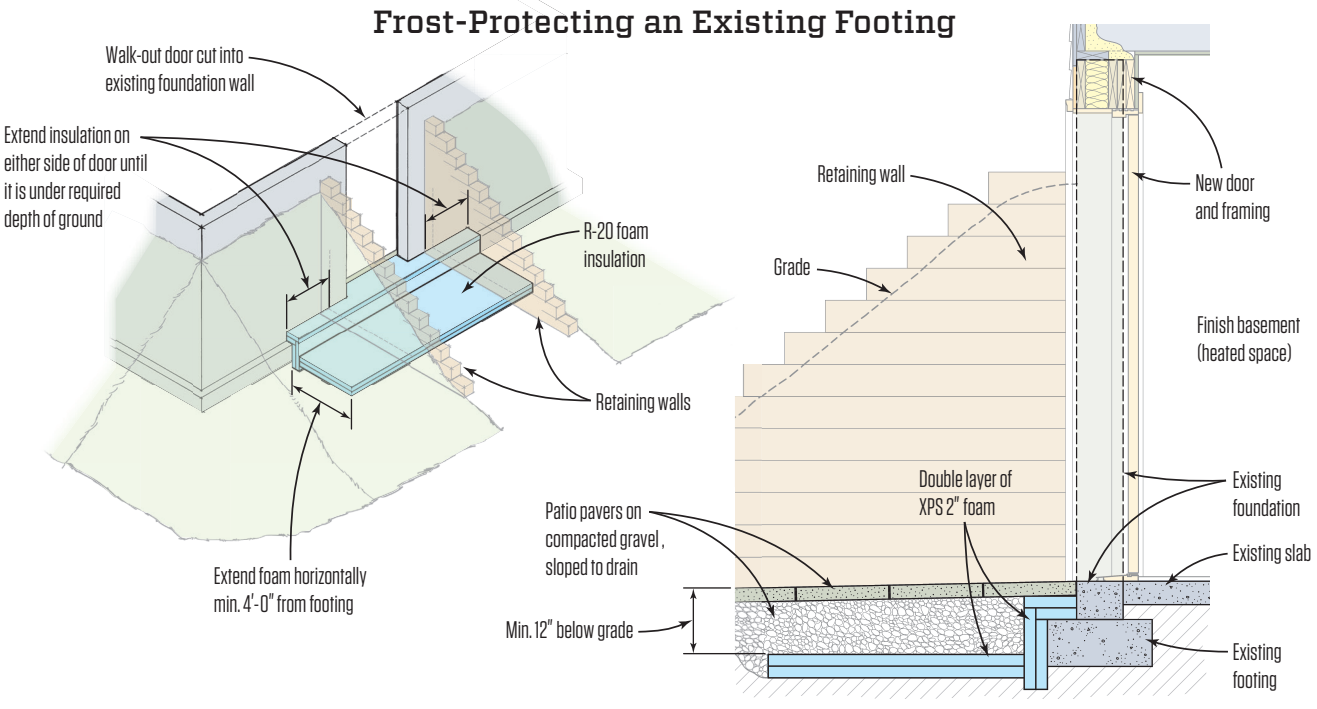
Q I was recently asked about finishing a basement in a home located in a very cold climate. Plans would include cutting a doorway in the foundation for a walk out, with the grade retained on both sides of the opening. Is there a way to protect the footing and foundation from frost using exterior insulation once the opening is cut?

A Steve Baczek, a residential architect from Reading, Mass., who specializes in building science, responds: The detail you would need to protect the door exit is not unlike a frost-protected shallow foundation. In this case, you'd have to excavate and insulate the foundation and the footing below the doorway. But one of my building mantras is "Don't do anything stupid." Creating a walk-out basement in the situation you describe gets pretty close. Here's why: The insulated foundation and footing at the doorway would rely on heat loss from the house through the basement slab to keep it above freezing. So while gaining the convenience of a walk-out basement, the client would be incurring the cost of heating the outside ground at the door location.

That being said, I'd wrap the foundation and footing below the opening with a minimum of R-20 rigid insulation (a double layer of 2-inch foam), letting the foam extend outward horizontally at least 4 feet from the foundation. (Check out "Revised Builder's Guide to Frost Protected Shallow Foundations," at toolbase.org. Use the Air Freezing Index to determine the exact thickness and horizontal distance of the insulation.) Put the top of the horizontal insulation at least 12 inches below grade and extend it to either side of the doorway until it is into the grade at least 12 inches. The insulation below the door opening will break grade and require a protective covering. Or you could run the walkway over to the foundation and sacrifice the top inch or so of insulation, but that would make the whole system less effective.

Frost-Protecting an Existing Footing



Q My clients want to install a gas fireplace "stove" as part of a living room renovation. What's the best way to create a non-combustible surface behind the stove? And how close to the wall can the stove safely sit?

A Ettore Bonfini, a mason who lives and works in Lindenhurst, N.Y., responds: My first recommendation would be to use 4-inch-thick brick because most bricks have a 2-hour fire rating. Leave at least a 1-inch air space behind the brick and tie the bricks to the wall with wall ties no more than 16 inches on-center. The same approach should work with a layer of stone.

If the 5 inches of space that this assembly occupies is more than you're willing to give up, an alternative would be to install a manufactured-stone veneer, which is much thinner. Manufactured stone also gives you a lot of choices as far as the look you're trying to achieve, and it's pretty easy to install.

If you go this route, apply the stone to cementitious backerboard that the manufacturer has approved for fire resistance. To create an air space behind the wall, mount the backerboard to metal furring strips attached to the wall horizontally. (I prefer attaching them perpendicular to the wall studs because it makes the structure a bit sturdier and gives me the option of attaching the backerboard with screws 12 inches on-center instead of 16 inches—perhaps a bit of overkill, but I'd rather be safe than sorry.)

Keep in mind that you will also need a non-combustible hearth surface under the stove. The easiest way to do this would be to remove the finish flooring down to the subfloor to get the hearth surface as low as possible. If you're installing brick or flagstone, nail a layer of metal lath to the subfloor before you put down the mortar. For an even simpler hearth, use a single slab of marble or granite. In either case, beef up the floor framing below the hearth to make sure it can handle the extra weight.

As for clearances between the wall and the stove, check with the stove manufacturer for recommendations. It's also crucial that you address how to properly vent combustion gases in accordance with the stove manufacturer's requirements. Improper ventilation can create a carbon monoxide risk. You may be required to provide make-up air for proper combustion and ventilation. Have your local building department approve your plans before you start.