

## **ITEM 01555.01 M - CONCRETE FOR STRUCTURES CLASS DP**

### **DESCRIPTION**

This work shall consist of furnishing and placing concrete at the locations indicated on the contract plans or as ordered by the Engineer. Other work to be performed under the terms of this section, when required by the nature of the project, are the following:

- A. Blastclean the structural concrete and exposed reinforcing steel.
- B. Support and tie reinforcing steel.
- C. Wet the existing concrete prior to placing Class DP concrete.

### **MATERIALS**

All the material requirements of §555-2 shall apply except Class DP concrete shall be used. In addition, the microsilica admixture shall be supplied in either a densified powder or slurry form.

The microsilica admixture shall be one appearing on the Department's Approved List. Only one brand shall be allowed for any structural element. The Manufacturer shall provide written certification that the supplied material meets the requirements of the procedural directives of the Materials Bureau. For each shipment supplied this certification shall list fineness, silica content, total chloride ion content, solids content for slurries, and moisture content for densified powers. Additionally, the Regional Materials Engineer shall take a minimum sample of one quart directly from the storage container, for each days placement of microsilica concrete, for testing by the Department.

If the microsilica admixture is supplied in the slurry form, the slurry shall be stored above the temperature of 0\_C. Slurries exposed to temperatures of 0\_C or less shall be removed and replaced at no cost to the Department. The slurry shall be homogeneous and agitated as necessary to prevent separation.

Class DP concrete shall consist of a homogeneous mixture of cement, fly ash, microsilica admixture, fine aggregate, coarse aggregate, air entraining agent, set retarding water reducing admixture and water which meets the requirements of the MIX CRITERIA table given on Page 2.

### **MIX CRITERIA**

Cement content (kg/m <sup>3</sup> )	318
Fly ash content (kg/m <sup>3</sup> )	86
Microsilica content (kg/m <sup>3</sup> )	26
Sand percent total aggregate (solid volume)	45.8
Designed water/total cementitious content	0.40
Desired air content (%)	7.5
Allowable air content (%)	6.0 - 9.0
Desired slump (mm)	75
Allowable slump (mm)	60-100
Type of coarse aggregate gradation	CA 1

**NOTE:** The criteria are given for design information and the data is based on a fine aggregate fineness modulus of 2.80. The mixture proportions shall be determined using actual conditions for fineness modulus and bulk specific gravities (saturated surface dry

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for aggregate). The proportions shall be computed according to Department written instructions.

The requirements of §501 shall apply, except as modified herein.

1. If a densified powder is used, the densified powder shall be weighed cumulatively with the cement and fly ash. The densified powder shall be last in the weighing sequence and the tolerance for each material draw weight shall be based upon the total weight of cement plus fly ash plus densified powder. The batching tolerance for the cement plus fly ash plus densified powder shall be  $\pm 1/2\%$  by mass.
2. If a microsilica slurry is used, the slurry shall be added using proportioning equipment approved by the Regional Materials Engineer. The microsilica slurry admixture shall be added through an existing automating system or a two stop off-line automated batching system. The automated batching system shall meet the following requirements:

Delivery accuracy of  $\pm 1\%$  (by volume)  
Program quantity (liters, nearest tenth)  
Batching tolerance  $\pm 2.0\%$  (by volume)  
System interlocks

Print requirements:

- a. Date and time
- b. Truck number (or alternate method relating microsilica to batch ticket)
- c. Delivered quantity (liters, nearest tenth)

The control box/printer for a two stop off-line batching system shall be located at the batch plant operator's work station unless otherwise approved by the Regional Materials Engineer.

Calibrating shall be in accordance with the procedures approved by the Regional Materials Engineer. Whenever any part or all of the off-line system is moved the entire system shall be recalibrated.

### **CONSTRUCTION DETAILS**

The provisions of 555-3 shall apply with the following modifications:

**A. Equipment.** All equipment proposed for uses shall have the Engineers' approval prior to the start of work. Additional equipment requirements are as follows:

1. Blastcleaning Equipment. This shall be capable of removing rust from reinforcing bars and cleaning existing concrete which will be bonded to new concrete.

**B. Blast Cleaning.** The provisions of §584-3.04 and §584-3.05 shall apply.

**C. Structural Concrete Wetting.** The existing concrete surfaces shall be prewet for 24 hours prior to the commencement of work. The existing concrete shall be in a saturated surface dry condition with no standing water on the surface at the time of placement.

### **METHOD OF MEASUREMENT**

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Payment will be made for the number of cubic meters within the lines of the structure as shown on the plans or as revised by authority of the engineer.

**BASIS OF PAYMENT**

The unit price shall include the cost of all labor, materials and equipment necessary to complete the work.

Payment will be made under:

<u>Item No.</u>	<u>Item</u>	<u>Pay Unit</u>
01555.01 M	Concrete for Structures - Class DP	Cubic Meter