Replacing an Oak Sill

Doing the job on a formal entry without tearing out jambs and trim

by Stephen Sewall

When I undertook the task of repairing the front entry of a Colonial Revival house in Portland, Maine, with its large 3½-ft. by 8-ft. door and side lights, I knew that the most difficult part would be replacing the rotted oak sill. It had suffered the neglect that many do, eventually checking and rotting from exposure to the weather because it hadn't been given periodic coats of sealant. The other repairs—which included replacing the raised panel in the door, replacing the pilaster bases, repairing the side lights and making some crown molding to replace part of the portico trim—were reasonably straightforward, but the sill presented some problems.

It seemed impractical to remove the entire jamb, replace the 7-ft. long sill and then reinstall it as the original (drawing, facing page) had been. Removing the jamb would require dismantling much of the trim inside and out, so it would be a big, labor-intensive job; Also, disturbing the entry that much could make refitting the door and side lights more difficult. Finally, I decided it would be best to replace the sill while leaving the jambs—both the inner jambs and the outer jambs at the side lights—intact.

Before the old sill could be removed, though, the door and the side lights had to be taken out. The side lights were held in place by stops on four sides. Since all of the trim was in good shape and I wanted to use it over, I was very careful to pry the stops out without damaging them.

The best tool I have found for removing any sort of wood trim is the Hyde #45600 Pry Bar-Nail Puller-Scraper. It has a thin blade that you can insert under almost any piece of trim without damaging either the molding or the surface to which it's attached. The thin end can also be sharpened so that you can cut small wire finish nails by hitting the other end of the bar with a hammer. The curved end of the pry bar can be used to open the joint up further and to scrape down the crusted paint before you reinstall the trim.

The stops of the side lights were inside mitered like most window trim, and because the side stops went in after the top and bottom, they had to be removed first. It's best to start prying at the middle, because the miters lock the ends in place. On each side light, I had to cut a few of the nails near the ends of the stop with the pry bar.

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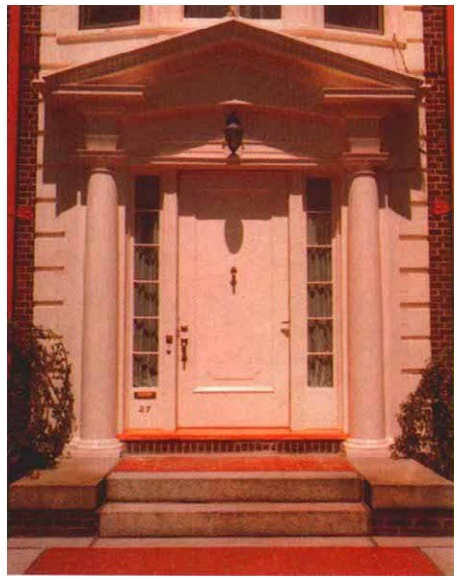


The author installed a new sill in this Colonial Revival entryway before going on to replace the raised panel in the door and repair the side lights and part of the portico trim.

As soon as the stops were removed, I marked their back sides so I'd be able to put them back where they belong. I pulled the remaining nails through from the back so I wouldn't disturb the finish side of the wood. The tools I have found most useful for this are a pair of end snips or end pliers. They shouldn't be too sharp or they will cut the nail instead of pulling it out.

After removing the side lights, I cut plywood panels to fit between the jambs. These would keep the jambs from floating free when I removed the sill. I made the panels short enough so that I'd have room to cut out the old sill underneath them (photo facing page). I attached the panels to the inner and outer jambs with drywall screws.

With the door and side lights removed and the jambs locked in place, I was ready to cut out the sill. I used a Sawzall with a 6-in. blade to make cuts through the sill on either side of both inner jambs, and as close to them as possible (drawing, facing page). I made two more cuts 3 in. from each end of the sill, being careful not to hit the nails coming from the outer jambs into the end grain of the sill. .This let me remove three large chunks of sill, leaving only the four pieces directly under the jambs.

I split out the remaining sections piece by piece with a 2-in. chisel. With all of the wood removed, I was left with 20d nails protruding from the end of the jambs. To get rid of these, I used a metalcutting blade in the Sawzall where I could, and a hand-held hacksaw blade on the less accessible nails.

The old sill had rested on five equally spaced 1-in. strips of wood embedded in mortar and running the width of the sill. I removed them and the mortar so I would be able to slip the new sill under the tenons of the door jambs. I also chipped away the mortar line between the brick and the old sill so that new mortar could be worked in under the outside edge of the new sill once I shimmed it into place.

The new sill—I saved the best section of old sill as a pattern for the new one. After a clean, square cut on the radial-arm saw, I was able to trace a full-size end profile. But even if I could have found a 14½-in. wide piece of 10/4 stock, the replacement sill would have been too hard to make in one piece. The 2-in. raised section under the door meant ¼ in. of stock would have to be removed from the rest of the sill. Making the sill in two sections, one ¼ in. thicker than the other, and splining them together would reduce the work—and the waste.

With the widths of 10/4 oak stock I had available, I made up the sill out of a 6-in. wide piece and an 8½-in. wide piece. The 6-in. section became the part over which the door would sit. This meant that I had only about a 3-in. width over which I'd have to waste ¼ in. of stock. After face-jointing and planing the stock to a net thickness of 2¼ in., I rabbeted out the ¼-in. by 3-in. section on the jointer. (If you haven't got access to a jointer, you could do this on a 10-in. table saw with the blade fully extended.)

The flat, raised section under the door was beveled at 3° to the back of the stock on the table saw. I cut a 45° bevel from the flat under the door to the point at which the finish floor contacts the sill. I used a rabbet plane to cut the small bevel on the other side of the flat.

The 8½-in. wide section needed its front edge ripped at 93° from the face so that it would be plumb when the sill, which would slope slightly toward the outside, was installed. I routed the top front edge with a ball-

bearing rounding-over bit. A ⅛-in. by ⅛-in. drip kerf was cut under the front edge of this piece to keep water from finding its way under the sill.

With all of the bevels cut and the front rounded over, I made the cuts for the splines. I cut a ½-in. slot 1 in. deep on each section of the sill, with the top faces held against the fence of the table saw. I epoxied in a piece of Baltic birch for the spline.

The visible parts of the sill needed to be belt-sanded before the wood could be finished. It's worthwhile to scrape off excess epoxy squeeze-out while you're gluing up because it can dull sanding belts in a hurry once it's dry. I find that most putty knives spread the glue on the surface rather than pick it up. The flexible tip of a small artist's paint knife, available at most art-supply stores, works much better.

To finish the sill, I wanted to use something more durable than spar varnish with an ultraviolet filter. In checking our local marine supply, I found that I had a choice of two two-part polyurethane varnishes that are used on the topsides of boats—Petit Durathane (Petit Paint Co., Inc., Borough of Rockaway, N. J. 07866), and Interlux Polythane Super Gloss (International Paint Co., 2270 Morris Ave., Union, N. J. 07083). It is important to buy the thinner recommended for these products. The first coat needs to be thinned down, because the unthinned varnish is a thick syrup that won't penetrate sufficiently. Be sure to use these products in a well-ventilated area. They smell terrible, and the vapors aren't especially good for your health. I applied three coats.

Installing the new sill—The top of the pilaster bases were in the way of installing the sill, and they also needed to be replaced, so I removed them. The bottom of the pilaster itself was also in the way, but the distance between the pilasters was only ¾ in. less than the finish length of the sill. I used my Japanese *azebiki* saw (it has rip teeth on one side, crosscut teeth on the other) to cut small sections out of the pilasters. Its thin, flexible blade makes a clean cut with a narrow kerf. I set the pieces aside to be epoxied back on once the job was complete and the sill and pilaster bases were in place.

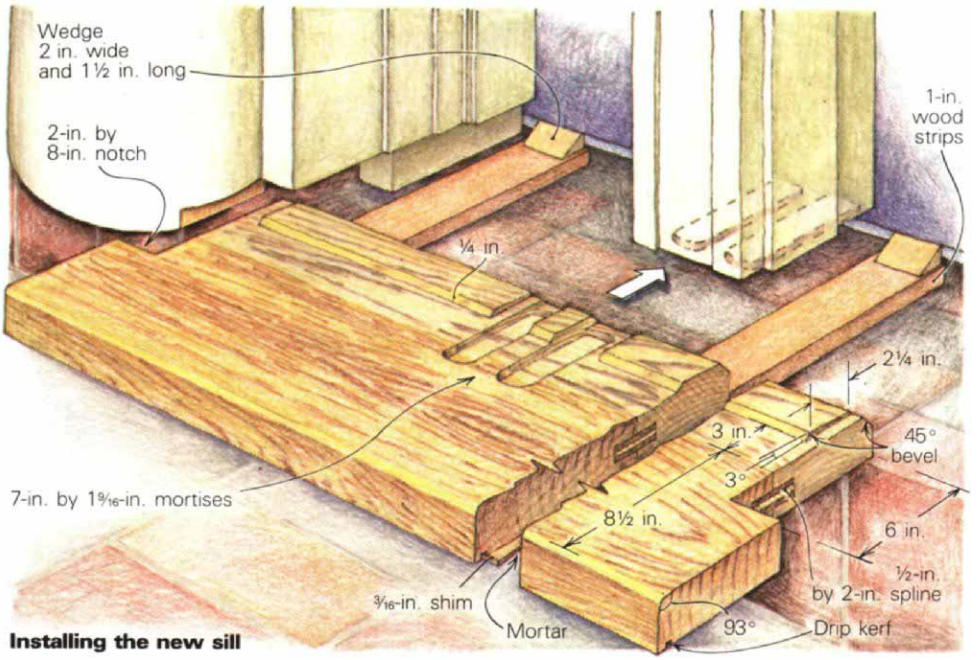
I cut the new sill to length with a skillsaw against a homemade guide clamped onto the sill. To fit around the outer jamb framing, I cut 2-in. by 8-in. notches out of the inside ends of the sill. These were cut partway with the skillsaw and then finished off with a handsaw. With these cuts made, the sill could be slid into place.

My new sill was a little thinner than the old one, and the old mortar had been cleared away, so there was room for the sill to slide in under the tenons of the door jambs. With the sill held up snug against the tenons, I marked the mortise locations on the sill. Before I pulled it back out, I took a rough measurement at the back edge to see how much it would have to come up to be at the correct height to the finish floor. This gave me a di-

Doorway with original sill


To start the job, Sewall removed the doorway's side lights and nailed plywood panels in place, with clearance beneath them to slide in the new sill. Then he removed the original sill, which had been resting on 1-in. strips of wood set in a bed of mortar.

Illustrations: Christopher Clapp



Installing the new sill

The new sill was splined together from two pieces of 10/4 oak, cut to the dimensions and angles shown in the drawing. The double mortises in the sill received the tenons at the bottom of the door jambs (photo left). Once the sill was in place, the pilaster bases were reinstalled (photo right), using shims to close up the joints between the middle and top half-round sections. The slivers that were cut out of the pilaster so that the sill could slide in were later glued back in place.

mension for the wedges needed to lift the back edge snug into place.

I used a router with a ½-in. straight-face bit to make the four mortises in the sill. I cut the mortises freehand, taking successively deeper cuts until the depth was just over ½ in. Each inner jamb had a double tenon. I cut each mortise ⅛ in. wider than the tenons and extended the mortises through the inside edge (drawing, and photo above left). The extra length was necessary because the wedges would start to push the mortise onto the tenon before the sill was all the way back into place. The extra length would be covered up when the inside plinth block was reinstalled.

I made two wedges out of oak to use for the back edge of the sill. They were 2 in. wide and 1½ in. long. I calculated one to be ⅝ in. high and the other ¾ in. These were set on the subfloor under where the sill would rest when it was slid into place. I used a hand plane to put a slight 45° chamfer under the back edge of the sill so it would slide up more easily on the wedges.

On the second dry fit, the sill slid up the wedges and I got a pretty good fit against the jambs, but one of the wedges needed to be changed to get a perfect fit. With the two wedges adjusted for height, I was ready to make three more to support the entire back edge of the sill. I ran a line from the top of the two wedges and took the measurements at the intermediate locations. With all five wedges in place, I tried a final dry fit. This time I used cedar shingles to shim up the front edge, where the mortar would eventually be packed. I needed to shim up the front edge only about ³⁄₁₆ in.—just right for a good mortar joint.

Before installing the sill, I spread epoxy on the tenons and in the mortises. I also ran a bead of butyl caulk underneath all of the shoulders of the jambs, and spread a stiff batch of mortar between the wedges and as high as I could without interfering with the sill's installation. As the sill rode up on the wedges and came tight to the jambs, the excess butyl and epoxy squeezed out and had to be cleaned off. I reinserted my four shims under the front edge, two at each end and two at the door jambs to lock the sill into place.

During all this, the door jambs were held in position sideways by the plywood in the sidelight openings, but they could move in and out slightly in the sill mortises. My next task was to make them plumb so that the front door would close properly. I ran a string on the inside from one outside jamb to the other, then tapped the door jambs into position with a block and hammer. To hold them there, I toe-screwed through them into the sill with 3-in. screws. I also put several toe-screws into the sill at the outside jambs because there was nothing else there to prevent the sill from creeping out, except the cedar shingles and the mortar under the front edge.

I mixed the mortar in a loose batch and worked it under the front edge of the sill. I snapped off the cedar shingles and knocked them in far enough so they would be covered by mortar. With a pointing tool, I worked as much mortar as possible back under the sill. I cleaned up the excess mortar with a stiff brush and water. The butyl caulk was scraped off, and the surface was wiped down with a rag soaked in paint thinner.

Finishing up—The old pilaster bases had been saved for samples so that new ones could be faceplate-turned on the lathe. I used mahogany because it is available in large dimensions and is more resistant to rot than pine. There were three pieces to each base: the square bottom, a half-round middle section and a scotia and half-round on top.

Before I installed the bases, I primed them with oil-base paint. To cushion the wood and to keep the square base from touching the granite below, I covered the base's bottom with butyl caulk and a layer of lead, which was fastened with copper nails.

The top section of the base fit into a rabbet at the bottom of the pilaster, so it could not be slid into place. I caulked the pilaster with butyl and held the upper section in place. With the square section put in place, the middle half round could be slid between the two.

To tighten up the three base sections, I inserted cedar shingles between the bottom two (photo above center). At some points on the circle no shimming was needed, and at others as much as ⅛ in. was needed. I used 8d galvanized finish nails to pin the sections to each other and the pilaster to the base. The cedar shingles were cut off as far in as possible with a utility knife, and the joint was caulked with butyl. Finally I epoxied and nailed back the slivers that had been cut out of the pilasters so the sill could be slipped between them.

I hung the front door as soon as the epoxy glue in the door jambs had hardened and the mortar under the sill had set. The door fit just as it had when I removed it. The side lights, stops and plinth blocks were reinstalled, and the job was done. □