

SECTION 04065

MASONRY MORTAR AND GROUT

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes mortar and grout for masonry.
- B. Related Sections:
 - 1. Section 04810 - Unit Masonry Assemblies: Installation of mortar and grout.
 - 2. Section 08115 - Standard Steel Frames: Grouting steel door frames.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C91 - Standard Specification for Masonry Cement.
 - 2. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
 - 3. ASTM C150 - Standard Specification for Portland Cement.
 - 4. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes.
 - 5. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
 - 6. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.
 - 7. ASTM C476 - Standard Specification for Grout for Masonry.
 - 8. ASTM C1019 - Standard Test Method for Sampling and Testing Grout.
 - 9. ASTM C1314 - Standard Test Method for Constructing and Testing Masonry Prisms Used to Determine Compliance with Specified Compressive Strength of Masonry.
 - 10. ASTM C1329 - Standard Specification for Mortar Cement.
 - 11. ASTM C1357 - Standard Test Method for Evaluating Masonry Bond Strength.
- B. The Masonry Society:
 - 1. TMS MSJC - Building Code for Masonry Structures (ACI 530/ASCE 5/TMS 402), Specification for Masonry Structures (ACI 530.1/ASCE 6/TMS 602) and Commentaries.

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal requirements.
- B. Samples: Submit two samples of mortar, illustrating mortar color and color range.
- C. Design Data: Submit design mix when Property specification of ASTM C270 is to be used, required environmental conditions, and admixture limitations.

- D. Test Reports:
 1. Submit reports on mortar indicating conformance of mortar to property requirements of ASTM C270 and test and evaluation reports to ASTM C780 for aggregate ratio and water content, air content, consistency and compressive strength.
 2. Submit reports on grout indicating conformance of grout to property requirements of ASTM C476 and test and evaluation reports to ASTM C1019.
- E. Manufacturer's Installation Instructions: Submit manufacturer's installation instructions.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with TMS MSJC Code and TMS MSJC Specification.
- B. Maintain one copy of each document on site.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01600 - Product Requirements.
- B. Hot and Cold Weather Requirements: TMS MSJC Specification.

PART 2 PRODUCTS

2.1 MORTAR AND MASONRY GROUT

- A. Manufacturers:
 1. Blue Circle Cement
 2. Citadel Cement
 3. CTS Cement Manufacturing Co.
 4. Lehigh Portland Cement
 5. Medusa Cement Co.
 6. The Quikrete Companies
 7. Substitutions: Section 01600 - Product Requirements

2.2 COMPONENTS

- A. Portland Cement: ASTM C150, Type I, white color.
- B. Mortar Aggregate: ASTM C144, standard masonry type.
- C. Hydrated Lime: ASTM C207, Type S.

- D. Grout Aggregate: ASTM C404, maximum 3/8 inch.
- E. Water: Clean and potable.
- F. Mortar Color: As selected to match existing building.
- G. Bonding Agent: Latex type.
- H. Calcium chloride is not permitted.

2.3 ADMIXTURES

- A. Plasticizer: Water reducing type if recommended by Testing Laboratory.

2.4 MIXES

- A. Mortar Mixes:
 - 1. Mortar For Non-Structural Masonry: ASTM C270, Type N using Property specification.
 - 2. Mortar For Non-Structural Masonry: ASTM C270, Type S using Property specification.
- B. Mortar Mixing:
 - 1. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.
 - 2. Achieve uniformly damp sand immediately before mixing process.
 - 3. Add mortar color to achieve uniformity of mix and coloration.
 - 4. Re-temper only within two hours of mixing.
- C. Grout Mixes:
 - 1. Bond Beams, Lintels, Fill Cores at Jambs: 3000 psi strength at 28 days; 8-10 inches slump; mixed in accordance with ASTM C476 fine grout.
- D. Grout Mixing:
 - 1. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476.
 - 2. Add admixtures; mix uniformly.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.
- B. Request inspection of spaces to be grouted.

3.2 PREPARATION

- A. Apply bonding agent to existing concrete surfaces.

3.3 INSTALLATION

- A. Install mortar and grout in accordance with ASTM C270.
- B. Install grout to requirements of the specific masonry section.
- C. Work grout into masonry cores and cavities to eliminate voids.
- D. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.
- E. Do not displace reinforcement while placing grout.
- F. Remove excess mortar from grout spaces.

3.4 FIELD QUALITY CONTROL

- A. Establishing Mortar Mix: In accordance with ASTM C270.

END OF SECTION

SECTION 04810
UNIT MASONRY ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes brick; concrete masonry units; reinforcement, anchorage, and accessories.
- B. Related Sections:
 - 1. Section 04065 - Masonry Mortar and Grout: Mortar and grout.
 - 2. Section 05500 - Metal Fabrications: Product requirements for loose steel lintels for placement by this section.
 - 3. Section 07110 - Dampproofing: Dampproofing masonry surfaces.
 - 4. Section 07212 - Board Insulation: Insulation for cavity spaces.
 - 5. Section 07600 - Sheet Metal Flashing and Trim: Product requirements for flashings for placement by this section.
 - 6. Section 07900 - Joint Sealers: Rod and sealant at control and expansion joints.
 - 7. Section 08115 – Standard Steel Frames: Product requirements for frame anchors for placement by this section.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - 2. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - 3. ASTM A951 - Standard Specification for Masonry Joint Reinforcement.
 - 4. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction.
 - 5. ASTM C126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.
 - 6. ASTM C1405 -
 - 7. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units.
 - 8. ASTM C140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units.
- B. The Masonry Society:
 - 1. TMS MSJC - Building Code for Masonry Structures ACI 530/ASCE 5/TMS 402, Specification for Masonry Structures ACI 530.1/ASCE 6/TMS 602 and Commentaries.

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal requirements.
- B. Product Data: Submit data for glazed face brick masonry units and fabricated wire reinforcement; wall ties; anchors and other accessories.
- C. Samples: Submit four samples of glazed face brick and face brick units to illustrate color, texture and extremes of color range.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with TMS MSJC Code and TMS MSJC Specification.

1.5 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum three years of documented satisfactory experience.

1.6 MOCKUP

- A. Section 01400 - Quality Requirements: Mockup requirements.

1.7 PRE-INSTALLATION MEETINGS

- A. Section 01300 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum two weeks prior to commencing any work of this section. The meeting shall be combined with the Pre-installation meeting requirements of Section 07110 and 08800.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Product storage and handling requirements.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Section 01600 - Product Requirements.
- B. Hot and Cold Weather Requirements: TMS MSJC Specification.

1.10 COORDINATION

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate masonry work with precast architectural concrete units, installation of window and door anchors.

PART 2 PRODUCTS

2.1 COMPONENTS

- A. Hollow Non-Load Bearing Concrete Masonry Units (CMU): ASTM C129, Type I - Moisture Controlled; light weight.
- B. Hollow Load Bearing Concrete Masonry Units (CMU): ASTM C90, Type I - Moisture Controlled; normal weight.
- C. Concrete Masonry Unit Size and Shape: Nominal modular size of 4 x 8 x 16 inches, 8 x 8 x 16 inches. Furnish special units for 90 degree corners, bond beams, lintels, and bullnosed corners.

2.2 ACCESSORIES

- A. Single Wythe Joint Reinforcement: Truss type; cold drawn steel wire conforming to ASTM A82, hot dip galvanized to ASTM A153, Class B2 after fabrication, 3/16 inch side rods with 9 gage cross rods. Manufacturer: Hohmann & Barnard, Inc., Model 120.
- B. Reinforcing Steel: specified in Section 03200. Strap Anchors: Bent steel shape, 1 1/2 inch x required length inch size x 3/16 inch thick, hot dip galvanized to ASTM A153/A153M, B2 finish.
- C. Mortar and Grout: As specified in Section 04065.
- D. Preformed Control Joints: Neoprene material. Furnish with corner and tee accessories, cement fused joints.
- E. Joint Filler: Closed cell polyethylene; oversized 50 percent to joint width; self expanding; 5/8 inch wide x by maximum lengths.
- F. Nailing Strips: Softwood, preservative treated for moisture resistance, dovetail shape, sized to masonry joints.
- G. Weeps: Full head joints.
- H. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01300 - Administrative Requirements: coordination and project conditions.
- B. Verify field conditions are acceptable and are ready to receive work.
- C. Verify items provided by other sections of work are properly sized and located.
- D. Verify built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION

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

3.3 INSTALLATION

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.
- C. Coursing of Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave.
- D. Placing And Bonding:
 - 1. Lay hollow masonry units with face shell bedding on head and bed joints.
 - 2. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.
 - 3. Remove excess mortar as work progresses.
 - 4. Interlock external corners.
 - 5. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment is required, remove mortar and replace.
 - 6. Perform job site cutting of masonry units with proper tools to assure straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
 - 7. Cut mortar joints flush where wall tile is scheduled, resilient base is scheduled, cavity insulation adhesive is applied, or bitumen dampproofing is applied.
 - 8. Isolate masonry from vertical structural framing members with movement joint as indicated on Drawings.

9. Isolate top of masonry from horizontal structural framing members and slabs or decks with compressible joint filler with joint as indicated on drawings.
- E. Joint Reinforcement And Anchorage - Single Wythe Masonry:
1. Install horizontal joint reinforcement 16 inches oc.
 2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
 3. Place joint reinforcement continuous in first and second joint below top of walls.
 4. Lap joint reinforcement ends minimum 6 inches.
 5. Reinforce joint corners and intersections with strap anchors 16 inches oc.
- F. Lintels:
1. Install reinforced unit masonry lintels over openings where steel lintels are not scheduled or indicated.
 2. Do not splice reinforcing bars.
 3. Support and secure reinforcing bars from displacement.
 4. Place and consolidate grout fill without displacing reinforcing.
 5. Allow masonry lintels to attain specified strength before removing temporary supports.
 6. Maintain minimum 8 inch bearing on each side of opening.
- G. Grouted Components:
1. Reinforce bond beam as indicated on drawings.
 2. Lap splices 24 bar diameters.
 3. Support and secure reinforcing bars from displacement.
 4. Place and consolidate grout fill without displacing reinforcing.
 5. Fill masonry cores with grout for minimum 12 inches both sides of opening.
- H. Control And Expansion Joints:
1. Do not continue horizontal joint reinforcement through control and expansion joints.
 2. Install preformed control joint device in continuous lengths. Seal butt and corner joints.
 3. Size control joint in accordance with Section 07900 for sealant performance.
 4. Form expansion joint by omitting mortar and cutting unit to form open space.
- I. Built-In Work:
1. As work progresses, install built-in steel door and fabricated metal frames, wood nailing strips, anchor bolts, plates, and other items to be built-in the work and furnished by other sections.
 2. Install built-in items plumb and level.

3. Bed anchors of steel door frames in adjacent mortar joints. Fill frame voids solid with grout or mortar. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
 4. Do not build in materials subject to deterioration.
- J. Cutting And Fitting:
1. Cut and fit for chases, pipes, conduit, sleeves, grounds, and electrical boxes. Coordinate with other sections of work to provide correct size, shape, and location.
 2. Obtain Architect's approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.4 ERECTION TOLERANCES

- A. Section 01400 - Quality Requirements: Tolerances.
- 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; 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 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.

3.5 CLEANING

- A. Section 01700 - Execution Requirements: Final cleaning.
- 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.

END OF SECTION