



# Illinois Department of Transportation

## Memorandum

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To: Regional Engineers  
From: Jack A. Elston   
Subject: Special Provision for Micro-Surfacing and Slurry Sealing  
Date: September 25, 2020

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This special provision was developed by the Bureau of Research (BR) and Central Bureau of Materials to update the slurry systems specification. It has been revised to include BR PT001 "Micro-Surfacing Job Mix Formula Form" and BR PT002 "Slurry Seal Job Mix Formula Form", which add mix design and quality assurance requirements.

This special provision should be inserted into contracts using micro-surfacing, slurry seal, or cape seal.

The districts should include the BDE Check Sheet marked with the applicable special provisions for the January 15, 2021 and subsequent lettings. The Project Coordination and Implementation Section will include a copy in the contract.

This special provision will be available on the transfer directory September 25, 2020.

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## MICRO-SURFACING AND SLURRY SEALING (BDE)

Effective: January 1, 2020

Revised: January 1, 2021

Revise Article 404.02 of the Supplemental Specifications to read:

**“404.02 Materials.** Materials shall be according to the following.

Item	Article/Section
(a) Cement (Note 1) .....	1001
(b) Water .....	1002
(c) Fine Aggregate (Note 2) .....	1004
(d) Bituminous Material (Tack Coat) .....	1032.06
(e) Emulsified Asphalts (Note 3)(Note 4) .....	1032.06
(f) Fiber Modified Joint Sealer .....	1050.05
(g) Additives (Note 5)	

Note 1. The cement shall be Type 1 portland cement.

Note 2. The fine aggregate material shall be Class B quality. Rut filling mixes shall be constructed using FA 23 gradation. Surface mixes shall be constructed using FA 24 gradation.

The aggregate shall be stone sand, wet bottom boiler slag, slag sand, granulated slag sand, steel slag sand, and crushed concrete sand. The blending, alternate use, and/or substitutions of aggregates from different sources for use in this work will not be permitted without the approval of the Engineer. Any blending shall be by interlocked mechanical feeders. The blending shall be uniform, compatible with the other components of the mix, and the equipment shall be approved by the Engineer.

If blending aggregates, the blend shall have a washed gradation performed every other day or a minimum of three tests per week. Testing shall be completed before the aggregate receives final acceptance for use in the mix.

Aggregates shall be screened at the stockpile prior to delivery to the paving machine to remove oversized material or contaminants.

Note 3. Slurry seal emulsions shall be CQS-1h.

The cement mixing test will be waived for this emulsion.

Note 4. Micro-surfacing emulsions shall be CQS-1hP.

Note 5. Additives may be added to the emulsion mix or any of the component materials to provide the control of the quick-traffic properties. They shall be included as part of the mix design and be compatible with the other components of the mix.”

Revise Article 404.06 of the Supplemental Specifications to read:

**“404.06 Mix Design.** Prior to beginning work, the Contractor shall submit designs for each required mixture to the Department for verification and approval. The mixture design shall be performed at a laboratory accredited for pavement preservation testing by AASHTO Re:source in addition to the following.

- (a) Micro-Surfacing. The micro-surfacing mix design shall be according to the Bureau of Research’s (BR) PT001 “Micro-Surfacing Job Mix Formula Form”.

Materials for the mix design shall be within the following limits.

Material	Limits
Mineral Aggregate, lb/sq yd (kg/sq m) dry weight (mass)	15 - 50 (8 - 30)
Latex Emulsified Asphalt Residue, % by weight (mass) of aggregate	7.0 - 10.5
Latex Base Modifier, % by weight (mass) of binder	3.0 min.
Mix Set Additive	Per laboratory requirements
Cement, % by weight (mass) of aggregate <sup>1/</sup>	0.25 – 3.00 depending on weather conditions

1/ Cement shall be considered as part of the aggregate gradation.

The Department will verify the micro-surfacing sample according to the following acceptable limits.

Illinois Modified AASHTO T 164 Requirements	
Parameter	Acceptable Range
Asphalt Binder Content	± 1.0 %
Moisture Content	± 1.5 %

- (b) Slurry Seal. The slurry seal mix design shall be according to the BR PT002 “Slurry Seal Job Mix Formula Form”.

Materials for the mix design shall be within the following limits.

Material	Limits
Mineral Aggregate, lb/sq yd (kg/sq m) dry weight (mass)	15 - 25 (8 - 15)
Emulsified Asphalt Residue, % by weight (mass) of aggregate	7.5 - 13.5
Mix Set Additive	Per laboratory requirements
Cement, % by weight (mass) of aggregate <sup>1/</sup>	0.0 - 3.0 depending on weather conditions

1/ Cement shall be considered as part of the aggregate gradation.

After the mix design is approved, no substitutions will be permitted unless approved by the Engineer.”

Revise Article 404.07 of the Supplemental Specifications to read:

“**404.07 Test Strip.** For each contract over 70,000 sq yd (58,500 sq m), at least one day prior to starting the project the Contractor shall designate a mutually agreeable location and apply a test strip of the slurry system using the approved mix design. The test strip shall be placed during the same time of day in which the normal placement will take place. The Engineer will evaluate the slurry system application rate and cure time.”

Revise the second paragraph of Article 404.08 of the Supplemental Specifications to read:

“Raised reflective pavement markers shall be removed according to Article 783.03(b) and holes filled with HMA, rut filling mix, or other material approved by the Engineer.”

Revise the fourth paragraph of Article 404.08 of the Supplemental Specifications to read:

“Joints and cracks 3/16 in. (5 mm) or wider shall be cleaned of vegetation, loose and unsound material and filled. The sealant shall be applied only when the joints and cracks are clean and dry, and the ambient temperature is 40-85 °F (4-29 °C). The sealant shall be applied using a pressurized wand delivery system with such devices as necessary to fill the cracks/joints and form a nominal 0.125 in. (3 mm) thick by 3 in. (75 mm) wide overseal band centered so the center of the 3 in. (75 mm) wide band is within 1 in. (25 mm) of the crack. The sealant shall be allowed to cure before opening to traffic. When approved by the Engineer, the sealant may be dusted with fine sand, portland cement, or mineral filler to prevent tracking.”

Revise the second sentence of Article 404.09(a) of the Supplemental Specifications to read:

“A tack coat shall be applied uniformly at a rate that will provide a residual rate of 0.025 lb/sq ft (0.122 kg/sq m) for HMA surfaces and/or 0.05 lb/sq ft (0.244 kg/sq m) for concrete surfaces according to Article 406.05(b).”

Revise the last sentence of Article 404.09(b)(1) of the Supplemental Specifications to read:

“This work is then followed by the micro-surfacing type shown in the plans and as described below.”

Revise Article 404.09(b)(2) of the Supplemental Specifications to read:

“(2) Micro-Surfacing, Single Pass. This method shall consist of applying the surface mix over the entire width of each lane in one pass at an application rate of not less than 20 lb/sq yd (11 kg/sq m).”

Add the following to Article 404.09(b) of the Supplemental Specifications:

“(3) Micro-Surfacing, 2 Passes. This method shall consist of applying the surface mix over the entire width of each lane in two passes to provide a total rate of application of not less than 32 lb/sq yd (17 kg/sq m). The rate of application per pass shall be  $16 \pm 3$  lb/sq yd ( $9 \pm 1.6$  kg/sq m). Unless otherwise directed by the Engineer, all hand work shall be completed during the first pass.

The second pass shall be placed not less than 18 hours after placing the first pass and the first pass is free of surface moisture.”

Add the following after the second paragraph of Article 404.09(b) of the Supplemental Specifications to read:

“The moisture of the aggregate shall be measured and recorded at a minimum of once daily. Additional moisture testing may be required if conditions change or at the discretion of the Engineer.

The Contractor shall maintain continuous control of the latex-modified emulsified asphalt to dry aggregate proportioning to conform to the approved mix design within a tolerance of  $\pm 2$  gal/ton ( $\pm 8$  L/metric ton).”

Revise the second sentence of the last paragraph of Article 404.09(b) of the Supplemental Specifications to read:

“The cement in the mix design may be increased or decreased by less than 0.5 percent when the micro-surfacing is being placed if it is found to be necessary for better consistency or set times.”

Revise the second sentence of Article 404.10(a) of the Supplemental Specifications to read:

“A tack coat shall be applied uniformly at a rate that will provide a residual rate of 0.025 lb/sq ft (0.122 kg/sq m) according to Article 406.05(b).”

Revise the second sentence of the last paragraph of Article 404.10(b) of the Supplemental Specifications to read:

“The cement in the mix design may be increased or decreased by less than 0.5 percent when the slurry seal is being placed if it is found to be necessary for better consistency or set times.”

Add the following to Article 404.12 of the Supplemental Specifications:

“The Contractor shall provide a copy of the paver calibration to the Engineer for verification and approval. The calibration shall be performed a minimum of once per job mix formula (JMF), per contract.

The Contractor shall collect a minimum of one sample per JMF in the presence of the Engineer. More samples may be collected at the discretion of the Engineer to address any issues on the job. Material for the sample shall be collected from the loading shoot of the pug mill prior to being deposited into the drag box. The sample shall be placed in a 1 gal (3.8 L) sealed plastic bag. Enough material shall be collected, evenly distributed in the plastic bag and laid flat to form approximately 1/2 in. (13 mm) of material. The bag shall be squeezed to remove excess air, sealed, and placed on a hard, flat surface. After allowing the bag to sit flat for 15 minutes, it shall be picked up and evaluated. The material should have turned black and show positive signs of setting up (stiffening). The results at 15 minutes shall be documented and the sealed bag placed into a 1 gal (3.8 L) friction top container and sent to the Department for AB content testing.”

Add the following to Article 404.15(b) of the Supplemental Specifications:

“(3) Micro-surfacing, 2 Passes. Micro-surfacing, 2 passes will be measured for payment in place and the area computed in square yards (square meters). The width for measurement will be the width of the top surface as shown on the plans or as directed by the Engineer.”

Revise the fifth and sixth paragraphs of Article 404.16 of the Supplemental Specifications to read:

“Micro-surfacing, single pass will be paid for at the contract unit price per square yard (square meter) for MICRO-SURFACING, SINGLE PASS.

Slurry seal will be paid for at the contract unit price per square yard (square meter) for ASPHALTIC EMULSION SLURRY SEAL.”

Add the following to Article 404.16 of the Supplemental Specifications:

“Micro-surfacing, 2 passes will be paid for at the contract unit price per square yard (square meter) for MICRO-SURFACING, 2 PASSES.”

Add the following gradations to the tables in Article 1003.01(c) of the Standard Specifications:

"FINE AGGREGATE GRADATIONS											
Grad No.	Sieve Size and Percent Passing										
	3/8	No. 4	No. 8 <sup>4/</sup>	No. 10	No. 16	No. 30 <sup>5/</sup>	No. 40	No. 50	No. 80	No. 100	No. 200 <sup>1/</sup>
FA 23	100	80±10	57±13		39±11	26±8		18±7		12±6	10±5
FA 24	100	95±5	77±13		57±13	35±10		19±6		15±6	10±5

FINE AGGREGATE GRADATIONS (Metric)											
Grad No.	Sieve Size and Percent Passing										
	9.5 mm	4.75 mm	2.36 mm <sup>4/</sup>	2.00 mm	1.18 mm	600 μm <sup>5/</sup>	425 μm	300 μm	180 μm	150 μm	75 μm <sup>1/</sup>
FA 23	100	80±10	57±13		39±11	26±8		18±7		12±6	10±5
FA 24	100	95±5	77±13		57±13	35±10		19±6		15±6	10±5"

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