

## NATIONAL BARN ALLIANCE – RESTORATION



### “The Sills” by Richard Lazarus

The sills of a barn usually fail because they rot. Sills seem to usually rot from the outside of the timber inward. The reason they rot is because they remain wet. Great-door sills are always the first to go. They are always nearer to grade than sills in other locations, and the doors, if left open, through neglect or failure of rollers or hinges, allow rain and snow to saturate them and promote rot.

Sills of a barn are like the keel of a ship. The foundation may rise and fall with the frost or spread under earth load, but the function of the sill is to keep the barn together. The original sills of a barn are usually the full length of the barn or have a scarf if the barn is longer than about fifty feet. The limit in length of timbers available today without hewing is about twenty-four feet. If the waste and expense of hewing can be tolerated, the recommended way to replace sills is with lengths to match the original. Also acceptable, is to use new timbers sawn to match the hewn size, lengthened with appropriate joinery and in appropriate structural locations. The sill should function structurally as a solid timber. Not acceptable is to laminate new sills from dimension, pressure treated, or rough-cut 2x lumber. The cost of materials is always greater and a carpenter experienced in traditional framing can cut a new timber and install it faster than building it up with kiln dried dimension lumber.

#### Floor system:

Failure in barn floor systems is found for two reasons. Roof leaks promote rot in the flooring and joists underneath. And when the great-door sills rot, the tenons of the joists that fit into them rot also, leaving the joist ends unsupported. If only the tenon of the joist and a small part of the joist near the tenon is rotted this is an appropriate place for the use of a steel repair piece. Cut away any rotten wood and fabricate and install a structurally appropriate piece of steel fastened to the wood in a structurally appropriate manner to support the remaining joist and tie it to the sill. I usually use a piece of 2”x8”x1/4”x 60”C channel, through bolted to the end of the joist, then tied to the sill with through bolts and resting on the foundation wall. Another way to support rot-shortened joists is to timber frame a beam with posts resting on adequate footers to support a row of joists. Of course replacing the entire or a part of the joist with a timber of appropriate size using traditional joinery is more acceptable, but a bit more expensive because the flooring may have to be removed (but not necessarily). Where roof leaks or other damage cause failure in the middle of a joist, the recommended repair is to replace the joist with a new timber. Floor joists of barns built in the nineteenth century were most often log joists hewn only on one face to provide a flat surface for flooring. If a log joist is to be replaced, it should be hewn to match the original if the species is appropriate and not extinct. Hewing is not difficult to learn and logs are not expensive, so cost should not be a factor in deciding to perform

repair or replacement. Many local mills will also saw flat one side of an appropriate log. Rotten or missing floorboards should be replaced using rough sawn 1x or 2x boards to match the original.

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