

# First Aid for

## The frame was worth saving

Although the footings and the stairs had to be replaced, the frame of our deck was in good shape. Temporary braces and supports kept it off the ground while we made repairs.

# a Failing Deck

Where Band-Aid solutions won't work, you might be able to save the frame and make your deck safe again

BY RICK ARNOLD

Recently, a friend asked me to give him a hand on a deck remodeling job. We were just going to replace the old decking and railings, but it turned out that the existing structure had the greatest number of issues I have ever seen on a deck. Band-Aid solutions wouldn't work here; we had to bring the entire deck up to compliance with current codes.

The problems began at the ground. Over time, the undersize and shallow concrete piers had shifted and sunk down. The 4x4 support columns just sat on top of the concrete piers with no connecting hardware. These 4x4 posts rose up to a 2x8 rim joist that served as a single-member beam to support the outer ends of the joists. That rim joist was not structurally adequate as a beam. In fact, it had sagged considerably as a result of the middle pier sinking down.

The list goes on. Stair risers varied in height by more than  $\frac{1}{2}$  in., exceeding the code-maximum difference of  $\frac{3}{8}$  in. and creating a potential fall hazard. Not one of the joist hangers was fastened properly. Where every one of the 18 holes in each hanger should have been filled with a 10d hanger nail, only two to six short roofing nails held each hanger in place. In some places, it appeared that the only thing holding a joist in place was the decking. The ledger was installed directly over the wood siding with no flashing, setting up the potential for rot in the house framing. Once the house framing rots, it can't support the deck ledger, and the deck can collapse. Additionally, the ledger was held to the house with an insufficient number of lag bolts. Since a leading cause of deck collapse and injury is failure of the connection between the ledger and the house, having an adequate number of bolts is crucial. Finally, there was no lateral-load connection between the house and the deck. Lateral-load connections ensure that the deck can't pull away from the house and are a relatively recent code requirement.

Other than those problems, the pressure-treated frame of the deck was in good shape and worth saving. We decided that after lightening the deck by tearing off the old railings and decking, we'd support the frame on temporary beams, detach it from the house, and pull the frame away to provide access for flashing and for adding lateral anchors. In the process, we'd address all the other framing issues. The inadequate footings and dangerous stairs we simply replaced.

Veteran *FHB* contributor Rick Arnold is a seasoned carpenter from North Kingstown, R.I. Photos by Andy Engel.

# DO DEMO RIGHT

When you're going to toss the debris, keep three things in mind. First, do no harm. That is, don't damage any components you intend to save, such as the frame (in this case). Second, don't waste time. The stuff is going into a Dumpster. Third, don't hurt yourself. Watch out for nails and screws, and don't move components so big that doing so would make an orthopedist cringe.



## Don't hurt the house

The railing was screwed to the house, and while it could have been levered off, doing so would have damaged the siding.

## Just cut it

Rather than pulling nails or removing screws, it's often much faster to cut doomed components free with a reciprocating saw.



## Long levers are your friend

Crowbars are great, and there are also a number of specialty decking-removal tools, but a cheap, 8-ft. 2x4 offers a lot of useful leverage.

## Take small bites

For speedy disposal, cut components into sections that one or two people can move easily.



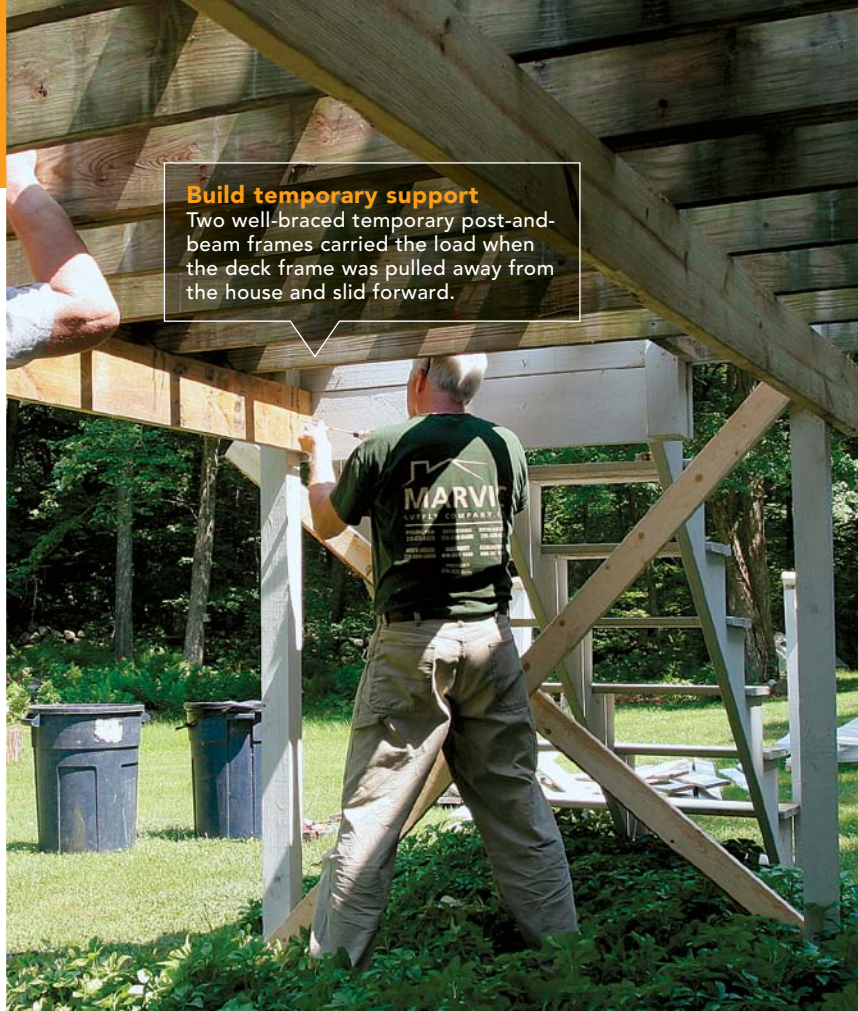
# MOVE THE FRAME

Because we needed access to the house for flashing and to add the lateral-load anchors, and because we wanted to reuse the existing frame, we decided to support the frame temporarily and pull it away from the house.



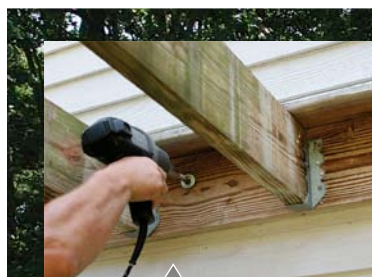
## Secure the joists to the ledger

A couple of roofing nails do not attach a joist hanger adequately. To reinforce the joist-to-ledger connections, we replaced each hanger and filled every nail hole with approved 1½-in. 10d hanger nails before moving the assembly.



## Build temporary support

Two well-braced temporary post-and-beam frames carried the load when the deck frame was pulled away from the house and slid forward.



## Disconnect the deck

While a wrench or ratchet would do the trick, a heavy-duty drill makes quick work of the lag bolts. Do not remove these bolts until the deck is otherwise supported.



## Use tools, not brute strength

A chain affixed to a tree combines with a come-along to pull the frame away from the house.

# ADD LATERAL-LOAD ANCHORS

A fairly new code requirement, lateral-load anchors (such as the Simpson Strong-Tie DTT2s used here) work in concert with lag bolts to keep the deck attached to the house. Each deck requires two. Because half the anchor is attached inside the house to the floor framing, access can be a problem. In this case, a basement ceiling was in the way. Rather than get involved in interior work, we temporarily removed a section of the house's rim joist to access the floor framing.



## Remove the siding

A reciprocating saw equipped with a long, flexible, metal-cutting blade slipped behind the siding makes quick work of cutting the nails.



## Cut out the rim and sheathing

After verifying there are no wires at risk inside, set a circular saw so its blade just penetrates the rim joist and sheathing. Pull any nails you can see, but use a cheap blade and safety glasses in case you hit others.

## Attach the inside half of the anchor

Structural screws secure the hold-down to the joist. A pair of nuts secures the threaded rod that will connect the two halves of the anchor, holding the rod steady and keeping it from turning when a nut is tightened on its outside. Finally, drill a hole for the rod in the cut-out sections of rim and sheathing, and nail them back in place.



## Attach the outside half

With the deck frame pushed back into place and the anchors' threaded-rod connector slipping through a hole drilled in the ledger, screw home the outside hold-down, and tighten the nut on the threaded rod. Adding a piece of blocking aligns the outside of the anchor with the inside.

# PUSH THE DECK BACK

Before flashing the house with a combination of peel-and-stick membrane and aluminum coil stock, we checked for water damage. Finding none, we began installing the layers of flashing. The idea is to direct any water that might get behind the deck ledger out onto the face of the siding below.



### Lap flashing onto siding below

To keep a peel-and-stick membrane from sticking where you don't want it, wait to peel the backing off until you've placed the membrane where you want it.



### Keep adding layers

It's easiest to work with narrower peel-and-stick, lapping courses top over bottom. Push the membrane over the anchor's threaded rod.



### Slip rigid flashing in

Cut the nails with a reciprocating saw, and work the rigid flashing behind the siding above. Make sure it laps the peel-and-stick.



### Push the frame onto the rods

Measure to find the locations of the threaded rods for the lateral anchors, then drill  $\frac{3}{4}$ -in. holes in the ledger so the  $\frac{1}{2}$ -in. rods slide through easily. Push back the deck frame in increments so that the threaded rods can be aligned with the holes in the ledger.

# REINFORCE THE OUTSIDE SUPPORT BEAM



Once the deck frame was back in place, we added two more 2x8s to the outside rim board so it would be adequately sized as a beam (removing the dip in the original one in the process). We made sure the crown, or arch, in the new members faced upward to help counteract the downward bow in the existing rim joist. When finished with the reinforcement, we added support posts between the new footings and the beam.

## Fasten the ledger to the house

A 2x4 jammed in place sets the ledger at the correct height, and LedgerLok structural screws connect the ledger to the house. The number of fasteners was determined by a table supplied by the screw manufacturer.



## Hang the new member

A couple of bent-over nails hooked over the old rim joist provide temporary support to the new 2x8.



## Work toward one end

With the far side of the first new 2x8 fastened, use the remaining length of the board as a lever to align the tops of the members while a second carpenter nails it off.

## Toenail it home

When a framing member needs additional persuasion to align with its mate, a toenail through the edge can often move the reluctant board.





**Set the new post**

A house jack lifts the deck frame enough to slide the new support post onto the post base at the footing and into place beneath the beam.



**Finish with drip edge**

Before installing the decking, nail an aluminum drip edge above the joists. Lap a piece of peel-and-stick over the drip edge and under the rigid flashing above.