



**CATEGORY 900**  
**MATERIALS**

**SECTION 902 — PORTLAND CEMENT**  
**CONCRETE AND RELATED PRODUCTS**

**902.06.01 Air Entraining Admixtures**

612 **ADD:** The following after the first sentence:

Concrete shall contain the amount of entrained air specified when tested in conformance with T 152 at the point of discharge (i.e. end of pump hose).

**902.06.02 Chemical Admixtures.**

**ADD:** The following after the first sentence:

Type A or D admixtures shall be used in concrete for bridges, box culverts and retaining walls.

**902.06.04 Pozzolans.**

613 **ADD:** The following after the first paragraph.

The Contractor shall use the maximum amount of ground iron blast furnace slag required to attain a white concrete color for the concrete elements, while meeting all other specified criteria.

The Contractor shall use up to 25% fly ash, or up to 10% silica fume, or up to 75% ground iron blast furnace slag to meet the permeability requirements.

**ADD:** The following at the end of subsection (a) Fly Ash, "If fly ash is used, the producer's certificate of fly ash shall be submitted to the Engineer for each delivery."

**902.06.05. Ground Iron Blast Furnace Slag**

**CHANGE:** The first sentence to read "The Contractor may request to substitute a maximum of 75 percent of the weight of cement with ground iron blast furnace slag."

**ADD:** The following after 902.06.06 Synthetic Fibers

**902.06.07 Corrosion Inhibitors.** The permeability specification limits for the moving average of three tests and the individual tests shall be 2000 and 2500 coulombs, respectively when calcium nitrite corrosion inhibitor is used in Mix 11.

The gallonage of corrosion inhibitor used in the concrete mixture shall be included as water when determining the water/cementitious materials ratio.

**902.07.03 Liquid Membrane**

614 **DELETE:** Section 902.07.03 in its entirety. Liquid membrane shall not be used in lieu of burlap, sheet materials or cotton mats.

902.10.03 Portland Cement Concrete Mixtures.

TABLE 902 A

616 ADD: The following as the last entry to Table 902 A.

TABLE 902 A

PORTLAND CEMENT CONCRETE MIXTURES									
MIX NO.	28 DAY SPECIFIED COMPRESSIVE STRENGTH	STANDARD DEVIATION	CRITICAL VALUE	MIN CEMENTITIOUS FACTOR	COARSE AGGREGATE SIZE	MAX WATER/CEMENT RATIO	SLUMP RANGE	TOTAL AIR CONTENT	CONCRETE TEMPERATURE
9	psi 6500	psi 975	psi 7110	lb/yd <sup>3</sup> —	M 43 67	by wt 0.40	in. 2-5	% 5-8	F 70±20
10	4000	600	4180	635	57,67	0.40	2-5	5-8	70±20
11	5000	750	5360	—	57,67	0.45	2-5	5-8	65±15
12	8000	1200	8870	658	7	0.40	2-5	3-6	70±20

DELETE: Note 1 in its entirety.

INSERT: The following.

Note 1: When concrete is exposed to water exceeding 15 000 ppm sulfate or sodium chloride content, Type II cement shall be used. In lieu of a Type II cement, a Type I cement may be used in combined form with an amount of up to 75 percent replacement with ground iron blast furnace slag, or an amount of up to 25 percent replacement with Class F fly ash. The Contractor shall submit to the Engineer the proposed mix proportions and satisfactory test results in conformance with C 1012 showing a sulfate resistance expansion not exceeding 0.10 percent at 180 days.

618 TABLE 902 B

**CHANGE:** For OPTION 2, change the % BY WEIGHT of the Ground Iron Blast Furnace Slag to 25-75.

**ADD:** The following after the last paragraph (immediately before 902.10.04):

- (a) **Mass Concrete Mixes.** Cements complying with M 85 Type II, or Type IV shall be used, provided that the specified temperature limitations and other requirements are met. Admixtures and/or low heat cement blends shall be used in the mix to conform to the temperature limitations. High range water reducing admixtures may only be used if the Engineer determines that the producer can design and show by trial mix that the concrete with the high range water reducer will not have a slump of more than 8 in., and will have an air entrainment of between 5 and 8 percent. The concrete mix shall contain an approved air entraining admixture and an approved Type D or G admixture conforming to 902.06. If a high range water-reducing admixture is permitted, it shall conform to 902.06.03, Type G. The Engineer will determine the design adequacy and trial mix evaluation performed by the Contractor. The Engineer may reject an admixture when the performance shows that after actual usage the required results are not achieved.
- (b) **Chloride Permeability Testing.** Chloride permeability of the concrete shall be less than 2000 coulombs using the Rapid Chloride Permeability Test in conformance with C1202. Acceptance of proposed mixes according to C1202 will be determined by laboratory tests. Additional C1202 tests on production concrete shall be performed by the Contractor at the following frequency:
1. One for each pier foundation element (footing or pedestal)
  2. One per day from each mix utilized at the precasting facility

The above Rapid Chloride Permeability Tests shall be performed at 56 days.

The Rapid Chloride Permeability Tests for deck slab pours shall be performed at a frequency of one per day from each mix utilized. The RCPT shall be in accordance with Note 4 for Table 902 C.

**ADD:** The following requirement.

Mix 11 shall be used for the bridge deck and shall conform to all requirements of Table 902 C.

**TABLE 902 C**

<b>MIX 11 PHYSICAL PROPERTIES</b>		
<b>TEST PROPERTY</b>	<b>TEST METHOD</b>	<b>SPECIFICATION LIMITS</b>
Minimum 28 Day Compressive Strength, psi	T 23	5000
Standard Deviation, psi	T 23	750
Critical Value, psi	902.10.07	5360
Minimum Cementitious Materials Factor, lb/cy	—	580
Maximum Content of Portland Cement, lb/cy	—	550
Water/Cementitious Materials Ratio by Wt.	—	0.45
Corrosion Inhibitor, <del>30% calcium nitrite,</del> <i>MSMT</i> gal/cy <i>project specific</i>		2.0
Permeability of Field Concrete, moving average of three tests, coulombs max	T 277 Modified	2000
Permeability of Field Concrete, individual test, coulombs max	T 277 Modified	2500
Shrinkage at 28 days, microstrains	C 157	400

- Note 1: Only Type I or II Portland cement shall be used for Mix 11.
- Note 2: Mix 11 shall contain fly ash, ground iron blast furnace slag or microsilica conforming to 902.06.04.
- Note 3: The water cement ratio shall be based upon the total water to cementitious materials ratio. The gallonage of the corrosion inhibitor shall be included in the water/cementitious materials ratio.
- Note 4: The permeability test value of field concrete shall be the average of two specimens representing production concrete. Test specimens shall be molded on the project site in 4 x 8 in. molds conforming to M 205. Test specimens shall be handled under the same conditions as compressive strength tests in conformance with C 31 for the first seven days. When seven days old, they shall be cured in a 100 F water bath for the remainder of the 28 day curing. The 28 day rapid chloride permeability of the specimens will be determined in conformance with T 277. Test for the geometry of test specimens will be waived.
- Note 5: Shrinkage tests will be performed on trial mixes only. The molds for this test will be supplied by the Administration.
- Note 6: High range water reducing admixture may be used except the water reducing requirements will be waived.
- Note 7: A sealer conforming to 902.12 shall be used on the finished surface.

**902.12 LINSEED OIL.**

623 **ADD:** The following after the existing paragraph.

When the Engineer determines that the application of linseed oil is not practical, the surfaces of Mix 11 concrete shall be sealed with a silane based sealer. The sealer shall be subject to the approval of the Engineer.



**SPECIAL PROVISIONS INSERT**  
902 — PORTLAND CEMENT AND RELATED PRODUCTS

CONTRACT NO. PG5155173  
1 of 1

**CATEGORY 900  
MATERIALS**

**SECTION 902 — PORTLAND CEMENT  
CONCRETE AND RELATED PRODUCTS**

612 **DELETE:** 902.03 PORTLAND CEMENT. in its entirety.

**INSERT:** The following.

**902.03 PORTLAND CEMENT.** Portland cement shall conform to M 85, with the fineness and the time of setting determined in conformance with T 153 and T 131, respectively.

621 **DELETE:** 902.10.08 TESTING. in its entirety.

**INSERT:** The following.

**902.10.08 Testing.** Sampling shall conform to T 141. Testing shall be performed as follows:

TEST	METHOD	MINIMUM TEST FREQUENCY	RESPONSIBILITY
Slump (a)(e)	T 119	1 per 50 yd <sup>3</sup> (or fraction thereof)	Project Engineer
Air Content (a)(e)	T 152 T 196	1 per 50 yd <sup>3</sup> (or fraction thereof)	Project Engineer
Compression (b)(c)(d)	T 23	1 per 50 yd <sup>3</sup> (or fraction thereof)	Project Engineer
Compression (b)(c)(d) Mix No. 7 Only	T 23	3 per Day	Project Engineer

- (a) A second test will be made when the first slump or air content test fails. Acceptance or rejection will be based on the results of the second test.
- (b) Compressive strength tests are defined as the average of two companion cylinders.
- (c) The Contractor shall be responsible for the making of all early break cylinders and furnishing the molds, stripping, curing/delivery of all cylinders, including 28 day cylinders, to the testing laboratory.
- (d) The Project Engineer will be responsible for making, numbering and signing the 28 day cylinders.
- (e) When constructing plain and reinforced concrete pavements, the testing frequency for slump and air content shall be 1 per 100 yd<sup>3</sup> or fraction thereof.

CATEGORY 900  
MATERIALS

SECTION 915 — PRODUCTION PLANTS

915.03 PORTLAND CEMENT CONCRETE PLANTS.

674 **ADD:** The following after the first paragraph.

Concrete delivered in nonagitating equipment shall be discharged within 45 minutes after the introduction of cement to the aggregates.