SECTION 04.20.00
UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Concrete Block.
   B. Hollow Brick.
   C. Reinforcement and Anchorage.
   D. Flashings.
   E. Accessories.

1.02 RELATED REQUIREMENTS
   A. Section 03.20.00 - Concrete Reinforcing: Reinforcing steel for grouted masonry.
   B. Section 04.05.11 - Masonry Mortaring and Grouting.
   C. Section 05.50.00 - Metal Fabrications: Loose steel lintels.
   D. Section 07.84.00 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.
   E. Section 07.92.00 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS
   A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; 2011.
   C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
   E. ASTM C62 - Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale); 2013.
   I. ASTM C140/C140M - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2014.
   L. ASTM C652 - Standard Specification for Hollow Brick (Hollow Masonry Units Made From Clay or Shale); 2014.

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

1.05 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. Samples: Submit four samples of facing brick units to illustrate color, texture, and extremes of color range.
D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
E. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.
F. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

1.06 QUALITY ASSURANCE
A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.

1.07 MOCK-UP
A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar, accessories, structural backup, and flashings (with lap joint, corner, and end dam) in mock-up.
B. Locate where directed.
C. Mock-up may remain as part of the Work.

1.08 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

2.01 CONCRETE MASONRY UNITS
A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
   2. Special Shapes: Provide non-standard blocks configured for corners.
   3. Load-Bearing Units: ASTM C90, normal weight.
      a. Hollow block, as indicated.
      b. Exposed Faces: Manufacturer's standard color and texture where indicated.
   a. Hollow block, as indicated.

2.02 BRICK UNITS
A. Manufacturers:
   1. General Shale Brick; Modular, "Full Range Charleston", 6028023463; Marion, VA Plant:
   2. Substitutions: See section 01.60.00 - Product Requirements.
B. Hollow Facing and Building Brick: ASTM C652, Grade SW; Type HBS; Class H40V.
   1. Color and texture: See above.
   2. Nominal size: Per selection above.

2.03 MORTAR AND GROUT MATERIALS
A. Mortar and Grout: As specified in Section 04.05.11.

2.04 REINFORCEMENT AND ANCHORAGE
A. Manufacturers of Joint Reinforcement and Anchors:
   1. Hohmann & Barnard, Inc (including Dur-O-Wal brand); 2-Seal Thermal Wing-Nut @ metal studs
      and 2-Seal Thermal Concrete @ concrete walls: www.h-b.com.
   3. Substitutions: See Section 01.60.00 - Product Requirements.
B. Reinforcing Steel: Type specified in Section 03.20.00; size as indicated on drawings; galvanized finish.
C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and
   truss type elsewhere, unless otherwise indicated.
D. Single Wythe Joint Reinforcement: Truss or ladder type; ASTM A1064/A1064M steel wire, mill
galvanized to ASTM A641/A641M, Class 3; 0.1483 inch side rods with 0.1483 inch cross rods; width
   as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each
   exposure.
E. Adjustable Multiple Wythe Joint Reinforcement: Truss type with adjustable ties or tabs spaced at 16 in
   on center and fabricated with moisture drip; ASTM A1064/A1064M steel wire, hot dip galvanized after
   fabrication to ASTM A153/153M, Class B; 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 more than 1
   inch and not less than 1/2 inch of mortar coverage from each masonry face.
   1. Vertical adjustment: Not less than 2 inches.
   2. Seismic Feature: Provide lip, hook, or clip on extended leg of wall ties to engage or enclose not
      less than one continuous horizontal joint reinforcement wire of 0.1483 inch diameter.
   3. Insulation Clips: Provide clips at tabs or ties designed to secure insulation against outer face of
      inner wythe of masonry.
F. Two-Piece Wall Ties: Formed steel wire, 0.1875 inch thick, adjustable, eye and pintle type, hot dip
   galvanized to ASTM A153/A153M, Class B, sized to provide not more than 1 inch and not less than 1/2
   inch of mortar coverage from masonry face and to allow vertical adjustment of up to 1-1/4 in.
G. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer
   and structural backup, hot dip galvanized to ASTM A153/A153M, Class B.
   1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through
      sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to
      provide positive anchorage.
   2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
   3. Vertical adjustment: Not less than 3-1/2 inches.
4. Seismic Feature: Provide lip, hook, or clip on end of wire ties to engage or enclose not less than one continuous horizontal joint reinforcement wire of 0.1483 inch diameter.

H. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws; corrosion resistant finish or hot dip galvanized to ASTM A153/A153M.

2.05 FLASHINGS
A. Copper/Polyethylene Flashing: Polyethylene film laminated to a 5 oz/sq ft copper sheet through a fiberglass scrim.
   1. Manufacturers:
      a. Hohmann & Barnard, Inc; Copper Fabric SA Self-Adhering, with pre-manufactured corners and end dams: www.h-b.com.
      b. Substitutions: See Section 01.60.00 - Product Requirements.
B. Factory-Fabricated Flashing Corners and Ends: Copper.
   1. Manufacturers:
      a. Hohmann & Bernard.
C. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.

2.06 ACCESSORIES
A. Preformed Control Joints: Polyvinyl chloride material. Provide with corner and tee accessories, fused joints.
   1. Manufacturers:
      b. Substitutions: See Section 01.60.00 - Product Requirements.
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) Hohmann & Bernard: Mortar Trap.
C. Nailing Strips: Softwood lumber, preservative treated for moisture resistance, dovetail shape, sized to masonry joints.
D. Termination Bars: Stainless steel; compatible with membrane and adhesives.
E. Weeps:
   1. Type: Polyester mesh.
   2. Manufacturers:
F. Drainage Fabric: Polyester or polypropylene mesh.
   1. Manufacturers:
      a. Keene: Keenestone Cut-2, DriWall Rainscreen 020-1.
G. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

PART 3 EXECUTION

3.01 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.

3.02 PREPARATION
A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS
A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

3.04 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.
D. Brick Units:
   1. Bond: Running.
   2. Coursing: Three units and three mortar joints to equal 8 inches.

3.05 PLACING AND BONDING
A. Lay hollow masonry units with face shell bedding on head and bed joints.
B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
C. Remove excess mortar and mortar smears as work progresses.
D. Interlock intersections and external corners, except for units laid in stack bond.
E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
G. Cut mortar joints flush where wall tile is scheduled, resilient base is scheduled, or bitumen dampproofing is applied.
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.

3.06 WEEPS/CAVITY VENTS
A. Install weeps in veneer and cavity walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.
B. Install cavity vents in veneer and cavity walls at 16 inches on center horizontally below shelf angles and lintels and near top of walls.

3.07 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.

3.08 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY
A. 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. Lap joint reinforcement ends minimum 6 inches.

3.09 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER
A. 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. Lap joint reinforcement ends minimum 6 inches.
E. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 32 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
F. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
G. Seismic Reinforcement: Connect veneer anchors with continuous horizontal wire reinforcement before embedding anchors in mortar.

3.10 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.
   1. Extend flashings full width at such interruptions and at least 6 inches into adjacent masonry or turn up at least 8 inches to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.
B. Extend metal flashings flush with exterior face of masonry.
C. Lap end joints of flashings at least 6 inches and seal watertight with flashing sealant/adhesive.

3.11 LINTELS
A. Install loose steel lintels over openings.
B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.
   1. Openings to 42 inches: Place two, No. 3 reinforcing bars 1 inch from bottom web.
   2. Openings from 42 inches to 78 inches: Place two, No. 5 reinforcing bars 1 inch from bottom web.
   3. Openings over 78 inches: Reinforce openings as detailed.
   4. Do not splice reinforcing bars.
   5. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
   6. Place and consolidate grout fill without displacing reinforcing.
7. Allow masonry lintels to attain specified strength before removing temporary supports.
   C. Maintain minimum 8 inch bearing on each side of opening.

3.12 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.

3.13 CONTROL AND EXPANSION JOINTS
A. Do not continue horizontal joint reinforcement through control or expansion joints.
B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance
with manufacturer's instructions.
C. Size control joints as indicated on drawings; if not shown, 3/8 inch wide and deep.
D. Form expansion joint as indicated on drawings.

3.14 BUILT-IN WORK
A. As work progresses, install built-in metal door frames and other items to be built into the work and
furnished under other sections.
B. Install built-in items plumb, level, and true to line.
C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
   1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
D. Do not build into masonry construction organic materials that are subject to deterioration.

3.15 TOLERANCES
A. Maximum Variation from Alignment of Columns: 1/4 inch.
B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.
G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.16 CUTTING AND FITTING
A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and
location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of
masonry work may be impaired.

3.17 FIELD QUALITY CONTROL
A. An independent testing agency will perform field quality control tests, as specified in Section 01.43.25.
B. Clay Masonry Unit Tests: Test each variety of clay masonry in accordance with ASTM C67
requirements, sampling 5 randomly chosen units for each 50,000 installed.
3.18 CLEANING
   A. Remove excess mortar and mortar droppings.
   B. Replace defective mortar. Match adjacent work.
   C. Clean soiled surfaces with cleaning solution.
   D. Use non-metallic tools in cleaning operations.

3.19 PROTECTION
   A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION