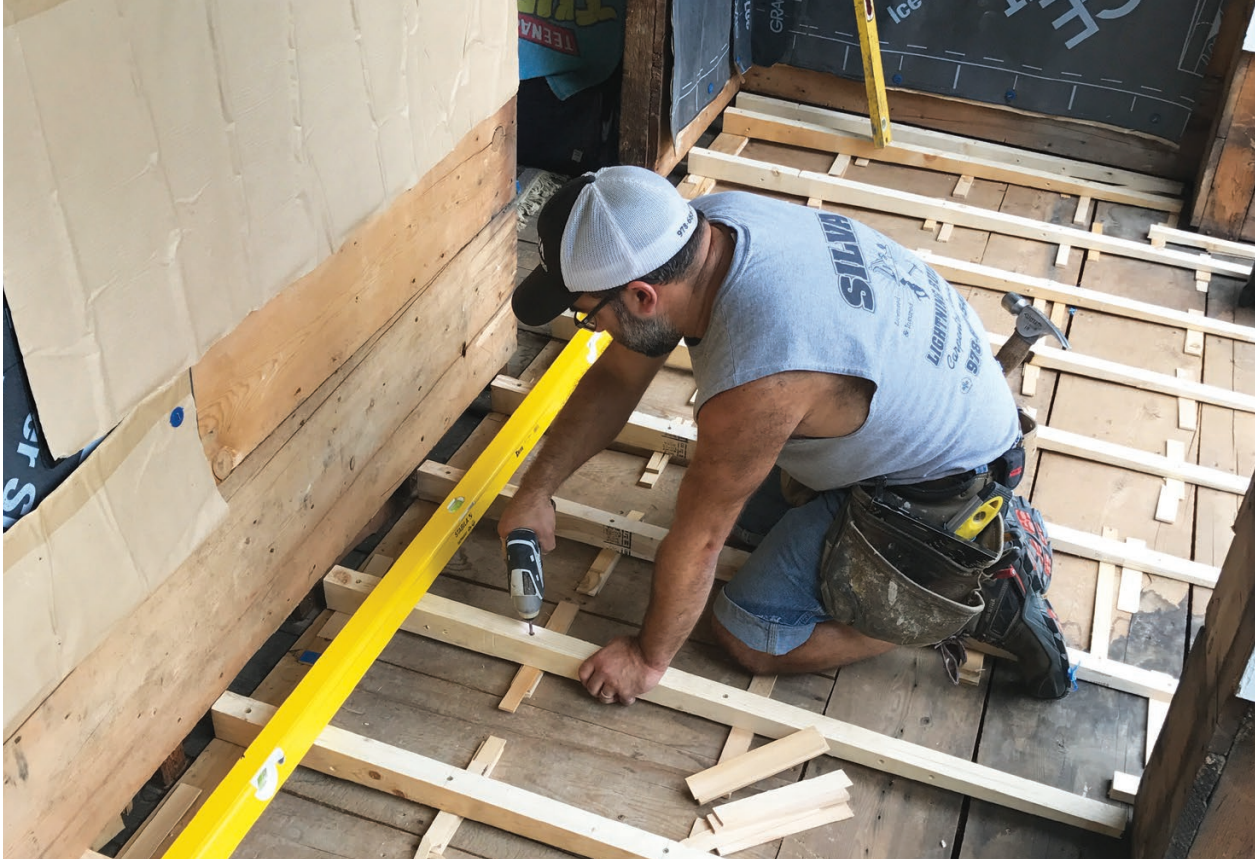

Replacing a Balcony Floor

A new meranti floor floating over an EPDM rubber membrane solves a leaky problem

by Emanuel Silva

Like many of my jobs, this one started out as a small leak repair but inevitably became a full-blown makeover—in this case, of a covered, third-floor balcony built into the gable dormer of an old Boston-area Victorian. My clients had noticed some minor water staining on the ceiling of the living space below the balcony and wanted me to fix that problem, as well as remove a pair of fixed windows from the arched openings in the gable wall and replace them with railings. When I assessed the job, I noted that the balcony floor had been framed with no pitch and was covered with asphalt roll roofing, not a good waterproofing combination for resisting the windblown rain that would inevitably make its way through the missing panes in the broken arched windows.

Demo

I started by removing the glass panels from the two arched openings, along with the attic door that led out onto the balcony, then stripped the aluminum siding from the lower part of the walls. To protect the living area below from water damage while I worked on the balcony floor, I covered the exposed wall sheathing with Grace Ice & Water Shield HT, a self-adhering rubberized asphalt membrane. I left the bottom 16 inches or so of release paper intact so that I could fold the membrane up while I worked on the floor-to-wall joint.

Next, I peeled away the roofing that covered the balcony floor. Underneath the roll roofing was a layer of small metal roofing panels that had been soldered together, along with continuous copper flashing at the eaves. Underneath it all was sawn board sheathing, which showed some areas of water staining around the center post between the arched openings and at the wall, indicating that water was draining back toward the building.

Tapered Sleepers

I wanted to give the roof underneath the new balcony flooring a positive pitch for better drainage, so using a jig to guide my circular saw, I ripped tapered sleepers from 2-by lumber. I laid these out on the sawn board sheathing 12 inches on-center, then spent the better part of a day carefully shimming the sleepers as needed to create a pitched but perfectly flat surface for new floor sheathing.

PHOTOS BY EMANUEL SILVA

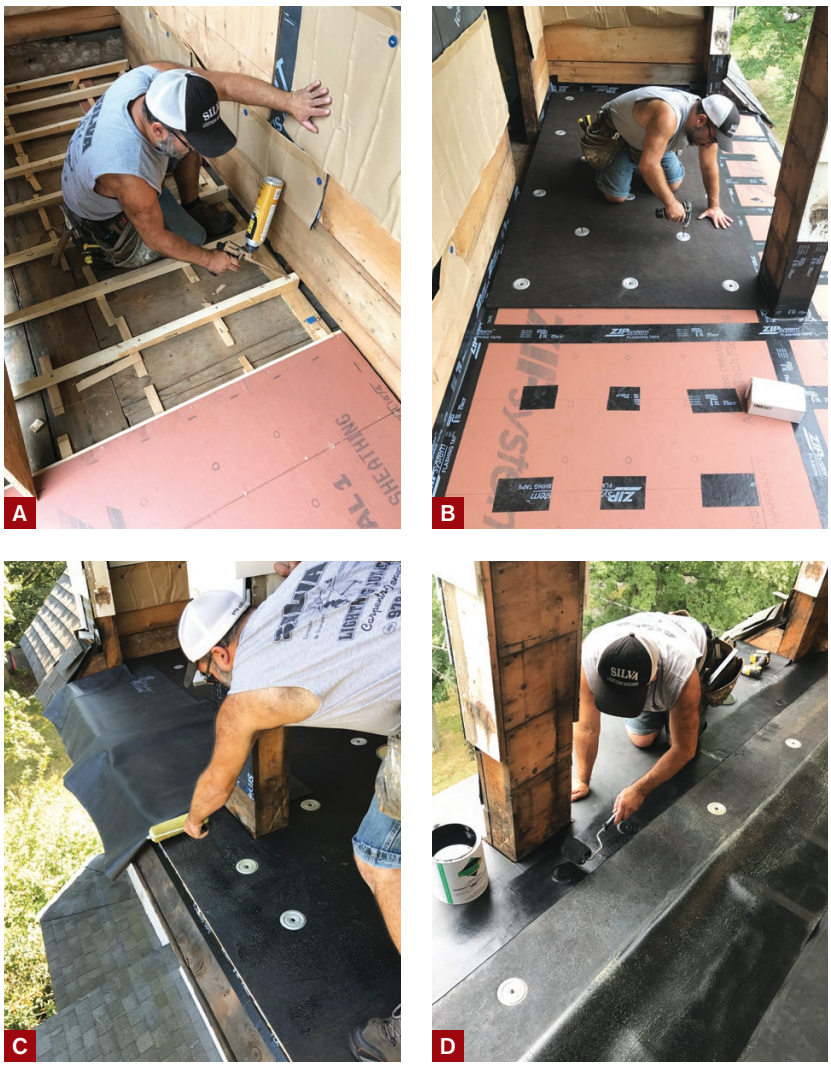

Figure 1. The author installed tapered sleepers followed by Zip sheathing to pitch the roof deck away from the house (A). Then he installed recovery board over the sheathing (B), followed by the EPDM roof membrane (C). The author used a neoprene bonding adhesive to glue the membrane to the underlayment, and a rubber-to-rubber adhesive at lap joints in the membrane (D).

Once I'd screwed the tapered sleepers down, I sheathed the floor with 5/8-inch-thick Zip panels. I was anxious to cover and dry-in the deck quickly in case of bad weather, and once the seams, fasteners, and edges of the panels were covered with Zip tape, they created a weatherproof barrier that allowed me to rest easy at night without worrying about a tarp being blown away by a storm. I used both screws and spray foam adhesive to bond the sheathing to the sleepers.

EPDM Roofing

For a project like this, EPDM synthetic rubber roofing membrane is a durable choice that's relatively easy to work with. I ordered and rolled out a 10-by-25-foot sheet of 60-mil material in my clients' driveway, used a straightedge and marker to draw cut lines, then cut the sheet into manageable sections with a pair of heavy-duty shears.

I started by covering the Zip sheathing with a layer of 1/2-inch roof recovery board. These 4x8 panels—which come in various thicknesses with different R-values—are made for use with single-ply roofing, with a foam core for insulation and an inorganic coated glass facer compatible with the adhesives used with EPDM membranes. The panels are held in place with screws driven through large plate washers (**Figure 1**).

Next, I dry-fit the largest section of the EPDM membrane, which I sized to lap about a foot up the walls and fall short of the center post. I then marked the outside edge of this section of membrane onto the underlayment and used this reference line to lay out the smaller piece of membrane that would overlap the eaves and wrap around the column. This piece had to be carefully cut to fit around the column and over the roof-to-wall intersections at the two outside corners of the balcony.

I installed the smaller section of membrane first, positioning it and then carefully folding it back onto itself one area at a time. This allowed me to clean off the underside of the membrane with a special solvent before rolling the bonding adhesive onto both the membrane and the underlayment. Once a section is pressed into place, the bond is permanent, so it's important to work carefully.

I installed the second, larger membrane section the same way, using both the bonding adhesive and the special rubber-to-rubber adhesive where the second membrane overlapped the first near the column. Here, a minimum of 2 inches of overlap is required, though I allowed for quite a bit more on this project because of the balcony's small size and tight fit, which made maneuvering the sheet material a little tricky.

Post flashing. To create a watertight joint at the post, I cut four small squares of EPDM membrane sized to wrap up the post about 12 inches, wrap a couple of inches around the sides of the post, and overlap the roof membrane by about 4 inches. For a tight fit, I made folds in each section and a couple of cuts from

either side in the bottom leg so the membrane would conform neatly to the post and roof deck. Then, starting with the outside face of the column, I cleaned the back of a piece of membrane and applied membrane adhesive where it would overlap the roof membrane, and bonding adhesive where it would contact the wood post (**Figure 2**). Then I installed the other three pieces, finishing with the one facing the attic. At the four corners, I installed small EPDM patches, completely flashing the column to the roof membrane.

Wall flashing. According to Grace, EPDM membranes are not compatible with asphalt-based flashing products, such as Ice & Water Shield HT, which tend to degrade the EPDM (a butyl-based version of Ice & Water Shield, called Ultra, is suited for this application but was unavailable when I was doing this project). So where the roof membrane wrapped over the roof eaves and up the wall sheathing on the attic wall and on either side of the balcony opening, I first applied Henry Blueskin Butyl Flash self-adhering flashing to isolate the EPDM membrane from the asphalt-based Vycor Plus flashing tape that I used in conjunction with the Ice & Water Shield membrane.

Finally, I removed the release paper from the lower part of the Ice & Water Shield membrane and folded it back down over the Blueskin covering the top edge of the EPDM membrane extending up the walls. This should prevent any water that gets blown into the balcony during a storm from penetrating the walls or roof deck and getting inside the house.

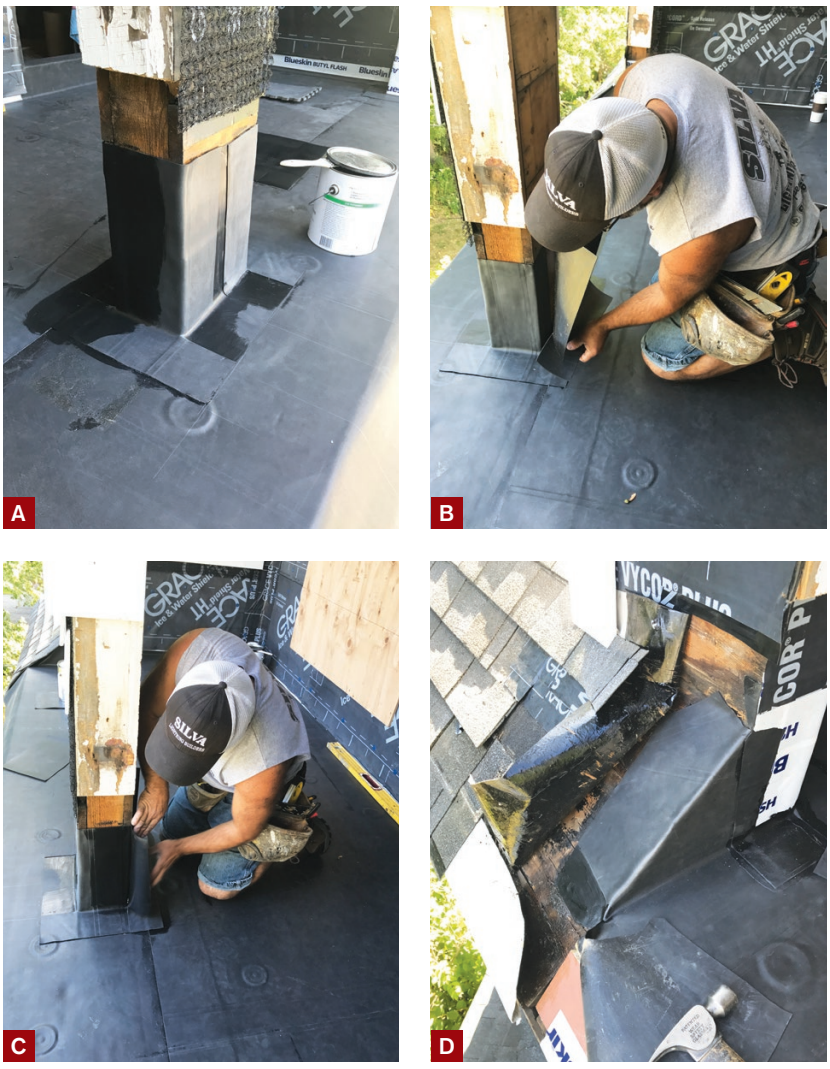

Figure 2. The author flashed the column with four pieces of membrane folded and cut to fit, starting with the outside face followed by the two sides (A). Rubber-to-rubber adhesive was used to adhere the legs of the last section of membrane on the inner face of the column to the previously installed pieces (B, C). At the sides of the balcony, the author used butyl-based flashing tape to isolate the EPDM roof membrane from the asphalt-based Vycor flashing (D).

Balcony Floor

After completing the membrane installation, I used my tapering jig to cut more sleepers from 2-by pressure-treated lumber, which I then laid over the roof membrane with the tapers reversed to create a flat surface. These sleepers aren't mechanically fastened to the balcony floor; they are just laid in place on 16-inch centers over a protective second layer of 2 1/2-inch-wide EPDM strips and held down by the weight of the decking and by the trim around the perimeter of the balcony.

I prefinished the balcony's new red meranti 1x4 decking on all six sides with Penofin tropical hardwood penetrating oil, then installed it starting from the outside and working inward toward the attic wall. I fastened the decking to the sleepers with 16-gauge stainless steel nails, carefully sizing them so that they wouldn't penetrate all the way through the decking and sleepers into the roof membrane. To ensure a good bond, I also glued the decking to the sleepers with 3M 4200, a tenacious, marine-grade polyurethane adhesive sealant that I often use on deck projects. For a consistent gap between boards that would ensure good drainage off the roof below, I spaced the decking with 8d nails tacked to the sleepers during installation (**Figure 3**).

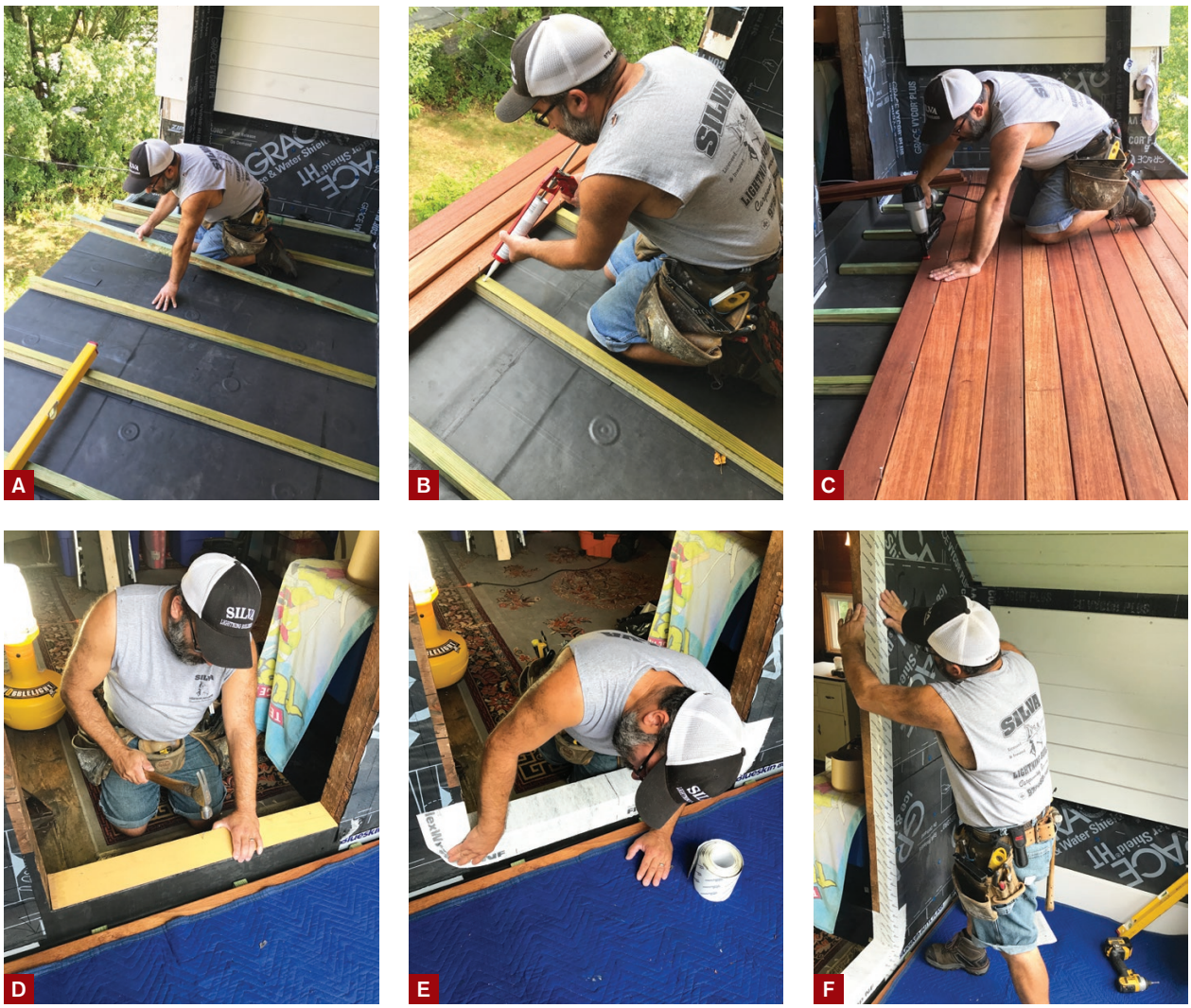

Figure 3. The author laid pressure-treated sleepers with a reverse taper over the membrane (A), then fastened 1x4 red meranti decking to the sleepers with marine-grade adhesive (B) and stainless steel nails (C). At the entryway to the attic, a short length of beveled siding tacked to the door sill over the membrane creates pitch for drainage (D). The author then waterproofed the sill with flexible flashing tape, which wraps up the jambs (E), then used regular peel-and-stick flashing tape to seal the sides of the opening to the WRB covering the wall (F).

Door

Before installing the new fiberglass entry door, I tacked a length of beveled siding to the subsill to create positive drainage, then flashed the bottom of the opening with FlexWrap NF. I sealed the sides of the opening to the Ice & Water Shield WRB with more flashing tape, spread a couple of thick beads of silicone sealant onto the sill and partway up the sides of the rough opening, and installed the door frame.

While the wall was out of plumb, I installed the door perfectly plumb and level so that it would operate properly (I don't believe in "ghost" doors). This resulted in door jambs that projected out from the wall, instead of being flush with the sheathing. This wasn't an issue on the inside, since the door opened into unfinished attic space, but on the exterior, it meant a couple of extra steps to case the door.

First, I flashed the sides of the jambs to the WRB with L-shaped lengths of Vycor Plus flashing tape. Then I added PVC rippings to the edge of the jambs with a 1/4-inch reveal, giving the jambs a little more depth and helping to support the head casing after it was installed.

I prefabricated the casing from a sheet of 3/4-inch PVC, using pocket screws to join the sides to the head casing, which I ripped to width to fit snugly against the balcony ceiling. Then, after fastening

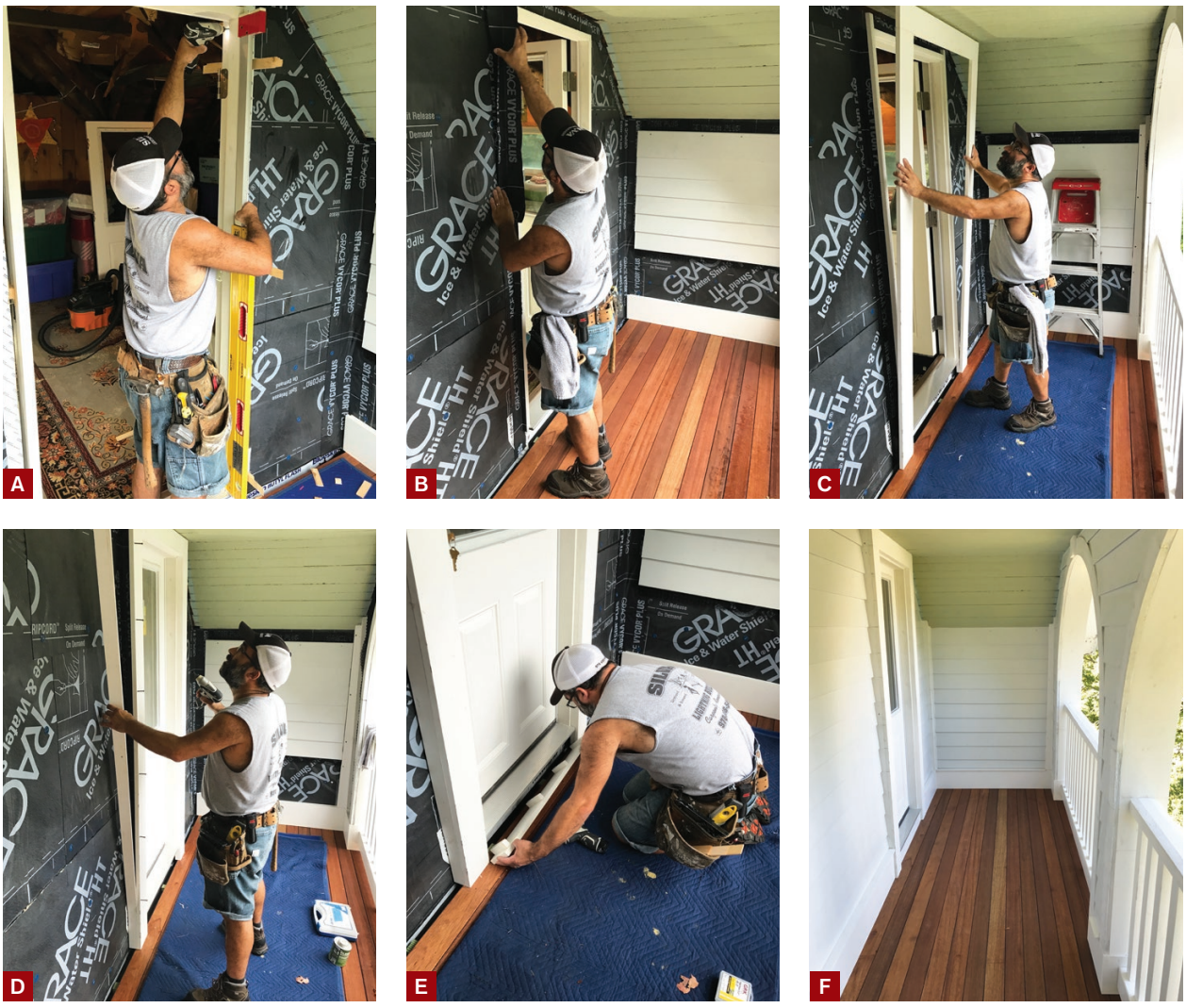

Figure 4. The author installed the door frame to be perfectly plumb, but the wall was out of plumb, so the jambs projected out from the sheathing (A). To match the plumb door to the out-of-plumb wall, the author taped the jambs to the WRB (B) and added extensions before casing the door with PVC trim (C). Tapered PVC rippings were then used to fill the gap between the casing and the wall (D), while blocking was used to pad out the trim under the sill (E). New railings fabricated from PVC replaced the glass panels in the balcony's arched openings (F).

the casing "kit" to the jambs with Cortex screws that I later capped with plugs, I filled the gap between the wall and the sides of the casing with tapered rippings. Underneath the door sill, I added blocks to the bottom casing to bring it in plane with the rest of the trim (**Figure 4**).

Finishing Up

Once I had trimmed the new door with PVC, it was time to re-install as much of the old trim around the arched openings as I could. With a little help, I was able to bend wide rippings of 1/2-inch PVC, sized to fit, into the insides of the arches. Then I re-installed the curved interior and exterior casings. After installing a water table detail at the bottom of the walls, I used 8 1/4-inch-wide fiber-cement siding with a 7-inch exposure to match the look of the home's existing wide aluminum beveled siding.

I fabricated railings and balusters from PVC stock that I glued up and milled to match the balustrades on the house's lower porch. These railings are 36 inches high to meet the requirements of the local building inspector. ❖

Emanuel Silva, a JLC *contributing editor, owns SilvaLightning Builders in North Andover, Mass. Contact him at silvalightningbuilders@gmail.com.*