

SPECIAL SPECIFICATION

3150

Warranted Microsurfacing (WMS)

1. **Description.** Furnish and place WMS as shown on the plans. Provide a Contractor’s warranty bond for 2-yr. Use the form provided by the Department.
2. **Materials.**
 - A. **Cationic Polymer-Modified Asphalt Emulsion.** Provide CSS-1P in accordance with Section 300.2.D, “Emulsified Asphalt.”
 - B. **Mineral Aggregates.** Furnish crushed aggregate from a single source meeting the requirements of Table 1 and Table 2. Provide aggregate from coarse aggregate sources listed in the Department’s Bituminous Rated Source Catalog (BRSQC). Provide aggregate from non-listed sources only when tested and approved by the Engineer before use. Allow 30 calendar days for the Engineer to sample, test, and report results for non-listed sources. Do not combine approved material with unapproved material. Include the amount of mineral filler added to the mix in determining the total minus No. 200 aggregate fraction.

Table 1
Aggregate Gradation Requirements
Tex 200-F, Part II (Washed)

Sieve Size	Cumulative % Retained
1/2"	0
3/8"	0-1
#4	6-14
#8	35-55
#16	54-75
#30	65-85
#50	75-90
#100	82-93
#200	85-95

Table 2
Aggregate Quality Requirements

Property	Test Method	Requirement
Surface Aggregate Classification (SAC), min	AQMP	A
Magnesium Sulfate Soundness, %, max	Tex-411-A	25
Coarse aggregate angularity, 2 crushed faces, % min	Tex-460-A, Part I	95
Sand Equivalent Value, %, min	Tex-203-F	70
Acid Insoluble (%), min	Tex-612-J	55

- C. Mineral Filler.** Provide a mineral filler that is free of lumps and foreign matter consisting of non-air-entrained cement meeting the requirements of DMS-4600, “Hydraulic Cement,” or hydrated lime meeting the requirements of DMS-6350, “Lime and Lime Slurry.”
- D. Water.** Provide water that is potable and free of harmful soluble salts.
- E. Other Additives.** Use approved additives as recommended by the emulsion manufacturer in the emulsion mix or in any of the component materials when necessary to adjust mix time in the field.
- F. Job-Mix Formula (JMF).** Provide a mix design conforming to the proportions shown in Table 3 and meeting the requirements shown in Table 4. The mix design is subject to verification using laboratory-produced mixes or trial batch mix before approval.

**Table 3
JMF Proportions**

Material	Proportion
Residual asphalt	6.0 to 9.0% by wt. of dry aggregate
Mineral filler (hydraulic cement or hydrated lime)	0.5 to 3.0% by wt. of dry aggregate
Field control additive	As required to provide control of break and cure
Water	As required to provide proper consistency

**Table 4
JMF Requirements**

Property	Test Method	Requirements
Wet track abrasion, g/sq. ft., max. wear value	Tex-240-F, Part IV	75
Gradation (aggregate and mineral filler)	Tex-200-F, Part II (Washed)	Table 1
Mix time, controlled to 120 sec.	Tex-240-F, Part I	Pass

Provide emulsion and aggregate that are compatible so that the mixing process will completely and uniformly coat the aggregate. Adjust the secondary strike-off to provide sufficient surface texture to maintain the required Skid Resistance.

- 3. Equipment.** Use equipment meeting the requirements of Article 350.3, “Equipment.”
- 4. Construction.**
 - A. General.** Produce, transport, and place WMS in accordance with Article 350.4, “Construction.”

Initial Performance Requirements. Meet Article 5, “Performance Requirements,” initially, after installation. After construction is complete, the Engineer will conduct an initial performance evaluation in accordance with Section 5.B, “Performance Evaluation Procedures.”

For WMS not meeting performance requirements, repair or replace until re-evaluation shows the WMS meets the performance requirements.

- B. Written Acceptance.** The Department will provide written acceptance after the Contractor meets the initial performance requirements. This written acceptance (see

attached sample form) will include the project information, location, length, and acceptance date of WMS.

5. Performance Requirements.

A. Performance Characteristic Requirements. Meet the WMS performance requirements in Table 1 for each lane-width, 0.1-mi. segment of WMS applied in the Contract, except for skid resistance. Meet the skid resistance performance requirement in Table 1 for each lane width for each test location.

Table 1

Performance Characteristic	Requirement¹
Flushing, %, max	5
Skid Resistance, SN50S, avg, min	25
Delamination, %, max	2
Weathering/Raveling, %, max	5
Rutting, in., max ²	3/8

1. These requirements are derived from industry performance standards and not from any safety requirements.

2. The Department will exclude from the warranty provisions pavement segments where the rut depth of the underlying pavement exceeded 1 in. The locations must be established by agreement before performing work.

B. Performance Evaluation Procedures. The Department will conduct performance evaluations for each lane-width, 0.1-mi. segment of the completed WMS. The Contractor may be present during these evaluations.

- 1. Flushing.** The Engineer will visually evaluate segments for excess asphalt binder on the WMS that creates a shiny, reflective condition that becomes tacky to the touch at higher temperatures. The Engineer will determine the percentage of flushed surface area based on the area of the segment.
- 2. Skid Resistance.** The Department will evaluate each 0.1-mi. segment of each lane-width for skid resistance according to ASTM E 274, SN50S [50 mph]. When the posted speed limit is less than 50 mph, the Department will evaluate the location at the posted speed limit. The Department will report the average SN50S of a test location unless shorter sections are needed to address site-specific conditions.
- 3. Delamination.** Delamination describes areas where the microsurfacing has debonded from the underlying pavement surface. The Engineer will visually evaluate segments for delamination and will determine the percentage of delaminated surface area based on the area of the segment.
- 4. Weathering/Raveling.** Weathering and raveling describes the wearing away of the microsurfacing from the underlying pavement surface course, caused by the

dislodging of aggregate particles (raveling) and loss of asphalt binder (weathering). The Engineer will visually evaluate each segment and determine the percentage of weathered/raveled surface area based on the area of the segment.

5. **Rutting.** The Engineer will place a 10 ft. straightedge across the lane width and perpendicular to the flow of traffic and measure rutting as the greatest perpendicular distance measured from the pavement surface to the bottom of the straightedge.

C. **Warranty Disclaimer.** The specifications and plan requirements do not relieve the contractor from warranty performance requirements, with the exception of the second to last paragraph under Article 6 of this specification.

6. **Contractor's Warranty Period.** The Contractor must provide a warranty bond using the Department-approved form, titled 'Contractor's Warranty Bond.' for the full bid price of WMS and traffic control, markings, and markers required for the WMS.

The Contractor's warranty period is for 2 yr. and starts the day after written acceptance of each separate project location. The Contractor is responsible for meeting Article 5, "Performance Requirements," for the duration of the warranty period.

During the warranty period, the Engineer will conduct periodic visual performance evaluations of WMS. The Contractor may be present during these evaluations. The Engineer may use Pavement Management Information System evaluations to monitor skid resistance and may conduct supplemental testing. For areas, which, in the opinion of the Engineer, have a questionable visual evaluation, the Contractor may replace the WMS or the Department will conduct a formal performance evaluation for the performance requirement in question in accordance with Section 5.B, "Performance Evaluation Procedures."

Replace WMS that fails to meet the performance requirements during the warranty period and within 30 days after notification following the procedures in Article 4, "Construction." All replacement WMS must meet the performance requirements in Article 5, "Performance Requirements." The end of the warranty period does not relieve the Contractor from the performance deficiencies requiring corrective action identified during the warranty period.

The Engineer may exclude WMS from the replacement provisions of the warranty period, provided the Engineer determines that the failure is a result of outside causes rather than defective material or workmanship. Examples of outside causes are damage by snow or ice removal and / or underlying pavement failure.

Provide a contact name, address, and phone number for notification of needed WMS corrective action. Perform corrective action in accordance with the original Contract, including traffic control, markings, and markers unless otherwise directed.

7. **Measurement.** WMS will be measured by the ton of the composite WMS mixture. The composite WMS mixture is defined as the asphalt emulsion, aggregate, and mineral filler.

A. **Asphalt Emulsion.** The quantity of polymer-modified asphalt emulsion in the accepted portion of work will be measured by the ton of material based on the accepted load tickets issued from the manufacturer. At the completion of the project, any unused

emulsion will be weighed back and deducted from the accepted asphalt emulsion quantity delivered.

- B. Aggregate and Mineral Filler.** The quantity of aggregate used in the accepted portion of work will be measured by net ticket weight of each individual load of aggregate based on dry weight of aggregate. Weigh the aggregate at the project stockpile site unless otherwise approved. Use either a suspended hopper scale or a belt scale meeting the requirements of Item 520, "Weighing and Measuring Equipment." The calculated weight of mineral filler based on the accepted portion of work will be used for measurement and included in the total aggregate weight.
- 8. Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Warranted Microsurfacing." This price is full compensation for preparing the existing surface (including removing existing raised pavement markers); furnishing, hauling, preparing, and placing materials; and equipment, labor, tools, and incidentals. Warranty work and corrective actions will not be paid for directly but will be subsidiary to the original Contract.

CONTRACTOR'S WARRANTY BOND	CONTRACT NO.	
	COUNTY	
	BOND NO	

KNOW ALL PERSONS BY THESE PRESENTS: That we, _____, an installing contractor of warranted microsurfacing, as Principal, and _____, as Surety, are held and firmly bound unto the State of Texas, as Oblige, in the penal sum of _____ Dollars \$ _____, lawful money of the United States, well and truly to be paid to the State of Texas, and we bind ourselves, our heirs, successors, executors, and administrators jointly and severally, firmly by these presents.

Whereas, the above bounden Principal has provided warranted microsurfacing to _____ for the foregoing contract entered into between _____ and the Oblige, attached hereto; and

Whereas, the Principal is required to protect the Oblige against any defects resulting from faulty warranted microsurfacing installed under said contract for a period of 2 years beginning the day after written acceptance.

Now, therefore, the condition of this obligation is such that if the above bounden principal, its heirs, successors, executors, and administrators shall promptly and faithfully carry out and perform the warranty as provided in said contract, and shall, within thirty days of due notice, replace any installed warranted microsurfacing that may fail to meet Oblige's performance evaluation as provided for in the Contract during the period specified above or shall pay over, make good, and reimburse to the said Oblige all loss and damage that said Oblige may sustain by reason of failure or default of said Principal so to do, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

Provided further that the end of a warranty period shall not relieve Principal from its obligation to correct deficiencies requiring corrective action, so long as those deficiencies are identified during the warranty period.

WITNESS our hand this _____ day of _____ 20 _____.

(Company Name)

****SURETY** (Print Firm Name and Seal)

By: _____
(Title)

* By: _____
(Company Officer)

* By: _____
(Company Officer)

****SURETY** (Print Firm Name and Seal)

By: _____
(Title)

****SURETY** (Print Firm Name and Seal)

By: _____
(Title)

Note:
 * Attach a Power of Attorney showing that the officer of the installing contractor has authority to sign this obligation.
 ** Attach a Power of Attorney showing that the surety officer or Attorney-In-Fact has authority to sign this obligation; the Power of Attorney and bond must be impressed with the corporate seal. The surety must be a US Treasury listed company and provide notification information.