



## Fibers in Slabs

by Henry Spies

### Can Fibers Replace Steel?

**Q.** Can polypropylene fiber additives (such as Fibermesh) be used instead of welded wire mesh in concrete slabs?

**A.** A lot depends upon what kind of reinforcement you need.

Polypropylene fibers can help reduce the initial shrinkage which occurs in concrete during the first two days of curing. But these fibers do not permit wider spacing of control joints over what is specified for unreinforced concrete. If the concrete does crack, the fibers will not hold the pieces in alignment as well as welded wire mesh. The fibers should not be counted on to resist stresses due to extreme temperature change or as a replacement for any steel  $\frac{1}{4}$  inch in diameter or larger.

Other fibers, such as nylon, alkali-resistant glass, and steel can provide significant gains in strength, but the mixes and applications should be carefully designed by an engineer.

### Fire Ratings for Engineered Lumber

**Q.** Do laminated veneer lumber (LVL) and wood I-beams have a lower fire rating than conventional wood framing members? If so, have the model codes addressed this?

**A.** Individual LVL members or wood I-beams won't resist fire as well as the solid wood members they replace. However, fire ratings are based on assemblies, not individual members. Several manufacturers of LVL and wood I-beams have obtained fire ratings on whole floor and ceiling assemblies by using their products with a Type X drywall facing the interior. For example, a one-hour fire-resistant ceiling assembly using TJI joists requires two layers of  $\frac{1}{2}$  inch Type X drywall applied to the bottom joist flange. A comparable one-hour assembly using solid-sawn joists requires one layer of  $\frac{3}{8}$  inch Type X drywall.

Since there are no "generic" wood I-beams (each is engineered to perform in specific ways) there is no generic assembly that achieves a certain fire rating. Each manufactured product and assembly must be approved after testing by a certified laboratory. Check with the manufacturer for each product you use. There are several small manufacturers whose volume does not justify the expense of obtaining a fire rating, and their products cannot be used where a fire rating is required.

### Do Termite Shields Work?

**Q.** Will termite shields actually deter the insects from entering a house?

**A.** Termite shields are breeders of false confidence. Termite shields do not prevent the entry of termites, but supposedly force the termites to build a tube around the shield, so their presence can be detected during an annual inspection.

According to conventional design, an effective termite shield is a piece of metal flashing that projects at least 2 inches below the woodwork on each side of the foundation, with the outer edge bent down at a 45-degree angle. All joints and openings, such as around anchor bolts, must be sealed. But because of porch and patio slabs, interior finished walls in basements, and other house details that interrupt the barrier, I have never found a house fully protected by termite shields. Soil poisoning is the only effective protection against subterranean termites I know of.

### Shrunken Headers

**Q.** Before closing in the walls on a recent job, we noticed that a  $\frac{3}{16}$ -inch gap had opened up between the jack stud and the header. Is this much shrinkage normal? How can we prevent this?

**A.** If you are using a solid header or one made up of 2x10s or 2x12s, the wood can shrink  $\frac{3}{8}$  inch across the grain as it dries from the 19% moisture content permitted in "dry" lumber to the 9% to 11% moisture content found in a heated house.

Undoubtedly, the header in question was well along that drying curve before the wall was closed.

The shrinkage can be reduced or prevented by using drier lumber for headers, preferably at about 12%. But lumber that dry may be difficult to find. Laminated veneer lumber beams are usually more stable than ordinary lumber. An alternative is to use a plywood box beam as a header, since plywood has already been dried and shrinks much less than solid stock.

The American Plywood Association (P.O. Box 11700, Tacoma, WA; 206/565-6600) publishes specifications for the design and fabrication of these beams in a technical bulletin called *Nailed Plywood and Lumber Beams*. ■

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