



Snapping a line. A chalkline can be snapped across the tops of studs and cripples to mark a cutline. Before anything is cut to length, the framers will set the top plate on edge above the line and mark the framing layout on it. *Photo by Roger Turk.*

Building Rake Walls

Two time-saving layout methods

by Larry Haun

Most wall layout is quite simple. The process of transferring dimensions from prints to concrete slab or subfloor usually consists of little more than snapping a series of chalklines to form squares and rectangles. On occasion, however, plans will call for a room with a cathedral ceiling that follows the pitch of the roof. Here rafters double as joists, rising upward from an outside wall to the ridge. Gable-end walls in these rooms are called rake walls, and laying one out isn't much more difficult than laying out a regular wall. But being aware of a couple of simple techniques will speed up the process. The methods I discuss here have served me well for the past 30 years (for another approach to building rake walls, see *FHB* #62, pp. 62-63).

The location of the bottom 2x plate of a rake wall is laid out on the floor like any other

wall. The location of the rake wall's top plate is chalklined out at an angle from the top of the shortest stud. This way, the framer can build the wall without making any further calculations, even though each stud will be a different length. The angle of the top plate is determined by the pitch of the roof.

A calculated solution—There are two fairly easy ways of laying out rake walls. The first calls for a pocket calculator, which is used to determine the difference in length between the shortest and longest studs. The shortest stud is normally a standard length, 92¼ in., so once you've established the *difference* in length between shortest and longest, you know the *actual* length of the longest stud. With the heights of both studs established, you'll know the position of the top plate, as well.

To determine the difference in length between the shortest and longest studs in a rake wall, you need to know both the length of the wall and the pitch of the roof. For example, in a house that's 33 ft. wide, a rake wall running to the center of the roof is 16 ft. 6 in. long. With a 6-in-12 roof pitch, multiply 6 by 16 ft. 6 in. (6 in. of rise for every foot of run and 16 ft. 6 in. of run) for a result of 99 in. Add 99 in. to the length of your shortest stud, and you've got the length of your longest stud—191¼ in.

Now go back to the subfloor to lay out the top plate (drawing next page). First, go to the end of the chalkline marking the bottom plate, where the plan indicates the low point of the rake wall. Usually this will be at an exterior wall, but check the plans for the exact location of the shortest stud. Measure up 92¼ in. on the subfloor and mark that point. Next,

come over 16 ft. 6 in. along the same chalkline to the house's center. Measure up $19\frac{1}{4}$ in. from there for the long stud and mark that point. Make sure your measurements are perpendicular to the chalkline. Connect the two points with a chalkline, and you've established the location of your top plate. Intermediate studs can now be cut to length without any further calculations.

No math, no sweat—Not every good carpenter tackles problems this way, however, and calculators still haven't become commonplace in most tool belts. Another method of laying out rake walls, developed by framers, dispenses with calculation altogether. The trick is to work on a 12-ft. grid and to figure the pitch in feet rather than inches (drawing facing page).

Let's look at the same problem again: a 6-in-12 pitch and a 16-ft. 6-in. wall. Measure up $9\frac{2}{4}$ in. from the bottom-plate chalkline at the low end of the rake wall. Mark that point; the height of the short stud hasn't changed. Next, come over 12 ft. along the bottom-plate chalkline and again measure up $9\frac{2}{4}$ in. perpendicular to the chalkline. Mark this point. So far, all you've done is lay out a rectangle that is $9\frac{2}{4}$ in. on the short sides and 12 ft. on the long sides.

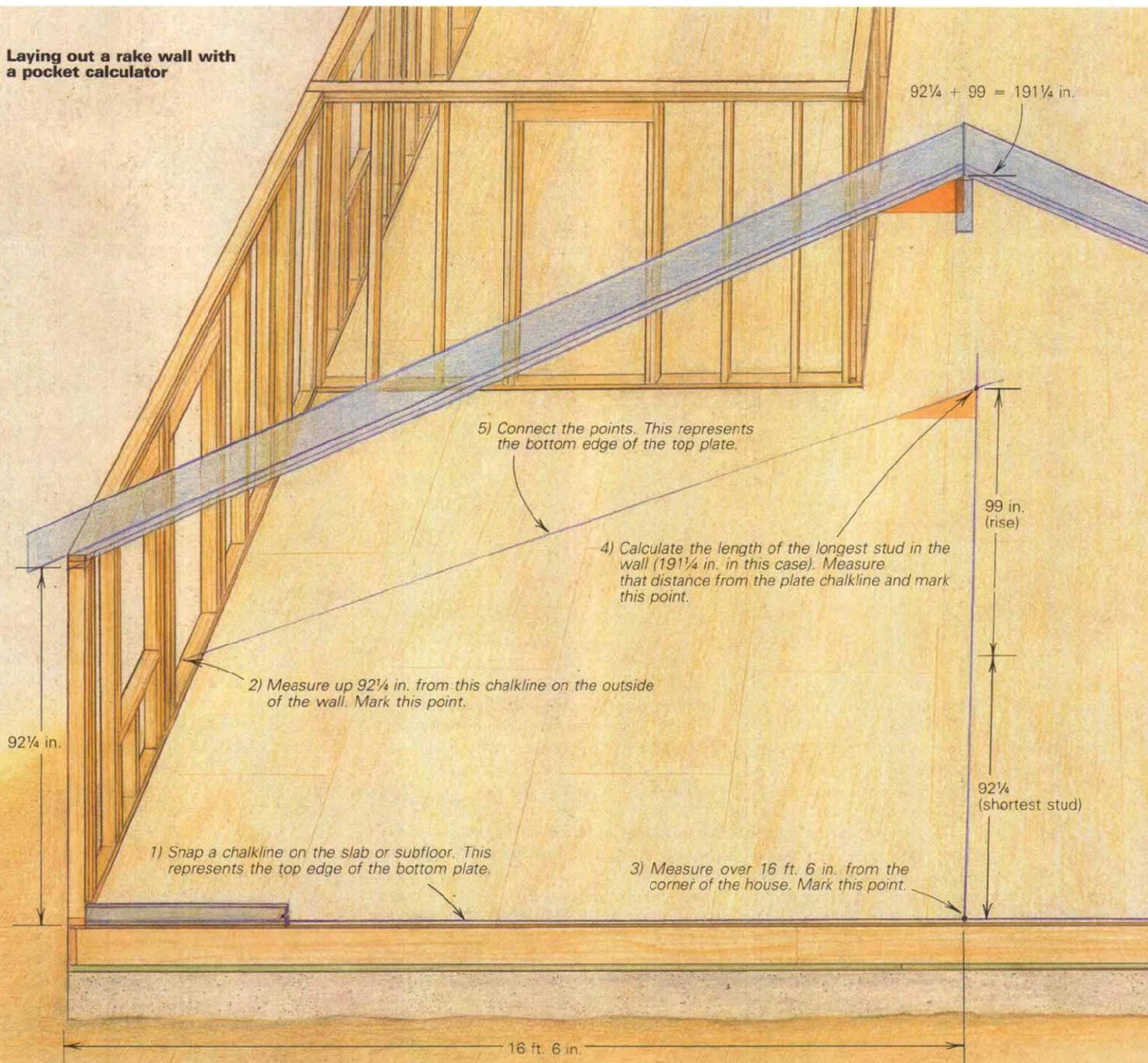
From the last point, at the $9\frac{2}{4}$ -in. mark, measure straight up in feet whatever the roof pitch is in inches. In this example, because you're working with a 6-in-12 roof pitch, measure up 6 ft. (the rise for a 12-ft. run) and mark that point. Snap a line between this point and the top of your short stud, and you've got your

roof pitch. Because your wall is longer than 12 ft., it's necessary to extend this top-plate chalkline several feet. Complete the layout by snapping a chalkline that will represent the outside edge of the longest stud at 16 ft. 6 in. You now have a full-size layout of the rake wall. This process works regardless of the pitch of the roof or the length of the wall and usually can be completed in just a few minutes.

You may run into situations where there isn't enough floor space to lay out the rake wall using this method. When that occurs, simply cut the wall length in half and lay out the pitch as a 3-in-6 instead of 6-in-12. This way, you only need 6 ft. of floor space.

Remember that the lines snapped on the floor show the length of the shortest and longest studs (at their outside edges), the

SEE ERRATA AT END OF ARTICLE



roof pitch and the length of the wall. The bottom plate goes below the bottom line, and the top plate goes above the top line as the wall is framed.

Framing a rake wall—Once you've got the perimeter of your rake wall laid out, mark *two* bottom plates (you'll see why in a moment) with stud, window and door locations. Place a stud at every layout mark, letting them extend a little beyond the top-plate chalkline. Nail these studs to one bottom plate, including any trimmers and king studs. Also nail in any headers at this stage. Cripples on top of the headers need to run past the top-plate chalkline, just as the studs do. Next, position the bottom plate so that its top edge is on, but below, the chalkline. Tack it in place with a

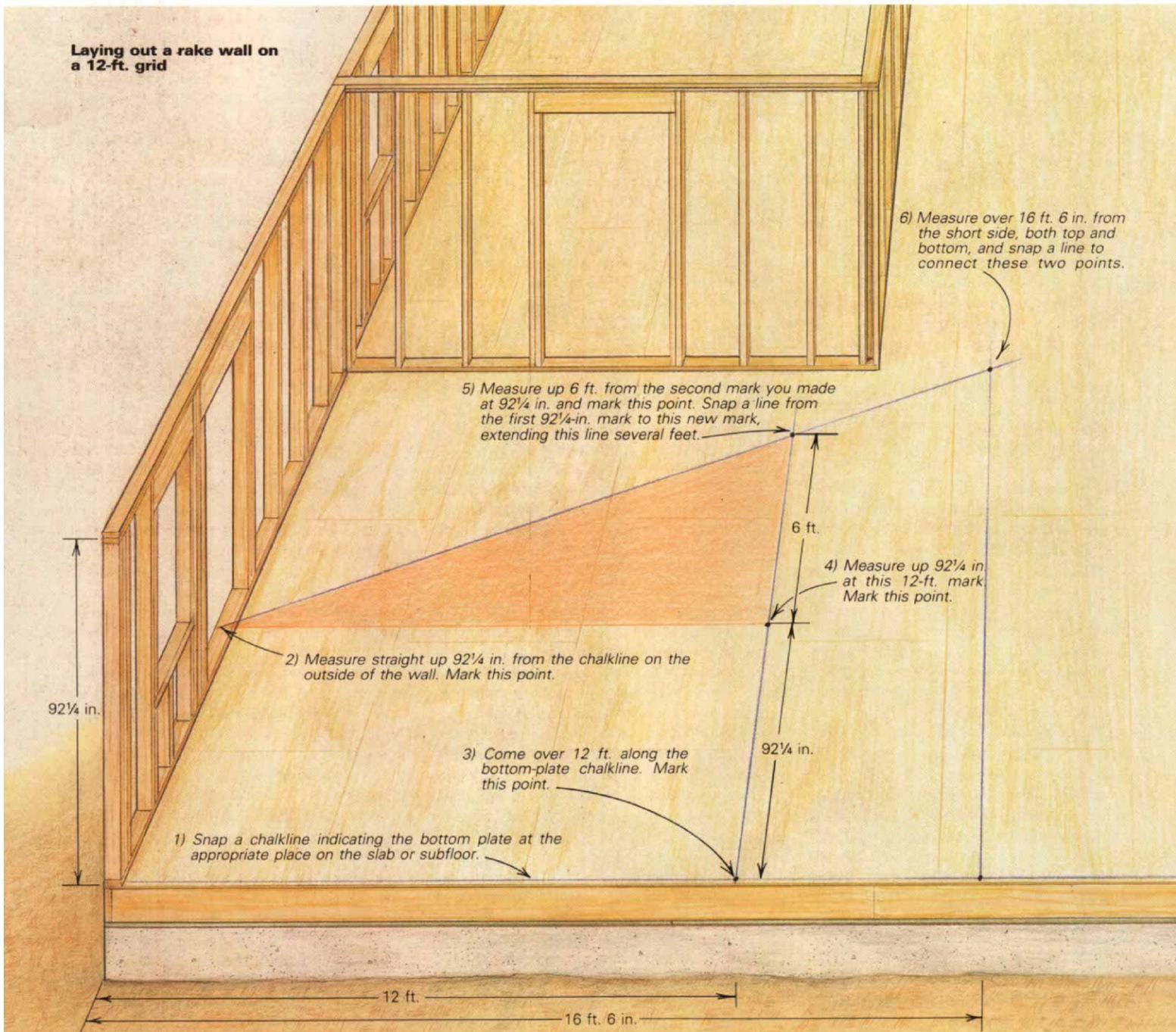
few 8d nails to make sure it stays straight, and use the extra bottom plate as a layout guide to align the loose top ends of the studs. Then pull a chalkline on the studs directly over the roof-pitch line and snap it to mark the studs for length (photo p. 67). Before cutting the studs to length, bring in the piece of lumber that will be your new top plate, place it on edge directly above the chalkline, mark it for length and indicate on it where the studs will be nailed once they are cut.

Now it's time to cut the studs to length. If the saw's shoe tilts in the right direction to make the cut, set it at the proper degree for the roof pitch ($26\frac{1}{2}^\circ$ for a 6-in-12 pitch). If the angles marked on the studs run opposite the direction in which your saw tilts, first cut them square and then make the second cut

at the correct angle. The next step is to nail on the top and double plates. Lap the double plate over $3\frac{1}{2}$ in. at the low end to tie the two walls together at the corner.

How much precision is necessary?—It's been my experience that carpenters often spend too much time on rake walls, trying to build them to extremely fine tolerances. It usually doesn't matter if these walls get built a little high or a little low. With a site-built roof, I actually like to run the rake wall at least 1 in. high so that a good tie can be made between it and the rafter sitting atop it. □

Larry Haun lives in Los Angeles, Calif., and is a member of Local 409; he was a longtime teacher in the apprenticeship program.



ERRATA

My rake wall article (*FHB* #72, pp. 67-69) looks good, but the photo leading it off was by Roger (not Ron) Turk. Also, the 92 ~~¼~~-in. dimension noted on pp. 68 and 69 (in the drawing) should be shown running from the top of the bottom plate; it refers to the stud length and doesn't include the bottom plate.

-Larry Haun, Los Angeles, Calif.