Solo-Building a High-Rise Deck

Working alone 23 feet off the ground takes planning, strength, and a crane

by Mac MacDonald

When I read news stories about decks collapsing, I think, "Not on my watch." I'm very particular about my projects — how they look, how safe they are, how long they'll last. Because I've had trouble finding employees who have the skills and dedication to the job that I require, I've decided to save myself the personnel headaches and just work alone. That gives me total control over the finished product, and I can focus on more challenging projects.

You might think that working by myself would limit the size of deck projects I could tackle, but with proper planning and equipment — and occasional help from heavy machinery — solo-building big decks like the one in this article (**photo, page 1**) is perfectly feasible. Some builds take longer without a crew, of course. This double-decker deck, which I built on a new house under construction, took me more than 350 hours to complete.

I used pressure-treated Douglas fir for the framing, 2x6 tight-knot cedar for the decking, and clear cedar and powder-coated steel for the handrails. The project was complicated by a couple of factors. For one, the upper level is 23 feet above grade. Also, the lower level supports a 6,000-pound hot tub (**photo, at top**); it's protected from the rain by DrySpace panels (TimberTech; 800/307-7780, timbertech.com) on the ceiling above (**photo, at bottom**). Here are the key strategies that helped me pull this project off.

A hot tub weighing 3 tons when full added to the challenge of building an airy deck.

An underdeck drainage system in the ceiling above makes soaking in a hot tub in the rainy Northwest more appealing.

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Assemble Footing Forms Before the Excavator Arrives

On the job site, getting to virgin dirt to place the footings meant digging down 5 feet below grade. The engineer initially specced 2-foot-square footings, which typically require a wooden form at the bottom topped with a cardboard tube form. But joining wooden forms to round concrete tube forms 5 feet below grade would have been problematic. Instead, I used 16-inch-by-4-foot tube forms and 36-inch round concrete forms (Bigfoot Systems; 800/934-0393, bigfootsystems.com). The Bigfoot forms attach to the tubes with a couple of deck screws.

Not relishing the prospect of digging 11 holes 4 feet square by 5 feet deep, I coordinated with the excavator. When he came out to backfill the house foundation, I had the forms ready to go. He dug the holes, I dropped the forms in, and he backfilled while I held the forms in position.

To make the best use of the excavator's time, the author assembled the footing forms beforehand. Plastic wrap prevents rain from damaging the cardboard forms.

Once all the forms were placed, a concrete pump filled them from the street. The concrete set up for 3 weeks so it was fully cured when construction of the deck began.

Another Contractor's Way of Setting Posts

I can handle building most decks alone, but in the past I found that raising, plumbing, and bracing tall posts for elevated decks required another set of hands. Until a few years ago, that is, when I came up with my "assistant" to help with this task. It's a 2x4 post with a couple of lateral braces, each attached with a single lag screw.

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Before raising the post, the base of the 2x4 "assistant" is attached to the post's concrete pier with a nylon load strap and secured plumb with the braces.

The first joist is run a little long so it can rest on the assistant, while providing space to raise and plumb the post.

The joist is temporarily secured, and the assistant can be relocated for the next post.

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It Takes a Platform to Raise a Deck

A scaffolding platform was the key to building this high-rise deck. Not only did it get me high enough off the ground to work on the deck, it also served to hold the posts until I could attach them permanently. Supports attached to the deck ledger locked the platform to the house.

I rented the scaffold, which cost $500 for the entire summer (I used it for three other decks). Setup took a day and a half, and breaking it down took another day.

The post bottoms were notched to fit their bases, then treated with an end-cut preservative to ensure against rot.

Once all the posts were positioned, a laser was used to mark their heights. Simpson Strong-Tie CC66 column caps (800/999-5099, strongtie.com) were installed to secure the posts to the beams.

Lifting the posts took strength and planning. Two 2x4s screwed to the post with 5-inch LedgerLoks (FastenMaster; 800/518-3569, fastenmaster.com) served as handles (1). Once the post was high enough to rest on a 2x4, the author changed position (2). Catches made of framing lumber secured the raised posts to scaffold (3).

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Do the Heavy Lifting With a Crane

In preparation for the crane that would move all the lumber from the driveway of the house into position for building the deck, I cut all the beams to length and screwed the joists together in bundles of 15. Given the height of the deck and how heavy the beams and the 4x12 joists were, hiring the crane might have been a good idea even if I had been working with a crew. It cost $1,500 for the day, including drive time, but I was able to set all the beams and move all the joists. A lot of running, a lot of climbing, and 9 hours later I had all my structural material in the air.

Although the crane moved it around back for me, the decking for the lower level had to wait on the ground until the deck was framed. Then I lifted it by hand. When the builder had the crane back to lift the hot tub, I used it to place the bundled decking on the upper deck.

A crane was used to lift the lumber from the street to the deck and set the individual beams on their posts. As the author had no line of sight to the crane operator, the author's wife operated a radio while he guided the lumber into position.

Once all the beams were placed, bundles of joists were craned into position. One end of the bundles rested on the beams, the other on temporary supports built next to the house.

The crane lightened the burden, but still the author had to rig the bundles of lumber on the ground and climb the scaffold to guide them into place.

The author rolled the joists into position while standing on the scaffolding.

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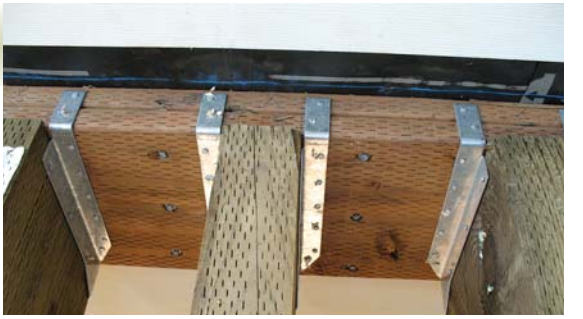
Frame for Efficiency and Stability

Working high up nearly always takes longer than building on the ground, so taking advantage of any efficiencies becomes more crucial than usual. Likewise, because of the height, making the framing as stable as possible takes on more importance.

Investing in your tool kit can make a big difference. I had purchased a positive placement nailer (Hitachi Power Tools; 866/775-9429, hitachipowertools.com) not long before starting this job. I was very happy I had it — over 100 connectors needed to be nailed in place for this project.



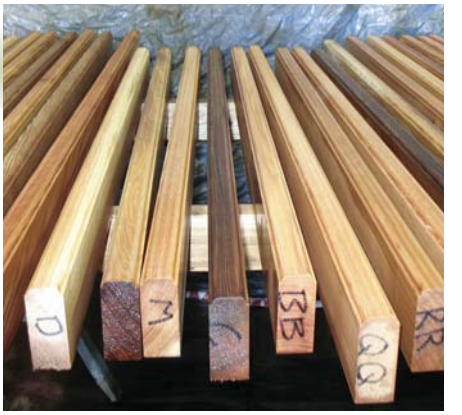
Oversize hangers for the 4x12 joists required a double ledger. All the joists received full-height blocking for additional stability, and the joists below the hot tub got three rows of blocking.

The 2x6 decking was face-screwed at a 45-degree angle to the house and framing both for appearance and to prevent lateral sway.

Make and Finish the Railing Off Site

Given both the rainy climate and the challenges of working high in the air, it made sense to do as much of the railing work as possible inside. I routed, sanded, and stained the 4x4 posts and 2x4 rails at my shop. I drilled holes for the balusters with a drill press and assembled the railing sections, holding them together with ratchet straps until I could install them on the deck. ❖

Mac MacDonald works by himself in Eugene, Ore.



The railing was shaped, drilled, and finished in the author's shop. Marks on the ends kept the lumber in order.

Cedar cap rail was routed on all four edges, and joints were half-lapped together with exterior adhesive and stainless steel screws. All fasteners were installed from below. Screw holes were plugged and sanded, leaving little trace of the mechanical connection.

Rails were secured with pocket screws (Kreg Tool Company; 800/447-8638, kregtool.com).