SECTION 04 20 00
UNIT MASONRY

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Face brick.

B. Related Sections:
1. Division 07 Section "Sheet Metal Flashing and Trim" for furnishing manufactured reglets installed in masonry joints.

1.02 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each type and color of exposed masonry unit.

C. Material Certificates: For each type and size of product indicated. For masonry units include data on material properties.

D. Mix Designs: For each type of mortar. Include description of type and proportions of ingredients.

1.03 QUALITY ASSURANCE

A. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

1.04 PROJECT CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.01 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

B. Regional Manufacture: Provide brick manufactured within 500 miles of the project site.

2.02 BRICK

A. General: Provide shapes indicated and as follows:
1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
2. For rowlock sills, provide units without cores or frog and with exposed surfaces finish.
3. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Face Brick: Facing brick complying with ASTM C 216.
1. Color: Buff (beige) and red, as selected by the Architect.
2. Grade: SW.
3. Type: FBX.
4. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
5. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
6. Size (Actual Dimensions): 3-1/2 inches wide by 2-1/4 inches high by 7-1/2 inches long or 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.

2.03 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Aggregate for Mortar: ASTM C 144.

C. Water: Potable.

2.04 TIES AND ANCHORS

A. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch cover on outside face. Provide units with outer ends of wires bent 90 degrees and extending 2 inches parallel to face of veneer.

B. Adjustable Ties: For attachment of veneer over sheathing to metal studs, furnish two-piece screw-attached masonry veneer anchor assemblies which allow vertical differential movement between masonry and back-up construction and resist tension and compression forces perpendicular to it.
1. Structural Performance: Ties capable of withstanding a 100 lbf load in either tension or compression without deforming over, or developing play in excess of, 0.05 inch.
2. Anchor Section: Zinc-alloy barrel section with flanged head with eye and corrosion-resistant, self-drilling screw. Eye designed to receive wire tie and to serve as head for drilling fastener into framing. Barrel length to suit sheathing thickness, allowing screw to seat directly against framing with flanged head covering hole in sheathing.

3. Wire Ties: Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.188-inch- diameter, hot-dip galvanized steel wire.
4. Product: Heckman; Pos-I-Tie.

2.05 EMBEDDED FLASHING MATERIALS

A. Flexible Membrane Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch.
1. Compatibility: Confirm compatibility with manufacturer of weather resistive barrier.
2. Products:
a. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Perm-A-Barrier Wall Flashing.
b. Henry Company; Blueskin TWF Self-Adhesive Thru-Wall Membrane Flashing.
c. Hohmann & Barnard, Inc.; Textroflash.

B. Sheet Metal Flashing: ASTM B 370, cold-rolled copper sheet, H00 temper, of minimum uncoated weight (thickness) indicated; coated on both sides with a zinc-tin alloy (50 percent zinc, 50 percent tin). Product: Revere Copper Products, Inc.; Freedom Gray.
1. Fabrication: Fabricate drip-edge flashing from material which weighs 16 ounces per square foot, minimum, before coating. Form to shapes shown on Drawings. Form on brakes, to provide flashing with straight lines and clean, sharp bends.
a. Turn up back of flashing inside the air space and at the ends of runs to form water dams, and solder continuously at seams to make the flashing watertight.
b. At changes of direction, provide prefabricated inside and outside corners, soldered continuously.
2. Fabricate cleats and edge strips from 20 ounce cold-rolled copper.

C. Solder and Sealants for Sheet Metal Flashings: As specified in Section 07 62 00, Sheet Metal Flashing and Trim.

D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.06 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; formulated from neoprene, urethane or PVC.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

D. Weep/Vent Products: Use the following unless otherwise indicated:

1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.
    a. Products: Subject to compliance with requirements, provide the following:
        1) Advanced Building Products Inc.; Mortar Maze weep vent.
        2) Blok-Lok Limited; Cell-Vent.
        3) Dayton Superior Corporation, Dur-O-Wal Division; Cell Vents.
        4) Heckmann Building Products Inc.; No. 85 Cell Vent.
        5) Hohmann & Barnard, Inc.; Quadro-Vent.
        6) Wire-Bond; Cell Vent.

E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
1. Products: Subject to compliance with requirements, provide the following:
    a. Advanced Building Products Inc.; Mortar Break or Mortar Break II.
    b. Archovations, Inc.; CavClear Masonry Mat.
    c. Dayton Superior Corporation, Dur-O-Wal Division; Polytite MortarStop.
    d. Mortar Net USA, Ltd.; Mortar Net.
2. Provide one of the following configurations:
    a. Strips, full-depth of cavity and 10 inches high, with dovetail shaped notches 7 inches deep.
    b. Strips, not less than 1-1/2 inches thick and 10 inches high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.
    c. Sheets or strips full depth of cavity and installed to full height of cavity.

2.07 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Diedrich Technologies, Inc.
    b. EaCo Chem, Inc.
    c. ProSoCo, Inc.

2.08 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
2. For exterior masonry, use portland cement-lime mortar.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification; Type N.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

C. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:
   1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
   2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.

3.02 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

3.03 MORTAR BEDDING AND JOINTING

A. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.04 CAVITY WALLS

A. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

3.05 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:
   1. Fasten screw-attached anchors through sheathing to wall framing with metal fasteners of type indicated.
   2. Embed tie sections in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing.
   3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
   4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 32 inches o.c. horizontally with not less than 1 anchor for each 3.5 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.

3.06 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at ledges and other obstructions to downward flow of water in wall, and where indicated.

B. Install flashing as follows unless otherwise indicated:
   1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
   2. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal drip edge.
   3. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal flashing termination.

C. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
   1. Use specified weep/vent products to form weep holes.
   2. Space weep holes 24 inches o.c. unless otherwise indicated.

D. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

3.07 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

B. Testing Prior to Construction: One set of tests.

C. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.

D. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

3.08 REPAIRING, POINTING, AND CLEANING

A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
2. Protect adjacent surfaces from contact with cleaner.
3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
4. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

END OF SECTION 04 20 00