

# Stealing Space From a Truss Roof

by Robert Geist

**Ever wonder how to make use of all that wasted space in a truss roof? This engineered solution uses Micro-Lams and steel plates.**

Recently, as we were finishing a small job, my client asked me if I would look at expanding his walk-in closet. Ron is an executive who travels a lot, and with all of his suits, shirts, ties, slacks, and jackets, he was constantly having to get dressed in three different bedrooms.

When he showed me the proposed location of the closet, at first I didn't think he was serious. Peering through a small access hole at the rear of his existing closet into the void of an 8/12 truss roof attic, I explained that even if it was possible, it would probably not be cheap. "Still," he said, "let's see what we can do."

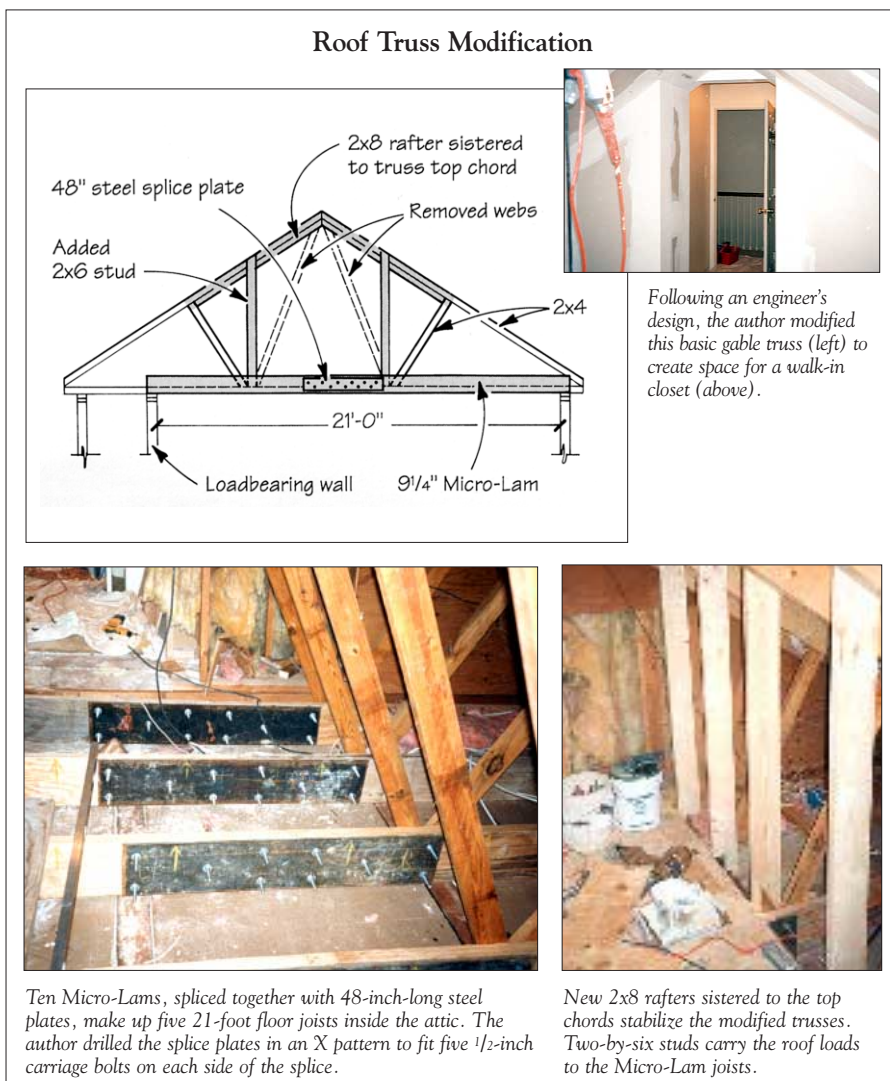
The roof trusses had 2x4 bottom chords, and a center height of 9 feet. They spanned 21 feet, from an exterior wall to an interior bearing wall. Below was the family room. It would be easy enough to open the existing attic access panel into a full-size doorway. But how could we carry the new floor loads? There was no way to get 21-foot beams into the area, much less turn them to align with the trusses. Cutting open the roof was too expensive an option. And there was the problem of how to reconfigure the trusses so as not to compromise their strength.

## Creative Engineering

I consulted with a registered engineer, who happens to be one of the owners of the lumberyard I use. We concluded that the job was possible with ten 12-foot-long, 9 1/4-inch-deep Micro-Lams, spliced together with 1/2-inch steel plates to create five floor joists inside the attic.

To make sure the new beams were uniform, we first assembled them in the garage, where we could adjust for the camber (1/8 inch), predrill all of the holes for the carriage bolts, and trim off the top angles where one end of the beams would extend into the eaves. We then dismantled each one, but at almost 11 feet 6 inches in length, each half-beam was still too long to carry through the house. Fortunately, the gable end of the attic opened up into the attic above the garage, so we were able to pass up all of the beams, splice plates, and the rest of the lumber we needed through this access.

Once they were in the attic, we laid the half-beams and splice plates on their sides, on top of temporary 2x4s running across the bottom chords of the trusses. We assembled the beams in place, rechecked the camber, then rolled them up on end and slid them tight against the underside of the roof sheathing at the exterior wall. When all five beams were in place, we through-nailed the adjacent truss chords to the Micro-Lams, checking the floor for level and for alignment with the floor of the existing closet. Next we glued and screwed the 3/4-inch tongue-and-groove subflooring to the Micro-Lams. At this point I could stop worrying about someone falling through the dry-wall ceiling and onto the couch below.



## Reconfiguring the Trusses

The next step was to sister 2x8 rafters to the 2x4 top chords (see illustration). We then installed 2x6 studs running from the new rafters above to the Micro-Lams below. The 2x6s carried the roof loads, stiffened the new truss configuration, and served as wall studs for insulation and drywall. A short 2x8 across the peak, like a mini collar tie, allowed for better airflow above the ceiling insulation and gave us room for a fluorescent light fixture.

With all of the structural lumber in place, now came the moment of truth — it was time to cut out the center truss webs. Each time my reciprocating saw passed through another 2x4, my heart skipped a beat. But we cut all five trusses without incident.

The rest of the job was routine — insulation, drywall, paint, custom shelving, and carpeting. Although we had removed the ceiling insulation to allow the heat to rise from the room below, we still installed a 1,000-watt oil-filled electric heater in the far end of the closet to make sure that mildew doesn't form.

In the end the owner was happy even though the labor involved to do the job right — without falling through the ceiling — ran about two days more than I had planned. Now Ron is finally getting dressed in one room, and we are in the design stages for his new master bath. ■

Robert Geist is a general contractor in Westminster, Md. Photos by the author.