



Iowa Department of Transportation

DEVELOPMENTAL SPECIFICATIONS FOR HIGH PERFORMANCE CONCRETE FOR OVERLAYS OF BRIDGE FLOORS

Effective Date
November 15, 2005

THE STANDARD SPECIFICATIONS, SERIES 2001, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

Sections 2413 and Division 41 of the Standard Specifications shall apply with the following modifications:

01069.02 MATERIALS.

A high performance concrete (HPC) with the following proportions shall be used in place of a Class O concrete or latex modified concrete:

- A. Basic w/c ratio of 0.40, with a maximum w/c ratio of 0.42
- B. A mid-range water reducing admixture meeting the requirements of Materials I.M. 403, Appendix C, shall be used. Other admixtures may be approved by the Engineer.
- C. Air content shall be in accordance with Article 2413.02, A, of the Standard Specifications, except the target shall be 6.5%, with a maximum variation of plus 2.0% and minus 1.0%

The slump, measured in accordance with Materials I.M. 317 shall be between 1 inch (25 mm) and 3 inches (75 mm) with a maximum of 4 inch (100 mm). Testing for slump from a continuous mixer shall commence within 2 to 4 minutes after the concrete is discharged.

The HPC mix shall have the following characteristics and absolute volumes per unit volume:

- A. Cement 0.134
- B. Fly ash (Class C) 15% replacement by weight maximum (mass)
- C. GGBFS 25% replacement by weight (mass)
- D. Water 0.168 (w/c ratio of 0.40)
- E. Coarse aggregate 0.317
- F. Fine aggregate 0.316
- G. Air 0.065

When blended cement (Type IP, IS, or I(SM)) is used, the GGBFS listed in C above shall will be eliminated from the mix. Other mix combinations may be approved by the Engineer.

Grout for bonding shall meet the requirements of Article 2413.02, A, of the Standard Specifications.

01069.03 EQUIPMENT.

Equipment shall meet the requirements of Article 2413.03 of the Standard Specifications, with the following exceptions:

When volumetric proportioning equipment is used, the cement, fly ash, and GGBFS shall be pre-blended by the producer or by using equipment capable of thoroughly mixing the materials to the tolerances in ASTM C 685.

The finishing machine shall meet the additional requirements of either Article 2413.03, C, 1 or 2413.03, C, 2 of the Standard Specifications, except that the screed may be cable winched with approval by the Engineer.

01069.06 PROPORTIONING AND MIXING.

Proportioning and mixing shall meet the requirements of Article 2413.06 of the Standard Specifications, except that ready mixed concrete equipment meeting the requirements of Article 2001.20 and 2001.21 of the Standard Specifications, will be allowed.

01069.07 PLACING AND FINISHING.

Placing and finishing of the concrete shall be done according to Article 2413.07 of the Standard Specifications **and the equipment modifications in Article 01069.03 above**, except that the requirement for consolidation to 100% of the rodded density is not required.

Placing concrete overlay will not be allowed if the theoretical rate of evaporation for the pour exceeds 0.2 lbs. per square foot per hour (1 kg/m² per hour). The theoretical rate of evaporation shall be calculated using the procedure in Article 2412.05 of the Standard Specifications.