

Q. Do Precast Foundation Walls Need Waterproofing?

Are precast concrete foundation walls subject to the same damp-proofing or waterproofing requirements as cast-in-place and block foundations? I've heard that because these walls are made of a high-strength concrete that's virtually nonporous and impervious to water, they don't require extra dampproofing or waterproofing. My building inspector disagrees.

A. *Bill Palmer, former editor of Concrete Construction and president of Complete Construction Consultants in Lyons, Colo., responds:* In general, concrete and masonry foundations need to be either dampproofed or waterproofed, depending on the soil conditions. Section R406.2 of the 2006 IRC requires waterproofing “in areas where a high water table or other severe soil-water conditions are known to exist” and defines several different acceptable waterproofing methods. But even normal soils contain a certain amount of water vapor, which can move through masonry and concrete, so section R406.1 requires acceptable dampproofing treatment even when walls don't need waterproofing. Most people use a black bituminous coating.

The same provisions apply to precast foundation walls — though that may change. Under conditions where waterproof-

ing is required, precast walls need the same waterproofing treatment as cast-in-place concrete and concrete block foundations. But Greg Stutz, vice president of technical services at the National Precast Concrete Association, says the International Code Council is considering a proposal to exempt the walls from the current dampproofing requirements based on precast concrete's low permeability. “The problem right now,” he says, “is really one of perception. Builders dampproof because owners and inspectors expect it — although we know that precast concrete is already dampproof.”

Check with the manufacturer of your precast wall system. For example, testing performed by ICC Evaluation Service on precast foundation wall panels built by Superior Walls (800/452-9255, www.superiorwalls.com) resulted in ES Report ESR-1553 (issued in November 2006), which states that Superior Walls alone are an alternative means of dampproofing and “therefore, no additional dampproofing is required.” Steve Glatfelter at Superior Walls says that this is due to the very dense concrete mix used to make the panels (5,000 pounds per square inch of compressive strength and a water-cement ratio of around 0.4) and the triple bead of polyurethane caulk used in the joints between them. With the ICC report in hand and the panel manufacturer's guarantee, both you and your inspector might be comfortable skipping the dampproofing.

Q. Removing Rocks Without Blasting

We're building a home on a site with difficult access, and we need to remove a lot of boulders without using heavy equipment. Is there a way to break the boulders into smaller chunks without having to deal with dynamite and the associated permitting?

A. *Dave Crosby, an excavation contractor in Santa Fe, N.M., responds:* Expansive demolition agents are a good alternative to explosives for quietly and safely breaking boulders into smaller pieces. They're shipped as a powder that you mix with water on site, and they have an expansive strength many times greater than that of rock or structural concrete. Several brands are available; I've used Dexpan (Archer Co., 866/272-4378, www.archerusa.com) with consistently good results. The procedure recommended by manufacturers is simple: With a rotary hammer, you drill holes of roughly 1½ inches in diameter in a pattern and depth suitable for the material and desired result; then you place the mixed agent into the holes according to the manufacturer's

instructions and leave the site. The next day, when you return, the rock should be broken.

In practice, I've found that drilling a 1½-inch-diameter hole 24 inches deep into hard rock or heavily reinforced concrete is a lot easier said than done. When access or budget prevents the use of bigger tools, I drill 1¼-inch-diameter holes on 12-inch centers about 18 inches deep, then drill ¾-inch-diameter holes to the same depth — or deeper — every 6 inches between the larger holes. This weakens the material for crack propagation. If the rock or concrete is really tough, I cut a 3-inch-deep kerf along the desired fracture line with a 14-inch demolition saw, which weakens it still further.

Even though expansive demolition agents aren't explosive, they're still very powerful. If you're working on a foundation or anywhere near a building, make sure that you've thought very carefully about how the forces would act and that you've provided a safe route for the expansion. It would be fairly easy to accidentally destroy a foundation with this stuff.

Q. Does the Size of a Rain-Screen Gap Matter?

Rain-screen wall assemblies seem like a good idea for protecting wood siding and paint, but they can create headaches when it comes to resolving door, window, and other trim details. Wider gaps mean that doors and windows would need jamb extensions, as well as screening to keep bugs out. But would a 1/4-inch or 1/8-inch gap — which might not require any additional detailing, or even screening — be equally effective?

A. *Bill Robinson, a long-time general contractor and moderator of the JLC Online exterior-details forum, responds:* To avoid the possibility of capillary action, researchers like John Straube of Building Science Corp. generally agree that rain-screen drainage gaps should be at least 1/4 inch wide. To provide ventilation so that wet siding can dry to the back, the size of this gap should increase as the average annual rainfall increases. Rain screens are probably unnecessary in mild climates with less than 20 inches of rain per year, while in an extreme coastal climate with more than 60 inches of rain annually and a lot of wind, the gap should be as large as possible and pressure-equalized, with ventilation at both the top and the bottom of the wall. In an average climate where 20 to 60 inches of rain falls annually, a 3/8-inch gap is typically recommended, though I'd think that a 1/4-inch gap would be acceptable in most cases.

Battens can be ripped from decay-resistant wood, but I've had good luck using battens cut from 4-foot-by-8-foot sheets of 6-mm-thick (1/4-inch-thick) Coroplast (800/666-2241, www.coroplast.com), a corrugated plastic that won't absorb moisture and is sold at most sign shops for about \$50 per sheet. For more ventilation and drying capacity, I use El Dorado's 3/8-inch-thick plastic battens (530/620-5287, www.eldorado-battens.com).

Any time you create a gap, you'll need to use screening to keep out the bugs. But if you establish the drainage plane on the sheathing (in the usual place) and flash window and door openings to that, it shouldn't be necessary to fur out the windows and doors, even when using a wider 3/8-inch rain-screen detail.