

## SECTION 0401

### MASONRY

#### 0401.0100 GENERAL

**0401.0101 Description of Work.** The work under this section shall consist of furnishing all labor, materials, and equipment necessary for constructing masonry structures in accordance with the requirements of these specifications.

**0401.0103 Submittals.** Before moving any materials to the site or commencing any of the work in this section, the Contractor shall submit three individual samples of masonry units for the Engineer's approval, showing the variations in each color and texture.

**0401.0104 Delivery, Storage and Handling.** All materials necessary for construction shall be delivered to the site, stored and handled in accordance with the manufacturer's instructions, except as modified by the plans special specifications, or as directed by the Engineer.

#### 0401.0200 PRODUCTS

##### 0401.0201 Materials.

(A) **Concrete Masonry Units.** Concrete masonry units shall be Grade "N-I" (U.B.C. Grade "A") hollow, load-bearing, conforming to ASTM C90. Units shall have a maximum linear shrinkage not to exceed .05 to 1% from a saturated to oven-dry condition.

Units shall be ordered a sufficient time prior to commencement of work to assure units to be from a uniform run. A statement to that effect shall be furnished to the Engineer.

Units shall be cured and dried before being used and shall not be wetted before being used, but shall be laid dry.

Color and type of concrete masonry units shall be as directed by the Engineer.

(B) **Masonry Mortar.** Masonry mortar shall be Type "S" natural color, as per ASTM C270, mixed in the ratios by volumes, 1 part Portland cement, 1/4 part minimum to 1/2 part maximum to 3 parts maximum sand.

All mortar shall attain a compressive strength of 1,800 psi at 28 days. A test to verify compressive strength may be required by the Engineer. Such a test shall be made by an independent testing and inspection laboratory at the expense of the City of Tucson. Two copies of the test results shall be forwarded directly to the Engineer by the testing agency.

(C) **Grout.** Grout shall be "coarse grout", as per ASTM C476, of fluid consistency and mixed in the ratio of volumes, 1 part Portland cement, 2 parts minimum to 3 parts maximum damp loose sand, and 1 part minimum to 2 parts maximum coarse aggregate. Fluid consistency shall mean that consistency is as fluid as possible for pouring without segregation of the constituent parts. Minimum strength in 2000 psi.

(D) **Reinforcement.** Steel bar reinforcement shall conform to ASTM A615.

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### 0401.0300 EXECUTION

#### 0401.0301 Workmanship

(A) **General.** All work shall be executed in the best workmanship manner and in full compliance with all applicable codes and ordinances. As a minimum, all work shall conform to the 1994 Uniform Building Code Chapter 21, American Society for Testing and Materials (ASTM) Standards and Recommendations of the National Concrete Masonry Association (NCMA) and (SD 1610)

(B) **Mortar.** All components of the masonry mortar shall be delivered to the jobsite separately and shall be combined into specified mortar on the jobsite only. Sand/lime plant mix, as a component of the mortar, may be furnished to the jobsite with three samples taken by the Engineer and analyzed as to the lime content.

(C) **Concrete Masonry Units.** Any unit that is chipped, cracked, broken or otherwise defective, whether before or after setting, will be rejected and shall be removed and replaced.

(D) **Mortar Joints.** The Contractor shall work units into full beds and ends, except around cells to be grouted, to obtain maximum bond. Closures shall be locked into place with the head joints thrown against the two adjacent units in place.

Mortar joints which become "thumbprint" hard shall be tooled with a round or otherwise approved jointed. The jointer shall be no smaller than one-inch in diameter so that complete contact is made along the edges of the units, compressing and sealing the surface of the joint.

Where fresh masonry joins totally or partially set masonry, the contractor shall clean, wet, and roughen the set masonry before laying new work. The mason shall avoid over-plumbing and pounding of the corners to fit units after they are set in position. Where an adjustment must be made after the mortar has started to harden, the mortar shall be removed and replaced with fresh mortar.

(E) **Wall Joints.** Masonry control joints (MCJ) at 20'-0" on center max. Masonry expansion joints (EJ) at 60'-0" on center max.

(F) **Reinforcement.** Reinforcing bars shall be straight except where bends or hooks are detailed on the Plans.

Reinforcing steel shall be lapped a minimum of 48 bar diameters where spliced. In the region of the spliced bars, the bars shall be securely tied to one another using suitable wire ties or proprietary bars positioners to insure bar to bar contact. "Stabbing" of bars shall not be permitted. Bars scheduled to be spliced shall be tied as described before any grout is placed.

Vertical bars shall be held in position top and bottom and shall be secured against displacement prior to grouting by wire positioners or other suitable devices at intervals not exceeding 200 bar diameters.

Vertical reinforcing steel shall be placed within the individual masonry cells as shown on the Plans. In no case shall the clearance between the interior cell of the masonry and the vertical bar be less than 1/2 inch for course grout or 1/4 inch for fine grout.

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Horizontal joint reinforcement shall be hot dipped galvanized truss type minimum 9 gauge longitudinal wire and 12 gauge cross wires. All joint reinforcing shall be spaced at 16 inches on center within the mortar joints. All laps shall be a minimum of 12 inches.

Bond beam reinforcing shall be as shown on the Plans. All bond beam laps shall be 40 bars diameters. All bond beam laps shall be staggered a minimum of 4 feet. All bond beams shall be 8 inches deep and fully grouted along the entire length of the bond beam.

**(G) Grout.** All reinforced hollow unit masonry shall be laid to preserve the unobstructed vertical continuity of the cells to be filled. Vertical cells to be filled shall have vertical alignment sufficient to maintain a clean, unobstructed continuous cell measuring not less than 3" x 3".

When grouting is stopped for one-hour or longer, horizontal construction joints shall be formed by stopping the pour of grout 1-1/2" below the top of the uppermost unit. All grouted cells are to be rodded with 1/2" rod to insure compaction and removal of air pockets. All masonry which is below ground shall be fully grouted.

**(H) Control Joint Filler.** Premolded joint filler shall be wide flange Rapid Poly-Joint manufactured by Dur-O-Wal, wide flange Vert-A-Joint manufactured by Vert-A-Joint Co., or equal.

**(I) Bond.** The common running bond shall be used.

**(J) Daily Clean up.** At the completion of each day's work, all masonry work shall be thoroughly cleaned with stiff fiber brushes until the wall is free of all dripped or spattered mortar. Extreme care shall be used to prevent any grout or mortar from staining the face of all masonry. Grout or mortar which is visible from the face of the masonry shall be removed immediately.

**(K) Final Clean up.** All masonry walls shall be thoroughly cleaned down on completion, damaged surfaces repaired or replaced, and mortar joints pointed to leave the work in a condition acceptable to the Engineer. Cleaning the point shall be started at the top and worked down. Cleaning shall be done with fiber brushes and clear water.

**(L) Curing.** The wall shall have its surface dampened with a very light fog spray during a three-day curing period for the mortar.

**(M) Freezing Weather.** No masonry will be laid when the temperature of the outside air is below 40°F unless suitable means are employed to protect the completed work from freezing during the period of laying and curing.

**0401.0401 Concrete Footings.** All concrete footings shall be Class "B" per Tucson Water Standard Specifications, Section Nos. 301, 302, 303 for concrete work.

**0401.0402 Gates.** The gates shall be per Tucson Water Standard Specifications, Section No. 0214; Standard Detail SD-1610; and as modified by the Plans. Vertical slatting shall be tan polyethylene as manufactured by PDS Fence Products or equal.