



THE DEFENDER SERIES

BT601 BLAST RESISTANT STOREFRONT

NOTE

THE INSTALLATION DETAILS FOUND IN THIS PACKAGE ARE GENERIC AND ARE FOR REPRESENTATION ONLY WITH THE INTENT OF GIVING THE INSTALLATION TEAM A VISUAL REPRESENTATION AS TO HOW THE ASSEMBLIES TYPICALLY INSTALL. THE SHOP SUBMISSION DRAWINGS AND DETAILS ARE THE GOVERNING DOCUMENTS AND AS SUCH THIS PACKAGE IS TO BE USED ONLY AS A RESOURCE

FOLLOW SEALANT MANUFACTURERS' RECOMMENDATIONS FOR USE AND APPLICATION OF ALL STRUCTURAL SILICONE SEALANT AND WEATHER SEAL SILICONE SEALANT.

CUSTOMER/PROJECT QUALITY ASSURANCE PROCEDURES ARE SEPARATE DOCUMENTS AND ARE TO BE FOLLOWED IN CONJUNCTION WITH THIS MANUAL.

11M0178_REV_A_11.21

HANDLING, STORAGE, AND PROTECTION OF ALUMINUM

The following precautions are recommended to protect the material against damage. Following these precautions will help ensure early acceptance of your products and workmanship.

HANDLE CAREFULLY.

All aluminum materials at job site must be stored in a safe place, well removed from possible damage by other trades. Cardboard wrapped or paper interleaved materials must be kept dry.

CHECK ARRIVING MATERIALS.

Check for quantity counts and keep records of where various materials are stored.

KEEP MATERIALS AWAY FROM WATER, MUD, AND SPRAY.

Prevent cement, plaster, or other materials from damaging the finish.

PROTECT THE MATERIALS AFTER ERECTION.

Protect erected frame with polyethylene or canvas splatter screen. Cement, plaster, terrazzo, other alkaline solutions, and acid based materials used to clean masonry are harmful to the finish. ***If any of these materials come in contact with the aluminum, IMMEDIATELY remove with water and mild soap.***

The rapidly changing technology within the architectural aluminum products industry demands that U.S. Aluminum reserve the right to revise, discontinue or change any product line, specification or electronic media without prior written notice.

NOTE: Dimensions in parentheses () are millimeters unless otherwise noted.

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GENERAL INSTALLATION NOTES

RECOMMENDED GUIDELINES FOR ALL INSTALLATIONS:

- 1. REVIEW CONTRACT DOCUMENTS.** Check shop drawings, installation instructions, architectural drawings and shipping lists to become thoroughly familiar with the project. The shop drawings take precedence and include specific details for the project. Note any field verified notes on the shop drawings prior to installing. The installation instructions are of a general nature and cover most conditions.
- 2. INSTALLATION.** All materials are to be installed plumb, level, and true.
- 3. INSTALLER QUALIFICATION.** The **Defender Series BT601** storefront system is intended for fabrication, assembly, sealing, installation and glazing by professionals with appropriate knowledge and experience of the system(s) and their incorporation into various building conditions.
- 4. BENCH MARKS.** All work should start from bench marks and/or column lines as established by the architectural drawings and the general contractor with guaranteed accuracy. Working from these datum points and lines determine:
 - a) The plane of the wall in reference to offset lines provided on each floor.
 - b) The finish floor lines in reference to bench marks on the outer building columns.
 - c) Mullion spacing from both ends of masonry opening to prevent dimensional build-up of daylight opening.
- 5. FIELD WELDING.** All field welding must be adequately shielded to avoid any splatter on glass or aluminum. Results will be unsightly and/or structurally unsound. Advise general contractor and other trades accordingly. All field welds of steel anchors must receive touch-up paint (zinc chromate) to avoid rust.
- 6. SURROUNDING CONDITIONS.** Make certain that construction which will receive your materials is in accordance with the contract documents. If not, notify the general contractor in writing and resolve differences before proceeding with work.
- 7. ISOLATION OF ALUMINUM.** Aluminum to be placed in direct contact with uncured masonry or incompatible materials should be isolated with a heavy coat of bituminous paint. For steel reinforcement primer, use manufacturer's standard corrosion resistant primer, meeting or exceeding Sherwin Williams Kem Kromik® and ASTM D5894, 1008 Corrosion Resistance.
- 8. SEALANTS.** The fabrication and installation of a structural silicone-glazed (SSG) or wet glazed system requires more technical knowledge and experience than is required for a conventional pressure-glazed or dry glazed system. The glazing contractor should take all steps as outlined and required by the structural silicone sealant manufacturer, glass fabricator, framing manufacturer, and the project professional engineer of record as well as follow local building code requirements and industry best practices to ensure the proper installation and safe performance of the SSG system.

The glazing contractor for each project needs to ensure compliance with each step, including, but not limited to, design reviews, formal adhesion testing, formal compatibility testing, project specification compliance, validating procedures, field testing, and quality control validation of installed product and surrounding conditions.

Testing of component materials for use in a SSG or wet glazed system is mandatory to fulfill project specifications and warranty requirements and must be submitted by the glazing contractor to the structural silicone manufacturer. All materials that comprise the structural silicone joint, such as the framing system (with the job-specific finish) and job-specific glass must be tested by the structural silicone manufacturer for compatibility and adhesion. All other accessory materials in contact with the structural silicone, such as setting blocks, spacers, gaskets, sweeps, air seals and expansion joints, must also be submitted to the silicone sealant manufacturer for compatibility testing.

To ensure that nothing has changed in formulation or chemistry since the initial tests, subsequent testing during periodic time frames of the project is to be conducted to confirm continued acceptance of the material for use on the project.

To ensure the structural performance and integrity of the insulating glass unit (IGU), the glazing contractor must submit the project shop drawings to the glass fabricator to obtain approval for use of their product(s) in any 2, 3 or 4-sided SSG applications.

Quality control procedures for field glazing are to be increased beyond those required for shop glazing. Job conditions will normally have dust, dirt, and other construction debris on the surfaces where structural silicone is to be applied. Great care should be exercised in cleaning and preparing these surfaces for silicone application. The recommendations of the silicone sealant manufacturer are to be strictly enforced and followed. The fabrication and installation of the SSG system and its components, whether shop or field glazed, should be governed by a quality control program, and all steps, procedures, and test reports should be documented throughout the project.

Prior to installation of any SSG system, refer to industry documents (e.g., AAMA Curtain Wall Design Guide Manual, ASTM C1401-14, and AAMA SSGDG-17) for detailed instructions and recommendations.

THE GLAZING CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR ENSURING COMPLIANCE WITH THE ABOVE, AND ASSUMES FULL LIABILITY FOR ANY ISSUES ARISING FROM NONCOMPLIANCE.

GENERAL INSTALLATION NOTES CONT.

RECOMMENDED GUIDELINES FOR ALL INSTALLATIONS:

9. **FASTENING.** Within the body of these instructions "fastening" means any method of securing one part to another or to adjacent materials. Only those fasteners used within the system are specified in these instructions. Due to the varying perimeter conditions and performance requirements, perimeter and anchor fasteners are not specified in these instructions. For perimeter and anchor fasteners refer to the shop drawings or consult the fastener supplier.
10. **BUILDING CODES.** Due to the diversity in state/provincial, local, and federal laws and codes that govern the design and application of architectural products, it is the responsibility of the individual architect, owner, and installer to assure that products selected for use on projects comply with all the applicable building codes and laws. U.S. Aluminum exercises no control over the use or application of its products, glazing materials, and operating hardware, and assumes no responsibility thereof.
11. **EXPANSION JOINTS.** Expansion joints and perimeter seals shown in these instructions and in the shop drawings are shown at normal size. Actual dimensions may vary due to perimeter conditions and/or difference in metal temperature between the time of fabrication and the time of installation. Gaps between expansion members should be based on temperature at time of installation.
12. **GLAZING PRACTICES.** The air and water performance of the **Defender Series BT601** storefront system is directly related to the completeness and integrity of the installation process, including but not limited to the assembly seals of the framing joinery, the installed glazing gaskets, and the alignment of the framing joinery glazing plane. Before glazing, verify the glazing pocket width and glazing infill thickness, as both must be in tolerance to assure adequate edge pressure and to achieve the desired air and water performance levels. (In general, framing systems utilizing 1" insulating glass are designed to accommodate a thickness variance of +/- 1/32"). Note: Excessive pressure can cause glass breakage and/or IGU failure. Consult the glass manufacturer for their recommended edge pressure per lineal inch.

To achieve the designed and tested air and water performance, best practices include:

- Glazing gaskets should be cut 1/4" longer per foot, and lay flat, preferably for 24 hours
- Gaskets should be cut as single monolithic pieces and "crowded" during their installation to avoid corner gaps caused by post-installation relaxation
- The interior glazing gasket should be installed so as to avoid stretching, buckles, or tears
- Corners must be cut square, and at a slight angle when required to conform to the bevel on the intersecting gasket; sealed and butted together.
- Gasket corner joinery must also be crowded, and sealant applied onto the gasket contact frame surface and into gasket reglet raceway where applicable.
- Gasket corner seals are to be done just prior to installing glass, while the sealant is still wet and uncured, and ensure exterior gaskets are installed so as to place the glass into it's final in service condition and allow the sealant to conform to optimum configuration. Note: If the sealant cures prior to glazing, the cured sealant could create excessive edge pressure onto the glass and has the potential to cause glass breakage.
- The glass must be checked for squareness, size dimension, and thickness along the edges paying attention to any variances from center edge to corner edge
- Check the placement of the installed glass and verify there is proper edge bite into the pocket, and proper edge clearance from framing elements

After sealant has set and a representative amount of the wall has been installed and glazed (250 square feet or more) run a water hose test in accordance with AAMA 501.2 specifications to check installation. On large projects the hose test should be repeated during the glazing operation. Consult and follow NGA's GANA Manual and FGMA Glazing Manual for proper glazing technique and procedure.

13. **COORDINATION WITH OTHER TRADES.** Coordinate with the general contractor any sequence with other trades which offset curtain wall installation (i.e. fire proofing, back-up walls, partitions, ceilings, mechanical ducts, converters, etc.).
14. **CARE AND MAINTENANCE.** Final cleaning of exposed aluminum surfaces should be done in accordance with AAMA 609.1 for anodized aluminum and 610.1 for painted aluminum.

FABRICATION

Cut lengths for frame fabrication

1. Measure rough opening to determine frame width and height dimension. Measure rough opening vertically in multiple places to determine shortest dimension. Allow a maximum of 1/2" (12.7) caulk space at head and jambs. See approved shop drawings for all other caulk space allowances. Subsill sits on substrate.

2. Cut members to length:

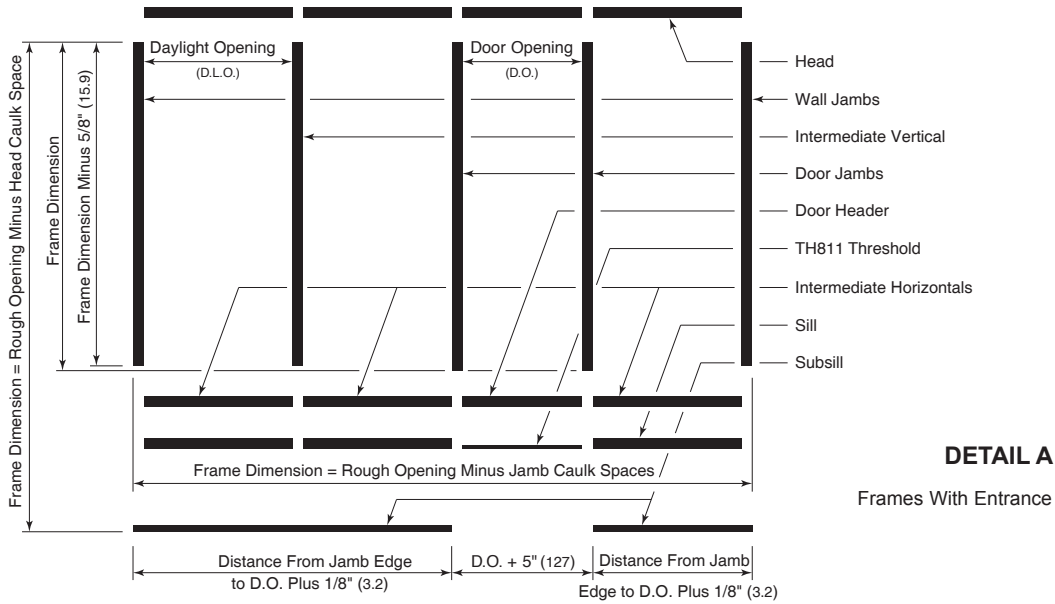
Subsill length is determined by entrance locations. Subsill butts to door jambs. Determine last bay installation and allow 1/8" (3.2) additional length to Subsill. See DETAIL A.

Subsill Length Without Entrance = Frame Dimension plus 1/8" (3.2). Subsill must extend 1/8" (3.2) outside last wall jamb to allow last bay installation. Subsill runs through. **See DETAIL B.**

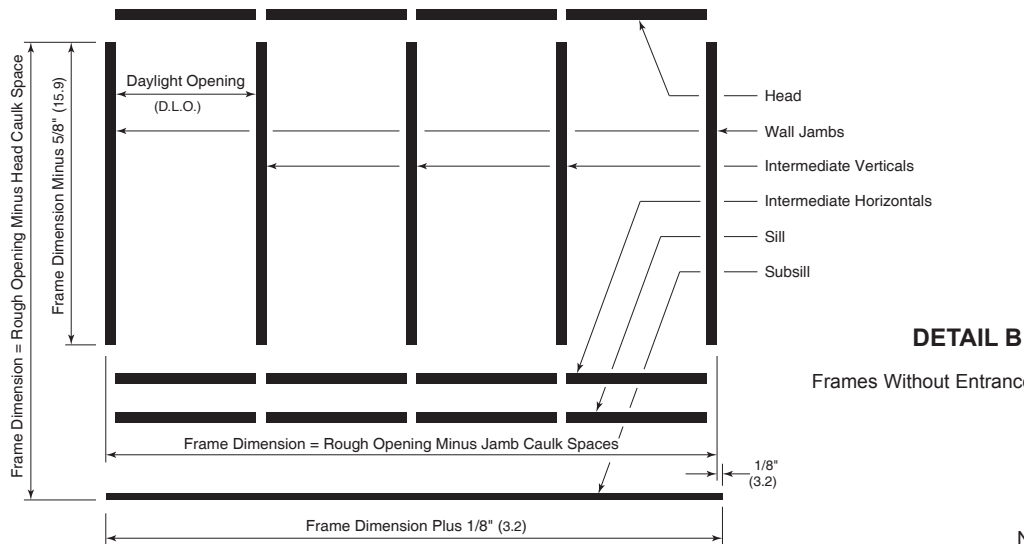
Vertical Length = Frame Dimension Minus 5/8" (15.9).

Horizontal Length = Daylight Opening.

Glass Stop Length = Daylight Opening Minus 1/32" (0.8).



DETAIL A
Frames With Entrance

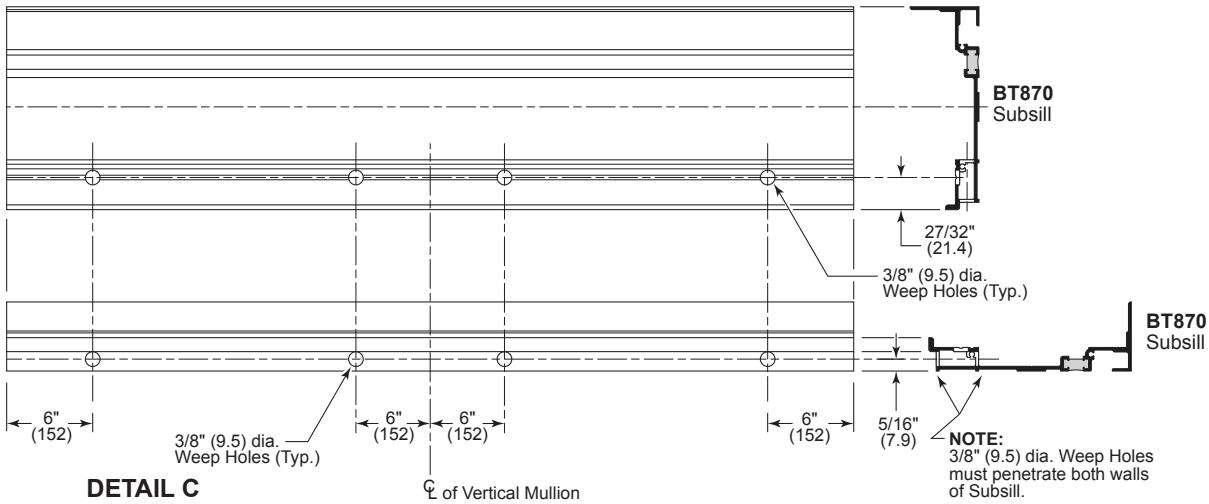


DETAIL B
Frames Without Entrance

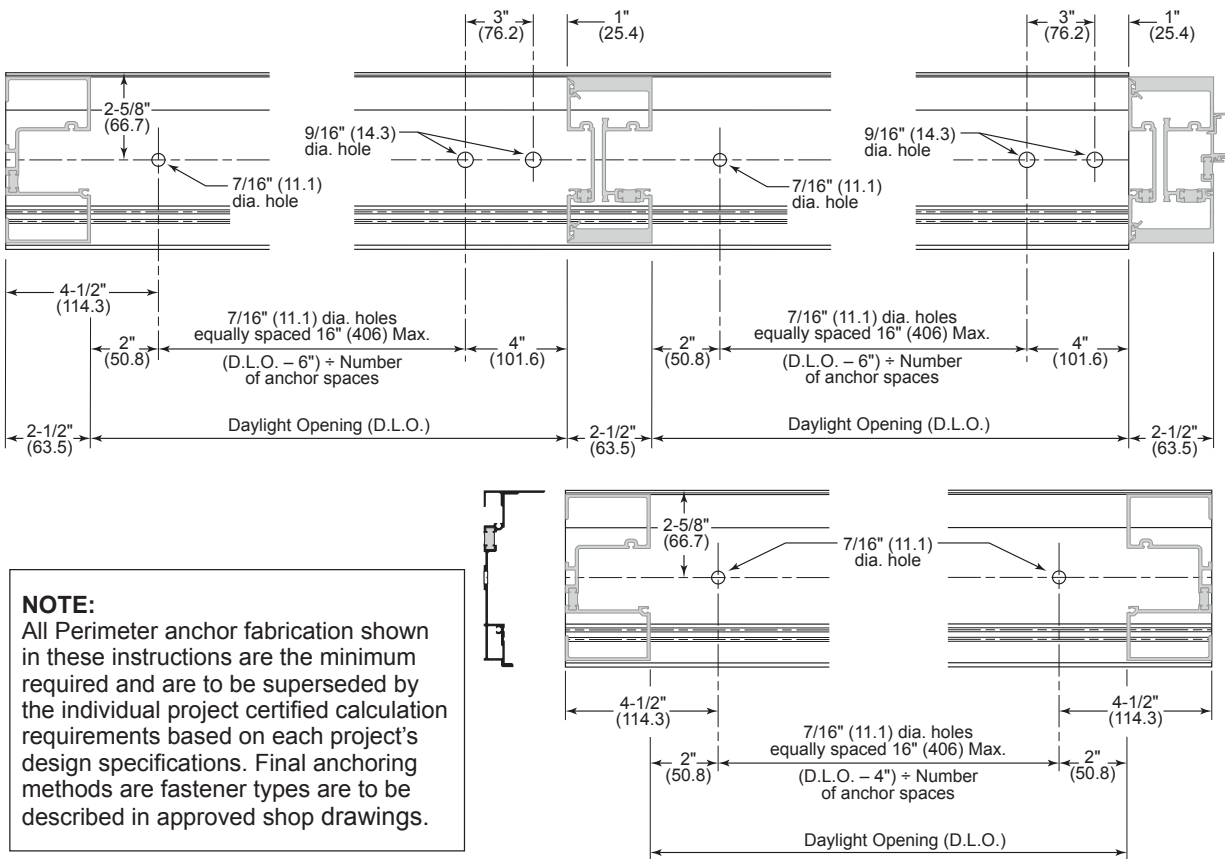
NOT TO SCALE

FABRICATION (continued)

- Fabricate Subsills for weep holes as **shown in DETAIL C**.
- Drill End Dam attachment holes as **shown in DETAIL C**. **NOTE: End Dams occur at wall jambs only.**



- Fabricate Subsills for anchor holes. **DETAIL D** shows base hole patterns. Final anchoring bolt types, spacings, and fabrication specifications, are to be project-determined and supersede these instructions. **See note below.**



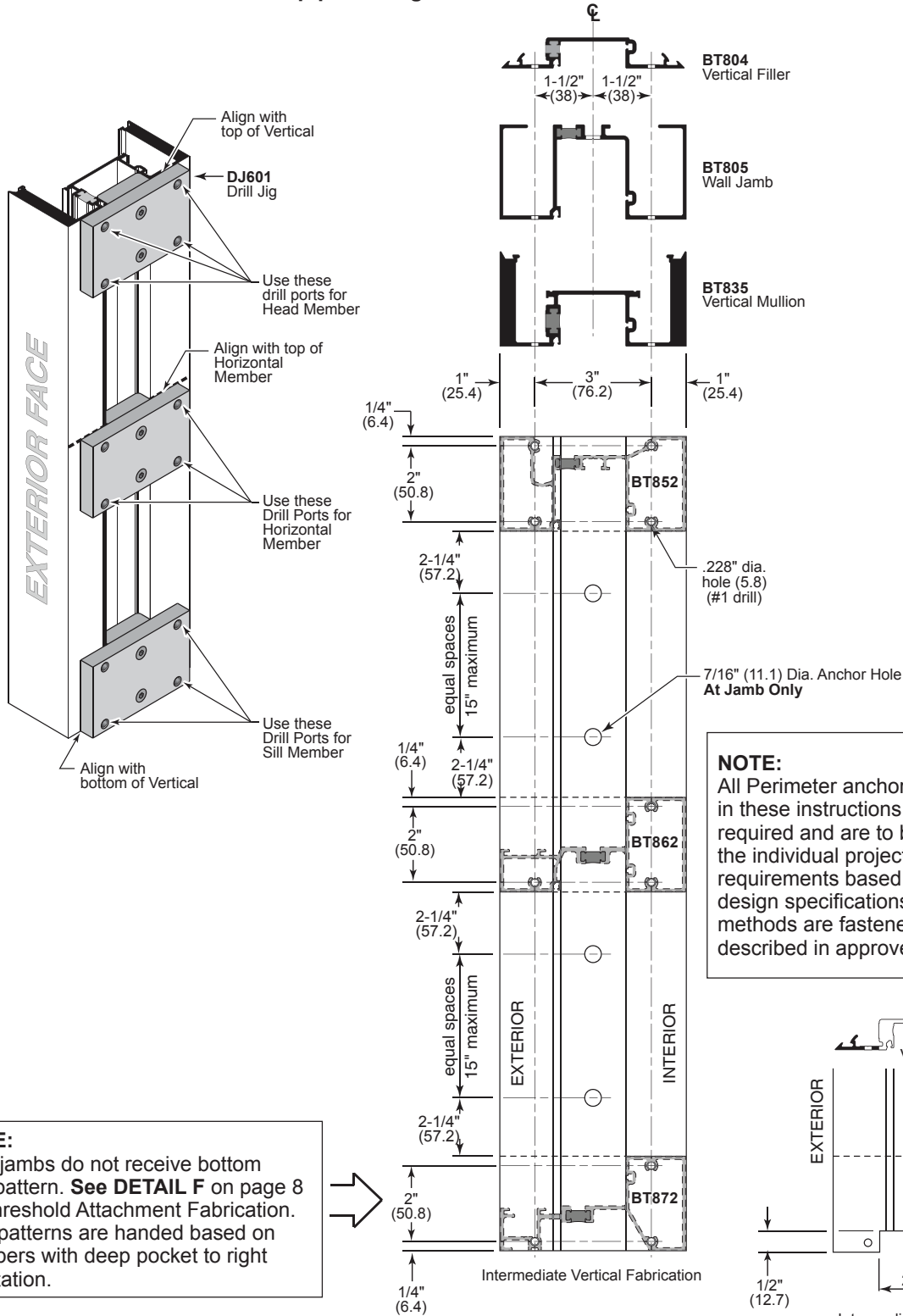
DETAIL D

NOT TO SCALE

FABRICATION (continued)

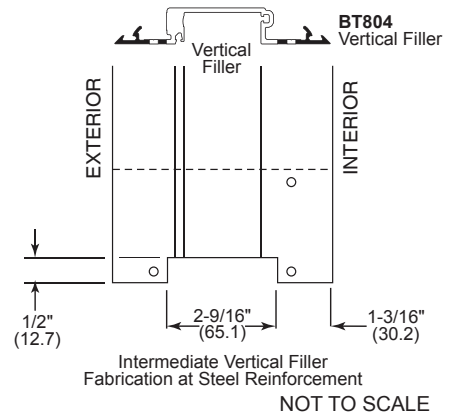
6. Fabricate vertical members for horizontal attachment. Drill attachment and access holes as **shown in DETAIL E**. Jamb members require anchor holes as **shown on DETAIL E**.

NOTE: Details shown with deep pocket right orientation.



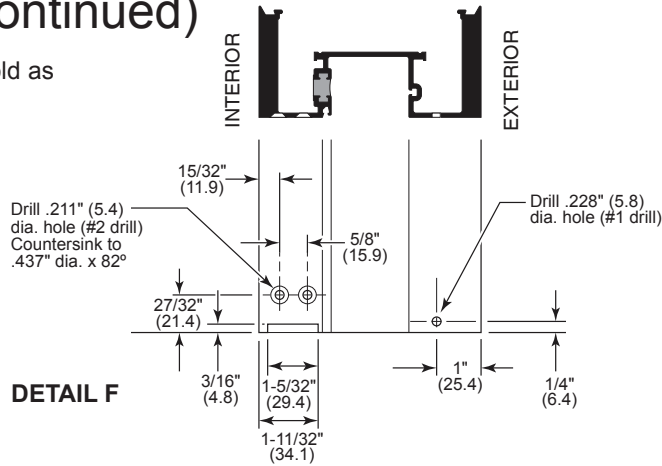
NOTE:
All Perimeter anchor fabrication shown in these instructions are the minimum required and are to be superseded by the individual project certified calculation requirements based on each project's design specifications. Final anchoring methods are fastener types are to be described in approved shop drawings.

NOTE:
Door jambs do not receive bottom hole pattern. See **DETAIL F** on page 8 for Threshold Attachment Fabrication. Hole patterns are handed based on members with deep pocket to right orientation.

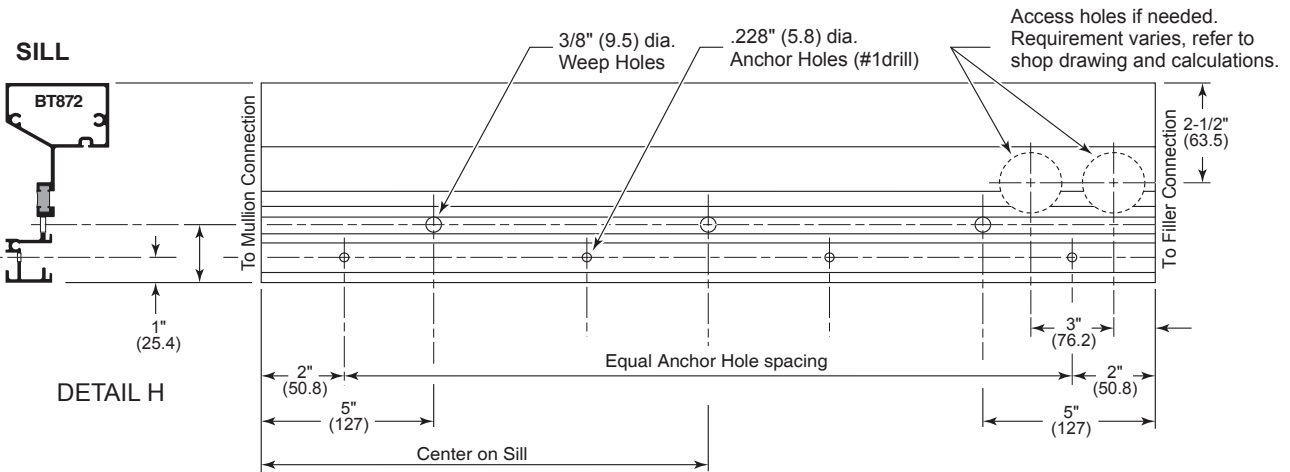
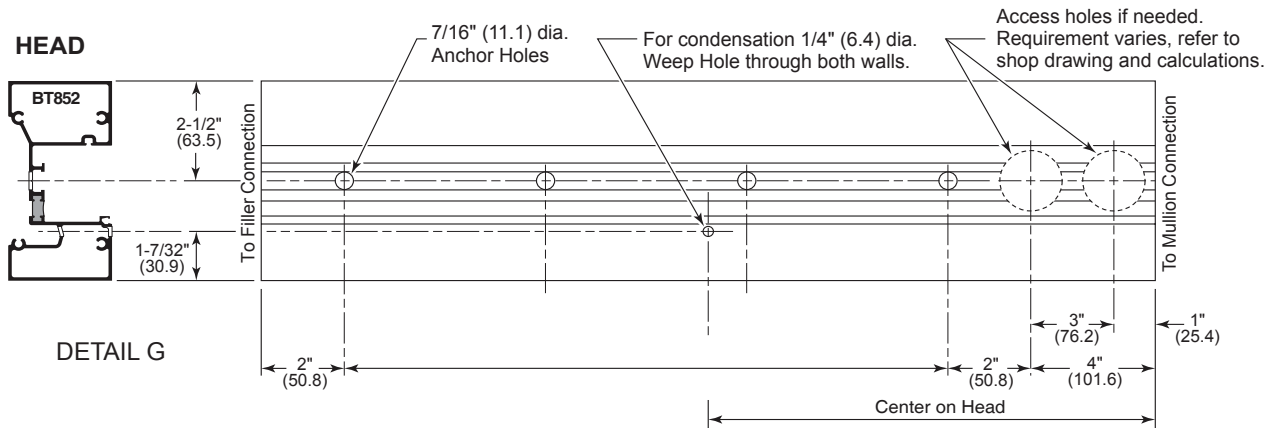


FABRICATION (continued)

7. Fabricate door jamb for threshold as shown in **DETAIL F**.



8. Fabricate head and sill members for anchor and weep holes as shown in **DETAILS G** and **H**.
Note: Hole patterns are handed based on mullion orientation. Coordinate handing is required.



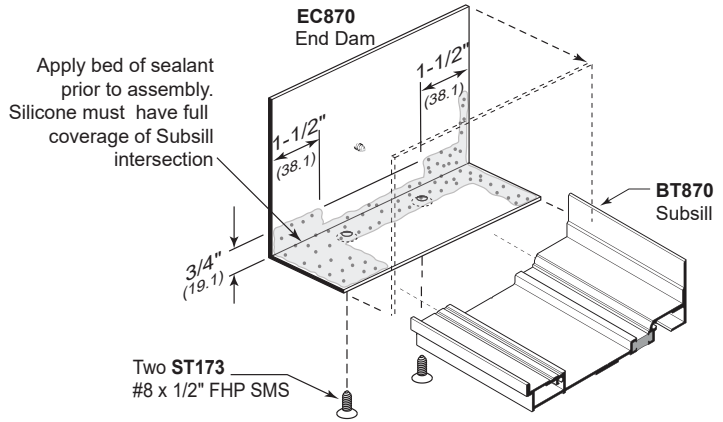
NOTE:
 All Perimeter anchor fabrication shown in these instructions are the minimum required and are to be superseded by the individual project certified calculation requirements based on each project's design specifications. Final anchoring methods and fastener types are to be described in approved shop drawings.

NOT TO SCALE

ASSEMBLY

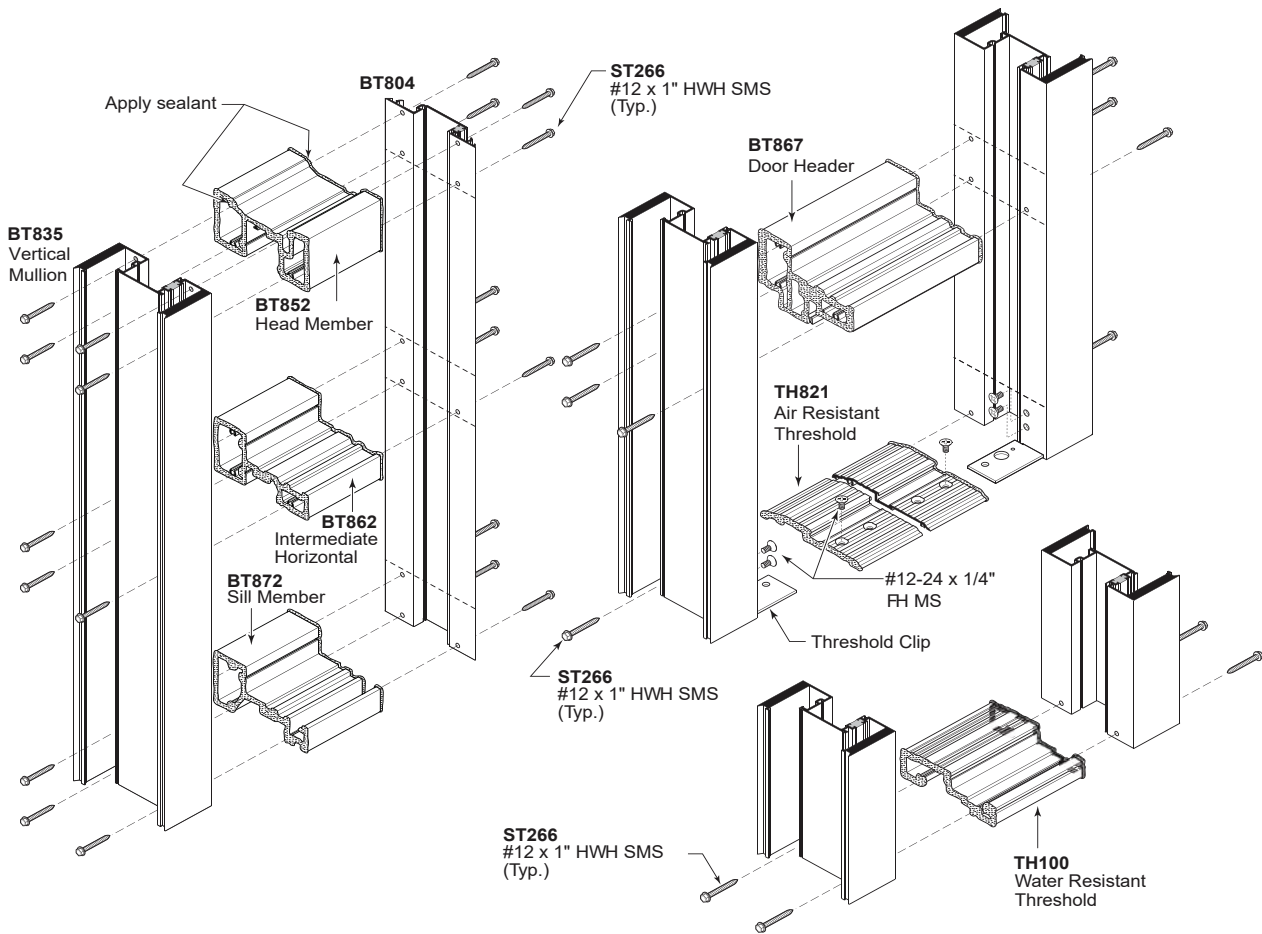
1. Clean ends of Subsills that are to receive End Dams.
Clean End Dams, apply sealant and install to ends of Subsill as shown in **DETAIL I**.

CRITICAL NOTE:
Before applying sealant, clean sealant surfaces with sealant manufacturer's recommended primer.



DETAIL I

2. Clean and apply sealant to ends of horizontals and thresholds. Attach horizontals to verticals using **ST266 #12 x 1 inch HWH SMS** screws. See **DETAIL J**. Clean excess sealant from exposed joints.

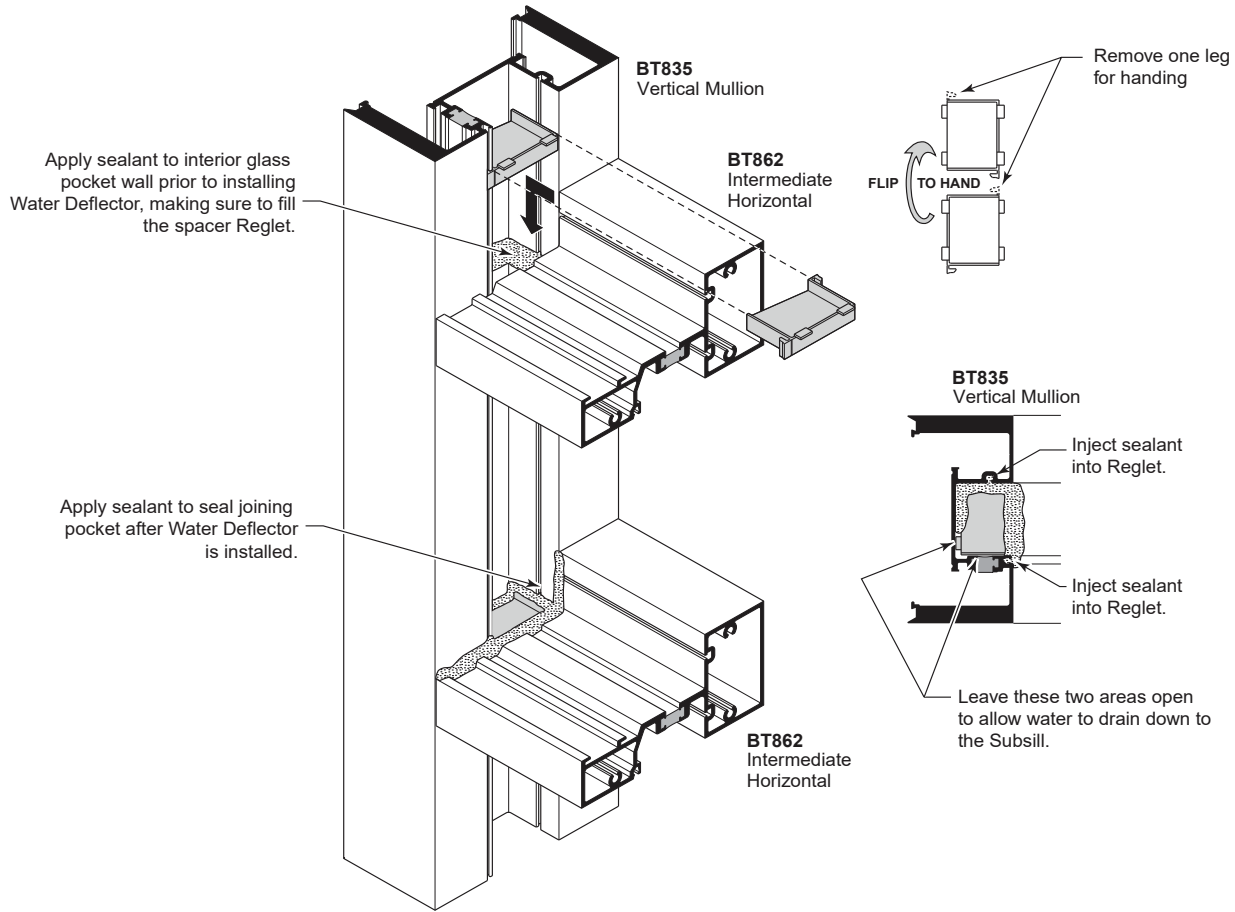


DETAIL J

NOT TO SCALE

ASSEMBLY (continued)

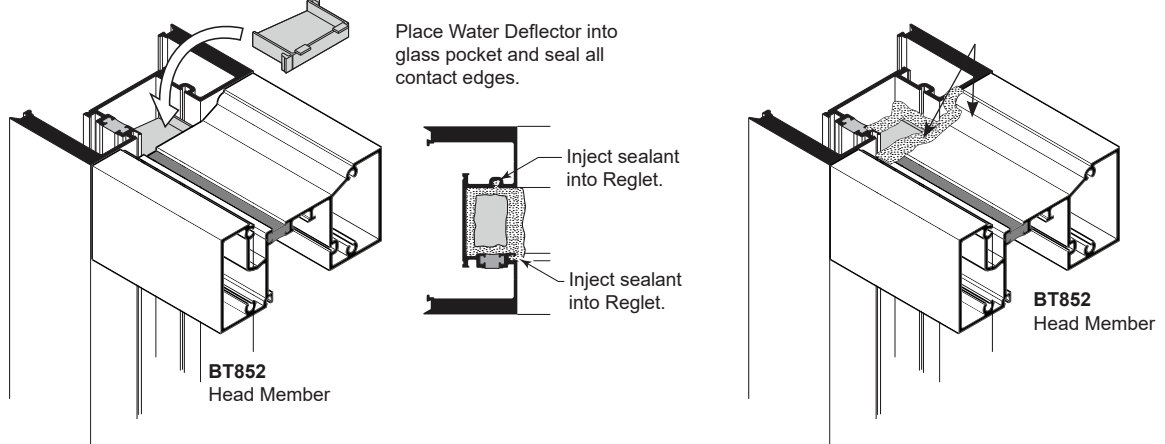
3. Install Water Deflectors into vertical glass pockets at vertical/horizontal intersections as **shown in DETAIL K**. Install Water Deflectors into vertical member at head as **shown in DETAIL L**. Apply silicone sealant as shown.



DETAIL K

Apply sealant to interior glass pocket wall prior to installing water deflector, making sure to fill the spacer reglet as **shown in DETAIL K**.

Thoroughly seal Horizontal to Vertical Joint.



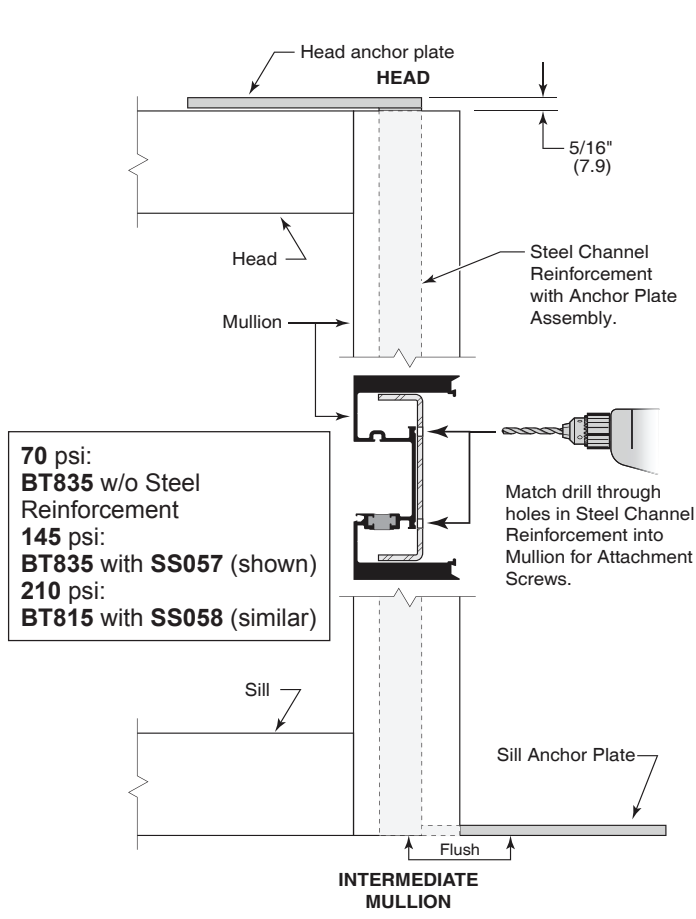
DETAIL L

NOT TO SCALE

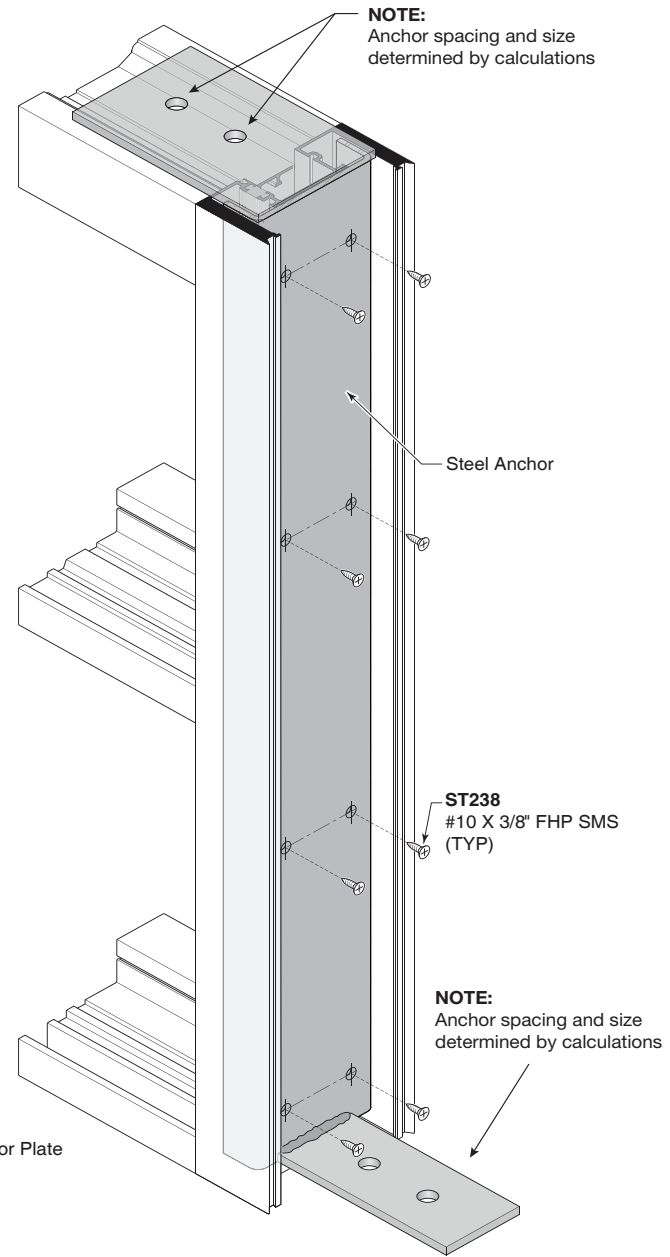
ASSEMBLY (continued)

Steel reinforcement can vary per project. Refer to approved shop drawings and certified project calculations for anchoring requirements. Coordinate head and sill fabrication (see page 8) with final steel design requirements.

4. Install steel anchor/reinforcement. Slide steel into mullion from top as **shown on DETAIL M**.
NOTE: Steel position is CRITICAL at sill. Steel over-hang should not exceed tolerances shown on DETAIL M.
5. Match drill through holes in steel reinforcement into mullion with #26 drill bit (.147" dia.) **See DETAIL M**.
6. Attach steel to mullion with **ST238 #10 x 3/8" FHP SMS**. **See DETAIL N**.



DETAIL M

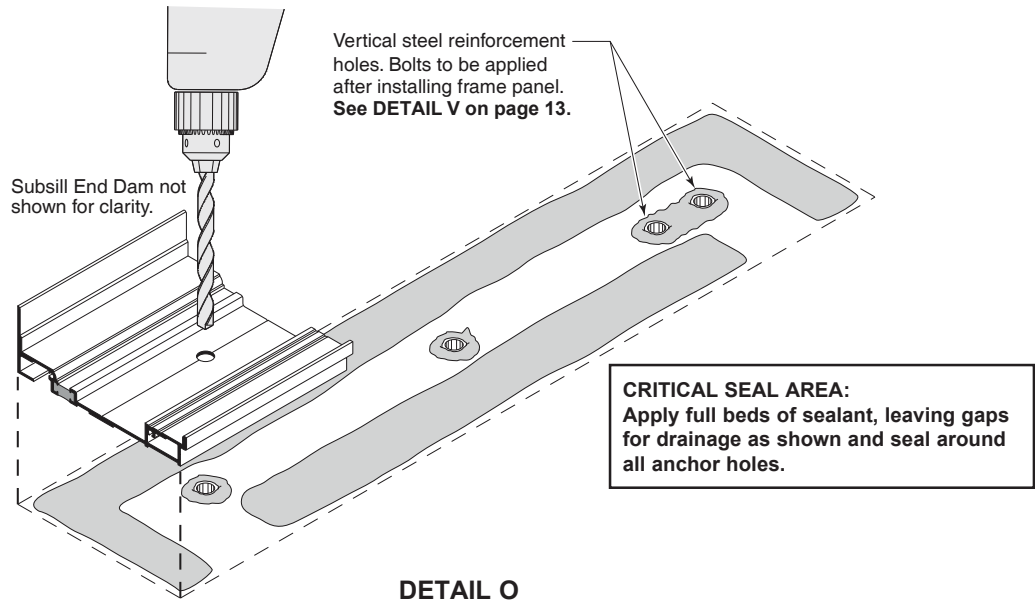


DETAIL N

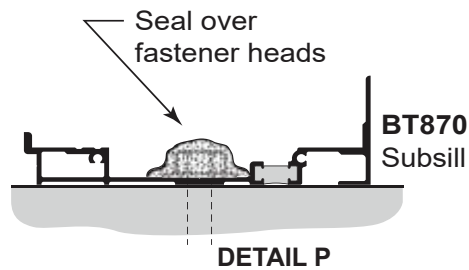
INSTALLATION

1. Place fabricated Subsill into opening allowing for jamb shim space and door frame. Match drill anchor holes using Subsill as template. Refer to shop drawings and calculations for bolt sizes and corresponding fabrications for bolts.
2. Remove Subsill, clean substrate. Apply full bed of sealant across both ends and full length of interior Subsill line. Run full bed of sealant across front area leaving a 3" (76.2) gap at each end as **shown in DETAIL O**.

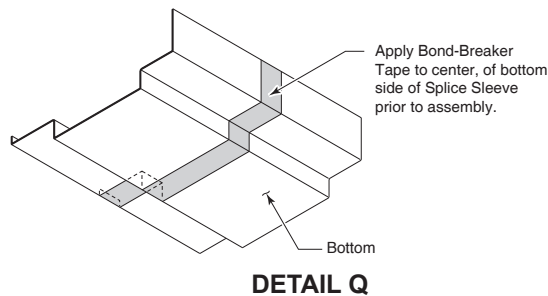
Note: Shim Subsill as required for leveling. Coordinate shim space dimension with vertical member cut lengths.



3. Replace Subsill into opening and anchor to substrate using required fasteners as described in approved shop drawings. Seal over all fastener heads as **shown in DETAIL P**.

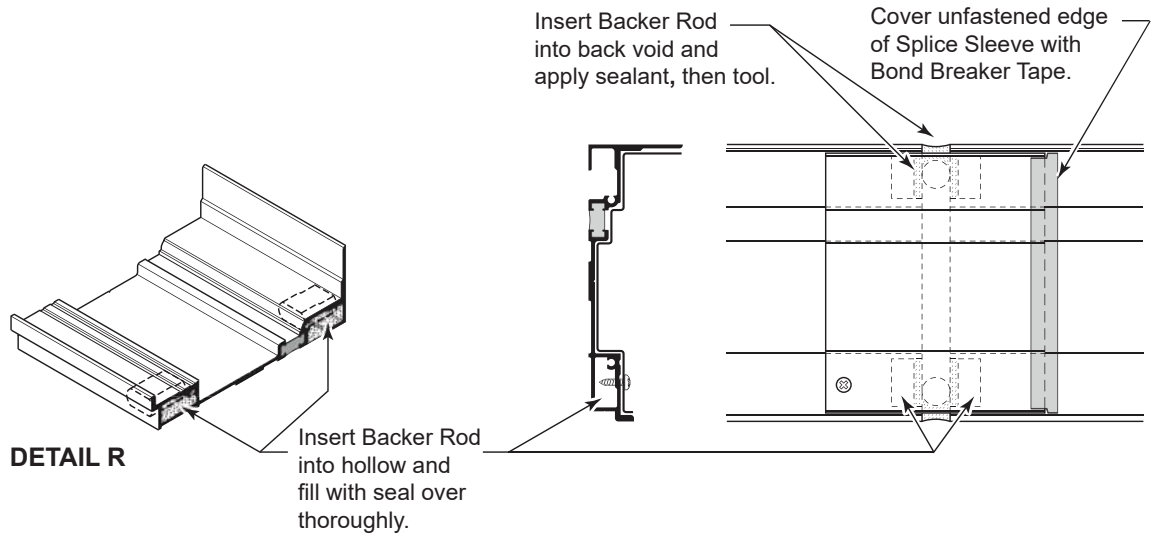


4. Subsill must be spliced for runs longer than 24' (731.5 cm). Apply 3/4" (19.1) wide Bond Breaker Tape across center of bottom side of Splice Sleeve as **shown in DETAIL Q**.

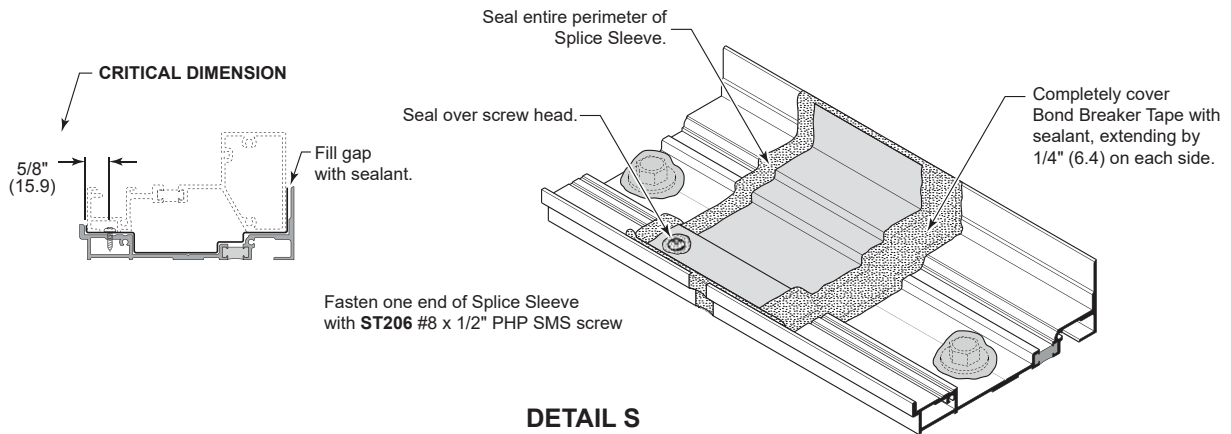


INSTALLATION (continued)

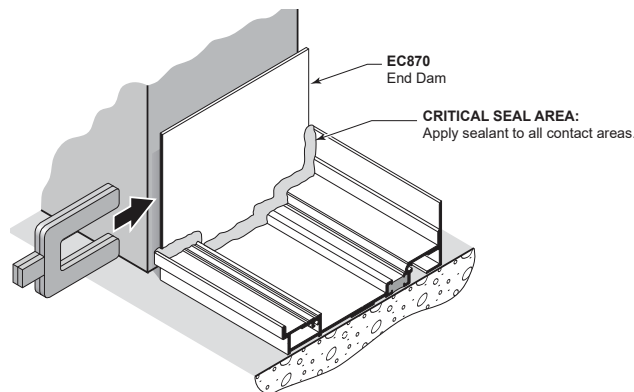
5. Insert backer rod into rectangular voids of Subsill ends and seal over as **shown in DETAIL R.**



6. Attach one side of splice sleeve to Subsill with **ST206 #8 x 1/2" PHP SMS**. Apply Bond Breaker Tape to unfastened end of splice sleeve as shown. Seal over tape, extending sealant 1/4" (6.4) each side of tape edges as **shown in DETAIL S.** Seal all remaining sleeve edges as shown.



7. Prior to installing first and last frame panels apply sealant to Subsill End Dam joints and screw tips. Tool sealant. Shim between End Dam and building. **See DETAIL T.**

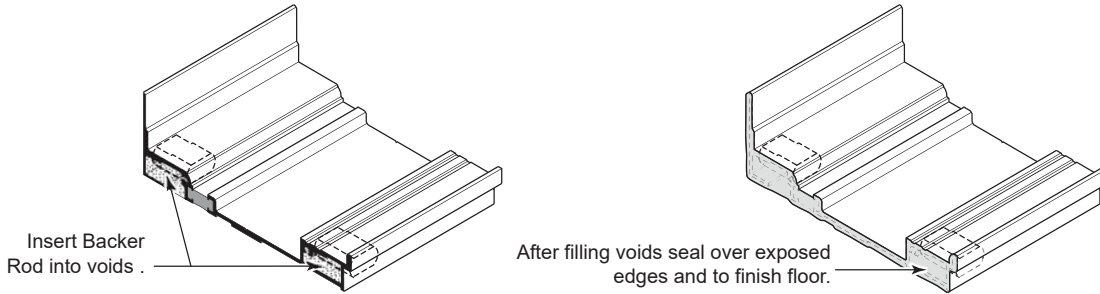


DETAIL T

NOT TO SCALE

INSTALLATION (continued)

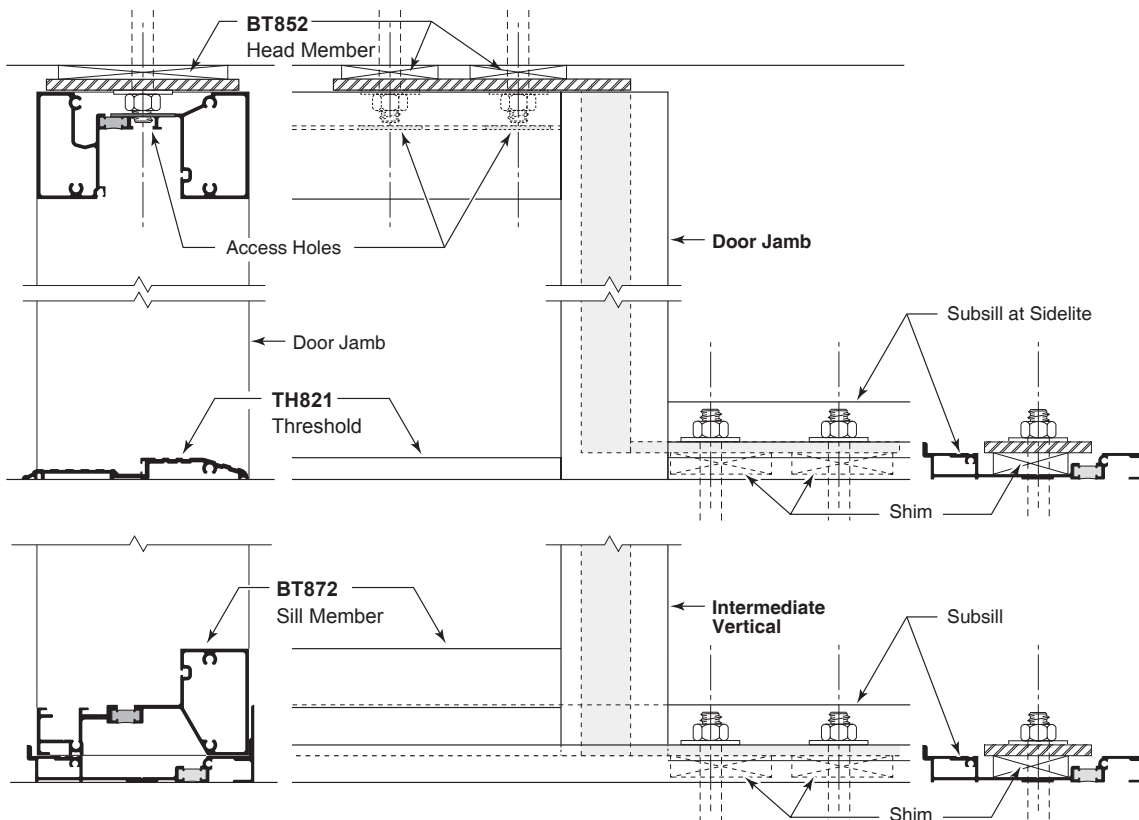
8. Seal ends of Subsill that abut door jambs as **shown in DETAIL U**.



DETAIL U

9. Install frame panels. **Door frame must be installed prior to sidelite panels. See DETAIL X on page 15** for erection sequence. Shim under steel reinforcement anchor plates as required. Anchor top and bottom steel reinforcement anchor plates with bolts indicated on shop drawings. **See DETAIL V.**

Steel reinforcement can vary per project. Refer to approved shop drawings and certified project calculations for anchoring requirements. Coordinate head and sill fabrication (see pg. 7) with final steel design requirements.



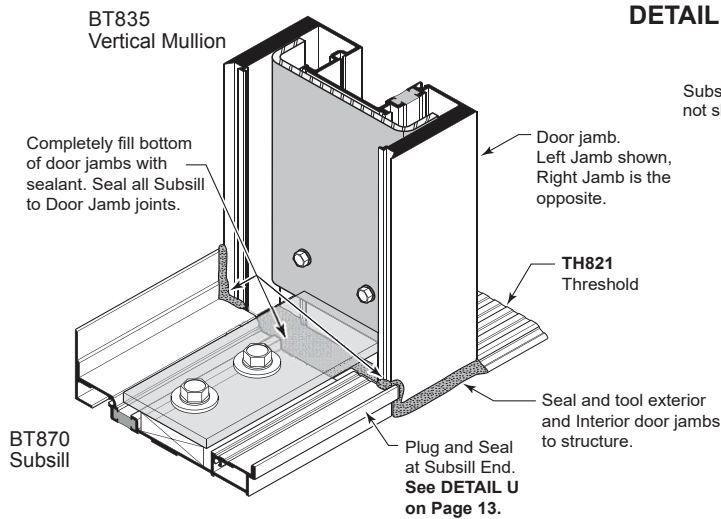
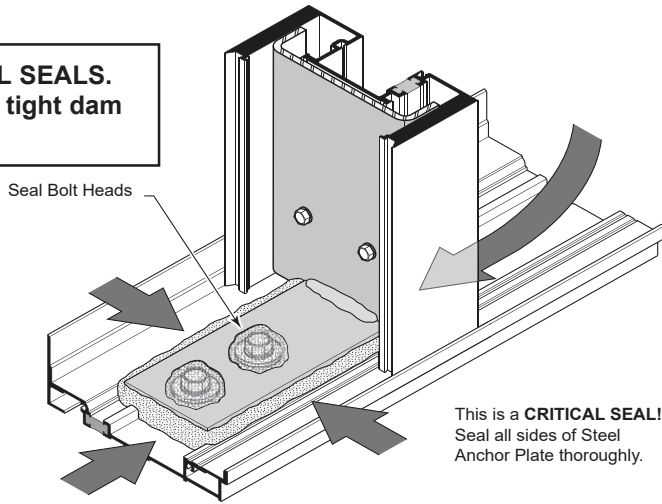
DETAIL V

NOT TO SCALE

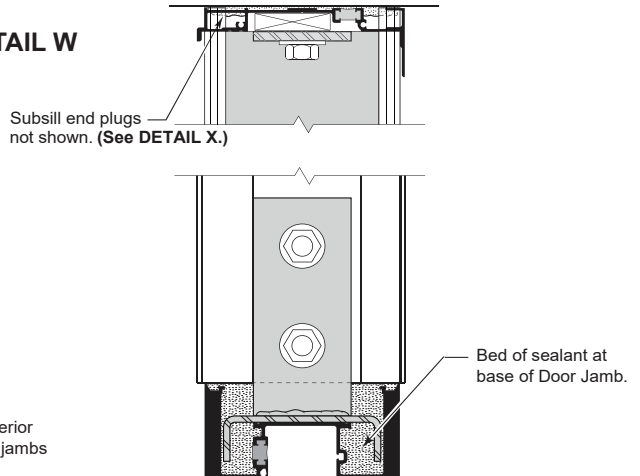
INSTALLATION (continued)

10. Seal the base of door jamb and edges of steel anchor plate. See **DETAIL W**.

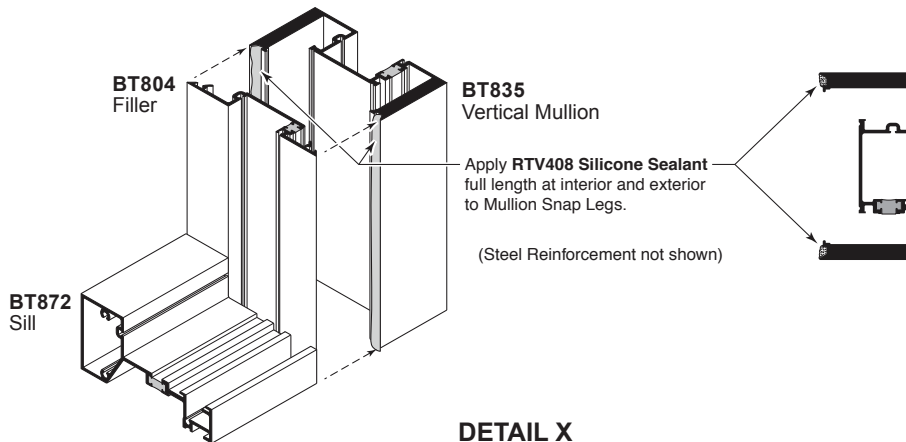
NOTE: These are CRITICAL SEALS.
Sealant must form a water tight dam
at base of door jamb.



DETAIL W



11. Apply a bead of **RTV408 Silicone Sealant** to interior and exterior snap legs as shown in **DETAIL X**.

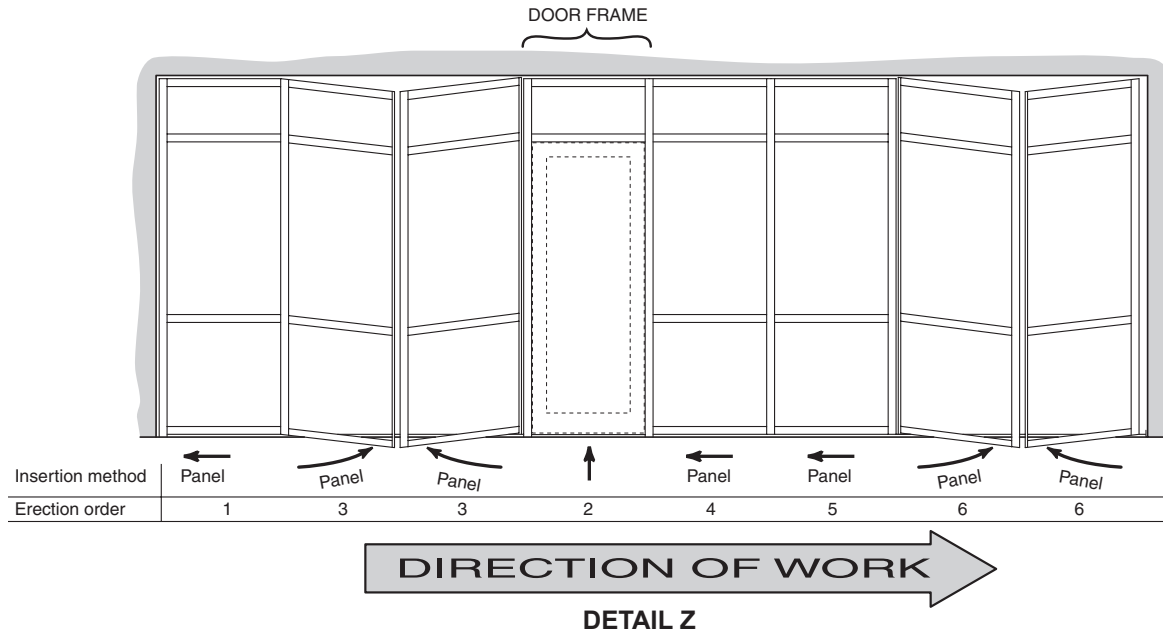


DETAIL X

NOT TO SCALE

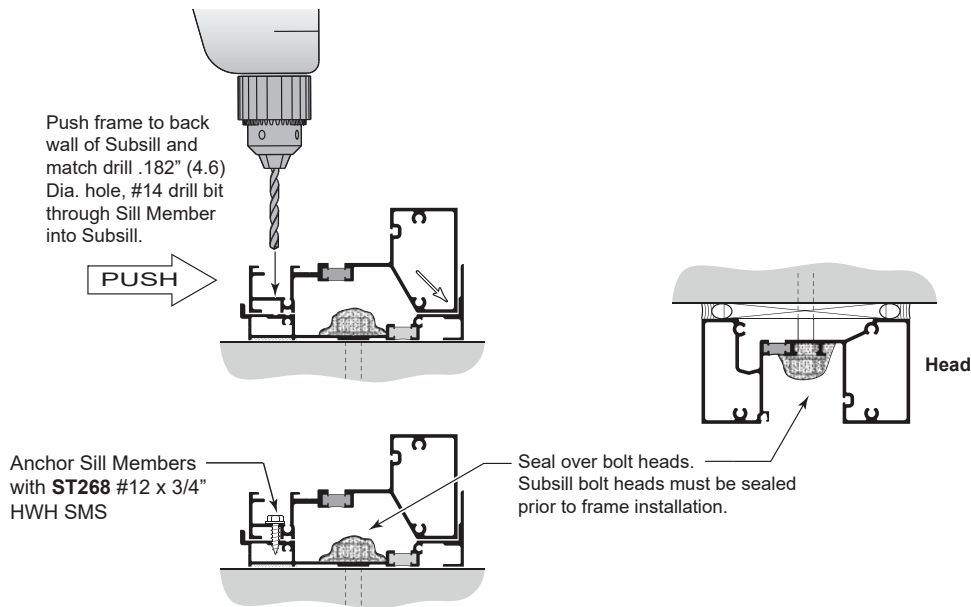
INSTALLATION (continued)

DETAIL Z below is an example of the erection order.



12. Install assembled frame panels into opening starting at left jamb, shimming for proper caulk spaces. Match drill through anchor holes in sill into Subsill as **shown in DETAIL AA**. Attach sill to Subsill with **ST268 (#12 x 3/4" HWH SMS)**. Shim at anchor locations and fasten jamb and head member to building. Install next panels in left-to-right sequence, anchoring each panel in place. Last bays and panels adjacent to installed door frame require "accordion" method to clear end dams and snap legs.

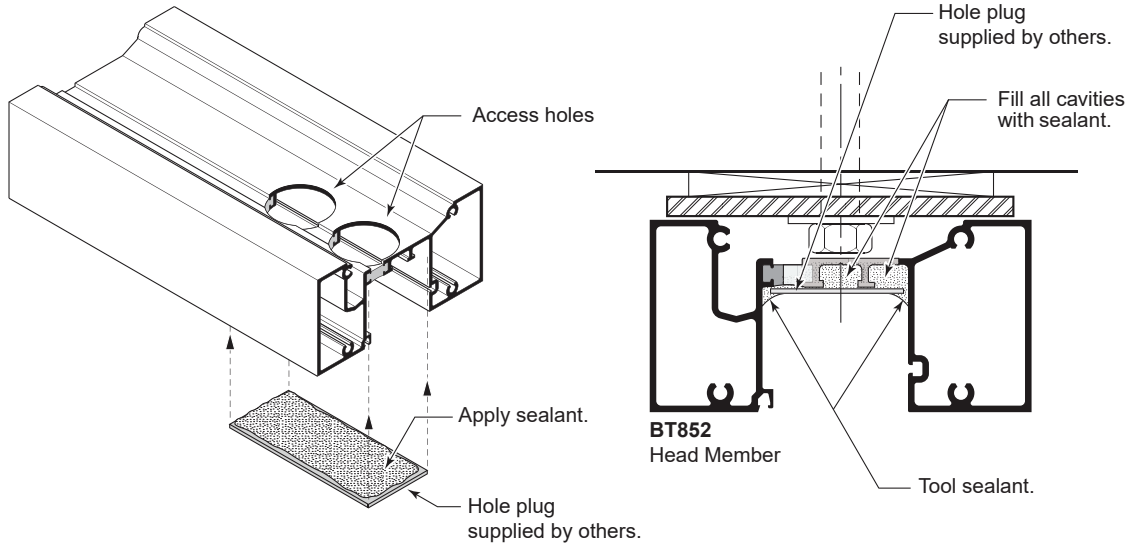
13. Seal over fastener heads at head and jamb members as **shown in DETAIL AA**.



DETAIL AA

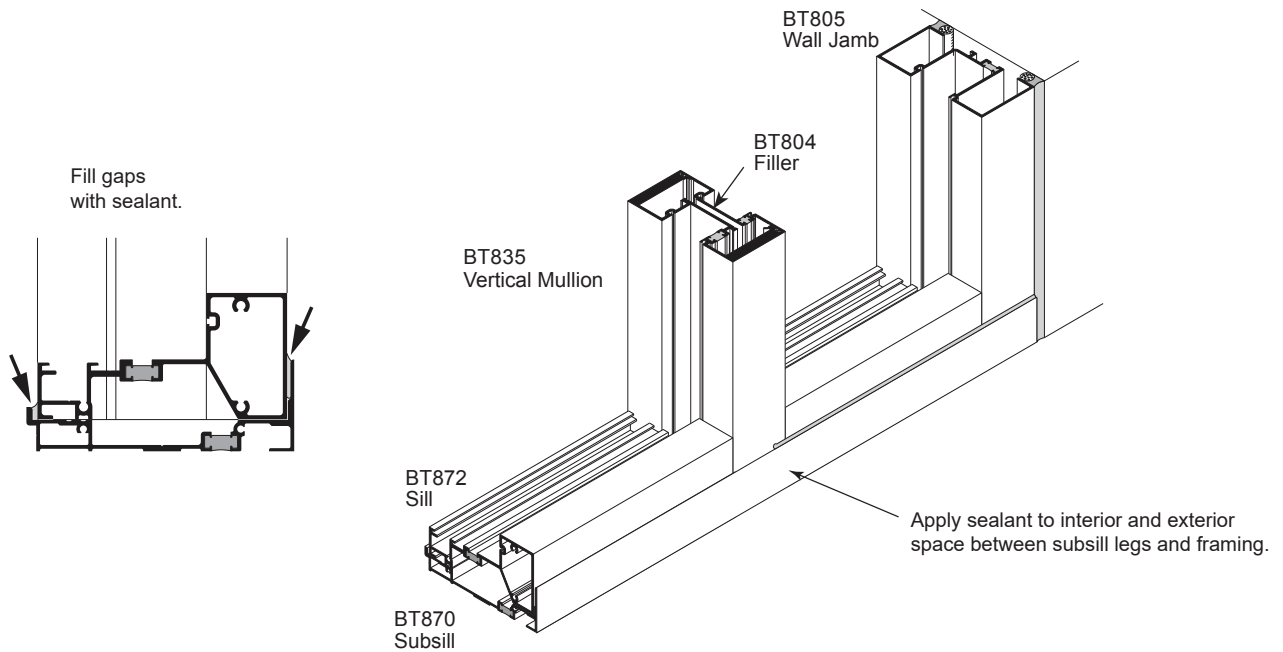
INSTALLATION (continued)

14. Apply full bed of sealant to access hole cover, press onto surface to cover both holes. Tool sealant.
See **DETAIL BB**.



DETAIL BB

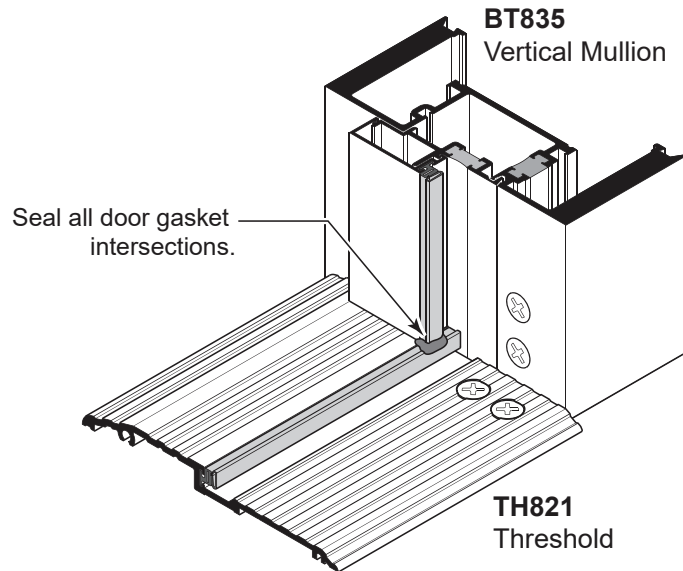
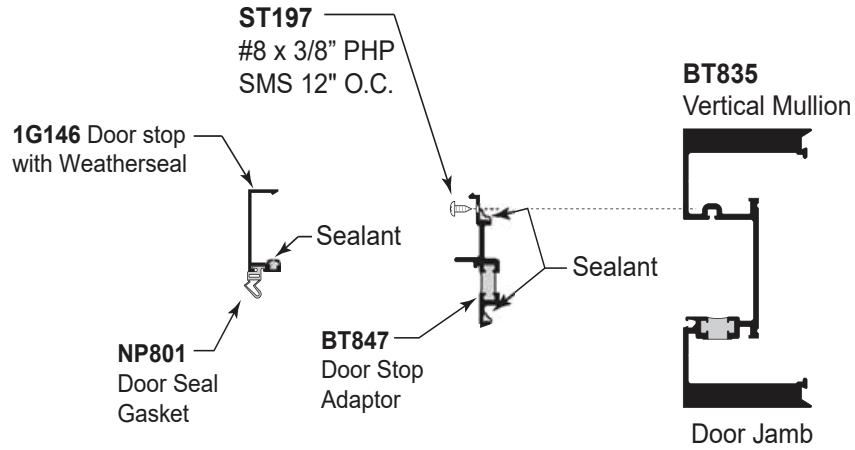
15. Install backer rod and apply sealant to interior and exterior frame perimeter at head and jambs.
16. Inject a bead of sealant into exterior and interior reveals of Subsill and sill members as **shown in DETAIL CC**.



DETAIL CC

INSTALLATION (continued)

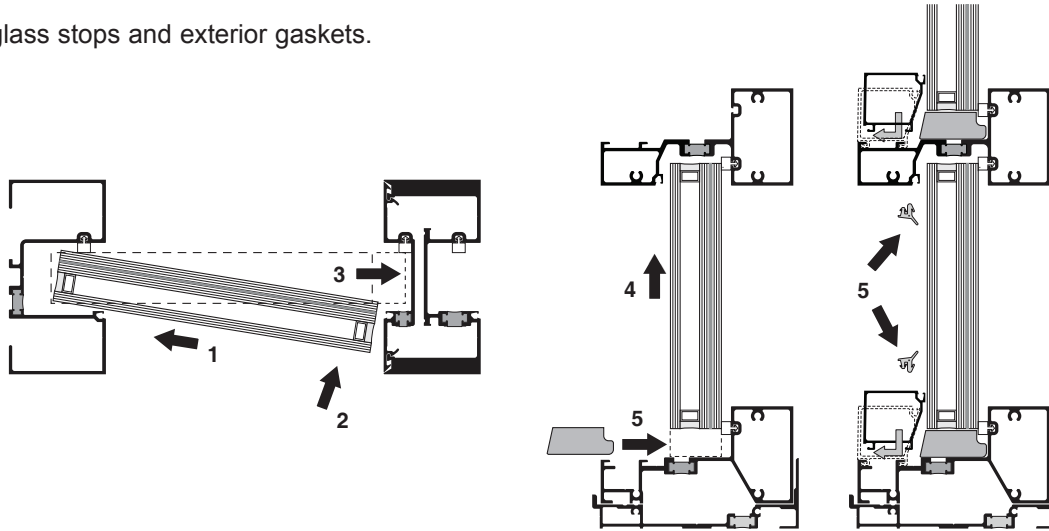
17. Lace gaskets into Door Stops, leaving 1/8" (3.2) extension past each end to ensure a tight joint with connecting gaskets.
18. Attach Door Stop Adaptors to door jambs with **ST197 #8 x 3/8" PHP SMS 12" O.C.** from each end and 12" O.C., and then snap on door stops. Apply sealant to Door Stop Adaptor and Door Stop as **shown on DETAIL DD**.



DETAIL DD

GLAZING

1. Clean glazing areas of frames that will come in contact with structural silicone.
2. Install spacer gaskets and setting blocks. Locate setting blocks at quarter points or as directed by approved shop drawings.
3. Clean surfaces of glass that will come in contact with structural silicone. **DO NOT ALLOW CLEANING SOLUTION TO COME IN CONTACT WITH LAMINATE AT EDGE OF GLASS.**
4. Install glass as **shown in DETAIL EE**. Center glass in opening. It is recommended to mark edges of glass to gauge proper glass bite. **PROPER GLASS BITE OF 9/16" (14.3) IS CRITICAL.**
5. Install glass stops and exterior gaskets.

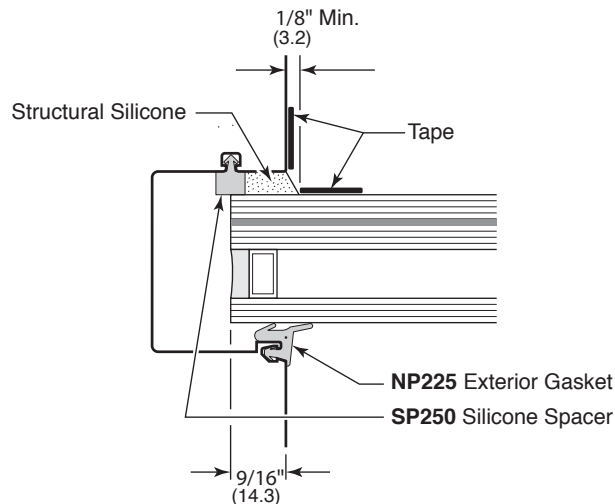


DETAIL EE

6. Mask off aluminum at edge of glass pocket and mask glass 1/8" (3.2) from the edge of aluminum as **shown in DETAIL FF**.
7. Apply structural silicone, tool, and remove tape. Use caution in removing tape to avoid marring tooled silicone. **Follow the manufacturer's recommendations for cure times.**

NOTE: Always follow structural silicone manufacturer's instructions and recommendations for surface preparation and silicone application.

NOTE:
It's critical that structural sealant be injected full depth of void for proper adhesion.



DETAIL FF

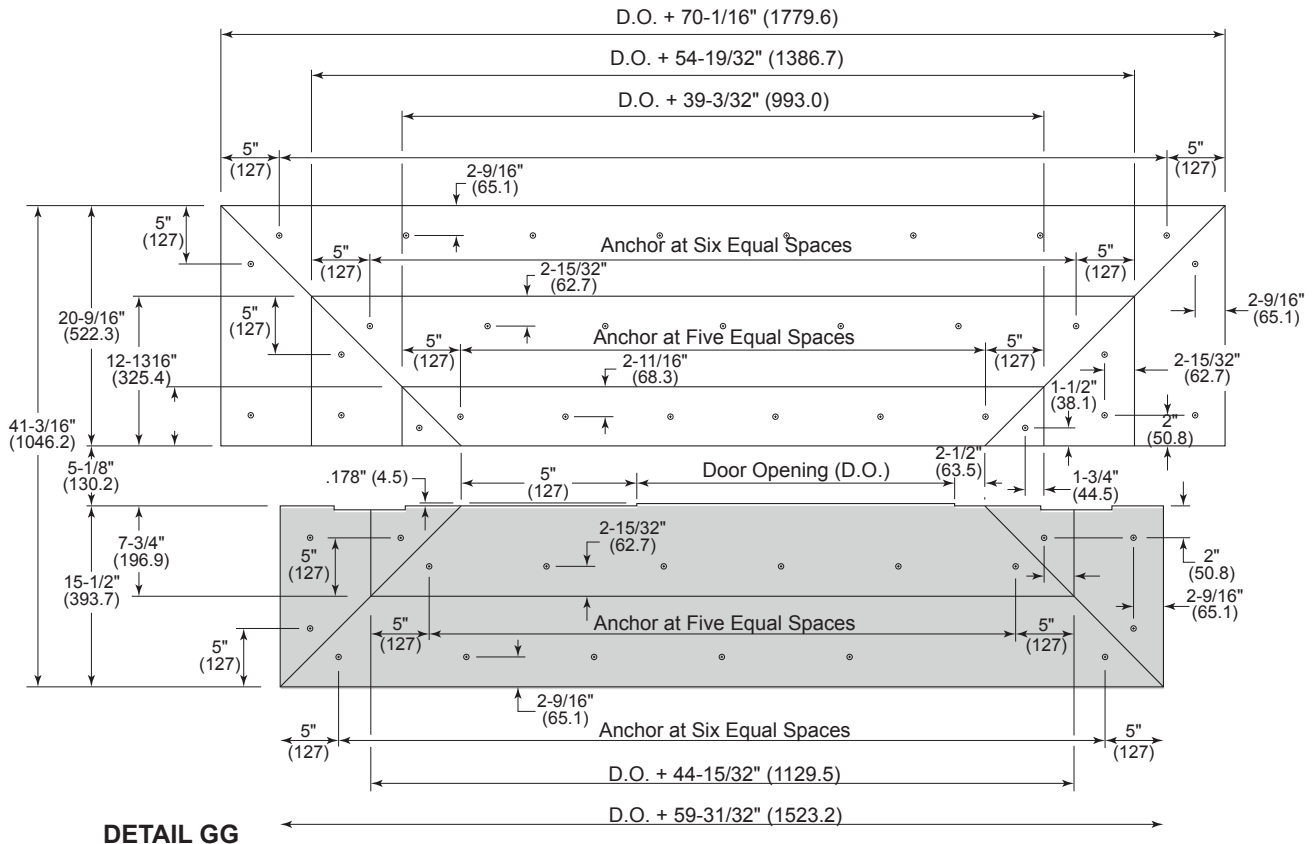
NOT TO SCALE

FABRICATION / INSTALLATION

a.d.a. threshold ramp fabrication layout

Door frames with **TH800** Thresholds require A.D.A. threshold ramps. The dimensions given are for reference only. Field measuring may be required to achieve proper miter joint alignment. Special consideration will be required for unlevel concrete conditions at entrance locations. Shimming under the small return end pieces may be required for proper leveling.

1. Cut pieces to length. **See DETAIL GG** for single doors.
2. Drill .221" Dia. Holes and countersink at .437" (11.1) X 82° for anchoring as shown. Anchor holes are shown with equal spacing and should not exceed 18" (457) O.C.

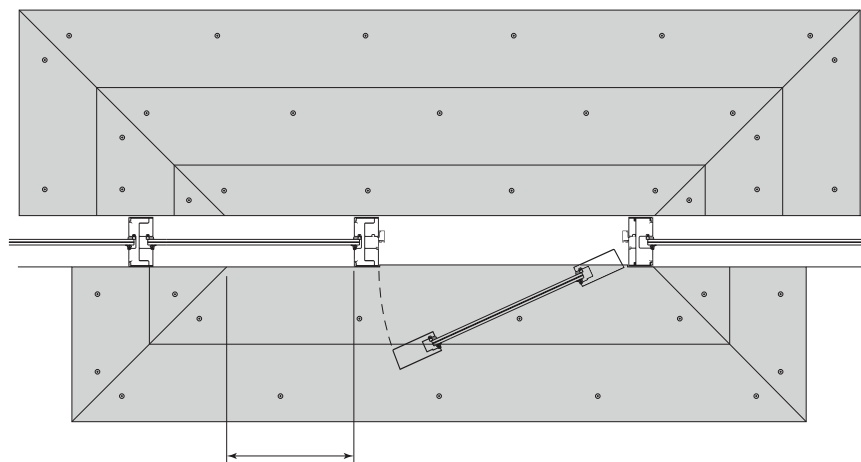


DETAIL GG

NOTE:

Ramps for single doors must extend 24" (609.6) beyond outside edge of lock jamb for approach access.

DETAIL HH shows hinge right layout with lock jamb to left.

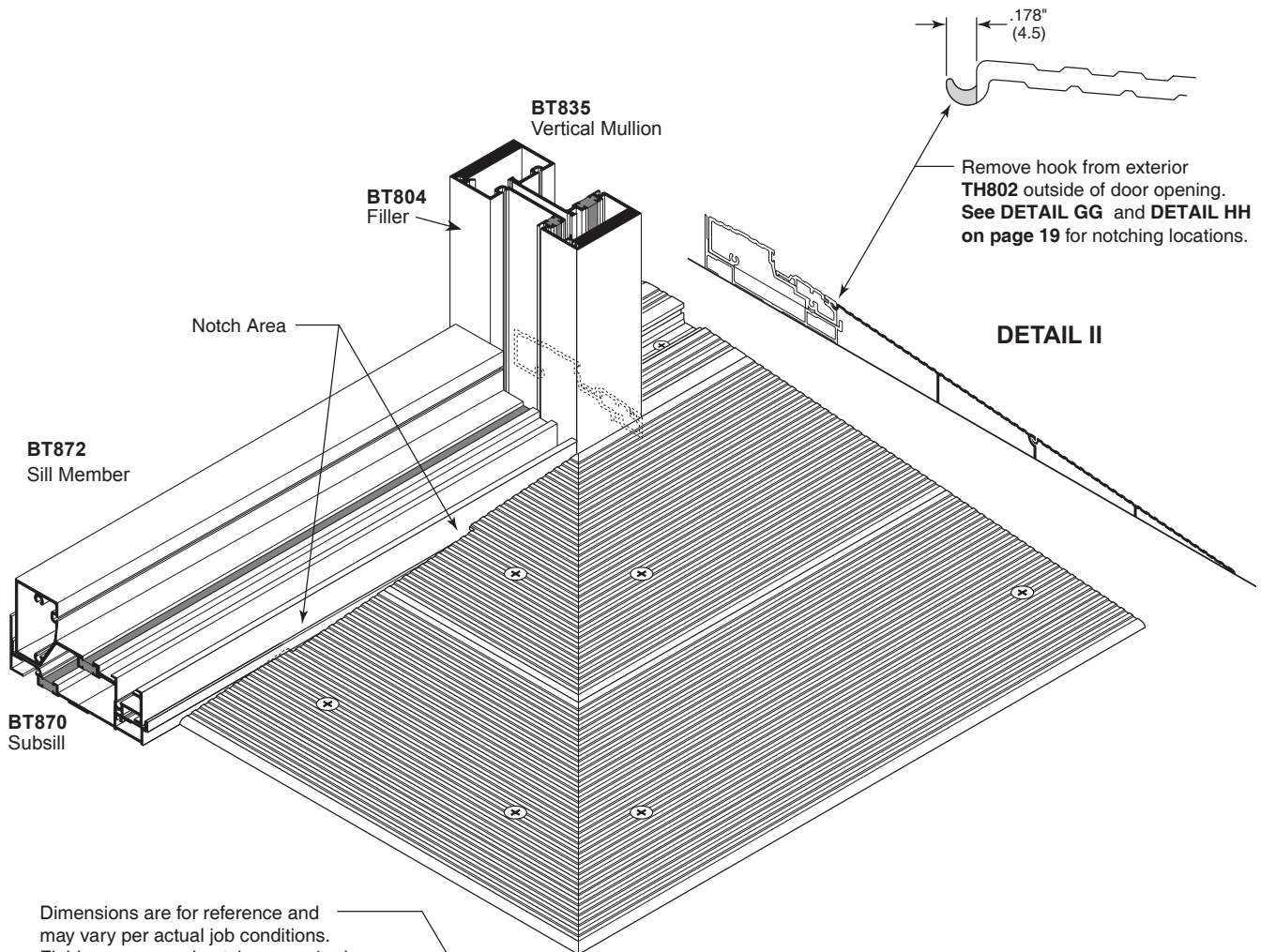


24" (609.6) Min.
from edge of lock jamb

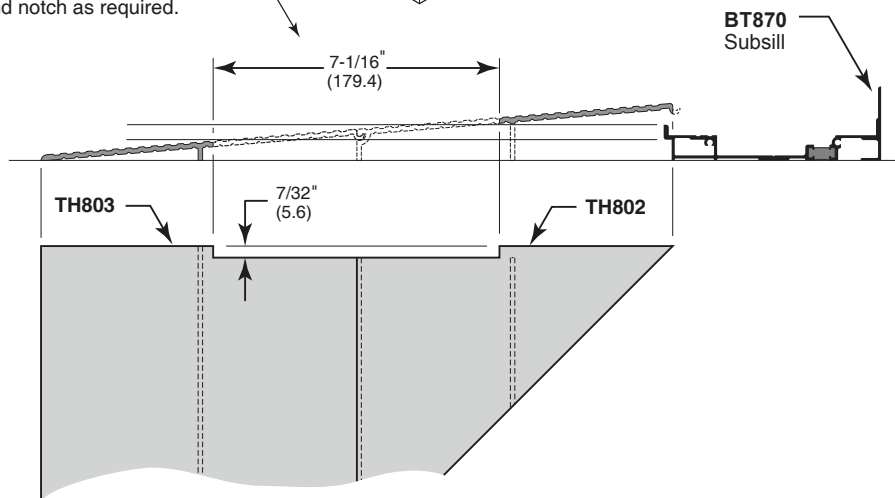
NOT TO SCALE

FABRICATION / INSTALLATION (continued)

3. Notch hook and exterior end pieces to clear frame components as shown in **DETAILS II** and **JJ**.



Dimensions are for reference and may vary per actual job conditions. Field measure and notch as required.



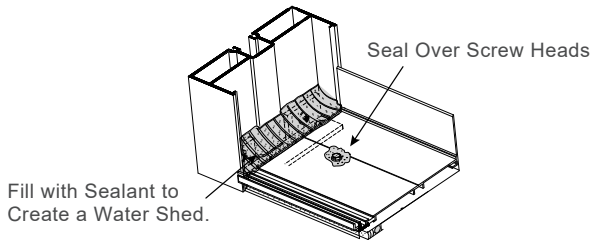
GUIDE TO SEALANTS

NOTE: All sealants must be tooled to ensure proper adhesion.

WATERPROOFING

• Typical Weather Sealant

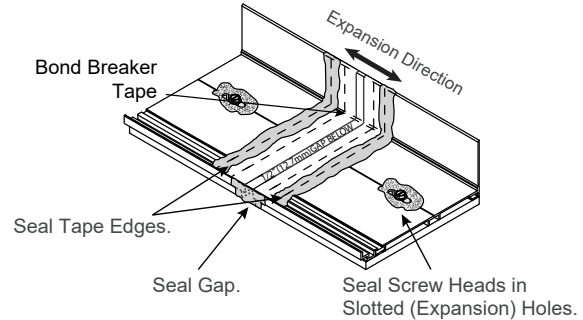
Sill to Subsill, End Dams, Screw Heads, and Threshold to Door Frame Sealing.



EXPANSION

• Typical Weather Sealant

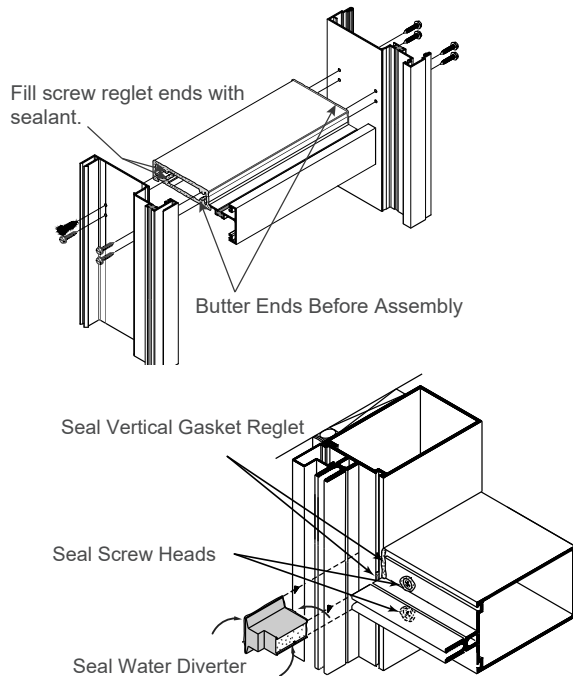
Expansion Joints.



JOINT ADHESIVE

• Typical Weather Sealant

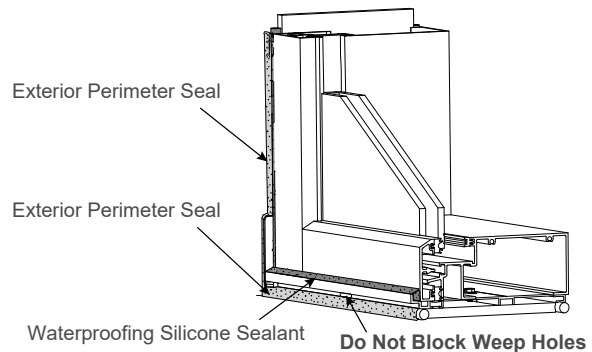
Small Joints, End Joints and Buttered Surfaces, Water Diverters, End Dams and Reglet Fills.



PERIMETER

• Typical Weather Sealant

Perimeter Seals, Expansion Joints, Sill and Threshold Beds, Concrete, Wood, and Steel Openings.



STRUCTURAL

• ALL STRUCTURAL SEALANTS REQUIRE TESTING AND APPROVAL.

Glass-to-Glass or Glass-to-Metal