INTERNATIONAL SLURRY SURFACING ASSOCIATION

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800 Roosevelt Road, Building C-312, Glen Ellyn, IL 60137

Method to Estimate Slurry Seal Spread Rates and to Measure Pavement Macrotexture

This bulletin is distributed as a part of the R & D committee's Spread Rate Task Force Project. Members are encouraged to use the methods described this season and to report their comparative results to the committee.

1. Scope

1.1 This sand box method for the measurement of pavement macrotexture offers a method for the common understanding of the demand of a volumetric Technique.

2. Summary of the Method

2.1 A simple sand box is constructed from common pine furring strips, 5/8" x 1 3/4" (15.9 mm x 44.5 mm) so that the inside dimensions are about 5/8" (17 mm) wide x 1 3/4" (44 mm) deep x 3 1/4" (82 mm) long. The box is placed on the pavement, one open side down, and filled level with fine sand (-50 + 100 mesh)(-300µm + 150µm mesh) and weighted to 3 lbs. (1.361kg). The box is drawn steadily along the surface to be measured until the sand is exhausted. The length of travel is measured and reported as " feet (meters) 60 cc sand box tex- ture." The results of several comparative measurements follows:

SAND BOX MACROTEXTURE

Distance Required to Spread 60 cc, -50(330µm) mesh sand, with 3 lb.(1.361 kg), 5/8" (17 mm) box

		Feet	Meters
1.	Steel Finished Concrete	16 ± 5%	4.9
2.	Roofing Felt, Outside	16	4.9
3.	Roofing Felt, Inside	18	5.5
4.	Two-Year Hot Mix, Oil soaked, Wheel Track	12.5	3.8
5.	Two-Year Hot Mix, Transverse	12.5	3.8
6.	Two-Year Hot Mix, Oil Free, Wheel Track	10.0	3.1
7.	Two-Year Hot Mix, Transverse	9.5	2.9
8.	Board Finished Concrete	8.5 ± 5%	2.6
9.	Old Hot Mix Parking Lot	6.0	1.8
10.	Old Hot Mix Parking Lot with Single Coat Tar Emulsion	8.0	2.4
11.	Adjacent 2-Month Old Hot Mix	10.5	3.2
12.	5-Year Shoulder Mix 5.5, 8.0, 6.6 avg.	6.5	2.0
13.	5-Year Shoulder Mix 5.5, 8.0, 6.6 avg.	7.1	2.2
14.	7-Year Type 2 Slurry … Longitudinal	4.3	1.3
15.	7-Year Type 2 Slurry … Longitudinal, Transverse	3.7	1.1
16.	10-Year Hot Mix … Longitudinal	4.8	1.5
17.	10-Year Hot Mix … Longitudinal, Transverse	3.5	1.1

Comments: Do not confuse sand box macrotexture as measurements of skid resistance. In general, sand box macrotexture measurements of more than 10-12 feet (3 to 3.5 meters) is subjectively judged as a suspicious lack of adequate macrotexture to prevent hydroplaning.

For illustrations and further data see—Benedict, "An Introduction to a Study for the Prediction of Slurry Seal Spread Rates," Proceedings of the ISSA 1st World Congress, 15th Annual Convention, Madrid, February, 1977.

3. Spread Rate Calculation and Report

3.1 Assuming a moderate squeegee contact pressure, a slurry consistency of 2.5 to 3 cm and a slurry depth of 5 to 6 inches (12.7 to 15.2 cm), basic spread rates applied to smooth surfaces may be selected from the following tables. The quantity of slurry required to fill surface texture may be added to the basic rate along with an estimate of requiredments due to cross sectional irregularity and for joint cracks and laps. These increments may be noted and totaled in Table 2 to give an **estimate** of the spread rate.

APPROXIMATE SPREAD RATE CALCULATION*

Table 1.

Basic Monolayer Spread Rates for Smooth Surfaces (McLeod "S" for 60 cc Sand Box Spread of (16 - 18') - ASG = 2.65, (4.9 - 5.5m) - ASG = 2.65)									
	Type I			Type II			Type III		
Gradation	% + 16	lb/yd²	kg/m²	% + 16	lb/yd²	kg/m²	% + 16	lb/yd²	kg/m²
Fine	10	5	2.71	30	9	4.88	50	14	7.59
Median	22.5	6	3.25	42.5	10.5	5.70	61	15.5	8.41
Coarse	35	7	3.80	55	12	6.51	72	17	9.22

Table 2.

Factors:	McLeod Rating	Sand Box Texture	Add		Total
			lb/yd²	kg/m²	
Basic Rate	S	16-18' (4.9-5.5 m)			
Add for Surface Texture	H-1	10-12' (3.0-3.7 m)	1	0.54	
	H-2	8-10' (2.4-3.0 m)	2	1.08	
	H-3	5-7' (1.5-2.1 m)	3	1.63	
		2-4' (0.6-1.2 m)	4	2.17	
Add for Cross Sectional Irregularity	Nominal - 3/8" (9.5 mm)		1	0.54	
	Moderate - 1/2-3/4" (12.7-19.05 mm)		2	1.08	
	Severe 1-1½" (25.4-38.1 mm)		3	1.63	
Add for Joint Cracks & Laps (Calculate)					
APPROXIMATE SPREAD RATE—TOTAL					

* Variables of Particle Shape, Dimensions, Matrix Volumes, Void Content, Screen Ratios, All affect the Spread Rate.

Note: See: ASTM E965 "Standard Test Method for Measuring surface macro texture using a sand volumetric technique" ("Sandpatch")