Concrete Advice

In recent *PDB* articles about concrete deck foundations, it seems that piers are always dug by hand, and that concrete is mixed from bags. What's up with that? Isn't time (or a better result) worth anything? If I needed piers dug below the frostline (no frost here in California), I'd hire a Bobcat-mounted drill. If I needed to cross a lawn, I'd lay down sheets of OSB and plastic sheeting for protection. Any job that requires anything approaching a yard of concrete gets ordered from a batch plant with a pump. That yard of concrete might be costly, but the job goes quickly without a lot of help, the foundations aren't full of cold joints, and a good pumper will clean his hose into the truck, leaving no mess.

While we're on the subject of concrete, this publication recently ran a two-part article on piers ("Better Deck Piers," February/March and April 2015). Besides all the above labor-intensive issues, the author suggests setting anchor bolts in wet concrete and "jiggling and turning" them for secure embedment. But if a concrete pour is being inspected in my area, the anchor bolts *must* be placed in anchor-bolt holders and attached to a form board, with the concrete poured around them. This is to prevent some knucklehead from forgetting the bolts until the concrete is mostly set up and then beating them in with a hammer. By the way, why anchor bolts and bases? Simpson makes a full range of post and column bases.

George
(from online comments)

Cumulative Errors Led to Balcony Collapse

The six people who died and the seven who were seriously injured in a balcony collapse in June on an apartment building on Kittridge St., in Berkeley, Calif., never should have died or been injured. That's my opinion, based on the information and documents I've received and photographs I've reviewed.

From what my review and discussions with other experts have come up with, it seems the wood cantilevered deck was framed out flat, despite the plans calling for a 2% slope on it. After being built, it was waterproofed using Grace 3000 Bituthene membrane, a peel-and-stick waterproofing sheet—which was good.

After the deck was waterproofed, it appears that sloping concrete-backerboard-type materials were placed on top, then screwed down through the waterproofing membrane. Grace advertises that its membrane is "self-healing," but also advises that any penetrations be patched—nearly impossible to do in this type of situation. But someone probably thought, hey, it's self-sealing, so no problem screwing through it. Apparently no further waterproofing over the sloped materials was done.

Then a concrete deck was poured over this assembly. Water will leak through concrete. It's permeable unless it's waterproofed. Stucco was applied as the finish under the balcony. One design flaw with the stucco was that no vents were installed on the underside of the deck.

My theory is that water got through the concrete and in at the door area. The fasteners used to screw the concrete board down allowed water to penetrate to the waterproofing membrane. As the screws rusted, they provided a channel for water to penetrate into the deck substrate and framing. With the wood wet, the rot could begin.

To be clear, the design of the waterproofing appears to have been a problem too. I've reviewed details of the waterproofing assembly, and the architect appears to have left out a critical piece of the system assembly: subsurface drainage.

The Grace 3000, like nearly every Grace waterproofing product, requires a drain board assembly to be placed on top of the waterproofing membrane over a pre-sloped substrate. Without the ability to drain water out, concrete will hold the water against the waterproofing membrane, allowing it to sit, especially on a flat deck. The Grace system, if properly designed and assembled, should have worked for years and years without issue.

I think that this balcony began to deteriorate as soon as it was built, which raises the question of whether or not the balconies at the property were ever inspected by a management company or a building evaluation specialist. If so, I would think that some signs of distress may have been present and noticeable to an expert, since experts inspected the other decks on this property after the collapse and determined several were dangerous and red-tagged them. It's reasonable to assume that this deck, had it been inspected, would have been found to be dangerous before this tragedy happened.

The lawyers will figure it out, and the insurance company will pay out. But we as an industry must become better at our trades, in both design and assembly. We can't afford cheap construction. ❖

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