

Q. Are Frost Stripes Cause for Concern?

Last year we completed a SIP roof deck using two kinds of panels. Some were the standard OSB-foam sandwich panels, and some had prefinished T&G pine ceiling boards attached to the bottom. During installation, we noticed a small gap between the panels with the attached T&G ceiling, because the pine boards were slightly wider than the OSB. The panel maker provided us with a foam gasket to seal the gap, which we supplemented with caulk. This past winter, whenever it was cold enough, a line of frost would appear on the shingle roof along the panel joints. The frost line occurred on both types of panels, so we don't think it is being caused by air leakage at the gasketed joints. Should we be concerned?

A. *Paul Malko, an engineer with Foard Panel in West Chesterfield, N.H., responds:* The frost lines (called frost ghosting or snow ghosting) you're seeing at the panel joints can have a few different causes, but I agree that air leakage isn't likely. Typically frost ghosting is caused by the presence of splines at the panel joints. You didn't say whether the exterior skins of the SIPs were splined together, but I'll assume they were, since that's most common. Most of the roof surface has a single layer of OSB (the top of the SIP), tar paper, and shingles. At the panel joints, however, there are two layers of OSB — the panel skin and a connecting spline — in addition to the tar paper and shingles (see illustration). Because of the extra layer of OSB, the thermal capacitance (or thermal mass, as it's often called) of the roof assembly is greater at the edges of the pan-

els than in the middle. That means the roofing over a splined joint changes temperature more slowly than over the rest of the SIP. Frost ghosting is usually seen in the morning when frost or light snow is beginning to melt off the roof. The frost or snow melts first at the center of the panels, where thermal capacitance is lowest (meaning that particular section warms the fastest in the sun). Because the thermal capacitance at the splined joints is greater, it takes longer for the sun to warm the roofing over them, which is why you see lines of frost there. The same process happens in reverse in the evening: As the air cools, the center of the panel cools first, allowing frost to accumulate more quickly there than at the joints.

Frost ghosting isn't uncommon on SIPs with directly applied roofing, and I've never known it to reduce the durability of the roof. Frost ghosting also occurs on other types of wooden roof structures, but because structural insulated panels typically lose heat more slowly than conventional framed roofs, the ghosting may last longer.

Q. Duct Chases and Electrical Wiring

Is it okay to fish electrical wiring through the wood-framed chases built around hvac ducts and chimneys?

A. *Harlan Madsen, an electrical contractor in Bloomington, Minn., responds:* We fish Romex (type NM nonmetallic cable) through hvac duct chases all the time without any objections from our electrical inspector. As long as there are no sharp edges in the chase that might physically damage the cable, there's no code violation if Romex touches metal hvac supply or return ducts. Romex can also come in incidental contact with a masonry chimney, so it's okay to fish it through a masonry chimney chase too, but if an access to the chase is ever provided in the future, all of the wires would then need to be secured. Metal chimneys and other combustion vents are a different matter, however, since they have necessary clearances that must be maintained. We leave these chases alone and find other routes for our Romex.

Romex isn't normally run through the ductwork itself; if something like a smoke detector or damper needs to be wired inside a duct, a metal wiring system as specified in NEC 300.22 is required. On the other hand, it's common practice to run Romex perpendicularly across a panned stud cavity or joist bay used as a cold air return duct. In such a case, we drill into the framing on both sides of the panned return, pull the cable through the holes, then seal the holes around the Romex with caulk.

Frost Ghosting on SIP Roof

