Cleaning Exterior Masonry

by Walter Jowers

Nobody likes dirt. So, for owners of an old commercial building—one that's collected a coating of urban crud for a half-century or so—getting the exterior clean isn't just an aesthetic decision, it's an economic one. Until the place sheds its coating of dirt and pigeon droppings, chances are nobody except Larry, Daryl, and Daryl (of TV fame) will want to shop, eat, or do business at the place. And Larry, Daryl, and Daryl would try to pay in possums...

In this article, I can't tell you everything there is to know about cleaning exterior masonry. When you finish reading this, you won't be ready to don a raincoat and pick up a pressure washing wand and go out and hose down a building. What you will know, I hope, is that cleaning masonry has developed into a science, with predictable results; and you'll have a pretty good idea what products and practices are used on a good cleaning job.

What Not To Do...

First, let me tackle a couple of practices, still widely used, that are *not* the best ways to clean a building. First, *sandblasting:* I know we preservation people are always preaching against sandblasting, and it's hard to take us seriously anymore because we sound like fanatics. We're not preaching dogma, though. There are lots of good-sense reasons for not sandblasting old buildings, including:

- Sandblasting removes the ceramic or waterproofing "face" of brick and tile. This leaves the surface subject to water penetration, and thus spalling and generally rapid decay.
- Sandblasting roughens the texture of any masonry surface; the rough surface will hold new dirt, and the building will need cleaning again much sooner than if it had been chemically cleaned.
- Sandblasting rounds off corners and blurs details of masonry surfaces.
- Sandblasting tears up mortar. A sandblasted building often requires extensive tuckpointing.
- Drifting sand and dust is a health hazard for anybody who breathes the stuff, bad for machines (computers, HVAC systems), and hard to clean up properly.
- Sandblasting will blow the chance for taking lucrative tax credits on a certified historic rehab.
- Generally, chemical cleaning works better, and costs less, than sandblasting.

Similarly, *steam cleaning* has its problems:

- Steam under pressure can cause leaching of salts and rust from masonry surfaces.
- Typically, acids have to be used in conjunction with steam cleaning. The steam drives the acid into the masonry and makes the leaching problem even worse.
- Again, chemical cleaning is generally cheaper, and works better, than steam cleaning.

With those two inferior methods out of the way, let's talk about what's involved in the chemical cleaning of a building.

Custom Work

First of all, every cleaning job is a custom job. No two are alike. Some buildings are all brick, with just a coating of dirt on them. Others are clad with brick here, stone there, terra cotta somewhere else, with some dirt, some soot, some pigeon droppings, and an unknown stain or two. This probably accounts for the still-wide use of sandblasting and high-pressure steam cleaning of buildings: one approach fits all cases.

To do a good chemical cleaning job, a contractor might have to do several test panels on the building, to find out what approach to use for the varying surfaces and stains. Deciding what types of cleaners to use and how to best use them is half the battle in a chemical cleaning job. This is the area in which one manufacturer of chemical cleaners, ProSoCo, can be a lot of help. ProSoCo makes a complete line of chemical cleaners, from paint strippers to limestone and marble cleaners, *and* they can offer technical assistance to contractors through their factory reps, who are available nationwide. Any contractor new to the business of chemical cleaning of buildings, or any experienced contractor confronted with unfamiliar conditions, would do well to get in touch with ProSoCo (755 Minnesota Avenue, Kansas City, KS 66101; 913/281-2700) and ask for "technical service."

In the most general terms (each case must be treated differently) the cleaning of a masonry exterior goes like this:

First, there's no substitute for experience. If possible, it's best to use a restoration architect and a contractor with considerable restoration experience on exterior cleaning jobs. Cleaning a building properly requires some "eyeballing" and some "feel," especially when it's time to pressure-rinse. Besides, the jury is still out on what constitutes proper specs for pressure-rinsing. (See sidebar.)

Test panels, typically 4 x 4 feet, are done on the varying surfaces and stains. The architect, the contractor, and the building owner (often with the help of the factory rep from the cleaner company) agree on a plan of action.

If it's necessary to erect staging around the building, the staging should be equipped with steel cable. Nylon, cotton, or hemp roping won't do, because chemical cleaners can eat through this stuff over time. Window glass, aluminum, painted surfaces, and foliage should be masked with polyethylene. Pedestrian traffic should be routed away from the building. Once the cleaning is under way, workers have to be careful to prevent wind drift of cleaners and rinse water onto unmasked surfaces.

People who will be exposed to cleaning agents should be properly outfitted with protective equipment, typically (but not limited to): A full rain suit of plastic, rubber, or PVC; rubber boots; and rubber goggles.

Two-stage chemical cleaning (alkaline) prewash and acidic cleaner from ProSoCo), reveals the rich terra-cotta facade under years of New York City grime on the Alwyn Court House. Chemical cleaning can be economical and safe to the building. It's applied with a roller, brush, or low-pressure spray.

If paint is to be stripped from the building, paint stripper—usually caustic or methylene-chloride-based — is applied to the building, let stand, then rinsed off the building.

Generally, diluted cleaning agents are applied with a very low (50PSI) spray, or tampico brush. You don't want to drive the cleaners deep into the masonry where they might cause leaching.

The cleaner is left on the surface just long enough to dislodge the offending stain, then rinsed off with a high-pressure, high-volume, cold-water spray. On some delicate surfaces, though, lower-pressure rinses—all the way down to hand-wiped rinses—are used. *Note: Spray pressures, volumes, and temperatures can make the difference between a job done right and a disaster.* This is why test panels are done, this is why each cleaner and each material has its own spec, and this is why an experienced contractor is important.

A second wash-and-rinse cycle might be performed on troublesome areas. Window sills, areas under eaves, and the like might have to be cleaned with a stronger solution, or rinsed at high pressure or temperature. Some cleaners have to be neutralized; and, depending on the surfaces, some or all of the masonry might need to be sealed to prevent further staining. Generally, this type of work involves water-borne cleaning agents and water rinsing. So, it can't be done when the temperature is below freezing.

And finally, chemical cleaning of buildings is not limited to masonry, nor is it limited to exteriors. ProSoCo and other suppliers of building cleaners also make aluminum cleaner (for all those fine Art Deco buildings); and cleaners for interior stone, such as marble. ■

Walter Jowers is a renovation specialist and technical writer based in Nashville, Tenn.

Clean by Intuition

Last year, in an article for the *APT Bulletin* (Volume XVII, No. 4, Association of Preservation Technology) Alfred M. Staehli, AIA, wrote about how efforts to quantify water pressures for masonry cleaning were all but useless. In his article, Staehli describes how pressures are often specified as low (20 to 100 psi), medium (200 to 600psi), and high (anything above 600psi), and how some architects religiously use these widely quoted numbers when specifying a masonry-cleaning job, even though the numbers don't seem to mean very much.

I have heard a similar sentiment from every contractor I know who ever picked up a water blaster. That is, you can talk about pressure until you're blue in the face, but it's what happens to the surface being cleaned that counts. If you hold a garden hose an inch from a wall, you can generate about the same force as you can with a monster pressure washer held at a "normal working distance." And from my own informal observations in the field, normal working distance for any pressure washing wand is defined by the pressure it takes to remove the dirt from the building without blasting out so much brick and mortar that you alarm the boss. If you try to specify water pressure more tightly than that, you quickly find yourself relying on higher mathematics that call for a new set of numbers every time the equipment operator scratches his neck. The task of quantifying water-blaster pressures would, I think, be harder than quantifying the exact force a cabinetmaker should apply to a plane of a given size, shape, and sharpness to remove a $1/32$-inch shaving from a 1-inch-wide oak hoard that came from a 200-year-old tree grown in Eastern Pennsylvania.

In the *APT* article, Mr. Staehli concludes that if we want to quantify what happens when we use pressure washers, we ought to come up with a standardized template that could be used to mask part of a masonry surface from a pressure wash. This would allow us to measure the differences between a washed area and an unwashed area, and thereby come up with a meaningful spec. He leaves it to others to manufacture and market the tools. Excellent ideas, if we really do need to quantify water blasting.

I think we can keep it even simpler than that. Some things, you just have to eyeball.

— *W. J.*