
Standard Practice for Slurry Seal Design

**AASHTO Designation: PP xx-17
Technical Section: 2a
Release: Group 3 (Month yyyy)**



**American Association of State Highway and Transportation Officials
444 North Capitol Street N.W., Suite 249
Washington, D.C. 20001**

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1. SCOPE

- 1.1. This standard practice for mix design evaluation uses mixture properties to determine the proportions of emulsified asphalt, mineral aggregate, water, mineral filler, and additives to produce a Slurry Seal job-mix formula.

2. REFERENCED DOCUMENTS

2.1. *AASHTO Standards:*

- M 17, Mineral Filler for Bituminous Paving Mixtures
- M 85, Portland Cement
- M 208, Standard Specification for Cationic Emulsified Asphalt
- M 295, Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
- M 303, Lime for Asphalt Mixtures
- MP xx, Materials for Slurry Seal

2.2. *ANSI Standard:*

- NSF/ANSI 60-2013, Drinking Water Treatment Chemicals-Health Effects

2.3. *ISSA Standards:*

- ISSA TB 100, Test Method for Wet Track Abrasion of Slurry Surfacing Systems
- ISSA TB 106, Measurement of Slurry Seal Consistency
- ISSA TB 109, Test Method for Measurement of Excess Asphalt in Bituminous Mixtures by Use of a Loaded Wheel Tester and Sand Adhesion
- ISSA TB 113, Test Method for Determining Mix Time for Slurry Surfacing Systems
- ISSA TB 114, Test Method for Wet Stripping of Cured Slurry Surfacing Mixtures
- ISSA TB 139, Test Method to Determine Set and Cure Development of Slurry Surfacing Systems by Cohesion Tester
- ISSA TB 147, Test Methods for Measurement of Stability and Resistance to Compaction, Vertical and Lateral Displacement of Multilayered Fine Aggregate Cold Mixes

3. SIGNIFICANCE AND USE

- 3.1. The procedure described in this standard practice is used to produce a Slurry Seal job- mix formula.

4. EVALUATION OF MATERIALS

- 4.1. Evaluate the aggregate in accordance with the requirements of MP XX.
- 4.2. Evaluate the emulsified asphalt in accordance with the requirements for CQS-1H in M 208
- 4.3. Evaluate the mineral filler in accordance with M 17 for bituminous mineral filler, M 85 for cement, M 295 for fly ash, M 303 for lime and ANSI 60 for aluminum sulfate.
- 4.4. Water shall be free of harmful salts and contaminants. If the quality of the water is in question, it should be submitted to the mix design laboratory for analysis along with the other raw materials to be used in the mix design.

5. DESIGN PROCESS

- 5.1. Evaluate mix formulations for system performance using the tests, methods and requirements outlined in Table I.

Table 1—Evaluation of Slurry Seal Performance

Test	ISSA Technical Bulletin	Requirement
Mix Time @ 77°F (25°C)	TB 113	Controllable to 180 s, Min
Slurry Seal Consistency	TB 106	2.0-3.0 cm (0.79-1.18 in)
Wet Cohesion (for quick traffic systems)	TB 139	
@ 30 minutes (Set)		12 kg-cm, Min
@ 60 minutes (Traffic)		20 kg-cm or Near Spin, Min
Wet Stripping	TB 114	Pass (90% Min)
Wet-Track Abrasion Loss	TB 100	
1-hr Soak		75 g/ft ² (807 g/m ²), Max
Excess Asphalt by LWT Sand Adhesion	TB 109	50 g/ft ² (538 g/m ²), Max

6. DETERMINING MIX TIME

- 6.1. Determine mix time in accordance with ISSA TB 113 and the requirements of Table 1. Emulsified asphalt percentages should result in mixture residual binder contents of 5.5 to 10.5 percent.

7. DETERMINING SLURRY SEAL CONSISTENCY

- 7.1. Determine mixture consistency in accordance with ISSA TB 106 and the requirements of Table 1.

8. DETERMINING SET AND CURE CHARACTERISTICS (TRAFFIC READINESS)

- 8.1. Determine initial set and cure development characteristics in accordance with ISSA TB 139 and the requirements of Table 1.

9. DETERMINING BINDER CONTENT

- 9.1. The minimum binder content is determined by excessive mixture loss in accordance with ISSA TB 100 and the requirements of Table 1. In general select 1 percent more emulsified asphalt (at 62 percent residue) from TB 100 with a tolerance of ± 0.5 percent emulsified asphalt during placement.
- 9.2. The maximum binder content is determined in accordance with ISSA TB 109 and TB 147 and the requirements of Table 1.

10. DETERMINING ASPHALT-TO-AGGREGATE COMPATIBILITY

- 10.1. Evaluate the potential of the mixture for stripping in accordance to ISSA TB 114 and the requirements of Table 1.

11. REPORT

- 11.1. Report all test results from Sections 4, 6, 7, 8 and 9.
- 11.2. Report the recommended mix formulation including proportions of all mixture components and appropriate tolerances.

12. KEYWORDS

- 12.1. Slurry Seal; emulsified asphalt, mineral filler.