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**SECTION 04 20 00****UNIT MASONRY****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Concrete block.
- B. Decorative Concrete Block
- C. Mortar.
- D. Reinforcement and anchorage.
- E. Flashings.
- F. Lintels.
- G. Accessories.

**1.2 REFERENCE STANDARDS**

- A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; 2011.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2015b.
- D. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.
- E. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2011.
- F. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.
- G. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2014.
- H. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2011.
- I. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2011.
- J. ASTM C150/C150M - Standard Specification for Portland Cement; 2015.
- K. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).
- L. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2014a.
- M. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.
- N. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2010.
- O. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2005.
- P. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.
- Q. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.
- R. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2005.
- S. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.
- T. BIA Technical Notes No. 7 - Water Penetration Resistance - Design and Detailing; 2005.
- U. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.
- V. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2005.

**1.3 ADMINISTRATIVE REQUIREMENTS**

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- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

#### **1.4 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for brickwork support system.
  - 1. Include calculations or selections from the manufacturer's prescriptive design tables that indicate compliance with the applicable building code and project conditions.
- D. Samples: Submit four samples of decorative block units to illustrate color, texture, and extremes of color range.
- E. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
- F. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

#### **1.5 QUALITY ASSURANCE**

- A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of Contract Documents.

#### **1.6 MOCK-UP**

- A. Construct a masonry wall as a mock-up panel sized 4 feet long by 3 feet high; include mortar, accessories, and flashings (with lap joint, corner, and end dam) in mock-up.
- B. Locate where directed.

#### **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

### **PART 2 PRODUCTS**

#### **2.1 CONCRETE MASONRY UNITS**

- A. Concrete Block: Comply with referenced standards and as follows:
  - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
  - 2. Special Shapes: Provide non-standard blocks configured for corners and other detailed conditions.
    - a. Provide bullnose units for all exposed outside corners and wall caps.
      - 1) Provide solid units for wall caps.
  - 3. Load-Bearing Units: ASTM C90, normal weight.
    - a. Hollow block, as indicated.
  - 4. Non-Loadbearing Units: ASTM C129.
    - a. Hollow block, as indicated.
    - b. Lightweight.
  - 5. Decorative Faced Units: Basis of Design Manufacturer: York Building Products; [www.yorkbuilding.com](http://www.yorkbuilding.com): ASTM C90, normal weight.

- a. Base Bid Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depth of 4 inches.
- b. Exposed Faces:
  - 1) Texture: Architectural Split Face with integral water repellent.
  - 2) Color: York Building Products - "Arctic White - YBP-20 (N0714)".

## **2.2 MORTAR MATERIALS**

- A. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Mortar Aggregate: ASTM C144.
- D. Grout Aggregate: ASTM C404.
- E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
- F. Water: Clean and potable.
- G. Basis of Design Mortar Manufacturer: Workrite Cements for Masonry; [www.workrite-cements.com](http://www.workrite-cements.com).

## **2.3 REINFORCEMENT AND ANCHORAGE**

- A. Manufacturers:
  1. Blok-Lok Limited: [www.blok-lok.com/#sle](http://www.blok-lok.com/#sle).
  2. Hohmann & Barnard, Inc: [www.h-b.com/#sle](http://www.h-b.com/#sle).
  3. WIRE-BOND [www.wirebond.com/#sle](http://www.wirebond.com/#sle).
- B. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi), deformed billet bars; uncoated.
- C. Adjustable Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
  1. Type: Truss or ladder, with adjustable ties or tabs spaced at 16 in on center.
  2. Material: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M, Class B.
  3. Size: 0.1875 inch side rods with 0.1483 inch cross rods and adjustable components of 0.1875 inch wire, width of components as required to provide not less than 5/8 inch of mortar coverage from each masonry face.
  4. Vertical adjustment: Not more than 1 1/4 inches.
  5. Insulation Clips: Provide clips at tabs or ties designed to secure insulation against outer face of inner wythe of masonry.
- D. Strap Anchors: Bent steel shapes, 1-1/2 inch width, 0.105 inch thick, 24 inch length, with 1-1/2 inch long, 90 degree bend at each end to form a U or Z shape or with cross pins, hot dip galvanized to ASTM A153/A153M, Class B.
- E. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not less than 5/8 inch of mortar coverage from masonry face.

## **2.4 FLASHINGS**

- A. Stainless Steel/Polymer Fabric Flashing - Self-adhering: ASTM A240/A240M; 2 mil type 304 stainless steel sheet bonded on inward facing side to a sheet of polymer fabric that has a clear adhesive with a removable release liner.
  1. Manufacturers:
    - a. Hohmann & Barnard, Inc: [www.h-b.com/#sle](http://www.h-b.com/#sle).
    - b. York Manufacturing, Inc; York 304: [www.yorkmfg.com](http://www.yorkmfg.com).

- B. Termination Bars: Stainless steel; compatible with membrane and adhesives.
- C. Drip Edge: Stainless steel; angled drip with hemmed edge; compatible with membrane and adhesives.
- D. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

## **2.5 ACCESSORIES**

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
  - 1. Manufacturers:
    - a. Blok-Lok Limited: [www.blok-lok.com/#sle](http://www.blok-lok.com/#sle).
    - b. Hohmann & Barnard, Inc: [www.h-b.com/#sle](http://www.h-b.com/#sle).
    - c. WIRE-BOND: [www.wirebond.com/#sle](http://www.wirebond.com/#sle).
- B. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
  - 1. Mortar Diverter: Semi-rigid mesh designed for installation at flashing locations.
    - a. Manufacturers:
      - 1) Advanced Building Products Inc: [www.advancedflashing.com/#sle](http://www.advancedflashing.com/#sle).
      - 2) Mortar Net Solutions: [www.mortarnet.com/#sle](http://www.mortarnet.com/#sle).
      - 3) York Manufacturing, Inc: [www.yorkmfg.com/#sle](http://www.yorkmfg.com/#sle).
- C. Weeps and Cavity Vents:
- D. Type: Polyester mesh.
- E. Color(s): As selected by Architect from manufacturer's full range.
  - 1. Manufacturers:
    - a. Advanced Building Products, Inc: [www.advancedbuildingproducts.com/#sle](http://www.advancedbuildingproducts.com/#sle).
    - b. CavClear/Archovations, Inc: [www.cavclear.com/#sle](http://www.cavclear.com/#sle).
    - c. Mortar Net Solutions: [www.mortarnet.com/#sle](http://www.mortarnet.com/#sle).
    - d. Mortar Net Solutions: [www.mortarnet.com](http://www.mortarnet.com).
- F. Type: Polyester mesh.

## **2.6 LINTELS**

- A. Lintels: For masonry bond beam lintels see "Masonry Wall Lintel Schedule" on structural drawings.

## **2.7 MORTAR AND GROUT MIXING**

- A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
  - 1. Masonry below grade and in contact with earth: Type S.
  - 2. Exterior, loadbearing masonry: Type N.
  - 3. Exterior, non-loadbearing masonry: Type N.
  - 4. Interior, loadbearing masonry: Type N.
  - 5. Interior, non-loadbearing masonry: Type N.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

**3.2 PREPARATION**

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary bracing as required during installation of masonry work. Maintain in place until building structure provides permanent bracing.
- C. Confirm that demolition of existing windows and doors in masonry walls was performed properly leaving existing remaining masonry units in a toothed condition.

**3.3 COLD AND HOT WEATHER REQUIREMENTS**

- A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

**3.4 COURSING**

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
  - 1. Bond: Running.
  - 2. Coursing: One unit and one mortar joint to equal 8 inches.
  - 3. Mortar Joints: Concave.
- D. Install new masonry units in new openings in existing walls utilizing the toothed in method continuing the existing coursing and bond pattern.

**3.5 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 is not permitted.
- D. Remove excess mortar and mortar smears 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.
- 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. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- I. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

**3.6 WEEPS/CAVITY VENTS**

- A. Install weeps in veneer and cavity walls at 32 inches on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.

**3.7 CAVITY MORTAR CONTROL**

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
  - B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.
  - C. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.
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**3.8 REINFORCEMENT AND ANCHORAGE - GENERAL, SINGLE WYTHE MASONRY, AND CAVITY WALL MASONRY**

- A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Embed longitudinal wires of joint reinforcement in mortar joint with at least 5/8 inch mortar cover on each side.
- E. Lap joint reinforcement ends minimum 6 inches.
- F. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.
- G. Embed ties and anchors in mortar joint and extend into masonry unit a minimum of 1-1/2 inches with at least 5/8 inch mortar cover to the outside face of the anchor.

**3.9 MASONRY FLASHINGS**

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
- B. Terminate flashing up 8 inches minimum on vertical surface of backing:
- C. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.
- D. Extend metal flashings to within 1/2 inch of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.
- E. Support flexible flashings across gaps and openings.
- F. Lap end joints of flashings at least 6 inches, minimum, and seal watertight with flashing sealant/adhesive.

**3.10 LINTELS**

- A. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.
- B. Maintain minimum 8 inch bearing on each side of opening.

**3.11 GROUTED COMPONENTS**

- A. Lap splices minimum 24 bar diameters.
- B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- C. Place and consolidate grout fill without displacing reinforcing.
- D. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

**END OF SECTION 04 20 00**