

Barn Raising, views 1& 2

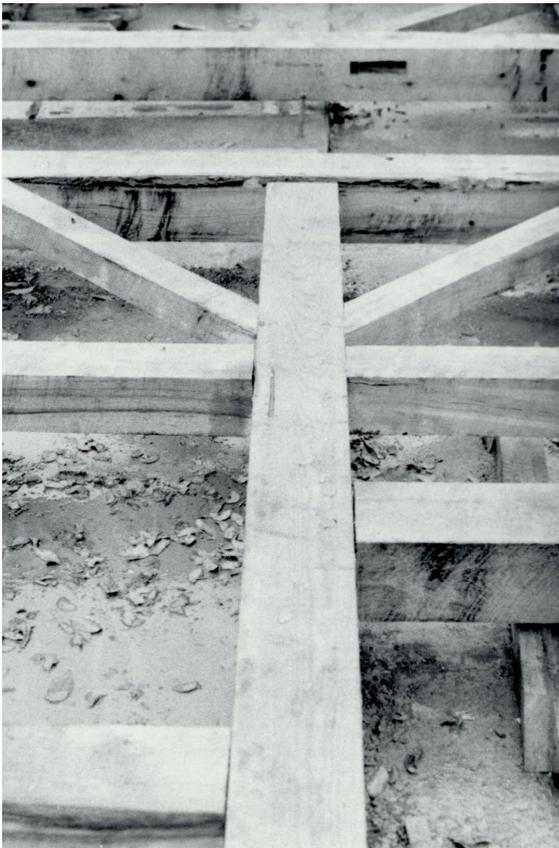


When we were exploring the Bretz farm we noticed that customary practices from the past are embedded in what we do in the present.

Here a timber frame building is being erected in a time when balloon frame construction (frames put together using 2x4 studs) is the norm.

Let's take a closer look to see how this was

done, remembering that machine power has replaced manpower for heavy lifting.



The major difference between timber framing and balloon framing is that in the former fewer, but bigger and thicker, pieces were used while in the latter more but much thinner pieces were used. This transition makes sense as forests of old growth timber were cut down and replaced by much younger second and even third growth timber.

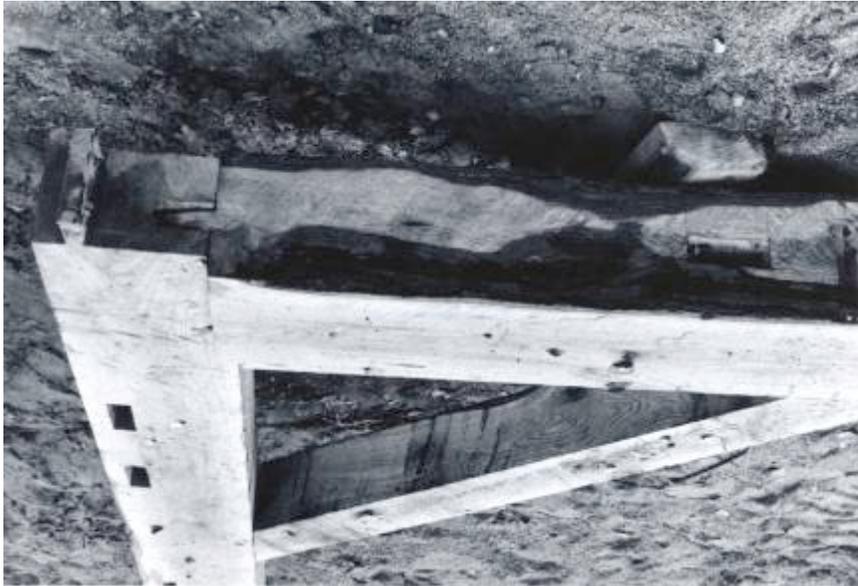
In the uppermost and horizontal beam, a rectangular hole known as a mortise has been cut. It will receive a tenon, or peg-like extension from the vertical beam, and the whole can be locked in place by a peg that passes through the entire assembly.

The diagonal braces collect the downward thrust of the supported load, transferring it to the vertical post and passing it down to the foundation.

The lower horizontal beams at both sides of the vertical post brace the framing structure to

prevent it from swaying side-to-side as a result of such forces as wind pressure or an uneven load on the upper floors of the structure.

Barn raising, view 3



The use of the mortise-and-tenon method to tie framing members together is evident on this framing piece.

The upright piece is a vertical framing post (a stud) and the horizontal piece at the top of the post is a tie beam that secures the side walls against the outward thrust of the rafter pairs.

The holes in the side of the post are mortises and the out-thrusting extension at the top and the tongue extending into the post are tenons.

Barn raising, view 4



Sections of the frame are put together on the ground. In a barn these transverse sections separate the interior space into separate bays.

The framing sections are tied together into a rectangular frame with horizontal cross beams being put into place here.

The vertical posts are mortised into a plate beam resting on the foundation. Notice the tenons at the bottom of the posts that fit into mortises in the plate.

Barn raising, view 5

This modern building is constructed on a concrete pad, but an earlier building would have been erected on a foundation and the floor would have taken a number of forms, depending on the time period and the area's use: wooden planks resting on floor joists, concrete in some areas of a barn such as a dairy room, earth for horse stalls, or a vegetable cellar in a house, and so forth.

Here the tenon of a post is being fitted into the mortise cut into a plate piece resting on the concrete pad to the right of the post.



Barn raising, view 6

In this detail from the previous picture the tenon on the vertical post is being set into the mortise, and the peg hole can be seen on the side of the plate beam for the peg that will lock the pieces into place.

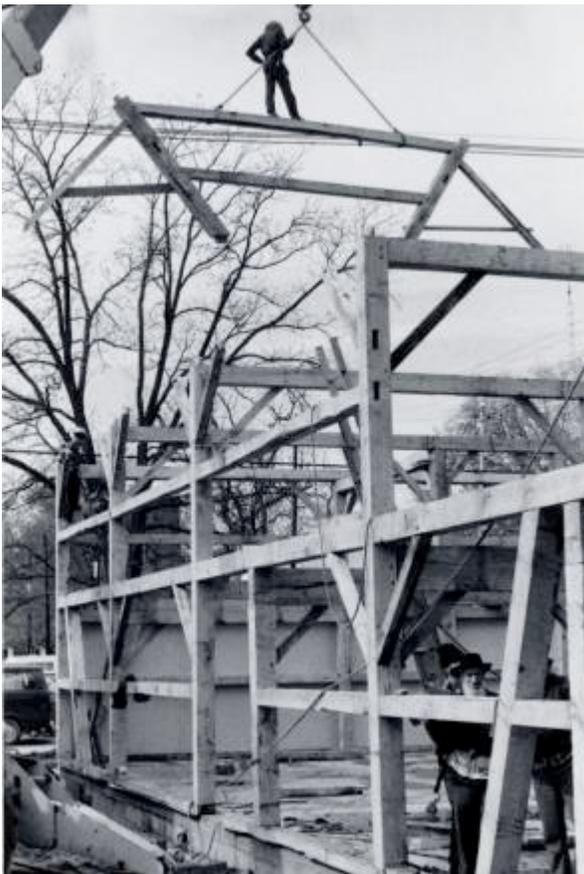


Barn raising, view 7



Before the advent of heavy construction machinery, these framing members would be raised by hand, with twenty or so men of the community using very long poles secured to the top cross member. With the poles, they pushed the frame up into position and held it there until it could be locked into place

Barn raising, view 8



Work now is beginning to provide support for the roof.

This framework will fit onto the gable end. The short cross-pieces forming an A at both ends are temporary pieces to hold the two diagonals at each end of the two cross beams in position until their tenons are matched to the mortices.

This structure will support the roof rafters half way between their footing on the top wall plate and the ridge beam at the peak of the roof.

A tenon can be seen sticking up at the left upper corner. It will lock in place a supporting piece running the length of the roof at the rafter's half way point that is called a purlin.

Before the advent of plywood, thin wood strips called lath were nailed from rafter to rafter, and on this was attached the roofing material, first tile, thatch, or shingles, later sheet metal, and in modern times, material such as asbestos

shingles.