



Section 353 Concrete Pavement Slab Replacement

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353 Complete Re-Write

- **If concrete producers have projects coming up with the July 2016 version of Section 353 please read this document!!**



353-1 General

353-1 Description

- **The Maturity Method (MM) will be used to open the new concrete to traffic**
- **353-2 Materials**
 - **No changes here; still have to be from approved sources**



353-3 Composition of Concrete

353-3.1

- Acceptance is 3,000 psi at 28 days
- Opening to traffic is 1,600 psi using MM
- Perform plastic properties as described in Section 346 - Prior to the accelerator being added.



353-3 Composition of Concrete

353-3.3 Demonstration Slab

- Prior to placing any concrete on a project, a demonstration will be performed
 - The Contractor is required to;
 - Demonstrate removal of the old slab
 - Preparation of the area for new concrete
 - Demonstrate proficiency at using the MM by
 - Placing concrete and installing the instrumentation
 - Provide the MM curves for the engineer to indicate when the concrete can be opened for traffic.



353-3 Composition of Concrete

353-3 Demonstration Slab

- Demonstration slab may be used in the work if successful
- Engineer may require additional demos if the original demo does not meet contract requirements



353-4 Batching and Mixing Concrete

Accelerators may be used;

- In accordance with the manufacturer's technical data sheet.
- Added into the truck at the jobsite
 - 30 additional revolutions



353-5 Test Requirements

353-5.1 General

- Sample and Test in accordance with 346
- Unit weight is required for mix approval
- Plastic properties taken before accelerator is added
 - Cylinders are made after accelerator is added.



353-5 Test Requirements

353-5.2 Field Delivered Concrete:

- Deviation from approved mix design;
 - Slump Tolerance ± 1.5 in.
 - Unit Weight ± 2.0 pounds
 - Temperature ≤ 100 F



353-5 Test Requirements

353-5.3 Verification of the Maturity Curve Data:

- New Maturity Curves are required if concrete properties are outside the following tolerances before accelerator is added;
 - Slump Tolerance ± 1.0 in.
 - Unit Weight ± 2.0 pounds



353-5 Test Requirements

353-5.4 Cylinder Fabrication and Testing

- On the first day of production,
- When the mix is changed and
- At the discretion of the engineer
- After all materials are added to the mix;
 - Make 3 cylinders for strength



353-6 Concrete Slab Acceptance and Testing

- Acceptance based on
 - Opening to traffic by Maturity Method
 - 3,000 psi, at 28 days
 - LOT, one days production
 - Testing and Acceptance in accordance with 346-8 and 346-9
- Lost missing or stolen cylinders language from 346 has been added



353-8 Curing

- Clear curing compound is to be used
 - Type 1, clear cc with a fugitive dye
 - Use curing blankets after the compound is placed
 - Cure slab until the MM temperatures indicate strength has been met.



353- 10 Protection and Opening to Traffic

- Keep slabs closed until MM data indicates 1,600 psi has been met.
- No traffic, including construction vehicles may be on the pavement until data indicates the strength has been met.



353- 10.2 Maturity Method Testing

- Research performed by UF indicated the most accurate method to determine early age strength
 - Arrhenius Method is required to be used
 - Activation Energy is 33,500 j/mol
 - FM 3-C1074 is the Florida Method to develop the curves
 - Lab must be qualified
 - CMEC has a class to qualify individuals using this method
 - 5 point Curve and data submitted to the Engineer prior to placement
 - Any changes in material sources requires a new set of maturity curves.



Questions

