Origination Form

Specifications

Name:	Oliver Chung	**Standard Specification Section:**	932
Email:	oliver.chung@dot.state.fl.us	**Special Provision:**	
Date:	2025-05-07T20:02:51Z	**Associated Specs:**	None

Summary:

932-1.3.3 This section is removed, ending the field sampling requirement. 932-4.3.1 Re-define the sample rate and test location, optimized the samples number.

Justification:

932-1.3.3 The field cure testing standard does not include the range specified. Additionally, these samples never have failed and may lead to field issues as they are removed from their final location. 932-4.3.1 Re-defined the sample rate and test location, optimized the samples number.

Do the changes affect other types of specifications?

Neither

List Specifications Affected:

Other Affected Documents/Offices	Contacted	Yes/No
Other Standard Plans		No
Florida Design Manual		No
Structures Manual		No
Basis of Estimates Manual		No
Approved Product List		No
Construction Office		No
Maintenance Office		No
Materials Manual		No
Traffic Engineering Manual		No

Are changes in line with promoting and making progress on improving safety, enhancing mobility, inspiring innovation, and fostering talent; explain how?

932-1.3.3 This method will eliminate the risk of joint sealers failing. 932-4.3.1 Re-defined the sample rate and test location.

What financial impact does the change have; project costs, pay item structure, or consultant fees?

932-1.3.3 Saves the project cost for no more field test. 932-4.3.1 Changes to FRP sampling will also save contractors money.

What impact does the change have on production or construction schedules?

932-4.3.1 Changes to FRP sampling rate and test location should improve construction schedules.

How does this change improve efficiency or quality?

932-1.3.3 Removal of this unnecessary testing requirement will improve efficiency and improve the quality of the materials in place. 932-4.3.1 Changes in FRP sampling rate and test location will improve efficiency by reducing the amount of testing on large projects and eliminating an additional step (3rd party testing) in the project verification process.

Which FDOT offices does the change impact?

State Materials Office

What is the impact to districts with this change?

N/A

Does the change shift risk and to who?

N/A

Provide summary and resolution of any outstanding comments from the districts or industry.

Comments and Responses are available on the Track the Status of Revisions hyperlink located on the Specifications landing page: https://www.fdot.gov/programmanagement/Specs.shtm

What is the communication plan?

Through the established specification revision process (e.g., Internal and Industry Review)

What is the schedule for implementation?

The Standard Specifications eBook and Workbook are effective July 1st every year.

NONMETALLIC ACCESSORY MATERIALS FOR CONCRETE PAVEMENT AND CONCRETE STRUCTURES
(REV 5-7-25)

SUBARTICLE 932-1.3 is deleted and the following substituted:

932-1.3 Low Modulus Silicone Sealant Materials:

932-1.3.1 Low Modulus Silicone Sealants: Silicone sealant shall be furnished in a one part or pre-measured two-part formulation meeting the requirements specified herein.

Acetic acid cure sealants are not acceptable. A primer as specified in 932-1.4 for bonding sealant to concrete shall be used if required by the manufacturer. When a manufacturer's product is tested and approved by the Department using a primer, primer will be required for project installation.

Do not use Low Modulus Silicone Sealants Types A, B or C for bridge expansion joints.

Silicones shall be identified in the following manner:

Type A - A low modulus, non-sag (non-self-leveling) silicone formulation, used in sealing horizontal and vertical joints in cement concrete pavements and bridges (i.e., concrete-concrete joints). Tooling is required.

Type B - A very low modulus, self-leveling silicone formulation, used in sealing horizontal joints (including joints on moderate slopes) in cement concrete pavements and bridges (i.e., concrete-concrete joints). Tooling is not normally required.

Type C - An ultra-low modulus, self-leveling silicone formulation, used in sealing horizontal joints (including joints on moderate slopes) in cement concrete pavements and bridges (i.e., concrete-concrete joints). It can also be used to seal the joints between cement concrete pavements and asphalt concrete shoulders (including asphalt-asphalt joints). Tooling is not normally required.

Type D - An ultra-low modulus, self-leveling silicone formulation, cold-applied, rapid-cure, used to seal expansion joints that experience both thermal and/or vertical movements. The material must cure by chemical reaction and not by evaporation of solvent or fluxing of harder particles. Tooling shall not be required. Use in accordance with Standard Plans, Index 458-110 for bridge deck expansion joints with backer rods or as shown in the Plans for other joints with or without backer rods.

932-1.3.2 Physical Requirements:

Table 932-3

Silicone Sealant Type	Test Method	Type A	Type B	Type C	Type D
Flow	ASTM D5893	No Flow			
Slump (maximum)	ASTM D2202	0.3 inches			
Extrusion rate (minimum)	ASTM C1183, Procedure A	20 ml/min	20 ml/min	20 ml/min	20 ml/min
Tack-free time at 77 ± 3ºF and 45 to 55% Relative Humidity	ASTM C679	90 minutes maximum	180 minutes, maximum	180 minutes, maximum	20 – 60 minutes
Specific gravity	ASTM D792, Method A	1.1 to 1.515	1.10 to 1.40	1.1 to 1.5	1.26 to 1.34

Table 932-3					
Silicone Sealant Type	Test Method	Type A	Type B	Type C	Type D
Durometer hardness, Shore A (Cured seven days at 77 ± 3ºF and 50 ± 5% Relative Humidity)	ASTM D2240	10-25			
Durometer hardness, Shore 00 (Cured 21 days at 77 ± 3ºF and 50 ± 5% Relative Humidity)	ASTM D2240		40-80	20-80	
Tensile stress (maximum) at 150% elongation	ASTM D412 (Die C)	45 psi	40 psi	15 psi	
Elongation (Cured seven days at 77 ± 3ºF and 50 ± 5% Relative Humidity)	ASTM D412 (Die C)	800% minimum			600% minimum
Elongation (Cured 21 days at 77 ± 3ºF and 50 ± 5% Relative Humidity)	ASTM D412 (Die C)		800% minimum	800% minimum	
Ozone and Ultraviolet Resistance	ASTM C793	No chalking, cracking or bond loss after 5,000 hours, minimum.			
Bond to cement mortar briquets (primed if required) (Cured seven days at 77 ± 3ºF and 50 ± 5% Relative Humidity)	AASHTO T 132	50 psi minimum			
Bond to cement mortar briquets (Cured 21 days at 77 ± 3ºF and 50 ± 5% Relative Humidity)	AASHTO T 132		40 psi minimum	35 psi minimum	
Movement Capability	ASTM C719	No adhesive or cohesive failure and adhesion, 10 cycles at -50 to +100%			No adhesive or cohesive failure and adhesion, 10 cycles at +100/-50 %

Portland Cement Mortar: Briquets shall be molded and cured 28 days minimum in accordance with AASHTO T 132. Saw cut cured briquets in half, clean, and dry at 230°, plus or minus 5ºF. Bond the two halves together with a thin section of sealant. After cure of sealant, briquets shall be tested in accordance with AASHTO T 132.

~~**932-1.3.3 Field Cure:** Six-inch samples of the sealant shall be taken by the Engineer from the joint at the end of a two-week curing period and tested for durometer hardness~~

~~(by FM ANSI/ASTM D2240), except that the requirements of a 1-inch sample width shall not apply. A minimum hardness of 7.0 is required as evidence of adequate cure.~~

932-1.3.~~4~~3 Approved Product List: The low modulus silicone sealant used shall be one of the products listed on the APL. Manufacturers seeking evaluation of their products shall submit product datasheets, performance test reports from an independent laboratory showing the product meets the requirements of this Section, an infrared identification curve (2.5 to 15 µm) and an APL application in accordance with Section 6. Information on the APL application must identify the sealant type.

932-1.3.~~5~~4 Shipment: The material shall be delivered in containers plainly marked with the manufacturer's name or trademark product name, LOT number and date of expiration.

932-1.3.~~6~~5 Primer: When required by the manufacturer's product, a primer shall be used.

The manufacturer shall perform quality control tests on each LOT of sealant primer material furnished to each project and submit a certified report that each LOT of primer material furnished to a project meets the company's specifications for that product and the primer is suitable for its intended use.

Sealant primer material shall be delivered in containers plainly marked with the manufacturer's name or trademark and product name, LOT number and date of expiration.

932-1.3.~~7~~6 Backer Rod and Tape Bond Breakers: Backer rods and tape shall be compatible with the joint sealant and approved by the sealant manufacturer. No bond or reaction shall occur between the rod and the sealant.

932-1.3.~~8~~7 Installation: Installation, material selection, joint dimensions, bond breaker suitability (by type and project) shall be in agreement with the requirements of Standard Plans, Indexes 350-001 and 458-110. Any modifications or exceptions to these requirements shall be shown in the Plans.

For new construction projects or general use where the joints to be sealed have uniform width, a closed cell, expanded polyethylene foam backer rod bond breaker shall be required. For rehabilitation projects and similar joint seals where the joints to be sealed have irregular width, an open cell, expanded polyethylene foam backer rod bond breaker with an impervious skin shall be required.

The backer rod shall be compatible with the joint sealant. No bond or reaction shall occur between the rod and the sealant.

Tape bond breaker approved by the sealant manufacturer may be used in lieu of backer rod bond breaker when sealing joints and/or random cracks, as required.

Type D Silicone sealant shall be placed when the ambient temperature is rising and is between 55°F and 85°F and the temperature is expected to rise for the next three hours minimum to provide to adequate joint opening and compression of the sealant during curing.

All installed bond breakers shall be covered by sealant at the end of each workday.

A tolerance in cross-sectional height at midpoint of minus 1/16 inches to plus 3/16 inches will be allowed to the nominal values shown for each joint width on the plan sheet. The Engineer shall check one joint for each 1,000 feet of roadway by cutting out

specimens. If the cross section of the cut specimen is out of the allowable range, additional specimens shall be taken as follows:

One joint every 100 feet of pavement, not to exceed 500 feet.

If the average of the specimens is out of tolerance, the Contractor shall remove and replace the entire 500-foot section at no additional expense to the Department.

Installation tolerance shall be verified at 1,000-foot intervals.

SUBARTICLE 932-4.3 is deleted and the following substituted:

932-4.3 Material Acceptance: Submit to the Engineer a certificate of analysis for each production LOT from the producer of the FRP reinforcing bars, confirming compliance with the requirements of this Section.

932-4.3.1 Sampling: The Engineer will ~~select a minimum~~ identify specimens for the test samples. Contractor will provide the testing samples if the project includes more than 15,000-feet of ~~six~~ straight ~~bars with minimum lengths~~or 10,000-feet of ~~7 feet each and a minimum of five~~ bent ~~bars~~ or 10,000-feet of spiral ~~bends/revolutions from each shipment, representing a random production LOT, per bar size of~~ or a combined length of more than 20,000-feet of FRP reinforcing ~~for testing in accordance with Table 932-9. Testing shall be conducted, at the Contractor's expense, by a Department approved independent laboratory. Each test shall be replicated a minimum of three times per sample. Submit the test results to the Engineer for review and approval prior to installation.~~bars. One sample of each size of straight, bent, and spiral FRP reinforcing bar must be selected. A straight bar sample includes six specimens of at least 7-foot length. A bent or spiral bar sample includes five specimens of at least 2-foot length. Testing will not be required for bars to be used solely as reinforcement for sheet pile ~~bulkheads~~bulkhead cap or pile jackets, but ~~LOT~~ samples will still be selected and retained by the Engineer until final acceptance of the work.

Table 932-9 Testing Requirements for Project Material Acceptance of FRP Reinforcing Bars				
Property	Test Method	Requirement	Test Required for Straight Bar	Test Required for Bent Bar
Fiber Mass Fraction	ASTM D2584 or ASTM D3171	≥70%	Yes	Yes – bent portion[b]
Short-Term Moisture Absorption	ASTM D570, Procedure 7.1; 24 hours immersion at 122°F	≤0.25%	Yes	Yes – bent portion[b]
Glass Transition Temperature	ASTM D7028 (DMA) or ASTM E1356 (DSC; T_m)/ ASTM D3418 (DSC; T_{mg})	≥230°F ≥212°F	Yes	Yes – bent portion[b]
Degree of Cure	ASTM E2160	≥95% of Total polymerization enthalpy	Yes	Yes – bent portion[b]
Measured Cross-sectional Area	ASTM D7205	Within the range listed in Table 932-~~6~~8	Yes	Yes – straight portion
Guaranteed Tensile Load[a]		≥ Value listed in Table 932-~~6~~8	Yes	No
Tensile Modulus		≥6,500 ksi for BFRP and GFRP (Type 0) ≥8, ~~500~~700 ksi for BFRP and GFRP (Type III) ≥18,000 ksi for CFRP (Type I) Bars ≥22,400 ksi for CFRP (Type II) Strands	Yes	No

a – Guaranteed tensile load shall be ~~equal to~~defined as the average test result ~~from all three LOTs~~ minus three standard deviations.
b – Bent portion specimens shall be extracted from a central location within a 90° bend.