

WINDOWS • CURTAIN WALLS • ENTRANCES • STOREFRONTS

SERIES 403x

Installation Instructions



February 13, 2020

1000 COUNTY ROAD • MONETT, MO 65708 • 800.221.4169 • EFCOCORP.COM



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For additional information see the following Supplements:

- Dorma RTS88 Concealed Overhead ClosersY013
- Door, Door Glass and Hardware.....Y015

Minimizing Condensation

Note: Please reference EFCO's "Understanding Condensation" brochure which can be obtained through your EFCO representative.

Condensation will form on any surface when unfavorable conditions (regarding interior temperature, relative humidity and exterior temperature) are present. When the formation of excessive condensation is a concern, it is highly recommended that a design professional is utilized to perform an analysis of the shop drawings to recommend the best possible installation methods. Please contact your EFCO representative for information on EFCO's Thermal Analysis Services.

Many current installation practices lead to an increase in the possibility of the formation of condensation. Though not all inclusive, the list of examples below illustrates conditions under which condensation is likely to occur:

1. Bridging the system thermal break with non-thermally broken metal flashing or lintels that are exposed to the exterior
2. System exposure to cold air cavities
3. Interior relative humidity levels not maintained at recommended levels, see EFCO's "Understanding Condensation" brochure
4. Inadequate separation between system and surrounding condition at perimeter
5. Product combinations during the shop drawing stage that result in bridging thermal breaks of one or all products involved

Section 1. General Notes

HANDLING / STORING / PROTECTING ALUMINUM

The following guidelines are recommended to ensure early acceptance of your products and workmanship.

- A. **HANDLE CAREFULLY** - Store with adequate separation between components so the material will not rub together. Store the material off the ground. Protect materials against weather elements and other construction trades.
- B. **KEEP MATERIAL AWAY FROM WATER, MUD, AND SPRAY** - Prevent cement, plaster, and other materials from contacting with and damaging the finish. Do not allow moisture to be trapped between the finished surface and the wrapping material.
- C. **PROTECT MATERIALS AFTER ERECTION** - Wrap or erect screens of plastic sheeting over material. Cement, plaster, terrazzo, and other alkaline materials are very harmful to the finish and are to be immediately removed with soap and water. Under no circumstances should these materials be allowed to dry or permanent staining may occur.

GENERAL GUIDELINES

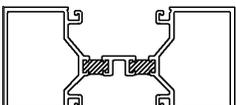
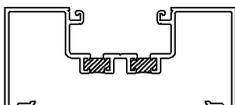
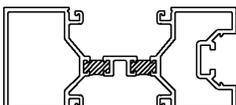
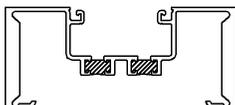
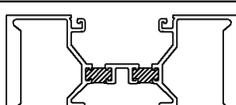
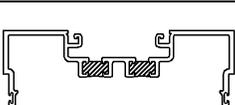
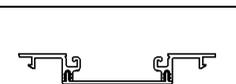
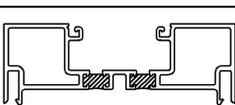
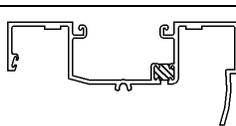
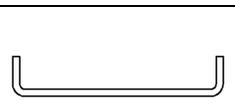
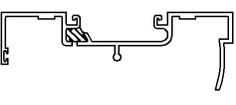
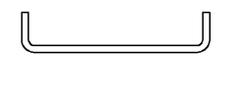
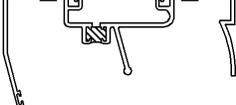
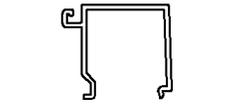
The following practices are recommended for all installations

- A. **REVIEW CONTRACT DOCUMENTS** – Become thoroughly familiar with the project. Check shop drawings, installation instructions, architectural drawings and shipping lists. The shop drawings take precedence and include specific details for the project. Shop drawings govern when conflicting information exists in the assembly and installation instructions. Note any *field verified* notes on the shop drawings prior to installing. EFCO assembly and installation instructions are general in nature and cover only some of the conditions.
- B. **INSTALL ALL FRAMING MATERIAL PLUMB, LEVEL, AND TRUE** – Proper alignment and relationships to benchmarks and column centerlines, as established by the architectural drawings and the general contractor, must be maintained.
- D. **PERIMETER CONDITIONS** - Verify that all job site conditions and accompanying substrates receiving the installation are in accordance with the contract documents. If deviations occur, notification must be given *in writing* to the general contractor and differences resolved before proceeding further with the installation in the area in question.
- E. **ISOLATION OF ALUMINUM** - Prevent all aluminum from coming in direct contact with masonry or dissimilar materials by means of an appropriate primer. Typical slab anchors may be set directly onto concrete surfaces in a block-out pocket at the edge of the slab. The block-out pocket is later filled in with grout thereby covering the slab anchor. In such cases, a heavy coat of zinc chromate or bituminous paint must be pre-applied to the slab anchor.
- F. **SHIPMENT VERIFICATION** - Verify contents of all material shipments received upon their arrival. Verify quantity and correct finishes. ***Notify EFCO immediately of any discrepancies or damage that may have occurred.***
- G. **SEALANT** - All sealant must meet **[ASTM C 920, CLASS 50]**. For the purposes of these instructions, sealant is to be defined as the following: SEALANT - A weather resistant, gunnable liquid filler which when cured provides a resilient, flexible (\pm 50% movement capability min.) air and water seal between similar and dissimilar materials.

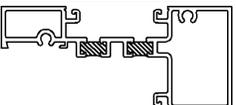
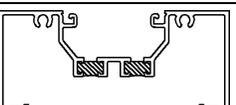
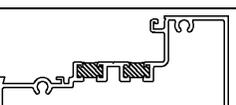
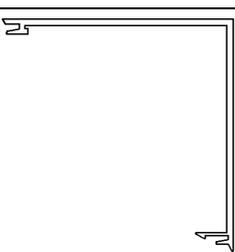
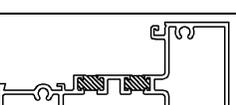
All sealant must be compatible with all surfaces on which adhesion is required, including other sealant surfaces. All frame surfaces should be clean, dry, dust, and frost free. If a primer is required, it must be applied to clean surfaces. All perimeter substrates shall be clean and properly treated to receive sealant. All sealants and primers must be applied according to the sealant manufacturers instructions and recommendations. It is the responsibility of the glazing contractor to submit a statement from the sealant manufacturer indicating that glass and glazing materials have been tested for compatibility and adhesion with glazing sealants, and interpreting test results relative to material performance, including recommendations for primers and substrate preparation required to obtain adhesion. The chemical compatibility of all glazing materials and framing sealants with each other and with like materials used in glass fabrication must be established.

Section 2. Parts Identification

Vertical Parts

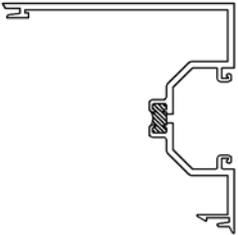
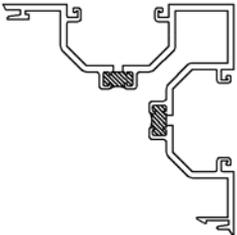
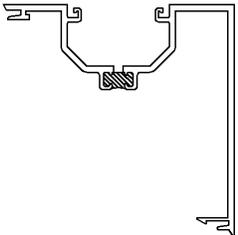
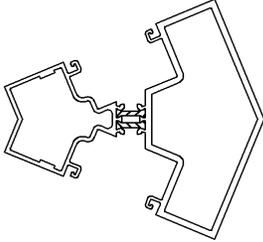
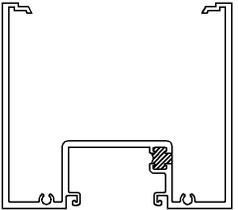
Profile	Part #	Description	Profile	Part #	Description
	21S3	Standard Duty Mullion		21T3	Standard Open Back Mullion/ Jamb
	21T2	Sunshade Mullion		21T0	Heavy Duty Open Back Mullion
	21T4	Heavy Duty Mullion		21S7	Male Expansion Mullion
	5G44	Open Back Shallow Cover		21S8	Female Expansion Mullion
	9316	0° to 15° Variable Female Mullion Half		L100	Steel Reinforcing for Tubular Mullion
	9317	0° to 15° Variable Male Mullion Half		L101	Steel Reinforcing for Expansion Mullion
	9318	15° to 30° Variable Male Mullion Half		9229	Removable Stop for 1" Glazing

Horizontal Parts

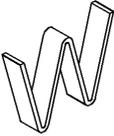
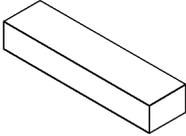
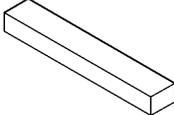
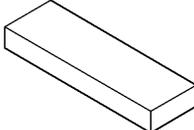
Profile	Part #	Description	Profile	Part #	Description
	21S1	Tubular Bead-Down Horizontal		E178	Frame Receptor Closure Use w/ 1510 Weathering WA04
	21S2	Sill / Head		1510	Frame Receptor Use w/ E178 Closure and Weathering WA04
	21S5	Head / Sill		9297	90° Corner Mullion Half Fits w/ 9299, 9300, & 9305 Also Is Self-Mating For Use As A Cover
	21T9	Tubular Bead-Up Horizontal			

Section 2. Parts Identification

Horizontal Parts (cont.)

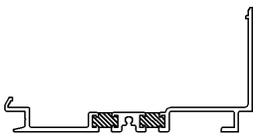
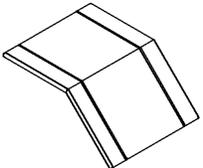
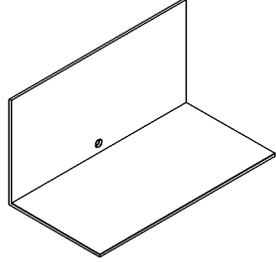
Profile	Part #	Description	Profile	Part #	Description
	9299	90° Corner Mullion Half Fits w/ 9297, 9300, & 9305 Also Is Self-Mating		9305	90° Corner Mullion Half Fits w/ 9299, 9305, & 9300 Also Is Self-Mating
	9300	90° Corner Mullion Half Fits w/ 9297, 9299, & 9300 Also Is Self-Mating		2G56/ 2G57	2G56 Outside 2G57 inside 135° Fixed Mullion
	9327	4" x 4 1/2" Head or Horizontal			

Setting and Anti-Walk Blocks

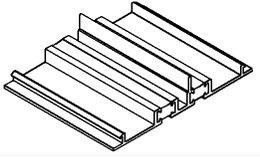
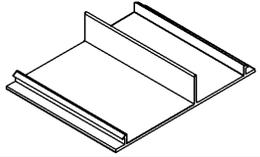
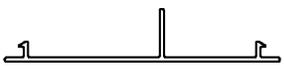
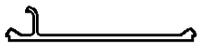
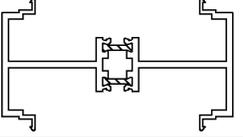
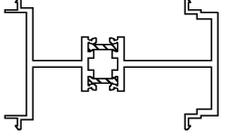
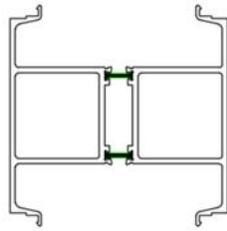
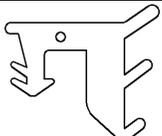
Profile	Part #	Description	Profile	Part #	Description
	HN52	1/2" Anti-Walk Block		HN63	Setting Block Pkg. @ Bead-Up Intermediate Horizontal
	HEP1	Setting Block Pkg. @ Bead-Down Intermediate Horizontal		H157	Setting Block Pkg. @21S2 Sill

Section 2. Parts Identification

Sill and End-Dam Parts

Profile	Part #	Description	Profile	Part #	Description
	21T1	High Performance Sill Flashing		WM01	Bond Breaker Tape 4" X .062" Used @ Sill Splices
	HDW1	Water Deflector @ Intermediate Horizontal		KO46	Sill Flashing End-Dam Package Use w/ 21T1 Sill Flashing
	HCW6	Weep Baffle used @ Sill			

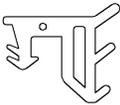
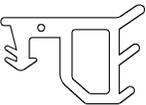
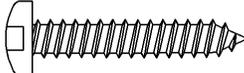
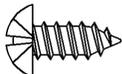
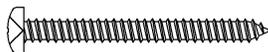
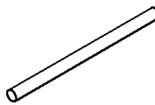
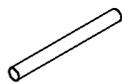
Misc. Parts

Profile	Part #	Description	Profile	Part #	Description
	F728	3" Perimeter Adaptor Clip		F729	3" Lightweight Vinyl Perimeter Adaptor Clip
	21S4	Stock Length Perimeter Adaptor Clip		LC57	Stock Length Lightweight Vinyl Perimeter Adaptor Clip
	LC55	Vinyl Pocket Filler @ Glass Pockets @ Perimeter		9351	Snap-In Pocket Filler for 1" Glazing Pocket
	9938	Shadow line Window Adaptor Equal Leg Use W104 Weathering		8643	System II Window Adaptor Equal Leg
	1G69	Horizontal / Vertical Stack Adaptor 2" Sightline		1G68	Horizontal / Vertical Stack Adaptor 2" Sightline w/ Reveal
	1G15	Horizontal / Vertical Stack Adaptor 4" Sightline		21T8	Glazing Adaptor for 1/4" Glass in 1" Glazing Pocket
				W166	Glazing Gasket for Oversized Glass 1 1/16" Infill @ 1" Glazing Pocket

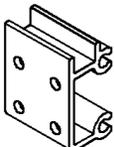
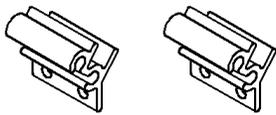
Series 403X Storefront Installation Instructions

Section 2. Parts Identification

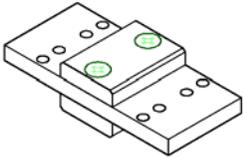
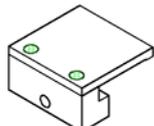
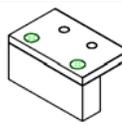
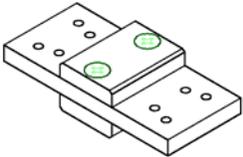
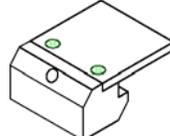
Misc. Parts (cont.)

Profile	Part #	Description	Profile	Part #	Description
	W199	Standard Glazing Gasket for 1" Infill @ 1" Glazing Pocket		W165	Glazing Gasket for Undersized Glass 3/4" Infill @ 1" Glazing Pocket
				WA04	Standard Weather Seal @ Sub-Frames
	W104	Weather Seal Gasket for Expansion Mullions		SPL3	Frame Spline Attachment Screw #12-11 x 1 1/4" SQ-PH-SMS 18-8 "A"
	STB9	Horizontal to Shear Block Screw #12-11 x 1/2" PL-RH-SMS 18-8 "A"		STB5	Shear Block Attachment Screw #12-11 x1-5/8" PL PH-SMS 18-8 "A"
	F727	3" Rod for Horizontal Dead Load Support @ Int. Verticals		F726	2" Rod for Horizontal Dead Load Support @ Perimeter Verticals

Shear Blocks

Profile	Part #	Description	Profile	Part #	Description
	KO48	Shear Block Pkg. for Tubular Horizontals		KO49	Shear Block Pkg. for Open Back Horizontals
	KO47	Shear Block Pkg. for 21S2			

Shear Blocks & Drill Fixtures

Profile	Part #	Description	Profile	Part #	Description
	DJ50	Screw Spline Drill Fixture for Vertical Fabrication		DJ49	Shear Block Drill Fixture for Horizontals
				DJ48	Dead Load Support Pin Drill Fixture
	DJ46	Shear Block Drill Fixture for Vertical Fabrication		DJ47	Shear Block Drill Fixture for Horizontal 21S2

Section 3A. Screw Spline Fabrication

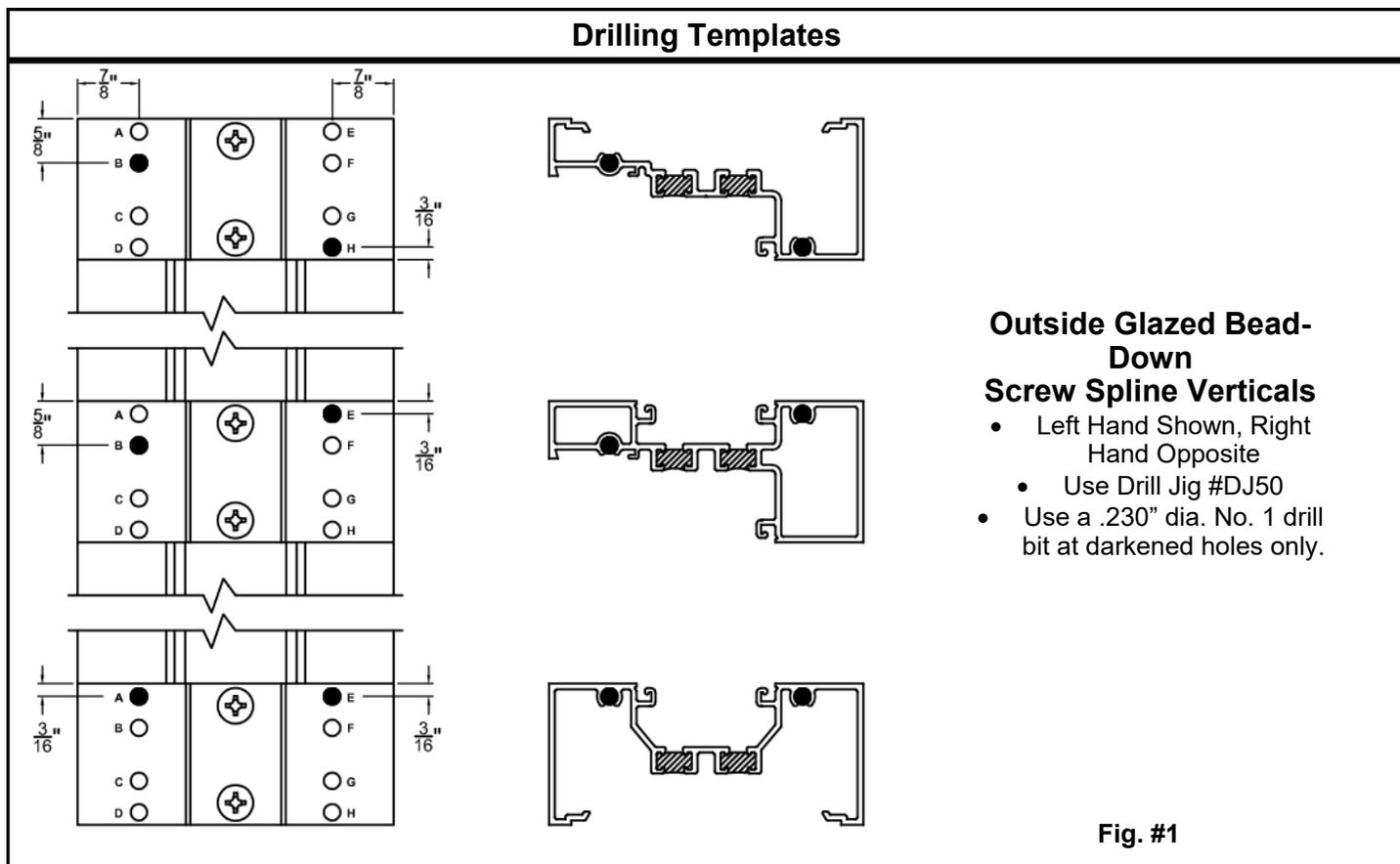
The screw spline system is a fabrication and erection method that permits the preassembly of single units in the shop or at the job site. These units are then erected by mating the male mullion of one unit to its counterpart female mullion of the adjoining unit.

Notes:

1. When an entrance is required, shear block joinery must be used to attach the side lite horizontals.
2. Due to the screw tensions required for correct installation, it will be necessary to 'wax' the frame assembly screws to prevent galling and breaking.

Fabrication Steps:

1. Measure the opening to determine the cut lengths of the frame components.
 - Allow a minimum 1/4" clearance at head and jambs and 3/4" clearance at the sill for shims and caulking.
 - Allow extra clearances, if necessary, to accommodate building tolerances and building movement.
2. Cut the vertical to frame size.
 - Verticals must run through.
 - If the opening has an entrance, see the appropriate frame and door fabrication installation sheets.
 - Door jambs run to the floor and are cut longer than other verticals.
3. Drill holes for assembly screws on vertical members per one of the following methods.
 - Drill jigs are available. (See Page #7)
 - Layout holes per figures #1,2, or 3 and drill.
 - Use punch press with appropriate die set.
4. Cut horizontal members to day lite openings. (Between vertical members) Also cut the horizontal glass stops to day lite opening minus 1/32". (DLO - 1/32")



Section 3A. Screw Spine Fabrication (cont.)

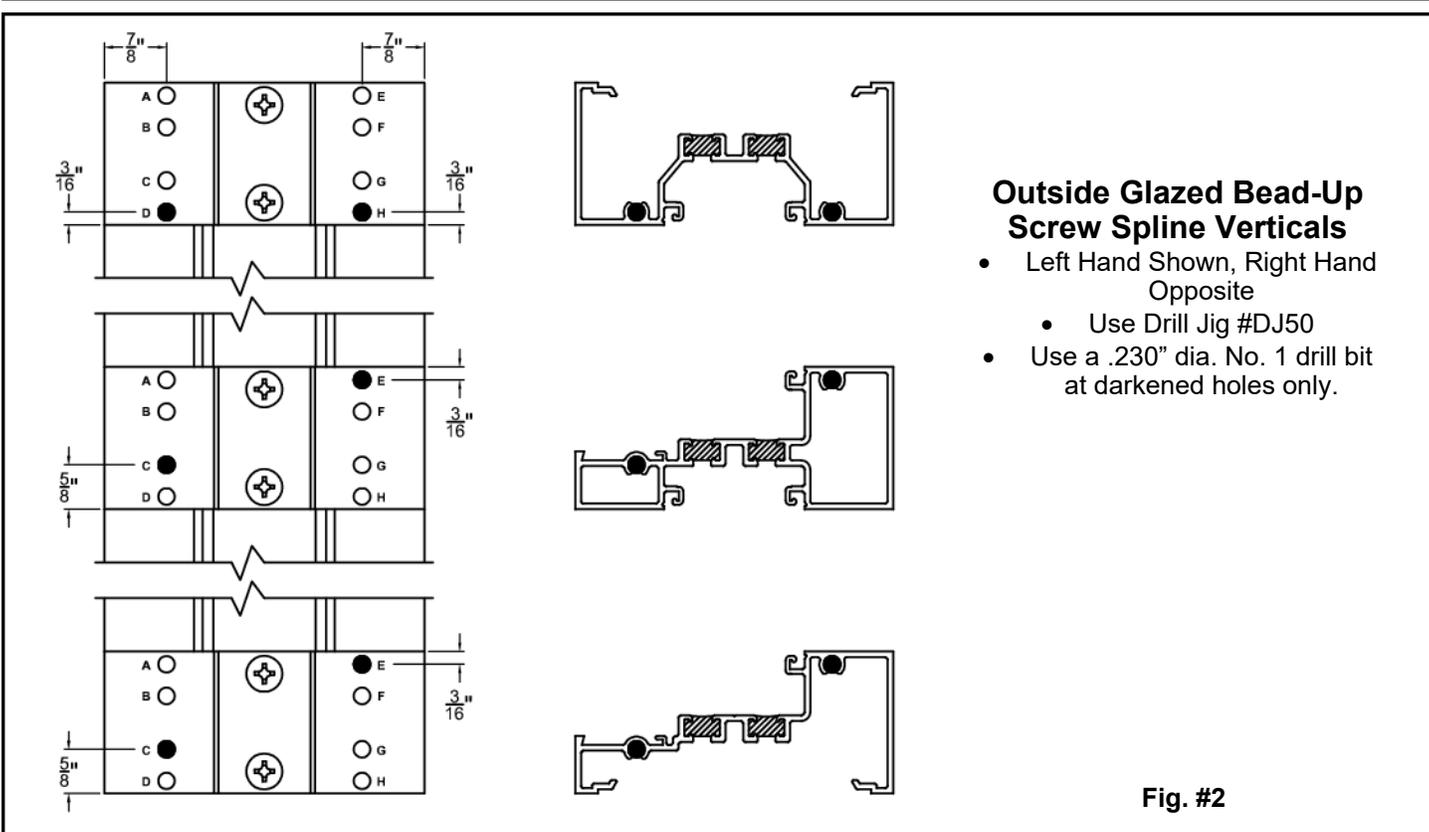


Fig. #2

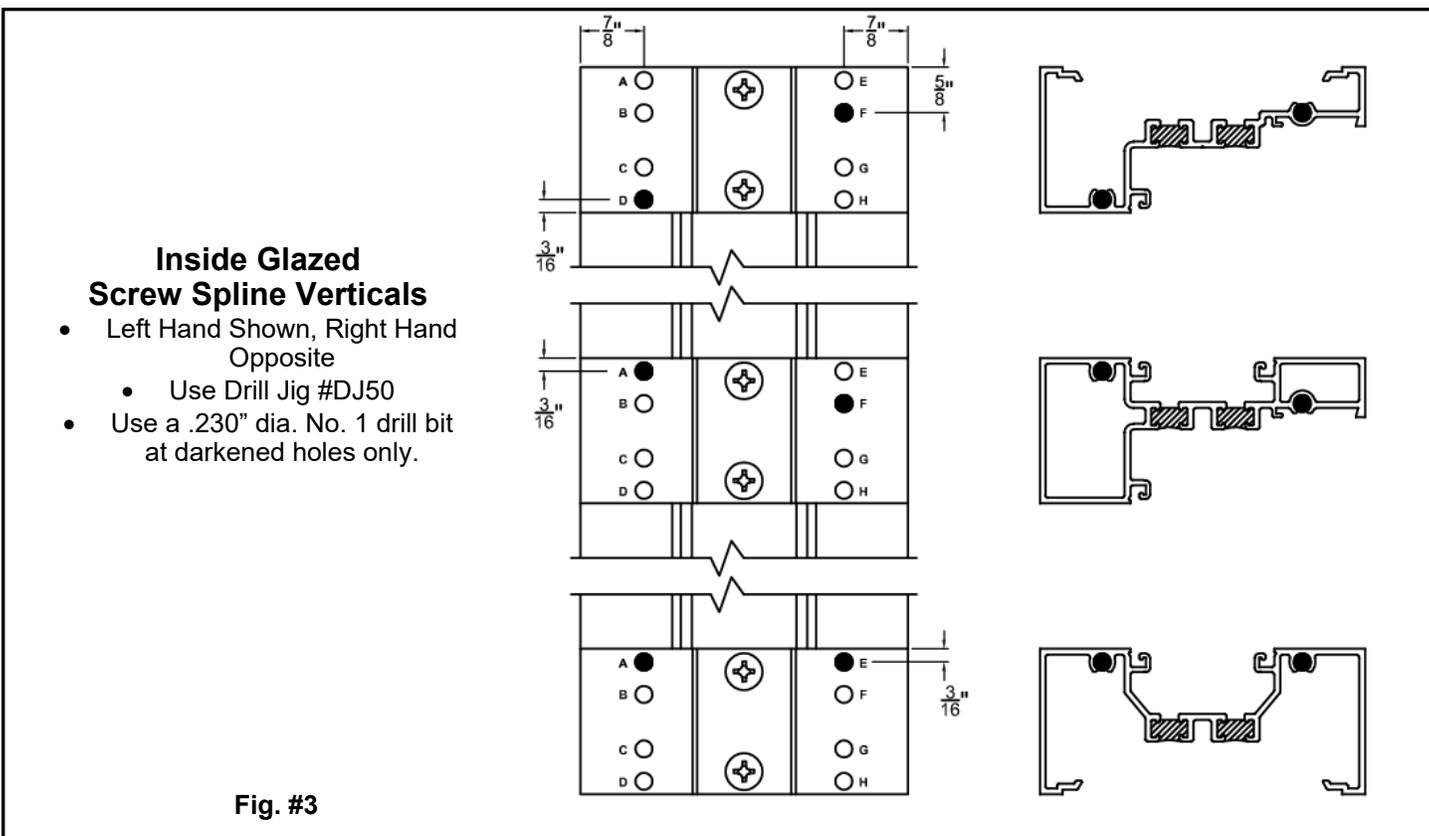


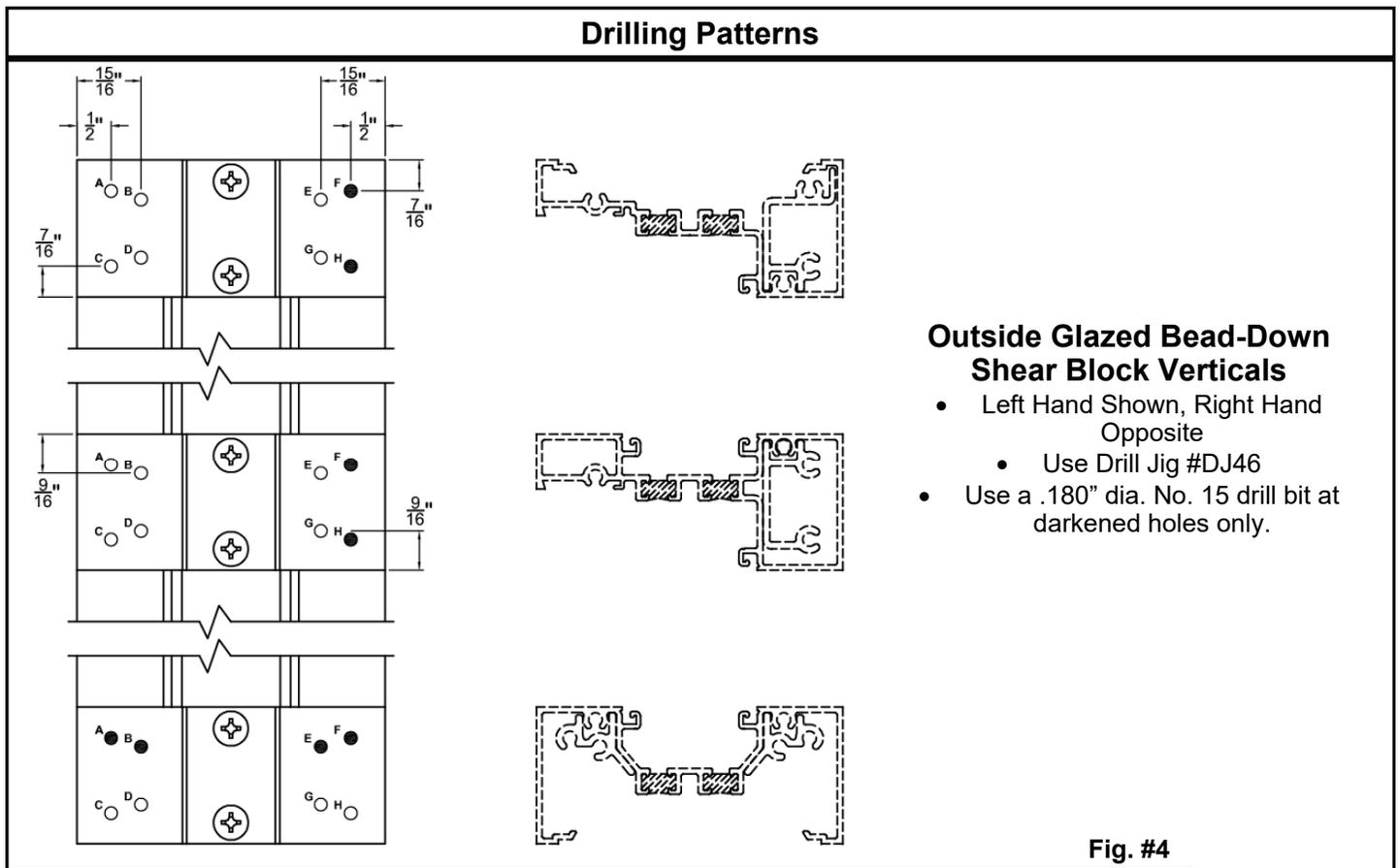
Fig. #3

Section 3B. Shear Block Fabrication

The shear block system is a fabrication and erection method that permits the preassembly of single units in the shop or at the job site. These units are joined with shear blocks and then installed as an assembled unit in the opening on top of any sill flashing that is used.

Fabrication Steps:

1. Measure the opening to determine the cut lengths of the frame components.
 - Allow a minimum 1/4" clearance at head and jambs and 3/4" clearance at the sill for shims and caulking.
 - Allow extra clearances, if necessary, to accommodate building tolerances and building movement.
2. Cut the vertical to frame size.
 - Verticals must run through.
 - If the opening has an entrance, see the appropriate frame and door fabrication installation sheets.
 - Door jambs run to the floor and are cut longer than other verticals.
3. Cut horizontal members to day lite openings. (Between vertical members)
4. Cut the horizontal glass stops to day lite opening minus 1/32". (DLO - 1/32")
5. Drill holes for shear block screws on vertical members and prepare attachment holes on horizontal members per one of the following methods.
 - Drill jigs are available. (See Page #7)
 - Layout holes per details #4,5,6 and drill.
 - Use punch press with appropriate die set.



Section 3B. Shear Block Fabrication (cont.)

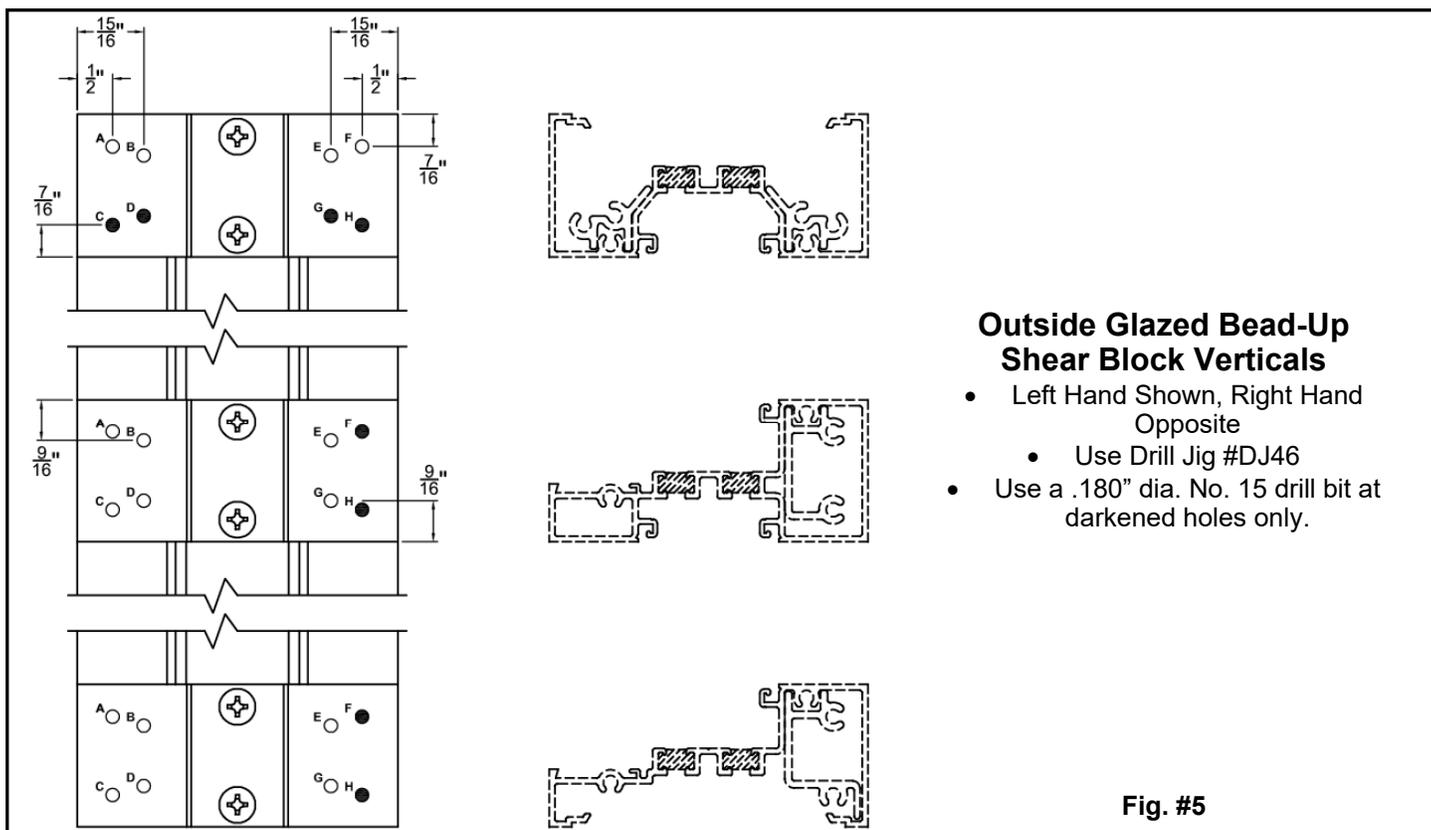


Fig. #5

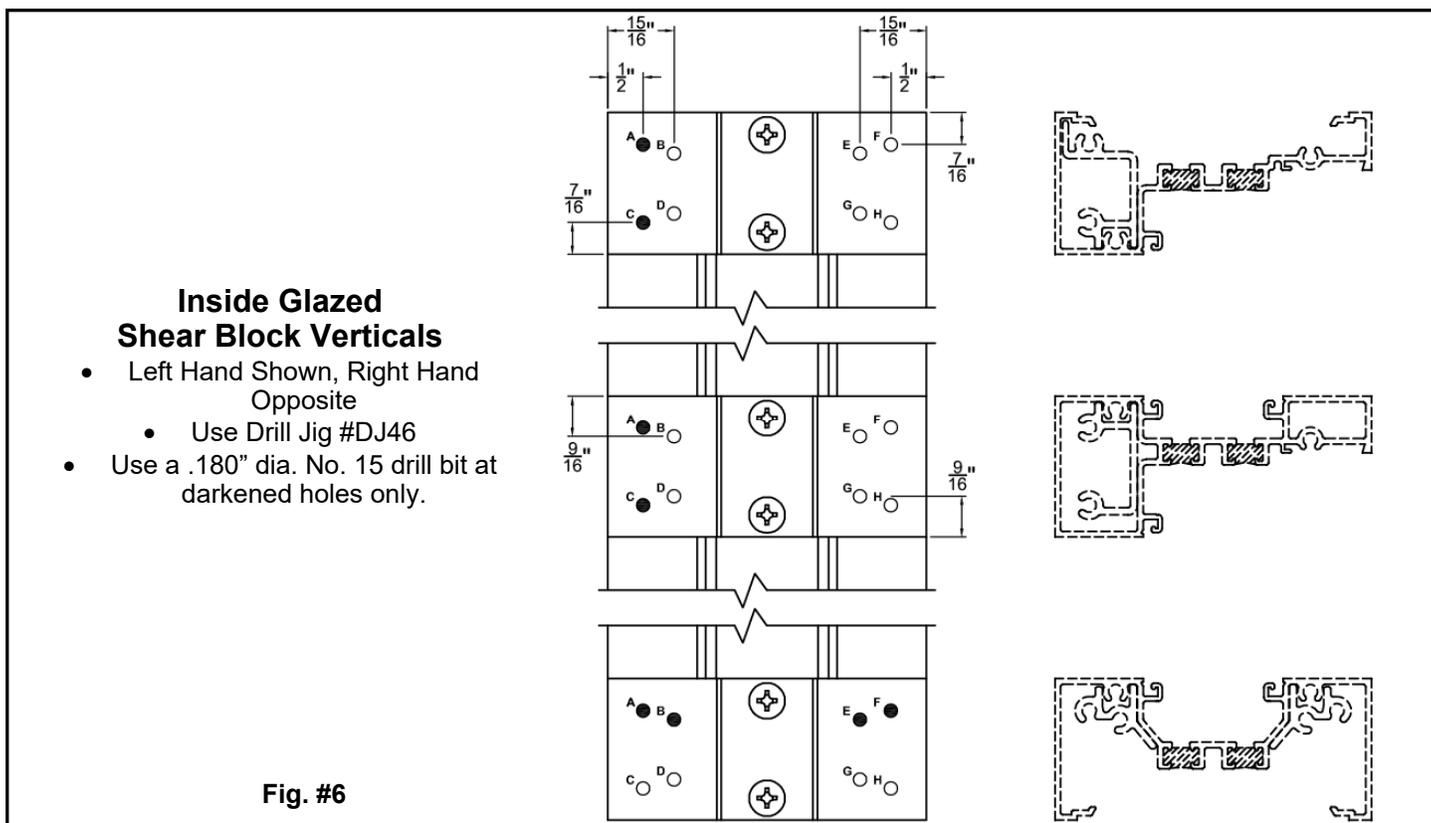


Fig. #6

Section 3B. Shear Block Fabrication (cont.)

Shear Block Horizontals

- 21S5 Shown, also for open back and tubular intermediate horizontals.
- Use Drill Fixture #DJ49 placed at each end of horizontal as shown.
- Use a .230" dia. No. 1 drill bit for each hole.

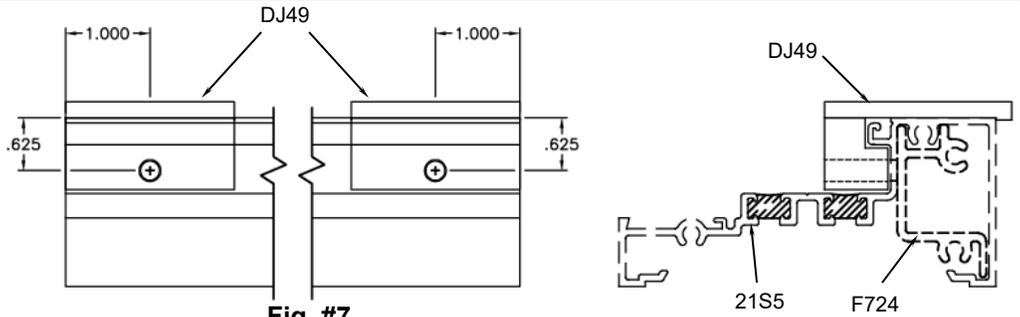
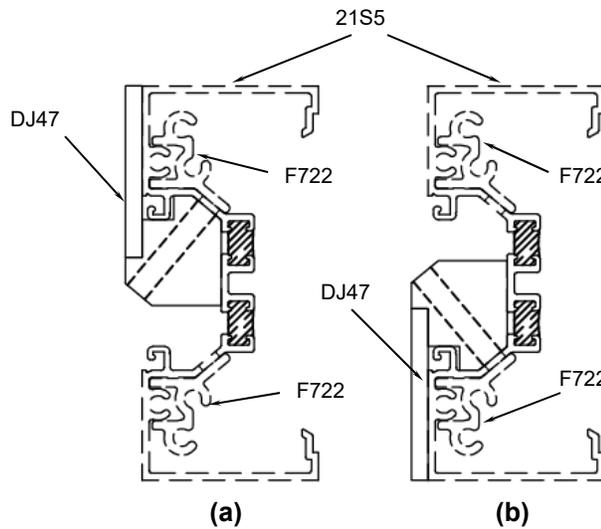
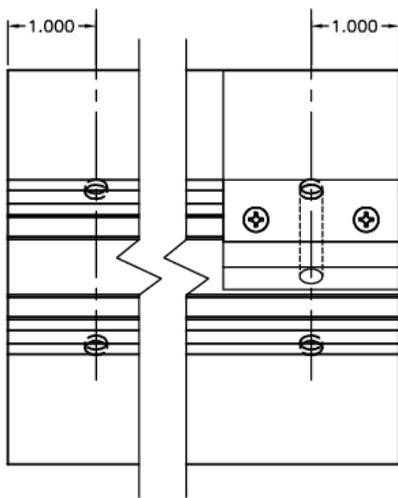


Fig. #7



21S2 Shear Block Horizontals

- Use Drill Fixture #DJ47 placed at each end of horizontal as shown.
- Drill one side as in Fig. 8a then flip drill fixture to opposite side as in Fig. 8b.
- Use a .230" dia. No. 1 drill bit for each hole.

Fig. #8

Vertical Dead Load Shear Pins

- Use Drill Fixture #DJ48 placed on vertical as shown below.
 - Left Hands Shown, Right Hands Opposite
- Use a .189" dia. No. 12 drill bit at darkened hole only.

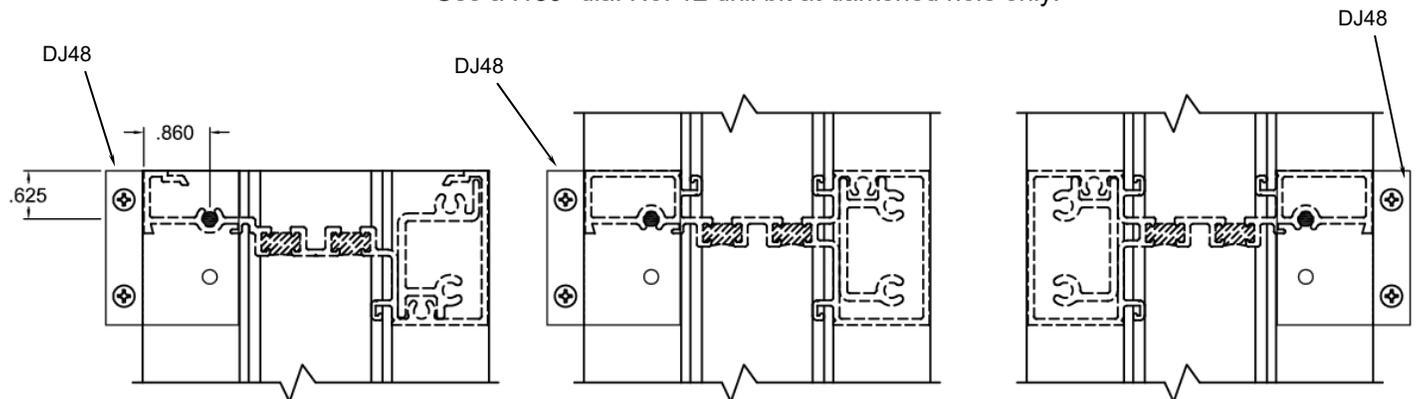


Fig. #9

Section 3C. Corner Fabrication

Notes:

1. 90° Corners are *designed* for use with the shear block or screw spline system.
2. Because of possible screw spline and corner snap interference, the 3 way corners must be shear block system only.
3. **Do Not** measure hole locations from locking corners.
4. All 4 1/2" vertical corners can be mated together or with any other corner regardless of system considerations.
5. The 90° corner halves may be snapped together and used as a one piece vertical mullion.
6. Refer to current available extrusions for all possible combinations.

Screw Spline System Fabrication Steps:

1. Follow steps 1-3 in Section 3A for cut lengths and hole preparations.
2. Follow standard unit construction method.

Shear Block System Fabrication Steps:

1. Follow steps 1, 2, and 5 in Section 3B for cut lengths and hole preparations.
2. Follow standard unit construction.

Standard Corner Fabrication Combinations

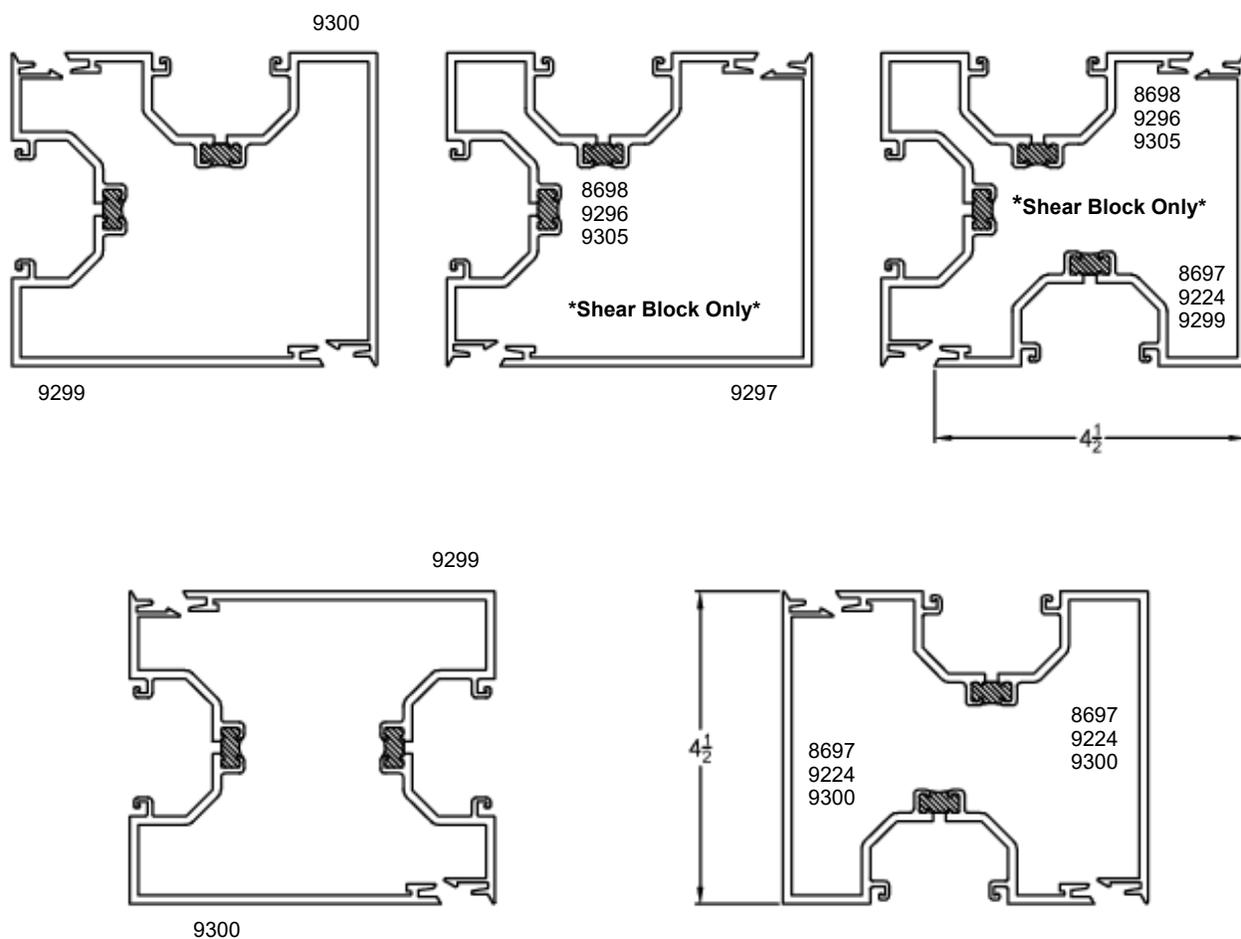


Fig. #10

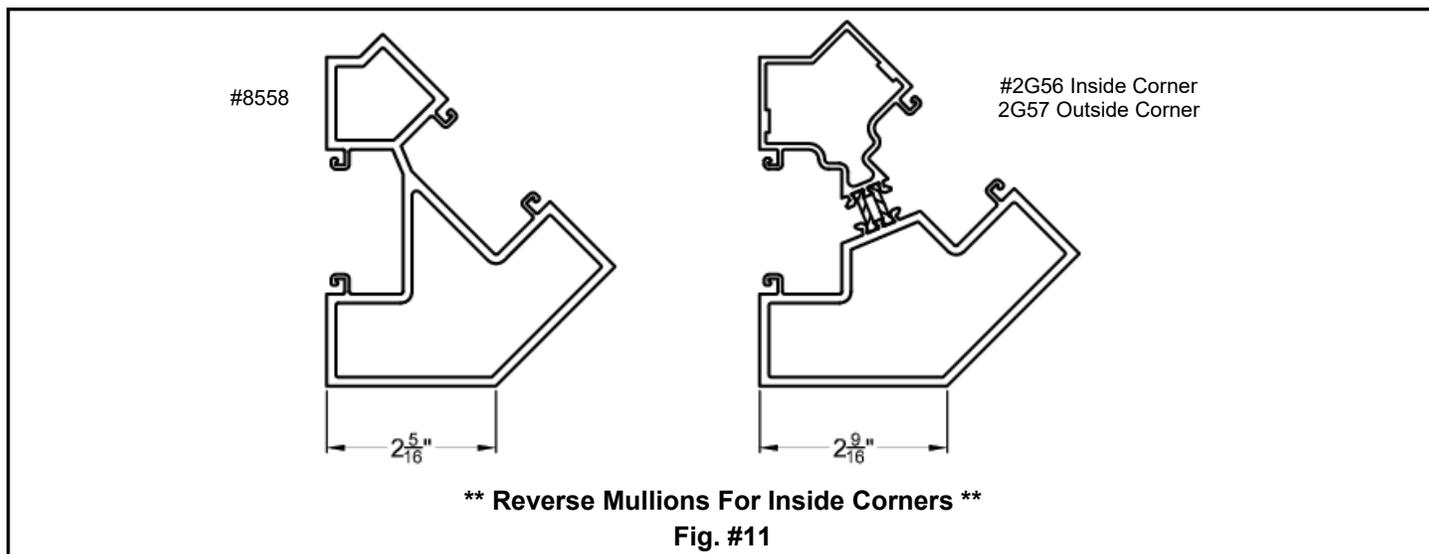
Note:

CORNERS MUST BE SLID APART

Section 3C. Corner Fabrication (cont.)

Fixed, Inside, Outside, and 135° Corners

- Shear block application only.
- Follow steps 1, 2, and 5 in Section 3B for cut lengths and hole preparations.

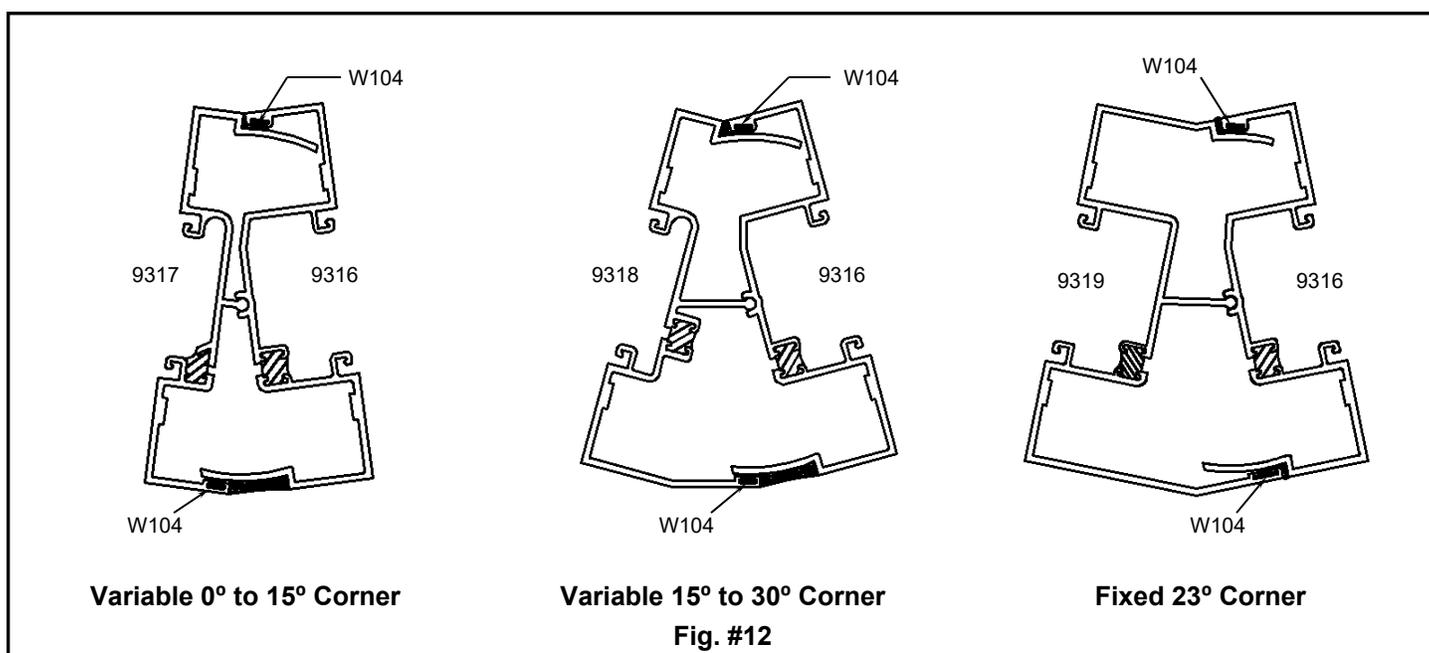


Variable Degree Corners

- Screw spline construction ONLY.
- The exterior exposure of the variable mullion will be dependent upon the angle of splay and will be job specific.

Screw Spline System Fabrication Steps:

1. Follow steps 1-3 in Section 3A for cut lengths and hole preparations.



Section 3D. Expansion Mullions

Expansion mullions are **required** in elevations that are over 20' - 25' wide and can be used with both screw spline and shear block systems.

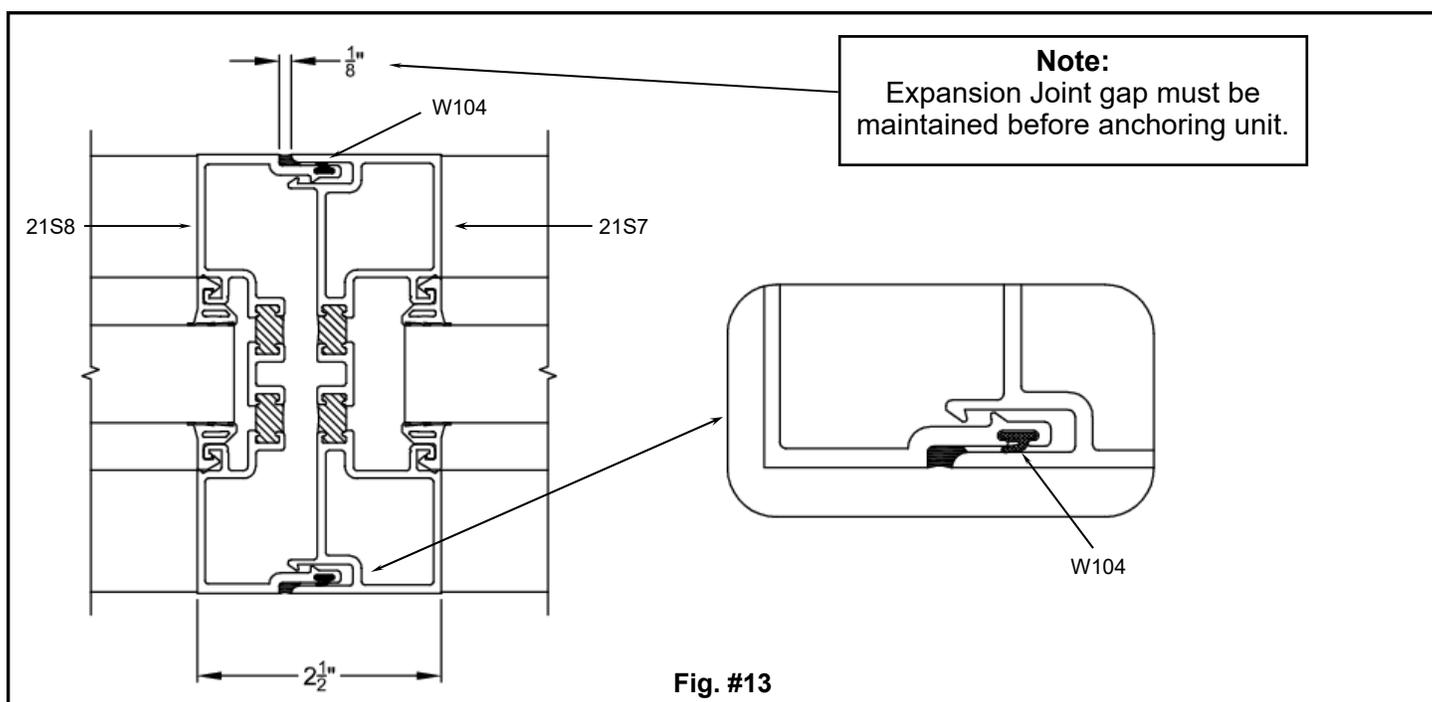
- **Do Not** use expansion mullions at entrance jambs. Locate the expansion mullion at the next vertical mullion over so that the distance between expansion mullions is never more than 25'-0".

Screw Spline System Fabrication Steps:

1. Follow steps 1-3 in Section 3A for cut lengths and hole preparations.
2. Follow standard unit construction method.

Shear Block System Fabrication Steps:

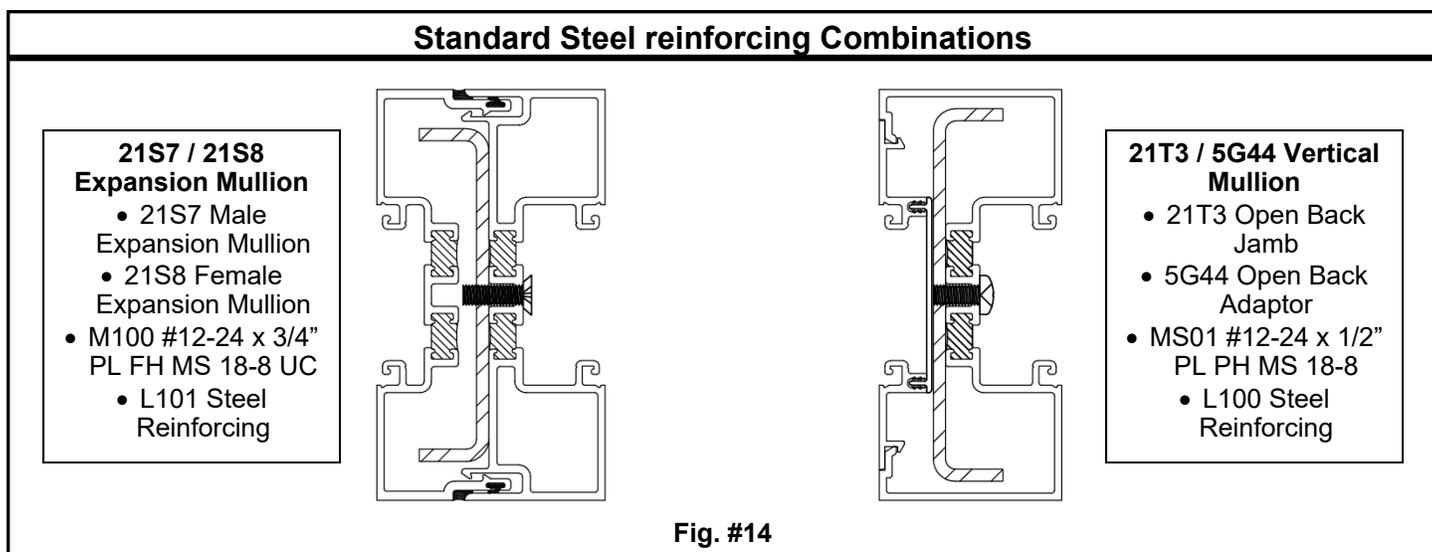
1. Follow steps 1, 2, and 5 in Section 3B for cut lengths and hole preparations.
2. Follow standard unit construction.



Section 3E. Steel Reinforcing

Fabrication Steps:

- Cut the steel reinforcing to mullion length minus 3" and set flush with the bottom of the vertical.
- Paint the cut ends to prevent rust.
- Insert the steel into the mullion, then drill through the deep pocket of the mullion and the steel reinforcing at 16" on-center - maximum spacing.
- Tap the hole in the steel to accept proper machine screw for that mullion and steel reinforcing combination.
- Drill a clear hole in the mullion with a $\varnothing.221$ " (#2) drill bit.
- Install the steel with the appropriate screw. If it is a flat head screw it **does not** countersink into the mullion.



Section 3F. Unit Assembly - Screw Spline

Assembly Steps:

- Butter the ends of all horizontals and fill Interior vertical glazing vinyl pockets with butyl type sealant as represented by the shaded areas in Fig. #15.
- **(Place sealant as shown unless ladder to be installed in opening immediately, then coat complete end of horizontal.)**
- Wax type lubricant may be required at assembly fasteners.
- Screw complete system together as shown in Fig. #15.
- Clean off all excess butyl sealant after assembled.

Note:

Inside Glazed Assembly shown, Outside Glazed, expansion mullion, and 4 1/2" horizontal assembly systems similar.

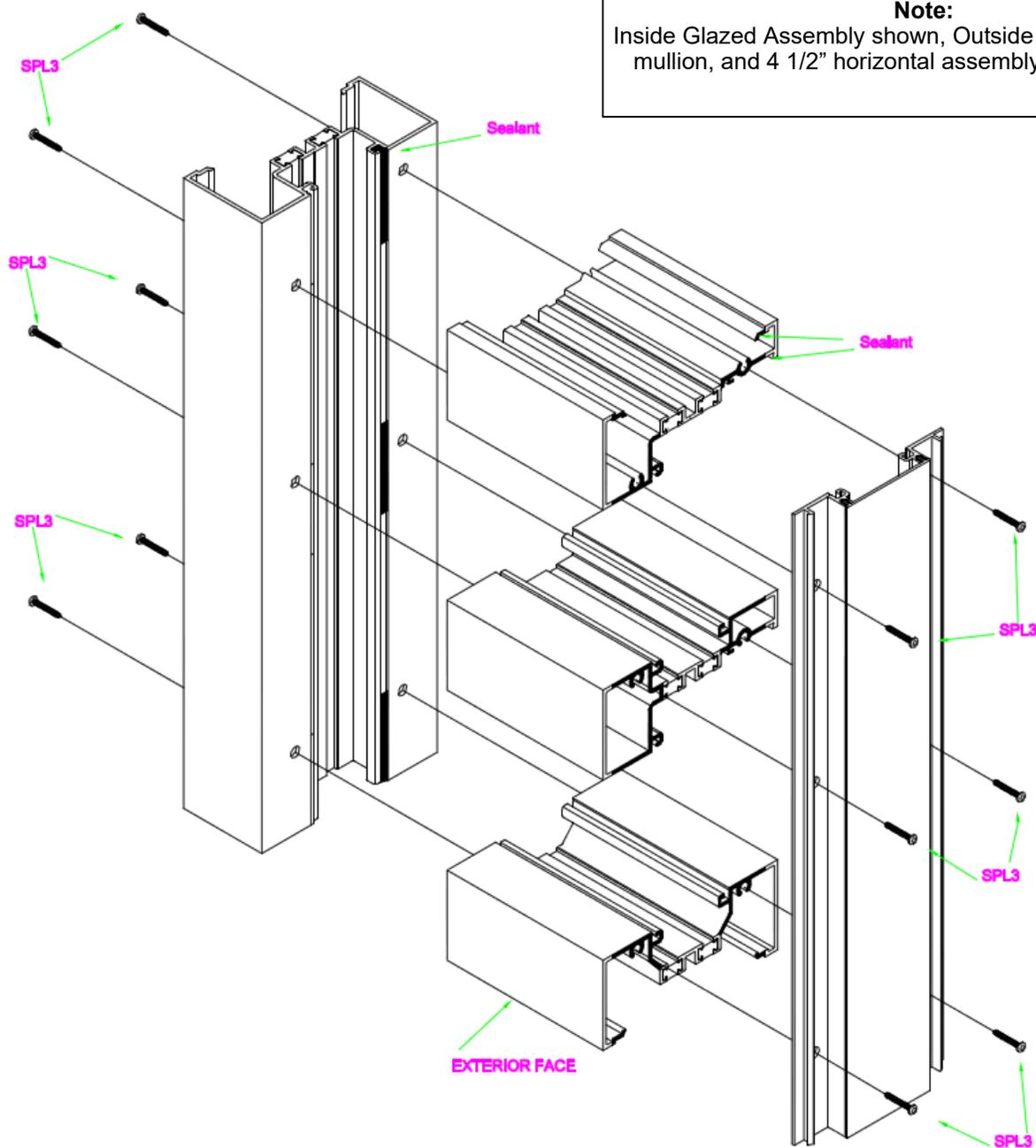


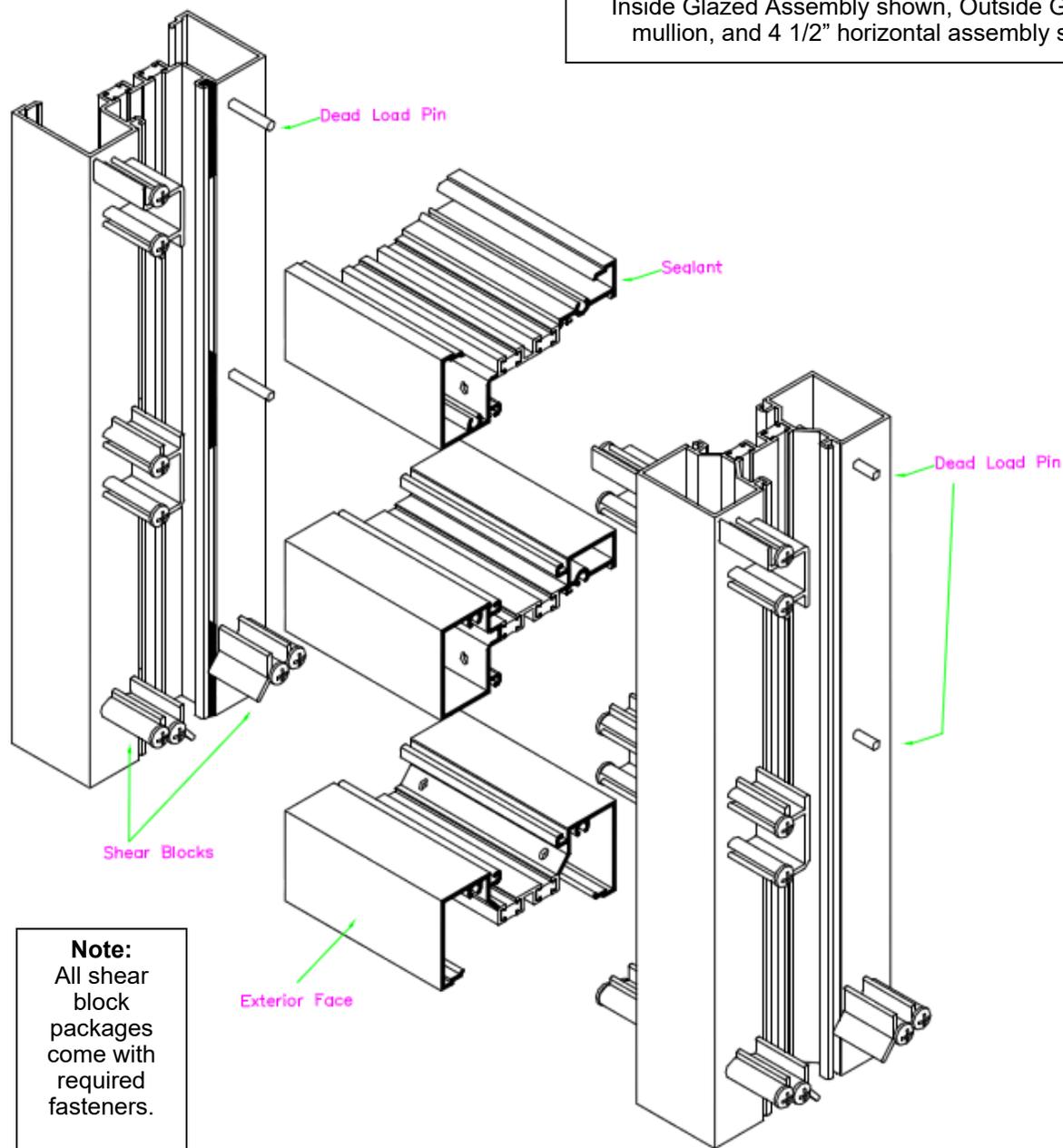
Fig. #15

Section 3F. Unit Assembly - Shear Block

Assembly Steps:

- Butter the ends of all horizontals and fill Interior vertical glazing vinyl pockets with butyl type sealant as represented by the shaded areas in Fig. #16.
- Wax type lubricant may be required at assembly fasteners and dead load pins.
- Attach all shear block to verticals with fasteners provided.
- Insert 2" dead load pins into jambs and expansion mullions and 3" dead load pins in all other vertical members as indicated.
- Screw complete system together putting screw through horizontals into shear blocks.
- Clean off all excess butyl sealant after assembled.

Note:
Inside Glazed Assembly shown, Outside Glazed, expansion mullion, and 4 1/2" horizontal assembly systems similar.



Note:
All shear block packages come with required fasteners.

Fig. #16

Section 4A. Door Frame Installation

Notes:

- If **NO** door frame is required, proceed to Section 4B.
- If a door frame is required, the frame must be installed first. All subsequent ladders must be installed from the door frame out.
- Door frame jambs do not set on sill flashing. Door jambs must run through to the floor condition.

Installation Notes:

- Correctly locate and install the door frame into the opening as specified on the shop drawings or architectural drawings.
- End dams are not required at the door frame end of a sill flashing.
- The sill flashing should butt up tight to the door frame.
- See Fig. #18 for sill flashing to door frame sealant requirements.

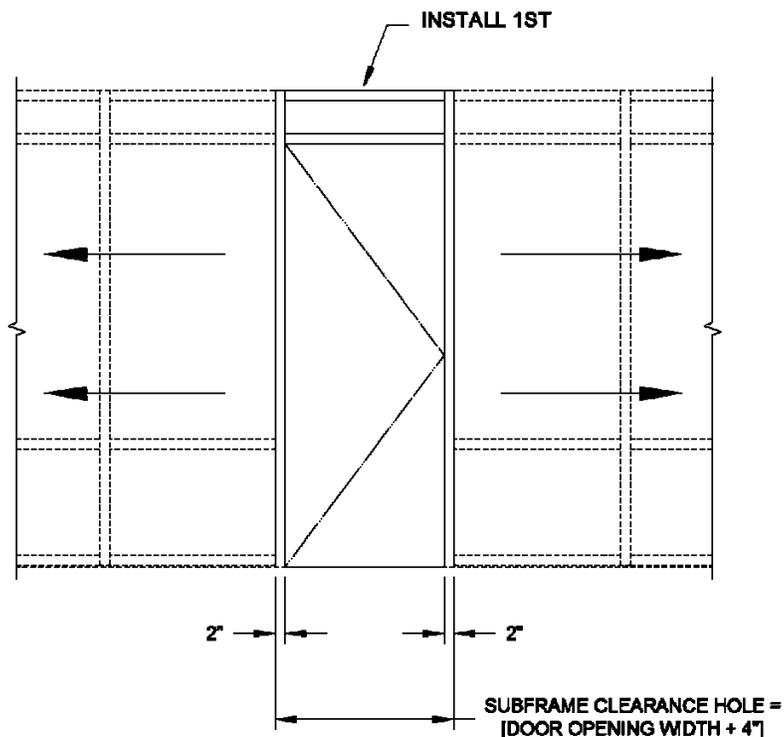


Fig. #17

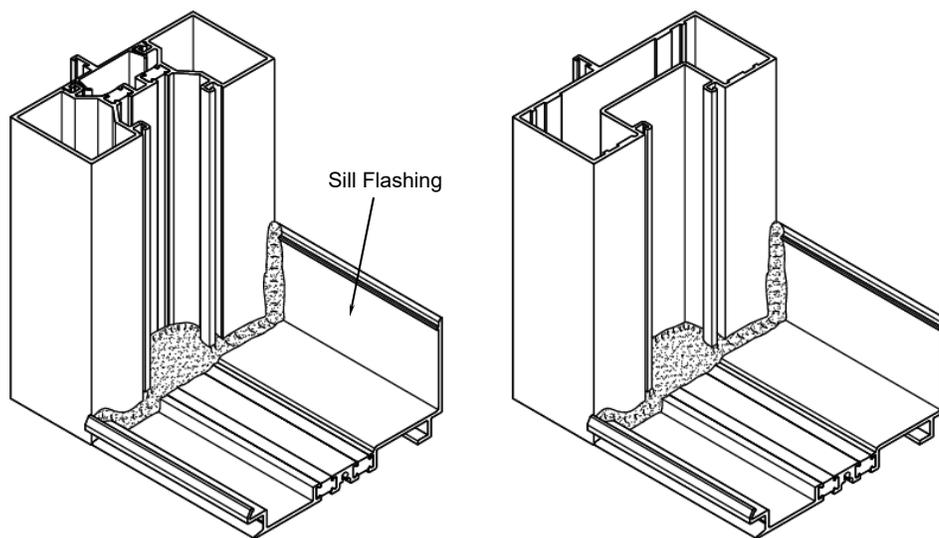


Fig. #18

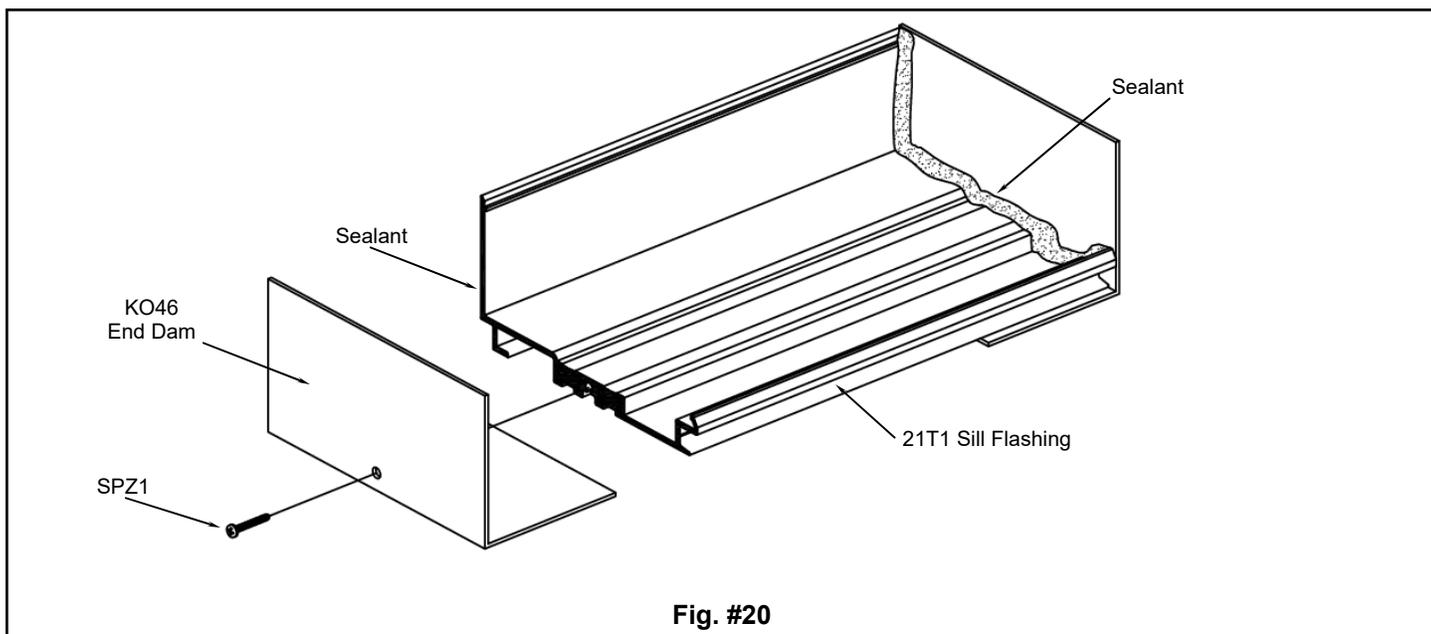
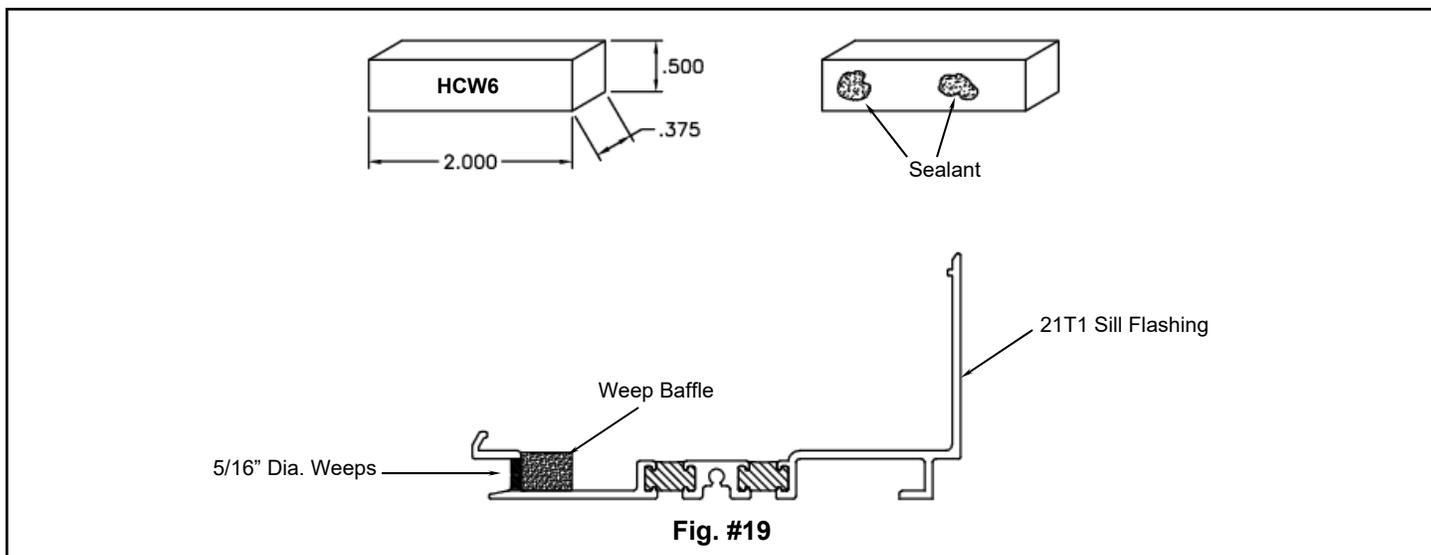
Installation Notes:

- Before installing the sill flashing, apply a bead of silicone style sealant to the end of the sill flashing.
- After Installation, tool excess sealant into the joint where sill flashing and door frame meet.
- At glazing pockets build-up silicone sealant in pocket to the tallest point of the sill flashing. Tool the silicone sealant so a watertight seal is made, and so that water will be directed out of the glazing pocket and into the sill flashing.
- See Fig. #18 for sill flashing to door frame sealant requirements.

Section 4B. Sill Flashing Fabrication

Fabrication Steps:

- 1. Cut Length** - Measure the rough opening width. Subtract a 1/4" per sill flashing end for the thickness of the water dam and the fastener head height from the rough opening.
 - With End Dams: $CUT\ LENGTH = ROUGH\ OPENING - 1/4" \times (\# \text{ of ends with end dam})$
 - Without End Dams: $CUT\ LENGTH = ROUGH\ OPENING$
- 2. Weep Holes** - Drill a min. 5/16" diameter holes in the sill flashing 6" from each end and at no more than 42" apart. (Fig. #19)
- 3. Weep Baffles** - Take (1) HCW6 baffle and cut in half to dimensions in Fig. #19. Apply Sealant along bottom and locate them over the weep holes as shown below.
- 4. End Dam Installation** - Attach the sill flashing with 1 SPZ1 fastener per end dam. Apply a bead of silicone sealant to the end of the sill flashing prior to attaching the end dam. Tool the sealant at the interior joint of the end dam (see Fig. 20) to ensure a good watertight seal.
- 5. Sill Flashing without End Dams** - Install sill flashing tight to the condition and then proceed to seal joint between sill flashing and condition. To ensure a watertight seal use silicone style sealant and tool seal similar to Fig. #20 below.



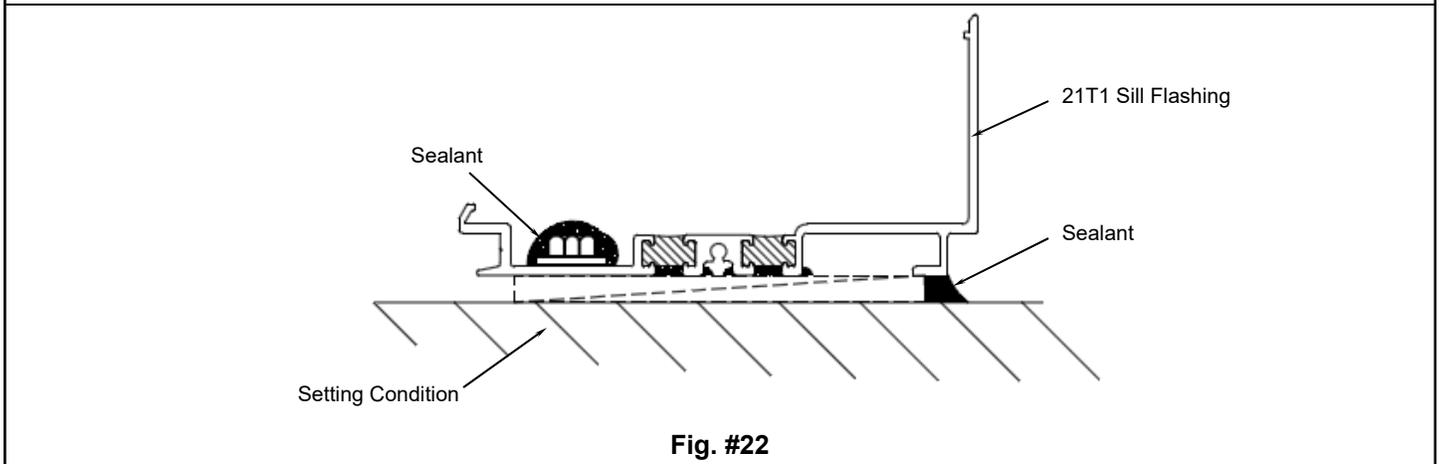
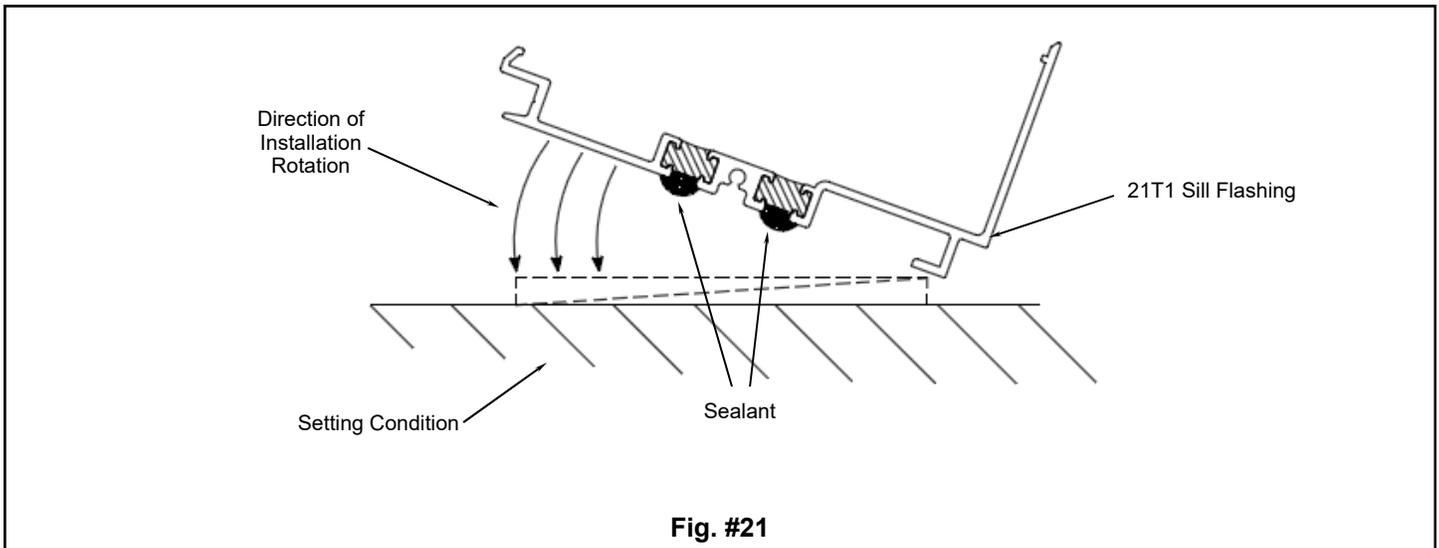
Section 4B. Sill Flashing Installation

Installation Steps:

1. **Chalk Line** - Before installing the sill flashing, measure the distance from the exterior of the condition to the desired location of the exterior of the sill flashing. Do this at both ends of the opening. If the opening is too wide for just two marks, measure every 15 feet. Snap a chalk line between the marks to align sill flashing.
2. **Sealant Bed** - Apply a silicone style of sealant to the sill flashing as shown in Fig. #21. Place the sill flashing into the rough opening, and rotate the exterior face down into position also shown in Fig. #21. Apply enough sealant to ensure a **complete** seal.
3. **Sill Flashing Anchoring** - At a minimum, anchor at 6" from each jamb and corner and 16" on center.
4. **Sill Flashing Anchor Seal** - Sill flashing anchors must be sealed with a silicone type sealant. To ensure a proper seal, tool the sealant onto the fastener and surrounding metal. This procedure should immediately follow anchor installation so it is not forgotten. (See Fig. #22)
5. **Sill Flashing Perimeter Seal** - The interior of the sill flashing should be sealed with a silicone type sealant. Apply the sealant and tool to ensure a proper seal. Clean off excess sealant. (See Fig. #22)

Notes:

- These recommendations are for general erection procedures only.
- For actual job conditions, see the details on the shop drawings.
- For perimeter anchor type and spacing, refer to approved shop drawings or consult the project design professional.
 - **Anchoring fasteners NOT supplied by EFCO**



Section 4B. Sill Flashing Installation (cont.)

Splicing Steps:

1. **Verify Sill Flashing** - Check to see that sill flashing has been installed correctly. Sill flashing to be spliced every 20' - 25'. Splice locations are to be located at least 6" from any vertical intermediate mullion.
2. **Splice Gap** - Make sure a 1/4" gap is left at every sill flashing splice location.
3. **Splice Material** - Use a silicone type sealant and a strip of WM01 bond breaker tape. Tape is to be 1 7/8" wide by approximately 7 1/2" long.
4. Apply silicone to both sides of sill flashing ends and fill 1/4" void between sill flashing ends as shown in Fig. #23.
5. Center bond breaker tape splice over gap and set into sealant. Tool the sealant over the edges of the splice to create a watertight seal.
6. **Interior Gap** - After the splice is installed, apply a cosmetic seal to the interior gap vertically up the splice. (Fig. #24)

Notes:

- These recommendations are for general erection procedures only.
- For actual job conditions, see the details on the shop drawings.

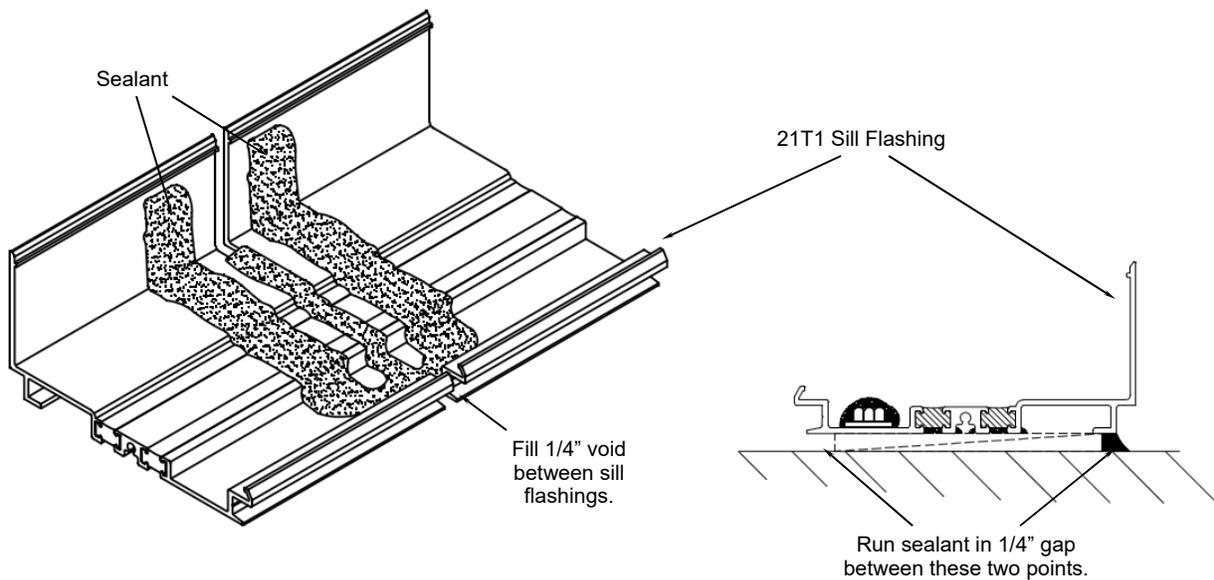


Fig. #23

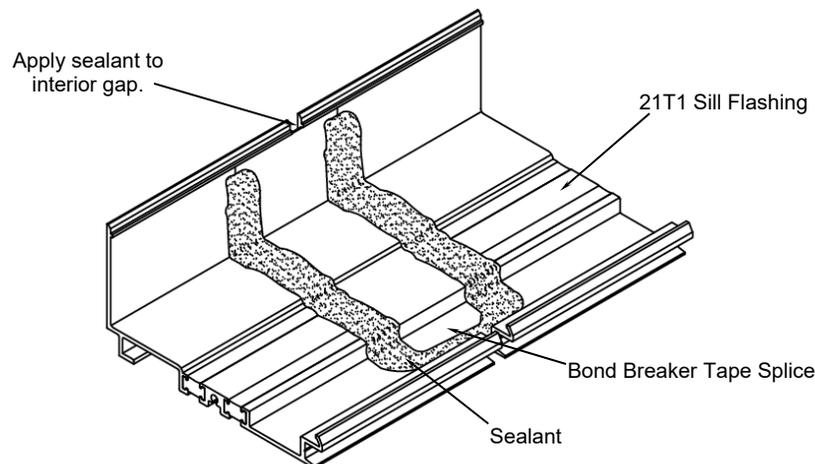


Fig. #24

Section 4C. Installation

Installation Steps:

- Sealing the sill onto the Sill Flashing** - Apply a silicone type sealant to the sill flashing as shown in Fig. #25 (a) before installing the first ladder of frame. Make sure enough sealant is applied to seal the areas shown. After all frame ladders are installed clean all excess sealant from any exposed areas.
- Installing Jamb side Ladder** - Starting from a door frame if one is in the opening or jamb, place the ladder on the sill flashing at an angle similar to what is shown in Fig. #25(b) below in its approximate location in the opening. Then stand the ladder up into the condition. See Fig. #25(c) below for proper sill placement in flashing. Then slide the ladder left or right into its final position.

DO NOT ALLOW SEALANT TO CURE BEFORE PLACING FRAME LADDER PIECE. FAILURE TO DO THIS WILL RESULT IN IMPROPER ENGAGEMENT OF SILL INTO FLASHING.

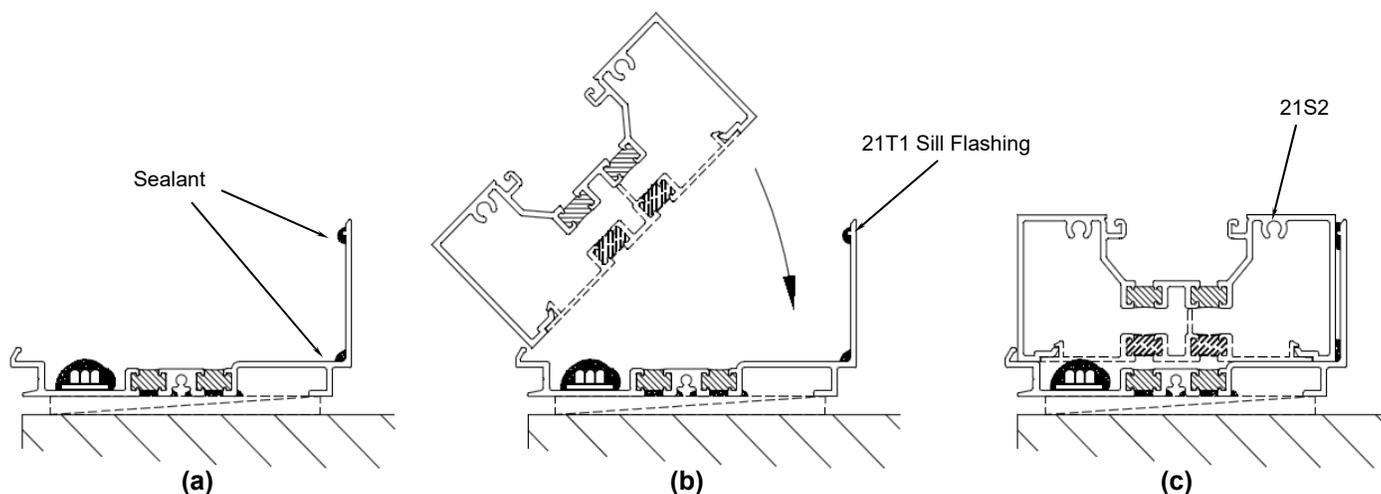


Fig. #25

Installation Steps:

- Anchoring the Head** - For D.L.O.'s (Day Light Opening) of 36" wide and smaller, locate one anchor 6" from each jamb or vertical member only. For D.L.O.'s larger than 36" wide, an additional anchor located at the center point of the D.L.O. is required. See Fig. #26 below.
- Anchoring the Jamb** - Anchors must be spaced 6" from the sill and head, and 24" ± 4" on-center along the rest of the height making sure they do not interfere with the horizontal members. Similar to Fig. #26 below.

These are only recommendations for general erection procedures only. For actual job conditions, perimeter anchor type and spacing, refer to approved shop drawings or consult the project design professional.

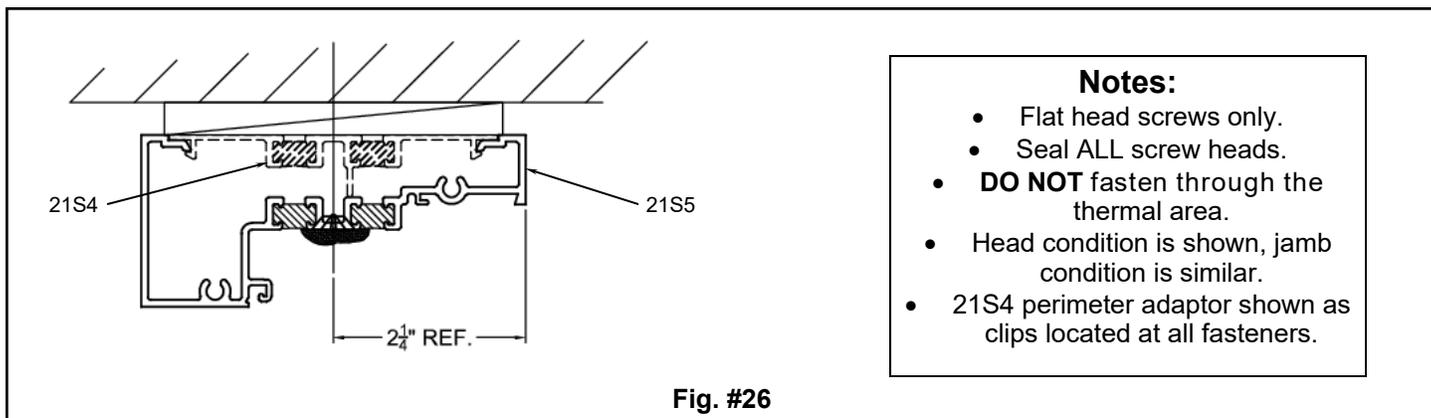


Fig. #26

Section 4C. Installation

5. **Installing additional Frame Ladders** - Make sure that the head and jamb have been shimmed and anchors have been installed on the previous frame ladder. Apply sealant to the sill flashing as shown in Fig. #25(a) on page 23. Place the additional ladder onto the sill flashing at approximately 1/4" from previously installed frame ladder and follow steps 2 and 3 from page 23.
- On screw spline construction make sure ladders snap together when pushed together.
 - On shear block construction make sure ladders are together and all shear block screws are installed.
6. **Snapping Mullions Together** - To snap the mullions together of two ladders, line up the mullion halves as shown in Fig. #27(a) below. Place one clamp at the sill end of the mullion using wood blocks to protect the extrusions. Tighten the C-clamp until snap begins to engage. Place additional C-clamps at mid-span and head of mullion. Tighten all clamps until sightline as shown in Fig. #27(b & c) below is achieved. It may be necessary to move clamps to ensure even engagement of snap. **DO NOT** try to hammer the mullion together as this will dent, bend, scratch, or deform the mullion and may cause it to leak. After correctly snapping mullion together continue to install ladder per step 3 on page 23.

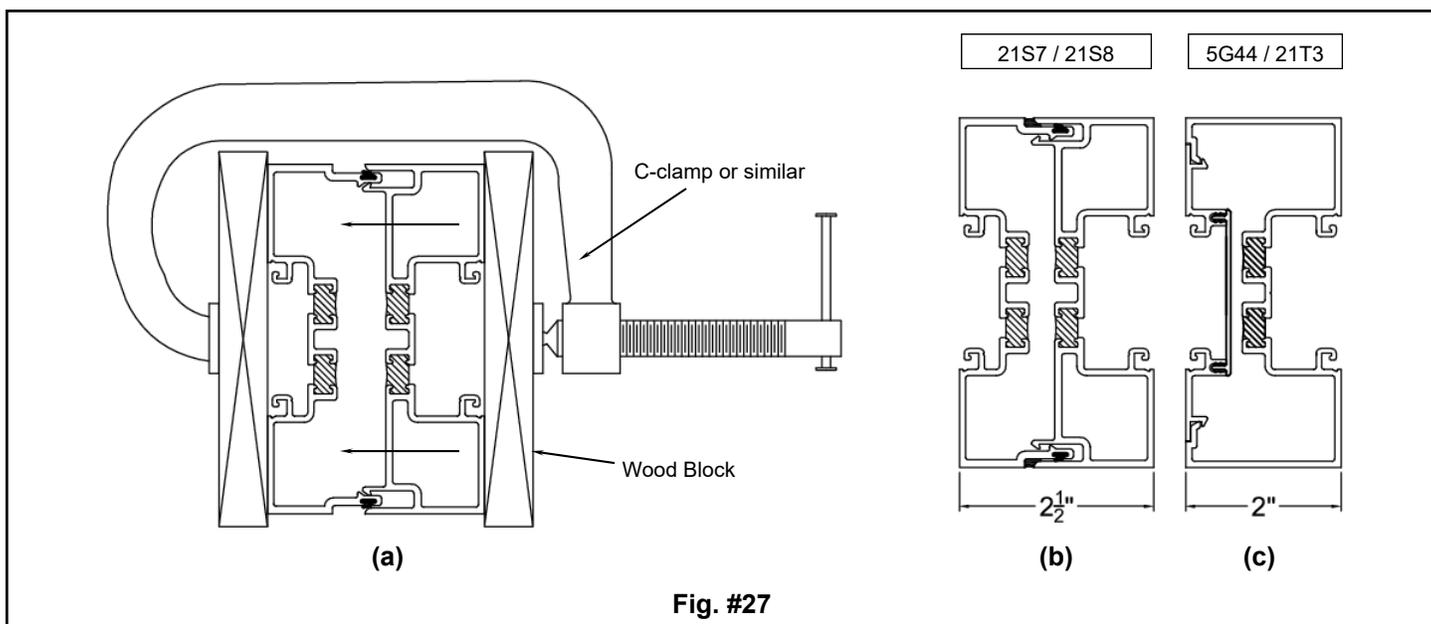
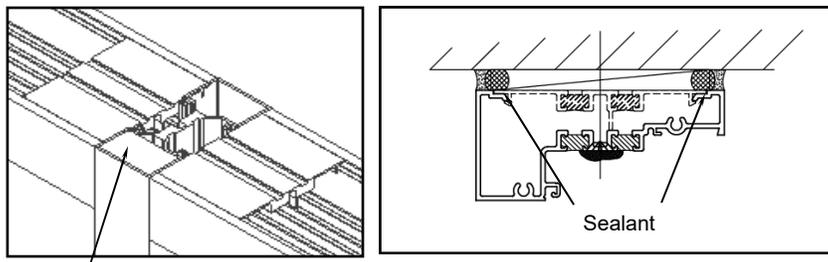


Fig. #27

7. **Perimeter Seal** - After all units are installed into the opening and anchored, begin sealing process. Apply a generous amount of silicone type sealant to the gap between the frame and rough opening. Tool off all excess sealant to ensure a proper seal and to achieve an appropriate appearance.



All open-ended vertical frame members must be closed off before installing the frame into the building opening. Insert a foam plug (N.B.E.) into the top of the mullion at the exterior side of the system. Make sure that the top of the plug is flush with the top of the vertical mullion in order to keep the exterior perimeter joint seal continuous.

Fig. #28

Section 5A&B. Water Deflector, Glass Pocket, & Glass Sizes

1. **Water Deflector** - Install the HWD1 at the ends of the intermediate horizontals only. It is not required at heads or sills. Use a silicone type sealant and place some on the horizontal to adhere the HWD1 onto the intermediate horizontals. Ensure that the HWD1 fits flush with the top of the intermediate horizontal glazing pocket and smooth any excess silicone sealant so water will flow easily over the water deflector.
 - As seen in Fig. #29 the deflector projects over the corner of the adjacent glass unit below.
 - Allow the silicone to cure prior to glazing glass.
2. **Glazing Pocket Dimensions** - The glazing pockets on the 403X are 1 7/16" (1.438) wide and will accept 1" glass, dry glazed. See Fig. #30.
3. **Glass Size Formulas** -
 - **Horizontal:** D.L.O. + 3/4"
 - **Vertical:** D.L.O. + 3/4"
 - See Fig.#31 Below

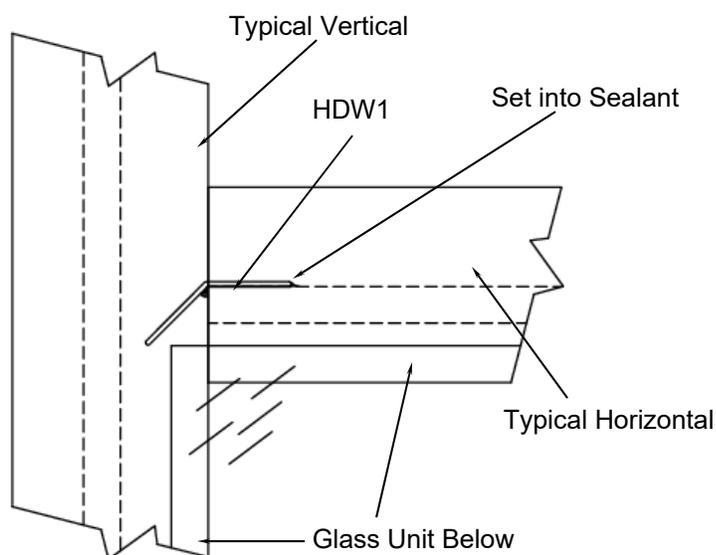


Fig. #29

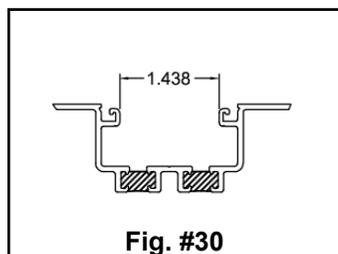
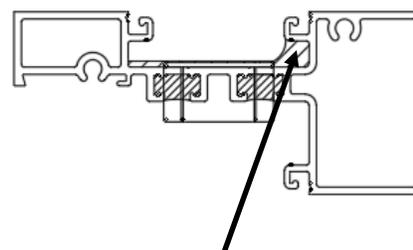


Fig. #30



Seal HWD1 in a continuous bed of sealant as shown, 1.5" away from the jamb. Make sure there is sealant at the inside face of the glazing pocket as shown.

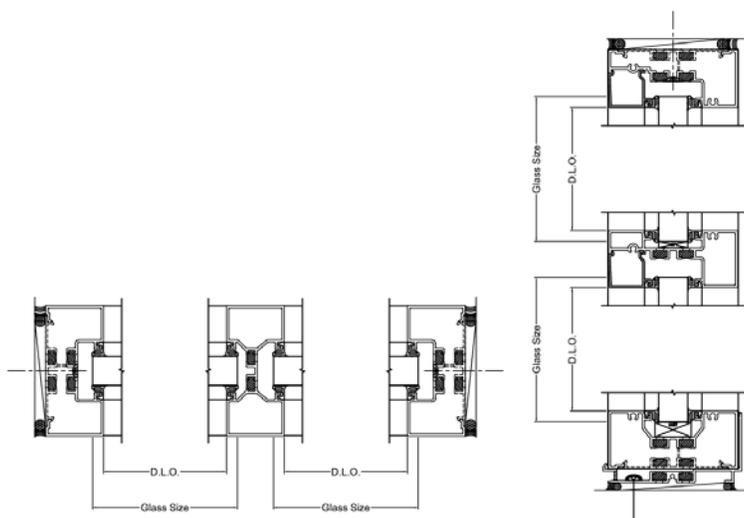
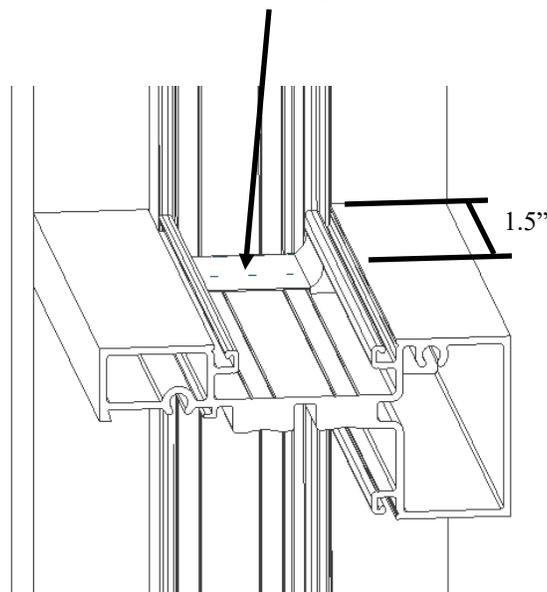


Fig. #31



Section 5C. Glazing

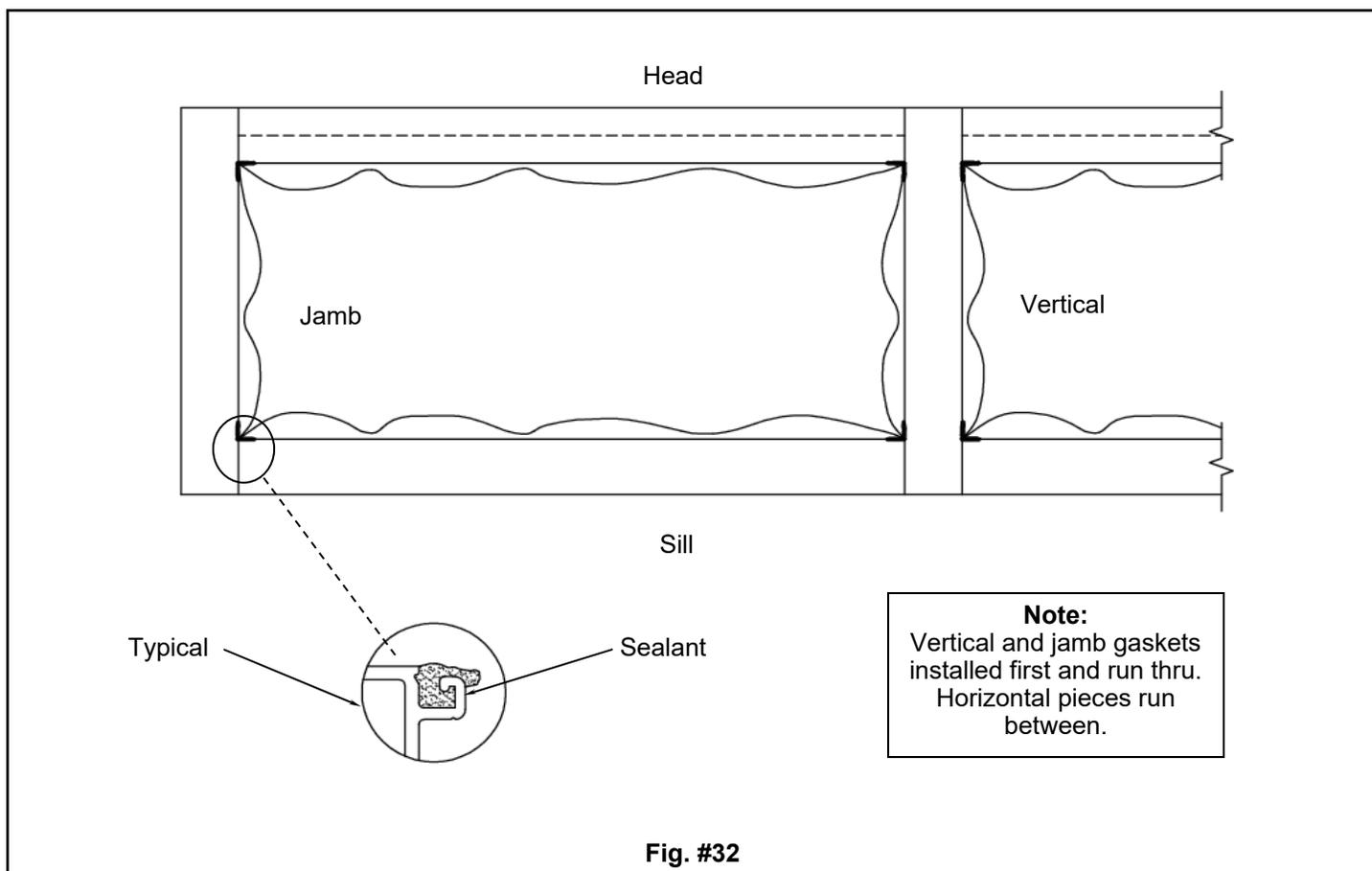
Glass Installation Steps

1. **Glass Blocks** - Place glass blocks at the standard 1/4 point locations. It may be necessary to place a small amount of sealant on the bottom of the glass blocks to ensure they remain in their intended position. Refer to approved shop drawings or consult project design professional to verify glass block locations.
2. **Glazing Gasket** - For inside glazed applications, install the exterior gasket prior to glass installation. For outside glazed applications, install the interior gasket prior to glass installation.

$$\text{Gasket Length} = \text{D.L.O.} + 3.0''$$

Glazing Gasket Installation Steps

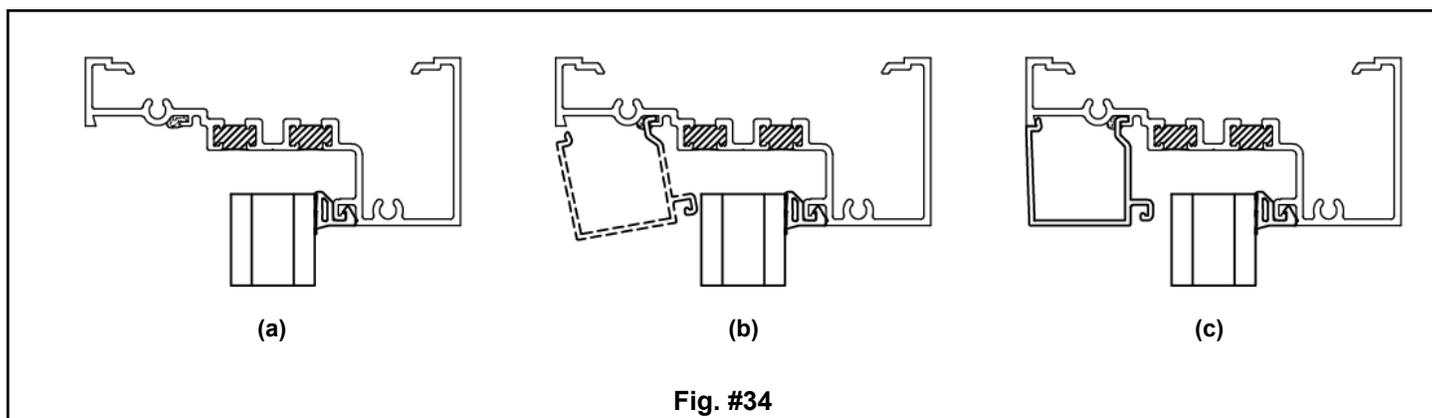
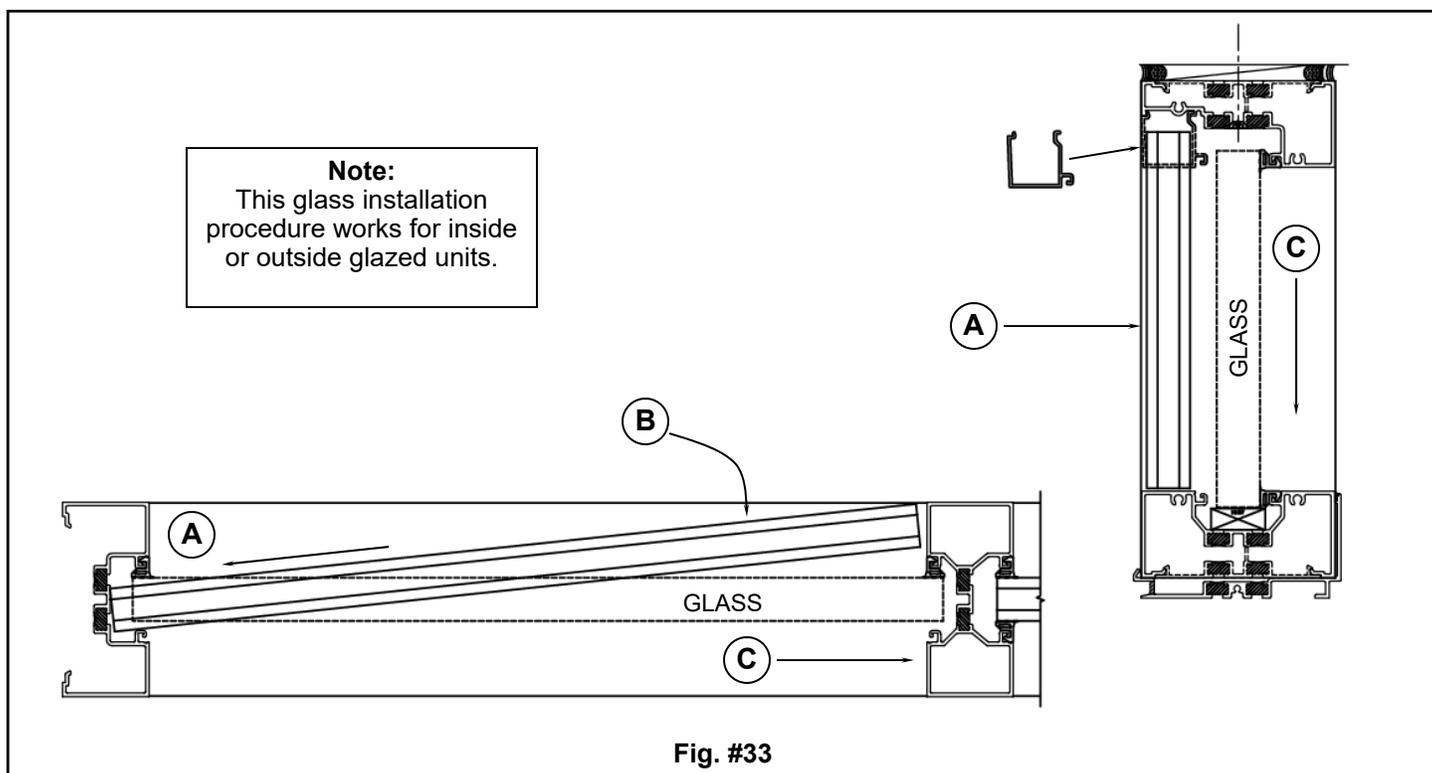
- Seal 1" vertically and horizontally in the gasket races with silicone type sealant at all corners.
- Install gasket by pushing the gasket into place at the ends. Move to the middle, then to 1/4 points and then work the "waves" toward the ends. **Do Not** stretch the gasket or it will return to its original form, creating gaps at the gasket intersections.
- Vertical gasket runs thru and horizontal between. Seal the ends of the horizontal gaskets.
- Clean off any excess sealant. Sealing races and gasket ends is required at the interior of the system however, optional at exterior of the system.
- See Fig. #32 below.



Section 5C. Glazing

Glass Installation Steps (cont.)

3. **Glass Installation** - Make sure glass blocks are still in place. After getting glass based upon glass size formulas on page 25 follow these steps:
 - A. Position the glass on the appropriate side of the framing without the removable glass stop installed. Shift the glass into the deep pocket to begin glass installation.
 - B. Swing the opposite glass edge around to align with the glazing pocket.
 - C. Slide the glass into the shallow pocket and lower onto the setting blocks. Shift the glass unit until there is equal glass bite on both sides of the D.L.O.. Ensure that the preinstalled gasket does not roll out of the gasket race when moving the glass into place.
4. **Glass Stop** - Ensure that the glass stop hook track is clean and free of oil and dirt. Run a continuous bead of silicone at area shown in Fig. #34(a). Before sealant cures place stop as seen in Fig. #34(b) and then rotate into final position as seen in Fig. #34(c). Strong hand pressure or a slight tap with a mallet will ensure the glass stop snap is engaged. This step is for both outside and inside glazed units.



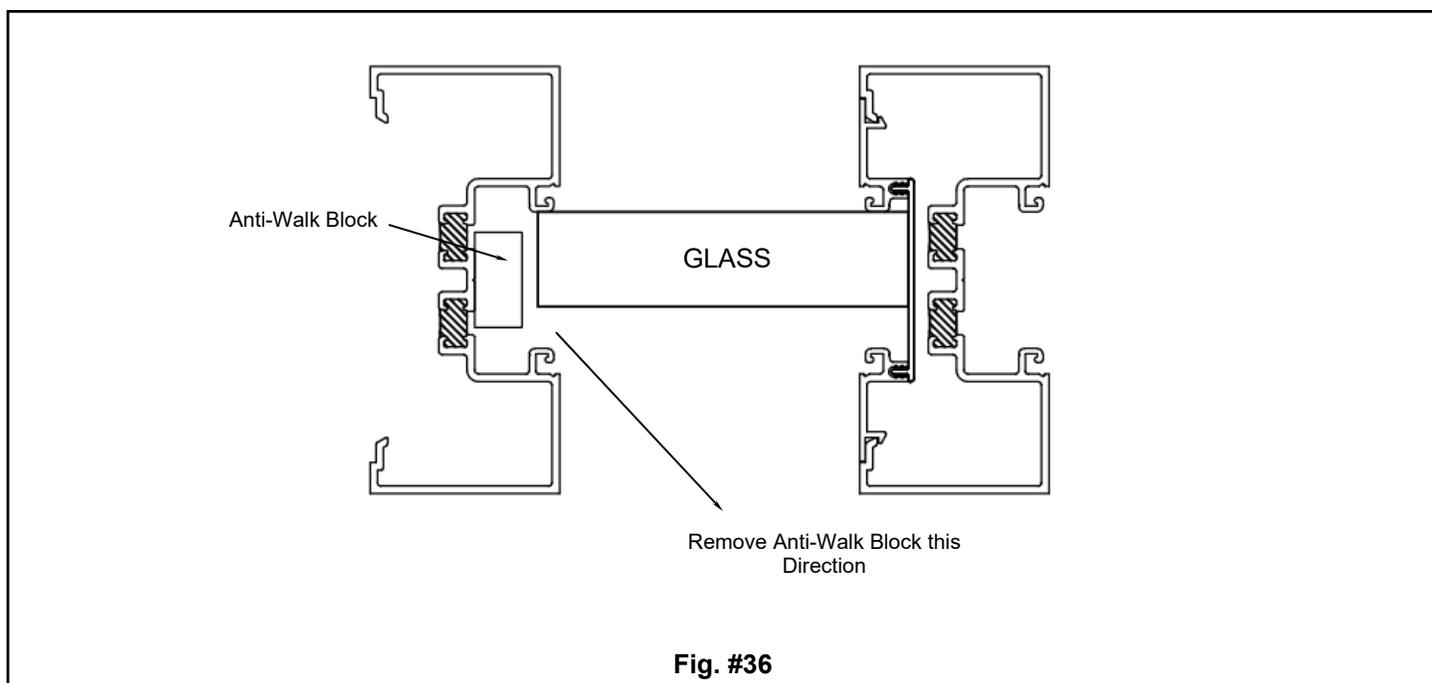
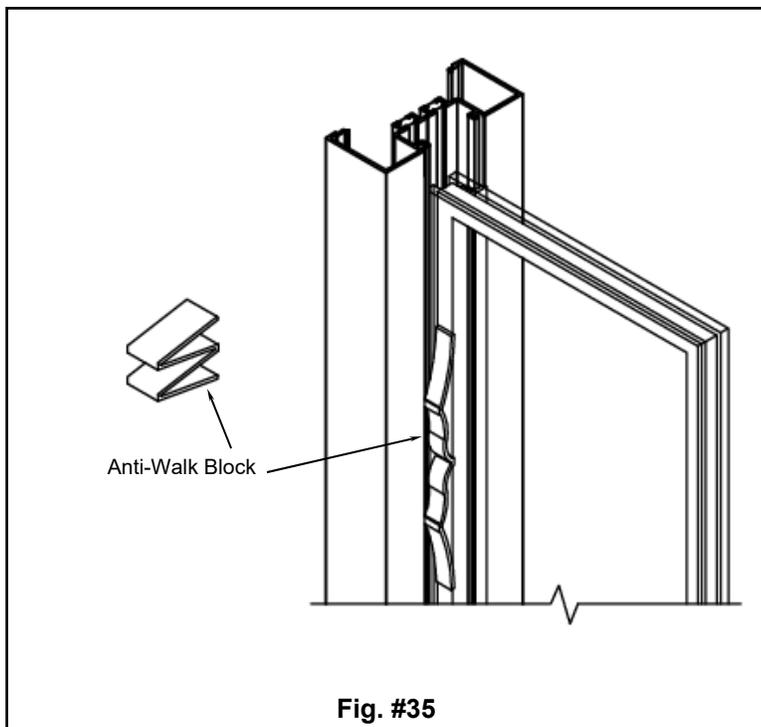
Section 5C. Glazing

Glass Installation Steps (cont.)

5. **Anti-Walk Block Installation** - Make sure the glass unit is pushed as far into shallow pocket as possible. Stretch the anti-walk block out as shown in Fig. #35. Slide the stretched out block between the glass unit and glazing gasket track and push it fully into the deep glass pocket at the midpoint of the glass unit.

Use Anti-Walk Blocks At Deep Pockets Only

6. **Second Glazing Gasket** - Install the second glazing gasket. Use the same instructions as was described in step 2 for the initial glazing gasket installation.
7. **Deglazing with Anti-Walk Blocks** - If necessary follow these steps to deglaze a glass unit with anti-walk block.
- Remove all interior and exterior glazing gasket.
 - Push the glass fully to the shallow pocket and either towards the exterior or interior of the pocket. See Fig. #36.
 - Use a hooked tool to pull the anti-walk block from the glass pocket.
 - Reverse the glass installation instructions to remove the glass unit.



Section 5D. Window Adaptors and Glazing Adaptor

Equal Leg Shadowline Adaptor

- For 1" glazing pockets only.
- Horizontal Cut Length = D.L.O. - 1/16" (Horizontal pieces run thru)
- Vertical Cut Length = D.L.O. - 11/32"
- 1/8" x 5/8" notch at back of vertical pieces to clear horizontal leg. (See Fig. #36)
- Seal Joint Completely
- For equal leg Shadowline windows: Window Dim. = D.L.O. - 9/16"

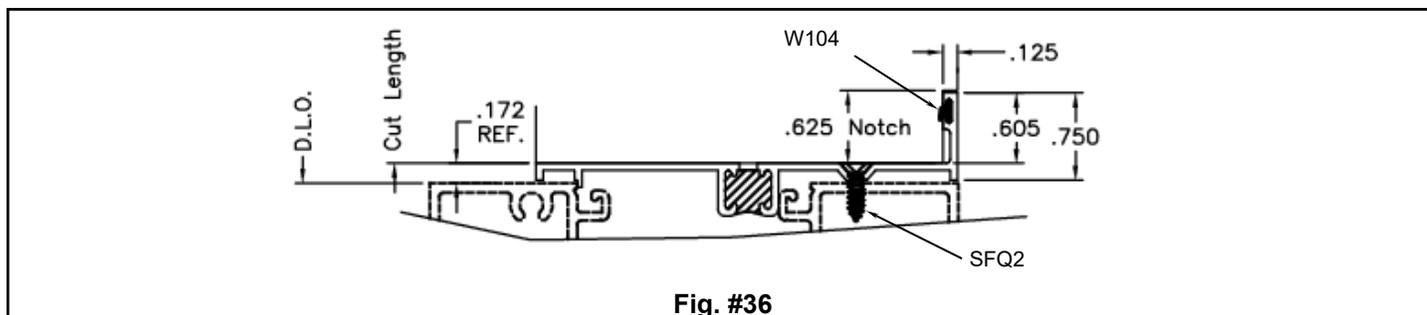


Fig. #36

Equal Leg System II Adaptor

- For 1/4" and 1" glazing pockets.
- Horizontal Cut Length = D.L.O. - 1/16" (Horizontal pieces run thru)
- Vertical Cut Length = D.L.O. - 5/16"
- 1/8" x 5/8" notch at back of vertical pieces to clear horizontal leg. (See Fig. #37)
- Seal Joint Completely
- Attachment screw length determined by pocket depth.
- For equal leg System II windows: Window Dim. = D.L.O. - 1/2"

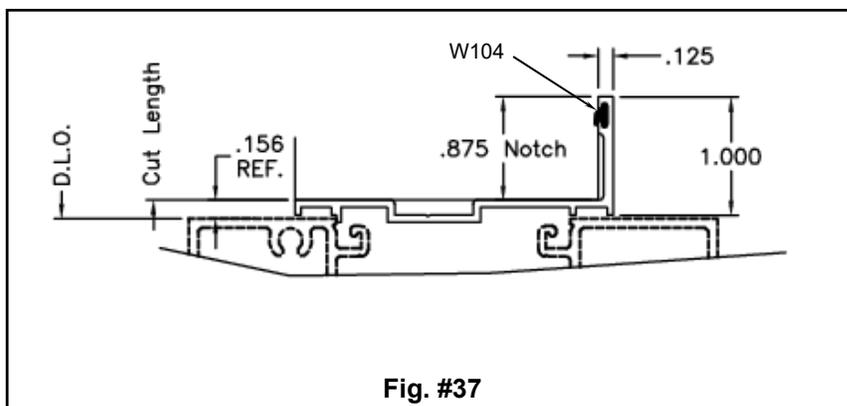


Fig. #37

Glazing Adaptor

- Use extrusion #21T8 to reduce 1" glazing pocket to a 1/4" glazing pocket.
- Fill glazing vinyl pocket 1" in each direction at all four corners of opening.
- Place adaptor as seen in Fig. #38 (a). Using hand pressure or tapping of a 6" long wood block engage adaptor snap.
- Push/tap until level with frame as seen in Fig. #38(b).
- Care must be taken not to bend the pocket reducer as it is being tapped into position.

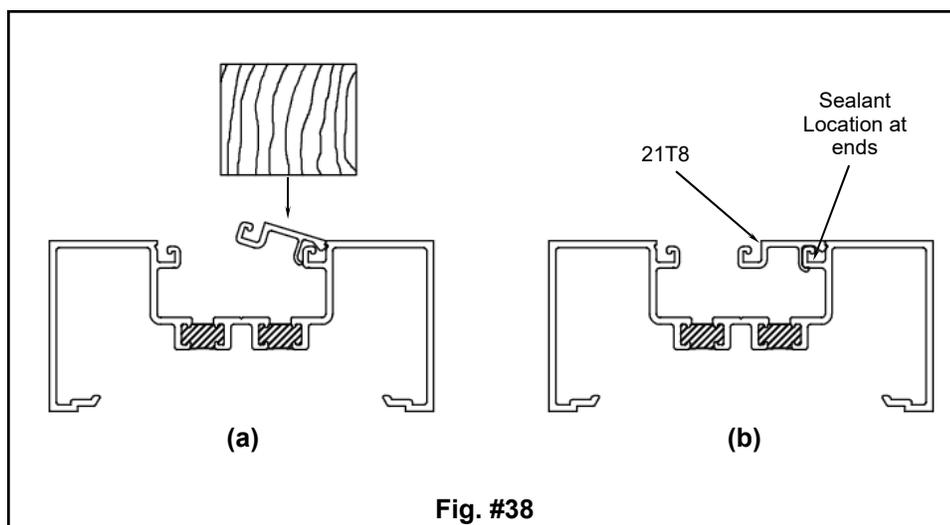


Fig. #38