Retrofitting a Skylight in a Truss Roof

Structural modifications to a few trusses made a flared skylight well possible

by Les Deal

Many of the homes I remodel have truss roofs, so occasionally I find it necessary to cut and alter trusses in order to build the project the homeowner wants. More often than not, this involves installing a skylight and opening up a skylight well to the room below.

I like to design skylight wells so that the light spreads outward in all four directions, which provides two advantages. First, the diverging sides of the well spread the light over a large area, instead of creating a smaller hot spot of light. Second, you don't have to stand directly under the skylight and look straight up in order to see it. The skylight's view and its pleasing effect are spread throughout the room.

Of course, trusses, if unaltered, make it impossible to angle the sides of a skylight well. Granted, you could install a narrow skylight that fits between the 2-foot-on-center trusses, and still angle the top and bottom walls of the shaft. But in my opinion, it's well worth the extra effort it takes to remove and alter the necessary trusses to allow for all four walls of the chase to be angled.

Altering Trusses

It would be nice if you could call up a truss company and have them tell you what to do to change a truss. Unfortunately, most truss engineers are hesitant to encourage you to do much of anything to a truss, let alone cut it. If you can verify that the truss was manufactured by a particular company, you might be able to get a modification design. The truss company, in that case, might insist that its field team do the work.

Because I'm a remodeling contractor, most of the houses I work on have been standing for many years, so there is typically no way of knowing who manufactured the trusses. To accomplish a remodeling design, I sometimes find it necessary to make modifications, always keeping a keen eye on the overall structural integrity of the roof.

On the project shown here, I spoke with a truss company engineer who agreed off the record that the modifications I was making would work fine. If you have doubts about reconfiguring a truss, you can probably find an engineer who will do the design work for you.

Figure 1. The first step in modifying the truss roof structure (top) was to add support posts from the peak to a bearing wall below (bottom). OSB gusset plates secured the connection.

Posting Down

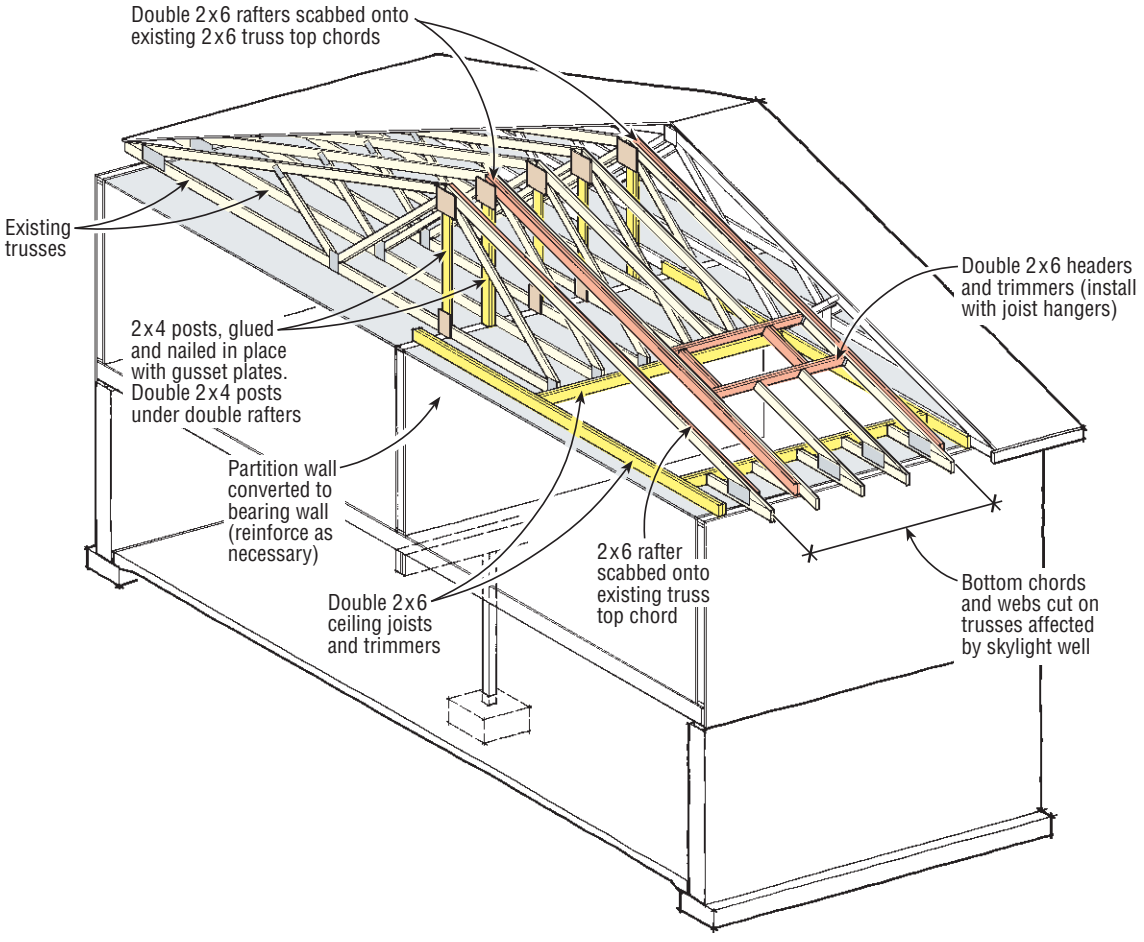
The roof of the ranch house in the photos was built with typical W-style trusses spanning from eaves wall to eaves wall. Fortunately, there was a partition wall running down the middle of the house, as there often is. By following the load path to the basement, I was able to use this partition wall as a bearing wall for the additional loading created by the skylight well (see Figure 1). The partition was built exactly like an exterior wall, with double top plates, so it didn't matter whether the studs in the wall lined up with the trusses.

The first thing we did was add 2x4 posts from the top plate of the bearing wall to the peak of the truss. We secured those connections with OSB gusset plates, glued and nailed in place. Adding these posts changed the single dual-slope truss into two mono trusses, making the two sloped sides of the roof independent of each other. We could then safely reframe the side of the roof that was receiving the skylight.

Framing the Skylight Opening

The first step in framing the skylight opening was to scab double 2x6 rafters onto the 2x6 truss top chords at each edge of the well area (Figure 2). These

Framing the Skylight Opening



Framing the Flared Shaft

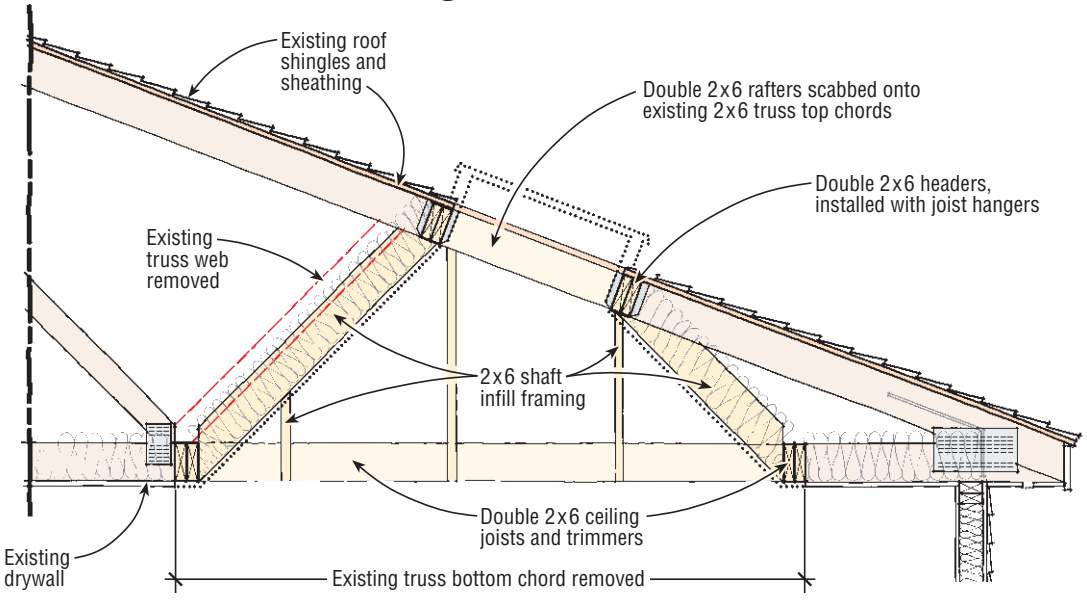


Figure 2. Adding posts under the roof peak transferred loading to a partition wall below, effectively creating two mono trusses from the original single full-span truss. The side of the roof with the well was then reframed conventionally with dimension lumber rafters, trimmers, and headers. Likewise, the ceiling was reframed with dimension lumber; then the flared shaft framing was filled in.

Figure 3. Cutting the bottom chord of the truss a little beyond the metal plate allowed the original truss web to provide some support for the drywall ceiling.

Figure 4. Recessed lights in the skylight well make it an important source of light and a visual focal point at night as well as during the day.

double trimmers ran all the way from the 2x4 posts at the peak to the top plate of the exterior wall. We doubled the posts under double rafters for extra bearing strength. These posts perform the same function as a structural ridge beam, providing support at the top of the rafter so the outside wall has no tendency to spread.

Adding these common rafters to the sides of the top chords supported the roof so that the webs and bottom chords of the trusses within the well area could be cut. On the job shown here, the well opening at the ceiling stopped right next to a metal truss plate. This was a plus, as it allowed us to leave a truss chord in place to provide support for the drywall ceiling while we framed the well (Figure 3).

Once the webs and chords were cut, we installed double headers across the upper and lower edges of the skylight hole with joist hangers, then reattached the cut top chords of the two trusses within the width of the skylight opening.

The Flared Shaft

Next, we framed the ceiling opening with 2x6s, again using double trimmers at the outside edges. Finally, we framed the flared sides of the well — like framing an irregular tray ceiling.

Nighttime lighting was part of the plan. The four recessed cans — one per side — make the skylight well an important source of evening light, rather than a dark hole at night (Figure 4). Recessed cans designed for slanted ceilings work well.

Les Deal *is a remodeler in Cedar Rapids, Iowa.*