BR201.66 HIGH PERFORMANCE CONCRETE FOR CAST-IN-PLACE BRIDGE DECK (3/22/07)

1. HIGH PERFORMANCE CONCRETE FOR CAST-IN-PLACE BRIDGE DECK

A. Description. This work is the materials, mix designs, proportioning and mixing, transportation, finishing, curing and protection of high performance concrete (HPC) (Class HPSD) for use in bridge decks meeting the requirements of Section 551 and 552 of the Standard Specifications except as modified herein.

B. General. Provide HPSD concrete from pre-approved acceptable Suppliers for use in the production of HPC cast-in-place concrete applications. Submit, as described in the "Quality Control/Quality Assurance of Cast-in-Place HPC" sections of this specification, the source, mix design, test data and approvals for the proposed materials to be supplied for the HPC concrete to be used for this project. Submit independent laboratory test data showing that they conform to all performance criteria of these specifications. All raw materials and sources for use in this project must be approved by the Montana Department of Transportation (MDOT).

Supply HPSD concrete that meets the performance criteria listed in Tables 1 and 2. Test results must be current within the past five years. Supply only concrete mixes that are pre-approved and conforms to the stated HPSD Performance Criteria of this specification. The Project Manager reserves the right to conduct additional tests as required to determine the acceptability of the durability and material properties of the mix. Quality control test requirements and pre-qualification procedures are provided in the specifications entitled "Quality Control/Quality Assurance of Cast-in-Place HPC Mixtures."

Table 1 - HPSD Mix Performance Criteria

Property	Required Values	Test Methods
Slump, maximum after HRWR addition	8 in.	AASHTO T119
Slump, minimum after 45 minutes after HRWRA addition	4 in.	AASHTO T119
Initial set time, minimum after batching	3 hours	AASHTO T197
Final set time, maximum after batching	11 hours	AASHTO T197
28-day compressive strength, minimum	4,000 psi	AASHTO T22
Maximum compressive strength	6,000 psi at 7 days 7,500psi at 28 days	AASHTO T22
Total air content, plastic concrete	6.5 ± 1.5% *	AASHTO T152
Total air content, hardened concrete	6.5 ±1.5%**	ASTM C457
Max air void spacing factor	0.010 in.	ASTM C457
Min air void specific surface	500 in. (-1)	ASTM C457
Electrical Conductivity	<2000 coulombs at 28 days	AASHTO T277

* Or as needed to meet the total air content in the hardened concrete as determined by trial batch testing and measured after pumping or conveying.

** Test hardened air void properties as part of trial batching and use to determine plastic concrete target air requirements. In-place concrete will not be rejected based on hardened air void properties but results used to modify target plastic values.

Table 2 - Testing of Durability and Material Properties of HPSD

Property	Required Value	Test Method
Freeze/thaw resistance	DF>95% at 300 cycles DF>90% at 500 cycles	AASHTO T161
Chloride penetration resistance (acid- soluble)	½ -1 in., <0.01% Cl by wt. of concrete at 90 days ½ -1 in, <0.02 Cl by wt. of concrete at 6 months	AASHTO T259/T260
Apparent Chloride Diffusion Coefficient (28-day cure)	$<3 \times 10^{-12}$ m^2/s at 56 days	ASTM C1556
Salt scaling resistance	Rating of 0-1 at 50 cycles	AASHTO C672
Shrinkage, in/in/deg F	$<700 \times 10^{-6}$ at 90 days	AASHTO T160
Cracking tendency (average of three samples)	> 20 days	ASTM C1581

C. Materials. Supply raw materials meeting the requirements of Section 551 and 701 of the Standard Specifications, except as modified herein. Submit independent test data showing that materials meet all requirements of this specification. The following is a list of the requirements for the raw materials:

1) Portland cement (Type I or I/II) [conforming to MDT Standard Specification Section 551]

a) ASTM C150 (AASHTO M85) chemical and physical requirements.

b) The following additional requirements.

(1) SO_3 less than 3.5%.

(2) Blaine fineness less than 400 m^2/kg. Cements having a Blaine fineness between 400 to 415 m^2/kg will be allowed if they conform heat of hydration requirements of ASTM C1157 MH (moderate heat).

(3) Does not contain blended fly ash unless from a pre-approved source.

(4) Equivalent alkalis' ($Na_2O + 0.658\ K_2O$) less than or equal to 0.60%.

(5) Needle penetration greater than 35 mm at 11 minutes, as measured by AASHTO T185.

(6) Water-soluble sulfate less than or equal to 0.5 g/L, as measured by ASTM C265.

c) Use cement that is free of lumps, unground clinker or other foreign material. Retrieve and file mill test certificates for all cement used in the production of concrete delivered for use on the project. Ensure that mill test certificates are traceable to a given cement shipment. Also, ensure that they include all of the results of the standard and optional physical and chemical tests identified in clause 4.0 of ASTM C150. Keep the maximum temperature of the cement entering the mixes to less than 150ºF (63ºC) unless otherwise approved. Higher cement temperatures may be used if independent testing verifies that the higher cement temperature does not adversely affect setting properties, per AASHTO T185 when tested at the higher temperature plus 10 deg F and water demand does not exceed the approved mix design and specifications.

2) Coarse aggregate. Finish aggregates meeting the requirements of Standard Specification Subsection 701.01 requirements, ASTM No. 67 (nominal max. size ¾ in.) crushed stone only. Do not use crushed concrete, crushed slag or crushed sandstone.

a) Use non-reactive aggregate per ASTM C33 Appendix and ASTM C295, C289, and C1260. If potentially deleterious per ASTM C289 or possibly deleterious by ASTM C1260, potentially reactive particles shall be less than 2% of particles by weight of aggregate (ASTM

C856) or control of reactivity using low-alkali cement and Class F fly ash or slag and silica fume must be demonstrated per ASTM C1567 or ASTM C1293 (<0.04% at 1 year).

3) Fine aggregate. Finish aggregates meeting the requirements of Standard Specification Subsection 701.01 requirements and being natural siliceous sand or stone sand.

a) Use fine aggregate having the amount passing the No. 200 sieve no more than 3% in accordance with AASHTO T27 and T11.

b) Use non-reactive aggregate per ASTM C33 Appendix and ASTM C295, C289, and C1260. If potentially deleterious per ASTM C289 or possibly deleterious by ASTM C1260, potentially reactive particles shall be less than 2% of particles by weight of aggregate or control of reactivity using low-alkali cement and Class F fly ash or slag and silica fume must be demonstrated per ASTM C1567 or ASTM C1293 (<0.04% at 1 year).

c) Use aggregate having water-soluble chloride less than or equal to 0.04% as measured by AASHTO T260, ASTM C1218, or the Soxhlet method.

d) Use fine aggregate with less than 45% retained between any two sieve sizes.

e) Use fine aggregate with minimum 10% passing #50 (300µm).

f) Do not blend, alternate use, or substitute fine aggregates from different sources.

4) Fly ash, Class F or C. Do not substitute Class C ash for Class F ash unless conformance to all HPC tests is demonstrated and control of ASR reactivity is demonstrated per ASTM C1567 or ASTM C1293 (<0.04% at 1 year).

a) Meet the requirements of AASHTO M295 and Standard Specification 551.02.10.

b) Keep SO_3 content 3.5% or less.

c) Keep available Na_2O equivalent less than or equal to 1.5%.

d) Keep loss on Ignition (LOI) less than or equal to 3.0%.

e) On autoclave soundness test (ASTM C151), keep 0.8% maximum expansion on the combination of the job fly ash with the job cement.

5) Slag (GGBFS). Grade 100 or 120 meeting AASHTO M302 requirements.

6) Silica Fume.

a) Meet AASHTO M307 requirements. Optional chemical and physical requirements of AASHTO M307 apply.

b) Meet the standard physical and chemical requirements of AASHTO M307, except that the Strength Activity Index requirement does not apply. Provide microsilica that meets the “Accelerated pozzolanic activity index: With portland cement at 7 days” as specified by ASTM C1240. A limit of available alkalis, as Na_2O, of 1.5% applies. Supply microsilica in a dry densified form. Do not use dissolvable bags. Do not mix different sources of microsilica or use alternately in the same item of construction unless approved by Project Manager.

7) Air-entraining agent. AASHTO M154 requirements (MDT approved) Standard Spec., Subsection 551.02.2.

8) High-range, water-reducing admixture (HRWRA). Meet the requirements of AASHTO M194 and Standard Specification Subsection 551.02.3, naphthalene sulfonate condensate type. Other types of HRWRA’s or mid-range (Type A) WRA’s meeting AASHTO M194 may be used if demonstrated to meet all the requirements of this specification and no adverse effects are noted. The addition of Type F HRWRA will be allowed in the field at the point of delivery for cast-in-place concrete. Limit the additions of Type G HRWRA to the batch plant.

9) Water. Use water meeting Standard Specification Subsection 551.02.5 Use mixing water with the maximum limit of turbidity of 2,000 parts per million, not containing neither more than 500 parts per million of chlorides as Cl, nor more than 1,000 parts per million of sulfates as SO_4.

D. Proposed Mix Designs. Table 3 lists mix design guidelines that have been tested and shown to meet the required properties for HPSD1. The Supplier, at its own option, may use another mix design if it meets all the requirements of this specification and has been approved. Approval does not allow deviation from the performance specifications listed herein.

1) Supply a concrete having a total water-soluble alkali content not exceeding 0.12% by weight of concrete.

2) Design the concrete mix with silica fume content between 5% and 8% measured as a percent of total cementitious material.

3) Mix Design Guidelines. Mix design guidelines are included below in Table 3.

Table 3 - HPSD Mix Design Guidelines

Concrete Component	Amount
Portland cement content, Type I or I/II	660-690 lb/yd^3*
Paste Volume Maximum	29 percent
Silica Fume	5% to 8% addition (by weight of cement)
Coarse aggregate	¾ in. maximum size (No. 67), crushed stone
Fine aggregate	Natural siliceous sand
Water/cementitious material ratio	0.36 to 0.42 (including water from HRWR)
Air entraining agent (1-2 oz/cwt typical)	Amount should be based on trial mixes
HRWR, AASHTO M194 Type F	Actual amount should be adjusted to provide the specific slump

*20% replacement (by volume) of cement with Class F fly ash or ground granulated blast furnace slag (ggbfs) is allowed. Class C fly ash is also allowed but mitigation of potential ASR must be demonstrated before being substituted. Higher dosages are accepted based on satisfactory performance in prequalification tests.

**Alternate HRWRA types must be tested and submitted for approval. Do not use corrosion inhibitors or accelerating admixtures (Types C or E) without approval.

E. Production / Placement of Concrete

1) Proportioning, Mixing and Placing

a) Perform concrete proportioning according to the QC/QA HPC Provisions. Submit the proposed mixing procedure for approval prior to production. Allow 15 days for review.

b) Perform a trial mixture of each HPC mix in the presence of the Project Manager at least 30 days prior to deck placement. Use the same equipment, personnel, and batching procedures for the trial that will be used for the project. Cast test slabs and samples and cure under site conditions. Test concrete per the QC/QA HPC Provisions and demonstrate proper consolidation and finishing procedures. Cast and finish a trial slab no smaller than 10 ft by 10 ft (3 m by 3 m). Batch at least one full truck load of HPC. Keep the slump within 15 mm (½ in.) and the air content within 1.0% of the mix design target values. Simulate haul times and mixing and placing procedures. Determine the compressive strength at 3, 7, 14 and 28 days on a minimum of three (3) cylinder breaks per age. Also determine the properties listed in Table 1 on duplicate concrete samples taken from the center third of the load.

c) The final dose of high range water reducing admixture (HRWRA) may be added at the project site. If added at the site, mix the concrete a minimum of five minutes at mixing

[1] Note: Cracking Tendency Testing was not performed

speed before discharge. Drum counters must be below maximum revolutions prior to the final 5 minutes of mixing, but maximum drum revolutions can be exceeded during final mixing. All or a portion of the HRWRA can be added at the batch plant.

d) Use hand vibrators, shovels, come-alongs and other tools used to place and consolidate the concrete having non-metallic surfaces when working near epoxy-coated reinforcement. Slip-on covers are not allowed. Do not locate bridge deck finishing machine rails within the pour. Do not walk in concrete that has been consolidated and struck off. Place concrete within the specified time limits and temperature limits in Standard Specifications Sections 551.03.4 and 552.03.5. Provide a Broom texture meeting the requirements of Standard Specification Subsection 552.03.12(E)(5) using a broom or plastic turf drag. Do not tine plastic concrete surfaces.

2) Superstructure Fogging. Use fogging equipment consisting of a mechanically operated pressurized system having triple headed nozzle or an equivalent nozzle designed for curing concrete that produces a fine fog mist that will increase the relative humidity of the air just above the fresh concrete surface without accumulating significant water on the concrete. Mount the fogging equipment on either the finishing equipment or a separate work bridge behind the finishing equipment. Hand-held fogging equipment can be used only to supplement stationary equipment. Operate fogging equipment unless the evaporation rate is less than 0.1 $lb/ft^2/hr$ (0.5 $kg/m^2/hr$), according to the Figure in the Portland Cement Association's publication titled "Design and Control of Concrete Mixtures". Provide temperature, relative humidity and wind speed measuring equipment at the site whenever concrete is being placed. Measure and record the evaporation rate each hour until all concrete is covered with wet curing per the requirements of Section C. Adjust the fogging equipment to ensure adequate cover of the fog mist without ponding water on the fresh concrete surface. If fogging is started, continue fogging until moist covering is applied.

3) Special Curing and Protection Requirements. Cure concrete by water curing per Standard Specification Subsection 551.03.6(A). Cover the surface of the concrete immediately after finishing with dry cotton mats or another approved fabric. Use cotton mats having cotton fill material [minimum 1.3 $oz./ft^2$ (400 $grams/m^2$)] covered with unsized cloth or burlap [minimum 0.65 $oz./f^2t$ (200 $grams/m^2$)], and tufted or stitched to maintain stability or as approved by the Project Manager. Use mats free from tears and in good condition. Soak the mats immediately with a gentle spray of water until saturated.

Place soaker hoses when the concrete has hardened sufficiently to prevent marring of the surfaces. Other continuous wetting systems that are not intermittent may be used if approved by the Project Manager. After placement of the soaker hoses, cover the cotton mats and hoses with white polyethylene sheeting or white plastic coated burlap. Wet cure for fourteen (14) days. Within 24 hours of removing formwork or wet cure blankets, , apply a Type 2 white-pigmented membrane curing compound to all exposed top and bottom side deck surfaces.

4) Grooving and Corrective Work. Groove deck transverse unless otherwise noted on the plans. Use a diamond saw type grooving machine. Space grooves at ¾ in. (20 mm) centers and be ⅛ in. (3 mm) wide by ⅛ to $^3/_{16}$ in. deep (3-5 mm).

Complete corrective work in accordance with the requirements of Standard Specification Subsection 552.03.12(E)(7).

BR201.66QA QUALITY CONTROL/QUALITY ASSURANCE OF CAST-IN-PLACE HPC (3/22/07)

1. QUALITY CONTROL/QUALITY ASSURANCE OF CAST-IN-PLACE HPC

A. Description. This Special Provision specifies the quality control responsibilities of the Contractor for high performance portland cement concrete (HPC) mixtures, and defines the quality assurance and acceptance responsibilities of the Project Manager.

The Contractor, by application for and receipt of prequalification, by submission of a bid and, if awarded the contract, by execution of the contract containing this Special Provision, certifies that it fully and thoroughly understands all aspects and requirements of this Special Provision; that it possesses the latest edition of and thoroughly understands all aspects and requirements of the procedures, manual and documents referred to and incorporated by reference in this Special Provision; and that it waives and releases any and all claims of misunderstanding or lack of knowledge of the same. Furthermore, the Contractor understands and agrees that compliance with the requirements of this Special Provision and the Quality Control Plan approved by the Project Manager is an essential element of the contract. Failure to comply with these requirements can result in one or more of the following: a major breach of this contract and default thereof, a loss of prequalification, and a suspension of the Contractor from bidding.

B. Equipment/Laboratory. Provide or identify necessary laboratory and test equipment to perform quality control testing. The laboratory will be approved by the Project Manager at the beginning of each project. Do not begin production of a mixture until written approval of the laboratory is received. Record daily documentation of all observations, records of inspection, adjustments to the mix, and test results, as described herein. Allow unrestricted access to the plant and laboratory at any time for the Project Manager to inspect measuring and testing equipment. Repair defective equipment immediately.

C. Quality Control Plan

Submit a written Quality Control (QC) Plan for approval a minimum of forty-five (45) calendar days prior to commencement of placing deck concrete. Describe the proportioning and mixing procedures, transportation and placing procedures, curing procedures, laboratory facilities, concrete testing personnel qualifications, and all QC testing of the high performance concrete. Identify the QC Manager and PCC technician to be used on the project and provide their credentials. Do not begin production of a mixture until the Project Manager provides written approval of the QC plan.

D. Mix Design and Test Submittal Requirements

Provide the concrete mix designs and other testing submittals to the Project Manager a minimum of forty-five (45) calendar days prior to production.

1) The mix design submittal must include and show conformance with all the criteria specified in the contract. More than one mix design may be submitted for each class or use. The test data submittal must include a registered Engineer stamp from an independent testing agency and a statement attesting that all information in the report is accurate and true.

2) HPC Materials. Include the following items for each HPC mix to be used:

a) Source and mill certificates for portland cements.

b) Source for fly ashes, silica fume and GGBFS.

c) Certificates and test data to demonstrate that the fly ash meets AASHTO M295, the silica fume meets AASHTO M307, and the GGBFS meets AASHTO M302.

d) Alkali-silica reactivity (ASR) test results for HPC (independent test data).

e) Certificates of compliance for all chemical admixtures.

f) Concrete mix design(s)

g) Batch sequence and admixture additions for concrete.

h) Samples of raw materials in quantities as described in Table 1, shipped to the State Highway laboratory.

i) Test reports for the tests in Table 2 (concrete) and Table 3 (materials).

Table 1 - Quantities of Materials for Submittal

Material	Quantity
Cement	10 lbs.
Fly Ash	10 lbs.
GGBFS	10 lbs.
Silica Fume	10 lbs.
Coarse Aggregate	50 lbs.
Fine Aggregate	50 lbs.

Table 2 - HPC Mix Performance Criteria

Property	Notes	Test Methods
Slump	after HRWR addition	AASHTO T119
Slump at 45 minutes	45 minutes after HRWR addition	AASHTO T119
Initial and final set time	-	AASHTO T197
Compressive strength	3, 7 and 28 day	AASHTO T22
Total air content, plastic concrete after HRWA addition	-	AASHTO T152
Total air content, hardened concrete	-	AASHTO C457
Max air void spacing factor	-	AASHTO C457
Min air void specific surface	-	AASHTO C457
Freeze/thaw resistance	300 and 500 cycles	AASHTO T161
Electrical Conductivity (RCP)	28 day and 56 day	AASHTO T277
Chloride penetration resistance (acid- soluble)	90 days and 6 months	AASHTO T259/T260
Apparent Chloride Diffusion Coefficient (28-day cure)	56-day exposure	ASTM C1556
Salt scaling resistance	50 cycles	AASHTO C672
Shrinkage	90 days	AASHTO T160
Cracking Tendency	-	ASTM 1581

Table 3 - Material Plant Sampling and Testing for Submittal and Project Quality Control

Item	Test	Minimum Frequency	AASHTO or ASTM Test Method
Aggregates	Gradation	Once per week	T248
Aggregates	Moisture: Fine Aggregate	Daily	AASHTO T255 or similar
	Moisture: Coarse Aggregate	As needed to control production, minimum once per week.	AASHTO T255 or similar
Aggregates (Stored at Plant in Stockpiles or Bins)	Absorption	Once per week	ASTM C127 and C128
Plastic Concrete Tests	Slump, Unit Weight	First 3 trucks each day and every 50 yd^3 thereafter.	AASHTO T119, T121 and T309
	Air Content	Each truck	AASHTO T152
Strength	Compressive (tested at 7 and 28 days)	Initial truck and every 250 yd^3, min daily	AASHTO T141, T22 and T23
Coarse Aggregate	Water-Soluble Chloride	At startup	AASHTO T260, ASTM C1218 or Soxhlet Method
Fine Aggregate	Water-Soluble Chloride	At startup	AASHTO T260, ASTM C1218 or Soxhlet Method
Cement	Early Stiffening	Each source	AASHTO T185
	Water-Soluble Sulfate	Each source	ASTM C265
	Equivalent Alkalis'	Each source	AASHTO T105
Fly Ash	Available Na_2O Equivalent	Each source	ASTM C311
	Loss on Ignition (LOI)	Each source	ASTM C311
	SO3 Content	Each source	ASTM C311
Fly Ash/Cement Combination	Soundness	Each source	ASTM C151 and C311, AASHTO T107
Hardened Concrete	Hardened Air Voids	Startup and every 500 yd^3	ASTM C457
	Concrete Total Alkali, water soluble	Startup	ASTM C114
	Electrical Conductivity	Startup and every 500 yd^3	AASHTO T277

j) Provide the following: the source of all materials; the gradation of fine and coarse aggregates; the absolute volumes, specific gravities, unit weights, water/cement ratio, mortar factor and any other values used in the mix design process; the type and proposed dosage of admixtures; and the target slump, air content and strength. Do not construe that verification of a

concrete mix design as acceptance of any mixture produced. Tests performed on concrete sampled at the jobsite will determine if a concrete mix meets specifications.

E. Quality Control By Contractor.

1) General. Perform quality control inspection, sampling, testing, and documentation to meet contract requirements. Quality control includes the recognition of obvious defects and their immediate correction. Quality control also includes appropriate action when passing test results are near specification limits. Quality control may require increased testing frequency, communication of test results to the plant or the jobsite, modification of operations, suspension of mixture production, rejection of material, or other actions as appropriate. Immediately notify the Project Manager of any failing test and subsequent remedial action. Report passing test results no later than the start of the next work day. When a mixture does not comply with specifications, reject the material and report immediately to the Project Manager.

2) Assign a Quality Control (QC) Manager who will have overall responsibility and authority for quality control. Provide sufficient personnel to perform the required QC inspections, sampling, testing and documentation in a timely manner.

3) Provide a PCC Technician that has an ACI-Level 1 field technician certificate (or equal) to perform all field testing of HPC.

4) Cast all concrete test samples from concrete that has been transported and placed on the deck, immediately before consolidation and finishing.

F. Quality Assurance By Project Manager.

1) General. Quality assurance tests on independent samples and split samples may be performed at the option of the Project Manager. A split sample is one of two equal portions of a field sample, where two parties each receive one portion for testing.

2) Comparing Test Results. Differences between the Project Manager and the Contractor's split sample test results will not be considered extreme if within the following limits:

Test Parameter	Acceptable Limits of Precision
Slump	20 mm (0.75 in.)
Air Content	0.9%
Compressive Strength	9.5 %

If either the Project Manager's or the Contractor's split sample test result for slump or air is not within specification limits, and the other party is within specification limits; do not place the concrete and perform an immediate retest on a new sample. A passing retest result by each party will require no further action. If either slump or air content retest result is a failure and the other party is within specification limits; the following actions shall be initiated.

a) The Project Manager and the Contractor shall investigate the sampling method, test procedure, equipment condition, equipment calibration and other factors. Replace test equipment as necessary.

b) Perform additional testing on split samples.

c) For jobsite slump and jobsite air content; if the failing test result is not resolved and the mixture has not been placed, the Contractor shall reject the material; unless the Project Manager accepts the material for incorporation in the work.

G. Acceptance By The Project Manager

1) General. Final acceptance will be based on compliance with the Specifications and the following:

a) The Contractor's compliance with all contract documents for quality control.

b) Validation of Contractor quality control test results by comparison with the Project Manager's quality assurance test results using split samples.

c) Visual inspection of the completed work. Visible full depth cracks, any crack greater than 0.4 mm (0.015 in.) wide and more than 300 mm (12 in.) long, honeycombing deeper than ¾ in., chipped or damaged edges and dimensions out of tolerance may be cause for rejection. Repair of defects may be allowed if approved by the Project Manager but without additional cost.

H. Documentation

1) Records. Document all observations, inspections, adjustments to the mix design, test results, retest results, and corrective actions in a bound hardback field book which shall become the property of the Project Manager. Include all test results and related information.

2) Delivery Truck Ticket. For each concrete mixture delivered to the jobsite, collect a delivery ticket. Record on each delivery ticket: ticket number, name of producer, contract number, name of Contractor, date, time batched, truck number, quantity batched, mix design number, and discharged, and total drum revolutions. Record any site additions to the truck and additional mix time. Record on each delivery ticket or in a bound hard back field notebook: initial/final revolution counter reading; mixing time after adding HRWRA at site; time discharged; total amount of each admixture in batch; total amount of water added at the jobsite; and actual water/cementitious materials ratio.

I. Method of Measurement. QC/QA will be measured for payment in (cubic yards) for all High Performance Concrete For Cast-in-place Bridge Decks(Class HPSD) indicated on the plans.

J. Basis of payment. QC/QA of Class HPSDC concrete will be paid for at the contract unit price per cubic yard for High Performance Concrete For Cast-in-place Bridge Decks(Class HPSD).