Replacing Windows in Brick-Veneer Homes

Flashing is critical, but it's not always so easy to get to

by Mike Sloggatt

I have replaced hundreds of windows in brick-veneer homes across Long Island. The coastal environment requires a little extra care, but the procedure is essentially the same for any climate. The tricky part with brick is getting the flashing in the right place.

With most window replacement jobs, the ideal installation requires the removal of the siding, which allows the window to be integrated with the existing weather-resistive barrier (WRB). In a brick-veneer structure, however, that's not so easy. Removing aged brick and mortar to access the window is certain to be noticed long after the job is done. The additional cost associated with surgical removal and the painstaking process of matching new brick and mortar is often prohibitive to most clients. So I resort to the methods described here. The procedures are a compromise, but they're a lot better than leaving an old drafty, leaky window.

MEASUREMENT IS KEY

The selection of the proper window is the primary consideration in this environment. I prefer to use a "prime" window. One I use a lot is the Andersen replacement window; it can be custom sized to fit the openings perfectly, which makes all the difference. But any high-quality window with a nailing flange system will work if you can get the right size for the existing openings.

Pay attention to measuring for the new window. When the window opening is in place, the flange will be secured to the framed wall and will be recessed into the brick opening. To ensure a watertight installation, you need enough room to integrate the flashing with the existing WRB.

There are two measurements of concern here: the rough opening (RO) and the brick opening (BO). The RO is the interior dimension of the framed wall opening. This is the opening we are most familiar with when installing windows in a framed wall. The BO, on the exterior, must be big enough to give us room to maneuver with our flashing around the new window. This space will get covered with an exterior brick mold once the new window is in place.

If we're lucky enough that the existing window has a wood-frame window with a brick-mold exterior trim, the existing RO can usually be used to order the new window. The old brick mold provides the room we need to integrate the flashing. But most of the applications I see

The key to a flawless window replacement in a brick-veneer wall is sizing the new window properly. The replacement unit must be small enough to fit through the existing brick opening without having to dismantle the brick and mortar, but large enough to minimize the unsupported flashing and allow the new unit to be inconspicuously trimmed out.

involve old metal-frame windows (usually steel or aluminum) that were mounted to the RO prior to the application of the brick veneer. The edges of the window typically come right to the edge of the BO, and the flanges are buried behind the brick. Steel-frame double-hungs, which have a spring mechanism buried in the jambs, have an even larger RO. In any of these cases, we can't use the existing RO to order new windows.

Instead, I first measure the BO from the exterior, then open the window and reference the available RO to the BO. The window should fit in the BO with enough room to allow at least 1 1/4 to 1 1/2 inches on both sides of the window (**Figure 1**) and a minimum of 3/4 inch on the top. It may be necessary to pack out the old RO to create an opening that is this much smaller than the BO. Ideally, I like to have 2 inches on the bottom, too, but I rarely get that and will settle for less if necessary.

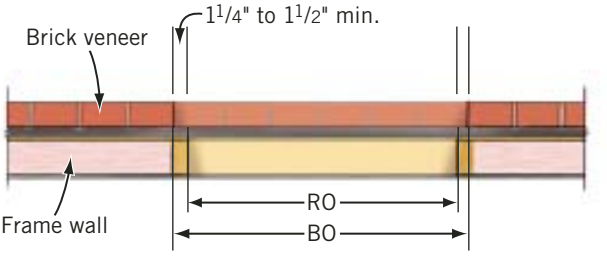

FIGURE 1. **MINIMUM OPENING SIZES**
The window should be sized to fit in a rough opening (RO) in the framed wall that's at least 1 1/4 to 1 1/2 inches smaller than the brick opening (BO). Ideally, this BO would also be 2 inches higher than the RO to allow room at the head and sill, but the window can still be made to fit through a smaller BO if the bottom flange is removed before it's installed.

INTEGRATING NEW FLASHING AND THE EXISTING WRB

Almost every job I have done has had No. 30 felt or building paper over the framed walls as a WRB. When removing the old window, care must be taken to pre-

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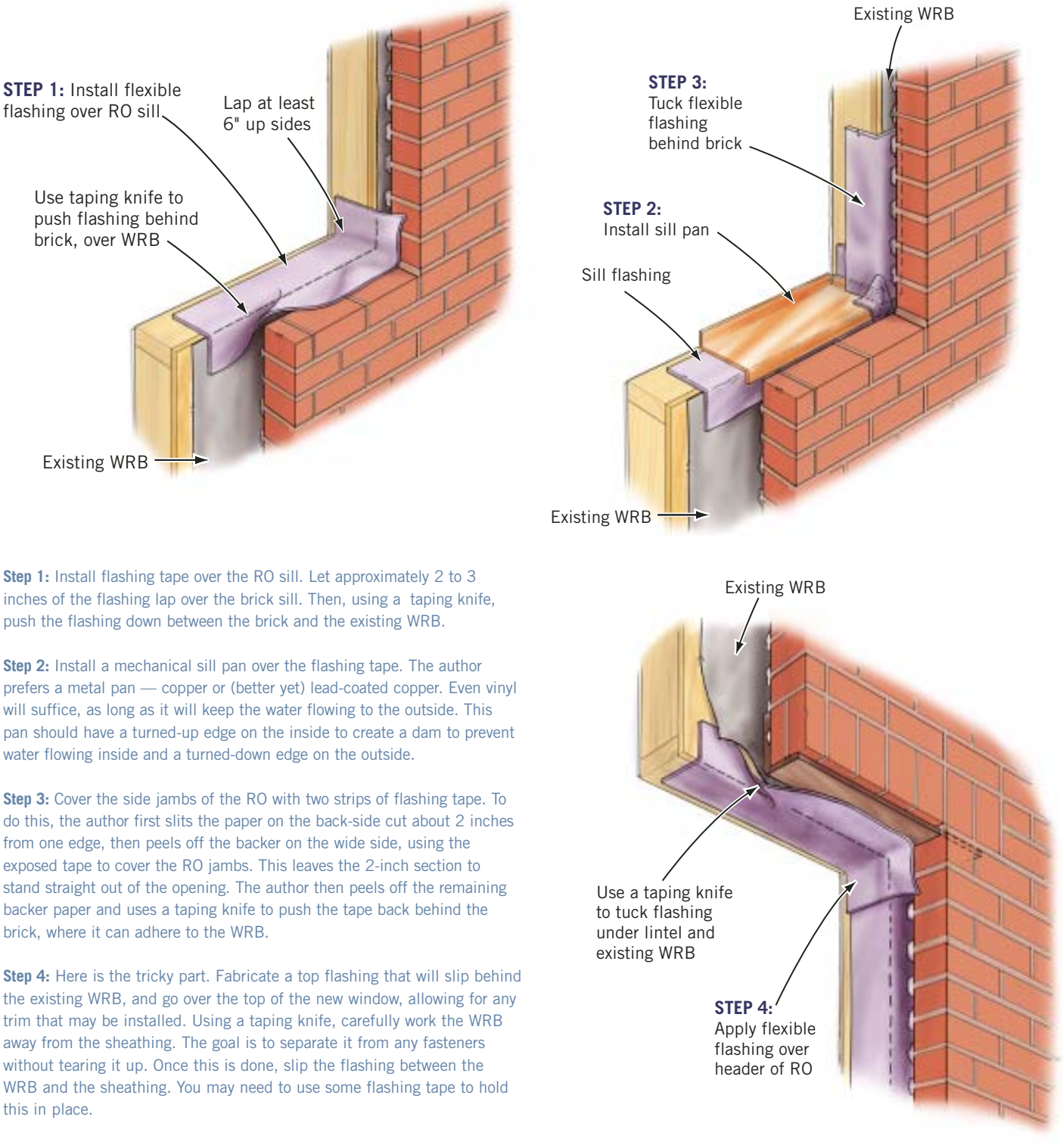
FIGURE 2. **FLASHING UNDER BRICK VENEER**



Step 1: Install flashing tape over the RO sill. Let approximately 2 to 3 inches of the flashing lap over the brick sill. Then, using a taping knife, push the flashing down between the brick and the existing WRB.

Step 2: Install a mechanical sill pan over the flashing tape. The author prefers a metal pan — copper or (better yet) lead-coated copper. Even vinyl will suffice, as long as it will keep the water flowing to the outside. This pan should have a turned-up edge on the inside to create a dam to prevent water flowing inside and a turned-down edge on the outside.

Step 3: Cover the side jambs of the RO with two strips of flashing tape. To do this, the author first slits the paper on the back-side cut about 2 inches from one edge, then peels off the backer on the wide side, using the exposed tape to cover the RO jambs. This leaves the 2-inch section to stand straight out of the opening. The author then peels off the remaining backer paper and uses a taping knife to push the tape back behind the brick, where it can adhere to the WRB.

Step 4: Here is the tricky part. Fabricate a top flashing that will slip behind the existing WRB, and go over the top of the new window, allowing for any trim that may be installed. Using a taping knife, carefully work the WRB away from the sheathing. The goal is to separate it from any fasteners without tearing it up. Once this is done, slip the flashing between the WRB and the sheathing. You may need to use some flashing tape to hold this in place.

FIGURE 3. The author uses a metal brake to form a copper pan (left). All windows eventually leak, but the pan will capture the water and allow it to drain to the exterior. The inside of the pan should have an upturned edge to prevent the water from draining to the interior, and the side flashings should lap over the ends of the pan (above).

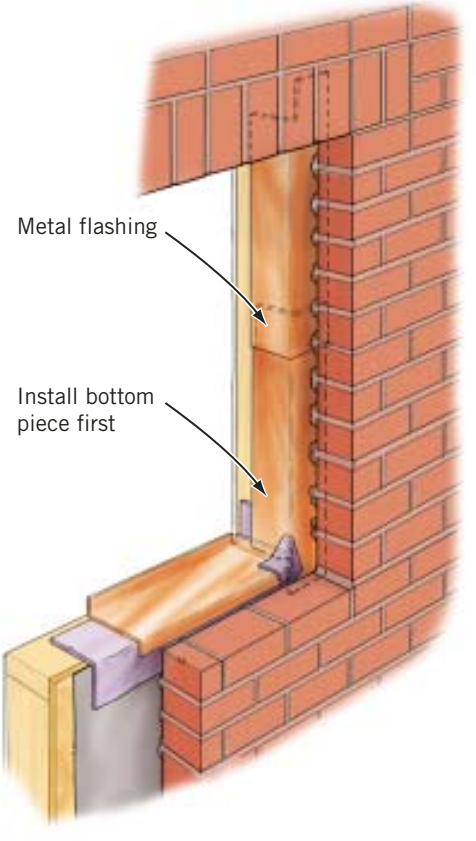


FIGURE 4. **ALTERNATIVE SIDE FLASHING**
If flexible flashing can't be pushed behind the brick at the sides of the window opening, the author bends four copper or aluminum L-strips to use as side flashing instead. To install these, he starts with the bottom piece, which is as long as at least half of the height of the window and has a flap that allows the end to slide down below the sill height. The second piece extends to the head, with a flap that reaches about 2 inches above the window opening and is long enough to lap over the first piece installed.

serve the integrity of this existing WRB. After a number of years it can become dry and brittle, so we have to be gentle to keep from tearing it up when working the opening.

Once the old window is out, we focus our attention on preparing the opening, using a metal sill pan and flexible flashing, as outlined in **Figure 2,** page 3. It's important to use a sill pan that gives you an upturned edge on the inside to block water draining to the interior, and to lap the flashing over the pan so water draining from higher up will be caught by the sill pan (**Figure 3**).

In some cases, however, there is not enough of a space behind the brick to push the flashing tape back there. Or, the mortar that squeezed out on the back side of the brick has clogged the space. This squeeze out may be chipped away at the edges, but if it's really heavy, even that won't be enough to provide clearance for flexible tape. In this case, I bend four aluminum or copper L-shaped strips, as shown in **Figure 4**. At a minimum, the legs of these L-strips should be 2 inches, but a 3- to 4-inch leg is preferable. Remember: The farther the water is deflected by the flashing from the edge of the BO, where the most water is likely to get blown in, the less likely the water will find its way back into the RO as it drains down the wall.

INSTALLING THE WINDOW

Once the sides and the sill have been wrapped, it's time to install the window. If the BO is tight, we may need to trim back the window flanges. I often have to completely remove the bottom flange to get the window in, as well. A jigsaw works for trimming off a formed vinyl flange. On some windows, it's possible to pull the flange extrusion out of the frame, or it may require careful trimming with snips and a utility knife.

The goal in any window installation is to keep the outside environment where it belongs: outside.

When installing the window, first apply caulking to the top and two side flanges. Without a bottom flange, we don't need caulk there. But even when we have an intact nailing flange, we never caulk the bottom of a window. If water leaks through the windows, it must be able to drain out.

Shim and square the window, and check it for proper operation. In coastal zones, impact-resistant units usually must be installed with framing clips, as

BUILDING SCIENCE BASICS

The goal in any window installation is to keep the outside environment where it belongs: outside. By "outdoor environment" we mean several things: the outdoor moisture, the outdoor air, and the outdoor temperature. Moisture is the obvious element. Anyone who's been in the trade knows that all windows will leak eventually. For this reason, every window should have a sill pan that will catch water that leaks through the window unit itself, providing drainage to the outside. The flashing at the head and the sides is meant to deflect water that leaks past the siding and around the window trim, shedding it to the outside. Therefore, the order in which the flashing is installed is important, so lower courses will lap *under* the courses above. In a coastal environment where water is likely to be driven by the wind, it's especially important to use a self-healing butyl-based adhesive that will seal around the trim fasteners that will get driven through it. DuPont StraightFlash (www.dupont.com/construction), Grace Vycor (www.na.graceconstruction.com), and Pactiv GreenGuard (www.pactiv.com) are all butyl-based products.

Some contractors try to air seal windows by stuffing fiberglass in the crack, but this won't work. Fiberglass doesn't stop air movement. A low-expanding foam sealant will.

Air sealing is less obvious to some builders but not less important to the performance and durability of a home. The gap around every window and door in a house represents a serious hole in the building enclosure, which not only will siphon off conditioned air from inside the home and pull outdoor air inside where it will displace conditioned air, but it can also carry moisture vapor that will condense on the first cold surface it encounters, leading to mold and rot. The greater the temperature difference between indoors and out, the more likely this will occur.

The exterior is not the place to deal with air leakage, however. Instead, seal the window from the interior with a low-expansion, closed-cell polyurethane foam sealant, such as Great Stuff Pro Window & Door (www.greatstuff.dow.com), Pur Fill 1G (www.todol.com), or Touch n' Seal Window & Door Sealant (www.touch-n-seal.com).

If you get the flashing and air sealing right, then all the high-performance features of a good window, such as low-E glass and gas-fills and nonconductive spacers, will be meaningful, and the chances of the home being able to keep the outside temperature outside are much greater. — *M.S.*

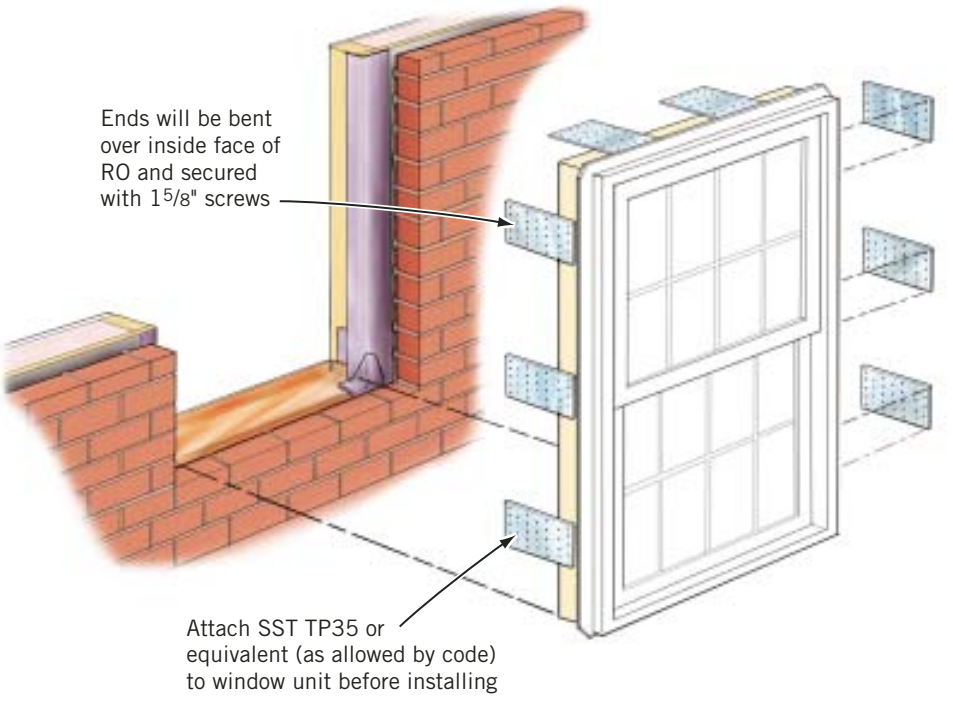


FIGURE 5. **FRAMING CLIPS FOR COASTAL WINDOWS**
In coastal wind zones, impact-resistant units must be installed with metal framing clips. These clips also help when the brick opening is tight and the nailing flange is hard to access.

shown in **Figure 5**. This actually simplifies the installation, since the nailing flanges may be hard to get to, especially at the top. If the window manufacturer does not offer special metal clips for this purpose, I use a 20-gauge metal tie plate, such as a Simpson Strong-Tie TP15 or TP35, screwed to the window first and then folded over at the inside edge of the stud. If you're unsure what the local codes require in high-wind zones, it's prudent to check with the code inspector first to make sure this will work.

After the window is in place, I foam the gap between the window and the RO with a low-expanding foam to create an effective air seal (see "Building Science Basics," page 5).

FIGURE 6. The last but often most difficult step is flashing over the window flanges before the brick mold goes on. If there's not enough room to slip this flashing behind, the author will lap the flashing tape onto the brick, and trim off the excess once the trim is installed.

FINAL FLASH

With the window installed, I go back outside and apply flashing tape over the flange. This can be difficult if the BO is tight. If possible, I push the tape behind the brick. However, if there is not enough room to get this final flashing behind the brick, I'll leave it long, allowing it to flap alongside the brick (**Figure 6**). Then, after I install the brick mold (or other trim to fill out the masonry opening), I will trim this excess away and caulk the trim to the masonry at the sides and bottom of the BO. Across the head, though, I leave gaps in the caulk to allow any water that might get past the brick above to escape. Most brick veneer should also have weep holes above the lintel for exactly this purpose.

Mike Sloggatt has been remodeling old homes on Long Island for more than 27 years and is a member of the JLC LIVE construction demonstration team. Photos by the author and his crew. Illustrations by Chuck Lockhart.