# FAST LAYOUT FOR Tall Rake Walls

## Snapping a full-scale layout on the deck speeds cutting and assembly

**by Don Dunkley**

As a custom home framer on the West Coast, I often build large houses with a variety of rake walls. These range from simple gables to complicated multi-sloped affairs full of beam pockets and window openings. It can be daunting the first time you try one of these walls, but they become easier with some simple procedures. For safety and convenience, I like to frame rake walls after the outside walls have been stood up and braced. I snap out the rake layout full-scale right on the deck, then build to the lines. In this article, I'll explain my step by step procedure for rake wall layout, using the most common type I run into — the cathedral ceiling.

Let's suppose we have to build the gable end of a 16-foot wide room with two 9-foot exterior walls supporting an 8/12 roof. To make room for more insulation, the cathedral rafters are 2x10s, while the rest of the house has 2x6 rafters. There's an exposed 6x12 ridge beam and two windows in the wall.

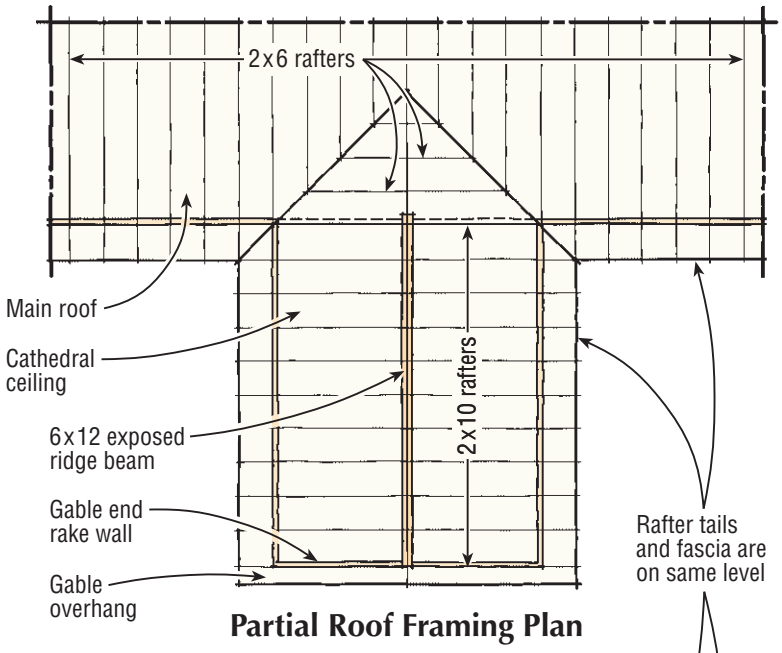
In reviewing the plans (see illustration, at right), a red flag goes up: The roof frame has more than one size rafter, but the rafter tails and fascia are at the same level around the entire perimeter of the house. I could accommodate the deeper rafters by shortening the walls of the cathedral room, but it's easier to handle the transition by manipulating the layout of the birdsmouth.

## Birdsmouth First

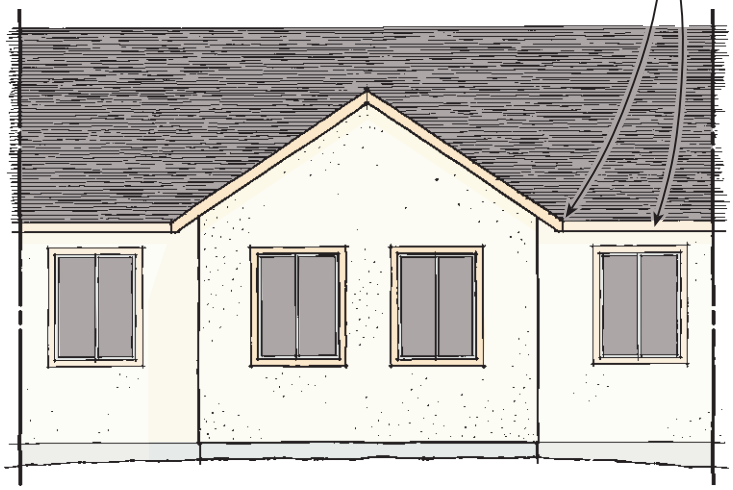
I lay out the rake wall so it will fit tight under the pair of opposing common rafters that is flush with the gable end. This solidly attaches the gable rafters along the full length of the rake wall, and I won't have to rip the gable rafters in order to get a tight fit.

The low point of the rake wall is determined by the location of the birdsmouth (seat cut). I first determine its location for the 2x6 rafters of the main roof, then lay out the 2x10 cathedral rafters with the same heel stand (top illustration, opposite page). I use a standard heel stand of $5\frac{3}{8}$ inches, which also works well for 2x6 rafters in an 8/12 roof on 2x4 walls. Using a scrap of 2x10, I make a full-scale birdsmouth using my heel stand. The layout shows that the birdsmouth will need to notch around the 2x4 wall, and that the bottom of the 2x10 rafter will end up extending $3\frac{3}{4}$ inches below the inside of the wall.

## Reviewing the Plans




Partial Roof Framing Plan



Partial Elevation

## Low Point, High Point

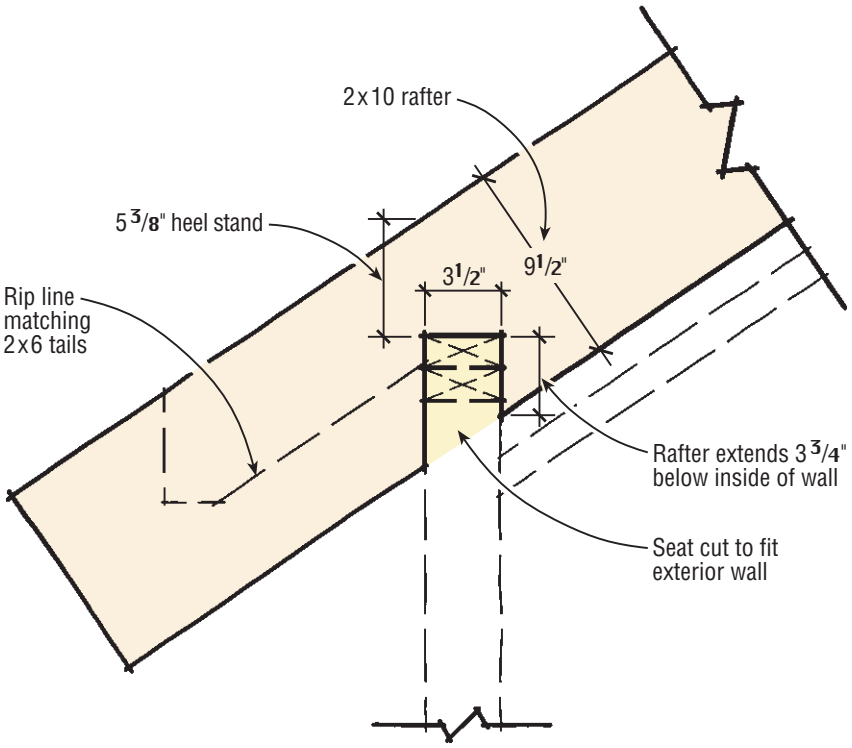
Now I can find the low and high points of the wall. The low point occurs where the rake wall attaches to the eaves wall. Using the full-scale birdsmouth layout, it's easy to find the low point by subtracting $3\frac{3}{4}$ inches from the outside wall height. On the West Coast, we commonly use $104\frac{1}{4}$-inch studs and three framing plates that add up to an overall thickness of about $4\frac{11}{16}$ inches. (Our plate stock tends to be closer to $1\frac{9}{16}$ inches thick, but if you measure the material you're using on site you'll never go wrong.) The wall ends up being about 9 feet $\frac{15}{16}$ inch (give or take $\frac{1}{16}$ depending on the moisture content). Subtracting $3\frac{3}{4}$ inches, I get a low point height on the rake wall of 8 feet $9\frac{3}{16}$ inches.

***Calculate the high point.*** I pull out the Construction Master to find the top of the rake wall. First, I divide the distance between the inside of the two opposing exterior walls in half. In our example, the span is 15 feet 5 inches, so the half-span, or run, is 7 feet $8\frac{1}{2}$ inches. On the calculator, I enter a pitch of 8 inches and a run of 7 feet $8\frac{1}{2}$ inches, hit the Rise key, and get 5 feet $1\frac{11}{16}$ inches. Adding this to the low point of 8 feet $9\frac{3}{16}$ inches yields 13 feet $10\frac{7}{8}$ inches as the peak of the wall in the center of the room. This may seem like a lot of math to some, but in the field it only takes minutes. A lot less time than if you have to rip those gable rafters or rebuild a miscalculated wall.

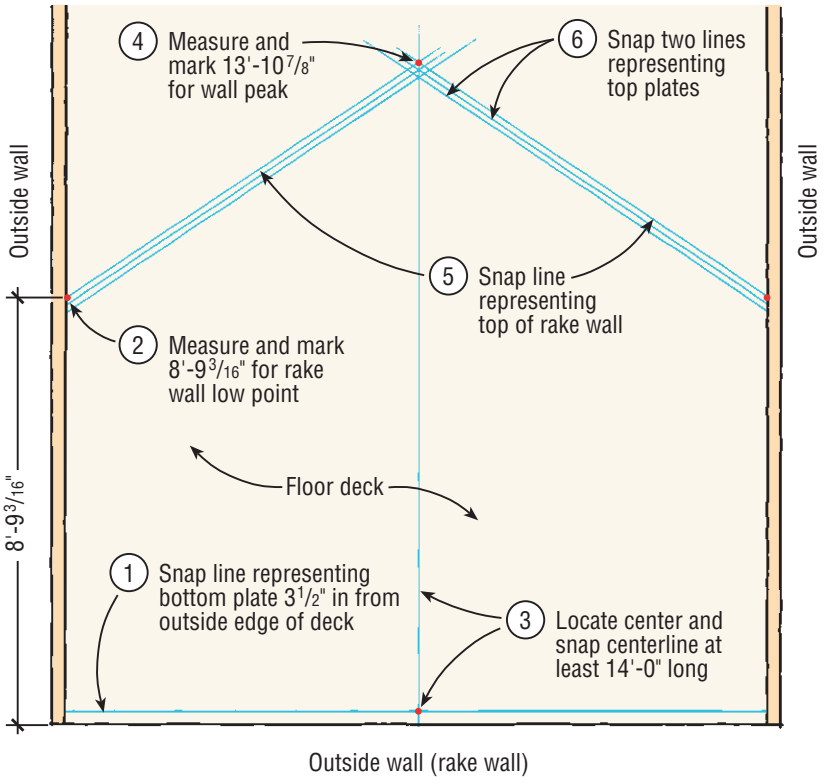
## Snap Out the Wall

Next I snap out the wall on the deck. If there isn't already a line for the rake wall bottom plate, I measure in $3\frac{1}{2}$ inches in from the outside of the deck at each end

## Birdsmouth Detail




## Rake Wall Layout




and snap a line. For purposes of layout, this line will represent the bottom of the rake wall, and from it I measure the low and high points of the wall (illustration, below left). Measuring along the bottom *inside* of the two standing walls, I mark out 8 feet $9\frac{3}{16}$ inches. I next locate the center of the room and, starting from the bottom line, I pop a line at least 14 feet long. Then, measuring from the bottom along this centerline, I mark the peak at 13 feet $10\frac{7}{8}$ inches.

***The rake.*** Now I can pop two lines from the center high point to the low points I marked on the inside of each outside wall plate. These angled snap lines mark the very top of the rake wall. It's easy to create an accurate top plate layout by using a 2-by scrap to scribe the double plates at the low points and at the peak. I then snap a line between these scribes and now have three lines marking the top plates full-scale on the deck.

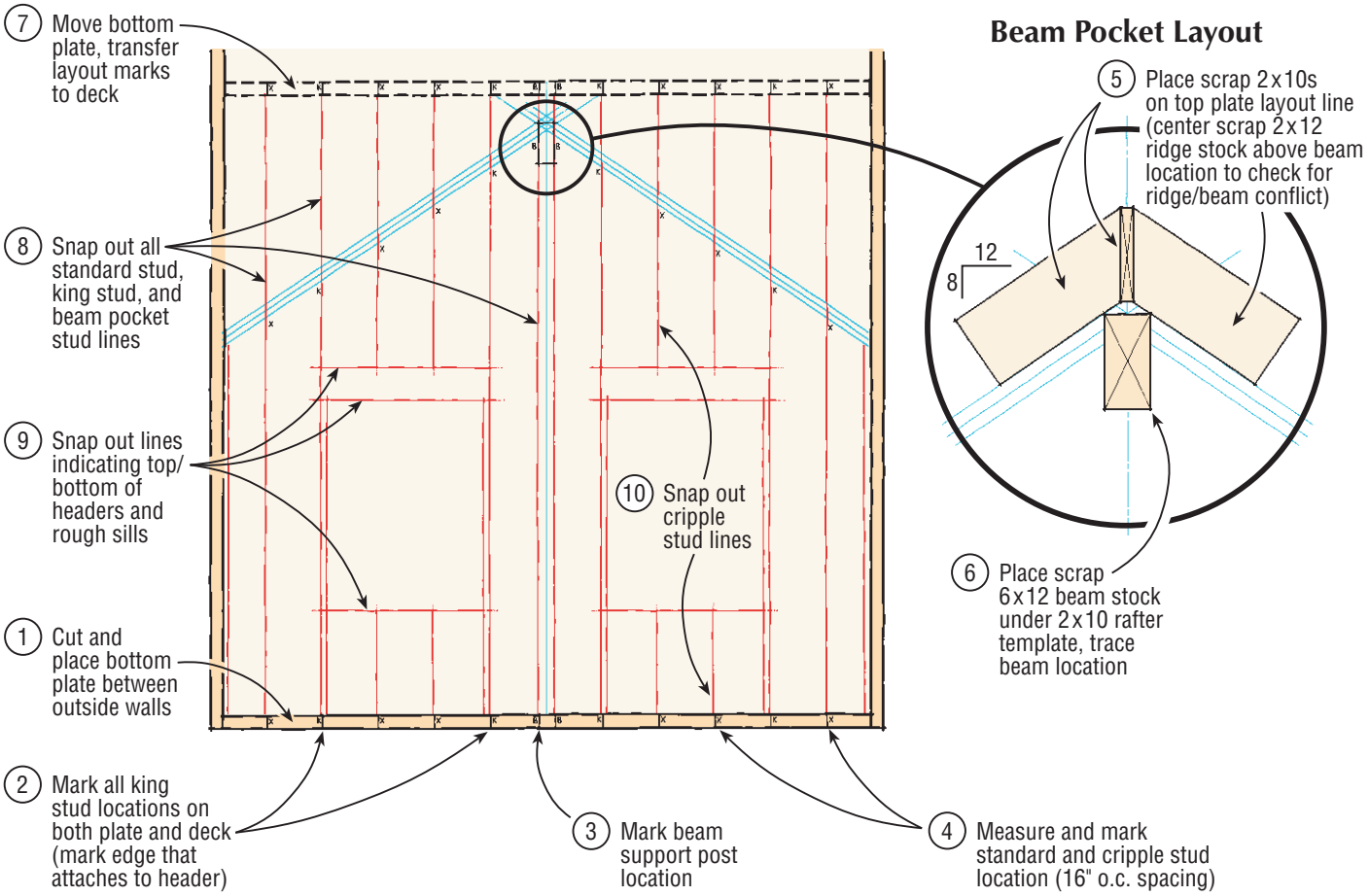
### King Studs & Beam Pocket

Next come door and window openings (illustration, next page). Starting at the bottom plate line, I locate all king studs, paying attention only to the edge that attaches to the header. To make things easier later, I go ahead and cut a bottom plate to fit snug between the outside walls. I place it on the *outside* of the bottom line. I mark the bottom plate at the same time as I mark the deck, locating post hold-downs as I go.

After the king studs, I mark out the 6x12 exposed beam, again using scrap stock. I make plumb cuts on a couple of pieces of 2x10 and place them on the deck at the layout peak with the plumb cuts butting. Then I fit a short piece of beam stock under these rafter templates and trace the beam location. For me, this is by far the easiest, quickest, and most accurate way of figuring out beam pockets.

I'll also determine the ridge board width, placing a short piece of 2x12 so it sits dead center above the beam location. I slide the two rafter pieces up tight to the ridge stock and place a mark

## Rake Wall Infill Layout




where the tops of the rafter pieces touch the ridge stock. This tells me how wide the ridge will have to be. A ridge may require some ripping or it might float a little above the beam depending on the pitch of the roof, the width of the rafter, and the thickness of the beam. I find using a ridge board easiest in this situation, while others might prefer to lap the rafters and run blocks in between. Either method works fine.

### Filling In

I now lay out the studs. Here's where the bottom plate I cut comes in handy. I mark the studs on the bottom plate line and on the plate itself. Then I place the plate just above the peak, parallel to the bottom plate, and quickly transfer all the layout marks to the deck. Now I can snap out all the standard studs, the king studs, and the beam pocket studs.

***Headers.*** I snap lines representing the tops and bottoms of the headers, then mark out rough sills. I clearly delineate each window opening, because gable end walls tend to get filled up with windows. Lastly, I fill in all the cripples above the headers and below the sills.

### Cutting

The beauty of full-scale layout is that cutting is a breeze. I measure and cut the headers, sills, and beam support posts first. To cut studs and cripples, I carry plenty of long stock to the rake wall area. I tack the bottom plate in place on the *inside* of the bottom snap line (so that I have $3\frac{1}{2}$ inches from the bottom of the plate to the outside edge). With the plate securely in place, I spread out all the 2x4 stock exactly in line with the layout on the deck, selecting material that reaches just beyond the upper plate layout. After making sure that the studs are butting tight to the bottom plate, I mark each one where it intersects the chalk line for the bottom of the first top plate. Because the leading edge of the standard stud layout goes in one direction throughout the length of the wall, half of the studs marked will be short point, the others long point. To avoid mistakes, I mark the top edge of each stud with a slash showing the direction of the bevel angle.

After all the studs are marked, I set the table of my circular saw for a bevel cut (33.7 degrees for an 8/12 slope) and cut the studs and cripples in place. The little bit of extra time it took to snap the layout on the deck is more than paid back as the wall quickly comes together.

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