

Illinois D.O.T. Specification

SECTION 448. MICRO-SURFACING

448.01 Description. This work shall consist of a latex modified asphalt pavement course to fill ruts and/or provide a wearing course for existing pavements.

448.02 Materials. Materials shall meet the requirements of the following Articles of Section 1000 – Materials:

Item	Article/Section
(a) Aggregate (Note 1)	
(b) Mineral Filler (Note 2).....	1001
(c) Water.....	1002
(d) Latex Modified Emulsified Asphalt.....	1009.07

Note 1. The aggregate shall be 100% crushed material and shall be crushed limestone, crushed dolomite, crushed sandstone, crushed air-cooled blast furnace slag, or crushed gravel, Class A quality meeting the gradation limits in the Table below and the physical properties of Article 1003.01. When used as a surface course, the aggregate shall conform to the friction requirements of the Department's "Skid Accident Reduction Program".

Gradation Limits for Aggregate

<u>Percent Passing Sieve</u>	<u>Surface Mix</u>	<u>Rutfill Mix</u>
½ inch	100	100
3/8 inch	100	90 - 100
No. 4	85 - 100	55 - 75
No. 8	50 - 80	40 - 55
No. 16	40 - 65	25 - 40
No. 30	25 - 45	19 - 34
No. 50	13 - 25	10 - 20
No. 200	5 - 15	4 - 10

Note 2. Mineral filler shall be Type 1 portland cement.

448.03 Equipment. Equipment shall meet the requirements of the following Articles of Section 1100 – Equipment:

Item	Article/Section
(a) Micro-Surfacing Mixing Machine.....	1102.11
(b) Micro-Surfacing Spreader.....	1102.12

448.04 General. The paving mixture shall be capable of filling up to 1-1/2 inch wheel ruts in one pass, be capable of field regulation of the setting time, and be suitable for nighttime placement. The compatibility of all ingredients of the mix, including the mix set additive, shall be certified by the emulsified asphalt manufacturer.

448.05 Proportioning. An independent laboratory provided by the contractor shall develop the Job Mix Formula (JMF) for the paving mixture, shall verify the functioning of the set regulating additives, and shall present certified test results for the Engineer's approval. The JMF shall have a minimum Marshall Stability of 1,800 lbs. And a flow of 6 to 16 units when tested according to ASTM D 1559

except air drying of the mixture at 70-75°F for three days before reheating and placing the material to be used on the project.

Proportions for the JMF shall be within the following limits:

Mineral Aggregate, dry mass (weight) lbs. per sq. yd.	15 – 50
Latex Emulsified Asphalt Residue, % by Weight of Aggregate	6.0 – 8.0
Latex Base Modifier	As required with % by mass (weight) of Binder, min. 2.5
Mix Set Additive	As required
Mineral Filler, % by mass (weight) of Aggregate	0.5 –2.5, depending on weather conditions

The Engineer shall approve the JMF prior to its use. After approval, the Contractor shall maintain continuous control of the latex-modified emulsified asphalt to dry aggregate proportioning to conform to the approved JMF within a tolerance of ±2 gals. per ton.

448.06 Weather Limitations. The mixture shall be placed only when it is not raining, and when the temperature is at least 40° F and rising and the forecast for the next 24 hours is above 32° F. Applications after October 31 and before March 31 will not be permitted when the temperature is less than 50° F.

448.07 Surface Preparation. Prior to applying the mixture, the Contractor shall clean the surface by removing vegetation, loose materials, dirt, mud and other objectionable materials. Water shall be misted on the existing pavement surface immediately prior to applying the asphalt mixture. A tack coat will be required on Portland cement concrete surfaces. The tack coat shall be limited to emulsified asphalts as outlined in Article 406.02 and shall be applied at a rate of 0.05 – 0.10 gallon per square yard. According to Article 406.06(b).

448.08 Application. If rut-filling is called for on the plans, the micro-surfacing shall be performed in two operations. The first operation shall include filling each of the two wheelpath ruts in a lane using the specially-designed rutbox and the rutfill mix. The second operation shall include a single application of the surface mix over the entire width of the lane and spread at a rate to provide a minimum of 15 pounds per square yard of aggregate (dry weight) in the mixture. It shall be the Contractor's responsibility to determine and estimate the quantities of rutfill mix required for rut filling.

For other than rut filling, the micro-surfacing shall consist of the application of the surface mix over the entire width of each lane in 2 passes to provide a total rate of application of not less than 30 pounds per square yard of aggregate (dry weight) in the mixture. The rate of application per pass may vary somewhat from one-half the total minimum rate at the option of the Contractor. For example, the Contractor may choose to place the surface mixture at a rate to provide 12

pounds per square yard of aggregate (dry weight) on the first pass and 18 pounds per square yard on the second pass. Unless otherwise directed by the Engineer, all hand work shall be completed during the first pass.

Determinations of application rates shall be from daily readings taken from the material control devices during the progress of the work.

Micro-surfacing edges shall be parallel with the existing pavement edges. If the existing pavement edge cannot be used to give a straight edge, a string line or other guide will be required.

The paving mixture shall be spread to fill minor cracks and shallow potholes and leave a uniform surface. Care shall be taken when rut filling to restore the designed profile of the pavement cross section. Excess crowning (over-filling) of rut areas shall be avoided. A sufficient amount of material shall be carried at all times in all parts of the spreader box to ensure complete coverage. No lumps or unmixed aggregate will be permitted in the finished surface.

A smooth, neat seam shall be provided where two passes meet. Excess material shall be immediately removed from the ends of each run. Any damage to, or irregularities in, the micro-surfacing shall be repaired by the Contractor at his/her own expense, as directed by the Engineer. All repairs shall be made with a paver box, except areas designated as hand work areas.

Those areas inaccessible to the spreader box and other areas approved by the Engineer shall be designated as hand work areas. Adjustments to the additive are permitted to provide a slower setting time when hand spreading is needed. If hand spreading is necessary, the mixture shall be poured in a small windrow along one edge of the surface to be covered and then spread uniformly by a hand squeegee or lute.

448.09 Sampling and Testing. The Contractor shall be responsible for all sampling and testing, and for furnishing all test results to the Engineer. The Contractor, in the presence of the Engineer, shall take a minimum of two samples per day for extraction/gradation analyses. The samples shall be taken from the pugmill discharge chute using a rectangular non-absorptive container, such as a loaf pan, of sufficient size to obtain a sample from the entire cross section of the mixture being discharged. Each sample should weigh from 2.5 to 4 lbs. Each sample shall be tested to determine the asphalt content and gradation of aggregate in the mixture. The testing shall be performed according to the requirements of the Department's "Manual of Instructions for Bituminous Proportioning and Testing".

448.10 Opening to Traffic. Micro-surfacing shall be capable of producing an emulsified asphalt paving mixture that will cure at a rate which will permit traffic on the pavement within one hour after application without damaging the pavement surface. Any damage done by traffic to the micro-surfacing shall be repaired by the Contractor at his/her expense.

448.11 Method of Measurement.

- (a) Contract Quantities. The requirements for the use of contract quantities shall conform to Article 202.07(a).
- (b) Measured Quantities. When rut filling is called for, micro-surfacing for the surface mix placed in one pass will be measured for payment in place and the area

computed in square yards. The width for measurement will be the width of the top surface as shown on the plans or as directed by the Engineer. Micro-surfacing for rut filling will be measured for payment in place in feet along the wheel path or filled rut.

For other than rut filling. Micro-surfacing for the surface mix placed in two passes will be measured for payment in place as specified above for the surface mix placed in one pass.

448.12 Basis of Payment. When rut filling is called for, this work will be paid for at the contract unit price per square yard for MICRO-SURFACING one pass and per foot for MICRO-SURFACING RUT FILLING.

When rut filling is not needed or called for on the plans, this work will be paid for at the contract unit price per square yard for MICRO-SURFACING TWO PASSES.

The above prices shall be considered as payment in full for the work complete in place, including the furnishing of all materials, (including tack coat if required) labor, equipment and incidentals necessary to complete the work as specified herein.