



## SECTION 03 60 00

### GROUTING

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. CONTRACTOR shall furnish all labor, tools, and equipment for the placement of grout in tie holes and other locations as shown on the DRAWINGS and specified herein.
- B. This section includes basic mixing, application, and curing methods for grout.

##### 1.02 RELATED SECTIONS

- A. The following is a list of SPECIFICATIONS which may be related to this section:
  - 1. Section 03 11 00, Concrete Forming.
  - 2. Section 03 15 00, Construction Joints.
  - 3. Section 03 31 00, Structural Concrete.
  - 4. Section 03 35 00, Concrete Finishing.
  - 5. Section 03 39 00, Concrete Curing.
  - 6. Section 32 16 00, Sidewalks, Curbs, and Gutters.

##### 1.03 QUALITY STANDARDS

- A. The following is a list of standards which may be referenced in this section:
  - 1. ASTM International (ASTM):
    - a. C78, Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
    - b. C109/C109M, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens).
    - c. C469, Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression.
    - d. C666/C666M, Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
    - e. C882, Standard Test Method for Bond Strength of Epoxy-Resin Systems used with Concrete by Slant Shear.
    - f. C1012, Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to Sulfate Solution.



- g. C1202, Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration.

#### 1.04 SUBMITTALS

- A. Provide product data on the following:
  - 1. Grout.
  - 2. Bonding agent.
  - 3. Curing compound.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Cement based mortar shall be delivered and stored in manufacturer's packaging until it is ready to be mixed and placed. Mortar bags shall be stored off the ground and protected from water and all other substances that may penetrate packaging.

### **PART 2 PRODUCTS**

#### 2.01 MATERIALS

- A. Mortar for Tie Holes: EMACO R320.
- B. Bonding Adhesives: Concessive Liquid LPL or Concessive Standard Liquid.
- C. Water: Only clean potable water shall be used.
- D. Curing Compound: MB 429, Masterkure 100W, Masterkure 200W.
- E. (Exposed) Reinforcing Steel Coating: EMACO P22.
- F. Evaporation Reducer: Confilm Evaporation Reducer.

### **PART 3 EXECUTION**

#### 3.01 GENERAL

- A. CONTRACTOR shall have a printed set of manufacturer's recommendations for product use onsite for review during preparation, mixing, and application of grout.
- B. These grouts contain admixtures that increase grout strength and workability. The strength and performance of the grout is dependent on proper surface preparation, grout mixing and curing. CONTRACTOR shall be required to use a calibrated measuring device to add clean potable water to the grout mix. Water added to a grout mix without a calibrated device is cause for grout rejection, removal and re-placement.
- C. Curing is critical to prevent shrinkage cracks that can develop with grouts containing some admixtures. Curing shall begin immediately after placement.
- D. All mixing, surface preparation, handling, placing, consolidation, and other means of execution for pre-packaged mortars shall be done according to the instructions and



recommendations of the manufacturer and this SPECIFICATION. In the event that a conflict occurs between this SPECIFICATION and manufacturer's instructions, the manufacturer's instructions shall prevail in all cases.

### 3.02 INSTALLATION

#### A. Preparation:

1. Thoroughly clean the roughened surface and any exposed reinforcement of rust, dirt, loose chips, and dust. Maintain substrate in a saturated, surface-dry condition.
2. Where applicable, coat exposed reinforcing steel with EMACO P22 reinforcing steel bar protection coating prior to patching.

B. Mixing: Comply with mortar manufacturer's recommendations for water quantity. Mechanically mix with a slow speed drill (four hundred to six hundred [400 to 600] rpm) and Jiffler-type paddle. Pour approximately ninety percent (90%) of the mix water into the mixing container; then add the bagged material while continuing to mix. Add remaining water as needed. Mix time shall not exceed five (5) minutes.

#### C. Application:

1. Apply bonding adhesive such as Concreive Liquid LPL or Concreive Standard Liquid.
2. Place and finish with trowel or screed. In hot, windy, or dry conditions, where rapid surface evaporation may occur, apply evaporation reducer.

D. Curing: Apply Masterkure 200 W curing compound in accordance with label instructions.

### 3.03 FIELD QUALITY CONTROL

#### A. Field Tests:

1. When OWNER is to perform grout testing, CONTRACTOR shall assist OWNER or the concrete testing consultant as requested during the performance of quality control testing.
2. When prescribed in the DRAWINGS or by these SPECIFICATIONS, length change test specimens will be taken during construction from the first placement of each type of mortar, and at intervals thereafter as selected by ENGINEER to ensure continued compliance with these SPECIFICATIONS. Unless otherwise specified on the DRAWINGS or SPECIFICATIONS the testing will be performed by OWNER or testing representative.
3. When required, length change tests and fabrication of specimens for cement-based mortar shall be performed as specified in ASTM C1012 at intervals during construction as selected by ENGINEER. A set of three (3) specimens will be made for testing at seven (7) and twenty eight (28) days.



4. All mortar, already placed, that fails to meet the requirements of this SPECIFICATION, shall be subject to removal and replacement at the cost of CONTRACTOR.
5. Unless otherwise specified in the DRAWINGS or SPECIFICATIONS, the cost of all laboratory tests on grout shall be borne by OWNER, but CONTRACTOR shall assist ENGINEER in obtaining specimens for testing. However, CONTRACTOR shall be charged for the cost of any additional tests and investigation of WORK performed which does not meet the SPECIFICATIONS.

**END OF SECTION**