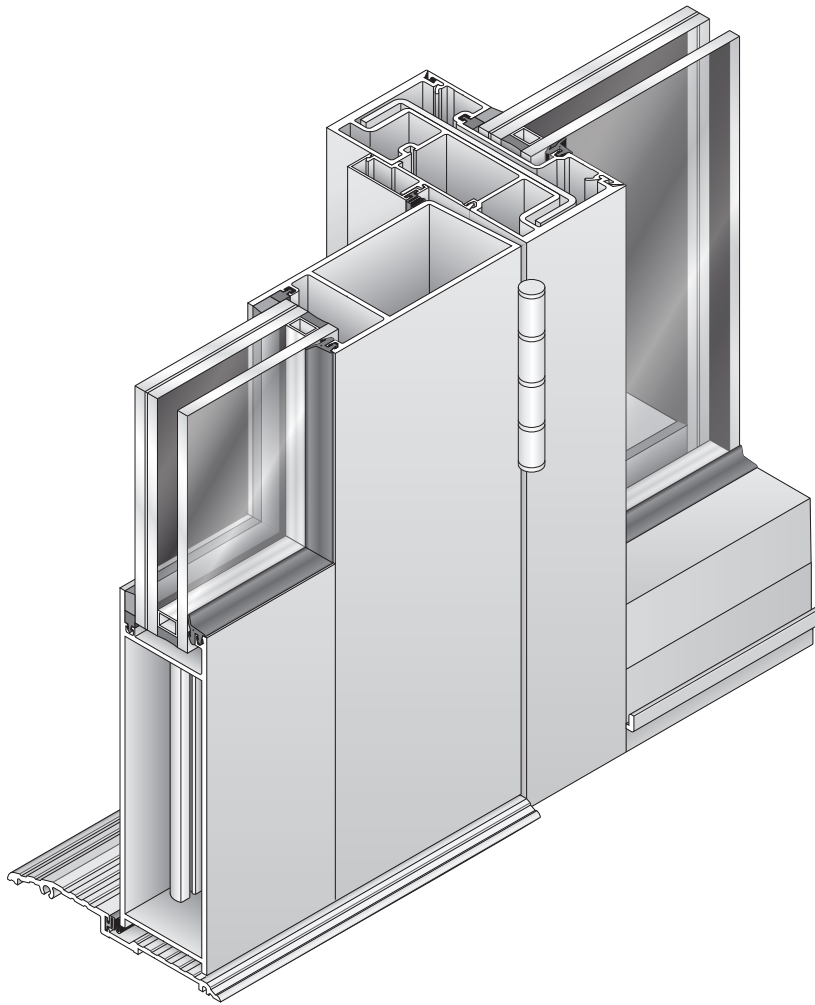


# INSTALLATION INSTRUCTIONS

# THE DEFENDER SERIES

## BR604 BLAST RESISTANT STOREFRONT



---

Phone: (800) 262-5151 • Fax: (866) 262-3299  
crlaurence.com • usalum.com • crl-arch.com

---

# 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.

**A. 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.

**B. CHECK ARRIVING MATERIALS.**

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

**C. KEEP MATERIALS AWAY FROM WATER, MUD, AND SPRAY.**

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

**D. 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.

# 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. **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.
4. **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.
5. **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.
6. **ISOLATION OF ALUMINUM.** Aluminum to be placed in direct contact with uncured masonry or incompatible materials should be isolated with a heavy coat of zinc chromate or bituminous paint.
7. **SEALANTS.** Sealants must be compatible with all materials with which they have contact with (full or incidental), including other sealant surfaces. It is the sole responsibility of the glass company to consult the sealant manufacturer for recommendations regarding joint size, shelf life, compatibility, cleaning, priming, tooling, adhesion, etc. 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. ***This is required on every project.***
8. **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.
9. **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.
10. **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.
11. **WATER HOSE TEST.** As soon as a representative amount of the wall has been glazed (500 square feet or 46.5 m<sup>2</sup>) a water hose test should be conducted in accordance with AAMA 502-08 specifications to check the installation. On all jobs the hose test should be repeated every 500 square feet (46.5 m<sup>2</sup>) during the glazing operation.
12. **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.).
13. **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.
14. **JOB SITE ESSENTIALS.** See pages 20 and 21.

# 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:

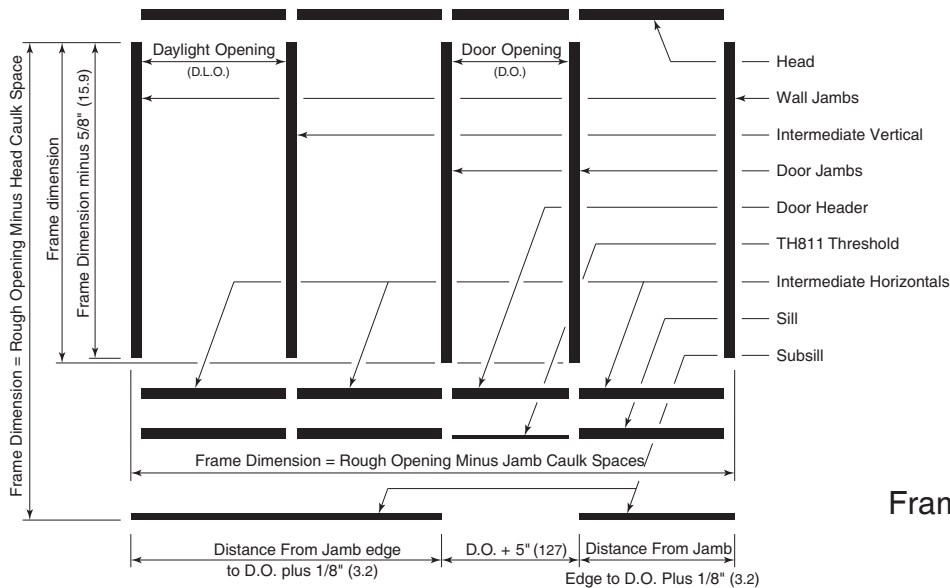
Subsill length is determined by entrance locations. Subsill butts to door jambs. Determine last bay installation and allow 1/8" (3.2) additional length to subsill. **See Detail A.**

**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.**

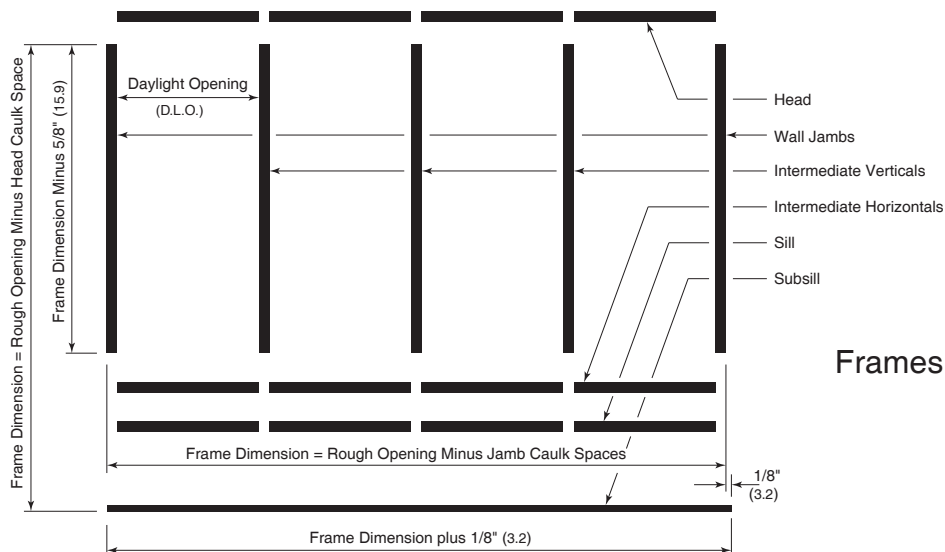
**Vertical Length** = Frame Dimension Minus 5/8" (15.9).

**Horizontal Length** = Day Light Opening.

**Glass Stop Length** = Day Light Opening Minus 1/32" (0.8).



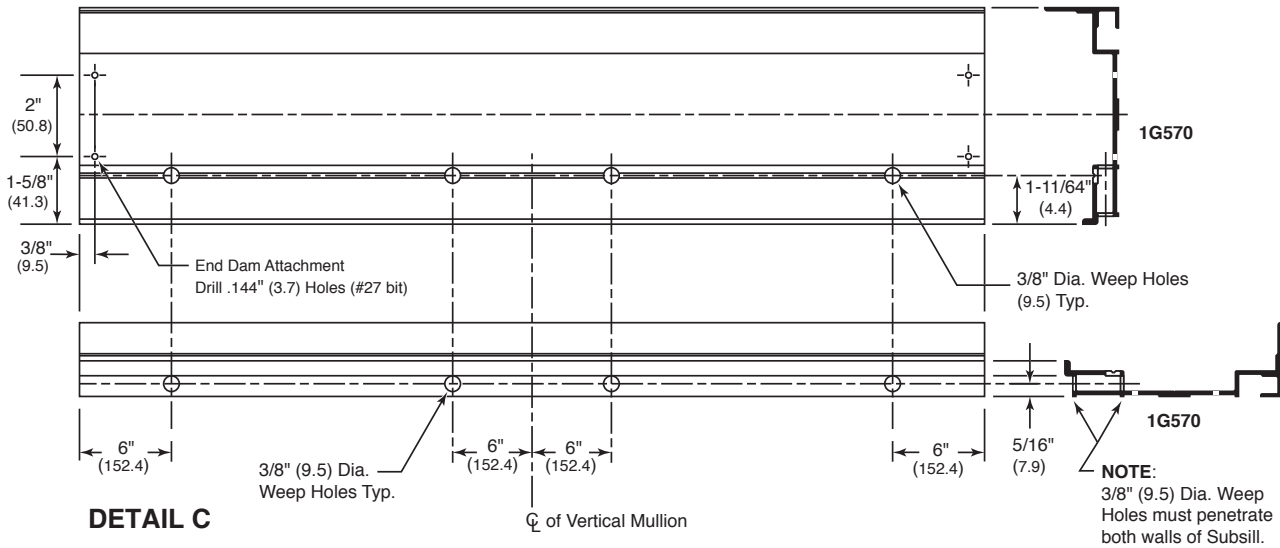
**DETAIL A**  
Frames With Entrance



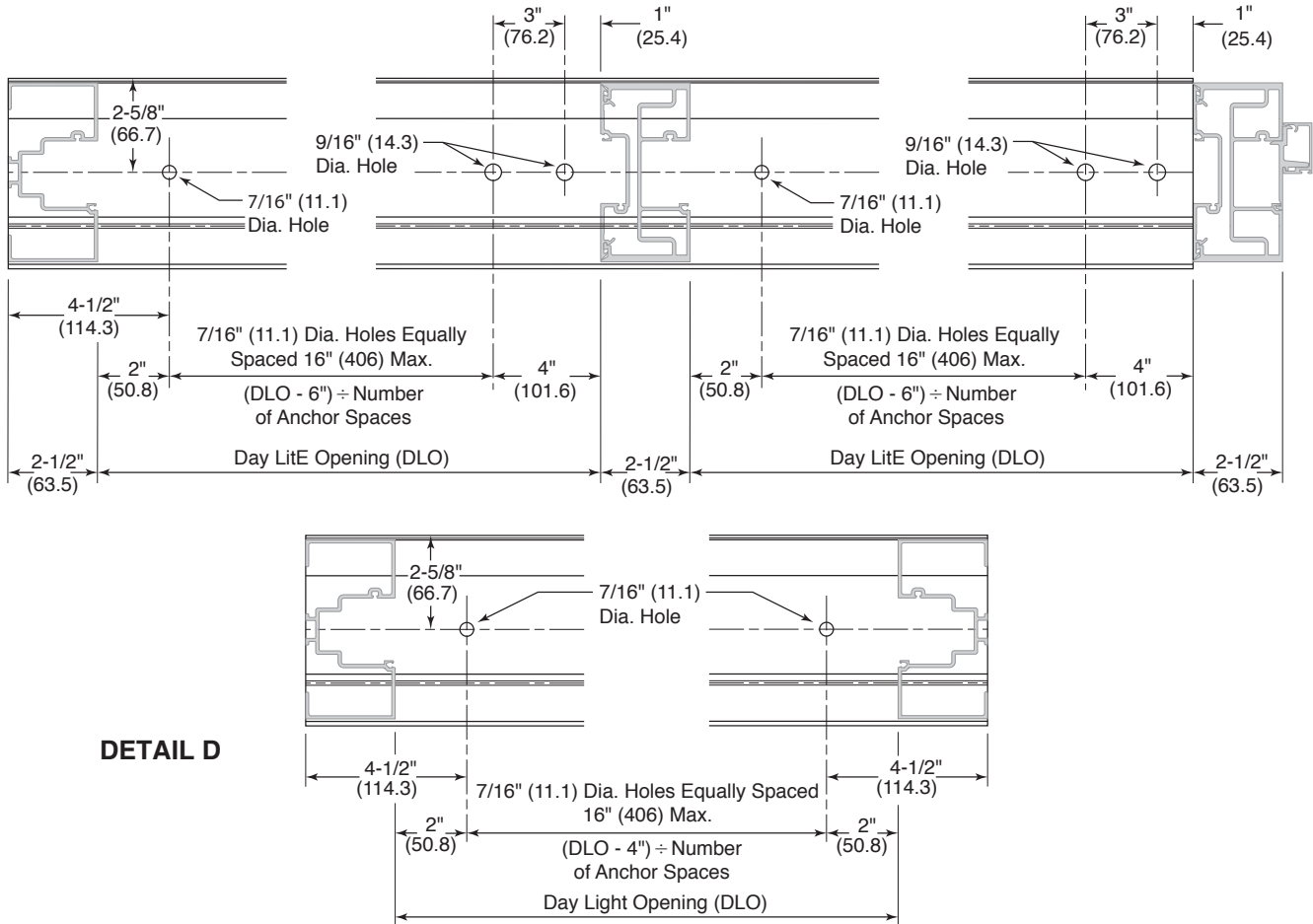
**DETAIL B**  
Frames Without Entrance

# FABRICATION

- 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.**



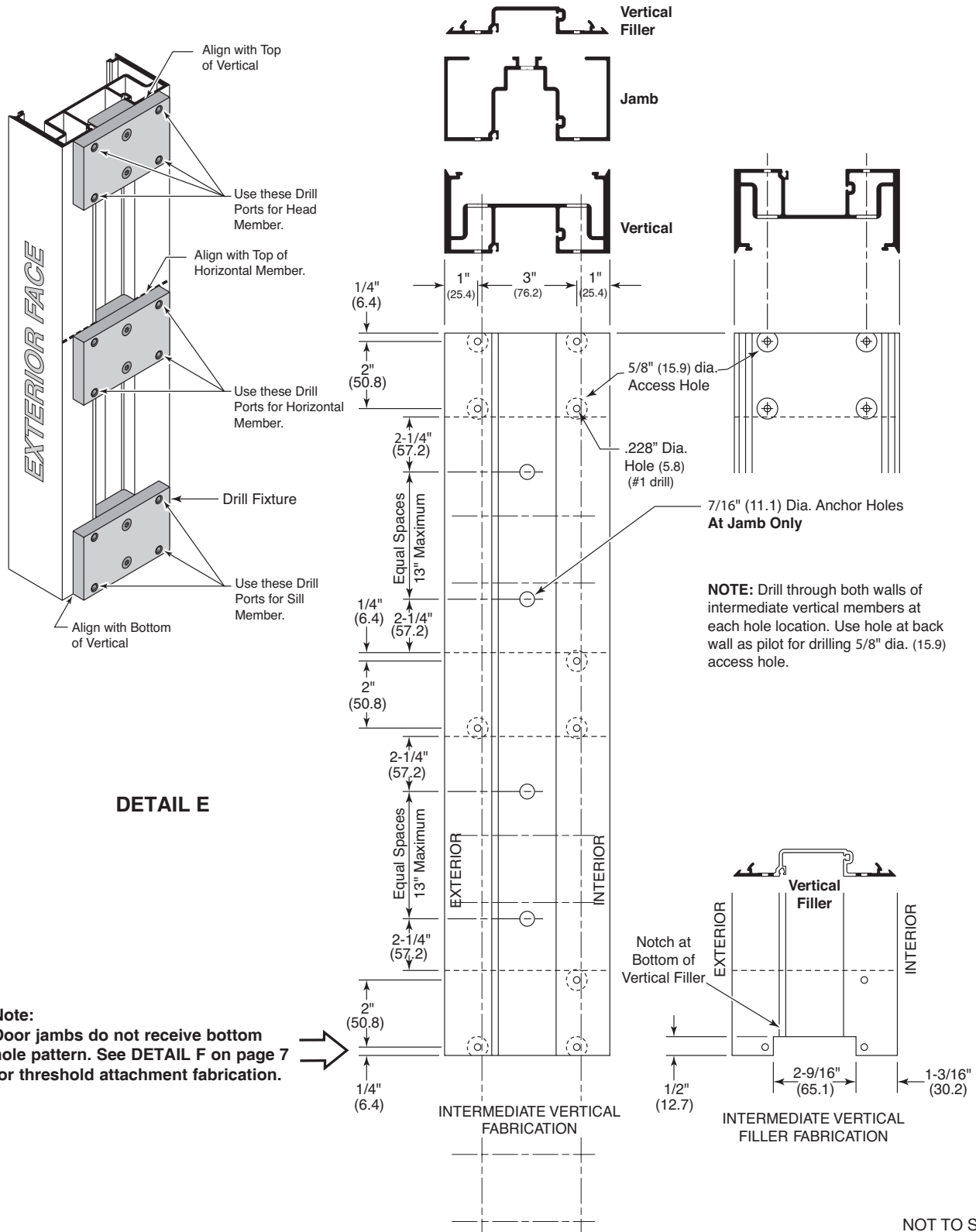
- Fabricate subsills for anchor holes as shown in **DETAIL D**.



NOT TO SCALE

# FABRICATION

5. Fabricate vertical members for horizontal attachment. Drill attachment and access holes as shown in **DETAIL E**.  
**NOTE: Details shown with deep pocket right orientation.**

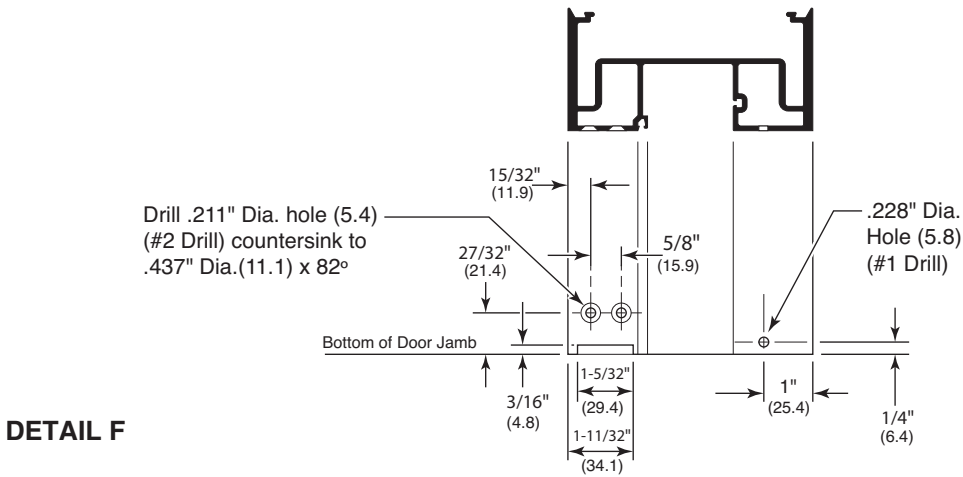


**Note:**  
 Door jambs do not receive bottom hole pattern. See **DETAIL F** on page 7 for threshold attachment fabrication.

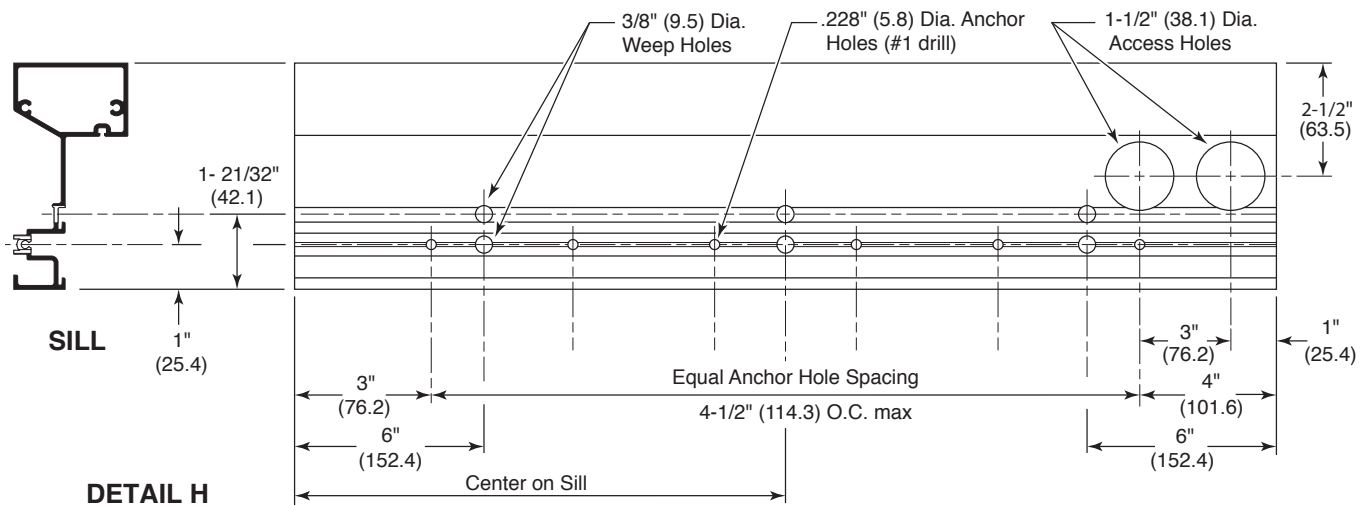
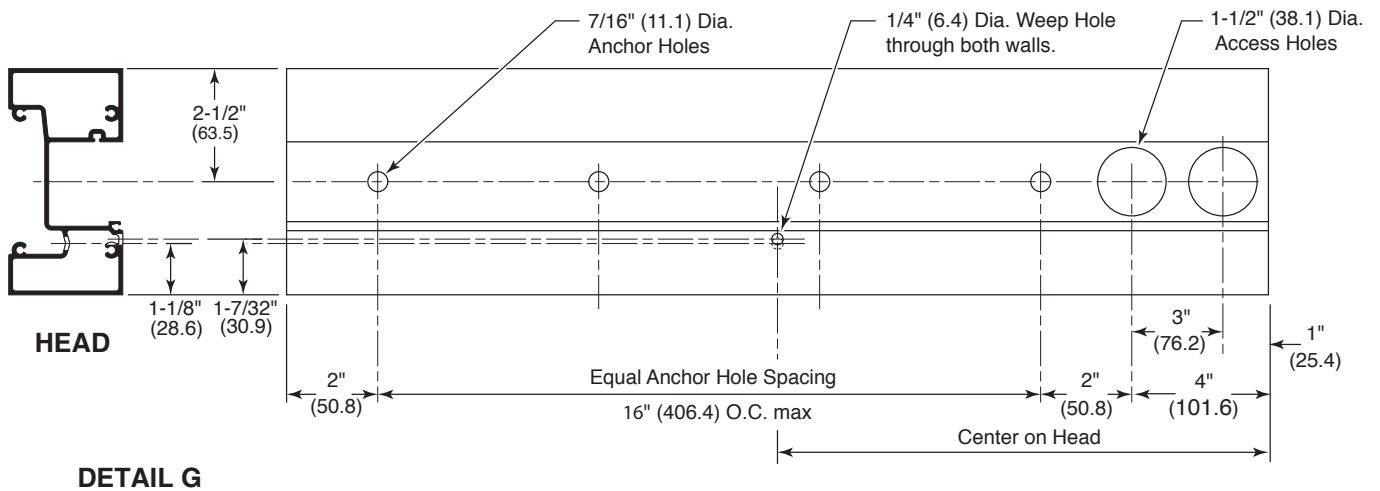
NOT TO SCALE

# FABRICATION

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



8. Fabricate head and sill members for anchor and weep holes as shown in **DETAIL G** and **H**.



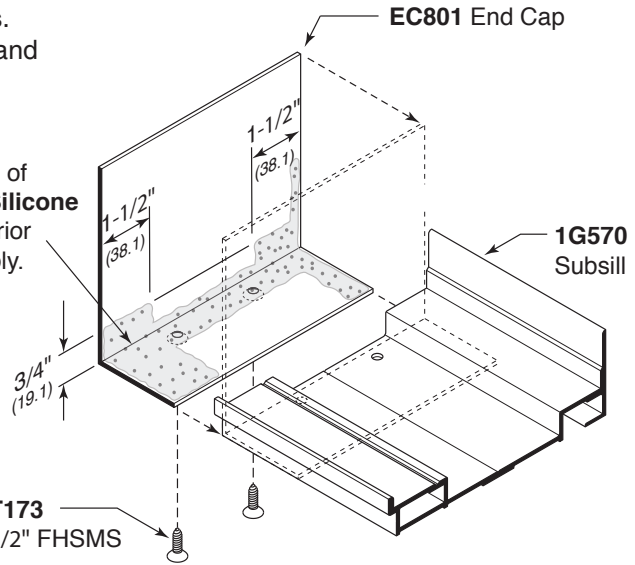
NOT TO SCALE

# ASSEMBLY

1. Clean ends of subsills that are to receive End Dams. Clean End Dams, apply **RTV408 Silicone Sealant** and install to ends of subsill as **shown in DETAIL I**.

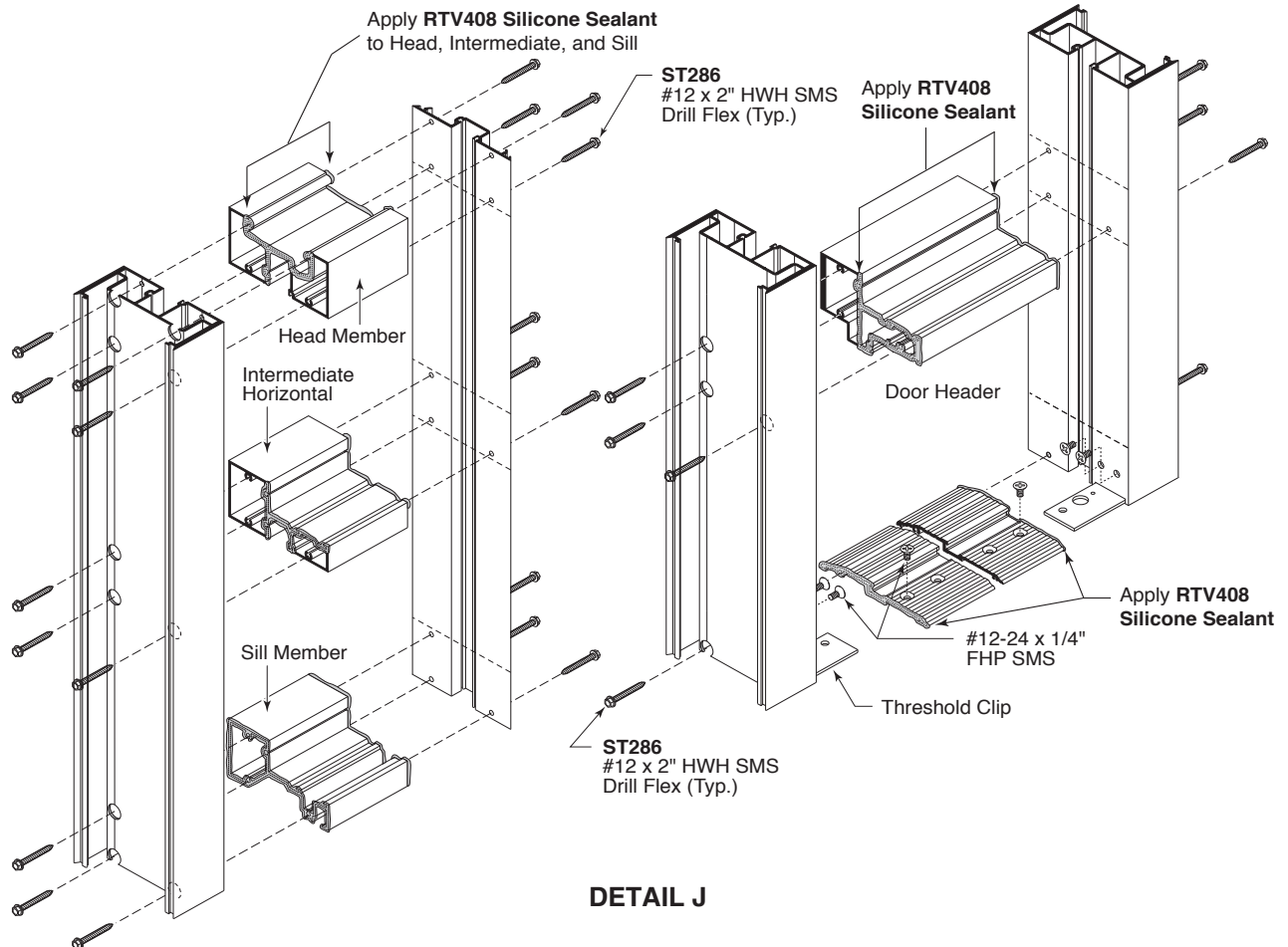
**CRITICAL NOTE:**  
Clean all contact surfaces with **CRL2032 Solvent** and wipe with a lint free cloth using the 3 cloth cleaning method.

Apply Bed of **RTV408 Silicone Sealant** prior to assembly.



**DETAIL I**

2. Clean and apply **RTV408 Silicone Sealant** to ends of horizontals and thresholds. Attach horizontals to verticals using **ST286 #12 x 2" HWH SMS**. See **DETAIL J**. Clean excess sealant from exposed joints.



**DETAIL J**

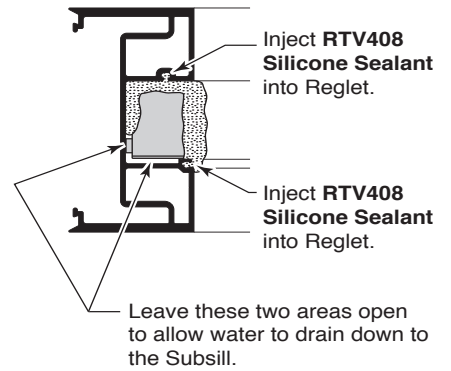
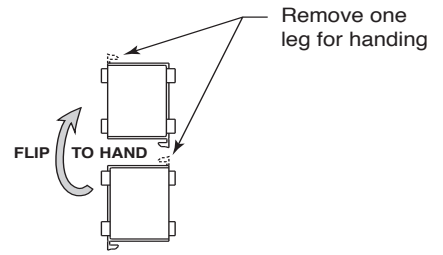
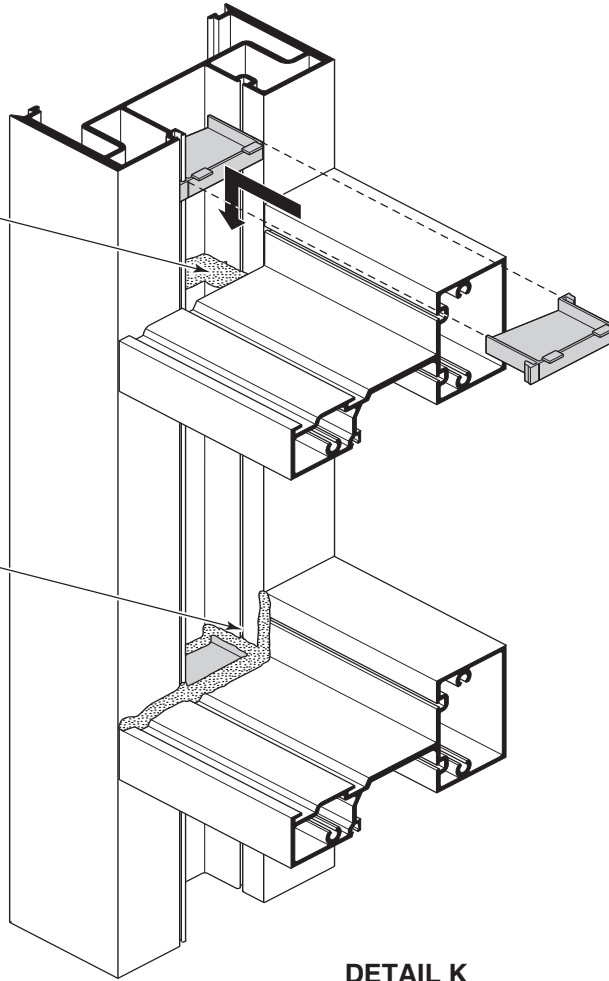


# ASSEMBLY

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 **RTV408 Silicone Sealant** as shown.

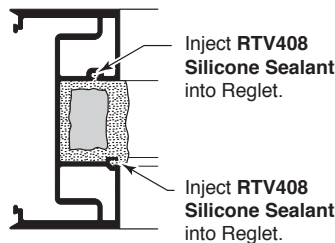
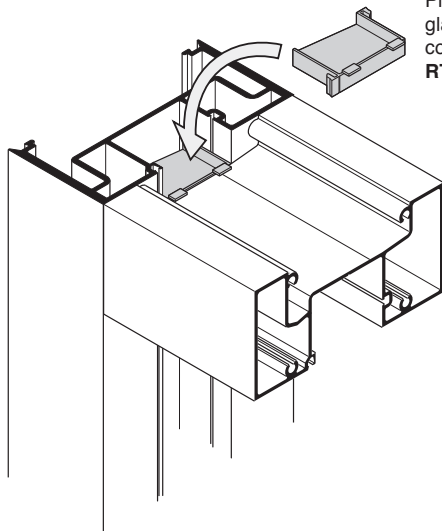
Apply **RTV408 Silicone Sealant** to interior glass pocket wall prior to installing water deflector. Making sure to fill the spacer Reglet.

Apply **RTV408 Silicone Sealant** to Seal joining pocket after Water Deflector is installed.

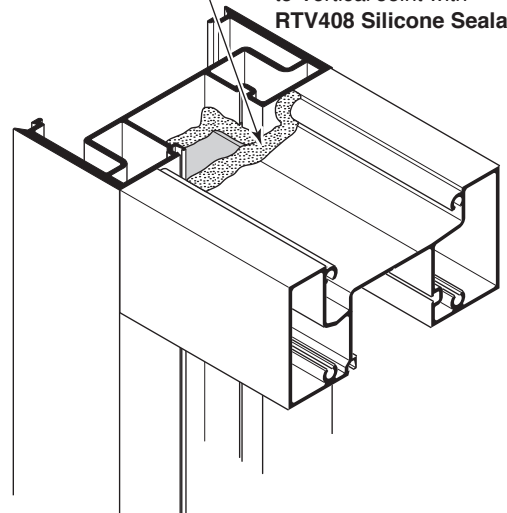


**DETAIL K**

Place Water Deflector into glass pocket and seal all contact edges with **RTV408 Silicone Sealant**.



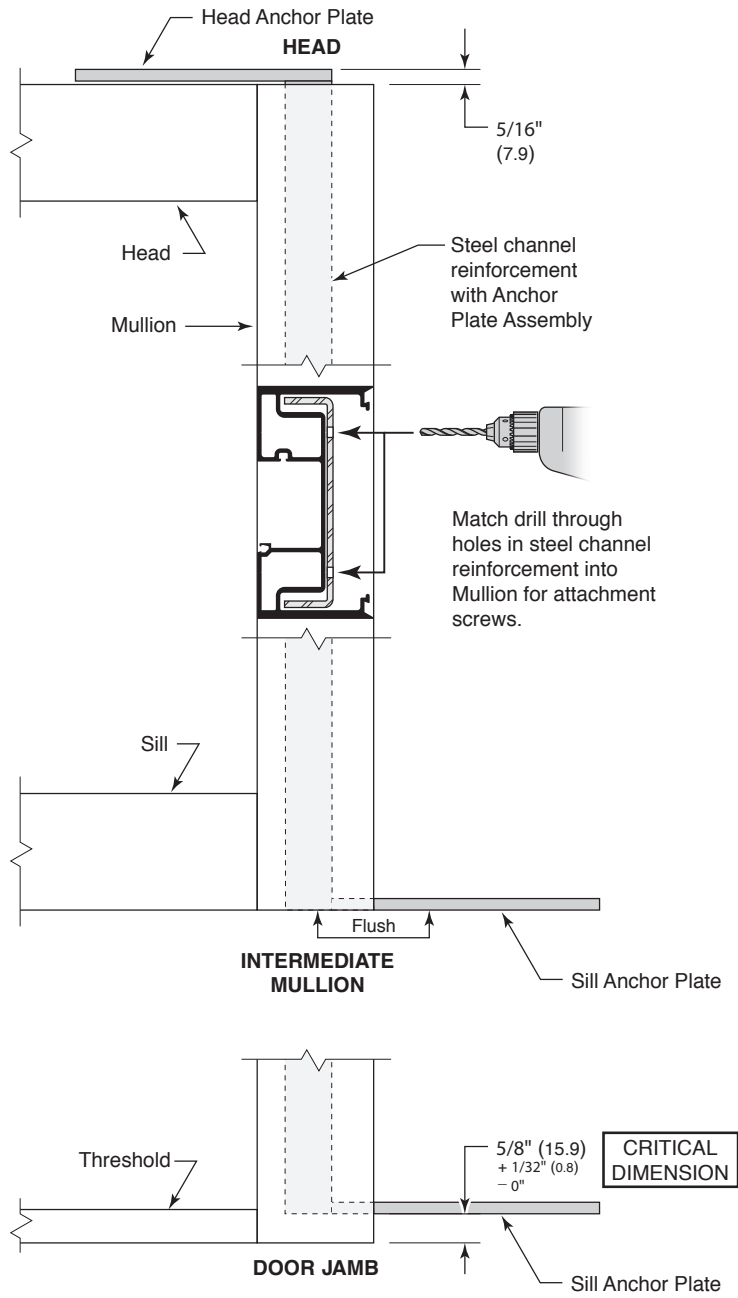
Thoroughly seal Horizontal to Vertical Joint with **RTV408 Silicone Sealant**



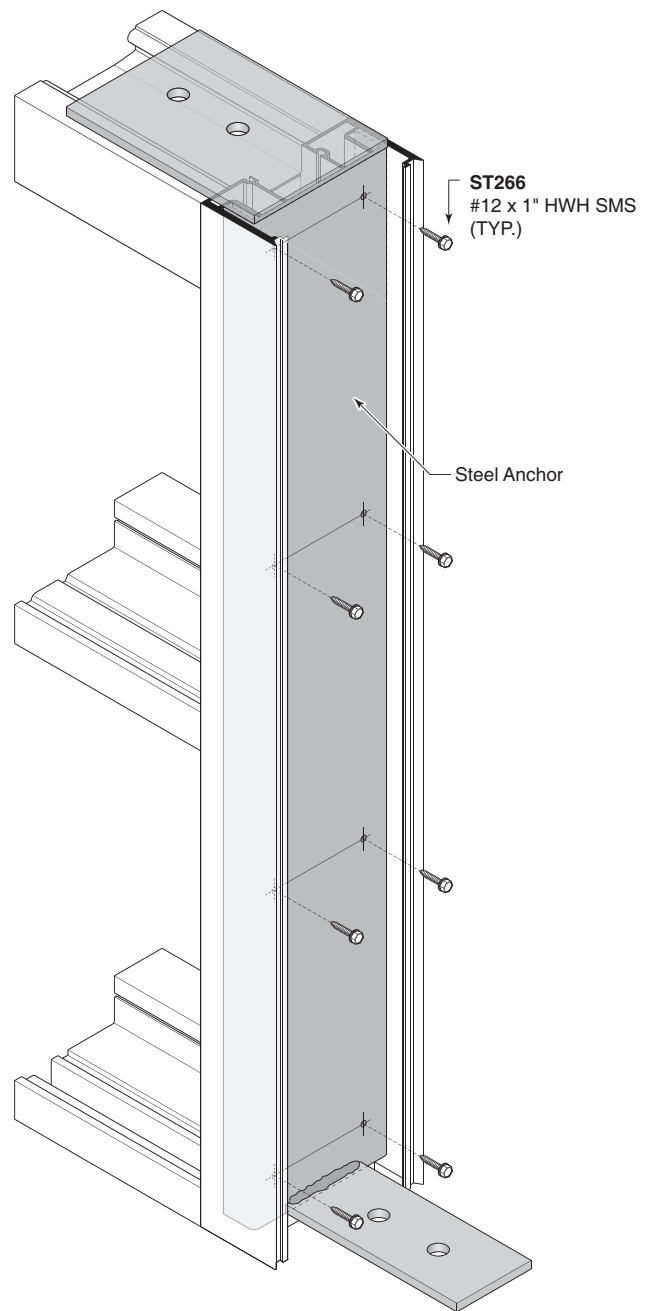
**DETAIL L**

# ASSEMBLY

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.**
4. Match drill through holes in steel reinforcement into mullion with #17 bit (.173" dia.). **See DETAIL M.**
5. Attach steel to mullion with **ST266 #12 x 1" HWH SMS**. **See DETAIL N.**



DETAIL M

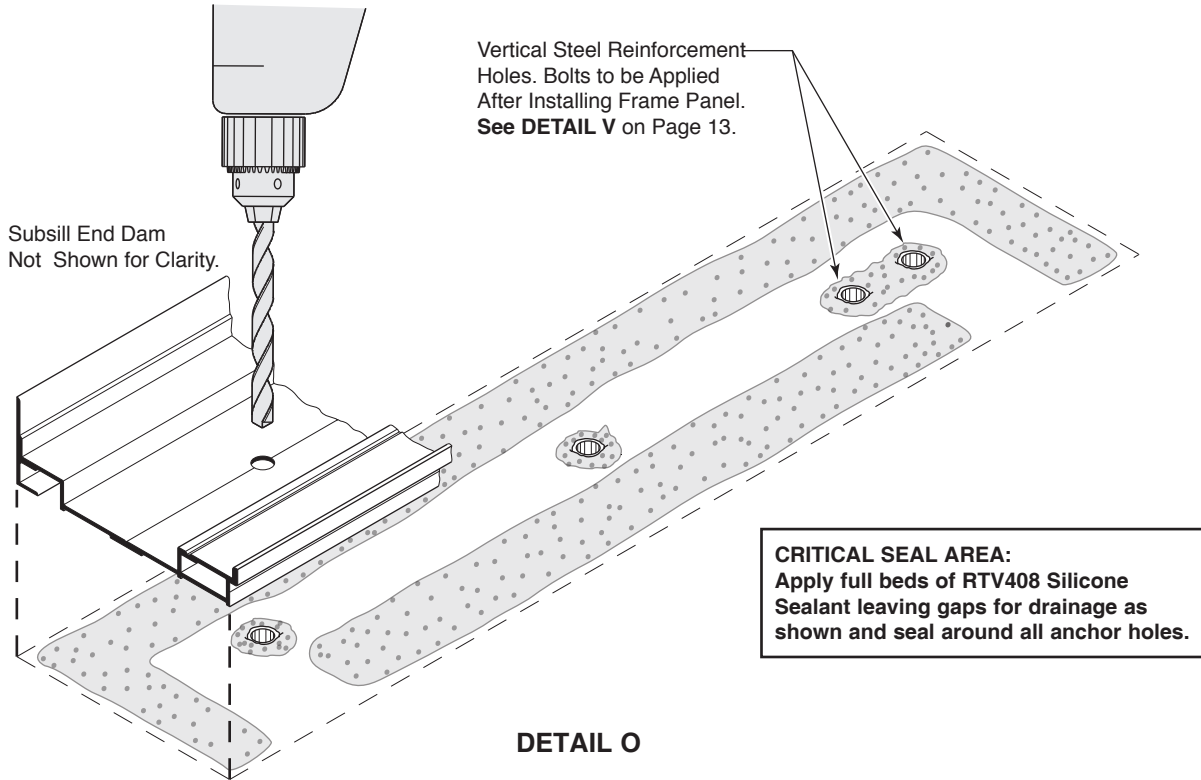


DETAIL N

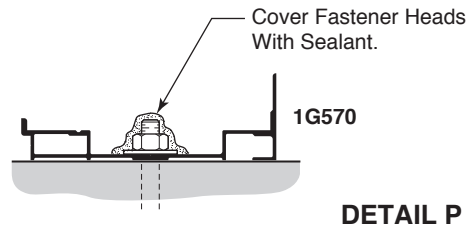
NOT TO SCALE

# INSTALLATION

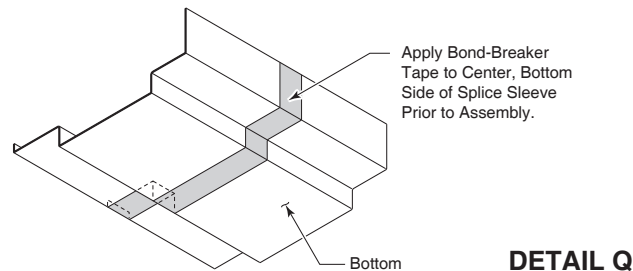
1. Place fabricated subsill into opening allowing for jamb shim space and door frame. Match drill anchor holes using subsill as template.
2. Remove subsill, clean substrate. Apply full bed of sealant across both ends and full length of interior subsill line. Run full bed of sealant across front area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



3. Replace subsill into opening and anchor to substrate. Seal over all fastener heads as **shown in DETAIL P**



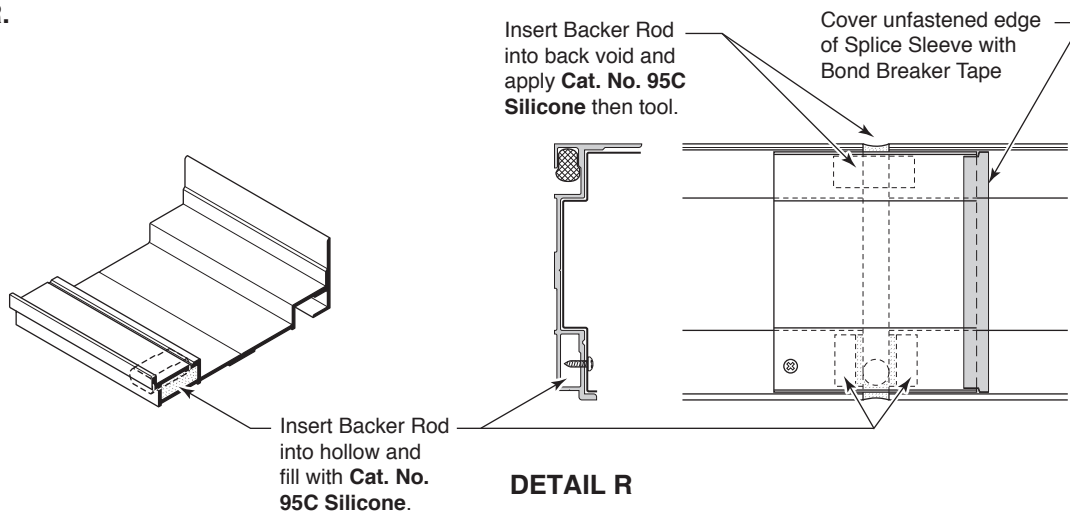
4. Subsill must be spliced for runs longer than 24' (731.5 cm). Apply 3/4" (19.1) wide **Cat. No. 827T34** Bond Breaker Tape across center of bottom side of splice sleeve as **shown in DETAIL Q**.



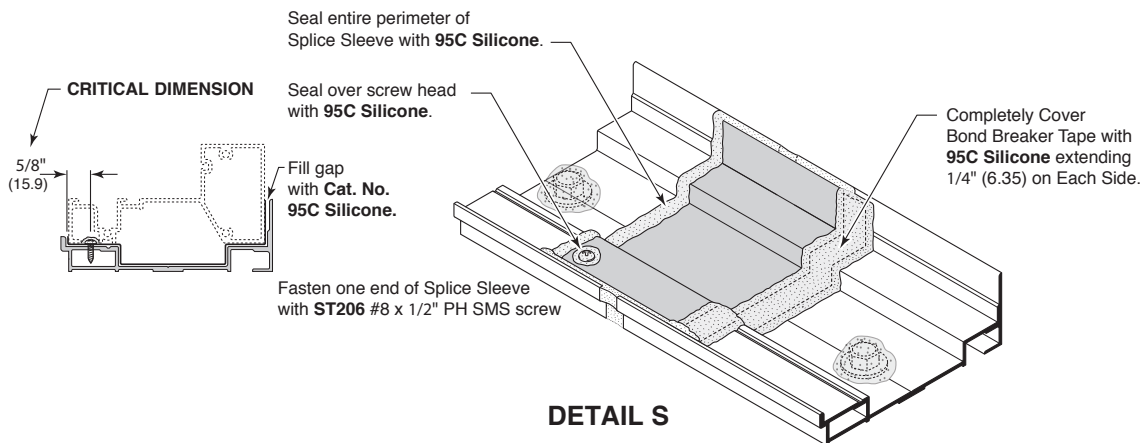
NOT TO SCALE

# INSTALLATION

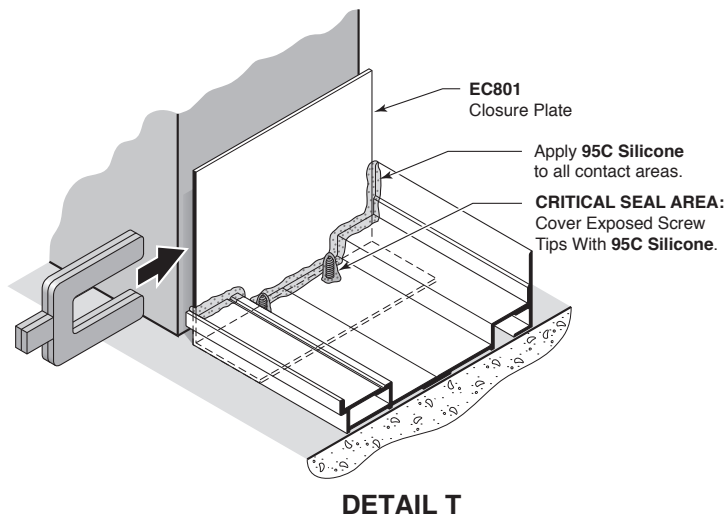
5. Insert backer rod into rectangular voids of subsill ends and seal with **Cat. No. 95C Silicone** as shown in **DETAIL R**.



6. Attach one side of splice sleeve to subsill with **ST206 #8 x 1/2" PH SMS**. Apply bond breaker tape to unfastened end of splice sleeve as shown. Apply **Cat. No. 95C Silicone** to seal over tape extending sealant 1/4" each side of tape edges as shown in **DETAIL S**. Seal all remaining sleeve edges as shown.

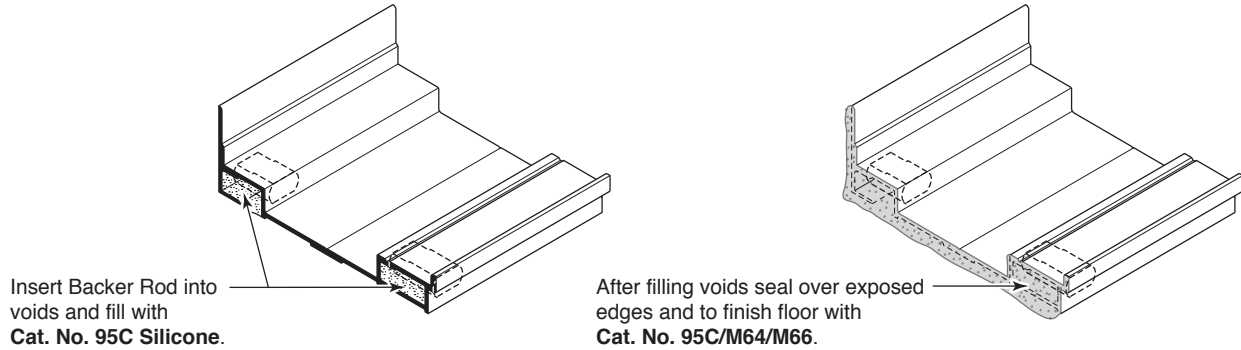


7. Prior to installing first and last frame panels apply **Cat. No. 95C Silicone** to subsill End Dam joints and screw tips. Tool sealant. Shim between End Dam and building. See **DETAIL T**.



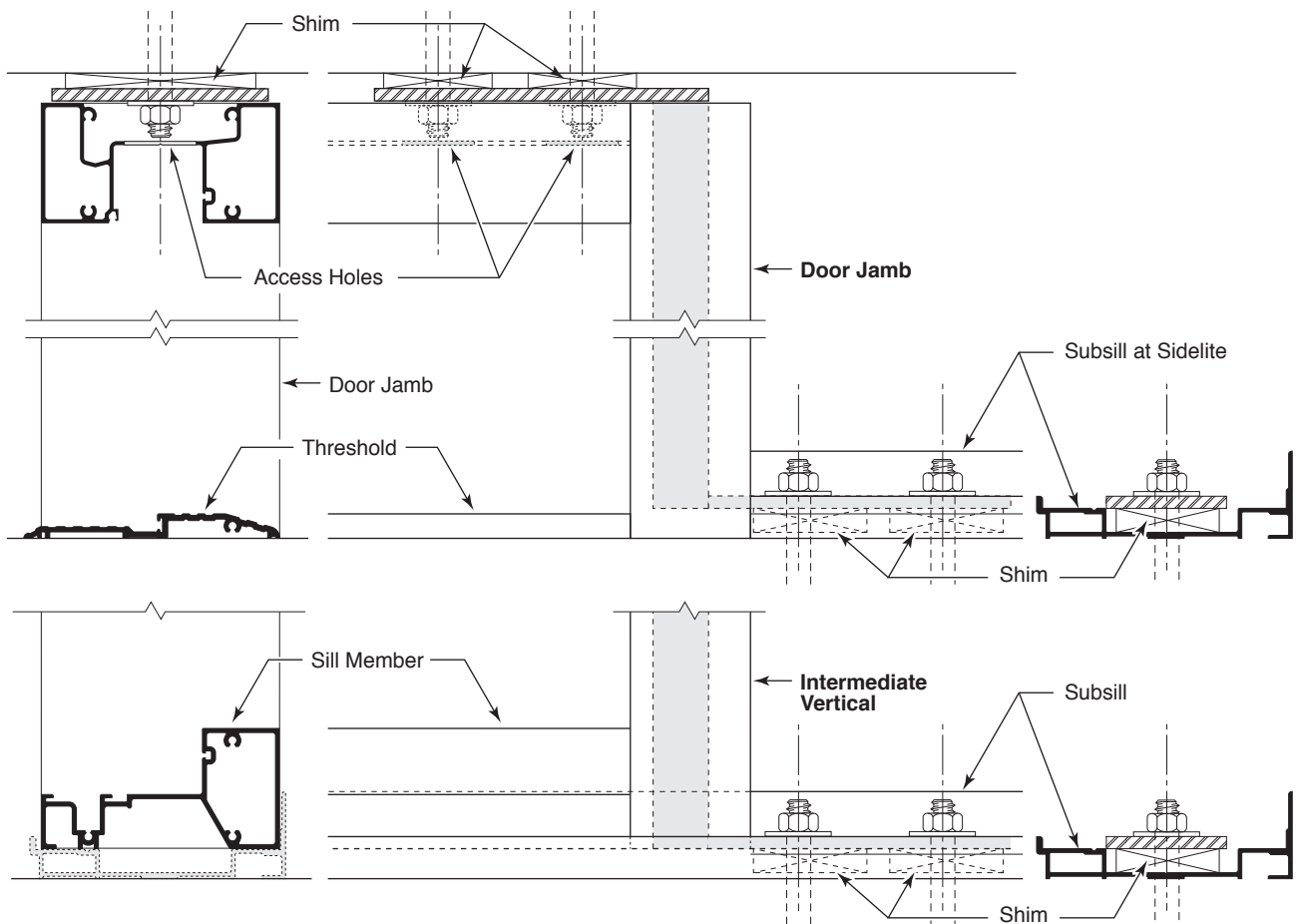
# INSTALLATION

8. Seal ends of subsill that abut door jambs with **Cat. No. 95C/M64/M66** as shown in **DETAIL U**.



**DETAIL U**

9. Install frame panels. **Door frame must be installed prior to side lite panels. See DETAIL Y** 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.**

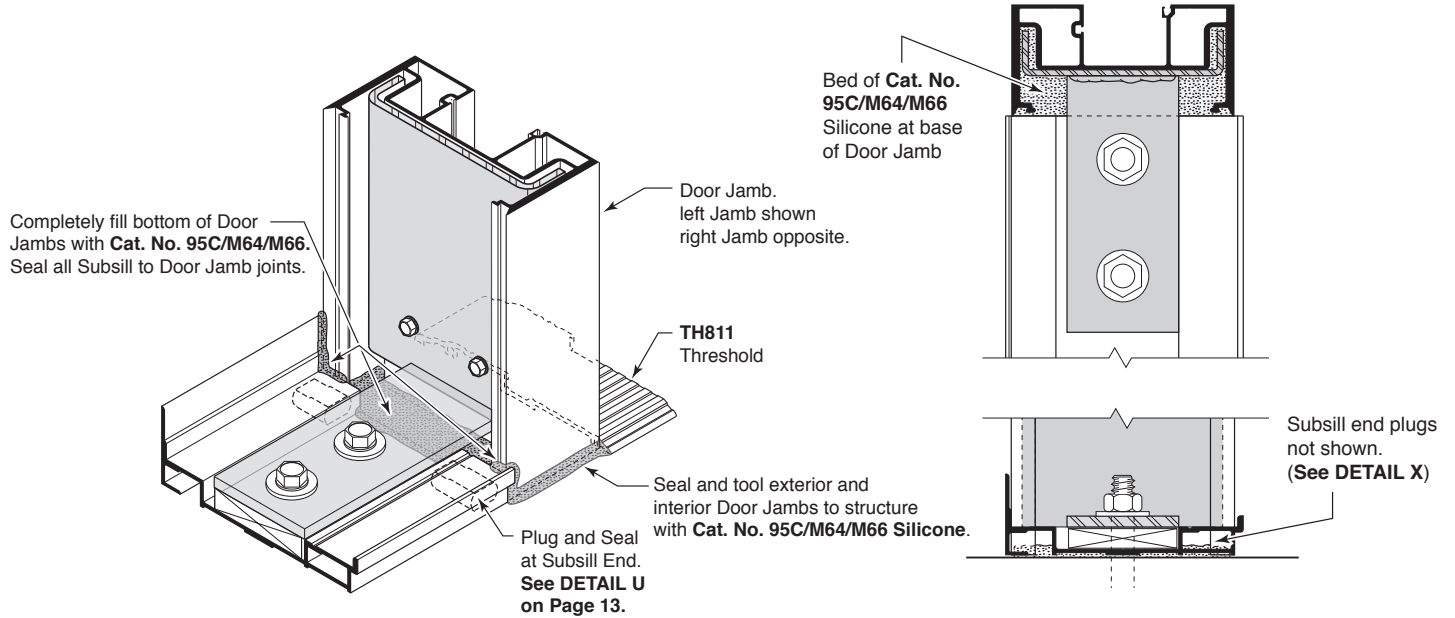


**DETAIL V**

# INSTALLATION

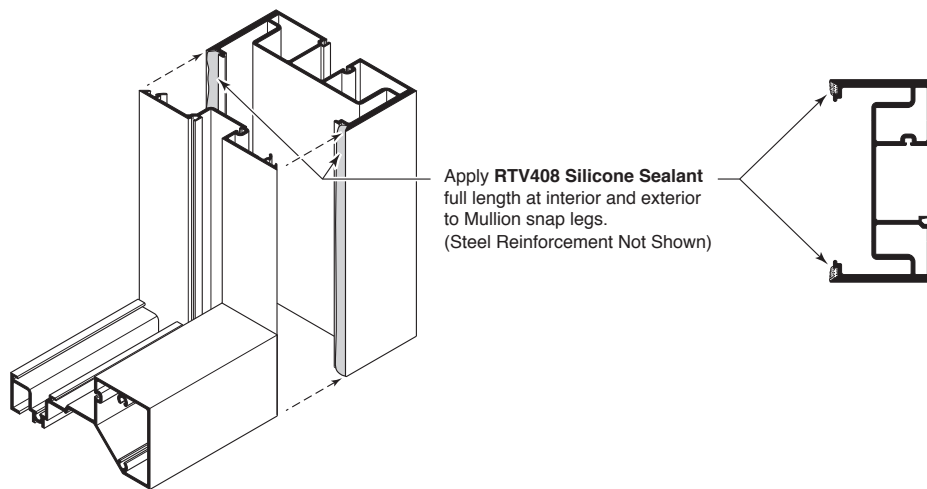
10. Apply **Cat. No. 95C/M64/M66** Silicone and seal base of door jamb and edges of steel anchor plate.  
See **DETAIL W**.

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



**DETAIL W**

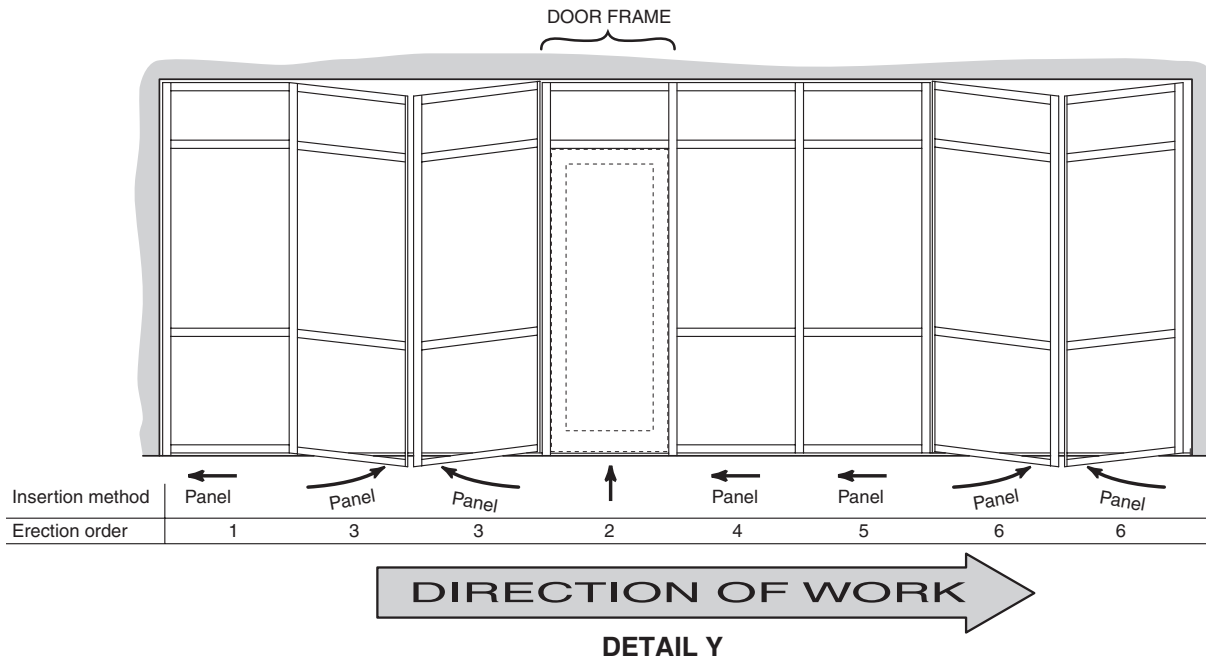
11. Apply a bead of **RTV408 Silicone Sealant** to interior and exterior snap legs as shown in **DETAIL X**.



**DETAIL X**

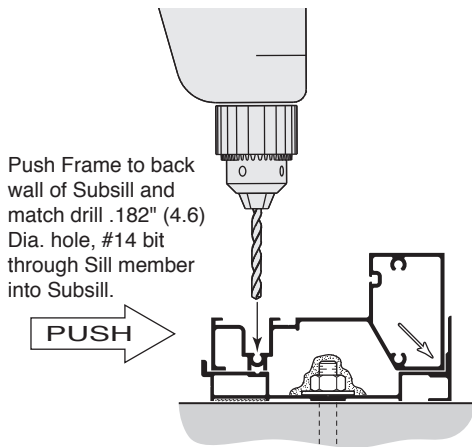
# INSTALLATION

DETAIL Y below is an example of the erection order.

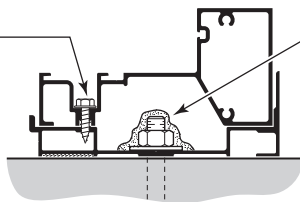


12. Install assembled frame panels into opening starting at left jamb shimming for proper caulk spaces. Match drill through anchor holes in sill into subsill as **shown in DETAIL Z**. Attach sill to subsill with **ST26800** (#12 x 3/4" HWH SMS). Shim at anchor locations and fasten jamb and head member 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. With **Cat. No. 33S Silicone** Seal over fastener heads at head and jamb members as **shown in DETAIL AA**.

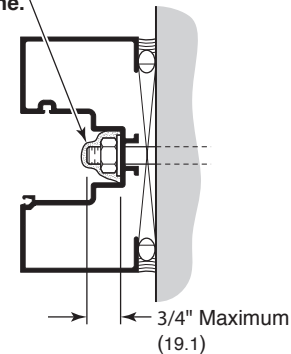
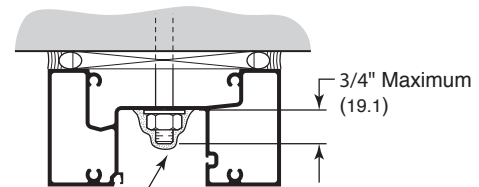


Anchor Sill members with **ST26800** #12 x 3/4" HWH SMS.



**DETAIL Z**

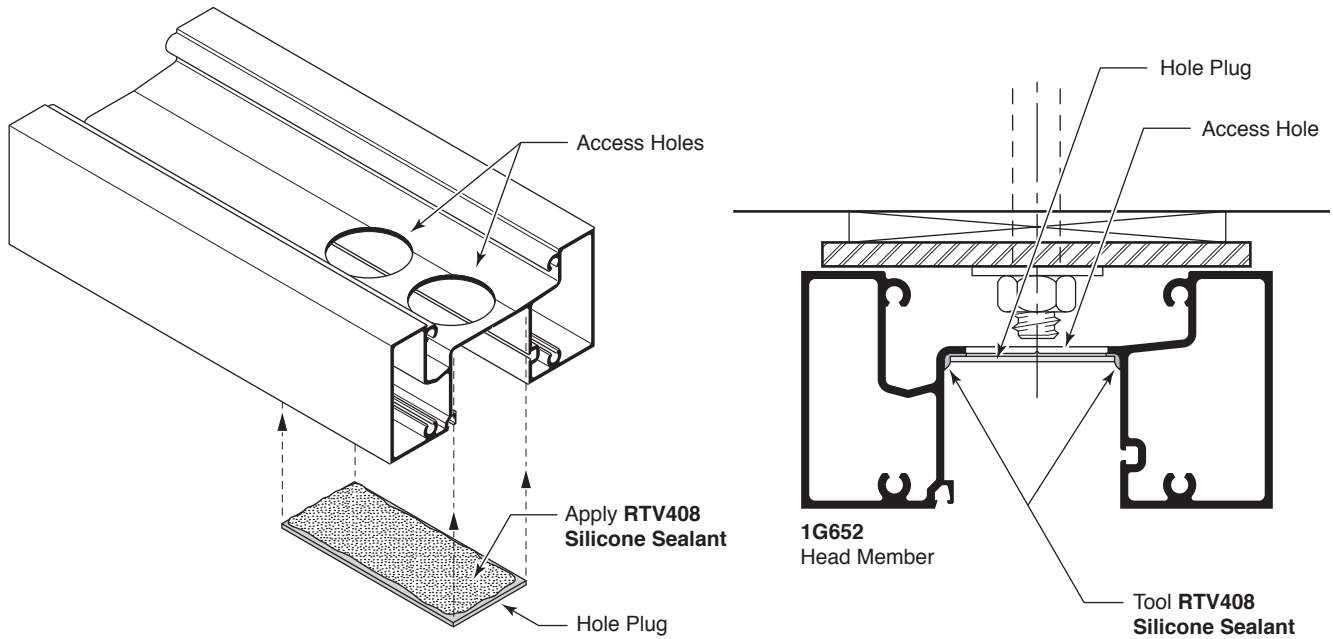
Seal over bolt heads with **33S Silicone** prior to frame installation.



**DETAIL AA**

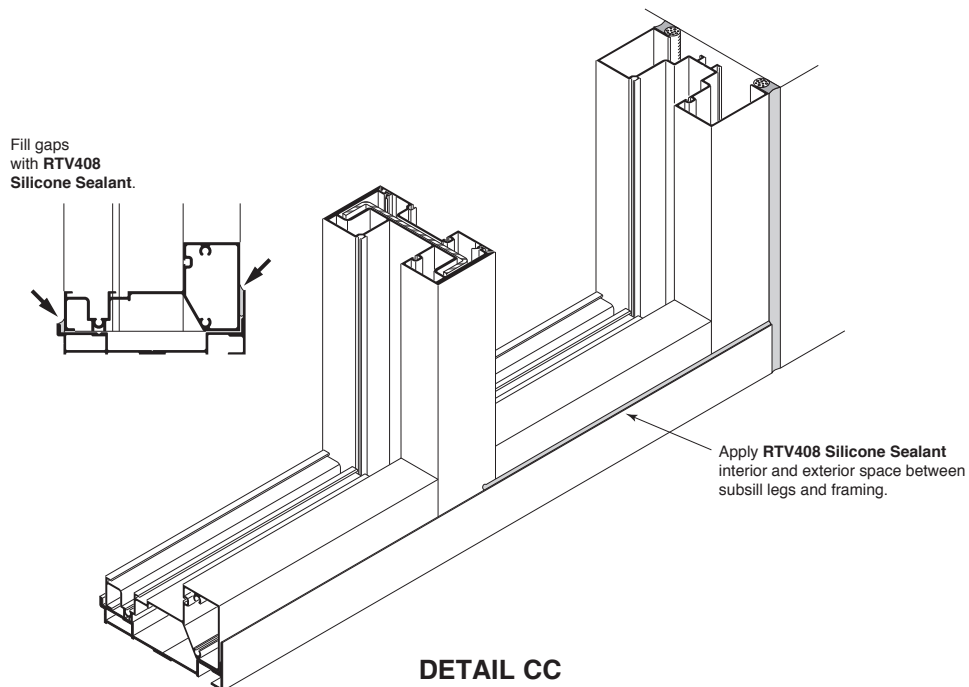
# INSTALLATION

14. Apply full bed of **RTV408 Silicone 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 **Cat. No. 95C/M64/M66 Silicone Sealant** to interior and exterior frame perimeter at head and jambs.
16. Inject a bead of **RTV408 Silicone Sealant** into exterior and interior reveals of subsill and sill members as shown in **DETAIL CC**.

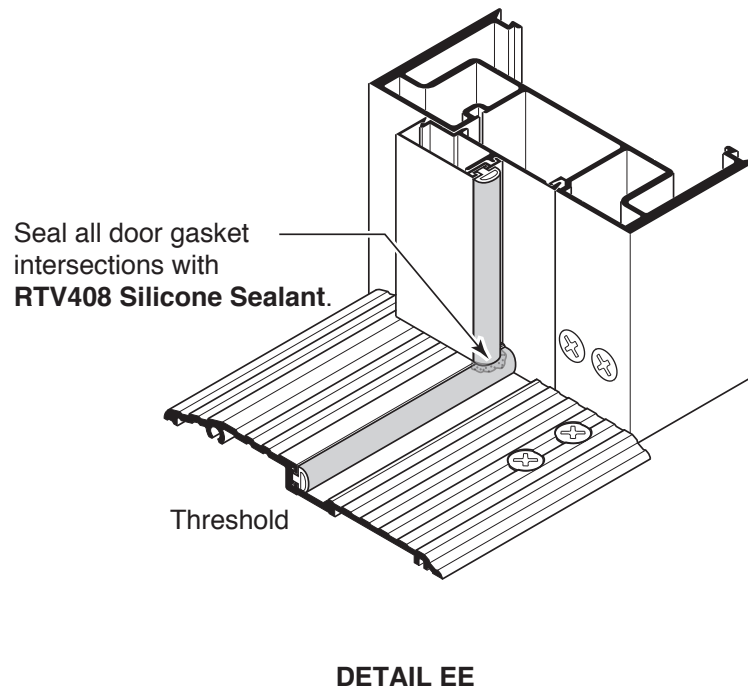
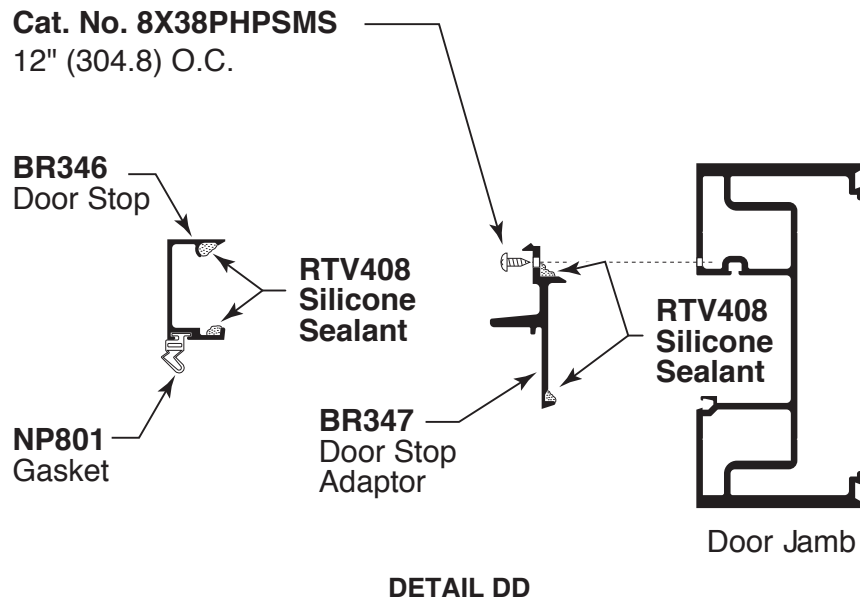


**DETAIL CC**



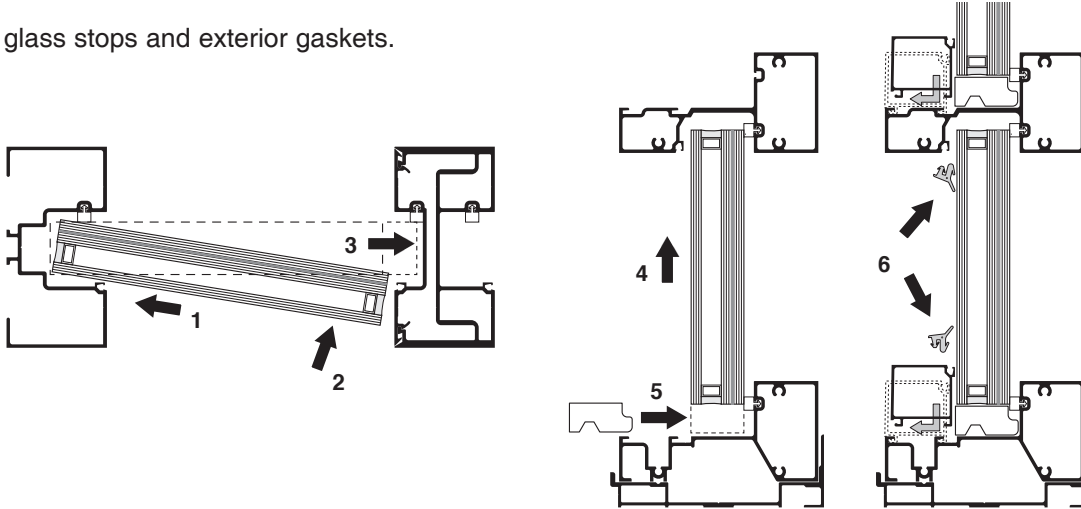
# INSTALLATION

17. Lace gaskets into door stops, header, and threshold leaving 1/8" (3.2) extension past each end to ensure a tight joint with connecting gaskets. Apply **RTV408 Silicone Sealant** to door stop adaptor and door stop as **shown on DETAIL DD**.
18. Attach door stop adaptors with **Cat. No. 8X38PHPSMS** 1" (3.2) from each end and 12" (304.8) O.C. and snap on door stops. Seal gasket intersections at head and threshold with **RTV408 Silicone Sealant**. See **DETAIL EE**.



# 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 FF**. Center glass in opening. It is recommended to mark edges of glass to gauge proper glass bite. **PROPER GLASS LITE OF 9/16" (14.3) IS CRITICAL.**
5. Install glass stops and exterior gaskets.

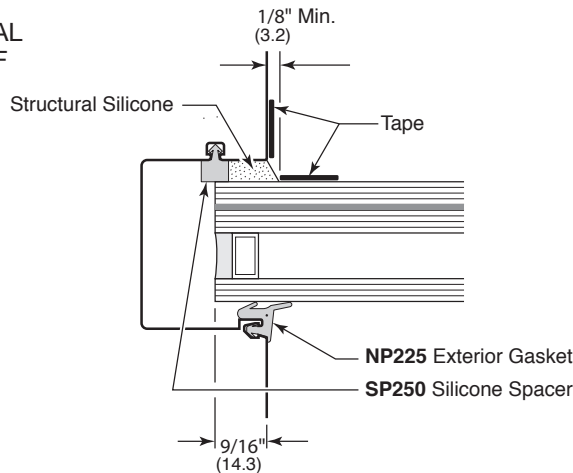


**DETAIL FF**

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 GG**.
7. Apply structural silicone, tool, and remove tape. Use caution in removing tape to avoid marring tooled silicone. **Follow manufacturers 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 GG**

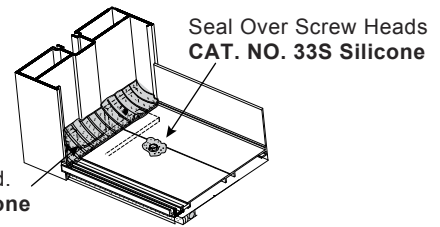
# CRL GUIDE TO SEALANTS

## WATERPROOFING

- CRL 33S ACETIC CURE SILICONE

NOTE: Not for use near insulating glass units with butyl sealant.

Fill with Sealant to Create a Water Shed.  
CAT. NO. 33S Silicone

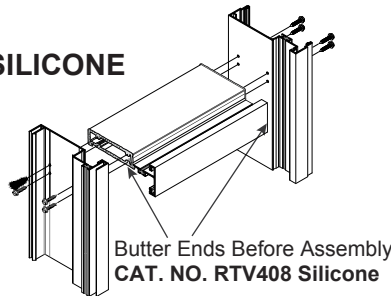


Sill to Subsill, End Dams, Screw Heads, and Threshold to Door Frame Sealing.

## JOINT ADHESIVE

- CRL RTV408 NEUTRAL CURE SILICONE

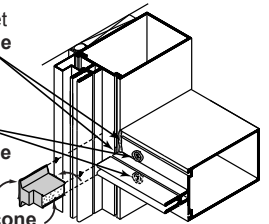
NOTE: I.G. butyl contact OK.



Seal Vertical Gasket Reglet  
CAT. NO. RTV408 Silicone

Seal Screw Heads  
CAT. NO. RTV408 Silicone

Seal Water Diverter  
CAT. NO. RTV408 Silicone



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

## PERIMETER

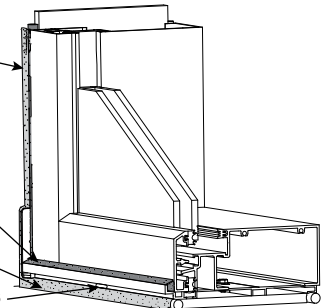
- CRL 95C NEUTRAL CURE SILICONE
- CRL M64 (SMOOTH) MODIFIED POLYURETHANE
- CRL M66 (TEXTURED) MODIFIED POLYURETHANE

Exterior Perimeter Caulking  
CAT. NO. 95C/M64/M66

Waterproofing Silicone Sealant  
CAT. NO. 33S/RTV408

Exterior Perimeter Caulking  
CAT. NO. 95C/M64/M66

Do Not Block Weep Holes



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

## EXPANSION

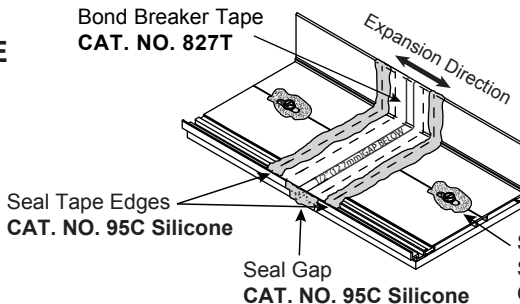
- CRL 95C NEUTRAL CURE SILICONE

Bond Breaker Tape  
CAT. NO. 827T

Seal Tape Edges  
CAT. NO. 95C Silicone

Seal Gap  
CAT. NO. 95C Silicone

Seal Screw Heads in Slotted (Expansion) Holes.  
CAT. NO. 95C Silicone



Expansion Joints.

## STRUCTURAL

- ALL STRUCTURAL SEALANTS REQUIRE TESTING AND APPROVAL.

Glass-to-Glass or Glass-to-Metal.



# JOB SITE ESSENTIALS

Helpful Tools and Supplies for Installing CRL U.S. Aluminum Entrances, Storefronts, Windows, and Curtain Wall Systems



**CRL 95C Silicone Building Sealant**



**CRL RTV408 Neutral Cure Silicone**



**CRL 33S Acetic Cure Silicone Sealant**



**CRL M64 Smooth Texture Modified Polyurethane Construction Sealant**



**CRL M66 Grainy Texture Modified Polyurethane Construction Sealant**



**CRL12:1 Ratio Strap Frame Caulking Gun CAT. NO. GA1203**



**CRL BOCBR Series Open Cell Backer Rod**



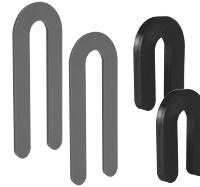
**CRL Backer Rod Roller Tool CAT. NO. SBRR**



**CRL Vacuum Cup CAT. NO. S7950**



**CRL Saint-Gobain/Norton V2100 Thermalbond® Structural Glazing Spacer Tape**



**CRL PHS Series Plastic Horseshoe Shims**



**CRL Digital Laser Level Tool CAT. NO. 406065**



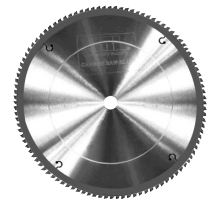
**CRL Cordless Screwdriver CAT. NO. LD823**



**CRL Portable Miter Saw 10" CAT. NO. LS1040**



**CRL Nordic Carbide Saw Blade CAT. NO. CSB10X100AX**



**CRL Cougar Carbide Saw Blade CAT. NO. CT10X100**



**CRL Door Jack CAT. NO. DJ1**



**CRL Complete Set of Seven All Stainless Steel Spatulas CAT. NO. AB958G**



**CRL Portable Ladder CAT. NO. 6206**



**CRL Hard Hat CAT. NO. ES3452**



**CRL Soft-Face Power Hitter CAT. NO. ST57532**



**CRL Bond Breaker Tape**



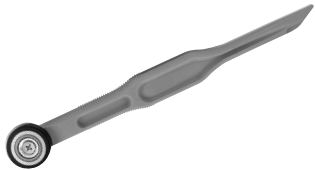
**CRL Glass Cutter**  
CAT. NO. TC17B



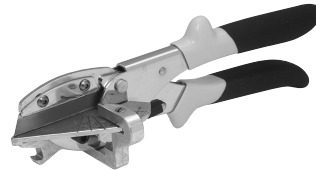
**CRL Running Plier**  
CAT. NO. PPG1



**CRL Utility Knife**  
CAT. NO. K82



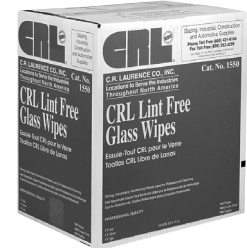
**CRL Gasket Roller**  
CAT. NO. VR10



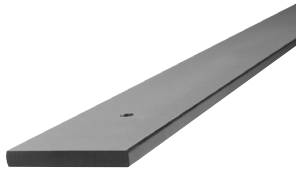
**CRL Gasket Cutter**  
CAT. NO. MC80N



**CRL Glass Cleaner**  
CAT. NO. 1973



**CRL Glass Wipes**  
CAT. NO. 1550



**CRL 96" Phenolic Straight Edge**  
CAT. NO. SEP96



**CRL Glazier's Rule Holder**  
CAT. NO. RH670



**CRL Phenolic L Square**  
CAT. NO. L48



**CRL Spring Clamp**  
CAT. NO. JC3202HT



**CRL Tape Measure**  
CAT. NO. 54125



**CRL Glass Marking Pencil**  
CAT. NO. GM44



**CRL Belt Sander**  
CAT. NO. LD321



**CRL Glass Grinding Belts**  
CAT. NO. CRL3X21120X



**CRL Gloves**  
CAT. NO. KF1TL



**CRL Utility Knife Blades**  
CAT. NO. 1992C



**CRL Cordless Driver/Drill**  
CAT. NO. LD147



**CRL All Terrain Dolly**  
CAT. NO. ATD1