HOPE'S®

• FIELD INSTALLATION MANUAL •

ARCHITECTURAL PRODUCTS

HOPE'S®

FIELD INSTALLATION MANUAL

RECOMMENDED GLAZING PROCEDURES
FOR HOPE'S ARCHITECTURAL PRODUCTS

CONTENTS

IMPORTANT

This manual contains general information for installation and glazing of Hope's products. Approved contract drawings and specifications should be used for your project.

If there are any questions regarding installation, glazing procedures or clarification of details, please do not hesitate to contact Hope's project management at 716-665-5124.

It is the installer's responsibility to properly install Hope's products and the glazier's responsibility to provide weather tight glazing. The procedures and illustrations provided by this informational manual are not specifications. They are provided for informational purposes and contain minimum procedures to be followed when using Hope's products. The installer and the glazier must refer to the project documents for specifications relating to their work. Hope's is not responsible for coordination of such specifications or for disseminating the information contained therein. Hope's will not be liable for any condition caused by or due to installation or glazing of its products that is not in accordance with the project specifications, Hope's approved shop drawings and the information provided herein.

RECEIVING AND STORAGE

Preparation for On-Site Storage

- Plan in advance.
- Consult with Job Superintendent for storage locations.
- Obtain canvas tarps or plastic rolls for protective coverings. Use a well-ventilated cover to prevent condensation from settling on window or door frames during storage.
- Locate a secure area to store the boxes of hardware and erection material.

Receiving and Inspecting Materials

- Count and inspect all materials as received (even those that may not be needed right away such as screens). **Hope's Shipping Notice** indicates the required quantities compared to the amount shipped on that particular shipment. The box and/or crate numbers are identified on this same notice to assist in inventorying your purchase. **Immediately notify Hope's project management of any error or deficiency in material shipped after reviewing this document.**
- **Check for freight damage and NOTE damage on the freight bill before signing it.**
- If there is a suspicion of damage after you have signed for the shipment, you have an opportunity within 5 days of arrival of shipment to request an inspection from the **Freight Company**. If this is not done, Hope's will not be held responsible for missing material.
- **Notify the Freight Company and Hope's project management immediately when shipping damage is discovered. Sending or e-mailing digital photographs assists us in understanding your particular situation; please consider this when notifying us. Failure to do so can result in loss of claim rights against the shipping company.**
- Do not attempt to correct any shipping damage before consulting with Hope's project management. Failure to do so may result in loss of Hope's warranty and the cost of remedial work.
- **Door leaves are not interchangeable. They must be installed with their corresponding frame to ensure custom fit and hinge alignment.**

Unloading Materials

- Lift and carry prefinished materials. DO NOT DRAG!
- Store in upright position.
- Cover with canvas or plastic to protect from weather. Use a well-ventilated covering. If packaging becomes wet, remove windows, repack them and move to a dry location.

PROTECTION OF FINISH SURFACES

- At all times, precautions must be taken to protect the factory finish on Hope's windows and doors against scratching, marring or chipping. Repairs must be made promptly to prevent rusting of exposed metal. **NOTE:** See field touch-up and painting section for field touch-up procedures.
- Care should be taken to protect unpainted hardware surfaces from contact with acid-based materials or other corrosive compounds. This can occur when applying sealant in close proximity or from workers' hands and gloves.
- Cement, plaster, terrazzo, mortar, and alkaline or acid-based materials used to clean masonry are very harmful to finishes. They should be removed immediately with water and mild soap. A spot test is recommended before any cleaning agent is used.
- **WARNING!** Wash down of masonry should be conducted before window installation. Hope's products have a factory applied final finish. **Acid based chemicals typically used for masonry wash down will attack the finish surfaces.**
- Do not allow masking tape or duct tape to remain on surfaces for a prolonged length of time, otherwise a permanent bonding to the paint may occur and leave marks upon removal of the tape.
- Products purchased prime painted from Hope's should be protected very carefully in the field and finish painted as quickly as possible. The prime coating alone provides a much lesser degree of protection than the finish coat.
- Always avoid getting paint on the weatherstrip when applying paint to the windows in the field.

CONSTRUCTION NOTES

Shop Drawing Review

- **Review approved marked "FINAL SHOP DRAWINGS FOR FIELD USE" to become thoroughly familiar with the project. These drawings take precedence and include specific details for this installation. Confirm you have the latest set of shop drawings.**
- Coordinate building openings with the openings shown on Hope's final shop drawings. Refer to the architectural drawings for accurate coordination. **NOTE:** Hope's window and door elevations are viewed from the building exterior, unless otherwise noted.
- Determine the best order to proceed. The windows and doors in openings used for incoming construction materials should be installed last.

Inspection of Openings

- Openings should conform to Hope's final shop drawings.
- Check openings for plumb, square and level.
- Check details and opening dimensions. If there are discrepancies, notify Hope's immediately. Do not attempt to install Hope's products until the jobsite conditions have been corrected. Any attempt to cut down or modify Hope's products without consulting Hope's will result in loss of Hope's warranty. **Hope's will not be held liable for back charges if installation proceeds and product is not in accordance with Hope's shop drawings unless written authorization from Hope's has been provided.** These terms and conditions are outlined in our contract. Consult before expending field labor that may not be reimbursed.
- Wash down of masonry should be completed. Masonry cleaning materials may damage the finish of the windows.

Alignment and Tolerances

- All work should start from the benchmarks or column centers established by the general contractor.
- All materials are to be installed plumb, level, true and in proper alignment to established line grades.

Sealant Compatibility

- Consult the sealant supplier for recommendations on compatibility, adhesion, priming, tooling and shelf life.
- Surfaces must be clean and dry before sealants are applied.

WINDOW INSTALLATION PROCEDURES

Prior to Installation

- Check Hope's final shop drawings to determine if weather bars or other items must be applied to the windows before the window is installed.
- Ensure all installation materials (shims, fasteners, backer rods, etc.) have been pre-purchased and are readily accessible. **NOTE:** If necessary, these items can be purchased through Hope's Windows.
- Be sure that the actual setting conditions match what is shown on the approved shop drawings.

Installing Windows to Flush Openings

- Plastic filler shims should be field attached by the installer to the window frame at each fixing hole location (see Fig. 1). Filler shims are field attached with sealant or adhesive.
- Between sash shims, glue a rectangular caulking poly filler or install a non-gassing poly backer rod (see Fig. 2).
- Insert window into opening being careful not to pull the back-up rod from the sash.
- Between sash shim and building structure use flat fixing shims (see Fig. 3). Fixing shims should be applied tight to structure to prevent window frames from twisting or racking during installation. Distance between the frame and the opening is at sealant manufacturer's recommendation.
- Using a level, plumb the window vertically, then horizontally using shims as required.
- Line drill through fixing holes into opening and install proper screws to suit condition. Make certain to properly touch up any abraded steel surfaces with kit provided by Hope's. Shim between sash shim and opening as required.
- Windows featuring Thermal Evolution™ technology are factory prepared at fixing hole locations (see Fig. 4). Operable windows may require field attached bushing caps to conceal screw heads (see Fig. 4).
- Caulk the exterior joint between the sash and opening and neatly point (see Fig. 5). **IMPORTANT: Seal all fixing screw heads to the web of the sash. Utilize sealant washers at holes and seal with sealant at slots. WARNING! Fixing holes left vacant can allow water or air infiltration, distortion of the product and void warranty.**

FIGURE 1: PLASTIC FILLER SHIMS

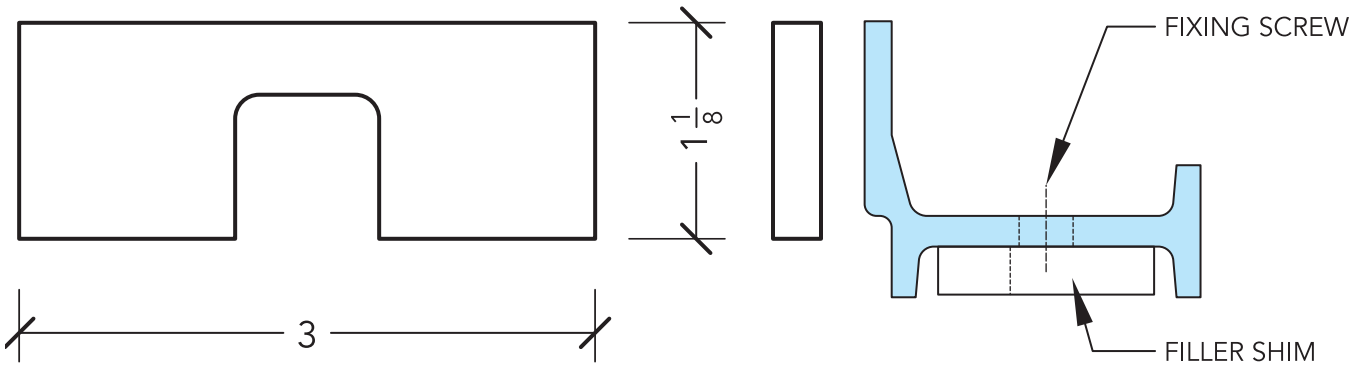


FIGURE 2: CAULKING BACK-UP

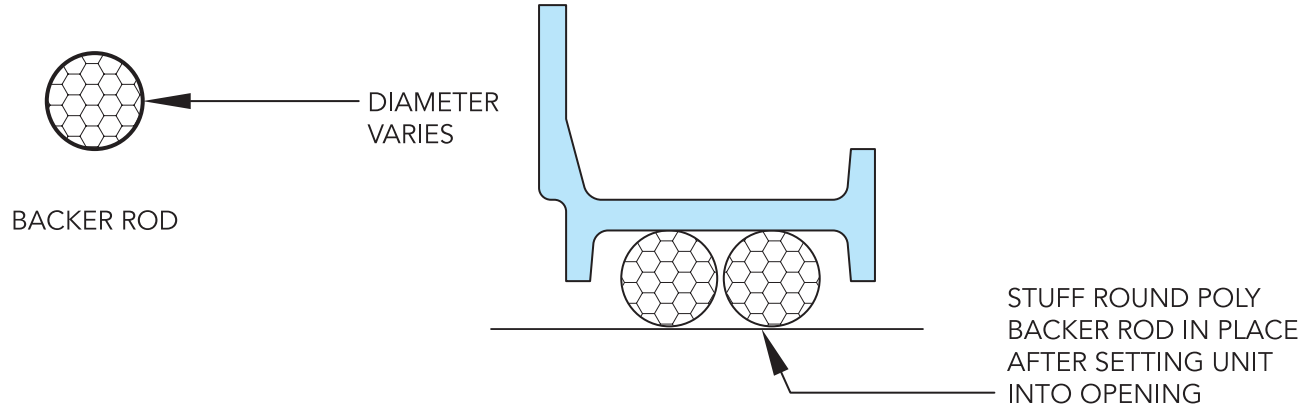


FIGURE 3: PLASTIC FIXING SHIMS

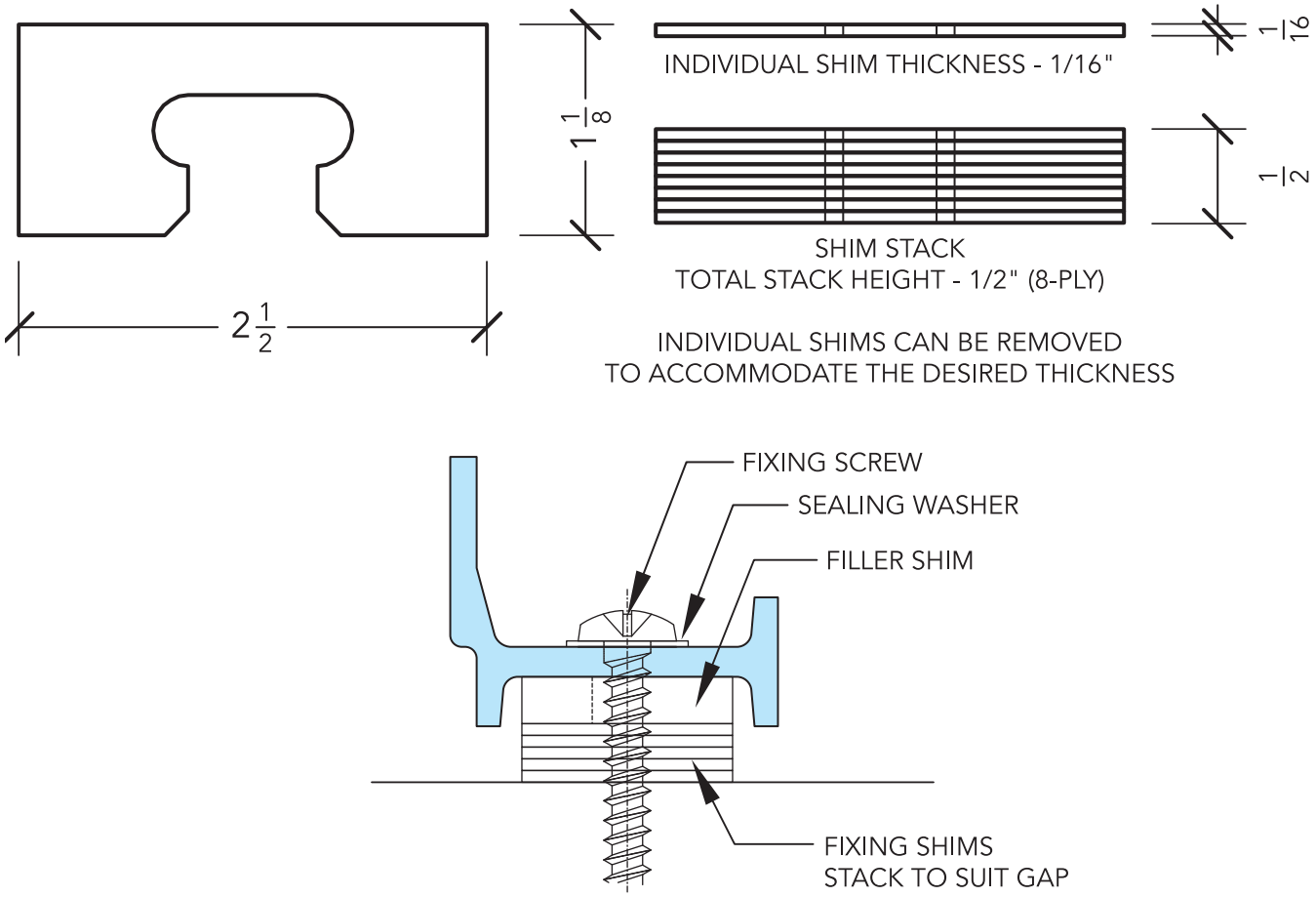
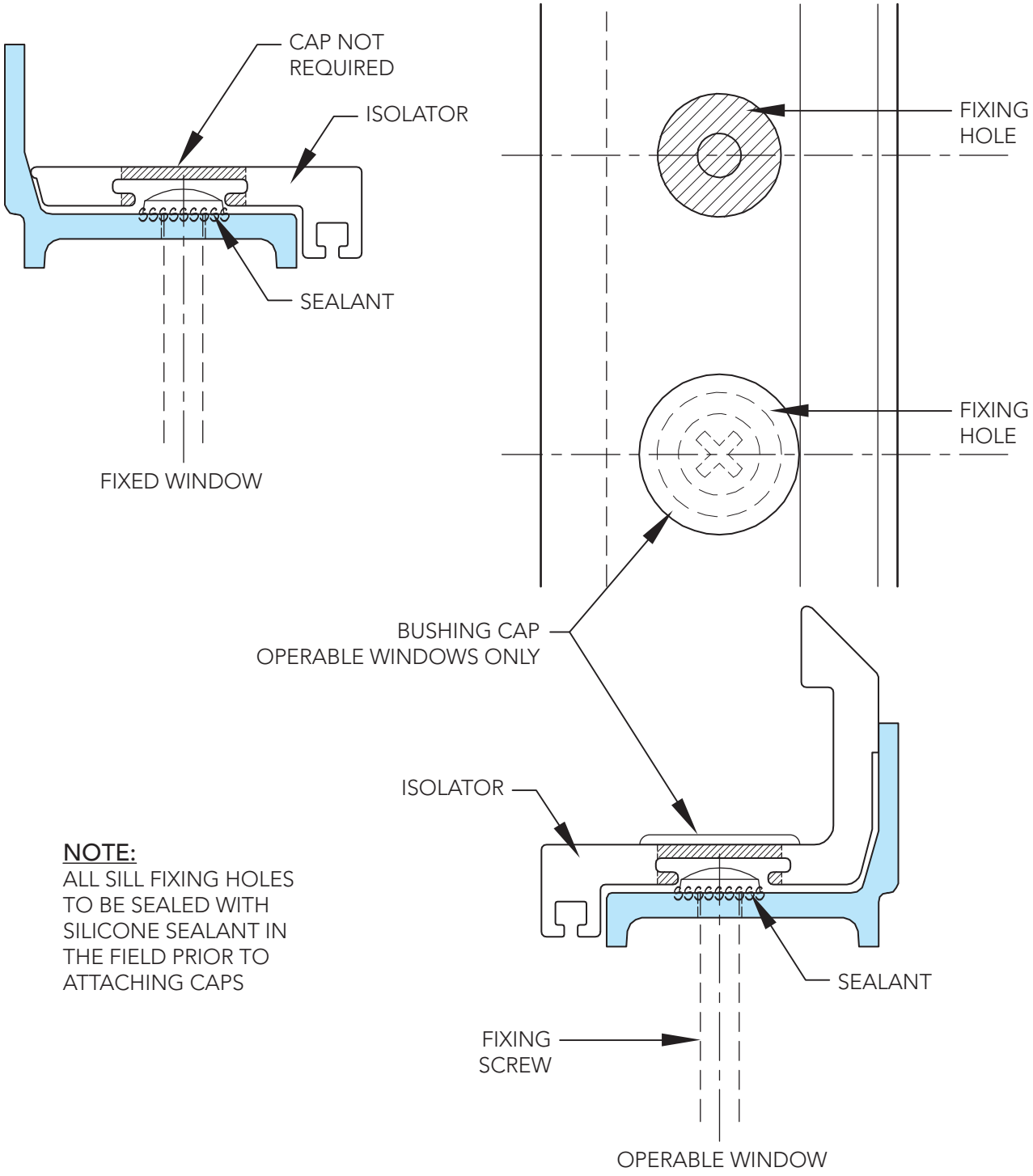


FIGURE 4: FIXING HOLE BUSHINGS AND CAPS



NOTE:
ALL SILL FIXING HOLES TO BE SEALED WITH SILICONE SEALANT IN THE FIELD PRIOR TO ATTACHING CAPS

FIGURE 5: EXTERIOR AND INTERIOR PERIMETER CAULKING

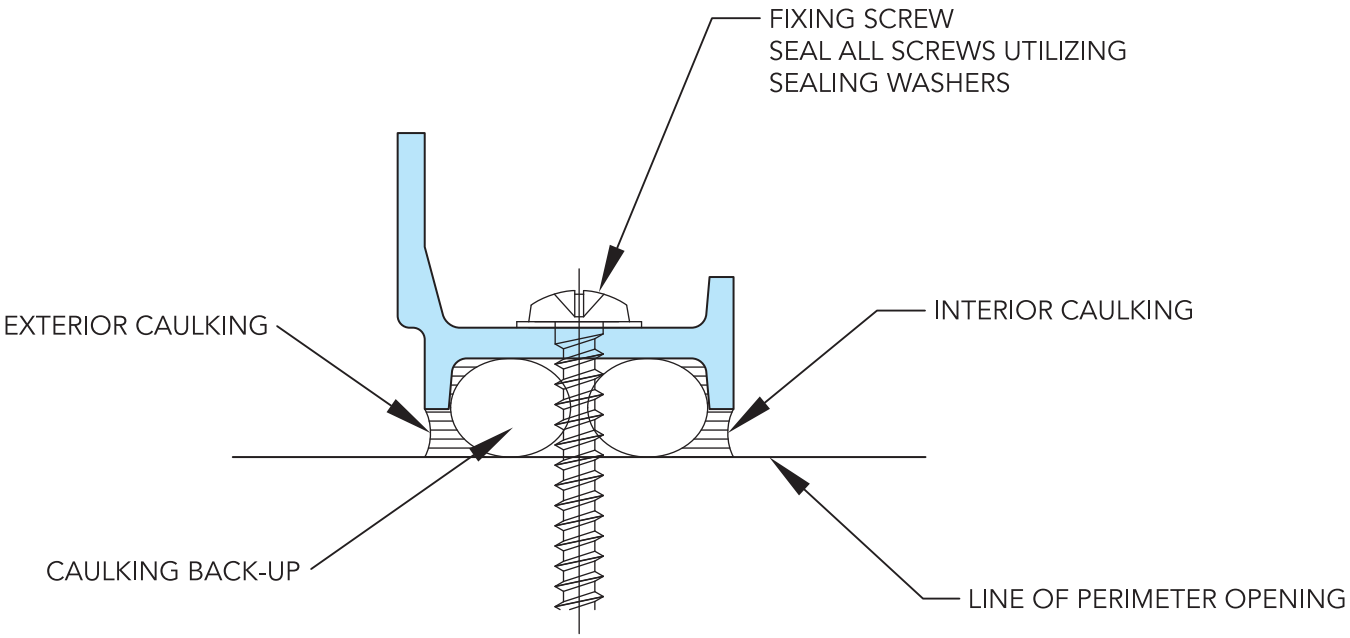
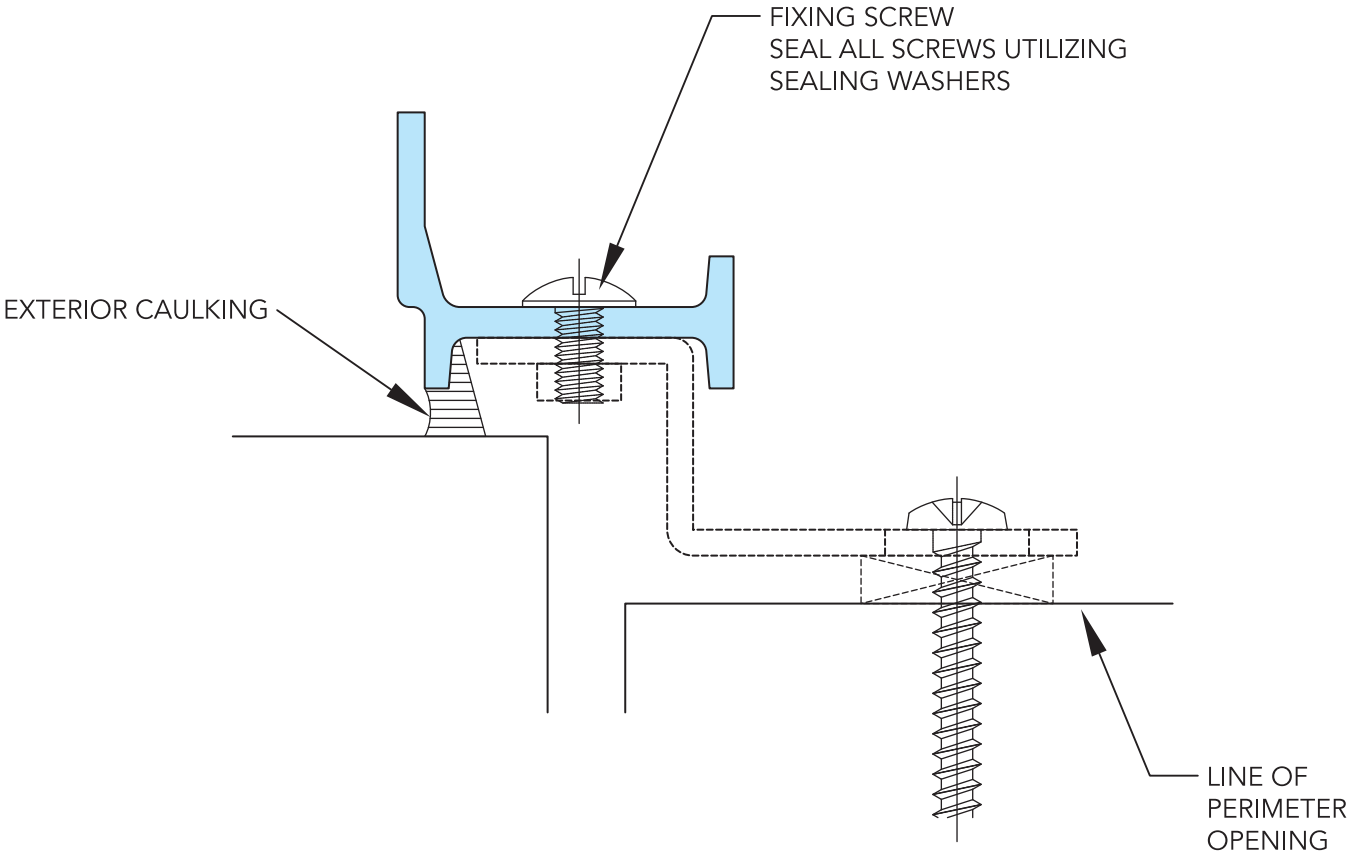


FIGURE 6: OFFSET ANCHOR DETAILS



Installing Windows with Anchors

- Attach all anchors to window frames as shown on approved shop drawings with bolts. Utilize sealing washers prior to insertion of bolt through frame into anchor (see Fig. 6).
- Insert window with anchors attached into opening.
- Using a level, plumb and level the window within the opening using shims between the anchors and the opening.
- Line drill through fixing holes into opening and install proper screws with sealant washers to suit condition. Shim between door shim and opening as required.
- Caulk the exterior joint between the sash and opening and neatly point. **IMPORTANT: Seal all fixing screw heads to the web of the sash. Utilize sealant washers at holes. WARNING! Fixing holes left vacant can allow water or air infiltration, distortion of the product and void warranty.**

Installing Mullions

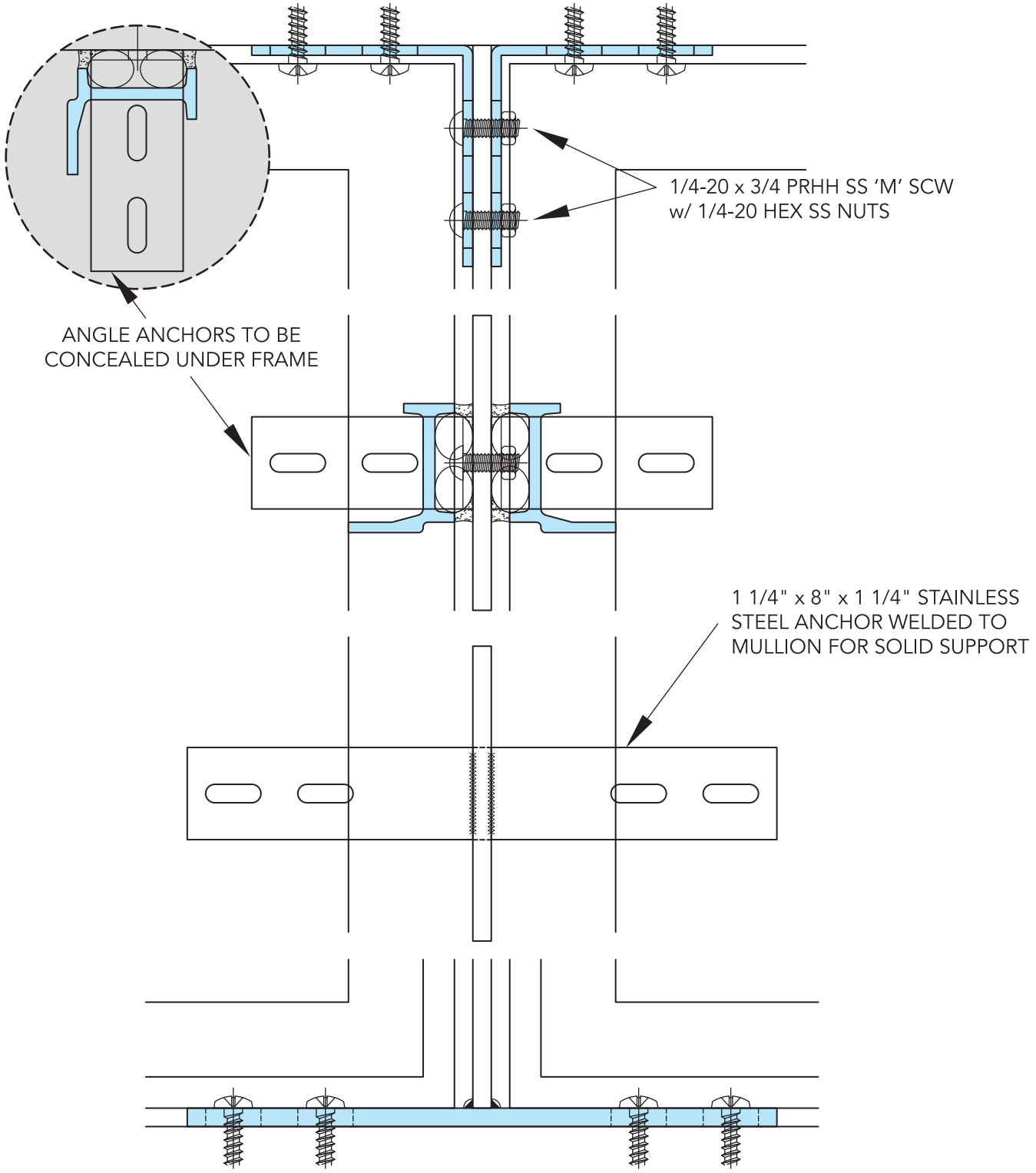
- Refer to Hope's approved shop drawings for mullion locations and anchorage conditions (see Fig. 7).
- Structural mullions (clipped) shall run to within 1/4" of the floor at the sill and have a 1/4" thick anchor that is welded to the mullion solidly supporting it to the floor. There should be no shimming the anchor at the floor.
- Structural mullions at the head shall use the standard 3" x 3" mullion clips nut and bolted to the mullion such that the clips can be initially loosely attached and slid up tight to the opening and then tightened down. Again, there will be no shimming at the head unless conditions do not allow the clip to be slid far enough to be tight.
- Mark mullion locations in opening.
- Install mullions in proper locations prior to window frames using anchors per approved shop drawings. The mullions are stamped with the proper opening type (see Fig. 8).
- For non-structural (unclipped) mullions, the mullion may be attached to the sash during sash installation. Place horse-shoe shim under mullion (at sill only) to add support and take weight off the sash screws. Please note that this will ensure the mullion is not in direct contact with sill materials which may cause corrosion (see Fig. 8a and 8b).
- After the mullion and windows are installed, but prior to sealing them, the mullion isolator is tape applied to the mullion edge. Then the sealant is applied (see Fig. 8b).

Attaching Window Hardware

Hope's Loose Window Hardware

- In order to prevent shipping damage, Hope's ships roto operator crank handles loose. It is the installer's responsibility to correctly apply these hardware components to the windows.
- After installation of the windows, always check for proper operation and bedding of ventilator to insure weather-tight seal.

FIGURE 7: STRUCTURAL MULLION ANCHORS



SCALE - HALF SIZE

FIGURE 8: SASH ANCHORS AT FLAT MULLIONS

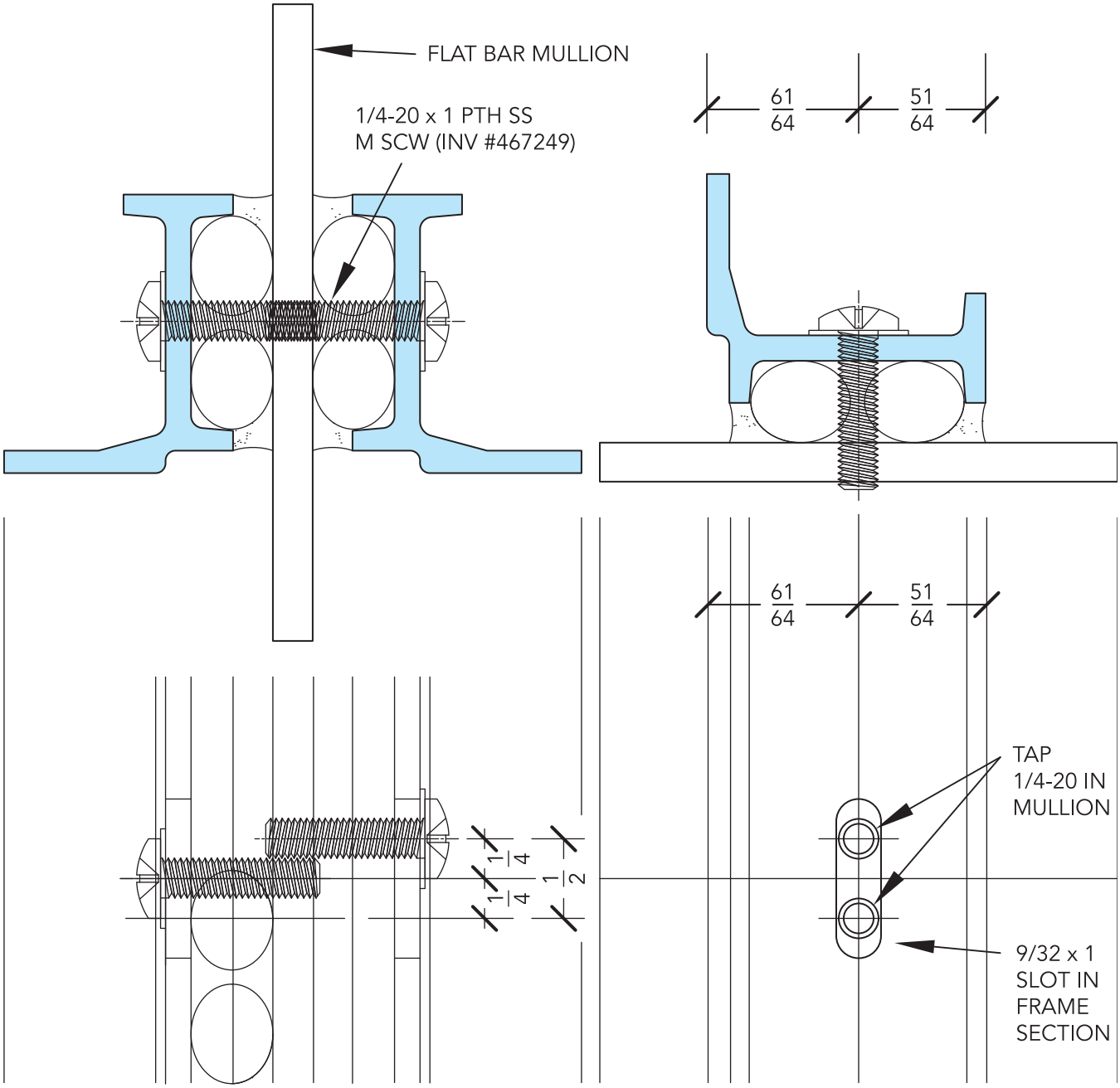


FIGURE 8a: NON-STRUCTURAL MULLION ANCHOR

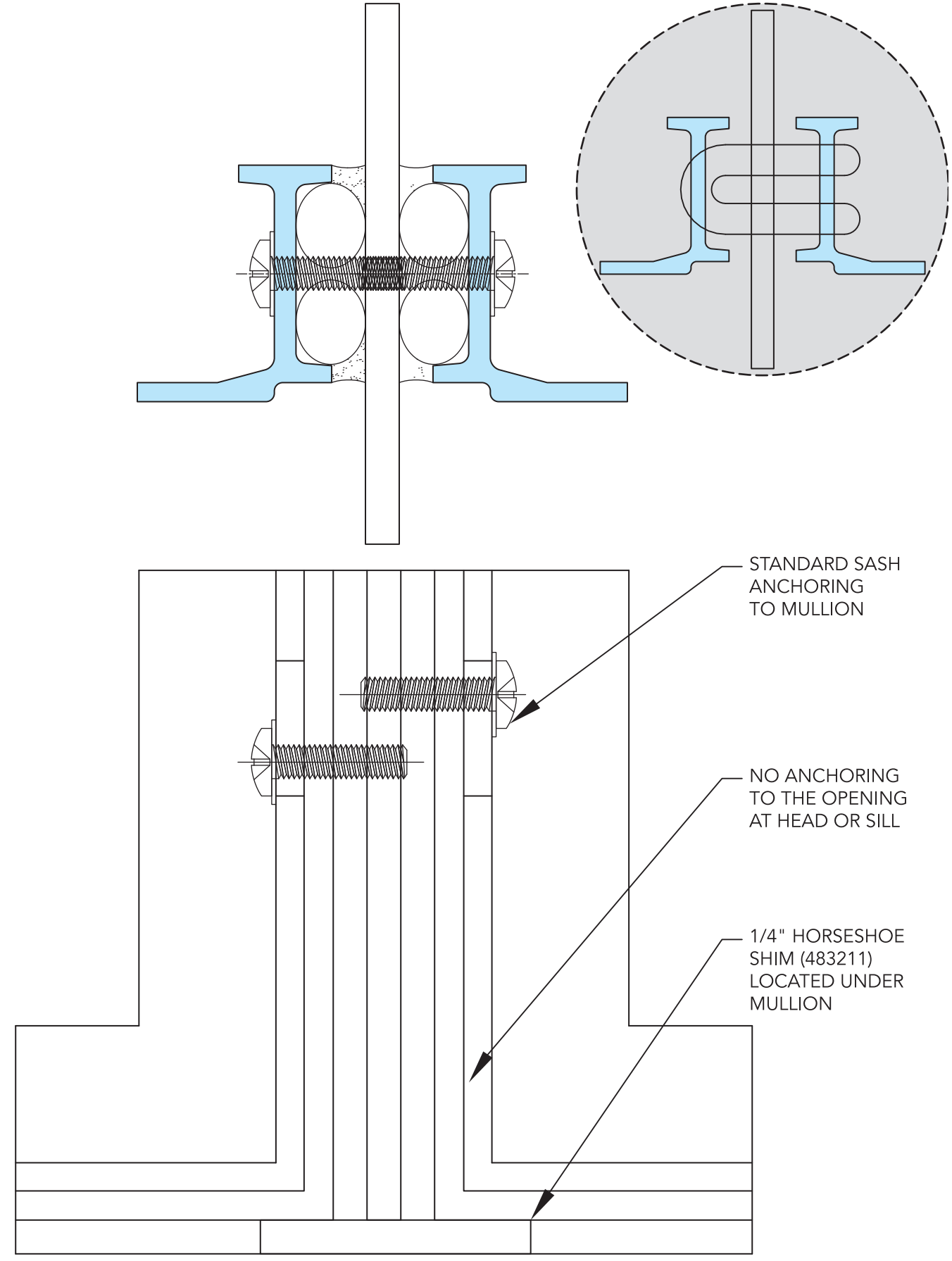
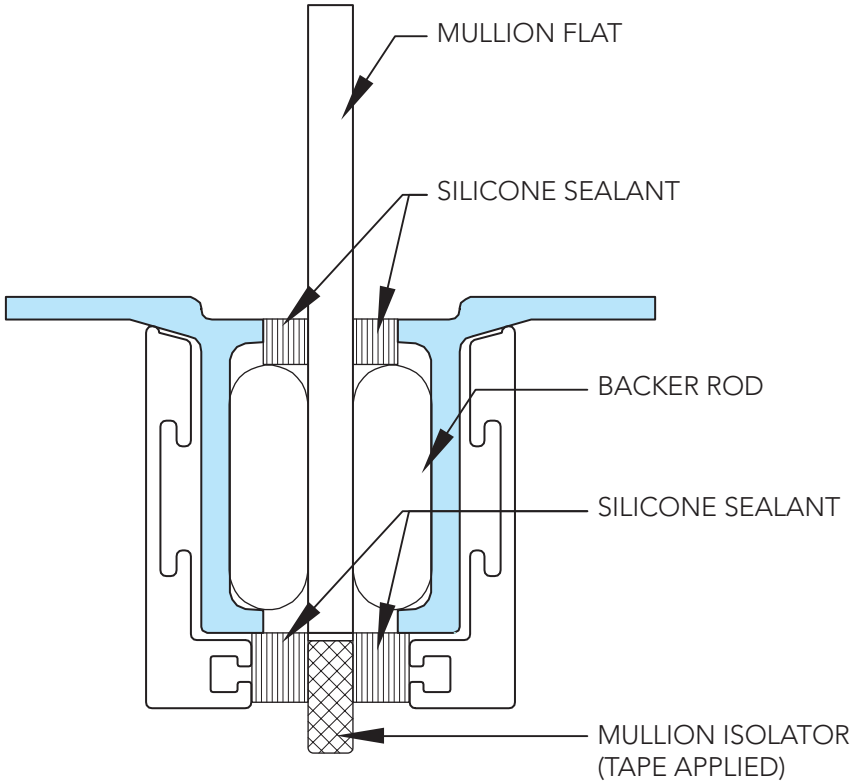


FIGURE 8b: SEALING METHOD AT MULLION



SHOWN WITHOUT MULLION ATTACHMENT PARTS

(ABOVE ILLUSTRATES A THERMAL EVOLUTION MULLION, STRUCTURAL OR NON-STRUCTURAL)

Cleaning Windows After Installation

- Clean dust, dirt and debris from windows.
- **Remove all steel drill shavings. Drill shavings will quickly rust and stain the paint finish.**
- Ideally an initial step of a forceful water rinse from the top down should be taken before the use of any cleaners. A volume of water at moderate pressure is better than a high volume at low pressure. Rubbing the surface with soft brushes, sponges or cloth during the rinsing also helps.
- If a simple water rinse is not sufficient then a mild detergent or soap will be necessary. Washing with a mild detergent or soap should be done by brushing or sponging with uniform pressure. Following washing, the surface must be thoroughly rinsed with clean water. If the cleaner has dried, it may become necessary to sponge the surface while rinsing. After the rinsing process, the surface may either be air dried or dried with the aid of a chamois or squeegee.
- Run-down of cleaners should be minimized; areas subject to run-down should be rinsed immediately to avoid possible streaking.

- Cleaning chemicals must not be allowed to collect or puddle on the horizontal surface or in the joints. These surfaces should be flushed with water and dried.
- Mild detergents and soaps that are safe for bare hands should be safe for painted windows. All detergents should be carefully spot tested.
- Some type of mild solvent such as mineral spirits may be used to remove grease. Stronger solvents may have a softening effect on paints. Extreme care must be taken to assure that no marring of the surface takes place since this could give an undesirable appearance at certain viewing angles.
- Cleaners are applied with a clean cloth and removed with a clean cloth. Remaining residue should be washed with a mild soap and rinsed thoroughly. Use solvent cleaners sparingly.
- If cleaning of a heavily soiled surface or stubborn stain is required, a more aggressive cleaner and technique may be required. Some local cleaning at this area may also be required. Always follow the recommendations of the cleaning agent manufacturer. Remember to spot test an area before using. When using stronger cleaners, do not rub excessively.

DOOR INSTALLATION PROCEDURES

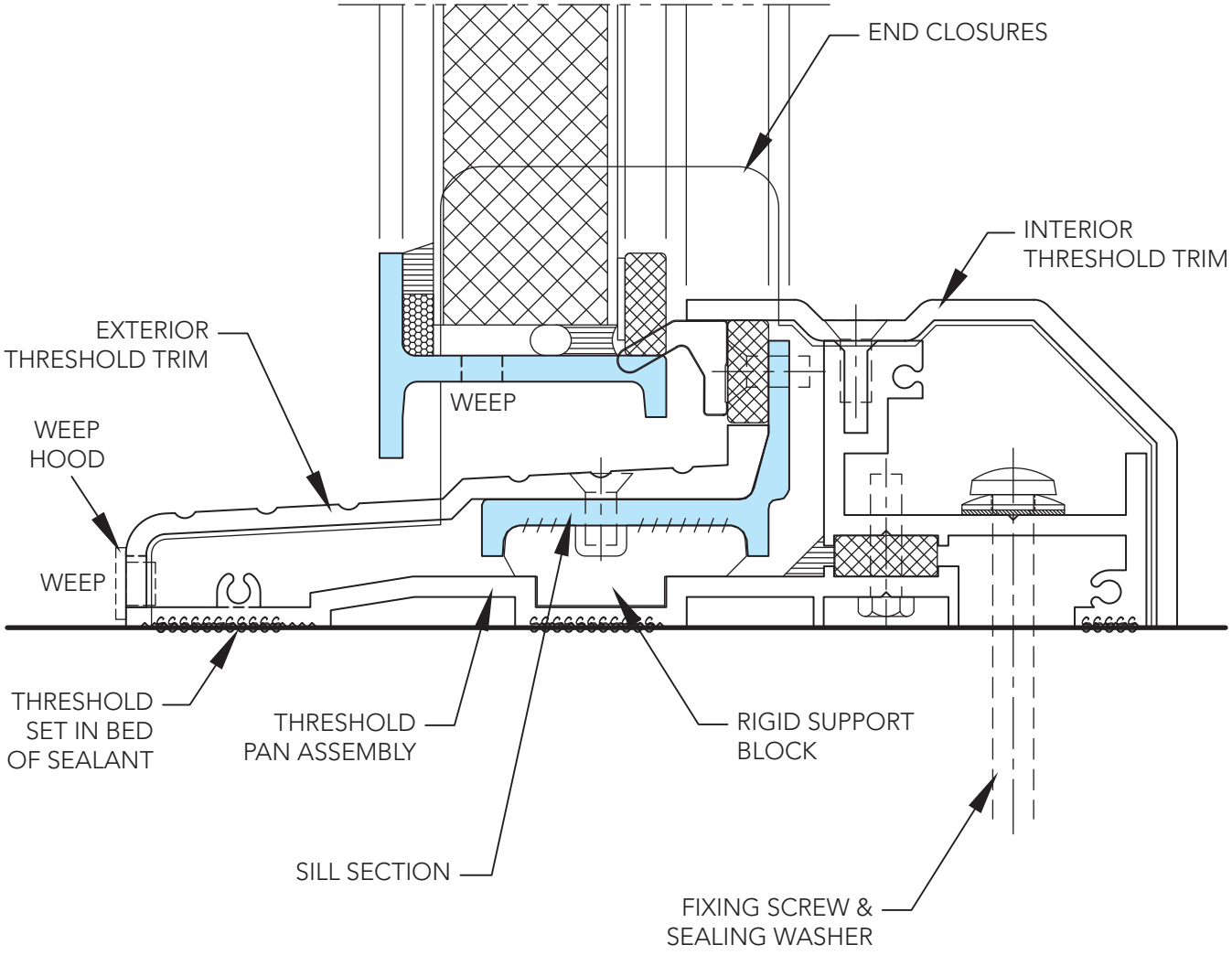
General Instructions for Installing Hot Rolled Steel Casement Doors

- Casement doors are custom fabricated with thin-member, hot rolled steel sections. They are subject to racking; therefore, great care is needed to be sure they are installed level and plumb. The installer should determine that the materials used will provide adequate support for the weight of the door and glass.
- Casement doors are normally shipped with Hope's standard hardware and standard threshold attached. Door leaves are shipped separate from the frames in order to minimize rubbing and scratching during shipment. In special cases where field applied hardware is called for, all hardware preparation has been done in the factory. **A pilot hole for the bottom bolts is provided; apply the strike plate (which may have been shipped separate) after installation for final adjustment and maximum weathertightness.**
- All Hope's casement doors are factory hung, bedded, fitted and inspected before they leave the factory. They are intended to be installed as a completed assembly. Match the door leaf(s) to the frame in the field as marked. Mismatching the doors and frames may adversely affect door operation upon reassembly. They are specific to each other and not interchangeable.
- Door strike has been designed with adjustment to allow for proper latching of the lock.
- **Any problems encountered with installing the doors, fitting hardware or obtaining proper operation should be referred to Hope's project management immediately.**

Installing Thresholds with Thermal Evolution™ Technology

- Position Hope's threshold pan in opening and ensure that it is level end to end and front to back.
- Remove Hope's threshold pan and lay beads of sealant to opening under pan (see Fig. 9). Reposition pan and attach with fixing screws. Apply sealant to fixing screw location prior to attachment.
- Seal threshold end closures to openings and to Hope's threshold pan.
- Bond rigid support block onto threshold pan with structural adhesive (see Fig. 9).
- Set door frame in opening plumb, level and square. Shim and anchor.
- Attach interior and exterior threshold covers (see Fig. 9).

FIGURE 9: THRESHOLD WITH THERMAL EVOLUTION™ TECHNOLOGY



Installing Thresholds (Other Than Hope's Attached Threshold)

- Locate position of threshold in the opening. The threshold must be level end to end and also level outside to inside, as shown on approved shop drawings.
- Apply a bed of sealant on the sill of the opening and press threshold into position.
- Line drill holes into the opening and install proper attaching screws into a bed of sealant.

Installing Hot Rolled Steel Casement Doors to Flush Openings

- Check Hope's final shop drawings to determine if weather bars or other items must be applied to casement doors before doors are installed.
- Plastic filler shims should be field attached by the installer to the door frame at each fixing hole location (see Fig. 10). Filler shims are field attached with sealant or adhesive.
- Between door frame shims, glue a rectangular caulking poly filler or install a non-gassing poly backer rod (see Fig. 11).

FIGURE 10: PLASTIC FILLER SHIMS

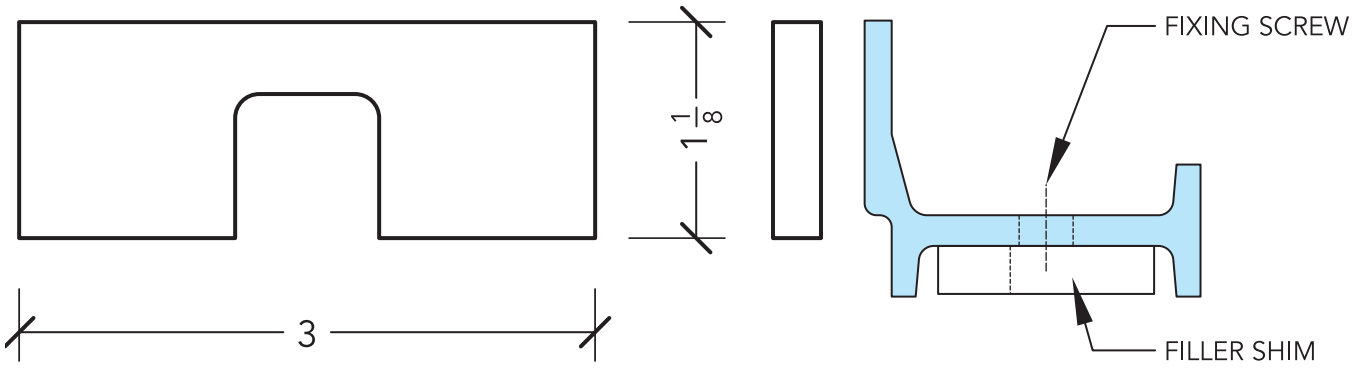
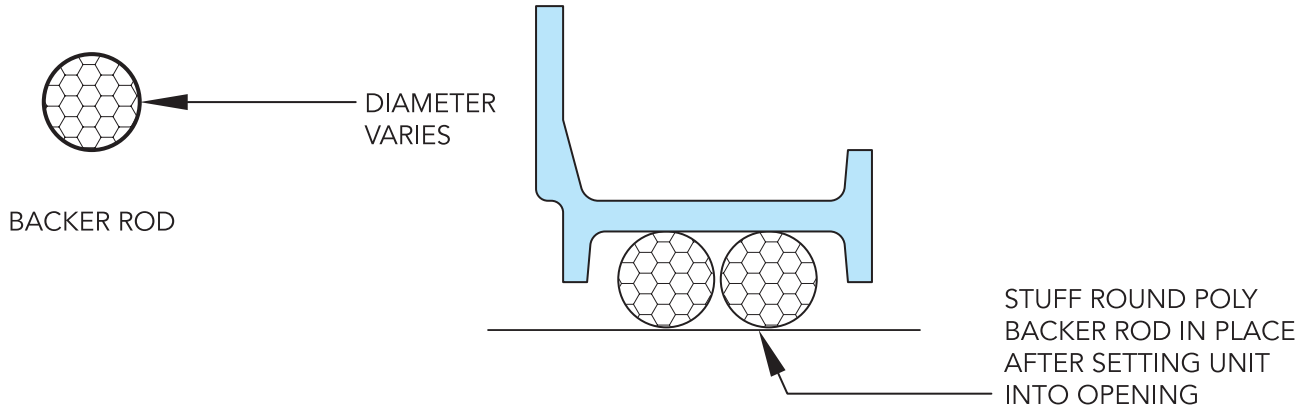
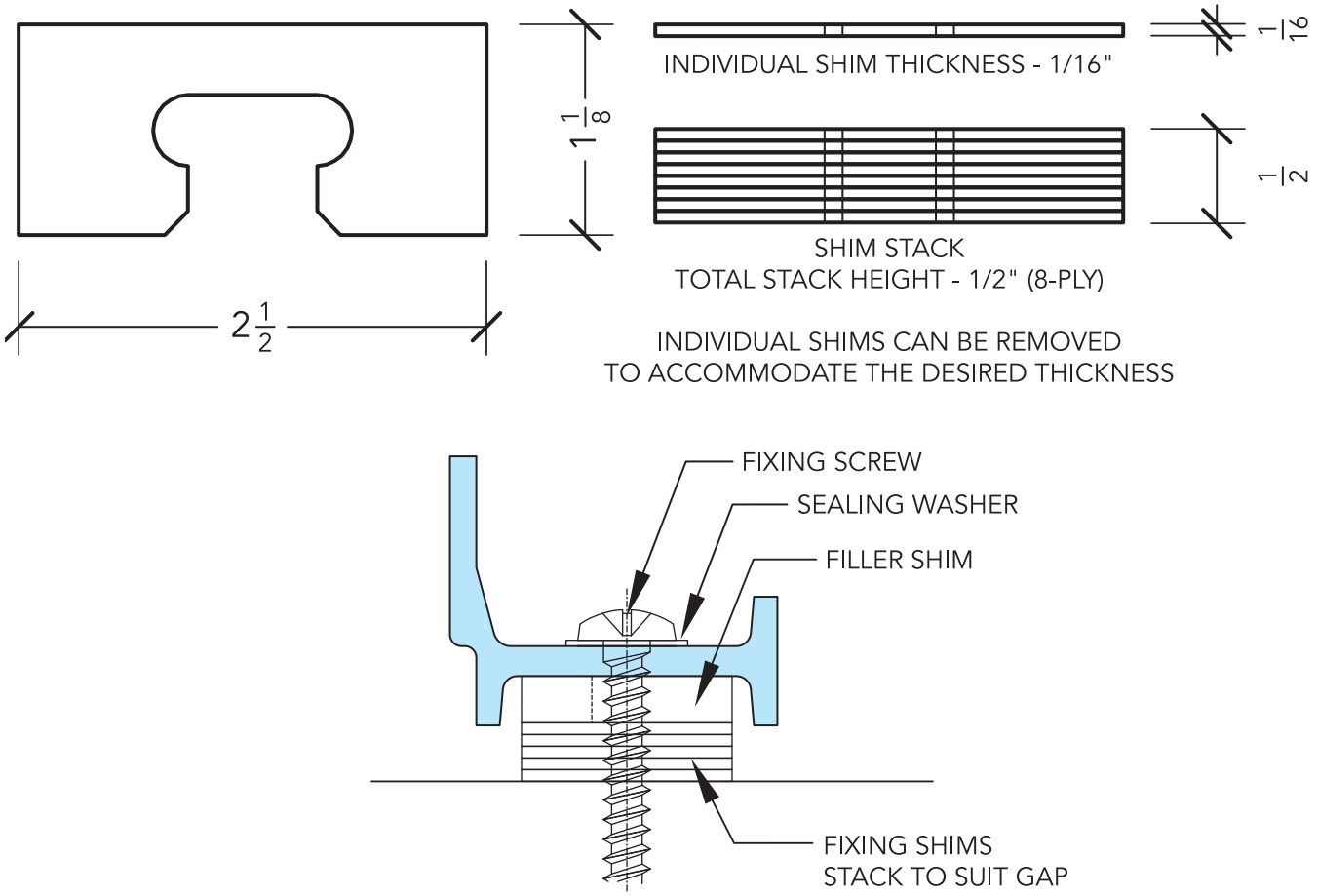


FIGURE 11: CAULKING BACK-UP



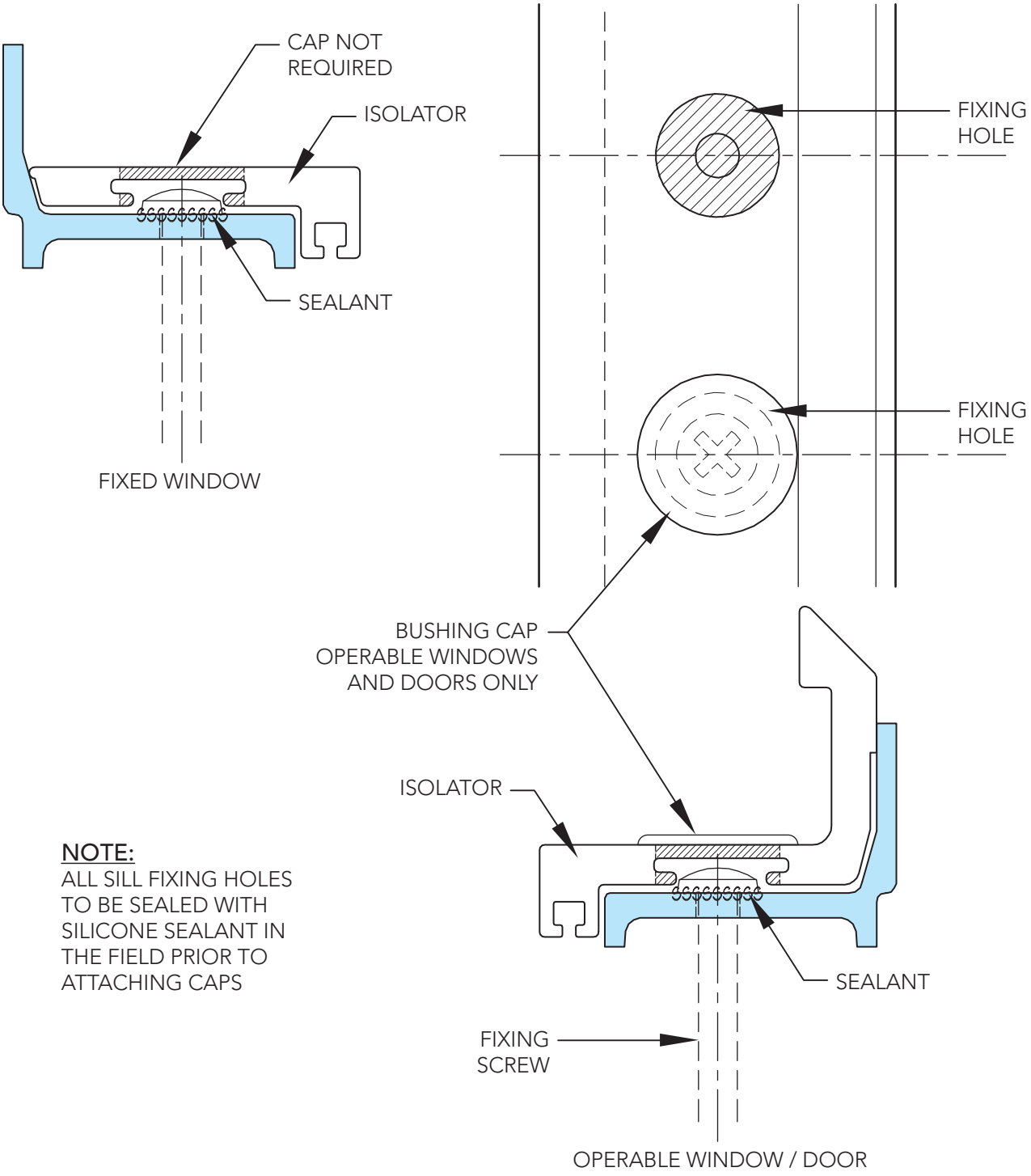
- Insert door frame into opening being careful not to pull the back-up rod from the sash.
- Between door frame shims and building structure use flat fixing shims (see Fig. 12). Fixing shims should be applied tight to structure to prevent door frames from twisting or racking during installation. Distance between the frame and the opening is at sealant manufacturer's recommendation.

FIGURE 12: PLASTIC FIXING SHIMS



- Using a level, plumb the door vertically, then horizontally using shims as required. Twisting of the frame will affect the bedding of the leaves. Please measure the in/out dimension around the opening to verify squareness. A simple string from corner to corner creating an "X" will show any twist in frame.
- Line drill through fixing holes into opening and install proper screws with sealant washers to suit condition. Make certain to properly touch-up any abraded steel surfaces with kit provided by Hope's. Shim between door shim and opening as required.
- Doors featuring Thermal Evolution™ Technology may require field attached bushing caps to conceal screw heads (see Fig. 13).
- Caulk the exterior joint between the sash and opening and neatly point (see Fig. 14). **IMPORTANT: Seal all fixing screw heads to the web of the sash. Utilize sealant washers at holes and seal with sealant at slots. WARNING! Fixing holes left vacant can allow water or air infiltration, distortion of the product and void warranty.**

FIGURE 13: FIXING HOLE BUSHINGS AND CAPS



NOTE:
ALL SILL FIXING HOLES TO BE SEALED WITH SILICONE SEALANT IN THE FIELD PRIOR TO ATTACHING CAPS

FIGURE 14: EXTERIOR AND INTERIOR PERIMETER CAULKING

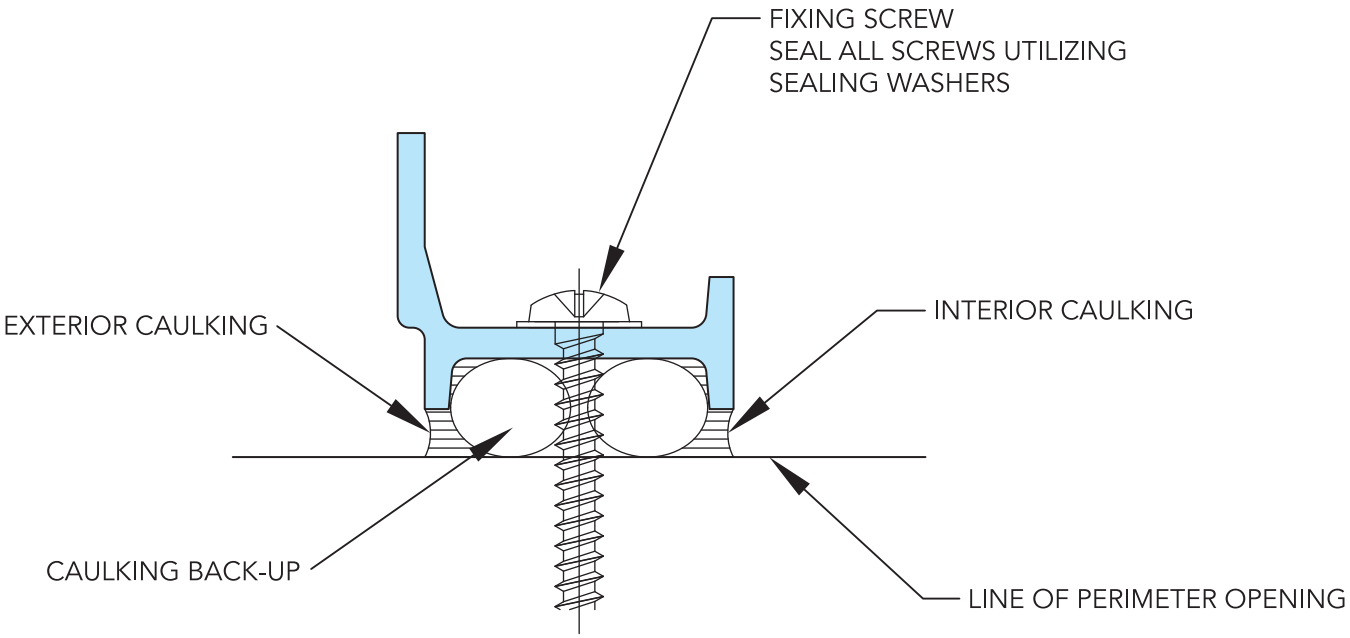
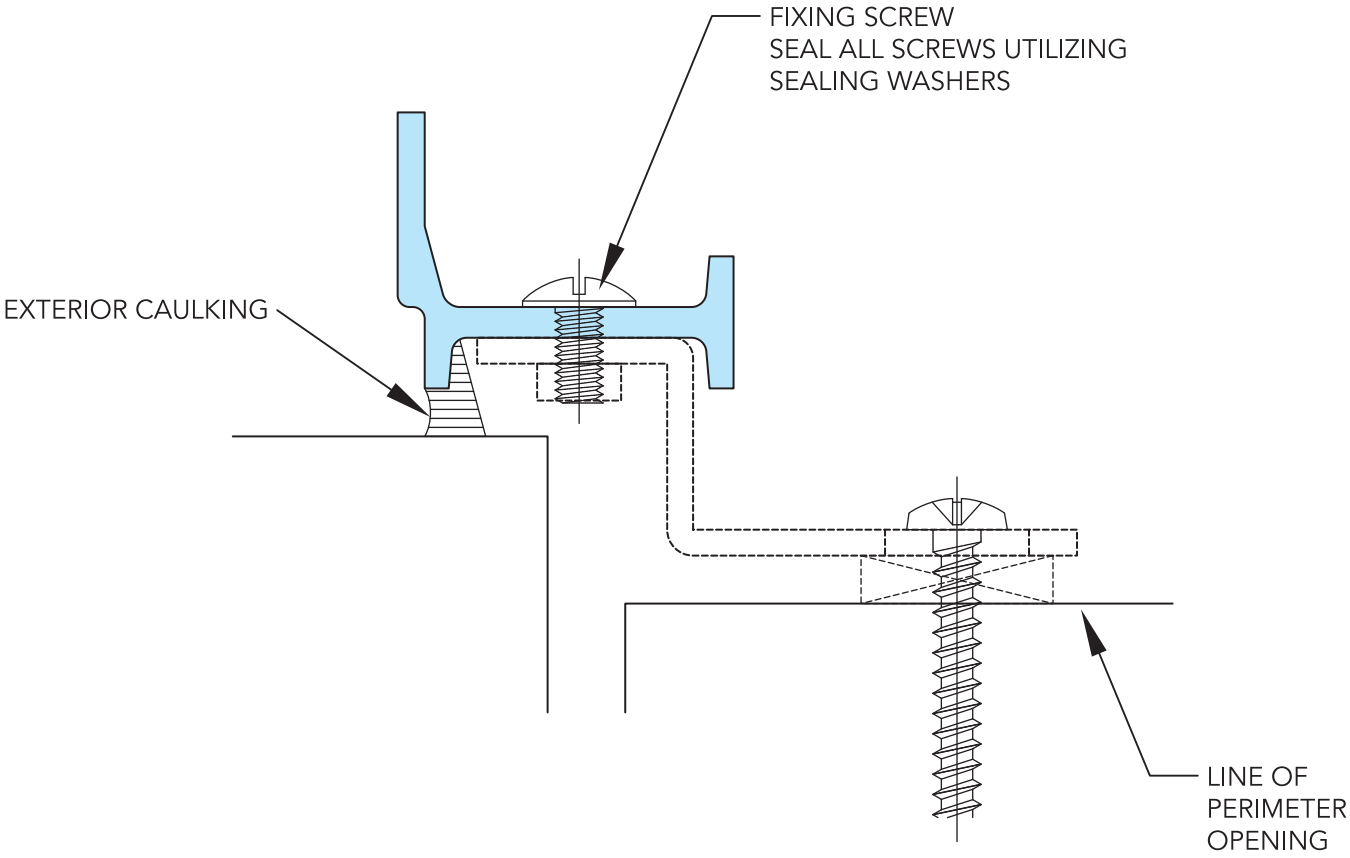


FIGURE 15: OFFSET ANCHOR DETAILS



Installing Hot Rolled Steel Casement Doors with Anchors

- Attach all anchors to door frames as shown on approved shop drawings with bolts. Utilize sealing washers prior to insertion of bolt through frame into anchor. (See Fig. 15)
- Insert door with anchors attached into opening.
- Using a level, plumb and level the door within the opening using shims between the anchors and the opening.
- Line drill through the anchor slots into the opening and install proper screws and plugs to suit conditions.
- Caulk the exterior joint between the sash and opening and neatly point. **IMPORTANT: Seal all fixing screw heads to the web of the sash. WARNING! Fixing holes left vacant can allow water or air infiltration, distortion of the product and void warranty.**

Installing 5000 Series™ Steel Doors

- Hope's 5000 Series hollow metal doors and frames are custom fabricated from heavy gauge sheet steel. The installer should determine that the materials used will provide adequate support for the weight of the door and glass.
- Hope's 5000 Series doors and frames are shipped with hardware preparation completed as shown on the approved shop drawings. Line drilled and through type fasteners are not shop prepared.
- All Hope's doors are factory hung, bedded, fitted and inspected before they leave the factory.
- **Any problems encountered with installing the doors, fitting hardware or obtaining proper operation should be referred to Hope's project management immediately.**
- Attach anchors to door frame (if required).
- **When positioning the door frame into opening, the frame must be plumb, square and level using shims furnished by installer as required.**
- Line drill through fixing holes into opening and install proper screws with sealant washers to suit condition. Shim between door shim and opening as required. Touch up any abraded surfaces to protect from rust.
- Lay a bed of sealant on the sill of the opening. Press the threshold into position and line drill and install proper attaching screws.
- **PLEASE CONSIDER UTILIZING LOCTITE® OR EQUIVALENT FOR HARDWARE ATTACHMENT.**
- Attach hinges to frame and door leaf and hang leaf.
- Attach mortised hardware using factory preparations.
- Field prepare and attach surface mounted hardware in accordance with hardware manufacturer's instructions. Touch up any abraded surfaces to protect from rust.
- Caulk the exterior joint between the frame and opening and neatly point per the caulking manufacturer's recommendations.

Cleaning Doors After Installation

- Clean dust, dirt and debris from doors.
- **<u>WARNING!</u> Remove all steel drill shavings. Drill shavings will quickly rust and stain the paint finish.**
- Touch up any abraded surfaces to protect from rust.
- Ideally an initial step of a forceful water rinse from the top down should be taken before the use of any cleaners. A volume of water at moderate pressure is better than a high volume at low pressure. Rubbing the surface with soft brushes, sponges or cloth during the rinsing also helps.
- If a simple water rinse is not sufficient then a mild detergent or soap will be necessary. Washing with a mild detergent or soap should be done by brushing or sponging with uniform pressure. Following washing, the surface must be thoroughly rinsed with clean water. If the cleaner has dried, it may become necessary to sponge the surface while rinsing. After the rinsing process, the surface may either be air dried or dried with the aid of a chamois or squeegee.
- Run-down of cleaners should be minimized; areas subject to run-down should be rinsed immediately to avoid possible streaking.
- Cleaning chemicals must not be allowed to collect or puddle on the horizontal surface or in the joints. These surfaces should be flushed with water and dried.
- Mild detergents and soaps that are safe for bare hands should be safe for painted windows. All detergents should be carefully spot tested.
- Some type of mild solvent such as mineral spirits may be used to remove grease. Stronger solvents may have a softening effect on paints. Extreme care must be taken to assure that no marring of the surface takes place since this could give an undesirable appearance at certain viewing angles.
- Cleaners are applied with a clean cloth and removed with a clean cloth. Remaining residue should be washed with a mild soap and rinsed thoroughly. Use solvent cleaners sparingly.
- If cleaning of a heavily soiled surface or stubborn stain is required, a more aggressive cleaner and technique may be required. Some local cleaning at this area may also be required. Always follow the recommendations of the cleaning agent manufacturer. Remember to spot test an area before using. When using stronger cleaners, do not rub excessively.

GLAZING HOT ROLLED WINDOWS, HOT ROLLED DOORS AND 5000 SERIES DOORS

(Applicable for either glazed-in or glazed-out conditions)

Preparation For Glazing

- Inspect the window glazing pocket. It should be clean and dry.
- Close and lock all ventilators and casement door leaves. Ventilators and casement door leaves must be glazed in the closed and locked position. Support door leaves with shims prior to glazing then remove after glazing has cured.
- **IMPORTANT: Door leaf must remain shut and supported until all glazing materials have hardened.**

Removing Hope's Factory Attached Glazing Beads

- Hope's windows and doors are shipped with factory attached glazing beads that are hand-cut and fitted around each glass lite. Before glass can be installed, the glazing beads must be removed and carefully set aside for reinstallation to the same location.
- **Hope's glazing beads are individually pre-fitted around each glass lite and are not interchangeable with other locations, even other lites with the same dimensions. Therefore, glazing beads must be reinstalled to the same location on the window or door from which each was removed.**
- When removing Hope's snap-in or hook-on glazing beads, observe the bead engagement with retainer; then reinstall the bead to become familiar with the attaching feature. **NOTE:** Glazing bead must fit tight against the frame section and remain in plane with face of the frame section.
- Figure 16 illustrates how Hope's snap-in beads should be removed to start the glazing process and how they should be reinstalled after the glass has been set. (See next section for glass blocking and setting procedures.)
- Figure 17 illustrates how Hope's hook-on beads should be removed to start the glazing process and how to reinstall them after the glass has been installed. Use the bent blade of a putty knife to apply pressure to the bottom of the bead forcing the lip of the bead under the glazing stud before installing the wedge.

Factory Cut Glazing Beads

- Beads may be factory cut and shipped loose per project or product requirements. (Reference Hope's release to manufacturing documents.)
- Reference Figure 16 for attachment of Hope's snap-in beads.
- Reference Figure 17 for attachment of Hope's hook-on beads.

FIGURE 16: REMOVING AND REINSTALLING SNAP-IN GLAZING BEADS

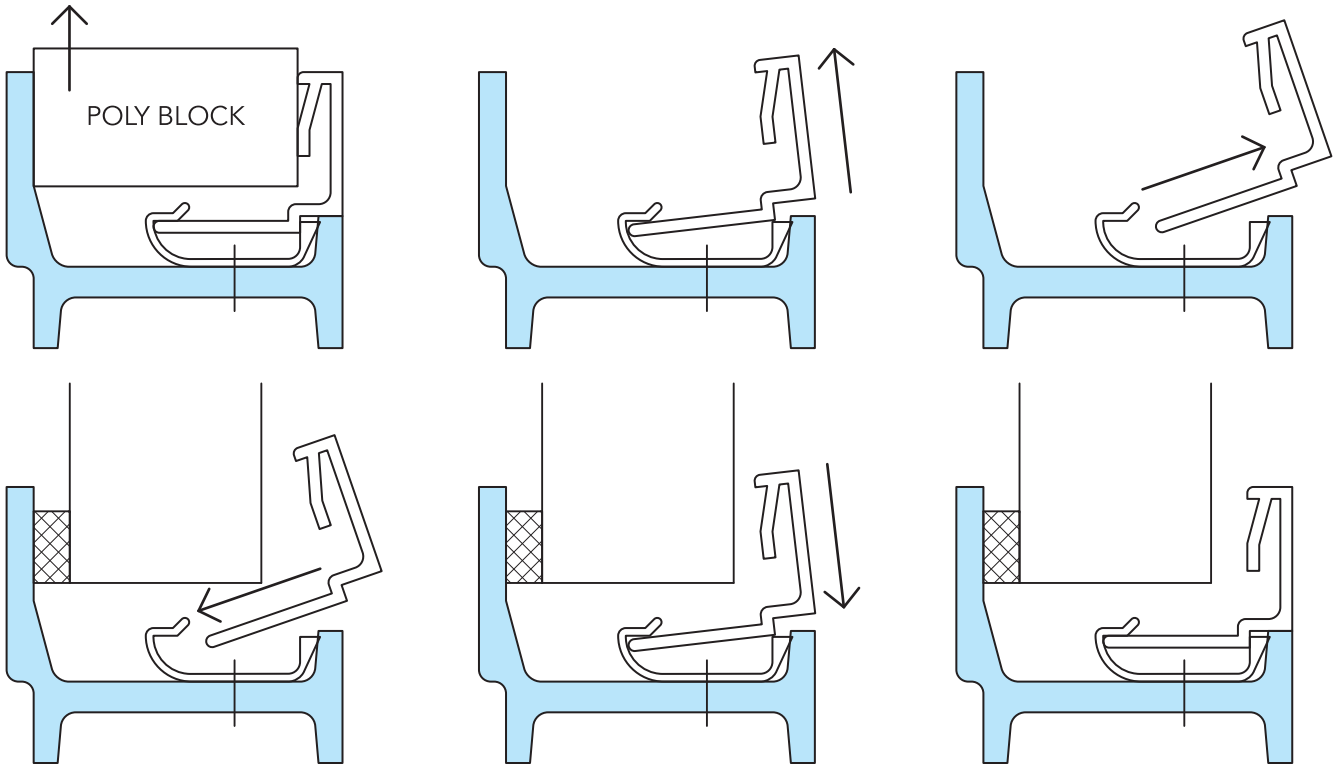
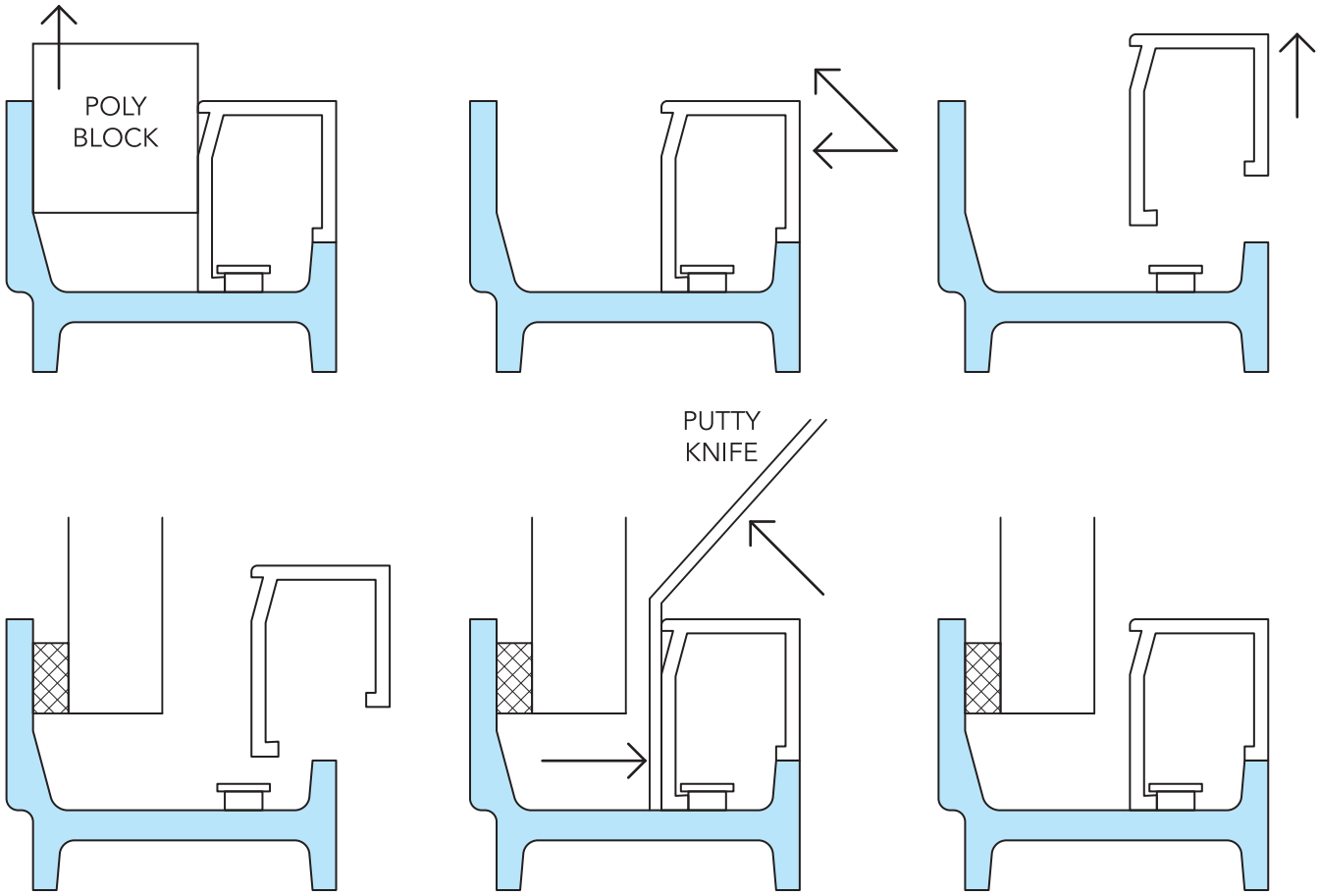


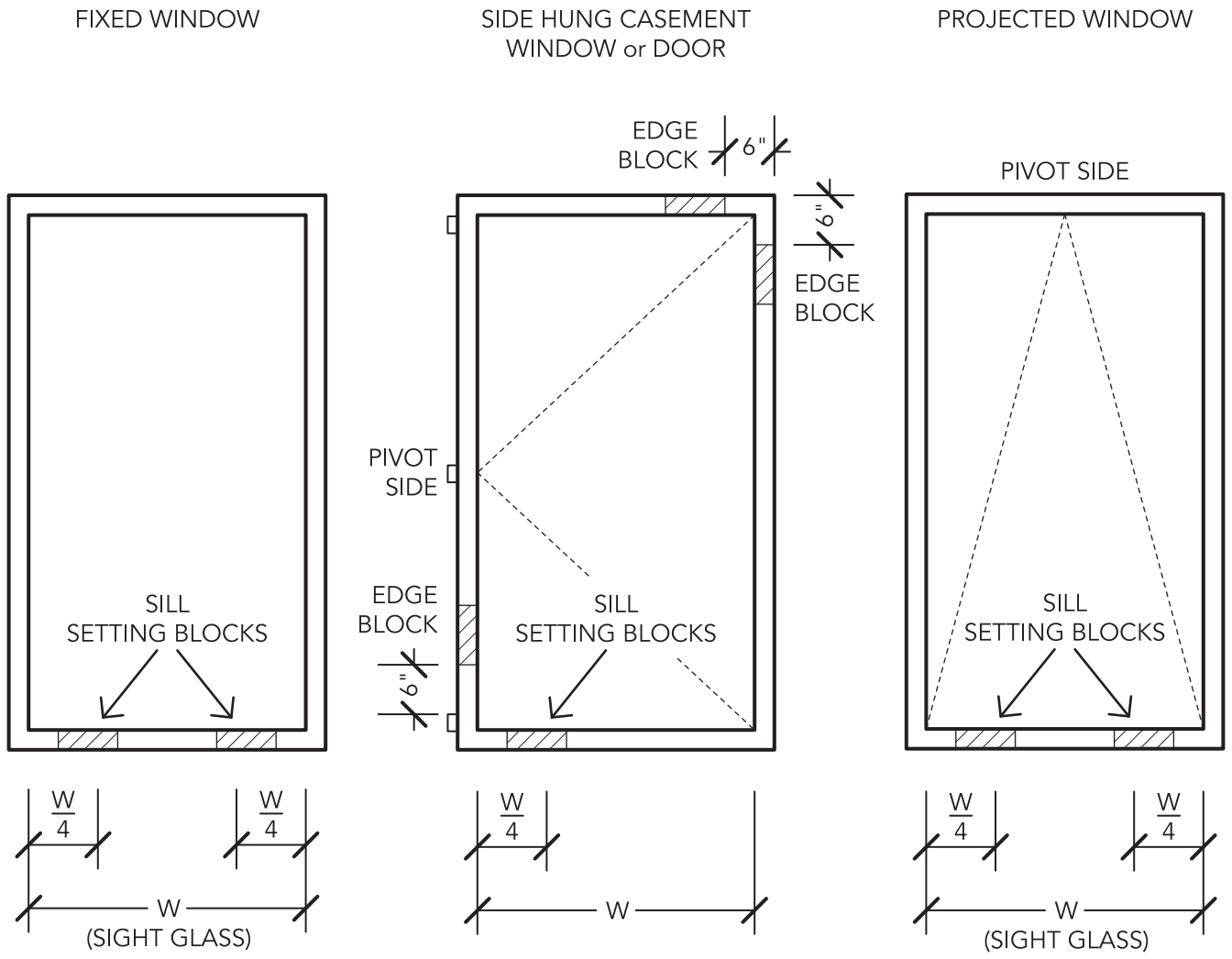
FIGURE 17: REMOVING AND REINSTALLING HOOK-ON GLAZING BEADS



Glass Blocking Recommendations

- Glass blocking should be placed as shown by the elevations in Figure 18. **<u>WARNING!</u> Failure to position blocking as recommended may result in racking of the window ventilator or casement door leaf and increase its inability to operate properly.** This may occur with large size units and heavy glass due to improper weight distribution.
- Hope's snap-in glazing beads for Jamestown175™ Series are notched to accommodate the setting block positions indicated. Width of all setting blocks must fit within the notch in the glazing bead. Snap-in glazing beads for Landmark175™ Series and University™ Series are not notched for setting blocks. Hook-on beads for all series are not notched for setting blocks.

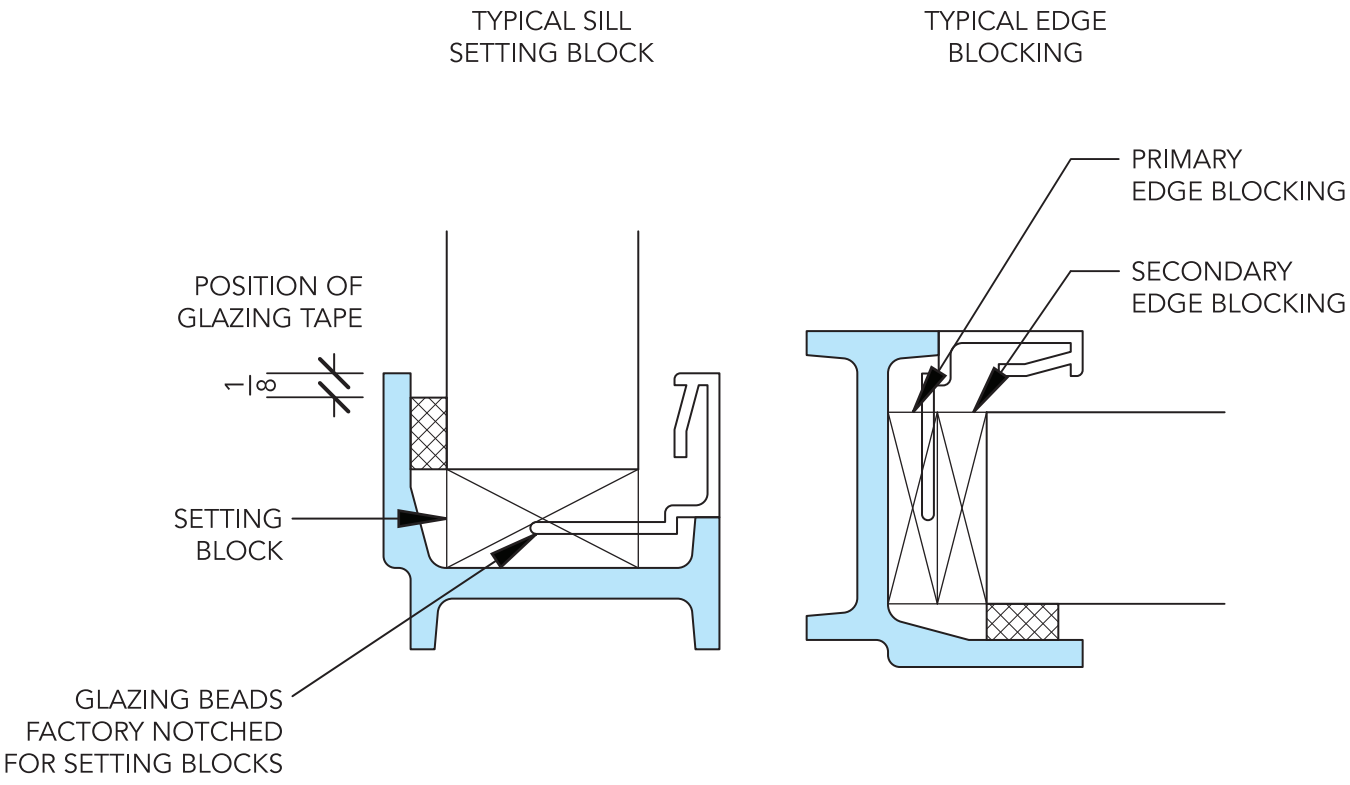
FIGURE 18: GLASS BLOCKING RECOMMENDATIONS



Glazing Procedure

- Refer to the shop drawings for product specific glazing details.
- Install glazing tape around the perimeter of the fixed glazing rebate (opposite side from glazing bead). The tape should be installed 1/8" below the edge of the rebate to provide a pocket for the sealant cap bead.
- Do not use a pre-shimmed tape on exterior unless otherwise noted on Hope's shop drawings. **A 3/16" foam tape compressed to 1/8" face clearance or a 1/4" foam tape compressed to 3/16" face clearance is recommended depending on glass thickness and tolerance.**
- Install setting block material at the sill to support glass and prevent sliding prior to curing of cap seal.
- For units that require edge setting blocks (vertically pivoted window vents, reversible window vents, casement window vents and casement door leaves) install 1/4" high head and jamb "primary" edge blocks prior to installing the glass. Attach with sealant or adhesive.
- Set glass on the sill setting blocks and firmly press against the back glazing (see Fig 19).
- Where required, wedge "secondary" edge block between primary edge block and glass edge.
- If a "structural" glazing procedure is required because of oversized units or special applications refer to the approved shop drawings for procedures or the sealant manufacturer's recommendations.

FIGURE 19: GLASS BLOCKING DETAILS



Reinstalling Snap-in and Hook-on Beads, Installing Glazing Wedge and Cap Bead

- Insert head and sill glazing beads into retainer. Insert shims or short pieces of glazing wedge between the bead and glass to temporarily hold the glass in position.
- Insert jamb beads into position.
- Cut a length of glazing wedge 1/4" longer per linear foot than the daylight opening of the lite (see Fig 20).
- Insert the glazing wedge between the glass and glazing bead beginning at the center working to half the distance to the corner. Spray soapy water to receive wedge. This will aid wedge installation.
- Insert the end of wedge at the corner and work back toward the center. Install the remaining opposite side of the drive wedge in the same manner. Rolling tools and soapy warm water are recommended for ease of installation.
- Complete the installation of the glazing wedge on the remaining three (3) sides. **NOTE:** Do not use one continuous strip, cut each side individually.
- Cap bead the perimeter between fixed glazing rebate and the glass with sealant and neatly point.
- See Figure 20 for detail of complete glazing components and example of how to figure proper length of glazing wedge.
- If the glazier elects to add a heel bead of sealant, it must not interfere with the factory prepared glazing weep system.

FIGURE 20: TYPICAL GLAZING DETAIL

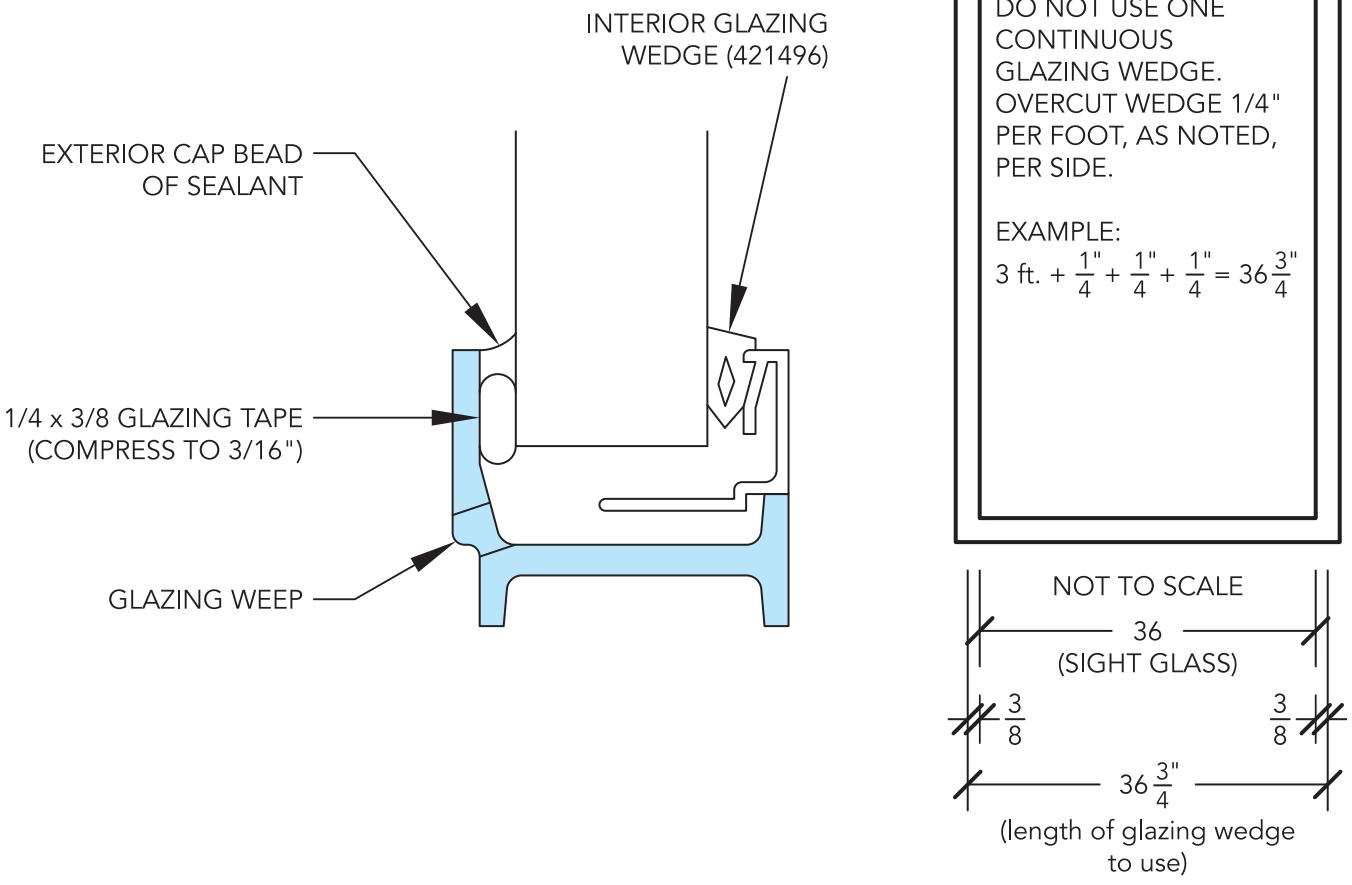


FIGURE 21a: TYPICAL GLAZING DETAIL FOR 1-1/8" THICK INSULATING GLASS FOR FIXED WINDOWS WITH THERMAL EVOLUTION™ TECHNOLOGY

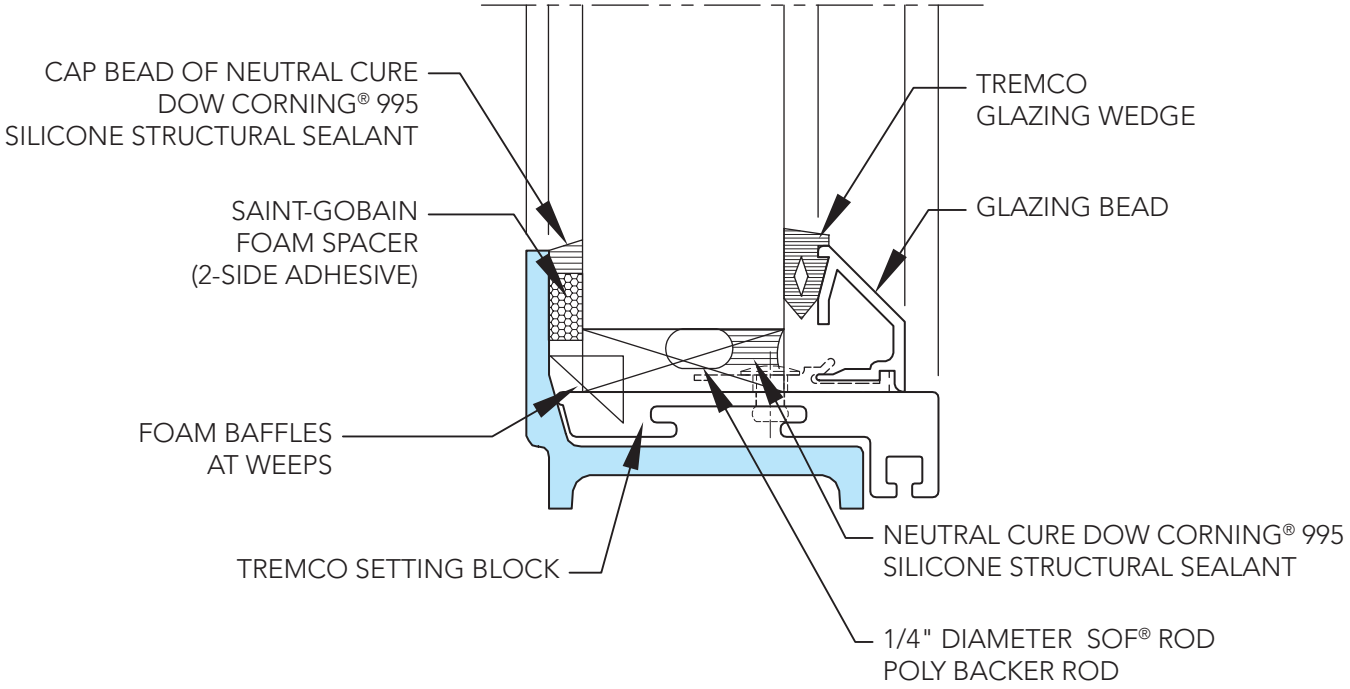
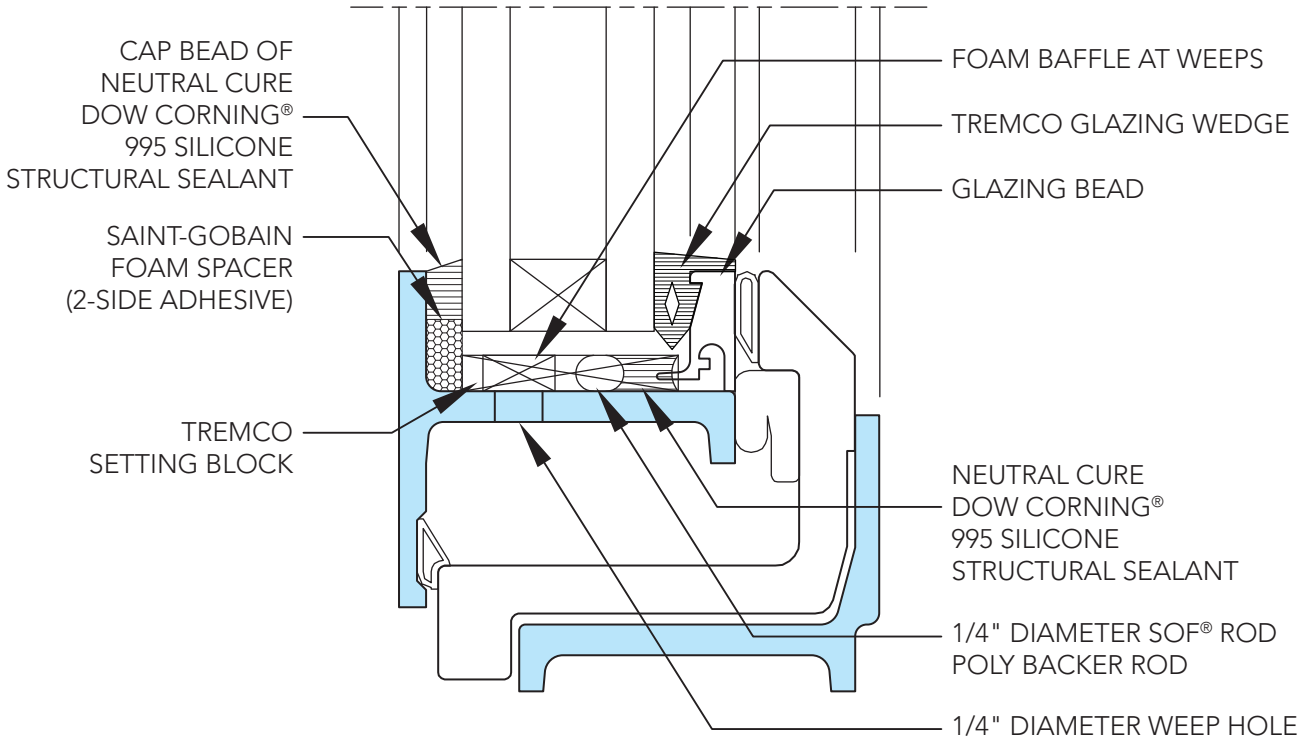


FIGURE 21b: TYPICAL GLAZING DETAIL FOR 1-1/8" THICK INSULATING GLASS FOR OPERABLE WINDOWS AND DOORS WITH THERMAL EVOLUTION™ TECHNOLOGY



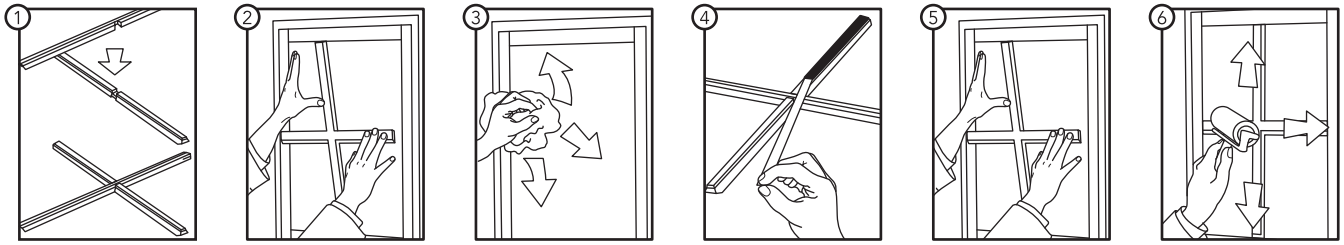
Attaching Applied Glazing Beads

- Install and glaze glass into position.
- Dry fit applied beads to ensure proper fitting (slight filing or cutting may be required).
- To obtain optimum adhesion, the beading surface must be well unified, clean and dry.
- Carefully remove all plastic liners on the tape side of the applied bead. Carefully apply bead to glass surface. **WARNING! Once the tape contacts the glass, the bead cannot be repositioned or removed.**
- Repeat this process for the remaining applied glazing beads.
- Using a roller, apply moderate pressure (no more than 15 psi) and press all areas of the beads onto the glass.

Attaching Applied Simulated Divided Lite Muntins (SDL)

- Assemble grid. Check fit of the grid to the glass — do not remove the plastic liner yet. Make sure that the grid lays flat on the glass with a slight gap at the ends (see Fig 22:1-2). **Refer to shop drawings for muntin end gap requirements.**
- Installer may need to trim the ends of applied SDL muntins where required due to shop tolerances. This is not uncommon due to the custom nature of steel sections, fabrication techniques, and the absence of glass in our scope. This is the responsibility of the muntin installer not Hope's Windows, Inc. Sealant may need to be applied on the ends of the muntins to close off space between the glazing material and the muntin ends.
- To obtain optimum adhesion, the bonding surface must be well unified, clean and dry. Prime the glass by spraying with rubbing alcohol (solvent made up of minimum 50% isopropyl alcohol/water mixture) (see Fig 22:3). Hope's does not recommend using Windex®. Wipe clean with a lint-free cloth. Wait 1-3 minutes to allow any residual moisture to evaporate.
- Carefully remove all plastic liners on the tape side of the grid (see Fig 22:4). Position the grid over the glass without touching the glass surface (see Fig 22:5). Two people can better accomplish this positioning, especially with larger sizes. Very carefully, lower the grid to the glass surface. **WARNING! Once the tape contacts the glass, the grid cannot be repositioned or removed.**
- Using the roller, apply moderate pressure (no more than 15 psi) and press all grid areas to the glass (see Fig 22:6). Bond strength is dependent upon the amount of adhesive-to-surface contact. Firm application pressure develops better adhesive contact and helps improve bond strength.
- Repeat the procedure on the other side of the glass if an interior/exterior application is required.
- Do not apply grid to glass unless weather conditions maintain 60 °F or warmer for 72 continuous hours with low humidity.

FIGURE 22: INSTALLATION PROCEDURE FOR MUNTIN GRIDS



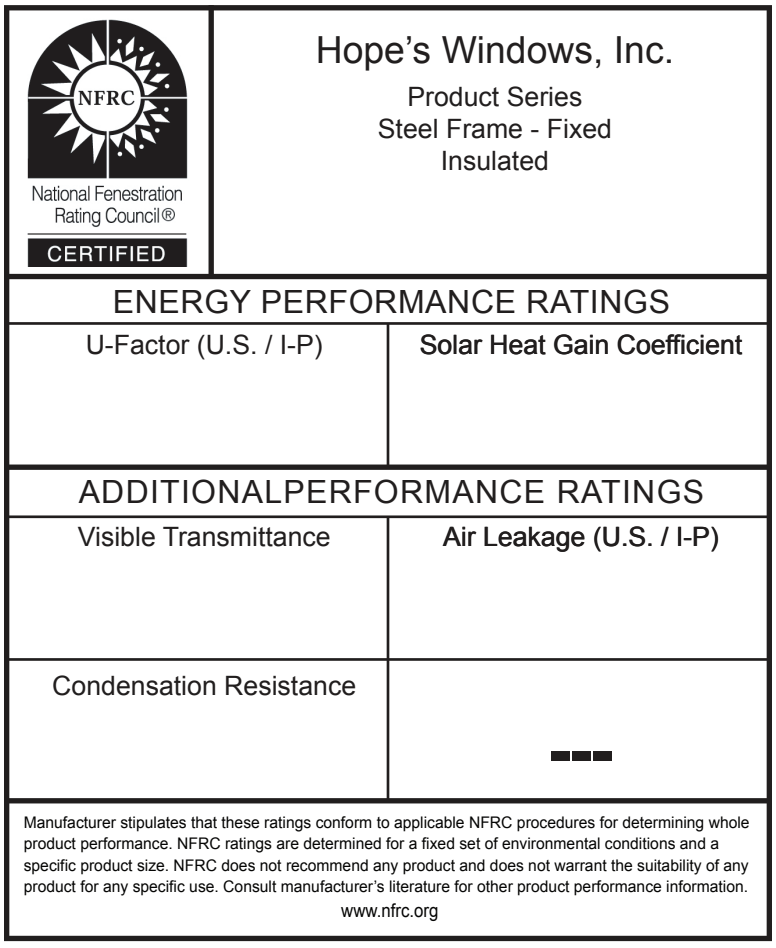
After Glazing

- Do not unlock or operate ventilators or casement doors until glazing has been cured.
- If nylon vent aligners or rider blocks are used for casement windows and the vent drags on the vent aligner, do one of the following: loosen the attaching screw and adjust downward the aligner height (1/16") or remove the 1/16" shim under the vent aligner.

Application of NFRC Temporary Labels

- Hope's will supply NFRC temporary labels for projects as required. (Reference Hope's manufacturing drawings to verify if temporary labels are required.)
- If required, these temporary labels (see Fig. 23) are to be applied after glazing. (Reference Hope's manufacturing drawings to identify label locations.)
- Label location shall be clean and dry prior to attachment.

FIGURE 23: NFRC TEMPORARY LABEL



SCREEN INSTALLATION

Installing Screens for Swing-Out Ventilators

- Position screen on screen support studs or on the roto operator housing (see Fig. 24).
- Attach screen clips using screws provided. **NOTE:** Taller screens may have preparation for additional clips that must be used (see Fig. 25).

FIGURE 24: ROTO OPERATOR HOUSING WITH SCREEN

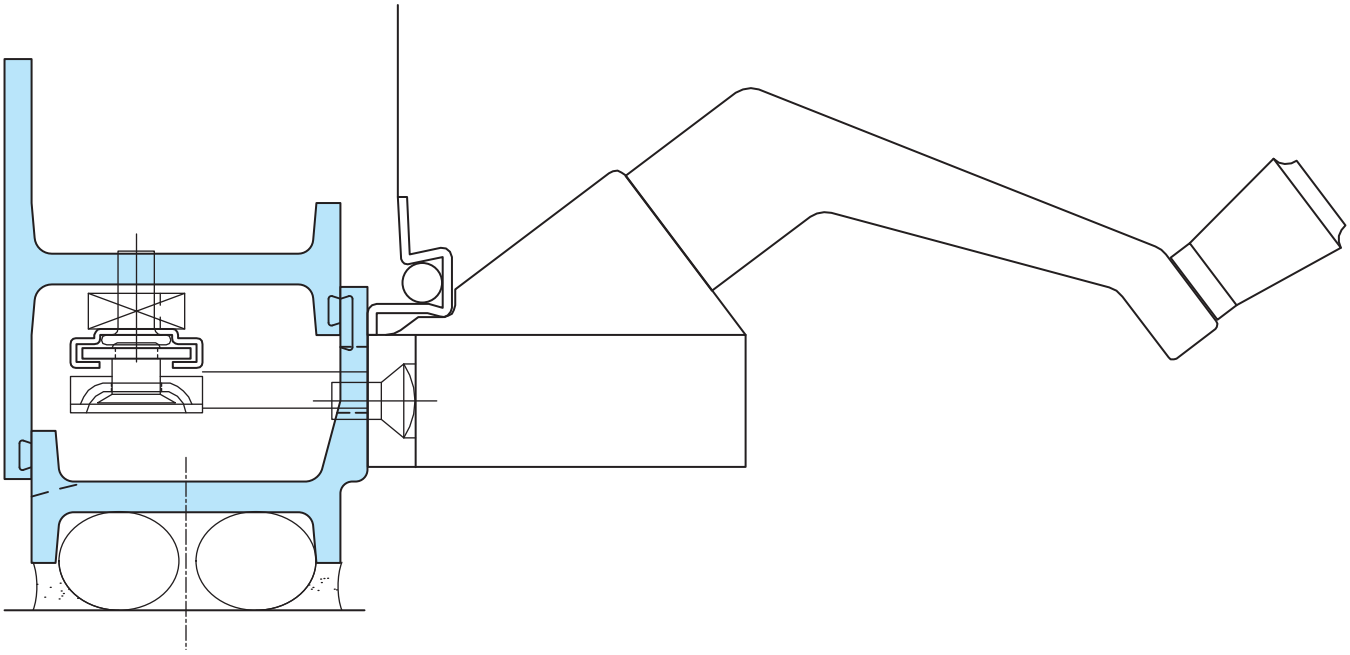
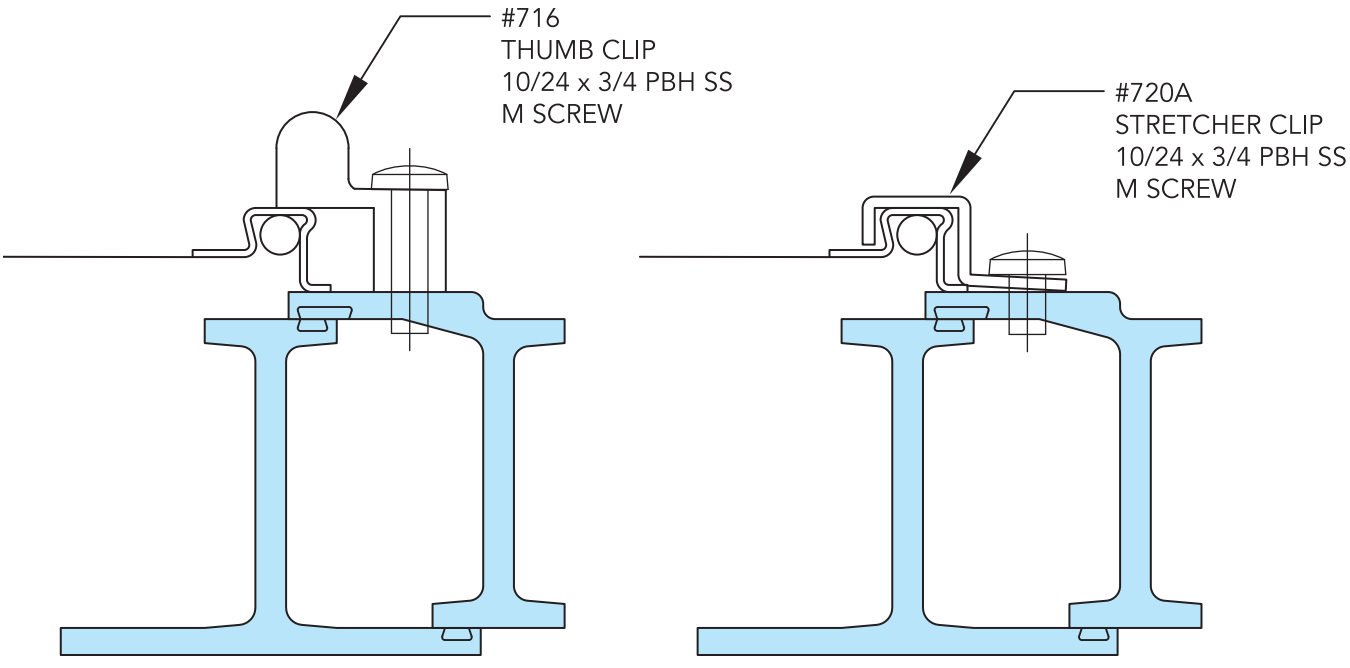


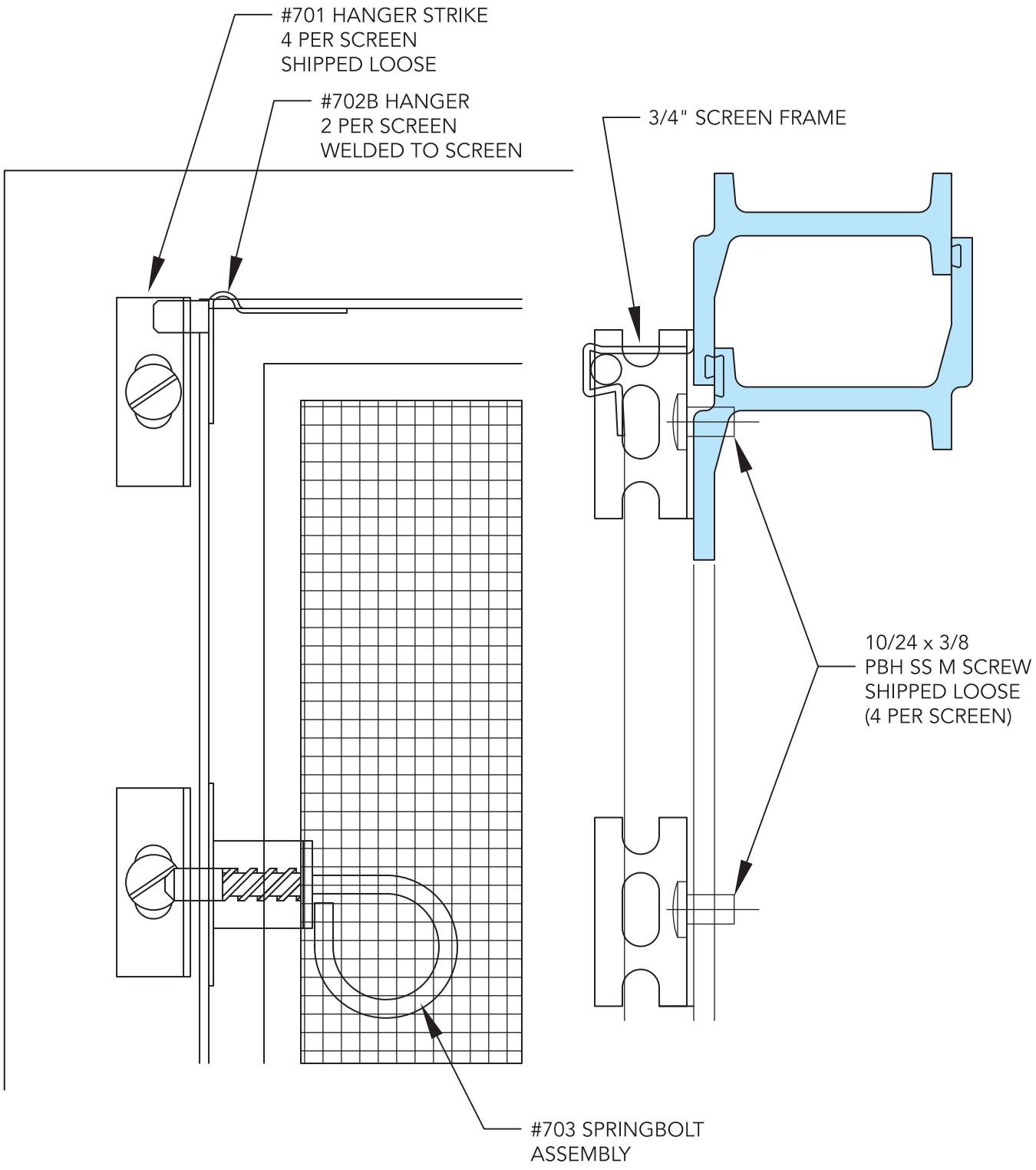
FIGURE 25: ATTACHING SCREENS FOR SWING-OUT VENTILATORS



Installing Screens for Swing-In Ventilators

- Attach four (4) hanger strikes to the exterior of the frame as shown in Figure 26. The screen can be installed from exterior or, using the ring pulls, from the interior.

FIGURE 26: ATTACHING SCREENS FOR SWING-IN VENTILATORS



FIELD TOUCH-UP AND PAINTING

Hope's advanced finishing process offers superior corrosion resistance and durability to our custom steel windows and doors. The system includes prime paint and finish top coat applications.

Should damage on the product occur, any corrosion will be confined to the point of damage rather than spread throughout the surface as with other finishes. Take time to completely read through and understand what is required for a high quality, acceptable paint repair/touch-up.

Unless otherwise noted on its shop drawings, Hope's uses PPG/Matthews Satin VOC MAP® acrylic polyurethane. The main advantage of this product is its abrasion resistance and ability to be applied in the field without oven curing. A small field touch-up kit will be included with your order. Do not attempt to use another brand of paint for either field touch-up or to apply over the factory applied finish without contacting the Hope's project management to check on compatibility.

FIELD TOUCH-UP PAINT KIT WILL BE PROVIDED BY HOPE'S CONTAINING THE FOLLOWING:

- 120 – 400 Grit Sand Paper
- Painter's Tape
- 1/8" Paint Brush
- Velour Mini Roller Kit
- Red Scotch-Brite™ Hand Pad (3M™ #7447)
- Graduated Mix Cup w/Lid x 2
- Dagger Brush
- 50/50 Cleaning Solvent
- Tack Cloth
- Mixing Stick
- Spray Pack

SHIPPED IN SEPARATE PACKAGE:

- Primer (Parts A & B)
- Finish Paint Kit (Part A, Part B, Thinner, Brush & Roll Additive)

Use these kits and recommendations supplied to maintain Hope's warranty.

Hot rolled steel sections used in the manufacture of steel windows and casement doors are normally rougher in surface texture than sheet steel or aluminum. **Do not misinterpret the difference in surface texture or paint gloss as a problem with the paint finish.**

Always avoid getting paint on the weather-strip when applying paint to the window in the field.

Hope's suggests the following to touch-up our product:

- "Brush touch up" can be used on small edge chips and needs to be done in stages after the scratch or defect has been sanded and blended with adjacent surfaces. A small high quality brush is best so you do not leave a significant build-up of paint.
- Surface scratches, chips, nicks, etc. need to be sanded member edge to edge or corner to corner for a natural starting and ending point. When a surface is touched up, it needs to be sprayed or rolled so it matches the factory finish. This entails preparation of the member being finished plus masking to avoid overspray or other problems.

Touch-Up Procedures

You will have to prime all bare steel repair areas, including small chips with supplied primer to maintain the Hope's Warranty.

All painting should be done using best practices of environmental and personal safety protection. Applications are to be done in safe, well-ventilated areas away from any sources of ignition. All safety equipment deemed necessary by OSHA for application of polyurethane coatings containing isocynates must be used including, but not limited to, goggles, gloves, paint suits, and respirators certified by NIOSH for use in applying coatings containing isocynates. Care must be exercised to be sure there are no other people in the application area that are not wearing the appropriate protective equipment during and immediately following application of the paint products.

Environmental temperature should be above 50 °F and below 90 °F for proper application. Best results are achieved by use of conventional or HVLP siphon or gravity feed spray guns commonly used in the application of automotive finishes by auto body professionals. Minor nicks can sometimes be repaired using a dagger-type striping brush.

Brushes: Use nylon/polyester or china bristle brushes

Rollers: Use woven polyester, mohair or lambs wool roller covers

It is important to note that the topcoat must be mixed with the proper amount of catalyst prior to the minor brush-touch application. The amount of reducer used may be lessened due to brush vs. spray application.

Cleaning, Sanding, and Primer Application

- Follow all safety precautions for environmental and personal protection.
- Remove loose scale (sanding, sandblasting, chemical, etc.).
- Clean all surfaces.
- Feather edge scratched or nicked surface with #320 – 400 dry sand paper. This may be accomplished by hand or with a DA (dual action) sander.
- Scuff sand the entire surface to be painted to dull the surface using, at minimum, a red Scotch-Brite™ hand pad.
- Blow surface and Tack Cloth surface.
- Exposed small spots of bare metal must be cleaned and primed immediately to eliminate the chance of corrosion from humidity, rain, or other types of environmental moisture.
- Prime the repair area with 274-908 White Epoxy Primer.

  This 3-component Epoxy Primer will provide adhesion and corrosion protection where feather edge sanding has exposed small spots of bare metal and help level the surface, improving the final appearance of the topcoat.

  Primer is mixed: 3 Parts 274-908 Epoxy Primer + 1 Part 274-909 Catalyst + 1 Part supplied reducer. Stir thoroughly. Apply with spray, brush or roll application, using one full wet coat. When dry, this primer may be lightly sanded or scuffed with the provided Scotch-Brite™ pad as necessary to remove any dust and dirt that may have collected in the primer surface during application. Refer to Product sheet #MPC125 for flash/dry times, DFT, spray gun set up, etc. Dry time will vary with temperature.
- Primer must dry a minimum of 1 hour at 70 °F prior to topcoat application. Primer may be dried overnight, and topcoat applied up to 24 hours later without the need of abrasion of the primer surface for topcoat adhesion.
- After primer has dried on the surface for more than 24 hours, the surface is to be dulled by abrasion with 320 – 400 grit dry paper or a red Scotch-Brite™ pad and wiped clean with a Tack Cloth prior to application of the topcoat.

Color Topcoat Application (Spray)

PPG/Matthews Satin VOC MAP® is formulated to provide lasting beauty and durability and is available in a wide variety of colors.

Mix color, catalyst and appropriate reducer at correct ratio:

3: Parts color
1: Part catalyst
1: Part supplied reducer

- Using proper spray equipment, apply 1 medium wet coat. Allow to flash off for 10 to 15 minutes (varies with temperature). Apply a second in the same fashion blending out each successive coat if area is a spot repair.
- If the entire unit is being recoated (beyond the repair area), the existing painted surface must be prepared by thoroughly cleaning and sanding to dull the existing painted surface for proper topcoat adhesion. Achieve a minimum of 2 mils dry film thickness (DFT) for color. This DFT is the preferred minimum dry film for maximum quality and weather durability. Care should be taken to ensure that the paints, catalyst and reducer mixing ratios are accurately blended (3:1:1). Apply color coats wet on semi-wet. Allow flash time of 5-10 minutes between coats as per technical bulletin MPC107. Allow finish to dry fully prior to exposure to the elements. Dry times will vary with temperature and humidity. Film should be dry to the touch within 3 hours at normal application temperature. Full cure of the system is achieved after 7 days.

Application (Brush & Roller)

Although the original finish is spray applied and baked at our factory, it is possible to obtain an acceptable field repair using the supplied products, tools, and reasonable painting skills. When a spray touch-up technique is not used, it is important that the topcoat is not only catalyzed, but that the brush and roll additive is used as well in place of the reducer.

The topcoat should be mixed as follows:

3:Parts of Part A Color
1:Part of Part B Hardener
1:Part of Part C Brush & Roll Additive

- Mix only enough that will be used within a 2-hour time frame. Application can be made using a brush and roll technique. In this technique, the mixed topcoat is brushed onto the window frame over the properly primed and sanded substrate. The paint is applied in a full wet coat with the supplied china bristle brush. Within 1 minute of the brush application, the painter gently runs the supplied velour DRY ROLLER over the wet painted surface to even the look and texture of the surface. If additional coat(s) are necessary, to obtain hiding and/or required DFT, the first coat must be dry to the touch prior to additional coat(s) being applied.

  It should be noted that the painter should realize the limitations of a brush and roller technique when trying to match a spray application. The location and size of the damaged area to be painted should be taken into consideration when preparing the unit for touch-up.

  Example: A small spot repair, feathered out with the roller technique vs. preparing and coating the entire face of the unit. If doing the entire unit, the brush and roll must continue to be done in unison as the unit is coated keeping in mind that the dry roller must be rolled over the wet brushed on topcoat within 1 minute. This allows the paint time to flow and smooth prior to it drying. Waiting too long to dry roll will cause the surface to dry to a rougher texture.

Clean Up

- Clean up all equipment immediately after use with Methyl Ethyl Ketone (MEK) or all purpose clean-up solvent.

Hope's Field Installation Manual

This manual contains general information for installation and glazing of Hope's products. Approved contract drawings and specifications should be used for your project.

If there are any questions regarding installation, glazing procedures or clarification of details, please do not hesitate to contact Hope's project management at 716-665-5124.

Cover Photo: Tom Arban Photography

Printed in U.S.A.

HOPE'S®
Windows, Inc.

Prop 65 Notification

To our valued customers:

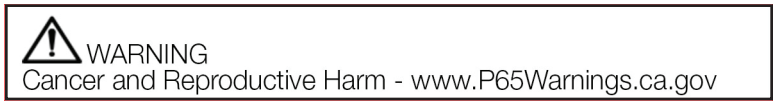
The State of California requires this notification regarding product warning and labeling requirements pursuant to the Safe Drinking Water and Toxic Enforcement Act of 1986, also known as Proposition 65 ("Prop 65").

Under the current Prop 65 regulations, manufacturers and distributors may provide notice to retailers and/or their immediate downstream distributors that a product requires a warning and provide the necessary warning materials to those retailers or distributors. Cal. Code Regs. tit. 27, § 25600.2(b). If the manufacturer/distributor chooses to provide notice and warning materials to the downstream entity, the latter is then responsible for placement and maintenance of the warning materials received from the manufacturer/distributor. Cal. Code Regs. tit. 27, § 25600.2(d) (2018). The downstream entity must confirm receipt of the notice electronically or in writing. Cal. Code Regs. tit. 27, § 25600.2(b)(4).

As required by Prop 65, this notice is to inform you that the following products may result in exposure to the identified Prop 65 listed chemicals and thus require a Prop 65 warning label:

Door and window hardware made from brass

- Potential exposure to lead
- Affected product lines and product types:
  - Handle sets, hinges and strikes in the finishes ORB (F79), Unlacquered Brass (F71) finish, Dark Bronze (F881), Antique Bronze (F883)
  - Keys included in handle sets with keyed cylinders, with keyed cylinders or keys sold separately
  - Handle sets and brass-based strikes that have been painted, coated or plated where the painted surface, coating or plating has become damaged or worn to expose the brass base material
  - Applicable Prop 65 warning label:



Hope's Windows, Inc. will renew this notice annually by February 28 as required by current Prop 65 regulations.