

ORIGINATION FORM

Date: **5/16/2014**

Originator: Michael Bergin

Contact Information: Michael.bergin@dot.state.fl.us 352-955-6666 or ext. 6666

Specification Title: **Section 938 Post Tensioning Grout**

Specification Section, Article, or Subarticle Number: **938-4.2, under Test Value in the table**

Why does the existing language need to be changed? The revision will be in-line with current national thinking and allowable chlorides resident to post tensioning grouts

Summary of the changes: **change the test value from 0.4 lbs/cyd to 1.2 lbs/cyd**

Are these changes applicable to all Department jobs? **Yes**

If not, what are the restrictions? **N/A**

Will these changes result in an increase or decrease in project costs? **No**

If yes, what is the estimated change in costs?

With who have you discussed these changes? **Mario Paredes, State Corrosion Engineer, Tim Ruelke, Director, Office of Materials.**

What other offices will be impacted by these changes? **none**

Are changes needed to the PPM, Design Standards, SDG, CPAM or other manual? **No**

Are all references to external publications current? **Yes**

If not, what references need to be updated (please include changes in the redline)?

Is a Design Bulletin, Construction Memo, or Estimates Bulletin needed? **Not until after the approval of the specification revision.**

Contact the State Specifications Office for assistance in completing this form.

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ANANTH PRASAD, P.E.
SECRETARY

MEMORANDUM

DATE: June 9, 2014

TO: Specification Review Distribution List

FROM: Daniel Scheer, P.E., State Specifications Engineer

SUBJECT: Proposed Specification: 9380402 Post Tensioning Grout – Laboratory Test.

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

The changes are proposed by Mike Bergin of the State Materials Office to be in-line with current national thinking and allowable chlorides resident to post-tensioning grouts.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DS, or daniel.scheer@dot.state.fl.us. Comments received after **July 7, 2014**, may not be considered. Your input is encouraged.

DS/ft
Attachment

POST-TENSIONING GROUT – LABORATORY TEST.

(REV ~~5-146-59-14~~)

SUBARTICLE 938-4.2 is deleted and the following substituted:

938-4.2 Laboratory Test: The grout shall meet or exceed the specified physical properties stated herein as determined by the following standard and modified ASTM and FM test methods conducted at normal laboratory temperature (65°F-78°F) and conditions. Conduct all grout tests with grout mixed to produce the minimum time of efflux. Establish the water content to produce the minimum and maximum time of efflux.

Property	Test Value	Test Method
Total Chloride Ions	Max. 0.41, 20.8 1.0 lbs/yd ³	FM 5-516
Fine Aggregate (if utilized)	99% passing the No. 50 Sieve (300 micron)	ASTM C136*
Hardened Height Change @ 24 hours and 28 days	0.0% to + 0.2%	ASTM C1090**
Expansion	≤ 2.0% for up to 3 hours	ASTM C940
Wet Density - Laboratory	Report maximum and minimum obtained test value lb/ft ³	ASTM C185
Wet Density - Field	Report maximum and minimum obtained test value lb/ft ³	ASTM C138
Compressive Strength 28 day (Average of 3 cubes)	≥7,000psi	ASTM C942
Initial Set of Grout	Min. 3 hours Max. 12 hours	ASTM C953
Time of Efflux	***	***
(a) Immediately after mixing	Min. 20 Sec. Max. 30 Sec.	ASTM C939
	or Min. 9 Sec. Max. 20 Sec.	ASTM C939****
(b) 30 minutes after mixing with remixing for 30 sec	Max. 30 Sec.	ASTM C939
	or Max. 30 Sec.	ASTM C939****
Bleeding @ 3 hours	Max. 0.0 percent	ASTM C940*****
Permeability @ 28 days	Max. 2,500 coulombs at 30 V for 6 hours	ASTM C1202

*Use ASTM C117 procedure modified to use a #50 sieve. Determine the percent passing the #50 sieve after washing the sieve.

**Modify ASTM C1090 to include verification at both 24 hours and 28 days.

***Adjustments to flow rates will be achieved by strict compliance with the manufacturer's recommendations. The time of efflux is the time to fill a one liter container placed directly under the flow cone.

****Modify the ASTM C939 test by filling the cone to the top instead of to the standard level.

*****Modify ASTM C940 to conform with the wick induced bleed test as follows:

(a) Use a wick made of a 20 inch length of ASTM A416 seven wire 0.5 inch diameter strand. Wrap the strand with 2 inch wide duct or electrical tape at each end prior to cutting to avoid splaying of the wires when it is cut. Degrease (with

Property	Test Value	Test Method
		<p>acetone or hexane solvent) and wire brush to remove any surface rust on the strand before temperature conditioning.</p> <p>(b) Condition the dry ingredients, mixing water, prestressing strand and test apparatus overnight at 65 F to 75°F.</p> <p>(c) Mix the conditioned dry ingredients with the conditioned mixing water and place 800 ml of the resulting grout into the 1,000 ml graduate cylinder. Measure and record the level of the top of the grout.</p> <p>(d) Completely insert the strand into the graduated cylinder. Center and fasten the strand so it remains essentially parallel to the vertical axis of the cylinder. Measure and record the level of the top of the grout.</p> <p>(e) Store the mixed grout at the temperature range listed above in (b).</p> <p>(f) Measure the level of the bleed water every 15 minutes for the first hour and hourly for two successive readings thereafter.</p> <p>(g) Calculate the bleed water, if any, at the end of the 3 hour test period and the resulting expansion per the procedures outlined in ASTM C940, with the quantity of bleed water expressed as a percent of the initial grout volume. Note if the bleed water remains above or below the top of the original grout height. Note if any bleed water is absorbed into the specimen during the test.</p>