WEB BASED
APPLICATION SPECIFIC
INSTALLATION INSTRUCTIONS

Replacing Steel Windows

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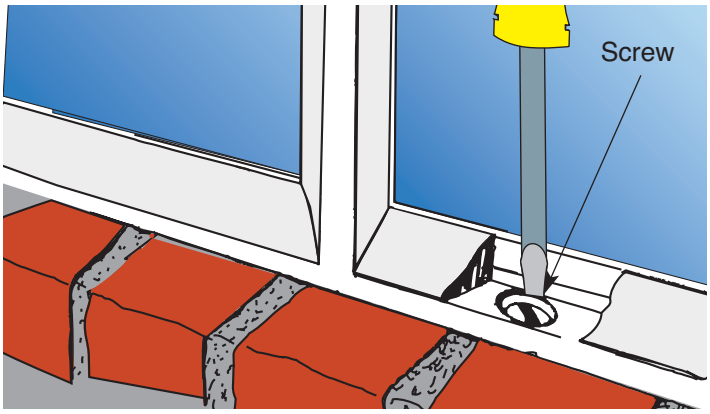
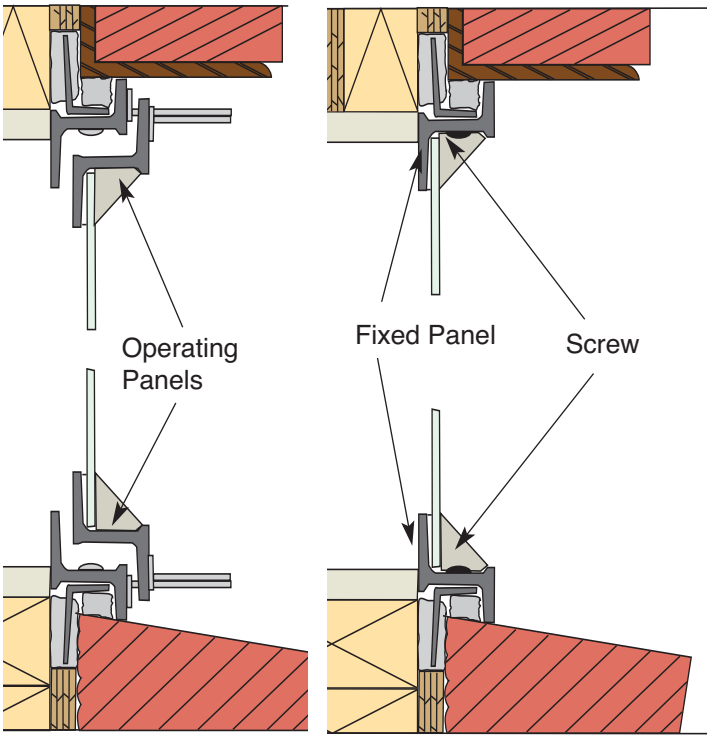
Vinyl Windows used as Replacement Windows were designed to fit into old wood double hung frames with both sash removed. However, due to consistencies in wall thickness of most buildings, other window types (casement, sliders, and other metal windows) can be removed and the opening prepared to receive replacement windows designed to be installed against an exterior "stop." It is important to measure accurately and order exact sizes to maximize fit and minimize trim work. As you read the following guidelines you can better judge how to specify windows for a particular installation and how to more accurately estimate labor.

Replacing A Steel Window

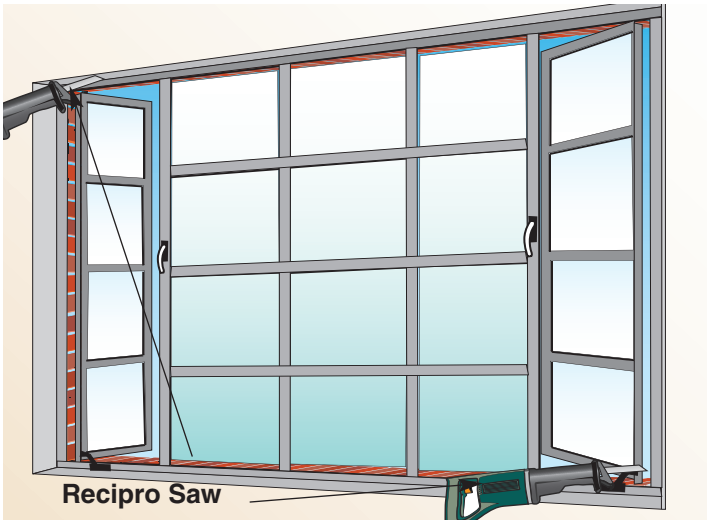
Note: These drawings are typical installations. Though not to exact scale, they are representative of most situations and are meant as a guide only.

Steel windows were usually installed with screws into the frame around the opening under the sash of operating units or outside the glass of fixed units. Usually covered with putty, most can be located with a little work.

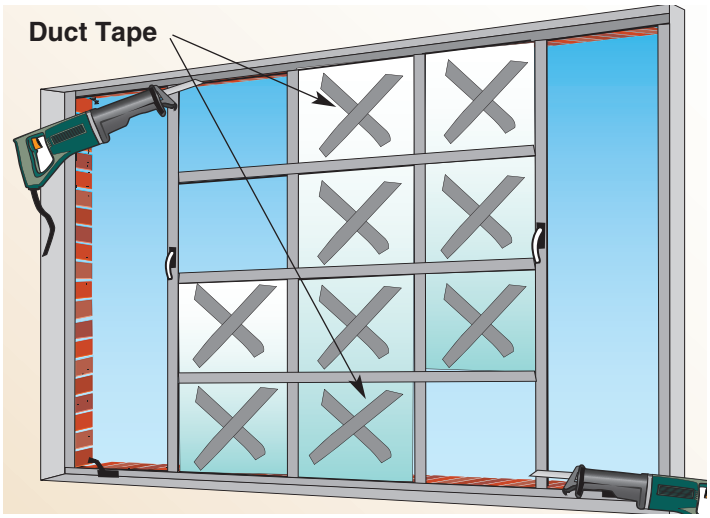




Remove those you can and drill out those you can't. Once the screws are removed, the whole window unit can be removed and the opening prepared with capping and/or new blindstop of aluminum/vinyl or wood as described in "aluminum window removal."



Under frequent circumstances, however, old steel windows are too firmly embedded to be "removed" as described above. The first step, then, is to remove the window operating assemblies by unscrewing or cutting with recipro-saw or hacksaw.

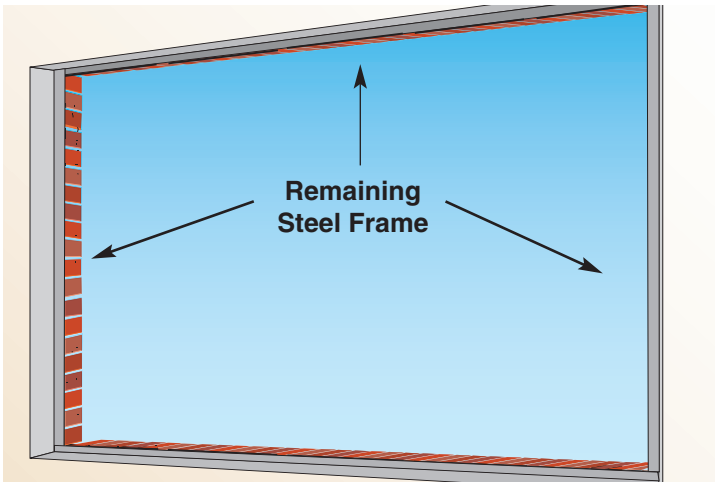


Once operating assemblies are removed, carefully remove or tape-protect all glass in the fixed panels.

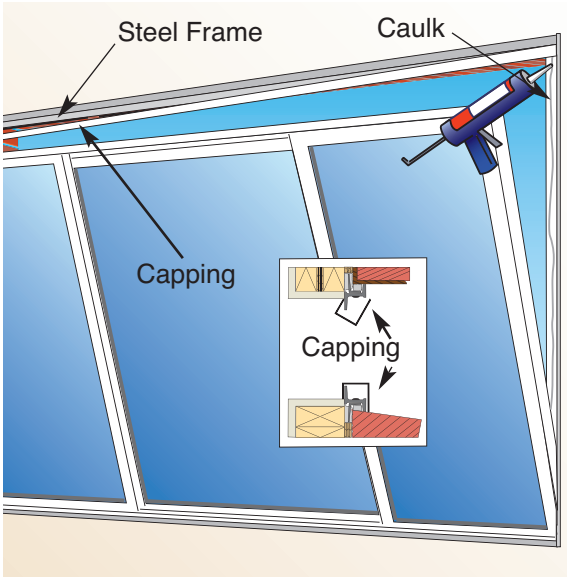
Using the recipro-saw or hacksaw, cut all remaining muntins and bottom metal frame leaving sides and top intact to serve as outside blindstops.

There are a couple of ways to create "the blindstop" to mount the new window against. First is to leave the old frame intact. Using coil stock, shape a "cap" to fit over the old steel frame remaining in the opening. The "U" shaped cap (app. 1"x1"x1") will cover the frame and hide the old exterior putty or concrete embedment. Once caulked, the exterior will be neat, finished, and weathertight.

Cover or caulk all cracks and holes. Install new window against outside "blindstop" formed by remaining frame pieces covered by the "U" cap.



The second option is to nail a 1" x 2" around the opening. This wood "blindstop" can be mounted with either the old steel frame completely removed or left intact. If the removal of the old frame creates a damaged area larger than the 1" x 2" can cover, a larger piece of wood can be used. If the opening is completely disrupted, a wood buck or frame of 1" x 4" can be attached on all four sides and then the 1" x 2" blindstop affixed. If the wood buck is necessary, don't measure for the new window until the wood buck is in place.



Pre-extruded shapes or "Snap Trim" can make the job easier. Mount the angle of the snap trim with "pop rivet" or snap into accessory groove to the top of window. After placed in opening, mount angle to other sides.

Cap and caulk additionally as necessary outside, and caulk and/or trim interior as required.

NOTE: *If you can remove the whole frame which is embedded in the masonry/brick, then you can use "F" Channel effectively to cover the opening and install the new window. See the section of F-Channel Installation elsewhere in this manual.*

Anchoring in the home must match the mounting in the lab to duplicate the lab performance in the home and meet code requirements.

There is a formula that can be used to deliver acceptable spacing for residential installation. Number of fasteners per side = Test Pressure x Width x Height x .0001/4

A 36" x 60" window for a required 40 psf wind pressure: No. of fasteners = (P x W x H)(.0001)/4 figures to be (40psf x 36" x 60")(.0001)/4 = 2.16 clips

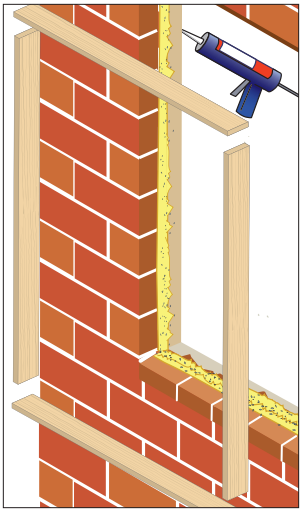
Rounded up to the next higher number, install 3 fasteners starting 4"-6"" from top and bottom and no more than 16" between - or as specified in the test results.

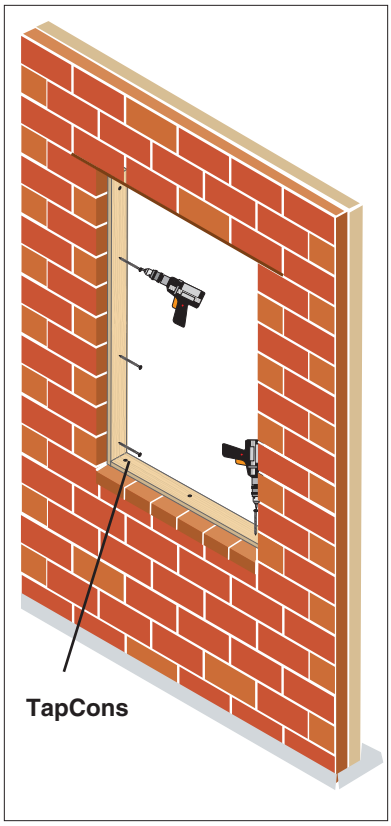
Mounting New Windows in Masonry

If the old window is mounted in a masonry opening or an opening with a masonry or brick veneer, and the old window is completely removed, frame and all, it is critical to allow the proper anchoring of the new window to match the required spacing and fastener length.

Bucking the Opening

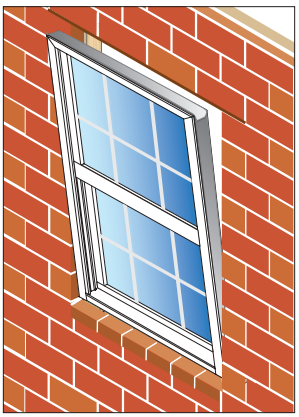
It is best to install a wood buck to cover the old joint. Use Tapcons of sufficient length to penetrate the masonry 1-3/8 " properly spaced matching the test.

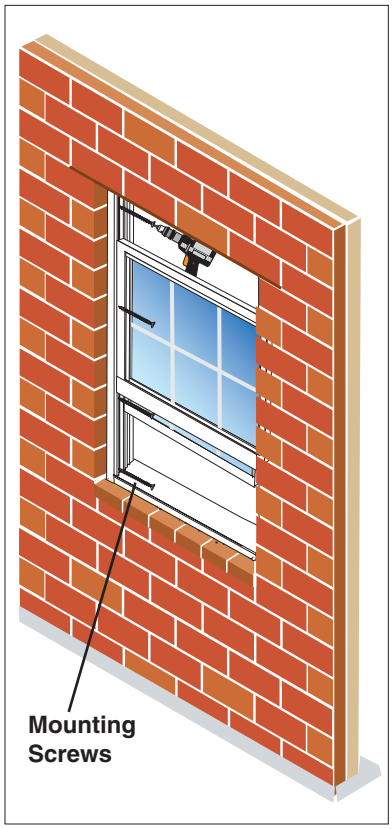




Mounting the New Window

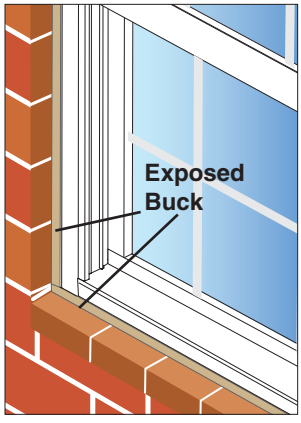
Foam wrap the new window and insert into the opening. Use Screw fasteners of sufficient length to penetrate the wood buck 1-3/8" properly spaced to match the test. It is best to avoid penetrating the sill

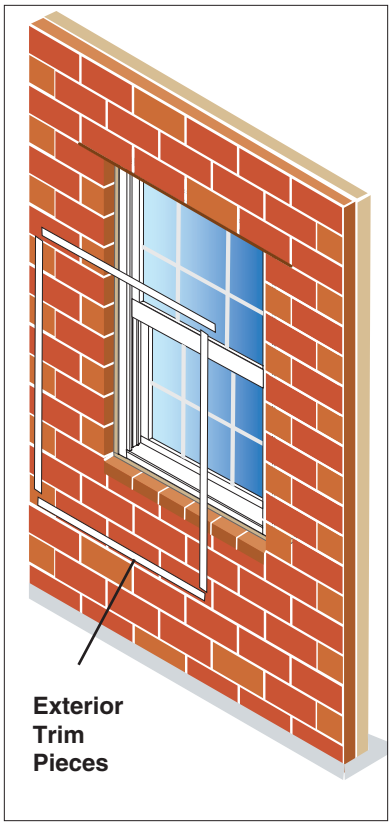




Finish Sealing

Mounting to the wood buck will leave the outside face of the buck exposed. Use finish capping (aluminum or pre-fab trim) to seal the exterior to the weather. Allow adequate sill drainage.





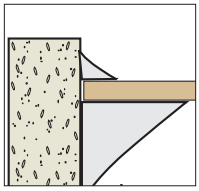
Picking the Proper Sealant

AWDI understands that the application of a sealant is as crucial as the choice of sealant. When a bead of sealant is applied to a joint there are severable factors to consider:

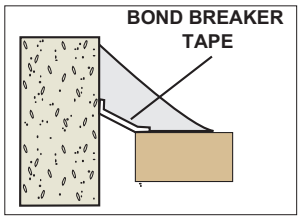
- Adhesion
- Flexibility
- Durability
- Compatibility
- Temp, Weather, Exposure)
- Aesthetics

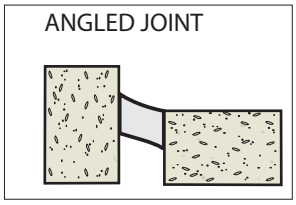
Within these three performance aspects there are countless combinations of applications, substrates and conditions a sealant is exposed to.

Bedding Joints:
For bedding joints, it is especially important that the sealant meet AAMA 800-802, and is of the right consistency and made up of 100% solids so it will not shrink after cure, unlike solvent and latex based sealants that shrink and create gaps after curing.

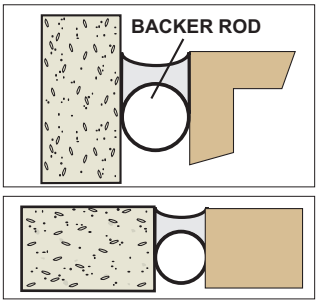


Fillet Joints:
A fillet joint is formed when two surfaces come together to form a right angle. The sealant used to join these two surfaces is triangular in shape. The sealant must adhere to the variety of substrates you're faced with. Without strong adhesion there is a high chance that the sealant will pull away from the substrate allowing for air and water infiltration.





Control Joints:
A control joint is formed when two similar or dissimilar materials meet or when substrates do not form a right angle. This joint will require both a backer rod and sealant for proper application. This joint can be as wide as 5/8 inch and be prone to extreme movement, a highly flexible sealant is necessary for a reliable seal with this application. In order to successfully install a window or door and effect a lasting weathertight seal, AWDI recommends an ASTM C920, Class 50 sealant such as premium DYNAFLEX® from DAP as a good representative to seal the exterior joints of windows and exterior finish materials. The best choice is a sealant that meets AAMA 800-802 to assure proper adhesion to the most common building materials and that is compatible with WRB and flashing tapes; and can be ued in a wide temperature range and wet surfaces.



Desired Properties

- No Shrinkage
- Locks out air and water infiltration to protect integrity of the seal
- Proven Wet Surface Application
- Ability to use the same sealant in warm and cold temperature situations to produce consistent results. 0F – 140F cold and warm weather application
- Strong Adhesion / All Surfaces Will stick to even the most difficult to bond building materials
- 5X stretch, 50% joint movement Long term durability assurance even with expansion and contraction of building materials
- 24 hour fast cure, paintable 1 HR. Fast cure to protect the building structure from outside forces and quick paintability saves time
- Achieves bubbling resistance faster to ensure optimal aesthetics
- 4,600 + Color Matches ensures perfect color match to all primary building materials
- Dirt & Dust Resistance ensures optimal visual appeal long after an installation
- UV Resistance
- Long term durability to compliment the durability of the building structure

Spray Foam Insulation

While the term “Spray Foam” is often widely used in construction, there are two different types and each has its advantages and disadvantage.

Spray foam has been shunned by window installers and manufacturers over the years because foams, in the past, have either continued to expand after trim has been applied deforming the more pliable vinyl window frames, or because they have been over used to fill the gaps left when old windows are removed and the underlying rough opening has been exposed.

Make sure the foam you use has been tested in accordance with AAMA 812 and meets standard for low pressure development.

Most standards applying to window installation do not delineate between open cell foam and closed cell foam, the more popular “minimal expansion” foams are most frequently used and they are mostly closed cell. More confusing yet, is when foams are recommended, the compressed foam tape alternatives are called out to be open cell.

When it comes to Spray Foams, it helps to understand the differences.Open-cell spray foam (ocSPF) has a cell structure where the cells are filled with air. The open-cell structure renders soft, flexible foam, with a density of about 0.5-0.8 pounds per cubic foot (pcf).

The R-value per inch of open-cell foam typically ranges from R3.6 to R4.5 per inch. Unlike fiberglass and cellulose, the fine cell structure of ocSPF makes it air-impermeable at certain thicknesses. The air-impermeability of ocSPF qualifies it as an air-barrier material, dramatically reducing air leakage through the building envelope, significantly lowering the building’s heating and cooling costs. However, ocSPF, like fiberglass and cellulose insulations, is moisture-permeable, and may require the installation of a vapor retarder in colder climates.

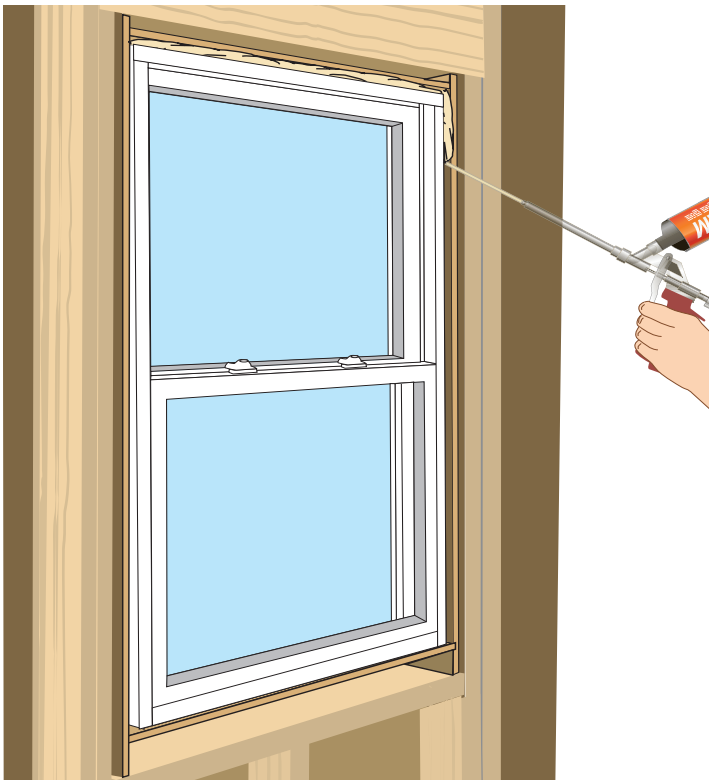
Closed-cell spray foam (ccSPF) has a closed cell structure which yields rigid hard foam, with a density of 1.8-2.3 pound per cubic foot (pcf), and can provide structural enhancement in certain framed buildings. The smaller cells trap insulating gas from the curing, which has a lower thermal conductivity than still air, and increases the R-value to anywhere from R5.8 to R6.9 per inch.

Like ocSPF, ccSPF is also air impermeable at certain thicknesses and can qualify as an air-barrier material. The bigger benefit is that the closed-cell structure of ccSPF also makes it water-resistant, and is the only spray foam that can be used where contact with water is likely.

At a thickness of 1.5 inches, no additional vapor retarder is required for most applications.

Desired Properties

- Make sure the foam used has been tested in accordance with AAMA 812 and meets standard for low pressure development.
- Quick Setting Formulation: can be cut or trimmed in less than 1 hour
- Cold Temperature Application: can be applied in temperatures as low as 14F
- Insulation Value of R5: makes it an efficient method for stopping air and moisture infiltration
- Remains Flexible Once Cured: will not crack or dry out



Using Spray Foam

For the best installation, it is necessary for the gap around the window or door to be sealed to block out air, water and vapor penetration. ccSPF can do that well if selected and used properly. Improper use can create water traps, impede drainage and exert excessive pressure to the window frame during expansion.

Remember: Vapor barriers need to applied on the warm side of the opening. Double vapor barriers (one on the warm side and another on the cool side) encourage condensation between and will trap the resulting condensation. Also, window installation cavities (the space between the window frame and the rough opening, or left-in-place old window frame) need to "breathe" to the outside, and allow drainage of collected water to the outside.

Used wisely, ccSPF can be the best solution. AWDI recommends DAP® DRAFTSTOP 812 Window and Door foam. DAP® DRAFTSTOP 812 also achieves a thermal performance of R-5 per inch.

Application

DAP DRAFTSTOP Foam is applied using a Foam Applicator Gun. This foam and gun combination allows for more precise application than the straw grade foam alternative. This gun offers a rear valve used to control the size of bead applied into the openings. The valve also allows the life of the foam to be extended by closing the opening of the barrel for future use.

For even smaller openings, a detachable screw on top is included with the gun to be able to fill gaps as small as ¼" wide.

Important tips:

• Similar to the sealant gun, it is critical that you balance the movement of the foam gun or straw barrel and how you dispense the foam so that the foam makes contact with both the rough or existing window frame and replacement window frame.

• If the dispensed foam does not make contact with both the rough frame and the window frame, there won't be an adequate bond to seal out water and air.

• Industry Standards suggest application of 1 inch beads, separated by an equal space. Be careful not to create two vapor barriers - one at the exterior and one at the interior. Make sure there is the ability for the opening to breathe to the cold side for drying and drainage. Use backer rod about one inch in the sill as a stop to make a workable back dam

• When applying foam around the perimeter of the window or door, you must maintain a minimum depth of 1 inch. This depth is required to provide the correct thermal performance, to help improve energy savings, and to protect against condensation problems.

• When applying foam as a back dam to the gap between the window frame and the rough sill, do not allow the foam to extend to the exterior edge of the opening. Maintain a minimum of a 1 inch gap between the foam and the exterior edge of the rough sill. If foam fills this gap at the sill, any water from leakage will not be able to drain to the drainage plane or exterior cladding surface. Place backer rod the length of the sill, 1" from edge and use it as a back dam guide.