



Which Floor Bounces More?

by Henry Spies

Q. *Is a wood I-beam floor bouncier than one built with dimensional lumber?*

A. Wood I-beams are actually stiffer than dimensional lumber of a comparable size. But you have to distinguish between “bounce” and “vibration.” Because wood I-beams are lighter, they tend to vibrate more easily, giving the floor a hollow feel. This generally won’t be a problem if a drywall ceiling is installed below the floor. If the floor is open below, install strapping to the bottom of the joists on 6-foot centers to reduce the vibration.

To reduce bounce, select wood I-beams for an allowable deflection of 1:360, not 1:240. If you are building for a greater anticipated load than normal (a water bed, a grand piano), go to the next deeper joist than required by the design tables.

Another trick is to build in the china cabinet at or near a bearing wall, rather than out in the middle of a span. Nothing will convince a customer he has a bouncy floor more than the crystal in an overcrowded hutch ringing like the Bells of St. Mary’s.

Sagging Rafters

Q. *We are replacing a hip roof that has three layers of asphalt shingles over the original skip sheathing and shake roof. This load has caused the 14-foot common rafters to permanently sag about 2 1/2 inches at midspan. Now that we have stripped off the old roofing, can we simply replace the sheathing (shimmed straight in the center) and install a single layer of roofing? Or should the rafters be replaced?*

A. The sag is permanent due to creep of the wood fibers when overstressed. You don’t indicate the rafter spacing and size, but in a structure old enough to have four roofs, I would expect them to be full-size 2x4s on 16-inch centers. No current span tables would consider them adequate, although they obviously have not collapsed under a load much heavier than anticipated. Depending upon what your local code official will permit, you could sister the rafters with new 2x6s that are slightly shorter than the original rafters (10 or 12 feet, depending upon the location of the bow). The original rafters have plenty of strength near the ends, and the sistered 2x6s, once nailed tightly to the original rafters,

should provide adequate strength. The new members will also provide a good, straight nailing base for the new sheathing, and eliminate the need to shim up the old rafters. I also recommend refastening the rafters to the top plate with metal framing connectors, since the original toenails have probably slipped somewhat.

Rot at Exterior Windows

Q. *We often encounter rot at the ends of window jambs and exterior casings that abut sloping wood sills. What is the best way to detail this connection?*

A. Rot is a common problem on exterior window trim, especially brick molding. Not only is the trim exposed to rain and snow, but moisture from the interior often escapes between the window and the rough opening. This moisture condenses on the molding and rots it from the back. Brick molding should be back-primed before installation. Seal the ends of jambs and window casing with paint or varnish before installation. You could also set the ends into a bead of long-lasting caulk to keep the joint from trapping moisture.

Leaky Stone Foundation

Q. *I am working on an old house with a stone basement foundation. The foundation is sound, but leaks. What is the best way to repair this?*

A. It is possible to control many basement leaks with grading and drainage. The ground should slope away from the house, and gutters and downspouts should carry water away from the house. However, in many cases basement leaks come not just from surface water, but from ground water. In this case, the best solution is to excavate along the foundation and install a water-proofing membrane on the stone wall, and a footing drain to a sump drain or to daylight. Bed the drain in gravel, and backfill with a sandy, well-draining soil. Use a filter fabric over the gravel backfill around the footing drain to prevent fines from clogging the gravel and drain. ■

Henry Spies is a building consultant formerly with the Small Homes Council-Building Research Council of the University of Illinois. Questions should be sent to him at JLC, RR #2, Box 146, Richmond, VT 05477.