BUILDING PORCHES THAT LAST

by Harold Chapdelaine

During my 20 years in the building business I've replaced a lot of rotted decks and porches. Some of these were less than ten years old; a few were less than seven. Many of the homes in question were otherwise well-built, with solid framing and quality interior trim. But the builders failed to provide two key elements: good watershedding details and air spaces to allow the porch lumber to dry after it got soaked by rain or snow.

The secret to a long-lasting deck or porch lies in keeping water out of the joints between the various layers of lumber and ensuring that those joints can dry out if water does get between them. Here are some simple techniques I use to accomplish this.

Porch Design and Materials

Resistance to water damage starts with the design. To give protection against windblown rain and accumulated snow and ice, I always include as large a step as possible between the decking and the door sill (or the sills of any full-height windows that open onto the deck).

I use only pressure-treated lumber for girders, posts, joists, and decorative aprons. I use select pine for fascia boards, and stock pine moldings. To make sure that the pine lumber will hold paint, I prime all surfaces (front, back, and ends) before installation.

One useful material for building decks and porches is bituminous eaves flashing — the black, rubbery membrane that's designed to protect roof edges against ice dams. This includes products such as Bird's *Ice and Water Barrier* (Bird Roofing, 1077 Pleasant St., Norwood, MA 02062; 800/247-3462) and Grace's *Ice and Water Shield* (W.R. Grace, 62 Whittemore Ave., Cambridge, MA 02140; 617/876-1400). I use it to keep water out of all joints where one piece of lumber is sandwiched flat against another — a common spot for decay to set in (see Figure 1, next page). Unlike tar paper or metal flashing, the membrane seals around any nails that pass through it, forming a tight barrier against unwanted water.

Ledger Details

Porch construction usually starts with the installation of a ledger board against the house (see Figure 2, page 27). Some builders install their ledger boards over wood spacer blocks applied to the siding; others fasten the spacers directly to the sheathing and flash them. I prefer different, more durable methods. My crew and I use one approach for new homes and additions, and another when adding a deck to an existing structure.

New construction. On new work, we fasten the ledger directly to the sheathing, then flash it properly. The installation is tight and clean, though it takes a little more time than using wood spacers.

Before installing any doors and windows that open onto the deck, we apply a strip of eaves flashing membrane to the exterior wall sheathing. The membrane extends from the bottom edge of the sheathing to at least 8 inches above where the top of the deck ledger will be; it also extends past each end of the deck by at least 6 inches. We run it over the subfloor at door openings as well as over the rough sills of any windows, taking care to fold the material up the 5 1/2-inch face of the jack studs. Where necessary, we use small pieces of membrane to seal any joints or slits.

We fasten the ledger using 1/2x4-inch carriage bolts 16 inches on-center extending all the way through the band joist of the house. Centering the bolts in the house's floor joist bays makes the nuts and washers easier to install and to retighten after the treated ledger dries and shrinks.

Next, we fabricate a standard metal flashing, using 6-inch roll stock (copper, zinc, or aluminum, depending on the budget), and making sure that it extends at least 3 3/4-inches up the side of the house. When using more than one piece of flashing, we overlap joints at least 6 inches. The flashing also extends far enough past the ledger to cover the end joists and apron boards.

Before installing the siding, we lap the housewrap or felt 2 or 3 inches over the top of the flashing. It's important not to bunch up the paper on the top of the ledger, as this will trap water. We hold the bottom of the siding back 1/2 inch from the top of the finished deck height.

Retrofits. When adding a deck to an existing house, we use a

To prevent rot, use details that keep water out of the connections and provide air spaces so wet wood can dry

Figure 1. *Doubled framing members (top) are good candidates for rot because water that seeps between them cannot drain. In a typical deck repair, the author covers the new double joist with bituminous eaves flashing membrane to keep the water out (above).*

method that incorporates 3/4-inch carriage bolts and 1-inch-long spacer rings cut from 3-inch PVC pipe.

The first step is to snap a line on the existing siding or skirt board where the top of the ledger will be. We then drill a 1/4-inch-diameter reference hole below the chalk line from the outside, being careful not to hit any wiring or plumbing. We use this reference hole to locate the interior floor joists. We then transfer the layout to the ledger, and the holes where the center of the joist bays will be, making sure they're far enough above the interior sill to allow installation of the nuts and washers on the inside. When installing the ledger over siding, we try to keep the holes roughly in the middle of a course. We drill 3/4-inch holes through the ledger and temporarily tack it in place as a template to drill through the siding, sheathing, and band joist.

Now it's time to cut the PVC rings. If you're installing the apron over bevel siding, you'll have to cut one end of the ring at an angle — usually between 5 and 10 degrees — to compensate for the siding angle. Getting the angle right is important. If the ledger is out of plumb, the ends of all the joists will have to be cut at an angle. When mounting the ledger over a skirt board, cut the PVC spacer square at both ends.

With the holes drilled, we lay the ledger on the ground so that the side that will face the house faces up. Then we run a bead of silicone sealant over the end of each ring and center the rings over each hole on the ledger. We let the silicone cure before attaching the ledger to the house.

Girders, Joists, and Railing Posts

Most of our decks are framed with 2x8 pressure-treated joists cantilevered over a triple 2x10 girder.

The girder's sandwich construction makes it a potential water trap, so we top it with a layer of eaves flashing (see Figure 3, page 28). For high decks, we support the girder on 6x6 posts, but for decks within 24 inches of grade, we lay the girder directly on top of concrete piers. We cut the sonotubes so that there's a level area in the middle equal to the width of the girder, while sloping the sides away to provide drainage (a 1/2-inch

slope is enough). After filling the tubes with concrete, we pull a string across the top to locate the centers, then insert a length of 1/2-inch rebar. The rebar penetrates 3 feet into the pier and about 8 inches into the girder.

We use a double band joist at the ends, covering the joint with eaves membrane, and notching and bolting the 4x4 railing posts as shown in Figure 3, next page.

Decorative Aprons And Fascia Boards

Decorative aprons are another problem area. Most of the trouble I've seen has been with unprimed aprons nailed directly to the deck joists. This looks fine when it's first completed, but it won't stand the test of time.

To encourage air flow behind the apron boards, we first install a 1x8 pressure-treated horizontal spacer. We rip a 15-degree bevel on the top edge of the spacer, and nail it to the deck's band joist, holding it down 3/4 inch from the top of the joist. Next we install the apron — vertical, 5/4x6-inch pressure-treated boards spaced at least 1/4 inch apart. We install the apron boards flush with the top of the band joist. The bevel on the spacer directs water to the gaps between the boards. We finish with a primed 1x6 select pine fascia and stock 3/4-inch scotia molding. As insurance, we cover the top of the apron with eaves flashing.

Decking

Once the aprons, girders, and all double joists have been covered with eaves flashing, it's time to lay decking. The type of decking we use depends on whether we're building an open deck or a roofed porch. For open decks, we use square-edge boards with at least 1/8 inch between them. For covered porches we frame the deck with a 1/4-inch-per-foot slope and install 1x4 tongue-and-groove flooring. While this slope won't drain like a roof, it will prevent standing water. We prime the flooring on all sides with a high-quality, mildew-resistant exterior primer, install it with tight seams, and finish it with at least two coats of a high-quality deck enamel. The finished floor effectively locks out water penetration.

When laying square-edge decking, we carefully adjust the spacing so that the last full piece stops 1/2 inch to 3/4 inch from the flashing. On new construction, we cut a series of 1/2-inch-deep by 1 3/4-inch-wide notches on the underside of this last piece of decking, placing the notches so they fall between the joist bays. These notches provide drainage above the ledger flashing. For retrofit ledgers, the clear space created by the PVC spacer rings ensures free drainage at the ledger.

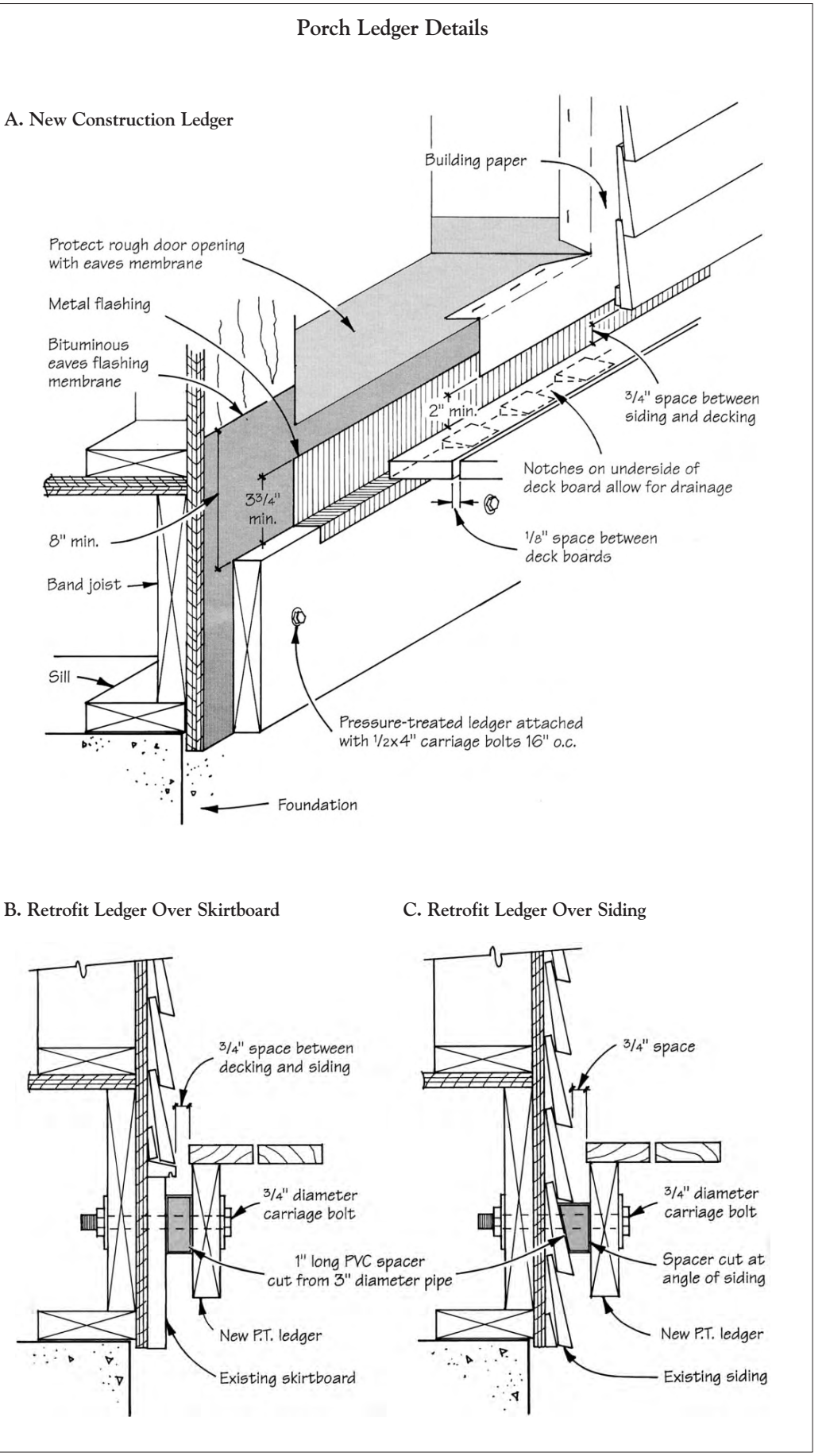

Figure 2. *When adding a porch to new construction (A), the author first installs a protective layer of bituminous eaves flashing over the sheathing. He then attaches the porch ledger several inches below interior floor level, bolting it through the band joist. Site-bent metal flashing, slipped behind the building paper above, covers the top of the ledger.*

For retrofit ledgers, the author uses PVC spacers to create a drainage gap behind the ledger. When installing the spacers over a finish skirt board (B), he cuts them square at both ends; over siding (C), he angles one end of the spacer.

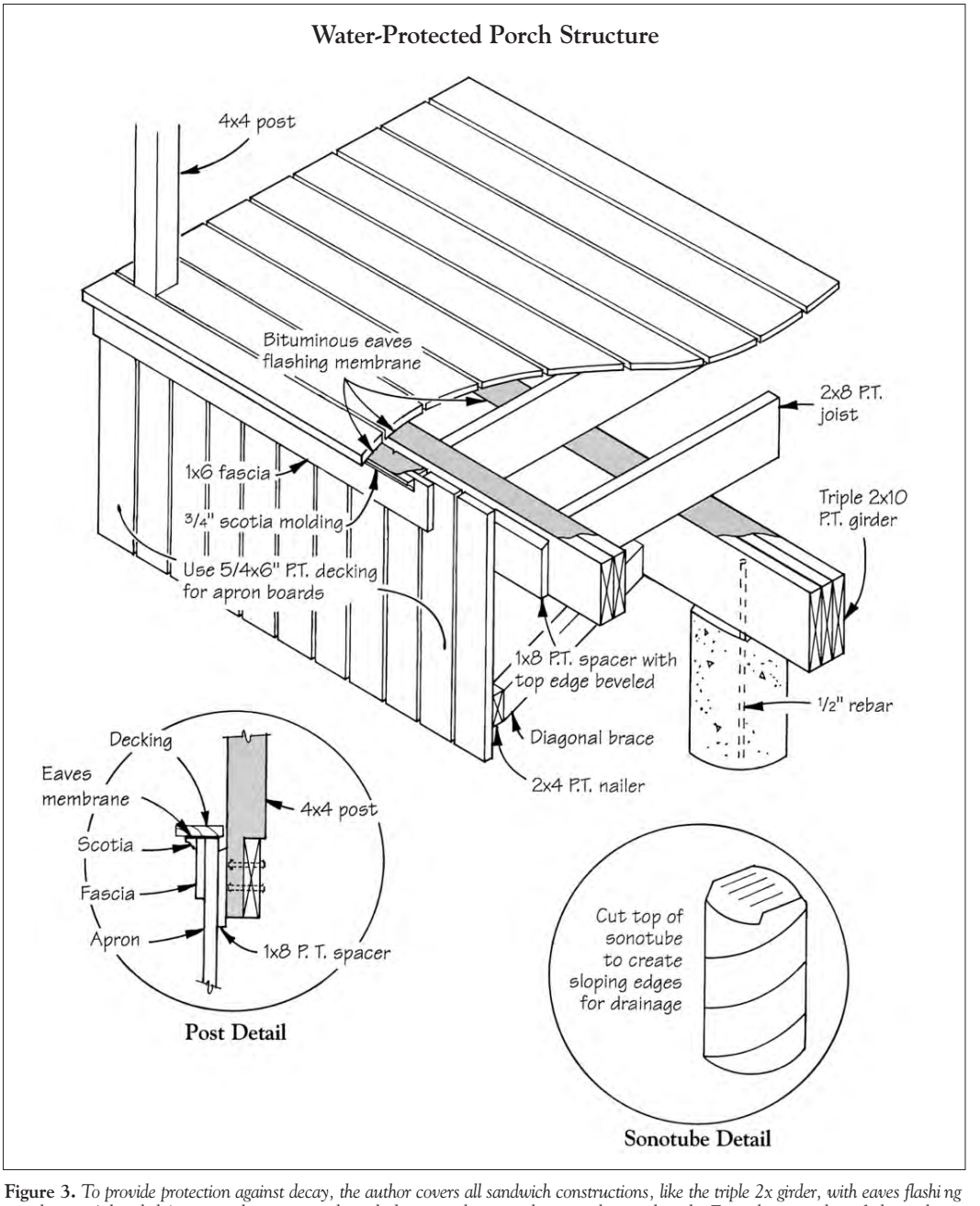

Figure 3. *To provide protection against decay, the author covers all sandwich constructions, like the triple 2x girder, with eaves flashing membrane. A beveled 1x spacer directs water through the spaces between the vertical apron boards. Even the sonotube is fashioned to create a watershedding surface at the top.*

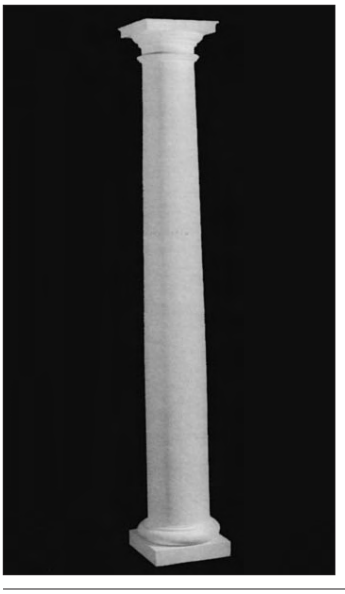

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Figure 4. *Because wood columns often delaminate (above), the author prefers to use fiberglass columns. They're strong, durable, and easier to install (left).*

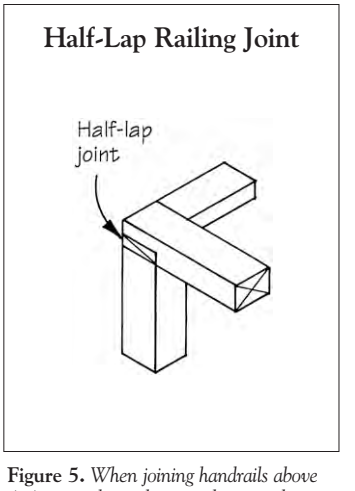

Figure 5. *When joining handrails above 4x4 posts, the author avoids mitered corners, which inevitably open with time. He prefers a half-lap joint, which looks neater and will remain tight.*

Fiberglass Columns

For some jobs we use columns to support a porch roof, as opposed to 4x4 wood railing posts. Over the years we have switched from factory-milled wood columns to structural fiberglass. Costs for clear lumber seem to rise weekly, and the expense of repainting every couple of years can eventually match the price of the columns. We have also been seeing a lot of quality problems with wood columns, including deterioration of the pine bases (no matter what we do to seal and paint them), constant bleeding of pitch in the lumber, and occasional delamination of the vertical seams (see Figure 4).

The two fiberglass column suppliers I'm familiar with are Chadsworth (P.O. Box 53268, Atlanta, GA 30355; 800/394-5177) and Marbleine (7800 Belfort Parkway, Jacksonville, FL 32256; 904/281-9710). Both are easier to install than wood. They require no special tools; the fiberglass cuts cleanly with a fine-tooth saber saw, hacksaw, or handsaw and grinds and smooths with a rasp, belt sander, or disc grinder. Small dents and nicks can be repaired with two-part epoxy. Wood railings are also simple to fasten to the columns. We just scribe the railing to the contour of the column, predrill the screw holes, and fasten with self-tapping, stainless-steel screws.

Fiberglass columns are extremely strong; some are rated for loads as high as 18,000 pounds. They weigh about one third as much as comparable wood columns, come in a wide variety of sizes and styles, and cost about the same as wood columns.

Railings

Most of our projects don't have fancy railing details. Most decks have 2x4 railings, sometimes with a profile routed along the edge. A lot of builders miter their 2x4 railings directly over the posts. Over time, the resulting joint is almost guaranteed to absorb water and open up. A neater way is to join them with a half-lap, as shown in Figure 5. This joint will absorb water too, but it will remain closed.

Selling Quality

Details like these do raise the cost of a project. But when I explain the consequences of doing otherwise, I've found that most clients will pay the price. If they're in doubt, I just show them the repair bills for rotten decks I've replaced. When they see that the repairs often cost more than the deck I'm proposing to build, they're usually persuaded. ■

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