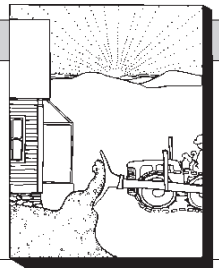

Straightening an Old House

by Carol U. Sisler

The building was the worst wreck in Ithaca, N.Y. It had been condemned by the building commissioner as unfit for human habitation, though it had never been built for human habitation in the first place. It had operated as a pottery workshop from 1841 to 1890, when it was fitted out for apartment living with rudimentary wiring and plumbing, lath, and plaster. But it had no insulation and no central heat.

It did have a good location though. It was situated on a deep lot by itself at the foot of Ithaca Falls within walking distance of Cornell University and downtown. It also had a good pedigree – it was built by Ezra Cornell to be operated by his father, a potter.

The two-story building was of post-and-beam construction, the posts located every 12 feet: The roof rafters were not supported by a ridge beam, and so were sagging. The 25x50 stone foundation was very solid. The clapboards were cracked and weathered but usable.

Despite its dilapidation, I liked the old building and the grounds; the simple basic lines appealed to me, and I could see its eventual use as a four-apartment rental property. I bought it for the price of the land alone; everyone thought I was nuts. Two preservationist friends told me that the building was too far gone to invest money in. And the darkest hour came when severe dry rot problems were found after the new roof had been completed. The building moldered through the winter on cellar jacks while I pondered what to do.

Finally, Richard Lazarus, a builder who had worked on another project with me, assessed the situation and determined he could do something. I studied the building code book and drew up tentative floor plans which were refined by an architect friend.

The layout was very simple. The 25x50 building was divided in half; each apartment would be 25x25. Two bedrooms were located on the west side and the living-room/kitchen area located on the east. All plumbing and wiring would come up through the core in the middle of the building; all bathrooms and kitchens would abut each other at the core.

The dirt would be dug away from the east wall of the building to allow for a stairway-porch. This would be the second-story apartment entrance. But before we could do anything about layout we needed to deal with three major structural problems.

View of the east wall being reconstructed with the balloon framing.

The finished product.

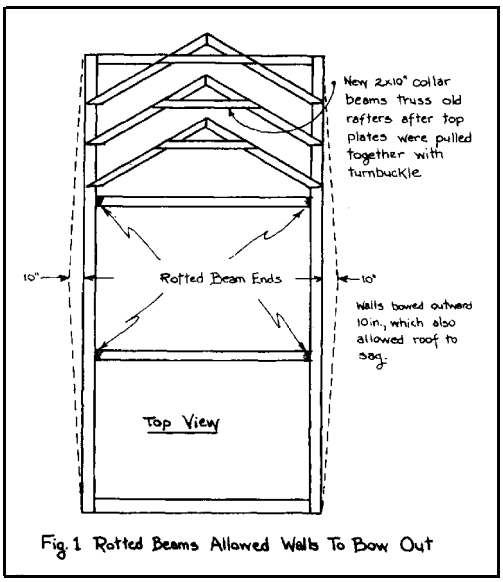

Fig. 1 Rotted Beams Allowed Walls To Bow Out

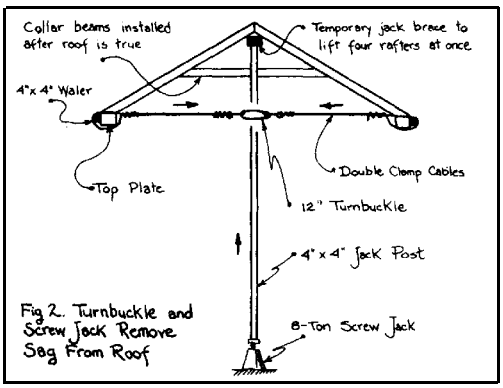

Fig 2. Turnbuckle and Screw Jack Remove Sag From Roof

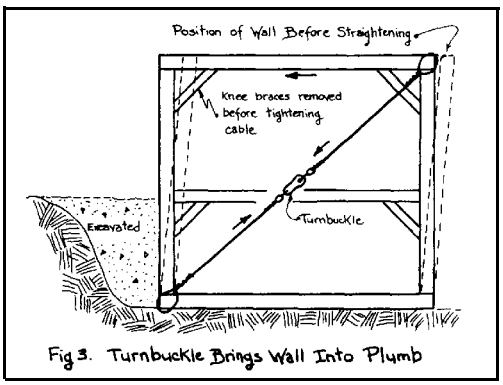

Fig 3. Turnbuckle Brings Wall Into Plumb

The Roof

First, the old roof had leaked so long that the tenons of the beams, which acted as collar beams and which supported the second floor ceiling joists, had rotted. Also, the plates on which the rafters rested had separated from each other because of snow loads. Hence, there was a very obvious saddle in the roof. The base of the rafters in the middle of the building were 20 inches further apart than the base of the rafters at the gable ends (Figure 1).

To correct the problem of the sagging roof, Rick looped ½-inch aircraft cable around the top plate in three places and connected the cables with turnbuckles as illustrated (Figure 2). While the turnbuckles were tightened, the peak of the roof was jacked up four rafters at a time from the cellar. After the roof was straight, collar beams were installed to truss the roof. The collar beams later acted as ceiling joists for a cathedral ceiling in the second floor apartments.

In order not to strain the already weak structure, the jacking and tightening procedure took place over several days. When we felt extreme resistance, something had to be removed because of the way the roof was coming back together. Also some of the roof sheathing had to be temporarily removed.

The East Side

The second problem was caused by earth which had pushed up against the east wall of the building on the first floor. The sill and posts had rotted. We provided support for the top plate and new studding for interior and exterior walling by erecting 16-foot balloon framing in eight-foot sections. This allowed the east side of the building to be lifted and supported by jacks as each frame section was erected.

Third, the frame of the building was racked by the pressure of the earth on the east side of the building. As viewed from the gable ends, the top comers of the building stuck out 10 inches over the bottom corners. After the earth was dug away and the new east-wall frame was in place, this problem was solved by using the cable and turnbuckle again. This time the cable was attached to the top west corner and the bottom east corner. As the cable was tightened, the frame was drawn back to a rectangle (Figure 3).

All the old knee (corner) braces were removed after the cable was attached and before any attempt was made to straighten. New corner bracing, in this case ½-inch CDX plywood, was installed at the corners (as in platform-frame construction) before the cable was loosened and removed.

The structure moved very easily under hand power with the methods described. To be sure, the building is not now square to the rule, but it is to the eye. The corners and walls are plumb.

Cables and jacks can also be used to brace and straighten masonry walls under repair as well. Rick used these methods for straightening several houses and barns damaged by time and use, and the only special tools required were two or three $80 screw jacks and $100 worth of steel cable and turnbuckles. Rick urges that hydraulic jacks not be used. Clean, well-greased screw jacks are infinitely safer.

The structural work on the building began in April 1976 and was completed in time for students to move in for the fall term. Rick worked with three carpenters and two helpers. The morale level was high for the most part because of beer and paychecks which arrived every Friday. The low point for the crew were the insults shouted from passing motorists: Tear the junk heap down! All this changed as the building pulled together and by August the skeptics had words of wonder and praise. ■

Carol U. Sisler was the Executive Director of Historic Ithaca, Inc. when she wrote this article. The article originally appeared in the December 1978 issue of Old House Journal *(69A 7th Avenue, Brooklyn, NY 11217; 718/636-4514), and is adapted with permission.*