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Conspectus's Tech Tips received the national Communications Award from the Construction Specifications Institute.

ABSTRACT:
How can you make sure you get that "like new" look for the completed masonry? Chemical masonry cleaning is a necessary evil in new construction. It's not as bad as you might think.

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UniFormat™
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04 01 40 - Stone Cleaning
04 20 00 - Unit Masonry
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KEYWORDS:
Masonry cleaning, chemical cleaning, acid, alkali, water, detergent

REFERENCES:
Brick Industry Association
Technical Note 20 - Cleaning Brickwork

NCMA
TEK 8-2A - Removal of Stains From Concrete Masonry

National Park Service
Preservation Brief 1 - Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings

Chemical Masonry Cleaning

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ACID IS BAD!

Remember that scene in *Alien* when they cut its leg and it bleeds acid? Acid burns! Well, in the world of masonry cleaners, acid may not as bad as you think. The general conception of acid cleaners in these days of 'green' architecture seems to be that they are to be avoided. But often circumstances dictate the use of an acid-containing cleaner to satisfactorily clean new masonry. In fact, when using alkali-based cleaners, which are required to clean acid-sensitive masonry, a light, typically acetic acid wash is required to neutralize them before rinsing them off with water.

What Are You Cleaning?

The cleaning of existing masonry construction typically consists of removing atmospheric dirt that has accumulated over the life of the building. In the absence of mortar stains, paint or graffiti, it is unlikely that chemical cleaners will be required. Water and detergent cleaners may be all that is required.

Cleaning new masonry construction is an entirely different matter. Arcom's MasterSpec Evaluations offers the following supporting information regarding acidic cleaners:

"Using proprietary acidic solutions for cleaning masonry has gradually become the standard practice, except for glazed units. Detergents will not generally help remove mortar smears, and the abrasive action of cleaning with wire brushes may be more harmful to some masonry units than the use of acidic cleaners."

Without acid to react with the cement and lime, complete mortar stain removal may not be possible unless chemical cleaning agents are employed. The specifications typically include language directing the Contractor to take precautions to avoid mortar splashing, but frequently the speed at which mason's work makes it almost impossible to avoid.

During the submittal phase, because the cleaners are proprietary, it may be difficult to learn what chemicals are included in the product. Manufacturer's literature may state the product is safer than muriatic acid or contains no muriatic acid. But these claims do not necessarily mean there is no acid in the cleaner.

Proprietary Acid Cleaners

Brick Industry Association Technical Note 20 cautions against the use of unbuffered muriatic (hydrochloric) acid, but permits proprietary acidic cleaners for brick that use either hydrochloric or phosphoric acids (BIA Technical Note 20). Also see National Concrete Masonry Association Removal of Stains from Concrete Masonry, TEK 8-2A (NCMA TEK 8_2A). Both reference standards contain easy to read charts which guide the architect to the correct

method to employ based on the nature of the stain. Another series of reference standards I like to consult are the Preservation Briefs published by the National Park Service. While these standards are aimed at historic masonry buildings, they contain valuable information about cleaning masonry in general.

Preservation Brief 1 outlines various cleaning methods and materials (Preservation Brief 1).

How To Choose the Right Cleaner

Applying the wrong cleaning agent to masonry can result in disaster. Specifications should always include testing cleaning products; in existing construction the test should be performed on an inconspicuous spot on the building. For new construction, a separate, free-standing mockup can be specified. One of the factors affecting the results of chemical cleaning is the amount of time a cleaner is left on the surface of the masonry. Another is adequate rinsing. Certain acids can leave behind salts or silica deposits on masonry which may be impossible to remove. Hydrochloric acid has been known to burn the surface of certain types of masonry.

The first step in BIA Tech Note 20 is to "Select the gentlest effective cleaning method." The gentlest effective cleaning method may not be known when the specifications are written, and so test areas or mockups are imperative. In general, testing should commence with the least invasive method proceeding gradually to more complicated methods. Low pressure water, one of the simplest cleaning methods, may prove to be effective prior to considering harsher methods. It is also safer for the building and the environment, and cost effective.

When selecting an appropriate cleaner for a given application, the size of the test area should be sufficient to give a true indication of its effectiveness. Cleaning of each masonry material should be tested, including different finishes of the same material. Tests should be evaluated only after the masonry has dried completely and, if feasible, a weathering period of one year would be ideal to evaluate the cleaning over a full range of seasons. Minimally, a one or two month weathering period is recommended prior to final evaluation.

The Environment and Health Considerations

There are pollution and health considerations associated with the use of chemical cleaners that are strictly regulated. Chemical cleaners and paint removers can damage landscape and adjacent materials such as metals and glass. The Contractor should develop a plan for the environmentally safe removal and disposal of hazardous cleaning materials and the cleaning effluent before beginning the cleaning process. The manufacturing sector, in response to growing concerns over VOC emissions, have developed more environmentally responsible cleaners and paint removers, but the use of any chemical cleaner should be reviewed with the appropriate government agency regulating it prior to commencing work.

Chemical cleaners also present health concerns for cleaning applicators. Proper equipment must be provided at all times to protect workers from contamination and injury. The general public must also be protected from chemical overspray and wind drift; sometimes cleaning must be done outside normal work hours in busy urban areas.

Conclusions

Acid-containing cleaners don't kill buildings; people do by not following proper procedures and taking the necessary precautions to ensure their safe and effective use. They are often necessary and happen to be very commonly used.

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