

DIVISION 4 – MASONRY

SECTION 04200 - UNIT MASONRY

PART 1 - GENERAL

SUMMARY

This Section includes the following:

Concrete unit masonry.
Brick unit masonry.

PERFORMANCE REQUIREMENTS

Provide unit masonry that develops the following installed compressive strengths (f'_m) at 28 days.

For Concrete Unit Masonry: As follows, based on net area:

$f'_m = 1500$ psi (10.3 MPa).

For Brick Unit Masonry: As follows, based on gross area:

$f'_m = 1500$ psi (10.3 MPa).

SUBMITTALS

General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

Samples of the following:

Full-size units for each different exposed masonry unit required showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.

Colored-masonry mortar samples for each color required.

Each different cement product required for mortar and grout, including name of manufacturer, brand, type, and weight.

Each type and size of anchors, ties, and metal accessories.

Grout mixes. Include description of type and proportions of grout ingredients.

QUALITY ASSURANCE

Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.

Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

Mockup: Prior to installing unit masonry, construct sample wall panels to verify selections made under sample submittals and to demonstrate aesthetic effects of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.

Build mockups of masonry in sizes approximately 48 inches (1200 mm) long by 48 inches (1200 mm) high by full thickness.

Notify Architect one week in advance of the dates and times when mockups will be constructed.

Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

Acceptance of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities.

Acceptance of mockups does not constitute approval of deviations from the Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing.

When directed by the Architect, demolish and remove mockups from Project site.

DELIVERY, STORAGE, AND HANDLING

Store masonry units on elevated platforms, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not install until they are in an air-dried condition.

Store cementitious materials on elevated platforms, under cover, and in a dry location.

Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

PROJECT CONDITIONS

Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely in place.

Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.

Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.

Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with the following requirements:

Do not lay masonry unless air temperature is 40°F or greater.

Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F (38 deg C) and above.

PART 2 - PRODUCTS

MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Concrete Masonry Units:

Thurman Building Materials

Face Brick:

Acme Brick Co.
Endicott Clay Products Co.
Thurman Building Materials

Portland Cement, Mortar Cement, Masonry Cement, and
Lime:

Lehigh Portland Cement Co.

Joint Reinforcement, Ties, and Anchors:

AA Wire Products Co.
Dur-O-Wal, Inc.

CONCRETE MASONRY UNITS

Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions. Provide bullnose units for outside corners, unless otherwise indicated.

Concrete Masonry Units: ASTM C 90, Grade N, hollow lead-bearing. Normal weight, Type I.

Unit Compressive Strength: 1900 psi.

Size: Manufactured to the actual dimensions indicated on Drawings within tolerances specified in the applicable referenced ASTM specification.

Size: Manufactured to the actual dimensions listed below (within tolerances specified in the applicable referenced ASTM specification) for the corresponding nominal sizes indicated on Drawings:

16" long x 8" high x 8" wide (nominal size).

Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

BRICK

Provide units without cores or frogs and with exposed surfaces finished for ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces.

Face Brick: ASTM C 216 and as follows:

Grade: SW.

3000 psi (20.7 MPa). Compressive strength, minimum.

Type: FBX.

Size: Bricks manufactured to the following actual dimensions within tolerances specified in ASTM C 216:

Standard: 3-1/2 to 3-5/8 inches (89 to 92 mm) thick by 2-1/4 inches (57 mm) high by 8 inches (203 mm) long.

Color and Texture: OSU blend as approved by the Architect.

MORTAR AND GROUT MATERIALS

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.

Masonry Cement: ASTM C 91.

Hydrated Lime: ASTM C 207, Type S.

Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.

Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm), use aggregate graded with 100 percent passing the No. 16 (1.18 mm) sieve.

Aggregate for Grout: ASTM C 404.

Ready-Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified in this Article; combined with set-controlling admixtures to produce a ready-mixed mortar complying with ASTM C 1142.

Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMU, containing integral water repellent by same manufacturer.

Water: Clear, drinkable.

REINFORCING STEEL

Steel Reinforcing Bars: Material and grade as follows:

Billet steel complying with ASTM A 615.

Grade 60.

Welded-Wire Fabric: ASTM A 185.

JOINT REINFORCEMENT

General: Provide joint reinforcement formed from the following:

Galvanized carbon-steel wire, coating class as follows:

ASTM A 153, Class B-2, for both interior and exterior walls.

Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet, with prefabricated corner and tee units, and complying with requirements indicated below:

Wire Diameter for Side Rods: 0.1483 inch (3.8 mm).

Wire Diameter for Cross Rods: 0.1483 inch (3.8 mm).

Truss design with continuous diagonal cross rods spaced not more than 16 inches (407 mm) o.c.

TIES AND ANCHORS, GENERAL

General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of this Article, unless otherwise indicated.

Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.

Galvanized Steel Sheet: ASTM A 526, G 60 (ASTM A 526M, Z 180) (commercial quality), steel sheet zinc coated by hot-dip process on continuous lines prior to fabrication, for sheet-metal ties and anchors in interior walls and in exterior walls when completely embedded in mortar.

EMBEDDED FLASHING MATERIALS

Vinyl Sheet Flashing: Flexible sheet flashing especially formulated from virgin polyvinyl chloride with plasticizers and other modifiers to remain flexible and waterproof in concealed masonry applications, black in color, and of thickness indicated below:

Thickness: 30 mils (0.8 mm).

MISCELLANEOUS MASONRY ACCESSORIES

Compressible Filler: Premolded filler strips complying with ASTM D 1056, Type 2, Class A, Grade 1; compressible up to 35 percent; of width and thickness indicated; formulated from the following material:

Neoprene.

Prefomed Control-Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

Polyvinyl Chloride: ASTM D 2287, General Purpose Grade, Type PVC-65406.

Weep Holes: 1/4" round x 4" long medium density polyethylene plastic tubes.

INSULATION - (CMU Loose Fill)

Loose-Granular Perlite Insulation: ASTM C 549, Type II surface treated for water repellency and limited moisture absorption.

MASONRY CLEANERS

Products: Sure Klean No. 600 Detergent; ProSoCo, Inc.

MORTAR AND GROUT MIXES

General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

Do not use calcium chloride in mortar or grout.

Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification, for job-mixed mortar; and ASTM C 1142 for ready-mixed mortar, of type "N."

PART 3 - EXECUTION

EXAMINATION

Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of unit masonry. Do not proceed with installation until unsatisfactory conditions have been corrected.

INSTALLATION, GENERAL

Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting, where possible. Allow units

cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

Wetting of Brick: Wet brick prior to laying. Allow units to absorb the water so they are damp but not wet at the time of laying.

CONSTRUCTION TOLERANCES

Variation from Plumb: Do not exceed 1/4 inch in 10 feet, nor 1/2 inch in 40 feet.

Variation from Level: Do not exceed 1/2 inch in 40 feet.

LAYING MASONRY WALLS

Bond Pattern for Exposed Masonry: Lay exposed masonry in running bond pattern.

Lay concealed masonry with all units in a wythe in running bond,

Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond.

Clean exposed surfaces of set masonry, wet clay masonry units lightly and remove loose masonry units and mortar prior to laying fresh masonry.

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

Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.

Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above and as follows:

Install compressible filler in joint between top of partition and underside of structure above.

MORTAR BEDDING AND JOINTING

Lay hollow concrete masonry units as follows:

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 filled with grout.

For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.

Maintain joint widths indicated, except for minor variations required to maintain bond alignment. If not indicated, lay walls with 3/8-inch joints.

CAVITIES

Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.

Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.

Tie exterior wythe to back-up with individual metal ties. Stagger alternate courses.

CAVITY-WALL AND MASONRY-CELL INSULATION

Pour granular insulation into all exterior wall to fill void spaces completely. Maintain inspection ports to show presence of insulation at extremities of each pour area. Close ports after complete coverage has been confirmed. Limit fall of insulation to 1 story in height, but not to exceed 20 feet.

HORIZONTAL-JOINT REINFORCEMENT

General: Provide continuous horizontal-joint reinforcement in all load-bearing walls.

Space reinforcement not more than 16 inches (406 mm) o.c.

Provide reinforcement in mortar joint 1 block course above and below wall openings and extending 12 inches (305 mm) beyond opening.

Reinforcement above is in addition to continuous reinforcement.

Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

Provide continuity at corners and wall intersections by using 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.

ANCHORING MASONRY VENEERS

Anchor masonry veneers to metal panels with masonry-veneer anchors to comply with the following requirements:

Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally with not less than 1 anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals around perimeter not exceeding 8 inches.

FLASHING, WEEP HOLES, AND VENTS

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

Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer before covering with mortar.

Install flashing as follows:

At masonry-veneer walls, extend flashing from exterior face of veneer, through the veneer, up face of CMU at least 4" and extend into block wall.

Cut off flashing flush with face of wall after masonry wall construction is completed.

Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:

Space weep holes 48 inches o.c.

REPAIRING, POINTING, AND CLEANING

Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units; install in fresh mortar or grout, pointed to eliminate evidence of replacement.

Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point-up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for application of sealants.

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

Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.

Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain present on exposed surfaces.

Protection: Provide final protection and maintain conditions that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

MASONRY WASTE DISPOSAL

Remove excess masonry waste and legally dispose of off Owner's property.

***** END OF DIVISION 4 – MASONRY
