

BY GREG AND SUE BURNET

Stair Stringers: Calculation and Layout

Stairs probably impact occupant safety more than any other construction element that carpenters are responsible for. At some point, we've all stumbled on stairs that weren't laid out correctly. Yet this basic element found in practically every structure causes more head scratching than just about anything else.

The building code (IRC, R311.7 Stairways) is strict regarding stair layout and includes minimum tread depth (10 inches), maximum riser height ($7\frac{3}{4}$ inches in IRC, but this can vary by state), maximum variance between

riser heights (typically $\frac{3}{16}$ inch) in a given stairway, and more. Much has been written about stair construction and codes. In this article, we share some guidelines and tips for both calculating (see illustration, below) and laying out (see page 12) a safe set of stairs, gleaned from the scores of stairways we've laid out over the years.

Greg and Sue Burnet are co-owners of Toolbelt Productions (toolbeltproductions.com), an education and training firm for the building industry.

Calculating Rise and Run for Stairs

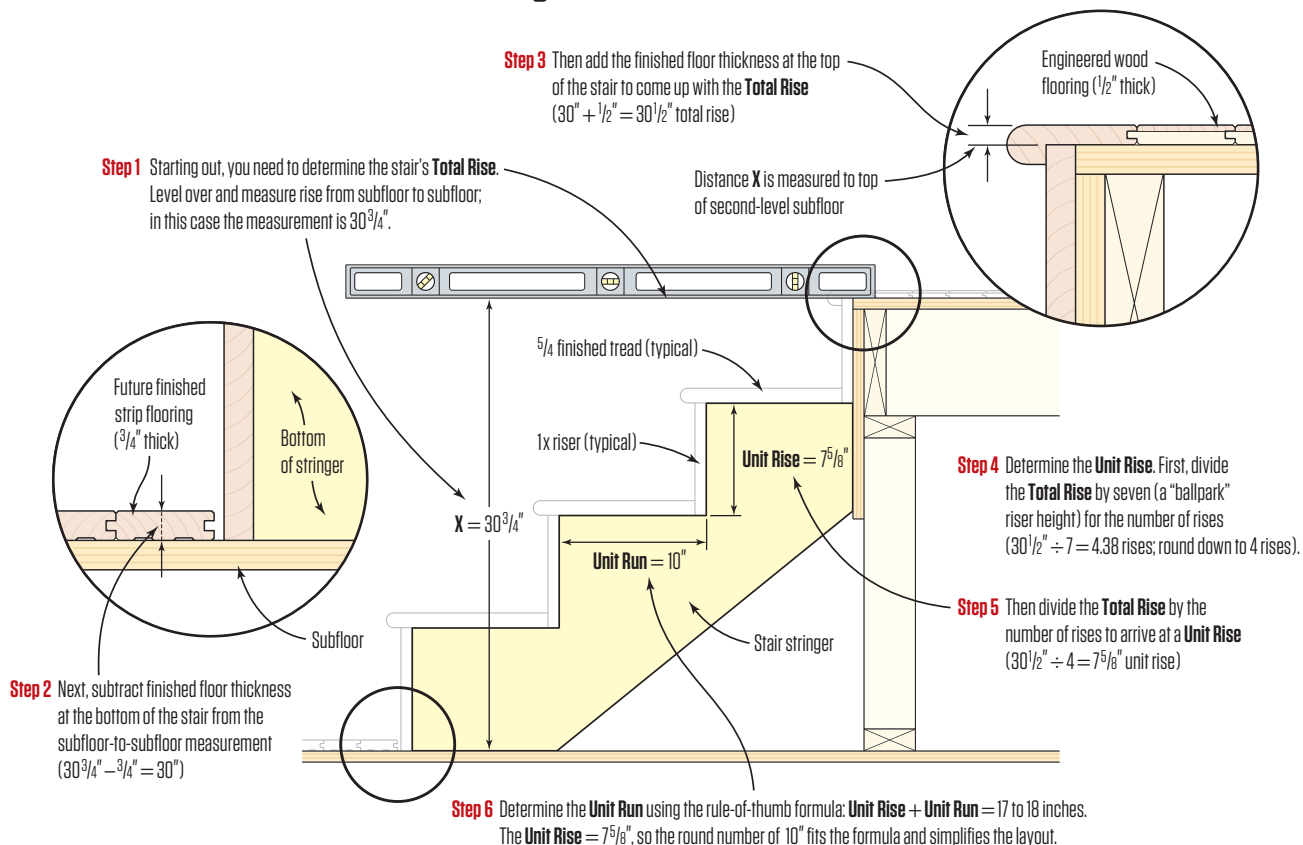
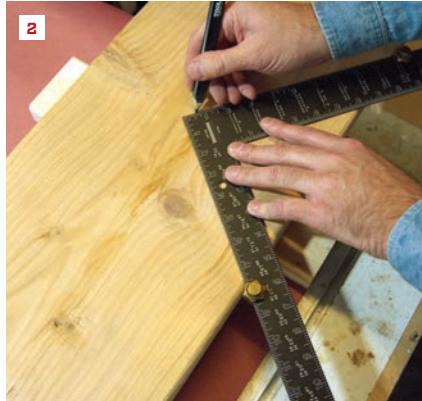
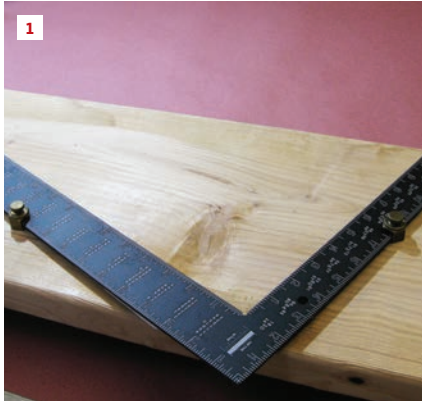


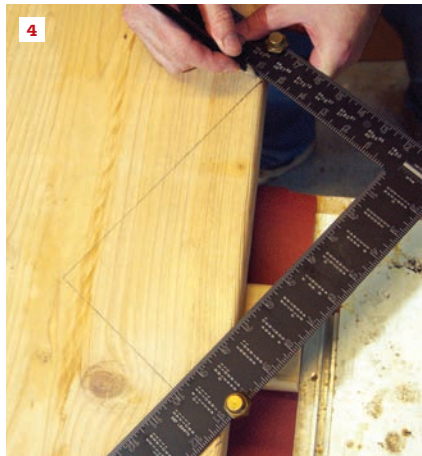
Illustration by Tim Healey; photos by Sue Burnet



Laying Out Stair Stringers

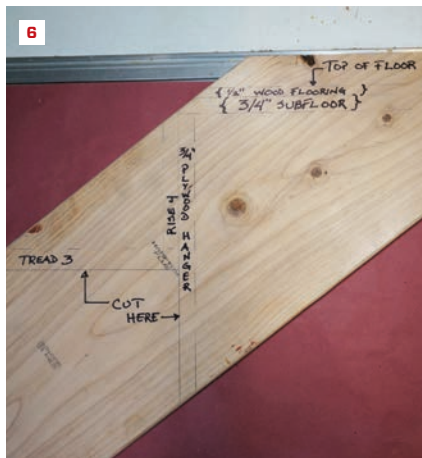
A stringer is basically a full-scale elevation of the stairway. After determining the rise and run, along with the number of rises, attach stair gauges to a framing square at the proper measurements—in this case, $7\frac{5}{8}$ rise and 10 run **(1)**.

Place the square with the attached gauges against the edge of the stringer and trace the rise and run **(2)**. A tick mark in line with the measurement helps to align the next step.



Continue moving the square up the side of the stringer and tracing the steps until you have marked the proper number of rises—in this case, four **(3)**.

If the stops don't hit the lumber for the bottom rise, flip the square over to draw it in **(4)**. Then place your square on the stringer without the stops and square over the bottom line of the bottom rise. Do the same to lay out the top line of the uppermost rise.



Draw in all of the details for the bottom of the stair, including the tread and riser materials and flooring, both existing and planned **(5)**. If you don't know whether the stairs are going in before or after the finished floor, label both options clearly.

Do the same at the top of the stairs, including the subfloor and finished flooring **(6)**. Don't forget to include the hanger material at the top step. Double-check the rise and run measurements from the finished floor to the top tread, and clearly label the cut lines.



For more information on calculating and laying out stair stringers, go to www.jlconline.com/training-the-trades/framing/stairs.