Drywood Termites

Q. *I work in and around Albuquerque, N.M. Do drywood termites cause trouble in this area? If so, what measures can one take to prevent damage?*

A. *Paul Fisette replies:* Drywood termites are present in New Mexico, and they can definitely cause trouble. They are found in a very narrow region along the southern fringe of the U.S., from California to Florida. Drywood termites do not live in the ground like the more well-known subterranean termites, and they don't multiply as fast. In the U.S., drywood termites cause far less damage than subterranean termites, but their ability to live in dry wood, without outside moisture or contact with the ground, makes them particularly troublesome. The destruction caused by drywood termites does not proceed rapidly, but over the course of many years they can completely destroy the timbers in a home.

Drywood termites are seldom seen and are difficult to detect. Signs of the presence of drywood termites include tiny termite fecal pellets and "kickout holes" in the wood, which are the size of a BB.

Drywood termites can be transplanted from one building to another in boxes, furniture, lumber, and other infested wooden objects. It is important to inspect lumber carefully before you build with it. Remove wood scraps, debris, old brush, and stumps from your building site. Keep exposed wood painted, since paint is a fairly good barrier to infestation by drywood termites. Even better, use treated wood where possible.

Pesticides can be used to get rid of existing drywood termites in a home. You can either spray the nests directly or fumigate the house, which is both very effective and very dangerous. However, reinfestation after fumigation is possible, since fumigation does not leave any residue behind. Spraying or fumigation should be left to a licensed exterminator. Call your state pest control office for a listing of licensed professionals.

Installing Fenceposts

Q. *I am installing a fence with pressure-treated 4x4 posts. Is there any advantage to installing a base of crushed stone at the bottom of the post hole? If I partially backfill around the post with concrete, will the concrete hold the fencepost more firmly, or will it encourage the fencepost to rot?*

A. *Paul Fisette responds:* In general, pressure treated wood will not rot. The chemical treatment is poison to the decay organisms that attack wood. Most treated wood is Southern pine, which is an easy-to-treat species. Although the chemical penetrates deeply into the wood during treatment, the heartwood is somewhat resistant to penetration. So if a 4x4 is cut from the central portion of the tree, the innermost core of the 4x4 may not be completely impregnated with chemical, so the core could rot.

I think that it is best not to set posts in concrete. Pouring concrete around the post may save time backfilling and tamping, but it will trap water around the post. This could lead to core rot, and may encourage carpenter ant infestation. Instead, backfill the post hole with free-draining soil or stones to encourage drainage. The best way to ensure that fence posts are firmly seated is to dig deep post holes.

Insulating a Cathedral Ceiling Under Metal Roofing

Q. *I need to insulate a cathedral ceiling that will be finished with tongue-and-groove pine paneling. The house has steel roofing installed over 1x3 purlins. There is no plywood roof sheathing. I'm concerned about possible condensation on the underside of the steel roofing, and I would like to know the best way to insulate this ceiling from the underside. Can I insulate with foam board insulation between the rafters? I intend to install a 6-mil poly vapor barrier under the ceiling boards.*

A. *Corresponding editor Henri de Marne responds:* Condensation on the underside of steel roofing is a common problem, so your concern is justified. Condensation above a cathedral ceiling can run down the poly vapor retarder until it finds its way through nail perforations in the ceiling, or enter the wall cavity at the base of the ceiling slope.

The best solution is to install the steel roofing over a solid deck covered with a water-shedding membrane like 30-pound asphalt felt. The felt should convey the liquid condensation all the way down to the drip-edge. To provide air flow above the sheathing, it would be preferable to have the roofing elevated above the deck on sleepers and purlins.

In your case, you are working from below after the roofing is installed, so the next best solution would be to have urethane foam insulation sprayed between the rafters. Since the insulation would seal all convective paths from the heated interior, it would effectively prevent condensation. The disadvantage of sprayed urethane is its relatively high cost.

It is possible to insulate from below, as you suggest, with rigid polystyrene insulation. First, nail 1x2s to the rafter sides, up against the roof strapping. This will provide an air space above the foam insulation, to improve ventilation on the underside of the metal roofing. Without an air space under the strapping to promote drying, condensation can cause the strapping to rot. Install the rigid insulation in lay-

ers, staggering the joints as much as possible. To prevent warm humid air from rising or condensation from trickling down, you must caulk each panel to the next, and to the rafters, as they are installed. Since rigid insulation shrinks slightly with time, use a quality polyurethane caulk.

Whatever insulation method you choose, you should install 6-mil poly on the warm side.

Finishing a Basement Wall

Q. *I would like to install insulation and drywall to finish off a poured-concrete basement wall. Although the basement is high and dry, with no signs of moisture problems, I'm still concerned about condensation. I'd like to know where to install the vapor barrier, if any, and whether there is any advantage to sealing the concrete wall with paint.*

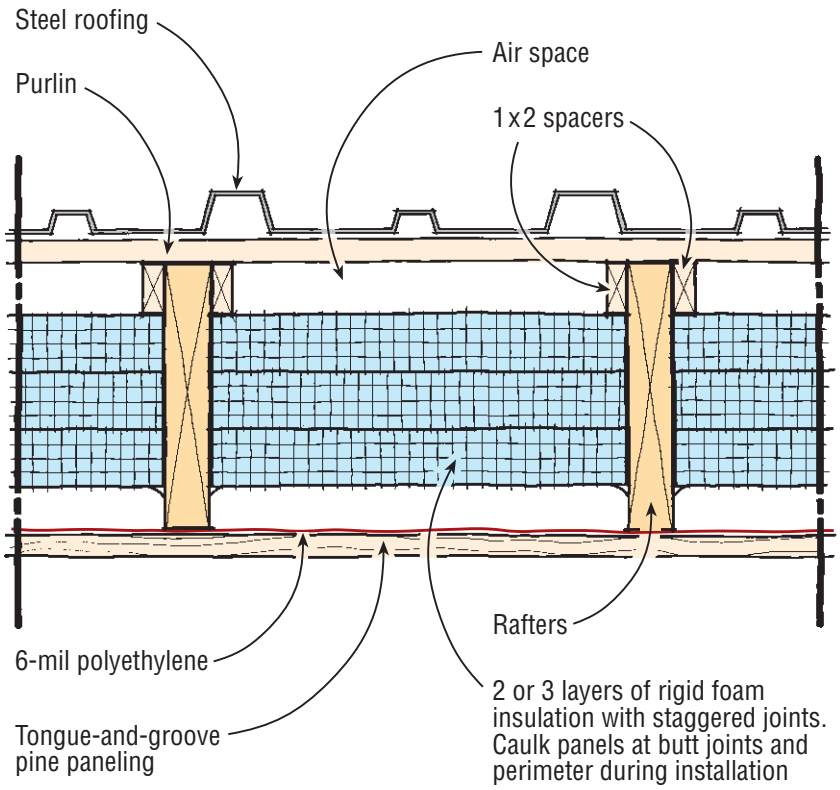
A. *Bill Rose, architect and building researcher at the University of Illinois Urbana-Champaign, responds:* Ideally, insulation should be installed on the exterior of your basement wall, but it is probably too late for that. If the soil at your site is very well drained and dry, then it is a fair thermal insulator, and (energy codes aside) you might consider omitting the drywall, and simply painting the interior walls with epoxy paint.

Assuming the client insists on interior insulation, there is no clear answer on the question of where to put a vapor barrier. Condensation usually occurs when moist air encounters a cold surface. You could argue for a vapor barrier on the inside of the insulation (assuming the foundation wall is cold), or on the foundation side of the insulation (assuming the foundation wall is wet). Chances are, the foundation is cold at the top and wet at the bottom. This situation leads to passionately held opinions on both sides of the issue.

Since interior basement insulation is susceptible to getting wet, the most important factor in choosing an insulation system is not where to put the vapor barrier, but how well the components can dry out. Although you claim your basement is high and dry, I think it would be wise to assume the possibility of a "water event" some time in the life of the house, and design accordingly. Recent research performed at the Canada Mortgage and Housing Corporation compared the drying ability of different types of basement insulation systems. The interior basement insulation system that performed best was spray polyurethane insulation covered by Dens-glass sheathing, closely followed by Owens Corning's Basement Wall Finishing System (consisting of removable panels made of rigid fiberglass insulation in a vinyl frame, covered with polyester fabric). The worst performing system, in terms of ability to dry out after wetting, consisted of wood studs, fiberglass batts, polyethylene, and drywall.

Of the two best-performing insulation systems, the one from Owens Corning is the easiest to install. These panels can be removed periodically to inspect for moisture problems, which is not possible with a conventional stud wall.

Insulating Beneath a Metal Roof



Does Wood Siding Need an Air Space Behind It?

Q. *I'm considering installing wood siding over a rain screen, but I'm unsure whether the potential benefits justify the extra expense. What is the real benefit of an air space behind wood siding?*

A. *Joe Lstiburek responds:* The main benefit of a rain screen is to increase moisture removal by creating a ventilated cladding. The ventilated cladding allows drying of both the siding (from the back surface) and the wall assembly (through the sheathing and building paper) into the air space behind the siding. Some sidings, including vinyl, aluminum, and brick veneer, are inherently self-ventilating. Other claddings, like wood siding, need help. In a rain-screen installation, the wood siding is installed over vertical battens. Alternatively, some installers vent clapboard siding by using wedges,

clips, or oval-headed ("bumpy") nails to separate the siding laps.

What is the real benefit? Well, is it a benefit for the siding not to rot, and the paint not to peel? Before the days of plywood, OSB, foam sheathings, cavity insulation, and interior poly vapor barriers, wet siding could dry towards the interior. Today's walls have low drying potential, due to the use of impermeable or semi-permeable sheathing, high levels of cavity insulation, and interior vapor barriers.

Finally, research has demonstrated that plastic housewraps and felt building papers can lose their water repellency when they are directly in contact with some types of wood siding, due to tannins and other extractives from the wood. Similar problems may occur due to contact with soaps, detergents, bleaches, dirt, dust, and paint. None of this is a problem when the siding is installed over an air space.

Joe Lstiburek is a principal of Building Science Corp. in Westford, Mass., and is author of the Builder's Field Guide *(available by calling 978/589-5100).*

Replacing Chimney Counterflashings

Q. *Whenever I need to replace chimney counterflashings, I seal the top of the flashing with Quickcrete, using a caulk gun. This product is made for concrete repairs, and comes in a tube. I know that some people will mix up a little mortar for this job, and others use silicone or urethane caulk. What is the best product to use?*

A. *Roofer Tom Brewer responds:* Mixing up mortar is time-consuming and messy. Since the mortar can shrink as it cures, you don't know how watertight the joint will be. Products installed with a caulk gun are much easier to install. When replacing chimney flashings, I usually use a polyurethane caulk. Silicone caulk and products like Quickcrete also adhere well to old masonry. Some people prefer products made for masonry, because they have texture. Whether you choose a product like Quickcrete or a caulk, using a caulk gun allows you to get the product into the tight spaces between the old masonry and new flashing, providing a solid, watertight seal and a clean, finished appearance.

Covering Up a Brick Fireplace

Q. *I am building an addition that will enclose the back side of an existing brick fireplace, which is now on the exterior of the building. Can 2x4 furring be attached directly to the brick?*

A. *Stephen Bushway, mason and venting system specialist, responds:* Unless the thickness of the chimney wall is at least 8 inches, most codes prohibit combustibles in direct contact with a chimney. The only exceptions are for pieces of wall trim and roof sheathing.

In the case of your addition, you will be creating an interior fireplace. In the area directly behind and around the firebox, all combustibles must be kept at least 2 inches away from the outside of the brick. Because of this requirement, in most cases the floor framing of the addition must also be kept at least 2 inches away from the chimney. This would be the case when the fireplace hearth is at the same level as the new floor, although not when the hearth is substantially higher than the floor level.

You can build a stud wall around the chimney. If the studs are wood, there must be a 2-inch space between the studs and the bricks. Because steel studs are noncombustible, they can be installed against or attached to the bricks, as long as there are no combustibles, including drywall, within 2 inches of the chimney. Instead of framing out around the masonry, one simple solution is to parge the chimney with a coat of stucco, or to screw cement backerboard directly to the chimney. The cement board can be finished with a skim coat of drywall compound. If stucco or cement board is installed on the chimney, the surface can be painted, but should never be wallpapered.

Finally, remember that your local code may have more stringent requirements than the 2-inch clearance required by BOCA. For example, diagram 3610.4.7a of the Massachusetts Building Code requires a 4-inch clearance, not a 2-inch clearance, between combustibles and the outside of the brick.

GOT A QUESTION? Send it to On the House, *JLC*, 186 Allen Brook Ln., Williston, VT 05495; or e-mail to *jlc@bginet.com*.