On the Job

Frost Protection for an Existing Foundation

by Brian Martin

I recently did a remodeling project that involved replacing a three-season sunroom **(1)** with fully conditioned living space. Since the budget was tight, we kept the original sunroom's footprint and built on the existing brick pony wall, which was uninsulated.

The owner had lived in the house for 30 years and assured us that the sunroom had been built on a proper foundation. In our part of southeastern Pennsylvania, the code requires a minimum footing depth of 36 inches. Prudence and the building inspector required that we dig down to the footing and confirm it was where it was supposed to be.

Unfortunately, the homeowner's memory was not very accurate. The footing was barely 24 inches below grade **(2)**. The inspector gave us two choices: We could tear out the existing foundation — and the pony wall itself — and start over by pouring new footings 36 inches deep, or we could underpin the existing foundation to the required depth. Either option would increase the cost of the project by at least $10,000, which was more than the homeowner was willing to spend.

Given the tough economy, I didn't want to lose this project. Looking for a more cost-effective way forward, I went back to a *JLC* article about frost-protected shallow foundations, in which a footing placed above the level of the local frost line was protected from freezing with layers of rigid foam (see "Super-Insulated Slab Foundations," 4/10). Since it was evident that the existing foundation didn't need much additional protection from frost — it had already lasted

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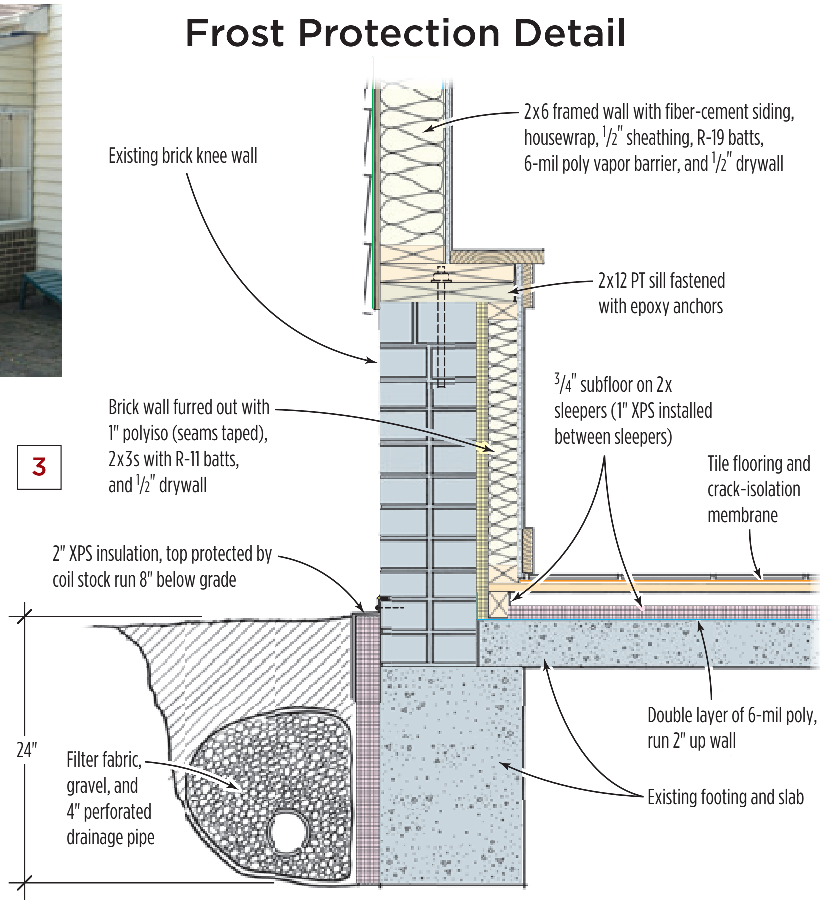

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three decades without heaving or cracking — this seemed like a good solution. I also read through the NAHB Research Center publication "Revised Builder's Guide to Frost Protected Shallow Foundations" (available at toolbase.org), which provided some useful detail about the science behind this technology. After some further research into the code, I came up with an approach I was confident would work.

My plan called for excavating to the bottom of the existing footing and installing a continuous layer of rigid polystyrene insulation against the foundation wall, all the way down to the base of the footing **(3)**. This insulating "curtain" would slow the passage of heat from beneath the slab into the soil beyond the footprint of the building, keeping the ground under the footing safely above freezing. Since wet soil conducts heat better than dry soil — and is more susceptible to heaving if it freezes — we also proposed installing a perimeter drain.

I emailed the building inspector copies of all the documentation I'd pulled together, including tables R403.3(1) and R403.3(2) from the 2009 IRC, which list our area as having an air freezing index of less than 1,000. According to the table, the footing depth of a heated building under those conditions can be as little as 12 inches below grade, provided that it's insulated with an exterior layer of 1-inch polystyrene, with no requirement for extending the insulation horizontally. I also included a section drawing of our proposed plan — which, for an added margin of safety, called for a 2-inch layer of foam.

The inspector agreed to the plan, and actual construction went off almost without a hitch. We did have to do some fiddling to get the foam to lie neatly against the foundation in areas where the concrete was a bit rough, but this was a minor problem **(4)**. We also lined the trench with filter fabric and installed a 4-inch drainpipe that ran to daylight, before backfilling with clean 1-inch stone. The upper edge of the foam finishes flush with the finish grade, where it's capped with a strip of aluminum coil stock. The coil stock is caulked into a ½-inch slot ground into the mortar and fastened with nail-in lead anchors; it extends 8 inches underground **(5)**.

In the end, developing and executing the alternative plan took about two weeks and added $5,000 to the project's budget. The owners have been happy with the result, and so have we: It allowed us to fill what could have been a painful void in our schedule with profitable work **(6)**.

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Quick Folding Chop-Saw Stand

by Jed Dixon

I hate it when I go to a job site and see some carpenter trying to cut a long molding while his $800 miter saw is balanced on a piece of drywall set on a plastic trash can. For one thing it's dangerous. I like a continuous wooden table that's long enough that I can safely trim the end of a 10-footer. I also want to be able to screw a stop to it for repeat cuts.

This is the saw stand I use. It takes me two hours to build; it's made of four 8-foot 2x4s, an 8-foot 2x6, less than half a sheet of ¾-inch plywood, a few 1⅝- and 3-inch drywall screws, and four 3½-inch-by-⅜-inch carriage bolts. I usually mount a power strip on it so I can use it as a workstation too.

You can figure it out from the pictures, but here are a few tips. The 2x6 crosspieces that support the work surface are notched to fit between the 2x4 rails so that the infeed and outfeed tables are exactly the height of the chop-saw table (the table on one of my saws is 3½ inches high, the other 4 5⁄16 inches high).

The center platform is about an inch longer and wider than the base of the saw. I usually use 48-inch-by-12-inch pieces of plywood for the upper tables. You'll probably have to cut the corner off the right-hand table to clear the handle of saws that miter to 60 degrees.

I usually don't add fences to the wooden tables. The saw's metal fence works well enough even for long pieces, and I can easily screw on a zero-clearance table and fence for cutting little fragile moldings.

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