Widow's Walk, Pacific Northwest Style

Special framing hardware supports the deck surrounding this unique structure

by Mark Meyer

In one of our more interesting projects, the clients wanted to reclaim an unused atrium, which was open to the sky and surrounded on all four sides by the rest of their house. The home is located at the top of a hill in Silverton, a quiet rural area about a 40-minute drive from our offices in Salem, Ore.

The plan was to remove an existing hot tub from the ground level, repurpose the first level into a large pantry (part of an extensive kitchen remodel), and transform the second floor of the former atrium into office space. The whole structure would be capped by a quiet reading room on the third floor, with access via a spiral staircase from the office below. On three sides, the reading room would be flanked by a wrap-around deck extending out over the roof below. Instead of gazing out over the ocean, like 19th-century New England wives awaiting the return of their sea captain husbands, occupants of this widow's walk would be gazing out over the surrounding hills and the broader Willamette Valley.

Demolition and Framing

A large hot tub occupied the atrium, so the first order of business was removing the tub and cleaning out the leaves and debris that had collected on the slab supporting the tub. We also demoed a small deck that surrounded the tub and was ledgered to the exterior walls.

Once we'd removed the windows and the exterior trim from the atrium well, framing the new space was straightforward. We removed and relocated an existing exterior wall on the first floor, which required a new support column in the basement to carry the redistributed loads from the floor system above. We also removed an exterior wall on the second floor, replacing it with a framed

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entryway into the new office space.

Where one second-floor wall supported an existing shed roof, we cut back the asphalt shingles and roof sheathing as needed to install blocking and new framing to prevent roof joist rotation. Then we extended the knee wall with new 2x6 studs to bring the wall up to full height, tying the studs to the double 2-by knee-wall top plate below with 15-inch-long Simpson Strong-Tie SDWH structural screws driven through DTT1Z hardware installed 24 inches on-center (**Figure 1**).

On the full-height wall supporting the other rafters, we used a similar approach. To stabilize the rafters, we installed blocking as needed above the double 2-by plate, then installed the new rim joist and floor joists for the third-floor deck. Then we used DTT1Zs to tie the new floor joists to the old wall framing below, driving long, 3⁄8-inch-diameter lag screws through the DTT1Zs and into the top plate.

Once the floor system was in place, we framed up the new 2x6 stud walls for the widow's walk. The new space is capped with a 5-in-12 hip roof.

Figure 1. An existing atrium was surrounded by four walls and open to the sky (A). The author's crew extended the second-floor atrium knee walls to full height, then added cantilevered beams to the new third-story floor system (B) to help support the deck that would surround the new structure (C).

SkyLift Solution

When we framed the third-level floor system, we installed two cantilevered beams

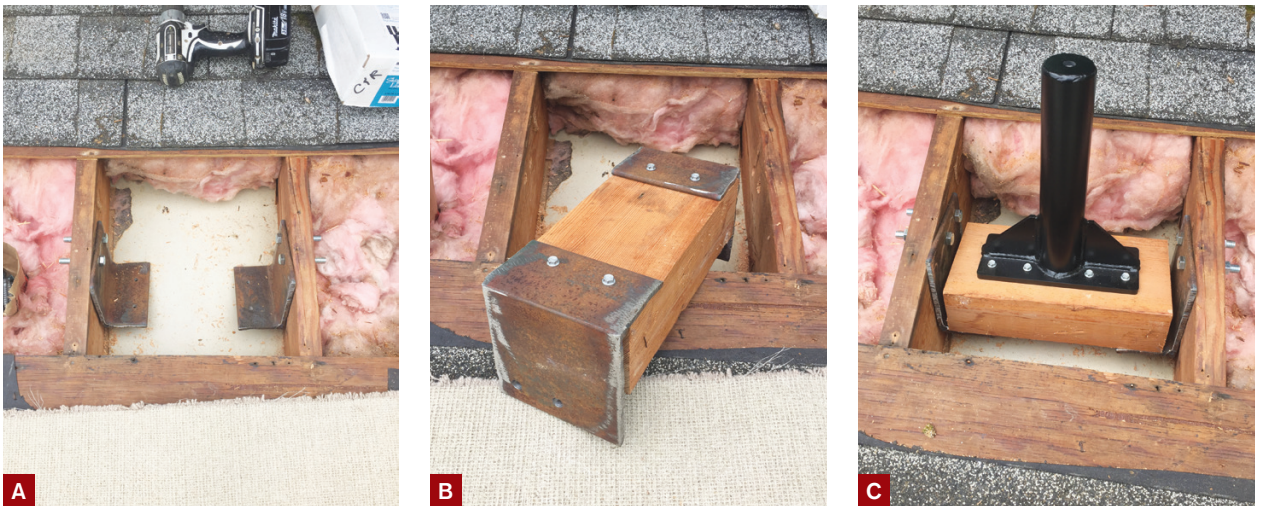

Figure 2. The crew opened up the roof sheathing and bolted steel angle brackets to the roof framing (A), with 4x6 Doug fir blocks bolted to the steel angles (B). SkyLift risers were then bolted to the blocks to help support the deck (C).

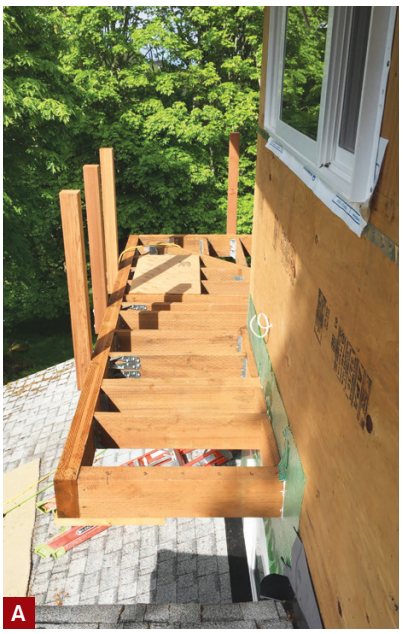

Figure 3. Part of the wrap-around deck is supported by cantilevered beams (A), with the rest bearing on beams supported by 4x4 PT Doug fir posts bolted to SkyLift risers (B). After bolting 4x4 and 4x6 clear cedar guard posts to the framing (C), the crew installed a 2x4 subrail and began installation of the capped composite decking that would complete the project (D).

to help support one side of the framing for the U-shaped deck that flanks the widow's walk. But we also needed to install four columns to support the rest of the deck framing. To ensure that loads from this small deck were properly supported by the roof framing below, we installed four SkyLift #12-HD 12-inch Heavy Duty Designer steel roof risers. These are engineered metal brackets designed to support elevated patio supports and similar structures. In this case, we used the risers to support the beams carrying the deck framing.

Most of the time, SkyLift risers are installed directly on top of the wall plates through access holes cut through the roof sheathing, but in this case, the risers needed to be supported by the roof framing midspan, underneath the deck. After plumbing down from the deck beams once they were installed and opening up the sheathing to verify the exact location of the rafters, we cut 4x6 Doug fir blocks to length to fit between the rafters at each riser location. Then we mounted the blocks to the rafters per the architect's drawing using 5/16-inch steel angle brackets with 6-inch-tall vertical legs and 3½-inch-wide horizontal legs, through-bolting the brackets to the rafters with ½-inch-diameter bolts (**Figure 2**).

We fastened the riser bases to the support blocks with ¼-in. x 3 ½-in. SST SDS structural screws. After patching the roof sheathing and slipping the flashing boots over the risers so that we could reshingle these sections of roofing, we bolted the 3½-inch saddles that hold the beams to the risers.

The SkyLift risers are connected to the deck framing with 4x4 PT Doug fir posts. At the top of the posts, we reinforced the post-to-beam connections with pairs of Stanley-National heavy-duty ¼-inch steel decorative corner braces, which we fastened to both the posts and the beams with ½-inch-diameter bolts. The longest column is also braced with a

diagonal PT 2x4 fastened to the post and deck framing with 3/8-inch-diameter through-bolts (**Figure 3**).

Finishing Details

We bolted the 2x8 PT deck ledgers to the widow's walk's rim joists, spacing the ledger away from the sheathing with 1/2-inch-thick polypropylene Deck2Wall spacers. After hanging the 2x8 deck joists, we reinforced the deck-to-house connection in several locations with pairs of SST DTT2Z lateral load anchors fastened to a deck joist and corresponding floor joist, each pair connected with a 1/2-inch-diameter threaded rod.

We through-bolted clear cedar 4x4 intermediate posts and 4x6 end posts to the rim joists of the deck every 36 inches, reinforcing each post connection with a pair of DTT2Z anchors. In preparation for the cable railing, we installed a 2x4 subrail, reinforcing the corners with SST 55L strap ties, then installed the clear cedar 2x6 top rail.

After we finished installing Wolf capped composite decking, we completed the Type 316 cable railing install (approximately 2 13/16 inches on-center). Where the end of the deck is close to roof level, we installed an aluminum gate and a short ramp for occasional access (to clean gutters and a metalbestos chimney). After the widow's walk was trimmed and painted, we stained the deck framing and rail posts to match (**Figure 4**). ❖

Mark Meyer is a lead carpenter for C&R Remodeling, located in Salem, Ore. In his spare time, Mark enjoys the Oregon outdoors along with his wife and two sons.

Figure 4. The widow's walk—a quiet reading room with views of Oregon's Willamette Valley—and surrounding deck and railing were finished to match the existing house.