

SECTION 04 05 12
MORTAR AND GROUT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Mortar and grout where specified and/or shown on the Plans shall conform to this section of the Specifications. Mortar and grout shall be designated by type as set forth. The uses and purposes of said types shall be consistent with the uses and purposes as designated. For grout filling existing lines please refer to SECTION 03 34 00 – GROUT FILL EXISTING LINE.

1.2 MEASUREMENT AND PAYMENT

- A. Where mortar and/or grout are measured for payment the unit of measurement will be cubic yards of mortar and/or grout, complete and in place. Payment shall be at the unit price bid in the Proposal. However, unless otherwise specified or directed, mortar and/or grout will not be measured as pay quantities but will be included in the unit price bid for the specific item or items into which they are incorporated as set forth in the bid proposal.

1.3 SUBMITTALS

- A. Mix Design

PART 2 – PRODUCTS

2.1 MATERIALS

- A. MASONRY MORTAR shall be composed of fine aggregate thoroughly mixed with cement and water. The mixture produced shall be homogeneous with a consistency required for ease of handling and spreading by a trowel.
- B. STANDARD GROUT shall have a consistency that will permit flow into the joints, completely filling them.
- C. PIPE JOINT MORTAR shall have consistency and workability for use as dictated by accepted practices and/or as required for specific job conditions.
- D. NEAT CEMENT GROUT shall be composed of Portland Cement and water mixed to the consistency required for specific job conditions.

2.2 TESTING REQUIRMENTS

Mortar and grout may be rejected for failure to meet any of the requirements of the Specifications, and specifically for:

- A. Re-tempered mortar and/or grout.
- B. Mortar and grout attaining initial set before use.
- C. Improper mixing.
- D. Mortar and grout containing frozen aggregates.
- E. Mortar and grout subjected to freezing within three (3) days after being placed in the work.

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PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS

The proportions by volume or weight of cement, fine aggregate and water shall produce a plastic mixture. The degree of workability shall be consistent with the use to which the mixture is placed, and shall be pre-approved by the Engineer.

A. **CEMENT**: Cement used in mortar and grout shall be Type I or Type III Portland Cement which shall conform to the current ASTM Designation C-150.

B. **FINE AGGREGATE**: Fine aggregate to be used in mortar and grout shall consist of sand or a mixture of sands, with or without a mineral filler. The sand or mixture of sands in fine aggregate shall consist of clean, hard, durable, uncoated grains, free from lumps. Fine aggregate shall not contain deleterious substances in excess of the following percentages by weight:

- Material removed by decantation 3.0%
- Clay lumps 0.5%
- Other deleterious substances 2.0%
(such as coal, shale, coated grains, and soft, flaky particles)

Fine aggregate shall be free from an excess of harmful salts or alkali. When subjected to the color test for organic impurities the sand or mixture of sands shall not show a color darker than the standard color. The fine aggregate shall be well graded from coarse to fine, and when tested by laboratory methods shall meet the following requirements for percentages by weight:

- Retained on 3/8 inch screen 0%
- Retained on 1/4 inch screen 0 - 5%
- Retained on No. 20 mesh sieve 15 - 50%
- Retained on No. 100 mesh sieve 85 - 100%

Combining two sands of different gradations may be the most economical way to meet these specifications. If this is done, each sand shall be separately and accurately measured by volume or weight in such proportions as the Engineer may direct. Sands and mineral filler shall not be mixed prior to batching. Mineral filler and the use of it shall be pre-approved by the Engineer. In no case shall the added amount of mineral filler exceed ten (10) percent of the weight of the fine aggregate. The mineral filler, when tested by laboratory methods, shall meet the following percentages by weight:

- Retained on No. 20 mesh sieve 0%
- Retained on No. 30 mesh sieve 0 - 5%
- Retained on No. 100 mesh sieve 0 - 30%

C. **WATER**: Water for use in mortar and grout shall be reasonably clean and free from injurious amounts of oil, acid, alkali, organic matter or other deleterious substances. Water suitable for drinking or ordinary household uses may be considered acceptable for use in mortar and grout.

D. EQUIPMENT

All equipment, tools and machinery used in handling and mixing mortar and grout shall meet the approval of the Engineer. Mortar and grout shall be machine mixed when the amount required justifies machine mixing. Machine mixers shall be of the batch type.

E. MIXING

Mortar and grout shall be mixed only in the quantities required for immediate use. Where machine mixing is indicated or directed, the fine aggregate along with the cement and water shall be measured separately, introduced into the mixer, and mixed for a period of time of not less than one and one-half (1 1/2) minutes. This is the time measured from the entry of the last aggregate into the drum until the discharging of mortar or grout. The required water shall be introduced into the mixing drum during the first fifteen (15) seconds of mixing. The entire contents of the drum shall be discharged before introducing any materials for the succeeding batch. Any hand mixing as pre-approved by the Engineer shall be done in a pre-approved watertight box, and the sequence of mixing operations shall be as follows:

1. The box shall first be filled with the required amount of sand; the sand shall be leveled with the required amount of cement spread uniformly on top of the sand; the materials shall then be dry mixed by turning not less than three (3) times with a mortar hoe; the required amount of water shall then be added and the hoe mixing continued until the batch is of uniform color and consistency.
2. All mortar and grout shall be used within one (1) hour after mixing or before any visible signs of setting become discernible. Retempering of mortar or grout will not be permitted.

The types, uses and proportions of mortar and grout shall be as follows:

TYPES	USES	SACKS OF CEMENT	CUBIC FEET OF FINE AGGREGATE
"A"	Masonry mortar	1	2
"B"	Standard grout	1	3
"C"	Pipe joint mortar	1	1
"D"	Neat cement grout	1	none

F. ADMIXTURES

Lime may be added to increase workability in an amount not to exceed ten (10) percent of the cement content of the masonry mortar. Admixtures for the purposes of curing, accelerating the setting, or lowering the freezing point will not be permitted.

END OF SECTION