

READERS' TIPS

Best techniques from the field



Rethinking Joist Layout

by Mark Dawson

When I lay out joists for a deck (since there is no insulation involved), I space them just under 16 or 24 inches on-center. The ends of deck boards are frequently cracked or checked, and the slightly closer joist spacing allows me to trim those bad ends off efficiently.

Most of the time, I simply lay out the joists $\frac{1}{8}$ inch less than whatever the normal spacing would be, no sophisticated math required. By using $15\frac{7}{8}$ -inch-o.c. spacing, you gain $\frac{3}{4}$ inch every 8 feet, and $\frac{1}{2}$ inch every 8 feet when using $23\frac{7}{8}$ -inch-o.c. spacing—just enough to get rid of any bunged-up or out-of-square ends. The important thing to remember is to lay out the center of the joists from the ends of the deck boards

themselves, including any overhang, rather than from the rim joist or fascia.

There are times, however, when I want all the joists—or, more typically, the exposed rafters on a porch—to be evenly spaced, similar to balusters. In those cases, I measure the entire length to be covered, including overhangs, then divide that length by the standard o.c. joist spacing for the material being used. For instance, if I'm covering a 26-foot-7-inch deck with 2-by-cedar decking, and I want just under 24-inch-o.c. spacing, I divide 319 inches by 24 = 13.29, or $13\frac{1}{4}$ spaces. I divide the total length by 14, so my joist spacing will be less than 24 inches o.c.: $319 / 14 = 22.785$, or slightly more than $22\frac{3}{4}$ inches o.c.

Decimal-to-fraction conversion can get a little tricky. I use a scientific calculator with a plus/equals function to lay out the joists (but not a Construction Master, which in rounding off would yield an accumulation of error). I know all the decimal equivalents of an inch to within $\frac{1}{32}$, so my layout will stay essentially perfect, with no one joist off by more than $\frac{1}{32}$ inch. In this example, the center of my first joist is slightly more than $22\frac{3}{4}$ inches from the end of my deck boards. I do the layout like this: $22.785 + 22.785 = 45.57$ (or $45\frac{9}{16}$ inches) + $22.785 = 68.35$ (or slightly less than $68\frac{3}{8}$ inches) + $22.785 = 91.14$ (or slightly more than $91\frac{1}{8}$ inches), and so on.

With a little practice, converting decimal parts of an inch to fractions like eighths and sixteenths is pretty easy. Being able to do that also comes in handy in figuring baluster spacing, which can baffle even experienced carpenters. For this second, more mathematical method, I give credit to Ken Todd, whose book *Carpentry Layout* (Craftsman Books, 1988) unlocked the “secret” of figuring spacing layout for me, and to Marshall Gross, whose book *Roof Framing* (Craftsman Books, 1984) taught me how to use a scientific calculator for construction. ♦

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