DETAIL

Air-Sealing Truss Floors

by Michael Polencheck

I take pride in the energy efficiency of my company's homes. Besides building thick, well-insulated walls, I also practice good vapor and air sealing, which includes carefully insulating and sealing the perimeter of the floor joist system. This is easy to do with a conventionally framed floor system. We just install 6-inch-thick, R-19 fiberglass batts behind the band joist and hold them in place with tightly fitting pieces of 1/2-inch-thick foil-faced rigid foam sheathing. The foam has an insulating value of R-7.5 per inch and serves as both an air barrier and a vapor retarder.

About two years ago, however, we stopped framing floors with 2x12s and instead switched to parallel-chord floor trusses. We've found trusses to be more cost-effective, more dimensionally consistent, and easier to use than dimensional lumber. But on our first truss job we ran into a problem. How would we insulate and seal the perimeter of the floor system? We tried to improvise by sealing around the trusses with pieces of fiberglass insulation and polyethylene, but it was a time-consuming job and didn't work very well. On one house, we simply omitted the vapor barrier around the truss perimeter. (The insulation sub on the job assured us this was standard practice.) But when we returned to check the house three months later, we found the insulation between the trusses soaked with condensation and frozen to the exterior sheathing.

We've since devised a simple system that uses polystyrene foam to insulate and seal the floor perimeter. In a floor truss system, a 2x4 band let into the ends of the trusses provides a nailer for the edge of the subfloor. We cut pieces of 1 1/2-inch polystyrene foam insulation to fill the end of each truss bay, fitting them between the bottom of the 2x4 band and the top of the 2x6 mudsill. We then add pieces of 1 1/2-inch foil-faced foam to fit behind these, covering the 2x4 band. We don't need to caulk the edges of the foam to complete the air seal. Instead, we cut the foam pieces 1/32-inch oversize on a table saw, then wedge them into place. We've had no condensation problems, and with 1-inch insulating sheathing on the outside, the system has a total insulating value of R-20.

Sealing the sides of the end trusses is even easier. The end trusses are ladder trusses, made with 2x4s 16 inches on-center. We simply insulate between them with 1 1/2-inch polystyrene, then add a continuous band of foil-faced foam on the interior. ■

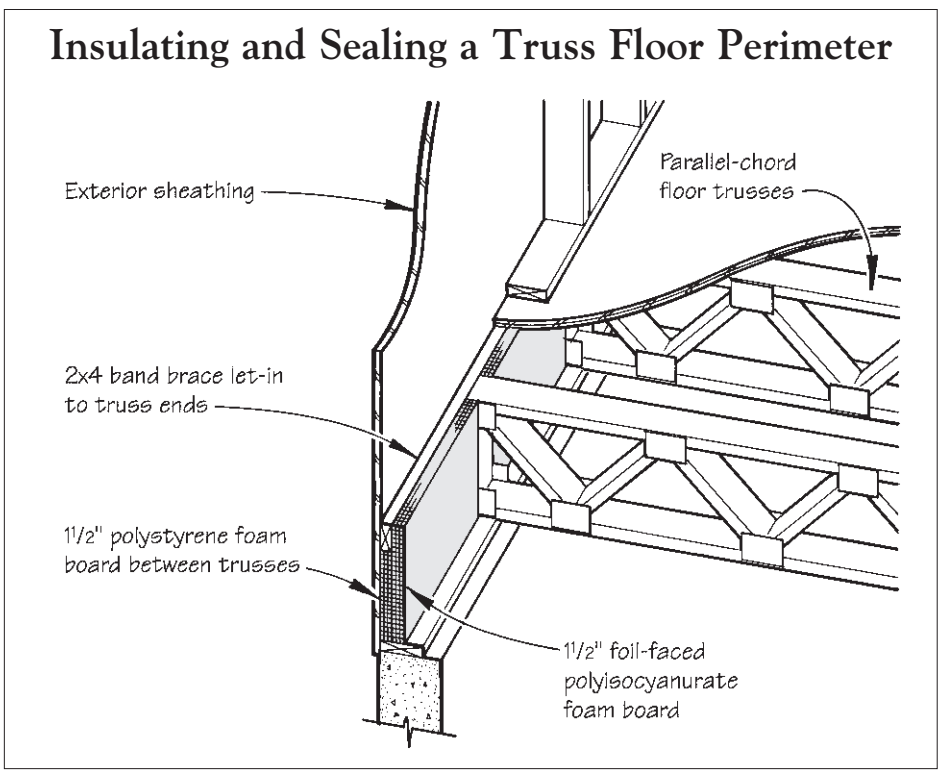

Figure 1. *The author uses two layers of foam board to seal and insulate the perimeter of truss floors. He places 1 1/2-inch polystyrene against the sheathing beneath the band brace, then follows with a layer of 1 1/2-inch foil-faced foam for added insulation and vapor sealing.*

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