



Splicing Hips and Valleys

Q. Framers in our area typically splice long hip and valley rafters with the scarf joint shown in the illustration. Is this adequate to support the roof load?

A. Robert Randall responds: No, the scarf joint you show is not adequate to support typical roof loads on a hip or valley rafter. These members must be able to function as bending beams carrying substantial vertical loads.

Hip and valley rafters should never be compromised by such a weak splice. If splicing is required, secure a sister that runs at least four or five feet on either side of the joint. This splice should be capable of developing the full bending strength of a continuous member. Spike the overlapping piece together with plenty of well-placed nails, or better yet, with carriage bolts, as shown.

An even better alternative would be to use engineered lumber (such as Microlam LVL), which is available in the required lengths. Although this material will cost more, it will offset, at least in part, the labor cost of mak-

ing a splice. And the end result will be superior.

Robert Randall, P.E., is a structural engineer in Mohegan Lake, N.Y.

Insulated Waterline

Q. I currently work in a mountain region where the winter temperatures go well below freezing. Water lines are set 4 feet below grade. In this climate, how would you recommend bringing a water line through a crawlspace and into a house? Code here requires a ventilated crawlspace.

A. Felix Marti responds: We have had to deal with this exact situation. We work in a mountain region with elevations between 8,000 to 10,000 feet, and frost depths from 4 to 5 feet. We detail the pipe as follows, and so far we have not been called back to repair a burst waterline.

While the trench is open and the water line is being plumbed into the house, we insulate the pipe all the way to the bottom of the trench. There are

several pipe insulations available. We typically use Rubatex — a rubber-based, closed-cell foam insulation (Rubatex, 906 Adams, Bedford, VA 24523; 800/782-2839), or Owens-Corning SSL-2 fiberglass pipe insulation (Owens-Corning Fiberglas, Toledo, OH 43604; 419/248-8000). Then we slip PVC pipe over the insulated pipe, making sure that we leave at least an inch of air space between the pipe wall and the insulation. We extend this pipe from the subfloor down to the bottom of the trench, which is below frost depth.

The plastic conduit allows warm, below-grade air to rise, warming the insulated pipe in the crawlspace. In one case where we wanted added insurance, we installed a PVC elbow at the bottom of the stack and extended the plastic conduit back about 30 feet along the trench. Then, before backfilling, we laid 1-inch rigid foam on top of the PVC. In theory, the added length of conduit enhances the convection of ground-temperature air in the PVC stack.

For additional peace of mind, it would be a good idea to wrap the outside wall of the PVC sleeve within the crawlspace to keep the rising air from cooling the air in the pipe. However, we have not done this, and have not had any problems.

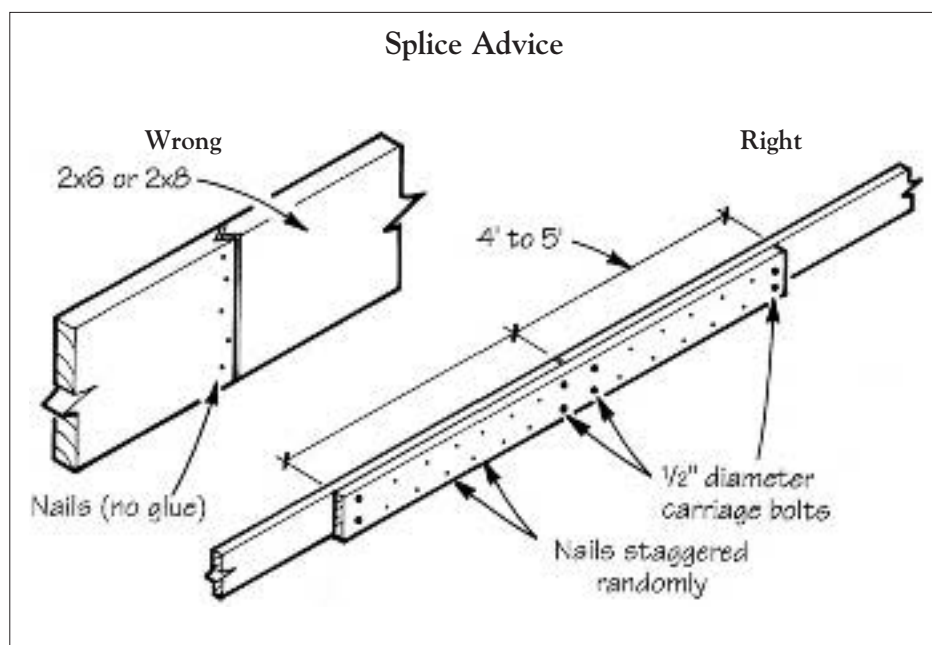
Felix Marti is a builder and remodeler in Ridgway, Colo.

Wiring in Stress-Skin Panels

Q. How is wiring accommodated in a house built with stress-skin panels? Is it possible to rout a channel in the panel to retrofit a wire?

A. Steve Andrews responds: Most manufactured panels have built-in electrical channels. These channels are typically 1-inch holes running through the center of the panel section, so they are well out of the way of drywall screws. They usually run horizontally 12 to 16 inches off the

Splice Advice



The simple scarf joint in question (left) is not adequate for splicing a hip or valley rafter. Splice hip or valley rafters with a sister (right, using plenty of nails and carriage bolts).

floor, or at about 44 inches (countertop height).

In addition to the horizontal runs, the panels have vertical channels. In some cases, these are placed in the center of the panels, so you have a rise for the wiring every 48 inches. In other cases, there is a notch behind the 2x4 spline that joins each panel. In either case, you have to drill a 1-inch hole through the plates as you set the panels. You then cut in switch and outlet boxes and fish your wires. Obviously, this process is more time-consuming than running wire in a conventionally framed home. And since fishing wire horizontally is so time-consuming and difficult (especially around corners), it's best to run more of the wiring in the floor cavity than you might ordinarily. In slab-on-grade homes, you have to run some wires as you set the panels, which lengthens the process even more.

For that occasional added light switch or outlet, you can rout a channel out, lay the wire in, and then foam it in place. Unless the panel has integral studs, never rout more than about 8 inches horizontally, or you'll destroy the strength of the panels' skin. Vertical runs should stop at least 14 inches from the top and bottom of the panel, which means you have to have a pretty long bit to finish the hole and drill through the plates.

When foaming the wires in, I typically bring the foam flush to the surface of the panel's skin. Later, this foamed-in channel will be covered by drywall. In the case of a retrofit, when the drywall is already up, leave the foam recessed, so you have room for mud to patch over the channel. To avoid a hassle with the code inspector, you have to rout at least a 1¹/₄-inch-deep channel (or, when drywall is up, at least 1³/₄-inch-deep), so drywall screws will not pierce the wire.

The bottom line with all these recommendations is *check with the manufacturer*. It may have a choice of options and specific guidelines for using its product. ■

Steve Andrews is the author of Foam Panels and Building Systems (published by Cutter Information Corp., Arlington, Mass.).

Got a question about a building or renovation project? Send it to On the House, JLC, RR#2, Box 146, Richmond, VT 05477.