

SECTION 04200

UNIT MASONRY

1 PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

- A. Extent of each type of masonry work is indicated on drawings.
- B. Types of masonry work required include:
 - 1. Face brick veneer.
 - 2. Masonry waterproofing.

1.3 QUALITY ASSURANCE:

- A. Fire Performance Characteristics: Where indicated, provide materials and construction which are identical to those of assemblies whose fire endurance has been determined by testing in compliance with ASTM E 119 by a recognized testing and inspecting organization or by another means, as acceptable to authority having jurisdiction.
- B. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
- C. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

1.4 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.
- C. Store cementitious materials off the ground, under cover and in dry location.
- D. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.
- E. Store aggregates where grading and other required characteristics can be maintained.

1.5 PROJECT CONDITIONS:

- A. Protection of Work: Where exposed to weather during erection, cover top of masonry with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.
 - 1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- B. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls or columns.
- C. Do not apply concentrated loads for at least 3 days after building masonry walls or columns.
- D. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.
- E. Cold Weather Protection:
- F. Do not lay masonry units which are wet or frozen.
- G. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.
- H. Remove masonry damaged by freezing conditions.
- I. Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperatures existing at time of installation.
 - 1. 40 deg F (4 deg C) to 32 deg F (0 deg C):
 - a. Mortar: Heat mixing water to produce mortar temperature between 40 deg F (4 deg C) and 120 deg F (49 deg C).
 - 2. 32 deg F (0 deg C) to 25 deg F (-4 deg C):
 - a. Mortar: Same as above.
 - 3. 25 deg F (-4 deg C) to 20 deg F (-7 deg C):
 - a. Mortar: Same as above.
 - b. Heat both sides of walls under construction.
 - c. Use windbreaks or enclosures when wind is in excess of 15 mph.
 - 4. 20 deg F (-7 deg C) and below:
 - a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 deg F (4 deg C) and 120 deg F (49 deg C).
 - b. Masonry Units: Heat masonry units so that they are above 20 deg F (-7 deg C) at time of laying.
 - c. Provide enclosure and auxiliary heat to maintain an air temperature of at least 40 deg F (4 deg C) for 24 hours after laying units.

5. Do not heat water for mortar to above 160 deg F (71 deg C).
- J. Protect completed masonry and masonry not being worked on in the following manner. Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry. For grouted masonry, temperatures ranges apply to anticipated minimum night temperatures.
1. 40 deg F (4 deg C) to 32 deg F (0 deg C):
 - a. Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.
 2. 32 deg F (0 deg C) to 25 deg F (-4 deg C):
 - a. Completely cover masonry with weather-resistive membrane for at least 24 hours.
 3. 25 deg F (-4 deg C) to 20 deg F (-7 deg C):
 - a. Completely cover masonry with weather-resistive membrane and insulating blankets or similar protection for at least 24 hours, 48 hours for grouted masonry.
 4. 20 deg F (-7 deg C) and below:
 - a. Except as otherwise indicated, maintain masonry temperature above 32 deg F (0 deg C) for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps or other methods proven to be satisfactory. For grouted masonry maintain heated enclosure to 40 deg F (4 deg C) for 48 hours.

2 PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS:

- A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.
- B. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.
- C. Concrete Block: Provide units complying with characteristics indicated below for Grade, Type, face size, exposed face and, under each form of block included, for weight classification.
 1. Grade N.
 2. Prism Strength: (f'm) = 1500 psi.
 3. Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" high x 8" thick (15-5/8" x 7-5/8" x 7-5/8" actual). Other special units of 16" length x 4" high x 4" thick (15-7/8" x 7-5/8" x 3-5/8" actual).

4. Type I, moisture-controlled units.
5. Exposed faces: Manufacturer's standard color and texture.
 - a. Where special finishes are indicated, provide units with exposed faces of the following:
 - 1) All CMU blocks shall be manufactured with an integral liquid polymeric water repellent admixture. This admixture shall be equal to "Dry-Block" CMU admixture as produced by Grace Construction Products. The admixture product shall be compatible with the mortar admixture product utilized for the project. Reference the Mortar and Masonry specification section 04100.
6. Hollow Load-Bearing Block Units: ASTM C90, Type I – Moisture Controlled.
7. Solid Load-Bearing Block Units: ASTM C90, Type I – Moisture Controlled; normal weight.

2.2 BRICK UNITS:

- A. **Face Brick: ASTM C216, Type FBS, Grade MW. Brick units for the main body color shall be in the old port narrow flashed range. Brick units for the accent band color shall be special pick old port dark flashed range of the same manufacturer of the as the main body brick.**
- B. Sizes and Shapes: Modular Brick: Nominal 8" length, 4" thick, and 3" height (7 5/8 x 3 5/8 x 2 7/24). Econo Brick: Nominal 8" length, 4" thick and 4" height (7 5/8 x 3 5/8 x 3 5/8" actual).

2.3 PRECAST CONCRETE TRIM UNITS:

- A. Reference Division 03450, Precast Concrete Products.

2.4 MORTAR MATERIALS:

- A. See Division 04100 Mortar and Masonry Grout.

2.5 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES:

- A. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics:
- B. Hot-Dip Galvanized Steel Wire: ASTM A 82 for uncoated wire and with ASTM A 153, Class B-2 (1.5 oz. per sq. ft. of wire surface) for zinc coating applied after prefabrication into units.
- C. Joint Reinforcement: Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10', with prefabricated corner and tee units, and complying with requirements indicated below:

1. Width: Fabricate joint reinforcement in units with widths of approximately 2" less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8" on joint faces exposed to exterior and 1/2" elsewhere.
 2. Wire Size for Side Rods: 0.1875" diameter.
 3. Wire Size for Cross Rods: No. 9 ga.
 4. For Single-wythe masonry provide type as follows with single pair of side rods:
 - a. Truss design with continuous diagonal cross rods spaced not more than 16" oc.
 5. For Multiple-wythe masonry provide type as follows with single pair of side rods:
 - a. Truss design with continuous diagonal cross rods spaced not more than 16" oc. and number of side rods as follows:
 - 1) Number of Side Rods for Multiple-wythe Concrete Masonry:
One side rod for each face shell of concrete back-up and of concrete masonry facing wythe.
- D. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
1. AA Wire Products Co.
 2. Dur-O-Wal, Inc.
 3. Heckmann Building Products, Inc.
 4. Hohmann & Barnard, Inc.
 5. Masonry Reinforcing Corp. of America.
 6. National Wire Products Corp.
- E. Brick Veneer Wall Ties and anchors: Reference Specification Section 04085 for specific masonry anchor wall tie requirements.

2.6 CONCEALED FLASHING MATERIALS

- A. Copper Fabric Laminate: 5 oz. Copper sheet bonded with asphalt between 2 layers of glass fiber cloth.
1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - a. Afco Copper Fabric; Afco Products Inc.
 - b. Copper Fabric Flashing; Sandell Manufacturing Co., Inc.
 - c. Copper Fabric Flashing; York Manufacturing Inc.

2.7 MISCELLANEOUS MASONRY ACCESSORIES:

- A. Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60 for bars No. 3 to No. 18.
- B. Non-Metallic Expansion Joint Strips: Premoulded, flexible cellular neoprene rubber filler strips complying with ASTM D 1056, Grade RE41.

- C. Weepholes: Medium density polyethylene, ¼"x4".
- D. Vents: Medium density polyethylene, ¼"x4".
- E. Cavity Mat: Nylon mesh type mortar mat at all flashing locations.

2.8 INSULATION:

- A. Extruded Polystyrene Board Insulation: Rigid cellular polystyrene thermal insulation with closed cells and integral high density skin, formed by the expansion of polystyrene base resin in an expansion process to comply with ASTM C 578, Type IV; 5-year aged R value of 5 Btuh at 75o F, in manufacturer's standard lengths and widths, in thicknesses as indicated.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Amofoam; Amoco Foam Products Company.
 - b. Foamular; UC Industries, Inc.
 - c. Styrofoam: The Dow Chemical Company.
- B. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.9 MASONRY CLEANERS:

- A. Acidic Cleaner: Manufacturer's standard strength general purpose cleaner, designed for new masonry surfaces of type indicated; composed of blended organic and inorganic acids combined with special wetting systems and inhibitors; expressly approved for intended use by manufacturer of masonry units being cleaned.
 - 1. Available Products: Subject to compliance with requirements, a product which may be used to clean unit masonry surfaces includes, but is not limited to, the following:
 - a. "Sure Klean" No. 600 Detergent; ProSoCo Inc.

2.10 MORTAR MIXES:

- A. See Division 04100 Mortar and Masonry Grout.

2.11 FLUE LINER:

- A. Flue liner: Minimum 5/8" thick fire clay liner; ASTM C315.

3 PART 3 EXECUTION

3.1 INSTALLATION, GENERAL:

- A. Do not wet concrete masonry units.
- B. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.

- C. Thickness: Build cavity and composite walls to the full thickness shown. Build single wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.
- D. Build chases and recesses as shown or required for the work of other trades. Provide not less than 8" of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.
- E. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
- F. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.
- G. Use dry cutting saws to cut concrete masonry units.

3.2 CONSTRUCTION TOLERANCES:

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arrises do not exceed 1/4" in 10', or 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story or 20' maximum, nor 1/2" in 40' or more. For vertical alignment of head joints do not exceed plus or minus 1/4" in 10', 1/2" maximum.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 1/2" in 40' or more. For top surface of bearing walls do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.
- D. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

3.3 LAYING MASONRY WALLS:

- A. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.
- B. Lay-up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.
- C. Pattern Bond: Lay exposed masonry in the bond pattern shown or, if not shown, lay in running bond with vertical joint in each course centered on units in courses above and below. Lay concealed masonry with all units in a wythe in running bond. Bond and

interlock each course of each wythe at corners. Do not use units with less than nominal 4" horizontal face dimensions at corners or jambs.

- D. Stopping and Resuming Work: Rack back 1/2-unit length in each course. Do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.
- E. Built in work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.
 - 1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
- F. Where built-in items are to be imbedded in cores of hollow masonry units, place a layer of galvanized metal lath in the joint below, and rod mortar or grout into core.
- G. Fill cores in hollow concrete masonry units with grout 3 courses (24" minimum) under bearing plates, beams, lintels, posts and similar items, unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING:

- A. Lay solid brick size masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.
- B. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.
- C. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.
- D. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.
- E. Tool exposed joints slightly concave using a jointer larger than joint thickness, unless otherwise indicated.
- F. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.
- G. Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise indicated.
- H. Non-bearing Interior Partitions: Build full height of story to underside of solid floor structure above, unless otherwise shown.

3.5 CAVITY WALLS

- A. Keep cavity clean of mortar droppings and other materials during construction. Strike joints facing cavity flush.

- B. Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes of concrete masonry units. Install at not more than 16" oc vertically.
- C. Use masonry anchors installed in mortar joints of brick veneer and back up masonry. Install at not more than 16" oc vertically and 24" oc horizontally.
- D. Provide weepholes in exterior wythe of cavity wall located immediately above ledges and flashing, spaced not more than 24" oc.
- E. Provide ventholes in exterior wythe of cavity wall located at or near the top of wall locations as well as directly below thru-wall flashing locations allowing ventilation to the lower wall cavity. Space not more than 24" oc and offset/stagger from all weep locations.

3.6 CAVITY WALL INSULATION:

- A. On units of plastic insulation, install small pads of adhesive spaced approximately 12" oc both ways on inside face. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly together both ways. Press units firmly against inside of masonry.
 - 1. Fill all cracks and open gaps in insulation with crack sealer recommended by insulation board manufacturer.

3.7 HORIZONTAL JOINT REINFORCEMENT:

- A. General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls, 1/2" elsewhere. Lap reinforcing a minimum of 6".
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Reinforce walls with continuous horizontal joint reinforcing at 16" oc vertically, unless specifically noted to be omitted.
- D. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.
- E. Reinforce masonry openings over 12" wide with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and below the sill. Extend reinforcement a minimum of 24" beyond the jambs of openings except at control joints.

3.8 CONTROL AND EXPANSION JOINTS

- A. General: Provide vertical and horizontal expansion, control and isolation joints in masonry where shown. Build in related items as the masonry work progresses.
 - 1. Build in non-metallic joint fillers where indicated.

3.9 LINTELS:

- A. Install steel lintels where indicated reference structural drawings for additional information.
- B. Provide masonry lintels where shown and wherever openings of more than 1'-0" for brick size units and 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide precast or formed-in-place masonry lintels. Cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.
- C. For hollow concrete masonry unit walls, use specially formed U-shaped lintel units with reinforcement bars placed as shown filled with coarse grout.
- D. Provide minimum bearing of 8" at each jamb, unless otherwise indicated.

3.10 FLASHING OF MASONRY WORK

- A. General: Provide concealed flashing in masonry work at, or above, shelf angles, lintels, ledges and other obstructions to the downward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through wall flashing on sloping bed of mortar. Seal penetrations in flashing with mastic before covering. Extend flashings through exterior face of masonry and turn down to form drip.
- B. Extend flashing the full length of lintels and shelf angles and a minimum of 4" into masonry at each end. Extend flashing from exterior face of masonry and turn up 8".
- C. Turn flashing, fold and seal at corners, bends and interruptions.

3.11 REPAIR, POINTING AND CLEANING:

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weepholes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.
- C. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
 - 2. Protect adjacent surfaces from contact with cleaner solutions.
 - 3. Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
 - 4. Acidic cleaner: apply in compliance with directions of cleaner manufacturer.
 - 5. Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "TEK" bulletins.

- D. Protection: Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

3.12 WATERPROOFING:

- ~~A. Apply waterproofing to all exterior masonry only in accordance with manufacturer's instructions at recommended spreading rates.~~
- B. Thoroughly clean masonry prior to applying penetrating sealers.
- C. Do not apply penetrating sealers until masonry has cured for a minimum of 28 days.

... END OF SECTION 04200