SECTION 04600

UNIT MASONRY

PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
2. Follow all provisions of ACI 530-88 unless a more rigid requirement is shown in this section
3. Note: The term "Engineer" refers to the Town of Collierville City Engineer and the term "Owner" refers to the Town of Collierville.

B. DESCRIPTION OF WORK:

1. Extent of each type of masonry work is indicated on drawings and schedule.
   a) Furnishing and installation of miscellaneous masonry accessories, including anchors and horizontal reinforcing, except furnishings only of masonry accessories to be built-in to work of other sections.

C. QUALITY ASSURANCE

1. Codes: Comply with the applicable requirements of governing authorities and codes for the types of masonry construction shown.
2. Coordination: Review installation procedures and coordinate with other work that must be integrated with masonry.
3. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
4. Single Source Responsibility for mortar Materials: Obtain mortar ingredients or uniform quality, including color for exposed masonry, from one manufacturer for each cementious component and from one source and producer for each aggregate.
5. Field Constructed Mock-Ups: Prior to installation of masonry work, erect sample wall panels to further verify selections made for color and textural characteristics, under sample submittals of masonry units and mortar, and to represent completed masonry work for qualities of appearance, materials and construction; built mock-ups to comply with the following requirements:
   a) Locate mock-ups on site in locations indicated or, if not indicated, as directed by Engineer.
   b) Build mock-ups for the following types of masonry in sizes of approximately 4' long by 4' high by full thickness, including face and back up as well as accessories for each type of exposed unit masonry work.
   c) Retain mock-ups during construction as standard for judging completed masonry work. When directed, demolish mock-ups and remove from site.

D. SUBMITTALS

1. Product Data: Submit manufacturer's product data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements.
2. Samples for Verification Purposes: Submit the following samples:
   a) Unit masonry samples for each type of exposed masonry unity required; include in each set the full range of exposed color and texture to be expected in completed work.

      1) Include size variation data verifying that actual range of sizes for brick falls within ASTM C216 dimension tolerances for brick where modular dimensioning is indicated.
      2) Colored masonry mortar samples for each color required showing the full range of color, which can be expected, in the finished work. Label samples to indicate type and amount of colorant used.

E. DELIVERY, STORAGE, AND HANDLING

1. Deliver masonry materials to site in undamaged condition.
2. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.
3. Store cementious materials off the ground, under cover and in dry location.
4. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

F. PROJECT CONDITIONS

1. Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.
2. Extend over a minimum of 24 inches down both sides and hold cover securely in place.
3. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed. Remove immediately grout of mortar in contact with such masonry.
4. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
5. Weather Protection:
   a) Do not lay masonry units, which are wet or frozen.
   b) Remove any water formed on masonry bed by carefully applying heat until top surface is dry to the touch.
   c) Remove masonry damaged by conditions.
6. Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperature existing at time of installation except for grout. For grout, temperature ranges apply to anticipate minimum night temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10°F. (6°C.)
   a) 40°F. (4°C) to 32°F. (0°C).

      1) Mortar: Heat mixing water to produce mortar temperature between 40°F. (4°C.), and 120°F. (49°C).

2) Grout: Follow normal masonry procedures.
3) Protect completed masonry and masonry not being worked on in the following manner. Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry. For grouted masonry, temperatures ranges apply to anticipate minimum night temperatures.

PART 2 PRODUCTS

A. BRICK MADE FROM CLAY OR SHALE:

1. General: Comply with referenced standards and other requirements indicated below applicable to each form or brick required.
   a) Brick Selection: 'Prinction' by Henry Brick Company – modular size.

B. MORTAR AND GROUT MATERIALS:

1. Portland Cement: ASTM C 150, Type 1. Provide natural color or white cement as required to produce required buff mortar color as per Architect.
2. White Mortar Aggregates: Natural white sand or ground white stone.
3. Aggregate for Grout: ASTM C 404
4. Colored Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigmented with record of satisfactory performance in masonry mortars.
5. Available Products: Subject to compliance with requirements, colored mortar pigments which may be incorporated in the work include, but are not limited to, the following: Color for brick veneer shall be as selected by Architect. Submit sample for final approval.
6. Clean and potable.

C. JOINT REINFORCEMENT AND ANCHORING DEVICES

1. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement and anchor for size and other characteristics.

   a) Zinc-coated (galvanized) Steel wire: ASTM A 82 for uncoated wire and with ASTM C 641 for zinc coating.
   b) Hot-dip Galvanized Steel Wire: ASTM A 82 for uncoated wire with ASTM A 123, Class B-2 (1.5 oz per sq. ft. of wire surface) for zinc coating applied after prefabrication into units.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
   a) AA Wire Products Co.
   b) Dur-O-Wall, Inc.
   c) Heckman Building Products, Inc.
   d) Hohmann & Barnard, Inc.
   e) Masonry Reinforcing Corp. of America
   f) National Wire Products, Corp.

D. MISCELLANEOUS MASONRY ACCESSORIES

1. Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60 for bars No. 3 to No. 18.
2. Non-Metallic Expansion Joint Strips: Premolded, flexible cellular neoprene rubber filler strips complying with ASTM D 1056, Grade RE41E1, capable of compression up to 35%, of width and thickness indicated.
3. Weepholes: Unless otherwise indicated, provide open heads weep joints. Locations indicated on the drawings.

E. MASONRY CLEANERS

1. Job-Mixed Detergent Solution: Solution of trisodium phosphate (½ cup dry measure) and laundry detergent (½ cup dry measure) dissolved in one gallon of water. Confirm proposed brick cleaning with manufacturer's standard requirements prior to initiating cleaning.

F. MORTAR AND GROUT MIXES

1. General: Do not admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellant agents, anti-freeze compounds or other admixtures, unless calcium chloride in mortar or grout.
2. Mixing:Combine and thoroughly mix cementious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.
3. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar require, unless otherwise indicated
   a) Limit cementious materials in mortar to Portland cement-lime.
   b) Use Type M mortar for masonry below grade and in contact with earth.
   c) Use type 5 mortar for reinforced masonry.
   d) Use Type 5 mortar for exterior, above grade load bearing walls; for interior load bearing walls; and for other applications where another type is not indicated.
4. Colored Pigmented Mortar: Select and proportion pigments with other ingredients to provide color required. Do not exceed pigment-to-cement ratio of 1-to-10, by weight.

PART 3 EXECUTION

A. INSTALLATION, GENERAL

1. Cleaning Reinforcing: Before placing, remove loose rust, and other coatings from reinforcing.
2. Thickness: Build cavity and composite walls, and other masonry construction to the full thickness of the masonry units, using units or nominal thickness indicated.
3. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.

4. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.
   a) Use dry cutting saws to cut concrete masonry units.

B. CONSTRUCTION TOLERANCES

1. Variation from Plumb: For vertical lines and surfaces of walls, shall not exceed ¼" in 10', or 3/8". For external corners, expansion joints, control joints and other conspicuous lines, do not exceed ¼". For vertical alignment of head joints do not exceed plus or minus ¼".
2. Variation from Level: Bed joints and horizontal grooves shall not exceed ¼" maximum.
3. Variation in Cross-Sectional Dimensions: Thickness of walls, from dimensions shown, do not exceed minus ¼".
4. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to ½". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

C. LAYING MASONRY WALLS

1. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, and wherever possible at other locations.
2. Lay-up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.
3. Pattern Bond: Lay exposed masonry in the bond pattern shown or, if not shown, lay in running bond with vertical joint in each course centered on units in courses above and below. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2". Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4" horizontal face dimensions at corners.

D. MORTAR BEDDING AND JOINTING

1. Lay solid brick size masonry units with completely filled bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.
2. Maintain joint widths shown, except for minor variations required to maintain bond alignment.
3. Cut joints flush for masonry walls, which are to be concealed or to be covered by other materials, unless otherwise indicated.
4. Tool exposed joints slightly concave using a jointer larger than joint thickness, unless otherwise indicated.
5. Remove masonry u nits disturbed after laying clean and reset in fresh mortar. Do not pound corners to shift adjacent stretcher units, which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

E. CAVITY WALLS

1. Keep cavity clean of mortar droppings and other materials during construction. Strike joints facing cavity flush.

F. CONTROL AND EXPANSION JOINTS

1. General: Provide vertical and horizontal expansion, control and isolation joints in masonry.
2. Build flanges of metal expansion strips into masonry. Lap each joint 4" in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints.
3. Build flanges of factory-fabricated expansion joints units into masonry.

G. FIELD QUALITY CONTROL

1. Contractor shall employ, at his own expense, a testing laboratory experienced in performing types of masonry field quality control tests for masonry indicated. Comply with requirements for qualification and acceptance of testing laboratory specified in Part 1 for pre-construction testing service.
2. Unit Test Method
   a) Brick tests: For each type and grade of brick indicated, test units by methods of sampling and testing of ASTM C 67 except select 5 bricks at random for each 100,000 units or fraction thereof installed.
   b) Mortar Tests: For each type indicated, test mortar by methods of sampling and testing of ASTM C 780. Conduct tests no less frequently than required to evaluate mortar used to install each increment of masonry units indicated above from which samples are taken for testing.
3. Report test results in writing and in form specified under each test method, to Engineer and Contractor, on same day tests are made.
4. Evaluation of Quality Control Tests: Masonry work, in absence of other indications of noncompliance with requirements, will be considered satisfactory if results from construction quality control tests comply with minimum requirements indicated.
5. Field Quality Control methods described shall be provided by the Contractor if Owner or Owner's representative has reason to question the quality of the materials used or proposed to be used. Should the material be found to be less than that specified, the Contractor shall pay for the testing used to identify the inferior material.

H. REPAIR, POINTING AND CLEANING

1. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.
2. Pointing: During the tooling of joints, enlarge any voids or holes, except Weepholes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.

3. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:
   a) Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
   b) Test cleaning methods on sample wall panel; leave ½ panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
   c) Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film or waterproof masking tape.
   d) Saturate wall surfaces with water prior to applications of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
   e) Use bucket and brush hand cleaning method described to clean brick masonry made from clay, except use masonry cleaner indicated below.
      (1) Detergent.
4. Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins .
5. Protection: Provide final protection and maintain conditions in a manner acceptable to installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

END OF SECTION