

Origination Form

Specifications

Submittal Information			
Name:	James Greene	Standard Specification Section:	333
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Date:	2026-06-18T18:02:48Z	Associated Specs:	332, 403, 974

Summary:

Transition from DEV Specs to Standard Specs

Justification:

This was Developmental Specifications 333. It has been successfully implemented in statewide projects with good construction consistency. Having proven its reliability in the field, this specification is now ready for transition to the Standard Specifications.

Do the changes affect other types of specifications?

Developmental Specifications

List Specifications Affected:

DEV333

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	Karen Byram	Yes
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?

High Friction Surface Treatments (HFST) has significantly enhanced surface friction and bridge durability. This successful transition from Developmental Specifications to Standard Specifications demonstrate the effectiveness of adopting new materials and modern construction methods.

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

Pay items will need to be moved and clarified from Developmental Specification to Standard Specification.

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

Transitioning to standard specification will improve the efficiency of production and construction schedules. By doing so, projects can be implemented directly without requiring individual approval from a monitor for this specific item.

How does this change improve efficiency or quality?

Transitioning to standard specifications will improve the efficiency of production and construction schedules. By doing so, projects can be implemented directly without requiring individual approval from a monitor for this specific item.

Which FDOT offices does the change impact?

State Construction Office, State Design Office, State Materials Office

What is the impact to districts with this change?

Positive impact, High Friction Surface Treatment (HFST) can be specified directly rather than gaining approval as a Developmental Specification.

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/specifications/default.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.

HIGH FRICTION SURFACE TREATMENT

(REV 6-18-26)

The following new Section is added:

333-1 Description.

This work consists of furnishing and applying a high friction surface treatment (HFST) using a two-part polymer resin binder and bauxite aggregate topping at locations shown in the Plans.

333-2 Materials.

Meet the following requirements:

Polymer Binder**Section 974

Aggregate*Section 974

*Aggregates used for surface treatment shall comply with Section 974.

**Use products listed on the Department's Approved Product List (APL).

333-3 Installer Personnel Qualification.

Use supervisory personnel experienced in applying HFST with a continuous automated method. Submit a list of similar projects on which a minimum of 3,000 square yards of HFST has been placed to substantiate their experience record. Submit the list to the Engineer at the pre-construction conference.

333-4 Application.

333-4.1 General: Do not apply the two-part polymer resin binder on a wet surface, when the ambient or surface temperature is outside the polymer resin binder manufacturer's specified application temperature range, or when weather conditions would prevent proper application of the surface treatment.

333-4.2 Surface Preparation: Use a mechanical sweeper to prepare the existing surface to be clean, dry, and free of all dust, oil, debris, and any other material that may interfere with the bond between the polymer resin binder material and existing surfaces. For applications on new pavements, install the HFST a minimum of 30 days after the placement of the underlying and adjacent asphalt pavement.

Clean concrete pavement surfaces by shot blasting to remove all curing compounds, loosely bonded mortar, surface carbonation, and deleterious material. Vacuum sweep or air wash the concrete pavement surface after shot blasting. Maintain the air lance perpendicular to and within 12 inches of the pavement surface with a minimum air pressure of 180 cubic feet per minute of clean and dry compressed air when air washing. Ensure the cleaned concrete pavement surface has an acceptable texture that achieves a Concrete Surface Profile (CSP) rating of CSP 5 to CSP 7 as defined by the International Concrete Repair Institute.

Protect utilities, drainage structures, curbs and other structures within or adjacent to the treatment location from exposure to the application of the surface treatment materials. Cover and protect all existing pavements and pavement markings that are adjacent to the application surfaces. Remove all pavement markings within the surface application area by grinding or hydroblasting. Thoroughly clean the surface by sweeping or other methods approved by the Engineer prior to applying the polymer resin binder.

Pretreat asphalt joints and cracks greater than 1/4 inch in width and depth with the mixed polymer resin binder specified herein. Apply the high friction polymer resin binder and aggregate topping once the polymer binder in the pre-treated areas has fully gelled.

333-4.3 Automated Mixing and Application: Apply HFST using a continuous automated applicator vehicle that mechanically mixes, meters, monitors, and applies the polymer binder resin system with the capability of spreading the high friction aggregate a minimum of 12 feet wide in one uniform and continuous pass. Use heated metering pumps when required by the polymer resin binder manufacturer.

Use an applicator vehicle with continuous pumping and proportioning devices that can blend and mix the polymer resin binder components within a controlled system per the manufacturer's specification ($\pm 2.0\%$ by volume) with the required polymer resin binder spread rate. Apply the polymer resin binder continuously once blended in accordance with Table 333-1.

Construct all HFST layers to a minimum of the drivable lane width. When two runs are required to cover the entire lane width due to the vendor's machine limitations, verify the following daily:

1. Joints appear neat and uniform without buildup, uncovered areas, or unsightly appearance.
2. For longitudinal joint construction, there are no openings or gaps between adjacent passes, and joints are not constructed within a vehicle wheel path.
3. Joints do not exceed 1/4 inch difference in elevation as measured with a 6-foot straightedge.

<u>Table 333-1</u> <u>Application Rate</u>	
<u>Polymer Resin Binder Application Rate</u>	<u>High Friction Aggregate Application Rate</u>
<u>50-65 mils (25 to 32 ft³/gal)</u>	<u>12 to 15 lbs/yd³</u>

Apply the aggregate within 30 seconds after the polymer resin binder application until complete saturation is achieved.

333-4.4 Manual Mixing and Application: Manual mixing and application are only allowed for areas that are less than 200 square yards. Obtain the Engineer's approval for locations where truck mounted application machines are inaccessible. Hand-mix the polymer resin binder in accordance with the manufacturer's recommendations. Uniformly spread the polymer resin binder using a serrated edge squeegee, and broadcast the aggregate within five minutes until complete saturation is achieved.

333-4.5 Curing: Allow each HFST course to cure in accordance with polymer resin binder manufacturer's recommendations. Protect treated surfaces from traffic until the area has cured. Remove areas of HFST that do not cure properly, at no cost to the Department.

Before opening to traffic, remove or recover the excess aggregate by mechanical sweeping or vacuum sweeping. Ensure any reused aggregate that was recovered is clean, uncontaminated, and dry.

Sweep or vacuum any loosened aggregate for up to two weeks after placement.

Apply pavement markings and to the cured surface as shown in the Plans and in accordance with Sections 710 and 711. Install raised pavement markers (RPMs) as shown in the Plans and in accordance with Section 706. Apply temporary pavement markings and RPMs as shown in the plans or as directed by the Engineer.

333-5 Finished Surface Requirements.

Produce a finished HFST surface of uniform appearance with no cracking, bleeding, raveling, delamination, and other surface defects. Repair any surface defects in accordance with the manufacturer's instructions, at no cost to the Department.

333-6 Friction Acceptance Testing.

Within 90 days of a finished HFST, evaluate friction characteristics using AASHTO T 242, or ASTM E1911 when AASHTO T 242 is not applicable. Secure the services of an independent enterprise with prior experience in roadway friction testing, using the specified equipment to perform all required friction tests. Complete all friction testing prior to final acceptance. Remove and replace areas that do not meet the minimum acceptable friction values of FN40R of 65 when tested under AASHTO T 242, or a DFT40 of 70 when tested under ASTM E1911, at no cost to the Department.

333-7 Method of Measurement.

The quantities to be paid for will be the plan quantity, in square yards, completed and accepted. No deduction from plan quantity will be made for the areas occupied by manholes, inlets, drainage structures, pavement markings or by any public utility appurtenances. The quantities to be paid for pavement markings and RPMs will be paid under the applicable sections. No payment will be made for installations failing to meet friction number or repair of surface defects.

333-8 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including, all cleaning and preparing of surfaces, furnishing of all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work. Final payment will be withheld until all deficiencies are corrected.

Payment will be made under:

Item No. 908-333- High Friction Surface Course - per square yard.