

## SECTION 04915 - MASONRY POINTING

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. General: Provide masonry pointing in accordance with the Contract Documents. The Work of this Section includes, but is not limited to:
  - 1. Preparing and pointing joints in existing marble.
  - 2. Installing new mortar, tooling joints and cleaning excess mortar from rebuilt cast stone.
- B. Related sections include the following:
  - 1. Divisions 4 Sections

#### 1.3 QUALITY ASSURANCE

- A. Restoration Specialist: Award masonry pointing to a firm regularly engaged in pointing masonry on historic buildings that can demonstrate to Owner's satisfaction that, within previous five (5) years, it has successfully performed and completed in a timely manner at least three (3) projects similar in scope and type to required work involving facilities designated as Landmarks by other governmental authorities; or buildings listed on the National Register of Historic Places or on a State Register of Historic Places.
  - 1. Subcontractor: Subcontractors are bound by same requirements as Contractor. No subcontractors shall be employed unless approved in writing by Architect.
  - 2. Foreman: Masonry pointing shall be directly supervised by a full-time foreman with experience equal to or greater than that required of Restoration Specialist. Foreman shall be on site daily for duration of work of this Section. Same foreman shall remain on project throughout work unless his performance is deemed unacceptable.
  - 3. Mechanics: Masonry pointing shall be carried out by a steady crew of skilled mechanics who are thoroughly experienced with materials and methods specified and have a minimum of three years' experience with work on historic buildings similar to that required by this Section. In acceptance or rejection of work of this Section, no allowance will be made for workers'

incompetence or lack of skill.

- B. **Testing of Workers:** Technicians proposed for cutting joints in historic masonry of this Project will be required to successfully complete six linear feet of cutting and raking of mortar joints in presence of Architect prior to working on project. One one-quarter-inch chip of masonry per linear yard will be standard of acceptable skill. Unsuccessful performance in this test area will be grounds for rejection of this technician for this job.
- C. **Source of Materials:** Obtain materials for masonry pointing from a single source for each type of material required to ensure a match in quality, performance, and appearance.
- D. **Field supervised Construction:** Contractor shall notify Architect before beginning masonry pointing work.
- E. **Familiarity with Site Conditions:** Bidders shall visit site prior to bid and carefully examine project scope and conditions that may affect proper execution of work of this Section and determine or verify dimensions and quantities. Contractor's submission of bid shall be acknowledgement that he is thoroughly familiar with project scope and site conditions.
- F. **Restoration of Damaged Masonry Units:** Repair or replace all masonry units damaged during masonry pointing to Architect's satisfaction at no additional cost to Owner.
- G. **Knowledge of Site:** Bidders shall visit site prior to bid and carefully examine project scope and conditions that may affect proper execution of work of this Section and determine or verify dimensions and quantities. Contractor's submission of bid shall be acknowledgment that he is thoroughly familiar with project scope and site conditions.

#### 1.4 SUBMITTALS

- A. **General:** Submit the following in compliance with the requirements of the Conditions of the Contract and specification sections. Revise and resubmit each item as required to obtain Architect's approval.
- B. **Qualification Data:** Submit qualification data for firm and personnel specified in "Quality Assurance" Article that demonstrates that both firm and personnel have capabilities and experience complying with requirements specified. For firm and foreman, provide a list of at least three (3) completed projects within the Boston Metropolitan Region similar in size and scope to work required on this project. For each project list project name, address, architect, conservator, supervising preservation agency, scope of contractor's work, and other relevant information. Submit this information with the bid.
- C. **Mortar Samples:** Samples of all mortars required for work of this Section are to be submitted as required by Restoration Mortar – Section 04901.
- D. **Product Literature:** Manufacturer's published technical data for each product to be use in work of this Section including recommendations for application and use. Include test reports and certificates verifying that product complies with specified

requirements.

- E. Program of Work: Detailed program for joint preparation and pointing of each masonry material and condition. Program for each condition shall include:
  - 1. Description of proposed materials, methods, tools, and equipment to be used.
  - 2. Description, including drawings, outlining proposed methods and procedures for protection of personnel, public, and existing construction during work of this Section.
  - 3. Description of proposed alternate methods and materials (if any) to those specified for any phase of masonry pointing work. Provide evidence of successful use on comparable projects and demonstrate effectiveness for use on this project.
  
- F. Prepare mock-ups as specified in Article "Mock-Ups," below.

#### 1.5 MOCK-UPS

- A. General: Before beginning masonry pointing, prepare mock-ups to provide standards for work of this Section. Do not proceed with masonry pointing until Architect has approved mock-ups.
  - 1. Locate mock-ups as directed by Architect.
  - 2. Notify Architect 48 hours prior to start of each mock-up.
  - 3. Architect will monitor mock-ups. Mock-ups not performed in presence of Architect will be rejected.
  - 4. Use crew that will be executing the work and follow requirements of this Section.
  - 5. Allow mock-ups using mortar to dry for seven days to allow mortar to reach final color and allow potential problems to appear. Notify Architect when mock-ups are ready for review.
  - 6. Repeat mock-ups as necessary to obtain Architect approval.
  - 7. Protect approved mock-ups to ensure that they are without damage, deterioration, or alteration at time of Substantial Completion.
  - 8. Approved mock-ups in undamaged condition at time of Substantial Completion may be incorporated into the Work.
  - 9. Approved mock-ups will represent minimum standards for masonry pointing. Subsequent masonry pointing work that does not meet standards of approved mock-ups will be rejected.
  
- B. Prepare the Following Mock-Ups

1. Pointing of Joints in Masonry: One panel including at least 6 linear feet of joint.
6. Installation of Lead Joint Covers: One location for each profile of joint cover to be installed.
7. Joint Preparation in replacement Cast Stone Unit Masonry: One panel, minimum 9 square feet.
8. Pointing of Joints in replacement Cast Stone Unit Masonry: One panel, minimum 9 square feet.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products and materials to prevent damage, deterioration, or degradation and intrusion of foreign material.
- B. Discard and remove from site deteriorated or contaminated materials and products that have exceeded their expiration dates. Replace with fresh materials.

#### 1.7 PROJECT CONDITIONS

- A. Applicable Regulations: Perform work of this Section following applicable federal, state, and local laws and regulations.
- B. Safety: Protect all persons, whether or not involved in the work of this Section, from harm caused by or resulting from work of this Section.
  1. Lead-Containing Material: Perform all work with materials containing lead in compliance with applicable OSHA regulations, including but not limited to, Lead in Construction and Hazard Communication Standard (Title 29, Sections 1926.62 and 1910.1200, respectively, Code of Federal Regulations, OSHA, US Department of Labor) and with all other applicable federal, state, and local laws and regulations.
- C. Protection of Building and Property
  1. Protect adjacent elements and materials from damage or deterioration during work of this Section. Provide all necessary protection and procedures to protect masonry not being pointed and all other elements and materials.
  2. Repair damage to elements and materials caused by masonry pointing work, using mechanics experienced in the respective type of work, to Architect's satisfaction at no additional cost to Owner.
- F. Protect components of storm drainage systems against damage and blockage caused or accelerated by work of this Section.
- G. Protection from weather: Protect exposed areas of building, including areas of masonry from which mortar has been removed, from penetration by wind, water, or other forces at times when work is not in progress. Cover openings when work is not in progress.

- D. Protection from Fire: Take all necessary precautions to prevent fire or spread of fire.
  - 1. Covers: Membranes, insulation blankets, and other materials used to cover masonry shall be flame retardant and fire resistant.
  - 2. Warming Devices: Heating blankets, infrared heaters, and other warming devices shall be UL approved and inspected for damage before use.
  - 3. Open Flame Heaters: No open flame heaters shall be used to protect finished masonry. Heaters used to warm water or sand for mortar or grout shall be well away from building and from flammable substances.
- E. Dust: Minimize dissemination of dust to greatest extent possible.
  - 1. Contractor shall hold Owner, Architect, and their consultants harmless from all claims relating to dust resulting from work of this Section.
- F. Protection of Masonry Being Pointed: Use all necessary care to protect existing masonry from damage during work of this Section. Take special care in removing existing mortar to ensure that no arrises are damaged, chipped, or broken. Contractor shall replace or repair masonry units damaged by work of this Section as directed by and to complete satisfaction of Architect at no additional cost to Owner.
- G. Staining: Prevent grout or mortar from staining face of masonry to be left exposed. Protect sills, ledges, and projections from mortar droppings. Immediately remove grout or mortar in contact with such masonry. Protect base of walls from rain splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
- H. Protection from Rain: Protect pointed joints with heavy waterproof sheeting from direct attack by rain or other precipitation for at least 24 hours after mortar has been applied.
- I. Contract Drawings: Drawings are two-dimensional representations of three-dimensional objects and do not show all surfaces. Perform work on all surfaces of projections, reveals, ornament, and other elements associated with areas on which work is indicated.
- J. Access for Inspection and Approvals: Provide Architect access on a regular basis to locations on which mock-ups are being carried out, on which work is ongoing, and where work has been completed to allow for inspections and approvals. Provide means of access and safety precautions required to facilitate inspections and approvals.
- K. Protection of Environment: Provide precautions necessary to protect site, site features, surrounding buildings, streets and sidewalks, air, water, and other elements of environment from damage or deterioration caused by work of this Section.

## 1.8 ENVIRONMENTAL CONDITIONS

- A. Cold Weather Masonry Pointing: Cold weather masonry pointing shall adhere to following requirements for work, performed in ambient temperatures indicated, as well as all published guidelines in "Cold Weather Masonry Construction and Protection Requirements," Brick Institute of America, latest edition. In case of conflict, most stringent requirements shall govern. Work shall not be permitted in freezing weather, or when temperature of air or wall is at or below freezing or expected to freeze within 48 hours of work without prior written approval from Architect. No work shall begin when any part of wall or materials in use are frozen or subject to freezing temperatures.
1. Temperature Range 40 deg F to 32 deg F: Heat mixing water or sand to produce mortar between 40 deg F and 120 deg F and maintain above 40 deg F until placed at that temperature.
  2. Temperature Range 32 deg F to 20 deg F
    - a. Heat mixing water and sand to produce mortar between 40 deg F and 120 deg F. Heat grout materials so grout is maintained and placed at a temperature between 40 deg F and 120 deg F. Maintain mortar and grout above freezing until used in masonry.
    - b. For work between 25 deg and 20 deg F, heat and maintain masonry units above 40 deg F if grouting.
  3. Temperature 20 deg F and Below: Heat mixing water and sand to produce mortar between 40 deg F and 120 deg F. Heat grout materials so grout is placed at a temperature between 40 deg F and 120 deg F. Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 deg F. Provide enclosure to heat and maintain temperatures above freezing within enclosure.
- B. Cold Weather Protection of Completed Masonry Pointing Work: Protect completed masonry pointing in the following manner. Temperature ranges indicated apply to anticipated minimum night temperatures.
1. Temperature Range 40 deg F to 32 deg F: Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.
  2. Temperature Range 32 deg F to 20 deg F: Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours, 48 hours for grouted masonry.
  3. Temperature 20 deg F and Below: Except as otherwise indicated, maintain masonry temperature above 32 deg F for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps, or other methods proven to be satisfactory. For grouted masonry maintain heated enclosure to 40 deg F for 48 hours.
- C. Damage Caused by Freezing: Remove masonry pointing work determined by Architect to have been damaged by freezing. Replace to comply with requirements of this Section.

- D. Hot Weather Construction: During hot weather, protect masonry pointing work from premature or too-rapid curing by use of dampened fabric coverings.

## PART 2 – PRODUCTS

### 2.1 TOOLS

- A. Hand Tools for Joint Preparation: Chisels, hammers, and mallets.
  - 1. Thickness of Chisels: Chisels used in masonry joints shall have a maximum thickness of 5/8 times joint width extending back from tip of chisel at least two times depth at which chisel will be inserted into joint.
  - 2. Special Tools: Provide special knives or special thin cutter blades for use in joints less than 1/8 inch in width.
- B. Do not spall edges of masonry units or widen joints. Replace damaged masonry units.
  - 1. Cut out old mortar by hand with a chisel and mallet, unless otherwise indicated.
  - 2. Do not use power-operated grinders without Architect's written approval based on submission by Contractor of a satisfactory quality-control program and demonstrated ability of operators to use tools without damaging masonry. Quality-control program shall include provisions for supervising performance and preventing damage due to worker fatigue.
- C. Brushes: Stiff, natural bristle brushes.
- D. Pointing Trowels: Long, thin pointing trowels narrower than joints being pointed.
  - 1. Fabricate special trowels for masonry pointing if necessary to ensure proper insertion and optimum compaction of mortar.

### 2.2 MORTAR

- A. Follow requirements of Restoration Mortar – Section 04901. Mortar for each type of masonry shall match existing original mortar (in clean condition) in color, texture, and other visual qualities.

### 2.3 MISCELLANEOUS MATERIALS

- A. Lead Joint Covers: Standard shapes of flexible lead strip with contoured top, ribbed underside, and darted anchor shaft specifically produced for protection of masonry joints from weather. Provide WEATHERCAP, by Weathercap, Inc., P.O. Box 776, Slidell, LA 70459-1776 (504) 649-4000. Provide type and size recommended by manufacturer for each joint configuration and width.

## PART 3 – EXECUTION

### 3.1 GENERAL PREPARATION

- A. Examine areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of work. Do not proceed until unsatisfactory conditions have been corrected.
- B. Erect dust impervious barriers and take other measures necessary to prevent dust from traveling beyond work platform before using power grinders, pneumatic chisels, or hand methods that generate airborne dust.

### 3.2 JOINT PREPARATION

- A. Remove mortar from joints to a depth of 3/4 inch or to sound mortar, whichever is greater. In all cases remove all deteriorated, weathered, and loose material.
  - 1. Completely remove mortar from surfaces of masonry units adjoining joint to allow new mortar to bond directly with masonry units.
  - 2. Cut surface of mortar at rear of joint uniform and roughly perpendicular to sides of joint.
- B. Do not damage faces or arrises of masonry units during joint preparation. Cease joint preparation work if, in Architect's judgment, masonry units are damaged. Do not resume work until tools, workers, and methodology have been corrected to ensure that masonry units are not damaged and that work meets standard set by approved mock-up.
- C. Mortar Removal
  - 1. Hand Tools: Use hand tools for removal of mortar from head joints in brickwork, all joints less than 6 inches long, and from other joints in which use of power tools might damage masonry units. Use hand tools to complete mortar removal from joints where power tools have been used to partially remove mortar.
    - a. For narrow joints of 1/8 inch or less in width, rake mortar from joints manually with a sharp knife blade or cutter made for this purpose. Cutter may be used with or without aid of a hammer.
    - b. Sharpen chisels hourly to minimize chipping.
  - 2. Do not spall edges of masonry units or widen joints. Replace damaged masonry units.
    - a. Cut out old mortar by hand with a chisel and mallet, unless otherwise indicated.
    - b. Do not use power-operated grinders without Architect's written approval based on submission by Contractor of a satisfactory quality-control program and demonstrated ability of operators to use tools without damaging masonry. Quality-control program shall include provisions

for supervising performance and preventing damage due to worker fatigue.

- D. Cleaning: Remove loose mortar and foreign material from raked joints using a fine, stiff natural bristle brush. Remove remaining particles, dust, and dirt using filtered, oil-free compressed air. Ensure that dust and dirt are not blown back into previously cleaned joints.
- E. Repair or replace masonry units damaged during joint preparation to Architect's satisfaction at no additional cost to Owner.

### 3.3 MORTAR APPLICATION

- A. Wetting: Thoroughly wet masonry 24 hours prior to and again immediately before masonry pointing. Let surfaces dry slightly. At time of masonry pointing, surfaces shall be damp, so that they do not rapidly absorb moisture, but free of standing water (saturated, surface dry).
  - 1. Failure to Properly Wet Substrate: Evidence that masonry to be pointed has not been properly dampened to prevent too rapid absorption of water from mortar will be cause for Architect to reject pointing work. Remove and replace rejected pointing to meet requirements of this Section at no additional cost to Owner.
- B. Masonry Pointing: Point joints as follows.
  - 1. Using a long, thin masonry pointing trowel, tightly pack mortar into joints in layers not exceeding 1/4-inch thick to fill joint to match original sound joints.
  - 2. Begin by filling areas from which mortar is missing to a depth greater than 3/4 inch in 1/4-inch-thick layers to within 3/4 inch of masonry surface to provide a uniform substrate for final masonry pointing. Fill final 3/4-inch depth continuously and uniformly in 1/4-inch-thick layers.
  - 3. Firmly iron each layer to compact mortar and ensure full bond between mortar and masonry units and a firm, solid joint.
  - 4. Allow each layer to reach thumbprint hardness before applying succeeding layer. Do not let previous layer dry out before applying succeeding layer. Construct uniform joints.
  - 5. Do not spread mortar over edges onto exposed surfaces of masonry units. Do not featheredge mortar.
  - 6. When stopping work at end of each day or for other reasons, stagger layers of mortar so that there will be no through joints in masonry pointing. Stagger joints in layers so that they are at least 3 inches from each other.
  - 7. Where applying new work to that of a prior day, dampen previous work to ensure good bond.

### 3.4 JOINT TOOLING

- A. Tooling: After final layer of mortar is "leather hard," tool joints with a flat rule jointer, or as directed by Architect.
- B. Profile: Tool joints to match original joint profiles as directed by Architect. Solidly compress mortar so that it adheres well to masonry on both sides and forms a dense surface. Premature or late tooling will result in unacceptable finishes that will be rejected.

### 3.5 CURING

- A. Keep newly pointed joints damp for at least 48 hours after mortar has been inserted. Do not apply a direct stream of water to joints for at least 24 hours after mortar has been placed.
- B. Ensure masonry temperature remains as required by specifications until mortar is thoroughly cured.

### 3.6 CLEANING AND REPAIR OF MORTAR JOINTS

- A. Water Washing: Wash pointed masonry with clean filtered water and nonabrasive hand tools to remove mortar debris from masonry surfaces.
  - 1. Wash within 48 hours following completion of masonry pointing.
  - 2. Use blunt-edged wood scrapers, stiff natural bristle brushes, and rough towels along with water to remove mortar debris. Do not use wire brushes.
- B. Repair of Pointed Joints: As cleaning progresses, examine joints to locate cracks, holes, and other defects. Carefully point up and fill such defects with mortar. Where joints are defective in opinion of Architect cut out joints and refill with pointing mortar exercising extreme care to ensure that color matches that of adjacent masonry pointing work. Exposed joint surfaces shall be free from protruding mortar, holes, pits, depressions, and other defects.

### 3.7 INSTALLING LEAD JOINT COVERS

- A. General: Install lead joint covers where necessary following manufacturer's recommendations.
- B. Ensure that joint has been pointed to appropriate depth from surface to allow optimum installation of joint cover.
- C. Prepare surfaces at sides of joint. Clean surfaces free of contaminants that might adversely affect adhesion or performance of sealant.
- D. Install backer rod or bond breaker tape in raked joint. Position so that surface of rod or tape is at least depth of anchor plus 1/4-inch behind surface of masonry.
- E. Protect face of masonry to either side of joint cover location using masking tape or other tested method to prevent sealant from contacting terra cotta surface.

- F. Prime surfaces if recommended by sealant manufacturer. Install sealant to fill joint and project approximately 1/8-inch above masonry surface.
- G. Install joint cover, pressing securely into sealant. Do not join sections of joint cover unless joints exceed maximum length of material.
- H. Remove excess sealant and protection.

### 3.8 CORRECTIVE MEASURES

- A. Should a crack occur in any joint surface or should mortar pull away from masonry unit, remove mortar and repoint following requirements of this Section to Architect's satisfaction.
- B. Should Architect determine that any masonry pointing work does not equal or exceed minimum standard established by accepted mock-up, cut out mortar to a depth of 3/4 inch and repoint following requirements of this Section to Architect's satisfaction.

END OF SECTION 04915