

Q&A

Q. LVLs Rotting in Crawlspaces

Many homes in the Dallas area are built on crawlspaces and use LVL beams. Most of these homes have dirt floors but are built to code with regard to crawlspace ventilation. In many cases, I'm finding that the engineered wood is rotting at the point where metal joist hangers are fastened to the LVL beam. Is this a problem in other parts of the country?

A. *Paul Fiset, director of building materials and wood technology at the University of Massachusetts Amherst and a JLC contributing editor, responds:* Like any wood that is neither treated nor naturally decay-resistant, an LVL — which is typically made of southern pine or Douglas fir — will rot when exposed to excessive levels of moisture. In this case, the problem isn't the engineered wood itself, but rather the conditions that the LVL beams are exposed to. You're probably seeing rot at metal-connector locations and not in other areas of the assembly because the metal

hangers are functioning as condensing surfaces and trapping moisture against the LVL beams. When the crawlspace air becomes saturated, condensation will form on the connectors first, creating the warm, wet environment that causes wood to rot.

To prevent this condensation, you need to lower the relative humidity in the crawlspace. The first step is to decouple the crawlspace from the damp soil. Whether the crawlspace is vented or unvented, it's critical to install a plastic ground cover over the soil. You can cover the plastic sheet with a layer of sand to hold the sheeting in place, which will also allow people to move around in the crawlspace without damaging the ground cover in the future. In addition, you should coat the below-grade sections of the crawlspace walls with a water-resistant, low-permeance material like Sto Watertight Coat (Sto Corp., 800/221-2397, www.stocorp.com) to slow moisture transfer through the wall.

Q. Insulating a Knee Wall

What's the best way to insulate a knee wall?

A. *Bruce Harley, technical director of Conservation Services Group in Westboro, Mass., and author of Insulate and Weatherize, responds:* In this notoriously leaky and difficult-to-insulate area, both the insulation and the air barrier must be continuous to prevent outside air from moving freely through the knee wall and into the rest

of the house. While fiberglass batt insulation is effective when installed properly, it won't stop air infiltration, regardless of how much is added to the knee-wall cavity. Without a continuous air barrier, outside air can enter through soffit vents, wash through insulation, and flow through joist bays (see illustration, next page, top).

While it's possible to insulate the knee wall and floor, I prefer to align the thermal boundary with the weather shell of the house by insulating the rafters, particularly if there's mechanical equipment, ductwork, or storage in the knee-wall space. Sprayed urethane foam can be used to provide both insulation and air barrier; note that vent chutes may be required by some codes before the foam is installed. Foam is expensive, but in remodeling jobs or where there is a lot of knee-wall area with dormers and other complex

GOT A QUESTION?

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geometry, the time and energy savings are well worth the investment.

Alternatively, after installing vent chutes and carefully insulating the rafters with properly sized fiberglass batts, a rigid or semirigid air barrier must be installed that is sealed from the top plate of the knee wall and down the rafters to the top plate of the first-floor exterior wall. You can make this air barrier using drywall or 1-inch rigid foam insulation, but I don't recommend using poly. The tricky part is notching around the floor joists; it's important to have a can of urethane foam or some caulking to seal this area carefully where the air barrier meets the floor framing (illustration, center). As a bonus, access doors into the conditioned space behind the knee wall won't need insulation or weather stripping.

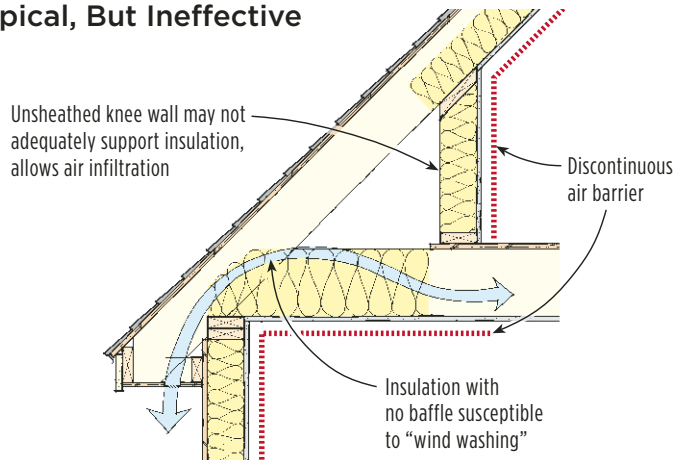
If you can't get at the underside of the rafters, or if creating a continuous air barrier would be impractical (for example, with truss roof framing), then you'll need to insulate the knee wall itself. In this case, after insulating the stud cavities with fiberglass batts, use 1-inch (minimum) rigid foam insulation to cover the back of the knee wall, which will prevent attic air from circulating around and through the insulation. Be sure to notch the rigid foam over the floor joists and run it all the way down to the drywall or plaster, or tuck separate 2-by or foam-board blocks between the joists to provide air stops in the joist bays, and seal all gaps with canned foam or caulking.

And, of course, insulate the floor of the space with plenty of loose-blown cellulose or two layers of fiberglass batts (illustration, bottom). Since the space behind the knee wall isn't conditioned, you should insulate and weatherstrip access doors.

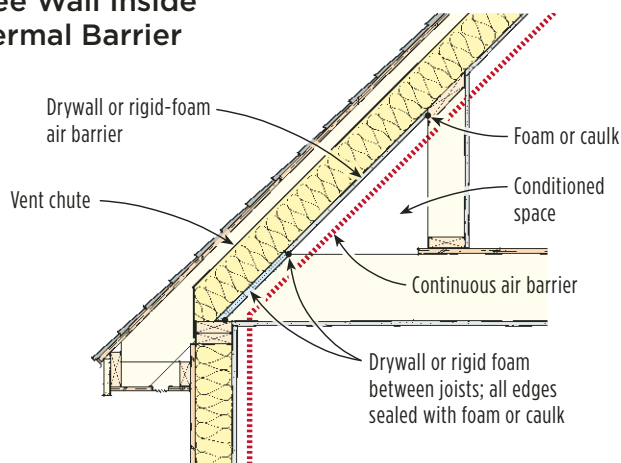
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Sealing a Knee Wall

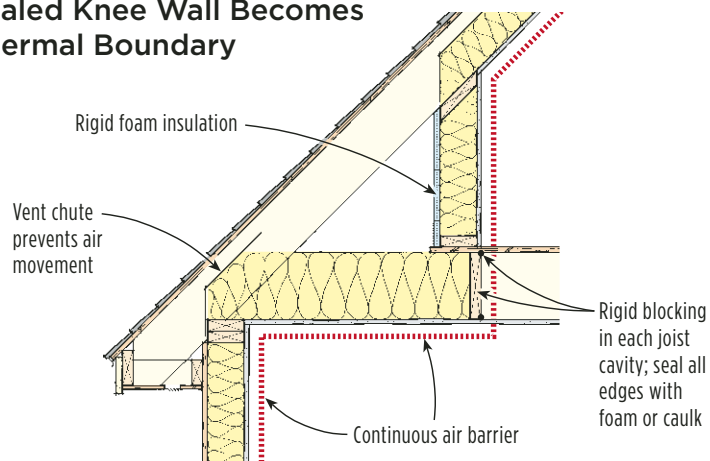
Typical, But Ineffective



Knee Wall Inside Thermal Barrier



Sealed Knee Wall Becomes Thermal Boundary



Q&A

Q. How to Tape a Knee Wall

As a remodeler, I've hung and taped my share of drywall on small jobs, but knee walls and sloped ceilings always give me a problem. I'm never able to get a really straight joint on these irregular inside corners. How do the pros do it?

A. *Myron Ferguson, a drywall contractor in Broadalbin, N.Y., and the author of Drywall: Professional Techniques for Walls and Ceilings, responds:* I'm not a framer, but the first thing I look at when I'm hanging drywall in these very conspicuous corners is the framing. If it's off, I first do a little shimming or floating over high spots along the edge. After hanging the drywall, it's sometimes necessary to prefill low areas with joint compound so that the seam is reasonably straight.

To tape the joint, I like to use a continuous piece of 3½- to 4-inch-wide paper tape, since I may have to conceal some gaps in the drywall and adjust the tape to get a straight line. Because I apply compound to both edges simultaneously, I like to work with a helper on longer walls, so that the compound doesn't start to dry before the tape is embedded.

After pressing the tape into place — but before it is embedded — I sight down along the corner as my helper makes adjustments to straighten the tape.

Finally, after embedding each edge, I sight down it yet again, making minor

adjustments as necessary (marking the center of the tape first with a pencil line helps make the sighting easier).

Several brands, such as No-Coat (Drywall Systems International, 888/662-6281, www.no-coat.com) and Strait-Flex (Strait-Flex International, 888/747-0220, www.straitflex.com) now offer special tapes that can be used on these difficult, off-angle inside corners. An interesting product I use a lot is Magic Corner (Trim-Tex, 800/874-2333, www.trim-tex.com). Made of vinyl with a rubber center, it's adjustable and easy to get straight, and it also acts as an expansion joint.

With all of these products, applying compound along the center isn't necessary — and with Magic Corner it's not recommended. As long as the tape is applied straight, it will finish straight, because only the edges are feathered in with joint compound.

Another good option I've used is Strait-Flex's X-Crack, an adjustable metal angle that attaches to the framing along the corner before the drywall is hung. The drywall is attached to the metal only along the corner, resulting in a straight corner that floats off the framing, so it's resistant to cracking.

By the way, some people recommend just scoring and folding — but not snapping — the drywall so that the two halves of the sheet bridge the angle. This technique, which doesn't require any taping if done right, can work okay on short walls, but it's not very strong. If the framing isn't perfect, the drywall

paper will tear or separate as the board is fastened near the angle. It's also difficult to position a larger piece of drywall without tearing the joint.

Q. Limits on Outlets

How many receptacles can I put on a 15-amp and a 20-amp circuit?

A. *Rex Cauldwell, a master electrician in Rocky Mount, Va.; the author of Wiring a House; and a frequent contributor to JLC, responds:* The electrical code places no limit on the number of receptacles you can put on either a 15-amp or a 20-amp general-use circuit in a residential situation. You could have 10 or you could have 1,000.

Practically speaking, it's not an issue, because the code requires that kitchen, bathroom, and utility-room receptacles be placed on individual branch circuits. Following minimum code, you could then put all the leftover rooms — living room, hall, bedrooms — together on one circuit. This is often the way it's done on low-bid jobs.

In commercial construction, however, the rules are a bit different: The limit is 10 receptacles on a 15-amp branch circuit and 13 receptacles on a 20-amp circuit.

Why the difference? In residential situations, it's assumed that all of the receptacles will not be used at the same time, while in a commercial setting they might be.