Making a Balcony Door Watertight

Q. *I built a house with a second-floor balcony, and I installed waterproofing membrane and tile on the balcony deck. Around the perimeter of the door, I installed Moistop flexible flashing. The siding is stucco. The room under the balcony is now leaking. Can you provide details on the best way to flash the intersection of the deck waterproofing and door threshold, as well as the best way to flash a door in a stucco house?*

A. *Ron Webber, owner of Prime Plastering in Irvine, Calif., responds:* There are many available deck waterproofing systems, and they aren't all installed the same way, so check with the manufacturer for the correct installation technique. Generally speaking, most leaks occur at termination points, including the transitions between deck and wall metal, deck and door threshold, and deck and door jambs. Other trouble areas include the attachment point for handrails and the area around scuppers and drains.

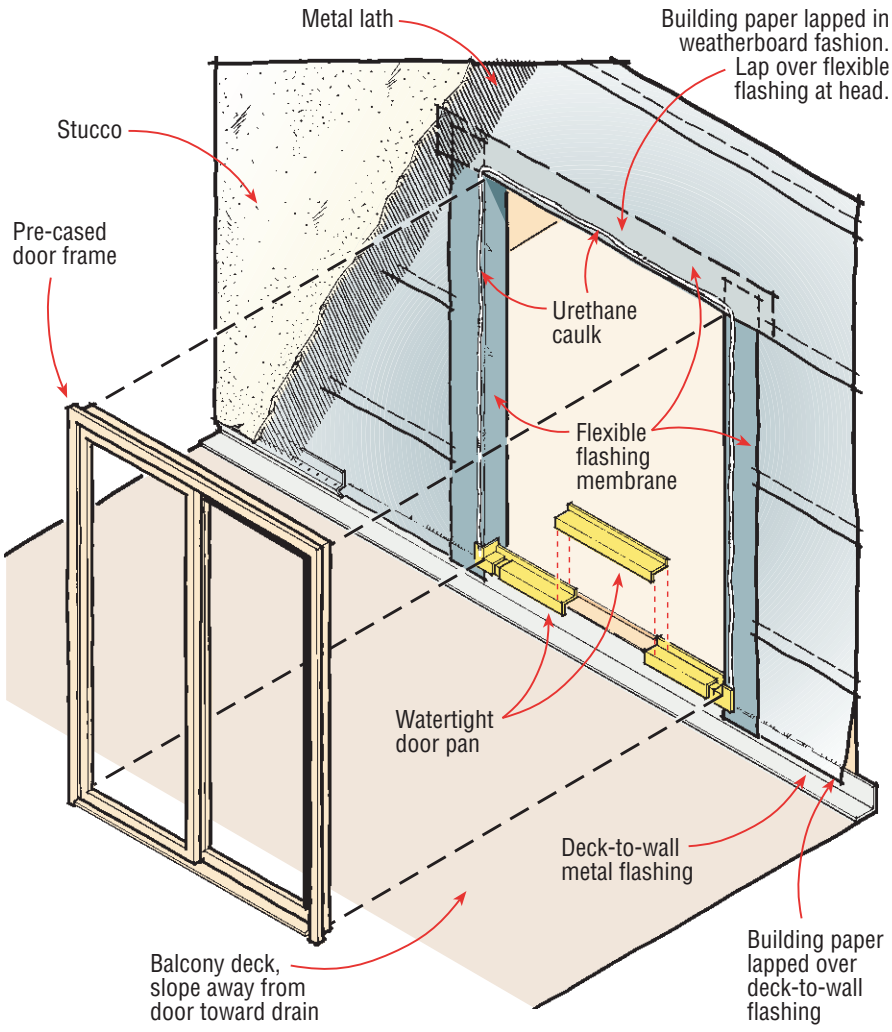
All penetrations and terminations should be flashed in a weatherboard (overlapping) fashion, with a minimum horizontal overlap of 2 inches and a minimum vertical overlap of 6 inches. Deck-to-wall joints must be lapped and caulked or soldered.

A door will require the following installation details:

1. Install a watertight door pan, like the Jamsill Guard (Jamsill, P.O. Box 485, Talent, OR 97540; 800/526-7455; www.jamsill.com). The door pan and finished floor inside must be at least 3/4 inch above the finished deck.
2. Tack the flexible flashing membrane (such as Moistop from Fortifiber) around the perimeter of the rough opening, being careful to lap the flashing over the deck-to-wall metal. The top piece of flexible flashing should overlap the side pieces.
3. Run a liberal amount of good quality urethane caulk around the rough opening, on top of the flexible flashing. Then install the pre-cased door jamb, pushing the stucco mold trim into the wet caulk.
4. When lathing, be sure to lap the felt or kraft-paper weather barrier in a weatherboard fashion. The felt should lap over the flexible flashing at the head of the door, and over the deck-to-wall metal.
5. If there are any holes, rips, or tears in the flashing membrane or weather barrier, repair the holes.

The deck should be sloped away from the door, toward the drains. The deck should be watertight before the base coat of stucco goes on. To check for watertightness, take a hose and squirt the deck

Flashing Details for a Balcony Door



and then the walls, starting at the bottom and working your way up. If anything leaks, locate the holes and repair them.

For more information, see the article "Stucco Flashing Details," 10/98.

Fiber-Cement with Aluminum Trim

Q. *Is it okay to butt fiber-cement siding against aluminum-clad windows and aluminum soffit, or will the fiber-cement cause a reaction that damages the aluminum?*

A. *Corresponding Editor Paul Fisette responds:* Portland cement is highly alkaline. Any cementitious material, including cement-based siding, can attack aluminum if the aluminum is not protected.

According to Miguel Gonzales, national accounts manager at Tamlyn & Sons, a manufacturer of vinyl and aluminum trim products, Tamlyn does not recommend that its aluminum trim products be used with fiber-cement siding.

If you do choose to use aluminum trim, it should be anodized. Virtually all major window manufacturers anodize their aluminum trim. Aluminum windows used with stucco siding have a long history of successful performance.

To be safe, I would be sure that any cement-based siding is fully primed on all sides and the ends before installation, in order to minimize the alkaline bleed. Carefully prime the ends of the siding at field cuts. This will help minimize any possible reaction with aluminum.

Conduit Capacity

Q. *What is the maximum number of 12-gauge wires permitted in 3/4-inch conduit?*

A. *Master electrician Rex Cauldwell responds:* For practical purposes, the maximum number of 12-gauge THHN conductors for a 3/4-inch EMT conduit is nine.

The answer would be different for another type of conduit (for example, ENT), or if the conductor had a different insulation type or different outside diameter. Although the *NEC* allows up to 16 current-carrying THHN conductors in such a conduit, it also requires that for any number of conductors over three, you have to derate the capacity of the conductor. The derating isn't significant until the number of conductors exceeds nine. For 10 to 20 conductors, 12-gauge wire is derated down to 15 amps.

Using an Electric Water Heater for Radiant Heat

Q. *In his November 1998 article, "Using Water Heaters for Radiant Heat," Bill Clinton shows how to heat a home with a gas water heater. Will an electric water heater work in this type of system? How about a tankless electric water heater?*

A. *Heating contractor Bill Clinton responds:* Yes, an electric water heater will work fine. Of course, in most parts of the country, electricity is a relatively expensive fuel to use for home heating. However, in areas of the Pacific Northwest where electricity is fairly cheap, using an electric water heater can make sense and will make for a very simple reliable system.

I would, however, stay away from the instantaneous electric heaters. They operate with fairly high pressure differentials, which makes pump selection difficult. You could also have problems if the electric input were substantially higher than the load, since this would cause excessive cycling and perhaps excessive temperatures. The advantage of a system with a storage tank is that the tank helps buffer the system from temperature and pressure extremes.

Removing Paint from Historic Exterior Brick

Q. *We are restoring a 19th-century Victorian home with a painted brick exterior. The client wants to remove the six or more existing layers of paint, down to the natural brick. What is the best way to remove the paint without destroying the brick or mortar?*

A. *John Leeke, a preservation consultant from Portland, Maine, responds:* The first step is to investigate the masonry to determine what type of bricks and mortar was used. Repressed bricks that are very square, with even sharp edges, and laid with narrow mortar joints, are usually fired hard and intended to hold up to the weather on their own. Some buildings were made of softer bricks with rounded edges; these softer brick were intended by the original builders to be painted. You wouldn't want to leave this type of brickwork exposed with no paint, because the surface would absorb too much water, causing serious problems over the long term.

If the bricks need a coating, determine if the existing coating is still performing its intended function. If the bricks will have to be recoated for the good of the building, the owners will want to reconsider their decision to expose the bricks.

We do testing and development on every one of our paint-removal projects. We usually test at least three removal methods and materials, starting with the least aggressive methods. Mechanical methods like scraping, chipping, and dry blasting are more likely to damage the masonry than chemical methods.

Blasting methods that use any kind of grit usually damage the bricks by taking off the weather-resistant surface, exposing the more absorbent core of the brick. Blasting can also remove mortar, leading to the need for repointing. Even high-pressure blasting with plain water can blast out softer but perfectly good mortar. Although blasting must be approached with caution, we still sometimes test and use blasting methods, which can work well under certain conditions.

In recent years, our tests have usually led us into using wet/chemical methods with low-pressure washing. With these methods it is easier to control the hazard of lead-containing waste. Generally, solvent-type chemicals give better results than caustics, because un-neutralized caustics seep back out of the wall to damage paint coatings (even on adjacent woodwork).

To determine which removal methods and chemicals work best, we begin by testing small 1x1 foot patches. Then we select the best performing method, and try three or more variations on methods and materials on successively larger test panels.

Why is testing necessary? Because the conditions on these older buildings are so variable and unknown. On a recent project, a tradesperson who knew better skipped testing and development and signed a contract for a paint removal project on a masonry building. It turns out that back in the 1970s, an owner of the building (who was a chemist at a local industrial plant) painted the house with a special chemical-resistant epoxy coating. The removal took six times longer than expected and put the guy out of business.

Tile Over Painted Concrete

Q. *Can I install ceramic tile over a painted concrete floor without removing the paint?*

A. *Tile consultant Michael Byrne responds:* Unless the paint in question is properly applied epoxy paint (not the kind that comes in a spray can), you shouldn't install ceramic tiles over either paint or paint overspray. If tiles are installed over a painted floor, the bond strength of the tile adhesive will not be any stronger than the paint's grip on the concrete.

A "Half-Timbered" Tudor

Q. *Can a timber-framed home have a stucco exterior, with the timbers exposed on the exterior, in the Tudor manner?*

A. *Will Beemer, co-executive director of the Timber Framers Guild in Becket, Mass., responds:* You are proposing an infill system, as opposed to the usual enclosure system, which wraps the entire structure with insulating panels. Traditional infill systems used materials such as adobe or wattle-and-daub. You are probably planning to build stud walls covered with stucco between the posts of the timber frame. Unfortunately, the finishing details where this infill meets the timbers would prove daunting.

Your proposal could work, but the success of the system would depend on a number of conditions: You must be located in an arid climate; you must use dry timbers; and you must be meticulous about caulking. In a mild, dry climate, such as that of the arid Southwest, you would not have the moisture migration and condensation problems we do in the Northeast. In a cool, damp climate, your timber frame is at risk of rotting from rain on the exterior or from the condensation of interior moisture on cold surfaces near air leaks.

Most timber frames are built with green timbers that shrink as they dry. Because shrinking timbers will magnify the difficulty of caulking any gaps between the infill system and the timbers, you should begin with dry timbers. One option is to use dry reclaimed timber, although such timbers are more expensive than green timbers.

Choose a species that is rot resistant and that swells and shrinks little with moisture changes. Cedar would be a good choice, although cedar is expensive and not very strong. I would probably use Eastern white pine, which shrinks very little, and get around the rot-resistance problem by keeping the frame well off the ground and protecting it from the weather with wide roof overhangs. Water does the most damage, not exposure to sunlight or air.

Any gaps that open up between the infill system and the drying timber would have to be caulked, both inside and out. This caulk could be the infill material itself (adobe, etc.) or one of the new synthetic caulks that bonds to wood and masonry. Since wood can swell and shrink with humidity changes, these caulk joints will require vigilant maintenance. If all of these requirements are discouraging, and you want an easier way to keep your timber frame lasting a few centuries, you should wrap it in an insulating skin.

Leaving Rigid Foam Exposed

Q. *I plan to install rigid foam insulation in a crawlspace. As far as I know, most types of rigid foam insulation can't be left exposed, but need to be covered with a layer of drywall for fire resistance. Is there a type of rigid foam insulation panel available that can be left exposed?*

A. *Corresponding Editor Paul Fisette responds:* Not that I know of. However, most building codes allow the installation of unprotected rigid foam in a crawlspace that has no open connection to a basement, as long as the foam has passed alternative testing procedures. Dow Styrofoam and Owens Corning Foamular are two products that pass the burn test and can be left unprotected in an isolated crawlspace.

Building codes restrict the use of unprotected foam in habitable or accessible spaces. Different code jurisdictions may have particular code sections that deal with this issue. Some codes say that if your crawlspace is connected to a basement, you need to cover the foam with an ignition barrier like 1/4-inch plywood or particleboard. Where inspectors draw the line often depends on whether or not there is a mechanical system in the crawlspace. The thinking here is that a fire could be set off by either the equipment or activity of people in the space. When in doubt, it always pays to talk to your inspector during the design stage.

GOT A QUESTION? Send it to On the House, *JLC*, 186 Allen Brook Ln., Williston, VT 05495; or e-mail to *jlc@bginet.com*.