SPECIFICATIONS and DRAWINGS
Construction Documents (100% Submittal)

PROJECT NO.: OFEO 1124108

PROJECT TITLE: SIB-Restore Exterior Stonework
Repair Earthquake Damage

FACILITY: Smithsonian Institution Building

DATE: 13 June 2012

This project is approved as being in conformance with applicable provisions of the Smithsonian Directive (SD) 410.

Michael I. Carrancho, P.E., Associate Director
Date

610 Maryland Avenue, S.W.
Suite 5001
Washington, D.C. 20024

USPS Mail OEDC Capital Gallery
MRC 511
P.O. Box 37012
Washington, D.C. 20013-7012
**DOCUMENT 000110**

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PROJECT INFORMATION

1.1. OFEO Project No. #1124108
SIB – Restore Exterior Stonework (Repair Earthquake Damage)
Smithsonian Institution Building
1000 Jefferson Drive, SW
Washington, DC

1.2. Smithsonian Institution Contacts:
Contracting Officer
Smithsonian Institution
Office of Contracting
2011 Crystal Drive, Suite 350
Arlington, VA  22202-3709

Contracting Officer's Technical Representative (COTR)
Terry Hatchett
Senior Construction Manager - COTR
600 Maryland Ave., SW
Capital Gallery Suite 690E
Washington, DC   20014
Ph: 202-633-6593
Fax: 202-633-7464
Email: hatchetttt@si.edu

SUMMARY OF WORK

2.1. The Contractor shall furnish all supervision, labor, materials and equipment needed to repair earthquake damage on the historic chimneys and towers at the Smithsonian Institution's Smithsonian Institution Building located at 1000 Jefferson Avenue, SW, Washington, DC, as set forth on the drawings for OFEO Project No. 1124108 included in specifications section 040140-Maintenance of Stone Masonry and in these specifications, both dated June 13, 2012.

2.2. The Work includes, but is not limited to:

1. Once scaffolding is erected, inspect each chimney confirm scopes with COTR.
2. Re-pointing mortar joints and selectively reset blocks in sandstone chimneys.
3. Carefully dismantle and reconstruct severely damaged sandstone chimneys.
4. Repair/replace various waterproofing and flashing on same chimneys.
5. Caulk crack in window sill in Flag Tower.
6. Reinstall sandstone finial at peak of eastern gable.
7. Re-point mortar joints atop the south tower.

2.3. Critical Elements of the Work: The successful Contractor shall be fully qualified to install critical elements of the Work. Upon request of the Contracting Officer, bidders shall submit a statement of qualifications to address the following critical elements of the Work:

1. Erection of scaffolding in historic landscapes and adjacent to historic structures.
3. Experience with historic sandstone masonry repairs.
CONTRACT TIME FOR COMPLETION

3.1. Work under this contract shall begin by the Contractor within ten (10) calendar days after the Notice to Proceed and shall be completed within the total contract time of 120 calendar days. All work, including project closeout activities, shall be completed in every respect within the contract time.

3.2. The start date and completion date shall be as stated in the Notice to Proceed issued by the Contracting Officer.

SCHEDULE OF ALTERNATES FOR BID

4.1. The following is a brief Statement of the Work identified for bid/proposal alternates. The complete description of the Work is identified elsewhere in the drawings and specifications.

BASE BID:
Base bid includes the re-pointing and selective repairs to 5 sandstone chimneys, the dismantling and reconstruction of 4 sandstone chimneys, installation of a stone finial atop gable, a crack repair on the Flag Tower and selective re-pointing of mortar joints on the South Tower. This work includes the erection and dismantling of all scaffolding and systems required for access to the chimneys.

ALTERNATE 1: ADD (or) DEDUCT
Provide scaffolding at the Flag Tower if the sill repair is not accessible from inside the tower. We recommend adding a crew instead of extending the schedule.

ALTERNATE 2: ADD (or) DEDUCT
Substitute dismantling and rebuilding for each of the chimneys noted to be re-pointed. It is anticipated that these alternates will be accomplished with additional crews, not extensions to the project schedule.

SCHEDULE OF UNIT PRICES

5.1. The unit prices in the following schedule shall be submitted as part of the base bid/proposal. The Smithsonian reserves the right to accept or reject any or all unit prices.

5.2. The Contractor agrees that, in the event that the Contractor is directed by the Smithsonian to increase or decrease the quantities of work required by the contract documents on items listed below, the contract amount shall be adjusted based on the following unit prices.

5.3. Unit prices shall include the furnishing of all materials, labor, equipment and services necessary for or incidental to the execution of the work specified. Unit prices shall include all direct and indirect costs, overhead, taxes, insurance and profit.

5.4. These unit prices shall be binding upon the Contractor for the duration of the project. No escalation or other variation shall be allowed.

5.5. If requested by the Smithsonian, the Contractor shall provide material, equipment and personnel to verify or determine changes in quantities. Contractor measurements and calculations shall be subject to verification by the COTR.
5.6. Schedule of Required Unit Prices

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Price ($)</th>
<th>Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dismantle and reconstruct brick masonry back-up and flue for chimneys.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Dismantle and reconstruction irregular stone masonry and flue for chimneys.</td>
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</tr>
</tbody>
</table>

BIDDER/OFFEROR EXAMINATION OF SITE

6.1. Every effort has been made to indicate all work necessary to complete the project as identified. All bidders shall carefully examine the premises during the bid period and satisfy themselves as to the extent, nature and location of the work, general and local conditions, particularly those bearing on transportation, disposal, handling and storage of materials, availability of labor, water, electric power, access routes, uncertainties of the weather, type of equipment and facilities needed for the successful execution of the Work.

6.2. Pre-Bid Conference and Site Visit: Before the bid opening date, a scheduled pre-bid conference and site visit will be announced by the Contracting Officer. The purpose of the scheduled meeting is to provide an opportunity for all bidders to review the project site. Any comments, information or discussion during the site visit shall not modify the contract documents.

6.3. This project requires special arrangements for access to a non-public area. Access to the site is restricted at times other than during the scheduled visit.

NON-PUBLIC, TENANT AND SECURED SPACES

7.1. Certain tenant spaces, non-public spaces, utility and equipment rooms and other areas related to or used for purposes of storage, conservation, research, curation of museum collection and artifacts or for scientific research may have restricted access.

7.2. The Contractor shall identify to the COTR as soon as possible, but no less than two (2) working days in advance, any occupied areas that the Contractor must access that are located outside the limits of the project site. The Contractor shall identify in writing:

7.2.1. Restricted areas to be accessed.
7.2.2. Specific reason for needing access.
7.2.3. Nature of the work to be performed.
7.2.4. Date(s) and hours needed to complete construction work activity.

PROTECTION OF HISTORIC PROPERTIES AND SCAFFOLDING REQUIREMENTS

8.1. The project site is located in a designated National Historic Landmark property and requires special attention to the quality of materials selected for installation and workmanship efforts to satisfactorily preserve and restore historic elements and finishes of an historic landmark.
structure.

8.2. Comply with "SECRETARY OF THE INTERIOR’S STANDARDS FOR THE TREATMENT OF HISTORIC PROPERTIES" and other standards and guidelines established by the Smithsonian Institution.

8.3. Upon request of the COTR, the Contractor shall submit evidence of technical competence in restoration work for National Historic Landmark structures, including subcontractor resumes, references and photographs or previous similar work.

8.4. Without exception, all building fabric of the Smithsonian Institution Building is designated historic.

8.5. Historic Preservation Plan: Prior to the commencement of construction, the Contractor shall prepare a detailed plan indicating anticipated historic preservation operations, including the following: Protection Plan, Demolition Plan, and Preservation Treatment Plan.

8.6. The scaffolding shall be designed and constructed in a manner that avoids damage to the landscape around the building and the scaffolding shall not be physically attached to the building facades or features in any manner. Existing Building Attachments: Do not drill or anchor into the existing building fabric. The scaffolding system shall be self-supporting and shall not depend on attachments into the existing walls for support. It may be permissible to install bracing in existing window openings to provide attachment points provided the following:

8.6.1 The SI does not warrant or guarantee that the existing building wall system can safely resist any anchoring loads without incurring damage.

8.6.2 Should the Contractor elect to use an anchoring system braced off the existing building then a test loading shall be performed and the COTR shall be notified in order to gain approval ahead of time.

8.7 Drawings for scaffolding and protection system and other data prepared by, or under the supervision of, a qualified professional engineer. Drawings shall be signed and sealed by a professional engineer registered in the District of Columbia, who shall be solely responsible for all scaffolding and protection work.

8.8 Submit the following scaffolding drawings and documents to the COTR for review purposes only.

8.8.1 Plans of complete perimeter of building at different elevations as necessary to show differing layouts. Plans shall also include a frame leg location plan that shows each support point at the grade level.

8.8.2 Drawings shall be at large enough scale to show clearly all relevant information.

8.8.3 Elevations of scaffolding for all sides of the building.

8.8.4 Sections through all different conditions including different building profiles and grade conditions.

8.8.5 Special bridging details over pedestrian access areas.

8.8.6 Stair and handrail details.

8.8.7 Large scale details of platform construction, leveling jacks, cross bracing, foundation details, and base plates.

8.8.8 Show clearly all building fabric protection details. Metal items shall not be in contact with any of the building fabric.
8.8.9 Erection instructions.
8.8.10 Design loads.
8.8.11 Material specifications including physical characteristics of all components include yield point, ultimate tensile strength and elongation of steel components.
8.8.12 Maintenance instructions.

8.9 Code Requirements: The scaffolding and protection system shall be designed, erected and maintained to comply with all requirements of OSHA, NFPA 101, 102, and the BOCA codes.

8.10 Comply with requirements of guidelines established by Scaffolding, Shoring and Forming Institute, Inc., 1300 Summer Avenue, Cleveland, Ohio 44115, telephone number (216) 241-7333.

8.11 Erect temporary scaffolding in accordance with OSHA 29 CFR 1926.451 and ANSI A110.8. Provide landing platforms with stairways or ladders for proper access and egress to all work areas.

8.12 Scaffolding system description:
8.12.1 Provide safe working platforms and access to all areas of work for COTR and all personnel.
8.12.2 Do not drill into or mark the existing building fabric.
8.12.3 Provide minimum 150 mm high kick boards along the perimeter of all platforms to prevent accidental dropping of materials or tools.
8.12.4 Provide continuous debris safety netting similar to AIB netting over the exterior perimeter of all scaffolding.
8.12.5 Provide personnel safety cables as required by OSHA, BOCA and all other governing codes.
8.12.6 Provide solid 20 mm plywood attached to the exterior of all scaffolding for a height of 2400 mm from grade and at sides of all pedestrian access paths to prevent access to work areas and to prevent climbing on scaffolding.
8.12.7 During non-working hours, close and lock the scaffolding with a physical barrier to prevent access by unauthorized persons.
8.12.8 Provide protection for staff and visitors through the scaffolding at the east entry.

8.13 Contractor shall provide COTR with pre-construction photographs (in digital format) of each face of each chimney of all other elements where work is to be performed. Contractor to provide overall photographs of all landscaping, public areas and building facades prior to erection of scaffolding. Contractor will provide weekly progress photos to document work. Contractor to provide final photos of same pre-construction views described above to document completion of work. COTR will provide technical requirements for photographs.

PROTECTION OF FLORA, FAUNA, AND CENTRAL COMPUTER CONTROLLER IRRIGATION SYSTEM

9.1 Flora Protection: The Contractor is expressly prohibited from collecting plant materials on Smithsonian property.

9.2 The Contractor shall not store materials inside the drip-line of trees or shrubs. Prior to the start of the work on site, the Contractor shall surround trees within the project site and adjacent areas with a protective fence ("snow fence"), 1.4 m high (minimum), 300 mm outside the drip line (minimum). The protective fencing shall be constructed of heavy-duty metal posts or pressure-treated 100 mm X 100 mm wooden posts, 1 m on center, with a top and bottom stringer of 50 mm X 100 mm members. The fencing fabric shall consist of 40 mm X 13 mm slats, pressure-treated.
9.3 Vehicular traffic inside the drip-line of trees, on turf areas, or on flower beds is not permitted without prior approval of the Smithsonian Gardens through the COTR. If flower beds must be crossed by vehicles, beds bridging is required. Bridging shall be two layers of ¾ inch exterior grade plywood or 2” x 10” or 1” protective plastic decking such as to help prevent soil compaction of the soil in the lawn areas and flower beds. No parking on the turf will be permitted at any time.

9.4 Where aerial work is being performed above shrub/flower beds, the Contractor shall protect them with an approved protective framework installed at least 300 mm above the tops of the plant materials. The Contractor shall submit the proposed method of protection to the COTR and Smithsonian Gardens for approval. Trees and shrubs shall only be tied back with the approval of the COTR and Smithsonian Gardens.

9.5 Any damage to the existing irrigation systems during construction shall be repaired by the Contractor within two calendar days from when the damage occurred. All repairs to the irrigation system shall be made by a certified irrigation contractor to work on Rain Bird Maxicom computer controlled irrigation systems. Certification is required.

9.6 Damaged piping shall be replaced in kind with materials approved by COTR.

9.7 The Contractor shall bear all costs for repairs to the damaged irrigation system. Where the low voltage control wiring is damaged due to construction then said wiring shall be replaced from the zone valve to controller. No splicing will be permitted.

9.8 Identification tape when damage shall be replaced with an identification wire from valve to controller.

9.9 All damaged irrigation piping shall be cleared of debris prior to making the permit connections.

9.10 The Contractor shall bear all costs for replacement of damaged plant materials. Replacement plant materials shall meet the criteria established by the Smithsonian Gardens, Division of the Office of Facilities Management and Reliability.

9.11 Plant material removed by the Contractor for re-use shall be balled, bagged, and protected in accordance with instructions prepared by the Smithsonian Gardens.

9.12 Turf areas damaged during construction shall be repaired by the Contractor by roto-tilling a minimum depth of 6 inches, backfilled with sandy-loam topsoil. Sod shall be certified sod, non-netted and a minimum of one year old. Sod shall be 90:10, consisting of a minimum of three varieties tall fescues and one Kentucky Bluegrass. Smithsonian Gardens through the COTR must approve the source of the sod. The Contractor shall bear all costs for these repairs. Suggested sources are:

1. Oakwood Sod Farm, Inc.
   29307 Waller Road
   Delmar, MD 21875
   Phone: (410) 896-4009
   Toll-Free: (800)379-8488

2. Collins Wharf Sod
   25361 Collins Wharf Rd
   Eden, MD 21822
   Phone 410-334-6676
   Fax 410-749-3815
   cwsod@collinswharfsod.com
3. Summit Hall Sod Farm  
21300 River Road  
Poolesville, MD 20837-9114  
Phone: 301-948-2900  
Fax: 301-349-2668

9.13. The Contractor shall be responsible for the daily removal of trash and construction debris from turf and flower/shrub beds within the limits of construction.

9.14. Any plant material destroyed and/or damaged by the Contractor during construction shall be replaced with like genus and species of the same size, at no additional cost to the Smithsonian. The damaged plant materials must be replaced prior to final payment. The same applies to artifacts or furniture collection pieces. Smithsonian Gardens requires (5) working day notice should any of the artifacts or furniture collection need to be removed to facilitate construction.

9.15. Any construction scaffolding on turf and planted beds must be coordinated with the Smithsonian Gardens through the COTR to ensure that its installation will not damage or destroy existing plant materials or turf area or interfere with daily maintenance of the grounds. Trees may be tied back to permit erection of scaffolding, no more than 4 feet if possible. The tying back must be performed by a certified Arborist with the approval of Smithsonian Gardens and the COTR. Where scaffolding is necessary to facilitate construction, Smithsonian Gardens requires a three (3) workday notice for said work.

9.16. Do to structural weight limits no vehicular traffic is permitted inside the Smithsonian's Enid A. Haupt Garden only with prior approval by the COTR and Smithsonian Gardens.

9.17. Fauna Protection: The Contractor is prohibited from hunting, collecting, or feeding animals on Smithsonian property. All food and food wrapping brought on the premises must be properly disposed of in approved containers which are secured from animals.

9.18. If a generator is placed on the turf, Smithsonian Gardens must have approved its placement. Generator shall be place on anti-compactor boards. The generator must be placed in a drip containment basin.

COMMITMENT TO SUSTAINABILITY

10.1. The Smithsonian Institution is a trust instrumentality of the United States (recognized as a tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code) and although not an Executive Branch of the U.S. Government, is committed to planning, designing, constructing, maintaining and operating its owned and leased buildings and facilities consistent with Federal environmental and energy management requirements, as listed in the Smithsonian OFEO Codes, Standards and Guidelines document, dated May 19, 2009, to the maximum extent practical.

CONTRACTOR USE OF PREMISES

HOURS OF WORK, WORKDAYS AND GOVERNMENT HOLIDAYS

11.1. Work shall be performed under this contract during the normal workdays of Monday through Friday, except Smithsonian holidays as specified herein and the normal work hours of 7:00 AM to 3:30 PM.
11.2. The premises will be continually occupied during this work. The east entry serves as staff and visitor entry for the SIB. This entry shall be protected and maintained for the duration of this work. Contractor to provide protection for this entry, its steps, fixtures and surrounding features for the duration of the work. Entry shall be free of construction debris and dirt at all times.

11.3. For each occasion the Contractor intends to work on Saturdays, Sundays or Smithsonian holidays or during hours other than those indicated above, the Contractor shall obtain written permission from the COTR, at least three (3) working days in advance.

11.4. The Contractor shall reimburse the Smithsonian Institution for security and inspection services provided by the Smithsonian when the Contractor chooses to work outside the normal workdays and hours, as identified herein. However, the Contractor will not be charged for SI overtime security and inspection services, if, in the opinion of the COTR, the work cannot be done during the normal workdays and hours due to requirements of the Smithsonian.

11.5. Smithsonian Holidays: For holidays that fall on Saturday, the Smithsonian holiday is observed on the previous Friday. For holidays that fall on Sunday, the Smithsonian holiday is observed on the following Monday. The Smithsonian holidays are listed below.

<table>
<thead>
<tr>
<th>Holiday</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Year's Day</td>
<td>January 1</td>
</tr>
<tr>
<td>Martin Luther King Jr.'s Birthday</td>
<td>January, third Monday</td>
</tr>
<tr>
<td>George Washington's Birthday</td>
<td>February, third Monday</td>
</tr>
<tr>
<td>Memorial Day</td>
<td>May, last Monday</td>
</tr>
<tr>
<td>Independence Day</td>
<td>July 4</td>
</tr>
<tr>
<td>Labor Day</td>
<td>September, first Monday</td>
</tr>
<tr>
<td>Columbus Day</td>
<td>October, second Monday</td>
</tr>
<tr>
<td>Veterans' Day</td>
<td>November 11</td>
</tr>
<tr>
<td>Thanksgiving Day</td>
<td>November, fourth Thursday</td>
</tr>
<tr>
<td>Christmas Day</td>
<td>December 25</td>
</tr>
<tr>
<td>President's Inauguration Day</td>
<td>January 21, 2013</td>
</tr>
</tbody>
</table>

QUALITY ASSURANCE

12.1. The Contractor shall provide for quality control, inspections, testing and re-testing as necessary for all work, including that of subcontractors, to assure compliance with the contract documents.

PERMITS, LICENSES & FEES

13.1. The Contractor shall obtain and pay for all applicable permits and licenses required by regulating agencies, including, but not limited to: permits for pedestrian and road markings, construction fences, sidewalk cuts, utility company connections, elevator certificates, waste containers, etc.

PROTECTION OF THE SITE

14.1. The Contractor shall provide adequate protection for all parts of the building, including interior and exterior surfaces, its occupants and contents and grounds wherever work under this contract is performed. See “Protection of Historic Properties and Scaffolding Requirements” and “Protection of Flora, Fauna and Central Computer Controller Irrigation System” above.
DEBRIS CONTROL AND DAILY CLEANUP

15.1. The Contractor shall regularly clean up the work areas and shall, at all times, maintain the project in as neat and orderly a manner as is consistent with normal operations. Debris resulting from construction operations shall be removed at all times from the site by the Contractor. The Contractor shall keep all access, haul routes and site areas free of dirt, debris and other materials resulting from construction activities.

15.2. The Contractor shall recycle, salvage or otherwise divert from landfills and incinerators, at least 50%, with a goal of at least 75%, by weight (tons), unless otherwise noted, of non-hazardous construction and demolition material. The contractor shall track recycling efforts and diversion rates using the Construction and Demolition Waste Tracking Sheet, attached. Before any work is started, the contractor shall submit a Construction Waste Management Plan, consisting of waste identification and a waste reduction work plan. Waste identification shall indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates. Waste reduction work plan shall list each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures. With each application for payment, the contractor shall submit the Construction and Demolition Waste Tracking Sheet, attached, with data compiled for the payment period, including receipts from hauler or destination. Before request for substantial completion, the contractor shall submit calculated end-of-Project percentage of waste diverted from landfills and incinerators (recycled, salvaged, or disposed) as a percentage of total waste generated by the Work. With request for final payment, the contractor shall submit actual percentage of waste diverted from landfills and incinerators (recycled, salvaged, or disposed) as a percentage of total waste generated by the Work.

STAGING, STORAGE AND WORK AREAS

16.1. Before any work is started, the Contractor shall coordinate with the COTR regarding the use of area for staging and storage of materials and equipment.

16.2 New construction fencing shall match existing, adjacent AIB construction fencing in size, design, materials and details. When installing new rolling gate in exiting AIB fence, modify existing screen material on fence to fit new gate and provide continuous visual effect similar to fencing now.

16.3 Contractor shall determine size of new rolling gates in order to complete the work.

BONDING AND INSURANCE

17.1. Bonding:

In accordance with IDIQ Contract requirements.

NOTE: The only acceptable method of bonding for the Smithsonian Institution is (1) Bid bond SF-24; Performance Bond SF-25; and Payment Bond SF-25A (U.S. Department of the Treasury Acceptable Surety); (2) Irrevocable Letter of Credit (issued by a member of the Federal Deposit Insurance Corporation); or (3) Cashier’s Check.
17.2. Insurance:

In accordance with IDIQ Contract requirements.

SUBMISSIONS

SUBMITTALS AND REVIEWS

18.1. Contractor Responsibility for Submittals: The Contractor shall provide all required submittals, by technical specification section, in accordance with the contract documents. All submittals, with exception of mockups or samples, are to be submitted electronically by email in PDF format. The Contractor shall clearly indicate on the submittal that it has been reviewed by the Contractor and found to meet the project requirements. Any items submitted as substitutions shall be clearly identified as such on the submittal and the transmittal document. If shop drawings show variations from the contract documents because of standard shop practices or for other reasons, the Contractor shall provide a separate, written description of variations along with the submittal. The Contractor shall:

18.1.1. Review each submittal for conformance with requirements of the contract documents and coordination with related work.

18.1.2. Determine and verify all field measurements, required material quantities, method of assembly or erection, installation requirements and proper connection to adjoining materials installed by others.

18.1.3. Assure that all submittals use the appropriate units of measure. All drawings and technical data shall be in SI (metric) units for projects designed in SI units. Preprinted literature in other units shall be accompanied by documentation to show conformance to project requirements.

18.1.4. Transmit all required submittals for a technical specification section at the same time unless prior written waiver of this requirement has been provided by the COTR.

18.1.5. Transmit submittals to the COTR in a logical and orderly sequence in accordance with the Submittal Schedule to prevent project delays or adversely impact work by the Smithsonian Institution or other contractors.

18.1.6. Correct and resubmit submittals according to response from the Smithsonian Office of Engineering Design & Construction.

18.1.7. Commence work on items requiring submittals only after all related submittals are reviewed and approved by the Smithsonian. All Work shall conform to approved submittals.

TOXIC AND HAZARDOUS SUBSTANCES

19.1. The Contractor shall submit to the COTR, at least ten (10) working days prior to their intended use, a written list of toxic and hazardous substances that will be used on the project. The Contractor shall submit a "Material Safety Data Sheet" similar to OSHA Form No. 20 for these substances to identify the following information:

19.1.1. Product Identification
19.1.2. Hazardous Ingredients
19.1.3. Physical Data
19.1.4. Fire and Explosion Hazard Data
19.1.5. Health Hazard Data
19.1.6. Emergency and First Aid Procedures
19.1.7. Reactivity Data
19.1.8. Spill or Leak Procedures
19.1.9. Special Protection Information
19.1.10. Special Precautions

19.2. The Contractor will commit to not using the following toxic and hazardous materials:

19.2.1. Products containing asbestos, urea formaldehyde, polychlorinated biphenyls (PCBs) and/or chlorinated fluorocarbons.

19.2.2. Products containing lead content, including solder or flux containing more than 0.2% lead; domestic water pipe or pipe fittings containing more than 8% lead; and paint containing more than 0.06% lead.

19.2.3. Chlorofluorocarbon (CFC)-based refrigerants in new base building heating, ventilating, air conditioning and refrigeration (HVAC&R) systems and comprehensive CFC phase-outs when reusing existing base building HVAC equipment.

19.2.4. The Contractor hereby understands that historic properties may contain pre-existing harmful materials and coatings including, but not limited to, arsenic, lead, dioxide, polyvinylchloride (PVC) and asbestos. Upon discovery of hazardous or toxic materials, the Contractor shall alert the COTR immediately.

EXISTING FIRE PROTECTION SYSTEMS

20.1. During the course of the Work, all existing smoke and heat detectors and sprinkler heads must remain operable. Coverings may be applied to protect them from spray coatings or other hazardous conditions only during the actual operations. Coverings must be removed immediately after the operations have concluded. Damaged detectors and sprinkler heads shall be replaced immediately by the Contractor at no additional cost to the Smithsonian Institution. The Contractor shall test replaced detectors and sprinklers after installation to the satisfaction of the COTR. This work is all exterior and is not anticipated to affect the fire protection systems.

GENERAL SECURITY REQUIREMENTS

21.1. The Contractor and his employees must comply with security requirements imposed by the Smithsonian Institution, including any necessary security clearances. Failure to inspect the site or obtain knowledge of security regulations shall not relieve the Contractor from security requirements or from performance of any part of the work.

SCHEDULING & PAYMENTS / BAR CHART

22.1. Project Schedule: The Contractor shall submit, to the COTR for approval, a Gantt bar chart project schedule within 5 calendar days after the date of contract award. Submit in PDF format. No work shall start at the site until the project schedule has been approved by the COTR. The approved bar chart will represent a baseline schedule on which the monthly construction progress will be indicated and submitted to the COTR. The baseline project schedule shall comply with the following:
22.1.1. Weekly breakdown of work activities shall be provided, including interaction between building trades, subdivided by items of work and areas of the project. Items of work shall be grouped and subdivided according to the divisions of the Construction Specifications Institute (CSI) format.

22.1.2. The start date and completion date shall be consistent with the Contract Time established by the Contracting Officer. Any intermediate deadline dates needed to meet specific requirements for Smithsonian use of portions of the work shall be shown.

22.1.3. Project condition survey activities shall be scheduled not later than the 14th calendar day of the contract time and prior to the start of any site work.

22.1.4. Project closeout activities shall be scheduled for completion in accordance with the requirements for the Contract Time for Completion.

22.1.5. Order dates and projected delivery dates shall be shown for equipment, special devices, hardware, products or other items requiring long lead time.

22.1.6. Required delivery dates for items to be furnished by Smithsonian and installed by the Contractor shall be shown, as well as items to be furnished and installed by Smithsonian, which will affect the Contractor's work.

22.1.7. Review periods for all submittals and time required for all necessary inspection and/or testing shall be shown.

22.1.8. Dates shall be given for ordering, delivery, installation and testing of major equipment and special materials and equipment.

22.1.9. The Contractor shall specifically identify work activities and dates associated with construction bid alternates.

22.2. Revisions to Baseline Schedules: The Contractor shall submit, to the COTR for approval, all revisions to the approved baseline project schedule. The Contractor shall submit a proposed revision to the schedule, as necessary, along with proposals for construction changes, clearly indicating modifications to the schedule based on the proposal. The Contractor shall also submit, for review and approval, any proposed changes to the schedule due to inability to accomplish the work as planned for any reason. Approved changes to the schedule shall be incorporated into the Project Schedule and it shall be resubmitted as necessary or as requested by the COTR.

22.3. Progress Behind Schedule: If it becomes apparent to the COTR that the overall progress of the project is behind the approved project schedule, then the COTR will notify the Contractor in writing. The Contractor shall submit, to the COTR for approval, a Recovery Schedule and Plan to describe how the Work will be accelerated to meet the Contract Time requirements in accordance with the General Conditions contract clause entitled "Commencement, Prosecution and Completion of the Work." The Recovery Schedule shall be superimposed on the approved baseline project schedule to demonstrate that proposed recovery activities will accomplish completion of the work by the approved completion date.

22.4. Reporting Progress and Applying for Payment: Each month, the Contractor shall apply for payment and submit a report of the actual construction progress as follows:

22.4.1. By the 25th of each month, the Contractor and the COTR shall have inspected the work to determine percentages complete for each item, projected through the end of the month. The parties shall attempt to reach agreement on each item, but if they cannot reach an agreement the COTR will determine percent complete.

22.4.2. By the last day of the month, the Contractor shall submit an Application for
Payment based on the determined percentages complete for each item. The application shall be submitted in triplicate on the Smithsonian standard Application for Payment form. Each copy of the Application for Payment shall be accompanied by the following:

1. A Progress Schedule identifying the cumulative progress superimposed on the latest revision of the approved Project Schedule. The net progress for the month and applicable dates shall be clearly indicated.

2. A complete set of copies of certified weekly-payroll data for the period.

22.5. Response to Application:

22.5.1. Payment shall be made only for progress agreed upon by the COTR, performed on original Contract Work or approved modifications, in accordance with the current, approved Project Schedule. Failure to submit the Application in accordance with the specifications will prevent the processing of payments.

22.5.2. Payments shall be mailed to the Contractor's address as identified in the contract documents on record with the Contracting Officer. Any changes of address or requests for wire transfer of progress payments must be made in writing, signed by the Contractor's authorized person and submitted to the Contracting Officer.

Warranty of Construction

23.1. The Contractor shall warrant that the work performed under this contract conforms to the contract requirements and is free of any defect in equipment, materials, design or workmanship performed by the Contractor or any subcontractor or supplier at any tier. Unless otherwise stated in the technical sections of the Specifications, the warranty of the Work shall continue for a period of one (1) year from the date of Final Completion status.

23.2. Submission of original warranties for all products, equipment and systems:
The Contractor shall assemble original warranty certificates or notarized copies of warranty certificates executed by the Contractor, subcontractors, suppliers and manufacturers in a tab-indexed three-ring loose-leaf binder with a durable plastic cover. The table of contents shall identify the item covered, the location of the item, the date of Substantial Completion, expiration date of the warranty and the supplier, vendor and installing contractor. Duplicate notarized copies of warranties shall be provided as required by "Manuals for Operation, Maintenance and As-Built Product Data." Include electronic copy in PDF format, on CD.

As-Built Record Drawings

24.1. During the progress of the work, the Contractor shall maintain a complete and up-to-date set of record prints, open to inspection by the COTR at any time. These prints shall provide a complete and accurate as-built record of all changes to the Contract Drawings, including rerouting of runs, relocation of items or control points and all other modifications. The exact location of pipes, conduit or other features concealed underground, under concrete, in chases or above ceilings shall be shown by perpendicular dimensions from at least two available landmarks. As-built drawings shall be neatly marked with colored pencils or ink, marked "As-Built" and signed and dated by the Contractor. Upon completion of the Work and before final payment, the Contractor shall submit, to the COTR, photographically produced as-built record drawings on 4-mil, double matte mylar sheets sized the same as the contract drawings. The Contractor shall submit electronic files in .DWG and PDF formats.
24.2. As-Built Record Survey of Underground Utilities submitted. If outside or underground utilities are part of the work, the Contractor shall furnish, to the COTR for approval, an acceptable and accurately dimensioned survey showing location and elevation of underground storage tanks, all utility lines for water, gas, electrical, sewer, steam, etc., including valves, connections and changes in direction, as installed under the contract, within the property lines and outside the building walls. Points where utility lines emerge from the building shall be located from lot monuments. The survey shall be made to scale and must be marked "As-Built" and signed and dated by the Contractor. The Contractor shall furnish as scanned, digital copy to the COTR as well as a copy on a 3-mil, double matte mylar sheet or sheets the same size as the contract drawings. There are no underground utilities in this Work.

24.3. As-Built Record Specifications submitted. The Contractor shall submit one (1) hard copy and a digital (scanned) set of project specifications with annotations to identify any changes made during construction, referencing modification numbers, dates and originators of authorizing letters or memos and other sources of changes. The cover shall be marked "As-Built" and signed and dated by the COTR.
**Construction and Demolition Waste Tracking Sheet:**
*To be submitted with each application for payment for the payment period, and at project completion with total waste data and total percentage of waste diverted from landfill for entire project period.*

**Project Name:** ___________________________________________________
**Start Date:** _____________________________________________________
**End Date:** _____________________________________________________

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<th>Material Description</th>
<th>Disposal date</th>
<th>Diverted from Landfill or incinerator? (Y/N)</th>
<th>Diversion method (Recycled, Salvaged, etc.)</th>
<th>Hauler or Destination (submit receipts)</th>
<th>Volume (in cubic feet)</th>
<th>Weight (in tons)</th>
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Total Diverted

Total Not Diverted

Total All Waste = Total Diverted + Total Not Diverted

% Diversion Rate* = Total Diverted/Total All Waste

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*Percentage Diversion Rate to be compiled after project completion. Minimum Diversion rate is 50%. Goal Diversion rate is 75%*
SECTION 040140 - MAINTENANCE OF STONE ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes maintenance of stone assemblies consisting of stone restoration and cleaning as follows:
   1. Repointing joints on the historic chimneys.
   2. Selectively removing and re-setting individual stones where indicated.
   3. Dis-assembling sandstone portions of the existing, history chimneys and reconstruction of same chimneys.

B. Related Sections:
   1. Section 01000 "General Conditions"
   2. Section 07146 "Cold Fluid-Applied Waterproofing"
   3. Section 079200 "Joint Sealants"

1.3 UNIT PRICES

A. Work of this Section is affected by unit prices specified in Section 010000 "General Conditions"
   1. Unit prices apply to authorized work covered by quantity allowances.
   2. Unit prices apply to additions to and deletions from Work as authorized by Change Orders.

1.4 ALTERNATES

A. Work of this Section is affected by alternate prices specified in Section 010000 "General Conditions"
   1. Alternate prices apply to authorized work covered by quantity and scopes as described.
   2. Alternate prices apply to additions to and deletions from Work as authorized by Change Orders.

1.5 DEFINITIONS

A. Very Low-Pressure Spray: Under 100 psi.

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

C. Medium-Pressure Spray: 400 to 800 psi; 4 to 6 gpm.

D. High-Pressure Spray: 800 to 1200 psi; 4 to 6 gpm.


F. Face Bedding: Setting of stone with the natural bedding planes (strata) vertical and parallel to the wall plane rather than horizontal or "naturally bedded," which holds bedding planes together by gravity.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.
B. Shop Drawings: For the following:
1. Replacement stone units and their jointing, showing relation of existing to new units-not anticipated but required if stones damaged during this work.
2. Partial replacement stone units (dutchmen)-not anticipated but required if stones damaged during this work.
3. Setting number of each new stone unit and its location on the structure in annotated plans and elevations-not anticipated but required if stones damaged during this work.
4. Replacement and repair anchors, including drilled-in pins. Include details of anchors within individual stone units, with locations of anchors and dimensions of holes and recesses in stone required for anchors, including direction and angle of holes for pins.

C. Samples for Initial Selection: For the following:
1. Pointing Mortar: Submit sets of mortar for pointing in the form of sample mortar strips, 6 inches long by 1/2 inch wide, set in aluminum or plastic channels.
   a. Have each set contain a close color range of at least three Samples of different mixes of colored sands and cements that produce a mortar matching the cleaned stone when cured and dry.
   b. Submit with precise measurements on ingredients, proportions, gradations, and sources of colored sands from which each Sample was made.
2. Include similar Samples of accessories involving color selection.

D. Samples for Verification: For the following:
1. Each type of sand used for pointing mortar; minimum 1 lb. of each in plastic screw-top jars.
   a. For blended sands, provide Samples of each component and blend.
   b. Identify sources, both supplier and quarry, of each type of sand.
2. Sealant Materials: See Section 079200 "Joint Sealants."
3. Accessories: Each type of anchor, accessory, and miscellaneous support.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For restoration specialists including field supervisors and restoration workers.

B. Quality-Control Program.

C. Restoration Program.

1.8 QUALITY ASSURANCE

A. Restoration Specialist Qualifications: Engage an experienced stone restoration firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience installing standard unit masonry or new stone masonry is not sufficient experience for stone restoration work.
1. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisors on Project site during times that stone restoration and cleaning work is in progress. Supervisors shall not be changed during Project except for causes beyond control of restoration specialist firm.
2. Restoration Worker Qualifications: Persons who are experienced and specialize in restoration work of types they will be performing.

B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage due to worker fatigue.

C. Scope Confirmation for Each Chimney: After scaffolding is erected, Contractor shall review each chimney with COTR to confirm scope, mock-up locations and assess any unexpected changes in scope or
condition of the chimneys. No work shall occur until after this meeting.

D. Restoration Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of restoration work including protection of surrounding materials and Project site.
1. Include methods for keeping pointing mortar damp during curing period.
2. If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program 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.

E. Mockups: Prepare mockups of restoration to demonstrate aesthetic effects and set quality standards for materials and execution and for fabrication and installation.
1. Repointing: Rake out 24 inches of a joint in 2 separate areas for each type of repointing required and repoint one of the areas. Locations will be determined with COTR during inspections when scaffolding is erected and plywood removed.
2. Re-construction: First reconstruction efforts shall be completed to a height of 1 meter and reviewed by COTR. This work then serves as the mock-up and standard for future work when accepted by the COTR.
3. Locate mock-ups on sides of chimneys least visible from the ground.
4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
5. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Preinstallation Conference: Conduct conference at Project site.
1. Review methods and procedures related to stone restoration including, but not limited to, the following:
   b. Scaffolding design.
   c. Materials, material application, sequencing, tolerances, and required clearances.
   d. Methods for marking stones to indicate reconstruction locations.
   e. Location and methods for storing stones after dis-mantling and before installation.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

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

C. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

D. Store lime putty covered with water in sealed containers.

E. Store sand where grading and other required characteristics can be maintained and contamination avoided.

1.10 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit stone restoration work to be performed according to manufacturers' written instructions and
specified requirements.

B. Reconstruct chimneys and repoint mortar joints only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least 7 days after completion of the Work unless otherwise indicated.

C. Protect tops of chimneys when they are left in dis-mantled states at the end of the day.

D. Cold-Weather Requirements: for stone repair and mortar-joint pointing unless otherwise indicated:
   1. When air temperature is below 40 deg F, heat mortar ingredients, repair materials, and existing stone to produce temperatures between 40 and 120 deg F.
   2. When mean daily air temperature is below 40 deg F, provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 7 days after repair and pointing.

E. Hot-Weather Requirements: Protect stone repair and mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar and patching materials. Provide artificial shade and wind breaks and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F and above unless otherwise indicated.

F. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.

G. 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.

1.11 COORDINATION

A. Coordinate stone restoration with all circulation patterns at Project site. Some work is near public circulation patterns for pedestrians, staff and vehicles. Public circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly.

1.12 SEQUENCING AND SCHEDULING

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

B. Order mortar materials for pointing mortar immediately after approval of mockups. Take delivery of and store at Project site a sufficient quantity to complete Project.

C. Perform stone restoration work in the following sequence for chimneys where the scopes is only re-pointing:
   1. Rake out mortar from joints surrounding stones to be removed and reset. Refer to drawings for stones to be removed and reset.
   2. Rake out mortar from joints to be repointed.
   3. Point mortar joints.
   4. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.

D. Perform stone restoration work in the following sequence for chimneys where the chimney is to be dismantled and reconstructed using the original materials:
   1. Rake out mortar from joints surrounding stone to be removed and reset.
   2. Carefully remove and label each stone from the chimney. Label each stone in a non-permanent manner on a surface to be hidden from view when reconstructed.
   3. Inspect brick and irregular stone masonry core and flue for earthquake damage. Notify COTR immediately of any damage or any problems related to the stability of brick or stone masonry core during dismantling and reconstruction.
4. Remove any remaining mortar from sandstone blocks.
5. Re-build sandstone chimneys by placing each stone in its original location with specified bedding mortar.
6. Rake out mortar from joints to be repointed below areas that have been reconstructed.
7. Point all mortar joints, both reconstructed and existing, with specified pointing mortar.
8. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.

PART 2 - PRODUCTS

2.1 STONE MATERIALS

A. Stone: If stone replacement is necessary due to damage during this Work, the Owner will provide stone for use in replacing damaged stone. Contractor will be responsible for transportation of stone and dressing stone to match adjacent stone, coursing, finish. Label each stone permanently on non-visible surface with date installed. COTR will provide information regarding location of stone if this provision is required.

2.2 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type II, white, or gray, or both where required for color matching of exposed mortar.
1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.


D. Quicklime: ASTM C 5, pulverized lime.

E. Mortar Sand: ASTM C 144 unless otherwise indicated.
1. Color: Provide natural sand of color necessary to produce required mortar color.
2. For pointing mortar, provide sand with rounded edges.
3. Bedding Mortar: Provide 60% Schofield #125 Sand and 40% Schofield #125 Sand or comparable.
5. Pointing Mortar Type #1: Provide 60% Schofield #180 Sand and 40% Schofield #125 Sand or comparable.
6. Pointing Mortar Type #2: Provide 65% Schofield #236 Sand and 35% Schofield #125 Sand or comparable.

F. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.

G. Water: Potable.

2.3 MANUFACTURED REPAIR MATERIALS

A. Cementitious Crack Filler: An ultrafine superplasticized grout that can be injected into cracks, is suitable for application to wet or dry cracks, exhibits low shrinkage, and develops high bond strength to all types of stone. (NOT ANTICIPATED BUT INCLUDED IN CASE STONE IS DAMAGED DURING THE WORK. REVIEW WITH COTR PRIOR TO BEGINNING ANY OF THIS WORK)
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

B. Stone-to-Stone Adhesive: 2-part polyester or epoxy-resin stone adhesive with a 15- to 45-minute cure at 70 deg F or 1-part cementitious stone adhesive, recommended by adhesive manufacturer for type of stone repair indicated, and matching stone color. (NOT ANTICIPATED BUT INCLUDED IN CASE STONE IS DAMAGED DURING THE WORK. REVIEW WITH COTR PRIOR TO BEGINNING ANY OF THIS WORK)

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Two-Part Polyester or Epoxy-Resin Stone Adhesive:
      1) Akemi North America; MS76 Stone and Marble Adhesive.
      2) Bonstone Materials Corporation; Fast Set 41.
      3) Edison Coatings, Inc.; Flexi-Weld 520T.
   b. One-Part Cementitious Stone Adhesive:
      1) Cathedral Stone Products, Inc.; Jahn Restoration Adhesive.

2.4 ACCESSORY MATERIALS

A. Stone Anchors and Pins: Type and size indicated or, if not indicated, to match existing anchors in size and type. Fabricate anchors and pins from Type 304 stainless steel.

B. Setting Buttons: Resilient plastic buttons, nonstaining to stone, sized to suit joint thicknesses and bed depths of stone units without intruding into required depths of pointing materials.

C. Masking Tape: Nonstaining, nonabsorbent material, compatible with pointing mortar, joint primers, sealants, and surfaces adjacent to joints; that will easily come off entirely, including adhesive.

D. Miscellaneous Products: Select materials and methods of use based on the following, subject to approval of a mockup:
   1. Previous effectiveness in performing the work involved.
   2. Little possibility of damaging exposed surfaces.
   3. Consistency of each application.
   4. Uniformity of the resulting overall appearance.
   5. Do not use products or tools that could do the following:
      a. Remove, alter, or in any way harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in contract.
      b. Leave a residue on surfaces.

2.5 MORTAR MIXES

A. Preparing Lime Putty: Slake quicklime and prepare lime putty according to appendix to ASTM C 5 and manufacturer's written instructions.

B. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
   1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.

C. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
1. Mortar Pigments: Where mortar pigments are indicated, do not exceed a pigment-to-cement ratio of 1:10 by weight.

D. Do not use admixtures in mortar unless otherwise indicated.

E. Mortar Proportions: Mix mortar materials in the following proportions:
   1. Pointing Mortar Type #1 for chimney repointing: Comparable to Type O mortar, Comply with ASTM C-150 and C-207, 1 part white portland cement, 2 parts lime, and 9 parts sand.
   a. Add mortar pigments to produce mortar colors required.
   2. Pointing Mortar Type #2 for tower repointing: Comparable to Type O mortar, Comply with ASTM C-150 and C-207, 1 part white portland cement, 2 parts lime, and 9 parts sand.
   a. Add mortar pigments to produce mortar colors required.
   3. Rebuilding (Setting) Mortar: Comparable to Type K mortar, Comply with ASTM C-150 and C-207, 1 part white portland cement, 3 parts lime, and 12 parts sand.

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from stone restoration work.
   1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.

B. Prevent mortar from staining face of surrounding stone and other surfaces.
   1. Cover sills, ledges, and projections to protect from mortar droppings.
   2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
   3. Immediately remove mortar in contact with exposed stone and other surfaces.
   4. Clean mortar splatters from scaffolding at end of each day.

3.2 STONE REMOVAL AND RECONSTRUCTION

A. At locations indicated, remove stone as indicated for re-use in the same location. Carefully remove entire units from joint to joint, without damaging surrounding stone, in a manner that permits re-setting in same location and orientations.

B. Support and protect remaining stonework that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

C. Notify COTR of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing stone or unit masonry backup, rotted wood, rusted metal, and other deteriorated items.

D. Remove in an undamaged condition as many whole stone units as possible.
   1. Remove mortar, loose particles, and soil from stone by cleaning with hand chisels, brushes, and water.
   2. Store stone for reuse. Store off ground, on skids, and protected from weather.
   3. Deliver cleaned stone not required for reuse to Owner unless otherwise indicated.

E. Clean stone surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

F. Replace removed damaged stone with other removed stone in good quality, where possible, or with new stone matching existing stone, including size. Do not use broken units unless they can be cut to usable size.
G. Install replacement stone (if required) into bonding and coursing pattern of existing stone. If cutting is required, use a motor-driven saw designed to cut stone with clean, sharp, unchipped edges. Finish edges to blend with appearance of edges of existing stone.
   1. Maintain joint width for replacement stone to match existing joints.
   2. Use setting buttons or shims to set stone accurately spaced with uniform joints.

H. Set stone with completely filled bed, head, and collar joints. Butter vertical joints for full width before setting and set units in full bed of mortar unless otherwise indicated.
   1. Rake out mortar used for laying stone before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing stone, and at same time as repointing of surrounding area.
   2. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

3.3 REPOINTING STONWORK

A. Rake out and repoint joints to the following extent:
   1. Once scaffolding is in place, Contractor, COTR and Architect will jointly inspect all chimney surfaces and confirm scopes at each location.
   2. All joints in areas indicated in drawings below.
   3. Joints where mortar is missing or where they contain holes (notify COTR of such areas).
   4. Cracked joints where cracks can be penetrated at least 1/4 inch by a knife blade 0.027 inch thick (notify COTR of such areas).
   5. Cracked joints where cracks are 1/16 inch or more in width and of any depth (notify COTR of such areas).
   6. Joints where they sound hollow when tapped by metal object (notify COTR of such areas).
   7. Joints where they are worn back 1/4 inch or more from surface (notify COTR of such areas).
   8. Joints where they are deteriorated to point that mortar can be easily removed by hand, without tools (notify COTR of such areas).
   9. Joints where they have been filled with substances other than mortar (notify COTR of such areas).

B. Do not rake out and repoint joints where not required.

C. Rake out joints as follows, according to procedures demonstrated in approved mockup:
   1. Remove mortar from joints to depth of 1" or not less than that required to expose sound, unweathered mortar.
   2. Remove mortar from stone surfaces within raked-out joints to provide reveals with square backs and to expose stone for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
   3. Do not spall edges of stone units or widen joints. Replace or patch damaged stone units as directed by Architect.
      a. Cut out mortar by hand with chisel and resilient mallet. Do not use power-operated grinders without Architect's written approval based on approved quality-control program.

D. Notify COTR of unforeseen detrimental conditions including voids in mortar joints, cracks, loose stone, rotted wood, rusted metal, and other deteriorated items.

E. Pointing with Mortar:
   1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
   2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than 3/8 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing stone has worn or rounded edges, slightly recess finished mortar surface below face of stone to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed stone surfaces or to featheredge the mortar.

4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.

5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.
   a. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
   b. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.

6. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

3.4 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed stone surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.
   1. Do not use metal scrapers or brushes.
   2. Do not use acidic or alkaline cleaners.

B. Wash adjacent woodwork and other nonstone surfaces. Use detergent and soft brushes or cloths.

C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

D. Sweep and rake adjacent pavement and grounds to remove mortar and debris. Where necessary, pressure wash pavement surfaces to remove mortar, dust, dirt, and stains.

3.5 FIELD QUALITY CONTROL

A. Notify COTR in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until COTR have had reasonable opportunity to make observations of work areas at lift device or scaffold location.

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Keynotes to Site Plan

1. Anticipated locations of scaffolding.
2. Alternate pricing for location of scaffolding this area.
3. Cantilevered scaffolding from upper flat roof to allow repairs of octagonal tower.
4. For Alternate #1, Smithsonian Gardens will tie back tree.
5. See enlarged plan, next page, for east staging area.

Chimney Types

Type 1: C1, C2, C6, C7, C8, C12 - Similar in size and detailing, dating from the Renwick Era (1857-1884)
Type 2: C3, C4, C5, C10, C11 - Similar in size and detailing, dating from the Cluss Era (1884-1887)
Type 3: C9 - Pre-1917 but post Cluss Era.

Summary of Scope

- C2, C3, C5, C7: Rebuild
- C1, C4, C9, C8, C10: Re-point
- C6, C11, C12: No work
- South Tower: Re-point
- Flag Tower: Caulk

Locations of Work

- 1. Anticipated locations of scaffolding.
- 2. Alternate pricing for location of scaffolding this area.
- 3. Cantilevered scaffolding from upper flat roof to allow repairs of octagonal tower.
- 4. For Alternate #1, Smithsonian Gardens will tie back tree.
- 5. See enlarged plan, next page, for east staging area.

Chimney Types

Type 1: C1, C2, C6, C7, C8, C12 - Similar in size and detailing, dating from the Renwick Era (1857-1884)
Type 2: C3, C4, C5, C10, C11 - Similar in size and detailing, dating from the Cluss Era (1884-1887)
Type 3: C9 - Pre-1917 but post Cluss Era.
Keynotes to East Staging Plan

1. Existing AIB construction fence.
2. Provide new SIB construction fence with gate on walk.
3. Provide new rolling gate in existing fence for controlled access.
4. Temporary staging area for install/deinstall of scaffold and for contractor access. Contractor shall coordinate and schedule use of this area with COTR.
5. Contractor staging and lay-own area on paved surface only.
6. Tree to be removed by Smithsonian Gardens
7. Tree to be tied back by Smithsonian Gardens
8. Urn to be removed by Smithsonian
9. Protect existing lamp posts
10. Protect birch trees with fence
11. Existing rolling gate
Flag Tower — North Elevation

Location of small repair (this is alternate work)

28825mm
General Notes

1. Scaffolding cannot attach to building fabric in any manner.
2. Assume brick masonry back-up or irregular stone back-up for each chimney type will remain intact during reconstruction. Notify the owner immediately if damage is observed or if back-up proves unstable.
3. Do not dis-mantle stones which are courses into building facades or cornices.
4. Assume all stones can be re-used without damage from dis-mantling.
5. Once scaffolding is in place, carefully remove plywood at each chimney and inspect chimney condition with COTR. At this time, the COTR will confirm the scope of work for each chimney, locations of mortar sample panels and define any unexpected repairs or changes in the scope of work.
**Keynotes**

1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-install sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial-provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.

**Chimney C1 Scope Information**

2. Alternative Scope: Dismantle and reconstruc- tion the chimney beginning one course above the flashing.

Chimney C1 Scope Information

Chimney C1-2: View Looking East. Similar for Chimney C2

Chimney C1-3: View Looking South. Similar for Chimney C2.
Keynotes
1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-intall sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial-provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.

Chimney C2 Scope Information
1. Basic Scope: dismantle and reconstruct the sandstone portions of the chimney
2. Alternate: None.

Chimney C2-1: View Looking North

Chimney C2-2: View Looking North
Keynotes

1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-intall sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial-provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.

Chimney C3 Scope Information

1. Basic Scope: dismantle and reconstruct the sandstone portions of the chimney.
2. Alternate: None.
Chimney C4 Scope Information

2. Alternative Scope: Dismantle and reconstruction the chimney beginning one course above the flashing. Provide new metal cap similar to C10.

Keynotes

1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-install sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial—provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.
Keynotes

1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-intall sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial-provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.
Keynotes

1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-intall sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial-provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.

Chimney C7 Scope Information

1. Basic Scope: dismantle and reconstruct the sandstone portions of the chimney.
2. Alternative: None.
Chimney C8 Scope Information
2. Alternative Scope: Dismantle and reconstruct the chimney beginning one course above the flashing.

Keynotes
1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-intall sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial-provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.
Chimney C9 Scope Information

1. Basic Scope: Repoint the entire chimney above the metal flashing.
2. Alternative Scope: Dismantle and reconstruct the chimney beginning one course above the flashing. Remove and reinstall ventilator and all associated flashing and caulking.

Keynotes

1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-install sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial-provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.
Keynotes
1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-install sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial—provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.

Chimney C10 Scope Information
1. Basic Scope: Repoint entire chimney. Existing cap to remain.
2. Alternative Scope: Dismantle and reconstruction the chimney beginning one course above the flashing.

Chimney C10: View Looking North
Keynotes
1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-install sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.

Gable Repair vScope Information
1. Basic Scope: Re-install finial.
Keynotes

1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-install sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial-provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.
Keynotes

1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-intall sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial-provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.
Tower Scope Information
1. Basic Scope: Remove loose mortar and re-caulk cracked concrete window sill, horizontal and vertical faces.

Keynotes
1. Protect existing metal flashing and each stone course immediately above flashing typical u.n.o.
2. Remove sandstone blocks, remove mortar from blocks and prep stone for re-installation.
3. Label, protect and re-install sandstone blocks in their original locations with new bedding and pointing mortar per the specifications.
4. Do not remove stone below this course. Protect stone below this level.
5. Not Used.
6. New elastomeric waterproofing applied over existing waterproofing.
7. Do not remove stones coursed into facade.
8. Existing flue, cap to remain
9. Do not remove blocks this location
10. Re-point all mortar joints this chimney. Refer to Note 11 for limits of re-pointing work.
11. No re-pointing to occur this course and below
12. Re-point mortar below area of reconstruction
13. Remove this stone. Remove mortar and reset stone.
14. Reinstall stone finial-provided by Owner. Clean and prep bed and bottom surface of finial for new mortar setting. Set dowels in finial in epoxy, then set dowels in gable in epoxy.
15. Remove and reinstall existing ventilator and associated flashing and caulking after work is complete.
16. Remove and replace existing dowels with new stainless steel dowels of same diameter and length. Set new dowels in epoxy.
17. Re-point joints along line indicated.
18. Coordinate location of scaffolding with owner prior to installation. Can not disturb video equipment currently located on the roof.
19. Not used.
20. Remove existing mortar and prep cracks for new caulk at all vertical and horizontal surfaces of concrete sill.
22. Access sill from inside operable steel window.
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SECTION 071416 - COLD FLUID-APPLIED WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes:
   1. Single component water-based waterproofing coating to cover existing liquid-applied waterproofing.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product indicated. Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.
B. Shop Drawings: Show locations and extent of waterproofing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
C. Samples: For the following products:
   1. Membrane-reinforcing fabric, 10 by 8 inches.

1.4 INFORMATIONAL SUBMITTALS
A. Qualification Data: For Installer.
B. Product Test Reports: For waterproofing, based on evaluation of comprehensive tests performed by a qualified testing agency.
C. Field quality-control reports.

1.5 QUALITY ASSURANCE
A. Installer Qualifications: A firm that is approved or licensed by waterproofing manufacturer for installation of waterproofing required for this Project.
B. Source Limitations: Obtain waterproofing materials from single source from single manufacturer.
C. Pre-installation Conference: Conduct conference at Project site.
   1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.6 DELIVERY, STORAGE, AND HANDLING
A. Deliver liquid materials to Project site in original containers with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, shelf life, and directions for storing and mixing with other components.
B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by waterproofing manufacturer.

C. Remove and replace liquid materials that cannot be applied within their stated shelf life.

D. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F above dew point.
   1. Do not apply waterproofing in snow, rain, fog or mist, or when such weather conditions are imminent during application and curing period.

B. Maintain adequate ventilation during application and curing of waterproofing materials.

1.8 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which waterproofing manufacturer and Installer agree to repair or replace waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
   1. Warranty does not include failure of waterproofing due to failure of substrate prepared and treated according to requirements or formation of new joints and cracks in substrate that exceed 1/16 inch in width.
   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 POLYURETHANE WATERPROOFING

A. Polyurethane Waterproofing: Comply with ASTM C 836 and with manufacturer's written physical requirements.
   1. Products: Subject to compliance with requirements, provide the following:
      a. SIKAlastic 601 Base Coat
      b. SIKAlastic 621 Top Coat

2.2 AUXILIARY MATERIALS

A. General: Provide auxiliary materials recommended by manufacturer to be compatible with one another and with waterproofing, as demonstrated by waterproofing manufacturer, based on testing and field experience.

B. Primer: Manufacturer's standard, factory-formulated polyurethane or epoxy primer.


D. Joint Reinforcing Strip: Manufacturer's recommended fiberglass mesh or polyester fabric.
PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.
1. Verify that substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION
A. Clean and prepare substrate according to manufacturer's written recommendations. Provide clean, dust-free, and dry substrate for waterproofing application.
B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage or overspray affecting other construction.
C. Close off chimney flues to prevent spillage and migration of waterproofing fluids.
D. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, acid residues, and other penetrating contaminants or film-forming coatings from concrete.
E. Remove fins, ridges, and other projections and fill honeycomb, aggregate pockets, and other voids.

3.3 PREPARATION AT TERMINATIONS AND PENETRATIONS
A. Prepare vertical and horizontal surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, and sleeves according to manufacturer’s written instructions.
B. Prime substrate unless otherwise instructed by waterproofing manufacturer.
C. Apply waterproofing in two separate applications, and embed a joint reinforcing strip in the first preparation coat when recommended by waterproofing manufacturer.
1. Provide sealant cants around penetrations and at inside corners when recommended by waterproofing manufacturer.

3.4 JOINT AND CRACK TREATMENT
A. Prepare, treat, rout, and fill joints and cracks in substrate according to waterproofing manufacturer's written instructions. Remove dust and dirt from joints and cracks, complying with ASTM D 4258, before coating surfaces. Repoint masonry joints prior to installation of waterproofing.
2. Apply bond breaker between sealant and preparation strip.
3. Prime substrate and apply a single thickness of preparation strip extending a minimum of 3 inches along each side of joint. Apply waterproofing in two separate applications and embed a joint reinforcing strip in the first preparation coat.

3.5 WATERPROOFING APPLICATION
A. Apply waterproofing according to manufacturer's written instructions.
B. Start installing waterproofing in presence of manufacturer's technical representative.
C. Apply primer over prepared substrate.
3.6 FIELD QUALITY CONTROL

A. Engage a site representative qualified by the waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, and application of the membrane, flashings, protection, and drainage components; and to furnish daily reports to Architect.

3.7 CURING, PROTECTION, AND CLEANING

A. Cure waterproofing according to manufacturer's written recommendations, taking care to prevent contamination and damage during application stages and curing.
   1. Do not permit foot or vehicular traffic on unprotected membrane.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 071416
SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Silicone joint sealants.

1.3 PRE-CONSTRUCTION TESTING

A. Pre-construction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
   1. Use ASTM C 794 or manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
   2. Submit not fewer than three pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
   3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
   4. After testing, obtain joint-sealant manufacturer's written instructions for installation, including materials and procedures for cleaning and priming.
   5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

1.4 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.
   1. SWRI Validation Certificate for each sealant specified to be validated by SWRI’s Sealant Validation Program.

B. LEED Submittals:
   1. Product Data for Credit IEQ 4.1: For sealants and sealant primers used inside the weatherproofing system, documentation including printed statement of VOC content.

C. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

D. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

E. Joint-Sealant Schedule: Include the following information:
   1. Joint-sealant application, joint location, and designation.
   2. Joint-sealant manufacturer and product name.
1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

C. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

E. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
   1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
   2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

F. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.
   1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
   2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 719 for adhesion and cohesion under cyclic movement, and indentation hardness to ASTM C 661.

D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
   2. When joint substrates are frost-covered or wet.
   3. Where joint widths are less than 1/4 inch, or below those allowed by joint-sealant manufacturer for applications indicated.
   4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: 10 years or manufacturer’s standard (whichever is longer) from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
   1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
   2. Disintegration of joint substrates from natural causes exceeding design specifications.
   3. Mechanical damage caused by individuals, tools, or other outside agents.
   4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, primers, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Colors of Exposed Joint Sealants: Except where otherwise indicated: As selected by Architect from manufacturer's full range. Separate colors will be selected for each variation in type and color of materials adjacent to joint.

2.2 SILICONE JOINT SEALANTS

A. Sealant JS-S2 - single-component, elastomeric sealant complying with ASTM C920, Type S, Grade NS, Use NT, Class 100/50, a silicone sealant from the following Table that has a current validation certificate from the Sealant, Waterproofing and Restoration Institute (SWRI).
   1. Products: Subject to compliance with requirements, provide:

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Product</th>
<th>Manufacturer Rated Movement Capability [CLASS]</th>
<th>Substrate Primer Required: Yes/No/Test</th>
<th>Mortar*</th>
<th>Anod. Alum.</th>
<th>Uncoated Glass</th>
<th>Other**</th>
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<tbody>
<tr>
<td>Dow Corning</td>
<td>790</td>
<td>+ 100/- 50%</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Test</td>
<td></td>
</tr>
<tr>
<td>May National Associates, Inc.</td>
<td>Bondaflex Sil 290</td>
<td>+ 100/- 50%</td>
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<td>Test</td>
<td>No</td>
<td>Test</td>
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<tr>
<td>Momentive Performance Materials, Inc.</td>
<td>Silpruf LM SCS2700</td>
<td>+ 100/- 50%</td>
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<td>Test</td>
<td>No</td>
<td>Test</td>
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<tr>
<td>Pecora Corporation</td>
<td>890</td>
<td>+ 100/- 50%</td>
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<td>Test</td>
<td>No</td>
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<tr>
<td>Tremco Incorporated</td>
<td>Spectrum 1</td>
<td>+ 100/- 50%</td>
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<td>Test</td>
<td>No</td>
<td>Test</td>
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<tr>
<td>Dow Corning</td>
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<td>± 50%</td>
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<td>Test</td>
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<tr>
<td>Dow Corning</td>
<td>795</td>
<td>± 50%</td>
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<td>Yes</td>
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<td>Test</td>
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<tr>
<td>Dow Corning</td>
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<td>± 50%</td>
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<td>Yes</td>
<td>No</td>
<td>Test</td>
<td></td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Product</td>
<td>Manufacturer Rated Movement Capability</td>
<td>Mortar*</td>
<td>Anod. Alum.</td>
<td>Uncoated Glass</td>
<td>Other**</td>
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<td>Test</td>
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<td>± 50%</td>
<td>Yes</td>
<td>Test</td>
<td>No</td>
<td>Test</td>
<td></td>
</tr>
<tr>
<td>Pecora Corporation</td>
<td>864</td>
<td>± 50%</td>
<td>Yes</td>
<td>Test</td>
<td>No</td>
<td>Test</td>
<td></td>
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<tr>
<td>Pecora Corporation</td>
<td>895</td>
<td>± 50%</td>
<td>Yes</td>
<td>Test</td>
<td>No</td>
<td>Test</td>
<td></td>
</tr>
<tr>
<td>Tremco Incorporated</td>
<td>Spectrum 3</td>
<td>± 50%</td>
<td>Yes</td>
<td>Test</td>
<td>No</td>
<td>Test</td>
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<tr>
<td>Tremco Incorporated</td>
<td>Spectrum 4-TS</td>
<td>± 50%</td>
<td>Yes</td>
<td>Test</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table Notes:
* Indicates substrates with a cement component, such as concrete, that require use of a primer.
** Indicates that other substrates shall be tested for adhesion to determine if a primer will be required.

2.3 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
   1. Do not use open-cell material in horizontal joints.
   2. Open-cell material, if there is reason to believe that it has become wet any time after manufacture, shall not be installed in joints and shall be removed from the Site. If placed in joints, and there is reason to believe that it has become wet before it is protected from weather, it shall be removed and discarded. Procedures for drying wet open-cell material are not acceptable.

C. Bond-Breaker Tape: Polyethylene or Teflon tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable. Duct tape is unacceptable.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Non-staining, non-absorbent material compatible with joint sealants and surfaces adjacent to joints.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

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

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
   1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
   2. Clean porous joint substrate surfaces by brushing, to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
      a. Concrete.
      b. Sandstone Masonry.
   3. Remove laitance and form-release agents from concrete.
   4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Apply the cleaner with clean oil-free, colorless cloths or lint-free paper towels using the two-cloth system. Nonporous joint substrates include the following:
      a. Metal.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Install sealant backing sized for the opening width. Braiding or twisting smaller backings to fit is unacceptable.
   2. Do not leave gaps between ends of sealant backings.
   3. Do not stretch, twist, puncture, or tear sealant backings.
4. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces. Water-based tooling agents are unacceptable.
   3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
   4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
   1. Extent of Testing: Test completed and cured sealant joints as follows:
      a. Perform 1 test for each substrate at location agreed to with COTR.
      a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
   3. Inspect tested joints and report on the following:
      a. Whether sealants filled joint cavities and are free of voids.
      b. Whether sealant dimensions and configurations comply with specified requirements.
      c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
   4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
   5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.
3.5  CLEANING  
   A.  Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6  PROTECTION  
   A.  Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7  JOINT-SEALANT SCHEDULE  
      1.  Joint Locations:  
       b.  Perimeter joints between historic sandstone masonry and chimney caps and counterflashing.  
      2.  Joint-Sealant Color:  To be selected from standard manufacturer color samples.

END OF SECTION