

MICRO SURFACING SPECIFICATIONS

DESCRIPTION

The Contractor shall furnish all labor, equipment, material, supplies, signage, traffic control, and other incidentals necessary to provide Micro Surfacing. Micro Surfacing shall consist of a mixture of an approved polymer-modified emulsified asphalt, mineral aggregate, water, and specified additives, proportioned, mixed and uniformly spread over a properly prepared asphalt surface. The completed Micro Surfacing shall leave a homogeneous mat, adhere firmly to the prepared surface, and have a skid-resistant surface texture throughout its service life.

MATERIALS

Emulsified Asphalt Material – The emulsion for Micro Surfacing shall be Emulsified Asphalt (CQS-1P) conforming to CDOT Table 702-12. The modified emulsion shall contain a minimum of 3% polymer, SBR latex, or natural latex by weight.

Test on Emulsion	Minimum	Maximum	AASHTO Test
Viscosity, Say bolt Furol, 25 C (77 F),s	15	100	T-59
Storage Stability Test, One day, %		1	T-59
Particle Charge Test	Positive		
Sieve Test, %(a)		0.1	T-59
Distillation:			
Oil distillate, by volume, %	-	.5	T-59
Residue, %	62*	-	T-59
Test on Residue from Distillation:			
Penetration, 25 C (77 F), 100g (.22 lbs), 5s	40	90	T-49
Ductility, 25 C (77 F), 50 mm (2") / sec	50	-	T-51
Solubility in Trichloroethylene, %	97	-	T-44
Softening Point, Ring-and-Ball, C (F)	57.2 (135)	-	T-53

*The standard distillation procedure shall be modified as follows:

The temperature on the lower thermometer shall be brought slowly to 350 F +/- 20 F and maintained at this point for 20 minutes. The total distillation shall be completed in 60+/- 5 minutes from the first application of heat.

AGGREGATE - The aggregate shall consist of manufactured granite crusher fines. The smooth textured crusher fines shall have less than 1.25% water absorption. The aggregate shall be gray in color and clean and free from organic matter, other deleterious substances and clay balls. Oversized granular material and/or presence of clay balls will require the project to be stopped and shall meet the following requirements:

Gradation Table – Aggregate (percent passing)

Sieve Size	Type II	Type III	Tolerance
3/8"	100	100	
No.4	90-100	70-90	+ or - 5%
No. 8	65-90	45-70	+ or - 5%
No. 16	45-70	28-50	+ or - 5%
No. 30	30-50	19-34	+ or - 5%
No. 50	18-30	7-18	+ or - 4%
No. 100	10-21	7-18	+ or - 3%
No. 200	5-15	5-15	+ or - 2%

- Resistance to Degradation (ASTM C131grading D) 20% maximum loss
- Soundness of Aggregate (ASTM C88) 15% maximum loss
- Sand Equivalent Value (ASTM D2419^A) 55 minimum
- LA Abrasion (AASHTO T96) 20% maximum loss

Mineral Filler: Hydrated lime, cement, or other approved filler meeting the requirements of ASTM D242 shall be used if required by the mix design. They shall be considered as part of the dry aggregate.

Water: All water used shall be potable and free of dissolved materials which may affect the mix characteristics or finished characteristics of the product. Filler shall be of the specific type specified in the mix design.

Additives: Additives may be used to accelerate or retard the break-set of the Micro Surfacing or to improve the resulting finished surface. The use of additives in the Micro Surfacing mix (or individual materials) shall be made initially in quantities predetermined by the mix design with field adjustments, if required, after approval by the Project Manager.

Micro Surfacing Mix Design Specifications: Before work begins, the Contractor shall submit a mix design covering the specific materials to be used on the project. The manufacturer of the polymer modified emulsion shall develop the job mix formula and present certified test results for the Contractor's approval. Compatibility of the aggregate and polymer modified emulsified asphalt shall be certified by the emulsion manufacturer. The mix design shall be in accordance with the ISSA TB-136 Wet Track Abrasion Loss, Six Day Soak with a maximum loss of 75 grams/sf. The emulsion supplier shall also provide a base line of emulsion to the owner for testing of latex percentages. The Micro Surfacing mixture shall meet the following specifications:

ISSA TEST NO.	DESCRIPTION	SPECIFICATION
ISSA TB-113	Mix Time at 77°F	Controllable to 120 seconds minimum
ISSA TB-114	Wet Stripping	Pass (90% Minimum)
ISSA TB-139	Wet Cohesion @ 30 Minutes Minimum (Set)	12 kg-cm Minimum

	@ 60 Minutes Minimum (Traffic)	20 kg-cm or Near Spin Minimum
ISSA TB-100	Wet-Track Abrasion Loss One-hour Soak Six-day Soak	50 g/ft ² (538 g/m ²) Maximum 75 g/ft ² (807 g/m ²) Maximum
ISSA TB-147	Lateral Displacement Specify Gravity after 1,000 Cycles of 125 lb (56.71 kg)	5% Maximum 2.10 Maximum
ISSA TB-109	Excess Asphalt by LWT Sand Adhesion	50 g/ft ² (538 g/m ²) Maximum
ISSA TB-144	Classification Compatibility	11 Grade Points Minimum (AAA, BBA)

Composition of mixture: The owner shall approve the design mix and all Micro Surfacing materials and methods prior to use and shall designate the proportions to be used within the following limits:

Residual Asphalt	5.5% to 10.5% by dry weight of aggregate
Mineral Filler	0% to 3% by dry weight of aggregate
Polymer Based Modifier	Shall be a minimum of 3% solids content
Water (Potable)	As required to provide proper consistency

Equipment: The machine shall be specifically designed and manufactured to apply Micro Surfacing. The material shall be mixed by an automatic-sequenced, self-propelled Micro Surfacing mixing machine. It shall be a continuous-flow mixing unit that accurately delivers and proportions the mix components through a revolving multi-blade, double-shafted mixer. Sufficient storage capacity for all mix components is required to maintain an adequate supply to the proportioning controls.

When specifying continuous machinery to minimize transverse joints, the specified machine must be capable of loading materials while continuing to apply Micro Surfacing. The continuous-run machine shall be equipped to provide the operator with full control of the forward and reverse speeds during application. It shall be equipped with opposite-side driver stations to assist in alignment. The self-loading device, opposite-side driver stations, and forward and reverse speed controls shall be of original-equipment-manufacturer design.

Spreading Equipment: The mixture shall be agitated and spread uniformly in the surfacing box by means of twinshafted paddles or spiral augers fixed in the spreader box. A front seal shall be provided to insure no loss of the mixture at the road contact point. The rear seal shall act as a final strike-off and shall be adjustable. The spreader box and rear strike-off shall be so designed and operated that a uniform consistency is achieved and a free flow of material is provided to the rear strike-off. The spreader box shall have suitable means provided to side shift the box to compensate for variations in the pavement geometry.

Calibration: Each mixing unit to be used in the performance of the work shall be calibrated in the presence of the B.A.R. prior to the start of the project. Previous calibration documentation covering the exact materials to be used may be acceptable, provided that no more than 60 days have lapsed. The documentation shall include an individual calibration of each material at various settings that can be related to the machine metering devices. Any component replacement affecting material proportioning requires that the machine be recalibrated. No machine will be allowed to work on the project until the calibration has been completed and/or accepted. ISSA Inspector's Manual describes a method of machine calibration. ISSA contractors and/or machine manufacturers may also provide methods of machine calibration.

Lines: Care shall be taken to insure straight lines along curbs and shoulders. No runoff on these areas will be permitted. Lines at intersections shall be kept straight to provide a good appearance.

Handwork: Approved hand squeegees, with burlap drags, shall be used to spread Micro Surfacing in areas not accessible to the Micro Surfacing spreader box. Care shall be exercised in leaving no unsightly appearance from handwork.

Curing: Areas receiving Micro Surfacing will be allowed to cure from one to three hours or until the treated pavement will not be damaged by traffic. The Contractor will protect the area with suitable barricades or markers for the full curing period. Areas which are damaged within 24 hours of application of Micro Surfacing, or prior to moving to new work locations, shall be repaired by the Contractor at his expense.

Surface Preparation: Immediately prior to applying the Micro Surfacing, the surface shall be cleared of all loose material, oil spots, vegetation and other objectionable material. Any standard cleaning method will be acceptable. If water is used, cracks shall be allowed to dry thoroughly before Micro Surfacing. Manholes, valve boxes, drop inlets and other service entrances shall be protected from the Micro Surfacing by a suitable method. The Project Manager shall approve the surface preparation prior to surfacing.

Weather Limitations: Micro surfacing shall not be applied if either the pavement or air temperature is below 50°F (10°C) and falling, but may be applied when both pavement and air temperatures are above 45°F (7°C) and rising. No Micro Surfacing shall be applied when there is the possibility of freezing temperatures at the project location within 24 hours after application. The Micro Surfacing shall not be applied when weather conditions prolong opening to traffic beyond a reasonable time.

Notification: All homeowners and businesses affected by the paving shall be notified 24 hours in advance of the surfacing. Suitable tow-away signs may be posted prior to the surfacing. Should work not occur on the specified day, a new notification will be distributed. The notification shall be in a form of written posting, stating the time and date that the surfacing will take place.

Traffic Control: Suitable methods shall be used by the contractor to protect the Micro Surfacing from damage from all types of vehicular traffic. Opening to traffic does not constitute acceptance of the work. The Project Manager shall be notified of the methods to be used. In areas that are subject to an increased rate of sharp-turning vehicles, additional time may be required for a more complete cure of the Micro Surfacing mat to prevent damage. Slight tire marks may be evident in these areas after opening but will diminish over time with rolling traffic. If these areas are not severely rutted, they should be considered as normal characteristics of a Micro Surfacing.

Clean Up: All areas, such as man-ways, gutters and intersections, shall have the Micro Surfacing removed as specified by the Project Manager. The Contractor shall remove any debris associated with the performance of the work on a daily basis.

Payment: The Micro Surfacing shall be measured and paid for by the square yards on the work completed and accepted by the buyer. The price shall be full compensation for furnishing all materials; for preparation, mixing and applying these materials; and for all labor, equipment, tools, test design, cleanup and incidentals necessary to complete and warrant the job as specified herein.

PAY ITEM
Micro Surfacing

PAY UNIT
S.Y.