SECTION 04810

UNIT MASONRY ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete Block and Veneer Units.

B. Mortar and Grout.

C. Reinforcement and Anchorage.

D. Accessories.

E. Cap blocks as noted on drawings.

1.02 RELATED REQUIREMENTS

A. Section 05500 - Metal Fabrications: fabricated steel items.

B. Section 07620 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.

C. Section 07900 - Joint Sealers: Backing rod and sealant at control and expansion joints.

1.03 REFERENCE STANDARDS

A. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures; American Concrete Institute International.

B. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International.

C. ASTM A 82/A 82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

D. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

E. ASTM A 580/A 580M - Standard Specification for Stainless Steel Wire.

F. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

G. ASTM A 641/A 641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

H. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

I. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

J. ASTM C 90 - Standard Specification for Loadbearing Concrete Masonry Units.

K. ASTM C 91 - Standard Specification for Masonry Cement.

L. ASTM C 140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units.

M. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar.

N. ASTM C 150 - Standard Specification for Portland Cement.

O. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.

P. ASTM C 270 - Standard Specification for Mortar for Unit Masonry.

Q. ASTM C 404 - Standard Specification for Aggregates for Masonry Grout.

R. ASTM C 476 - Standard Specification for Grout for Masonry.

S. ASTM C 780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.

T. ASTM C 979 - Standard Specification for Pigments for Integrally Colored Concrete.

U. IMIAWC (HW) - Recommended Practices & Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council.

1.04 SUBMITTALS

A. See Section 01350 - Submittals, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Samples: Submit 2 samples of masonry units to illustrate color, texture, and extremes of color range.

D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.
   1. Maintain one copy of each document on project site.

1.06 MOCK-UP

A. Construct a masonry wall of each masonry unit type as a mock-up panel sized 8 feet long by 6 feet high; include mortar and accessories in mock-up.

B. Locate where directed or as indicated on drawings.

C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Concrete Masonry Units:
      a. Angelus Block Co. Inc. 1705 N. Main Street, Orange, CA 92865; Tel: (714) 637-8594.
      b. Orco Block Co., Inc., 8042 Katella Avenue, Stanton, CA 92680; Tel: (714) 527-2239.

B. Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer or each different product required for each continuous surface or visually related surfaces.

C. Obtain mortar ingredients of uniform quality including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

2.02 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations. Veneer units shall be 2-3/4 inches in depth.
   2. Load-Bearing Units: ASTM C 90, normal weight.

a. Exposed faces: Manufacturer's standard color and texture where indicated on drawings.

2.03 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I; color as required to produce approved color sample.
   1. Not more than 0.60 percent alkali.

B. Hydrated Lime: ASTM C 207, Type S.

C. Mortar Aggregate: ASTM C 144, except that not less than 3% of sand shall pass #100 sieve.

D. Grout Aggregate: ASTM C 404.

E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C 979.
   1. Color(s): As indicated on drawings.
   2. Manufacturers:
      a. Davis Colors: www.daviscolors.com.
      b. Lambert Corporation: www.lambertusa.com.
      c. Solomon Colors: www.solomoncolors.com.
      d. Substitutions: See Section 01640 - Substitutions, for substitution criteria.

F. Water: Clean and potable.

2.04 REINFORCEMENT AND ANCHORAGE

A. Manufacturers of Joint Reinforcement and Anchors:
   1. Dur-O-Wal: www.dur-o-wal.com.
   2. Hohmann & Barnard, Inc: www.h-b.com.
   3. Masonry Reinforcing Corporation of America: www.wirebond.com.
   4. Substitutions: See Section 01640 - Substitutions, for substitution criteria.

B. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420) deformed billet bars; uncoated.

C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

2.05 MORTAR AND GROUT MIXES

A. Mortar for Unit Masonry: ASTM C 270, using the Proportion or Property Specification.
   1. Masonry below grade and in contact with earth: Type S.
   2. Exterior, loadbearing masonry: Type S.
   3. Interior, loadbearing masonry: Type N or S.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Alexander + Hibbs AIA, Inc.'s sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. Grout: ASTM C 476.
   1. Consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
   2. Proportion grout by volume with sufficient water added to produce consistency for pouring without segregation. In no case shall grout contain more than 7-1/2 gallons of water per sack of cement.

D. Mixing: Use mechanical batch mixer and comply with referenced standards.

E. Do not use calcium chloride in mortar or grout.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of ACI 530.1/ASCE 6/TMS 602 or applicable building code, whichever is more stringent.

B. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

C. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.
   3. Mortar Joints: Concave.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar and mortar smears as work progresses.

E. Interlock intersections and external corners unless noted otherwise.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

3.06 REINFORCEMENT AND ANCHORAGE - GENERAL

A. General: Clean free of loose rust, mill scale, earth, or other materials which will reduce bond to mortar or grout. Do not use reinforcing bars with kinks or bends not shown on drawings or final shop drawings, or bars with reduced cross-section due to excessive rusting or other causes.

B. Position reinforcing accurately at the spacing shown. Horizontal reinforcing may be placed as the masonry work progresses. Where vertical bars are shown in close proximity, provide a clear distance between bars of not less than the nominal bar diameter or 1 inch (whichever is greater).

C. Splice reinforcing bars where shown; do not splice at other points unless acceptable to the Architect. Provide lapped splices, unless otherwise shown. In splicing vertical bars or attaching to dowels, lap ends, place in contact and wire tie.
   1. Provide not less than minimum lap shown, or if not shown, as required by governing code.
   2. Weld splices where shown. Comply with the requirements of AWS D1.4 for welding materials and procedures and with Section 03300 for welded reinforcement.

D. Completely embed all bars in mortar or grout for joint reinforcement embedded in horizontal mortar joints, and provide not less than 5/8 inch mortar coverage on exterior face of walls and 1/2 inch at other locations. For all other reinforcement provide minimum coverage of one bar diameter over all bars, but not less than 3/4 inch except where exposed to weather or soil in which case provide minimum coverage of 2 inches.

E. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 8 inches on center.

F. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

G. Place continuous joint reinforcement in first joint below top of walls.

H. Lap joint reinforcement ends minimum 6 inches.

I. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 24 inches horizontally and 24 inches vertically.

3.07 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Extend metal flashings through exterior face of masonry and turn down to form drip. Install joint sealer below drip edge to prevent moisture migration under flashing.

C. Extend metal flashings to within 1/4 inch of exterior face of masonry.

D. Lap end joints of flashings at least 4 inches and seal watertight with mastic or elastic sealant.

3.08 GROUTED COMPONENTS

A. Vertical cells shall have vertical alignment, to maintain continuous unobstructed vertical cell area of 3-by-3 inches minimum. Grout shall be sufficiently fluid to ensure complete filling of all sections of units, but not so thin as to allow segregation of aggregate.

B. Grout pours in excess of 24 inch height shall be provided with cleanouts.

C. Unless high-lift method is used the maximum lift of grout pour shall be 4 feet.

D. When grouting is stopped for a period of one hour or longer, horizontal construction joints shall be formed by stopping the grout one inch below top of uppermost unit.

E. High lift grout method may be used complying with the following
   1. ACI 530.1.

F. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

G. Place and consolidate grout fill without displacing reinforcing.

3.09 CONTROL AND EXPANSION JOINTS

A. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

B. Size control joint in accordance with Section 07900 for sealant performance.

C. Form expansion joint as detailed.

3.10 BUILT-IN WORK

A. As work progresses, install built-in metal door frames, anchor bolts, and plates and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

C. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout.

D. Do not build into masonry construction organic materials that are subject to deterioration.

3.11 TOLERANCES

A. Maximum Variation from Alignment of Columns and Pilasters: 1/4 inch.

B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.12 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, sleeves, and grounds. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.13 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01410.

B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C 140 for conformance to requirements of this specification.

C. Mortar Tests: Test each type of mortar in accordance with ASTM C 780, testing with same frequency as masonry samples.

3.14 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.15 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 04852

STONE MASONRY VENEER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cut stone veneer panels at exterior walls.

B. Metal anchors and accessories.

C. Setting mortar.

1.02 RELATED REQUIREMENTS

A. Section 04810 - Unit Masonry Assemblies: Joint reinforcement, Ties, and Anchors.

B. Section 07620 - Sheet Metal Flashing and Trim: Flashings.

1.03 REFERENCE STANDARDS

A. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel.

B. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

C. ASTM C 270 - Standard Specification for Mortar for Unit Masonry.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

A. See Section 01350 - Submittals, for submittal procedures.

B. Product Data: Provide data on stone panel units, mortar, and reinforcement.

C. Samples: Submit two stone samples illustrating minimum and maximum stone sizes, color range, texture, and markings.

1.06 QUALITY ASSURANCE

A. Stone Fabricator Qualifications: Company specializing in fabricating cut stone with minimum ten years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type required by this section, with minimum 5 years of documented experience.

1.07 MOCK-UP

A. Construct stone wall mock-up, 4 feet long by 4 feet wide; include corner condition in mock-up.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect stone from discoloration during storage on site.

B. Provide ventilation to prevent condensation from forming on stone.

1.09 FIELD CONDITIONS

A. Cold Weather Requirements: Comply with requirements of ACI 530.1/ASCE 6/TMS 602 or applicable building code, whichever is more stringent.

B. Maintain materials and ambient air at minimum of 40 degrees F (5 degrees C) prior to, during, and for 48 hours after completion of work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Stone Distributors:
   1. Thompson Building Materials, Orange (714) 637-7373.
   2. Substitutions: See Section 01640 - Substitutions, for submission criteria.

2.02 STONE

A. Stone: Sandstone type, Sunny Beach Ledgestone, 6x24 inch interlocking panel, order number 0742-1737.

2.03 MORTAR

A. Setting Mortar: ASTM C 270, Type N, using the Proportion Method or premixed.

2.04 ACCESSORIES

A. Weather Resistant Barrier: Kraft waterproof building paper, UBC Standard No. 14-1.

B. Metal Lath: 3.4 lb. galvanized expanded rib lath.

C. Fasteners:
   1. Into Metal Studs: Minimum 7/16 inch head diameter, corrosion-resistant, self-drilling, self tapping, pancake head screws of sufficient length to penetrate 3/8 inch minimum into the stud.

D. Flashings: As specified in Section 07620.

E. Cleaning Solution: Type that will not harm stone, joint materials, or adjacent surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that support work and site conditions are ready to receive work of this section.

B. Verify that items built-in under other sections are properly located and sized.

3.02 PREPARATION

A. Establish lines, levels, and coursing. Protect from disturbance.

B. Clean stone prior to erection. Do not use wire brushes or implements that mark or damage exposed surfaces.

C. Clean sawn surfaces of rust stains and iron particles.

3.03 INSTALLATION

A. Install masonry product in accordance with manufacturer's installation instructions using mortarless joints.

B. Install flashings of longest practical length and seal watertight to back-up. Lap end joints minimum 6 inches and seal watertight.

C. Cut stone panel at site to produce clean faces.

D. Size stone units to fit opening dimensions and perimeter conditions.

E. Wet absorptive stone in preparation for placement to minimize moisture suction from mortar.

F. Arrange stone pattern to provide color uniformity and minimize visual variations.

G. Provide setting mortar in accordance with manufacturer's instructions.
   1. If water is lost by evaporation, re-temper mortar only within two hours after mixing.
   2. At ambient air temperature 80 degrees F and above, use mortar within two hours after mixing; at ambient air temperature below 50 degrees F, use mortar within two-and-one-half hours after mixing.

H. Fill dowel holes in stone units with mortar.

I. Set stone in full mortar setting bed to fully support stone over bearing surface.

3.04 CLEANING

A. Remove excess mortar as work progresses, and upon completion of work.

B. Clean soiled surfaces with cleaning solution.

C. Use non-metallic tools in cleaning operations.

3.05 PROTECTION

A. During temporary storage on site, at the end of working day, and during rainy weather, cover stone work exposed to weather with non-staining waterproof coverings, securely anchored.

END OF SECTION