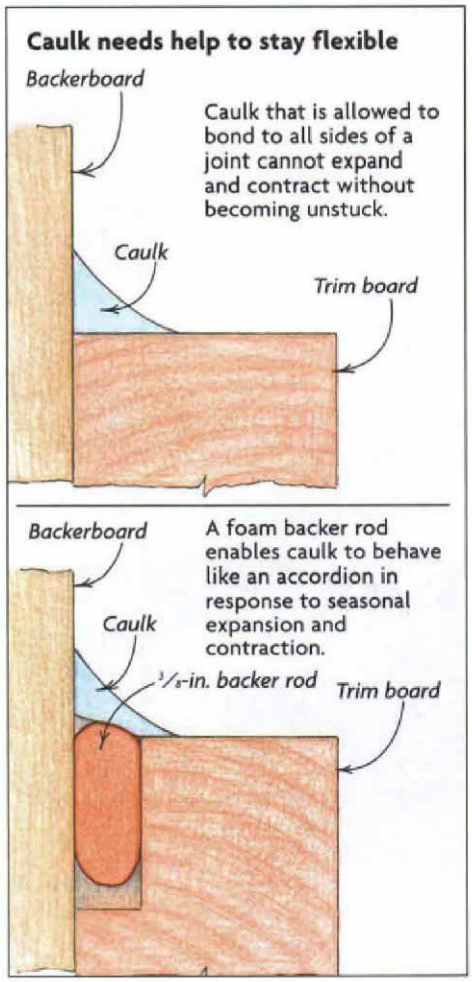
Exterior-Trim Details That Last

Flexible caulk joints combined with a drainage path for moisture keep vulnerable trim elements rot-free

BY JOHN MICHAEL DAVIS



Drainage mat gives moisture a way out. Because even the best caulk joint can fail, a ⅜-in. thick drainage mat is applied between this porch post and its base trim. Any moisture that gets past the caulk is able to run out beneath the front baseboard, which is left uncaulked.

The old saying "It's better to be lucky than smart" certainly applies to New Orleans, Louisiana. Considering the rot-acceleration chamber that passes for a climate here, it's remarkable that New Orleans has more 19th-century houses than any other city in the country. Although it's tempting to credit the skill of old-time carpenters who built things to last, the only reason all these houses are still standing is luck. When the first Europeans arrived, almost every acre of land in New Orleans was concealed beneath a massive canopy of old-growth cypress trees. Clearing the land for development released a seemingly unlimited supply of one of the heartiest building materials on the planet.

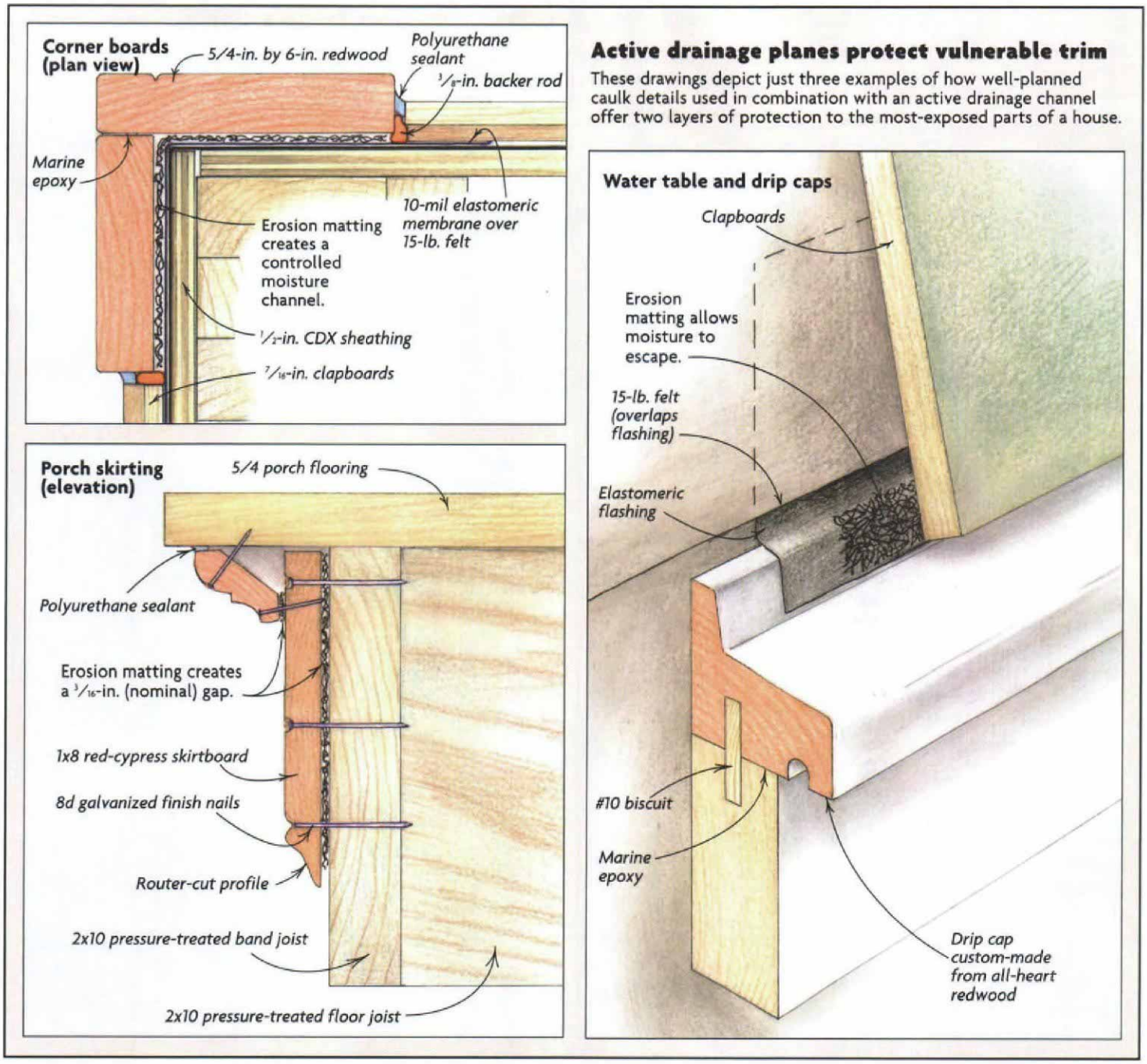
The old-timers didn't worry about back-priming, drainage planes or caulking. They just nailed together two pieces of wood and walked away; no fungus was going to take a bite out of a 2,000-year-old chunk of cypress. Do that with the fast-growth sapwood we have to work with today, and you can be sure the forces of decay will start moving in before the extension cords are rolled up.

Caulk is the first line of defense

Among all the places where rot can secure a foothold in exterior woodwork, caulked joints are probably the most vulnerable. Seasonal changes in temperature and humidity cause wooden trim elements to expand and contract. Unless caulk has the flexibility to accommodate this movement, sooner or later, the bead will crack, and water will seep in. From that point on, the caulk actually does more harm than good because it allows water to soak into the wood while it restricts air circulation that would promote drying.

My approach to protecting vulnerable exterior trim is twofold: First, I try to create a caulk joint that can weather many seasons of expansion and contraction. I've been around long enough to know that even the best

Drawings: Christopher Clapp



caulk joint will eventually fail, however, so as often as possible, I also build a path for moisture to escape when that happens.

Backer rod gives caulk the freedom to move

There are two ways to create a caulk joint that can handle expansion and contraction: Either reduce the amount of movement, or increase the ability of caulk to move. I do both. Certain species of wood, such as pressure-treated southern yellow pine, are inherently unstable, so I try not to use them when given a choice. For exterior trim, I prefer to use the highest-quality kiln-dried lumber I can find; in my area, that's either mahogany, Spanish cedar or all-heart redwood. I also fully prime every piece of trim, and I assemble permanent (crackproof) miter joints using biscuits and marine epoxy (Gougeon Bros. Inc.; 989-684-7286).

I increase the ability of the caulk to move with the wood by applying high-quality polyurethane caulk (sidebar p. 65) on top of a backer rod to create a two-sided caulk joint. (Caulk doesn't adhere to the foam backer rod.) The biggest mistake most amateur caulkers make is to fill the joint completely where two pieces of wood meet. This procedure not only wastes caulk, but it also creates a three-sided joint that's prone to failure: The caulk adhering to the bottom as well as to both sides of the joint is left little room for movement. A two-sided joint—one in which the caulk bonds to the sides but not the bottom of the joint—allows the caulk to expand and contract like an accordion. (For more on caulks and sealants, see *FHB* #61, pp. 36-42.)

In principle, creating a two-sided caulk joint is simple enough: Just cover the bottom of the joint with a bond breaker, any material that will prevent the caulk from bonding. If a joint is shallow and cannot be enlarged, special Fine Line tapes are used as bond

breakers, but these tapes can be difficult to work with. An easier, better approach is to enlarge the joint to make space for a foam backer rod.

Wherever there's a place that two pieces of exterior trim must fit together tightly, my standard operating procedure is to cut a 3/16-in. wide by 1/2-in. deep rabbet into the inside edges of the trim pieces (drawing p. 60). After the trim is assembled, I compress a 3/8-in. dia. poly foam backer rod into the bottom of the joint. This 3/8-in. backer rod leaves enough space on top for a 3/16-in. wide by 1/8-in. deep bead of caulk.

Erosion mat gives moisture an out

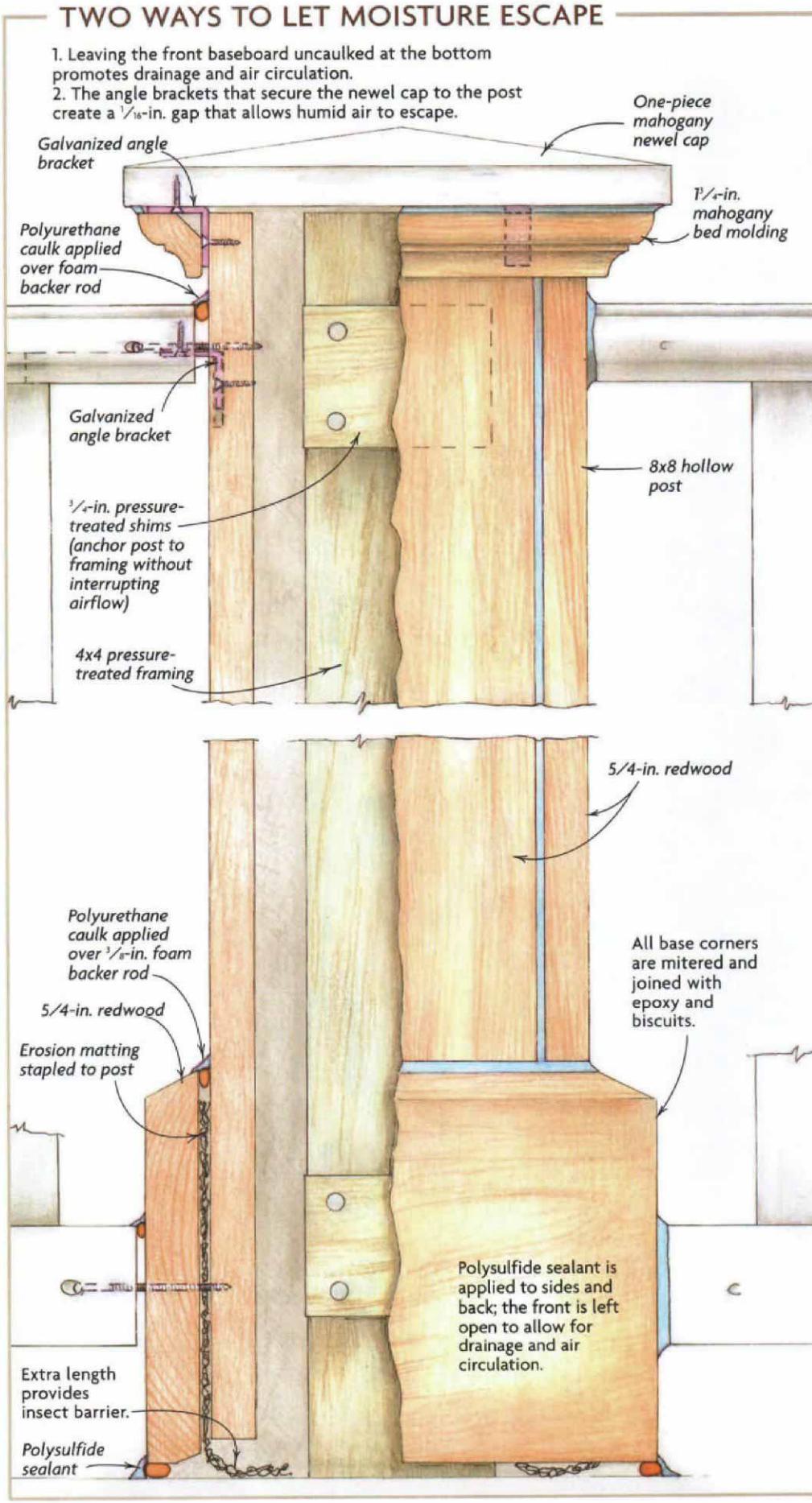
Unfortunately, the best caulking job doesn't come with a lifetime guarantee. No matter how conscientious I am, at some point in time, somewhere along the joint, I know the caulk is going to fail. Failure could be caused by a minor installation flaw such as a drop of sweat on the wood or an undetected bubble in the bead. If I'm lucky, the joint will last the life of the sealant (20 years tops). But at that point, no one else is going to lavish the same attention on the work as I did. So to ensure long-term survival of exterior trim dependent on caulk for survival, I build in a means for moisture to escape.

An escape route for moisture could be something as simple as a couple of circular louvers near the top and bottom of a hollow column to promote air circulation. On the other hand, a fully exposed trim element such as a corner board, drip cap or porch skirting (drawing p. 61) that has nothing but caulk to protect its innards from wind-driven rain or splash-back requires an active drainage plane.

Not long ago, I had to repair built-up posts that supported a railing on an uncovered second-story porch. In this case, most of the rot damage occurred when water seepage became trapped between the applied baseboards and the bottom of the post carcase. To prevent the same type of damage from happening in the future, I created a simple drainage plane to give moisture a way out (drawing right).

Any type of rot-resistant shim stock can be used to create a drainage plane, but the best material I've found is Enkamat #7010, a 1/4-in. thick mat of entangled nylon filaments that is manufactured for use as an erosion matting (sidebar p. 65). After cutting the mat to size with a utility knife, I wrapped it tightly around the post and then fastened it with staples.

To allow for the mat's thickness, I added 3/8 in. to the length of each baseboard. After



Creating the perfect caulk joint

Before I apply any caulk, I make sure all the wood surfaces are fully primed; if some of the woodwork in the photos looks unprimed, it's because my favorite primer (Primkote #8006-1) is a two-part epoxy that goes on clear (Abatron; 800-445-1754). Wherever I've installed backer rod, I use my finger as a gauge to make sure the rods are deep enough to allow a minimum sealant depth of ⅛ in.

A professional-grade caulking gun is a must for applying the thick polyurethane sealants (photo 4, right); I've never given much thought to whether it's better to push or pull the gun while applying the caulk, however, because to me the gun is simply a delivery device. I tool every bead of sealant I apply, and my favorite tools are my thumb and forefinger. (They're just always there; what can I say?)

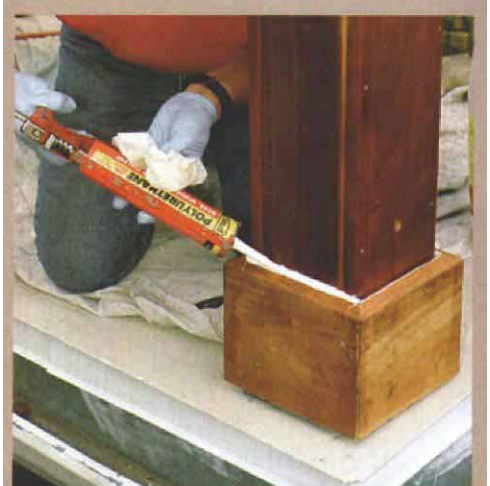
Polyurethane has to be cleaned up with mineral spirits, and over the years, I've developed chemical sensitivity to prolonged exposure, so I wear 4-mil disposable nitrile gloves (W. W. Grainger; 800-323-0620) almost all the time. It's not always easy to get crisp drags with gloves on, so when the appearance of the joint is crucial, I will use a bare finger if nothing else works, but I prefer to use a tool.

I think I've tried every tool specifically designed for dragging caulk, and I've never had much luck with any of them. What works best for me is a 3-in. artist's palette knife (photo 1, top right). Looking like a miniature bricklayer's trowel, a palette knife (Charette; 800-367-3729) has a long, thin, tapered blade with a rounded tip that's flexible enough to offer precise control. The blade is also polished and slick enough to get a really smooth drag, especially if it's regularly wiped off and lubricated with solvent.
—J. M. D.


1. Palette knife tools visible joints.


2. Mineral spirits remove excess caulk.


3. Backer rod allows caulk to flex.


4. Polyurethane is the first line of defense.

cutting all the baseboards to length, I preassembled three sides of the box before slipping it around the post. While applying slight pressure on the corners to compress the mat, I checked the reveals by sight before I tacked the baseboards using an air nailer (photo p. 60).

After the final side of the baseboard was glued and tacked in place, I filled the gap around the top with ⅜-in. backer rod. The best tool I've found for forcing backer rod into a tight gap is a window-screen spline roller (photo 3, left). Because this tool has different-size wheels on each end, I choose the end that fits the situation best and simply roll the rope in with one hand while stretching it slightly with my other hand. Using a finger as a gauge, I roll back and forth over the backer rod until the top is at least ⅛ in. below the top of the baseboard. Then I cover the backer rod with a 3/16-in. bead of polyurethane caulk (photo 4, left).

Hardware creates breathing room

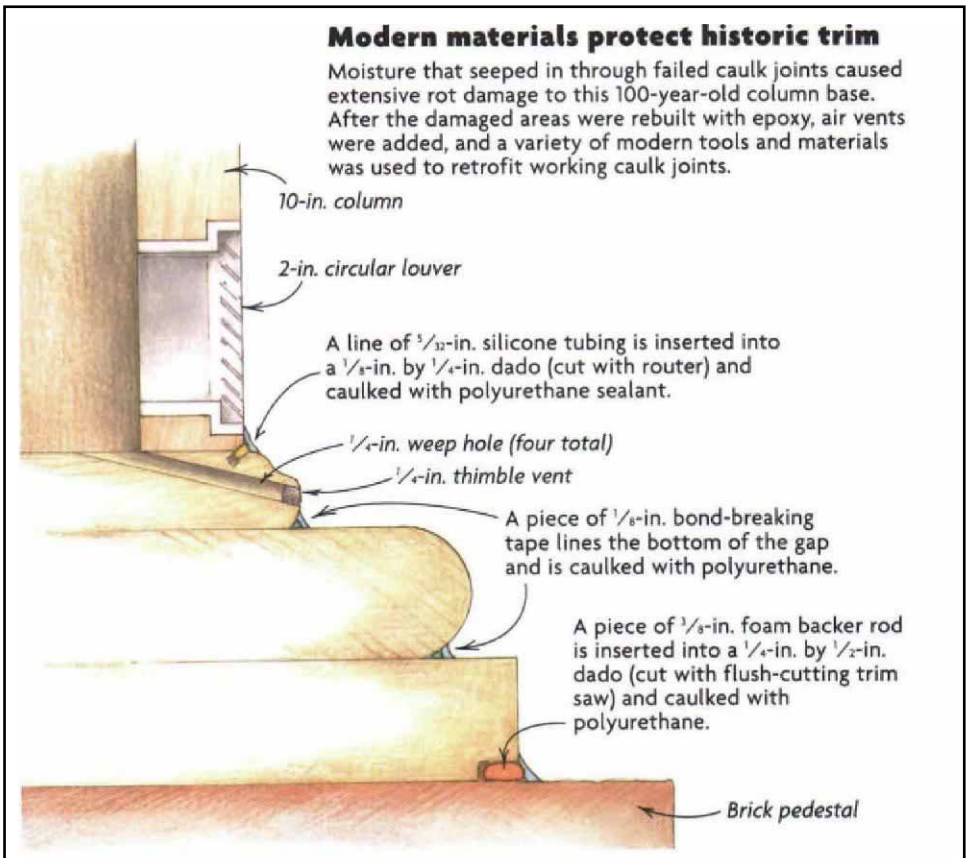
Other weak points on the built-up post are the post-cap assembly and the joint where the railings meet the post. If the railing I'm installing is thick enough, I'll make space for ⅜-in. backer rod by rabbeting the edge the same way I described earlier. If I'm installing a narrow railing, like the one on this job, however, I cut the railing ¼ in. short and mount it on top of a galvanized angle bracket (drawing facing page).

Those handy angle brackets also make it easy to create a breathing space while mounting the post cap. Using a scrap of cardboard as a temporary shim between the top of the post and the cap, I installed two 1-in. angle brackets on each side to anchor the post to the cap; then I removed the shim and covered the brackets with a bed molding. I caulked the joint where the molding met the cap but left the bottom of the molding uncaulked to promote air circulation.

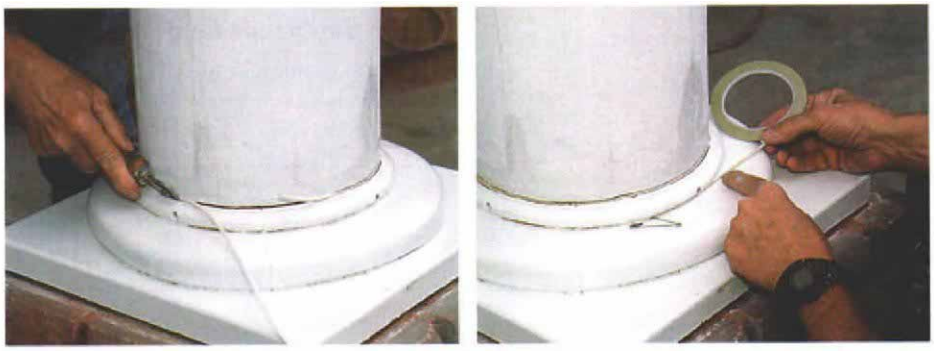
Older trim needs help, too

Although modern lumber is more susceptible to rot, even old-growth cypress can deteriorate after years of neglect. When I have to repair localized rot damage on significant structures such as windowsills or porch columns, I try to rebuild the missing or damaged sections in place using epoxy (see *FHB* #107, pp. 60-65). Wherever a failed caulk joint was the source of moisture, I retrofit the structure with working caulk joints. I also try to install air vents and weep holes that could help to promote drying (drawing p. 64).

Recently, I used these strategies to create working caulk joints on the base of a 10-in.



Retrofitting for backer rod. A corner-grooving tool carves a 1/8-in. dado into the joint where the column shaft meets the upper torus of the base (photo left). Custom-mounted on a Plexiglas base, a flush-cutting saw cuts a rabbet where the edge of the plinth meets the brick pier (photo right).



Innovative bond breakers (backer materials) fill small gaps. When standard backer rods are too thick, other materials are pressed into service. Some 5/32-in. silicone weatherstripping fits the 1/8-in. groove at the top of the base (photo left). Fine Line tape backs up the caulk joint between the upper and lower torus sections (photo right).

round column. As with most cases, the worst rot damage occurred at the top and the bottom of the base. At these places, I used a couple of specialty tools (not made for the purpose) to carve out the space for backer rods.

At the top of the base, where the column shaft rested on the upper torus ring of the base, I was able to use a corner-grooving tool, which is intended for installing weatherstripping in old door frames (Resource Conservation Technology Inc.; 410-366-1146), to carve a 1/8-in. wide by 1/4-in. deep dado (photo top left). I've also been able to make this cut, although not as easily, using a cordless drill equipped with a 1/8-in. ball-shaped die-grinder bit. The only problem with carving a narrow groove such as this one is that standard backer rods are too wide; fortunately, I have found an alternative, which I'll describe in a moment.

Before completing the caulking detail on the top of the column base, I used the flush-cutting saw I'd normally use for trimming door jambs (Crain Power Tools; 408-946-6100) to make a space for standard backer rod underneath the base (photo top right). The flush-cutting saw allowed me to place a 1/2-in. deep saw kerf, 1/4 in. up from the bottom. I needed a few swipes with a sharp chisel to remove the waste, and the base was ready for backer rod.

After blowing out the sawdust, I coated both grooves with Primkote #8006-1 (Abatron Inc.; 800-445-1754), a fast-drying epoxy primer that did not clog the groove as most primers would have. Five minutes later, when the primer was dry, I inserted a 3/8-in. foam backer rod in the groove beneath the base. In the narrow groove on top, I inserted my stand-in for backer rod, a length of 5/32-in. silicone tubing (photo bottom left) that, like the cutting tool, was also intended for weatherstripping (sidebar facing page).

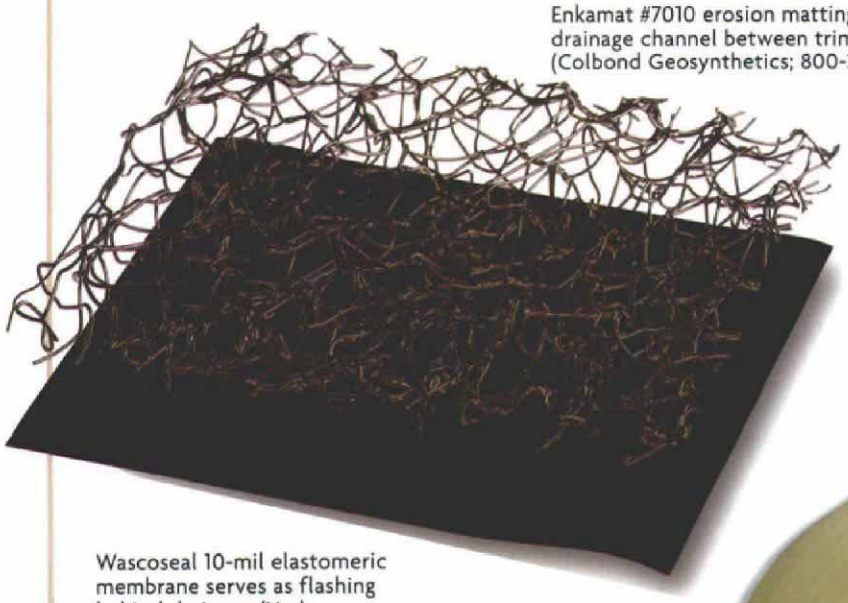
Although the top and bottom of this column suffered the most rot damage, I also caulked the two middle joints where the individual torus sections came together. Both joints had enough cleavage between them for caulk but not backer rod, so I used bond-breaking tape instead (photo bottom right). To prevent a three-sided bond that would crack and fail, I lined the bottom of each joint with 1/8-in. wide (#218) Fine Line tape. Once all the bond breakers were in place, I caulked all the joints with polyurethane sealant and tooled them smooth, confident that this column will be around a lot longer than I will. □

John Michael Davis is a restoration carpenter in New Orleans, LA. Photos by Tom O'Brien.

THE RIGHT STUFF MAY BE HARD TO FIND

Although some of the materials mentioned in this article can be found at local supply houses (depending on your location), many are available only by mail order. So plan ahead.

Enkamat #7010 erosion matting creates a drainage channel between trim boards (Colbond Geosynthetics; 800-365-7391).



Foam (3/8 in.) is the standard backer rod for two-sided caulk joints (Macklanburg-Duncan; 800-654-8454).

Silicone tubing (5/32 in.) serves as alternate backer rod for narrow (retrofitted) caulk joints (R. C. T. Inc.; 410-366-1146).

Wascoseal 10-mil elastomeric membrane serves as flashing behind drainage (York Manufacturing Inc.; 207-324-1300).

Fine Line tape (1/8 in.) serves as bond breaker for shallow caulk joints (3M Co.; 800-494-3552).

One-in. Midget Louvers and 1/4-in. thimble vents allow moisture to escape from within hollow columns (Midget Louver Co.; 800-643-4381).

THE BEST CAULKS ARE FLEXIBLE AND PAINTABLE

Polyurethane sealant is my preferred exterior caulk. Although more than twice as expensive as premium acrylic latex, polyurethane's vastly superior adhesion and flexibility make it a bargain. I use Sikaflex 1a, a European polyurethane available only through marine suppliers or by mail order (Resource Conservation Technology Inc.; 410-366-1146). Recently, my local suppliers have begun stocking polyurethane sealants from Macklanburg-Duncan (now GE Sealants; 866-275-4372) and PL (ChemRex; 800-433-9517). One day, I'll give them a try.

Although polyurethane is my standard exterior caulk, for super-critical joints—such as the front edge of a threshold—I use polysulfide. Polysulfide costs three times as much as Sikaflex and takes three to seven days to dry. Nevertheless, polysulfide retains significantly more flexibility far longer than polyurethane and is sandable. Where appearance is critical, sandability allows me to create seamless fillets. I use 3M #101 polysulfide (3M Co.; 800-364-3577), but have only small (3 oz.) tubes on hand because they don't keep well after opening.

Silicone is highly flexible and adhesive, but I don't use it often because—despite some marketing claims—it can't be painted. Where wood has been painted or where trim elements are metal, glass or masonry, silicone is a more effective caulk than polyurethane. All silicones are not alike, however; in my opinion, Dow Corning #795 (Dow Corning Corp.; 517-496-6000) is thicker, more adhesive and more toolable than anything I can get at a hardware store, and it costs only a dollar or two more a tube.

—J. M. D.

3M #101 polysulfide

Dow Corning #795 silicone sealant

Sikaflex 1a polyurethane sealant