Yet Another Raining Ceiling

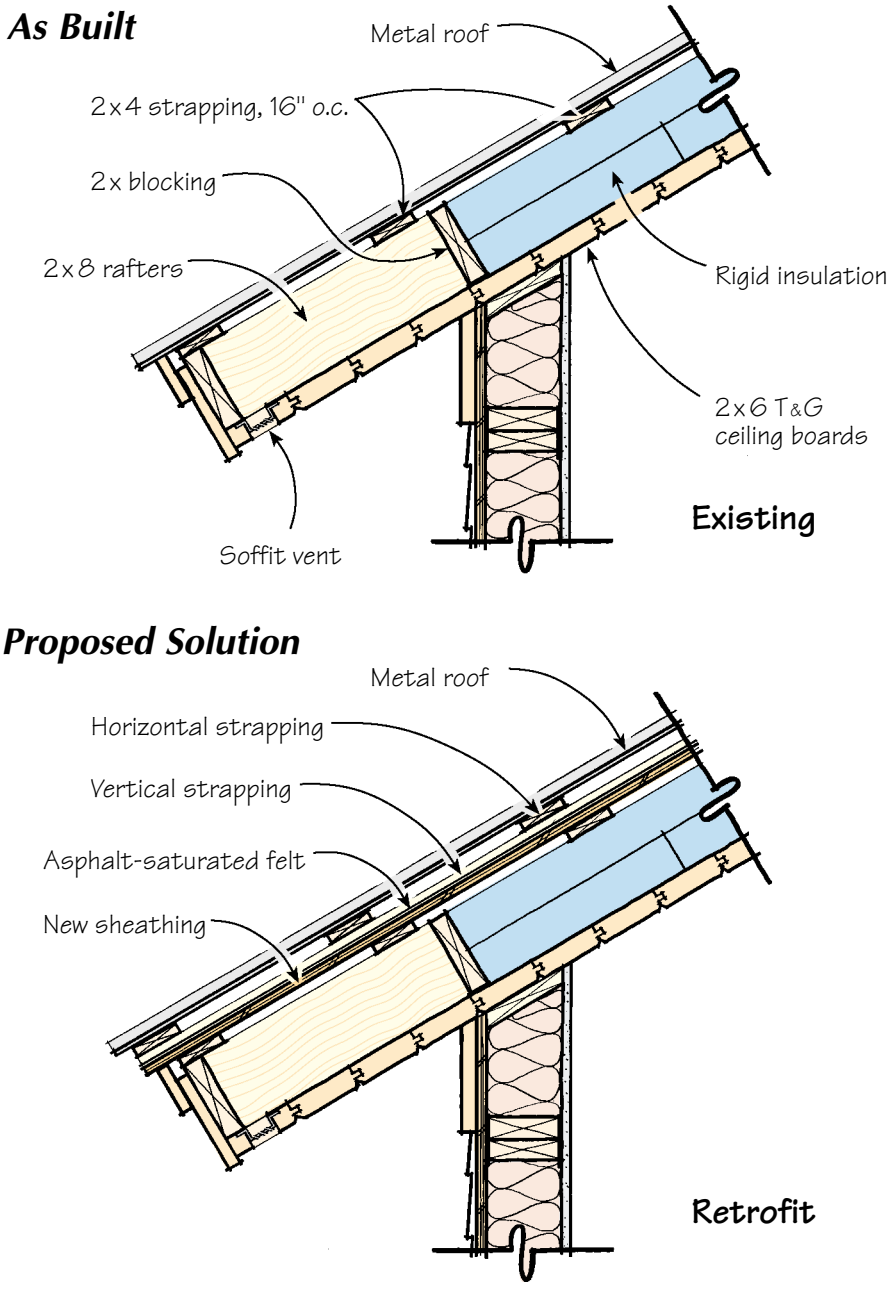
Q. *I designed an open-plan house with what I hoped would be an energy-efficient, maintenance-free roof. The house and its roof have performed well except for occasional annoying ceiling drips, which occur every winter. (A similar but not identical situation was discussed in your March '99* On the House *column.) The roof construction is 2x6 T&G planking, two layers of 3-inch rigid foam, 2x4 horizontal strapping, and a galvanized roof attached with neoprene-gasketed screws. There is a continuous ridge and soffit venting. There is no poly vapor barrier above the plank ceiling because I was assured that the double-layered foam insulation formed its own vapor barrier due to the closed cell structure of the foam. There is no felt above the insulation.*

Dripping does not occur after heavy rains, but seems to occur most often during thaws after very cold weather, on both north- and south-facing roofs. The water accumulation is a couple of tablespoonsful from each of two or three drips.

Where is the water coming from — above or below? Is there a fix short of pulling off the roof or putting on a new ceiling?

A. *Corresponding editor Henri deMarne responds:* The water is probably condensate forming on the underside of the metal roof on cold nights when night radiation causes the metal to become several degrees colder than the ambient air. The problem may start as frost that melts when the outside temperature rises above freezing or the sun shining on the roof heats the metal. It is also possible that moisture from the interior space is driven through the T&G ceiling boards by convective currents, finds its way through the joints between the rigid insulation panels (which will shrink somewhat as they age), and condenses on the underside of the metal roof. Then, when enough water accumulates, it drips onto the rigid insulation, is blocked by the 2x4 strapping and finds its way through the joints in the rigid insulation and the ceiling boards. I have seen both of these situations a number of times over the last 20 years.

Had you installed the recommended 6-mil plastic vapor retarder on top of the T&G ceiling, you would have accomplished two things. First, you would have prevented air leakage into the ceiling cavities — air that takes moisture with it. Second, any condensate generated from outside would



have been prevented from leaking through the joints between the T&G boards, as long as the plastic were properly overlapped, as is done for roofing felt. However, that water would have been trapped by the 2-by blocking at the eaves and it could eventually have penetrated the walls below or rotted nearby lumber, which would be an invitation for carpenter ants.

The best way to have prevented the problem would have been to install #15 or #30 felt, which should always be installed under metal roofs, regardless of the type. However, the problem would not have been completely solved unless you had also first installed "vertical" strapping from the eaves to the ridge, so that water would have had channels to drain through.

You mention ridge and soffit vents. How do they work with the strapping system you show on your drawing (see illustration) There is no continuous channel from soffits to ridge.

The best solution is to remove the metal panels and nail new sheathing over the existing horizontal strapping. Then apply #15 or #30 asphalt-saturated felt and strap vertically, then horizontally, to ensure a vent space. Though this may seem like a lot of extra work, screwing the metal directly to the sheathing through the felt would not allow the inevitable moisture that will form on the underside of the metal to evaporate. Instead, the condensate would wet the felt, and could pass through the sheathing around the roof's fasteners where it could eventually cause problems.

Asphalt Shingles & High Wind

Q. *Is the self-adhesive strip on standard asphalt shingles adequate for occasional 100-mph winds, or should extra roofing cement be applied under each shingle?*

A. *Paul Fisette, director of the building materials and wood technology program at the University of Massachusetts in Amherst, responds:* Wind-resistant shingles are recommended in areas subject to hurricane-force winds, which are defined as winds in excess of 75 mph. Typical asphalt roof shingles have a UL 997 rating and come with a "wind resistant" label right on the bundles. However, this UL 997 listing only tells you that the wind testing was conducted in a certain way; it doesn't refer to a specific wind-speed resistance. In fact, most shingle manufacturers limit their warranties to wind speeds between 60 and 80 mph.

Since you are in an area subject to even stronger winds, you may want to take extra measures. Shingle manufacturers recommend that in windy locations, you place a dab of asphalt cement the size of a quarter at the bottom corner of each tab of a standard three-tab shingle (a total of six dabs). Double-nailing (for a total of six nails per shingle) is also a good idea. And it's best, if possible, to install the shingles in warm weather so the self-sealing mechanism works properly.

Cordless Tool Question

Q. *I'd like to know why cordless tools don't have trigger guards anymore. Bosch used to make one, but they gave it up, or so it seems. Does it have something to do with government requirements? With the gun I use now (Bosch), I hang it in the spare hammer loop on my left hand nail bag, but the new guns without trigger guards cannot be hung this way without the trigger being depressed.*

I use three nail bags and a separate hammer loop, so I don't have room for an additional drill holster. If you have any influence on the manufacturers, please bring this to their attention.

A. *Tool editor Dave Crosby responds:* I called several cordless tool manufacturers about your question, and it seems that the disappearance of the trigger guard is a change in style as much as anything. To keep your cordless driver-drill from running by itself in your hammer loop or nail bag, try putting the forward/reverse selector in the midway, or "neutral," position. Some tools are intentionally designed by the manufacturers to lock the trigger in this position. Most tools, even if not specifically designed to do so, will resist light to moderate trigger pressure with the selector set halfway between forward and reverse.

But heavy pressure on certain tools will allow the selector to engage one way or the other, so even though this usually works, it's obviously a compromise. If your particular tool isn't designed to actually lock the trigger securely, there could be a safety consideration here, so if you decide to do this, use care. As for bringing this common and irritating problem to the manufacturer's attention, consider it done.

GOT A QUESTION? Send it to On the House, *JLC*, 932 West Main St., Richmond, VT 05477; or e-mail to *jlc@bginet.com*.