SECTION 04 22 00

CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.01 RELATED SECTIONS

A. Division 1 Sections

B. Section 032000 – Concrete Reinforcement.

C. Section 033000 – Cast-in-Place Concrete.

D. Section 042000 – Unit Masonry.

1.02 REFERENCES

TMS 602 – Specification for Masonry Structures.

ASTM A82 – Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

ASTM A615 – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

ASTM A951 - Standard Specification for Steel Wire for Masonry Joint Reinforcement

ASTM C90 – Standard Specification for Loadbearing Concrete Masonry Units.

ASTM C109 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. Cube Specimens).

ASTM C140 – Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.

ASTM C144 – Standard Specification for Aggregate for Masonry Mortar.

ASTM C270 – Standard Specification for Mortar for Unit Masonry.

ASTM C404 – Standard Specification for Aggregates for Masonry Grout.

ASTM C476 – Standard Specification for Grout for Masonry.

ASTM C1019 – Standard Test Method for Sampling and Testing Grout.

ASTM C1314 – Standard Test Method for Compressive Strength of Masonry Prisms.

ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications.

ASTM D2287 – Standard Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds.

1.03 SUBMITTALS

A. Refer to Structural Quality Assurance Plan in Structural Drawings for additional submittal requirements.

B. Submit coarse grout mix design.

C. Shop Drawings: Submit for masonry reinforcement complying with Section 032000.

D. Submit procedures for construction of masonry walls to be filled with coarse grout. Procedures should include low lift grouting as applicable to Project.

1.04 QUALITY ASSURANCE

A. Masonry construction and materials shall conform to all the requirements of TMS 602, except as modified by the requirements of the Construction Documents.

B. Refer to the Structural Quality Assurance Plan in the Structural Drawings.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store materials in a dry condition to protect from elements and prevent contamination, deterioration, or damage due to moisture, temperature changes, contaminants, corrosion, and other causes.

PART 2 - PRODUCTS

2.01 CONCRETE MASONRY

A. Specified Compressive Strength, f'm: See Structural Notes in the Structural Drawings.

2.02 CONCRETE MASONRY UNITS

A. Concrete masonry units: Comply with ASTM C90.

B. Weight: Lightweight.

C. Net Area Compressive Strength of unit: As listed in Table 2 of TMS 602 required for the specified f'm.

D. Face Dimensions: 16" long x 8" high nominal, unless indicated otherwise.

E. Special shapes: Where indicated on the Drawings.

F. Fire Rating: Where indicated in the Architectural Drawings, provide concrete masonry units that comply with the specified fire ratings.

2.03 MORTAR

A. Mortar: Type M or Type S in accordance with ASTM C270. Refer to Structural Drawings for locations.

B. Do not use admixtures that contain chlorides.

2.04 COARSE GROUT

A. Coarse Grout: In accordance with ASTM C476.

B. Compressive Strength: See Structural Notes in the Structural Drawings.

C. Slump: 8 and 11 inches.

D. Do not use admixtures that contain chlorides.

2.05 WATER

A. Water: Clean potable water free of deleterious substances.

2.06 REINFORCEMENT

A. Horizontal and Vertical Reinforcing Bars: Comply with Section 032000.

2.07 HORIZONTAL JOINT REINFORCEMENT

A. Horizontal Joint Reinforcement: Manufactured with longitudinal, parallel, deformed side wires in accordance with ASTM A951 and of the size specified in the Structural Drawings. Cross wires shall be No. 9 gage, plain, in accordance with ASTM A82, unless noted otherwise in Structural Drawings.

B. Provide as a minimum, one side wire for each face shell of hollow masonry units. Provide additional side wires or eye sections for adjustable wall ties as specified for multiwythe wall construction.

C. Ladder type reinforcement shall be used in walls with vertical reinforcement.

D. Finish: Hot-dipped galvanized in accordance with ASTM A153, Class B-2.

E. Provide prefabricated corner and tee section accessories.

2.08 CONTRACTION JOINT MATERIAL

A. Contraction joint material:
1. Rubber shear keys complying with ASTM D2000, M2AA-805 and with a minimum durometer hardness of 80, or
2. PVC shear keys complying with ASTM D2287, Type PVC 654-4 and with a minimum durometer hardness of 85.

PART 3 - EXECUTION

3.01 PREPARATION

A. Cold weather masonry construction shall comply with TMS 602, Section 1.8, Paragraph C when either of the following conditions exist:
1. The ambient air temperature falls below 40 degrees Fahrenheit, or
2. The temperature of masonry units is below 20 degrees Fahrenheit.

B. Hot weather masonry construction shall comply with TMS 602, Section 1.8, Paragraph D when either of the following conditions exist:

1. The ambient air temperature exceeds 100 degrees Fahrenheit, or
2. The ambient air temperature exceeds 90 degrees Fahrenheit with a wind velocity greater than 8 mph.
3. When the ambient temperature exceeds 115 degrees Fahrenheit, or exceeds 105 degrees Fahrenheit with a wind velocity greater than 8 mph, implement the requirements of Article 1.8 D.1.a and shade materials and mixing equipment from direct sunlight.

3.02 CONCRETE MASONRY UNIT PLACEMENT

A. Use dry masonry units. No frozen or wet units shall be used.

B. Discard cracked, chipped, and spalled masonry units.

C. Lay hollow units as follows:
1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, pilasters, and in walls where adjacent to cells or cavities to be filled with grout.
3. For starting course on footings where cells are not to be grouted, spread out full mortar bed including area under cells.
4. Maintain joint widths indicated, except for minor variations to maintain joint alignment. If not indicated, lay walls with 3/8 inch joints.
5. Buttering corners of joints, deep or excess furrowing of mortar joints is not permitted.

D. Lay units in running bond, unless noted otherwise in the Structural Drawings.

E. Fully bond external corners of concrete masonry.

F. Where non-loadbearing masonry partitions extend to underside of floor, roof deck or structural system, stop masonry short 3/8 inch to ½ inch to allow for live load deflection. Fill gap with soft joint filler.

3.03 GROUT PLACEMENT

A. Execute placement of grout in accordance with TMS 602, Section 3.5.

B. Place coarse grout in maximum 5’-4” lifts, unless intermediate bond beams are present or approved in writing by the architect/structural engineer. In the case of intermediate bond beams in the wall, the maximum lift should be equal to the bond beam spacing.

C. Do not fill reinforced cells with mortar.

3.04 MOVEMENT JOINTS

A. Place expansion joints at locations indicated in the Structural Drawings.
1. Do not run any horizontal reinforcing through expansion joints.

B. Place contraction joints at locations indicated in the Structural Drawings.
1. Install contraction joint material.
2. Do not run horizontal reinforcement through contraction joints, except reinforcement in bond beams at floor and roof levels shall be continuous across contraction joints.

3.05 REINFORCEMENT

A. Place reinforcing bars as indicated in the Structural Drawings and in accordance with TMS 602, Section 3.4.

3.06 HORIZONTAL JOINT REINFORCEMENT

A. Place horizontal joint reinforcement in the horizontal mortar beds at spacings noted in the Structural Drawings and noted below.

B. For masonry below grade, space horizontal joint reinforcing at 8 inches vertically.

C. Place horizontal joint reinforcement above lintels and below sills at openings. Extend two feet beyond opening.

D. Joint reinforcement shall be continuous. Lap joint reinforcement a minimum of 8 inches.

3.07 ERECTION BRACING

A. Design, provide, and install temporary erection bracing during construction as required to stabilize erected masonry until complete structural system is constructed.

3.08 CLEANING AND POINTING

A. Dry brush masonry surfaces before mortar has set hard to remove mortar crumbs and accumulation.

B. Clean masonry with commercial brick cleaner approved by brick manufacturer. Protect other work from cleaning materials.

C. Cut out defective mortar and repoint.

3.09 PROTECTION OF FINISHED WORK

A. During erection cover top of wall, projections, and sills with strong waterproof membrane at end of each day's work.
   1. Extend and secure cover a minimum of 24 in. down both sides.

B. Do not apply uniform floor or roof loading for at least 12 hours after placing masonry columns or walls.

C. Do not apply concentrated loads for at least 3 days after building masonry columns or walls.

END OF SECTION