REPLACING A Main Carrying Beam

by Will Schwarz

My company recently had to remove and replace a set of existing solid-sawn 8x8-inch carrying beams as part of a larger kitchen and dining room remodeling project. The posts that supported the original beams near midspan interfered with the new design, so the clear span of approximately 21 feet called for fairly substantial structural members. We had used a steel beam at one end of the room to support floor and roof loads over a large open archway we created leading into the new kitchen. But the carrying beams we had to replace were in the middle of the room (see Figure 1). It was impractical to work in such a tight space with long, heavy steel beams, so we decided instead to support the second-floor joists with a pair of triple 2x14-inch Microllam beams.

Since there was quite a bit of sag in the existing wood beams, we used screw jacks to raise them to near level before installing the temporary bracing system (Figure 2). To temporarily support the second floor framing, we built a makeshift 2x4 bearing wall, placing each stud directly under each joist and bracing the studs diagonally. No additional shoring was needed below the first-floor joists because the walls were nearly aligned over bearing walls in the basement. With the second-floor joists securely supported, we took away the screw jacks, and used a metal-cutting blade in a recip saw to cut off the nails that held the ceiling joists to the old beams. Since the beams were spliced, the 8x8s dropped right out when we knocked out the old posts.

The LVLs we were installing were much deeper than the 8x8s that supported the ceiling joists. To reinstall them as "dropped" beams would have left too little headroom, so we decided to cut out a portion of each joist and install the new beams flush with the underside of the second-floor subflooring. We snapped full-length chalk lines on the bottom of the joists to mark the position of both sides of each new beam, then used a reciprocating saw to cut out the joist material between the marks. We allowed an extra 1/2 inch in width for clearance to make it easier to slide the LVLs into place.

The old beams had been supported at either end by rough-cut studs in the exterior walls. Since we planned to slide the new LVLs into the building, we cut a slightly oversize opening in the wall at one end, trimming the existing studs to rough-in elevation at the same time. At both ends, we removed just enough finish material to make room for additional studs to provide adequate bearing.

We cut the LVLs to length outside, then slid them one at a time into position through the access hole in the exterior wall, nailing them off in place. The nailing was a little difficult because the temporary support system was in our way; next time, we'll keep it farther back from the beam pocket to provide more room to work. When the new beams were completely nailed together, we jacked them tight against the subfloor above, and shimmed each end with hardwood wedges.

To catch the joists, we considered running a 2x4 support cleat along the

Figure 1. The 8x8 carrying beams were spliced over posts that interfered with the design for a kitchen addition and dining room renovation. To avoid the demolition and rigging required to replace the sagging 8x8s with steel, the author opted for built-up replacement beams made of LVLs fastened together in place.

Figure 2. The old beams were first jacked to within 3/8 inch of level (left), then a temporary 2x4 bearing wall was built on either side, with each stud aligned directly under a second-floor joist (right). To maximize headroom, a section of each existing joist was cut out to make room for an inset 5 1/4-inch-wide by 14-inch-deep LVL beam.

new beams, but opted instead for metal hangers (Figure 3). Since the beams were eventually boxed with drywall, using hangers produced a cleaner final appearance. Otherwise, we would have had to rock around the cleat or fur out the LVLs 1 1/2 inches on each side; either way, the beams would have looked too bulky.

The way the sleek, continuous look of the new clear-span beams redefined the kitchen and dining room area thrilled our clients. The Microllams turned out to be the right solution. Steel beams would have required more demolition of the exterior walls, and more extensive rigging to jockey into place. Even though steel is less expensive than LVLs, the reduced labor costs made working with engineered lumber less expensive overall.

***Will Schwarz**, owner of WJS Contracting, completed this job together with Dave Smith of Knob Hill Carpentry. They both live and work in the Plainfield, Vt., area.*

Figure 3. The LVLs were cut to length outside, slid through an access hole cut in the exterior wall, and nailed together in place. The steel hangers used to fasten the existing joists to the new beams made for a sleek appearance when the beams were wrapped in drywall.