

Rotten-Sill Repair

Old-house experts share a safe, conservative approach to fixing a failing timber-frame sill beam

BY IAN SCHWANDT

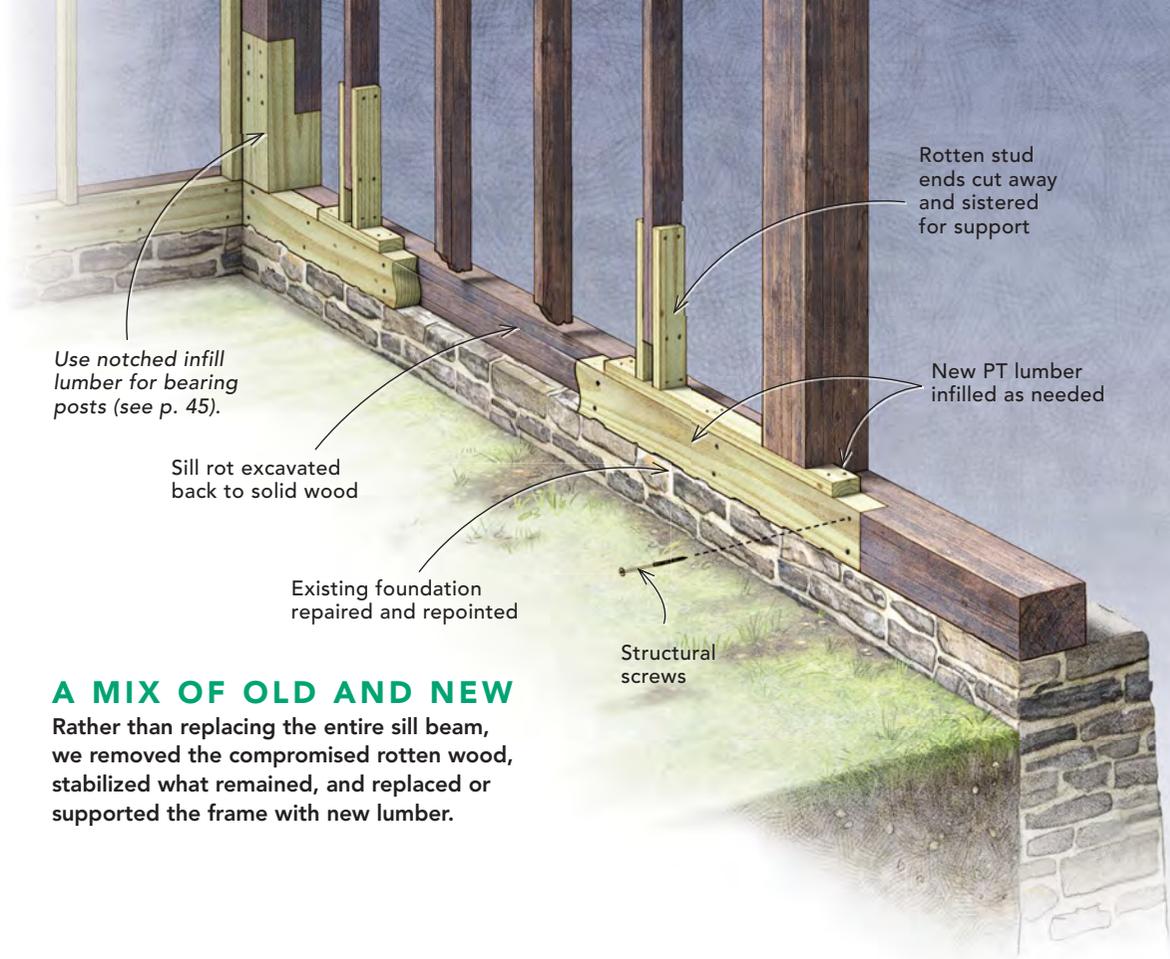
Most seasoned remodelers are used to structural repair work on platform-framed homes, whether it's adding a window in a bearing wall, shoring up an overspan floor frame, or replacing a rotten sill plate. But the company I work for specializes in the restoration of centuries-old homes, which means we mostly deal with timber-frame construction—many times built by the original inhabitant of the house—and that's a different ball game. Material species and

sizes vary from one old house to the next, as does construction method, and there's almost always been some remodeling work over the years that adds to the fun. So in our line of work, you have to carry a big bag of tricks.

On this particular project, a 1750s timber-frame farmhouse, the sill beam had sustained significant water damage from failed roof gutters and a grade that was actually above the foundation. In our experience, sills rot from the exterior side on the bottom, and this project was no exception. So rather than

removing the entire 6x8 oak sill, we decided to cut away the rotten area on the outside of the beam and sister in a new 16-ft. pressure-treated 4x6 to handle forces from above and resist rolling or twisting. This allowed us to effectively fix the problem without disturbing the floor joists or inside of the house, or blowing the budget. □

Ian Schwandt is a lead carpenter at Hudson Valley Preservation in Kent, Conn. Photos by Matthew Millham.



A MIX OF OLD AND NEW

Rather than replacing the entire sill beam, we removed the compromised rotten wood, stabilized what remained, and replaced or supported the frame with new lumber.

THE STRENGTH OF A TRIANGLE

To offer support and lateral stability while the sill was removed, we fastened 1x6 boards to the studs. Although a single horizontal ledger accomplishes similar goals, we like the inherent strength of fastening three boards in a triangle shape, with pairs of construction screws in each stud.



REMOVE THE ROT

Sills tend to rot from the outside in, so repair work starts by removing any and all damaged wood, and then stabilizing the wood that will remain.



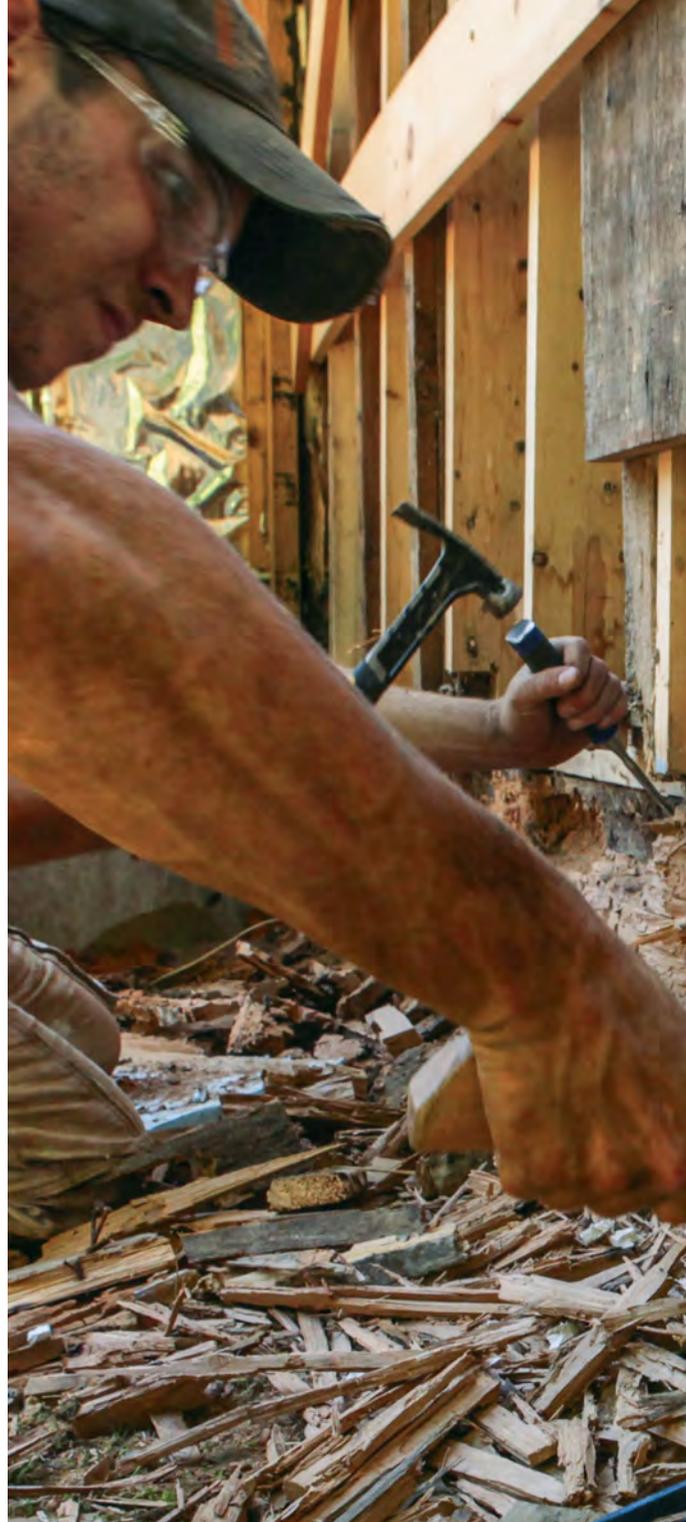
EXCAVATE FOR NAILS

Hand-forged nails and other embedded metal will wreak havoc on sawblades and hand tools, and must all be removed. For large nails, we drill out the area around the nail shank, allowing room to get a good grip with pliers.



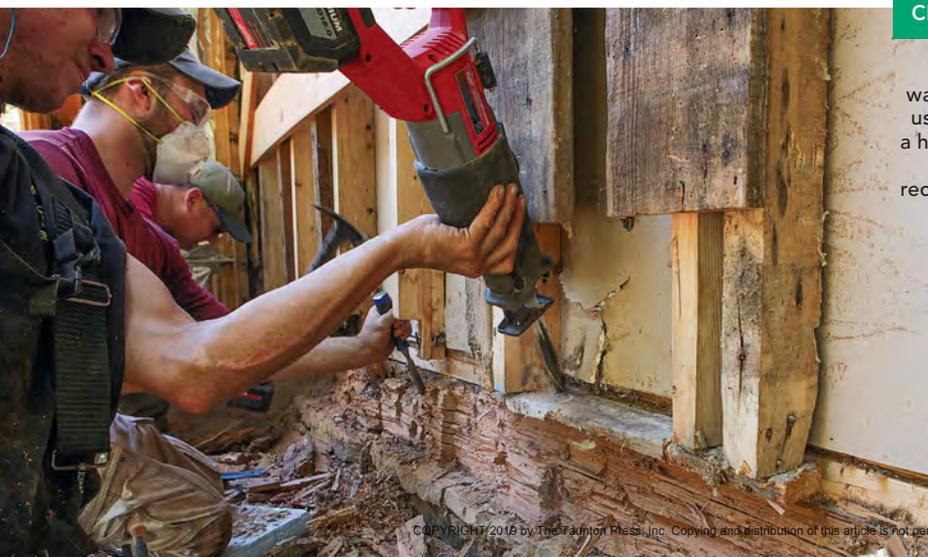
KERF THE SILL

Making a series of parallel cuts with a circular saw, we increase the depth of cut incrementally to match the extent of the rot. A note of caution: Old-growth wood is very dense, so choose a high-amperage saw to avoid burning out the motor.



CLEAR AWAY THE WASTE

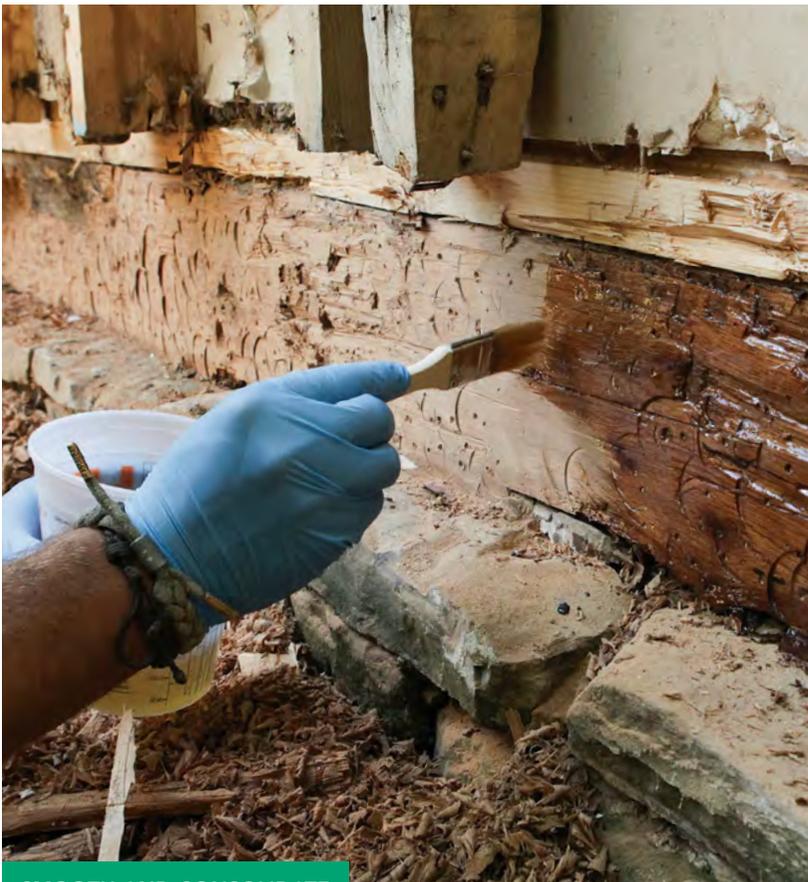
The bulk of the waste is removed using the claw of a hammer, chisels, pry bars, and a reciprocating saw.





AIM FOR FLAT AND PLUMB

We use a drill and Forstner bit to fine-tune the surface of the cut-back sill beam, checking the surface for flat and plumb using a level.



SMOOTH AND CONSOLIDATE

After a quick pass using an angle grinder equipped with a sanding disc, the surface of the remaining wood is treated with Abatron LiquidWood, a two-part epoxy consolidant that penetrates and solidifies any remaining decay.

FIT THE NEW SILL

After the dirty work is done, it's time to fit and fasten the new sill. Here we're using a pressure-treated 4x6, which we fasten to the existing sill using structural screws.



BLIND SCRIBE

After cutting the sill to length, we rest it on the edge of the foundation and reach behind the wood with a pencil to trace the ups and downs of the stone.



CUSTOM CURVES

To remove large swaths of wood, we create kerfs with the circular saw, knock away the waste, and then smooth out the contours of the scribe using an angle grinder equipped with a sanding disc to work to the line.



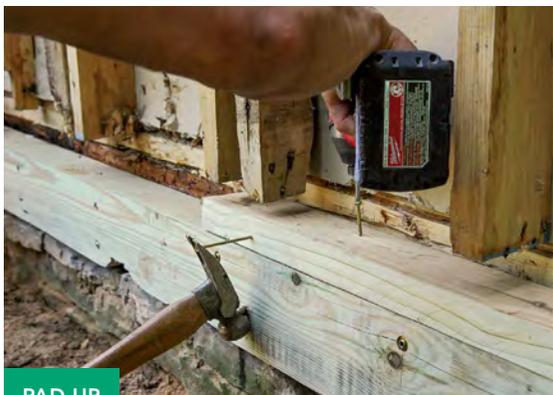


JOINING NEW AND OLD

Although supported by the foundation, the new sill beam must still be fastened securely to the existing sill. We use pairs of GRK's 8-in. RSS structural screws spaced every 12 in., keeping them at least an inch from the top and bottom edges to prevent splitting either the new or existing sill.

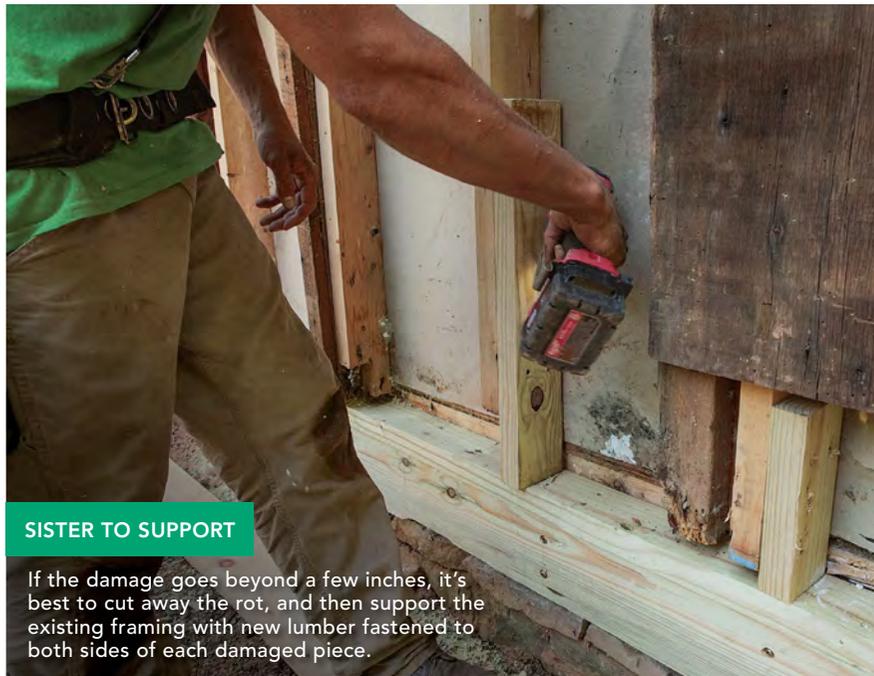
FILL IN TO FINISH

It's not uncommon for decay to creep into the end grain of studs and posts that rest on old sill beams, and these pieces need to be repaired as well. So, with the new sill in place, we typically either build up or reinforce, depending on the extent of the rot.



PAD UP

If the damage to studs and posts only extends up an inch or two, we measure up from the top of the sill in 1½-in. increments, allowing for an easy infill with one or more pressure-treated 2x4s to provide solid bearing.



SISTER TO SUPPORT

If the damage goes beyond a few inches, it's best to cut away the rot, and then support the existing framing with new lumber fastened to both sides of each damaged piece.



FILL AND PACK

Ensuring the loads from above are transferred through the sill and down to the foundation below typically requires a bit of masonry touch up. Using Type N mortar, we reset any loose stones, and completely fill up any gaps, packing the mortar tightly with a tuck-point trowel.

Post mortem

When rot extends several inches or more into the ends of timber-frame posts, as we experienced on one inside-corner post of this project, dealing with the weight of the point load requires additional bracing and some deeper repair work.



Double 2x10s pick up the load from posts and transfer it diagonally to the ground.

A row of 2x4s driven diagonally into a hole in the ground provides solid end support for a wooden wedge, which pushes the diagonal bracing up.

Custom-made, heavy-duty angle bracket fastened to post using lag screws.



PATCH THE POST

The rotten post bottom is cut away and stepped back to receive a new, mating replacement piece.