

ITEM 04502.05 M - ACCELERATED STRENGTH PORTLAND CEMENT CONCRETE PAVEMENT, UNREINFORCED, CLASS F UNPROFILOGRAPHED

DESCRIPTION

This work shall consist of constructing an accelerated strength portland cement concrete pavement in accordance with these specifications and in reasonably close conformity with the lines, grades, thicknesses and typical cross sections shown on the plans or established by the Engineer.

MATERIALS

The requirements of Section 502-2 shall apply except those requirements which are here-in-after designated.

Under section 502-2 add the following:

Non-Chloride Accelerator Admixture.....Approved List

Use only neutralized vinsol resin-based air retraining agents.

Water reducers, if used, shall be Type A (Normal)

Cement may be Type I/II or Type III

Concrete Production

Apply the requirements of §501, Portland Cement Concrete - General, except as modified herein. Use Class F concrete as specified in Table 501-3, Concrete Mixtures. At the contractor's option, use any combination of the above materials to achieve the specified strength, air content and slump. Use only one type of accelerator at any one time. Hot water may be used to raise the concrete drop temperature to a maximum of 35°C.

Mix Design and Trial batch. Develop a mix design and prepare a trial batch using those materials to be used on the project. Demonstrate the mix's ability to achieve the specified properties to the Regional Materials Engineer's satisfaction. Changes other than minor fluctuations in admixture dosage rates will require a new mix design trial batch. The Engineer may halt paving and order additional trial batches whenever the specified properties are not achieved.

The mix must meet the following requirements:

Property	Minimum	Desired	Maximum
18 Hour compressive Strength (trial Batch)	15 MPa	-	-
18 Hour Compressive Strength (Project)	14 MPa	-	-
28 Day Compressive Strength (trial Batch)	30 MPa	-	-
Air Content	5%	6.5%	8.0%
Slump	40 mm	-	100 mm

Alternate mix designs will be considered provided they meet the above requirements as determined by the Regional Materials Engineer.

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If subsequent trial batches are required, the engineer may waive the 28 day compressive strength testing.

CONSTRUCTION REQUIREMENTS

The requirements of Section 502-3 shall apply except those requirements which are here-in-after designated

Under Subsection 502-3.09D, Texturing, delete the entire paragraph and add a new paragraph D. Texturing:

D. Texturing. Immediately after finishing and prior to applying the curing compound, texture the concrete surface with a set of irregularly spaced spring steel tines perpendicular to the pavement centerline. Use rectangular tines 3 mm wide, 0.7 mm thick, and approximately 125 mm long. Use tines with the following center-to-center spacing in millimeters:

16/25/22/16/32/19/25/25/25/25/19/22/25/22/10/25/25/25/32/38/22/25/22/25.

Produce tine texture 3 - 4 mm deep with minimal dislodging of aggregate as determined by the Engineer. Multiple tine passes in the same area are not permitted unless the surface is re-finished between passes.

Operate the tine head manually or mechanically. In either case, hold the tines as near an angle of 45° with the concrete surface as possible to minimize mortar dragging. Keep the tines free of hardened concrete. If the tine texture is manually placed, or if the mechanical equipment does not operate off the same referencing system as the paver, provide a 75 mm - 100 mm blank at each transverse joint saw cut location.

Under Subsection 502-3.15, Defective or Damaged Concrete, delete the entire paragraph and add a new paragraph:

502-3.15 Defective or Damaged Concrete. Repair or replace all damaged or defective concrete which occurs prior to final acceptance. Perform these repairs as described in the contract documents or as directed by the Engineer at no cost to the Department. Damage and defects include, but are not limited to, cracking, spalling, honeycombing, or imperfections caused by inadequate pavement protection, traffic, and/or construction practices.

Under Subsection 502-3.16, Thickness Tolerance, delete the entire paragraph and add a new paragraph:

502-3.16 Plastic Thickness Determination. The cement concrete pavement shall be constructed to the nominal thickness shown on the plans. In a slip form paving operation, anchor flat 16 gauge (1.52 mm thick), 150 mm x 150 mm rigid steel or plastic plates to the permeable base (or subbase) surface 600 mm from both placement edges at 100 m intervals. Clearly mark the plate locations on the subbase, permeable base, or previously placed concrete immediately adjacent to the placement. Provide the Engineer with a round, rigid, non-aluminum probe, having a 3 - 6 mm diameter. The Engineer will determine the plastic thickness of the concrete by inserting the probe to the plate and measuring the insertion depth. The plate thickness will be added to the insertion depth to determine concrete thickness. Keep several probes at the project.

In a slip form paving operation, the measured plastic thickness must equal or exceed the thickness required

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in the contract documents. Slip formed concrete having substandard plastic thicknesses will be rejected in 100 m segments. If two consecutive measurements indicate a substandard thickness, stop paving and reestablish the paving operation such that acceptable thicknesses are being obtained.

Add new Subsection 502-3.17 - Project Strength Determination:

502-3.17 Project Strength Determination. The Engineer will cast two pairs (four total) of cylinders (in accordance with Materials Method 9.2, Field Inspection of Portland Cement Concrete) from each days' placement. The Engineer will mark the cylinders and leave them adjacent to the pavement under similar curing conditions.

The Regional Materials Engineer will determine the concrete compressive strength at the desired **time**. **Test** one pair of cylinders from the two pairs cast. Open the placement to traffic if:

- the average compressive strength of the cylinder pair exceeds 14 MPa and
- the minimum compressive strength of each cylinder is above 10.5 MPa, and
- The corresponding time frame has elapsed for the entire area to be opened.

If these conditions are not met, the Regional Materials Engineer will re-test the remaining cylinder pair a minimum of 6 hours later. If these conditions are again not met, open the placement after 72 hours.

Project testing of 28 day compressive strength is not required.

METHOD OF MEASUREMENT

The requirements of Section 502-4 shall apply.

BASIS OF PAYMENT

The requirements of Section 502-3 shall apply except those requirements which are here-in-after designated

Under Subsection 502-5.01 add the following:

No payment will be made for areas rejected with substandard thicknesses as described in Plastic Thickness Determination.