SECTION 04200

UNIT MASONRY

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. Work includes furnishing all labor, materials and equipment necessary for the Unit Masonry work as specified herein and shown on the Drawings.

1.2 REFERENCES

1.3 QUALITY ASSURANCE:

A. Coordination: Review installation procedures and coordinate with other work that must be integrated with masonry including electrical and mechanical.

1. Construction Tolerances:

a. Variation from Plumb: For lines and surfaces of walls, do not exceed 1/4" in 10 feet. Except for external corners, and other conspicuous lines, do not exceed 1/4" in any story.

b. Variation from Level: For lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 3/4" in 40' or more.

c. Variation of Linear Building Line: For position shown in plan and related portion of walls, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.

d. Variation in Cross-Sectional Dimensions: For thickness of walls, from dimensions shown, do not exceed minus 1/4", nor plus 1/2".

1.4 SUBMITTALS

A. Samples: Submit samples and associated product data for each masonry unit in accordance with SECTION 01340. Compliance with all other requirements is the exclusive responsibility of the Contractor.

B. Shop Drawings: Submit shop drawings for steel reinforcing indicating all critical dimensions for determining fit and placement in masonry in accordance with the requirements of SECTION 01340.

1.4 JOB CONDITIONS

A. Inspection: Masonry Installer must examine the areas and conditions under which masonry is to be installed, and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Masonry contractor is responsible for existing job-site conditions affecting the masonry installation.

B. Masonry Protections:

1. Protect masonry materials during storage from wetting by rain, snow or ground water and from soilage or intermixture with earth or other materials.

2. Do not use metal reinforcing or ties having loose rust or other coatings, including ice, which will reduce or destroy bond.

3. In exposed work, do not use masonry units with chips, cracks, voids, discoloration, or other defects that might be visible or cause staining in the finished work.

4. Protect masonry from freezing when the temperature of the surrounding air is 40 degrees F. and falling. Heat materials and provide temporary protection of completed portions of masonry work. Comply with governing codes and with the "Construction and Protection Recommendations for Cold Weather Masonry Construction of the Technical notes on Brick and Tile Construction by the Brick Institute of America (BIA).

C. Frozen Materials: Do not use frozen materials or materials mixed or coated with ice or frost. For masonry which is to be wetted, comply with BIA recommendations.

D. Frozen Work: Do not build on frozen work. Remove and replace masonry work damaged by frost or freezing.

PART 2 PRODUCTS

2.1 MATERIALS:

A. Masonry Units:

1. Manufacturer: All concrete block units of the same type shall be obtained from one manufacturer, of uniform texture and color for each continuous area and visually related areas.

a. General: All concrete masonry units (CMU) shall comply with ASTM C-90, Grade N, Type 1, f'_m = 1,500 psi unless noted otherwise on the drawings. Units shall be medium weight (50/50), with a density of approximately 110 to 115 pounds per cubic foot, as manufactured by Mutual Materials, or approved equal.

b. Finish: All standard concrete masonry units for exterior walls shall be Smooth Face unless noted otherwise on the drawings, as manufactured by Basalite, or approved equal. Interior surfaces of exterior walls and all interior CMU walls shall be smooth faced CMU, as manufactured by Basalite, or approved equal.

c. Color: All concrete masonry units (CMU) exposed to the exterior shall be colored block (colors to be used, see drawings). All concrete masonry units (CMU) exposed only to the interior of the building shall be natural gray.

d. Sizes: Shall be 8" x 8" x 16" CMU or 12” x 8” x 16” CMU as shown on the drawings..

2. Mortar: All masonry mortar shall conform to IBC and ASTM C 270, Type "S", having a minimum compressive strength of 1,500 psi at 28 days unless noted otherwise on the drawings. The proportions of sand, cement and lime shall be controlled. Shovel counts shall not be used. Masonry cement mortars shall not be used. Dry mix or ready mix mortars may be used if accepted by the Engineer prior to construction. Mortar shall colored to match CMU as selected by Engineer.

C. Aggregate: Shall conform to ASTM C404.

D. Grout: All masonry grout shall conform to IBC. Grout shall be proportioned by laboratory or field experience to obtain the required masonry assemblage strength f'_m. Grout proportions shall be submitted for Engineer acceptance in accordance with SECTION 01340 prior to construction. Grout shall have compressive strength equal to or greater than 2000 psi when tested in accordance with ASTM C476. Sufficient water shall be added to the grout before placement to assure filling of masonry cells. Grout slump at the time of grouting shall be a minimum of 8 inches.

E. Masonry Accessories:

1. Anchoring Devices for Masonry: Provide straps, bars, bolts and rods fabricated from not less than 16 gauge sheet metal or 3/8" diameter rod stock, unless otherwise indicated.

2. Anchor Bolts: ASTM A307

3. Reinforcing Bars: Reinforcing, when not welded, shall conform to ASTM A 615, Grade 60, f_y = 60,000 psi. Reinforcing shall be secured against displacement prior to grouting by wire positioners or other suitable devices at intervals not exceeding 200 bar diameters.

4. Adhesive Anchoring System: Shall be "HVA" Adhesive Anchoring System with "HVU" Adhesive as manufactured by Hilti, or approved equal.

F. Exterior Masonry Sealer: Shall be Fabrishield 653 Siloxane/Quartz Water Repellent as manufactured by Fabrikem Chemicals International, or approved equal. (See SECTION 09900 – for interior masonry)

G. Masonry Fill Insulation: Shall be Zonolite Masonry Insulation as manufactured by W.R. Grace & Company, or approved equal.

PART 3 EXECUTION

3.1 GENERAL:

A. Build openings as shown and as required for work of other trades. Provide not less than 8" of masonry between chase or opening and jamb of openings, and between adjacent chases and openings.

B. Cut masonry units with motor-driven saw designed to cut masonry with clean, sharp, unchipped edges. Cut units as required to provide pattern shown and to fit adjoining work neatly. Use full units without cutting wherever possible.

C. Wet units that display an absorption rate of 12% or more when immersed for one hour in boiling water.

3.2 REINFORCEMENT:

A. Placing Reinforcing:

1. General: Clean free of loose rust, mill scale, earth, ice or other materials that 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.

2. Position reinforcing accurately at the spacing shown. Support and secure vertical bars against displacement. 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" (whichever is greater).

3. Horizontal Reinforcement: Reinforcement shall consist of continuous bond beam with continuous reinforcing bars as indicated on Drawings and as specified. Also provide additional horizontal reinforcement at the top and bottom of all walls and at top and bottom of all openings and at all roof and/or floor diaphragm levels as indicated on the Drawings. Place small mesh expanded metal lath or wire screening in mortar joints under bond beam courses over cores or cells of non-reinforced vertical cells, or provide units with solid bottoms.

4. Vertical Reinforcement: Locate reinforcement to match steel from foundation walls. Also provide reinforcement vertically at all corners wall ends and both sides of all openings as indicated on the Drawings.

3.3 MASONRY:

A. Pattern Bond: Lay masonry in running bond with vertical joint in each course centered on units in course above and below. Layout walls in advance for accurate spacing of bond patterns, with uniform joint widths and to properly locate openings, movement-type joints, returns and off- sets. Avoid the use of less-than-half-size units at ends of walls, jambs and wherever possible at other locations. Lay-up walls plumb and true and with courses level, accurately spaced and coordinated with other work.

B. Stopping and Resuming Work: Rake back 1/2 masonry unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if specified to be wetted, and remove loose masonry units and mortar prior to laying fresh masonry.

C. Built-in Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items. Fill space between hollow metal door frames and masonry solidly, fully and completely with mortar.

D. Mortar Bedding: Mix mortar ingredients for a minimum of 5 minutes in a mechanical batch mixer. Use water clean and free of deleterious materials that would impair the work. Do not use mortar which has begun to set, or if more than 2-1/2 hours has elapsed since initial mixing, Retemper mortar during 2-1/2 hr. period as required to restore workability.

E. Joints: Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints, tool joints slightly concave. Cut joints flush for all 8" masonry walls. Remove masonry units disturbed after laying; clean and relay in fresh mortar. Do not pound corners at jambs to fit stretcher units that have been set in position. If adjustments are required, remove units, clean off mortar, and reset in fresh mortar.

F. Grouting: Lay brick to maximum pour height. Do not exceed 4' vertically. Pour grout-using container with spout or by chute. Rod or vibrate grout during placing. Place grout continuously; do not interrupt pouring of grout for more than one hour. Terminate grout pours 1-1/2" below top course of pour. Pressure grout final top course, ensuring all cells in the top course are fully grouted. Occasional interior face cells (above ceiling line) may be cut out and replaced as required for pressure grouting.

G. Bond Beams: Stop grout in vertical cells 1-1/2" below bond beam course. Place horizontal reinforcing in bond beam; lap at corners and intersections as shown. Place grout in bond beam course before filling vertical cores above bond beam.

H. The owner may engage the services of a testing agency to conduct inspection and testing of the masonry work and its placement to determine its compliance with these Specifications. This testing, if performed, will be solely for the benefit of the Owner. The Contractor shall cooperate at all times with testing agency and provide required testing samples and access to all necessary areas of the Work.

I. Masonry Fill Insulation: Fill all non-grouted cells with masonry fill insulation in accordance with manufacturer's recommendations.

3.4 REPAIR AND POINTING:

A. Remove and replace masonry units which are loose, chipped broken stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence for replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, and completely fill with mortar. Point-up all joints at corners, openings and adjacent work to provide a neat, uniform appearance, properly prepared for application of caulking or sealant compounds.

3.5 SEALING OF MASONRY:

A. Preparation: All surfaces shall be thoroughly dry and dust free, and cleaned of any stains, grease, oil, efflorescence, excess mortar or grout.

B. Sealing of Exterior Masonry: Apply sealer in strict accordance with Manufacturer's written instructions. Protect the sealed masonry from dust, dirt or soiling until sealer has sufficiently cured.

END OF SECTION