

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 Qualification.

The HFST vendor must be certified through the FDOT Product Application and Tracking History (PATH) system and shall provide a list of similar projects on which a minimum of 3,000 square yards of HFST has been placed within the past three years from the date of the submittal of bid.

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 below or above the manufacturer's recommendation, or when the anticipated weather conditions would prevent the proper application of the surface treatment as determined by the manufacturer's representative.

333-4.2 Surface Preparation: Surfaces shall be clean, dry, and free of all dust, oil, debris and any other material that might 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 calendar days after the placement of the underlying and adjacent asphalt pavement.

Clean asphalt pavement surfaces using a mechanical sweeper to remove dirt, loose aggregate, debris, and deleterious material.

Clean concrete pavement surfaces by shot blasting to remove all curing compounds, loosely bonded mortar, surface carbonation, and deleterious material. The final surface must have, at minimum, the texture of Concrete Surface Profile (CSP) 5 as specified by the International Concrete Repair Institute (ICRI). The texture should not go above CSP 7. After shot blasting, vacuum sweep or air wash, with a minimum of 180 cfm of clean and dry compressed air. Maintain the air lance perpendicular to the surface and the tip of the air lance within 12 inches of the surface.

Utilities, drainage structures, curbs and any other structure within or adjacent to the treatment location shall be protected against the application of the surface treatment materials. Cover and protect all existing pavements and pavement markings that are adjacent to the application surfaces. Pavement markings that conflict with the surface application shall be

removed by grinding, or by other methods approved by the Engineer, and the surface shall be swept clean prior to the polymer binder application.

Pre-treat asphalt joints and cracks greater than 1/4 inch in width and depth with the mixed polymer specified herein. Once the polymer in the pre-treated areas have gelled, the high friction polymer binder and aggregate topping installation may proceed.

333-4.3 Automated Mixing and Application: Apply HFST with a continuous automated method using an applicator vehicle. The applicator vehicle shall mechanically mix, meter, monitor, and apply the binder resin system and have the capability to spread the high friction aggregate a minimum of 12 feet wide in one uniform and continuous pass. If recommended by the manufacturer, metering pumps shall be heated.

The applicator vehicle must have continuous pumping and proportioning devices that blend the binder components within a controlled system and can blend and mix per the manufacturer's specification ($\pm 2.0\%$ by volume). The polymer resin binder must be continuously applied once blended. The applicator vehicle must be capable of applying the minimum polymer resin binder spread rate.

All HFST layers must be constructed to a minimum of the drivable lane width. When the lane width exceeds the capability of the vendor's machine and the machine has to make two runs to cover the whole lane width, verify the following for daily acceptance:

1. Joints appear neat and uniform without buildup, uncovered areas, or unsightly appearance.

2. For longitudinal joint construction, there will be no opening or gap between adjacent passes and joints should not be constructed within a vehicle wheel path.

3. Construction joints have no more than 1/4 inch) difference in elevation across the joint 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>

The aggregate shall be applied less than 30 seconds after the polymer resin binder application. Completely cover the "wet" polymer binder with aggregate until refusal.

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 where truck mounted application machines are not applicable to the specified locations because of construction constraints. Hand-mix the polymer resin binder in accordance with the manufacturer's recommendations. Uniformly spread the binder using serrated edge squeegee, and within five minutes broadcast the aggregate until refusal. All other conditions apply.

333-4.5 Curing: Allow each course of the HFST to cure in accordance with manufacturer recommendations. Protect treated surfaces from traffic and environmental effects until the area has cured. After the initial cure, the inspector may perform a visual inspection to verify that the polymer resin binder has cured properly and that there are no uncured spots. HFST that does not cure properly is subject to removal at the Contractor's expense.

Before opening to traffic, remove or recover the excess aggregate by mechanical sweeping or vacuum sweeping. Recovered aggregate to be reused must be clean, uncontaminated, and dry.

Aggregate shedding after construction shall require additional sweeping or vacuuming on the shoulders as needed to remove excess aggregate, but not more than two weeks after final HFST placement.

Restripe the pavement surface and reinstall pavement markers as directed in the plans after the HFST has been completed and approved by the Engineer. Temporary striping may be necessary as described by 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. The Contractor must repair any surface defects in accordance with manufacturer's instructions.

333-6 Friction Acceptance Testing.

Within 90 calendar days following HFST construction, friction characteristics shall be evaluated using AASHTO T 242, or ASTM E1911 when AASHTO T 242 is not applicable. The Contractor must secure the services of an independent enterprise with prior experience in roadway friction testing, using the specified equipment to perform all required friction tests. All friction testing must be completed prior to final acceptance. The minimum acceptable values are an FN40R of 65 when tested under AASHTO T 242, or a DFT40 of 70 when tested under ASTM E1911. Any installation that does not meet the required friction values must be removed and replaced at no additional cost.

333-7 Method of Measurement.

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

333-8 Basis of Payment.

Payment will be made under:

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