

## SECTION 042000 - UNIT MASONRY

## PART 1 - GENERAL

## 1.1 SECTION REQUIREMENTS

- A. See Division 05 Section "Metal Fabrications" for furnishing steel lintels for unit masonry.
- B. Submittals:
  - 1. Samples for face brick.
  - 2. Material Certificates: For each type of product indicated. Include statements of material properties indicating compliance with requirements.
- C. Comply with ACI 530.1/ASCE 6/TMS 602.
- D. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections required by authorities having jurisdiction.
  - 1. Inspections: Level 1 special inspections according to the IBC.
  - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.

## PART 2 - PRODUCTS

## 2.1 MASONRY UNITS

- A. Concrete Masonry Units (CMU): ASTM C 90; Density Classification, Normal Weight.
- B. Decorative Concrete Masonry Units: ASTM C 90; Density Classification, Normal Weight.
  - 1. Finish: Exposed faces with split-face finish.
  - 2. Integral Water Repellent: ACM Chemistries; RainBloc, BASF Aktiengesellschaft; Rheopel Plus, or Grace Construction Products, W. R. Grace & Co. - Conn.; Dry-Block.
  - 3. Special shapes for sills, lintels, corners, jambs, sash, control joints, and other special conditions.
- C. Concrete Lintels: Precast units matching concrete masonry units and with reinforcing bars indicated or required to support loads indicated.
- D. Face Brick: ASTM C 216, Grade MW or SW, Type FBX.
  - 1. Products:
    - a. Submit brick samples from three sources matching the existing brick, for Architect's selection.
  - 2. Size: To match dimensional characteristics of existing brick.
  - 3. Solid brick with exposed surfaces finished for ends of sills and caps.
  - 4. Special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

## 2.2 MORTAR AND GROUT

- A. Mortar: ASTM C 270, proportion specification.
  - 1. Use portland cement-lime or masonry cement mortar.
    - a. At Face Brick locations, match existing in color and composition.

2. Do not use calcium chloride in mortar.
  3. For masonry below grade or in contact with earth, use Type M.
  4. For reinforced masonry, use Type S.
  5. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions, and for other applications where another type is not indicated, use Type N.
  6. Water-Repellent Additive: For mortar used with concrete masonry units made with integral water repellent, use product recommended by manufacturer of units.
- B. Grout: ASTM C 476 with a slump of 8 to 11 inches.

### 2.3 REINFORCEMENT, TIES, AND ANCHORS

- A. Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.
- B. Joint Reinforcement: ASTM A 951.
1. Coating: Hot-dip galvanized at both interior and exterior walls.
  2. Wire Size for Side Rods: 0.187-inch diameter.
  3. Wire Size for Cross Rods: 0.187-inch diameter.
  4. Wire Size for Veneer Ties: 0.187-inch diameter.
  5. For single-wythe masonry, provide either ladder design or truss design.
  6. For multiwythe masonry, provide ladder design with three side rods.
- C. Veneer Anchors: Hot-dip galvanized steel, two-piece adjustable masonry veneer anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to studs, and acceptable to authorities having jurisdiction.

### 2.4 EMBEDDED FLASHING MATERIALS

- A. Sheet Metal Flashing: Copper, 10-oz./sq. ft. weight or 0.0135 inch thick for fully concealed flashing, 16-oz./sq. ft. weight or 0.0216 inch thick elsewhere.
- B. Laminated Flashing: Copper sheet 7 oz./sq. ft., bonded with asphalt between two layers of glass-fiber cloth. Use only where flashing is fully concealed.

### 2.5 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded strips complying with ASTM D 1056, Grade 2A1.
- B. Preformed Control-Joint Gaskets: Designed to fit standard sash block and to maintain lateral stability in masonry wall; made from styrene-butadiene rubber or PVC.
- C. Weep Holes: Round polyethylene tubing, 3/8-inch OD with cotton or polyester rope, 1/4 to 3/8 inch in diameter, 24 inches long.
- D. Extruded-Polystyrene Board Insulation: ASTM C 578, Type IV or X.
- E. Proprietary Acidic Masonry Cleaner: Product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units.

## PART 3 - EXECUTION

## 3.1 INSTALLATION, GENERAL

- A. Cut masonry units with saw. Install with cut surfaces and, where possible, cut edges concealed.
- B. Mix units for exposed unit masonry from several pallets or cubes as they are placed to produce uniform blend of colors and textures.
- C. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- D. Stopping and Resuming Work: Rack back units; do not tooth.
- E. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- F. Build non-load-bearing interior partitions full height and install compressible filler in joint between top of partition and underside of structure above.
- G. Tool exposed joints slightly concave when thumbprint hard unless otherwise indicated.
- H. Keep cavities clean of mortar droppings and other materials during construction.

## 3.2 LINTELS

- A. Install lintels where indicated.
- B. Minimum bearing of 8 inches at each jamb unless otherwise indicated.

## 3.3 FLASHING AND WEEP HOLES

- A. Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated.
- B. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing before covering with mortar.
  - 1. Extend flashing 4 inches into masonry at each end and turn up 2 inches to form a pan.
- C. Trim wicking material used in weep holes flush with outside face of wall after mortar has set.

## 3.4 CLEANING

- A. Clean masonry as work progresses. Remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly cured, clean exposed masonry.
  - 1. Wet wall surfaces with water before applying acidic cleaner, then remove cleaner promptly by rinsing thoroughly with clear water.
  - 2. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

END OF SECTION 042000

## SECTION 042113 – MASONRY RESTORATION

## PART 1 - GENERAL

## 1.1 SCOPE OF WORK

## A. GENERAL STATEMENT:

1. Coordinate all work closely with Owner / Owner's Representative to minimize interference with operation of the facility, inclusive of all materials and effluent utilized and treated during cleaning operations. Work will be performed where and as directed by the Owner / Owner's Representative, and as identified in the specifications and drawings, in strict accordance with the various material manufacturer's installation, instruction requirements and recommendations for all work to be performed.
2. Closely inspect any uncovered condition and alert Owner / Owner's Representative to any condition which may interfere with the performance of the new materials.
3. All work and activities shall be completed in such a manner to provide Owner with a watertight system.

## B. INTENT OF SPECIFICATION:

1. Work of this section shall provide Owner with a functional weathering surface by applying masonry restoration materials and appropriate building sealants to ensure a weathertight exterior.

## C. WORK INCLUDES:

1. Masonry tuck pointing at chimneys above the level of the roof.
2. Brick replacement and repair at the masonry walls screening the air cooled condensers on the west side of the north and south wings.
3. Removal of brick masonry coping at the areaways on the north side of the north wing and south side of the south wing, and replacement with a new precast concrete coping.
4. The masonry chimney caps shall be remediated and a waterproof coating shall be applied per this section and the project drawings.

## 1.2 STANDARD REFERENCES

- A. Portland Cement Association, manuals and handbooks.
- B. Masonry Cement - American Society for Testing and Materials (ASTM) C-91.
- C. Portland Cement - ASTM C-150 (Types I, IA, II, IIA, III, or IIIA).
- D. Blended Hydraulic Cement - ASTM C-595 (Types IS, IS-A, IP, IP-A, I (PM), or I (PM) - A.
- E. Hydrated Lime for structural uses - ASTM C-5.
- F. Sand - ASTM C-144.

## 1.3 PRODUCT DELIVERY, HANDLING AND STORAGE

- A. Deliver, handle, and store all materials as recommended by the manufacturer and in such a manner as to prevent damage. All product delivered to the site shall be in original unopened containers or wrappings.

- B. Schedule delivery materials required so as not to delay work.
- C. For roof top storage, average live loads on the roof during the work shall not exceed twenty (20) pounds per square foot at any time.

#### 1.4 QUALITY ASSURANCE

- A. Engage a single masonry restoration firm for all components and aspects of Section 04 21 13, Masonry Restoration. This firm must have not less than five (5) years of experience in masonry restoration.
- B. All construction personnel i.e., masons, laborers, journeymen, etc. shall conform to the qualification standards established. In general, all field personnel must have successfully completed or currently be part of an approved registered training program and shall have status as journeymen with only 25% apprentices on site or as local labor jurisdictions allow.
- C. Submit proof of certification of approved applicator as required by this section by the specified manufacturers with the bid. Failure to provide this information may constitute a non-responsive bid (required for sealants and water repellent).

#### 1.5 WARRANTIES

- A. Provide a minimum one (1) year warranty for labor and materials for items as detailed below:
  - 1. Brick repair and replacement
  - 2. Mortar repair and replacement
  - 3. Surface coatings
- B. Provide a manufacturer's extended warranty for the water repellent (ten (10) year labor and material warranty).
- C. Provide a written manufacturer's extended warranty for all sealants to be used (three (3) year labor and material warranty).

### PART 2 - PRODUCTS

#### 2.1 MORTAR FOR MORTAR JOINT REPAIR AND UNIT REPLACEMENT

- A. The following mortar mix shall be utilized for all repair and replacement of building mortar joints as well as the replacement and resetting of stone or masonry.
  - 1. Portland Cement - ASTM C-150, Type I
  - 2. Hydrated Lime - ASTM C-207, Type S
  - 3. Aggregates for Mortar - ASTM C-144
  - 4. Colored Mortar Pigment - Use colored aggregates to desired mortar color. If appropriately colored aggregates are not available for desired mortar color, use colored mortar pigments made from metallic oxides. Use the minimum quantity of pigments that will produce the desired results. The maximum permissible quantity of metallic oxide pigments is 10% of the cement content by weight.
  - 5. The color of the mortar shall match the existing mortar on the building.
  - 6. Water - Clean, free of oils, acids, alkalis, and organic matter.

## 2.2 CHIMNEY CAP COATINGS AND SEALANTS

- A. Primer Coat. Products:
  - 1. Eco-Fast II Primer, Carlisle Coatings & Waterproofing, Wylie, Texas
  - 2. Vulkem #171, Tremco – Sealant/Weatherproofing, Beachwood, Ohio
  - 3. Qualipur 152, Advanced Polymer Technology, Harmony, Pennsylvania
- B. Base Coat. Products:
  - 1. Eco-Fast 601/T, Carlisle Coatings & Waterproofing, Wylie, Texas
  - 2. Vulkem 360 NF, Tremco – Sealant/Weatherproofing, Beachwood, Ohio
  - 3. Qualipur 252, Advanced Polymer Technology, Harmony, Pennsylvania
- C. Top Coat. Products:
  - 1. Eco-Fast II – Intermediate/Interior Top Coat, Carlisle Coatings & Waterproofing, Wylie, Texas
  - 2. Vulkem 351 NF, Tremco – Sealant/Weatherproofing, Beachwood, Ohio
  - 3. Qualipur 372, Advanced Polymer Technology, Harmony, Pennsylvania
- D. Detail Coat
  - 1. Eco-Fast 601/T, Carlisle Coatings & Waterproofing, Wylie, Texas
  - 2. Vulkem 160 NF, Tremco – Sealant/Weatherproofing, Beachwood, Ohio
  - 3. Qualipur 252, Advanced Polymer Technology, Harmony, Pennsylvania
- E. Sealant
  - 1. CCW-201, Carlisle Coatings & Waterproofing, Wylie, Texas
  - 2. Vulkem 227 Sealant, Tremco – Sealant/Weatherproofing, Beachwood, Ohio

## 2.3 MASONRY WATER REPELLENTS

- A. All brick and mortar repairs to chimneys above the level of the roof to receive one (1) flood coat at the manufacturer's specified rate.
  - 1. Use water repellants specified in Section 071916.

## 2.4 MASONRY JOINT SEALERS

- A. Install sealants, back-up material, etc. in such a way as to not damage or deface surrounding substrates.

## 2.5 URETHANE SEALANTS

- A. Sealants shall conform to ASTM C-920 Type M, Grade NS, Class A, such as:
  - 1. Dymeric - As manufactured by Tremco
  - 2. Chemcaulk 900 - As manufactured by Bostik
  - 3. Or approved equal materials. If materials from other manufacturers are proposed, supporting technical literature, drawings, performance data, and manufacturer's written endorsement of this specific product for use under job conditions must be submitted with the bid for comparison.

## 2.6 MODIFIED SILICONE SEALANT

- A. Sealants shall conform to ASTM C-920 Type S, Grade NS, Class A, such as:

1. Dow 795 - As manufactured by the Dow Chemical Company
2. Or approved equal materials. If materials from other manufacturers are proposed, supporting technical literature, drawings, performance data, and manufacturer's written endorsement of this specific product for use under job conditions must be submitted with the bid for comparison.

## 2.7 BACKER MATERIAL

- A. Backer material shall be a closed-cell polyurethane backer rod as manufactured by:
1. Sof-rod Corporation
  2. Or approved equal materials. If materials from other manufacturers are proposed, supporting technical literature, drawings, performance data, and manufacturer's written endorsement of this specific product for use under job conditions must be submitted with the bid for comparison.

## 2.8 BRICK REPLACEMENT UNITS

- A. All replacement units shall match the original brick units in color, size, surface and texture. Use brick units specified in Section 042000.
- B. Use industry standard ties for securing to masonry backup.

## 2.9 REJECTED MATERIALS

- A. The Owner's Representative shall have the right to inspect all materials brought to or stored at the job site. Those materials which do not comply with the above requirements shall be removed from the Owner's premises within two (2) hours of verbal notification to the person designated by the Contractor to be the lead on site supervisor. The verbal notification will be by the Owner's Representative, which will be followed by written confirmation.

## PART 3 - EXECUTION

### 3.1 MORTAR JOINT REPAIR

- A. Removal and Replacement of Defective Mortar Joints
1. Defective mortar joints on this building are defined as those where the mortar joint is weathered back from the original contour one-fourth inch (1/4") or greater, if a fracture exists on one side of the mortar joint and the width is greater than one-thirty-seconds of an inch (1/32"), if hair line cracks exist on both sides of the mortar joint or if the mortar joint is missing.
  2. These deteriorated mortar joints shall be carefully removed by hand method or with the use of a small grinder so as not to damage the stone / terra cotta / pre-cast panel.
  3. Mortar shall be removed to a depth of two and one-half (2-1/2) times the width of a joint but not less than three-fourths inch (3/4") or to a depth of sound mortar, whichever is greater.
  4. All evacuated joints shall be blown clean and repointed with a proper mortar material to a configuration matching the adjacent joints.
  5. Damage to the limestone, bricks or any mortar material smeared on the limestone or brick is not acceptable. Damage or smears shall be removed and remedied at the Contractor's expense.

### 3.2 CHIMNEY CAP REMEDIATION

- A. Prepare and clean all cracks one-sixteenth of an inch (1/16") or less. Apply a 30-mil thickness (wet mils) of Detail Coat over the crack a minimum of six inches (6") wide centered over the crack.
- B. Cracks greater than one-sixteenth of an inch (1/16") and less than one-half inch (1/2") shall be ground to a depth of one-half inch (1/2") and a width of one-quarter of an inch (1/4"). A backer rod installed and a sealant applied to the joint. Once the sealant has cured, apply a Detail Coat over the crack a minimum of six inches (6") wide centered over the crack.
- C. Prepare all detail work per the attached details and the manufacturer's recommendations.
- D. Apply the Primer Coat at the rate recommended by the coating manufacturer. The coatings shall cover all exposed concrete.
- E. Apply the Base Coat to a thickness of 30 mills (wet).
- F. Apply the Top Coat to a thickness of 15 mills (wet). Broadcast 20 – 4 mesh clean sand at a rate of approximately 50 pounds per 100 square feet into the uncured coating. Allow the coating to cure and remove excess sand.
- G. Apply another application of Top Coat to a thickness of 15 mills (wet).

### 3.3 BRICK WATER REPELLENT

- A. Assure that all masonry, patching materials, and mortar materials have cured sufficiently in accordance with the manufacturer's directives.
- B. Perform sample test areas in order to determine the appropriate application rate. For bidding purposes, use an estimated application rate of 100 square feet per gallon based on the net square footage of the building.
- C. Apply the specified dampproofing material at the specified rate to all specified surfaces according to the written manufacturer's recommendations.
- D. Provide on-site company representation from the manufacturer in order to obtain full manufacturer's ten (10) year labor and material warranty.

### 3.4 MASONRY JOINT SEALERS

- A. Skyward Facing Joints
  1. Skyward facing joints are those horizontal joints at all stone joint locations such as coping stone, sills, trim belts, etc.
  2. All skyward facing joints shall be treated as follows:
    - a. Remove all existing sealant and/or mortar to a depth of three-fourths inch (3/4").
    - b. Clean out all evacuated joints and install bond breaker material.
    - c. Install modified urethane sealant at a joint design if depth equals one half the width of the joint (See 2.5 Modified Silicone Sealant).
    - d. The finished joint design should be of a convex shape. Taping along either side of the joint may be required to assure neatness.

- B. Treatment of Surface Wash Joints
    1. Wash joint surfaces are those joints which are in a wash plane of such items as sills, trim belts, decorative protrusion, etc.
    2. Remove all existing sealant and/or mortar to the minimum depth of three-eighths inch (3/8").
    3. Clean the evacuated joint and install bond breaker material.
    4. Neatly install urethane sealant to proper joint configuration and strike flush with the adjacent surfaces.
    5. Forcibly impinge aggregate into the wet sealant to make these areas appear mortar like.
  
  - C. Static and Dynamic Fracture Repair
    1. All static and dynamic fractures shall be routed to a "V" configuration and neatly filled with a small bead of urethane sealant.
    2. Following the application of the urethane sealant, an aggregate will be forcibly impinged into the wet sealant to make the areas appear mortar like.
    3. The sealant and the color of the aggregate shall be custom blended in order to match the surrounding substrate.
  
  - D. Wall Protrusions
    1. All miscellaneous wall protrusions shall be carefully sealed, utilizing urethane sealant followed by forceful impingement of aggregate into the wet sealant, custom blended to match the surrounding substrate.
  
  - E. Horizontal Ledging Joints
    1. Install urethane sealant at a 45-degree slope at all horizontal ledging joints.
    2. Forcibly impinge aggregate into the sealant custom blended to match the existing mortar joint or reface color.
  
  - F. Dynamic Fracture Repair
    1. All dynamic building fractures shall be raked out, packed as necessary, and have the proper urethane sealant installed.
    2. All sealants shall be installed with a design configuration of the depth equaling one half the width of the joint.
    3. After sealant installation, aggregates shall be firmly embedded in the sealant.
    4. The combination of sealant, color and aggregate shall match the substrate as closely as possible. Samples of this operation must be performed on site for approval.
- 3.5 BRICK MASONRY REPAIR
- A. Protect surrounding wall sections. Remove individual or grouping of bricks. Provide clean, sharp, unchipped edges and a clean cavity.
  - B. Lay out brick pattern to duplicate the existing pattern and maintain the same profile as the stable brick veneer.
  - C. Mortar for unit masonry to comply with ASTM C-270. Point up all joints to provide a neat, uniform appearance to match the existing joint design.
  - D. Final cleaning shall include removal of large mortar particles and a job mix detergent solution to meet "BIA Technical Note No. 20, Revised."

### 3.6 COMPLETION

- A. Correction of Work - Work which does not conform to specified requirements including tolerances, slopes and finishes shall be corrected and/or replaced as directed by Owner/Owner's Representative at Contractor's expense without extension of time. Therefore, Contractor shall also be responsible for cost of correction to any work affected by or resulting from corrections to work of this section.
- B. Site clean-up, including both interior and exterior building areas that have been affected by the Contractor, shall be restored.
- C. All landscaped areas affected by construction activities shall be raked clean, seeded, or restored to preconstruction condition.
- D. All manufacturer's on-site inspection reports shall be submitted prior to final payment.
- E. All guaranties, as required in Part 1 of this specification, shall be submitted for approval prior to final payment.

END OF SECTION 042113