

**Q** I have a client with an older home on a slab with an uninsulated foundation. In our northern climate, the perimeter of the floor gets very cold in winter. Would insulating the foundation from the outside make a significant difference in how cold the slab gets?

**A** Steve Baczek, a residential architect from Reading, Mass., who specializes in building science, responds: Because the edge of the slab links directly to the cold outside air (via the uninsulated foundation), the surface temperatures of the floor and wall materials at the perimeter of the house will be cold as a result. Preventing warmth from escaping along the edge of the slab would greatly improve the floor temperature at the perimeter of the house, and applying a layer of insulation to the outside of the foundation is an excellent way to do this.

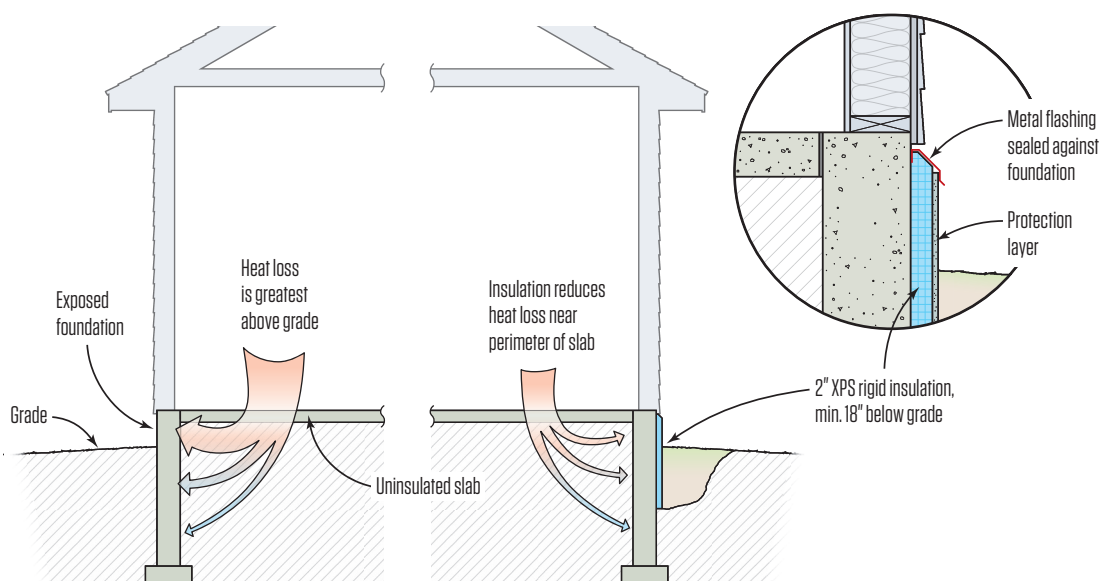
How much insulation? The more the better. I'd recommend 2-inch XPS (extruded polystyrene) rigid foam, which has an R-value of 10. But depending on the details of your client's home, the outside plane of the foam board may stick out past the siding, creating an aesthetic problem. And finding a visually acceptable protective covering for the rigid insulation might also be a chal-

lenge. Though 1-inch board would not give you as high an R-value, it would still provide a thermal break, and it may be easier to blend into the home's appearance with a protective covering.

As far as depth is concerned, the above-grade portion of the slab and foundation has the largest temperature difference between the inside and outside, so that area benefits the most from being insulated. Below grade, the difference in temperature diminishes as you go deeper into the ground. Cover the entire exposed area of the foundation and extend the insulation at least 18 inches into the ground.

If you apply insulation to the outside of a foundation, please note that rigid insulation and its protective covering can provide concealed access for insect infestation. Cover the top of the insulation board with a material such as metal flashing and seal that against the foundation to create an impenetrable barrier.

### Preventing Heat Loss From an Uninsulated Slab





I need to attach a deck to a home with an I-joist floor system. Can I attach the ledger to the engineered-wood rim joist?

**A** Mike Guertin, a builder and remodeler in East Greenwich, R.I., and a presenter at JLC Live, responds: If

the rim joist is structural—in other words, designed to transfer compression loads between the subfloor sheathing and the mud-

ill or plate below—then a deck ledger can be attached to it. The American Wood Council's "Prescriptive Residential Wood Deck Construction Guide" (DCA6) contains a prescriptive ledger-fastening table (Table 5), similar to the one in the IRC, that includes spacing requirements for attaching a deck ledger to 1- or 1 ½-inch engineered-wood rim boards with ½-inch lag screws and ½-inch through-bolts. Manufacturer prescriptive ledger tables for proprietary structural ledger screws—such as FastenMaster LedgerLok (fastenmaster.com), Simpson Strong-Tie SDWH and SDWS (strongtie.com), and GRK RSS (grkfasteners.com)—also list engineered rim-board types. Most building officials will accept the DCA6 as well as manufacturer's tables for connecting ledgers to an engineered rim board.

But not all engineered floors are framed with structural rim boards. When I was framing floors with I-joists in the late 80s, engineered rim board was not available, and we closed the rim with either an I-joist or ¾-inch plywood ripped to the I-joist height. Deck ledgers cannot be attached to these I-joists or nonstructural plywood rims.

If you can view the rim board from inside the house, you may be able to find spray-on labeling that identifies it as structural. Otherwise, to determine whether a rim joist is structural, drill a 1-inch-diameter hole—in a location that can be flashed over if needed—all the way through the rim board to ascertain its thickness. If it is 1 inch or 1 ½ inches thick, it's considered structural and you can proceed with fastening the ledger according to the tables mentioned above.

If the rim closure is nonstructural, however, the simplest solution is to construct a freestanding deck—set footings, posts, and a beam 1 foot or so from the house to bear the deck load ordinarily carried by a ledger. If a freestanding deck is not a viable option, the best alternative is to have an engineer design the ledger attachment, and have that approved by your local official.

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**I'm doing a remodel on a home that is currently heated with steam radiators. The boiler is fairly new, but I'm wondering if I should stick with steam or convert to hydronic? And if I do keep the steam system, should I upgrade to newer radiators or keep the old, bulky, but classic-looking ones?**

**A** Keith Cappuccio, a licensed plumber in New York City, responds: Steam is a time-tested method of heating a home. Although it's not as versatile as hot water (hydronic) heat, when installed correctly steam should provide decades of relatively maintenance-free operation. When asked about the feasibility of converting a steam system to a hydronic one, I usually point out the following items for general consideration.

First, many steam systems are one-pipe systems, with only a supply pipe and no return, so it might not be possible to re-use the existing steam pipes to circulate water

through the house. Running new pipe would not be a problem if you are gutting the home's entire interior. If you aren't, though, you can anticipate having to remove and refinish a significant amount of plaster and trim to run those new lines, even though trusted PEX brands can be fished through the house more easily than the copper pipe of 20 years ago.

Next, hydronic systems use more pumps, valves, and relays than a steam system, so maintaining a hot-water system over the years may prove to be more parts-and-labor intensive.

But hydronic heat has its benefits. It is very versatile and can be used for radiant,

baseboard convectors, or freestanding radiators—all in the same system. Plus you can combine a solar water heater with the boiler for a super-efficient design.

My advice? If the work you're planning to do is more cosmetic, stick with the present steam system. If the house will be gutted, however, consider re-using the boiler block as a hot-water unit and install a radiant manifold with ¾-inch PEX lines traveling individually to each radiator. The supply manifold includes balancing valves to control the temperature of each heating circuit. You'll get a classic look, while saving money on radiators and a new boiler.

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