INSULATED CONCRETE MASONRY UNITS
Section 04220

PART 1 GENERAL

1.01 Summary

A. Section Includes

1. Insulated masonry wall units (CMU's)

2. Decorative insulated masonry wall units

1.02 SUBMITTALS

A. Samples: Submit samples to Architect for review prior to constructing job-site mock-ups, delivering materials to Site or commencing Work in this Section.

1. Provide samples of each type and weight classification of concrete masonry units, to be used on Project showing range of texture and/or color variations of exposed surfaces for units.
2. Units provided to Project shall match these samples.

B. Product Data: Indicate methods of fabrication and installation for the insulated concrete masonry units.

C. Certificates: Submit certification to the Architect prior to delivery of concrete masonry units to jobsite, signed by Concrete Masonry Unit Manufacturer, stating that the concrete masonry units to be supplied: 1) shall meet the specified requirements for concrete masonry units for exterior building wall construction, and; 2) are suitable for proposed usage.

D. Test Reports:

1. Submit test results for concrete masonry units for exterior building wall construction to be used to Architect in accordance with specifications.
2. Test results shall clearly indicate:
   a. Types of materials and composition.
   b. Classification of concrete masonry unit in accordance with ASTM C90 requirements.
3. Able to provide independent quality assurance test results for concrete masonry units manufactured and tested within a calendar year.

1.03 QUALITY ASSURANCE

A. Standards:

1. Comply with the requirements of ACI 530.1/ASCE6/TMS 602 unless modified by requirements in the Contract Documents.

B. Regulatory Requirements: Masonry materials and workmanship shall meet requirements of building codes which are applicable to jurisdiction in which Project is located.

C. Pre-installation Meetings:

1. A preconstruction meeting between the electrician and the mason shall be conducted to ensure that the electrical plan is accurate and complete.
2. A preconstruction meeting between the window and door supplier and the mason shall be conducted to coordinate the installation of windows and doors.
3. A preconstruction meeting between the plumber and the mason shall be conducted to ensure that the plumbing plans (water and waste) are accurate and complete.

4. A preconstruction meeting between other subcontractors/ suppliers (that will have embeds within the masonry) and the mason shall be conducted to ensure that the location of the embeds are understood and that plans regarding those embeds are accurate and complete.

1.03 DELIVERY, STORAGE AND HANDLING

A. Transport and handle masonry units in such a manner as to prevent chipping and breakage. Complying with ASTM C 90 standards section 7.1, 7.2, 7.2.1.

B. Deliver and store materials in dry, protected areas.

C. Keep free of stain or other damage.

1.04 PROJECT/SITE CONDITIONS

A. Hot Weather Requirements:
1. Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
2. Do not spread mortar beds more than 4 feet ahead of placing block units.
3. Place block units within one minute of spreading mortar.

B. Cold Weather Requirements:
1. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
2. Fully protect concrete masonry units against freezing by a weather-tight covering which shall also prevent accumulation of ice.
3. Do not lay concrete masonry units when temperature of surrounding atmosphere is below [Insert number of degrees F] , unless adequate protection is provided.

C. Field Measurements:
1. Verify measurements shown on Drawings by taking field measurements.
2. Proper fit and attachment of concrete masonry units is required.

1.05 SCHEDULING AND SEQUENCING

A. Coordination: Coordinate with other Trades whose Work relates to concrete masonry unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Insulated Masonry wall Units shall be Omni Block as manufactured by (Put name of manufacturer here) e.g. Ernest Maier 4700 Annapolis Rd Bladensburg, MD 20710 (301) 927-8300, or comparable product by one of the following:

a. ~~Parker Block~~
b. ~~EP Henry~~

2.02 MATERIALS

A. General Requirements for Insulated Concrete Masonry Units Omni Block
   1. Concrete masonry units shall meet ASTM C90 requirements.
   2. Finishes and appearance will comply with ASTM C90 standards section 7.1, 7.2, 7.2.1.
   3. Units shall be in the same condition in wall as they were upon delivery.
   4. Block Design:
      a. Unit sizes shall be 8 by 8 by 16 inches, 8 by 12 by 16 inches or as shown on Drawings.
      b. No direct cross webs (thermal path shall be extended to approximately 16 inches).
      c. Offset cross webs shall create 2 rows of cells (interior and exterior) that are individually filled with molded EPS insulation inserts.
   5. Surface of units shall be clean and free from dirt when laid in walls.
   6. Provide special block sizes and shapes required or as shown on Drawings.

B. Architectural Decorative CMU's- Architectural Omni Block
   1. Concrete masonry units shall meet ASTM C 90 requirements.
   2. Basis-of-Design subject to compliance and requirements, provide Omni Block by ~~Ernest Maier 4700 Annapolis Rd Bladensburg, MD 20710 (301) 927-8300~~.
   3. Finish and Textures [Mirra-Tex] [Mirra-Tex Plus] [Pierra-Tex] [Split Face] [Weathered Satin] [Smooth Face] [Smooth Face Single Score] [Omni Brick Half High].
   4. Or a comparable product by one of the following:
      a. [Insert manufacturer's name]
   5. Colors [Insert manufacturer's colors] [Color range 1] [Color range 2] [Color range 3] [Match Architect's samples] [As selected by Architect from manufacturer's full range]

C. Accessory Units: Provide units as required for window sills and jambs, doors, control joints, bond beams, lintels, pilaster, caps and other locations as indicated on Drawings with a minimum of block cutting. Accessory units shall match adjacent unit color and texture unless noted otherwise. Units shall match samples submitted to Architect for review.

D. Water Repellents: Acceptable CMU Manufacturer: Unit Masonry shall be produced by a BASF Admixtures (Master Builders) Certified CMU Producer using a Rheopel Admixture series product (Master Builders Brand).
   1. Concrete Masonry Units with Rheopel Admixture series product, added at the time of manufacturing: complying with ASTM C 90.

E. Substitutions: Not permitted.

2.03 ACCESSORIES

A. Reinforcing Steel: As specified under Section 03200.

B. Control Joints:
   1. Rubber: Extruded, solid section, ASTM D2000 2AA-805 with a durometer hardness of 70 or 80 when tested per ASTM D2240.
   2. Polyvinyl Chloride (PVC): ASTM D2287, Type PVC 654-4 with a durometer hardness of 85 (+5) when tested per ASTM D2240, minimum tensile strength of 1750 psi with minimum 300 percent elongation per ASTM D638, and cold crack brittleness of 50 degrees F per ASTM D746.

3. Sizes and Profiles: As indicated on Drawings.

C. Mortar and Grout: As specified under Section 04065.

D. Water - Repellent Admixture: Mortar admixture shall be Rheopel Mortar Admixtures (Master Builders brand) as produced by BASF Admixtures (Master Bulders).

E. Substitutions: Not permitted

F. Surface Bond (if required): Cementitious, fiber reinforced compound that has epoxies, water proofers, and Silica sand as its main ingredients. Supply in pre-mixed bags that require water as the only additive.

G. Masonry Wall Insulation:
1. Molded Expanded Polystyrene (EPS) inserts manufactured by Omni Block Inc.
2. R-4 per inch.
3. UL Listed "non-toxic" product.
4. Recyclable.
5. Non CFC
6 Fluted for moisture migration.
7. Designed and sized to fit into Omni Block's designed cavity in block for inserts.
8. Inserts are to include non-mortar interfering indents (vertically and horizontally).

H. Steel Lintels: As indicated or scheduled on Structural Drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Installer shall examine supporting structure and conditions under which unit masonry is to be installed, and notify Contractor, in writing, conditions detrimental to proper and timely completion of Work. Do not proceed with the installation of unit masonry Work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

B. Finish and appearance of CMU's will comply with ASTM C90 standard section 7.1, 7.2, 7.2.1.

C. Do not build on frozen Work; remove and replace unit masonry Work damaged by frost or freezing.

D. Do not use frozen materials or materials mixed or coated with ice or frost. Do not lower freezing point of mortar by use of admixtures or anti-freeze agents, and do not use calcium chloride in mortar or grout.

3.02 PREPARATION

A. Protection: Protect sills, ledges, offsets and other projections from dropping of mortar and grout.

3.03 ERECTION, INSTALLATION, APPLICATION

A. General Requirements for Concrete Masonry Walls:
1. Workmanship: Provide Standard Level workmanship and select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

2. Lay units in uniform and true courses, level and plumb to height indicated on Drawings.
3. Insulation Inserts:
    a. Insulation inserts shall be placed in all exterior cells and shall be installed in interior cells that are not filled with grout and rebar as the wall is laid up (each course).
    b. Interior inserts shall overlap from block-to-block at each course of block.
4. Lay concrete unit masonry in such a way that cracks are not formed at time unit is placed in wall.
5. Units shall not be wetted before being used and shall be laid dry.
6. Adjusting Units:
    a. Units shall be adjusted to be level, plumb and straightened into final position in wall while mortar is still soft and plastic enough to ensure a good bond.
    b. Avoid over-plumbing and pounding of corners and jambs to fit stretcher units after they are set in position.
    c. If position of unit is shifted after mortar has stiffened, or bond is broken or cracks are formed, re-lay unit in new mortar.
7. Bearings on Walls: Provide 3 courses of solid units or grouted hollow masonry units below steel bearing plates or beams bearing on walls. Extend bearings each side of contact with load as required to properly transfer loads into wall.
8. Openings: Provide openings in masonry walls where required or indicated. Steel lintels shall be provided unless otherwise noted.
9. Cutting of masonry: When required, exposed block units shall be cut with a power driven Carborundum or diamond disc blade saw. When using "wet" cutting methods, clean water shall be used on exposed units.
10. Bond pattern shall be regular running bond unless indicated otherwise on the drawings. Bond shall be plumb throughout face of wall.
11. Tolerances: Standard Level of Quality for dimension and locations of elements, lines and levels, and joints.
12. See also "A Field Guide to building with Omni Block" available at www.omniblock.com or from Ernest Maier (301) 927-8300.

B. Bonding:
1. Bond pattern shall be regular running bond unless indicated otherwise on the drawings.
2. Bond shall be plumb throughout face of wall.

C. Bearing Wall Intersections:
1. Intersecting block bearing walls shall not be tied together in a masonry bond, except at corners.
2. One wall shall terminate at face of other wall with a control joint at intersection.
3. Provide sealing of control joint as specified in Section 07900.

D. Control Joints:
1. Provide control joints, as detailed, at vertical masonry walls where such walls exceed 40 feet in length. In long length of walls, provide joints at approximately 24 feet on center or as detailed.
2. Control joints shall be continuous full height of walls.
3. At bond beams, control joints shall separate both block and grout; however, steel reinforcing shall be continuous.
4. Control joints shall not occur at wall corners, intersections, ends, within 24 inches of concentrated points of bearing or jambs or over openings unless specifically indicated on Structural Drawings.
5. Control joint materials shall be held back from finished surface as required to allow for sealant and back-up materials.

E. Vertical Reinforcing and Bond Beam Reinforcing:
1. Place in accordance with requirements of Drawings.
2. Vertical Reinforcement: Provide continuous reinforcing full height of wall at wall ends, corners, intersections, jambs of openings and each side of control joints. Vertical reinforcing shall match and lap dowels which are at top of foundation walls and precast concrete beams.
3. Bond Beams: Provide horizontal reinforcing of 2 bars in minimum 8 inch deep grouted continuous bond beam at roof and elevated floor lines.
4. Parapets: Provide horizontal reinforcing of 1 bar in minimum 8 inch deep grouted continuous bond beam at top of parapets.
5. Bond Beam and Parapet Reinforcing at Vertical Control Joints: Place bars continuous through control joint and wrap mastic tape around bars for 18 inches each side of control joint.
6. Bond Beam and Parapet Reinforcing at Corners and Wall Intersections: Provide bent bars to match reinforcing at corners and wall intersections.
7. Lap splices in reinforcing not less than 40 bar diameters for #7 and larger bars; 30 bar diameters for #6 and smaller bars.
8. Use spacers to position reinforcing steel in center of grout at center of wall as required by code.

F. Grouting:
1. Reinforcing steel is to be in place and inspected before grouting starts.
2. Vertical cells to be filled shall have vertical alignment to maintain a continuous cell area.
3. Keep cell to be grouted free from mortar.
4. Fill cells solidly with grout in lifts not to exceed 4 feet.
5. Grout may be poured by hand bucket, concrete hopper or through a grout pump.
6. Do not wet down grout space prior to pouring of grout.
7. Stop pours 1-1/2 inches below top of cell to form a key at pour points.
8. Grout shall be consolidated by mechanical vibration during placing before loss of plasticity in a manner to fill grout space. Grout pours greater than 12 inches shall be reconsolidated by mechanical vibration to minimize voids due to water loss. Grout pours 12 inches or less in height shall be mechanically vibrated, or rodded.
9. Grout barrier below bond beams shall be continuous wire lath or other approved material.
10. Grout beams over openings and bond beams in a continuous operation.
11. Solidly grout in place bolts, anchors and other items within wall construction.
12. Fully grout jambs and head of metal door frames connected to masonry. Filling of frames shall be done as each 2 feet of masonry is laid.
13. Use extreme care to prevent grout or mortar from staining face of the masonry.
14. Immediately remove grout or mortar which is visible on face of masonry.

G. Surface Bonding (optional):
1. Interior:
a. Interior surface bond shall be applied to seal the wall. Surface bond shall be troweled onto the wall with a semi-smooth coat.
b. Dampen surface of wall evenly to obtain uniform suction.
c. Windows are to be securely fastened into place when the surface bond is applied onto the wall, over the window sill and up to the window itself to provide an airtight seal around the window.

3.04 CLEANING
A. Daily Cleaning: Keep walls clean. Soiled masonry from mortar and grout spills which will be exposed to view at completion of Project shall be cleaned immediately with stiff fiber brushes until wall is free of dropped or spattered grout.

B. Remove scaffolding and equipment used in Work.

C. Clean up debris, refuse and surplus material and remove from premises.

3.05 PROTECTION

A. Furnish temporary protection for exposed masonry corners subject to injury.

B. Carefully cover tops of walls left incomplete at conclusion of day's Work with tarpaulins or other approved covering.

END OF SECTION