Projected and Casement Windows

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ARCHITECTURAL PRODUCTS

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Installation Guidelines for

Projected and Casement Windows

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Installation Guideline Disclaimer

This document contains general installation guidelines of the Graham Architectural products and does not address each particular condition or installation. Shop drawing installation details may vary from these Guidelines as these Guidelines do not address every possible condition so any variances should be addressed by the design professional. These Guidelines do not address the structural adequacy on any installation and such should be addressed by a design professional. Anchorage to existing or proposed wall conditions are not addressed in this document. Also sealant compatibilities should be addressed by the sealant manufacturers. Sealant application details should be reviewed by the sealant manufacturer. This document does not address the connection between the window system and the building weather barrier system and should be reviewed by the waterproofing consultant. It is generally recommended that insulation be installed in all voids of a thermally improved systems, but the application of insulation in wet areas needs to be addressed by the design professional and the particular type of insulation may need to be specified.

Projected and Casement Windows

Thank you for your purchase of Graham Architectural Windows. These instructions include the installation and initial adjustment instructions of the windows.

Read these instructions before starting any installation. Following the attached installation instructions step by step will assure trouble free operation of your new windows.

HANDLING – SORTING – PROTECTING ALUMINUM WINDOWS

Aluminum windows are finished products and must be protected against damage. The following precautions are recommended to assure early acceptance of your products and workmanship:

1. HANDLE CAREFULLY – DO NOT DROP. Stack with adequate separation so window parts will not rub together, including any protruding hardware such as handles. Do not use the hardware or grids for lifting or manipulating the window.
2. Protect windows from moisture and dirt prior to installation. It is important that all windows that are not installed, are protected from direct contact with rain, snow, or ice so as to protect the finish of the product.
3. Protect from construction debris, cement, plaster, terrazzo, and other construction materials, which include, but are not limited to, alkali based materials or caustic cleaners. This must be removed immediately to prevent damage to the finish of the aluminum or to the clarity of the glass.
4. Construction debris and dirt within the frame will affect the operation of the window.
5. Prior to applying sealants, the surfaces must be cleaned and prepared as directed by the sealant manufacturer.

CAUTION – Windows are not to be used as ladders, scaffolds, or supports. Installed window openings are not to be used as construction entrances, unless adequate protection to the window sill and jambs is provided. Damage to any products from any construction activity will void the product warranty for the products in question.

Note: *Copies of these instructions can be downloaded from www.grahamwindows.com/architectural-resources/technical-information/*

Projected and Casement Windows

Window Installation

General Instructions

A. Upon delivery carefully check that all windows have been received undamaged. If any of the windows have been damaged, immediately notify your Graham Representative.

B. Install the windows in accordance with the shop drawings.

C. It is not recommended to drill through the sill. If fasteners are required to penetrate sill; sealant must be applied in the pre-drilled hole first, then install the fastener, and then seal over the fastener head.

D. The sill will need adequate support. The sill must be level in accordance with Table 1.

Unit Shimming Tolerance (+/-) Nominal			
	Inches / Foot	Inches Maximum	Method of Measurement
Level (Horizontal Measurement)	1/32"	1/8"	Level and steel rule or tape
Plumb (Vertical Measurement)	1/32"	1/8"	Level or plumb-line and steel rule or tape
True (In Plane Measurement)	1/32"	1/8"	Using strings across corners
Straight/True (Measure of Straightness)	1/64"	1/16"	Level or plumb-line and steel rule or tape
Square (Diagonal Measurement)	NA	1/8"	Steel rule or tape

Table 1

Note: The margins between the vent and the frame need to be even around the perimeter of the vent (See figure 12).

E. Never place fasteners too close to the edge of masonry substrates. Refer to fastener manufacturers guidelines for proper edge distance, load capacity and installation techniques.

F. Seal the exterior in accordance with the shop drawings.

G. Insulate between the window frame and the rough opening.

Through Frame Installation

A. Position the frame in the opening. Be careful not to twist or rotate the frame during handling or installation.

B. The fastening schedule will generally be determined by a structural engineer. If a fastening schedule has not been specified, Graham Architectural recommends applying fasteners a maximum of 9 inches from each corner, and then a maximum of 18 inches apart. (*Note: Recommended fastening does not apply to projects that have blast mitigation or hurricane requirements*)

Window Installation

Through Frame Installation (Continued)

C. Apply shims and/or blocking at each hinge and fastener location (See figure 1). The window must be level, plum and square in accordance with Table 1.

D. When fastening through the window frame, seal the heads of the fasteners before and after installation.

Receptor Installation

A. If the windows are to be installed in a receptor system, refer to the Graham Installation Guidelines for Receptor Systems for more detailed instructions. *www.grahamwindows.com /architectural-resources/technical-information/*

B. If a casement is installed in a receptor, cross-blocking will be needed to prevent the window from going out of square when opened (See figures 2 and 3). Apply shims and/or blocking at each hinge and lock location (See figure 3). Apply fasteners at, or within 2", of the hinge and lock locations.

C. The window must be level, plum and square in accordance with Table 1 shown on the previous page.

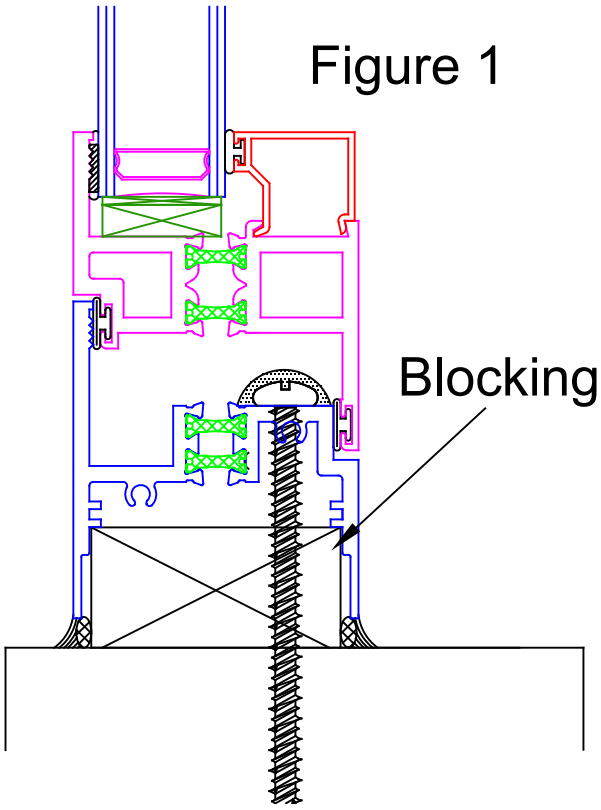


Figure 1

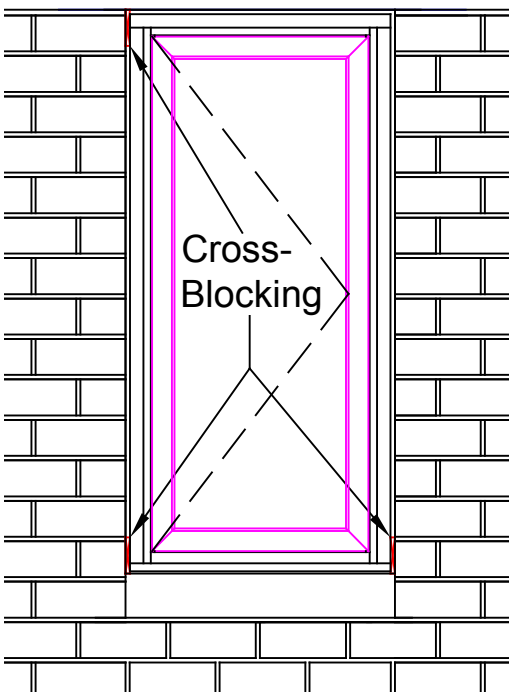


Figure 2

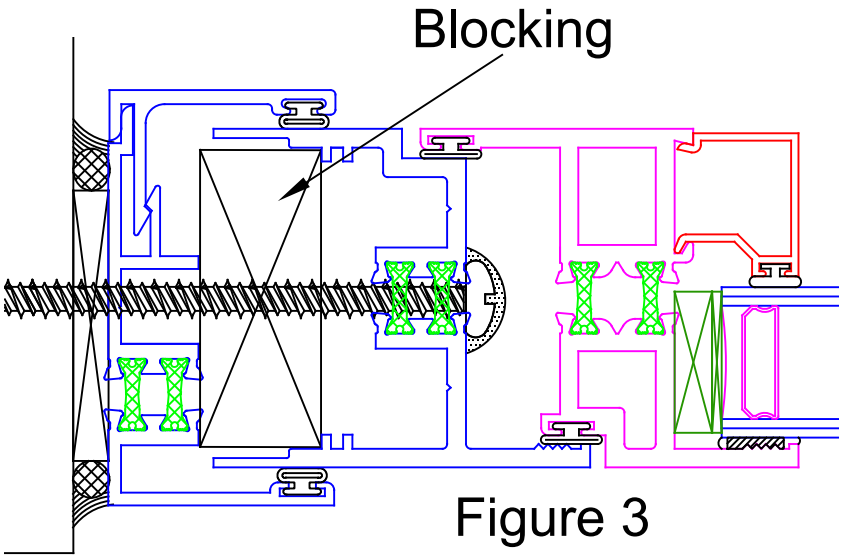
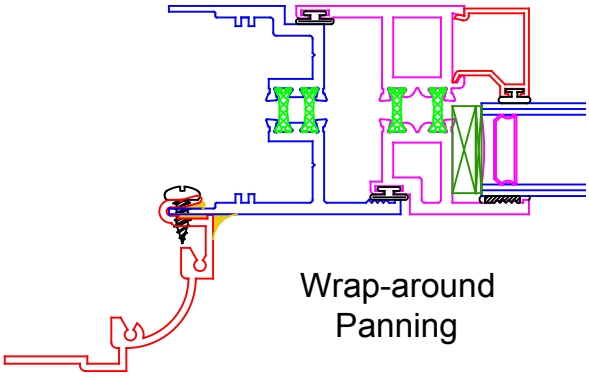


Figure 3

Window Installation

Panning Installation

A. If the windows are to be installed using panning, refer to the Graham Installation Guidelines for the type of panning being used. *www.grahamwindows.com/architectural-resources/technical-information/*

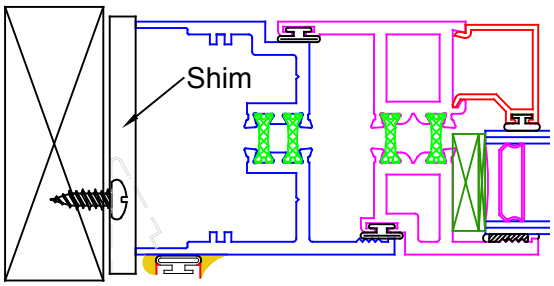


Wrap-around Panning

Trim and Clip Installation

A. If trim and clip are used, trim clips can be full length or 3" long sections. If sections are used, they will need to be lined up in order for the trim cover to snap in place.

B. The trim clip to window fastener must be a minimum of #8 x 1/2" screw, or heavier as required to meet project design loads. The trim clip must be attached to the rough opening before attaching it to the window. The trim clip to rough opening fastener is dictated by the substrate. Graham Architectural recommends that the fastener is greater than, or equal to, that of the fastener used at the clip to window (as required to meet project design loads).



Pre-set Panning

C. Apply shims and/or blocking at each hinge and lock location. If a casement is large or heavy (larger than 2' x 4' and/or aspect ratio of greater than 0.5 A/R = W/H), additional blocking and fasteners will be needed along the jambs to support the window.

D. The fastening schedule will generally be determined by a structural engineer. If a fastening schedule has not been specified, Graham Architectural recommends applying fasteners a maximum of 9 inches from each corner, and then a maximum of 18 inches apart. (*Note: Recommended fastening does not apply to projects that have blast mitigation or hurricane requirements*)

E. The head and (if used) the sill trim covers are field cut to size. Snap trim covers on using a rubber mallet, or a block of wood with a hammer. Be careful not to dent or scratch the finish on the trim cover when installing it.

F. The jamb trim covers are field cut to size. Snap trim covers on using a rubber mallet, or a block of wood with a hammer*.

G. The window must be level, plum and square in accordance with Table 1 shown on the previous page.

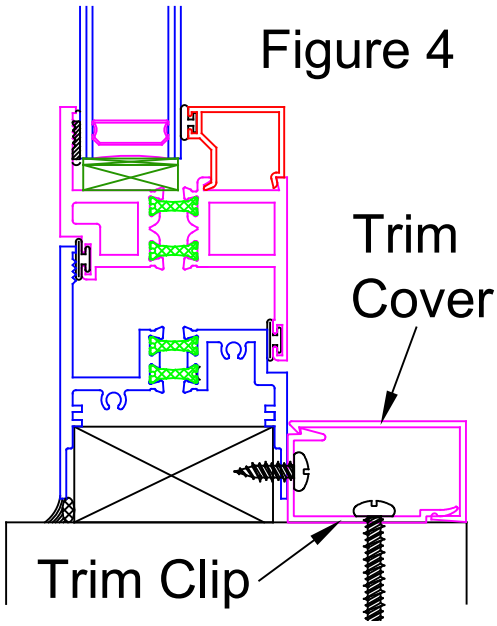


Figure 4

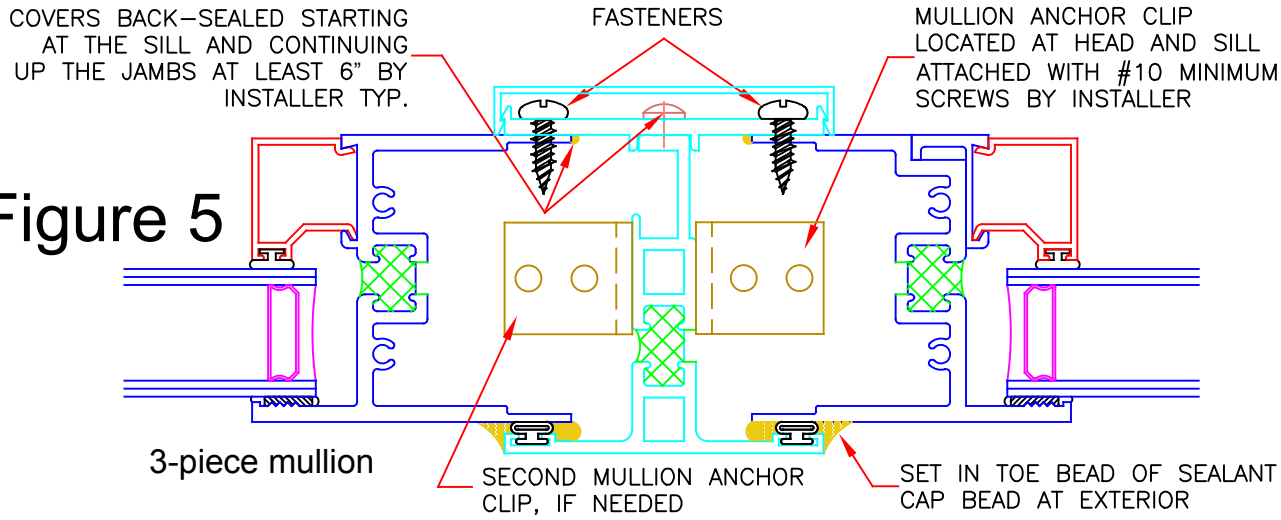
Projected and Casement Windows

Vertical Mullions

A. Vertical 3-piece mullions will need attached to the head and sill of the rough opening with one or more mullion clips or angles. The mullion will need back-sealed to the window frames, and cap-sealing is recommended.

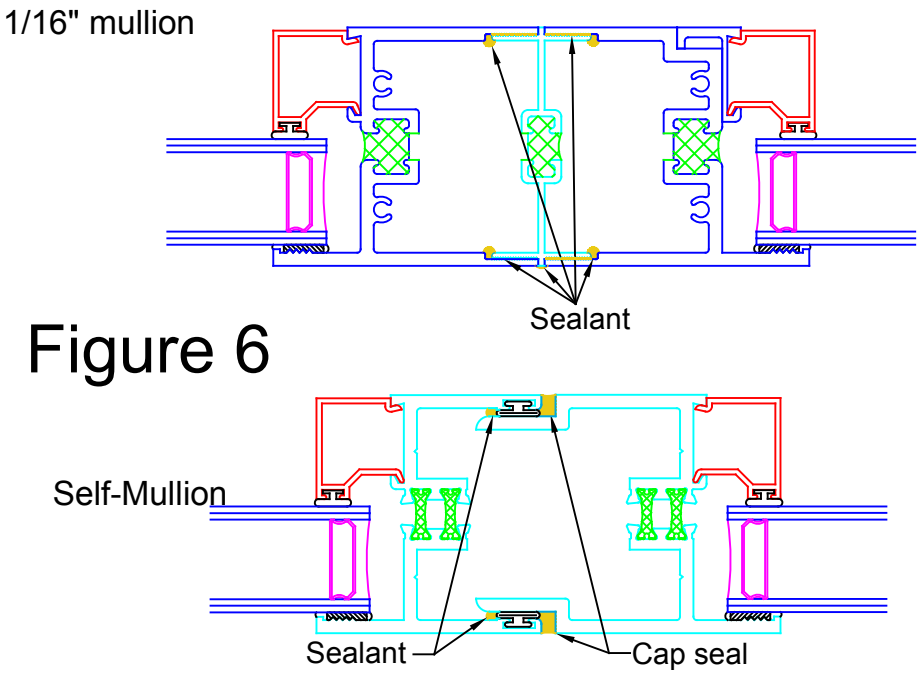
B. Mullion pressure plates (covers) should be back-sealed starting at the sill and continuing up at least 6". The pressure plates should be attached to the jambs with #8 x 1/2" screws (not supplied by Graham), a maximum of 9" form the ends and a maximum of 18" on center.

Figure 5



C. Self-mullions (male/female) and 1/16" mullions need sealant applied to the interior and exterior legs of the jamb prior to final assembly. Self-mullions also need cap sealed.

Figure 6



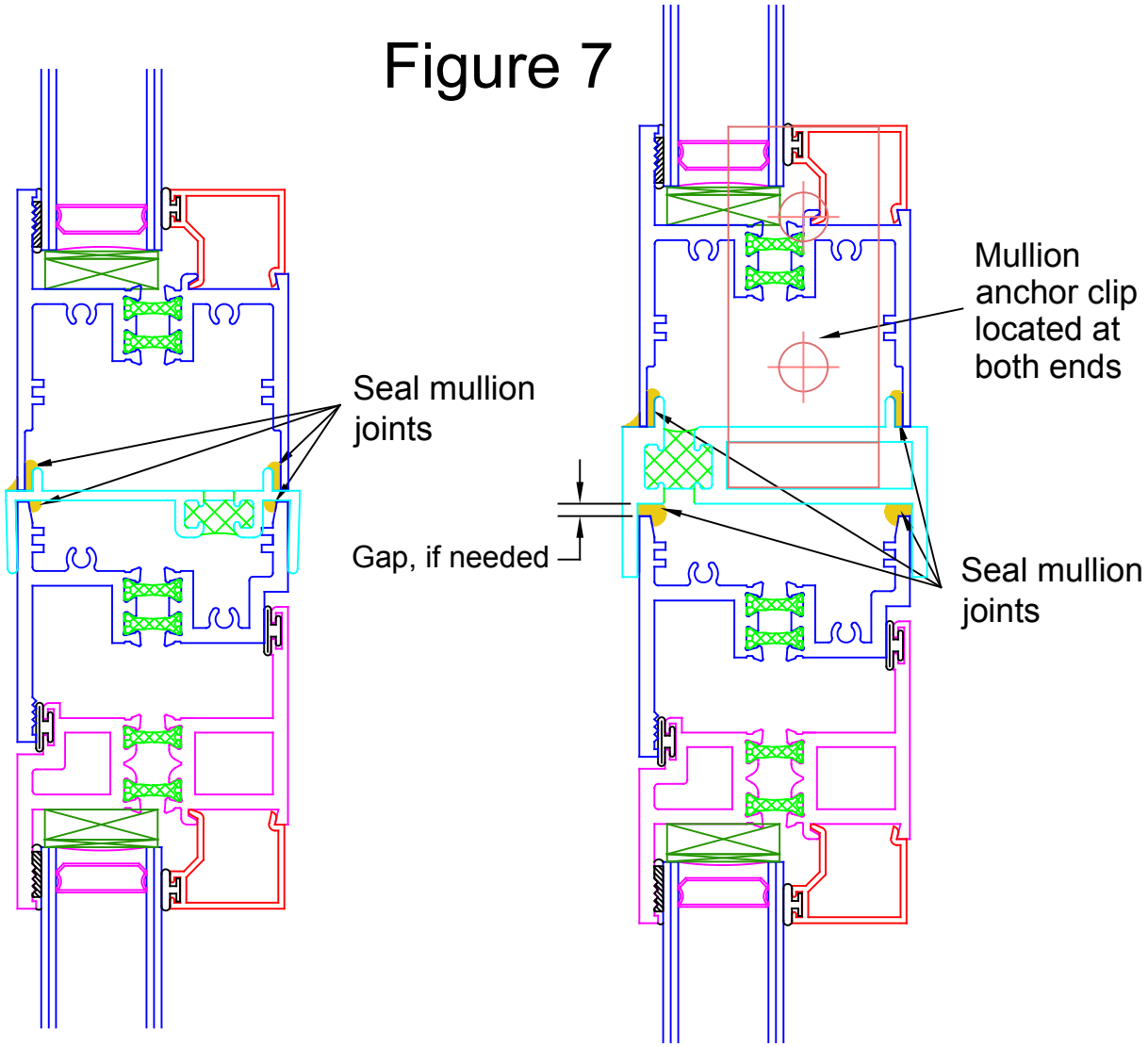
Horizontal (Stack) Mullions

A. Horizontal (stack) mullions need sealed to the frame of the window above and below. The exterior legs must be sealed, and Graham Architectural recommends that the interior legs are sealed.

B. Mullion anchor clips may be required depending on the size of the window, and/or the design load requirements. Reference the project shop drawings, or contact the Engineering Department of Graham Architectural to determine when mullions clips are needed for each type of stack mullion.

C. If multiple stack mullions are used in an opening, clearance will be needed between the stack mullion and the window below. Contact the Engineering Department of Graham Architectural for the clearance recommendations for each specific project.

Figure 7



Projected and Casement Windows

Locks and Operators

A. Graham Architectural offers multiple types of lock and operator systems on the projected and casement windows. The cam locks, casement style locks, and roto-type operators do not have any adjustment of the locks or operators. The multi-point locks and the single handle operator/lock systems have some adjustments for the locks (See steps B through F).

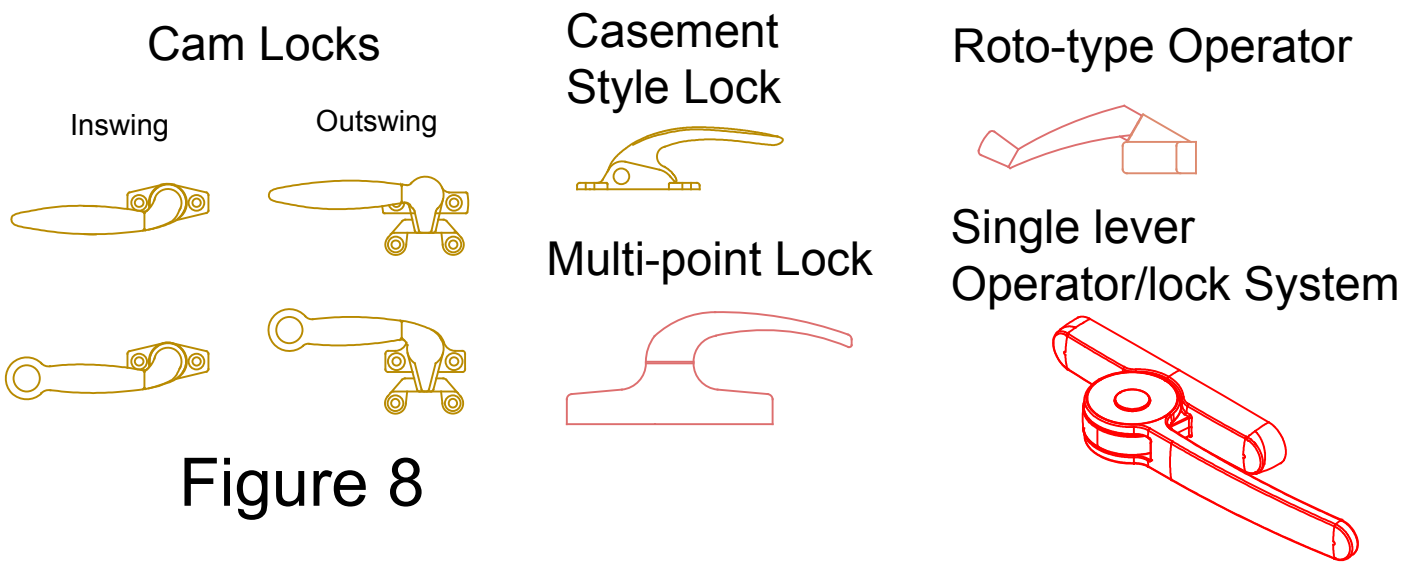


Figure 8

B. Check the alignment of the lock points, by opening the window, engage the locks , almost close the window, and the lock points should align with the keepers (See figure 9).

C. If the keepers need adjusted parallel to the frame, loosen the lateral adjustment (hex) screws and slide as needed. Re-tighten the screws. (See figure 10).

D. Open and close the window a couple of times. If the handle is hard to turn, the lock keepers will need to be loosened (Go to Step F).

E. Compression of the weatherstrip can be checked by inserting a piece of flexible paper (dollar bill) between the vent and the frame, and closing and locking the window. If the paper pulls out easily, the lock (keepers) will need tightened (Go to Step F).

F. If the vent needs tightened (more compression on weatherstrip) or loosened (lighter handle pressure) to the frame, loosen the keeper adjustment screw and adjust the keeper as needed. Re-tighten the screw. (See figure 10).

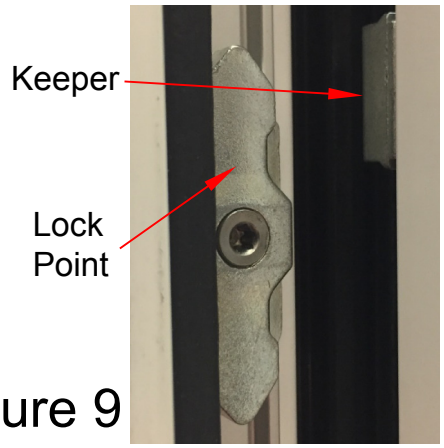


Figure 9

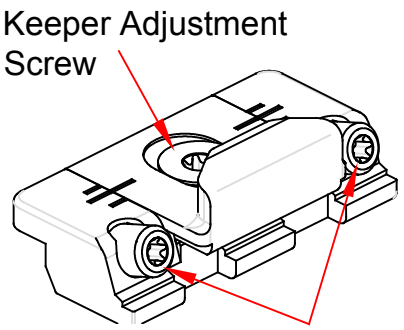


Figure 10

Hinges

A. Graham Architectural offers multiple types of hinge systems on the projected and casement windows. Butt hinges do not have any adjustment for the vent alignment. Multi-bar hinges can be adjusted in one direction (See the Multi-bar Hinge adjustment instructions on the next page). The Euro-style hinges can be adjusted in multiple directions. Because there are several types of Euro-style hinges that all have different methods of adjustment, refer to the hinge manufacturers adjustment instructions.

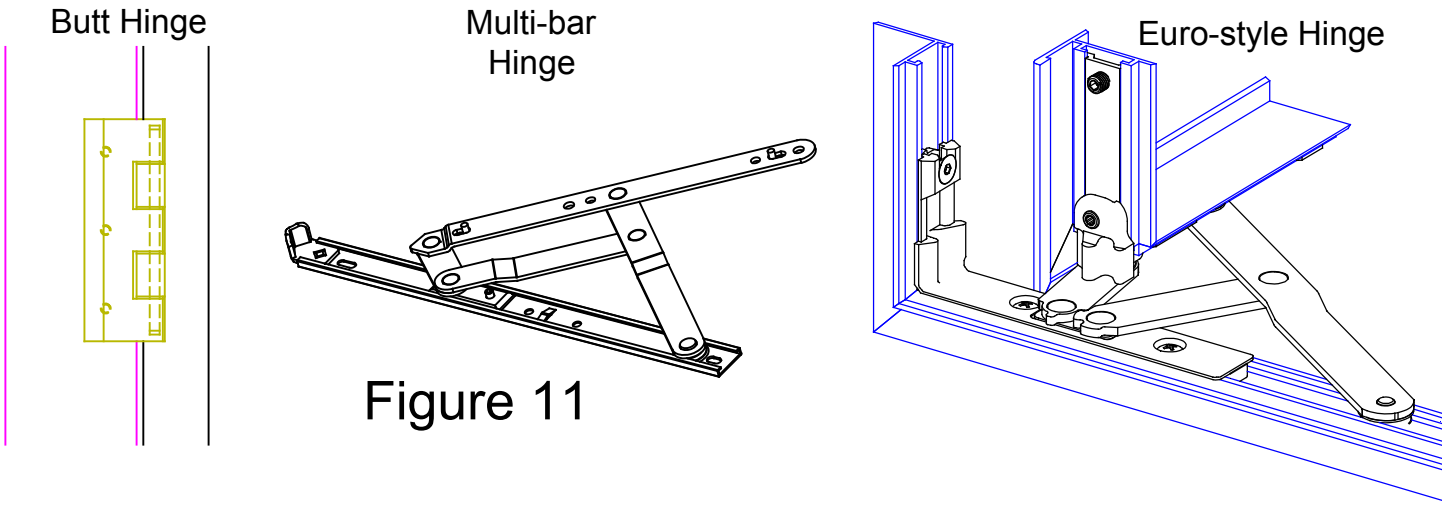


Figure 11

B. Look at the margin between the vent and the the frame (See figure 12). If the margin is not even around the perimeter of the vent, the window will need adjustment. Determine which direction the vent needs the adjustment. The vent needs uniformly centered in the frame.

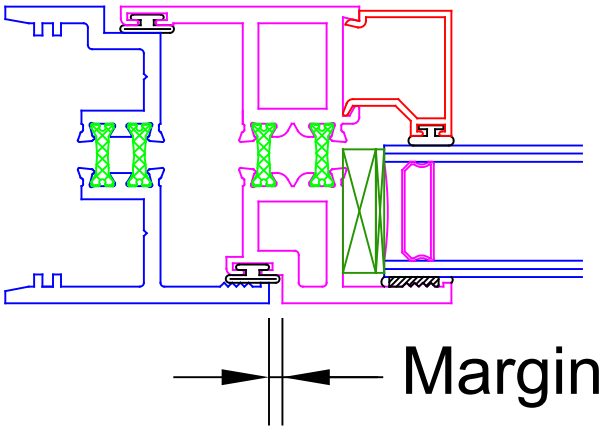


Figure 12

Hinges

Multi-bar Hinge Adjustment Instructions

A. Multi-bar hinges can adjust up or down in projected (awning or hopper) windows, or horizontally in casement windows.

B. Open the vent and locate the screws that attach the hinge to the frame. While supporting the vent, remove the set screws and loosen the adjustment screws. (See Figure 13 below)

C. Adjust the vent location by sliding the hinge. Re-tighten the adjustment screws, and check the alignment of the vent.

D. If the hinge has several set screw holes, install a fastener through one of the other set screw holes. If the hinge has one set screw hole, drill a new set screw hole through the hinge track near the original set screw hole, and install a new set screw.

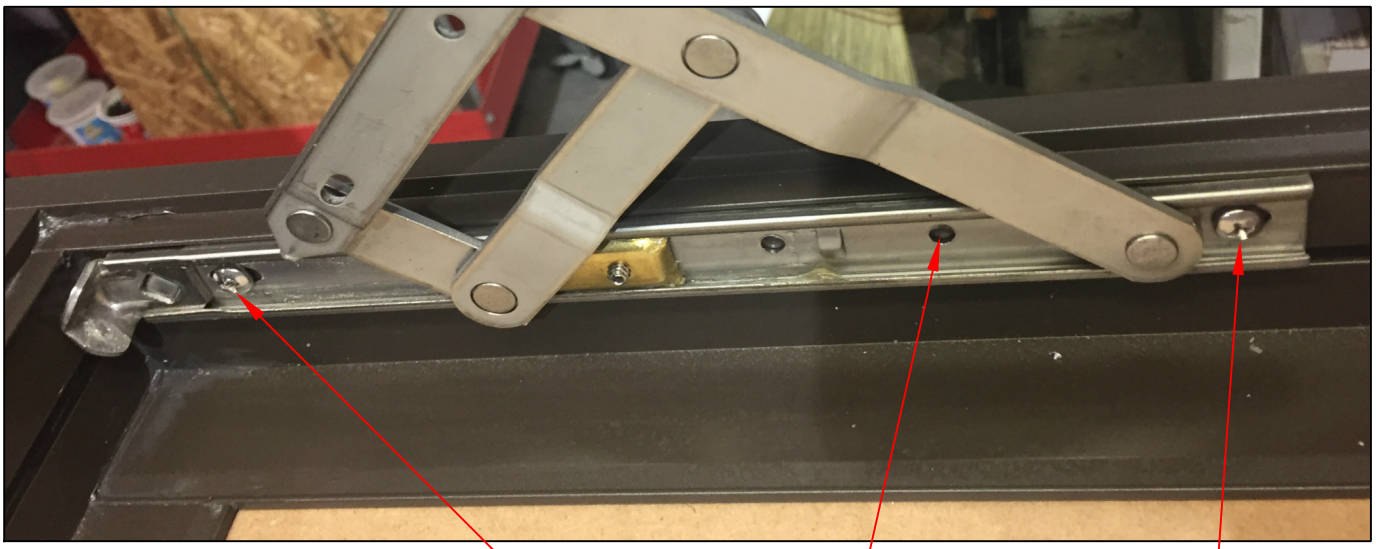


Figure 13

Vent Limit Systems

A. If a project requires the vent opening to be limited, Graham Architectural offers multiple types of vent limit systems (See pictures below). None of the limit systems can be adjusted, but some can be disconnected for installation or maintenance purposes.

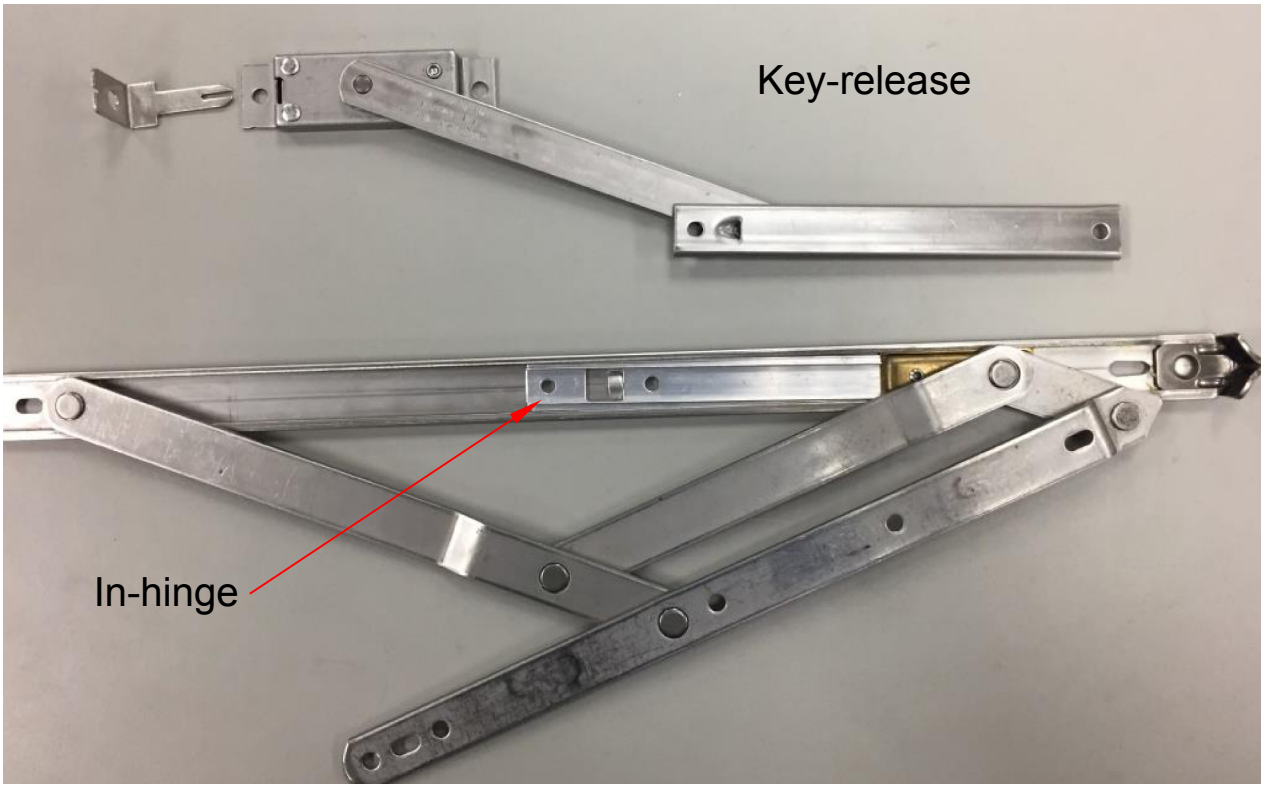
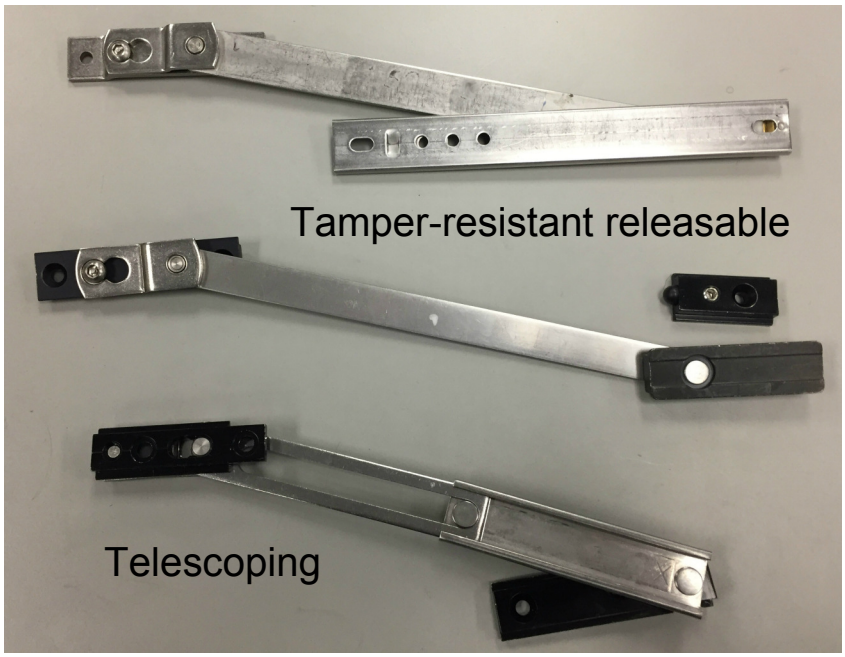


Figure 14



Vent Limit Systems

B. The tamper-resistant releasable style limit arms can be disconnected by loosening the release (hex-pin) screw, and sliding the limit arm until the keyway can slide over the screw head. (See Figure 15). The release screw is a machine screw, therefore loosening it too much will cause it to fall out.

Figure 15

C. The Key Release type can be disconnected by inserting a special key and pulling the limit arm out of the housing (See Figure 16).

Figure 16

Cleaning/ Lubrication

A. After a window has been exposed to the conditions at a construction site, the window will need inspected, cleaned, and should be lubricated.

B. Inspect the window for damage and missing parts. Damage from the construction trades, including exposure to alkaline products (e.g. stucco and mortar), acidic cleaners, and weld splatter may require replacement of window parts or replacement of the entire window. The Graham warranty does not cover these types of damage.

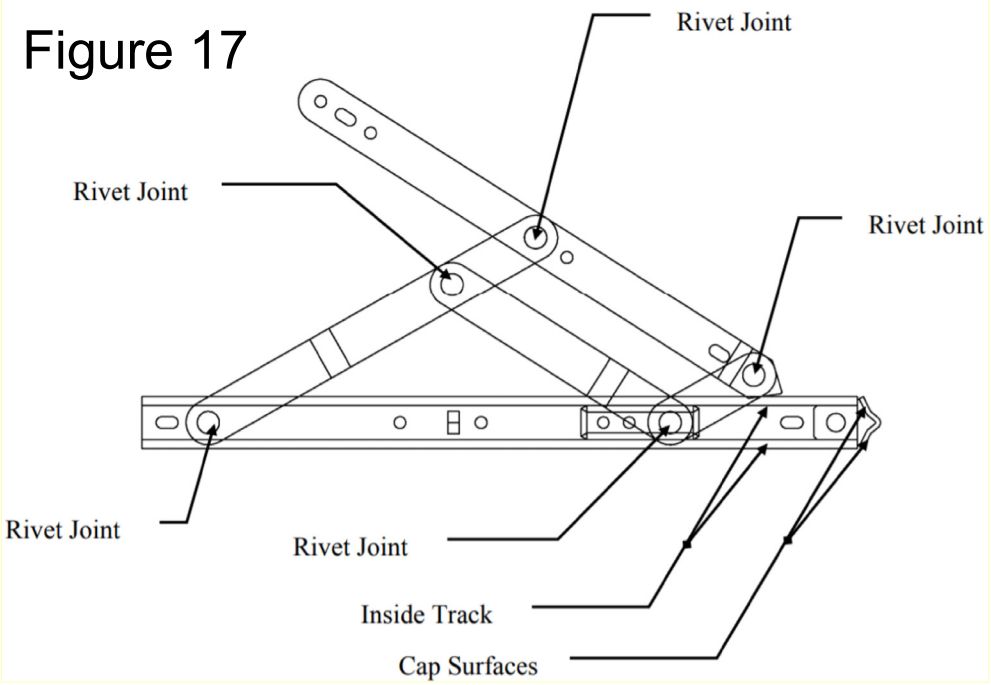
C. If there is construction dirt and debris in between the vent and the frame, a vacuum cleaner should be used to remove the larger debris. Then a mild detergent mixed with water can be used with a soft cloth or sponge to remove the dirt. The mixture will then need rinsed with clean water. DO NOT USE AGGRESSIVE ALKALINE, ACIDIC, OR ABRASIVE CLEANERS.

D. The interior and exterior can also be cleaned using a mild detergent mixed with water, or mild cleaning agents. Do not use aggressive organic solvents such as chlorine bleach, grease removers, or nail polish remover. DO NOT USE AGGRESSIVE ALKALINE, ACIDIC, OR ABRASIVE CLEANERS.

E. Commercial glass cleaners can be used to clean the glass. Do not use abrasive cleaners to clean the glass. DO NOT USE SHARP METAL OBJECTS (SUCH AS A RAZOR BLADE) TO SCRAPE THE GLASS.

F. If the hinges, limit devices, and/or the multi-point lock systems were exposed to cleaners and/or construction dirt, lubricate the pivot points and/or guide areas with a non-petroleum based lubricant, such as spray silicone. Refer to Figure 17 for typical lubrication areas.

Figure 17



Screen Installation

Graham offers several screen options. The following are basic instructions for each type.

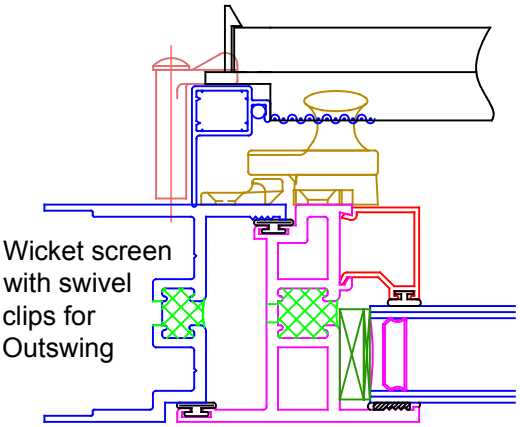
Swivel Clips - Some screens are attached using swivel clips. The swivel clips will need attached first. Then, the screen is put in place and the swivel clips rotated until they tighten down on the screen frame.

Sliding Screen - Some screens slide in a screen track. These screens have spring clips on one side of the screen frame. Side load the screen member with the the spring clips first, and then rotate the screen while holding pressure on the screen clips.

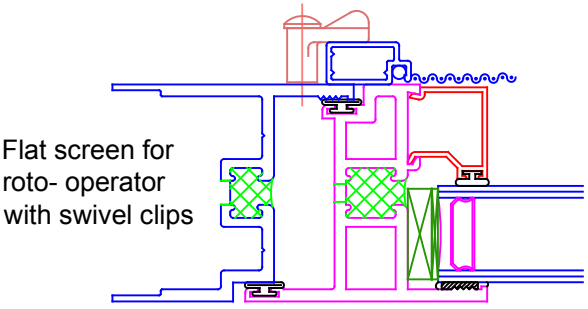
Hanger Clips - Some screens are attached using hanger clips, which have a metal hanger and a hanger slot in the screen frame. Position the screen with the hanger slots above the hanger clip and slide the screen down to engage the clip.

Pin Clips - Some screens use pin clips. Hook the top pin clip and then rotate the screen until the bottom of the screen is snapped into the lower spring pins.

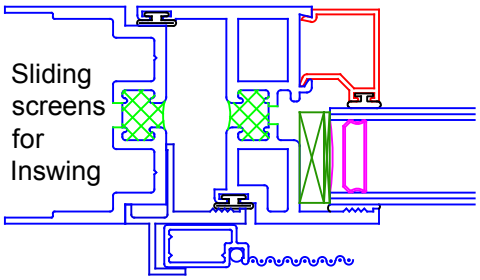
Security screens are usually attached at the factory, therefore these instructions do not include the installation of those products.



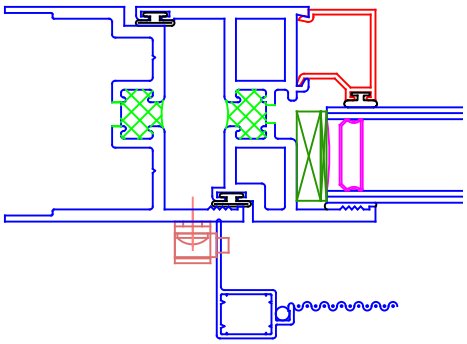
Wicket screen with swivel clips for Outswing



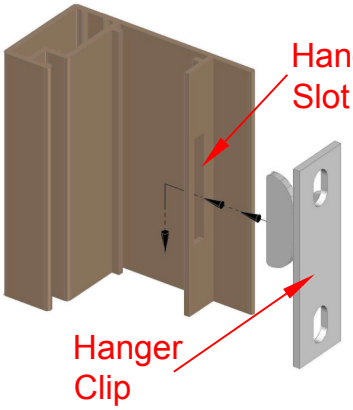
Flat screen for roto- operator with swivel clips

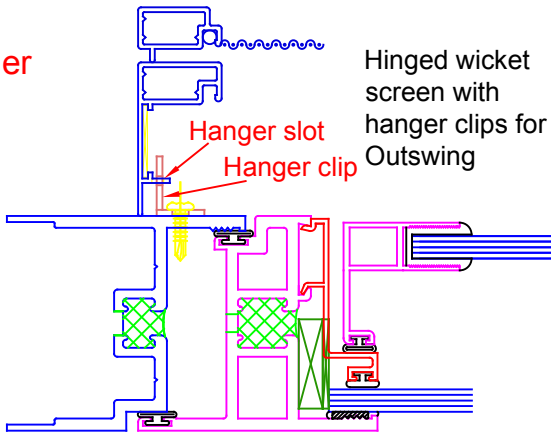


Sliding screens for Inswing



Exterior screen with pin clips for Inswing





Hinged wicket screen with hanger clips for Outswing