

Q When I'm building an insulated header, should I place the insulation on the inside or the outside of the assembly?

A Steven Baczek, a residential architect from Reading, Mass., who specializes in designing durable, low-energy homes, responds: As with many questions regarding building techniques, the answer to this one is, it depends. Before we talk about insulation, we must acknowledge that a header's primary duty—transferring loads around window and door openings—is structural. Without that structural factor, the header is pretty useless no matter where you place the insulation. But we should also acknowledge that in many situations, headers aren't a necessary structural ingredient in the wall framing. That's a topic worthy of its own discussion.

For the sake of this discussion, however, let's say that we're building a header for a 2x6 wall—so

we're working with 5½ inches of width. Also, let's say that we're using dimensional lumber to make a header for a 3-0 door opening. For the structure of the header, we need two 2-bys, nailed together on a code-approved schedule from both sides. A horizontal 2x6 is also needed under the header for nailing the sheathing outside and the drywall inside. The double 2-by header leaves a 2½-inch space for insulation, and most builders use 2-inch rigid foam and leave a ½-inch air space. But here is where the strategies vary.

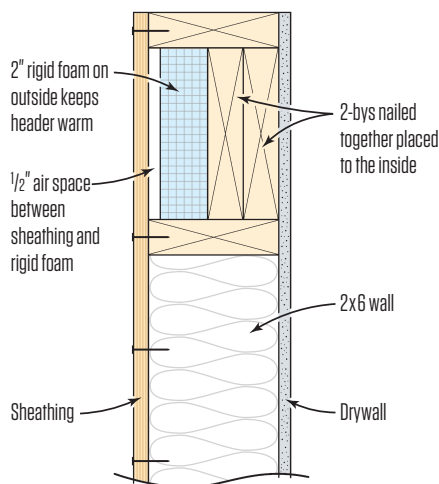
For the best building performance, placing the insulation on the outside keeps the header warm and puts the thermal break on the outside of the header (see illustration, below). Note that in this scenario, the sheathing cannot be nailed directly

Insulating Site-Built Headers

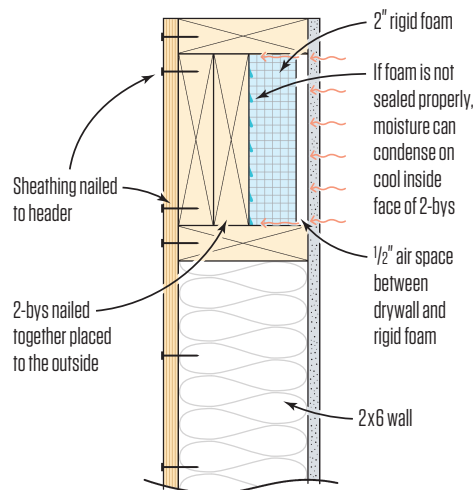
Insulating a header in cold climates.

Placing the insulation on the outside of the 2-bys (near right) keeps the header warm and puts the thermal break on the outside. With the insulation on the inside of the 2-bys (far right), moisture from inside air can condense on cool 2-bys if the insulation isn't sealed properly, possibly leading to rot.

Better Building Performance: Insulation to the Exterior




Better Structural Performance: Insulation to the Interior



to the header. Alternatively, the typical treatment of placing a layer of 2-inch rigid foam on the *inside* of the 2-bys also provides a thermal break for the header. However, when using this method in cold climates, it's important to seal the edges of the foam; otherwise, condensation may form on the cold, outer face of the insulation (against the 2-bys) and, over time, lead to rot.

When we use a double 2-by header on the high-performance houses that we build in high-wind areas, we always put our structure to the outside, which allows us to nail the sheathing directly to the structural header. The insulation installers can fill the space on the inside of the header with the same cavity insulation that they use in the stud bays. With this configuration, we usually provide air-sealing for the entire wall at the sheathing.

Should electrical receptacles be installed with the ground facing up or down?

 Ben Giles, licensed electrician and owner of South Shore Electrical Contractors, in Wakefield, R.I., responds: The electrical code does not address the direction that receptacles should be installed. You can put them in with the ground

facing up, down, or sideways. Much more important is making sure the receptacles are wired and installed properly (see “Wiring Receptacles and Switches,” Sep/17).

Orienting receptacles a certain way seems like one of those things that folks get in the habit of doing just because their boss told them to do it that way. I've heard of electricians who install receptacles with the ground up (upside down in my book) so that if a plug isn't fully engaged in the receptacle and something made of metal falls on the exposed male blades, the metal will hit the ground instead of bridging across the hot and neutral blades. That scenario seems highly unlikely to me. Similarly, I have heard of electricians orienting receptacles with the ground up when they are to be fitted with metal cover plates. The reasoning is that if something is plugged in loosely and the plate comes loose and falls, then it will land on the ground blade and not the hot. Again, the odds of that happening are pretty slim.

Even if the above events were more likely, with the properly-sized arc-fault breakers that we currently install in the main panels, the circuits trip so easily that the chances of harm or damage from occurrences like those are negligible at most. And finally, it should be noted that 90% of home appliances, as well as most lamps, vacuum cleaners, and the like, have two-prong male plugs. The orientation of the ground in the receptacle would make no difference for any appliance with this type of plug.