

**DIVISION 4 MASONRY****SECTION 04100 MORTAR AND MASONRY GROUT****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Mortar and grout for masonry.

**1.02 RELATED SECTIONS**

- A. Section 01400 - Quality Control: Testing laboratory services.
- B. Section 04300 - Unit Masonry System: Installation of mortar and grout.

**1.03 REFERENCES**

- A. ASTM C91 - Masonry Cement.
- B. ASTM C94 - Ready-Mixed Concrete.
- C. ASTM C144 - Aggregate for Masonry Mortar.
- D. ASTM C150 - Portland Cement.
- E. ASTM C207 - Hydrated Lime for Masonry Purposes.
- F. ASTM C270 - Mortar for Unit Masonry.
- G. ASTM C404 - Aggregates for Masonry Grout.
- H. ASTM C476 - Grout for Masonry.
- I. ASTM C780 - Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
- J. ASTM C1019 - Method of Sampling and Testing Grout.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, protect, and handle products to site under provisions of Section 01600.
- B. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

**1.05 ENVIRONMENTAL REQUIREMENTS**

- A. Maintain materials and surrounding air temperature to minimum 50 degrees F 10 degrees C) prior to, during, and 48 hours after completion of masonry work.

- B. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS - PREMIX MORTAR

- A. Blue Circle/Williams Brothers - Product - Blue Circle
- B. Southern Cement - Product - Magnolia Masons Mix
- C. Longview Lime Corporation - Product - Longview Mortar Mix.
- D. Ideal Cement Company - Product - Ideal Masonry Cement.
- E. Substitutions: Under provisions of Section 01600.

### 2.02 MATERIALS

- A. Portland Cement: ASTM C150, Type I.
- B. Masonry Cement: ASTM C91, Type S or Type N as required below, and color as selected from manufacturer's standards.
- C. Mortar Aggregate: ASTM C144, standard masonry type.
- D. Hydrated Lime: ASTM C207, Type S.
- E. Grout Course Aggregate: ASTM C404.
- F. Water: Clean and potable.
- G. Bonding Agent: Latex type.
- H. Integral Water Repellent: ASTM-E 514 - with Class E rating. Required in all exterior walls.

### 2.03 MORTAR MIXES

- A. Mortar For Load Bearing Walls and Partitions: ASTM C270, Type S using the Property specification.
- B. Mortar For Non-Load Bearing Walls and Partitions: ASTM C270, Type N using the Property specification.

### 2.04 MORTAR MIXING

- A. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.
- D. Do not use anti-freeze compounds to lower the freezing point of mortar.

- E. If water is lost by evaporation, re-temper only within two hours of mixing.
- F. Use mortar within two hours after mixing at temperatures of 90 degrees F (32 degrees C), or two-and-one-half hours at temperatures under 50 degrees F (10 degrees C).

#### 2.05 NON SHRINKING GROUT

- A. Non-Metallic, high early strength grout: CRD-C621; Sure-Grip high performance grout manufactured by Dayton Superior Corporation.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Request inspection of spaces to be grouted.

#### 3.02 PREPARATION

- A. Apply bonding agent to existing concrete surfaces.
- B. Plug clean-out holes with masonry units. Brace masonry for wet grout pressure.

#### 3.03 INSTALLATION

- A. Install mortar in accordance with manufacturer's instructions.
- B. Install non-shrink grout in accordance with manufacturer's instructions.

#### 3.04 FIELD QUALITY CONTROL

- A. Field testing will be performed under provisions of Section 01400.
- B. Test and evaluate mortar in accordance with ASTM C780.
- C. Test and evaluate grout in accordance with ASTM C1019.

END OF SECTION



**SECTION 04300 UNIT MASONRY SYSTEMS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Brick over load bearing concrete masonry units.
- B. Reinforcement, anchorage, and accessories.

**1.02 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION**

- A. Section 05120 - Structural Steel: Placement of steel anchors for beams.
- B. Section 05210 - Steel Joists: Placement of steel bearing pads for joists.
- C. Section 05500 - Metal Fabrications: Placement of loose steel lintels, fabricated steel items, and trusses.

**1.03 RELATED SECTIONS**

- A. Section 01400 - Quality Control: Testing laboratory services.
- B. Section 04100 - Mortar and Masonry Grout: Mortar and grout.
- C. Section 05500 - Metal Fabrications: Loose steel lintels, and fabricated steel items.
- D. Section 07214 - Foamed-In-Place Insulation.
- E. Section 07900 - Joint Sealers: Rod and sealant at control and expansion joints.

**1.04 REFERENCES**

- A. ASTM A153 - Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products.
- B. ASTM A641 - Zinc-Coated (Galvanized) Carbon Steel Wire.
- C. ASTM B370 - Copper Sheet and Strip for Building Construction.
- D. ASTM C55 - Concrete Building Brick.
- E. ASTM C62 - Building Brick (Solid Masonry Units Made From Clay or Shale).
- F. ASTM C90 - Load-Bearing Concrete Masonry Units.
- G. ASTM C129 - Non-Load Bearing Concrete Masonry Units.
- H. ASTM C216 - Facing Brick (Solid Masonry Units Made From Clay or Shale).
- I. ASTM C652 - Hollow Brick (Hollow Masonry Units Made From Clay or Shale).

## 1.05 SUBMITTALS

- A. Submit under provisions of Section 01300. Product Data: Provide data for decorative, pre-faced masonry units and fabricated wire reinforcement.
- B. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

## 1.06 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

## 1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

## 1.08 MOCKUP

- A. Provide mockup of composite masonry under provisions of Section 01400.
- B. Construct a masonry wall into a panel sized 8 feet long by 6 feet high, which includes mortar and accessories, structural backup, wall openings, flashing, wall insulation, and parging.
- C. Locate where directed.
- D. Mockup may remain as part of the Work.

## 1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Accept pre-faced units on site. Inspect for damage.

## 1.10 ENVIRONMENTAL REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 50 degrees F., 10 degrees C prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

## 1.11 COORDINATION

- A. Coordinate work under provisions of Section 01039.
- B. Coordinate the masonry work with installation of window anchors.

## PART 2 PRODUCTS

## 2.01 CONCRETE MASONRY UNITS

- A. Hollow Load Bearing Block Units (CMU): ASTM C90, Type II – Grade N - Non-moisture Controlled; light weight.
- B. Solid Load-Bearing Block Units (CMU): ASTM C90, Type II – Grade N -Non-moisture Controlled; light weight.
- C. Hollow Non-Load Bearing Block Units (CMU): ASTM C129, Type II – Grade N - Non-moisture Controlled; light weight.
- D. Concrete Brick Units: ASTM C55, Grade N, and Type of same Grade, Type, and Weight as block units.
- E. Size and Shape: Nominal modular size as shown on drawings. Provide special units for 90-degree corners, bond beams, and lintels.
- F. Integral Water Repellent: ASTM-E 514 with Class E rating. Required at all exterior walls (face veneer and back up block units).

## 2.02 MANUFACTURER'S BRICK UNITS

- A. Include in the bid an allowance of \$400 per 1,000 brick, including delivery to site, to furnish a brick to match existing brick.
- B. Substitution: Under provisions of Section 01600.

## 2.03 BRICK UNITS

- A. Face Brick: ASTM C216, Type FBS, Grade SW.
- B. Building Brick: ASTM C62, Grade SW; solid units.
- C. Hollow Facing and Building Brick: ASTM C652, Grade SW, Type HBS.
- D. Size and Shape: Nominal modular size of 2-1/4 x 7-5/8 x 3-5/8 inches. Provide special units for 90 degree corners, and lintels.

## 2.04 REINFORCEMENT AND ANCHORAGE

- A. Single Wythe Joint Reinforcement: ASTM A82 Truss type; steel wire, hot dip galvanized to ASTM A641 Class 1 after fabrication, 3/16 inch side rods with 3/16 inch cross ties.
- B. Multiple Wythe Joint Reinforcement: Truss type; with moisture drip; adjustable type, steel wire, hot dip galvanized to ASTM A641 Class 1 after fabrication, 3/16 inch side rods with 3/16 inch cross ties.
- C. Reinforcing Steel: type, specified in Section 03200, uncoated finish.
- D. Ties: Formed steel wire, 3/16" triangular, hot dip galvanized to ASTM A153 B3 steel finish as manufactured by Heckman.

- E. Veneer Anchors: Tapioca Pos-i-tie as manufactured by Heckman.
- 2.05 MORTAR AND GROUT
- A. Mortar and Grout: As specified in Section 04100.
- 2.06 FLASHINGS
- A. Cross laminated polyethylene/rubberized asphalt backed, 40 mil thick, Textro flash as manufactured by Hohmann & Barnard, Inc.
- 2.07 ACCESSORIES
- A. Preformed Control Joints: Rubber chloride material. Provide with corner and tee accessories with cement fused joints.
  - B. Joint Filler: Closed cell polyurethane; oversized 50 percent to joint width; self expanding; 3 inch wide x by maximum lengths.
  - C. Mortar Net: A high density polyethylene or nylon strands woven into 90% open mesh, shaped as required to prevent mortar damming. Provide Morter Net as manufactured by Hohmann & Barnard, Inc.
  - D. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
  - E. Weeps: Preformed plastic tubes, cotton wick filled.
- Manufacturers:
- a. Dur-O-Wall, Inc. Model D/A 1005
  - b. Heckman - Model 330
  - c. Hohmann & Barnard, Inc. - Model 341.

### 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 item is in proper location, and ready for roughing into masonry work.

#### 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. Concrete Masonry Units:
  - 1. Bond: Running.
  - 2. Coursing one unit and one mortar joint to equal 8 inches.
  - 3. Mortar Joints: Concave.
- D. Brick Units:
  - 1. Bond: Running.
  - 2. Coursing three units and three mortar joints to equal 8 inches.
  - 3. Mortar Joints: Concave.

#### 3.04 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering corners 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. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- H. Cut mortar joints flush where wall tile is scheduled, cement parging is required, resilient base is scheduled, or bitumen dampproofing is applied.
- I. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

#### 3.05 WEEPS

- A. Install weeps in veneer at 32 inches oc horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.
- B. Install mortar net continuous at locations where weepholes occur.

#### 3.06 CAVITY WALL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weeps.
- B. Build inner wythe ahead of outer wythe to receive insulation.

- C. Build inner wythe and dampproof in accordance with Section 07160 before building outer wythe.
- D. Install mortar net in accordance with manufacturer's instructions.

### 3.07 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

- A. Install horizontal joint reinforcement 16 inches center to 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 joint reinforcement continuous in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Wall ties in masonry back up to bond veneer at maximum 16 inches center to center vertically and 36 inches center to center horizontally. Place at maximum 3 inches center to center each way around perimeter of openings, within 12 inches of openings.
- F. Install Tapon Pos-I-tie veneer anchors at existing masonry walls in accordance with manufacturer's instructions.

### 3.08 MASONRY FLASHINGS

- A. Extend flashing horizontally at foundation walls, above ledge or shelf angles and lintels, and at bottom of walls.
- B. Turn flashing up minimum 8 inches and bed into mortar joint of masonry back-up.
- C. Lap end joints minimum 6 inches and seal watertight.
- D. Turn flashing, fold, and seal at corners, bends, and interruptions.

### 3.09 LINTELS

- A. Install loose steel lintels over openings.
- B. Install reinforced unit masonry lintels over openings where steel lintels are not scheduled.
- C. Openings Up To 42 inches Wide: Place two, No. 4 reinforcing bars 1 inch from bottom web.
- D. Openings From 42 inches Up To 78 inches Wide: Place two, No. 5 reinforcing bars 1 inch from bottom web.
- E. Openings Over 78 inches: Reinforce openings as detailed.
- F. Do not splice reinforcing bars.
- G. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) 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.

### 3.10 GROUTED COMPONENTS

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

### 3.11 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 (6 mm) from edge of unit grout spaces, bevel back and upward. Permit mortar to cure 7 days before placing grout.
- C. Reinforce masonry unit cores and cavities 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 03200.
- E. Wet masonry unit surfaces in contact with grout just prior to grout placement.
- F. Grout spaces less than 2 inches (50 mm) in width with fine grout using low lift grouting techniques. Grout spaces 2 inches (50 mm) or greater in width with course grout using high or 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 to three CMU courses and rod for grout consolidation. Place subsequent lifts in 8-inch increments and rod for grout consolidation.

### 3.12 CONTROL JOINTS

- A. Do not continue horizontal joint reinforcement through control and 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 joint in accordance with Section 07900 for sealant performance.

### 3.13 BUILT-IN WORK

- A. As work progresses, install built-in metal door and glazed frames, fabricated metal frames, window frames, wood nailing strips, anchor bolts, plates, and other items to be built-in the work and furnished by other sections.
- B. Install built-in items plumb and level.
- C. Bed anchors of metal doorframes 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.

### 3.14 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 and 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft., 1/4 inch in 10 ft., and 1/2 inch in 30 ft.
- F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

### 3.15 CUTTING AND FITTING

- A. Cut and fit for chases, pipes, conduit, sleeves, and grounds. 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.

### 3.16 CLEANING

- A. Clean work under provisions of 01700.
- B. Remove excess mortar and mortar smears as work progresses.
- C. Replace defective mortar. Match adjacent work.
- D. Clean soiled surfaces with cleaning solution.
- E. Use non-metallic tools in cleaning operations.

3.17 PROTECTION OF FINISHED WORK

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

END OF SECTION

