SECTION 04810 - UNIT MASONRY SYSTEM

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

1.2 SECTION INCLUDES

A. Concrete masonry units, reinforcement, anchorage, and accessories.

B. Reinforced masonry.

C. Concrete pre-cast lintels.

D. Mortar and grout.

E. Related Sections include, but are not limited to:

1. Section 03300 - Cast-In-Place Concrete.
2. Section 06100 - Rough Carpentry.
3. Section 07620 - Flashing & Sheet Metal.
4. Section 09220 - Stucco.

1.3 SUBMITTALS

A. Comply with provisions of the Contract Documents.

B. Product Data: for each different masonry unit, accessory, and other manufactured product specified and for each precast concrete item and fabricated wire reinforcement.

1. Submit manufacturer's installation instructions.

C. Samples for Verification:

1. Anchors (to verify material).
2. Accessories embedded in masonry, other than anchors.

D. Shop Drawings: Show fabrication and installation details for reinforcing steel. Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show bar schedules, bent bar diagrams and other arrangements as required for fabrication and placement. Show floor plans and elevations of reinforced walls, if required.

E. Quality Assurance Submittals:

1. Certified Test Reports showing compliance with specified performance characteristics and physical properties.
2. Manufacturer's Certificate that materials meet specification requirements.

1.4 QUALITY ASSURANCE

A. Comply with the Florida Building Code, 2007 Edition and following Standards:

1. ASTM C90 Hollow Load-Bearing Concrete Masonry Units.
2. ASTM C140 Sampling & Testing Concrete Masonry Units.
3. ASTM C145 Solid Load-Bearing Concrete Masonry Units.
4. UL 618 - UL Standard for Safety Concrete Masonry Units.
5. ASTM C270-1a - Standard Specification for Mortar for Unit Masonry.

B. Perform Work in accordance with the latest applicable edition of the following American Concrete Institute (ACI) Standards:

1. ACI 530 - "Building Code Requirements for Masonry Structures".
2. ACI 530.1 - "Specifications for Masonry Structures".

C. Preconstruction Testing: Employ and pay a qualified independent testing agency to perform the following preconstruction testing to establish compliance of proposed materials and construction with specified requirements:

1. Concrete Masonry Unit Test: For each different concrete masonry unit indicated, test units for strength, absorption, and moisture content per ASTM C 140.
2. Test mortar properties per test methods of ASTM C 270.
3. Test grout compressive strength per ASTM C 1019.

D. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.

E. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.

F. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

1.5 DELIVERY, STORAGE, & HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required.

B. Comply with Hot Weather Requirements of IMIAC - International Masonry Industry All-Weather Council: "Recommended Practices and Guide Specification for Hot and Cold Weather Masonry Construction".

1.7 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. Hollow Load Bearing Block Units: ASTM C90, normal weight, Grade N or S, with unit strength as indicated on the Structural Drawings, complying with specifications for the Florida Concrete and Products Association, Inc.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi, unless otherwise indicated on the Structural Engineer's Drawings.

B. Size and Shape: as indicated on the drawings. Use special blocks at jambs, beams, etc., as required.

C. Faces to Receive Stucco: Open texture concrete unit masonry (also referred to as "stucco block') manufactured to achieve maximum mechanical bond between concrete unit masonry surface and stucco.

D. Provide minimum 3000 psi grout or as noted on the drawings, with vertical reinforcing bars as

indicated on drawings. Grout slump shall be between 8 and 11 inches. Use of Super Plasticizer is prohibited.

2.2 REINFORCEMENT AND ANCHORAGE

A. Single Wythe Joint Reinforcement: Ladder type; hot dip galvanized to ASTM A641 after fabrication, cold drawn steel wire conforming to ASTM A82, 9 gauge side rods with 12 gauge cross ties. Furnished in flat sections 10' to 20' in length except that corner reinforcement and other special shapes may be less in length.

1. Manufacturers:

   a. Dur-O-Wal, Inc. - Dur-O-Wal #9 Ladur Type www.dur-o-wal.com .
   b. Heckman Building Products, Inc. www.heckmanbuildingprods.com .
   c. Holman & Bernard, Inc. www.h-b.com .

B. Reinforcing Steel: deformed type, specified in Section 03300 uncoated finish.

C. Strap Anchors: bent steel shape, 14 ga. x 1-1/4 inch size x length indicated, hot dip galvanized to ASTM A123 G90 finish, 2-inch bend.

D. Dovetail Anchors: Minimum 16 gage, 1" wide, 8" long with outer end turned up 1/4". Provide continuous anchor slots to be built into columns to receive anchors.

E. Wall Ties: Corrugated formed sheet metal, 7/8 x 7 inch size x 16 ga. thick, hot dip galvanized to ASTM A123 steel finish.

2.3 ACCESSORIES

A. Control-Joint Gaskets: Designed to fit standard sash block and to maintain lateral stability in masonry wall. Made from styrene-butadiene-rubber compound complying with ASTM D 2000, Designation M2AA-805

1. Durometer Hardness of 60-80, complying with ASTM D 2240.
2. Manufacturers:

   a. Dur-O-Wal, Inc. - DA 2003, DA 2025 www.dur-o-wal.com .
   b. Heckman Building Products, Inc. www.heckmanbuildingprods.com .
   c. Holman & Bernard, Inc. www.h-b.com .

B. Building Paper: No. 15 lb. asphalt saturated felt.

C. Sheet metal flashing: refer to Section 07620 for locations indicated on the drawings.

2.4 LINTELS

A. Poured in Place Concrete Lintels: Provide lintels as indicated on the structural drawings.

1. Provide not less than 8" bearing on masonry at each end of opening. See Structural Drawings for attachment of poured in place concrete lintel adjacent to existing concrete column.

2.5 MORTAR AND GROUT

A. Portland Cement: ASTM C 150, Type I or II construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Masonry Cement: ASTM C 91, type intended for the mortar strength required.

C. Hydrated Lime: ASTM C207, Type N.

D. Sand: 100% passing a #8 sieve, and not more than 15% passing a #100 sieve.

E. Water: clean, potable, and free of injurious matter.

F. Type M (2500 psi) - Mix thoroughly with the minimum amount of water for satisfactory workability and only in such quantity as needed for immediate use.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that field conditions are acceptable and are ready to receive Work. Beginning of installation means installer accepts existing conditions

B. Coordinate placement of anchors supplied to other Sections.

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

D. Allow wet masonry units to dry prior to placement.

3.2 COURSING

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

B. Lay concrete masonry units in running bond. Course one unit and one mortar joint to equal 8 inches. Form flush mortar joints.

3.3 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 are not permitted.

D. Remove excess mortar as Work progresses.

E. Interlock intersections and external corners.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace. If mortar begins to stiffen from evaporation or absorption of part of the mixing water, retemper by adding water and remixing. Do not use mortars after the cement has begun its initial set or more than 25 minutes after retempering.

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

H. Provide struck flush joints at interior of exposed stair walls and areas to receive stucco; provide concave struck joints at all other exposed masonry areas.

I. Isolate masonry partitions from vertical structural framing members with a control joint.

J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with 3/8 inch joint filler material where indicated.

K. Provide uniformly smooth blocks, without cracks or spalls, with flush, tightly compacted joints, in rooms where walls are to be left exposed and paint or cement enamel are scheduled.

3.4 REINFORCEMENT AND ANCHORAGE

A. Install horizontal joint reinforcement 16 inches oc. Install horizontal joint reinforcement 8 inches o.c. in parapet and free standing walls.

B. Where masonry abuts existing masonry, attachment shall be made with epoxy set anchors. See Structural Drawings.

C. Lap joint reinforcement ends minimum 6 inches. Extend minimum 16 inches each side of openings.

D . Each course either bonded to adjacent construction with horizontal joint reinforcing or anchored thereto with dovetail anchors, spaced not over 16" o.c. Use corrugated dovetail anchors at concrete columns. Provide anchor slots to be built into columns for installation in formwork. Coordinate with concrete work. Fill block cavities with mortar where anchors occur.

3.5 REINFORCED MASONRY

A. Lay masonry units with core cells vertically aligned and cavities between wythes clear of mortar and unobstructed.

B. Place mortar in masonry unit bed joints back 1/4 inch from edge of unit grout spaces, bevel back and upward. Permit mortar to cure 7 days before placing grout.

C. Reinforce masonry unit cores and cavities with reinforcement bars and grout as indicated.

D. Retain vertical reinforcement in position at top and bottom of cells and at intervals as noted on the drawings. Splice reinforcement bars 48 diameters, minimum. Refer to structural drawings for additional requirements.

E. Grout spaces less than 2 inches in width with fine grout using low lift grouting techniques. Grout spaces 2 inches or greater in width with course grout using high or low lift grouting techniques

F. When grouting is stopped for more than one hour, terminate grout 1-1/2 inch below top of upper masonry unit to form a positive key for subsequent grout placement.

G. High Lift Grouting:

1. Provide cleanout opening no less than 6 inches high at the bottom of each cell to be grouted by cutting one face shell of masonry unit.
2. Clean out masonry cells and cavities. Permit complete water drainage.
3. Request the Architect/Engineer to inspect the cells and cavities.
4. After cleaning and cell inspection, seal openings with masonry units or plywood.
5. Pump grout into spaces. maintain water content in grout to intended slump without aggregate segregation.
6. Limit grout lift to 48 inches and rod for grout consolidation. Wait 15 minutes before placing next lift.
7. Limit pour height to 12 feet.

3.6 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control and expansion joints.

B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant elliptical core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.

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

D. Form expansion joint as detailed.

3.7 EMBEDDED FLASHING AND WEEP HOLES

A. General: Install embedded flashing and weep holes in masonry at, or above, lintels, ledges, and other obstructions to downward flow of water in wall so as to divert such water to the exterior.

B. Place through-wall flashing on sloping bed of mortar and cover with mortar.

C. Seal penetrations in flashing with bituminous mastic before covering with mortar.

D. Install weep holes in head joints in first course of masonry immediately above embedded flashing and in locations indicated on the drawings.

3.8 BUILT-IN WORK

A. As work progresses, install built-in metal door frames anchor bolts, plates and other items furnished by other Sections. Build in items plumb and level.

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

adjacent masonry cores with grout minimum 8 inches from framed openings.

3.9 UNFINISHED WORK

A. Do not step back unfinished work for joining with new work. Bring each day's work up to leads and complete each course between columns or walls. Toothing may be resorted to only when specifically approved by the Engineer. Before new work is started, remove loose mortar and wet the exposed joint thoroughly.

3.10 TOLERANCES

A. Maximum Variation from Plumb: 1/8 inch per story non-cumulative;1/ 4 inch in two stories or more.

B. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft ; ½ inch in 30 ft.

3.11 CUTTING AND FITTING

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

3.12 PARGING

A. Dampen masonry walls prior to parging.

B. Parge masonry walls in two uniform coats of mortar to a total thickness of 3/4 inch; to a smooth steel trowel finish. Parge walls of parapets, curbs behind stonework, ceramic tile, with Type S or N mortar to smooth out the surface as a base for fluid applied waterproofing. Trowel to a smooth, dense surface. Form a wash at top and a cove at bottom. Damp cure for at least 24 hours and protect until cured.

3.13 FIELD QUALITY CONTROL

A. Owner will engage a qualified independent testing agency to perform field quality-control testing indicated below during the construction period:

1. Concrete Masonry Unit Test: For each different concrete masonry unit indicated, test units for strength, absorption, and moisture content per ASTM C 140.
2. Test mortar properties per test methods of ASTM C 780.
3. Test grout compressive strength per ASTM C 1019.

B. Tests and Evaluations listed in this Article will be performed during construction for each 5000 sq. ft.of wall area or portion thereof.

3.14 CLEANING

A. Remove excess mortar and mortar smears as work progresses. On completion, point up exposed masonry including joints between concrete columns, beams, etc., fill all holes and joints, remove loose mortar. Cut out defective joints and repoint only where necessary. Clean masonry surfaces

which are to be exposed, either painted or unpainted, free of mortar, stains, etc. Remove and replace cracked or chipped blocks.

B. Clean all surfaces of concrete unit masonry as required for proper applications or the specified finishes.

C. Upon completion of all work of this Section, promptly remove from job site all mortar droppings, broken units, debris arising from the work of this Section, and all tools and equipment of this Section, leaving all areas in a neat and orderly condition.

END OF SECTION 04810