# SECTION 04 01 [20][40].91–[UNIT MASONRY] [stone] Restoration

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**TIPS:**

To view non-printing **Editor's Notes** that provide guidance for editing, click on the Show/Hide button or Word 2010 offers a convenient keyboard shortcut; press the Ctrl+\* keystroke to toggle on/off. (Press the Ctrl key, Shift key, and the number 8 simultaneously).

### SUMMARY

#### This section includes cleaning of existing [masonry] [stone] as follows:

##### Cleaning exposed, existing [masonry] [stone] surfaces.

##### Protection of existing structure during cleaning operations.

#### Related Sections:

##### Section 01 25 00 – Substitution Procedures

##### Section 01 33 00- Submittal Procedures

##### Section 07 19 00 - Water Repellents

##### Section 07 90 00 - Joint Sealants

### DEFINITIONS

#### Masonry Cleaning: This Specification describes a cleaning system designed to effectively clean and restore the existing exterior masonry surfaces. The system combines the application of a specific restorative cleaner with efficient rinsing pressure.

#### Rinsing-Pressure Spray: 400 to 1000 psi; 6 to 8 gpm.

#### Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.

### SUBMITTALS

#### General: Submit the following according to the Conditions of the Contract and Division 01 General Requirements specification sections.

#### Product data for each product indicated including recommendations for their application and use. Include test reports and certifications substantiating that products comply with requirements.

#### Material certificates for the following signed by manufacturer and Contractor certifying that each material complies with requirements.

##### Each type of chemical cleaning material.

#### Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, telephone numbers, names of Architects and Owners, and other information specified.

#### Restoration program: For each phase of the restoration process, including protection of surrounding materials on building and site during operations. Describe in detail the materials, methods, and equipment to be used for each phase of the restoration work.

##### If alternative methods and materials to those indicated are proposed for any phase of restoration work, provide a written description, including evidence of successful use on other comparable projects, and a testing program to demonstrate their effectiveness for this Project.

#### Cleaning Program: Describe cleaning process in detail; protection of surrounding materials on building and site; and control of runoff during operations. Describe in detail the materials, methods and equipment to be used.

##### If alternative methods and materials to those indicated are proposed for any phase of cleaning work, provide a written description, including evidence of successful use on other comparable projects, and a testing program to demonstrate their effectiveness for this Project.

#### Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.

### QUALITY ASSURANCE

#### Restoration Specialist: Engage an experienced masonry restoration and cleaning firm that has specialized in the types of work required for this Project for a minimum of five (5) years. At Contractor's option, the work may be divided between two specialist firms: one for cleaning work and one for repair work.

##### Field Supervision: Require restoration specialist firm to maintain an experienced full-time supervisor on the job site during times that stone masonry restoration and cleaning are in progress.

##### Restoration Worker Qualifications: Persons who are experienced in restoration work of types they will be performing. When stone units are being patched, assign at least one worker among those performing patching work who is trained and certified by manufacturer of patching compound to apply its products.

#### Chemical Manufacturer Qualifications: A company regularly engaged in producing masonry cleaning compounds, which have been used on similar projects with successful results, and that retains factory-trained representatives who are available for consultation and job site inspection and assistance at no additional cost.

#### Source of Materials: Obtain materials for masonry restoration from a single source for each type material required (stone, cement, sand, etc.) to ensure a match of quality, color, pattern, and texture.

#### Field-Constructed Mockups:

##### Schedule a Pre-Mockup conference to review brick and mortar removal and replacement procedures with the A/E . The A/E will select locations for any mockups.

##### Restoration Mockup: Prior to starting general masonry restoration, Prepare mockups on existing walls under same weather conditions to be expected during remainder of the Work. Prepare mockups using same materials, equipment, and methods proposed for the Work. Obtain A/E's acceptance of visual qualities before proceeding with masonry restoration.

###### Notify A/E one week in advance of dates and times when samples will be prepared. Manufacturer's representative of cleaning materials to be present during testing.

###### Masonry Cleaning: Demonstrate the materials and methods to be used for cleaning each type of masonry surface and condition on sample location approximately 25 sq. ft. in area.

Test materials and methods on samples of adjacent non-masonry materials for possible reaction with cleaning materials, except where materials and methods are known to have a deleterious effect on such materials.

Allow a waiting period of the duration indicated, but not less than 3 calendar days, after completion of sample cleaning to permit a study of sample panels for negative reactions.

###### Retain acceptable panels in an undisturbed condition, suitably marked, during construction as a standard for judging the completed Work. Areas may remain as part of the completed work.

###### Approval of sample panels is for degree of cleaning; relationship of mortar and sealant colors to masonry unit colors; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by the Architect in writing.

##### Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels, unless such deviations are specifically approved by the A/E in writing.

### DELIVERY, STORAGE, AND HANDLING

#### Deliver masonry materials to Project in undamaged condition.

#### Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

### PROJECT CONDITIONS

#### Clean masonry surfaces only when air temperature is 40 deg F and above and will remain so until masonry has thawed and dried out, but for not less than 7 days after completion of cleaning.

##### Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has thawed and dried out, but not less than 7 days after completion of cleaning.

##### Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from masonry. Provide artificial shade and wind breaks and use cooled materials as required.

###### Refer to chemical cleaner manufacturer’s recommendations for application techniques when application hot-weather conditions exist.

### SEQUENCING AND SCHEDULING

#### Order replacement materials at earliest possible date, to avoid delaying completion of the Work.

#### Perform restoration work in the following sequence:

##### Remove plant growth, if any.

##### Inspect for open mortar joints and repair before cleaning to prevent intrusion of water and other cleaning materials into the wall.

##### Clean masonry surfaces.

##### Apply water repellent coating.

## PRODUCTS

### MANUFACTURERS

#### Substitutions: [No Substitutions] [In accordance with Section 01 25 00 – Substitution Procedures].

### CLEANING MATERIALS and equipment

#### Water for Cleaning: Clean, potable, free of oils, acids, alkalis, salts, and organic matter.

#### Biological Soiling Remover: Manufacturer’s standard cleaner designed to remove mold, mildew, and atmospheric staining from masonry.

##### Approved Products:

###### “[Enviro Klean ReVive](https://prosoco.com/product/revive/)”: PROSOCO, Inc. (800-255-4255) (Basis of Design).

#### Nonabrasive Brushes: Fiber bristles only.

#### Spray Equipment: Provide equipment for controlled spray application of water and chemical cleaners, if any, at rates indicated for pressure, measured at spray tip, and for volume. Adjust pressure and volume, as required, to ensure that damage to masonry does not result from cleaning methods.

##### For chemical cleaner spray application, provide a low-pressure tank or chemical pump suitable for the chemical cleaner indicated, equipped with a cone-shaped spray tip.

### CHEMICAL CLEANING SOLUTIONS

#### General: Unless otherwise indicated, dilute chemical cleaning materials with water to produce solutions of concentration indicated but not greater than that recommended by chemical cleaner manufacturer.

## EXECUTION

### EXAMINATION

#### Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

### PREPARATION

#### General: Comply with the chemical cleaner manufacturer's recommendations for protecting adjacent building surfaces against damage from exposure to their products.

##### Proceed with installation only after unsatisfactory conditions have been corrected.

#### Protect persons, motor vehicles, surrounding surfaces of building whose masonry surfaces are being restored, building site, plants, and surrounding buildings from injury resulting from masonry restoration work.

##### Comply with chemical cleaner manufacturer's and Owner’s written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be injured by such contact.

##### Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.

##### Keep wall wet below area being cleaned to prevent streaking from runoff.

##### Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.

##### Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

##### Erect temporary protection covers over pedestrian walkways and at points of entrance and exit for persons and vehicles that must remain in operation during course of masonry restoration work.

#### Protect adjacent surfaces from contact with chemical cleaners by covering them with a liquid strippable masking agent or polyethylene film and waterproof masking tape. Apply masking agent to comply with manufacturer's recommendations. Do not apply liquid masking agent to painted or porous surfaces.

##### Contractor must provide detailed information on materials and method plan to be used on these surfaces, prior to beginning of work, and as approved by A/E.

#### Masonry surfaces that are not to be cleaned shall be protected from contact with the cleaning solution with sheets of polyethylene or other proven protective materials, firmly fixed and sealed to the surface. Non-masonry surfaces that are not protected shall be kept running-wet with clean water throughout the cleaning process of adjacent stone.

##### Contractor must provide detailed information on materials and method plan to be used on these surfaces, prior to beginning of work, and as approved by A/E.

#### All surfaces not to be cleaned shall be tested for possible detrimental effect of the cleaning solutions and protected as determined necessary by test results.

#### All open joints shall be temporarily caulked or otherwise protected to prevent intrusion of washing waters into the wall structure or building interior. Build up waterproof dams to divert flowing water to exterior.

### UNUSED ANCHOR REMOVAL

#### Remove masonry anchors, brackets, wood nailers, and other extraneous items no longer in use unless identified as historically significant or indicated to remain.

##### If item cannot be removed without damaging surrounding masonry, replace masonry unit.

### BIOLOGICAL SOILING REMOVER

#### Proceed with cleaning of biological soiling if specified mild cleaner was tested and ineffective to blackened area. Apply in an orderly manner; work from bottom to top.

#### Use only those cleaning methods indicated for each masonry material and location in strict accordance with manufacturer's written instructions.

##### Scrub surface with nonabrasive brush or synthetic scrubbing pad. Do not use wire brushes.

##### Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip.

##### For water spray application, use fan-shaped spray tip that disperses water at an angle of 15 to 45 degrees.

#### Application Methods:

##### Dilute chemical cleaner based on testing and manufacturer’s published recommendations.

##### Apply diluted chemical cleaner to dry masonry surfaces. Comply with chemical cleaner manufacturer's written instructions until surface is thoroughly wet; use brush or spray application methods, at Contractor's option.

##### Do not spray apply at pressures exceeding 50 psi.

##### Let chemical cleaner dwell for 2 to 3 minutes. Reapply the cleaner to keep surface wet for allotted time period.

##### Mist treated surface with water and gently scrub with non-metallic, short-fibered scrub brush to loosen biological soiling.

##### Rinse thoroughly with clean water from bottom to the top.

##### Reapply, if necessary to achieve specified results. It may take several days for the full cleaning effect to be realized. When practical, allow two or more weeks for biological soiling to disappear.

### PROTECTION

#### Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

#### Correct damage by cleaning, repairing or replacing, and repainting, as approved by A/E.

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