

QUESTION & ANSWER

Splices in Built-Up Beams

Q I've been asked to repair a built-up beam where a splice is not over a bearing point. How can I do this?

A Glenn Mathewson, a certified Master Code Professional, Combination Inspector, and former deck builder, responds: It sounds like you understand that all beam splices must be over bearing points. Section R502.6 of the 2006 International Residential Code (IRC) specifies “the ends of each joist, beam or girder shall have not less than 1.5 inches of bearing on wood or metal ...” Fortunately, this does not mean you have to get out the chainsaw and tear the job down.

The first consideration is whether the beam can make the span with only the remaining plies. Section 502.10, “Framing of openings,” allows a single header to carry other joists when the span is 4 feet or less and the header is the same dimension as the joists it carries. While this section applies to header beams at floor openings, the concept is the same: a spanning member carrying other members. If you're lucky — that is, the problem beam is 4 feet or less in length and one ply is fully supported on both ends — you can simply write off the spliced ply.

Another option would be to install an additional ply to the side of the beam that's fully spanning; you may need to increase the post size so the new ply will have full bearing at the ends. If you have to install the new ply on the side with the bad splice, the fasteners must extend through the spliced ply and into the full-length ply. A 16D nail wouldn't be



The span called for a three-ply beam, but the carpenter installed only one continuous ply (top). The engineered solution was to add a 1/4-inch flitch plate with twelve 1/2-inch through-bolts (above).

long enough to make this shear connection, but through-bolts or lag-bolts would be both long and stout enough. As always, you should check with your local inspector before doing the work.

If the above ideas aren't feasible, you need to consult a licensed design professional — an engineer or, in some states, an architect. An engineered repair could be as simple as a report stating “no repair required.” It may also be as easy as installing a strap across the splice and near the bottom edge of the ply, carrying the

tension the bottom of the beam is under. Larger mistakes, however — like the beam shown in the top photo — may require a more involved repair. In this case, as can be seen in the bottom photo, a 1/4-inch steel flitch plate was required to be installed on one side, with a dozen 1/2-inch through-bolts — not fun or pretty!

Any construction design or method that isn't prescribed specifically in the governing code — including engineered designs — is considered an “alternative” and must be approved by the local building official.

QUESTION & ANSWER

Priming a Porch in the Winter

Q I finished up a porch floor made from 5/4 x 4 tongue-and-groove fir just before it turned cold. I did prime the edges and bottom before installation, but the top is bare wood. Now, it's too cold to paint outside. I'm concerned about damage to the unpainted wood over the winter, from water and from people walking on it. What are my options?

A Andy Engel, editor of *Professional Deck Builder*, responds: If possible, you should at least get a primer on the wood. I prefer alkyd (oil-based) primers, as they take longer to dry and so have more time to penetrate the wood. Also, alkyd primers can generally be used in colder weather than latex primers. However, you should use the primer recommended by the manufacturer of the finish paint you'll use.

Depending on the outside temperature, the volume of the porch, and how many Btus you have at hand, you could enclose the porch with tarps and warm it enough to paint. This will take a day or so, as both the air and wood temperatures must be within the paint manufacturer's

specifications.

The best way to heat the tarped porch would be to open the windows and doors to the house, but the homeowner might object to the smell of paint. The chief alternatives — unvented kerosene or propane construction heaters — pump a lot of water into the air, which can affect the paint's drying. Also, it's likely that condensation would drip onto your new paint.

Another solution would be electric heat or a vented combustion heater. But with any open flame or electric heater, you should not use alkyd paint, as it and its fumes are combustible.

Bare wood that's exposed to the sun for as little as two weeks begins to lose its ability to hold paint. Wood is composed of two main parts — the cellulose fibers and the lignins that hold these fibers together. Ultraviolet light from the sun degrades the lignins, so those on the surface lose the ability to hold the cellulose together.

Since paint sticks to the top layer of cellulose, the paint is doomed to fail if that cellulose isn't adhered to the layers below. The only solution is

to sand the wood. The USDA Forest Products Laboratory recommends 60- to 80-grit paper to provide the best tooth for paint adhesion.

Before painting, you should check the moisture level of the wood because paint won't adhere to saturated wood. Use a moisture meter (they cost around \$100, which is cheaper than a failed paint job). Inherently stable woods such as cedar, redwood, and vertical-grain fir can be painted if they're at 19 percent moisture content or less. Less stable woods, such as standard pressure-treated southern yellow pine, should be closer to 15 percent.

One potential problem with applying heat from above is you'll drive moisture downward, which may peel the primer from the underside. Generally speaking, moisture moves from warm to cold and from wet to dry. If the floor's moisture content is high — say, above the fiber saturation point of 22 percent to 25 percent — be gentle with the heat. Don't suddenly warm the space to 80 degrees. Put a dehumidifier in the tarped-off porch and gradually increase the warmth over the course of a few days.

Uniform Stairs

Q If a stair is interrupted by a landing, do the dimensions of rises and runs on the lower part of the stair need to be the same as those on the part of the stair above the landing?

A Glenn Mathewson, a certified Master Code Professional, Combination Inspector, and former deck builder, responds: The 2006 International Residential Code (IRC),

section R311.5.3, requires that stair riser heights be uniform, with a maximum 3/8-inch variation from the tallest riser to the shortest riser in any flight of stairs. Likewise, the greatest and least tread run and nosing-projection must also be uniform, with a maximum 3/8-inch variation.

Without this uniformity, trips and falls are more likely, because we get used to a certain rhythm and expect the next tread to be in about the

same place as the previous ones.

The answer to the question is dependent on how a flight of stairs is defined. There's no definition for stairs in IRC chapter two, "Definitions." However, section R201.3, "Terms defined in other codes," specifies that when a term is not defined in this code, the user may look to other international codes for a definition.

The International Building Code (IBC) defines a stair as "a change in

QUESTION & ANSWER

elevation, consisting of one or more risers.” It defines a stairway as “all stairs and landings required to create an uninterrupted pathway from one level to another level.” Based on these definitions and the specific use of the word *stairs* rather than *stairway* in the section discussing stair uniformity, one can conclude that riser and run dimensions can indeed change after interruption by a landing.

Historically, it’s been accepted that a landing disrupts a person’s rhythm, allowing the mind and body to begin a new rhythm when setting out on the next flight of stairs. Keep in mind, though, that the code is only the minimum standard. While it may not be required, it’s still a good idea to maintain uniformity within a complete stairway for the comfort and safety of the user.

As with all code questions, always consult the local authority or review the locally adopted code. While the IRC may be the most widely adopted model code in the nation, it is often amended or customized prior to adoption. Unfortunately, code enforcement in the U.S. still varies in uniformity much more than a set of stairs! ♦

GOT A QUESTION FOR OUR EXPERTS?

Send it to

Professional Deck Builder,

186 Allen Brook Lane,

Williston, VT 05495;

or e-mail it to

prodeck@hanleywood.com.