

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

| SPECIAL PROVISION NO. 907-713-4

CODE: (SP)

| DATE: 04/29/2015

SUBJECT: Admixtures for Concrete

Section 713, Concrete Curing Materials and Admixtures, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

After the second paragraph of Subsection 713.01.2 on page 676, add the following.

Type 1-D compound may be used on bridge rails, median barriers, and other structures requiring a spray finish. When Type 1-D compound is used, it will be the responsibility of the Contractor to assure that the compound has dissipated from the structure prior to applying the spray finish and that the spray finish adheres soundly to the structure.

Delete Subsection 713.02 on pages 676 & 677, and substitute the following.

907-713.02--Admixtures for Concrete. Air-entraining admixtures used in Portland cement concrete shall comply with AASHTO Designation: M 154. Set-retarding, accelerating, and/or water-reducing admixtures shall comply with AASHTO Designation: M 194. Water-reducing admixture shall meet the minimum requirements for Type A. Set-retarding admixtures shall meet the minimum requirements for Type D. Admixtures providing a specific performance characteristic(s) other than those of water reduction or set retardation shall meet the minimum requirements for Type S. For admixtures meeting the requirements for Type S, the manufacturer shall provide data to substantiate the specific performance characteristic(s) to the satisfaction of the State Materials Engineer.

In order to obtain approval of an admixture, the State Materials Engineer shall have been furnished certified test reports, made by an acceptable independent laboratory regularly inspected by the Cement and Concrete Reference Laboratory of the National Institutes of Standards and Technology, which show that the admixture meets all the requirements of the applicable AASHTO Standard Specification.

The Department reserves the right to sample, for check tests, any shipment or lot of admixture delivered to a project.

The Department reserves the right to require tests of the material to be furnished, using the specific cement and aggregates proposed for use on the project, as suggested in AASHTO Designation: M 154 and outlined in AASHTO Designation: M 194.

After an admixture has been approved, the Contractor shall submit to the State Materials Engineer, with each new lot of material shipped, a certification from the manufacturer in accordance with the requirements of Subsection 700.05.1 and stating the material is of the same

composition as originally approved and has not been changed or altered in any way. The requirement in Subsection 700.05.1(b) is not required on the certification from the manufacturer.

Admixtures containing chlorides will not be permitted.

Failure to maintain compliance with any requirement of these specifications shall be cause for rejection of any previously approved source or brand of admixture.

Admixtures shall only be used in accordance with the manufacturer's recommended dosage range as set forth in the manufacturer's approval request correspondence. When an admixture is used in Portland cement concrete, it shall be the responsibility of the Contractor to produce satisfactory results.

907-713.02.1--Source Approval. In order to obtain approval of an admixture, the Producer/Suppliers shall submit to the State Materials Engineer the following for review: certified test reports, made by an acceptable independent laboratory regularly inspected by the Cement and Concrete Reference Laboratory of the National Institutes of Standards and Technology, which show that the admixture meets all the requirements of the applicable AASHTO or Department Specification for the specific type and the dosage range for the specific type of admixture.

907-713.02.2--Specific Requirements. Admixtures containing chlorides will not be permitted.

907-713.02.3--Acceptance. The Department reserves the right to sample, for check tests, any shipment or lot of admixture delivered to a project.

The Department reserves the right to require tests of the material to be furnished, using the specific cement and aggregates proposed for use on the project, as suggested in AASHTO Designation: M 154 and outlined in AASHTO Designation: M 194.

Failure to maintain compliance with any requirement of these specifications shall be cause for rejection of any previously approved source or brand of admixture.

With each new lot of material shipped the Contractor shall submit to the State Materials Engineer, a notarized certification from the manufacturer showing that the material complies with the requirements of the applicable AASHTO or Department Specification.

When an admixture is used, it shall be the responsibility of the Contractor to produce satisfactory results.

907-713.03--Waterproofing Admixture. This product is used as a waterproofing admixture for cast in place concrete bridge decks and bridge deck topping.

The Contractor shall submit manufacturer's product data and installation methods for each type of the products required to demonstrate the product complies with specifications.

The materials shall be installed in accordance with manufacturer's instructions.

The waterproofing admixture shall be one of the following, or an approved equal.

- Xypex Admix
- Everdure Caltite
- Hycrete W1000

The dosage rate for the above admixtures shall be as follows:

- Xypex Admix shall be 15 pounds per cubic yard.
- Everdure Caltite shall be a minimum of 1.5% by weight of cement or more as required to meet Testing Requirements outlined below.
- Hycrete W1000 shall be a minimum one (1) gallon per cubic yard or more as required to meet Testing Requirements outlined below.

Any retardation of set that occurs will depend upon the concrete mix design and the dosage rate of the admixture.

907-713.03.1--Testing Requirements. The waterproofing system shall be tested in accordance with the following standards and conditions, and the testing results shall meet or exceed the performance requirements as specified herein. Independent tests verifying these results shall be submitted prior to approval.

Independent Laboratory. Testing shall be performed by an independent testing laboratory meeting the requirements of the recognized specifying body of the country in which the testing is performed. The testing laboratory shall obtain all concrete samples and waterproofing product samples.

Waterproofing Verification. The capability of the waterproofing system shall be evidenced by independent SEM (Scanning Electron Microscope) photographs showing waterproofing formations within the concrete matrix at a magnification no greater than 2,000 times.

Permeability. Independent testing shall be performed according to U.S. Army Corps of Engineers CRD-C48 - Mod "Permeability of Concrete". Under CRD-C48 treated concrete samples that are no greater than two inches (2") thick shall be pressure tested to 150 psi (350-foot head of water). The treated samples shall exhibit no measurable leakage against control samples which shall exhibit full saturation and measurable leakage. In all cases, treated and untreated samples shall have the same mix design.

DIN 1048/EN 12390 "Water Impermeability of Concrete" Requirement. Treated and untreated samples that are 120-mm thick shall be subjected to hydrostatic pressure for three (3) days (Minimum of three (3) samples of each). Control samples shall have a minimum of 100 millimeters of penetration (average of samples). Treated samples shall show a minimum of 90% reduction in depth of water penetration when compared to the control sample (average of samples). In all case cases treated and untreated samples shall have the same mix design.

Compressive Strength. Independent testing shall be performed according to ASTM C39 "Compressive Strength of Cylindrical Concrete Specimens". Concrete samples containing the waterproofing additive shall be tested against an untreated control sample. At 28 days, the treated samples shall exhibit no decrease in compressive strength over the control sample.

Crack Bridging Capability. The product requirement shall be a minimum of 0.4 millimeters. Crack heal effect shall be supported by reports from a recognized independent agency documenting crack healing effects of modified versus a control concrete in the same application.