**PART 1-GENERAL**

**1.01 SUMMARY**

A. Provisions of Division 01 apply to this section.

 B.Sections Includes:

 1. Brick masonry as indicated.

 2. Reinforcing steel and dowels embedded in concrete

 3. Setting of anchors, bearing plates, and other Work to be embedded into masonry.

 C.Related Sections:

 1. Section 001 45 23: Testing and Inspection.

 2. Section 03 11 00: Concrete Forms and Accessories.

 3. Section 03 20 00: Concrete Reinforcement.

 4. Section 03 30 00: Cast-In-Place Concrete.

 5. Section 05 50 00: Metal Fabrications.

**1.02 REFERENCES:**

 **A.** American Society for Testing and Materials (ASTM) Standards:

 1. ASTM C5-Standard Specification for Quicklime for Structural Purpose.

 2. ASTM C62-Standard Specifications for Building Brick (Solid Masonry Units Made from Clay or Shale.)

 3. ASTM C67-Standard Test methods for Sampling and Testing Brick and Structural Clay Tile.

 4. ASTM C144- Standard Specification for Aggregate for Masonry Mortar.

 5. ASTM C150-Standard Specification for Portland Cement.

 6. ASTM C207-Standard Specification for Hydrated Lime for Masonry Purpose.

 7. ASTM C216-Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale).

 8. ASTM C270-Standard Specification for Mortar for Unit Masonry.

 9. ASTM C404- Standard Specification for Aggregate for Masonry Grout.

 10. ASTM C476-Standard Specification for Grout for Masonry.

 **B.** Masonry Standards Joint Committee (MSJC):

 1. ACI 530.1/ASCE6/TMS602-Specification for Masonry Structures.

 2. ACI 530/ASCE5/TMS402-Building Code Requirements for Masonry Structures.

**1.03 SUBMITTALS**

A. Mix Design: Submit grout and mortar mix designs. Mix designs shall be signed and sealed by a Civil or Structural Engineer registered in the State of California.

 B. Product Data: Submit manufacturer’s Product Data for assembly components, materials, and accessories. Submit certificates and data assuring that the proposed materials meet the specified ASTM standards.

 C. Samples: Submit Samples for each type of required masonry unit, including reinforcement and accessories.

 D. Shop Drawings: Indicate wall reinforcement, splice locations and bending diagrams.

 E. Admixtures: Additives and admixtures to mortar and grout shall not be used unless approved by the enforcing agency. Submit product data for any proposed admixture.

**1.04 QUALITY ASSURANCE**

A. Comply with the requirements of Specification Section 01 45 23: Testing and Inspection.

 B.Examination: Brick masonry, including brick veneer, shall be continuously inspected during installation.

 1. Test grout and mortar for compliance with Specifications.

 2. Testing and Coring:

 a. Test for compliance of brick, mortar and grout with 28-day strength requirements.

 b. Repair brick masonry units after coring or other testing is performed.

 C**.** Mock-up: Provide a minimum 100 square foot mock-up of corner condition, parapet, and window opening.

**1.05 DELIVERY, STORAGE AND HANDLING**

 **A.** Store brick masonry units above grade on a level platform to provide air circulation under stacked units.

 **B.** Cover and protect brick masonry units from becoming wet before installation.

 **C.** Store cementitious ingredients in weather tight enclosures.

**PART 2-PRODUCTS**

**2.01 MANUFACTURERS**

A. Angelus Block Co., Inc., Sun Valley, CA.

 B. Orco Block Co., Inc., Stanton, CA.

 C. Lindsay Concrete Products, Inc., San Bernardino, CA.

 D**.** Elliot Precision Block Co., San Bernardino, CA.

**2.02 MATERIALS**

A. Common Brick: ASTM C62, Grade SW Type FBS.

 B. Face Brick: ASTM C216, Grade SW Type FBS, size as indicated, color and texture as selected.

 C. Mortar and Grout Sand: Natural sand or sand manufactured by crushing stone or gravel, conforming to ASTM C144, except that at least 3 percent shall pass a No. 100 sieve.

 D. Pea Gravel for Grout: ASTM C33 and ASTM C227. Maximum size of aggregate shall be 3/8 inch.

 E. Cement: ASTM C150, Portland cement, Type I or II low alkali.

 F. Hydrated Lime: Standard brand conforming to ASTM C207, Type S; Kel-Crete may be substituted for lime.

 G. Mortar Color: Pure mineral pigment, lime-proof, non-fading, designed for use in mortar. Color as selected by the Architect.

 H. Water: Clean and potable, free from deleterious amounts of acids, alkalis, salts or organic materials.

 I. Reinforcing: As specified in Section 03 20 00: Concrete Reinforcement.

**PART 3-EXECUTION**

**3.01 EXAMINATION**

A. A special inspector, approved by DSA to inspect the Work of this section, shall inspect brick masonry before and during installation. The PI shall be responsible for monitoring the work of the special inspector and testing laboratories to ensure that the testing program is satisfactorily completed.

 B.Brick masonry units shall be clean and free of dirt, dust, and other deleterious substances before installation.

**3.02 GENERAL**

A. Install patterns and details, maintain indicated face bond. Install courses level and true to line, each tier plumb, with clean, straight and uniformly thick joints. Provide vertical joints plumb from top to bottom in corresponding courses. Toothing is prohibited; hold racking to a minimum.

 B. Set and install anchors, bolts, sleeves, and other required Work items.

 C. Brick shall be damp when installed. Allow surface water to drain off before installing. During installation, brick shall demonstrate sufficient absorption to retain applied mortar and absorb excess grout water. Mortar shall remain plastic for leveling and plumbing without breaking mortar bond.

 D. Brick shall be installed as full units except where otherwise detailed. Install in a full bed or unfurrowed mortar. Solidly fill head joints with mortar and install brick into position. If a brick must be moved or shifted after initial installation, remove setting mortar, thoroughly clean the brick and install with fresh mortar.

 E. Install brick with uniform joints, thickness as indicated; perform joint finishing while mortar is still soft. Trowel exposed exterior joints flush and tool with a round bar, or tool, to provide a dense slightly concave surface. Exposed interior joints shall be finished flush. Cut off unexpected joints flush with face of brick. Install brick in bond pattern indicated on Drawings.

 F. Top surfaces of walls shall be maintained free of mortar and grout droppings. To continue installation of brick masonry, clean brick, joints, and dampen top of brick surfaces with water.

**3.03 PREPARATION**

 **A.** Lime Putty: Manufactured from hydrated lime. Lime putty shall weigh no less than 83 pounds per cubic foot.

 **B.** Mortar: One part Portland cement, at least ¼ part but not more than ½ part lime putty or dry hydrated lime, and not more than 4 parts of sand based on dry loose volumes. Mortar shall provide a minimum strength of 3,350 psi and shall be Type S.

 **C.** Grout: One part Portland cement to not more than 3 parts sand and at least one part, but not more than 2 parts pea gravel, based on dry loose volumes. Add sufficient water to cause grout to flow into joints of masonry. Grout shall attain a minimum strength of 2,000 psi. Use Sitka Chemical Corporation Grout Aid per manufacturer’s instructions.

 **D.** Reinforcement: Clean of mill scale, loose rust, oil, and coatings which would reduce bond. Securely anchor in place.

 **E.** Measurement: Accurately measure materials in calibrated devices. Shovel measurements are not permitted. Allowance for bulking of sand when measured damp loose shall not exceed 20 percent.

 **F.** Mixing: Place sand, cement, and water in mixer in that order for each batch of mortar or grout and mix as long as needed to secure a uniform mass, but in no case less that 10 minutes. Add lime for mortar after initial 2 minutes of mixing time. Furnish paddle type mixers of as lest one-sack capacity. Batches requiring fractional sacks will not be permitted unless cement is weighed for each such batch. Mortar and grout awaiting installation shall be turned and remixed as required to maintain a work able mix. Re-tempering of grout is not permitted. Re-tempering of mortar shall be performed by adding water is not a mortar basin with additional mortar added to it. Re-tempering by dashing water over mortar is not permitted. Any mortar or grout not installed with one hour after initial mixing shall be removed from the Work. Mortar shall be mixed and maintained on boards to a slump of 2-3/4 inch, plus or minus ¼, using a truncated cone 4 inches to 2 inches, 6 inches high.

**3.04 INSTALLATION**

A. Brick Veneer:

 1. Frame walls to receive brick veneer shall have sheathing covered with 15 pound asphalt saturated felt applied shingle fashion. Start at the bottom of area to be covered, install sheets horizontally, and secure to sheathing with nails or screws spaced 16 inches on center along edges. Lap each succeeding sheet 3 inches over the one below.

 2. Nail of screw continuous vertical galvanized anchor slots to each stud or support, as shown on the Drawings. Install continuous 10 gauge straight galvanized wires as detailed.

 3. Install brick veneer on frame construction with a 1-1/4 inch minimum space between backing and backside of brick. Remove mortar projecting into space, which obstructs flow of grout. Install grout after each course is installed and puddle to eliminate voids and to solidly fill grout space. Where it is not possible to install grout, fill space solidly with mortar.

 B. Brick Veneer on Concrete:

 1. Anchor brick veneer to concrete walls by anchor slots spaced as shown on the Drawings and set into concrete. Install continuous 10 gage straight galvanized wires as detailed.

 2. Install brick veneer with an one inch minimum grout space between concrete and backside of brick. Fill grout space as specified for frame construction.

C.Brick Veneer Planters:

 1. Construct brick planter boxes and curbs or walls around planting areas as detailed. Provide weep holes by omitting mortar from every third vertical joint in lowest exposed course of brick.

 2. Before installation of waterproofing, inside surfaces of planters shall be parged from the footing to first mortar joint above finish grade of planting soil. Furnish cement mortar as specified for parging.

**3.05 FINISHING**

 **A.** Upon completion, holes, cracks, and defects in mortar joints shall be neatly pointed with mortar and finished weather tight.

 **B.** Maintain brick Work continuously moist with a nozzle-regulated fog spray for at least 3 days after installation.

**3.06 TESTING**

A. Samples: Mortar and grout Samples will be prepared by the special inspector. At the beginning of masonry Work, at least one test specimen each of mortar and grout shall be obtained on 3 consecutive days.

 B. Grout test specimens shall be obtained from the mason’s containers as it is being installed. Additional test specimens shall be obtained whenever any change in a materials and conditions of the Work occur. At least 3 mortar cylinders and 3 grot prisms shall be obtained and tested for each 30 cubic yards of fraction thereof.

 C. Test Specimens shall be stored and tested as specified for “Molded Cylinder Test” for concrete as specified in Section 03 30 00: Cast-In Place Concrete. Minimum compressive strength of test specimens shall be as follows:

 **ITEM 7 DAYS 28 DAYS**

 Mortar 900 psi 1,900 psi

 Grout 1,200 psi 2,000 psi

 D.At least 2 cores with diameter of approximately 2/3 of wall thickness shall be obtained from each Project by the independent testing agency. At least once core shall be obtained from each building for each 5,000 square feet of wall area. One-half of the cores obtained shall be tested on compression normal to wall face and shall provide strength of at least 1500 psi at 28 days. Cores shall be obtained and tested as specified for concrete core test in Section 03300: Cast-In-Place Concrete. One-half of the cores shall be tested in shear, testing joint between unit and grout core, and shall provide unit shearing strength as required by CBC. Masonry cut or removed by coring operation shall be replaced with new masonry to match adjoining Work.

**3.07 PROTECTION**

 **A.** Protect the Work of this Section until Substantial Completion.

**3.08 CLEAN UP**

 **A.** Remove rubbish, debris and waste materials and legally dispose of off the Project site.

**END OF SECTION**