Proposed Revision To:

☒ **Standard Specifications For Public Works Construction**
☐ **Standard Plans For Public Works Construction**

Change No. 190NS

(ASSIGNED BY GREENBOOK COMMITTEE

Public Works Standards, Inc.
AGC Southern California Regional Office
1255 Corporate Center Dr., Suite #100
Monterey Park, California 91754

Date Proposal Received

10-18-2007

(ASSIGNED BY GREENBOOK COMMITTEE)

Subsection or plan to be revised: Section 202 **On page(s):** 67-69

Revision: See Attached.

Reason For Revision: Pages 68 and 69 provide specifications for mortar and grout. To the uninformed the pages look like duplicates. This revision will update the specification while reducing redundancy.

Submitted By: Don Vivant **Phone No:** 714-720-4023

Agency: Sully Miller

Address:

Instructions: **Use a separate form for each revision. Use plain paper attached to this form if more space is needed. For minor changes, copy present wording using ~~strike over~~ with dashes for words to be deleted and underline new text. For major changes, rewrite or add paragraph or section. Reason MUST be given.**

Subcommittee Action: **On** _____ **(Date)**

☐ **Recommended For** _____ **Supplement/Edition**

☐ **Rejected** ☐ **As Modified**

Editorial Standards Subcommittee Review:

On _____ **(Date)**

☐ **Reviewed For Surf/Und/Spec/Plans Subcommittee**

☐ **NO Modifications** ☐ **As Modified**

Greenbook Committee Action:

On _____ **(Date)** ☐ **Approved For** _____ **Supplement/Edition** ☐ **As Modified**

☐ **Rejected**

TABLE 201-1.1.2(A)

Type of Construction	Concrete Class[7, 8, 9] U.S. Standard Measures (Metric Units)	Alternate Class U.S Standard Measures (Metric Units)	Maximum Slump Inches (Millimeters)
Street Surface Improvements			
Coarse Masonry Grout	610-E-2000G[6] (360-E-14G[6])	**610-EF-2000G[6]** **(360-EF-14G[6])** 580-EFW-2000G[6] (345-EFW-14G[6])	10 (250) 10 (250)

1. Concrete mixes followed by a "P" have been designed to accommodate placement by a concrete pump. A pump mix may be substituted for a similar class or alternate class mix and placed utilizing standard placement methods by the Contractor at its option. Said substitution, if made, shall be at the Contractor's expense.
2. The Engineer should consider sulfide resistance of mix prior to use in sewers or appurtenant structures.
3. Use B Aggregate gradation when placing conditions permit.
4. Use limited to bedding concrete over which backfill will be placed not less than 40 hours after placement. For backfill after 24 hours, add 3 pints per 100 pounds of cement (31 milliliters per kilogram of cement) of calcium chloride. For backfill after 16 hours and removal of sheeting after 18 hours, use 660-C-3750 (390-C-26) with 3 pints per 100 pounds of cement (31 milliliters per kilogram of cement) calcium chloride solution.
5. Controlled Low Strength Material (CLSM) conforming to Section 201-6 may be used when approved by the Engineer, except the maximum slump requirement in the table does not apply.
6. Concrete mixes followed by a "G" have been designed to accommodate the grout requirements of Section 202, Masonry Materials. **Water-reducing admixtures shall not be used with masonry grout aids.**
7. A water reducing admixture conforming to 201-1.2.4 may be used in any concrete specified by class and is required in all 4000 psi (28 MPa) compressive strength concrete specified by class.
8. Fibers conforming to 201-2.3 may be used in any concrete specified by class.
9. Color conforming to 303-7 may be used in any concrete specified by class.

201-5.2 Cement. Portland cement shall conform to 201-1.2.1. ~~Plastic (masonry) cement shall conform to ASTM C 91.~~

SECTION 202 – MASONRY MATERIALS

202-1 BRICK.

202-1.1 General. Brick shall be whole, sound, hard, burned, give a clear ringing sound when struck together, and be uniform in quality. They shall be culled or sorted before delivery to the worksite. Mortar used in brick construction shall be Class "D" as specified in 201-5.1 and 202-3.11. Grout used in brick construction shall be as specified in 202-3.2. Fine grout shall be used in spaces less than 2 inches (50 mm) clear in any dimension. Coarse grout shall be used in spaces 2 inches (50 mm) or larger in all horizontal directions.

202-1.2 Manhole Brick Sewer manhole brick shall conform to ASTM C 62, Grade MW, with the following exceptions:

1) Average compressive strength of five bricks shall not be less than 4,000 psi (28 MPa) and compressive strength of any individual brick shall not be less than 3,500 psi (24 MPa).
2) The absorption of any individual brick shall not be more than 16 percent when submerged 24 hours in cold water.
3) Brick shall conform to following dimensions:

TABLE 202-1.2 (A)

	Depth inches (mm)	Width inches (mm)	Length inches (mm)
Standard Size Allowable Variation	2-1/2 (64) ±¼ (±6)	3-7/8 (98) ± 3/8 (± 10)	8-1/4 (2010) ± ½ (±13)

4) Plaster for brick sewer structures shall be "D" mortar as specified in 201-5.1.

202-1.3 Building Brick. Building brick shall conform to requirements of ASTM C 62 Grade MW. The size and texture shall be as shown on the Plans or as approved by the Engineer.

202-1.4 Facing Brick. Facing brick shall conform to requirements of ASTM C 216, Grade MW. Type FBS. The size, color, and texture shall be as shown on the Plans or as approved by the Engineer.

~~**202-1.5 Mortar, Grout, Water, and Plaster.**~~

~~**202-1.5.1 Mortar.** Mortar used in brick construction shall be Class "D" as specified in 201-5.1 to which ¼ to ½ part hydrated lime or lime putty has been added to portland cement mixtures, and no more than 1/10 part hydrated lime or lime putty has been added to plastic (masonry) cement mixtures. Mortar shall attain a minimum compressive strength of 13 MPa (1,800 psi) in 28 days.~~

~~**202-1.5.2 Grout.**~~

~~**(a) General.**~~

~~(1) Fine grout shall be used in spaces less than 50 mm (2 inches) clear in any dimension.~~

(2) Coarse Grout shall be used in spaces 50 mm (2 inches) or larger in all horizontal directions.
(3) Grout shall attain a minimum compressive strength of 14 MPa (2,000 psi) in 28 days.
(4) Grout shall be tested in accordance with ASTM C1019, Sampling and Testing Grout.

(b) Site-mixed Grout.

1) Site-mixed grout shall be proportioned by volume.
2) Fine grout shall be 1 part portland cement, 2 to 3 parts sand, and not more than 2 parts hydrated lime may be added...
3) Coarse grout shall be 1 part portland cement, 2 to 3 parts sand, and not more than 2 parts No. 4 Concrete Aggregate.

(c) Ready-mixed Grout.

1) Ready mixed grout shall conform to 201-1.
2) One cubic meter (cubic yard) of fine grout shall consist of a minimum of 445 kg (750 pounds) portland cement, sand, and sufficient water to achieve a 250 mm (10 inch) slump. Admixtures may be used as specified or as approved by the Engineer.
3) Coarse grout shall conform to Concrete Class 360-E-14G (610-E-2000G).

202-1.5.3 Water. Water shall conform to the requirements of 201-1.2.3. The quantity of water to be used in the preparation of the mortar or grout shall be the minimum required to produce a mixture sufficiently workable for the purpose intended.

202-1.5.4 Plaster. Plaster for brick sewer structures shall be "D" mortar as specified in 201-5.1.

202-2 CONCRETE BLOCK.

202-2.1 General. Mortar used in concrete block construction shall be Class "D" or "E" as specified in 201-5.1 and 202-3.1.1. Grout used in concrete block construction shall be as specified in 202-3.2. Fine grout shall be used in spaces less than 4 inches (100 mm) clear in any dimension. Coarse grout shall be used in spaces 4 inches (100 mm) or larger in all horizontal directions.

202-2.2~~1~~ Masonry Units. Masonry units shall be made with sand-gravel aggregate and conform to ASTM C 90 for Type I Units. The net size of units shall be as indicated on the Plans. Unless otherwise specified in the Special Provisions, all units shall be of the normal weight classification [oven-dry weight of concrete 125 pounds per cubic foot (2000 kg/m^3) or more]. Lightweight aggregates for use in concrete masonry units shall be manufactured from expanded clay, expanded shale, scoria, pumice, or a combination thereof, and shall conform to ASTM C 331.

202-2.2 Mortar, Grout, and Water.

202-2.2.1 Mortar. Mortar used in concrete block construction shall be Class "D" or "E" as specified in 201-5.1 to which ¼ to ½ part hydrated lime or lime putty has been added to portland cement mixtures, and no more than 1/10 part hydrated lime or lime putty has been added to plastic (masonry) cement mixtures. Mortar shall attain a minimum compressive strength of 13 MPa (1,800 psi) in 28 days.

202-2.2.2 Grout.

(a) General.

(1) Fine grout shall be used in spaces less than 100 mm (4 inches) clear in any dimension.
(2) Coarse grout shall be used in spaces 100 mm (4 inches) or larger in all horizontal directions.
(3) Grout shall attain a minimum compressive strength of 14 MPa (2,000 psi) in 28 days.
(4) Grout shall be tested in accordance with ASTM C 1019, Sampling and Testing Grout.

(b) Site-mixed Grout.

(1) Site-mixed grout shall be proportioned by volume.
(2) Fine grout shall be 1 part portland cement and 2-1/4 to 3 parts sand to which 1/10 part hydrated lime may be added.
(3) Coarse grout shall be 1 part portland cement and 2 to 3 parts sand, and 1-3/4 to 2 parts No. 4 Concrete Aggregate.

(c) Ready-mixed Grout.

(1) Ready-mixed grout shall conform to 201-1.
(2) One cubic meter (cubic yard) of fine grout shall consist of a minimum of 445 kg (750 pounds) portland cement, sand, and sufficient water to achieve a 250 mm (10 inch) slump. Admixtures may be used as specified or as approved by the Engineer.
(3) Coarse grout shall conform to Concrete Class 360-E-14G (610-E-2000G).

202-2.2.3 Water. Water shall conform to the requirements of 201-1.2.3. The quantity of water to be used in the preparation of the mortar or grout shall be the minimum required to produce a mixture sufficiently workable for the purpose intended.

202-3 Mortar, Grout, and Water.

202-3.1 Mortar.

202-3.1.1 General. Mortar shall be as specified in 201-5.1 to which ¼ to ½ part hydrated lime or lime putty has been added to portland cement mixtures. Mortar shall attain a minimum compressive strength of 1,800 psi (13 MPa) in 28 days when tested in accordance with ASTM C109.

202-3.2 Grout.

(a) General.

1) Grout shall attain a minimum compressive strength of 2,000 psi (14 MPa) in 28 days.
2) Grout shall be tested in accordance with ASTM C1019, Sampling and Testing Grout.

(b) Site-mixed Grout.

1) Site-mixed grout shall be proportioned by volume.
2) Fine grout shall be 1 part portland cement and 2 1/4 to 3 parts sand to which 1/10 part hydrated lime may be added.
3) Coarse grout used in brick construction shall be 1 part portland cement, 2 to 3 parts sand, and not more than 2 parts No. 4 Concrete Aggregate.
4) Coarse grout used in concrete block construction shall be 1 part portland cement, 2 to 3 parts sand, and 1-3/4 to 2 parts No. 4 Concrete Aggregate.

(c) Ready-mixed Grout.

1) Ready mixed grout shall conform to 201-1.
2) Fine grout shall consist of a minimum of 750 pounds (445 kg) per cubic yard (cubic meter) of portland cement, sand, and sufficient water to achieve a 10 inch (250 mm) slump. Admixtures may be used as specified in the Special Provisions or as approved by the Engineer.
3) Coarse grout shall conform to Table 201-1.1.2 (A) for Coarse Masonry Grout.

202.-3.3 Water. Water shall conform to the requirements of 201-1.2.3. The quantity of water to be used in the preparation of the mortar or grout shall be the minimum required to produce a mixture sufficiently workable for the purpose intended.