SECTION 04 20 00

CONCRETE UNIT MASONRY

1. GENERAL
   1. DESCRIPTION OF WORK
      1. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
         1. Standard concrete masonry units (CMU's) with G-Mix Low Carbon Formula.
         2. Architectural concrete masonry units with G-Mix Low Carbon Formula of the following types:
            1. Ground-face.
            2. Polished ground-face.
            3. Shot blasted.
            4. Brushed.
            5. Split face.
            6. Split rib, 4 ribs.
            7. Split rib, 8 ribs.
            8. Smooth face.
            9. Scored face.
            10. Sound absorbing.
   2. SUBMITTALS
      1. Product Data: Submit manufacturer's product data.
      2. Samples: Submit to Architect for review prior to constructing job-site mock-ups, delivering materials to Site or commencing Work in this Section.
         1. Each type and weight classification of concrete masonry unit, used on Project showing range of texture and color variations of exposed surfaces for units.
         2. Units provided to Project shall match approved samples.
      3. Certificates: Submit certificates to 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 meet the specified requirements for concrete masonry units for exterior building wall construction.
      4. Test Reports: Submit test results for concrete masonry units for exterior building wall construction to be used in accordance with specifications. Clearly indicate types of materials and composition, and classification of concrete masonry unit in accordance with ASTM C90 requirements.
      5. Low Carbon Formula Submittals: Submit manufacturer’s EPD (Environmental Product Declaration), third-party testing and ASTM- verification for Global Warming Potential (reference: [ASTM.org EPD](https://www.astm.org/products-services/certification/environmental-product-declarations/epd-pcr/epd-for-genest-concrete-block.html)) for the following products:
         1. G-Mix for Standard CMU with a low carbon concrete mix with 50% less cement and minimum 5% recycled material.
         2. G-Mix for Architectural CMU with a low carbon concrete mix with 50% less cement and minimum 5% recycled material.
      6. USGBC LEED v4 Submittals, Recycled Content: Submit percentages by weight of postconsumer and preconsumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.
   3. QUALITY ASSURANCE
      1. Standards: Comply with requirements of ACI 530.1/ASCE6/TMS 602 unless modified by requirements in the Contract Documents.
      2. Regulatory Requirements: Masonry materials and workmanship shall comply with requirements of building codes which are applicable to jurisdiction in which Project is located.
      3. Fire-Resistance Ratings: Units must comply with requirements as indicated, and as determined by testing units of equivalent thickness according to ASTM E119, or by other means acceptable to authorities having jurisdiction.
      4. Sample Panels: Build freestanding sample panels for typical walls, approximately four courses wide and three courses high. Verify selections made under sample submittals to demonstrate aesthetic effects. Review for materials and workmanship.
      5. Field Measurements: Verify measurements shown on Drawings by taking field measurements. Proper fit and attachment of concrete masonry units is required.
      6. Pre-Construction Meeting: Convene a pre-construction meeting at the site to discuss schedule, site conditions, and requirements for sequencing. Confirm coordination with other trades, including concrete, metal fabrications, windows, doors, flashing, sealants, plumbing, and electrical. Ensure location of embeds are established and plans are accurate and complete.
   4. PROJECT CONDITIONS
      1. Protection of Masonry During Construction: Cover wall tops, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
      2. Stain Prevention: Immediately remove grout, mortar, and soil contacting exposed masonry faces.
      3. Hot-Weather Requirements: Comply requirements in ACI 530.1, ASCE 6, and TMS 602.
      4. Cold-Weather Requirements: Comply with requirements in ACI 530.1, ASCE 6, and TMS 602.
         1. Do not use frozen materials or materials mixed or coated with ice or frost.
         2. Do not build on frozen substrates.
         3. Remove and replace unit masonry damaged by frost or by freezing conditions.
   5. DELIVERY, STORAGE AND HANDLING
      1. Transport, deliver and handle masonry units in such a manner as to prevent chipping and breakage. Complying with ASTM C 90, including Sections 7.1, 7.2, 7.2.1.
      2. Deliver and store materials in dry, protected areas. Keep free of stain or other damage.
   6. SCHEDULING AND SEQUENCING
      1. Coordination: Coordinate with other trades whose Work relates to concrete masonry unit installation.
2. PRODUCTS
   1. MANUFACTURER
      1. Concrete Unit Masonry: Provide units manufactured by Genest Concrete Works, Inc., 36 Wilson Street, Sanford Maine 04073. (207) 324-3250, (800) 649-4773.
         1. Standard Concrete Masonry Units with Low Carbon Formula: G-Mix by Genest, manufactured using a proven method of CO2 reduction with quantifiable and verifiable results.
            1. G-Mix for Standard CMU with a low carbon concrete mix with 50% less cement and minimum 5% recycled material.
         2. Architectural Concrete Masonry Units with Low Carbon Formula: G-Mix by Genest, manufactured using a proven method of CO2 reduction with quantifiable and verifiable results, of the following types:
            1. G-Mix for Architectural CMU with a low carbon concrete mix with 50% less cement and minimum 5% recycled material for the following types:

Ground-face.

Polished ground-face.

Shot blasted.

Brushed.

Split face.

Split rib, 4 ribs.

Split rib, 8 ribs.

Smooth face.

Scored face.

Sound absorbing.

* + - 1. Size, Face and Color: As indicated on the Drawings.
      2. Size, Face and Color: Match Architect's samples.
      3. Size, Face and Color: As selected by Architect from manufacturer's full range.
    1. Accessory Units: As required for window sills and jambs, doors, control joints, bond beams, lintels, pilaster, caps and other locations indicated on Drawings with a minimum of block cutting.
       1. Match adjacent unit color and texture unless noted otherwise.
       2. Match samples submitted to Architect for review.
    2. Integral Water Repellent: BASF Admixtures, Master Builders Certified CMU Producer using a Rheopel Admixture series product; Master Builders Brand.
  1. MATERIALS
     1. General Requirements for Concrete Unit Masonry:
        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.
  2. ACCESSORY PRODUCTS
     1. Reinforcing Steel: Refer to the Drawings and as specified in Section 03 20 00 – Concrete Reinforcing.
     2. Mortar and Grout: Refer to the Drawings and as specified in Section 04 05 00 - Common Work Results for Masonry.
     3. Flashing: Refer to the Drawings and as specified in Section 07 20 00 - Flashing and Sheet Metal.
     4. Sealants: Refer to the Drawings and as specified in Section 07 92 00 - Joint Sealants.
     5. Control Joints: Rubber or PVC, durometer hardness suitable for application.
     6. Steel Lintels: As indicated or scheduled on the Structural Drawings.

1. EXECUTION
   1. EXAMINATION
      1. Installer shall examine supporting structure and conditions under which unit masonry is to be installed, and notify Contractor, in writing, of conditions detrimental to proper and timely completion of Work. Do not proceed until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
   2. PREPARATION
      1. Site Conditions: Do not build on frozen substrate. 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.
      2. Protection: Protect sills, ledges, offsets and other projections from dropping of mortar and grout.
   3. INSTALLATION
      1. Installation: Install units in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction. Finish and appearance of shall comply with ASTM C90 standard section 7.1, 7.2, 7.2.1.
      2. Comply with NCMA Recommended Practices for Laying Concrete Block and TEK Bulletins and with the following requirements.
      3. Requirements for Concrete Masonry Walls:
         1. Workmanship: Standard level. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Lay units in uniform and true courses, level and plumb to height indicated on Drawings.
         2. Placement: Lay concrete unit masonry such that cracks are not formed at time unit is placed in wall. Units are not be wetted before being used and are to be laid dry.
         3. Adjusting Units:
            1. Units to be level, plumb and straightened into final position in wall while mortar is still soft and plastic enough to ensure a good bond.
            2. Avoid over-plumbing and pounding of corners and jambs to fit stretcher units after they are set in position.
            3. If position of unit is shifted after mortar has stiffened, or bond is broken or cracks are formed, re-lay unit in new mortar.
         4. Bearings on Walls: Provide three 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.
         5. Openings: Provide where required or indicated. Use steel lintels unless otherwise noted.
         6. 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.
         7. Bond Pattern: Bond pattern shall be regular running bond unless indicated otherwise on the drawings. Bond shall be plumb throughout face of wall.
         8. Tolerances: Standard Level of Quality for dimension and locations of elements, lines and levels, and joints.
      4. Bonding:
         1. Bond pattern shall be regular running bond unless indicated otherwise on the drawings.
         2. Bond shall be plumb throughout face of wall.
      5. Bearing Wall Intersections:
         1. Intersecting block bearing walls are not be tied together in a masonry bond, except at corners.
         2. One wall is to terminate at face of other wall with a control joint at intersection.
         3. Seal control joint in accordance with Section 07 90 00 - Joint Protection.
      6. Control Joints: Continuous full height of walls.
         1. As detailed, at vertical masonry walls where walls exceed 40 feet (1016 mm) in length. In long length of walls, place joints nominally at 24 feet (7315 mm) on center or as detailed.
         2. At bond beams, control joints separate both block and grout. Steel reinforcing is to be continuous.
         3. Control joints are not to occur at wall corners, intersections, ends, or within 24 inches (610 mm) of concentrated points of bearing or jambs or over openings unless specifically indicated on Structural Drawings.
         4. Control joint materials to be held back from finished surface as required to allow for sealant and back-up materials.
      7. Vertical Reinforcing and Bond Beam Reinforcing:
         1. Placement: Place in accordance with requirement indicated on the Drawings.
         2. Vertical Reinforcement: Continuous reinforcing full height of wall at wall ends, corners, intersections, jambs of openings and each side of control joints. Vertical reinforcing to match and lap dowels which are at top of foundation walls and precast concrete beams.
         3. Bond Beams: Horizontal reinforcing of 2 bars in minimum 8 inch (200 mm) deep grouted continuous bond beam at roof and elevated floor lines.
         4. Parapets: Horizontal reinforcing of 1 bar in minimum 8 inch (200 mm) 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 (450 mm) each side of control joint.
         6. Bond Beam and Parapet Reinforcing at Corners and Wall Intersections: Bent bars to match reinforcing at corners and wall intersections.
         7. Lap Splices in Reinforcing: Minimum 40 bar diameters for #7 and larger bars; 30 bar diameters for #6 and smaller bars.
         8. Spacers: Use spacers to position reinforcing steel in center of grout at center of wall as code requires.
      8. 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 (1200 mm).
         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 (38 mm) below top of cell to form a key at pour points.
         8. Grout to be consolidated by mechanical vibration during placing before loss of plasticity in a manner to fill grout space. Grout pours greater than 12 inches (300 mm) to be reconsolidated by mechanical vibration to minimize voids due to water loss. Grout pours 12 inches (300 mm) or less in height to 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 (600 mm) 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.
      9. Flashing: Install flashing in accordance with Section 07 62 00 - Flashing and Sheet Metal. Comply with NCMA TEK 19-04, Flashing Strategies for Concrete Masonry Walls, and NCMA TEK 19-05, Flashing Details for Concrete Masonry Walls.
      10. Sealants: Install sealants in accordance with Section 07 92 00 - Joint Sealants.
      11. Daily Cover: Cover tops of incomplete walls at the end of each day. Use tarpaulins or approved covering.
   4. CLEANING
      1. Keep walls clean. Clean soiled masonry daily from mortar and grout spills which will be exposed to view at completion of Project immediately with stiff fiber brushes until wall is free of dropped or spattered grout.
      2. Clean up debris, refuse and surplus material and remove from premises.
   5. PROTECTION
      1. Furnish temporary protection for exposed masonry corners subject to injury.

END OF SECTION