a lot easier (Figure 2). Two-by-six studs afford you the luxury of offsetting the band joist a couple of inches while still getting a solid 3½ inches of bearing. In this particular detail, 2x4's are substituted for 2x6's at the upper top plate of the first floor and the bottom plate of the second floor. This saves you a little money and greatly simplifies lining up the inset band joist and the plates—no chalk lines, no muss, no fuss. Weaving the air/vapor barrier between the lower and upper top plates might look like a nuisance, but it saves the poly from a good deal of abuse it might suffer while you lay out and nail the joists. On the exterior, 2 inches of rigid insulation are installed, which keeps the vapor barrier on the warm side of the insulation where it belongs. One caution: if you're planning to install insulating sheathing and horizontal siding, you should provide nailing for the siding at the band joist area by installing a width of plywood or vertical nailers. Otherwise, you'll be nailing your siding with four-inch spikes here.

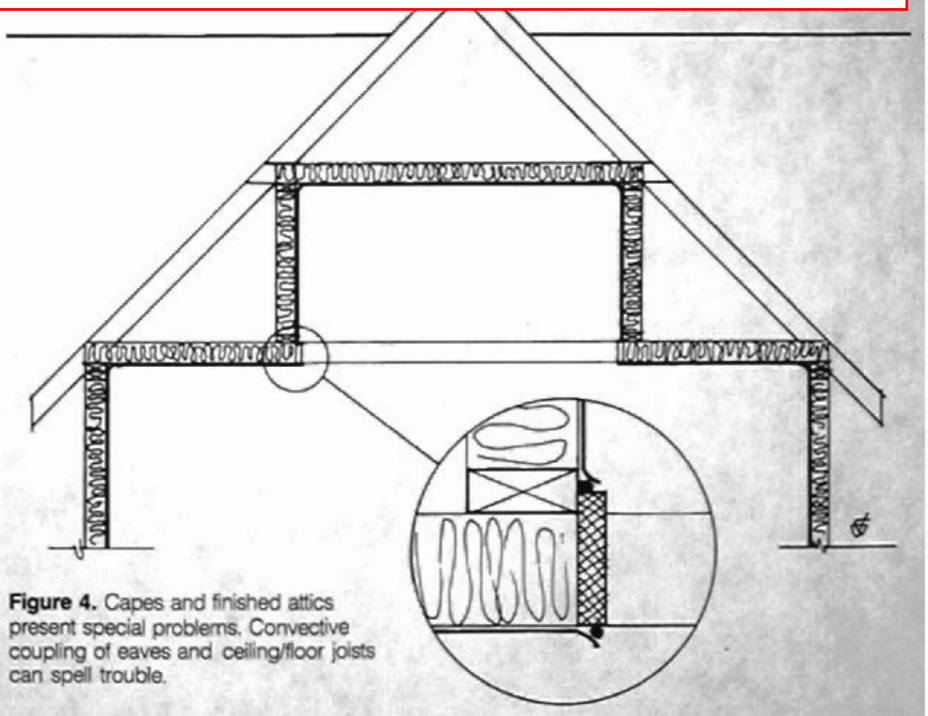

Figure 4. Capes and finished attics present special problems. Convective coupling of eaves and ceiling/floor joists can spell trouble.

Overhangs

Overhangs are most easily treated using the first technique, cutting and pasting rigid insulation blocks between the joists (Figure 3). Only in this case you should run the poly over the plywood decking above before

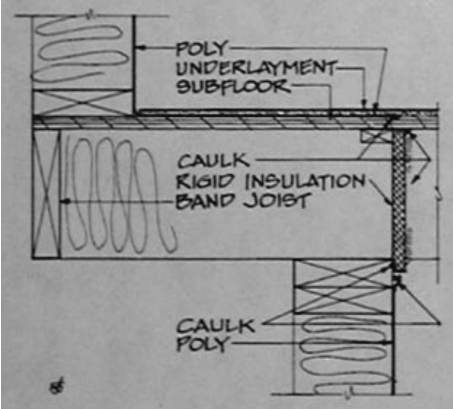

Figure 3. Overhangs are sealed with caulking and blocking and the soffit area is insulated.

continuing up the wall. This keeps the insulated soffit area isolated from the interior air. One contractor had a problem with this detail because he wanted to glue wood-parquet finish flooring directly to tongue-and-groove plywood decking. The solution was to omit that section of plastic and pick up at the junction of floor and wall above. With glued decking and glued wood tiles, inside air is not likely to leak down into the soffit area below. Remember, it is the *leakage* of moist inside air into wall cavities through cracks—not *diffusion* through materials—that is the major cause of condensation problems. And plywood is a pretty good vapor barrier anyway. Use common sense.

The same problem occurs in reverse where kneewalls in a finished attic or cape-style house meet the floor (Figure 4). The solution is the same—blocking between the joists to continue the air/vapor barrier on the warm side of the insulation. This is often overlooked, resulting in air passage between the cold eaves and the floor/ceiling cavity. Since this cavity is between two heated spaces, it is a heated space also. If it is convectively coupled to the outdoors, you'll be heating the outdoors.

Other tricks

In some situations, it is feasible to get a continuous air/vapor barrier by using a modified form of balloon framing. Here, the joists are hung from the band joist (functioning as a ledger) using metal joist hangers. The band joist is spiked or lagged to the face of the studs so the vapor barrier can pass behind it uninterrupted. This detail can be used in some cape and saltbox designs in which a partial wall extends above the floor level. It has some potential in full two-story designs but fire stops and structural loads notwithstanding, it's a building inspector's nightmare.

No poly here

I hate to say this, but a radical Canadian splinter group has recently been decrying the polyethylene air/vapor barrier altogether on several counts: One, unless you use UV- and oxidation-stabilized polyethylene, it will get brittle over time and fail. Two, under peak wind loading or pressurization testing, the poly will rip around the staples and come undone at seams unless fully supported. And three, to do it the right way with the right materials is just too expensive for the tract builder to consider.

So, they've come up with a new, improved, poly-free vapor barrier (Figure 5) based on the theory that controlling air leakage, rather than diffusion, is the key to successful moisture control. In their approach, the painted drywall, the framing members, and strategically placed gaskets function together as the air/vapor barrier. The folks at the University of Toronto who thought this up have tested several versions and are currently working with three tract builders in Ontario to build a number of demonstration units. For information, contact Joseph W. Lstiburek, P.E., Building Engineering Design Corp., 14 Whitehall Road, Toronto, Ontario, M4W 2C6 Canada. More on this when the results are in.

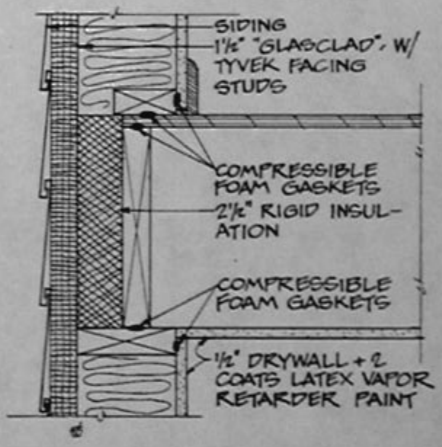

Figure 5. Researchers at the University of Toronto offer a fresh solution they feel is economical to the tract builder—the poly-less air/vapor barrier.