

Rebuilding an Old Attic Space



Added rafters beefed up an old under-built roof, and a scribed sleeper system leveled the floor

by Will Schwarz

One of last winter's projects was to turn an old, unused attic space into a new master bedroom in a home in Montpelier, Vt. The job was a typical case where the homeowners needed to renovate an under-built, out-of-level space on a tight budget. As with much of our remodeling work, we had to come up with cost-effective solutions to the structural problems.

Roof

The most glaring problem was the roof framing, which was more than 100 years old. The

rough-sawn 2x6s, placed on 30-inch centers (more or less) were much too small to carry the local snow loads, even had they been placed more closely together. In addition, a major fire in the 1950s had burned much of the original roof structure and the fire damage repairs had been haphazardly scabbed together. Since the existing roofing was in good condition, we never seriously considered removing and replacing the entire roof structure — not only because of the cost but also because removal would have risked exposing the living space below the attic to the elements.

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Figure 1. New 2x6s sistered onto the undersized existing rafters matched the drywall plane formed by new 2x12 rafters.



Figure 2. New 2x12 rafters were installed between existing rafters to strengthen the roof framing. There was enough give to the old roof sheathing so that the new rafters could be installed without having to fiddle with jacks — a sledgehammer did the job.



Figure 3. Roof vents keep the roof sheathing cold during snow season to prevent ice dams.



After we demolished a few old plaster-and-lath partitions, we reinforced the roof framing from the inside. Our strategy was to hang a new 2x6 rafter off of each existing rafter and then add new 2x12 rafters between the existing rafters. We attached new 2x6 rafters to the old rafters using 11¹/₄-inch-long 2x4 blocks as hangers (see Figure 1). By bumping these blocks to the underside of the roof sheathing, the new 2x6s matched the plane of the new 2x12 rafters.

Early on, we thought we'd have to jack the roof, section by section, to install the new 2x12 rafters. We were surprised to find, however, that the roof was light enough to lean into and lift by hand. We flattened all the old nails that were protruding through the sheathing, then wedged the rafters into place using a block, sledgehammer, and a healthy dose of Mr. Armstrong (Figure 2). Next, we installed Prop-R-Vent foam roof-venting channels, followed by 9 inches of R-30 fiberglass (Figure 3). Although it would have been nice to add a layer of rigid foam insulation, tight door clearances, coupled with budget considerations, dictated that we settle for just rafters, batt insulation, and strapping. For strapping, we installed furring strips on top of the vapor barrier. We adjusted areas that were still slightly out of plane using a straightedge and shims.


Before dealing with the out-of-level floor, we had to rebuild the kneewalls and the gable end wall. The original balloon-framed wall consisted of rough-sawn 2x4s. We took a close look at the kneewalls, which resist the outward pushing forces of the roof load, and determined that they were straight and showed no signs of distress. Since everything checked out okay, we simply furred out the exterior walls of the room to 5¹/₂ inches to accommodate R-19 fiberglass insulation. To block out cold air drafts on the insulation, we snaked Typar housewrap between the studs and the backside of the sheathing as best we could.

Aesthetically, a big part of this remodeling job was a new round-top

window. We enlarged the existing window opening on the gable end wall to make way for the new window, then stripped all the old exterior siding, re-papered the sheathing, and installed new clapboards.

Floor

With the roof and walls taken care of, we turned our attention to the settled and sagging floor. Since the kitchen and den were located directly beneath the attic space, jacking was out of the question because it would have damaged the finishes in these rooms. Instead, we opted for a custom sleeper system over the existing floor. We began by using a water level to put a benchmark in every corner of the room, then we ran a nailing strip around the entire perimeter of the room using a string to stay straight and level. This established a level floor plane. Next, we temporarily fastened 2x4s on edge directly above each existing floor joist. By snapping a line flush to the tops of the nailing strips on each side of the room, we were able to cut scribed sleepers (Figure 4). After the sleepers went down using construction adhesive and coarse-threaded decking screws, we installed $\frac{3}{4}$ -inch tongue-and-groove plywood (Figure 5). In the end, we had a nice level surface that served well later on when carpet and built-ins were installed.

Working in old balloon-framed buildings can be tricky, especially on a tight budget. Looking back on this project, we were lucky that the kneewalls had held up to the test of time and that the fire damage did not require extensive demolition. By simply strengthening the roof, adding an attractive window, furring out the walls, and leveling the floor, we transformed the attic into a comfortable master bedroom (Figure 6). These cost-effective alternatives to demolition and reconstruction helped us squeeze the most out of our clients' budget. 

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Figure 4. After installing a level nailing strip around the perimeter of the room, the author snapped cut lines on each sleeper. This scribed sleeper system leveled and took the sags out of the floor.



Figure 5. A new $\frac{3}{4}$ -inch tongue-and-groove plywood subfloor provided a sound base for carpet and built-ins.



Figure 6. Prepped for finishes, the new attic room has straight ceiling lines, a level floor, and a much stronger roof. Along the bottom of the walls, plywood provides solid nailing for paneled wainscoting.

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