

**SPECIFICATIONS
FOR
CONSERVATION OF MEDIEVAL FEATURES**

REHABILITATION OF THE TERRACE & RELATED FEATURES

**THE EXPLORERS CLUB
46 E. 70TH STREET
NEW YORK, NY**

**OWNER:
THE EXPLORERS CLUB
46 E. 70TH STREET
NEW YORK, NY**

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**Specifications
for
Conservation of Medieval Features**

**Rehabilitation of the Terrace & Related Features
The Explorers Club, New York, NY**

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SECTION 01004 - SPECIAL CONDITIONS

PART 1: GENERAL

1.01 PROJECT INTENT

- A. The Explorers Club has been determined to possess architectural significance; it is listed on the National and State Registers of Historic Places and is located within the New York City Upper East Side Historic District. The Contractor shall recognize that all aspects and elements of the property may potentially contribute to this significance, and the contractor shall not judge the relative significance of any features or the impact of any or all proposed work. This responsibility shall rest solely with the Architect. Consequently no deviations from the contract documents shall be performed, and no features or materials shall be altered, removed, reused, or taken from the premises, without the written approval of the architect as being consistent with the requirements of the contract documents. All work shall be consistent with the regulations and guidelines of the New York City Landmarks Preservation Commission.
- B. The intent is to temporarily disassemble and salvage for conservation the deteriorated antique capitals, columns and other features of the arcade, and reinstall in sound condition in their original locations, as indicated on drawings.**
- C. Towards this end, all existing construction is designated as historic and is to be carefully protected and preserved throughout construction except where explicitly indicated otherwise in the drawings. All repaired, replaced, restored, conserved and reconstructed elements shall match the original existing elements in quality, design, color, texture, size, shape, and appearance.
- D. The Explorers Club will remain in use during construction.
- E. The Contractor shall provide site logistics plan noting transportation, access, toilet use, egress, crating, storage areas, dumpsters, etc. Plan shall be reviewed and approved by Owner and Architect in writing prior to commencement of work.

1.02 QUALITY ASSURANCE

- A. Work shall be performed by an individual or firm of established reputation which is regularly engaged in and which maintains a regular force of technicians skilled in the conservation of architectural materials. Only accepted conservation firms and senior level conservation technicians may perform the work.

- B. The Contractor shall have successfully performed work of similar scale and content on a minimum of three (3) such projects in the past ten (10) years. The Contractor shall provide the names, address, dates of work, contact person and telephone number for up to three (3) similar projects completed.

1.03 STORAGE AND PROTECTION

- A. Limited storage facilities will be provided inside the church belfry. No other parts of the church complex will be available for storage during construction. Contractor may provide such storage facilities as he/she deems necessary providing this area does not conflict with the on-going Church operations and such location is acceptable to Owner.
- B. Owner will assume no responsibility for loss or damage to materials stored on-site. Contractor shall take all precautions to protect materials from loss, damage, or possible injury to premises or persons. Contractor shall take all steps to assure the security of the church building complex. No flammable materials will be stored on the site.
- C. Contractor shall keep the construction site presentable at all times. Unsightly materials shall be kept from the public view at all times.
- D. The Contractor shall take all precautions to prevent fire and/or spread of fire.
- E. All exterior and interior components of the structure are considered to be historic fabric, therefore, extreme care shall be taken by the Contractor through all phases of the preparation and construction. The Contractor shall be responsible for any damage to any building components which occur as a result of all phases of work mentioned in this Specification.

1.04 COORDINATION WITH OWNER'S ACTIVITIES

- A. Contractor shall be aware of Owner's activities and take precautions so as not to interfere with the normal user pedestrian activities allowing for safe access and egress to and from the church. Contractor shall notify the proper authorities and the Owner at times when access is not recommended, and shall properly sign the construction site and mark clear legal detours as necessary.
- B. Work will be allowed on-site weekdays between the hours of 8:00 AM and 5:00 PM only. Required individual exceptions must be arranged with at least 48 hour notice.

1.05 INSURANCE

A. Contractor shall carry insurance in the following amounts, and in accordance with all applicable governmental regulatory and statutory guidelines. Contractor shall cause to be named the Owner and Architect as additional insured on all of Contractor's insurance policies related to the Project.

B. Umbrella Policy: \$ 5,000,000

C. Workman's Compensation and Employer's Liability Insurance:

1. Statutory: in amounts and coverage as required by laws at place of building

2. Employer's Liability: \$ 1,000,000

D. Comprehensive General Liability Insurance

1. Public Liability coverage including the following: Operations Premises; Contractor's protective; completed operations and products and contractual, including hold-harm indemnification as follows:

To the fullest extent permitted by law, Contractor shall indemnify and hold harmless Owner and the Architect and their agents and employees from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees arising out of or resulting from the performance of the Work. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this paragraph.

In any and all claims against Owner or Architect or any of their agents or employees by any employee of Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts. The obligations of Contractor under this paragraph shall not extend to the liability of the Architect, his agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or (2) the giving or the failure to give directions

or instructions by the Architect, his agents or employees provided such giving or failure to give is the primary cause of the injury or damage.

- a) Each person: \$ 1,000,000
- b) Each occurrence: \$ 1,000,000

2. Personal Injury Liability:

- a) Each person: \$ 1,000,000
- b) Each occurrence: \$ 1,000,000

E. Property Damage Liability:

- 1. Each occurrence: \$ 1,000,000
- 2. Aggregate: \$ 1,000,000

F. Comprehensive Automobile Liability Insurance: (including owned, non-owned, and hired vehicles)

1. Personal Injury Liability:

- a) Each person: \$ 1,000,000
- b) Each occurrence: \$ 1,000,000

2. Property Damage Liability:

- a) Each occurrence: \$ 1,000,000
- b) Aggregate: \$ 1,000,000

G. Contractor shall maintain completed operations and products insurance for a period of three (3) years after completion of the Project.

1.06 PERMITS

- A. Contractor shall be responsible for filings, procurement, display, and sign-off of all permits required for the work. All permits and approvals for this work shall be Contractor's complete responsibility.
- B. All items of materials and methods of construction shall conform in all necessary particulars to the requirements of the Occupational Safety and Health Act, and to all

other applicable governmental rules, regulations, codes and ordinances. In the event of conflict between Contract Documents and such governmental rules, regulations, codes and ordinances, the latter shall govern, except where authorized variances are obtained from the appropriate officials. Contractor shall inform Owner of all such conflicts.

1.07 WATER AND POWER

- A. Electrical and water service is available at the site. All services shall be inspected by the Contract Bidder before the bid is submitted. Additional services as necessary, must be arranged by Contractor.

1.08 TOILET FACILITIES

- A. No temporary toilet facilities will be allowed on the site. The Contractor may use existing toilet facilities designated by the Owner within the church.

1.09 PERSONAL SECURITY

- A. Contractor's crew must obey all existing security measures. These include, but are not limited to: appropriate entrances and exits; sign in/sign out sheets; etc.

1.010 CLEANING OF WORK AREAS

- A. In addition to the general requirements of the Contract Documents, Contractor shall remove any stains, spots, or dirt accumulated as a result of Contractor's work. The Contractor shall be responsible for the cleaning of passageways or areas where dirt or debris had accumulated as a result of his/her activities. The entire site must be left broom clean at the termination of each day's work. Dumpsters outside the building are permitted. Contractor is responsible for all permits.

1.11 CONTRACTOR INFORMATION

- A. Prior to commencement of work, Contractor and each of its subcontractors must submit in writing the names and telephone numbers of individuals to be contacted in the case of emergency. Contractor shall also include the name and telephone number of the job foreman.

1.12 JOB MEETINGS

- A. Weekly job meetings shall be held at a mutually convenient time, for the purpose of discussing work progress and technical issues. Contractor must identify his representative who will attend these meetings.

1.13 PROTECTION OF PROPERTY AND THE PUBLIC

Contractor shall:

- A. Construct and maintain all Project on-site fences and barricades required for the protection of the public in accordance with applicable governmental regulations, and protect the base of all scaffolding from public access with plywood or fencing to a minimum 10' height.
- B. Take all proper precautions to protect Owner and the adjoining property from injury or unnecessary interference; provide proper means of access to the property and replace or put in good condition every public or private way, conduit, catch basin, tree, fence, or other thing injured in carrying out the work.
- C. Hold harmless Owner, Architect, Owners Consultants, and any and all other persons connected with the Church or Project, from all claims arising from the use of public streets, sidewalks, and adjoining properties from construction purposes.

1.14 STAGING, SCAFFOLDING, AND HOISTING

- A. Contractor shall maintain and remove at the conclusion of the work as directed by Owner, all staging, scaffolding, or rigging, and hoisting equipment not required for the future phases of work. Staging, rigging and hoisting equipment, design, structure and use shall be in full conformance with all applicable governmental regulations. Contractor is responsible for all procurement, maintenance, and costs associated with the permits for: staging, rigging, and hoisting.

1.15 SAMPLES

- A. Samples of all materials shall be presented in advance on site, in situ, no less than one week in advance of construction for acceptance by the Architect. Presentation and procurement of samples shall be the responsibility of Contractor.

1.16 SHOP INSPECTIONS

- A. Contractor shall provide access and suitable facilities for Owner's Consultants and Testing Laboratory to inspect off site operations and facilities. If access should be

denied, any work performed during inaccessible periods will be deemed suspect and rejected.

1.17 DRAWINGS

- A. Before undertaking any fabrication or construction involving existing fabric, Contractor shall take careful field measurements and verify all existing conditions, bearing all responsibility for the proper dimensioning of such work, including replacement of any work fabricated to incorrect dimensions. All work must match existing fabric and Owner reserves the right to request shop drawings for any scope of work at no cost increase. These drawings must be accepted by Owner's Consulting Engineer and Architect before any work pertaining to, or in any way connected with the drawings may proceed.
- B. Any conflict of new construction with existing architectural, structural, or mechanical conditions shall be brought to the attention of the Architect prior to the implementation of any repair approach.

1.18 DEVIATION FROM DRAWINGS

- A. Under no circumstances shall any deviation from the drawings be made without the prior written approval of the Architect. In the event that conditions are uncovered that affect structural elements, the Architect shall be given timely notice in order to properly evaluate the condition and plan alterations, if required.

1.19 SIGNS

- A. No signs may be erected on the site without the Owner's written consent.

1.20 SEQUENCE OF WORK

- A. Prior to the commencement of the work Contractor shall submit a schedule for the entire scope of the project. This schedule will be used to coordinate Owner's activities and shall include required submission dates, review periods, critical dates, and anticipated time extents required to perform to work.
- B. It is Contractor's responsibility to follow the most logical order of the work. If the sequence of work will in any way deviate from the schedule, Contractor shall notify the Architect prior to the beginning of the Work.

1.21 DOCUMENT DISCREPANCIES

- A. Any discrepancies between any sections of the entire Bid Package, including those between the supplementary established by the Owner and the AIA documents shall be ruled by Owner toward Owner's best interest. These discrepancies include any or all: government regulations; forms of liability; payment schedules; insurance premiums; or any other discrepancy

1.22 GUARANTEE

- A. The Contract Bidder at the completion and acceptance of his work shall provide a written guarantee to the Owner for all Workmanship and materials described with the Contract Documents. This written guarantee shall be for ten (10) years.

END OF SECTION 01004

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. General provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 PROJECT DESCRIPTION

- A. The Base Scope of Work encompasses all materials and labor to complete the following exterior work:
1. General:
 - a. Provide scaffolding and permits as required by New York City Building Code for performance of work.
 2. Deconstruction, Salvage and Handling (See Section 024291 and 040140.91):
 - a. Temporarily remove capitals and columns, as scheduled. Number, document and photograph all features.
 - b. Transport features in crates to conservator's studio.
 - c. Crate and deliver conserve features to work area.
 3. Stone Conservation and Restoration
 - a. Perform conservation and restoration, including injection grouting; pinning; and composite and epoxy patching, as scheduled, in studio.
 - b. Furnish new shafts, as scheduled, to match original in profile, color, materials and tooling for reinstallation.
 - c. Clean arcade elements as scheduled.
 - d. Apply surface consolidant on arcade elements, as scheduled.
 - e. Reinstall conserved arcade elements with new non-corrosive fasteners, as scheduled, to match original, 100%.
- B. There are two alternates:

1. ALTERNATE #1:
 - a. Perform additional pinning in addition to base scope.
 - b. Replace selected column shafts in lieu of conservation.
2. ALTERNATE #2:
 - a. Provide temporary shop facilities on terrace and perform all conservation work on site in lieu of off-site shop.

1.3 GENERAL REQUIREMENTS

- A. The Contractor shall obtain and pay for all permits and fees required.
- B. The Contractor shall verify all information pertaining to existing conditions by actual measurement and observation on the site. All discrepancies between actual conditions and those shown in the contract documents shall be reported to the Architect for evaluation before the affected construction is put in place. Failure to notify the Architect will not relieve the Contractor of the responsibility to perform the work as intended in the Contract Documents.
- C. Do all cutting, patching, and repairing as required to perform all of the work as may be required to complete the job.
- D. Maintain the structural stability and integrity of existing structure during the construction operations.

1.4 CONTRACTOR USE OF PREMISES

- A. General: Limit use of the premises to construction activities in areas indicated; allow for full Owner occupancy.
- B. Owner Occupancy: The Owner will occupy the site during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage.
- C. The Work will be sequenced in such a way as to provide the least possible interference to the activities of the Owner and to permit continued use of areas not under construction.

- D. Be responsible for keeping the site free of rubbish and debris, and in a neat orderly condition at all times. Clean up and remove all accumulated rubbish and debris for all trades on a daily basis.

1.5 TEMPORARY PROTECTION

- A. While work under this contract is in progress, protect existing building, grounds, contents, passersby and occupants, including those on adjacent property, whether public or private, from damage or harm due to the work under this contract. Provide temporary protection, bridging, safety netting and other acceptable methods to protect persons and property from harm. Comply with laws, ordinances, regulations, and requirements of the agencies of New York having jurisdiction. At no additional cost, satisfactorily repair or replace, to architect's and owner's satisfaction, marred or damaged elements and surfaces.
- B. Where existing construction is removed provide adequate enclosure, tarpaulin or other temporary waterproof covers to protect against the elements. Remove protection only when new construction provides weather tight seal.
- C. Protect existing building fabric with securely anchored and maintained protection materials. At no additional cost, satisfactorily repair or replace, to architect's and owner's satisfaction, marred or damaged elements and surfaces.
- D. Remove temporary protection promptly on completion of construction activities when no longer needed.

1.6 TEMPORARY SCAFFOLDS

- A. Contractor shall provide chutes, scaffolding, staging, rigging, sidewalk bridges, stairs, platforms, railings, and similar items for proper execution of the work. Such apparatus, equipment, construction, and use shall meet applicable requirements of labor laws, codes, and regulations of authorities having jurisdiction.

1.7 UTILITY SERVICES

- A. Contractor shall not interrupt any utility service such as water, gas, steam, sewers, electricity, or fire protection serving the building or neighboring properties without written approval of the owner(s) and other authorities having jurisdiction.

PART 2 - PRODUCTS (Not applicable).

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01010

SECTION 024291 REMOVAL AND SALVAGE OF HISTORIC CONSTRUCTION MATERIALS

PART 1 GENERAL

1.1 DESCRIPTION

- A. The work under this section covers the dismantling, handling, and storage of marble and limestone column shafts and capitals.

1.2 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all technical specifications sections, apply to this Section.
- B. Drawings and technical specifications of work to be performed by others including:
 - 1. Masonry Restoration and Roof, Terrace and Skylight Replacement drawings and specification section 02250 – Shoring.

1.3 DEFINITIONS

- A. Dismantle: Removal and match marking of existing elements to be reused.
- B. Catalog: Match Marker (label and numbering) system to identify elements for reuse.
- C. Salvage: Handling and storage of elements to be reused.
- D. Reuse: In order to preserve the historic integrity of the site, some material such as the coping stones and other miscellaneous extant features are to be stored for reinstallation in the new construction.

1.4 SUBMITTALS

- A. The Contractor shall provide resumes of qualified workers trained and experienced in restoration of historic masonry for at least 5 consecutive years, and trained for applications and repointing mortar.
- B. Details and photographs illustrating the proposed methods of dismantling, cataloging, salvage, and reuse of column shafts and capitals.
- C. The Contractor shall provide a plan describing the dismantling process and documenting the cataloging system to be used during construction. The Contractor shall provide a

narrative detailing intended removal and handling methods.

- D. Shop Drawings: Indicate dismantling and removal sequence, location and construction of temporary work, protection and waterproofing.
- E. Handling and Transportation Procedures: Include method that will be used for crating, container labeling, hoisting, and transporting from Project site to studio.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for demolition work, dust control and safety of public. See Subchapter 19 of Title 27 of the Building Code of the City of New York ("Safety of Public and Property During Construction Operations").
- B. Obtain required permits from authorities.
- C. Do not close or obstruct egress width to any building or site exit.
- D. Do not disable or disrupt building fire or life safety systems.
- E. Conform to procedures applicable when hazardous or contained materials are discovered.

1.6 WORKER QUALIFICATIONS

- A. The Contractor shall provide qualified workers trained and experienced in restoration of historic masonry for at least 5 consecutive years, and trained for applications and repointing mortar. A list of similar jobs shall be provided identifying when, where, and for whom the work was done.

1.7 EQUIPMENT

- A. Equipment that is dependable and adequate to accomplish the specified work shall be assembled at the work site in sufficient time before the start of the work to permit thorough inspection, calibration of weighing and measuring devices, adjustment of parts, and the making of any repairs that may be required. The cutting and cleaning of in-place mortar joints will be performed only with manual or pneumatic chisels. No saw cutting is allowed. The equipment shall be maintained in acceptable working condition during the life of the project.

1.7 QUALITY ASSURANCE REQUIREMENTS

- A. The historic materials upon which work will be performed under this specification

directly contribute to the historical importance of the building. The methods, equipment, workers, and/or systems proposed to perform work on these materials shall be superior, and shall offer better protection of these historic materials as compared to how the same work would be performed for non-significant or commonplace materials. The methods, equipment, workers, and/or systems proposed to perform this work shall have elements, qualities, and/or skills that are superior to commonplace practices and that are commensurate with the historic significance of the materials being handled. The methods, equipment, workers, and/or systems used to perform this work must promote and contribute to the safe and delicate handling of these historic materials.

1.6 PROJECT CONDITIONS

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Cease operations immediately if structure appears to be in danger and notify Architect/Engineer. Do not resume operations until directed.

PART 2 PRODUCTS

2.1 STORAGE CONTAINERS AND PROTECTION

- A. Wooden 2x4s
- B. 1/2-inch plywood
- C. Unbleached Cotton Sheeting
- D. Foam sheeting or bubble wrap
- E. Polyethylene sheeting
- F. Polyethylene foam boards

PART 3 EXECUTION

3.1 DISMANTLE METHODS

- A. Prior to commencing work, the Contractor shall perform a complete existing conditions survey.
 - 1. Thoroughly photograph the capitals and shafts prior to dismantling.
 - 2. Inspect shoring supporting the arcade constructed by others before commencing

work.

- B. The Contractor shall be responsible for compliance with all Federal, State and local laws and regulations relative to disposal, and for payment of fees for removal or disposal.
- C. Column shafts and capitals shall be removed by the Contractor as indicated on the contract drawings. Methods used for removal, reinstallation, and disposal of existing materials shall be in accordance with the contract documents and subject to the approval of the Architect.
 - 1. Using a grinder, carefully cut through the center of the joint between the units.
 - 2. There may be pins holding the column shafts in place. Carefully cut through the pins.
 - 3. Carefully disassemble the column units and place them within the assembled, lined storage containers.
- D. The dismantled elements shall be cataloged with durable tags. In lieu of tags, other catalog methods may be used when approved by the Architect. Cataloging shall be sufficient to allow each component to be reassembled in the same location, position and orientation as in the existing construction.
 - 1. Clearly label the exterior of the crate with the content held within.
- E. All materials resulting from removal and approved for disposal by the Architect shall be appropriately disposed of by the Contractor.
- F. Extreme care shall be taken when disassembling and handling the components. The Contractor is expected to take appropriate measures to protect every piece of historic material from any form of damage, wear, and/or tear in accordance with Part 1.7 above. Any damage caused by the contractor's operations will be replaced as directed by the Architect at the Contractor's expense.
 - 1. Pack the containers with any excess spaced filled with additional foam board and/or foam beads to prevent the units from shifting in the container.
 - 2. Wrap the capital in unbleached cotton sheeting, followed by foam sheeting or bubble wrap to protect surfaces during removal. Write the label of each unit on the outside of the wrapping in indelible ink.
- G. Damaged marble and limestone material shall be replaced in kind. The Contractor will

be required to identify a quarry to supply like or visually compatible stone. The Contractor will be required to submit a sample of the stone replacement to the Architect for approval. A search for compatible stone could be extensive.

3.2 SALVAGEABLE MATERIALS

- A. The Contractor will be allowed to stockpile materials considered by the Architect as salvageable materials at locations approved by the Owner. Salvaged materials shall be stored in a secure location.
- B. Salvageable materials shall be placed on suitable blocking at the approved storage location to keep them out of contact with the terrace paving or ground. Components shall be supported so as to avoid damage to members while in storage.
- C. A lifting, moving, and storage plan shall be submitted to the Architect for review and approval prior to commencement of work.

3.3 FIELD QUALITY CONTROL:

- A. The following records will be prepared for the Architect. The records shall be completed and submitted for information within 24 hours after completion of each part of the work (removal, salvage, and reinstallation) for each type of material. The records shall include the following minimum information:
 - 1. Identification and quantity of shafts and capitals removed/salvaged/reinstalled.
 - 2. Identification and quantity of any miscellaneous features removed/salvaged/reinstalled.
 - 3. Quantity of rubble masonry removed/salvaged/reinstalled.

3.4 CONSTRUCTION OF STORAGE CRATES

- A. Storage containers will be constructed of 2 x 4 timbers and half inch plywood.
- B. Two sizes of containers will be required.
 - 1. One size large enough to hold one capital
 - 2. One size large enough to hold one column shaft.
- C. Polyethylene sheeting and foam boards and will line the container completely. Seams of the sheeting will overlap sufficiently to protect the units from any possible water infiltrating the containers.

- D. The storage containers will consist of the following sequence of protection layers:
 - 1. Polyethylene sheeting
 - 2. Polyethylene foam boards
 - 4. Marble unit wrapped in cotton sheeting and bubble wrap
 - 5. Polyethylene foam boards
- E. A polyethylene foam board will be placed between the masonry units and the cover. Covers will be fastened with screws, not nails, to avoid damage.
- F. The storage containers will be clearly labeled on the outside with the identification number of each unit contained within. A list will be produced indicating the number of the storage container and the content of each storage container.
- G. The containers will be kept in a locked, dry and fireproof location that will be guarded from theft and vandalism. The boxed units must not be turned upside down or stored on their side. Containers shall not be stored directly on the ground or floor and will be labeled as such.

3.5 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

END OF SECTION

SECTION 040140.52 – MASONRY CLEANING

PART 1 GENERAL

1.01 DESCRIPTION

- A. The work shall include all labor, materials, tools, equipment, appliances and services required for the completion of work in this Section.
- B. The work of this Section includes but is not limited to the following:
 - 1. Removal of atmospheric soiling, gypsum crusts, biological growth, and any cementitious material/coatings from the marble, limestone, and cast stone column capitals, shafts, and bases.
 - 2. Removal of atmospheric soiling, gypsum crusts, and biological growth, from the limestone arches of the arcade.
 - 3. Removal of efflorescence from the brick pier adjacent to the double column J.
 - 4. Removal of general soiling, biological growth, and iron stains from the gargoyles on the south wall of the terrace.
 - 5. Removal of any adhesives from the columns.
 - 6. Protection of pedestrians and adjacent materials and buildings, and building occupants and contents during cleaning.
 - 7. Collection and proper disposal of all solid and liquid wastes in accordance with current governmental regulations.
 - 8. Compliance with all local, state and federal regulations.
- C. Cleaning is intended to remove all surface dirt and other deposits from the columns and return the stone to a more uniform color. Surfaces shall be cleaned with no evidence of streaking, bleaching or unnatural color variation. No change in the surface texture of the masonry should result. Masonry pores shall be left free of any residual chemical cleaners and surface pH shall be neutral. Cleaning shall not damage any adjacent materials or the surrounding environment

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.
- B. Section 024291 Removal and Salvage of Historic Construction Materials
- C. Section 040140.52 Masonry Conservation and Restoration

D. Drawings and technical specifications of work to be performed by others including:

1. Exterior Restoration CDs Section 02250 – Shoring.
2. Exterior Restoration CDs Section 04510 Masonry Restoration

1.03 SCHEDULING AND COORDINATION

- A. Cleaning shall be performed before any masonry repairs take place.
- B. The Contractor shall coordinate the work of all other trades related to the successful completion of the work of this Section. The Contractor shall not proceed with aspects of this work that require completion of other trades until all such work of other trades is completed.
- C. At least three weeks prior to commencing the work of this Section, a meeting must be scheduled at the jobsite to discuss conformance with the requirements of specifications and job site conditions. Representatives of the Contractor, Architect, and other parties involved in the scope of this work shall attend the meeting.
- D. Work is to be performed on a daily basis, without interruption, from the start of sample installations through project completion, unless weather conditions prohibit the performance of work, or unless directed otherwise by the Owner or Architect.

1.04 QUALITY ASSURANCE

- A. Standards: Comply with the cleaning recommendations of the National Park Service Technical Preservation Services Division as outlined in: Keeping It Clean: Removing Exterior Dirt, Paint, Stains and Graffiti from Historic Masonry Buildings, Preservation Assistance Division, 1988, except as modified by these Specifications.
- B. Workmanship: Foreman shall submit resume demonstrating a minimum of five (5) years of experience cleaning historic masonry surfaces. The Contractor will be required to provide at least three references for buildings of similar size and materials. Mechanics shall have skill and experience of sufficient level to accomplish the work described. Mechanics shall be carefully supervised to ensure that the work is accomplished to meet or exceed the highest standards of the trade. In acceptance or rejection of cleaning, no allowance will be made for lack of skill on the part of the mechanics.

- C. Pre-Installation Conference: Prior to the commencement of cleaning operations, Contractor shall meet the Architectural Conservator to review cleaning program, procedures and schedule.

1.05 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Submit qualification data and references for firms and persons specified in Section 1.04 "Quality Assurance" to demonstrate their capabilities and experience. Bidders shall visit the site and make themselves familiar with the site conditions.
- C. Provide written descriptions, drawings, and diagrams outlining proposed methods and procedures for protection of personnel, the public, and the existing construction during the work of this Section.
- D. Product Literature: The Contractor shall submit copies of the manufacturer's technical data and MSDS for each product including their recommendations for handling, storage, and applications. Include test reports and certificates that verify the products' compliance with the specification's requirements.
- E. Program of Work: Contractor shall submit work plan including detailed description of how the work of this Section will be accomplished. Work plan should also include materials, methods, and equipment to be used.
- F. Samples: Prior to commencing full-scale cleaning operations, prepare field test samples on the marble, limestone and cast stone elements.
 - 1. Purpose of testing: To determine appropriate cleaning agents, strength and dwell time, method of application, method and duration of rinsing, and to ensure no detrimental effect to masonry or other materials on or adjacent to the building.
 - 2. Tests shall include the removal of atmospheric soiling, efflorescence, biological growth, cementitious coatings/residues, and iron stains.
 - 3. Field tests shall be clearly labeled as to product type and dwell time. Preparation of the test panels shall be done in the presence of the Architect and/or Architect's Representative.
 - 4. Approved samples will serve as the standard for judging completed work and shall remain in place for the duration of the work.

5. Supervision of testing: Architect or Architect's Representative will be on-site at all times during the testing process and will provide instruction and guidance throughout duration of process. Locations of test areas will be determined prior to testing by the Architect.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. All materials for use in the work of this Section shall be delivered to project site in undamaged condition and in manufacturer's original sealed containers bearing the manufacturer's label. Unlabeled materials will be rejected.
- B. All material for use in the work of this Section shall be stored according to manufacturers written instructions. Arrangement shall be made with the Owner's Representative to store equipment and materials in designated areas. The Owner shall not be responsible for damaged or stolen materials or equipment left on the premises by the Contractor.
- C. Place used tools, waste or other materials that constitute a safety hazard in airtight plastic containers. Keep containers closed when not in use. Remove all hazardous waste materials from the site at the close of each work day.
- D. Continue to follow all safety and label warnings even after container is emptied of product; empty product containers retain product residue.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Protect any existing surfaces, which are to remain in place, from incidental damage caused by chemical agents.
- B. Do not clean when the temperature is below 40° Fahrenheit.
- C. Contractor will restore all areas damaged during the course of this contract using approved means at no cost to the owner.

PART 2 MATERIALS

2.01 TOOLS

- A. Nylon or synthetic-bristle brushes
- B. Wooden or plastic scrapers
- C. Full-range (1-14), pH test strips.

- D. Sanding blocks and/or paper for hand polishing/removal of cementitious coatings and residues.
- E. Drill for mechanical removal of cementitious coatings and residues.

2.02 MANUFACTURERS

- A. Contractor shall provide the highest quality cleaning agents from manufacturers with a long-standing reputation for producing restoration cleaning products.
- B. Acceptable manufacturers include:
 - 1. ProSoCo, Inc., 3741 Greenway Circle, Lawrence, KS 66046, Phone: (800) 255-4255, Fax: (785) 830-9797
 - 2. Cathedral Stone Products, Inc., 7266 Park Circle Drive, Hanover, MD 21076, Phone: (800)684-0901, Fax: 800-684-0904
 - 3. 3M, 3M Center, St. Paul, MN 55144-1000, Phone (888) 3M HELPS
 - 4. Franmar Chemicals P.O. Box 5565, Bloomington, IL 61702, Phone: (800) 538-5069
 - 5. Dynacraft/Back to Nature, Phone: (800) 323-8611
 - 4. Or approved equals.

2.03 CLEANING PRODUCTS

- A. For general cleaning removal:
 - 1. Nebulized water misting
 - 2. Or approved equal.
- B. For biological growth removal:
 - 1. D/2 Biological Solution, distributed by Cathedral Stone Products,
 - 2. Sure Klean BioWash, manufactured by ProSoCo, Inc.
 - 3. Sure Klean BioKlean, manufactured by ProSoCo, Inc.
 - 4. Or approved equal.
- C. For efflorescence removal:
 - 1. Poultice of inert clay material (Fuller's earth or kaolin) and water,
 - 2. Or approved equal.

- D. For cementitious coating removal:
 - 1. Mechanical grinding/polishing by hand
 - 2. Mechanical grinding/polishing using 3M Roloc Surface Conditioning Discs, distributed by The Compleat Sculptor, 90 Vandam Street, New York NY 10013, 212-243-6074
 - 3. Or approved equal.

- E. For iron stain removal:
 - 1. Sure Klean T-1087 Special Poultice, manufactured by ProSoCo, Inc.
 - 2. Or approved equal.

- F. For adhesive removal:
 - 1. Back to Nature Double Duty VII, manufactured by Dynacraft Industries,
 - 2. Safety Peel 1, manufactured by ProSoCo, Inc.
 - 3. Soy-Gel Professional Paint and Urethane Remover, manufactured by Franmar Chemicals,
 - 4. Or approved equal.

PART 3 EXECUTION

3.01 INSPECTION

- A. Prior to the start of work, inspect each section of work. Immediately report any discrepancies and additions to the Architect. Do not proceed with work in such areas until all discrepancies have been resolved. Beginning work signifies Contractor's acceptance of substrates and conditions.

3.02 PROTECTION

- A. Protect people, vehicles, property, plants, metal, all non-masonry and chemically-sensitive surfaces from contact with products, rinse residue, fumes and wind drift. Protect/divert auto and foot traffic. Clean when traffic is at a minimum.

- B. Maintain all wrappings or protection furnished with items provided by other trades and installed in areas where cleaning is required.

3.03 GENERAL CLEANING PROCEDURES

- G. Products and procedures employed will comply with the approved test panels.

- H. Follow all manufacturers' instructions regarding protection, mixing, dilution and application of each product.
- I. Dilute cleaning products with water as recommended by testing and in accordance with the manufacturer's printed instructions.
- J. Immediately remove all spills or stains on adjacent surfaces and restore effected surfaces at no expense to the owner.
- K. Comply will all Local, State and Federal Regulations regarding the containment and disposal of effluent.
- L. The use of wire brushes or steel wool is not permitted. Scrubbing methods shall be performed using natural or synthetic fiber, bristle brushes.
- M. Re-application of cleaners may be required to achieve a uniform level of clean.
- N. Finished work shall show no signs of stains, scratches, streaks or runs of discoloration from use of cleaners or mechanical polishing. Leave all exposed surfaces neat and clean.
- O. After rinsing and neutralization, as required, cleaned masonry surfaces shall be pH neutral. This shall be confirmed using pH test strips.

3.04 BIOLOGICAL GROWTH REMOVAL

- A. When possible, biological growth and root systems shall be removed by hand.
- B. Treat surface growths with a biocide.
- C. If appropriate, mix biocide solutions according to the manufacturer's directions.
- D. Apply biocide with a brush, roller, or pump sprayer.
- E. Scrub surface thoroughly with a non-metallic, short fibered scrub brush.
- F. Allow the biocide to remain on the surface for 1 or 2 minutes, then apply additional cleaner to maintain a wet surface. Lightly mist with water and continue scrubbing.
- G. Rinse thoroughly with clean water. Rinse with a hose or a pump sprayer.

- H. If required by the manufacturer, neutralize the treated surfaces as directed.
- I. Re-apply if necessary.

3.05 GENERAL SOILING REMOVAL

- A. Construct, or use, a misting apparatus consisting of non-corrosive pipe, like PVC, fitted with non-corrosive misting nozzles capable of producing a nebulized mist of water. If the nozzles are fitted onto a fixed pipe, make sure that the nozzles are set so that they produce sprays that overlap.
- B. If the nozzles are articulate, or mobile, aim the nozzles directly at the soiling. Be sure that the nozzles (articulate or fixed) are positioned close enough to the masonry surface that blowing wind cannot prevent the mist from reaching the marble.
- C. Allow the misting apparatus to mist for at least 12 hours. It may be necessary to mist particularly heavy gypsum crusts longer.
- D. Lightly rinse down the masonry to wash away the loosened soiling.

3.06 EFFLORESCENCE REMOVAL

- A. Vacuum to remove any loose and powdery efflorescence from the masonry surface.
- B. Mix water and dry clay powder together. Add clay and water until a wet paste consistency is achieved. The poultice must be as wet as possible, but still able to cling to a vertical surface without slumping.
- C. Apply the clay poultice to the affected masonry using a brush, spatula, trowel, or low-pressure spray equipment to a thickness of at least 1/4-inch.
- D. Cover the poultice with plastic for at least 12 hours. Secure the edges of the plastic with tape to prevent the poultice from prematurely drying out.
- E. After 12 hours, remove the plastic and allow the poultice to completely dry.
- F. Remove the dry poultice using plastic or wooden scrapers, taking care not to scratch the masonry surface. Rinse the residual clay material using low-pressurized water and soft-bristled brushes. The pressure washer must be

equipped with a fan-tipped nozzle and water pressures must not to exceed 500psi

- G. Re-apply the poultice if necessary.

3.07 CEMENTITIOUS COATING REMOVAL

- A. Carefully remove any thin deposits of cementitious material or residue from the marble columns by mechanical polishing.
- B. Use the finest grit that will successfully remove the coating without gouging into the marble.
- C. Once the cementitious material has been removed, use successively finer grits to remove any scratches and match the surface texture of the affected area with the surrounding marble.

3.08 IRON STAIN REMOVAL

- A. Mix T-1087 Special Poultice liquid and Sure Klean poultice powder together. Add clay and liquid until a wet paste consistency is achieved. The poultice must be as wet as possible, but still able to cling to a vertical surface without slumping.
- B. Apply the clay poultice to the affected masonry using a brush, spatula, trowel, or low-pressure spray equipment to a thickness of at least 1/4-inch.
- C. Cover the poultice with plastic for at least 12 hours. Secure the edges of the plastic with tape to prevent the poultice from prematurely drying out.
- D. After 12 hours, remove the plastic and allow the poultice to completely dry.
- E. Remove the dry poultice using plastic or wooden scrapers, taking care not to scratch the masonry surface. Rinse the residual clay material using low-pressurized water and soft-bristled brushes. The pressure washer must be equipped with a fan-tipped nozzle and water pressures must not to exceed 500psi.
- F. Re-apply the poultice if necessary.

3.09 ADHESIVE REMOVAL

- A. Remove excess adhesive residue from masonry using plastic or wood spatulas. Treat dry areas of residue with the approved stripper applied according to manufacturer's instructions.
- B. Allow the paint stripper to remain on the surface as determined during field mockup panels. Remove excess stripper and residue from the masonry with a solvent-proof plastic or wood spatula and/or natural bristle scrub brush and clean water.
- C. Rinse the surface with clean water.

3.10 WASTE DISPOSAL AND SITE CLEAN-UP

- A. The Contractor must consult and comply with all current Federal, state, and local regulations regarding containment, run-off, transportation, and disposal of hazardous wastes.
- B. Neither the Owner nor the Architect is responsible for any aspect of waste disposal or compliance.
- C. Remove all rubbish, rags and effluent from the site daily during coatings removal operations.
- D. Waste Disposal
 - 1. Solid, liquid or semi-solid wastes generated through the use of a chemical coatings remover or stripper may be defined for Federal Standards under EPA's Resource Conservation and Recovery Act (RCRA) of 1976 as "solid waste". The waste is classified "hazardous" if it is determined to be corrosive, toxic, or both. All current Federal, state, and local regulations must be stringently followed regarding containment, transportation, and disposal of hazardous waste.
 - 2. Contractor shall obtain and maintain all applicable permits for this job.

END OF SECTION

SECTION 040140.91 - MASONRY CONSERVATION AND RESTORATION

PART 1 GENERAL

1.01 DESCRIPTION

- A. The work shall include all labor, materials, tools, equipment, appliances and services required for the completion of work in this Section.
- B. The work of this Section includes but is not limited to the following:
 - 1 Consolidation of marble capitals and shafts to stabilize erosion and sugaring.
 - 2. Pinning of through-cracks in the marble shafts.
 - 3. Removal of incompatible patches and replacement with material that matches the surrounding marble.
 - 4. Patching losses with compatible restoration mortar.
 - 5. Grouting and patching cracks.
 - 6. Dutchman repairs for significant losses.
- C. Restoration work may be completed off-site (Base Bid) or in a temporary shop facility furnished by the Contractor at the project site (Bid Alternate #2).

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.
- B. Section 024291 Removal and Salvage of Historic Construction Materials
- C. Section 040140.52 Masonry Cleaning
- D. Drawings and technical specifications of work to be performed by others including:
 - 1. Exterior Restoration CDs Section 02250 - Shoring.
 - 2. Exterior Restoration CDs Section 04510 Masonry Restoration

1.03 SCHEDULING AND COORDINATION

- A. Cleaning shall be performed before any masonry repairs take place

- B. The Contractor shall coordinate the work of all other trades related to the successful completion of the work of this Section. The Contractor shall not proceed with aspects of this work that require completion of other trades until all such work of other trades is completed.
- C. At least three weeks prior to commencing the work of this Section, a meeting must be scheduled at the jobsite to discuss conformance with the requirements of specifications and job site conditions. Representatives of the Contractor, Architect, and other parties involved in the scope of this work shall attend the meeting.

1.04 APPLICABLE CODES AND STANDARDS

- A. Materials and methods shall conform to the "Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings", 1995.
- B. ASTM - American Society for Testing and Materials
 - 1. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar
 - 2. ASTM C150 - Standard Specification for Portland Cement
 - 3. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes
 - 4. ASTM C270 - Standard Specification for Mortar for Unit Masonry
 - 5. ASTM C503 - Standard Specification for Marble Dimension Stone

1.05 QUALITY ASSURANCE

- A. All masonry restoration shall be done by a qualified Restoration Contractor (heretofore referred to as "Contractor") with experience working with historic masonry. The Contractor must have a minimum of five (5) years of experience. Contractor must demonstrate three (3) projects similar in scope and type to the required work in the New York metropolitan region involving facilities designated as Landmarks by local governments, or buildings listed on the National or State Register of Historic Places.
- B. Contractor shall maintain a steady work crew consisting of skilled mechanics who are experienced with the materials and methods specified, and are familiar with the design requirements. Contractor shall maintain a full-time Foreman who fluently speaks, reads, and writes English. Contractor shall confirm that all workers understand the job's requirements. Mechanics shall be

- fully supervised to ensure that the work is accomplished to meet or exceed the highest standards of the trade.
- C. Architect shall be given regular access to the Contractor's scaffolding or work site so that he/she may inspect work being performed.
 - D. Contractor shall replace at no additional expense to the Owner all broken, lost, or damaged materials resulting from the masonry restoration.
 - E. Obtain materials for masonry restoration from a single source for each type of material required to ensure a match in quality, color, texture, and pattern.
 - F. In acceptance or rejection of the work of this Section, no allowances shall be made for lack of skill on the part of the mechanics.
 - G. Materials shall be used only at the manufacturer's recommended temperature tolerances.

1.06 SUBMITTAL REQUIREMENTS

- A. Submit qualification data and references for firms and persons specified in Section 1.5 "Quality Assurance" to demonstrate their capabilities and experience.
- B. Contractor shall submit a work plan including detailed description of how the work of this Section will be accomplished. This should include sequencing of work, products to be used, methods, and equipment for masonry restoration, etc.
- C. Provide written descriptions, drawings, and diagrams outlining proposed methods and procedures for protection of personnel, the public, and the existing construction during the work of this Section.
- D. Contractor shall submit copies of the manufacturer's technical data for each product indicated or proposed for use, including recommendations for their application and use. Include test reports and certificates that verify the product's compliance with the specification's requirements. One complete set of product literature and MSDS shall be placed in a 3-ring, loose-leaf binder and shall be present on the job site at all times for the reference of the Architect.
- E. Samples: Submit, for verification purposes, prior to mockup erection, samples of the following:

1. Three (3) composite patching samples, matching the existing marble, for each type of marble requiring patching. In some instances, due to the variation in the marble several colors may be required for one column.
 2. All masonry pins and anchoring devices.
 3. Samples of replacement marble for new shafts and Dutchman repairs. The samples shall have the intended surface finish for the completed work.
 4. Samples of the lead for capping the capitals and gargoyles.
 5. Color samples of the mortar to be used during the reinstallation.
- F. If alternate methods and materials to those specified are proposed for any phase of the work, provide written description. Provide evidence of successful use on comparable projects and demonstrate its effectiveness for use on this project.

1.07 MOCK-UPS

Prior to executing work, provide in-place mockups for the Architect's approval. Resubmit panels until the Architect is fully satisfied. Mockups shall be prepared by the Contractor using the same workmen, methods, and materials that will be employed for the remainder of the work. Upon approval, the mockups will remain the standard throughout the job. The approved mockups shall be retained, undisturbed and suitably marked, throughout construction. Mockups may be incorporated into the finished work, when so approved by the Architect.

- A. No mockups shall be made until the methods and locations are approved by the Architect.
- B. Architect will be present during the creation of all mockups. Do not proceed with the work unless the Architect is present. Notify the Architect not less than forty-eight (48) hours in advance of masonry restoration mockup.
- C. Provide protection for adjacent surfaces during the mockup phase.

The mockups are as follows:

1. One (1) marble pinning repair in a location selected by the Architect.
2. One (1) marble patching repair in a location selected by the Architect.
3. One (1) marble Dutchman repair in a location selected by the Architect.
4. The reinstallation of one column capital and its associated columns in the arcade. The reinstallation shall include the installation of the lead cap over the capital.

1.08 PROTECTION

- A. Protect all adjacent areas from damage during the work of this Section using approved means of physical protection.
- B. While working on areas, cover all new work from the weather until this work has set, dried, and been completed.
- C. Protect all sills, ledges, faces of masonry units, other surfaces and projections from all dropping mortar, patching, and coating materials. Use canvas or polyethylene covers if necessary, and remove all unwanted material that comes in contact with masonry immediately so as not to cause staining.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. All materials shall be delivered to the job site in factory-sealed containers clearly labeled as to product, manufacturer, color, and other pertinent characteristics.
- B. All materials for use in the work of this Section shall be stored under environmental conditions recommended by the manufacturer. Materials shall be kept dry (includes liquid moisture and water vapor), well-ventilated, and free of foreign matter.
- C. Arrangement shall be made with the Owner to store equipment and materials in designated areas. The Owner shall not be responsible for damaged or stolen materials or equipment left on the premises by the Contractor.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. No wet restoration work is to be performed outdoors when temperatures are lower than 40 degrees, including overnight.
- B. Salt or other chemicals or admixtures for lowering the freezing temperature of the mortar shall not be used.
- C. Do not use frozen materials or lay masonry on frozen materials; remove frozen materials from wall.
- D. In extreme heat over 90 degrees F, protect all mortar and patching from drying too quickly using tarps and periodic misting.

- E. Protection from rain: Protect all newly replaced columns with heavy waterproof sheeting from any direct attack by rain or other precipitation for at least 24 hours after mortar has been applied.

PART 2 MATERIALS

2.01 TOOLS

- A. Grinders for cutting through the mortar joints to remove the capitals and shafts
- B. Chisels shall be narrower than the joints in which they are used.
- C. Brushes for cleaning areas to be replaced shall be stiff, natural bristle brushes.
- D. Trowels for applying patching materials and mortar.
- E. Syringes or other equipment for grout injection of cracks.
- F. Low pressure, corrosion resistant sprayers for application of consolidation materials.

2.02 MARBLE

- A. New marble is required for Dutchmen repairs and for replacing columns that are beyond repair.
- B. Provide new marble that matches the original in color and texture.
 - 1. Several types of marble will be required.
 - 2. New marble shall have a honed finish.

2.03 DUTCHMEN ANCHORS AND ACCESSORIES

- A. Provide hardwood or plastic shims, non-staining to marble, sized to suit joint thicknesses and bed depths of dutchmen.

2.04 PATCHING

- A. Several colors of patching material will be required to match the marbles used in the arcade.

- B. Jahn M100 Masonry Repair Mortar, color-matched to the original marbles (as manufactured by Cathedral Stone Products, Inc., 7266 Park Circle Drive, Hanover, Maryland 21076). Only Certified Installers may install Jahn M100 Masonry Repair Mortar.
- C. Custom System 45, color-matched to the original marbles (as manufactured by Edison Coatings, Inc, 3 Northwest Drive, Plainville, CT, 06062)
- D. Thin-Fill 55 (for patching losses less than 1/4-inch deep) color-matched to the original marbles (as manufactured by Edison Coatings, Inc, 3 Northwest Drive, Plainville, CT, 06062)
- E. Or approved equal.

2.05 CRACK REPAIR

- A. Jahn M30 #32 (as manufactured by Cathedral Stone Products, Inc., 7266 Park Circle Drive, Hanover, Maryland 21076). Only Certified Installers may install Jahn Repair products.
- B. Pump-X53i (as manufactured by Edison Coatings, Inc, 3 Northwest Drive, Plainville, CT, 06062)
- C. Or approved equal.

2.06 MARBLE ANCHORS AND PINS

- A. Threaded dowels:
 - 1. Small stone fragments: 1/8" stainless steel threaded rods.
 - 2. Large stone fragments: 1/4" stainless steel threaded rods.

2.07 MORTAR MATERIALS

- A. Mortar for resetting units should be a Type N mortar as specified by ASTM C270 Proportion Specification
- B. Gray and/or White Portland Cement, Type I, conforming to ASTM C150
- C. Hydrated Lime, Type S, conforming to ASTM C207

- D. Aggregate, conforming to ASTM C144

2.08 ADHESIVES

- A. Akepox 5010, UV-resistant, epoxy stone adhesive, knife grade, by Akemi
- B. Sikadur 31, Hi-Mod Gel as manufactured by Sika
- C. Or approved equal.

2.9 CONSOLIDATION MATERIALS

- A. Conservare Hydroxylating Conversion Treatment (HCT), followed by HCT Finishing Rinse (manufactured by ProSoCo, Inc., 3741 Greenway Circle, Lawrence, KS 66046, (800) 255-4255)

PART 3 EXECUTION

3.01 DOCUMENTATION

- A. Numbering: The capitals, shafts and bases and all medieval features numbering system shall be as per approved shop drawings. This system shall remain constant throughout the Work.
 - 1. Contractor shall mark all sketches and photographs in the lower right hand corner with numbers clearly shown. Markings shall be legible in photo materials.
- B. Pre-Work Photo Documentation: The following documentation shall be performed prior to the removal of any medieval feature from its setting, and/or any work on the medieval feature including but not limited to temporary stabilization and/or cleaning. Loose elements to be laid out on a work table, with appropriate and consistent white light, in the same configuration as in their original location. Size, type, and distance of the lighting from the elements shall be constant for all similar modes of photography. All photography must be evaluated and approved by the Architect prior to any work.

3.02 EXAMINATION, REVIEW AND INSPECTION

- A. Medieval Feature Examination In-Situ: Contractor shall examine all medieval features to be removed, and denote prior to the medieval feature removal any stone pieces or elements that should be removed, adjusted, stabilized, or otherwise treated as protective measures towards avoiding any damage to any section or element of the medieval feature during the removing process. All proposed protective measures shall be approved by the Owner and Architect prior to any work or application. Prior to the start of work, inspect each section of work. Immediately report any discrepancies and/or additions to the Architect. Do not proceed with work in such areas until all discrepancies have been resolved. Beginning work signifies Contractor's acceptance of substrates and conditions.
- B. Medieval Feature Examination In Studio: Contractor shall examine areas and elements to be cleaned, pinned, grout injected, patched, consolidated, or otherwise treated; and conditions under which treatment is to be applied. Contractor shall consult with Architect regarding unsatisfactory conditions before proceeding. Where existing coatings are to be treated, Contractor shall verify condition of existing elements prior to any work or application.

3.03 PROTECTION

- A. Protect sills, ledges, windows and all adjacent masonry from mortar and adhesive drippings or other damage. Immediately remove misplaced mortar or adhesive.

3.04 CONSOLIDATION APPLICATION

- A. General
 1. Before applying, read "Preparation" and "Safety Information" sections in the Manufacturer's Product Data Sheet for HCT. Do not dilute or alter.
 2. Treatment of marble or limestone surfaces with Conservare HCT should proceed after the deinstallation of the columns and after the incompatible patches are removed, but before any restoration repairs are installed.
 3. Best results are achieved when temperatures are between 50–90°F (10–32°C). Do not apply to wet surfaces, during rain or when there is a chance of rain.
 4. Do not atomize/ vaporize the material. Adjust spray pattern to produce a saturating, low-pressure, wet spray.

5. Working from the bottom of the work area to the top, apply Conservare HCT in three successive saturating applications. Treated surfaces must dry thoroughly between each saturating application of HCT, and prior to application of HCT Finishing Rinse.

B. HCT Application

1. Apply HCT to the point of rejection.
2. Allow the treatment to be absorbed for 30 minutes or until surface is visibly dry and absorbent. If necessary, drying time may be extended overnight without adverse effects.
3. Repeat steps 1 and 2 until three saturating applications have been completed. With some stones (e.g. porous limestone), additional applications may be required.
4. Allow surfaces treated with HCT to dry for 30 minutes or until surface is visibly dry.

C. Finishing Rinse Application

1. Apply HCT Finishing Rinse to the point of rejection.
2. Allow treated surfaces to dry for 24 hours before applying additional conservation treatments or surface repairs.

D. Cleanup tools and equipment with fresh water.

3.05 ADHESIVE REPAIR

- A. Reattach small stone fragments which have spalled or cracked with a two part, epoxy-based stone adhesive.
- B. Stone surfaces must be dry, free of dust and grease.
- C. Apply dabs of the adhesive to the broken surfaces with wooden spatula. Be careful to avoid the edges. Press together and apply pressure.
- D. Remove any dripped or excess adhesive with solvent as recommended by adhesive manufacturer.

- E. Allow minimum 4 hours of cure time before patching around newly adhered areas.
- F. Grout around the resultant crack using the approved injection grout.
- G. Once the grout has set up, repair the crack surface with restoration mortar matching the surrounding marble.

3.06 PIN REPAIR

- A. Carefully measure the position of the pin along the broken surface of two pieces to be pinned together.
- B. Drill into stone face using drill bit 1/16" larger than intended pin diameter
- C. Before setting the pin, dry fit the pieces together using the pin to ensure proper alignment.
- D. Place adhesive within the drilled holes and insert stainless steel pin. Apply small dabs of adhesive to the broken surface. Remove any adhesive that spills on face of stone with solvent as recommended by adhesive manufacturer.
- E. Allow minimum 4 hours of cure time before patching around newly adhered areas.
- F. Grout around the resultant crack using the approved injection grout.
- G. Once the grout has set up, repair the crack surface with restoration mortar matching the surrounding marble.

3.07 DUTCHMAN REPAIRS

- A. Preparation
 - 1. Using hand held tools remove unsound or damaged marble, taking great care not to abrade or mar adjacent marble surfaces or edges.
 - 2. Square-up voids, leaving a sound and level bed on which to place dutchmen.
 - 3. Remaining marble surfaces shall be cleaned and all loose material shall be rinsed with water to remove all dust and debris.

B Setting

1. Rinse marble dutchman before setting, do not install dirty or dusty marble and dampen joint and surrounding stone surfaces prior to placing mortar.
2. Use water soaked hardwood, or plastic shims to stabilize marble dutchman in proper alignment while mortar is setting. Make sure that sufficient shim material is placed to avoid point loading the stone as this may squeeze freshly applied mortar out of joints.
4. Verify proper horizontal and vertical alignment before bedding mortar sets.
5. Remove shims only after mortar has set, do not disrupt bond.
6. Tool final layer of mortar to match the surrounding marble.

3.08 CRACK REPAIR

A. Open cracks shall be grouted

B. Previously filled but non-matching repairs shall be removed without damaging the stone.

C. Mixing:

1. No more material than can be used in 30 minutes shall be mixed at any one time. Material that has exceeded its pot life shall be discarded.
2. Follow manufacturer's specification for proportions. Mix for a minimum of three (3) minutes.

D. Procedure:

1. Moisten the interior of the crack by flushing with clean water. Repeat this step if the surface becomes dry before grout is placed.
2. Cracks can be filled by injecting the grout into the crack until it flows freely from the other side of the crack. Clean up overflow immediately.
3. Cracks can also be filled by forcing the grout into the crack.
4. Once the grout has set up, repair the crack surface with restoration mortar matching the surrounding marble.

3.9 PATCHING REPAIR

- A. Previously filled but non-matching repairs shall be removed without damaging the stone.
- B. Surfaces to be patched must be sound and free of all dust, dirt, grease, laitance and/or any other coating or foreign substance which may prevent proper adhesion. Remove all loose and deteriorated masonry from the repair area using manual or pneumatic cutting tools approved by the Architect.
- C. Areas to be patched using Jahn M120 or Custom System 45 should be a minimum of 1/4-inch in depth. Wherever possible, carefully square the edges around the patch as feathered edges will cause repairs to fail prematurely.
- D. Thin-Fill 55 can be used for patches of 1/32-inch to 1/8-inch in depth.
- E. Wash the prepared surface with clean water and a bristle brush to remove dust from the pores.
- F. Moisten the substrate using clean water with no pooling water on horizontal applications. If the surface is allowed to dry out before applying the patching material, this step must be repeated.
- G. Mix the mortar according to the manufacturer's instructions.
- H. Apply a slurry coat of the patching material to the wet substrate, then apply the patching material immediately after. Do not let the slurry coat dry on the surface.
- I. Large repairs may require successive applications in order to avoid material slump. If this is necessary, be sure to remove the shiny cement skin that sometimes forms on the surface by scraping away 1/16-inch of material. This will open the pores before an additional layer of material is applied. Dampen surface and continue application.
- J. Build up material beyond the surface of the substrate. The waiting period before finishing will vary, depending upon wind, temperature, and humidity. After achieving initial set, scrape away excess mortar until the desired profile is reached.
- K. Periodically mist repairs using clean water for at least a 72 hour period. The timing for initial misting will vary with ambient conditions. Mist several times a day. Should access to the repairs be impossible over a period of time, plastic

may be used to cover them temporarily. The application of plastic, however, does not remove the need for normal curing techniques.

- L. The restored areas shall match the color, finish, tooling and texture of the cleaned original marble as closely as possible.

3.10 REINSTALLATION OF COLUMN CAPITALS AND SHAFTS

- A. Reset fully restored or replaced column shafts on their bases using the approved mortar.
- B. Reset the capitals on their shafts using the approved mortar.
- C. Set the lead cap on the top of the capitals as shown in the Drawings.
- D. Bracing and shoring may be necessary to support the columns until the mortar sets.

3.11 INSTALLATION OF LEAD CAP OVER GARGOYLES

- A. Install lead cap on the top of the gargoyles as directed in the Drawings.

3.12 FINAL CLEANING

- A. Prior to cleaning, examine exposed masonry work and replace defective joints, patches, and crack repairs.
- B. As work progresses, dry-clean reset columns using soft-wood paddles or scrapers to remove excess mortar, mortar smears and drippings.
- C. At completion of masonry work, clean exposed masonry work with clean water and stiff bristle brushes.
- D. If care is taken during resetting and dry-cleaning masonry is acceptable to the Architect, the Architect may, at his option, delete the water cleaning requirement.

3.13 SITE CLEAN UP

- A. Upon completion of work, clean all surfaces of any debris, mortar droppings, construction materials, etc.

END OF SECTION

SECTION 04520 - NEW STONE

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. Provide all materials, labor, equipment, and perform all operations for the complete installation of work in this section. Work shall include, but not be limited to, the following:
1. Scaffolding to accomplish restoration work.
 2. Furnish and install new natural serpentinite column shafts, as scheduled, to match original color, texture, profiles, and tooling, 100%.

1.02 RELATED WORK UNDER OTHER SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all technical specification sections, apply to this Section.
- B. Drawings and technical specifications of work to be performed by others, including:
1. Exterior Restoration Drawings.
 2. Exterior Restoration Specifications Section 02250, Shoring
 3. Exterior Restoration Specifications Section 04510, Masonry Restoration and Section 03300, Concrete.

1.03 REFERENCE STANDARDS

- A. The most recent version of the following standards shall apply to this Section.
1. Limestone/Marble
American Society for Testing and Materials (ASTM):
C 97 Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone
C 99 Test Methods for Modulus of Rupture of Dimension Stone
C 170 Test Method for Compressive Strength of Dimension Stone
C 920 Specifications for Elastomeric Joint Sealants
 4. Anchoring Systems
American Society for Testing and Materials (ASTM):

A 666 Standard Specification for Annealed or Cold-Work
Austenitic Stainless Steel

1.04 QUALITY ASSURANCE

- A. SPECIAL EXPERIENCE REQUIREMENTS: The Contractor or subcontractor who will perform the work specified in this section must, within the last five (5) consecutive years, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work, involving facilities determined by the City or State to be of landmark quality and/or historical significance.
- B. Samples and mock-ups, as described below: Notify Architect for inspection of designated mock-up areas. Approved mock-ups will be the standard of workmanship for respective types of work and will remain in place until completion of the work.
- C. Submit samples, product data and test reports to indicate that materials meet the requirements of the specifications.
- D. All completed work will be subject to review by the New York City Landmarks Commission.

1.05 SUBMITTALS

- A. General
 - 1. Submit product literature, shop drawings, and samples to the Architect for review and approval prior to ordering materials.
 - 2. No work is to proceed until submittals have been approved in writing by the Architect.
- B. Product Literature
 - 1. Provide catalogue cuts for the following features:
 - a. New/replacement stone units, indicating quarry source
 - b. Cement and lime binders in setting and repointing mortars
 - c. Masonry anchors, ties, and other attachment/reinforcement
 - 2. As requested by the Architect, submit available certified test reports conducted for quarries or distributors by independent test agencies for

all stone furnished under this Section indicating compliance with Specifications. Testing shall be in accordance with the following:

- a. Compressive strength, psi (ASTM C 170).
- b. Density, lbs./c.f. (ASTM C 97).
- c. Absorption by weight, percent (ASTM C 97).
- d. Abrasion resistance (ASTM C 241).
- e. Modulus of rupture, average (psi) (ASTM C 99).

C. Shop Drawings

1. Provide the Owner with cutting and setting drawings of stone units prior to ordering stone.
 - a. Cutting drawings of natural stone pieces shall indicate sizes, dimensions, layout, finishes, arrangement and provisions for bedding, bonding, jointing, anchoring, cut-outs and holes, and other necessary details for reception of other work.
 - b. Drawings shall indicate locations of inserts for stone anchors and supports which are to be built into masonry substrate, and locations and dimensions of cut-outs, holes, openings, and other provisions required for the work of other trades.
 - c. Shop drawings shall indicate the setting number of each piece. Setting numbers are to be transferred to each piece in a non-staining paint.

D. Stone Samples

1. Provide two samples of each specified finish to the Owner:
 - a. Stone: minimum 4" x 8" x 1" samples
2. Samples of each specified stone shall fully demonstrate color, shade, veining, texture of material to be supplied.

E. Attachments/Reinforcements

1. Provide one sample of each masonry anchor, tie, and other means of attachment and reinforcement.

1.06 DELIVERY, STORAGE, HANDLING AND PROTECTION

- A. Stone shall be carefully packed and banded by the supplier for shipment. Following shipping, stone shall be stored on wood skids or pallets, covered with non-staining, waterproof membrane and protected from the weather. Skids shall be placed and stacked in such a manner as to evenly distribute the weight of the stone and to prevent damage to individual units. Stone shall be stored in such a manner as to allow air to circulate around the material. Stone shall not be permitted to be in direct contact with the ground any time during storage.
- B. Stone shall be carefully handled to prevent chipping, breakage, soiling or other damage. Pinch or wrecking bars shall not be used without protecting edges of stone with wood or other rigid materials. Stone units shall be lifted with wide-belt type slings wherever possible; wire rope or ropes containing tar, oil or other substances which might cause staining or damage to stone finish will not be permitted.
- C. All other masonry materials shall be delivered to the job site in factory-sealed containers clearly labeled as to product, manufacturer, color, and/or other pertinent characteristics.
- D. All materials for use in the work of this Section shall be stored under environmental conditions recommended by the manufacturer.
- E. The Contractor shall take extreme care in protecting the surrounding materials, buildings, vehicles, and pedestrians. It is the Contractor's responsibility to ensure that protective measures are in place, and are adequate for work being performed.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Strictly adhere to manufacturer's directions unless more stringent requirements are contained herein.
- B. The masonry work may only be performed as long as the temperature remains above forty (40) degrees Fahrenheit. If in a given twenty-four (24) hour period the temperature drops or is expected to drop below forty (40) degrees F., exterior masonry work must stop. In the event that the temperature falls below forty (40) degrees F. at any time, work will not recommence until a constant temperature of forty (40) degrees F. is projected for a minimum period of seventy-two (72) hours. Once stopped for reason of temperature, work will recommence only on approval of the Architect.
- C. The masonry work shall be protected during hot weather from premature or rapid curing by the use of dampened fabric coverings.

- D. The Contractor shall comply with all applicable safety codes and regulations that govern this Work, including OSHA and EPA regulations covering waste water disposal.
- E. The Contractor shall take any additional precautions deemed necessary by the Architect and Owner to insure the safety of pedestrians and those working in the building.

1.08 PROTECTION AND SCAFFOLDING

- A. The Contractor shall take extreme care in protecting the surrounding materials, buildings, vehicles, and pedestrians. It is the Contractor's responsibility to ensure that protective measures are in place, and are adequate for the work being performed.
- B. Promptly as work proceeds and upon completion, remove excess mortar, smears, and droppings. Clean adjacent and adjoining surface of marks arising out of execution of the work of this Section.
- C. Scaffold work required to accomplish restoration work will be the responsibility of the Contractor and will be made available to all required trades without charge and will be adequately and safely maintained. All scaffolding, staging and appurtenances shall comply, in total, to the requirements of Safety and Health Regulations for Construction, and all other government agencies having jurisdiction. The most stringent requirements shall govern.
- D. Provide waterproof protection to ensure watertightness of project area during construction.

1.09 SCHEDULING

- A. The Contractor shall submit a schedule for proposed project execution. Work is to be performed on a daily basis, without interruption from the start of testing thorough project completion, unless weather conditions prohibit the performance of work or unless directed otherwise by Owner or Architect.
- B. Disruption of building use and service, including blocking entrances, sidewalks, etc., shall not be permitted without prior arrangement of the Owner.

1.10 DEFECTIVE WORK

- A. Any piece of stone showing flaws or imperfections upon receipt at the storage yard or building site shall be referred to the Architect for determination as to whether it shall be rejected, patched or redressed for use.

- B. Stone damaged in any manner will be rejected, if it cannot be patched to the satisfaction of the Owner, and shall be replaced with new materials at no additional cost to the Owner.

PART 2: PRODUCTS

2.01 STONE

A. General

1. All new stone delivered to the site must be equal in all respects to approved samples.
2. Stone shall be standard grade, free of flaws, reeds, rifts, laminations, cracks, seams, starts or other defects which may impair its strength, durability, function or appearance. Exposed surfaces shall be free from spots, spalls, chips, stains, discoloration or other defects which are not within the approved sample range and would affect its appearance.
3. Color, texture and finish of stone shall be within the range of approved samples.
4. All faces shall be at right angles to the plane of the top.
5. Stone shall be cut and turned accurately to required shapes and dimensions, as indicated on the drawings.

B. Serpentinite

1. New stone shall be equal in appearance to serpentinite of existing column shafts.
2. Finish surfaces: Surfaces exposed when installed shall have a honed finish.
3. Tolerances: Variations in finish smoothness shall not exceed 1/32" over 12".

2.02 ANCHORS

- A. ASTM A 666 stainless steel dowels where indicated in the Drawings.

PART 3 - EXECUTION

3.01 GENERAL

A. Storage

1. Store masonry materials off ground to avoid contamination by water, mud, dust or materials likely to cause staining or other defects.

B. Protection:

1. Cover stored masonry materials and work -in-progress with a weather resistant membrane held securely in place or otherwise protect units from the elements.

3.02 SETTING NEW AND RESTORED STONE COLUMN

- A. All setting shall be done by competent stone setters under adequate supervision and in accordance with the approved shop drawings.
- B. New stone units with chips, cracks, stains, or other defects which might be visible in the finished work shall not be used.
- C. Before setting, stone shall be clean and free of dirt and foreign matter on all sides to allow proper leveling and setting. Stone shall be dry before setting.
- D. Stone shall be set true to the required lines and grades. Joints shall be uniform in thickness and as indicated on the Drawings.
- E. Exposed surfaces shall be kept free from mortar and grout at all times. Any mortar smears shall be immediately removed with a clean sponge and clean water before mortar can set.
- F. Embed new stainless steel anchors in grout in shafts, as indicated on the Drawings.
- G. Apply grout to upper surfaces of shafts to provide smooth and even bearings for capitals.
- H. Install shafts as indicated on the Drawings.

3.03 CLEANING

- A. After setting, pointing, brick restoration and stone conservation work, carefully clean completed work to remove all dirt, excess mortar, stains and other

defacements.

- B. Where practicable, use mild non-abrasive cleaners that contain no harsh or caustic ingredients applied with fiber brooms or brushes and low-pressure clear water. Wire brushes, steel wool, and high-pressure water are expressly prohibited.
- C. Upon completion of masonry work, surfaces shall be left in a clean, unsoiled condition, acceptable to the Architect and Owner.

END OF SECTION 04510