Sealing the Foundation To the Framing

BY MATT RISINGER

Air-sealing during framing is increasingly a fact of life on residential jobsites. From a performance perspective, it can be done most effectively from the outside **(1)**, but sealing on the inside with less-expensive materials **(2)** is still a good option compared with conventional sill sealer—which is not an effective solution.

Photos by Matt Risinger

When it comes to air-sealing, one of the areas that we rarely see done well is the joint between the foundation and the framing. Most houses in America get foam sill seal laid on top of the foundation. This plastic foam product primarily works as a capillary break between the concrete and the framing. As the weight of the framing crushes the foam slightly, it also (sort of) works as an air-seal, but it is not a perfect seal by any measure, because the top of the concrete is never perfectly smooth.

Beyond ordinary sill sealer, we have taken several approaches to improving air-sealing at this critical juncture.

GOOD INTERIOR OPTIONS

If you're working from the inside, the easiest and least-expensive method is to simply lay a fat bead of caulk in the gap created by the foam sill seal between the foundation and the framing. Anyone can do this on any house under construction. I recommend using an exterior silicone formulation for concrete **(2)** or a high-quality polyurethane sealant. Both will stick well to the wood and the concrete. Acoustical sealant is a better, albeit slightly more expensive, option. Caulk often works best at a slab-wall transition **(3)**.

An even better, but also more expensive, option is to use a high-quality air-sealing tape. Siga makes Wigluv tape **(4)**, which sticks well to concrete. When you are applying it to the protected inside, you don't necessarily need to use primer.

BETTER EXTERIOR OPTIONS

While sealing from the inside will work, sealing from the outside is the better way to go. This way, you are blocking the air before it has a chance to find another path to the inside through the wall cavity. But it is also a little more expensive to do it from the outside.

I've found two tape options that work well here: One is Cosella-Dorken's Multi-Band **(5)**. This tape in the Delta line comes in two widths—60mm (2.36 inches) and 100mm (3.94 inches)—and I have used it frequently with many Delta waterproofing products. Outside, where we have more exposure to the elements, and therefore more intense changes in temperature and humidity, we need to use a primer. With Multi-Band, I use the Delta HF primer. I run a couple of courses of tape to protect the foundation so I'm only coating the first 2 inches of concrete with primer, and I also run the primer up onto the framing. The primer is an adhesive, so you get sticky on sticky when you apply the Multi-Band tape, and it will stick tenaciously.

Caulk works best where walls sit on a foundation slab **(3)**, whereas a high-quality tape, such as Siga's Wigluv, makes an effective seal across a vertical or stepped surface **(4)**. But the most effective place to air-seal is along the outside, blocking the air before it enters the wall cavity, where it can find many pathways to the inside. For this, the author has used Cosella-Dorken's Multi-Band **(5)** or Siga's Fentrim F **(6)**, after applying a primer on the concrete.

Another option for sealing from the outside is Siga's Fentrim F **(6)**. This is a new product that Siga claims will stick even better than its Wigluv tape. I have found the bond to be impressive, but I still want to use a primer outside. The wider Fentrim F tapes (6-, 9- and 12-inch widths) have a split back so you can peel off half to stick it to the concrete and then roll it up onto the framing.

BEST PRACTICE

While using a primer makes for a strong bond on both the concrete and the framing, there are always issues with bonding to concrete. Form oils, wax, concrete additives, and especially moisture can affect the bond, and I always feel reserved about the long-term viability of the adhesive bond. With this in mind, I have begun experimenting with some of the newer fluid-applied air barriers. Recently, we used Prosoco's R-Guard Joint & Seam Filler, which is a moisture-curing compound, so it bonds directly to damp or dry surfaces (with no primer needed) and cures under a variety of weather conditions and even on green concrete. Low temperatures and dry conditions will slow down the drying time, and high temperatures and high humidity or wet conditions will accelerate curing. But the bond will only improve over time, which appeals to me. Another option is PolyWall's Blue Barrier Joint Filler 2200 (see photo 1, page 19). This is a bit thicker than the Prosoco and fills gaps up to ¾ inch.

The fluid-applied options form a "rubber barrier" at the base of the home, doing an excellent job to stop air flow. They also protect the vulnerable bottom edge of the wood sheathing against splash-back and give you something to shingle your weather barrier over later.

Matt Risinger owns Risinger & Co., in Austin, Texas. He is a frequent contributor to JLC *and jlconline.com, where you can find his companion video to learn more about using fluid-applied flashing.*

Shop-Built Panel Doors

BY GARY STRIEGLER

We often hear back from previous clients when they have new projects. In this case, we had originally built the client's house with a wide opening between the kitchen and the living room that was almost 2 feet deep and finished with flat panels. But now my client was looking for a way to occasionally close off the opening, in a way that would match the original woodwork we'd done.

The opening was just under 8 feet tall and more than 8 feet wide. We have built pairs of doors that large in the past, but there just wasn't enough room for doors that wide to fold back against the wall when open (which would probably be most of the time). My solution was to build four door panels that would fill the opening. The two outside panels would be stationary, and the two middle door panels would swing in and store against the fixed panels when they were open.

For projects such as this one, I begin by doing the layout on a story pole **(1)**. I first did a layout across the width of the finished opening to figure out how wide each door panel should be. We started with four identical panels, but we've found that it is better if the two fixed panels are slightly wider than the operable ones, so we cut back the operable panels at the time of installation. From the story pole, I also calculated the width for the door stiles, as well as the lengths of the rails. Then I did a vertical layout so the doors would match the paneled jambs.

BUILDING DOORS IN LAYERS

I choose poplar for most doors that I make; it stains well if you select lighter colored wood, and it paints perfectly. I select the flattest boards for the door stiles, and then I assemble the frames so that any bowed boards will counteract each other when I glue the frames back to back. I also cut all the parts longer and a little wider at first. Sometimes a straight, wide board will develop a bowed edge when you rip it, so I always leave enough extra width to straighten it on the joiner if needed.

I assemble the frames with pocket screws, but no matter what system you use, it's important to have clean, square edges on all the parts. To create those edges, we stand the parts on edge and run them through a planer in pairs. I also run all the material through a drum sander before it is cut to final length. When I cut the rails, I make sure that all the end cuts are clean and

A story pole creates a full-scale layout for building the doors **(1)**. After milling and cutting the parts, the crew assembles the frames in pairs. They roll glue on the frames **(2)**, clamp the assembly at the corners, and place it on a flat surface **(3)**. They add more clamps and wipe off excess glue with a damp cloth **(4)**.

Photos by John Lovelace

square. I also try to be precise with the layout cutting so that the frames line up perfectly when they are glued back to back. When all the pieces are ready, I screw the frames together. With four door panels, there were eight frames in all.

GLUE THE FRAMES TOGETHER

For interior doors such as these, I apply a generous coat of yellow glue with a roller to both frame surfaces **(2)** and then place one frame on top of the other. I use K-body clamps because they spread the clamping pressure across a wide area and I don't have to use pad strips to protect the wood. After we've mated the two frames, one clamp on each corner is enough to keep the frames aligned while we transfer the assembly to a flat surface. Any door you build will be only as flat as the surface you use for the glue-up, so I set the assembly on the floor of my shop **(3)**.

Once the frames are on the floor, I clamp them together every 6 inches or so. After the last clamp is tightened, we wipe off all the glue that has squeezed out with a damp rag **(4)**. That saves a lot of time scraping later. I leave the clamps on for a couple of hours; if the shop is cold, I wait twice that long.

After removing all the clamps, I use a flush-trim router bit to true up any spots where the frames didn't line up perfectly **(5)**, and we clean up any glue we may have missed.

As a final step before adding the trim, I go over the joints on each side of the door with a random orbital sander. If I've done a careful job building the frames, the joints need only a minor touch-up.

ADDING THE PANEL AND TRIM

To match the doors to the paneled jambs, I used the same trim profile to hold the flat panel and glass in place. The panel molding that I needed to use to match the original jambs was almost 3/4 inch thick along the outside edge. So to make room for the 1/2-inch plywood panel and to make the panel molding work more like a bolection molding, I rabbeted its edge.

The total thickness of the door was 1 1/2 inches, so when I subtracted the panel thickness, the rabbets on each side of the door had to be 1/2 inch deep to hold the panel in the center of the door. That seemed like a lot of material to remove safely with a router bit, so I made the rabbets with two passes on a table saw, always using a push stick to finish up each cut.

I've always found it easier to start with the panel in place and then apply the trim to it. So I tacked on 1/2-inch-thick spacers flush with one side of the opening to hold the panel temporarily. After flipping the door over, I dropped the plywood panel in place on top of the spacers **(6)**.

After the glue sets, a router with a flush-trim bit trues up the surfaces **(5)**. The author tacks temporary blocks to hold the panel in the center of the opening **(6)** and attaches rabbeted panel molding to hold the panel in place **(7)**. After pinning molding to the other side of the panel, he attaches the same molding to one side to hold the glass **(8)**. To make up for the thickness difference, he attaches a thin strip to the back of the glass molding **(9)**.

Cutting the lengths of trim is a lot easier if you have a miter-saw stand with a very accurate stop (see "Two Essential Stands for Finish Carpentry," Feb/17). My setup lets me cut multiple pieces to the exact same length without measuring.

The edge of the molding that sat on the face of the door was thin, so I made the lengths of the trim pieces fairly tight and attached them with headless pins **(7)**. Then I nailed the inside edge of the molding to the panel with shorter headless pins. After flipping the door over, I removed the temporary blocks and cut the molding pieces for that side.

I used the same modified panel molding on the top section of each door to hold the glass. I installed the trim on one side and painted it before installing the glass (for this job, the glass didn't go in until after the doors were installed). Again I cut the molding as tight to the opening as possible and glued the joints carefully **(8)**.

The top panel required one extra step. Because the glass was only 1/4 inch thick, I added a 1/4-inch-thick filler to the molding on one side to make up the difference **(9)**. Instead of trying to make the molding flush with the filler, I left a 1/16-inch reveal to step the molding in from the edge of the opening.

INSTALLING THE DOORS

At that point, the stiles and rails were still slightly wider than I needed. First, we scribed the stationary panels to the opening, keeping them tight to its top and sides. I made all the top and bottom cuts on the doors with a track saw and used a power planer for the sides. The operable panels hinge off of the stationary panels, so after painting the bottom, top, and blind side of the stationary panels, I mortised for the hinges, using a router template **(10)**. I attached the stationary panels to the paneled jamb along the side and at the top free corner with long finish-head screws **(11)**, leaving the bottom inside corners free for the moment.

Next, I scribed the operable panels to the opening, taking care to leave a perfect reveal between the two panels. To put the operable panels perfectly in plane when closed, I simply pressed lightly on the free bottom corner of the stationary panel until the edges aligned perfectly **(12)**. Then another finish-head screw anchored the free corner in the adjusted position **(13)**.

The rest was easy. I set the glazing in place and installed the final pieces of molding. After everything was painted, we installed the hardware, and these easy-to-build doors perfectly matched the paneled opening, looking like they had always been there.

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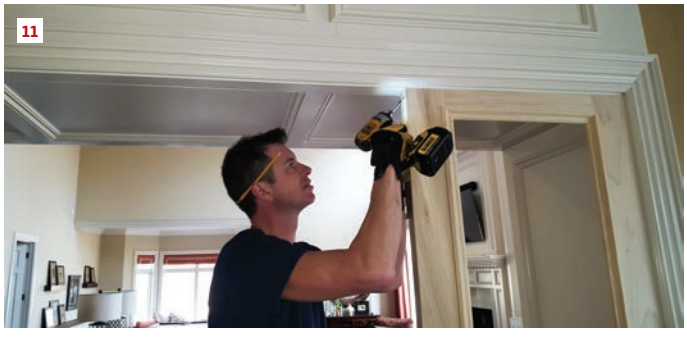

After scribing the stationary panels to fit, the author routs the hinges for the operable panels **(10)**. The stationary panels screw to the jamb and to the top free corner **(11)**. He scribes and mounts the operable panels and aligns their free edges by pushing lightly at the bottom of the stationary panel **(12)**. When they line up, the bottom free edges are anchored in their adjusted positions **(13)**.