

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-410-13

CODE: (SP)

DATE: 06/08/2016

SUBJECT: High Friction Surface Treatment

Section 410, Bituminous Surface Treatment, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby deleted in toto and replaced as follows.

SECTION 907-410 -- HIGH FRICTION SURFACE TREATMENT

907-410.01--Description. This work consists of installing a textured, high friction surface treatment in areas designated and detailed on the plans, or in the contract documents. The color of the high friction surface treatment shall be similar to the surface which it will be applied.

907-410.02--Materials. The materials used for the high friction surface treatment shall consist of a two-part binder and aggregate meeting the following requirements.

907-410.02.1--Binder. The binder shall be a two-part cold applied modified exothermic polymer resin binder. The binder shall consist of a thermosetting compound which holds the aggregate firmly in position. The binder shall also meet the following requirements.

<u>Property</u>	<u>Value</u>	<u>Test Method</u>
Tensile Strength @ 7 days, psi, minimum	2400	ASTM D 638
Elongation at break point, %, minimum	30	ASTM D 638
Hardness, Shore D, minimum	70	ASTM D 2240
Compressive Strength, psi, minimum	1600	ASTM D 695
Gel Time, minutes, minimum	15	ASTM C 881
Cure Rate, hours (dry through time), @ 75°F, maximum	3	ASTM D 1640
Water Absorption, %, maximum	1.0	ASTM D 570
Adhesion Strength, psi, minimum	200	ASTM D4541

907-410.02.2--Aggregate. The aggregate shall be crushed Calcined Bauxite. The aggregate will be delivered to the construction site in clearly labeled bags or sacks. The aggregate shall be clean, dry and free from foreign matter. The aggregate shall meet the following requirements:

<u>Property</u>	<u>Value</u>	<u>Test Method</u>
Aggregate Abrasion Value, 'C' Grading, maximum, %	20	AASHTO T 96
Aggregate Grading,		AASHTO T 27
No 4 Sieve Size, passing, %	95 - 100	
No 16 Sieve Size, passing, %	0 - 5	

907-410.02.3--Material Acceptance. The Contractor shall furnish to the Engineer three copies of the manufacturer's test report(s) showing results of all required tests and certification that the

material meets the specifications. Certified test report(s) and certification shall be furnished for each shipment of component materials.

907-410.03--Construction Requirements. For applications on new asphalt pavements, a mandatory 30-day cure period shall take place prior to the installation of the high friction surface treatment.

907-410.03.1--Application of Binder and Aggregate.

907-410.03.1.1--Equipment for Mechanical Application. Unless otherwise specified by the plans or the contract, the equipment used to place the high friction surface treatment shall be capable of placing the binder and aggregate in a continuous operation. The Contractor shall be able to periodically monitor the volume of binder and aggregate placed on the roadway as a verification of the proper application of both the mil thickness of the binder and the spread rate of the aggregate. The equipment shall be capable of placing the binder and aggregate in the same pass and at a minimum width of 12 feet.

The equipment for mechanical application shall produce a finished product meeting the requirement of this specification with no visible wet spots in which the binder is visible once the aggregate is installed. Hand work of the finished high friction surface treatment will not be allowed unless approved by the Engineer.

907-410.03.1.2--Hand Mixing and Application. Hand mixing of the binder and application of the aggregate may be allowed for small or irregular areas. These areas will be specified in the contract or directed by the Engineer. Areas considered for hand mixing and application will be areas in which the use of automated equipment is impractical.

The binder shall be spread onto the surface using a serrated edge squeegee to the specified thickness. Immediately following the application of the binder, the aggregate should be broadcast at slightly more than the specified rate such that the finished product contains no visible wet spots in which the binder is visible.

907-410.03.2--Construction Methods. The application of the surface treatment shall be in accordance with the manufacturer's recommendations.

The two-part polymer binder material shall not be applied on a wet surface, when the existing pavement surface temperature is below 50°F or above 105°F, or when the anticipated weather conditions would prevent the proper application of the surface treatment as determined by the manufacturer. The Contractor shall demonstrate that the polymer binder meets the specified cure rate dry through time of less than three (3) hours when cured at temperatures representative of the anticipated ambient placement temperature. Additionally, prior to placement of the high friction surface treatment, the Contractor shall demonstrate that there is not excessive moisture in the existing pavement by conducting ASTM D 4263 with the exception that a minimum 2-hour test duration will be allowed. In the event of rain at the job site, the Contractor will allow the pavement to dry a minimum of 24 hours prior to performing ASTM D 4263.

Receiving surfaces must be clean, dry and free of all dust, oil, debris and any other material that might interfere with the bond between the polymer binder material and existing surfaces. For asphalt pavements, the existing surfaces shall be cleaned by use of mechanical sweepers, high pressure air or other methods approved by the Engineer prior to the installation. For concrete surfaces, the surface shall first be shot blasted and then cleaned by use of mechanical sweepers, high pressure air or other methods approved by the Engineer. Shot blasting shall be performed no more than seven days prior to the application of the polymer binder.

Any existing pavement markings, as deemed necessary by the Engineer and/or manufacturer's representative, shall be removed. Adequate cleaning of all surfaces will be determined by the Engineer and/or manufacturer's representative.

All existing pavement markings to remain, utilities, drainage structures, curb and any other structure within/adjacent to the treatment location shall be protected against the application of the surface treatment materials.

All inadequately sealed joints and cracks greater than ¼-inch shall be cleaned and filled with an approved crack sealant.

A manufacturer's representative shall be on site to provide technical assistance during the start up operations and as necessary during the surface preparation, material placement and during any necessary remedial work.

907-410.03.2.1--Application of the Binder. The polymer binder shall be placed in accordance with the manufacturer's recommended methods. The in-place thickness of the mixed polymer shall be approximately 60 mils above the pavement surface. For irregular surfaces, the application rate may be adjusted, as determined by the manufacturer's representative. The two-part modified polymer binder components shall be proportioned to the correct ratio and, in the case of mechanical application, mixed within the automated machine. In the case of hand application, the binder shall be mixed using a low-speed, high-torque drill fitted with a helical stirrer at a rate recommended by the manufacturer.

The homogenously mixed polymer binder shall be uniformly distributed over the pavement section to be treated and within the temperature range specified. Operations shall proceed in such a manner that will not allow the polymer material to chill, set up, dry, or otherwise impair retention of the aggregate.

A certification from the two-part modified polymer resin manufacturer shall be supplied to the Engineer stating that the material meets the specifications.

907-410.03.2.2--Application of the Aggregate. The dry aggregate shall be immediately applied onto the polymer binder prior to the polymer binder reaching its gel time coverage. Do not use vibratory or impact type compaction on the aggregate after placement. Lightweight rollers shall be used to seat the aggregate topping. Complete coverage of the "wet" polymer binder with aggregate is necessary to achieve a uniform surface. No exposed wet spots shall be visible once

the aggregate is placed. The application rate shall be such that the retained aggregate will be at least 12 pounds per square yard.

Excess aggregate can be reused on the next day's installation. The excess aggregate shall be clean, uncontaminated and dry. If recovered aggregate from a previous day's installation is used, the recovered aggregate shall make up no more than 33% of the placed aggregate.

907-410.03.3--Curing And Opening to Traffic. The treatment shall be allowed to cure in accordance with manufacturer recommendations, but not less than three hours. Excess aggregate shall be removed by mechanical sweeping or suction sweeping before opening to traffic. The treated surfaces shall be protected from traffic and environmental effects until the area has cured.

An additional sweeping shall be performed 24 to 36 hours after placement of the high friction surface treatment. The coverage rate of the retained aggregate shall be at least 12 pounds per square yard. Any unused material shall be disposed of by the Contractor.

907-410.03.4--Friction Testing. Within 30 days after construction of the high friction surface treatment, the Department will measure the friction characteristics in accordance with AASHTO Designation: T 242 using a tire meeting the requirements of AASHTO Designation: M 261. The materials used in the high friction surface treatments shall produce a friction number of at least 65.

907-410.04--Method of Measurement. High friction surface treatment will be measured by the square yard, complete in place and accepted.

907-410.05--Basis of Payment. High friction surface treatment, measured as prescribed above, will be paid for at the contract unit price bid per square yard, which price shall be full compensation for furnishing all equipment, tools, labor, materials, and for all pertinent operations necessary to complete the work.

Payment will be made under:

907-410-D: High Friction Surface Treatment * - per square yard

* Additional information may be specified