

Hidden Defects Complicate a Simple Deck Replacement

BY MIKE WHALEN

In late 2020, my company was approached by a client who wanted to replace a small deck on the condo she had recently purchased. Measuring roughly 12 feet square and framed with pressure treated 2x8 joists with 2x6 PT decking, the deck had been built in the 1990s at the same time as her home, the end unit of a four-unit townhouse that's part of a 100-plus-unit condo development. Even after 25-plus years of service, the deck seemed structurally fine, but the owner wasn't happy with the 8-inch step up from the deck to floor level **(1)**.

When we began to demo the deck the following spring, we discovered that the deck's two ledgers had not been flashed properly. The home's vinyl siding was butted against the top of the decking on both the eaves and adjacent end walls, concealing that the deck-to-wall flashing was missing. The housewrap was just lapped over a narrow strip of building paper that had been tacked in place behind the ledger, with the top edge of the paper aligned with the top of the deck.

The outward appearance of the ledger connection seemed OK—the deck wasn't too wobbly—but when we removed the ledgers, we found that the OSB sheathing underneath was in bad shape **(2)**. The more vinyl siding we removed below the deck, the more rotted OSB we found, particularly on the condo's end wall **(3)**.

With little to no overhang and more surface area than the eaves wall, the end wall was more vulnerable to water damage from wind-driven rain. Compounding matters, the woven-type housewrap beneath the vinyl leaked like a sieve at various times and in different locations along this critical juncture.

No rim boards. Another hidden surprise was the floor system, which was framed without rim boards. When we removed the end wall's damaged OSB, the ends of the wood I-joists were just staring us in the face **(4)**. These 12-inch-deep I-joists run perpendicular to the end wall and parallel to the eaves wall, with 2x4 squash blocks run vertically on either side of the joists.

Along the end wall, the original builders had lag-screwed the ledger to the squash blocks, as well as to the wall's double top plate. On the eaves wall, where the outer I-joist "rim board" offered little help in terms of ledger fastening, the 2x8 ledger was only lagged at the double top plate. I sent pictures of our findings to an architect we frequently work with, and he was stunned.

We informed the homeowner what we discovered



While the existing deck displayed no outward signs of instability **(1)**, the ledgers had not been properly flashed and the underlying OSB sheathing was revealed to be water damaged upon removal **(2)**.



The end-wall sheathing was severely deteriorated **(3)**, and removing the water-damaged materials revealed that the floor framing had been installed without rim boards; a square hole (top right in photo) was cut into the outboard I-joist to verify floor framing direction **(4)**.

Photos by Mike Whalen

and inspected the interior of the home for signs of water damage and mold and found none. After removing all the rotted OSB sheathing (the bulk of which was from the end wall) and fiberglass batt insulation, we found that the underlying framing was in fairly good shape. So we applied a mold-inhibitor onto the affected areas, sistered a few new studs onto the studwall, and left the exposed stud bays open overnight and into the next day. Because it was early spring and still cold, we had to balance wanting to dry out the wall cavity and quickly buttoning everything up for heating purposes.

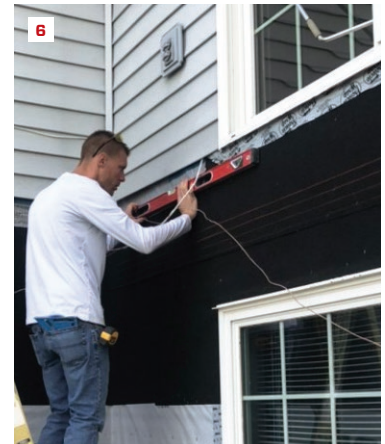
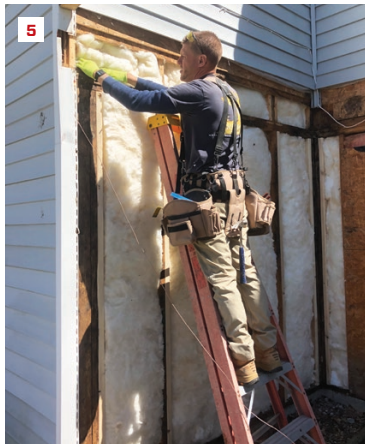
A structural redesign. The architect sent us a couple of ledger attachment scenarios for the planned deck: lagging the 2-by PT ledger to the existing house framing with staggered LedgerLok screws 6 inches on-center if the I-joists ran perpendicular to the eaves wall; or, if the I-joists ran parallel, installing four hold-down devices attached to joists with 1/2-inch-diameter threaded rod with nuts and washers. To see which scenario would apply, we cut a roughly 6x6 square into the web of the outboard I-joist running parallel to the wall, confirming that the floor joists were indeed parallel to the eaves wall.

In lieu of removing interior drywall to block out five joist bays for the hold-downs and threaded rod, we opted to build a less-invasive, free-standing deck. This decision was also prompted by the client's desire to raise the deck elevation to decrease the step down from the sliding door from 8 to 4 inches, which would have made securing a new load-supporting ledger along the eaves wall all the more difficult.

The new deck matches the original deck's footprint, but we increased the joist size to 2x10 stock, which helped with the ledger attachment issues to the house. At either end of the deck, we supported the joists with a pair of double PT 2x12 drop beams, which in turn are supported by four 6x6 posts on 18-inch-diameter by 48-inch-deep concrete piers. For lateral stability, we fastened the two 2x10 ledgers to the house framing with LedgerLok screws 16 inches on-center in a staggered pattern where feasible. At the eaves wall, the flush-framed joists are secured to the ledger with hangers.

We installed peel-and-stick membrane behind the ledgers and flashed them with L-shaped copper properly integrated with the WRB. After completing the free-standing deck, we reinstalled the existing vinyl siding (5-9). For a job that should have taken only a couple of days, this small deck project—with all its hidden problems—took two weeks.

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After re-insulating (5) and resheathing the walls, workers installed a peel-and-stick membrane in the ledger area (6), running the membrane 6 inches above the new deck elevation and behind the WRB.



L-shaped copper flashing (yorkflashings.com) is installed on top of the ledger along the deck-to wall juncture. The new deck was raised 4 inches to decrease the step down from the sliding door (7).



The free-standing deck is supported by a pair of double PT 2x12 drop beams and four 6x6 posts (8). While the condo association approved the new Trex composite decking, the posts and railings needed to be dark brown to match the original deck (9).