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REPAIRING Cantilevered Balconies



My company specializes in condominium maintenance and repairs. In California, homeowners

by Angus Smith

have up to ten years to bring suit against the original builder for faulty workmanship. Condo associations are often awarded settlements for remedial projects that can run into the millions of dollars — work that is usually undertaken by companies much larger than mine.

We're most often hired by associa-

The right flashing details, reinforced framing, and durable waterproof decking give new life to old balconies

tions that have already passed the ten-year limit, which means that the work must be paid for out of a maintenance budget. Our most common job involves repairing water-damaged framing, especially in the cantilevered balconies that are so popular in multi-

family buildings here. The jobs we tackle are awarded in quantities from 1 to 50 balconies at a time.

Anatomy of a Balcony

The typical condo balcony we encounter is framed with cantilevered

joists that project about 6 feet from the face of the building, or from one-fourth to one-third of their overall length. The remainder of the joist is buried inside, an integral component of the interior floor system. A fractured or delaminated balcony surface (typically plywood, covered by one of several possible waterproofing systems) is usually the first tip-off to greater problems; all too often, the unseen damage is extensive and poses a hazard to the occupants (see Figure 1). Stucco, a common exterior finish in this part of the world, can also conceal a multitude of problems. Although the surface seldom reveals underlying rot, staining and discoloration should raise suspicions.

Water, water everywhere. We rarely encounter cantilevered joists with a deliberate, taper-sawn slope to drain water away from the structure, despite the minimum 1/4-inch-per-foot slope requirement specified by most waterproofing manufacturers. These flat decks permit water to puddle on the surface, leading to premature failure of the waterproofing membrane. In addition, we often find poorly detailed or missing flashing at the balcony perimeter, which allows wind-driven water to enter the framing.

Railing systems are usually solid half walls rather than open assemblies,



Figure 1. Surface cracks in a balcony's waterproofing are often the first sign of hidden structural damage. Cracks typically appear above joints in the plywood deck sheathing.

which makes for easy construction and provides privacy for the residents. It also prevents runoff from a balcony from dripping directly onto one below, but at a cost: The rainwater that falls onto each balcony must be collected and directed outside. This is usually handled by a floor drain or an open, floor-level scupper draining to a gutter. Either drainage method can lead to rot unless the spout that passes through the framing is properly installed and sealed (Figure 2).

Inadequate flashing and finishing at railing post penetrations often allow water to run down into the framing cavity, making those common points of failure as well. We frequently find railings that are attached to the building without proper flashing, allowing

water to become trapped against the wall. As the framing decays and the fasteners corrode, the railing provides little support, and the condition is often dangerously invisible.

Joist Repair

Repairing rotten joists is particularly difficult because we can't go inside to tear up the floor or open the ceiling over the occupant below. We've had to devise effective techniques for repairing damage and preventing future problems while working almost entirely outside.

Bolted sisters. The first order of business is to expose the bare joists by tearing off the railing, the plywood deck, and any soffit paneling underneath. In most cases, we find enough sound wood to permit repairing the joists,



Figure 2. Improperly flashed scuppers (left) and floor drains (right) often allow water into the framing, leading to hidden rot.



Figure 3. To eliminate puddling, the author rips a 1/4-inch-per-foot taper from the top edge of the cantilevered joists, creating a positive drainage slope. A power planer cleans up the cut.

rather than replacing them. Rot is often concentrated in the outermost 6 inches of the joists and along the upper edges, where nail penetrations have allowed water in. We cut the damaged ends back to healthy wood and sister new, 6-foot-long joists of equal dimension alongside, using two carriage bolts at the center and two at each end to tie the joists solidly together. To make a neater-looking repair and provide full nailing for the deck sheathing and trim, we fill in the end cuts with blocks of lumber.

Any top-edge rot gets ripped away to undamaged wood and replaced with a new ripping, which we simply gun-nail into place. We treat all cuts with a termite and rot repellent, Jasco Termin-8 (Jasco; 888/345-2726, www.jasco-help.com), a green, oil-based copper-naphthenate solution that helps prevent future infestation. If the original joists didn't incorporate a drainage slope, we'll rip a full-length, 1/4-inch-per-foot taper on the top edge, cleaning up the cuts afterward with a power plane (Figure 3).

Shifting the load. Joists that are too far gone to repair must be replaced. With no practical way to insert a new cantilever, this can pose a real problem if the rot is extensive. Fortunately, we usually find that only one or two of the original joists are rotted to the point of being unusable. In such cases, we rely on the remaining members for structural support by installing a new, double rim joist at the outboard edge and tying it to each solid joist with an upside-down joist hanger (Figure 4).

This beefed-up rim hangs from the sound joists, providing outboard support to the few joists that must be completely replaced. The inboard ends of the replaced joists rest on the wall plate, while the outboard ends are supported by conventionally installed joist hangers at the rim — an approach that shifts the load from these replaced “cripple joists” to the repaired and sistered joists through the rim.

I gleaned this detail from a structural engineer many years ago, and it has proved to be reliable in practice.



Figure 4. Joists that are too far gone to repair must be replaced between the wall plate and the new double rim joist (left). The rim hangs at the ends of the intact cantilevered joists on upside-down joist hangers. The replaced “cripple joists” are hung conventionally (right).



Figure 5. Flexible membrane flashing, tucked behind existing building paper and overlapping a sheet-metal skirt flashing, provides positive wall drainage onto the new balcony surface.

But obviously, it demands common sense and good judgment. If more than two in ten joists must be replaced, I'll consult an engineer. That also applies to another situation we sometimes encounter, where the damaged cantilever framing consists of a heavy beam at either end of the balcony with perpendicular infill joists running between them. In either case, it will usually be necessary to tear up the floor inside or post the balcony to the ground, but that's another story.

Buttoning Up

Once the joists are repaired, we apply a 3/4-inch T&G plywood deck, glued and screwed to the joists, to help create a strong, unified structure. It's important to observe the prescribed 1/8-inch spacing between plywood sheets; otherwise, this is the area where a waterproofing membrane will first show signs of stress.

In replicating the original closed or open railing system, we pay strict attention to the sequence and detailing of the flashing. (Incredibly, we often find that the original flashing was mindlessly installed to trap rather than shed water.) Where the railing abuts the building, we break back the stucco



Figure 6. Galvanized expanded metal lath, thoroughly stapled to the plywood deck, reinforces the cementitious waterproofing membrane. Plywood expansion joints are isolated and protected from filling by a proprietary seam tape.

or siding and weave Moistop Flashing (Fortifiber, Reno, Nev.; 800/733-4777, www.fortifiber.com), a polyethylene-fiberglass composite membrane, behind the existing building paper to protect all framing transitions from water penetration. The top of the railing gets a sheet-metal cap flashing, followed by Moistop, woven behind the existing building paper.

California condo framing typically has no sheathing over the wall studs,

except where a shear panel is required. Instead, stucco lath is applied directly to the studs over 60-minute building paper. To make sure that the transition from deck to sidewall is watertight, we break the stucco (or other siding) back about 6 inches up the wall and run a 9-inch-wide Moistop strip over the sidewall framing, behind the original building paper and over the flange of the 26-gauge bonderized, galvanized sheet-metal (C&J Metal Products,

Long Beach, Calif.; 800/500-8660, www.cjmetals.com) transition flashing that runs onto the deck surface (Figure 5, previous page).

Waterproofing

To prevent future problems in the repaired balcony, proper waterproofing is essential. I rely on Life Deck AL (Life Deck, San Diego, Calif.; 800/541-3310, www.lifedeck.com), a reinforced three-coat cementitious product made for exterior plywood walking surfaces. We handle the installation ourselves, paying close attention to the manufacturer's specifications.

First, we install bonderized sheet-metal wall flashing and drip edge, nailing it directly to the plywood and sealing overlaps with an approved polyurethane caulk. To prevent the expansion joints between plywood sheets from filling up, we cover them with self-adhesive, 40-mil-thick Life Deck Seam Tape. Then we install a layer of galvanized expanded metal lath over the plywood and flashing and thoroughly fasten it with a pneumatic stapler, using at least 16 staples per square foot (Figure 6, previous page). The base coat — a thick, soupy mix of cement and acrylic polymer — is poured on and troweled into the lath. After the base coat cures, we trowel on a similar, slurry layer to build up the membrane and fill any voids. The third, texture-coat layer is splattered on using a hopper-fed texture gun, at about a 70% coverage rate, and knocked down with a steel trowel while wet.

Once the texture coat can be walked on, we complete the patching of the stucco siding, following the original steps of 60-minute building paper, stucco lath (wire), scratch coat, brown coat, and a color and texture coat. Usually, we're patching small areas, so we use a quick-drying mortar mix to help expedite the job (Figure 7). We take the stucco down over the apron flashing but not all the way to the deck, leaving a narrow band of metal exposed. This allows for some necessary structural movement and elimi-




Figure 7. Stucco siding repairs follow the original three-layer process of scratch coat, brown coat, and color coat. A narrow strip of the sheet-metal flashing is left exposed to allow crack-free movement between wall and deck.



Figure 8. A final, acrylic color coat seals and protects the multilayered deck system from water absorption.

nates cracking at the junctions.

A proprietary acrylic color coat seals and completes the deck surface treatment (Figure 8). The deck can be walked on within about 4 hours, but it's best to wait 24 hours before putting the surface to regular use. 

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