

Condensation on Ceiling

Q. Often my customers request that we insulate vaulted ceilings when we're reroofing. These roofs usually have 4x6 rafters, 2x6 T&G planks exposed to the inside, and composition shingles on the outside. Our technique has been to strip the roof, lay out 2x4 or 2x6 rafters over the open beam area, install R-30 rigid insulation in the bays, then install plywood and shingle roofing above. Recently, I had a problem with one of these roofs. In an area about 2 feet down from the peak of the living room ceiling, the paint started to peel and mold spots are

growing. I checked with a moisture meter and found that water is condensing on the surface of the ceiling. Do I need to somehow vent this assembly?

A. Henri de Marne, a consultant on light-frame buildings in Waitsfield, Vt., responds: What is probably happening is that interior moisture is being carried by air convection through the joints in the T&G planking, the rigid insulation, and the rafters, and is condensing on the underside of the new sheathing. From

there, it drips down through the joints of the same components back into the living space.

There are some changes you can make to this assembly that should prevent the problem. The first thing you should do is to install a 6-mil plastic vapor retarder over the roof side of the T&G plank ceiling. This will stop the convection of moisture-laden air into the roof cavity. This should be done preferably in one piece. If that's not feasible, start from the bottom and overlap the upper sheets by several inches, then tape the joints.

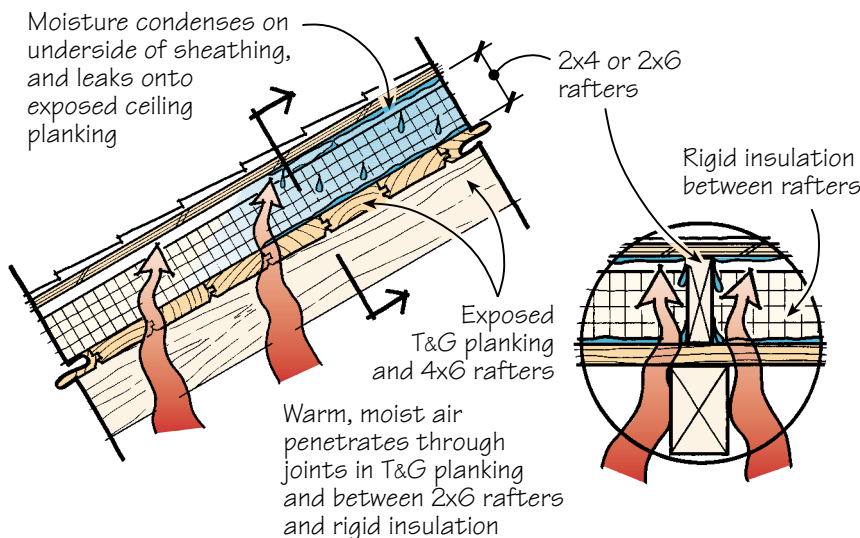
The second problem with your assembly is that you are placing the rafters directly over the T&G deck and laying the rigid insulation between them. It would be much more efficient to lay the rigid insulation directly over the decking, thus minimizing the joints between materials and increasing energy efficiency by eliminating the short circuits provided by the rafters. Good-quality extruded polystyrene foam has plenty of compressive strength to handle a roof load.

On future jobs, instead of rafters, use 2x3 sleepers on edge 24 inches on-center, and fasten them to the deck with long screws. If you mark the location of the beams below, the screws can be driven without concern about coming through the ceiling. With shallower-pitch roofs, a 1-inch penetration into the roof decking should be sufficient as long as you put enough screws in. With steeper pitches, you should provide greater penetration and use strapping across the ridge.

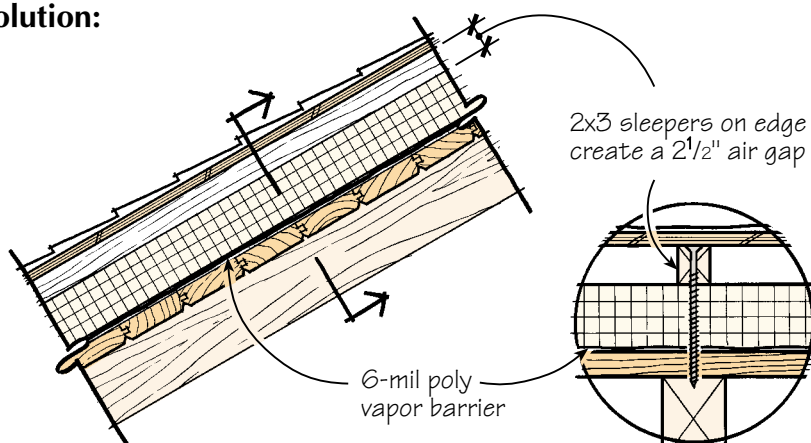
Finally, you should provide continuous ventilation on the underside of the plywood. Extend the tails of the sleepers 3 inches beyond the existing fascia, install a new fascia, and provide soffit ventilation by means of an off-the-shelf ventilation strip. You should also install

Cold Roof Detail

Problem:



Solution:



an externally baffled ridge vent such as Shinglevent II at the ridge.

Insulating Around Replacement Windows

Q. When replacing old double-hung windows with vinyl replacement units, what's the best way to insulate the counterweight cavity?

A. John Curran, owner of RSI General Contractors, a roofing, siding and insulation company in Syracuse, N.Y., responds: In our experience, the most effective way to insulate the counterweight cavity is to use blown cellulose. After the stops, sashes, and pulleys have been removed, we tape over the pulley hole, then drill a single 1-inch-diameter hole in the center of the jamb (where it will be covered by the new window). We then pump in cellulose until it backs up and we know the cavity is full.

The advantage of cellulose is that we can pack the cavity tight without losing R-value, as with fiberglass, or risking damage from expansion, as with expanding spray-foam. The disadvantage is that we have to lug a blower machine to the job. Fortunately, we have a small one-bag unit, which is relatively portable. These machines can be rented or borrowed from home centers if you buy enough insulation.

If we couldn't put our hands on a blower, our second choice would be to fill the cavity with fiberglass batt insulation. We do this by removing the counterweight access door and pushing small clumps of insulation upward, and by forcing even smaller pieces downward through the pulley hole. Even though we lose some R-value, we pack the insulation cavity tight to eliminate air infiltration.

Until now, we've avoided using spray foams because of the unpredictable expansion rate: It's almost impossible to completely fill a blind cavity without overfilling and bowing out the walls. We were also concerned that over time, the foam would shrink and leave gaps. I've been told recently that both Great Stuff (Flexible Products Co., 800/800-3626) and Handi-Foam (Fomo Products,

800/321-5585) now have two-part "slow-rise" formulas that are much easier to keep under control. A representative from Fomo Products even told me that if I knew the volume of the cavity, I could call their 800 number and they would tell me exactly how long to squeeze the trigger to dispense the correct amount of foam. I'll probably try it one of these days, on my own house first.

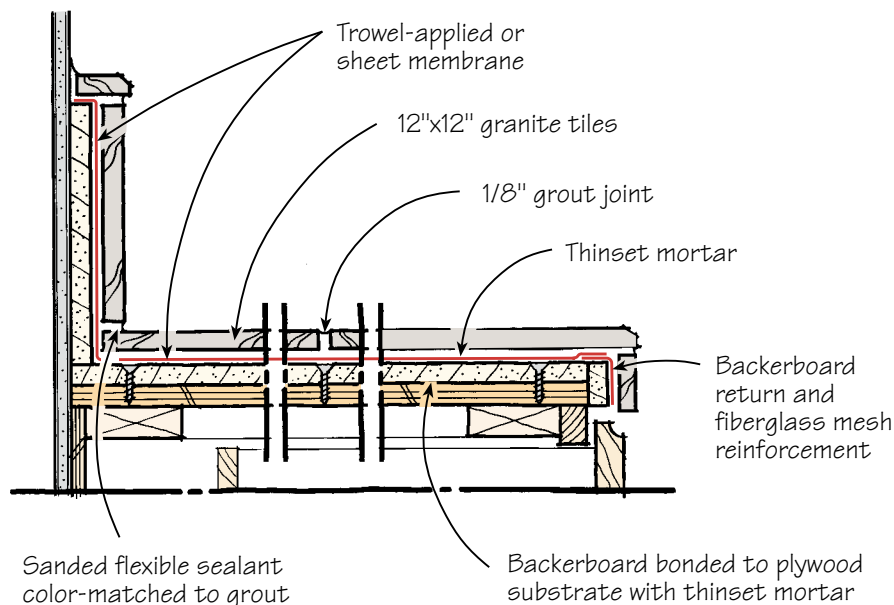
Granite Tile Countertops

Q. We are planning to use 1-foot-square granite tiles in a kitchen counter application because it is more affordable than granite slabs. Can I install the granite right over plywood, or do you recommend Durock as an underlayment? What type of grout would work best? How wide a space should we leave between tiles? Thank you for any advice you can offer.

A. Michael Byrne, director of the Ceramic Tile Education Foundation, responds: I wouldn't risk granite tiles over plywood. The best base to use is a backerboard made specifically for ceramic tile. This could be a cementitious backer unit, like Durock or Hardibacker, or a glass mat water-resistant gypsum board, like Dens-Shield.

The backerboard should be laid over a

Granite Tile Countertop



3/4-inch exterior-grade plywood substrate, attached with a leveling bed of thinset mortar in between, and secured with Hi-Lo S Rock-On screws or galvanized roofing nails. Avoid the use of drywall screws.

For a counter that will get heavy use, you should also consider using a trowel-applied or sheet membrane over the cementitious backerboard and extending up into the backsplash area (Dens-Shield needs no further waterproofing).

As for grout, my recommendation is for a natural cement-colored grout mixed with a latex additive (or use a polymer-modified grout). Width is up to you. I usually recommend narrow joints (1/8 inch or less) because they're easier to clean than wide joints.

Use a heavy-duty sealer as well (not a cheap silicone pour-on), and most important, include caulked expansion joints around sinks, cooktops, chopping blocks and at the joint between the top and the backsplash (see illustration, above).

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

