SECTION 04225
INSULATED CONCRETE MASONRY UNITS

PART 1   GENERAL

1.01   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 2 samples of each type and weight classification of concrete masonry units, (stretcher, left/right corners and half 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 Section 01430.
   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. Testing laboratory shall notify Architect of non-conforming material submittals.

1.02   QUALITY ASSURANCE

A. Standards:
   1. The "Levels of Quality", Standard 107 of Arizona Masonry Guild (AMG) shall apply and by reference is hereby made a part of this Specification. Reference to Custom, Standard or Economy in this Specification shall be as defined in latest edition of AMG Standard 107.
   2. Comply with the requirements of ACI 530.1/ASCE 6 "Specifications for Masonry Structures", except as otherwise indicated.

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

C. Preinstallation 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.

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

C. Keep free of stain or other damage.

D. Locate storage piles, pallets, stacks or bins to avoid or protect material from heavy or unnecessary traffic.

E. Replace damaged material at no cost to Owner.

1.04 PROJECT/SITE CONDITIONS

A. Hot Weather Requirements:
   1. When ambient air temperature exceeds 100 degrees F., or when ambient air temperature exceeds 90 degrees F. and wind velocity is greater than 8 mph, Masonry Contractor shall implement hot weather protection procedures as submitted to Architect.
   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. Fully protect concrete masonry units against freezing by a weather-tight covering which shall also prevent accumulation of ice.
   2. Do not lay concrete masonry units when temperature of surrounding atmosphere is below 40 degrees F. or is likely to fall below 40 degrees F. in the 24 hour period after laying, 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 for placing required blocking, backing, furring, conduits and other items.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Concrete masonry units shall be as manufactured by Omni Block, 15125 N. Hayden Road, Suite 123, Scottsdale, AZ (480) 661-9009 or approved equal.
2.02 MATERIALS

A. General Requirements for Concrete Masonry Unit:
   1. Concrete masonry units shall meet ASTM C90 requirements except that when CMU will be exposed in final construction, ASTM C90-00, paragraph 7.2.1 shall be modified to read: "Three percent of a shipment containing chips not larger than 1/2 inch in any dimension, or cracks not wider than 0.02 in. and not longer than 10% of the nominal height of the unit is permitted."
   2. Units shall be in the same condition in wall as they were upon delivery.
   3. Block Design:
      a. Unit sizes shall be 8 by 8 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 insulation inserts.
   4. Surface of units shall be clean and free from dirt when laid in walls.
   5. Units not complying with the appropriate ASTM Standards and AMG Standard 107 shall not be laid in the wall where exposed to view. Any unit that is chipped in excess of the requirements of AMG Standard 107 will be rejected and shall be removed and replaced.
   6. Provide special block sizes and shapes required or as shown on Drawings.

B. 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.

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. 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.

E. Masonry Wall Insulation:
   1. Molded Expanded Polystyrene (EPS) inserts.
   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 cavity designed in block for inserts.
   8. Inserts are to include non-mortar interfering indents (vertically and horizontally).
F. Steel Lintels: As indicated or scheduled on Structural Drawings.

G. Aluminum windowwall frames: As specified under Section 08410.

H. Electrical boxes in masonry wall construction: Standard electrical box configuration as supplied by Insulated Concrete Masonry Unit manufacturer.

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. Do not use units with chips, cracks, or other defects which might be visible in the finished Work unless otherwise acceptable to the Architect.

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:


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 in accordance with AMG Standard 107.


**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.

**D. 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.

**E. 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.

**F. Provisions for Other Trades and Built-in Items:**
1. Build in items required and indicated, including; but not limited to, reinforcing steel, anchors, flashings, sleeves, frames, structural steel, loose lintels, anchor bolts, nailing blocks, door and window frames, electrical components and miscellaneous iron.
2. **Window wall frames (specified in Section 08410) are to be installed into insulated concrete masonry unit walls as the wall is erected without any screws or clips. The flange of the window shall slide between the middle lineal wall of the block and interior foam inserts. Windows shall be securely fastened into place when the surface bond is applied.**
3. **Electrical:**
   a. Electrical outlets, switches, phone and cable jacks contained within the masonry wall shall be installed by the mason.
   b. Standard electrical box configuration supplied by Insulated Concrete Masonry Unit manufacturer shall slide into the block in such a way that it cannot move. Box shall remain uniformly flush with the face of the wall.
   c. Conduits shall be installed vertically and horizontally to connect from box-to-box where possible.
d. Electrical contractor shall pull wiring upon completion of wall construction in accordance with requirements of Division 16.

4. Enclosures for pipes, stacks, ducts and conduits:
   a. Construct slots, chases, cavities, and similar spaces as required.
   b. Where masonry is to enclose conduit or piping, bring it to proper level indicated and as directed.
   c. Cover no pipe, conduit chases or enclosures until advised that Work has been inspected and approved.

G. 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.

H. 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.

I. 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.

2. Exterior:
   a. Surface bond the exterior to completely seal and water resist the structure.
   b. Dampen surface of wall evenly to obtain uniform suction.
   c. Apply to a semi-smooth finish to provide substrate acceptable to the manufacturer of the EIFS system to be applied in accordance with Section 07240.

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