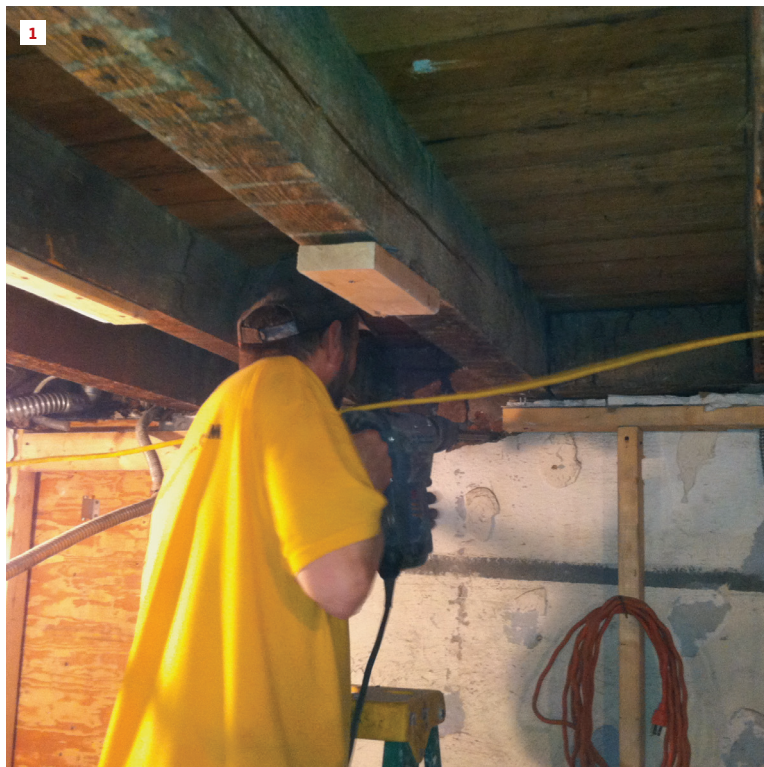


BY ROB CORBO



A Flush-Framed Floor to Maximize Space

Recently, I was asked to remodel a four-story, two-family brownstone in Hoboken, N.J. The owners used to share half the building with tenants but needed more space to raise their growing family. They hired an architect and settled on a plan to occupy most of the home except for a small basement apartment, which would give them some rental income and maintain the home's two-family zoning status.

The scope of this project included a complete gut-rehab of two of the four floors. In this article, however, I'll focus on the structural work related to the basement apartment and the first-floor entry.

During design, the clients were concerned that the apartment's 375 square feet would feel small. The basement's low 7 ½-foot ceiling and a dropped box beam supporting the first-floor joists impinged on the space. And an existing brick pier supporting the dropped beam land-

ed smack in the middle of the apartment's main room. The solution: Eliminate both the dropped beam and brick pier to maximize the perceived volume of space. Working with the architect, we came up with a plan to flush-frame the existing first-floor girders. We'd clear-span the width of the building with a couple of steel beams running parallel to the existing floor joists. This steel would support new Microlam headers in the floor to support the floor framing (see "First Floor Framing Plan," next page). It seemed a simple enough plan, but I knew better. A Hoboken brownstone is like a box of Cracker Jacks: There's always a surprise inside.

Right away we discovered numerous structural issues with the house while demoing the basement. These issues centered largely on the stairway: On a previous renovation, the builders didn't install a box header for the stairs; the existing floor joists were cut and left hanging

without proper bearing. Also, the wall at the stairwell—a bearing wall that ran from the roof to the basement—had been built on the slab without a proper footing to support it. And we discovered a few hidden point loads we needed to address.

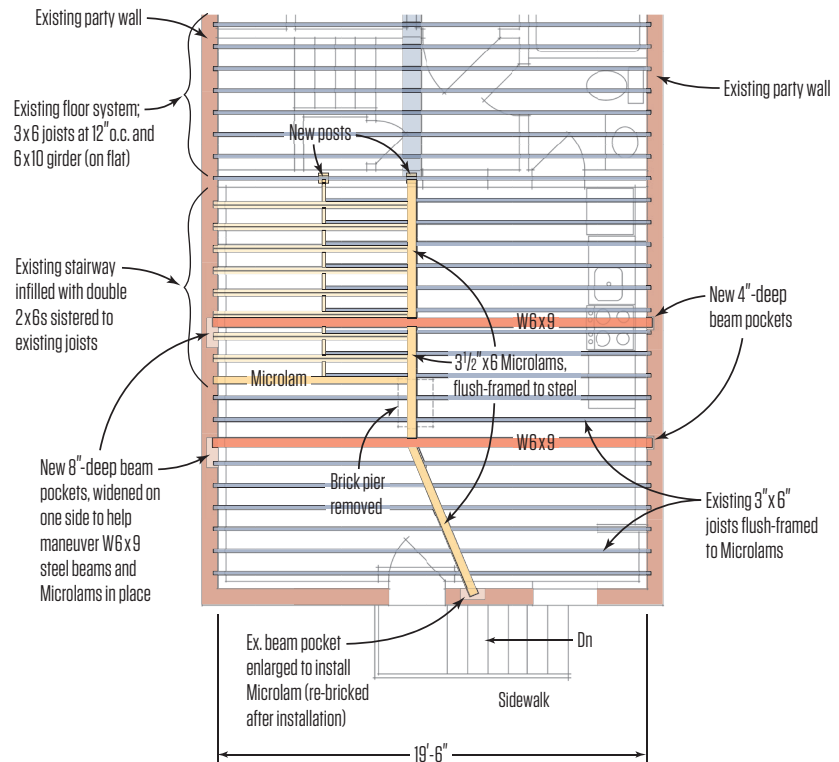
Steel beams. After redirecting the gas line, sewer pipe, and electrical wiring, we began work on the floor system. Lead carpenter Danny DuCouto hammer-drilled out four new beam pockets for the steel in the existing brick party walls (1). The interior span between the two walls was 19 feet 6 inches, so we ordered two 20-foot-long W6x9 steel beams—long enough to provide 3-inch bearing on both brick walls. (Though if there are no width constraints, we usually like to have 5 to 6 inches of bearing.)

The W6x9 I-beams weighed 180 pounds each, so they weren't too heavy; the main issue was their length (2). We managed to move the beams inside through an existing street-side window. It took three of us to put them roughly in place, setting one end up in the 12-inch-wide pocket we had chiseled out of the party wall (3). The walls were three brick-wythes wide (12 inches thick), so Danny cut the new beam pockets two wythes deep (8 inches) on one party wall and one wythe deep (4 inches) on the other. We needed the extra depth to slide the beam into place. Danny also cut them wider than needed, for extra maneuvering room.

We shored up the existing floor system with temporary 2x4 stud walls, placing them around the steel (4), then started removing the dropped beam and the brick pier (5). We lifted the W6x9s in place, pushing them into the 8-inch-deep pocket and at a slight angle along the horizontal plane at the wider, chipped-away side of the pocket (6). We then moved on to install the Microlam beams.

Microlams. In order to flush-frame the three new 3½-by-6-inch Microlams, we had to cut away the existing 3x6 joists (7) and notch the ends of the Microlams so they would fit between the flanges of the W6x9. We started at one end of the room and worked toward the street side. We cut the joists, then fit the first Microlam into place, posting it up at one end. The widened beam pocket allowed us to sledgehammer the steel into place, nudging it toward the

First-Floor Framing Plan



Microlam until the web of the steel I-beam flushed up with the Microlam's notched end. We did the same for the second Microlam (8). This time we had to insert the Microlam's leading end into the first W6x9, then pound the second W6x9 into place.

The third Microlam followed the path of the removed girder, which angled over to avoid the door opening on the street-side brick wall. To install it, we had to remove a couple of feet of brick under the existing beam pocket. We lifted the last Microlam in place at an angle, placing the leading edge into the steel, then temporarily posted it up at the wall until we re-bricked the pocket. With steel and Microlams roughly in place, we shimmed the steel level and applied non-shrink grout at the beam pockets. We connected the existing joists to the Microlams with joist hangers and clip angles, then removed the shoring (9).

Sistered joists. In an effort to create clear space in the apartment below, we removed the existing bearing wall at the stairwell (10). We infilled the stair opening with new double 2x6s sistered to the existing 3x6 joists with through-bolts. Where we needed to pick up point loads from above (avoiding posts and pilasters in the basement), we swapped out a few 2x6s for Microlams (11), then installed solid 2x6 blocking to help stiffen the floor (12). In order to redirect the floor and roof loads from above—leaving the new steel to support just the first floor—we used a 5 ¼-by-14-inch LVL beam in the second-floor framing and posted down to new footings in the basement. Once new subflooring covered the infilled opening, we started framing the powder room and closet (13).

Finishing up. With the structural work complete on the first floor, we moved on to the other floors, juggling the clients (who stayed in the house during construction) from space to space. The finished basement, though small, looked pretty slick (14). The dedicated entry on the first floor featured a powder room, closet, and new 6-foot opening to the living room. We cleaned and sealed the existing brick party wall and installed a built-in closet to hide the electrical panel by the new front door (15).

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Photo: 15, Kim Church