

HIGH PERFORMANCE CONCRETE, LOW SHRINKAGE

**These provisions were used on the Barton BRO 1449(29) bridge project in conjunction with a Category II Experimental Work Plan for incorporating a concrete shrinkage compensating admixture into the concrete mix design for concrete bridge railing, curb, and sidewalk concrete. If used again, some parameters may change on a project basis. Otherwise, they are final for repetitive use.

- xx. DESCRIPTION. This work shall consist of furnishing and placing high performance portland cement concrete at the locations indicated in the Plans and as directed by the Engineer.

The work under this Section shall be performed in accordance with these provisions and Section 501 of the Standard Specifications.

- xx. CLASSIFICATION AND PROPORTIONING. Proportioning of High Performance Concrete, Low Shrinkage shall meet the following requirements:

HPC Class	Req.*** Cem. Mat. (lbs./cy)	Maximum Water- Cem. Mat. Ratio	Max.* Slump (in.)	Air Content (%)	Coarse Aggregate Gradation Table	28-Day** Comp. Strength (psi)	28-Day** Modulus of Rupture (psi)
Low Shrinkage	611	0.44	7	6.0 ± 1.5	704.02B	3500	600

*A maximum slump of 8 inches is allowed after the addition of admixtures.
 ** The listed 28-day compressive strength or modulus of rupture will serve as the basis of designing or approving the concrete mix.
 ***See additional (English unit) tables located in Subsection 501.03 for required cementitious materials (use HP Class B).

- xx. SHRINKAGE COMPENSATING ADMIXTURE. A shrinkage compensating admixture shall be added during the initial concrete mixing phase. The shrinkage compensating admixture shall be W.R. Grace and Company's "Eclipse Plus" or approved equal. The Final dosage rate will be determined by the product representative and the concrete producer. The dosage rate volume is computed into the final water/cementitious ratio.

- xx. METHOD OF MEASUREMENT. The quantity of Special Provision (High Performance Concrete, Low Shrinkage) to be measured for payment will be the number of cubic meters (cubic yards) of concrete placed in the complete and accepted work, as determined by the prismatic method using dimensions shown on the Plans or as directed by the Engineer, including the volume of precast concrete stay-in-place forms, but excluding the volume of steel or other stay-in-place forms and form filling materials. No deductions will be made for the volume of concrete displaced by steel reinforcement, structural steel, expansion joint material, scuppers, weep holes, conduits, tops of piles, scoring, chamfers or corners, inset panels of 38 mm (1½ inches) or less in depth, or any pipe less than 200 mm (8 inches) in diameter.

10/5/2011

xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (High Performance Concrete, Low Shrinkage) will be paid for at the Contract unit price per cubic meter (cubic yard). Payment will be full compensation for performing the work specified, including designing the mix, satisfactory finishing and curing, and for furnishing all forms, materials, including joint filler and bond breaker, labor, tools, admixtures, equipment, including automatic temperature recording units, trial batches, and incidentals necessary to complete the work. The cost of heating materials and protecting the concrete against cold weather, and any additional cost for cement, will not be paid for separately but will be considered incidental to Special Provision (High Performance Concrete, Low Shrinkage).

The cost of furnishing testing facilities and supplies at the batch plant and the setting of inserts, bench marks, and bridge plaques furnished by the Agency will not be paid for separately but will be considered incidental to Special Provision (High Performance Concrete, Low Shrinkage).

Costs for all materials, labor, and incidentals for steel or other stay-in-place forms and form filling materials will not be paid for separately, but will be considered incidental to Special Provision (High Performance Concrete, Low Shrinkage).

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
900.608 Special Provision (High Performance (Concrete, Low Shrinkage)	Cubic Meter (Cubic Yard)