Q&A

Flashing an Arched Window

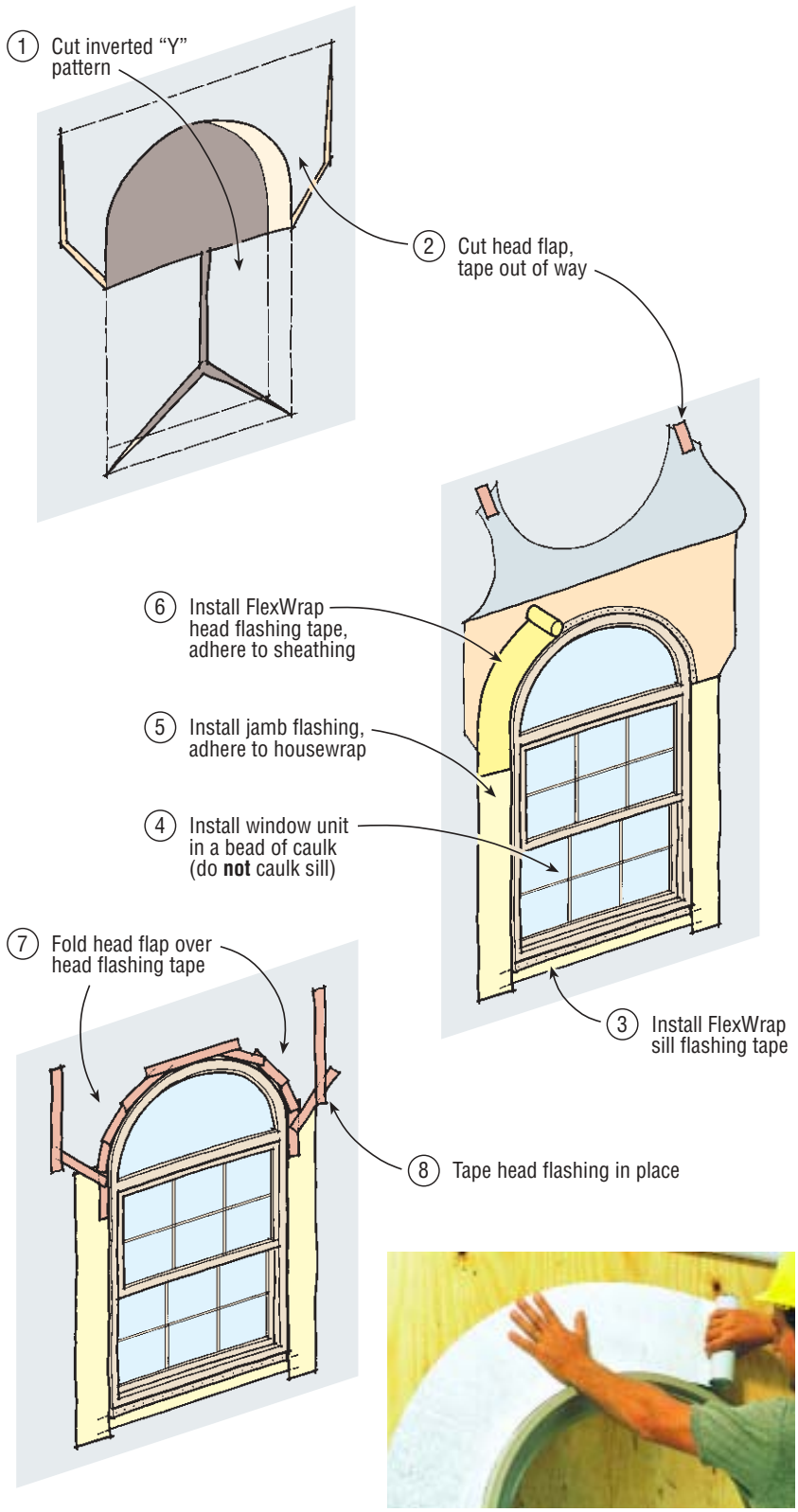
Q. *What's the best way to flash an arch-topped window?*

A. *Builder and designer Carl Hagstrom replies:* The slickest way I've found to flash a circle-top window is to use DuPont FlexWrap, a flexible flashing tape from the makers of Tyvek housewrap. I refer to FlexWrap as "peel-and-stick on steroids." Like generic peel-and-stick, FlexWrap is self-healing (it seals around fastener penetrations), and it has a very aggressive butyl adhesive backing. It costs about $2 a lineal foot.

FlexWrap stretches over two times its original length (no, that doesn't mean you have to buy only half as much) and will easily conform to any radius circle-top window. I also use FlexWrap for the window sill flashing — the flexibility allows me to fan out the corners and make a one-piece sill flashing.

The sequence of installation is critical in a properly flashed window. First, the window opening is cut out following an inverted "Y" pattern (the head piece of the old "X" pattern cut directs moisture toward the interior and shouldn't be used), and a head flap is cut and taped up and out of the way above the window. Next, the one-piece FlexWrap sill flashing tape is installed, followed by the window unit installed in a bead of elastomeric latex caulk. *Do not* caulk the sill flange — that would trap inside the opening any moisture that finds its way onto the rough sill. An uncaulked sill flange provides a weep area for moisture to escape. Even if the sill is level, shimming the unit provides free space for the water to exit more easily. A fat bead of caulk at the interior side of the sill creates a dam to force water to the sill weep.

Jamb flashing tape is installed next,



followed by the FlexWrap head flashing tape. To avoid a reverse lap, the head flashing should adhere directly to the sheathing, *not* the house wrap. The head flap is then folded over the head flashing tape and taped in place. A second piece of housewrap can be cut and inserted in a slit cut above the head flap. This second piece extends at least 12 inches beyond the head flap cut and is backup protection for the head flap taped seam.

Insulating a Floor Over an Unheated Garage

Q. *Any suggestions on the best way to insulate the ceiling of a garage? The garage will have an in-law suite above, with living, sleeping, and bath areas. The floor construction will be 2x10 joists, or possibly 11 7/16-inch wood I-joists. I'm especially concerned about plumbing freezing if the overhead garage door is inadvertently left open on a cold winter day (it can drop to 13°F below in our area in winter). I also want to ensure a comfortable warm floor in the winter months.*

A. *Michael Uniacke, owner of Advanced Insulation in Prescott, Ariz., replies:* When it comes to insulation, quality control is at least as important as the choice of materials and methods. If all the work is done carefully, you can effectively insulate a floor over a cold space using fiberglass batts. But the more plumbing, wiring, central vacuum pipes, and the like that run through the floor, the harder it is to achieve a careful fit and the more I'm inclined to use a blown-in or sprayed-in product. I'd rather rely less on hand labor and more on a mechanical process that has some measure of inherent quality control.

A critical detail like this also needs good coordination between the builder, the insulator, and the other subcontractors (especially the plumber). The big worry is the potential for pipes to freeze. If plumbing runs within the floor system, it's vital to have the plumber hold the piping as close to the subfloor as possible, away from the cold, lower side of the assembly. This is an instance where the effectiveness of insulation can work against you: The farther the plumbing is from the conditioned space, the colder it will get.

In extremely cold climates, the plumbing should be attached to the subfloor and not the framing members, because of the thermal bridging caused by wood's lower insulating value. Framing has an R-value of about 1 per inch; 3 1/2 inches up, a 2x8 might provide a thermal resistance of R-3 to R-4. If copper piping is attached halfway up the floor joist with a typical copper fitting, you're risking a freeze on some bitter cold night. So locating the plumbing correctly makes a big difference.

If you use fiberglass batts, use full 16-inch batts between wood I-joists, or 15-inch batts for conventional framing. You want a batt that fits snugly into the cavity right out of the bag. Also, you want the cavity completely filled from subfloor to ceiling drywall. So for 2x8 floor framing, an 8-inch (R-25) batt will work best. The batts should even be a little compressed — if you can't fill the cavity completely, use another system.

For peace of mind, you might want to upgrade to either a dense-blown cellulose system such as par/PAC (877/937-3257, www.parpac.com), or a low-density spray foam such as Icynene. We like par/PAC, which relies on a reinforced poly that gets attached to the framing members with a 1-inch crown roof staple. We attach the poly drum tight and then blow the cavity with cellulose at a density of 3 to 3.5 pounds per cubic foot.

Icynene and similar products also can do an excellent job, as long as the cavity is completely filled and any plumbing is attached close to the warm side. Icynene can be cost competitive with par/PAC because less site labor is involved, but finding a spray foam contractor is a challenge in many areas.

No material or process is perfect. Batts can be installed haphazardly. Cellulose and spray foam provide more assurance than fiberglass, but only if they're done right. Cellulose can be installed at densities so low that the product settles, creating cold spots. And if spray foam is not installed flush with the bottom of the floor joist, thin spots here and there can put plumbing at risk. So no matter what system you choose, be sure you inspect it before the work is covered up.

Drywall Nail Pops

Q. *We're getting more nail pops in our drywall applications this year than ever before. I've been told that as wood gains moisture, it swells and squeezes the nail out of the nail hole. Are all these nail pops caused by excessive moisture in the house? How can we prevent them?*

A. *Corresponding editor Paul Fisette responds:* Nail pops are related to changes in the moisture content of your framing, but they're a sign of moisture loss, not moisture gain. Pops generally result when drywall is fastened to the face of framing material with a relatively high moisture content. As the studs dry, they shrink. The point of the fully driven drywall nail stays positioned within the stud at the depth it was originally driven, but the face of the stud or framing member shrinks along the shaft of the nail toward the nail point, leaving the head of the nail proud of the drywall surface.

The shorter the penetration of the nail tip into the wood, the less shrinkage along the shaft of the nail, and the less noticeable the nail pop will be. So one way to minimize the magnitude of pops is to use the shortest nails allowed.

The best advice, however, is to use

dry framing lumber. Do not use lumber that is stamped S-green — that stands for "surfaced-green" and indicates a moisture content greater than 19%. Instead, purchase lumber that is either kiln dried (KD) or S-dry (which indicates a surface moisture content of less than 19%).

You must still verify that the lumber has been kept dry in storage and is as close as possible to the in-service moisture content you want (about 12% to 14%). You can verify that with a moisture meter. Also, it's better to use drywall screws instead of nails.

Sinking Foundation

Q. *I'm looking at a wood frame house with a block foundation that is settling. The basement wall sits on a 20-inch-wide concrete footing, but someone later poured a concrete brick shelf from footing to grade and then put brick veneer siding on the house. The soils can't carry the extra weight. What can I do to give the house sufficient support?*

A. *Foundation repair contractor Dave Cunningham responds:* That house needs a deep pier system to support the footings from below. It's a job for a specialty contractor. Your choices on the market are concrete pilings, push piers, or helical piers; which one you choose will depend on what the local contractors in your area have available, and on which contractor you feel most confident about. I'd get at least three proposals before you decide.

Some systems can be installed from inside the basement if there are exterior elements you don't want to disturb. But, generally, you end up excavating around the exterior down to the footing and attaching your piers to the footing from the outside.

Concrete pilings are probably the costliest way to go. That involves auguring a 24-inch hole wherever you need a pier, placing a rebar cage in the hole, and pouring a concrete pier. To raise the house, you have to terminate the pier 2 feet below the footing, with a shoulder that extends under the footing where you can place your hydraulic jacks. If you're just trying to stabilize the foundation but not lift it, you bring the shoulder or shelf right up to the bottom of the existing footing.

Push piers, your second choice, are steel tubes that are pushed down into the soil with a hydraulic rig. The depth is determined by the resistance that builds up as the pier is pushed deeper. The piers attach to the footings with metal brackets. Again, if you're lifting, you'll have to provide for the jacks.

The option I prefer is helical screw piers. These are screwed or augured into the soil rather than driven. If you have bedrock a reasonable distance down, I'd use just one helix per pier and take it down to rock. But if your rock is too deep, you have to rely on the soil to carry the load. In that case, you add more helixes. With two or three helixes per pier, you may have to go down only 8 or 10 feet below the footing, depending on the soil.

The soil is a critical factor — its bearing capacity will determine pier spacing and depth. It's well worth the money to have a soils engineer evaluate the job, do a soils test, and place the piers for you. Here in Kansas City I pay $225 for that service.

The job itself would cost on the order of $1,000 to $1,200 per pier in my area, and you're likely to need a pier every 4 to 6 feet wherever the footing needs support.

Ceramic Tile on Basement Slab

Q. *What's the best way to vapor-seal a basement slab before tiling over it?*

A. *Dave Gobis, executive director of the Ceramic Tile Education Foundation, responds:* Surface-sealing a slab before applying tile is not required or recommended by the tile industry. Tile can readily tolerate basement slab moisture, as long as you choose the appropriate tile and tile setting material. In fact, applying sealer to concrete is likely to cause problems for tile by closing the pores that are required for cement-based compounds to bond to the concrete slab.

In any case, you definitely cannot use mastic, premixed thinset, or any latex-modified product in this application. If the slab is perfectly sealed, the material will not adhere because the pores will be closed; on the other hand, if any moisture does rise out of the slab, the adhesive will probably deteriorate and lose the bond that way.

For ceramic tile in a basement with a history of moisture issues, your best choice would be a vitreous tile (with a water absorption of .5% to 3%) or a semivitreous tile (with a water absorption of 3% to 5%). That would allow the use of regular dryset mortar instead of the latex- or polymer-modified material recommended by manufacturers of porcelain tile, which is impervious (less than .5% absorption). Standard dryset, unlike many latex and polymer formulations, will cure very well in a damp environment. Make sure the surface is clean, free of sealers, and free of any standing water before application.

One caution: In most instances of high moisture, alkalinity is also present, which may cause efflorescence (a white powdery deposit that typically appears first at tile edges). If the slab is alkaline, talk to your local concrete and masonry supply house about treating the slab with a cleaning product like Sure Klean Concrete Cleaner from Prosoco (www.prosoco.com). But if the alkalinity is continually migrating through the slab, it may be caused by excessive subsoil moisture. In such instances, chemical treatment will not have a lasting effect and you may have to take more expensive measures, such as drainage improvement or, in rare cases, slab reconstruction.

Q&A

Will Wax Protect Wood Floors?

Q. *I'm building a new home for a couple who want to finish their hardwood floors with wax, the way it used to be done. When they recently refinished the polyurethane-topped floors in their existing home, they were upset that they had to move all their furniture into storage and swore, "Never again." I'm trying to talk them out of the wax finish, and I'd appreciate some feedback from a flooring expert. Can a wax finish protect floors for the long term?*

A. *Floor finisher Michael Purser, owner of the Rosebud Co. in Atlanta, responds:* Whether wax will provide the protection most homeowners want depends on how the floors are treated. I consider wax not a finish but a cosmetic product applied to the surface of wood to enhance its appearance. And it absolutely has to be applied over a surface that is well sealed. That used to be done with shellac or sanding sealers. Since neither of those products is used much these days, a penetrating sealer is usually applied several times before the floor is waxed. The most common complaint with wax is that it doesn't provide enough protection and requires a lot of work to keep the floors looking attractive. Most common household liquids will easily damage a paste wax.

As far as doing it "the way it used to be done," I would point out that people used to cook on wood stoves and wash their clothes by hand. Because of the inefficiency and labor involved, few homeowners wish to return to those good old days. Likewise, most homeowners today dislike products that require any more maintenance than is necessary or provide inadequate protection. Urethane products have become popular because they're durable and make little work for the owner.

If the homeowners want the floors waxed, I would make sure that they are thoroughly informed and that they sign off on some document that spells out the potential problems and expenses of this kind of floor before I apply the wax.

Got a question?

Send it to Q&A, ***JLC***, 186 Allen Brook Ln., Williston, VT 05495; or e-mail to jlc-editorial@hanley-wood.com.