Q&A

Q. Sawn vs. Plywood Shims

Ideally, pier/beam connections are always properly aligned, with the pier at the right elevation to fully support the beam above. But in the real world, a little shimming always seems to be required. Are shims ripped from framing lumber really adequate for supporting beams, or should I use plywood?

A. *Tim Garrison, a professional engineer, the president of ConstructionCalc.com, and the author of* Cracks, Sags, and Dimwits: Lessons to Build On, *responds:* Wood achieves its greatest compressive strength when it's oriented like a post, so that loads are applied parallel to grain and resisted by its long fibers.

But most shims are cut along the grain so that they don't fall apart; they receive compression loads perpendicular to grain, which tends to crush the wood fibers.

Or, to put it another way, Doug fir's allowable compression parallel to grain is around 1,500 psi; its allowable compression perpendicular to grain is around 625 psi.

Thus, the answer to your question depends a lot on how well the shim is cut. A 3.5-inch-square Doug fir shim at the top of a 4x4 post in a crawlspace can take approximately 7,656 pounds of load (625 x 3.5 x 3.5 = 7,656 pounds) as long as the shim seats perfectly. That's a lot of load — probably more than will ever be applied by a floor beam.

The rub comes, of course, when shims are not cut carefully and do not seat properly. Most shims are not perfect, uniformly thick wafers. They're wedges, hacked from a stray board by an overworked framer toting a worm drive. If such a shim, cut from a 2-by, is driven into the gap at the top of the same 4x4 post and bears on half its length and its complete width, the load capacity is only 1,640 pounds (625 x [3.5/2] x 1.5 = 1,640 pounds).

When this shim gets overloaded — during the annual Thanksgiving gathering, say — it will crush and the beam will settle a bit. Once the feast is over and the in-laws go home, the floor will either have a permanent dip (if the post was at a beam end) or be bouncy or squeaky (if the post was located midbeam).

Plywood may seem like a reasonable alternative, but its allowable stress perpendicular to grain is around 300 psi, making it only about half as strong as Doug fir for this purpose. Unless the loads are light and you are sure the shim is seated completely, I wouldn't recommend making shims from plywood.

Steel-plate shims are the best choice, provided they seat properly and are available in the right thickness. The allowable compressive stress for steel is on the order of 25,000 psi — far more than for any wood.

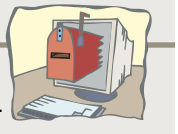
Q. Service-Entrance Cable Under a Garage

The proposed location for my client's new detached garage is right on top of a buried service-entrance cable. The electric meter is mounted on a pedestal about 100 feet from the house, and a conduit runs to the house through the area where the garage — which will have a stem-wall foundation and concrete slab floor — is to be located. The electric utility doesn't have a problem with the building's location because it is responsible for the line only as far as the meter. Is it okay to pour the foundation around the conduit so that it runs through the stem walls and underneath the new slab, or do the cable and conduit have to be rerouted around the foundation?

A. *Joe Tedesco, a licensed electrician, a certified electrical inspector, and the moderator of* JLC Online's *electrical forum, responds:* In general,

GOT A QUESTION?

Send it to Q&A, *JLC,* 186 Allen Brook Lane, Williston, VT 05495; or e-mail to jlc-editorial@hanleywood.com.



the NEC doesn't permit service-entrance conductors to pass through the interior of another building unless they are protected by brick or concrete, or a specially constructed vault.

But in your case, as long as the conductors are enclosed in conduit and are buried at least 18 inches below grade, the NEC would consider them to be outside the building (2005 NEC 230.6[4]).

In addition, the NEC considers these conductors to be outside of a building when covered by a concrete slab that measures at least 2 inches thick. So your existing service entrance is fine where it is, though it will make excavating the site and pouring the foundation a little trickier.

Q. Fast Fix for Dark Paneling

We recently completed the remodel of a 1970s relic complete with dark paneling and shag carpet. In some areas, the homeowner acquiesced and allowed us to apply new ½-inch drywall over the old paneling, while in other areas we simply painted over it. But is there a simpler approach that doesn't involve removing and reinstalling all the trim, or being left with those telltale vertical grooves?

A. *Tish Iorio, a member of the National Guild of Professional Paperhangers and the owner of Creative Endeavors in Annapolis, Md., responds:* As you learned, the fastest and most economical approach to dealing with old paneling is simply to paint it.

When clients just want to lighten up a paneled room, I suggest cleaning the walls well and painting the sections between the grooves two or more very subtle colors that are only two or three tones apart.

Another technique is to paint everything one color and then use a clear polyurethane over every other section, which provides a little variation and — thanks to the reflection the poly provides — better light in the room.

Yet another approach that will give you the look of new drywall — while sparing you the job of redoing the trim — is to use a bridging liner. These products are made of thick, usually nonwoven materials, so they can span minor imperfections; they can be used over paneling and other textured surfaces, including brick and block. Although several different companies make them, I have had good luck with material from Cavalier Wall Liner (800/221-5798, www.wallliner.com).

As with any wallcovering, proper prep work is key.

First, you have to be completely sure that there is no Murphy's oil soap, wax, nicotine, or other contaminants on the paneling, because nothing will stick permanently if there is. Washing with TSP (trisodium phosphate) is the best start; I like to use Dirtex (Savogran, 800/225-9872, www.savogran.com) because it leaves a little tooth.

Next, prime with a wallcovering primer and hang the bridging liner horizontally so that the seams don't fall on the paneling seams. When the walls are dry (typically after 24 hours), check for any voids or dips in the liner and fill them with joint compound where necessary. After a light sanding, you'll be ready to prime and topcoat.