SECTION 040345 - HISTORIC STONE CONSOLIDATION TREATMENT

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
   * + 1. RELATED DOCUMENTS
          1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
       2. SUMMARY
          1. Section includes historic treatment work consisting of stone consolidation treatment.
          2. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 013591 "Historic Treatment Procedures" for general historic treatment requirements.

Section 071900 "Water Repellents" for separately applied water-repellent treatments.

* + - 1. ALLOWANCES

Retain products and Work included in this Section that are covered by cash or quantity allowance. Do not include amounts. Insert descriptions of items in Part 2 or 3 to provide information affecting the cost of the Work that is not included under the allowance.

* + - * 1. Allowances for stone consolidation treatments are specified in Section 012100 "Allowances."

Paragraph below is an example only; revise to suit Project.

* + - * 1. Preconstruction testing is part of testing and inspecting allowance.
      1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

Pressure spray value in "Low-Pressure Spray" Paragraph below is not standardized; revise pressure to suit Project.

* + - * 1. Low-Pressure Spray:

Pressure: [**100 to 400 psi**].

Flow Rate: [**4 to 6 gpm**].

* + - 1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" Paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference on historic masonry repair and stone consolidation at [**Project site] <Insert location**>.

If needed, insert list of conference participants not mentioned in Section 013591 "Historic Treatment Procedures."

Retain subparagraphs below if additional requirements are necessary; include information about conference.

Review minutes of Preliminary Historic Treatment Conference that pertain to masonry historic treatment and stone consolidation.

Review methods and procedures related to stone consolidation treatment including, but not limited to, the following:

Verify historic treatment specialist's personnel, equipment, and facilities needed to make progress and avoid delays.

Materials, material application, and sequencing.

Fire-protection plan.

Stone consolidation treatment program.

Coordination with building occupants.

* + - 1. SEQUENCING AND SCHEDULING

"Work Sequence" Paragraph below is an example only; revise to suit Project, or delete if not prescribing a work sequence. Stone consolidation should be performed after cleaning, because it might not penetrate properly on dirty surfaces or may encapsulate dirt. Obtain written recommendation from manufacturer. Some stone consolidation treatments, particularly those with water repellent, must be scheduled after all repair and pointing work is completed, because mortar and sealants do not adhere to them.

* + - * 1. Work Sequence: Perform stone consolidation treatment work where scheduled in "Sequencing and Scheduling" Article in [**Section 040310 "Historic Masonry Cleaning"] [Section 040342 "Historic Stone Masonry Repair"] [and] [Section 040343 "Historic Stone Masonry Repointing."] <Insert requirement**>.

Retain paragraph below if scaffolding anchor holes in masonry and patching them are acceptable and required for access for access to stonework being consolidated; revise to suit Project.

* + - * 1. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry according to [**Section 040322 "Historic Brick Unit Masonry Repair"] [and] [Section 040342 "Historic Stone Masonry Repair**"] as appropriate for locations of holes.
      1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each type of product.

Include recommendations for product application and use.

Include test data substantiating that products comply with requirements.

Consider "Qualification Data" and "Stone consolidation treatment program" paragraphs below as they relate to Project goals and importance.

* + - * 1. Qualification Data: For [**historic treatment specialist] [including field supervisors and workers] [consolidant manufacturer] [testing service] [and] [inspectors**].

Retain "Preconstruction Test Reports" Paragraph below if specifying preconstruction testing in "Preconstruction Testing" Article as Contractor's responsibility.

* + - * 1. Preconstruction Test Reports: For consolidation treatment on existing stone.

Retain paragraph below if retaining program in "Quality Assurance" Article.

* + - * 1. Stone consolidation treatment program.
      1. QUALITY ASSURANCE

In "Historic Treatment Specialist Qualifications" Paragraph below, insert additional, specific requirements for demonstrating unique skills of firm and personnel to suit Project. See Section 013591 "Historic Treatment Procedures" for general qualifications of historic treatment specialist.

* + - * 1. Historic Treatment Specialist Qualifications: A qualified stone consolidation treatment specialist. Experience applying standard coatings or sealers is insufficient experience for stone consolidation treatment work.

If retaining "Consolidant Manufacturer Qualifications" Paragraph below, verify that manufacturers of products listed in Part 2 comply with requirements.

* + - * 1. Consolidant Manufacturer Qualifications: A firm regularly engaged in producing stone consolidants that have been used for similar applications with successful results, and with Company Service Advisors who are available for consultation and Project-site inspection and on-site assistance.
        2. Stone Consolidation Treatment Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of the historic treatment work, including protection of surrounding materials and Project site.

Include methods for protecting consolidant-treated surfaces from precipitation during curing period.

If materials and methods other than those indicated are proposed for any phase of historic treatment work, add a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project and worker's ability to use such materials and methods properly.

Retain required mockups in "Mockups" Paragraph below; insert others to suit Project. Test areas that were prepared or are required as part of a separate contract to evaluate and establish historic treatment materials and processes are not mockups. If using a consolidation treatment with water repellent, consult manufacturer whether the product will prevent further treatment if mockup results are unsatisfactory.

* + - * 1. Mockups: Prepare mockups of consolidation treatment to demonstrate aesthetic effects and to set quality standards for materials and execution.

Apply stone consolidation treatment to an area [**approximately 4 sq. ft.] [as indicated**].

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Director’s Representative specifically approves such deviations in writing.

* + - 1. PRECONSTRUCTION TESTING

Retain this article for preconstruction testing. Usually, test existing or similar stone before preparing the Specifications, and delete this article. Some preconstruction testing results from Section 040342 "Historic Stone Masonry Repair" may also be used. Project-specific preconstruction testing can be expensive but may be the best means of proving that performance requirements are met.

* + - * 1. Preconstruction Testing Service: [**Director’s Representative will engage] [Engage**] a qualified testing agency to perform preconstruction testing on stone as follows:

Retain applicable subparagraphs below; revise tests and insert others if required.

Provide test specimens as indicated and representative of proposed materials and existing construction.

If no masonry repairs other than consolidation treatment are required, the taking of samples of existing stone according to "Existing Stone" Subparagraph below may be unacceptable.

Existing Stone: Test each type of existing stone indicated for consolidation treatment, according to ASTM C170 for compressive strength, wet and dry, perpendicular and parallel to rift, and according to ASTM C97 for absorption. Carefully remove [three] <Insert number> existing stones for testing from locations designated by Director’s Representative. Take testing samples from these stones.

* + - 1. FIELD CONDITIONS

Usually retain this article; revise to suit Project.

* + - * 1. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit stone consolidation treatment work to be performed according to product manufacturers' written instructions and specified requirements.
        2. Apply stone consolidation treatment only when surface and air temperatures are between 50 and 90 deg F and rain is not expected within 24 hours.

1. PRODUCTS
   * + 1. PERFORMANCE REQUIREMENTS
          1. Source Limitations: Obtain each type of stone consolidation treatment from single source with resources to provide materials of consistent quality in appearance and physical properties.
       2. STONE CONSOLIDATION MATERIALS

Retain "Stone Consolidation Treatment" Paragraph below if consolidation without water repellency is required.

* + - * 1. Stone Consolidation Treatment: Ready-to-use product designed for consolidation of stone that has deteriorated from weathering and exposure to pollutants. Active ingredients shall be based on silicic ethyl esters.

Retain "Stone Consolidation and Water-Repellent Treatment" Paragraph below if consolidation with water repellency is required. Consult manufacturers if a separately applied water-repellent treatment is required.

* + - * 1. Stone Consolidation and Water-Repellent Treatment: Ready-to-use product designed for consolidation and water-repellent treatment of stone that has deteriorated from weathering and exposure to pollutants. Active ingredients shall be based on silicic ethyl esters and a silane water repellent.
      1. ACCESSORY MATERIALS
         1. Masking Tape: Nonstaining, nonabsorbent material, recommended in writing by consolidant manufacturer; compatible with mortar, sealants, and surfaces adjacent to consolidant-application area; and that easily comes off entirely, including adhesive.

Insert paragraphs(s) for other types of masking products, including tapes, sheets, etc., to suit Project.

* + - * 1. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:

Previous effectiveness in performing work involved.

Minimal possibility of damaging exposed surfaces.

Consistency of each application.

Uniformity of the resulting overall appearance.

Do not use products or tools that could do the following:

Remove, alter, or harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in contract.

Leave residue on surfaces.

1. EXECUTION
   * + 1. HISTORIC TREATMENT SPECIALIST

Retain this article if using list of preapproved firms as quality-control procedure.

If retaining second option in "Historic Treatment Specialist Firms" Paragraph below, include procedure for approving other firms in Document 002213 "Supplementary Instructions to Bidders."

* + - * 1. Historic Treatment Specialist Firms: Subject to compliance with requirements, [**provide stone consolidation treatment by one of the following] [firms that may provide stone consolidation treatment include, but are not limited to, the following**]:

<**Insert, in separate subparagraphs, names of historic treatment specialist firms**>.

* + - 1. PROTECTION
         1. Prevent consolidation treatment from contacting face of surrounding stone, not indicated to be treated, and other surfaces.

Cover sills, ledges, and other projecting items to protect them from droppings.

Immediately remove treatment in contact with exposed stone, not indicated to be treated, and other surfaces.

Retain paragraph below if applicable; insert other items that may interfere with execution of stone consolidation work.

* + - * 1. Remove[ **gutters and**] downspouts and associated hardware adjacent to immediate work area and store during stone consolidation treatment. Reinstall when consolidation treatment is complete.

Provide temporary rain drainage during work to direct water away from building.

* + - 1. CONSOLIDATION TREATMENT, GENERAL
         1. Have stone consolidation work performed only by qualified historic treatment specialist.

Retain "Appearance Standard" Paragraph below to control overall appearance from a distance.

* + - * 1. Appearance Standard: Fully cured, treated surfaces are to have a uniform appearance as viewed from [20] [50] feet away by Director’s Representative.
      1. STONE CONSOLIDATION TREATMENT <**Insert drawing designation**>

Insert drawing designation if only specific locations require treatment. Use these designations on Drawings to identify locations. See "Delineating the Work" Article in the Evaluations for discussion.

Revise paragraphs below to suit Project, based on consultation with manufacturers and Designer's knowledge of the building's materials and experience with similar work.

* + - * 1. Apply treatment to clean, dry surfaces according to manufacturer's written instructions. Remove areas of blind exfoliation, delamination, and flaking before applying.
        2. Apply in cycles to small sections of stonework, not more than 100 sq. ft. in area. Each cycle shall consist of three successive saturating applications, applied at five- to 15-minute intervals depending on drying conditions.
        3. Apply by low-pressure spray to point of rejection in each application. Apply from bottom of the section to top.
        4. Apply three cycles, allowing treated surface to dry for 60 to 90 minutes between cycles.
        5. Protect treated surfaces from precipitation for 48 hours after treatment.
        6. Allow treated surfaces to dry for at least 21 days before repointing, patching, or applying water repellents or sealants.
      1. FINAL CLEANING
         1. Remove masking materials, leaving no residues that could trap dirt.
      2. FIELD QUALITY CONTROL

Retain "Testing Agency" Paragraph if Director’s Representative retains full-time inspectors, or retain "Architect's Project Representatives" Paragraph below if Architect's representatives will be on-site daily to make observations, or both.

* + - * 1. Testing Agency: Director’s Representative will engage a qualified testing agency to perform tests and inspections. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.
        2. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.
        3. Notify [**testing agency] [and] [Architect's Project representatives**] in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until [**inspectors] [and] [Architect's Project representatives**] have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

Retain "Manufacturer's Field Service" Paragraph below to require a Company Service Advisor to provide on-site assistance.

* + - * 1. Manufacturer's Field Service: Engage consolidant manufacturers' Company Service Advisor for consultation and Project-site inspection, and provide on-site assistance when requested by Director’s Representative.

END OF SECTION 040345