SECTION 106

CEMENT MORTAR AND GROUT

106.1 GENERAL

Cement mortar prepared under this specification shall consist of a mixture of cementitious materials, aggregate, and water.

106.2 REFERENCES

106.2.1 ASTM

C 5	C 207
C 91	C 266
C144	C 270

106.2.2 This publication
SECTION 101

106.3 DESIGNATIONS

106.3.1 The designation of cement mortar according to type listed in the following tabulation indicates the proportions of materials to be used in the preparation thereof; the proportions indicated are on a volume basis. The type of mortar to be used shall be as specified in Tables 106.3.1.1, 106.3.1.2, as shown on the plans, or as approved by the ENGINEER.

106.3.2 Grout shall be Type M mortar, unless otherwise approved by the ENGINEER. Neat cement grout shall consist of cement mixed with water as necessary to obtain a fluid and workable mix.

106.4 CEMENT AND LIME

Cement to be used shall conform with the requirements in Section 101. Masonry cement shall conform to ASTM C 91. Quicklime shall conform to ASTM C 5. Hydrated lime shall conform to ASTM C 207.

106.5 AGGREGATES

Aggregates to be used shall conform with ASTM C 144.

106.6 WATER

Water shall be clean and free of deleterious amounts of acids, alkalis, or organic materials.

106.7 ADMIXTURES OR MORTAR COLORS

Admixtures or mortar colors shall not be added to the mortar at the time of mixing unless approved by the ENGINEER and, after the materials are so added, the mortar shall conform to the requirements of this specification.

106.8 ANTIFREEZE COMPOUNDS

No antifreeze liquid, salts, or other substances shall be used in mortar to lower the freezing point.

106.9 MORTAR FOR REPAIRING SPALLED AREAS AND FOR NOSING GROUT.

Mortar shall have a fast setting Portland cement base, no metallic additives, and shall mix, place and finish similar to regular concrete. It shall develop minimum compressive strengths (psi) of 3200 @ 24 hr. and 4500 @ 7 days. The mortar shall meet the resistance to the action of freeze-thaw cycles as ascertained using the rapid method outlined in ASTM C-266 and shall show no excessive spalling after 300 cycles of rapid freezing and thawing in water.

106.10 MEASURING AND MIXING OF MATERIALS

106.10.1 The method of measuring materials for the mortar used in construction shall be such that the specified portions of the mortar materials can be controlled and accurately maintained.

106.10.2 All cementitious materials and aggregate shall be mixed for a least 3 minutes with the maximum amount of water to produce a workable consistency in a mechanical batch mixer.

106.10.3 Mortars that have stiffened because of evaporation of water from the mortar shall be retempered by adding water as frequently as needed to restore the required consistency. Mortars shall be used and placed in final position within 2 1/2 hours after initial mixing.

106.11 TESTS

The mortar shall be designed and the laboratory mix tested in accordance with ASTM C 270.

106.12 MEASUREMENT AND PAYMENT

106.12.1 Measurement and payment for mortar and grout used in repair of spalled areas and for joint nosing material in drainage channels shall be by the square foot and shall include all chipping, sawing, sandblasting, and materials and work required for the completion of the repair.

TABLE 106.3.1.1
MORTAR TYPES

Mortar Type	Portland Cement	Masonry Cement	Hydrated Lime or Lime Putty	Aggregate, Measured In A Damp, Loose, Condition
M	1	1 (type II)	0	Not less than 2 1/4 and not more than 3 times the sum of the volumes of the cement and lime used.
M	1	0	1/4	
S	1/2	1 (type II)	0	
S	1	0	Over 1/4 to 1/2	
N	0	1 (type II)	0	
N	1	0	Over 1/2 to 1 1/4	
O	0	1 (type I or II)	0	
O	1	0	Over 1 1/4 to 2 1/2	
K	1	0	Over 2 1/2 to 4	

TABLE 106.3.1.2
MORTAR TYPE VS STRENGTH

Mortar Type	Average Compressive Strength at 28 days, psi
M	2,500
S	1,800
N	750
O	350
K	75

106.12.2 No separate measurement and payment will be made for mortar and grout in other applications unless designated by the ENGINEER.