

## **SECTION 04 5000 MASONRY**

### **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 DESCRIPTION OF WORK**

- A. Remove and restore exterior masonry where new cap flashings are being installed.
- B. Prepare and repoint mortar joints.
- C. Prepare and reseal joints in the precast masonry band and the facade control joints.
- D. Install clear water repellant on exterior masonry that has been repointed.
- E. Carefully dismantle and rebuild exterior masonry where indicated.
- F. Install cement based waterproofing on properly prepared surfaces.

#### **1.3 RELATED WORK SPECIFIED ELSEWHERE**

- A. PVC Roofing - Section 07 54 19
- B. Sheet Metal Flashing & Specialties - Section 07 62 00
- C. Roof Accessories - Section 07 72 00

#### **1.4 QUALITY ASSURANCE**

- A. Installer Qualifications:
  - 1. A firm (Installer) with not less than 5 continuous years experience performing masonry work similar to that required for this project, employing skilled personnel.
    - a. The Installer shall directly employ the personnel performing the work of this section.
    - b. The Installer shall have a full time supervisor/foreman on the roof when roofing work is in progress. The Supervisor shall have a minimum of 5 years experience in roofing work similar in nature and scope to this project, and speak fluent English.
  - 2. The Installer shall provide a reference list of at least three projects of comparable size and similar design, within a fifty mile radius of this project, which may be observed by representatives of the Owner:
    - a. The reference list shall include at a minimum, the completion date, a description of the work performed, the Owner's name - contact person - phone number and address and the Architect's name - contact person and phone number.
    - b. The Installer shall provide the reference list prior to contract award if requested.
- B. Material Quality: Obtain each type of material from a single source to ensure consistent quality, color, pattern, and texture.
- C. Pre-Work Conference: Attend the pre-roofing meeting and discuss the following:
  - 1. How masonry work will be performed and coordinated with other work.
  - 2. How the building will be kept watertight as masonry work progresses.
  - 3. The construction schedule, forecast weather, availability of materials, personnel, equipment and facilities needed to proceed and complete the work on schedule.
  - 4. A schedule for Architect and Owner inspections.

#### **1.5 SUBMITTALS**

- A. Submit the following items far enough in advance to obtain approval prior to performing any work on site:
  - 1. Pre-work site and building inspection report with photos, to document conditions before work starts.

2. Manufacturer's literature for all materials, including recommended installation procedures.
  3. Test reports and certifications substantiating compliance with specification requirements.
  4. Samples to show sizes, grade and color, prior to mock-up erection, of each new exposed masonry material. Include the full range of colors and textures needed in the samples.
    - a. Bricks: not less than 4 units.
    - b. Mortar: 6 inch long 1/2 inch wide strips set in metal or plastic channels.
    - c. Anchors: each type of anchor.
  5. Material Safety Data Sheets.
- B. Simultaneously provide all Material Safety Data Sheets needed for this project, for all specification sections - collated by section, in three ring binders. Provide two binders for each building / school.
- C. Simultaneously provide all technical submittals needed for this project, for all technical sections, collated by section.
1. Technical submittals shall be prepared and made by the firm that will perform the actual work.
- D. Payment requisitions will not be processed until all submittals are received and approved.

## **1.6 JOB MOCK UP**

- A. Prepare, in actual job locations, mock-ups of masonry work.
1. For brick rebuilding - provide 4 foot long mockups.
  2. For repointing - provide 2 foot square mockups to show how the joints will be cut, and 2 foot square mockups to show new pointing.
  3. For sealant joints - provide 4 foot long mockups.
- B. Construct each mock up with its associated roof and wall flashings, to show the following:
1. The color, size and type of each masonry unit and mortar used to set it, and quality of workmanship.
  2. The size and spacing of weep holes.
  3. How flashings will be built into the masonry.
  4. Other related materials and their installation techniques to fully establish a quality standard for the work.
- C. The purpose of each mock-up is to establish the minimum acceptable standard of materials and workmanship, and assure that completed work which matches the mock ups will be fully functional and serve the purpose for which it was designed.
- D. Approved mock-ups may be left in place and incorporated into the permanent installation. Rejected mock-ups shall be removed and replaced until approved.
- E. Do not proceed with masonry work until mock-ups are installed, inspected and approved in writing.

## **1.7 DELIVERY, STORAGE AND HANDLING**

- A. Carefully pack, handle, and ship masonry units and accessories strapped together in suitable packs or pallets or in heavy cartons.
- B. Deliver material to the site in the Manufacturer's original and unopened containers and packaging, bearing labels which identify the type and names of the products and Manufacturers. Unload and handle to prevent chipping and breakage.
- C. Protect masonry materials and aggregates during storage and construction from excess wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.
- D. Protect grout, mortar and cement products from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Protect liquid components from freezing.
- E. Do not overload the structure when storing materials on the roof.

## **1.8 GUARANTEE**

- A. Provide a Contractor's written Guarantee which warrants that all work will remain free of material and workmanship defects and in a watertight condition for a five year period beginning upon Final Completion:
  - 1. Defective work includes but is not limited to the following types of failure: leakage, delamination, lifting, loosening, splitting, cracking, and undue expansion.
  - 2. The Contractor's Guarantee shall provide that the Contractor will make the repairs and modifications necessary to enable the work to perform as warranted at his own expense:
  - 3. The Guarantee shall include the removal and replacement of items or materials installed as part of the original work, if removal is needed to affect guaranteed repairs.
- B. Provide one Contractor's Guarantee that covers "all work performed" when a single contract is awarded for work specified in multiple Sections.
- C. The Contractor's Guarantee shall be issued no more than 30 days before the satisfactory completion of punch list work.
- D. The Contractor's Surety Company may add a rider to the Performance Bond which clarifies that Performance Bond Coverage expires two years after Final Completion; i.e., Performance Bond Coverage does not run for the entire five year term of the Contractor's Guarantee.

## **1.9 JOB CONDITIONS**

- A. Perform masonry work only when the air temperature is 40 degrees F and above and will remain so until the masonry has dried, but for not less than 72 hours after completion.
- B. Erect temporary covers over pedestrian walkways and at building entrances and exits which will remain active as the work progresses.
- C. Prevent mortar from staining the face of surrounding masonry and other building surfaces, immediately remove any which falls or spills. Protect sills, ledges and projections from mortar droppings.
- D. Coordinate masonry removal and restoration with the installation of new metal and membrane flashings.

## **PART 2 - PRODUCTS**

### **2.1 MASONRY MATERIALS**

- A. Face Brick: Severe weather (SW) Grade face brick and accessories, including special bricks for corners, and other special shapes, to match the color, surface texture, shape and size of existing adjacent brick.

### **2.2 MORTAR**

- A. General Construction Mortar:
  - 1. Type S, custom colored, non-staining masonry cement containing Type I Portland cement meeting ASTM C150 and Type S hydrated lime meeting ASTM C207.
  - 2. Natural or manufactured sand aggregate selected to match the size, texture, gradation and color of the existing mortar aggregate, meeting ASTM C 144.
  - 3. Clean potable water, free of oils, acids, alkalis and organic matter.
- B. Pointing Mortar:
  - 1. Factory blended Type N masonry cement, aggregate and custom coloring agent, ready to use when mixed with clean potable water, as supplied by Spec-Mix.

### **2.3 MISCELLANEOUS MATERIALS**

- A. Anchors: Fabricated from Type 304 stainless steel to match existing.

- B. Sealant: High performance, solvent free, formulated and moisture curing silyl-terminated polyether sealant, ASTM C-920, Type S, Grade NS, Class 25, NovaLink construction sealant by ChemLink, color as selected.
- C. Backer Rod: Closed cell polyethylene foam, non-absorbent, compressible, chemically inert rod.
- D. Masonry Water Repellent: Cloudy odorless water-based penetrating liquid, UV stable, alkali resistant, translucent floural carbon emulsion, containing no volatile organic compounds: Cathedral Stone Products, Inc. R-97 Water Repellent.
- E. Weeps: Full height head joint inserts formed of a polypropylene honey comb, three-eighths inch thick, Hohmann & Barnard, Inc. #QV Quadro-Vent.
- F. Cement based waterproofing: Natural cement colored paste for application using a 4-knot brush, Thoro System Thoro-Seal.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Carefully perform work so the structural integrity of adjoining masonry is preserved. Simultaneously remove limited sections of existing masonry; support and protect masonry remaining next to and above the removal areas.
- B. Completely remove and replace any existing masonry that moves or if cracks form in the mortar joints or between the masonry units.
- C. Cure all mortar by misting it with water to maintain it in a damp condition for not less than 72 hours. Shield fresh mortar from direct sunlight with wet burlap, and prevent fresh mortar from prematurely drying during the curing period. Remove and replace mortar joints that dry prematurely.
- D. Cut and remove existing masonry using hand and machine methods. Equip each machine with a separate dedicated vacuum. Use each machine manufacturer's blade guard vacuum attachment and control the amount of dust produced so there are no visible plumes.

### **3.2 MORTAR MIXES**

- A. Measurement and Mixing:
  - 1. Measure general construction mortar materials when dry by volume. Do not measure with a shovel, use a pail or similar container.
    - a. Mix mortar using 1 part mortar cement and 3 parts sand aggregate.
    - b. Thoroughly mix cement and aggregate in a clean mechanical batch mixer before adding water; then continue mixing and add only enough water to produce a workable mix. Do not mix mortar by hand.
  - 2. Mix factory blended pointing mortar in a clean mechanical batch mixer, adding only enough water to produce a workable mix. Do not mix mortar by hand.
  - 3. Use mortar within 45 minutes of final mixing; do not re-temper or use partially hardened material.
- B. Mix and install mortar with the same ingredients used to produce the approved mock-up. Do not adjust the color or proportions without written approval. Do not use admixtures of any kind in the mortar unless specifically approved.

### **3.3 BRICK REMOVAL AND REPLACEMENT**

- A. Carefully remove bricks on a piece-by-piece basis. Cut out full units from joint to joint and to permit replacement with full size units. Clean the edges of remaining bricks, to remove all mortar, dust, and loose debris in preparation for rebuilding.
- B. Simultaneously remove limited sections of existing masonry; support and protect masonry remaining next to and above the removal areas.

- C. Install new cap flashings, and wall flashing extensions, properly connected to the existing wall flashings, as indicated on the drawings and specified elsewhere before installing new bricks.
- D. Wet bricks which have initial rates of absorption (suction) greater than 30 grams per 30 square inches per minute, (in accordance with ASTM C 67), to ensure the bricks are nearly saturated with water, but surface dry when laid.
- E. Install new brick to replace removed brick. Fit replacement bricks to match the original bond and course pattern. Use a motor driven diamond blade wet saw to cut bricks with clean, sharp unchipped edges.
- F. Lay replacement brick with completely filled bed, head and collar joints. Butter the ends with sufficient mortar to fill the head joints and shove the bricks into place.
- G. Install new bricks with mortar joints to match the width of the adjoining brick joints. Tool the new joints to match existing joints in surrounding brickwork.

### **3.4 REPOINTING EXISTING MASONRY**

- A. Joint Preparation:
  - 1. Remove existing mortar and foreign material from the mortar joints to a minimum depth of 1 inch, and deeper where needed to expose sound unweathered mortar.
  - 2. Remove mortar from the sides of the joints to provide joints with square backs and to expose the masonry for contact with the pointing mortar. Brush or vacuum the joints to remove dirt and loose debris.
  - 3. Remove mortar and other foreign material from the surface of the masonry at the joint.
  - 4. Do not spall the edges of adjoining masonry or widen the joints. Replace any masonry which is damaged.
- B. Joint Pointing:
  - 1. Rinse the joint surfaces with water to remove dust and mortar particles just prior to repointing. Time the rinse, so when repointing occurs, excess water has evaporated and joint surfaces are damp but free of standing water.
  - 2. Apply pointing mortar in 1/2 inch thick layers, and thoroughly compact each layer before adding the next layer, to completely fill each joint.
  - 3. Slightly recess pointing mortar from the face of the adjoining masonry units. Do not spread mortar on the edges or faces of the masonry. Do not featheredge the mortar.
  - 4. Tool repointed joints to match the appearance of adjoining joints when the mortar is thumbprint hard. Remove excess mortar from the edges of the joints with a soft bristle brush.
- C. Cleaning:
  - 1. Immediately after the mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter using stiff nylon or bristle brushes and clean water, spray applied at low pressure.
  - 2. Do not use metal scrapers or brushes. Do not use acid or alkali cleaning agents.

### **3.5 SEALANT JOINTS**

- A. Carefully remove existing sealant and back up material from within masonry control and expansion joints to a minimum depth of 1-1/2 inches, and from the surface of the masonry at the edges of the joints.
  - 1. Use hand tools and work to avoid damage to the adjoining masonry.
  - 2. Replace adjoining masonry damaged during sealant removal work.
- B. Install new backer rod without puncturing or tearing it, to snugly fill the joint at a depth to yield a sealant joint twice as wide as it is deep.
  - 1. Do not twist backer rods, or install multiple pieces of undersized rod, when the correct size rod is not onsite.
- C. Mask the edges of all joints prior to installing sealant.

1. Push sealant into the joint to completely fill it, tool the sealant to produce a slightly concave, neat recessed joint, and remove joint masking before excess sealant sets.

### **3.6 WATER REPELLENT**

- A. Prepare and clean masonry surfaces to receive water repellent utilizing hand, chemical and pressure water methods as needed to remove all dirt, dust, efflorescence, mold, salt, grease, oil, asphalt, laitance, paint and other foreign materials.
- B. Allow the surface to dry for a minimum of 48 hours at a temperature above 50° F.
- C. Mask and protect adjoining surfaces i.e., the roof, flashings, windows, side walls and site plantings from over spray.
- D. Apply water repellent using a low pressure (15-20 psi maximum) wet fan type nozzle or 1 inch nap roller in a “flooding” application starting at the bottom so the material runs 6 to 8 inches below the points of application.

### **3.7 CLEANING, PROTECTION AND WATERTIGHTNESS**

- A. Conduct an inspection of the interior and exterior of the building and grounds, and submit a written report with photos to document any pre-existing leakage or damage, prior to performing any work.
- B. The Owner will conduct a similar inspection at the completion of the work, and the Contractor will be charged for all leakage or damage which was not documented in the Contractor’s report, or repaired to the Owners satisfaction at the Contractor’s expense.
- C. Provide any equipment, material and labor necessary to protect the site, the building, its contents and occupants, pedestrians, and surrounding landscaped and paved areas from damage due to the construction work or from inclement weather during construction.
- D. Do not perform work during inclement weather. Protect incomplete work and the building from damage by inclement weather which may occur unexpectedly. Make all work areas watertight at the end of each day's work.
- E. Frequently clean up all refuse, rubbish, scrap materials and debris so the work site presents a neat, orderly and workmanlike appearance.
- F. Carefully clean the roof to remove all residual debris when work is complete. After cleaning the roof, thoroughly clean all drain sumps, drain lines, leader heads and leaders. Do not allow debris to enter the drainage system.

**END OF SECTION**