

Rock-Solid Deck Stairs

A simple solution to framing new stairs to an out-of-level, 100-year-old patio

BY KEVIN MANNING

Historic remodels often present challenges that involve plumb, square, and level. On this house, floors and ceilings were out of level up to 4 in. in some areas. When adding a new deck to the back of the house, we also encountered similar issues typical of a home that's over 100 years old—for example, the visibly sloping brick patio where the stairs would land.

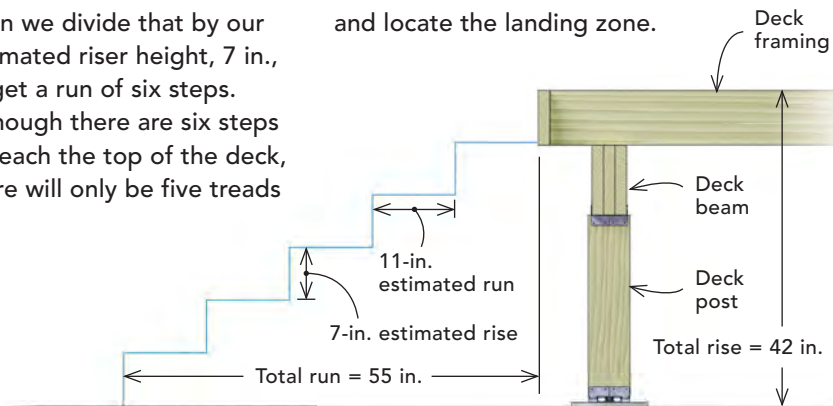
Typically, leveling the landing zone would be a straightforward process: Pull up some bricks, pour a level pad, then reintegrate bricks around the pad. But the clients didn't want to disturb the historic, moss-covered patio—they wanted the stairs to land on the bricks as if they had always been there. For us, that meant incorporating the slope into our stringer calculation during framing. □

Kevin Manning is project manager for Roof Services in Deer Park, N.Y. Photos by Colin Russell.

DETERMINE THE RISE AND RUN

To locate where the stringers will land, we make an initial calculation based off a central stringer position at the deck frame. Measuring from the top of the frame to the grade below, we establish a rise of 42 in. Then we divide that by our estimated riser height, 7 in., to get a run of six steps. Although there are six steps to reach the top of the deck, there will only be five treads

because the rim joist acts as the top riser. To determine how far out the stringers will project, we multiply five treads by 11 in., our estimated tread depth, to get 55 in. At that location we can measure the overall rise and locate the landing zone.

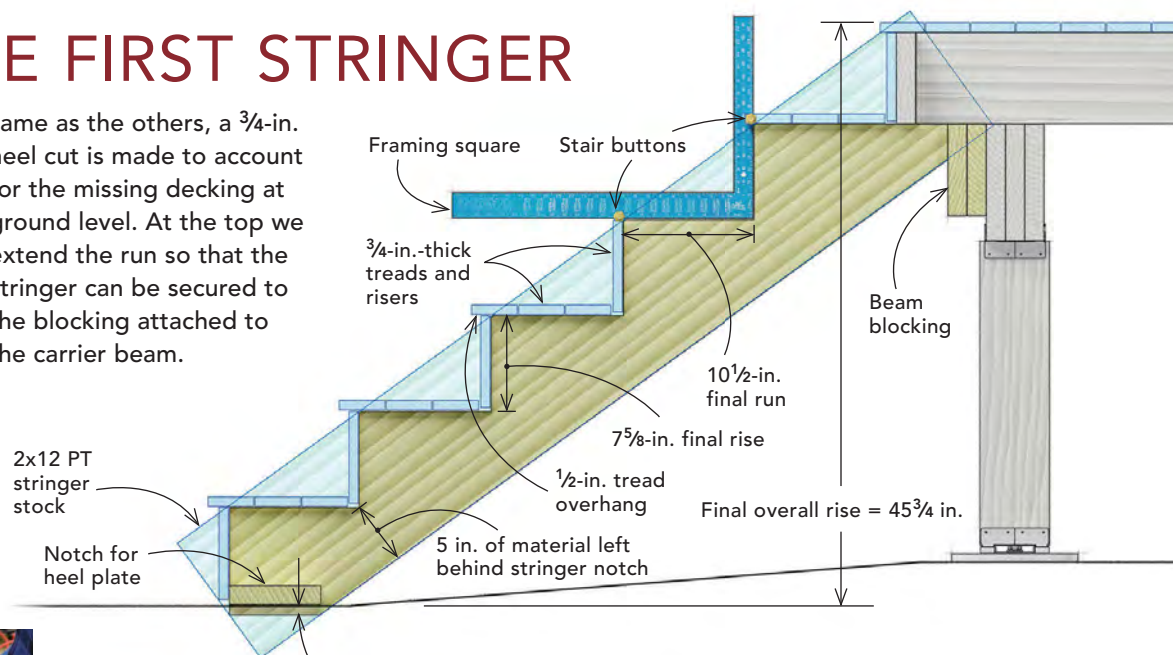


Find the overall rise. At a central location across the deck frame, we used a level to extend the deck height outward 55 in. At this point we found the grade 3 in. lower than at the edge of the 42-in.-high deck frame, for an overall rise of 45 in.

LAY OUT THE FIRST STRINGER

The total rise is the distance from the patio surface to the deck, so we add the decking thickness, $\frac{3}{4}$ in., to our overall rise, 45 in., and divide by six steps. This results in a final riser height of $7\frac{5}{8}$ in. For the run, the 11-in. treads will have a $\frac{1}{2}$ -in. overhang, so the stringer's tread depth will be marked and cut at 10 $\frac{1}{2}$ in. Except for the bottom landing, every tread has $\frac{3}{4}$ -in. decking; to keep the rise at the bottom the

same as the others, a $\frac{3}{4}$ -in. heel cut is made to account for the missing decking at ground level. At the top we extend the run so that the stringer can be secured to the blocking attached to the carrier beam.



A heel cut, equal to the thickness of one stair tread, is made after layout but before cutting the notch for the heel plate.



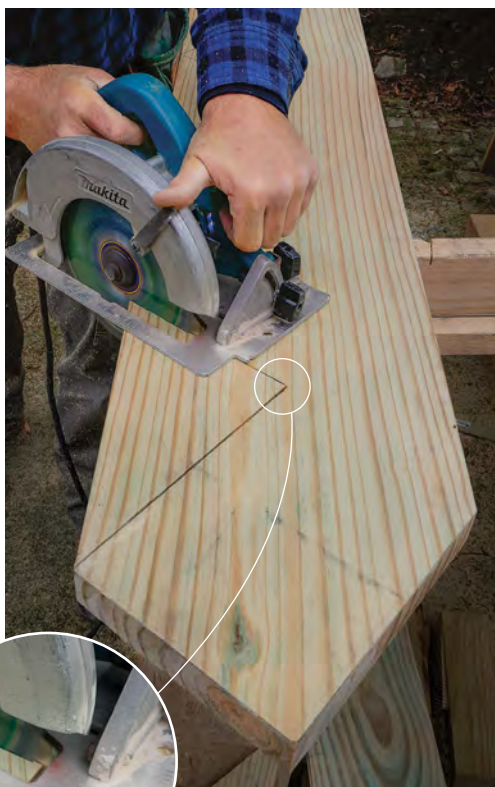
Buttressed in. Stair buttons fastened to a framing square at the rise and run dimensions make accurate layout a breeze.



Squared off at the top and bottom. The bottom of the stringer is squared off at the riser height before the heel cut is marked. The run at the top of the stringer is extended to reach the blocking on the carrier beam.

CUT THE FIRST STRINGER

When it comes to cutting stringers, being precise is a time-saver later. This deck will be wrapped in mahogany hardwood, so to get the finished details right, we need to spend less time battling framing. When cutting stringers, we make initial cuts right up to the line with a circular saw, and complete the cuts with a jigsaw. We use the first stringer as a template for the remaining stringers. We leave the heel cuts for last so that there's enough material to dial them in one at a time to compensate for the patio's slope from left to right.



FIT THE FIRST STRINGER



Use the first stringer as a template. Align the straight edge of the template to the new stock, and hold it firmly in position. Use a sharp pencil to transfer the layout.



Cut the heel and check the fit. The first heel cut matches the thickness of the decking. Make the cut, then position the stringer so that it's tight against the carrier beam and snug to the band joist above. Use a torpedo level to ensure treads are level.



Notch the heel to fit the plate. Use a circular saw followed by a jigsaw to cut an accurate notch for receiving the 2x10 plate that will tie the assembly together. Dry fit both pieces, and check that the treads are still level.



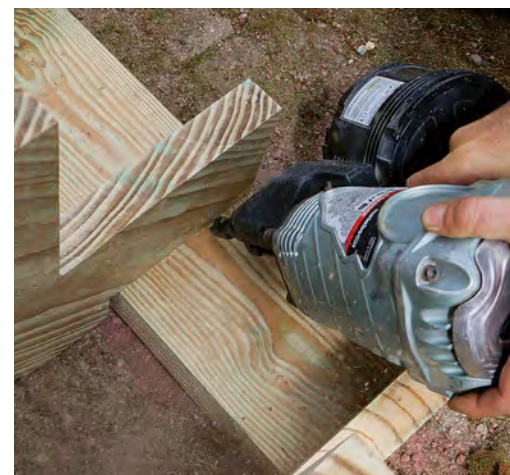


DIAL IN THE HEEL CUTS

Now that the first stringer is fit, we can address the out-of-level base. All we need to do is find the riser height for the first step of each stringer so we can trim the stringers individually. Because the patio slopes from left to right, that means we'll be taking more material off on the left and less on the right.



Incorporate the slope. Extend a level across the first step of the first stringer. Measure the distance to the plate at the location of each additional stringer, add the plate thickness, and cut the heel before notching for the heel plate.



Toenail in place. Position and toenail the stringers into the carrier beam to hold each in position. Then toenail the heel of the stringer to the bottom plate.

Secure the stringers to the frame. Fasten the stringers to the blocking attached to the carrier beam using structural connectors and compatible screws to make the final connection.



Lock down the heel plate. Use a mason's bit to drill holes through the plate and into the brick. Then drive concrete screws, two between each stringer, to lock the plate into position.