

 An official website of the United States government



U.S. General Services Administration

Removing Dirt From Stone Masonry Using The Water-Soak Method

Procedure code:

440003S

Source:

Developed For Hspg (Nps - Sero)

Division:

Masonry

Section:

Stonework

Last Modified:

01/25/2017

PART 1---GENERAL

1.01 SUMMARY

A. This procedure includes guidance on removing dirt build-up on masonry using the water-soak method. Prolonged saturation with water will cause the dirt to expand and contract at a much faster rate than the stone, causing it to crack away from the surface.

B. Water washing of stone masonry may be used periodically to remove dust, dirt, accumulations of grime or airborne pollutants which settle on the stone and do not get washed off by the natural action of wind-driven rainwater.

C. Advantages of the Water-Soak Method:

1. Effective for cleaning heavily deteriorated ornate masonry that can not withstand pressure washing or abrasive cleaning techniques.
2. It allows use of mild cleaning agents and techniques for effective removal of severe carbon encrustations.

D. Limitations of the Water-Soak Method:

1. EFFECTIVE ONLY ON CALCAREOUS STONE SUCH AS LIMESTONE--NOT RECOMMENDED FOR CLEANING BRICK, TERRA COTTA, GRANITE, SANDSTONE, BROWNSTONE AND MANY OTHER NON CALCAREOUS SURFACES.
2. This is an expensive, time-consuming process. It is not the most practical method for cleaning an entire building facade. It is most appropriate for use on small surface areas.
3. Thorough testing is required. Prolonged exposure to water may result in oxidation of natural components of the masonry and may transport deleterious salts deep into the masonry.

4. Thoroughly saturated masonries may take several months to dry.
5. Water soaking procedures must be scheduled when there is no threat of freezing temperatures throughout the cleaning and drying process.
6. Cascading water used in this process may result in erosion of the wash surfaces.
7. Scaffolding and rigging requirements for this procedure are more elaborate.
8. Prolonged exposure to water may result in damage to interior surfaces, furnishings and equipment.

E. Safety Precautions:

1. Precautions should be taken to guard against unnecessary water infiltration. Monitors should be set within the walls to determine moisture content and possible problems.
Caution should be provided concerning possible oxide `blooms' caused by some masonry cleaners, including the water soak process.

F. See 01100-07-S for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Safety Precautions
2. Historic Structures Precautions
3. Submittals
4. Quality Assurance
5. Delivery, Storage and Handling
6. Project/Site Conditions
7. . Sequencing and Scheduling
8. General Protection (Surface and Surrounding)

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Regional Historic Preservation Officer (RHPO).

G. See also 04400-02-P and 04400-02-P for alternative guidance on removing dirt from stone masonry.

PART 2---PRODUCTS

2.01 MATERIALS

A. Clean, potable water (preferably mineral water)

2.02 EQUIPMENT

A. Garden hose and nozzle (size appropriate for very fine misting)

B. Fan-shaped spray-tip which disperses water at angle of not less than 15 degrees.

PART 3---EXECUTION

3.01 PREPARATION

A. Protection:

1. Observe all precautions to protect the building from excess water infiltration and to protect adjacent property and

persons from water over-spray and run-off damage.

2. Before proceeding with work, check to see that there are no open joints or cracks and that windows, doors and other points of entry are securely covered to prevent entry of water into the building.

3.02 ERECTION/INSTALLATION/APPLICATION

A. Water-soak a test area of approximately 100 SF

1. Hang or support a 1/2-inch plastic pipe water spray array under a designated section to thoroughly and uniformly wet the area, soften any gypsum encrustation, and prepare it for final rinsing off with a plain water pressure washing.
2. Connect the spray array to a building water hydrant with 5/8-inch garden hose as required.
3. Fit the plastic pipe array with four to six fixed fine spray or mist garden sprinkler heads to cover the area and wet all face and side surfaces.
4. Provide a mechanical or electric timer control valve with adjustable time settings, lawn sprinkler type, with the capability of cycling the spray water on and off continuously for four hour cycles, or other timed periods as directed, 24-hours pe day.

B. Following approval of the test installation, operate the water soak test spray system for a 24 hour period with a repeat test as directed.

C. Follow the 24 hour water soaking by a plain water pressure washing (see 04400-01-P for guidance).

1. The Contracting Officer should record the effectiveness of the cleaning.
2. As Contracting Officer directs, include a repeat test cleaning on the same area, with a different timed cycle for sprays, for up to an additional 48 hour period followed by the same pressure wash rinse and Contracting Officer's observation
3. The repeat test may be waived by the Contracting Officer if the initial test results are conclusive.

D. Following approval of the test cleaning, spray the masonry with a fine mist of water over a prolonged period of time under the conditions approved by the Contracting Officer and the RHPO.

1. The spray should never be pointed directly at the surface. The spray should be fine and use approximately 110 to 140 liters of water per hour (45 liters per hour for delicate detailing).
2. Prolonged saturation with water will eventually loosen any heavy dirt or crusts (it may take from 4-6 hours to a week or more).
3. When the dirt has softened, remove it by hand-scrubbing with non-metallic brushes or by using a moderate-pressure water wash (see 04400-01-P); Use a wooden scraper to remove heavy sulphate crusts.