

SECTION 04200

UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete masonry units for single wythe and cavity wall construction.
- B. Face brick units for cavity wall construction.
- C. Mortar for masonry units.
- D. Reinforcement, anchorage and accessories.
- E. Masonry flashings.
- F. Masonry sealer coating.

1.02 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

- A. Section 05500 - Metal Fabrications: Placement of loose steel lintels.

1.03 RELATED SECTIONS

- A. Section 01020 - Allowances: Cash Allowances.
- B. Section 07100 – Waterproofing and Dampproofing: Application of dampproofing at cavity wall construction.
- C. Section 07900 - Joint Sealers: Rod and sealant at control joints.

1.04 REFERENCES

- A. ANSI/ASTM A82 - Cold-Drawn Steel Wire for Concrete Reinforcement.
- B. ANSI/ASTM C652 - Hollow Brick (Hollow Masonry Units Made From Clay or Shale).
- C. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- D. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
- E. ASTM B370 - Copper Sheet and Strip for Building Construction.
- F. ASTM C90 - Hollow Load Bearing Concrete Masonry Units.
- G. ASTM C145 - Solid Load Bearing Concrete Masonry Units.
- H. ASTM C144 - Aggregate for Masonry Mortar.
- I. ASTM C150 - Portland Cement.
- J. ASTM C207 - Hydrated Lime for Masonry Purposes.

- K. ASTM C270 - Mortar for Unit Masonry.
- L. ASTM C387 - Packaged, Dry, Combined Materials, for Mortar and Concrete.
- M. ASTM C404 - Aggregates for Masonry Grout.
- N. ASTM C476 - Grout for Masonry.
- O. ASTM C780 – Pre-construction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
- P. ASTM C1019 - Method of Sampling and Testing Grout.
- Q. ANSI/ASTM C73 - Calcium Silicate Face Brick (Sand-Lime Brick).
- R. ANSI/ASTM C126 - Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.
- S. ANSI/ASTM C216 - Facing Brick (Solid Masonry Units Made From Clay or Shale).
- T. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Cold Weather Masonry Construction.
- U. UL - Underwriters' Laboratories.

1.05 SUBMITTALS

- A. Submit product data under provisions of Section 01340.
- B. Submit samples under provisions of Section 01340.
- C. Submit four samples of face brick units to illustrate color, texture and extremes of color range.
- D. Include mortar design mix; indicate Proportion or Property method used, required environmental conditions and admixture limitations.
- E. Samples: Submit two ribbons of mortar color, illustrating color and color range.
- F. Submit manufacturer's certificate under provisions of Section 01340 that products meet or exceed specified requirements.

1.06 QUALIFICATIONS

- A. Installer: Company specializing in performing the work of this Section with minimum **five** years documented experience.

1.07 REGULATORY REQUIREMENTS

- A. Conform to requirements for masonry construction.

1.08 MOCK-UP

- A. Provide mock-up of face brick masonry under provisions of Section 01400.**
 - B. Erect face brick to 4 x 4 feet panel size, include specified mortar and accessories.
 - C. When accepted, mock-up will demonstrate minimum standard for the Work. Mock-up may not remain as
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part of the Work.

1.09 PRE-INSTALLATION CONFERENCE

- A. Convene one week prior to commencing work of this Section.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site under provisions of Section 01600.
- B. Store and protect products under provisions of Section 01600.
- C. Accept face brick units on site. Inspect for damage.

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Strictly comply with recommendations of the International Masonry Industry All-Weather Council – Recommended Practices and Guide Specifications for Cold (Hot) Weather Masonry Construction; the Brick Institute of America – Technical Notes on Brick Construction, Parts 1, 2 and 3; The Portland Cement Assoc.

1.12 SEQUENCE AND SCHEDULING

- A. Coordinate work under provisions of Section 01040.
- B. Coordinate the masonry work with brick veneer and installation of window anchors.

PART 2 PRODUCTS

2.01 MANUFACTURERS – CONCRETE MASONRY UNITS

- A. Park Avenue Cement Block Company.
- B. Substitutions: Under provisions of Section 01600.

2.02 CONCRETE MASONRY UNITS

- A. Hollow Load Bearing Block Units: ASTM C90, Grade N, Type I - Moisture Controlled; normal weight.
- B. Veneer Block Units: ASTM C145, Grade N-1; Architectural split face, natural color.
- C. Masonry Units: Nominal modular sizes of 4 x 16 x 8 inches, 6 x 16 x 8 inches, and 8 x 16 x 8 inches. Provide special units for 90 degree corners, bond beams, lintels and control joints.

2.03 MANUFACTURERS – FACE BRICK UNITS

- A. Glen-Gery Brick.
- B. Spaulding Brick Company of Rhode Island.
- C. Belden Brick Company.

- D. Substitutions: Under provisions of Section 01600.

2.04 FACE BRICK UNITS

A. See Section 04233 – Calcium Silicate Building Stone.

2.05 MORTAR MATERIALS – CONCRETE MASONRY UNITS

- A. Portland Cement: ASTM C150, Type I.
- B. Aggregates: ASTM C144, standard masonry type; clean, dry, protected against dampness, freezing and foreign matter.
- C. Hydrated Lime: ASTM C207, Type S.
- D. Water: Clean and free from injurious amounts of oil, alkali, organic matter or other deleterious material.
- E. Use no admixtures unless written approval is obtained from Architect.
- F. Color: As selected by Architect.

2.06 MORTAR MIXES – CONCRETE MASONRY UNITS

- A. Mortar for Load Bearing Walls and Partitions: ASTM C270, Type S, using the Property Method, 1800 psi compressive strength.
- B. Mortar for Reinforced Masonry; ASTM C270, Type S using the Property Method, 1800 psi compressive strength.

2.07 GROUT MIXES

- A. Grout: ASTM C476; consistency which will completely fill all spaces intended to receive grout.
- B. Bond Beams and Lintels: 3,000 psi strength at 28 days; 7-8 inches slump; premixed type in accordance with ASTM C94 or mixed in accordance with ASTM C476, fine and course grout.
- C. Engineered Masonry: 3,000 psi strength at 28 days; 7- 8 inches slump; premixed type in accordance with ASTM C94 or mixed in accordance with ASTM C476, fine and course grout.

2.08 MORTAR MATERIALS – FACE BRICK UNITS

- A. Portland Cement: ASTM C150, Type I, white color.
- B. Mortar Aggregate: ASTM C144, Standard Masonry Type.
- C. Hydrated Lime: ASTM C207, Type N.
- D. Water: Clean and potable.

2.09 MORTAR MIXES – FACE BRICK UNITS

- A. Mortar for Reinforced Masonry: ASTM C270, Type N, using the Property Method to achieve 750 psi strength.

2.10 MORTAR MIXING – FACE BRICK UNITS

- A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.
- B. Add mortar color, if required, in accordance with manufacturer's instructions. Provide uniformity of mix and

coloration.

- C. Do not use anti-freeze compounds to lower the freezing point of mortar.
- D. If water is lost by evaporation, retemper only within two hours of mixing.
- E. Use mortar within two hours after mixing at temperatures of 80 degrees F, or two-and-one-half hours at temperatures under 50 degrees F.

2.11 MORTAR COLOR – FACE BRICK UNITS

- A. Mortar Color: Mineral oxide pigment; color as selected by Architect.

2.12 ADMIXTURES

- A. The use of air entraining, antifreeze compounds or calcium chloride admixtures or other substances is not allowed.

2.13 REINFORCEMENT AND ANCHORAGE

- A. CMU: Truss type, welded wire units fabricated from 9 gage ASTM A82 cold-drawn galvanized steel wire with deformed side wire and smooth cross wire; Space reinforcing at 16” on center vertically maximum. Provide one side rod for each concrete masonry shell face.
- B. CMU AND BRICK VENEER: Composite wall ties with two legged, galvanized steel adjustable eye and pintle type units with minimum 3/16” wire diameter; Spaced anchors at 16” on center horizontally and at 16” on center vertically.
- C. Joint Stabilizing Anchors: To connect new masonry walls to existing masonry walls at vertical control joints; Cold-drawn steel; hot dip galvanized; spaced at 16” on center vertically; “D/A 2200,” manufactured by Dur-O-Wall, Inc.”
- D. Reinforcing Steel: ASTM A615, 60 ksi 276, 414, 517 MpA yield grade, deformed billet bars, unprotected finish..
- E. Substitutions: Under provisions of Section 01600.

2.14 MASONRY FLASHINGS

- A. Membrane Flashings: Grace Construction Products, Inc. –“Perm-A-Barrier” self-sealing, self-healing, fully adhered wall flashing; 32 Mil thick, pliable and highly adhesive rubberized asphalt compound bonded completely and integrally to 8 mil thick, high density 4 ply cross laminated fill; 40 mil overall thickness.
- B. Substitutions: Under provisions of Section 01600.

2.15 ACCESSORIES

- A. Preformed Control Joints: Neoprene material conforming to ASTM D1056, Class RE41; provide with heat fused joints; thickness as required to suit masonry condition; manufactured by "AA Wire Products Company".
- B. Weep Holes: Preformed plastic tubes.
- C. CLEANING SOLUTIONS: ProSoCo, Inc. “SureKlean 600” detergent masonry cleaner; Non-acidic, not harmful to masonry work or adjacent materials.
- D. Substitutions: Under provisions of Section 01600.

2.16 MASONRY SEALER COATING

- A. Sealer Coating: ProSoCo, Inc. "Sure Klean" products.
 - 1. "Sure Klean Weather Seal": For use on brick veneer surfaces.
 - 2. "Sure Klean Blok-Guard"; For use on CMU veneer surfaces.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Verify items provided by other Sections of work are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.
- D. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied to other Sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 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. Lay concrete masonry units in running bond. Course one unit and one mortar joint to equal 8 inches. Form concave mortar joints.
- D. Lay brick units in running bond. Course three brick units and three mortar joints equal to 8 inches. Form concave mortar joints.

3.04 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head, bed and collar joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering courses of joints or excessive furrowing of mortar joints are not permitted.
- D. Remove excess mortar as Work progresses.
- E. Interlock intersections and external corners.
- F. Prior to laying, wet brick having an I.R.A. greater than 25 GR/Min/30In.

- G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- H. Perform jobsite cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- I. Cut mortar joints flush where insulation bitumen dampproofing is applied.

3.05 WEEPS

- A. Install weep holes in brick veneer at 32 inches on center horizontally above through-wall flashing, above shelf angles and at bottom of walls.

3.06 CAVITY WALL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep holes.

3.07 REINFORCEMENT AND ANCHORAGES – SINGLE WYTHE MASONRY

- A. Install horizontal joint reinforcement 16 inches oc.
- B. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place joint reinforcement continuous in first joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches. Extend minimum 16 inches each side of openings.
- E. Reinforce joint corners and intersections with prefabricated corner pieces 16 inches oc.

3.08 REINFORCEMENT AND ANCHORAGES – CAVITY WALL VENEER MASONRY

- A. Install veneer anchors at 16" on center horizontally and 16" on center vertically; at one course above all openings, extending three feet beyond each side of opening; and within 8 inches of corners and abutting masonry veneer.

3.09 MASONRY THROUGH-WALL FLASHINGS

- A. Install through wall flashing on top of masonry base course or at locations shown on the Drawings. Terminate flashing at top by extending up and behind sheathing as shown on the Drawings. Overlap adjacent pieces by 2" and roll all overlaps with a steel hand roller or blunt object..
- B. Trim bottom edge ½" back from exposed face of building. Apply a bead or trowel coat of bituthene mastic along termination's seams, cuts, penetrations and punctures.
- C. Fill cavity to depth of 8" with 3/8" pea stone.

3.10 LINTELS

- A. Install loose steel lintels over window openings and door openings as specified on the drawings.
- B. Install reinforced unit masonry lintels over openings as specified on the drawings.
- C. Openings up to 48 Inches Wide: Place two, No. 5 reinforcing bars 1 inch from bottom web, unless noted otherwise.

- D. Openings Over 48 Inches. Reinforce openings as detailed.
- F. Use single piece reinforcing bars only.
- G. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- H. Place and consolidate grout fill without displacing reinforcing.
- I. Allow masonry lintels to attain specified strength before removing temporary supports.
- J. Maintain minimum 8 inch bearing on each side of opening.

3.11 BITUMINOUS DAMPPROOFING

- A. Apply Bituminous dampproofing to face of concrete masonry backer units at cavity wall construction.

3.12 GROUTED COMPONENTS

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

3.13 ENGINEERED MASONRY

- A. Lay masonry units with core cells vertically aligned and cavities between wythes clear of mortar and unobstructed.
- B. Place mortar in masonry unit bed joints back 1/4 inch from edge of unit grout spaces, bevel back and upward. Permit mortar to cure 7 days before placing grout.
- C. Reinforce masonry unit cores with reinforcement bars and grout as indicated.
- D. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters. Splice reinforcement in accordance with Section 03300.
- E. Wet masonry unit surfaces in contact with grout just prior to grout placement.
- F. Grout spaces less than 2 inches in width with fine grout using low lift grouting techniques. Grout spaces 2 inches or greater in width with course grout using low lift grouting techniques.
- G. When grouting is stopped for more than one hour, terminate grout 1 1/2 inch below top of upper masonry unit to form a positive key for subsequent grout placement.
- H. Low Lift Grouting: Place first lift of grout to a height of 16 inches and rod for grout consolidation. Place subsequent lifts in 8 inch increments and rod for grout consolidation.

3.14 CONTROL JOINTS

- A. Do not continue horizontal joint reinforcement through control joints.
- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- C. Size control joint in accordance with Section 07900 for sealant performance.
- D. Provide control joints at 20 feet on center, maximum, unless noted otherwise.

3.15 BUILT-IN WORK

- A. As work progresses, build in metal door frames, window frames, wood nailing strips, anchor bolts, plates, lintels and other items furnished by other Sections.
- B. Build in items plumb and level.
- C. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
- D. Do not build in organic materials subject to deterioration.

3.16 TOLERANCES

- A. Maximum Variation From Unit to Adjacent Unit: 1/32 inch.
- B. Maximum Variation From Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.
- C. Maximum Variation From Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- D. Maximum Variation From Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet; 1/2 inch in 30 feet.
- E. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.
- F. Maximum Variation From Cross Sectional Thickness of Walls: 1/4 inch.

3.17 CUTTING AND FITTING

- A. Cut and fit for concealed items as required. Coordinate with other Sections of Work to provide correct size, shape and location.
- B. Obtain Architect approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.18 CLEANING

- A. Clean work under provisions of Section 01700.
- B. Remove excess mortar and mortar smears.
- C. Replace defective mortar. Match adjacent work.
- D. Clean soiled surfaces with cleaning solution.
- E. Use non-metallic tools in cleaning operations.
- F. Do not use strong acids for cleaning.

3.19 PROTECTION OF FINISHED WORK

- A. Protect finished installation under provisions of Section 01500.
- B. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

3.20 SCHEDULES

- A. Exterior wall systems; Locations of wall types shown on drawings.

END OF SECTION 04200