



SECTION 04060

MASONRY MORTAR

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Mortar for masonry specified in other Sections.

1.2 RELATED SECTIONS

- A. Section 04210: Brick Unit Masonry.
- B. Section 04810: Unit Masonry Assemblies.

1.3 REFERENCES

- A. ASTM C91: Standard Specification for Masonry Cement.
- B. ASTM C144: Standard Specification for Aggregate for Masonry Mortar.
- C. ASTM C150: Standard Specification for Portland Cement.
- D. ASTM C207: Standard Specification for Hydrated Lime for Masonry Purposes.
- E. ASTM C270: Standard Specification for Mortar for Unit Masonry.
- F. ASTM C595: Standard Specification for Blended Hydraulic Cements.
- G. ASTM C780: Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Masonry.
- H. ASTM C1157: Standard Performance Specification for Hydraulic Cement.
- I. ASTM C1329: Standard Specification for Mortar Cement.
- J. ASTM C1384: Standard Specification for Admixtures for Masonry Mortars.
- K. ICBO-ES - Evaluation Report 3759: Easy Spread Plasticizer for Mortar.
- L. NCMA TR-88: Hot and Cold Weather Masonry Construction Manual.

1.4 DESIGN REQUIREMENTS

- A. Use mortars and cements in the recommended locations.
 - 1. Type O: Use at non-load bearing interior and exterior low compressive strength applications.

2. Type N: Use at above-grade construction and for exterior masonry.
3. Type S: Use at above or below-grade construction.
4. Type M: Use at below-grade construction and where additional compressive strength is required by design.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's specifications and technical data for each different type of mortar manufactured product indicated.
- C. Samples: Submit two (2) samples of the following, unless otherwise indicated.
 1. Mortar Samples: Each type of mortar indicating range of color that can be expected.
 - a. Colored mortar samples: Label samples to indicate product code.
- D. Quality Control Submittals:
 1. Material certificates: Signed by Manufacturer and Contractor certifying the following complies with requirements specified.
 - a. Each different cement product, including manufacturer, brand, type, and weight slips at time of delivery.
 2. Material test reports: From qualified Independent Testing Laboratory indicating and interpreting test results relative to compliance of proposed masonry materials with requirements indicated.
 3. Field Quality Control Submittals are specified in Part 3 of this Section.

1.6 QUALITY ASSURANCE

- A. Inspecting Laboratory Qualifications: Demonstrate to Architect's satisfaction, based on evaluation of laboratory submitted criteria conforming to ASTM C1093, that it has experience and capability to satisfactorily conduct testing indicated without delaying progress of Work.
- B. Preconstruction Testing: Owner will employ and pay qualified independent testing laboratory to perform the following preconstruction testing indicated as well as other inspecting and testing services required by referenced unit masonry standard or indicated herein for source and field quality control.
 1. Mortar Tests: Mortar properties will be tested per property specification of ASTM C270.
 2. Bond Strength Tests: For each mortar, prisms will be tested per ASTM C1072.
 3. Prism tests: For each type of wall construction indicated, masonry prisms will be tested per ASTM E447, Method B.
- C. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
- D. Mortar Design: Test selected mortar for water retentivity and compressive strength per ASTM C270. Test laboratory shall submit special instructions for mortar preparation or wetting of brick.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping: Deliver materials in undamaged condition.
- B. Storage and Protection: Store mortar components in a manner to prevent their deterioration or damage due to moisture, temperature changes, contaminants, and other causes.

1. Store cementitious materials off ground, under cover and in a dry location.
2. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
3. Store accessories including metal items to prevent corrosion and accumulation of dirt and oil.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: WORKRITE Cements, 5952 Lincoln Highway West, Thomasville, PA 17364. ASD. Tel: 717.792.4700 Web: <http://www.yorkbuilding.com/workrite-cements/>
Email: mlewis@yorkbuilding.com.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MASONRY CEMENTS

- A. Colored Masonry Cement: Prepackaged masonry cement meeting requirements of ASTM C91
 1. Composition of some or all of the following: Combination of Portland cement, finely ground limestone, synthetic metal oxide pigments added for coloring per ASTM C979, Type S hydrated lime, and proprietary admixtures that enhance board life and durability.
 2. Provide masonry cement in the following formulations where required by structural:
 - a. Type N: Normal Strength
 - b. Type S: Medium Strength
 - c. Type M: High Strength.
 3. Acceptable Product: WORKRITE Colored Masonry Cement.

2.3 MORTAR CEMENTS

- A. Mortar Cement: Prepackaged mortar cement meeting requirements of ASTM C1329.
 1. Composition: Combination of Portland cement per ASTM C150 and Easy-Spreading Lime replacement.
 2. Provide mortar cement in the following formulations where required by structural:
 - a. Type N: Normal Strength.
 - b. Type S: Medium Strength.
 3. Acceptable Product: WORKRITE non-pigmented Mortar Cement.

- B. Colored Mortar Cement: Prepackaged mortar cement meeting requirements of ASTM C1329.

1 Composition: Combination of Portland Cement per ASTM C150, Easy-Spreading Lime replacement, synthetic metal oxide pigments added for coloring per ASTM C979, and proprietary admixtures that enhance board life and durability.

1. Provide mortar cement in the following formulations where required by structural:
 - a. Type N: Normal Strength.
 - b. Type S: Medium Strength.
2. Acceptable Product: WORKRITE Colored Mortar Cement.

2.4 PORTLAND CEMENT & LIME BLENDS (PCL)

- A. Portland Cement and Hydrated Lime Blend: Prepackaged Portland cement and lime blend consisting of Type I Portland cement and Type S hydrated lime.
 - 1. Composition: Combination of Portland cement per ASTM C150 and Type S hydrated mason's lime per ASTM C207.
 - 2. Provide Portland cement /hydrated lime blend in the following formulations where required by structural:
 - a. Type O: Low Strength.
 - b. Type N: Normal Strength.
 - c. Type S: Medium Strength.
 - d. Type M: High Strength.
 - 3. Acceptable Product: WORKRITE non-pigmented Portland Cement & Lime.

- B. Colored Portland Cement and Hydrated Lime Blend: Prepackaged Type I Portland cement and lime blend consisting of Type I Portland cement, Type S hydrated lime, and synthetic metal oxide pigments added for coloring.
 - 1. Composition: Combination of Portland cement per ASTM C150, Type S hydrated mason's lime per ASTM C207 and pigments per ASTM C979.
 - 2. Provide Portland cement in the following formulations where required by structural:
 - a. Type O: Low Strength.
 - b. Type N: Normal Strength.
 - c. Type S: Medium Strength.
 - d. Type M: High Strength.
 - 3. Acceptable Product: WORKRITE Colored Portland Cement & Lime.

2.5 ACCESSORY MATERIALS

- A. Water: Clean and free from deleterious acids, alkalies, and organic matter.
- B. Admixtures: Comply with ASTM C1384 or ICBO-ES Evaluation Report 3759.
- C. Sand: Mason's sand, ASTM C144.

2.6 MIXING

- A. Assure that mixing equipment is clean and in good working order.
- B. Mixing Procedure: Utilize mixing instructions, sequence and timing of mix, recommended by material manufacturer.
- C. Re-tempering: Use mortar within 90 minutes of initial mixing. Re-temper mortar that has stiffened because of evaporation of water from mortar by adding water and blending as frequently as needed to restore required consistency.
 - 1. Colored mortar shall not be re-tempered
 - 2. Discard mortar not used within 2-1/2 hours after initial mixing.
- D. Cold Weather: Follow National Concrete Masonry Association recommendations for cold weather construction.
- E. Hot Weather: Follow National Concrete Masonry Association recommendations for hot weather construction.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Refer to Section 04210 for installation of mortars for brick veneers.
- B. Refer to Section 04810 for installation of mortars for concrete block.
- C. Discard mortar not used within 2-1/2 hours after initial mixing.
- D. Do not shift or tap masonry after mortar has taken initial set. Where adjustment must be made, remove mortar and install fresh mortar.
- E. Rock closures into place with head joints thrown against 2 adjacent bricks in place. Do not pound corners or jambs to fit stretcher units after setting in place. Where adjustment to corners or jambs must be made after mortar has started to set, remove mortar and install fresh mortar.

3.2 MORTAR BEDDING AND JOINTING

- A. Install face brick in 1/2 lap (centered - running bond) unless otherwise indicated.
- B. Install face brick in 1/3 - 2/3 bond unless otherwise indicated.
- C. Install face brick with lap to match existing unless otherwise indicated.
- D. Maintain uniform 3/8 inch (10 mm) thick mortar joints.
- E. At cavity walls, install brick with beveled bed joints as described in BIA Technical Note No. 13.
- F. Mortar Joint Finishing:
 - 1. Tool joints when mortar is thumbprint hard, using jointing tool of proper shape and size.
 - 2. Tool exterior face of joints located below grade to a smooth, dense, concave surface.
 - 3. Tool exposed joints to a smooth, dense, concave surface.
 - 4. Tool exposed joints to a smooth, dense surface to match shape of existing mortar joints.
 - 5. Flush cut joints not indicated to be tooled.

3.3 FIELD QUALITY CONTROL

- A. Tests:
 - 1. Provide field quality control tests and inspections to comply with Section 01400.
 - 2. Bond strength field-testing: Tests of bond strength to comply with ASTM C1072, between mortar and face brick for exterior walls at various times during progress of Work.
 - a. Construct two 7-brick prisms for every 10,000 brick laid. Test prisms at 7 days and at 28 days.
 - b. Construct two 7-brick prisms for every 5,000 brick laid. Test prisms at 7 days and at 28 days.

END OF SECTION