



# Iowa Department of Transportation

## DEVELOPMENTAL SPECIFICATIONS FOR IMPROVED DURABILITY CONCRETE FOR BRIDGE DECKS

Effective Date  
January 17, 2007

**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.**

### **01088.01 DESCRIPTION.**

This work shall consist of providing improved durability concrete for bridge decks. Specific requirements are required when curing to prevent shrinkage cracks and to improve permeability. The work includes establishing longitudinal grooving into the hardened concrete of the bridge floor.

Sections 2403 and 2412 of the Standard Specifications shall apply with the following modifications.

### **01088.02 MATERIALS.**

Coarse aggregate shall be crushed limestone, quartzite, or granite meeting Class 3i durability.

Water to cementitious ratio shall be 0.45 maximum.

### **01088.03 CONSTRUCTION.**

#### **A. Placing Concrete.**

Article 2412.05 of the Standard Specifications shall apply with the following exceptions:

**Replace** the first sentence of the third paragraph.

Placing concrete floors will not be allowed to begin if the theoretical rate of evaporation for that day exceeds 0.2 lbs. per square foot per hour (1 kg/m<sup>2</sup> per hour) 0.1 lbs. per square foot per hour (0.5 kg/m<sup>2</sup> per hour).

**Add** as new fourth, fifth, and sixth paragraphs.

The theoretical evaporation rate shall be monitored at a maximum interval every 3 hours during the placement at a location as near the deck as possible. If the rate exceeds 0.15 lbs. per square foot per hour (0.75 kg/m<sup>2</sup> per hour) the placement shall be ceased at the next location acceptable to the Engineer.

If concrete is to be placed by pumping, measures for reducing exit velocity of the pumped concrete and minimize damage to epoxy coated reinforcement shall be submitted to the Engineer for approval prior to pumping.

Epoxy coated reinforcement shall be protected from damage caused by placing and handling equipment.

**B. Curing.**

Article 2403.10 of the Standard Specifications shall apply with the following exceptions:

**Add** as the eighth paragraph.

Forms shall remain in place for 168 hours of curing.

Article 2412.07 of the Standard Specifications shall apply with the following exceptions:

**Replace** the entire article.

Concrete floors shall be cured as follows:

~~The first layer of prewetted burlap shall be placed on the floor within 10 minutes after final finishing or texturing. Burlap shall be prewetted with sufficient water, prior to placement, to prevent absorption of moisture from the concrete surface. It shall be kept wet. As soon as practical but not later than 2 hours after the first layer is placed, a second layer of burlap shall be placed on the floor. No curing compound shall be placed on the floor. Two layers of pre-wetted burlap shall be placed on the floor immediately after finishing with a maximum time limit of 10 minutes after the finishing machine passes. A manufactured evaporation retardant shall be readily available during placement for application as directed by the Engineer. Water shall be applied to the burlap covering for a period of 4 calendar days 168 hours by means of a pressure sprinkling system that is effective in keeping the burlap wet during the moist curing period. The system may be interrupted only to replenish the water supply, during periods of natural moisture, or during construction contiguous to the concrete being cured. Interruptions for periods longer than 4 hours may be approved by the Engineer on the basis of the method for keeping the concrete moist.~~

Continuous contact, except as noted above, shall be maintained between all parts of the concrete floor and the burlap during the ~~4 calendar day moist~~ curing period.

~~On concrete floors placed after October 1 and prior to April 1, after 20 hours of the application of water, the Contractor may substitute the application of a moisture proof plastic film not less than 3.4 mils (86 µm) thick over the wet burlap in lieu of applying water. Intimate contact must be maintained between the surface of the concrete, the burlap, and the plastic film.~~

**C. Cold Weather Protection.**

Concrete and its surface temperature shall be maintained at a temperature of not less than 50°F (10°C) for 168 hours of continuous wet sprinkling system curing. Curing time will not be counted if the concrete temperature falls below 50°F (10°C).

Surface temperature of concrete shall be monitored continuously during the curing period with recording type thermometers approved by the Engineer. The Contractor shall be responsible for monitoring the temperature and furnishing the information to the Engineer.

**01088.04 METHOD OF MEASUREMENT.**

The quantity of Improved Durability Concrete, in cubic yards (cubic meters), will be the quantity shown in the contract documents.

**01088.05 BASIS OF PAYMENT.**

The Contractor will be paid the contract unit price for Improved Durability Concrete per cubic yard (cubic meter).

The cost for manufactured evaporation retardant shall be included in the contract unit price for Improved Durability Concrete.