

## SECTION 040513

### MASONRY MORTARING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Mortar for masonry.
- B. Related Sections:
  - 1. Division 01: Administrative, procedural, and temporary work requirements.
  - 2. Section 042000 - Unit Masonry.

##### 1.2 REFERENCES

- A. ASTM International (ASTM):
  - 1. C144 - Standard Specification for Aggregate for Masonry Mortar.
  - 2. C150 - Standard Specification for Portland Cement.
  - 3. C207 - Standard Specification for Hydrated Lime for Masonry Purposes.
  - 4. C270 - Standard Specification for Mortar for Unit Masonry.
- B. The Masonry Society (TMS):
  - 1. 402 - Building Code for Masonry Structures.
  - 2. 602 - Specification for Masonry Structures.

##### 1.3 SUBMITTALS

- A. Submittals for Review:
  - 1. Samples: 1/2 x 1/2 inch x 3 inch long colored mortar samples.
- B. Quality Control Submittals:
  - 1. Test reports: Indicating mortar compliance with ASTM C270.
  - 2. Delivery tickets: If mortar is delivered to site dry and pre-blended, furnish delivery tickets indicating quantity, mortar type, and date of manufacture.

##### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with TMS 402 and 602.

##### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver cement and lime in manufacturer's original, unopened packages or containers.
- B. Protect materials from moisture absorption and damage; reject damaged containers.
- C. Store aggregate to prevent inclusion of foreign matter.

#### PART 2 PRODUCTS

##### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Colorants:
  - 1. Cathay Pigments. ([www.cathaypigments.com](http://www.cathaypigments.com))
  - 2. Davis Colors. ([www.daviscolors.com](http://www.daviscolors.com))
  - 3. Solomon Colors. ([www.solomoncolors.com](http://www.solomoncolors.com))
- B. Substitutions: Under provisions of Division 01.

## 2.2 MATERIALS

- A. Portland Cement:
  - 1. ASTM C150, Type I.
  - 2. For exposed surfaces, provide cement from one source throughout project.
- B. Aggregate:
  - 1. ASTM C144, standard masonry type.
  - 2. For exposed surfaces, provide aggregate from one source throughout project.
- C. Lime: ASTM C207, Type S.
- D. Colorant: Pure mineral oxide type, color to be selected from manufacturer's full color range.
- E. Water: Clean and free from oils, acids, alkalis, organic matter, and other substances in amounts deleterious to mortar or metals in masonry.

## 2.3 MIXES

- A. Mortar Mixes: To ASTM C270 using the Proportion Method.
  - 1. Brick unit masonry: Type N, color to be selected.

## 2.4 MIXING

- A. Mix mortar in accordance with ASTM C270.
- B. Jobsite Proportioning of Mortar:
  - 1. Mix using mechanical mixer. Hand mixing not permitted.
  - 2. Mix approximately three-quarters of required water, all of cement and lime, and one-half of aggregate for minimum of 2 minutes.
  - 3. Add remainder of water and aggregate; mix for minimum of 3 minutes.
- C. Dry Preblended Mortar:
  - 1. Mix using continuous, self-cleaning mixer mounted at apex of silo cone.
  - 2. Set water flow valve to provide workable consistency.
- D. Provide uniformity of color in exposed mortar.
- E. Colorant may not exceed 9 pounds per 94 pound bag of cement for mineral oxides.
- F. Thoroughly mix ingredients in quantities needed for immediate use.
- G. Discard lumpy, caked, frozen, and hardened mixes.
- H. Mortar may be retempered by adding water as required. Use mortar within 2-1/2 hours after initial mixing at ambient temperatures below 80 degrees F and within 1-1/2 hours after initial mixing at ambient temperatures over 80 degrees F.
- I. Do not add accelerators, retarders, water repellents, antifreeze compounds, or other additives without Architect's approval.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Follow requirements specified in referenced sections.

END OF SECTION

**SECTION 040516**  
**MASONRY GROUTING**

**PART 1 GENERAL**

1.1 SUMMARY

- A. Section Includes:
  - 1. Grout for masonry.
- B. Related Sections:
  - 1. Division 01: Administrative, procedural, and temporary work requirements.
  - 2. Section 042000 - Unit Masonry.

1.2 REFERENCES

- A. ASTM International (ASTM):
  - 1. C150 - Standard Specification for Portland Cement.
  - 2. C207 - Standard Specification for Hydrated Lime for Masonry Purposes.
  - 3. C404 - Standard Specification for Aggregates for Masonry Grout.
  - 4. C476 - Standard Specification for Mortar and Grout for Reinforced Masonry.
- B. The Masonry Society (TMS):
  - 1. 402 - Building Code for Masonry Structures.
  - 2. 602 - Specification for Masonry Structures.

1.3 SUBMITTALS

- A. Quality Control Submittals:
  - 1. Test reports: Indicating grout compliance with ASTM C476.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with TMS 402 and 602.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver cement and lime in manufacturer's original, unopened packages or containers.
- B. Protect materials from moisture absorption and damage; reject damaged containers.
- C. Store aggregate to prevent inclusion of foreign matter.

**PART 2 PRODUCTS**

2.1 MATERIALS

- A. Portland Cement: ASTM C150, Type I.
- B. Aggregate: ASTM C404.
- C. Lime: ASTM C207, Type S.
- D. Water: Clean and free from oils, acids, alkalis, organic matter, and other substances in amounts deleterious to mortar or metals in masonry.

## 2.2 MIXES

- A. Grout Mix:
  - 1. ASTM C476, coarse grout.
  - 2. Compressive strength: Minimum 2500 psi at 28 days.
  - 3. Slump: 7 to 8 inches.

## 2.3 MIXING

- A. Mix grout in accordance with ASTM C476.
- B. Thoroughly mix ingredients in quantities needed for immediate use.
- C. Mix dry ingredients mechanically until uniformly distributed; add water to achieve workable consistency.
- D. Discard lumpy, caked, frozen, and hardened mixes.
- E. Use grout within 2-1/2 hours after initial mixing at ambient temperatures below 80 degrees F and within 1-1/2 hours after initial mixing at ambient temperatures over 80 degrees F.
- F. Do not add accelerators, retarders, water repellents, antifreeze compounds, or other additives without Architect's approval.

## **PART 3 EXECUTION**

### 3.1 INSTALLATION

- A. Follow requirements specified in referenced sections.

END OF SECTION

## SECTION 042000

### UNIT MASONRY

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Concrete unit masonry.
  - 2. Brick unit masonry.
  - 3. Integral flashings.
  
- B. Related Sections:
  - 1. Division 01: Administrative, procedural, and temporary work requirements.
  - 2. Section 040513 - Masonry Mortaring.
  - 1. Section 040516 - Masonry Grouting.
  - 2. Section 079200 - Joint Sealers.

##### 1.2 REFERENCES

- A. ASTM International (ASTM):
  - 1. A153/A153M - Standard Specification for Zinc-Coating (Hot Dip) on Iron and Steel Hardware.
  - 2. C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
  - 3. C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Concrete.
  
- B. The Masonry Society (TMS):
  - 1. 402 - Building Code for Masonry Structures.
  - 2. 602 - Specification for Masonry Structures.

##### 1.3 SUBMITTALS

- A. Submittals for Review:
  - 1. Product Data: Provide information on reinforcing and anchors including sizes, profiles, materials, and finishes.
  - 2. Samples: Brick samples in quantities showing full color and texture range.

##### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years documented experience in work of this Section.
  
- B. Perform Work in accordance with TMS 402 and 602.

##### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Store masonry off ground; prevent contact with materials that could cause staining or damage.
  
- B. Protect reinforcement and anchors from corrosion.

##### 1.6 PROJECT CONDITIONS

- A. Wall Protection:
  - 1. During erection, cover tops of partially completed walls with strong waterproof membrane at end of each day or work stoppage.
  - 2. Extend cover minimum of 24 inches down both sides; hold securely in place.

- B. Load Application:
  - 1. Do not apply uniform loads for at least 12 hours after building masonry columns or walls.
  - 2. Do not apply concentrated loads for at least 3 days after building masonry columns or walls.
- C. Environmental Requirements:
  - 1. Hot weather requirements: If ambient temperature is over 95 degrees F or relative humidity is less than 50 percent, protect from direct sun and wind exposure for minimum 48 hours after installation.
  - 2. Cold weather requirements: Do not use frozen materials or build on frozen work.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Acceptable Manufacturers - Masonry Accessories:
  - 1. Blok-Lok Ltd. ([www.blok-lok.com](http://www.blok-lok.com))
  - 2. Heckmann Building Products. ([www.heckmannbuildingprods.com](http://www.heckmannbuildingprods.com))
  - 3. Hohmann and Barnard, Inc. ([www.h-b.com](http://www.h-b.com))
- B. Substitutions: Under provisions of Division 01.

### **2.2 MATERIALS**

- A. Brick: Refer to Drawings.
- B. Concrete Masonry Units:
  - 1. ASTM C90, hollow load bearing type, normal weight.
  - 2. ASTM C129, hollow non-load bearing type, normal weight.
  - 3. Size: Nominally 8 inches high x 16 inches long x 8 inches thick.
  - 4. Special shapes: Lintels, Bond beams, Solid units as required.
  - 5. Surface finish: Split.
  - 6. Color: To be selected from manufacturer's full color range.

### **2.3 ACCESSORIES**

- A. Mortar: Specified in Section 040513.
- B. Grout: Specified in Section 040516.
- C. Single Wythe Joint Reinforcement:
  - 1. Ladder type; ASTM A951, hot-dip galvanized steel wire, 9 gage side rods with 9 gage cross ties.
  - 2. Width: Nominal wall thickness less 1-1/2 inches.
  - 3. Corner and tee fittings: Type to match reinforcement.
- D. Veneer Ties: Formed steel wire, two piece adjustable type with backing plate, hot dip galvanized, ASTM A153/A153M, B2 finish, minimum 2 inch embedment into masonry.
- E. Fasteners: Stainless screws, minimum 3/4 inch penetration into substrate.
- F. Reinforcing Bars: ASTM A615/A615M, deformed billet steel, Grade 40 or 60.
- G. Flashings:
  - 1. Rubberized asphalt laminated to plastic film, release paper facing, self adhering.
  - 2. Termination mastic: Type recommended by flashing manufacturer.
- H. Weeps: Preformed plastic tubes.
- I. Mortar Dropping Control: Preformed plastic mesh.

- J. Joint Sealer: Specified in Section 079200.
- K. Cleaner: Type recommended by masonry manufacturer.

### **PART 3 EXECUTION**

#### **3.1 PREPARATION**

- A. Wet brick having an absorption rate in excess of 20 g per 30 square inches per minute as determined by ASTM C67 so that absorption rate when laid does not exceed this amount.
- B. Remove dirt, loose rust, and other foreign matter from reinforcement and anchors.

#### **3.2 INSTALLATION**

- A. Establish lines, levels and courses indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimensions. Form horizontal and vertical joints of uniform thickness.
- C. Lay concrete masonry in running bond. Course one masonry unit and one mortar joint to equal 8 inches.
- D. Lay brick masonry in running bond unless otherwise indicated. Course three brick units and three mortar joints to equal 8 inches.
- E. Lay masonry plumb and level. Do not adjust masonry units after mortar has set.
- F. Lay solid masonry units in full mortar bed, with full head joints. Lay hollow masonry units with face shell bedding on head and bed joints.
- G. Do not butter corners or excessively furrow joints.
- H. Machine cut masonry with straight cuts and clean edges; prevent oversized or undersized joints. Discard damaged units. Do not expose cut cells.
- I. Isolate masonry from structural members with compressible filler.
- J. When joining fresh masonry to partially set masonry, remove loose masonry and mortar; clean and lightly wet exposed surface of set masonry.
- K. Stop horizontal runs by racking back normal bond unit in each course. Tothing not permitted.
- L. Horizontal Reinforcement:
  - 1. Place reinforcement at maximum 16 inches on center vertically, at topmost course, and at first two courses above and below openings.
  - 2. Extend minimum 24 inches each side of openings.
  - 3. Center reinforcing in wall.
  - 4. Lap ends 6 inches minimum; use fabricated tee and corner fittings at corners and intersections.
- M. Secure masonry to structural members with wall ties spaced maximum 16 inches on center.
- N. Control and Expansion Joints:
  - 1. Do not continue horizontal joint reinforcement through joints.
  - 2. Keep joints free from mortar and grout.
  - 3. Install joint backing and joint sealer at control joints in accordance with Section 079200.
  - 4. Form expansion joint as indicated on Drawings.

- O. Finishing Mortar Joints:
  - 1. Exposed locations: Tool joints to concave profile.
  - 2. Concealed locations: Cut joints flush.
  
- P. Reinforcing Bars:
  - 1. Position reinforcing accurately and hold securely in place to prevent displacement. Maintain minimum 1 inch space between masonry and reinforcing.
  - 2. Grout at intervals of not more than 60 inches in 6 to 8 inch lifts.
  - 3. Vibrate grout during and after placement to ensure complete filling.
  - 4. Stop grout 1-1/2 inch below top of masonry if grouting is stopped for 1 hour or more, except where completing grouting of finished wall.
  
- Q. Flashings:
  - 1. Install flashing with outer edge flush with outside face of masonry; extend up backup 8 inches minimum and seal.
  - 2. Lap end joints 4 inches minimum and seal.
  - 3. Form end dams where flashing is stopped or interrupted.
  - 4. Apply trowel coat of mastic along flashing at top edge, seams, cuts, and penetrations.
  
- R. Weeps:
  - 1. Locate in head joints in first course above flashings at maximum 32 inches on center.
  - 2. Set weeps flush with exterior face of masonry.
  
- S. Install mortar dropping control continuously in cavities above flashings.
  
- T. Installation Tolerances; Maximum variation from:
  - 1. Alignment of columns and pilasters: Plus or minus 1/4 inch.
  - 2. Alignment face to face of adjacent units: Plus or minus 1/8 inch.
  - 3. Vertical alignment of head joints: Plus or minus 1/2 inch in 10 feet.
  - 4. True plane of wall: Plus or minus 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.
  - 5. Plumb: Plus or minus 1/4 inch in 10 feet noncumulative; 1/2 inch in 20 feet or more.
  - 6. Level coursing: Plus or minus 1/8 inch in 3 feet; 1/4 inch in 10 feet; 1/2 inch in 30 feet.
  - 7. Joint thickness: Plus or minus 1/8 inch.
  - 8. Cross sectional thickness of walls: Plus or minus 1/4 inch.

### 3.3 FIELD QUALITY CONTROL

- A. Testing and Inspection Services:
  - 1. Mortar: Mold and test one set of compressive strength cubes in accordance with ASTM C780 for each 500 square feet of wall area.

### 3.4 CLEANING

- A. Protect adjacent and underlying surfaces.
- B. Apply masonry cleaner in accordance with manufacturer's instructions.
- C. Thoroughly rinse surfaces with clean water after completion of cleaning; remove all traces of cleaning solution.

END OF SECTION