ORIGINATION FORM
Proposed Revisions to the Specifications

(Please provide all information - incomplete forms will be returned)

Date: 2/27/2020

Office: State Materials Office

Originator: Richard DeLorenzo

Specification Section: 938

Telephone: (352) 955-6667

Article/Subarticle: 938-4.2.2 Table 938-1

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****Will the proposed revision require changes to:**

Publication	Yes	No	Office Staff Contacted and date contacted
Standard Plans Index	○	◉	R. Jenkins, C. Hudson 4/27
Traffic Engineering Manual	○	◉	Javier Ponce 4/27/2020
FDOT Design Manual	○	◉	Bobby Bull 4/27/2020
Construction Project Administration Manual	○	◉	Scott Arnold 4/27/2020
Basis of Estimate/Pay Items	○	◉	Melissa Hollis 4/27/2020
Structures Design Guidelines	○	◉	Ben Goldsberry 4/27/2020
Approved Product List	○	◉	Karen Byram 4/27/2020
Materials Manual	○	◉	Jose Armenteros 4/27/2020

**This section must be completed prior to processing proposed revisions.

Will this revision necessitate any of the following:

Design Bulletin ☐ **Construction Bulletin** ☐ **Estimates Bulletin** ☐ **Materials Bulletin** ☐

Are all references to external publications current? **Yes** ◉ **No** ○

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

Why does the existing language need to be changed?

Current testing methods are insufficient to characterize and evaluate post-tensioning grouts for bleed and segregation potential. Based on performed research, a new Florida Method (FM5-619) has been developed and added to this specification.

Summary of the changes:

Updated Table 938-1 to include the Florida Method and its requirements.

Are these changes applicable to all Department jobs? **Yes** ◉ **No** ○

If not, what are the restrictions?

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

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M E M O R A N D U M

DATE: May 28, 2020

TO: Specification Review Distribution List

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

SUBJECT: Proposed Specification: **9380301 DUCT FILLER FOR POST-TENSIONED STRUCTURES**

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

This change was proposed by Richard DeLorenzo to update tables and language to reflect new Florida Method FM5-619 to the Standard Specification.

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 online at: http://fdotewp1.dot.state.fl.us/programmanagement/development/industryreview.aspx . Comments received after **June 25, 2020,** may not be considered. Your input is encouraged.

DS/dh

Attachment

DUCT FILLER FOR POST-TENSIONED STRUCTURES
(REV 2-27-20)

ARTICLE 938-3 is deleted and the following substituted:

938-3 General Requirements.

938-3.1 Grout: Grouts shall exhibit thixotropic properties and shall be prepackaged in clearly labeled moisture proof containers. The containers shall indicate application type, date of manufacture, LOT number and mixing instructions. The manufacturer's Quality Control Data Sheet for each lot number and shipment sent to the job site shall be provided to the Contractor ~~by the grout supplier~~ and submitted to the Engineer.

938-3.2 Flexible Filler - Microcrystalline Wax: The flexible filler shall be a petroleum based microcrystalline wax delivered to the project site in clearly labeled prepackaged containers and stored in accordance with the manufacturer's recommendations as applicable for the particular project. ~~A~~The manufacturer's Quality Control Data Sheet ~~indicating compliance with Table 938-2~~ for each shipment sent to the job site shall be ~~submitted~~provided to the Contractor and ~~furnished~~submitted to the Engineer.

SUBARTICLE938-4.2.2 is deleted and the following substituted:

938-4.2.2 Laboratory Testing: 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-90°F) and conditions. Prepare all laboratory test specimens using 110 percent of the maximum water allowed by the manufacturer unless otherwise noted in Table 938-1. Tests A, B, N, and O will be conducted by the Department.

Table 938-1

Test ID	Property	Test Value	Test Method
A	Total Chloride Ions	Max. 1.0 lb~~s~~/yd^3	FM 5-516 (1)*
B	Total Sulfate Ions	Max. 30 ppm	FM 5-618 (1)*
C	Gradation	99% passing the No. 50 95% passing the No. 100 90% passing the No. 170	ASTM C136(2)**
D	Hardened Height Change @ 24 hours and 28 days	0.0% to + 0.2%	ASTM C1090
E	Expansion	≤ 2.0% for up to 3 hours	ASTM C940
F	Wet Density - Laboratory	Report maximum and minimum obtained test value lb/ft^3	ASTM C138
G	Wet Density - Field	Report maximum and minimum obtained test value lb/ft^3	ASTM C138 or ASTM D4380

Table 938-1			
Test ID	Property	Test Value	Test Method
H	Compressive Strength 28 day (Average of 3 cubes)	≥7,000psi	ASTM C942
I	Initial Set of Grout	Min. 3 hours Max. 12 hours	ASTM C953
J	Time of Efflux immediately after mixing	Max. 12 seconds	ASTM C939(3)***
K	Bleeding @ 3 hours	0.0 percent	ASTM C940(4)****
L	Pressure Induced Bleeding	0.0 percent	ASTM C1741
M	Surface Resistivity@ 28 days	≥16 ~~KOhms~~kOhms-cm	AASHTO T358
N	Relative Viscosity, RV_f, determined from Dynamic Sheer Rheometry	< 1.15	FM 5-605
O	Inclined Tube Test	~~< 0.3% (@3 hours)~~	~~EN 445~~FM5-619
	Amount of Bleed	≤ 0.0%	
	Allowable Difference in Moisture	≤ 2.0%	
	Penetration at 500 psi	≤ 1 mm	
	(1)*Obtain test sample from upper vent of inclined tube test specimen after 7 days curing. (2)**Use ASTM C117 procedure to determine the percent passing after washing the sieve. (3)***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. Use the midrange of the water content indicated in the manufacturer's technical data sheet to produce the time of efflux. (4)****Use ASTM C940 to conform with the wick induced bleed test as modified by the Post-Tensioning Institute specification PTI M55.1-12.		

SUBARTICLE 938-5.2 is deleted and the following substituted:

938-5.2 Laboratory Testing: The wax shall meet 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. Prepare and test all laboratory test specimens as noted in Table 938-2.

Table 938-2		
Property	Test Value	Test Method
Salt Fog – 168 hours@35°C	No corrosion	ASTM B117(1)*
Chlorides	≤ 50 ppm (total)	ASTM D512(2)**
Sulfate	≤ 100 ppm	ASTM D516(2)**
Congealing Point	≥ 65°C	ASTM D938
Cone Penetration at 25°C	≤ 260 d-mm	ASTM D937
Bleeding at 40°C	≤ 0.5%	ASTM D6184
Resistance to Oxidation	≤ 0.03 MPa	ASTM D942

100 hours at 100°C		
Kinematic Viscosity at 100°C	10 – 30mm^2/s	ASTM D445

(1)*Test sample consists of a 4 inch x 6 inch steel panel blast cleaned to a NACE surface preparation SP5 or equivalent, with a 2 to 2.5 mil surface profile. The plate is covered with a layer of wax equivalent to 0.5 grams wax per square inch of panel.

(2)**Prepare sample in accordance with NF M07-023, sections 6a through 6c or equivalent. Other analytical methods are acceptable as long as equivalency to the above methods has been established by the Department.