Retrofitting New Windows

Strategies for fast and professional installation—on a budget

BY EMANUEL SILVA

Over the past 18 years, my company has installed so many windows that I've lost count. During that time we've learned how to work very efficiently, performing all the steps necessary to achieve long-lasting results in the shortest period of time. But more importantly, we do our best to please our clients so that they're happy to refer us to future customers.

We were recently contacted to replace eight windows on the front of a client's home. I submitted the bid and received the go-ahead. But with our busy calendar, we had to schedule the job for mid-winter. On the day we signed the contract, I spent a few hours making an accurate list of window measurements as well as a stock list for all the parts we'd need to complete the job. The windows were two different sizes; I temporarily removed the interior trim from one of each size so that I could take all the measurements I needed.

Once I'd measured the existing rough openings, I chose stock-size windows that were close to the originals. Using stock windows significantly helped keep the price down for the clients. Not only were the window units less expensive, but also I was able to streamline the installation by preassembling interior and exterior trim kits and by precutting all the flashings, as well as the filler pieces that would be needed to pad the openings for the new windows.

When winter arrived, it brought with it the coldest and snowiest

Photos: John Simmons

weather in this area's history. So being able to do the prep work in the relatively warm confines of my garage shop meant that the work on site would move along at a faster pace, and we could minimize the amount of time the interior of the house—as well as the crew—would be exposed to the elements.

PRECUTTING LENGTHS OF FLASHING TAPE

The large work table in my shop was great for doing the prep work. First, I tackled precutting the flashing tape. For this project, we had chosen a recently introduced Grace product, Vycor Pro, which was compatible with all the surfaces we were working with and was rated for application in below-freezing temperatures (24 degrees). Vycor Pro comes in rolls of various widths; for the flashing around these windows, we opted for the 9-inch width.

Using the list I had made on site, I cut two sets of tape to install around each window. The first set would seal the edges of the rough opening, and the second set would seal the window flanges to the wall of the house after the windows were installed.

For each window, I began by cutting the pieces for the sills and the heads. These would all be the same length. I unrolled the flashing to the measurement needed and used the hook of my tape to mark the appropriate length. To keep the cuts straight and square, I placed one side of the tape along the edge of the work table and lined up my layout square with the hook mark to guide the cut **(1)**. Then I labeled all the cut pieces and put them aside **(2)**.

I planned to flash each side of the windows in two pieces to prevent the tape from sticking to itself as it slipped behind the siding. So for two layers of flashing on both sides of each window, I cut a total of eight lengths. I labeled these pieces, as well.

The last pieces to cut were the "bow ties" that I use to seal the corners where the sill flashing and jamb flashing meet. Vycor Pro is reported to be a "highly-conforming, non-asphaltic, butyl-modified flashing tape." And while the material will stretch a little, these small bow-tie-shaped pieces ensure a good seal at the two lower outside corners of the window opening, the places most vulnerable to moisture intrusion. I needed sixteen of these pieces, and started by cutting 3-inch strips. To make the bow-tie shape, I folded each strip in half and measured in 1 inch from both sides along the fold. From those marks, I cut to the opposite ends, creating the angular shape I needed for bending around the corners **(3)**.


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While in the shop, I also cut the pieces of wood I'd need to build-in the existing openings to the rough-opening size for the new stock-size windows. After removing the interior trim on an earlier visit, I determined that the wall thickness was 4½ inches overall. I ripped two 2x6s to raise the sill to the proper height and ripped lengths of ¾-inch plywood to build-in the sides. I also ripped lengths of primed cedar clapboard to create a sloped drainage plane for the sills. Finally I prefabricated the exterior trim for each window, a process I'll describe later in the article.

GETTING READY FOR THE NEW WINDOW

After arriving at the jobsite, I worked one window at a time. I began by removing the old exterior trim, then I slowly started to pry back the siding. Immediately, I discovered that removing the siding would be a bigger challenge than I'd originally thought. The installers had attached it with 3-inch galvanized finish nails driven into the house framing instead of the usual box nails.

When I tried to loosen the first row of clapboards, the finish nails stayed put, pulling through the back of the clapboard and cracking it in the process. So instead of prying, I slipped the blade of my reciprocating saw behind the siding and clipped the nails. With the nails cut, the pieces of clapboard came out easily **(4)**. Next, I lifted the felt paper and tacked it out of the way while I prepped and installed the new window **(5)**.

When I retrofit a window, I typically peel back the siding along both sides of opening to simplify installation and flashing of the new window. But because of budget constraints, I used a different strategy: I kept the siding in place along the sides of the window and pried it away from the wall to create enough space for the flashing tape to slide behind **(6)**. With the clapboards slightly lifted away from the wall, I slid my pry bar behind the siding as a gauge to find the nail that was closest to the opening, which gave me the maximum width for the flashing along the sides of the opening.

CREATING A NEW ROUGH OPENING

To create the rough openings for the new windows, I installed the fillers that I'd cut earlier in my shop. I started with the two sill pieces, then I screwed a ¾-inch plywood strip to each side. The last piece to go in was the length of clapboard with a tapered shape that would act as a drainage board **(7)**.

Cutting and installing these fillers took about a half-hour per window. The cost of my time and the few materials for the fillers worked out to be a lot cheaper than what the upcharge would have been for ordering custom-size windows to fit the original rough openings.

FLASHING THE OPENING

To insure a watertight installation, the opening must be properly flashed and integrated with the existing weather barrier; in this case, felt paper. Pulling the siding slightly away from the wall yielded enough room for the flashing to extend 4 inches onto the wall—2 inches on the sheathing and 2 inches on the felt paper to create a tight seal around the opening.

To make sure the flashing pieces fit properly and easily, I made a control line to help align the pieces as they were applied. I first marked the centerline of the opening (measured left to right) on the sill. I found the center of the sill flashing tape by folding it in half. By lining up the fold with my centerline, I then was able to accurately mark where the flashing tape met the side jambs, which was also where I needed to cut the flashing tape to fit around the sill. I made the cut so that the remaining flap of flashing tape would extend up the outside wall and behind the siding.

To apply the sill flashing, I peeled back the release paper on half of the sheet and lined up the center marks. I applied pressure outward from the center in both directions to help secure the flashing tape to the drainage board. To secure the outside of the sill flashing, again I worked from the center out, sealing the bottom flap first. Where the ends of the flashing tape met the siding, I used a narrow shim to guide the flashing into place **(8)**.

Next I installed the bow ties—the most crucial part of the flashing installation **(9)**. Starting on the wall of the house, I applied the bow tie at an angle to the lower corner of the sill. I pulled the bow tie over the corner, letting it bridge between the sill and the side jamb. The side-jamb tape would then extend down over the bow tie and the sill to make a weather-tight corner.

Applying each side's flashing tape in two pieces made the process much easier. This time I made my alignment marks for the top edges of the tape, and again I prefit the pieces and located my cuts accurately before peeling off the protective backing.

After aligning the flashing with the mark, I worked down the

jamb until I reached the inner corner, using my layout square to press the flashing tight to the corner. I smoothed the outer face with my hand and again slid the flashing behind the siding and pressed it into place with a shim shingle **(10)**.

To complete the side-jamb flashing, I installed the top pieces as I had the lower ones, except the extra flap extended up the wall for 3 or 4 inches. The last piece to be applied was the head flashing. Again I marked the centerlines and installed the flashing tape working from the center outward, one side at a time. I installed the head flashing with the bottom edge flush with the opening instead of tucked inside **(11)**. The rough opening was now ready for the window.

SETTING AND FLASHING THE WINDOW

Before sealing and fastening the new window, I set it into the opening to establish exactly where it would sit. With the existing siding still in place, I left equal space on both sides so that the trim kit would fit with only minor alterations. I made a reference mark on the head flashing above the opening and on the top window flange. I then popped the window back out and applied a generous bead of OSI Quad (a low-temperature sealant) to the back of the flange, making sure to cover the nail holes **(12)**. The bottom flange was left without sealant to allow water or moisture to drain away easily.

I tilted the window into place, using my reference lines to help position it correctly. I set my long level on top of the window while a helper on the inside shimmed the bottom of the window until it was perfectly level **(13)**. At that point I temporarily tacked both bottom corners using 2-inch galvanized roofing nails.

Next, I made diagonal measurements in both directions to square up the window **(14)**. When both measurements were the same, I nailed the top corners **(15)** and finished driving the nails on the lower corners. Before I nailed through the remaining holes, I ran my level along the top, bottom, and sides of the window to make sure they were still true and there was no distortion of the flanges. Once I finished nailing off the flange, I wiped off any excess sealant that might prevent the outer flashing from lying flat against the wall.

To make the window watertight and to seal the flange to the flashing I had applied earlier, I installed outer strips of flashing tape

along both sides. Before I applied the flashing, I scribed a pencil line along the top and sides of the window about ⅜ inch from the flange, using my finger as a guide. This line helped me place the flashing tape during the installation, and having the tape lap slightly onto the side of the window provided a better seal along the edges of the window frame to prevent moisture from entering.

Again I used two pieces of tape along the sides to make installation easier. Starting from the bottom, I overlapped the bottom corner flange of the window and the side flashing around the rough opening. As I applied the side flashing, I sealed it to the window flange and worked under the edge of the siding **(16)**. I let the top of the side flashing extend past the top of the window by about 4 inches.

For the head flashing, I used two pieces of 5-inch-wide tape. Starting from one side, I applied the top edge first and worked it down toward the window **(17)**. Using a small flat bar, I smoothed the tape into the corner of the flange. The ends of the head flashing completely covered the tops of the side pieces and extended slightly under the siding.

The window manufacturer's instructions called for a metal drip cap along the top of the window, so I cut a piece of aluminum drip-cap flashing to length and sealed it in place with flashing tape **(18)**.

PREASSEMBLE THE WINDOW TRIM

To match the existing trim on the house, we used brick mold around the windows. I opted to use PVC trim instead of wood; PVC is more durable and would require less maintenance. I also used a PVC sill to match the original.

As mentioned earlier, I prefabricated the trim kits for each window in my shop before the installation. To make the trim kits, I first took measurements directly from the window. I made sure to leave the required space between the window and exterior trim as specified in the instructions. I then returned the windows to their boxes to protect them until they were installed.

With the measurements done, I started by cutting the sills to the proper length. This was also the length of the top casing. I cut both ends of the top casing at 45 degrees, measuring between the long points for my length. For the side trim, I cut one end of both sides at 45 degrees. Before cutting the other ends of the side pieces, I needed

to know the angle of the sill where the sides would attach. To copy the angle, I laid the sill on its back and placed a scrap piece of casing against it. I traced the angle and then took the scrap to my miter saw and lined it up with the blade to set the angle of the cut.

With the saw blade properly set, I cut the side-trim pieces to length. To make the two sides exactly the same length, I measured and marked one side. Then I lined up the long points on both pieces and set them against the fence on the miter saw. Cutting both pieces together and face up produced the two opposite sides that were exactly the same length.

The large, flat area of my work table made building the trim kits fast and easy. To assemble them, I started with the mitered corners. I applied PVC cement to one side of the corner and mated both pieces together. I predrilled and drove coated trim-head GRK screws to secure the joint. I repeated the same procedure for the other mitered corner. For the sill, again I predrilled and drove the screws, this time through the bottom of the sill. Assembling the trim kit was just a matter of applying glue to the sill and screwing into the bottoms of the side casings.

To speed up installation and to minimize the time we would need to spend outside, I predrilled and set all the fasteners that would secure the trim kit to the wall of the house. Knowing that brick mold is not as wide as traditional casing, I made sure that I set the screws along the outer edge of the brick mold so that they wouldn't penetrate the window flange. I spaced the screws about 12 inches apart wherever possible, which provided plenty of holding power.

INSTALLING THE WINDOW TRIM

To install the trim kit, I set two spacers on the top of the window to create the gap required (and the gap I'd planned for). I also checked the gaps along the sides to see if any adjustment was necessary. Once the trim kit was in its correct location, I used the edge to scribe a line along one side indicating where the ends of the clapboards needed to be trimmed **(19)**. To avoid cutting through the siding and into the flashing tape, I slid a thin strip of wood behind the ends of the clapboards that I would be trimming back. An oscillating multi-tool made quick and clean cuts along the scribed line **(20)**.

Before installing the trim kit, I primed all the bare edges of the

wood with quick-drying primer. Raw wood, like the cut ends of clapboards, is vulnerable to absorbing moisture, which can cause paint to fail prematurely (or worse, can lead to rot).

I applied a bead of low-temperature sealant to the back of the trim kit on all sides and then placed it around the window. I set a level on top of the trim and made some minor adjustments to make sure it was perfect. Then I drove in all the preset screws **(21)**.

I like my trim kits to lie perfectly flat against the wall. But if the screws are simply driven in as tight as possible—as they usually are—any waves or unevenness in the wall will telegraph through the casing, especially with the more flexible PVC material. To prevent that, I used a straightedge and fine-tuned each screw to let the casing lie flat without mirroring the wall's imperfections.

For this project, I used the Cortex concealed-fastener system to hide the screw holes. Cortex provides plugs made from the same PVC material as the trim; after the screws were driven to their proper depth, I inserted the plugs into the holes and drove them flush. Because I had adjusted the depth of the screws, some of the plugs sat proud and could not be driven flush, so I simply shaved them with my knife as needed.

BUTTON UP THE SIDING

Before replacing any clapboards, I installed a second drip cap on the top of the trim kit, as specified by the window manufacturer **(22)**, and sealed it in place with flashing tape **(23)**. I then let the felt paper (that I'd tacked out of the way earlier) come back down to cover the whole assembly, sealing the vertical edges with strips of flashing tape.

I installed the new pieces of clapboard above the window, leaving a ⅜-inch gap between the siding and the window trim. After being predrilled, the siding was fastened with stainless steel nails **(24)**. Where the boards butted, I slipped a strip of felt paper behind them and caulked the joint to help prevent water from entering.

To seal between the window and the trim kit, I inserted foam backer rod and then applied a bead of low-temperature sealant. I sealed all four sides of the window, using my finger and mineral spirits to tool the caulking smooth **(25)**. I also caulked the edges of the casing adjacent to the clapboards.

A frequent contributor to JLC, *Emanuel Silva owns Silva Lightning Builders in North Andover, Mass. For more photos of this project, visit JLConline.com.*