Q How do I waterproof the shingled roof of a framed addition where it meets an existing wall of a log home?

A Robert W. Chambers, a consultant and log-home construction specialist, responds: The new roof of the addition will have step-flashing, installed in the typical fashion with a piece of metal flashing added as each course of shingles is put down. But the step flashing itself does not attach to the log building. After the addition roof is completed, counterflashing attaches to the existing wall of the log building, overlapping the step flashings by at least 2 inches. The height of the step flashing and counterflashing depends in part on whether future log-wall settling is expected (more on that later).

To install the counterflashing, cut a kerf, or reglet, into the logs to capture the top part of the counterflashing. The reglet needs to be deep enough to completely bridge the "valleys" between the logs, and be cut with a slope of at least 30 degrees for drainage. The best way to cut the reglet is with a circular saw, using a straight edge to guide the cut. If the reglet is not straight, sliding the counterflashing into it could be problematic. If the space is too tight for a circular saw, an oscillating multi-tool with semi-circular blade might work.

The counterflashing tucks into the reglet and stays in place by friction, with no pins or nails needed for attachment. The vertical leg of the counterflashing should sit snugly against the step flashing (but not be attached to it in any way). The counterflashing may be caulked to the reglet, but do not use caulk where the step flashing and counterflashing meet.

Log homes take up to five years for the logs to reach the equilibrium moisture content for local humidity

Roof-to-Log Wall Flashing

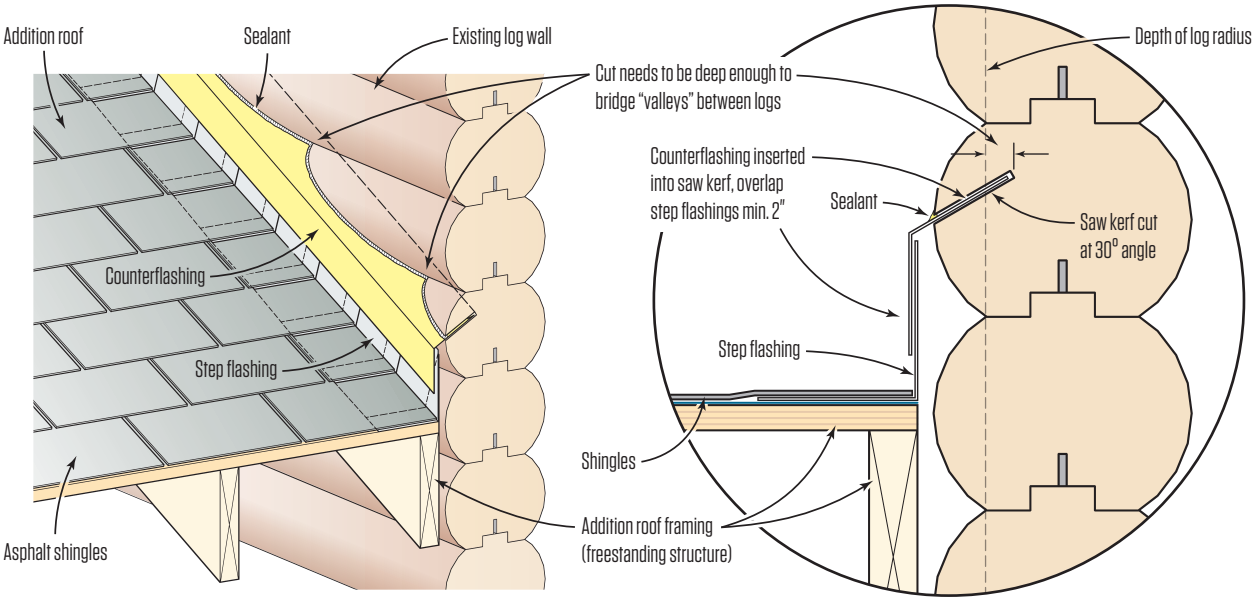


Illustration by Tim Healey

conditions. Up to that point, the logs will settle or shrink dramatically—6% is the industry standard, which means that a 9-foot wall will settle as much as 6 1/2 inches! Your conventionally framed addition will shrink very little by comparison. So if the log home you're adding on to is more than five years old, you shouldn't have to worry.

If the log home is less than five years old, then you must leave a gap between the bottom of the counterflashing and the new roof that is at least as big as the settling that is still expected. You will need to work out the dimensions of the flashing to maintain the 2-inch overlap when you install it, but still have room for the bottom edge of the counterflashing as it settles closer to the addition roof over time.

If settling is expected, the addition should not be attached to the log building, unless you allow for unrestricted movement of the log building. It is safer to build the addition as a freestanding structure, holding the addition structure away from the logs by several inches. And be aware of any protruding parts of the logs such as knots that may move down and interfere with the addition as the log structure settles.

If you've never worked with a log home before, or if you are unsure about the settling that may occur, I'd recommend consulting with a log-home specialist in your area. Also, there are a couple of good publications that can help you better understand the dynamics of log home construction: *Effective Practices & Methods for Log Home Construction*, available through the International Log Builder's Association, logassociation.org, and *Log Construction Manual*, available at logbuilding.org.

Q The stair layout method described in *Training the Trades* (Apr/17) was great, but what do you do when the rise turns out to be an odd fraction?

A Greg Burnet, author of *Training the Trades* and a remodeling contractor from Chicago, Ill., responds: We used a fairly simple example in the column on purpose, but in reality, the rise calculation rarely works out to a nice, even fraction. For more complex situations, I break out my Construction Master calculator. I go through the same initial steps as described in the article, but then double-check my calculations by multiplying the rise dimension that the calculator arrived at by the number of rises.

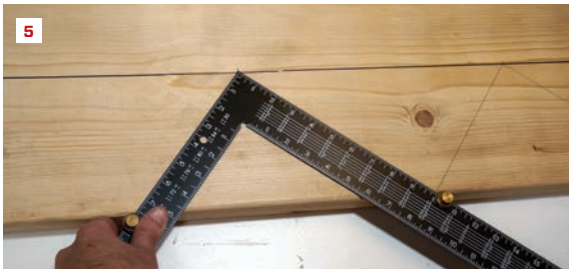
This figure hardly ever exactly matches the actual overall rise that I started with. Why? Because the Imperial measurement system that we use in this country is based on units of sixteenths and thirty-seconds and their multiples, and quite often these fractions are not equally divisible by what are essentially odd numbers. As a result, the calculator rounds up or down slightly, providing an approximate rise. The difference is then averaged between all the rises.

In some cases, this "close enough" method may be perfectly acceptable, but if I am doing fine finish work on the stairs, those differences may compound and require me to custom-cut all the finish pieces. Instead, I prefer to go a step further in the calculations.

So let's say that the overall rise is 30 11/16 inches and I have four rises. Turning to the construction calculator, I enter the overall rise measurement and divide it by the number of rises (see calculation

After setting rise and run stair gauges, place a square against the board and mark the heel **(1)**. Adjust a combination square to that measurement **(2)** and use it to scribe a line down the board at that distance **(3)**.

Photos by Sue Burnet



Determine Unit Rise

Total Rise (30 11/16") ÷ number of rises (4) = **Unit Rise** of 7 11/16" (or 7.671875)

Determine Unit Diagonals

On the Construction Master, punch in the following sequence:

7 [Inch] 11 [/] 16 [Rise] 10 [Run] [Diag] = 12 5/8" **Unit Diagonal**

Then hit [+] [=] = 25 3/16" [=] = 37 13/16" (remaining **Unit Diagonals**)

sequence, below left). I enter the result (7.671875) as "Rise," and the Run (10), and then press the "Diagonal" key. This number (a hair less than 12 5/8 inches) is the hypotenuse of each tread-riser combination. With the number still displayed, I press the "+" key, then the "=" key, and so on, to calculate the number for each diagonal tread-riser location: 12 5/8 inches, 25 3/16 inches, 37 13/16 inches.

The calculator stores the leftover tiny fraction and rounds up or down accordingly. I have my calculator set to 1/16 inch, so these numbers are all rounded to the nearest sixteenth. This method works because it averages the weird little fractions to the closest sixteenth without creating accumulating errors. I write down these numbers as "Unit Diagonals."

After setting up the square with gauges at the rise and run locations, I place the square against the stringer stock and mark the heel (the intersection of the tongue and body) **(1)**. I adjust a combination square to the heel mark **(2)** and use it to scribe a line along the length of the board **(3)**. Then I hook my tape measure on what will be the lower portion of the stringer and make tick marks at the Unit Diagonal measurements along this line **(4)**. To lay out the steps, I slide the square along the edge of the stock until the heel intersects each tick mark, and then I strike the tread and riser lines at each location **(5)**. The layout now should accurately reflect the exact overall rise of the stair, with each rise being equal.

After determining the diagonal distance on a construction calculator (left), mark those measurements along the scribed line **(4)**. Then lay out the stringer by aligning the heel of the framing square with each of the measurement marks **(5)**.

Q The Schluter manual recommends that tile underlayment be installed so that the distance between its edges and the nearest joist is one-quarter of the joist spacing. What is the logic behind this advice?

A Bryant Bouchard, an installation specialist at Schluter Systems, responds: This recommendation seems counterintuitive, but it's quite ingenious once you take time to understand it.

Typically, the subfloor (which in many cases is 3/4-inch T&G plywood or OSB) bends the most at the center of the space between the joists when a load is applied. With 16-inch-o.c. joists, the center is approximately 8 inches from the joists on either side. At the same time that a load is bending the panel down at the center, the areas of the subfloor that are under the second-most amount of stress from the applied load are directly over the joists. Those areas want to lift under the load. So the area in the subfloor that is changing the least—or is under the least amount of stress—is halfway between the center of the panel and the joist, or at the quarter point of the joist spacing.

When installing underlayment for tile, you try to have the least amount of movement to make the floor assembly as stable as possible beneath the tile. The weakest spots in the underlayment are the seams, so when you're putting down the underlayment before applying Schluter's Ditra Mat, we recommend you place the weakest points—the seams—of that second layer of plywood over the most stable area of the subfloor—at one-quarter of the joist spacing. So with 16-inch-o.c. joists, the quarter point would be 4 inches from the joists; with 19.2-inch spacing, it would be 5 inches; and with 24-inch-o.c. joists, the quarter point would be 6 inches from the joists. (Be aware that with wider joist spacing, a thicker subfloor might be needed to meet the deflection requirements.)

And while we're on the subject of underlayment, always remember to leave the proper gap between sheets of underlayment to allow for expansion. We recommend 1/8-inch gaps between sheets and a 1/4-inch gap around the perimeter of the floor.