

**CONSTRUCTION STANDARD SPECIFICATION**

**SECTION 04050**

**MASONRY MORTAR AND GROUT**

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**PART 1 - GENERAL**

**1.01 SUMMARY**

**A. RELATED SECTIONS**

1. Section 03300, "Cast In Place Concrete"
2. Section 04220, "Concrete Masonry Units"
3. Section 05500, "Metal Fabrications"
4. Section 07200, "Building Insulation"
5. Section 07600, "Exterior Insulated Finish System"
6. Section 09900, "Painting"

**1.02 REFERENCES**

**A. American Society for Testing and Materials (ASTM)**

- |         |   |
|---------|---|
| C143    | Test for Slump of Portland Cement Concrete  |
| C144-93 | Specification for Aggregate for Masonry Mortar  |
| C270    | Mortar for Unit Masonry   |
| C404    | Specification for Aggregates for Masonry Grout  |
| C476    | Mortar and Grout for Reinforced Masonry   |
| C780-02 | Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry |
| C1019   | Standard Test Method for Sampling and Testing Grout   |

**B. Masonry Codes and Specifications**

**C. National Concrete Masonry Association (NCMA)**

**D. International Building Code (IBC): Chapter 21 Masonry**

### 1.03 SUBMITTALS

Submit the following in accordance with conditions of Contract and Section 01330, "Submittal Procedures":

- A. Test reports: Testing laboratory shall submit test reports indicating compression, yield and slump of mortar and grout.
- B. Asbestos-free and lead-free certification for all masonry mortar and grout.
- C. Samples: Colored masonry mortar samples showing full extent of colors available.
- D. Material certificates: Certificates signed by manufacturer and Contractor certifying that each material complies with requirements, for each different cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.

### 1.04 ENVIRONMENTAL REQUIREMENTS

Heat mixing water when air temperature is below 40° F and heat aggregates when air temperature is below 32° F, to assure mortar and grout temperatures between 40° F and 120° F until installed. Do not heat water or aggregates above 120° F.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Mortar: Mortar mix shall comply with proportion specifications of ASTM C270 for job-mixed mortar. Masonry cement shall not be used for mortar.
  - 1. Aggregate ratio shall be not less than 2 1/4 and not more than 3 times the sum of the separate volumes of cementitious materials.
  - 2. Exterior Walls Above Grade: Type S, 1/4 to 1/2 part hydrated lime to 1 part Portland cement by volume.
  - 3. Exterior Walls At or Below Grade: Type M, 1/4 part hydrated lime to 1 part Portland cement by volume.
  - 4. Interior Walls: Type S, 1/4 to 1/2 part hydrated lime to 1 part Portland cement by volume.
- B. Grout: Grout shall comply with proportion requirements of ASTM C476.
  - 1 part Portland cement
  - 1/10 part hydrated lime
  - 3 parts sand
  - 2 parts coarse aggregate (for coarse grout only, omit for fine grout)

- C. Slump: Unless otherwise indicated, mix grout to a consistency, which has a slump between 8 and 10 inches (203 and 254 mm).
- D. Portland Cement: ASTM C150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or gray cement as required to produce required mortar color.
- E. Hydrated Lime: ASTM C207, Type S.
- F. Fine aggregate: ASTM C144, except for joints less than 1/4 inch (6.35 mm) use aggregate graded with 100% passing the No. 16 sieve.
  - 1. Gray Mortar Aggregates: Gray sand or ground gray stone.
  - 2. Colored Mortar Aggregates: Ground marble, granite, or other sound stone, as indicated.
- G. Coarse aggregate: ASTM C404, maximum size 3/8" sieve.
- H. Admixtures: The use of admixtures including color pigments, accelerators, retarders, water repellent agents, or other admixtures shall not be permitted except as specified or as directed by the SDR.
  - 1. No air-entraining admixtures or materials containing air-entraining admixtures may be used for mortar.
  - 2. No antifreeze compounds shall be added to mortar or grout.
  - 3. No admixtures containing chlorides shall be added to mortar or grout.
- I. Water: Water shall be clean, potable and free of deleterious quantities of acids, alkalis, and organic materials.
- J. Colored Mortar Pigments: Mortar pigment shall conform to ASTM C979.
  - 1. Natural and synthetic iron oxides, chromium oxides and carbon black, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.
  - 2. Mineral oxide pigment shall not exceed 10% of the weight of Portland cement.
  - 3. Carbon black shall not exceed 2% of the weight of Portland cement.
  - 4. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
    - "Centurion Pigments," Centurion.
    - "True Tone Mortar Colors," Davis Colors, A Subsidiary of Rockwood Industries, Inc.
    - "SGS Mortar Colors," Solomon Grind-Chem Services, Inc.

## PART 3 – EXECUTION

### 3.01 PREPARATION OF MIXES

- A. Mortar: Mix mortar materials in a mechanical mixer with approximately one-half ( $\frac{1}{2}$ ) of the water and fine aggregate placed into the mixer first. Cementitious materials, and remaining water and sand should then be added and mixed for not less than 5 minutes. Hand mixing shall not be used unless specifically approved by Architect.
- B. Grout: Proportion and mix grout in accordance with the requirements of ASTM C476. The mixture shall be fluid as possible without segregation of materials. Consistency of grout shall have a slump of 8 to 10 inches, as determined by ASTM C-143, at time of placement.

### 3.02 USAGE

Use mortar and grout within 1-hour of initial mixing. Discard mortar and grout that have begun to set. If mortar stiffens from evaporation or absorption of mixing water, temper by adding water and remixing. Mortar or grout mixture shall not only be retempered once.

### 3.03 APPLICATION

Use as specified in Section 04220, "Concrete Masonry Units".

### 3.04 FIELD QUALITY CONTROL

- A. The Contractor shall employ the services of a qualified testing laboratory to perform tests and submit test reports.
- B. Provide daily field tests for mortar per IBC standards.
- C. Grout slump per ASTM C143 for each set of compressive strength test specimens.
- D. Compression Test Specimens: Obtain and test grout samples per ASTM C119 on a daily basis during grouting operation. When volume of grout utilized exceeds 25 cubic yards in one day increase test frequency to provide tests for every 25 cubic yards of fraction thereof.

END OF SECTION