



*Florida Department of Transportation*

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GOVERNOR

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KEVIN J. THIBAUT, P.E.  
SECRETARY

January 27, 2022

Khoa Nguyen  
Director, Office of Technical Services  
Federal Highway Administration  
3500 Financial Plaza, Suite 400  
Tallahassee, Florida 32312

Re: State Specifications Office  
Section: **974**  
Proposed Specification: **9740000 Surface Applications.** \*

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

The changes are proposed by Karen Byram to modify the detectable warnings requirement for NTPEP to allow independent laboratory reports, add testing criteria for snowplow, remove Non-Vehicular references from Patterned Pavement, and change friction testing to DFT.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to [daniel.strickland@dot.state.fl.us](mailto:daniel.strickland@dot.state.fl.us).

If you have any questions relating to this specification change, please call me at 850-414-4130.

Sincerely,

Signature on file

Daniel Strickland, P.E.  
State Specifications Engineer

\*Associated with proposed Standard Specification revision 5230000.

DS/dh

Attachment

cc: Florida Transportation Builders' Assoc.  
State Construction Engineer

**SURFACE APPLICATIONS.**(REV ~~11-297-212~~)

SECTION 974 is deleted and the following substituted:

**SECTION 974  
SURFACE APPLICATIONS****974-1 Description.**

This section specifies the material requirements for detectable warnings and patterned pavement.

**974-2 Detectable Warnings.**

Provide detectable warnings in accordance with the Americans with Disabilities Act Standards for Transportation Facilities, Section 705. Provide detectable warnings consisting of materials intended for exterior use subject to routine pedestrian traffic and occasional vehicular traffic. Provide detectable warnings with size and pattern comprised of truncated domes aligned in parallel rows. Detectable warnings with a diagonal pattern are not permitted. Detectable warnings consisting of truncated domes fabricated in the field are not permitted.

**974-2.1 Approved Product List Submittal Requirements:** Manufacturers seeking evaluation of products for inclusion on the APL shall submit an application in accordance with Section 6 and include the documentation identified in the Table 974-1. Documentation and reports must demonstrate that the product meets the requirements of this Section, Section 527, and the Standard Plans, Index 522-002.

Table 974-1	
Documentation	Requirements
Product Photo	Displays the significant features of the product.
Technical Data Sheet	Uniquely identifies the product and includes product specifications, storage instructions, and recommended installation materials and equipment as applicable.
Product Label	For each component of the product system.
Safety Data Sheet (SDS)	SDS meeting OSHA requirements for product and manufacturer recommended installation materials as applicable. <u>Non-Hazardous, per RCRA Subtitle C Table 1 of 40 CFR 261.24 "Toxicity Characteristic" and not exude fumes which are hazardous, toxic, or detrimental to persons or property.</u>
National <del>Testing</del> <u>Transportation</u> Product Evaluation Program (NTPEP) Test Report <u>or Independent Laboratory Test Report</u>	Testing must be conducted using the <del>p</del> Project Work Plan for NTPEP Laboratory Testing of Detectable Warning Systems, using the cold exposure category <u>[i.e., 4 repetitions of the following exposure series: Abrasion (4 cycles) followed by freeze-thaw (15 cycles)]</u> .
Independent Laboratory	<del>Color/Contrast testing as identified in Table 974-2</del> <u>Test CAP Y</u>

Documentation	Requirements
Test Report	<u>in accordance with ASTM E1349.</u>
Installation Instructions	Surface preparation and installation procedures for different substrates. The minimum curing time prior to installing the product for surface-applied materials.
Product Sample	Submit upon request from the Department. If the product is a system, a sample of each component must be submitted.

**974-2.2 Performance Requirements:** Provide detectable warnings that meet the performance requirements of Table 974-2. Manufacturers shall provide before exposure testing and proof that the product has been submitted for exposure testing. All testing shall be complete by July 1, 2023.

Property	Documentation	Test Value	
Domes and Spacing Dimensional Testing <sup>1</sup>	Provide NTPEP Test Report <u>or Independent Laboratory Test Report</u>	Meets the requirements <del>with</del> <u>of</u> the Americans with Disabilities Act Standards for Transportation Facilities, Section 705.	
Slip Resistance <sup>1</sup>	Provide NTPEP Test Report <u>or Independent Laboratory Test Report</u>	Dry Coefficient of Friction – 0.8 min. Wet Coefficient of Friction – 0.65 min. (include recessed areas between truncated domes).	
Visual and Microscopic Evaluation <sup>1</sup>	Provide NTPEP Test Report <u>or Independent Laboratory Test Report</u>	No lifting, debonding, <del>cracking,</del> flaking, <del>and</del> missing <u>domes,</u> <del>or</del> partial domes, <u>or significant cracking.</u>	
<del>Color Measurement<sup>2</sup></del>	<del>Provide NTPEP Test Report</del>	<del>Uniform color, for each color.</del>	
<del>Resistance to Impact from Falling Tup<sup>2</sup></del>	<del>Provide NTPEP Test Report</del>	<del>No cracking, flaking, missing or partial domes, 20 ft-lb energy.</del>	
<del>Adhesive, Coating, and Single Dome Bond Strength on Uncured (<math>\leq</math> 72 hours) Concrete Panel [AASHTO T 388]; <del>uncured concrete panel<sup>3</sup></del></del>	<del>Independent Laboratory Test Report</del> <u>Provide NTPEP Test Report</u>	<u>For surface applied detectable warning systems installed on uncured concrete: 150 psi min. with an elapsed <u>concrete</u> panel cure time of less than 72 hours.</u>	
Color/Contrast <sup>1,2</sup> <u>[ASTM G155 / D4355]</u>	Independent Laboratory Test Report	<del>Meets the requirements of this Section</del>	
		Color	CAP Y
		Safety Yellow	25 – 45
		Brick Red	5 – 15
		Black	0 – 5

<sup>1</sup> Report values before and after exposure testing.

<sup>2</sup> 1,000 hours, UV exposure only.

**974-3 Patterned Pavement.**

Provide patterned pavement products that produce an adherent, weather resistant, skid friction resistant, and wear resistant surface that meets the requirements of this Section, and Section 523.

Material color and friction elements shall be integral and homogenous.

Patterned pavement installations requiring removal of pavement are not permitted.

**974-3.1 Approved Product List Submittal Requirements:** Manufacturers seeking evaluation of products for inclusion on the APL shall submit an application in accordance with Section 6 and include the documentation identified in Table 974-3. Documentation and reports must demonstrate that the product meets the requirements of this Section and Section 523.

Table 974-3	
Documentation	Requirements
Product Photo	Displays the significant features of the product.
Technical Data Sheet	Uniquely identifies the product and includes product specifications, storage instructions, and recommended installation materials and equipment as applicable. Include the following information as applicable: <ol style="list-style-type: none"> <li>1. Use on concrete surfaces.</li> <li>2. Use on asphalt surfaces.</li> <li><del>3. Use as "Vehicular".</del></li> <li><del>4. Use as "Non-vehicular".</del></li> <li><del>5</del>3. Patterns, textures, and templates.</li> <li><del>6</del>4. Resin, sealers, coatings, coloring, and friction materials.</li> <li><del>7</del>5. Friction material source <u>and rate of application.</u></li> </ol>
Product Label	For each component of the product system.
Safety Data Sheet (SDS)	SDS meeting OSHA requirements for each material used in the product system. <u>Non-Hazardous, per RCRA Subtitle C Table 1 of 40 CFR 261.24 "Toxicity Characteristic" and not exude fumes which are hazardous, toxic, or detrimental to persons or property.</u>
<del>Independent Laboratory Test Report</del>	<del>Skid Test and Integral Color testing as identified in Table 974-4.</del>
Installation Instructions	Surface preparation and installation procedures for different substrates.
Product Sample	Submit upon request from the Department. A sample of each component must be submitted.

~~974-3.2 Performance Requirements: Provide patterned pavement products that meet the performance requirements of Table 974-4.~~

Table 974-4		
Property	Documentation	Test Method and Value

Skid Test <sup>1</sup>	Independent Laboratory Report	ASTM E303 using the British Pendulum Tester, British Pendulum Number (BPN) of at least 40.
Integral Color <sup>1,2</sup>	Independent Laboratory Report	Visual inspection, Color is integral and uniform.
Non-Hazardous Classification <sup>1,2</sup>	Material Safety Data Sheet (SDS)	Non-Hazardous, per RCRA Subtitle C Table 1 of 40 CFR 261.24 "Toxicity Characteristic" and not exude fumes which are hazardous, toxic, or detrimental to persons or property.
Friction Resistance <sup>2</sup>	Product Sample Panel for FDOT Laboratory Test	FM 5-622—Part A, Initial Dynamic Friction Test (DFT40) value of 40 or greater.
<sup>1</sup> For Non-vehicular use. <sup>2</sup> For Vehicular use.		

**974-3.32 Performance Requirements for Products in Vehicular Traffic Areas:** ~~Manufacturers shall install the product on a site provided by the Department and test the installation using an independent testing facility in accordance with FM 5-592. Provide patterned pavement products that meet the performance requirements of Table 974-45.~~

**974-3.2.1 Department Testing:** Submit product samples and panels for Department analysis upon request from the Department and in accordance with this Specification. Products are subject to verification testing in accordance with this Section and infrared identification curve (2.5 to 15 μm) for the vehicle component.

**974-3.2.2 Friction Resistance:** In-service pavement markings shall maintain a DFT40 value of 40 or greater, or FN 40R value of 35 or greater for a three-year period as tested per FM 5-622-Part B.

Property	Documentation	Test Method and Value
Wear	Field Service Test Photos	Visual, Wearing shall not expose more than 15% of the underlying surface area as measured within the traveled way for 3 years.
<u>Initial Friction Resistance [FM 5-622 Part A]</u>	<u>Department Testing Reports</u>	<u>Dynamic Friction Tester (DFT40) ≥ 50</u>
Friction	Independent Testing Facility	<del>FM 5-592, Test using one of the following: a. Locked Wheel Friction Tester—minimum FN40R value of 35 or greater at all testing intervals for 3 years, or b. Dynamic Friction Tester—minimum DFT40 value of 40 or greater at all testing intervals for 3 years.</del>

**SURFACE APPLICATIONS.****(REV 1-27-21)**

SECTION 974 is deleted and the following substituted:

**SECTION 974**  
**SURFACE APPLICATIONS**

**974-1 Description.**

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**974-2 Detectable Warnings.**

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**974-2.1 Approved Product List Submittal Requirements:** Manufacturers seeking evaluation of products for inclusion on the APL shall submit an application in accordance with Section 6 and include the documentation identified in the Table 974-1. Documentation and reports must demonstrate that the product meets the requirements of this Section, Section 527, and the Standard Plans, Index 522-002.

Table 974-1	
Documentation	Requirements
Product Photo	Displays the significant features of the product.
Technical Data Sheet	Uniquely identifies the product and includes product specifications, storage instructions, and recommended installation materials and equipment as applicable.
Product Label	For each component of the product system.
Safety Data Sheet (SDS)	SDS meeting OSHA requirements for product and manufacturer recommended installation materials as applicable. Non-Hazardous, per RCRA Subtitle C Table 1 of 40 CFR 261.24 "Toxicity Characteristic" and not exude fumes which are hazardous, toxic, or detrimental to persons or property.
National Transportation Product Evaluation Program (NTPEP) Test Report or Independent Laboratory Test Report	Testing must be conducted using the Project Work Plan for NTPEP Laboratory Testing of Detectable Warning Systems, using the cold exposure category [i.e., 4 repetitions of the following exposure series: Abrasion (4 cycles) followed by freeze-thaw (15 cycles)].
Independent Laboratory Test Report	Test CAP Y in accordance with ASTM E1349.

Table 974-1	
Documentation	Requirements
Installation Instructions	Surface preparation and installation procedures for different substrates. The minimum curing time prior to installing the product for surface-applied materials.
Product Sample	Submit upon request from the Department. If the product is a system, a sample of each component must be submitted.

**974-2.2 Performance Requirements:** Provide detectable warnings that meet the performance requirements of Table 974-2. Manufacturers shall provide before exposure testing and proof that the product has been submitted for exposure testing. All testing shall be complete by July 1, 2023.

Table 974-2			
Property	Documentation	Test Value	
Domes and Spacing Dimensional Testing <sup>1</sup>	Provide NTPEP Test Report or Independent Laboratory Test Report	Meets the requirements of the Americans with Disabilities Act Standards for Transportation Facilities, Section 705.	
Slip Resistance <sup>1</sup>	Provide NTPEP Test Report or Independent Laboratory Test Report	Dry Coefficient of Friction – 0.8 min. Wet Coefficient of Friction – 0.65 min. (include recessed areas between truncated domes).	
Visual and Microscopic Evaluation <sup>1</sup>	Provide NTPEP Test Report or Independent Laboratory Test Report	No lifting, debonding, flaking, missing domes, partial domes, or significant cracking.	
Bond Strength on Uncured ( $\leq 72$ hours) Concrete Panel [AASHTO T 388]	Independent Laboratory Test Report	For surface applied detectable warning systems installed on uncured concrete: 150 psi min. with an elapsed concrete panel cure time of less than 72 hours.	
Color/Contrast <sup>1,2</sup> [ASTM G155 / D4355]	Independent Laboratory Test Report	Color	CAP Y
		Safety Yellow	25 – 45
		Brick Red	5 – 15
		Black	0 – 5

<sup>1</sup> Report values before and after exposure testing.

<sup>2</sup> 1,000 hours, UV exposure only.

### 974-3 Patterned Pavement.

Provide patterned pavement products that produce an adherent, weather resistant, friction resistant, and wear resistant surface that meets the requirements of this Section, and Section 523. Material color and friction elements shall be integral and homogenous.

Patterned pavement installations requiring removal of pavement are not permitted.

**974-3.1 Approved Product List Submittal Requirements:** Manufacturers seeking evaluation of products for inclusion on the APL shall submit an application in accordance with

Section 6 and include the documentation identified in Table 974-3. Documentation and reports must demonstrate that the product meets the requirements of this Section and Section 523.

Table 974-3	
Documentation	Requirements
Product Photo	Displays the significant features of the product.
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Product Label	For each component of the product system.
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Installation Instructions	Surface preparation and installation procedures for different substrates.
Product Sample	Submit upon request from the Department. A sample of each component must be submitted.

**974-3.2 Performance Requirements:** Provide patterned pavement products that meet the performance requirements of Table 974-4.

**974-3.2.1 Department Testing:** Submit product samples and panels for Department analysis upon request from the Department and in accordance with this Specification. Products are subject to verification testing in accordance with this Section and infrared identification curve (2.5 to 15  $\mu\text{m}$ ) for the vehicle component.

**974-3.2.2 Friction Resistance:** In-service pavement markings shall maintain a DFT40 value of 40 or greater, or FN 40R value of 35 or greater for a three-year period as tested per FM 5-622-Part B.

Table 974-4		
Property	Documentation	Test Method and Value
Wear	Field Service Test Photos	Visual, Wearing shall not expose more than 15% of the underlying surface area as measured within the traveled way for 3 years.
Initial Friction Resistance [FM 5-622 Part A]	Department Testing Reports	Dynamic Friction Tester (DFT40) $\geq 50$