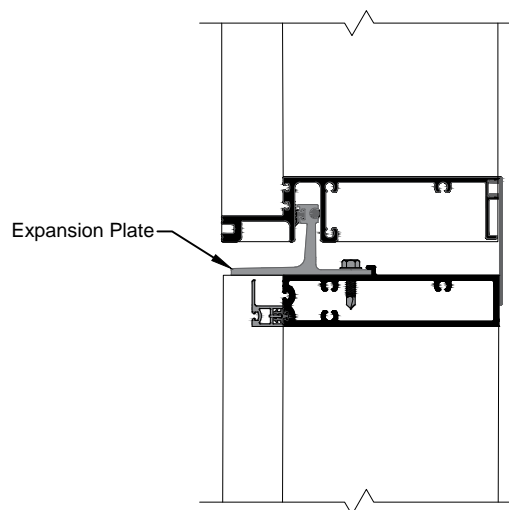


Fig. 39.1

NOTE: The 400SS shop glazed system is spliced with a specially designed expansion horizontal for live load/thermal movement of $\pm 1/2$ " maximum movement. See Fig. 39.2.

*Live load/thermal movement based on standard shapes. Consult Tubelite Engineering for job specific requirements out of this range.



Expansion at Horizontal

Fig. 39.2

FRAME UNIT ASSEMBLY

Step 10: Install Water Dams

- Pre-seal the cavity where the water dam is to be installed. Sealant should be applied liberally. See Fig. 40.1 and 40.2. When expansion horizontals are used, only the upper horizontal (sill of upper frame unit) will receive a water dam.
- Push the water dam into the cavity between the end of the horizontal and the vertical tongue. This is a pressure fit.
- After the water dam is in place, apply silicone between the top of the dam and end of the horizontal, tooling over the end dam for a water tight seal. Seal over the top of the water dam onto the horizontal tongue, damming the end of the horizontals. **THIS IS A CRITICAL SEAL.**
- For vertical SSG applications, water dams must be installed after the frame units are erected. Follow the same sealing procedures as with a captured system noted above. See Fig. 40.2.

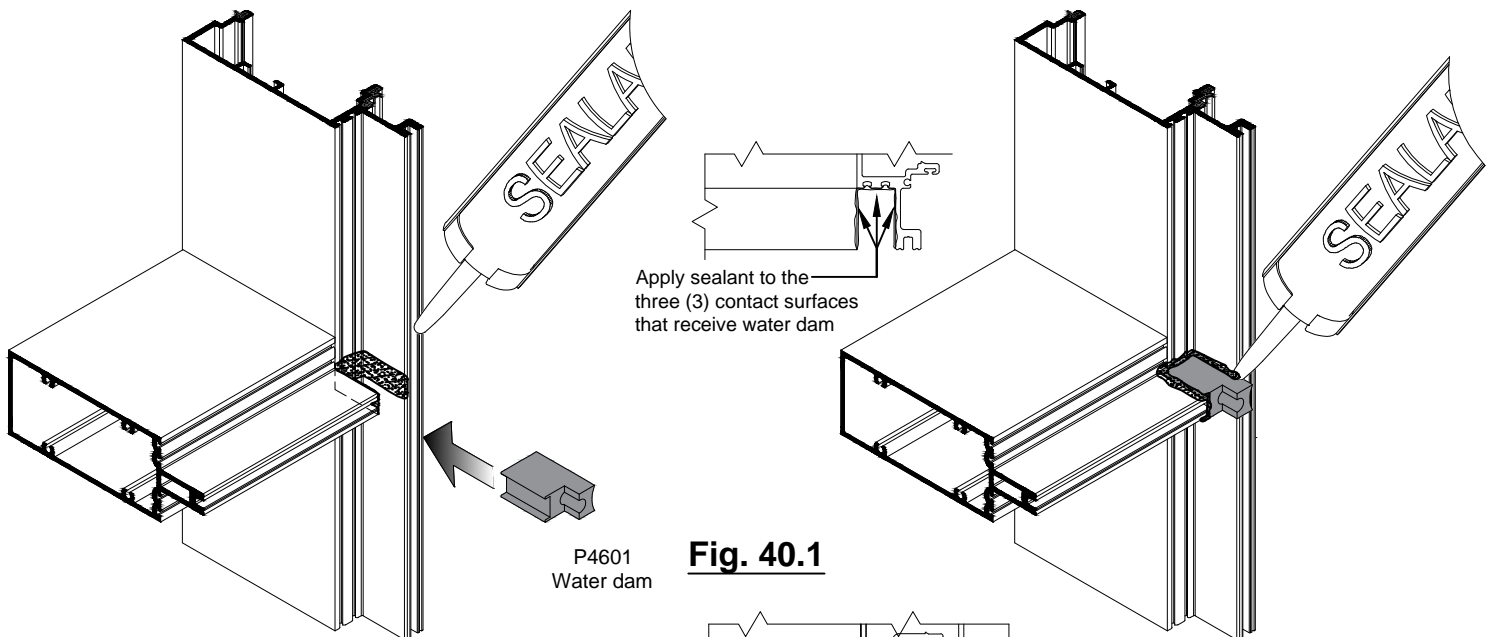
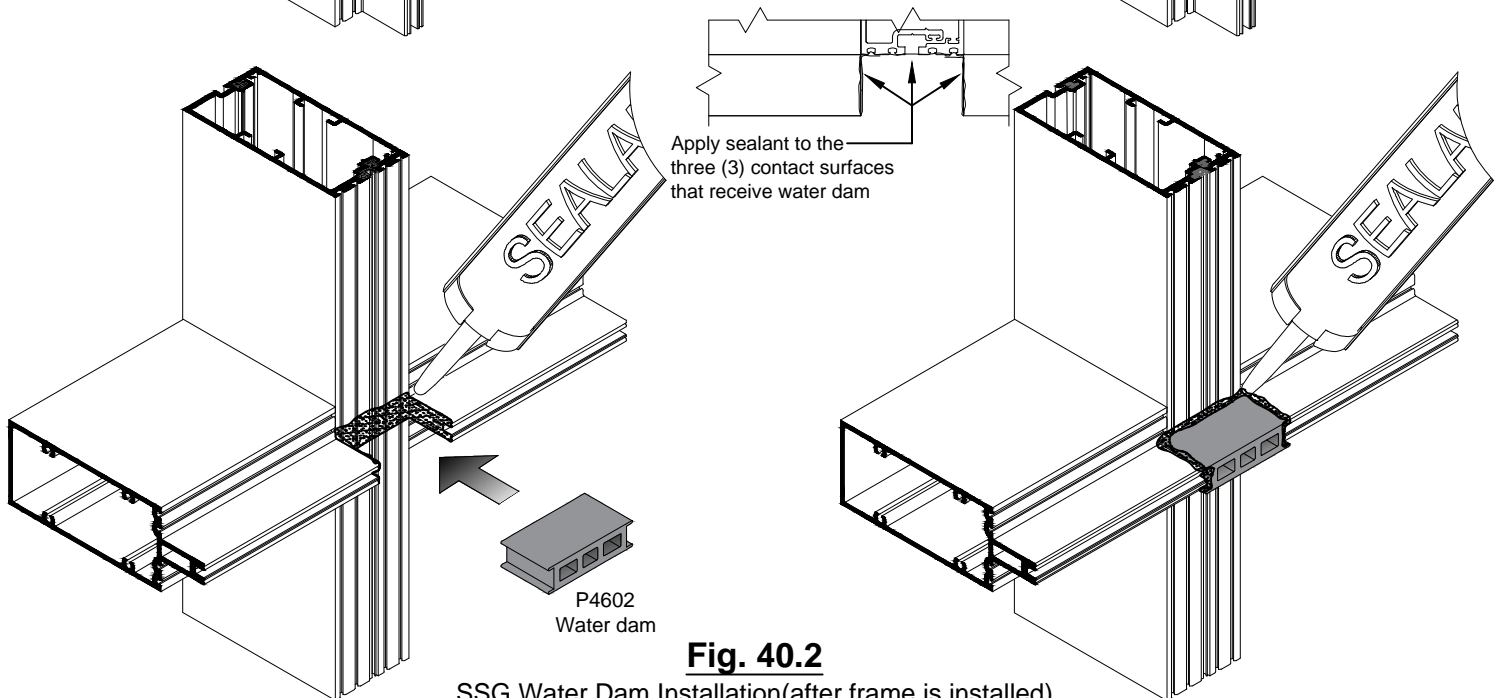


Fig. 40.1



FRAME UNIT ASSEMBLY

Step 10: Install Water Dams (continued)

- A. For pre-sealing captured mullion frames: Water dams can be pre-applied to each bay in the shop before transporting to the jobsite. Follow the same sealing procedures as with a captured system noted above. See Fig. 41.1.

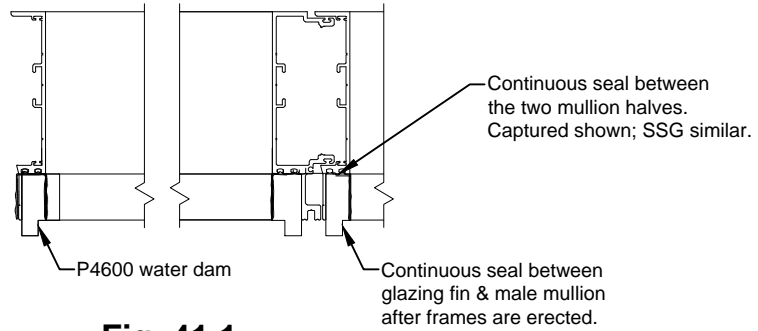


Fig. 41.1

Step 11: Installing Gaskets

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

- Remove any debris from the glazing pockets and reglets.
- Install P4606 gasket into vertical mullions. See Fig. 41.2 and 42.1. Vertical mullion gaskets run beyond the horizontals.
- Install P4606 gasket into the horizontal members.
- Install P4605 isolator gasket into the vertical and horizontal tongues.

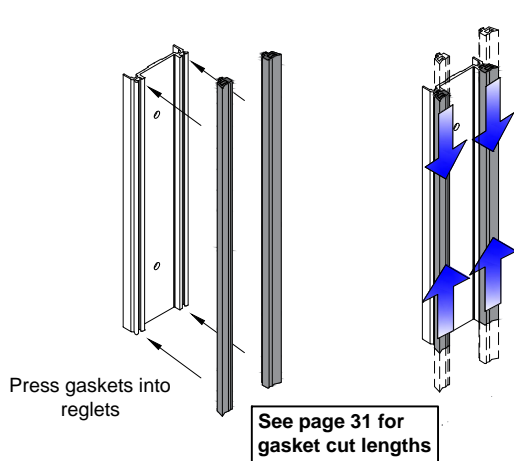


Fig. 41.2

Typical with vertical and horizontal gaskets.

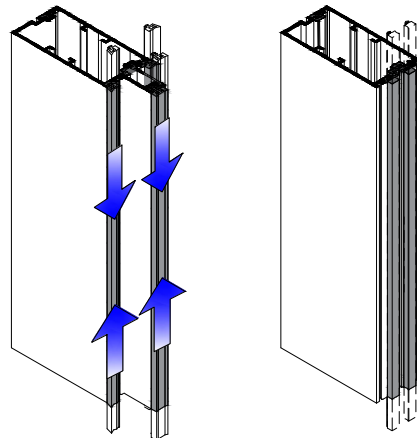
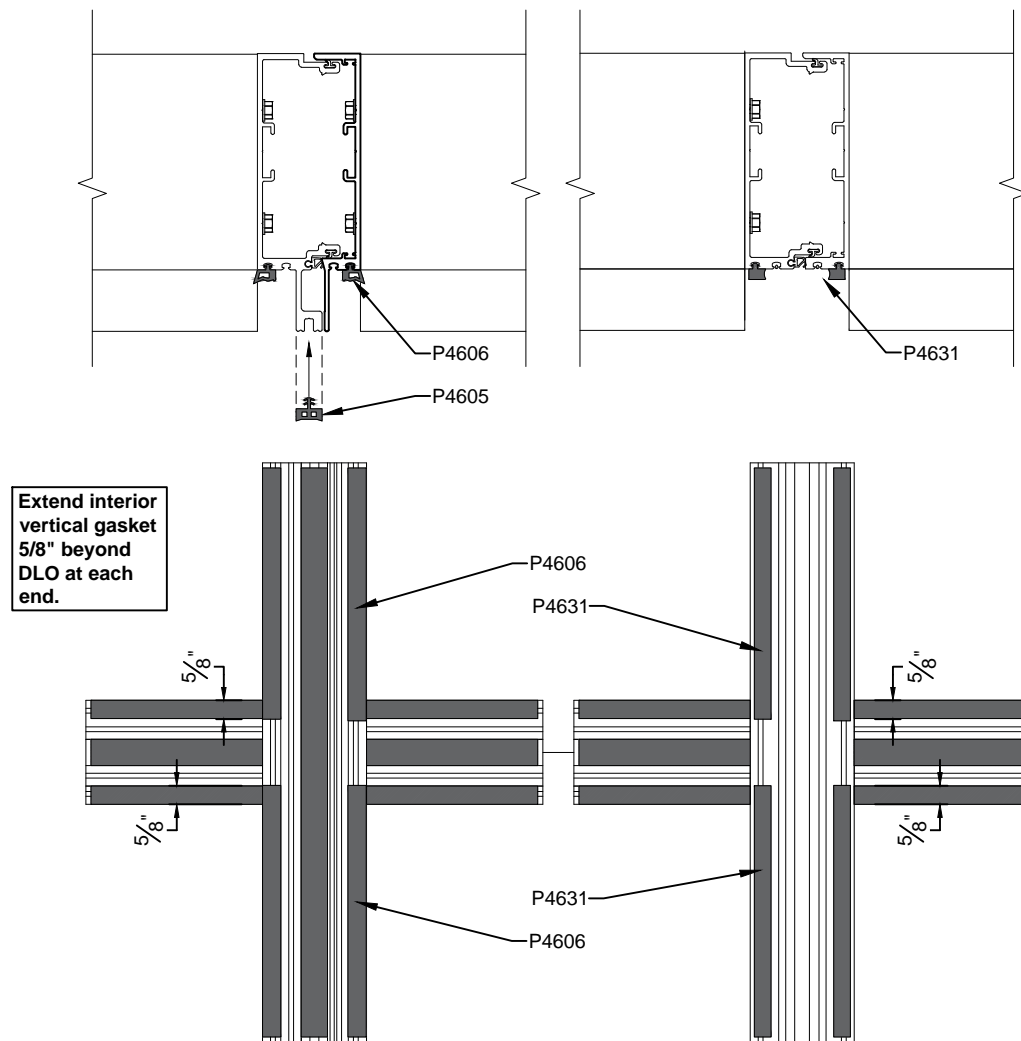


Fig. 41.3

Step 11: Installing Gaskets (continued)**FRAME UNIT ASSEMBLY**

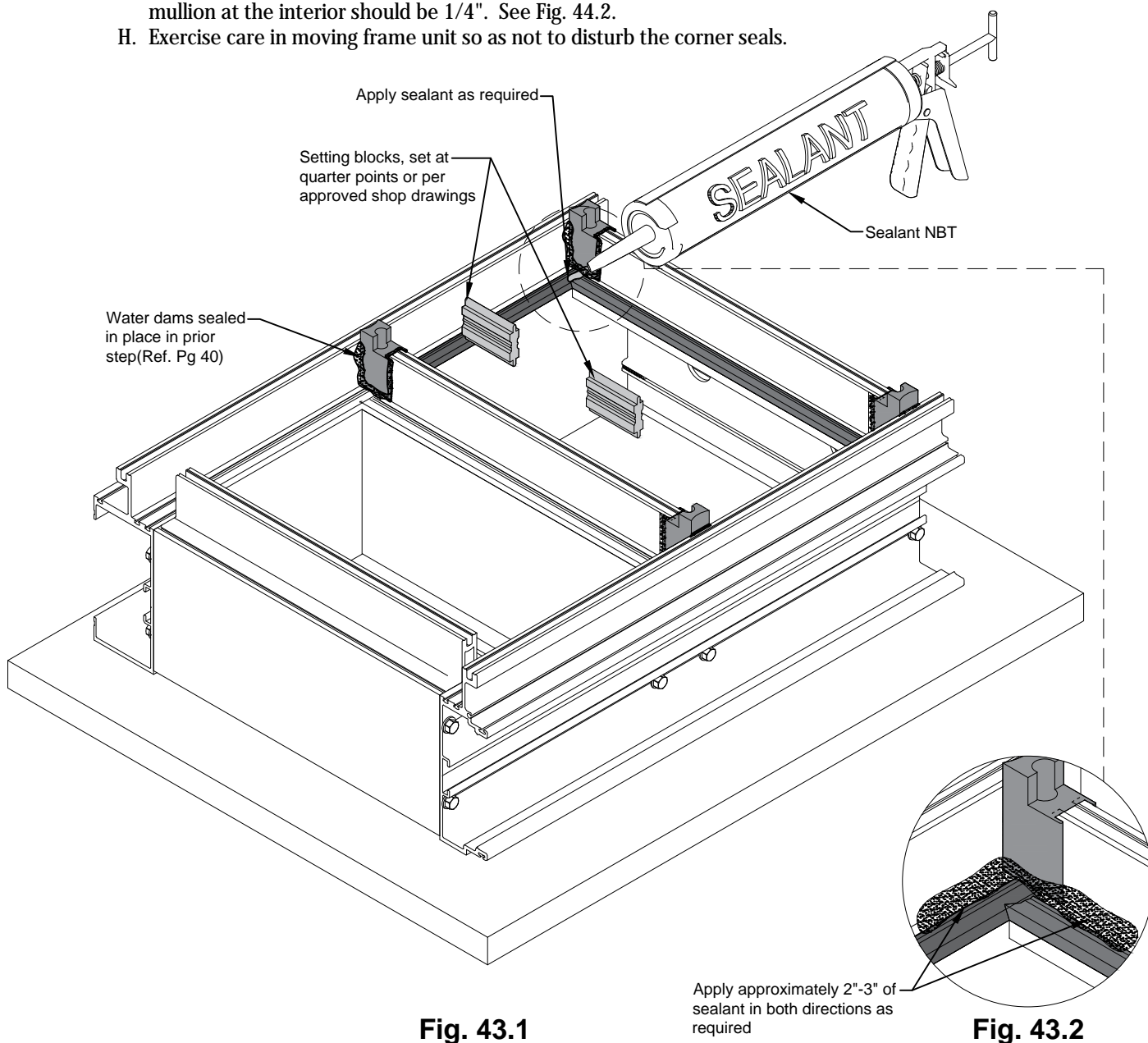
- E. For SSG applications, install the P4631 SSG spacer gasket into the mullion (vertical gasket runs beyond horizontal). See Fig. 41.3 and 42.1.

**Fig. 42.1**

FRAME UNIT ASSEMBLY

Step 12: Shop Glazing - Blocking Method

- A. Set frame on a horizontal surface, glass side up. Frame must be square.
- B. Thoroughly clean edges of glass and frame where silicone will be contacting.
- C. Place setting blocks at sill member per approved shop drawings.
- D. Seal corners of interior gaskets prior to setting the glass. See Fig. 43.1.
 Note: When seismic and/or interstory horizontal movement is anticipated, place a safety seal around the outside corners of the gaskets prior to setting glass. See Fig. 43.2.
- E. Set glass in place, ensuring a 9/16" glass bite on all sides. Verify per approved shop drawings
- F. Install edge blocks into corners to hold glass in place during transport. See Fig. 44.1.
- G. Install P4790 temporary retainer on both sides of each corner. Tighten retainer to ensure glass is compressed against the interior gaskets for a good seal. A thicker gasket or shim, may need to be used to obtain the correct compression on the glass. Face clearance between the glass and the mullion at the interior should be 1/4". See Fig. 44.2.
- H. Exercise care in moving frame unit so as not to disturb the corner seals.



FRAME UNIT ASSEMBLY

Step 12: Shop Glazing - Wet Seal Method

- A. Set frame on a horizontal surface, glass side up. Frame must be square.
- B. Thoroughly clean edges of glass and frame where silicone will be contacting.
- C. Place setting blocks at sill member per approved shop drawings.
- D. Apply structural silicone around interior gasket corners a minimum of 6" in each direction prior to setting the glass. Note that larger lites may need more than 6". Consult Tubelite Engineering for specific job requirements. See Fig. 44.1.
- E. Set glass in place, ensuring a 9/16" glass bite on all sides.
- F. Apply structural silicone between the mullion tongue and the glass on top of bead placed in step D. Tool sealant. See Fig. 44.2. Note: Seal only the inboard lite of glass so any infiltrated water is not trapped in the glass pocket.
- G. Install P4790 temporary retainer within 2" of each corner, horizontal/vertical intersections and at mid-lite. Tighten retainer to ensure glass is compressed against the interior gaskets for a good seal. A thicker gasket or shim may need to be used to obtain the correct compression on the glass. Face clearance between the glass and the mullion at the interior should be 1/4". See Fig. 44.2.
- H. Check D.L.O. and frame unit diagonal dimensions for squareness. Adjust as necessary. It is critical that the frame unit is square before silicone cures.
- I. Exercise care in moving frame unit so as not to disturb the corner seals. Follow sealant manufacturer's recommendations for cure time before moving and installing frame units.

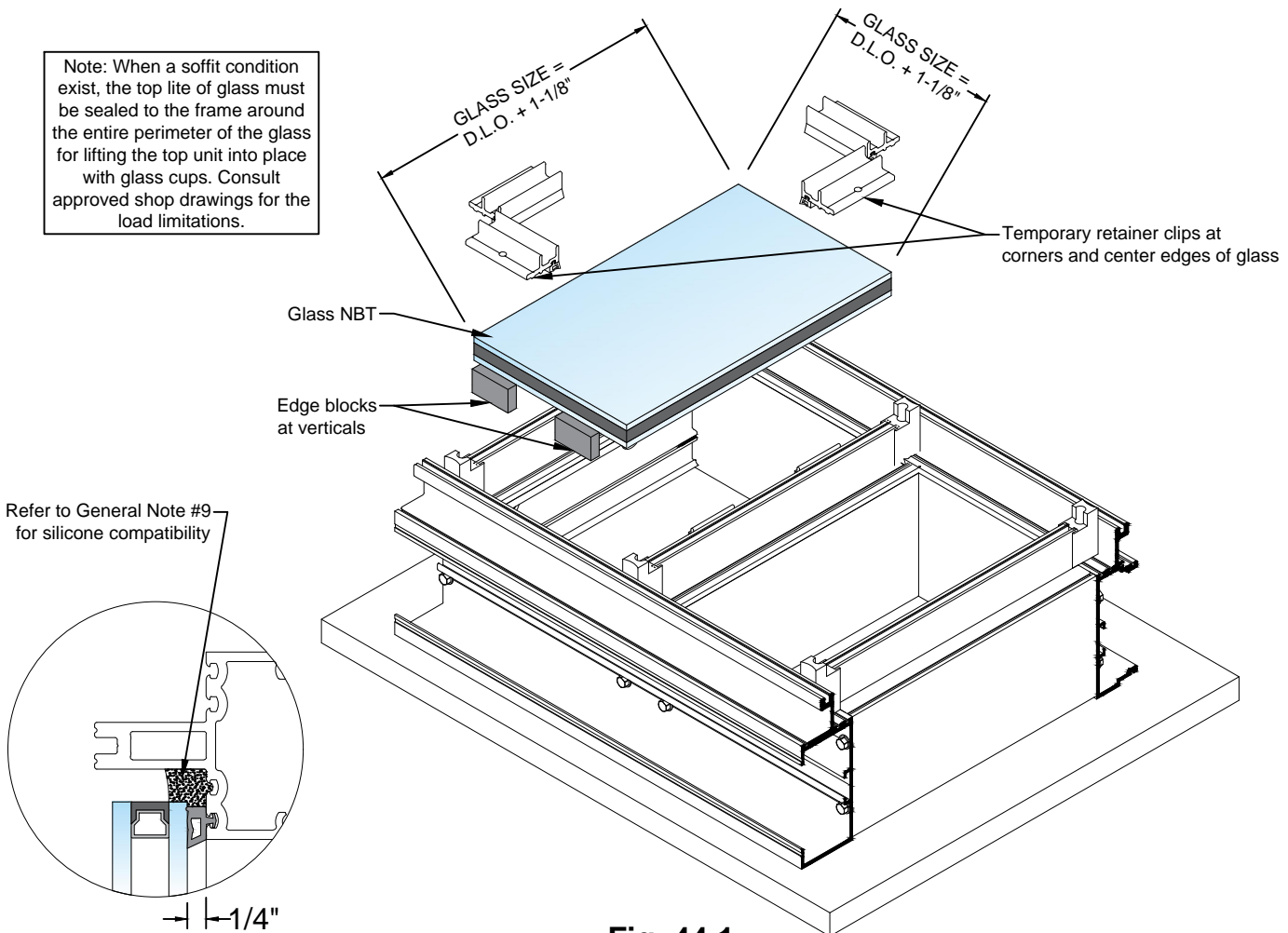


Fig. 44.2

Fig. 44.1

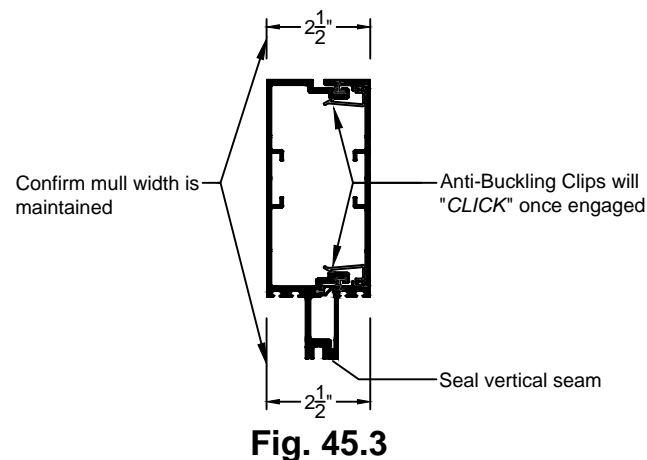
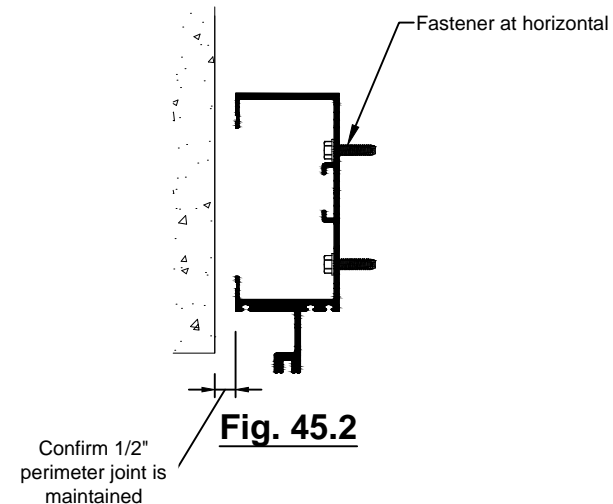
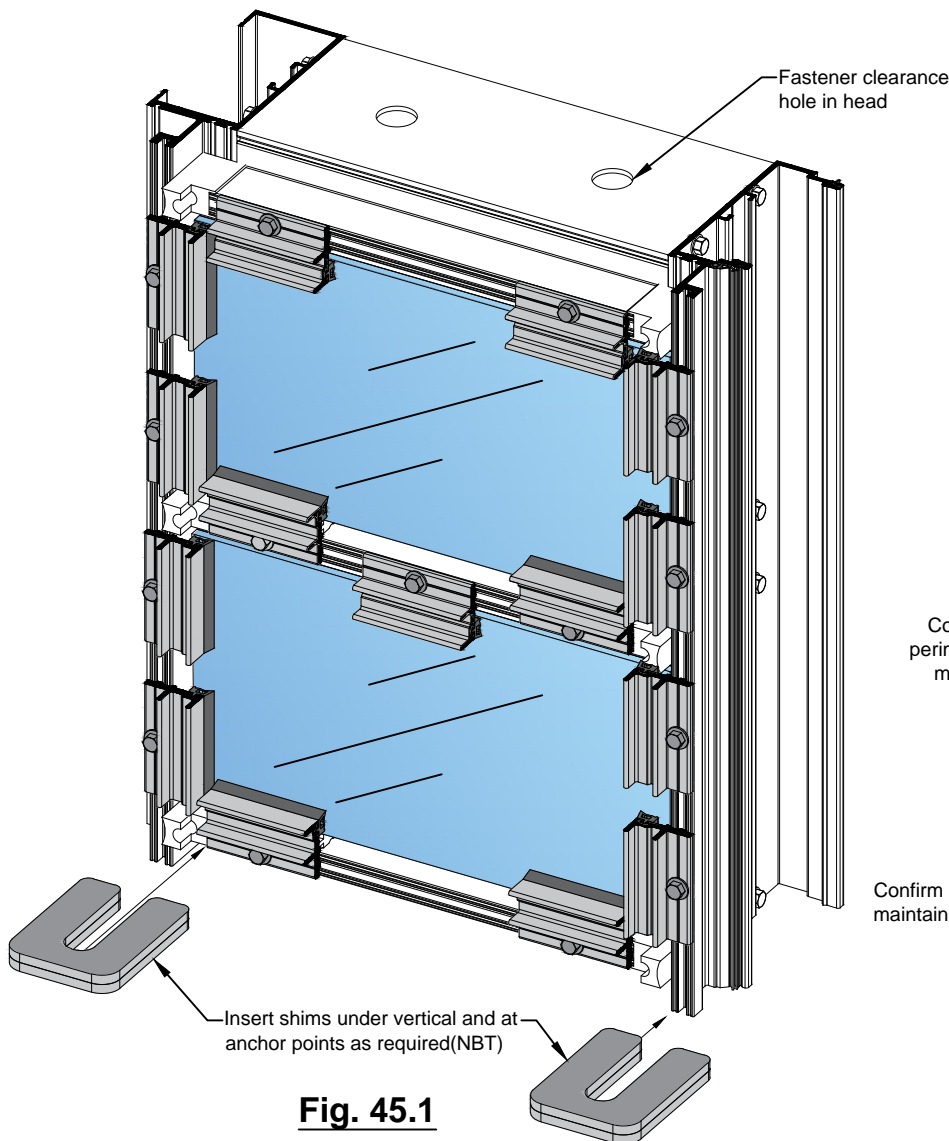
FRAME UNIT INSTALLATION

Step 13: Installing Frame Units

Note: Check frame unit diagonal dimensions and vertical mullion sightlines after units are assembled together to ensure frames are square and properly mated together.

Single Span Installations

- i. Set first frame unit in opening, shimming at the sill according to approved shop drawings. Make sure the shim extends under the vertical mullion for proper dead load support. Check the jamb joint width prior to anchoring the frame unit to the building at the head and sill. See Fig. 45.2. Note: Do not shim the top of the frame unit to allow for thermal and live load movement.
- iii. Install the next frame unit by engaging the mullion halves together. A click will be heard when the anti-buckling clips are properly engaged. Check to see that the bottoms of the adjacent frame units align and the width of the intermediate verticals are consistently 2-1/2". See Fig. 45.3. Repeat steps i. and ii. above until all frame units are installed.
- iv. Seal the seam at the front of all shop glazed vertical mullions per Fig. 45.3.



FRAME UNIT INSTALLATION

Step 13: Installing Frame Units (continued)

Note: Check frame unit diagonal dimensions and vertical mullion sightlines after units are assembled together to ensure frames are square and properly mated together.

Multi-Span Installations Using Expansion Horizontal

- i. Set first frame unit in opening from the floor above, shimming at the sill according to approved shop drawings. Make sure the shim extends under the vertical mullion for proper dead load support. Check the jamb joint width prior to anchoring the frame unit to the building at the anchor point. See Fig. 46.1.
- ii. Slide P4765 anchor shoe into anchor clip that is attached to the back of the vertical mullion. Set over the anchor plate ball and secure with S458 #12 x 3/8" U-drive setting screw. For dead load anchors, install S468 9/16-12 x 3-1/2" HH jack bolt and nut at the top of the anchor clip. Adjust jack bolt and anchor plate as necessary for proper sill joint, frame unit squareness and offset distance from edge of slab. See Fig. 46.2.

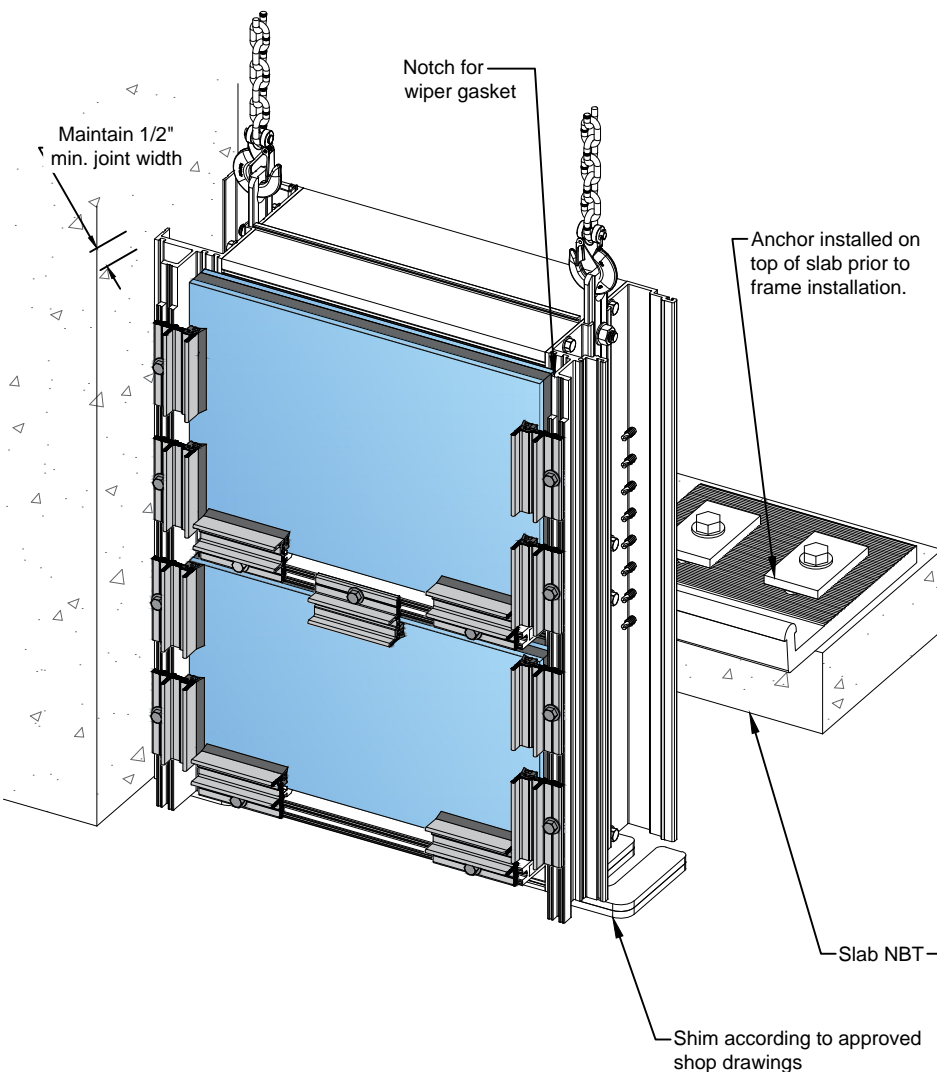


Fig. 46.1

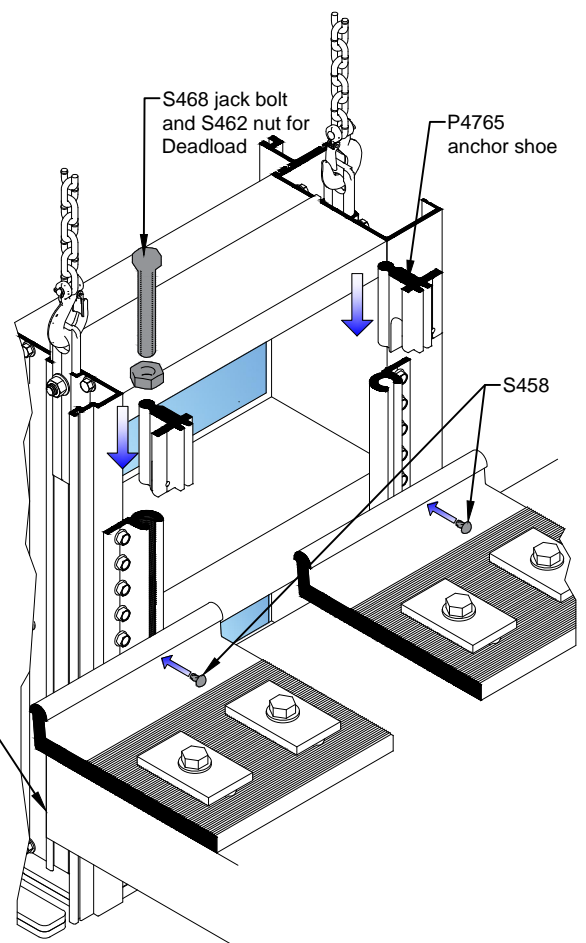
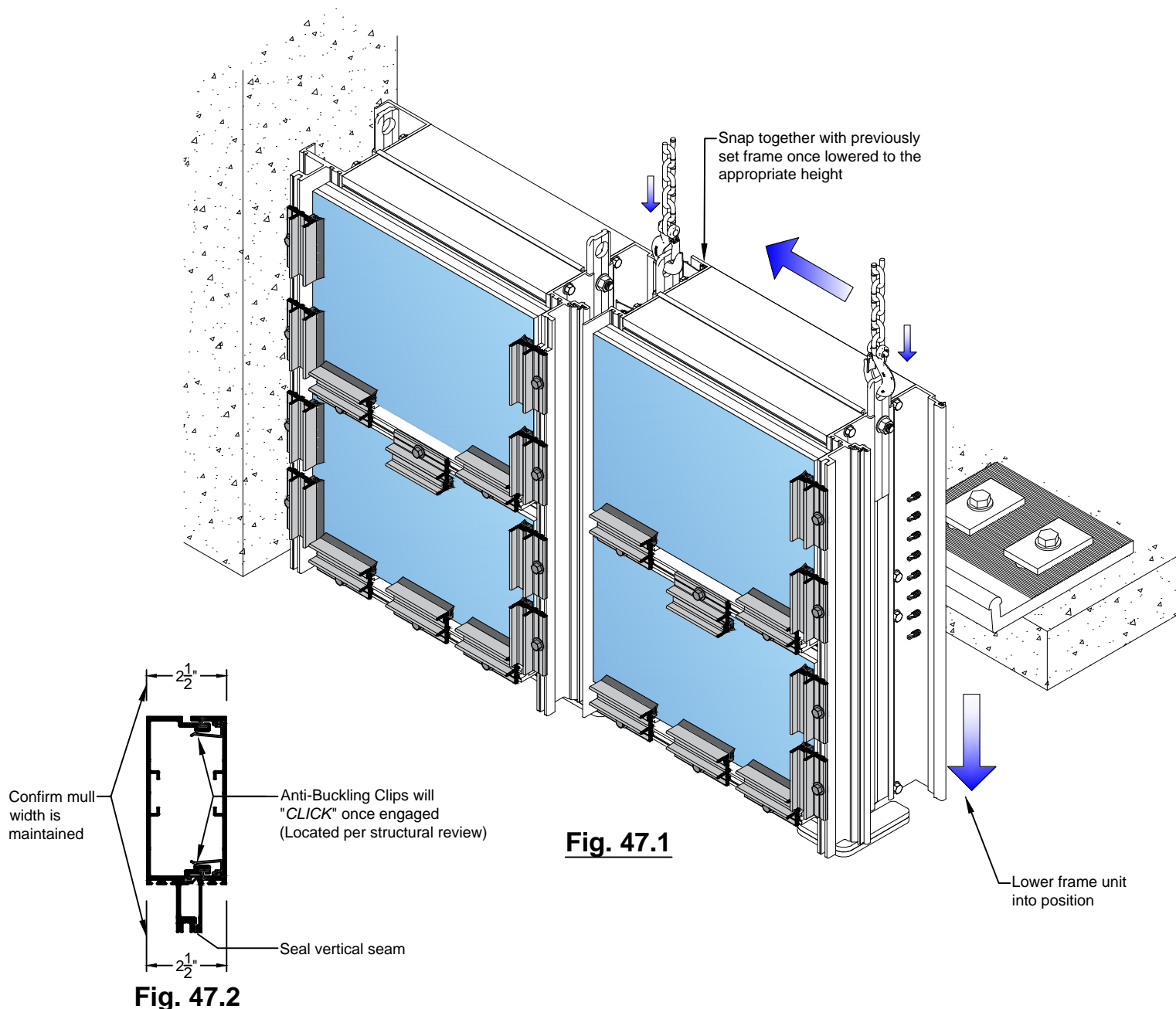


Fig. 46.2

FRAME UNIT INSTALLATION

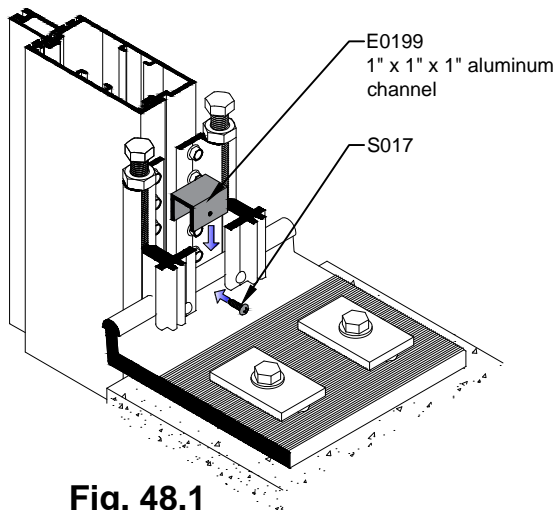
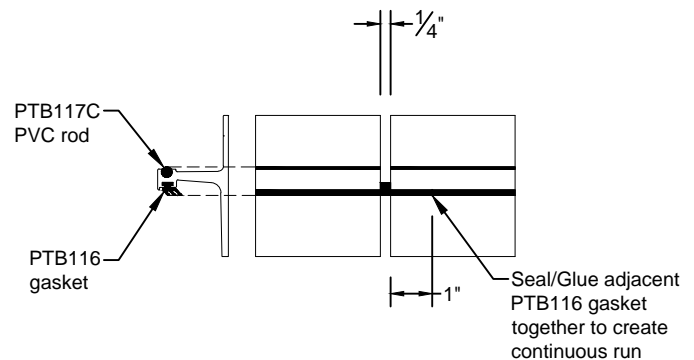
Step 13: Installing Frame Units (continued)

- iii. From the floor above, install the next frame unit by engaging the mullion halves together. A click will be heard when the anti-buckling clips are properly engaged. Check to see that the bottoms and tops of the adjacent frame units align and the width of the intermediate verticals are consistently 2-1/2". See Fig. 47.1 & 47.2. Repeat steps i., ii. and iii. on previous page until all lower frame units are installed.
 - a.a. Install the next adjacent frame
- iv. Finish anchoring the frame units

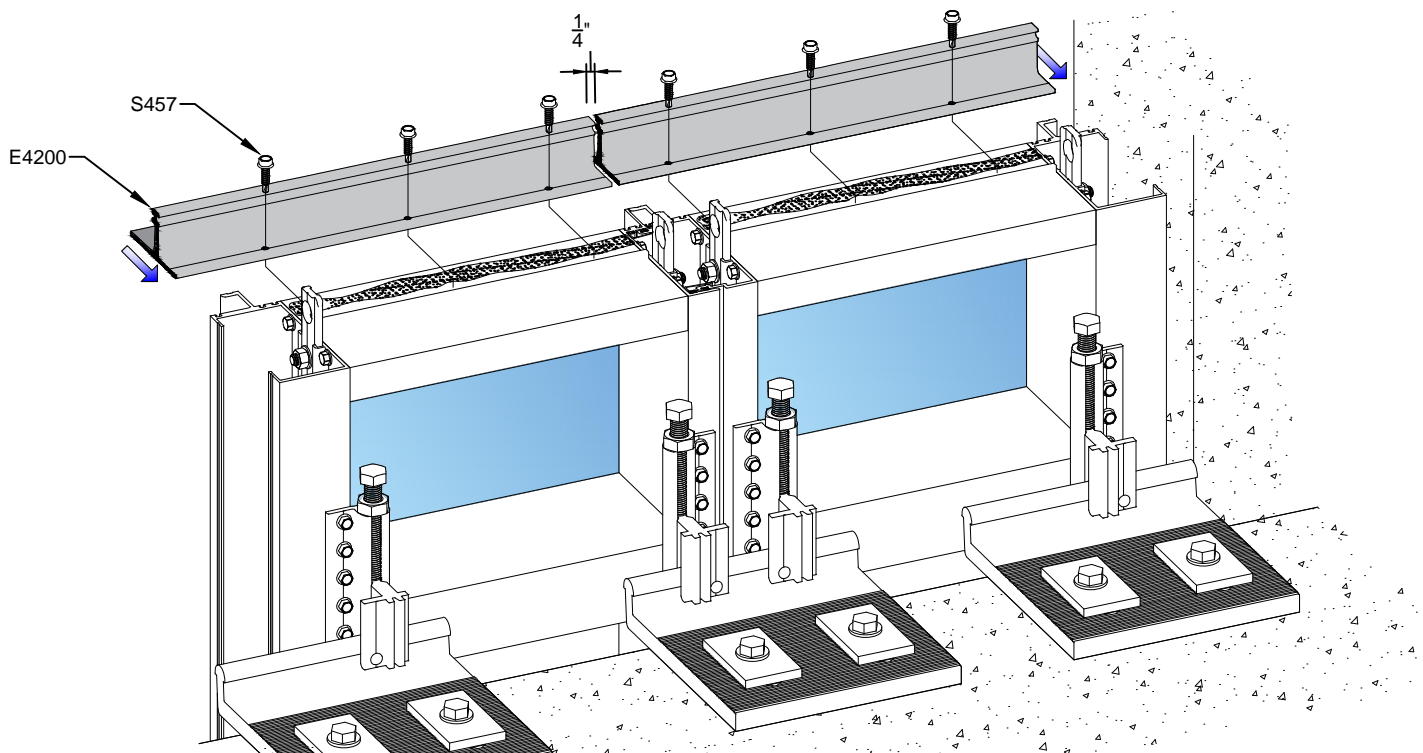


FRAME UNIT INSTALLATION**Step 13: Installing Frame Units (continued)**

- b. When all adjustments have been made, install E0199 1" x 1" x 1" channel between P4765 anchor shoes to lock in place. Cut length should be snug and is determined by field conditions. Attach channel to anchor plate ball with S017 #10 x 5/8" PH. See Fig. 48.1.

**Fig. 48.1****Fig. 48.2**

- v. After the lower units are installed and anchored in place, set the E4200 chicken head on each bay in a bead of sealant then attach to head with S457 1/4" x 1" HWH self-drilling screws at spacing per approved shop drawings. Cut length will equal vertical centerline-to-centerline - 1/4". See Fig. 48.2.

**Fig. 48.3**

Step 13: Installing Frame Units (continued)

- vi. Install PTB116 gasket and PTB117C PVC rod onto the chicken head. PTB117C rod should be cut to the chicken head length. The PTB116 gasket runs continuous. If a splice is required, make sure it is offset at least 1" from the chicken head splice joint. See Fig. 49.1.
- vii. At chicken head splice locations, set a silicone sheet in a bed of silicone over the splice joint. Press sheet into the silicone and tool excess around perimeter. See Fig. 49.1. Use backer rod and sealant on the interior side of the E4200 splice. See Fig. 49.2.
- vij. Once lower bays are installed the lifting lugs need to be cut, prior to installing the upper units, to a maximum of a 1/4" above the expansion plate.

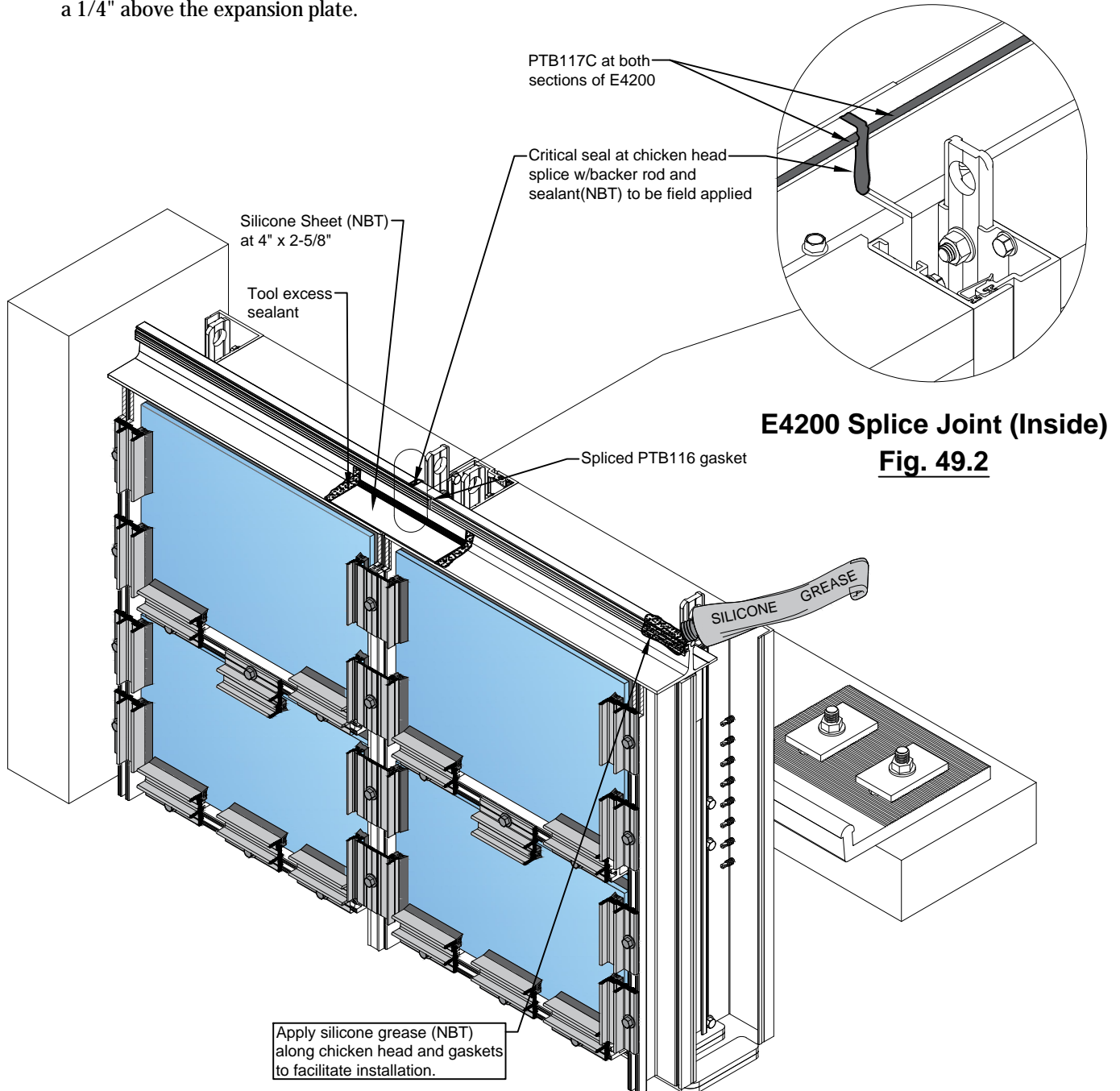
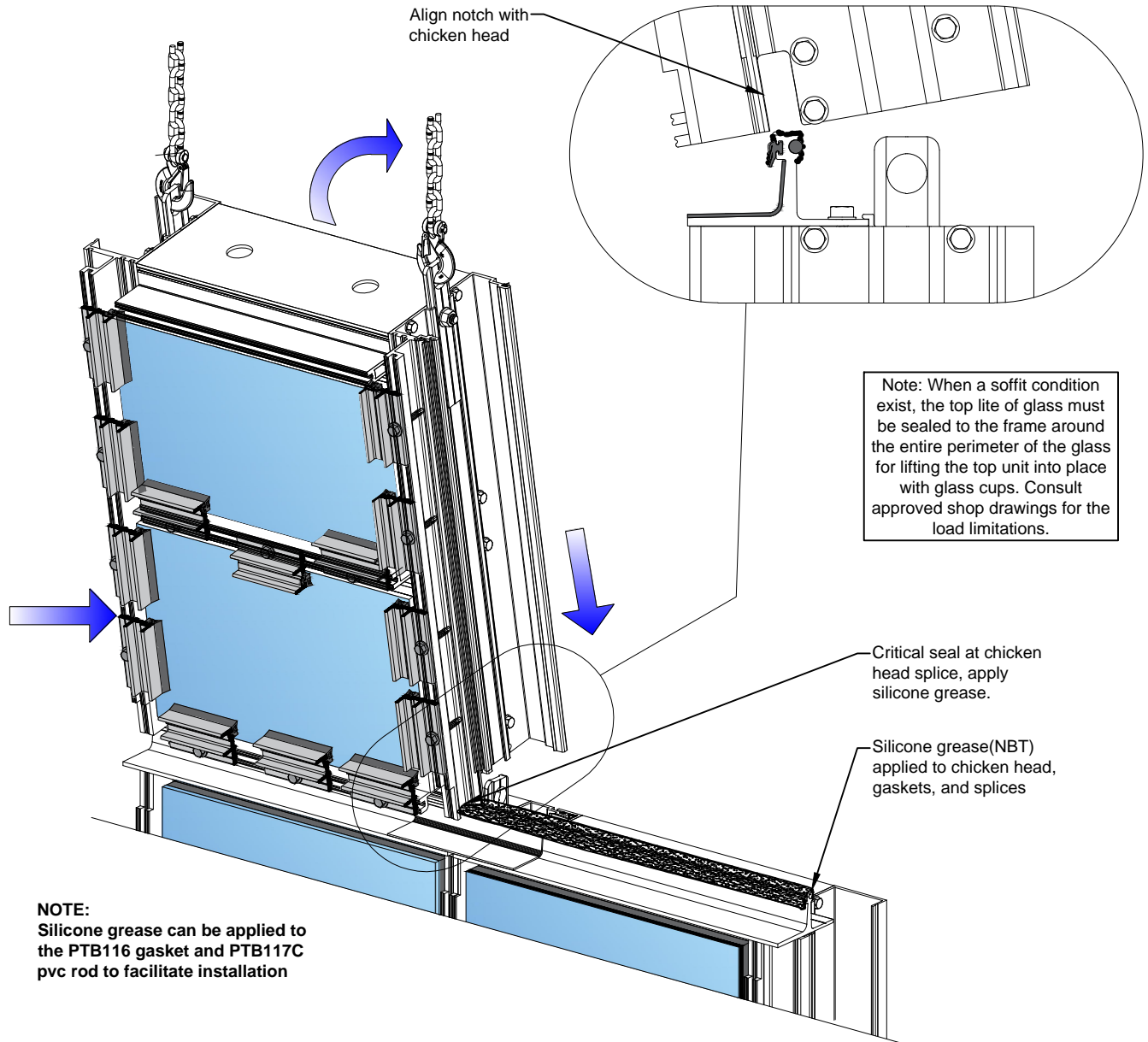


Fig. 49.1

FRAME UNIT INSTALLATION

Step 13: Installing Frame Units (continued)

- viii. Set the next row of frame units above the first row from the floor above, aligning mullion notch over the chicken head. Set the frame expansion joint to the correct height before anchoring the upper frame unit per step ii. above. See Fig. 50.1.

**Fig. 50.1**

Step 13: Installing Frame Units (continued)

- ix. At chicken head splice joints, apply a liberal amount of DOW 111 or equivalent to cover the top of the splice joint prior to setting the upper frame unit into position. Where there are chicken head gasket splices, apply seal here as well. See Pg. 49, and Fig. 51.1.

Note: When a soffit condition exist, the top lite of glass must be sealed to the frame around the entire perimeter of the glass for lifting the top unit into place with glass cups. Consult approved shop drawings for the load limitations.

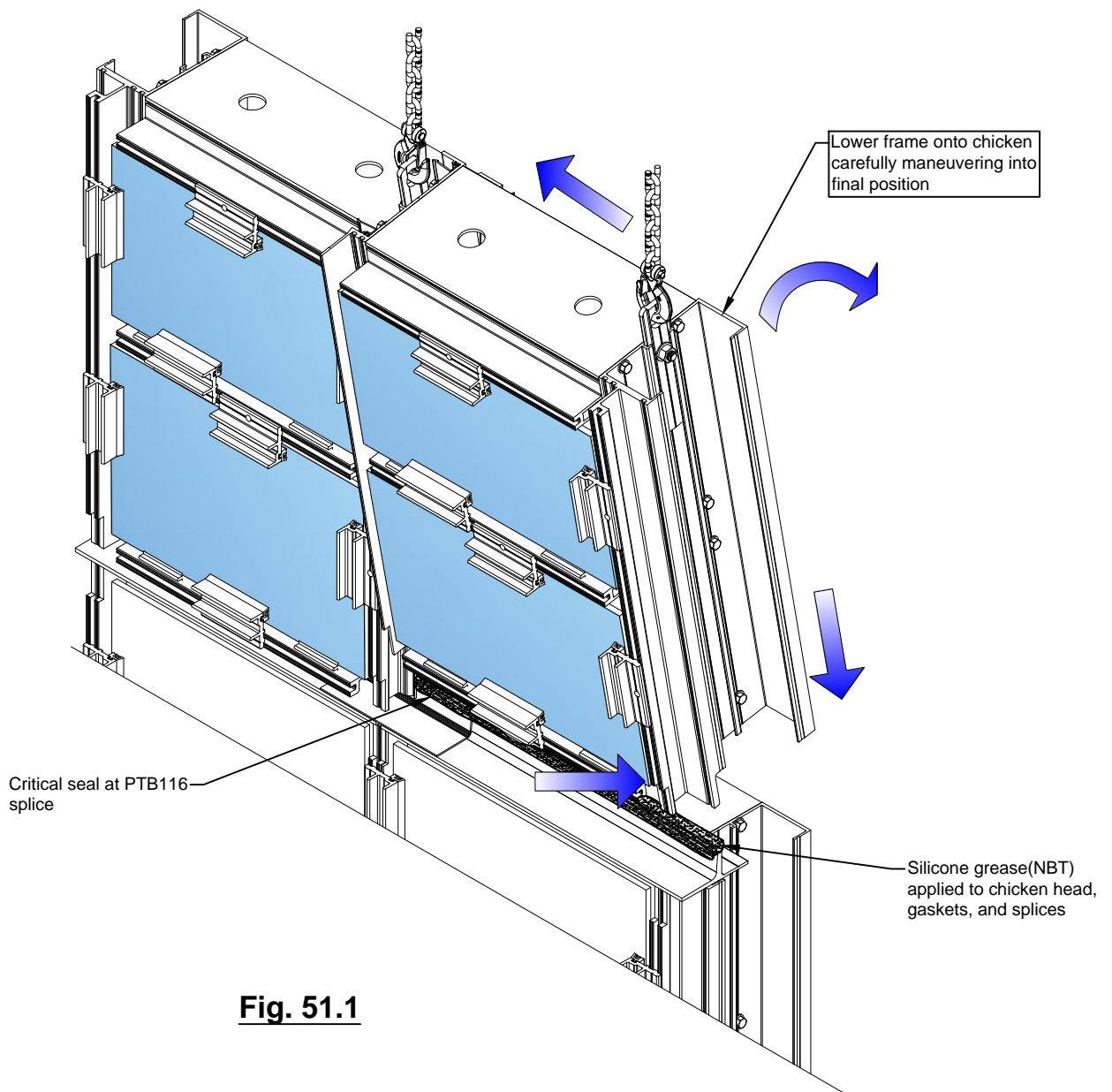
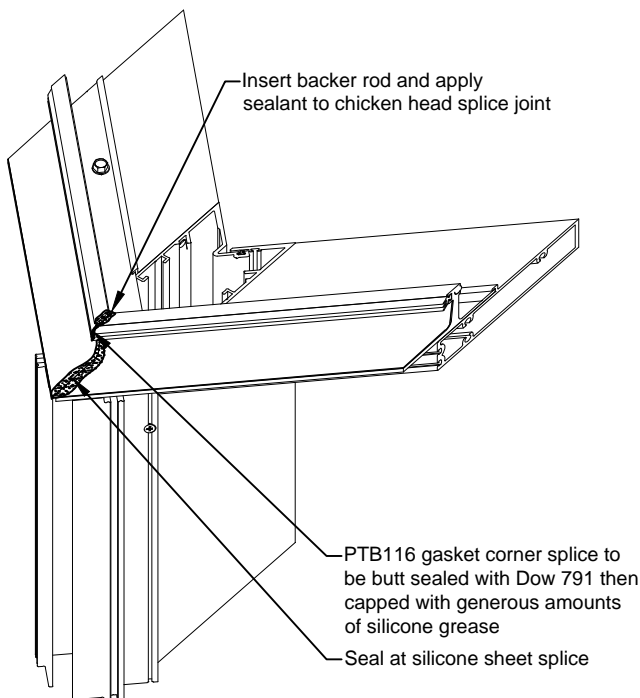
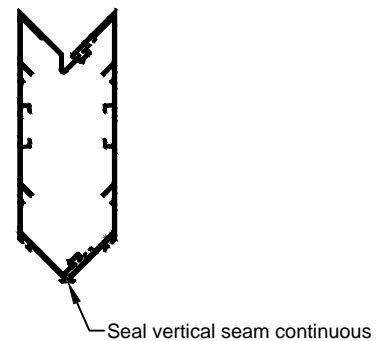
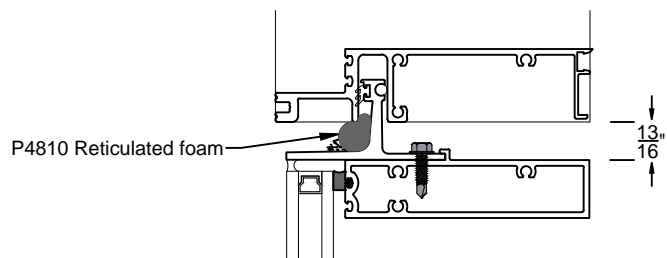


Fig. 51.1

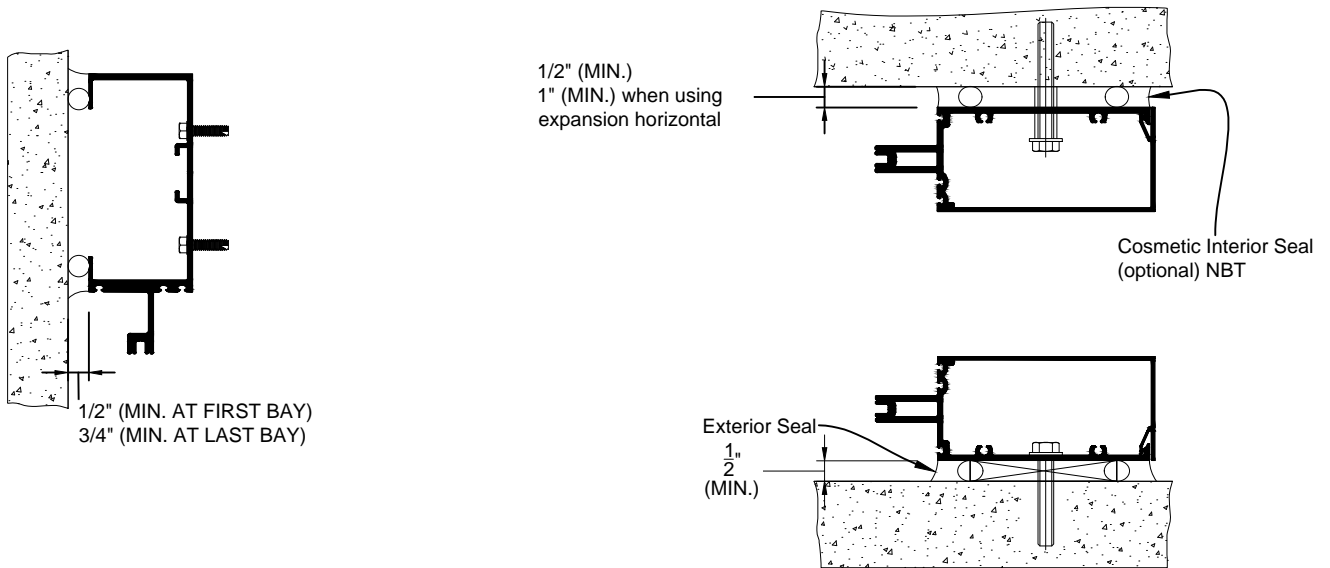
FRAME UNIT INSTALLATION**Step 13: Installing Frame Units (continued)**

- x. At corner mullions, miter the chicken head gasket for a tight fit. Seal together with Dow 791. See Fig. 52.1.
- xi. Repeat step iv. to anchor the frame units.
- xii. If more rows of frame units are to be installed, repeat steps v. through x.
- xiii. Seal the seam at the front of all outside and inside corner mullions per Fig. 52.2.
- xiv. After all frame units are in place, anchor the top row of frame units at the head per approved shop drawings.
- xv. At SSG verticals, refer to Step 10 to apply the water dams. See Fig. 40.2.
- xvi. Install P4810 reticulated foam under each vertical mullion at the chicken head. Hold in place with a dab of silicone. See Fig. 52.3.

**Fig. 52.1****Fig. 52.2****Fig. 52.3**

Step 14: 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.
- C. See Fig. 53.1 for perimeter sealing.
- D. For Polyamide and Thermal pressure plates use the P4607 PVC tube at the perimeter. See Fig. 53.2



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

Fig. 53.1

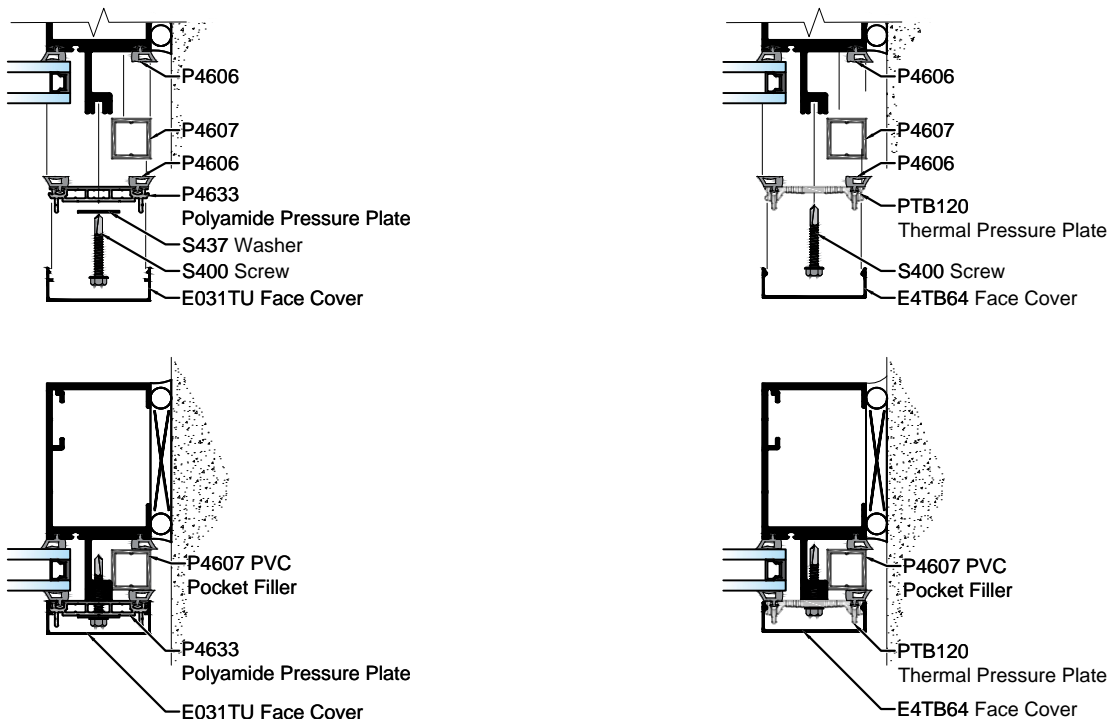


Fig. 53.2

GLAZING

Step 15: Install Pressure Plates & Face Covers

NOTE: If glass was pre-glazed using the blocking method (Step 13, "Blocking Method"), remove blocks prior to installing the pressure plates.

- 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. See Fig. 54.1. For vertical pressure plates below expansion horizontals, maintain a 13/16" joint between the bottom of the expansion horizontal and the pressure plate. At the vertical pressure plates above expansion horizontals, locate 1/4" above the top of the upper horizontal. See Fig. 60.1.
- C. Anchor the pressure plates to the vertical mullion using proper fastener.
- D. Anchor the pressure plates to the horizontal mullion using proper fastener, ensuring that weep holes are on the top side of the pressure plate.

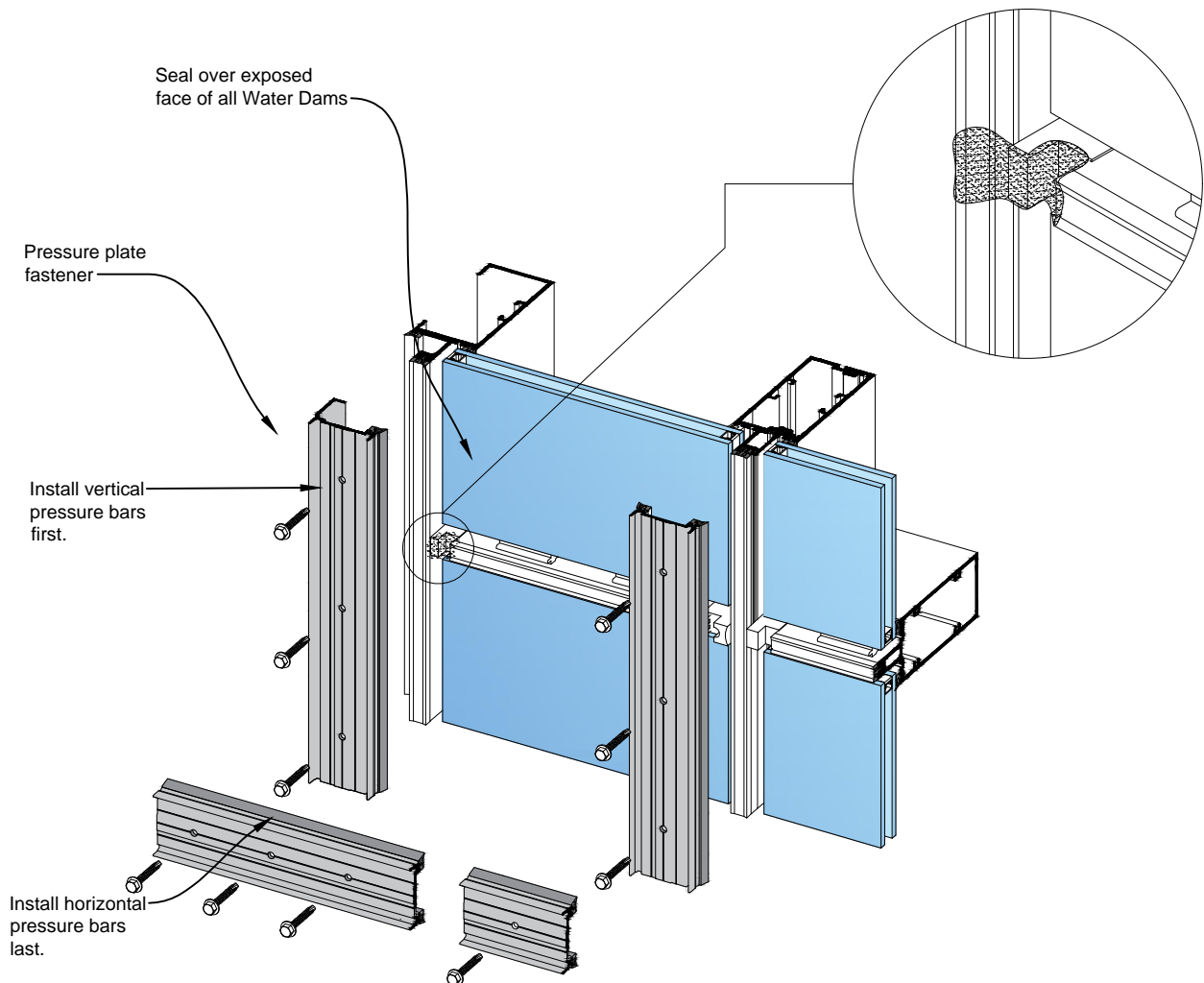


Fig. 54.1

GLAZING

Step 15: Install Pressure Plates & Face Covers (continued)

- E. When expansion horizontals are used, ensure that the horizontal pressure plate and face cover run continuously over the intermediate verticals and the PTB115 wiper gasket is installed continuously into the pressure plate and crimped in place at each end.
- F. As required, drill additional anchor holes in vertical and horizontal pressure plates so that there are anchor holes 2" max from the ends and 2" max from each horizontal/vertical intersection to maintain proper compression on the glass.
- G. Torque all pressure plate fasteners 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.

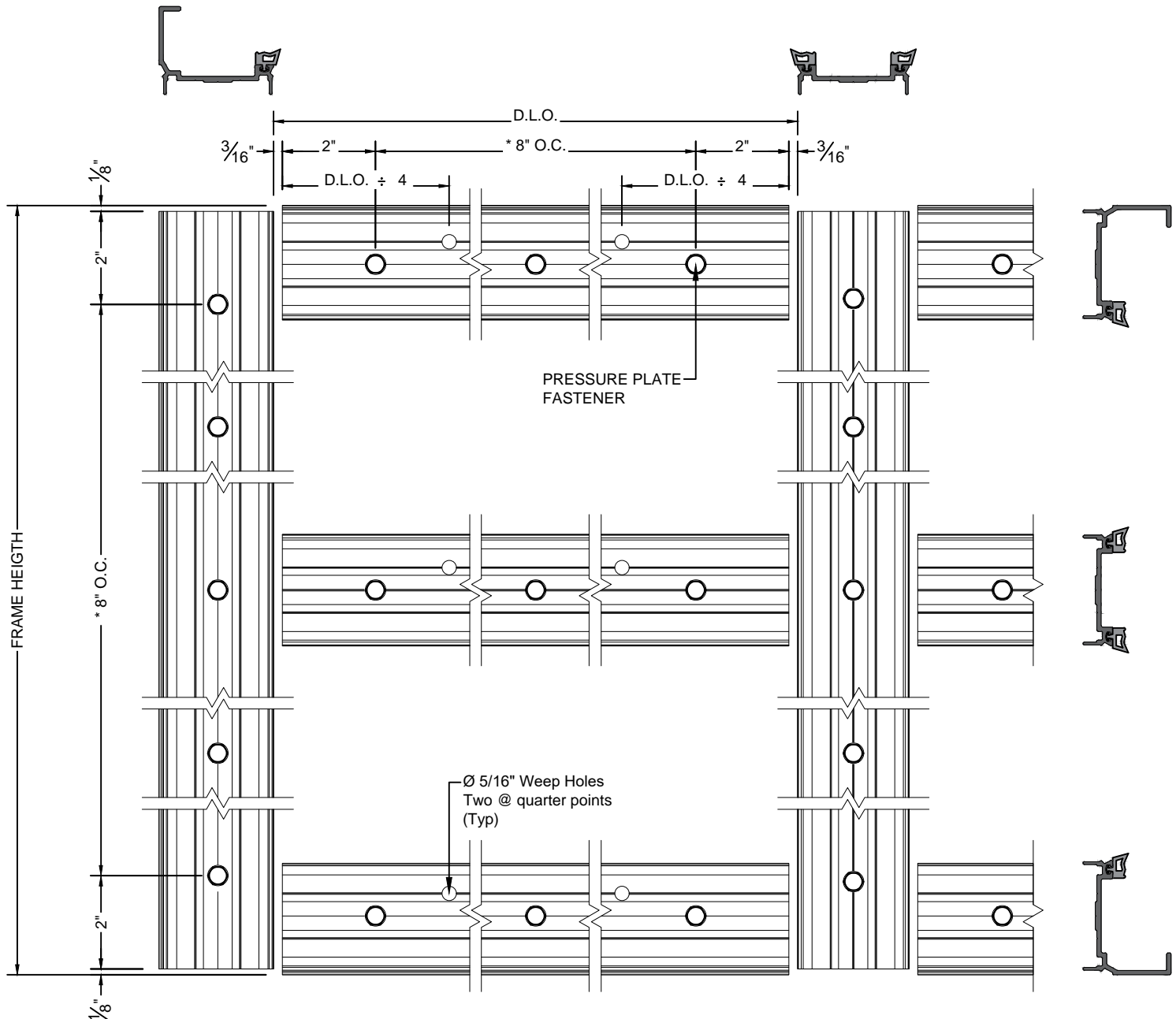


Fig. 55.1

GLAZING

Step 16: Install Pressure Plates & Face Covers (continued)

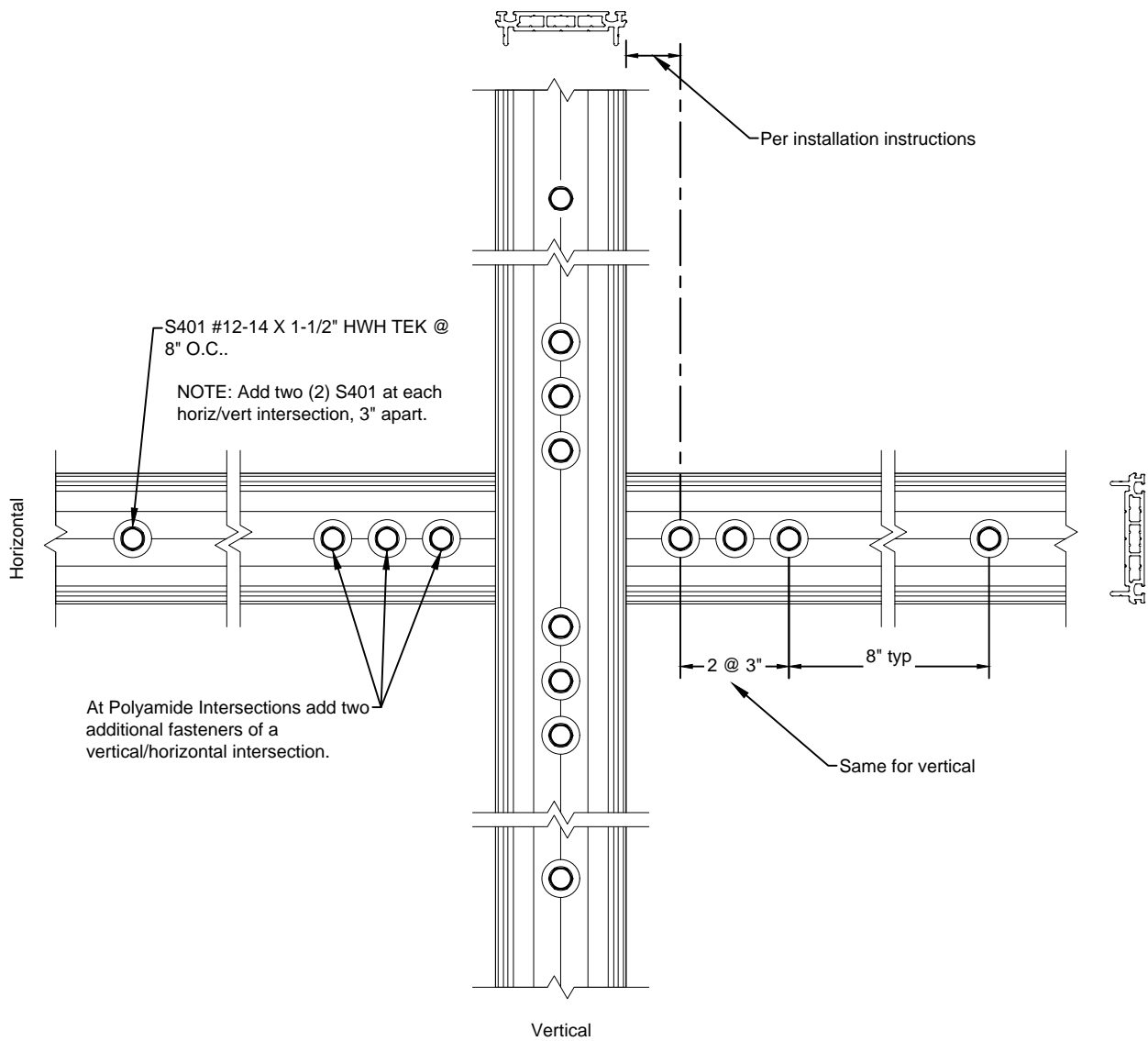


Fig. 56.1

GLAZING

Step 16: Install Pressure Plates & Face Covers (continued)

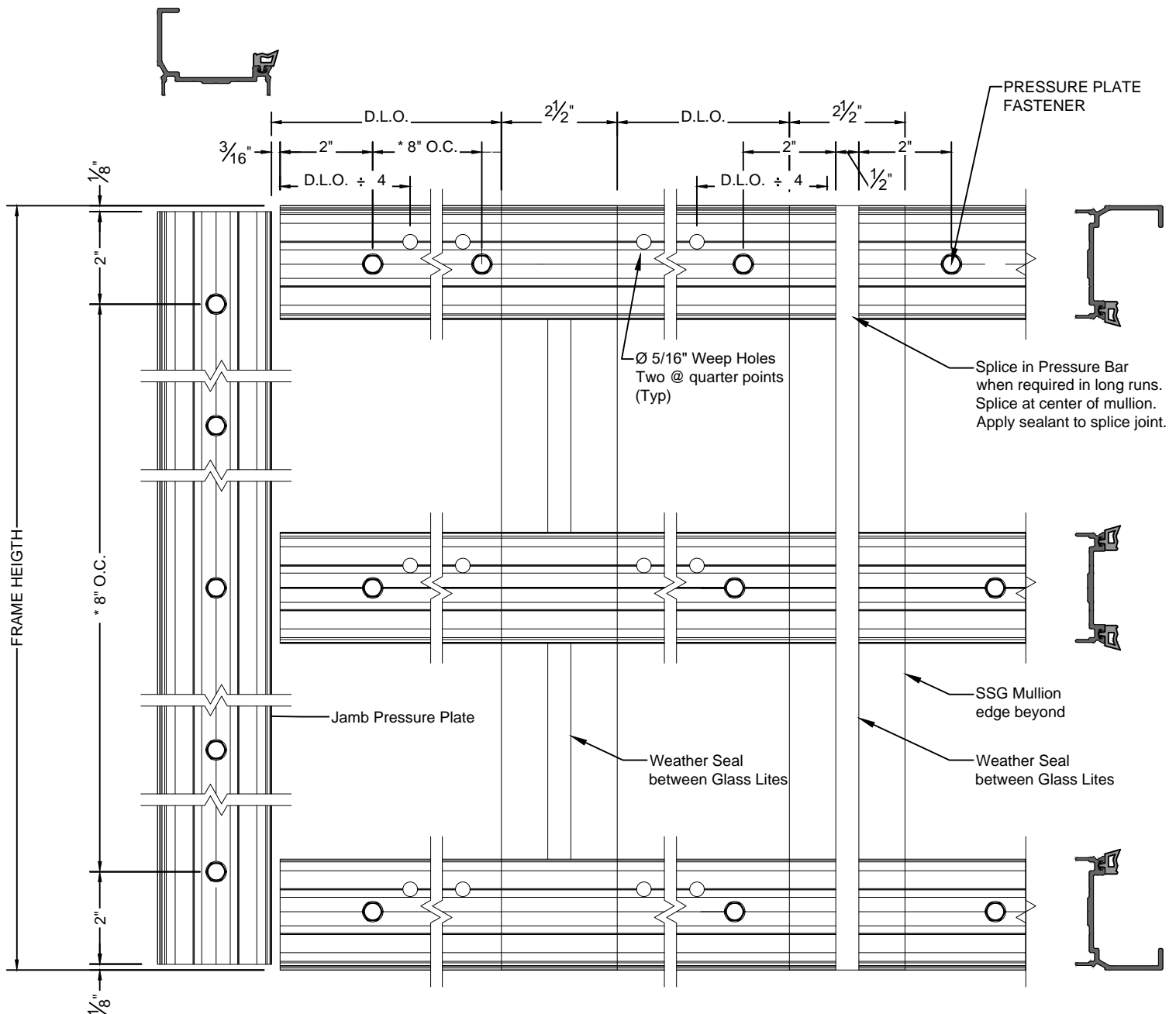
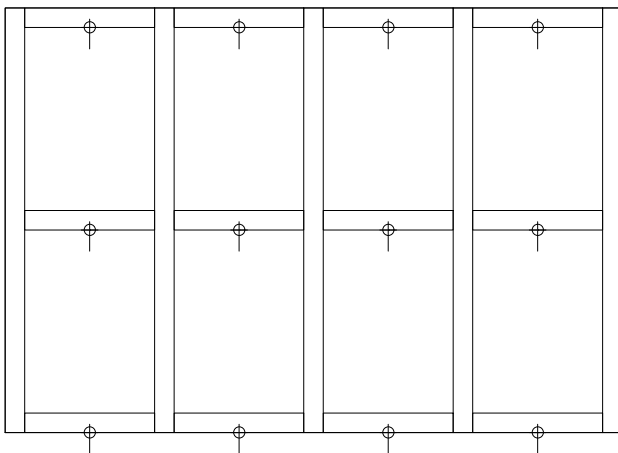


Fig. 57.1

GLAZING

- H. Install the vertical face covers first by using a wood block to protect the finish.
- I. Seal the top termination point of all vertical face covers per Fig. 60.2 (below an expansion horizontal) and Fig. 58.4(top of frame).
- K. Pinning requirements for all pressure plates:
 - Cover depth less than 1": Pin to pressure plates as required
 - Cover depth 2" or more:
 - Less than 6 ft long: Pin to pressure plate at center on each side
 - Greater than 6 ft long: Pin to pressure plate on each end and 3 ft O.C.
 - Building Specific conditions may require spacing different than this. Consult Tubelite Engineering for recommendations.
- L. Seal the horizontal pressure plates to the vertical face covers, tooling the sealant into the joint. See Fig. 59.1 and 59.2.
- M. Install the horizontal face covers leaving equal gaps on each end. Make sure the weep holes are pointing down. See Fig. 59.1.



TYPICAL WEEP HOLE
(Located at bottom of
horizontal Face Caps)

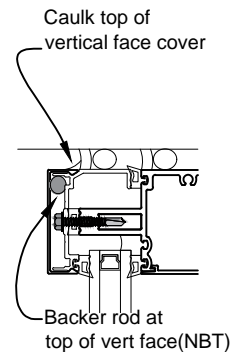
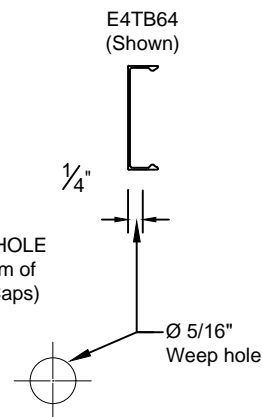


Fig. 58.2

Fig. 58.1

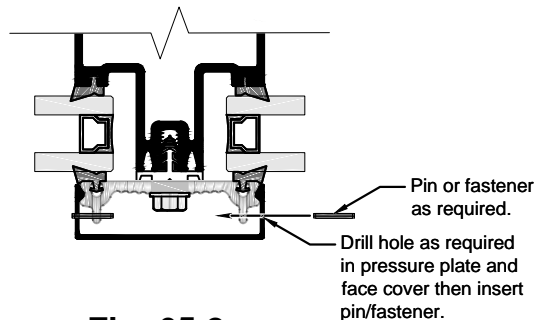


Fig. 65.2

GLAZING

Step 16: Install Pressure Plates & Face Covers (continued)

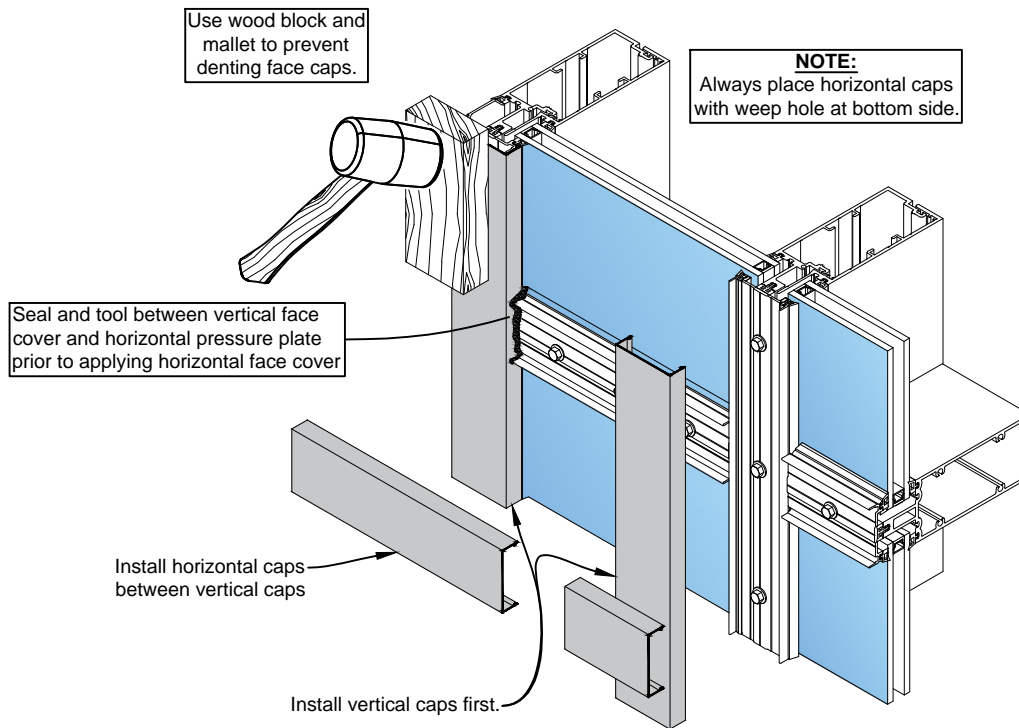


Fig. 59.1

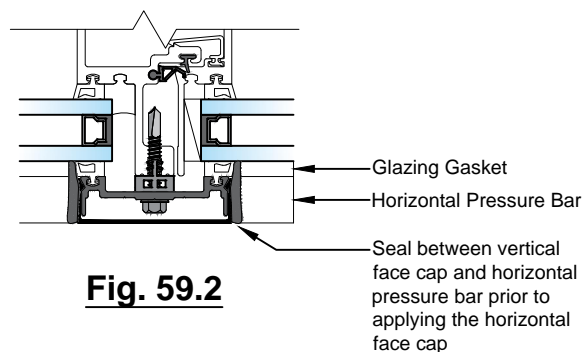


Fig. 59.2

GLAZING

Step 16: Install Pressure Plates & Face Covers (continued)

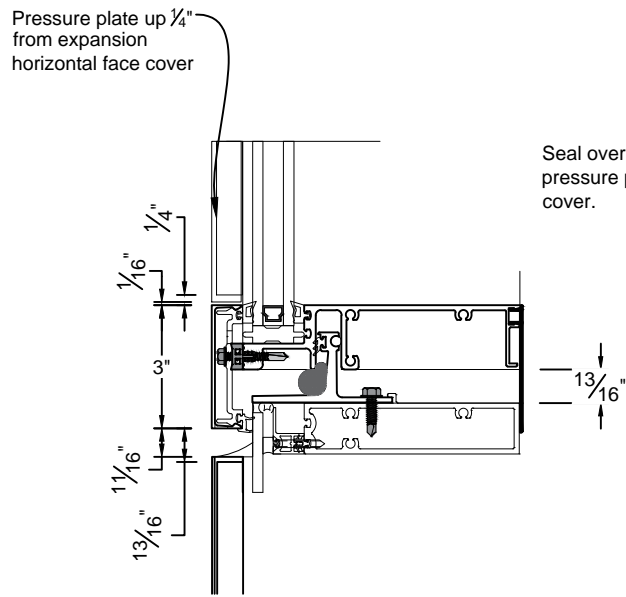


Fig. 60.1

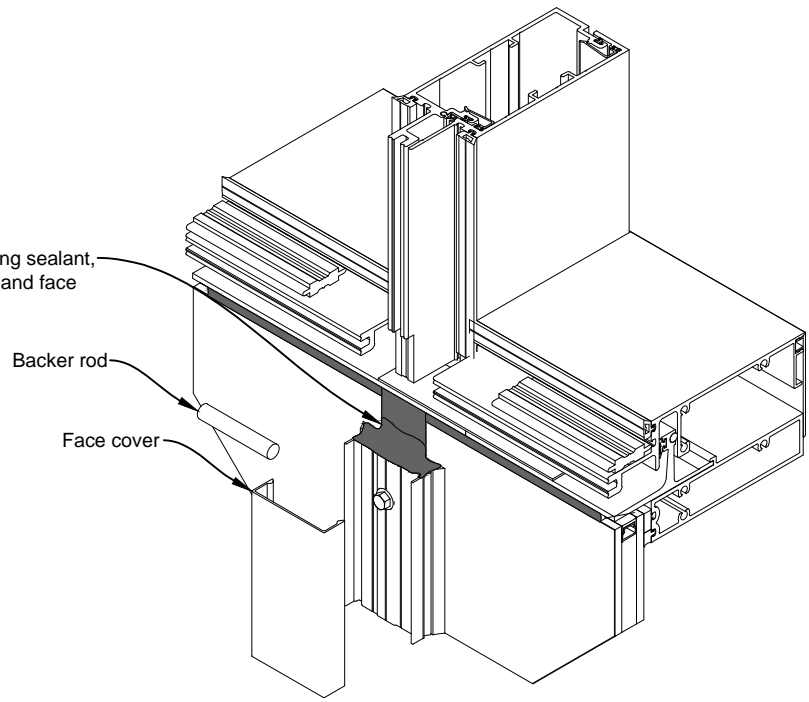


Fig. 60.2

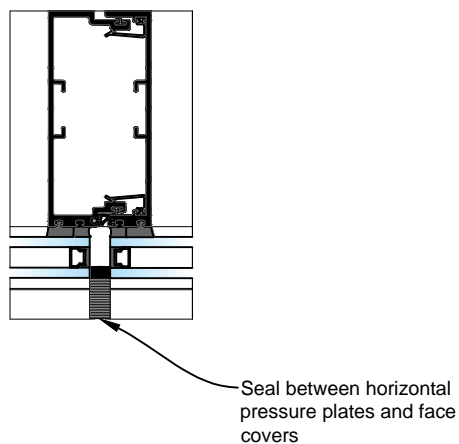


Fig. 60.3

ENTRANCE FRAMING

ENTRANCE FRAMING

- A. All door framing is shipped fabricated from the factory. Curtain wall frames can be installed in the field prior to installing the doors.
- B. Curtain wall verticals and door sub frames run to floor. Bed verticals in sealant and anchor to building per approved shop drawings. See Fig. 61.1 for possible anchoring method.
- C. Always refer to approved shop drawings for specific requirements.

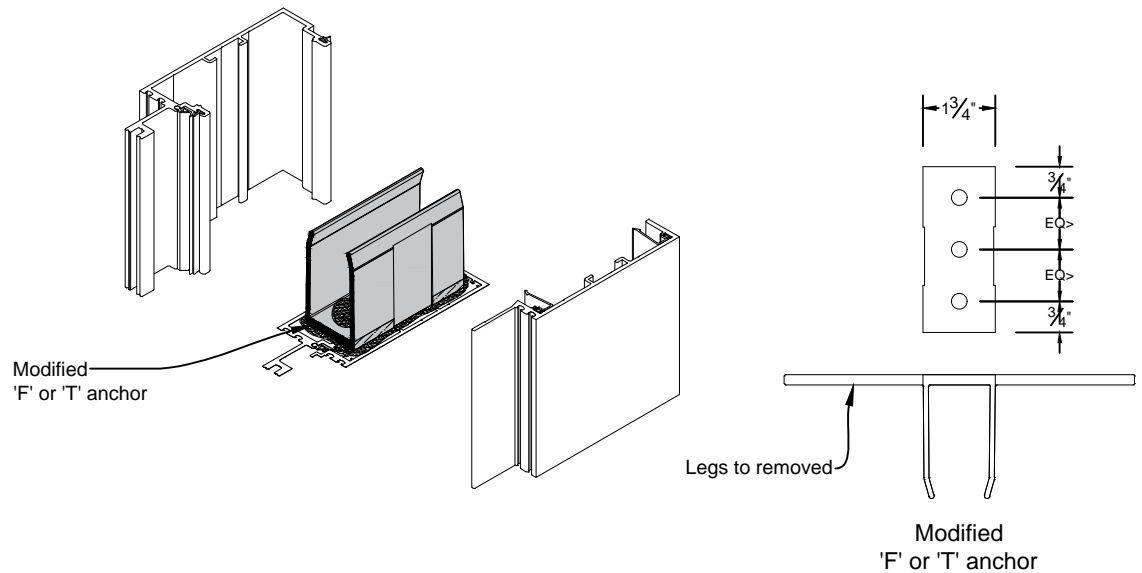


Fig. 61.1

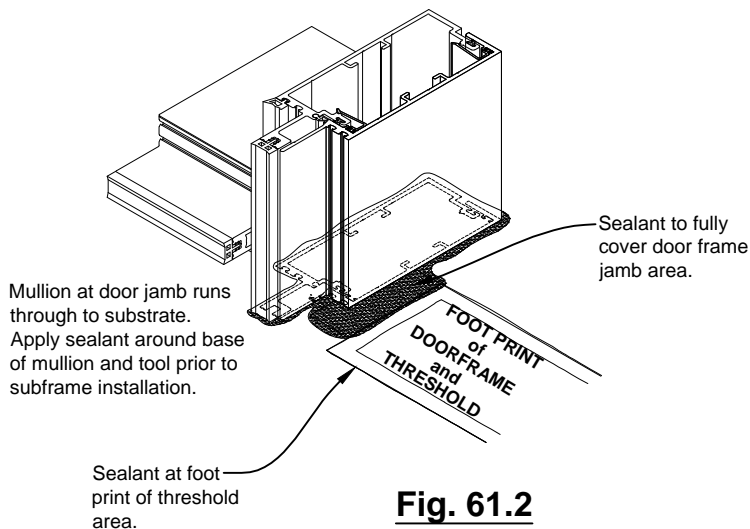


Fig. 61.2

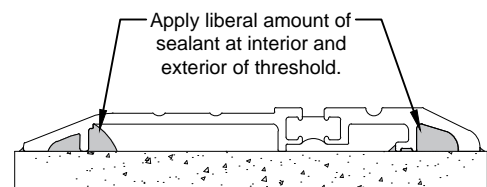


Fig. 61.3

ENTRANCE FRAMING

ENTRANCE FRAMING (Continued)

A. C. SUBFRAME INSTALLATION

- Prep the curtain wall frame with pocket closures or as detailed on approved shop drawings.
- Prior to installing the sub frame, lay down a bed of sealant where the threshold will be installed. See Fig. 70.2 and Fig. 70.3.
- Install sub frame onto curtain wall mullion, shimming equally from side to side. Attach sub frame per approved shop drawings. Cap seal all fasteners and seal joint between sub frame and curtain wall.
- Seal the top of the jamb sub frame as shown in Fig. 71.3.
- Attach threshold to building per approved shop drawings.
- Install door per Tubelite's Entrances and Frames Installation Manual.

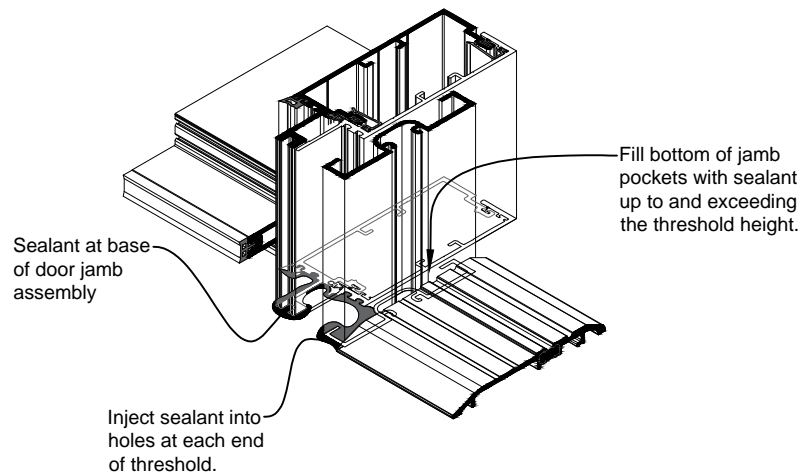


Fig. 62.1

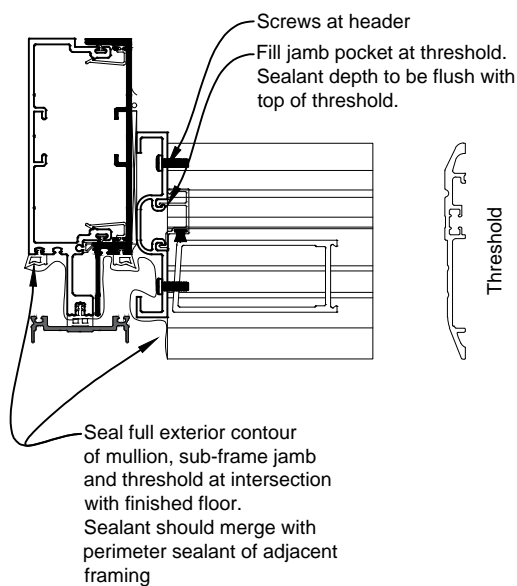


Fig. 62.2

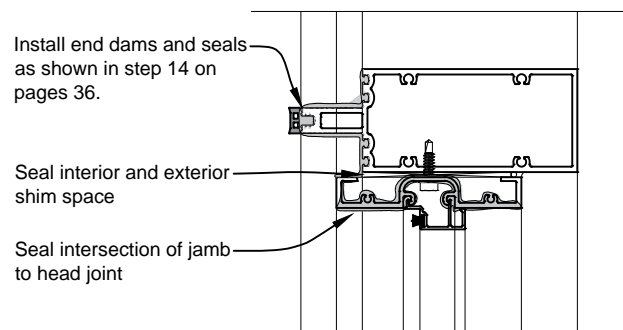


Fig. 62.3

REGLAZING

1. Reglazing is done from the exterior.
2. Carefully remove face covers surrounding the lite to be removed.
3. Remove vertical and horizontal pressure plates adjacent to affected lite.
4. Temp surrounding glass in place with P4634 temporary retainers per Step 16, page 59. Remove lite of glass and gaskets from opening. Clean debris and sealant from the glass pocket and glazing reglets.
5. Install new glass in opening per Step 16-17, pages 59 through 69.

CORNER CONDITIONS

CAPTURED OUTSIDE CORNER

- Captured outside corners require a special cut on the horizontal members. See Fig. 66.2 for illustration.
- Follow the procedures set forth in Step 6 & 8 to assemble the horizontals to the corner vertical halves and
- install lifting lugs. Water dams can be pre-installed and sealed on the captured outside 90 degree corner. Refer to Step 11 Page 42 for instructions.
- Install gaskets per Step 9, Page 43. Refer to Steps 10-14 to complete the installation of the corner.

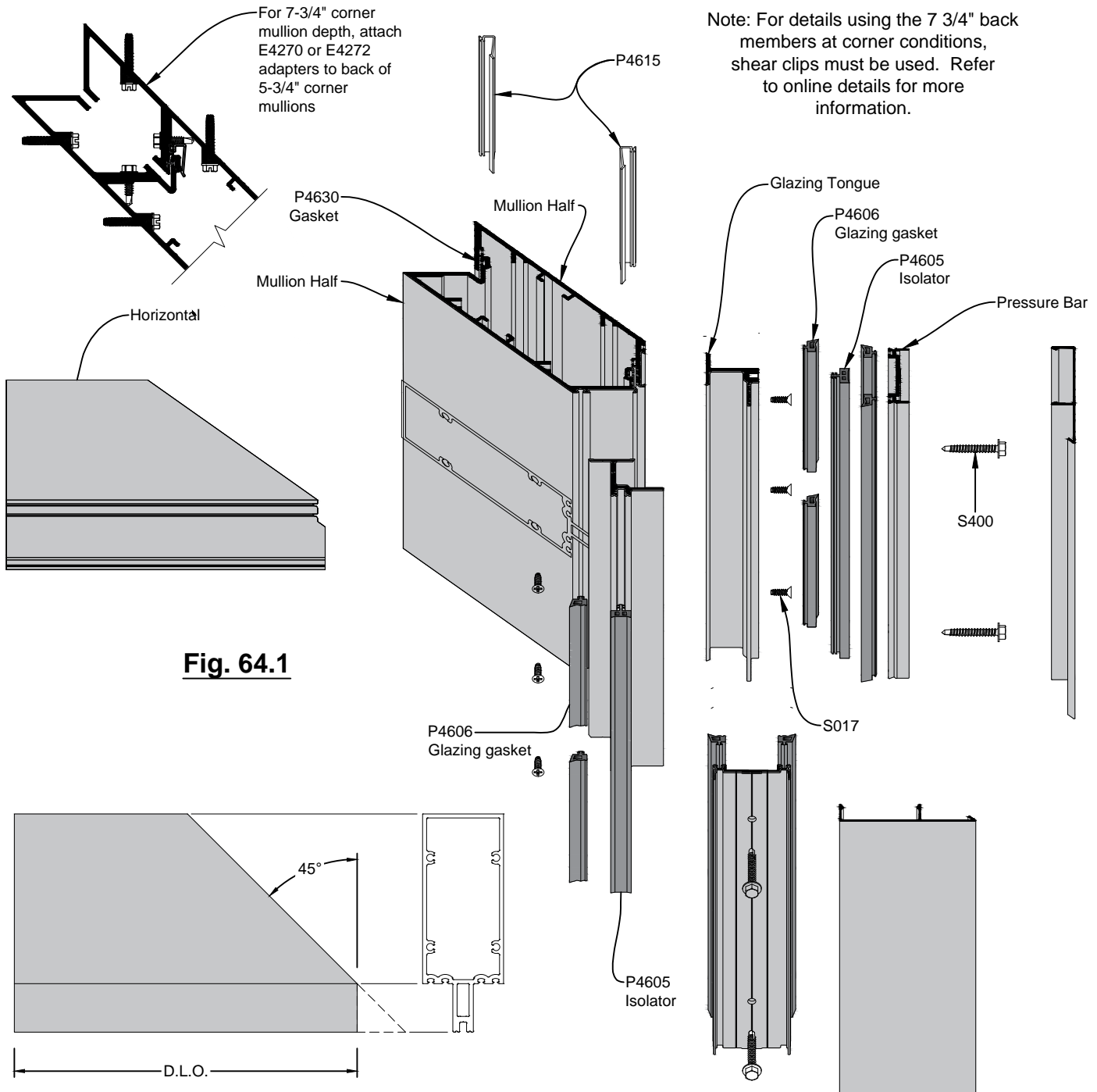


Fig. 64.1

Fig. 64.2

CORNER CONDITIONS

SSG OUTSIDE CORNER

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

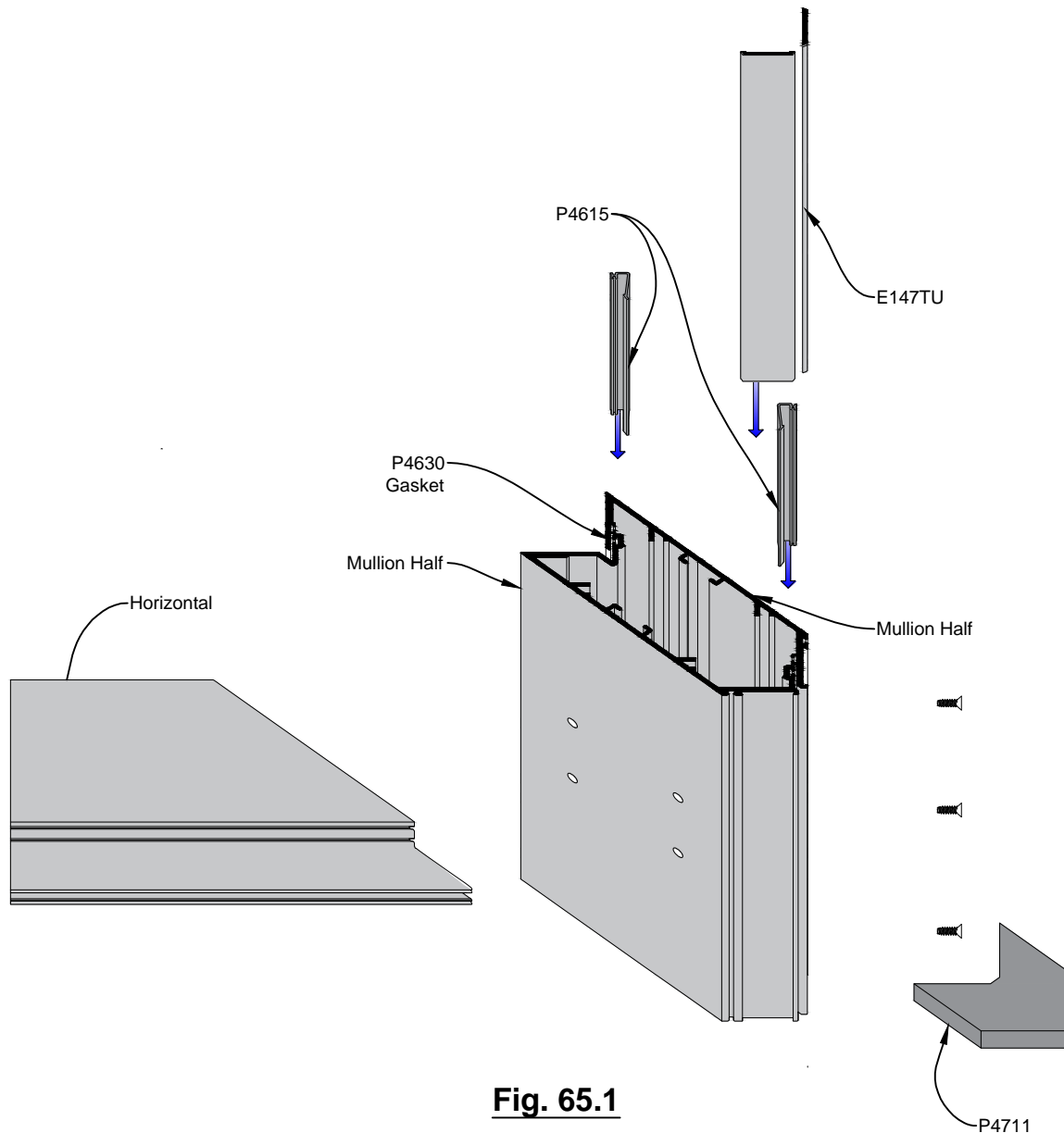


Fig. 65.1

CORNER CONDITIONS

SSG INSIDE CORNER

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

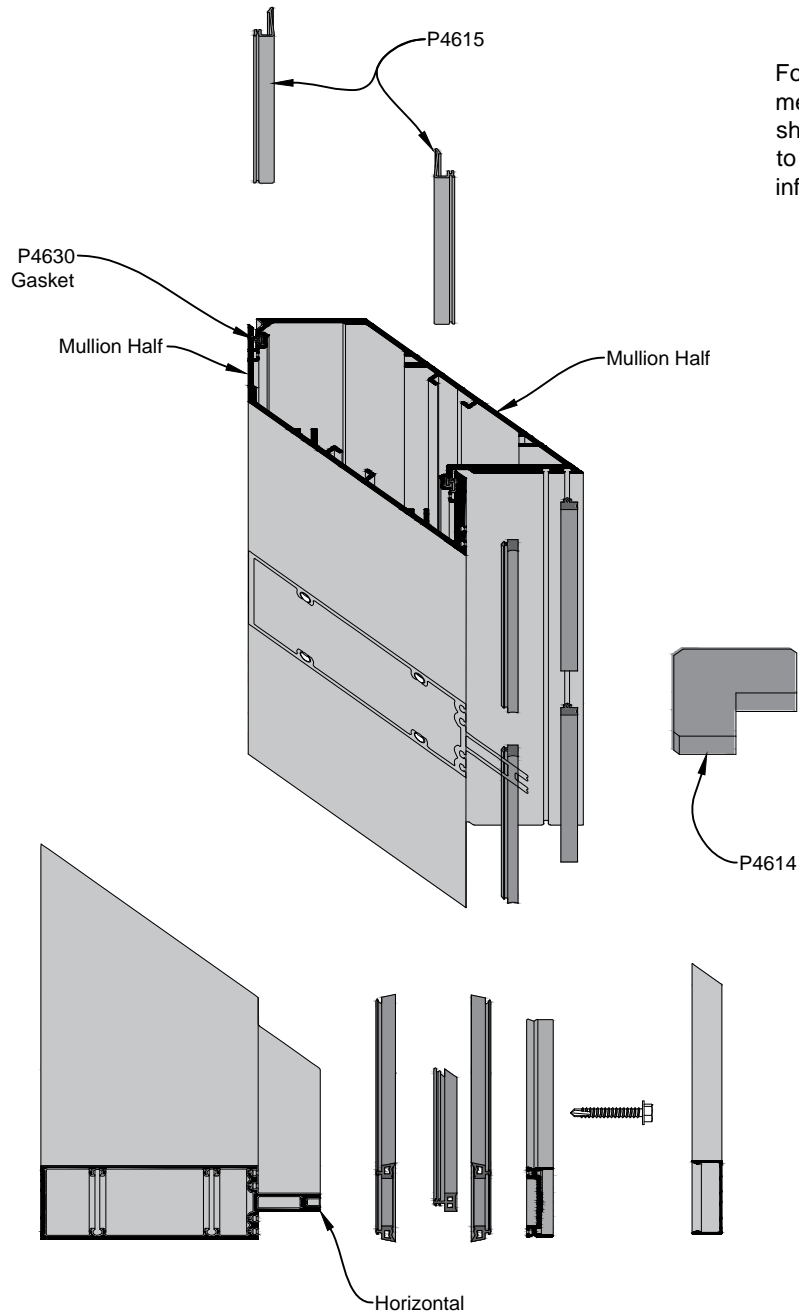


Fig. 66.1