16
MASONRY CLEANING AND RESTORATION

New masonry construction should be cleaned after completion to remove mortar smears and construction-related stains. Periodically throughout its life, the masonry may require additional cleaning if heavy industrial or urban pollutants discolor the surface. Cleaning may also become a diagnostic tool in the repair of structures whose surface defects may be obscured by soil or grime. But cleaning should always be evaluated for necessity and appropriateness, and any cleaning method selected should always be the gentlest possible.

16.1 CONSTRUCTION CLEANING

Cleaning new brick and concrete masonry is easiest if some simple protective measures are taken during construction. But even with protections in place, some mortar smears and splatters will have to be cleaned after the work is complete.

The finished appearance of masonry walls depends to a great extent on the attention given to the surfaces during construction and during the cleaning process. Care should always be taken to prevent mortar smears or splatters on the face of the wall, but if such stains do occur, daily cleaning can help prevent permanent discoloration. Excess mortar and dust can be brushed from the surface easily when the work is still fresh. For brick walls, a brush of medium-soft bristle is preferable. Any motions that rub or press mortar particles into the unit face should be avoided. On concrete block walls, mortar droppings are easier to remove after they have dried.

16.1.1 Protections

Other precautions that may be taken during construction include (1) protecting the base of the wall from rain-splashed mud or mortar droppings by using straw, sand, sawdust, or plastic sheeting spread out on the ground and

up the wall surface; (2) turning scaffold boards on edge at the end of the day to prevent rain from splashing mortar or dirt directly onto the wall; (3) covering the tops of unfinished walls at the end of the day to prevent saturation or contamination from rain; and (4) protecting masonry units and packaged mortar ingredients from groundwater or rainwater contamination by storing off the ground, protected with waterproof coverings.

16.1.2 Cleaning Methods

The cleaning process itself can be a source of staining if chemical or detergent cleansing solutions are improperly used, or if windows, doors, and trim are not properly protected from possible corrosive effects. New masonry may be cleaned by bucket-and-brush hand scrubbing with water, detergent, muriatic acid solution, or proprietary cleaning compounds. Cleaning should be scheduled as late as possible in the construction, and the mortar must be thoroughly set and cured. However, long periods of time should not elapse between completion of the masonry and the actual cleaning, because mortar smears and splatters will cure on the wall and become very difficult to remove. Most surfaces should be thoroughly saturated with water before beginning (saturated masonry will not absorb dissolved mortar particles). Confine work to small areas that can be rinsed before they dry. Environmental conditions will affect the drying time and reaction rate of acid solutions, and ideally the cleaning crew should be just ahead of the sunshine to avoid rapid evaporation. Walls should be cleaned only on dry days.

Detergent solutions will remove mud, dirt, and soil accumulations. One-half cup dry measure of trisodium phosphate and $^1/_2$ cup dry measure of laundry detergent dissolved in 1 gal of water are recommended. *Acid cleaners* must be carefully selected and controlled to avoid both injury and damage. Hydrochloric acid dissolves mortar particles, and should be used carefully in a diluted state. Hydrochloric acid should be mixed with at least 9 parts clean water in a nonmetallic container, and metal tools or brushes should not be used. Acid solutions can cause green vanadium or brown manganese stains on some clay masonry, and should not be used on light-colored, brown, black, or gray brick that contains manganese coloring agents. *Proprietary cleaning compounds* should be carefully selected for compatibility with the masonry material, and the manufacturer's recommended procedures and dilution instructions should be followed.

Some contractors use *pressurized water* or *steam* cleaning combined with detergents or cleaning compounds. If the wall is not thoroughly saturated before beginning, high-pressure application can drive the cleaning solutions into the masonry, where they may become the source of future staining problems. High-pressure washing can also damage soft brick and mortar and accelerate deterioration. *Abrasive sandblasting* should not be used to clean masonry.

All cleaning methods should be tested on a small, inconspicuous area to determine both the effect and the effectiveness of the process. For cleaning new masonry, the BIA has established guidelines for the selection of methods depending on the type of brick used (*see Fig. 16-1*). ASTM E1857, *Guide for Selection of Cleaning Techniques for Masonry, Concrete, and Stucco Surfaces* provides a protocol for identification and characterization of substrates, identification of soiling and staining, selection criteria, cleaning techniques, testing, and evaluation for existing buildings, but does not apply specifically to new construction.