Introduction to Slurry Seals & Microsurfacing

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FP2 Inc

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FP2 Inc.

- ✓ Industry supported trade association
- ✓ Major sponsors are NAPA, ISSA, AEMA, ARRA, Asphalt Institute, IGGA, Colas, MeadWestvaco, Western Emulsions
- ✓ Others supporters are contractors, material suppliers, equipment manufactures, polymer suppliers

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- ✓ Priorities:
  - Advocacy for preservation language in the SAFETEA-LU re-authorization
  - Promotion of the benefits of pavement preservation
  - Support research programs included in the FHWA System Preservation Roadmap
  - Financially support the NCPP

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Acknowledgement

The National Center for Pavement Preservation
@
Michigan State University

Pavement Preservation

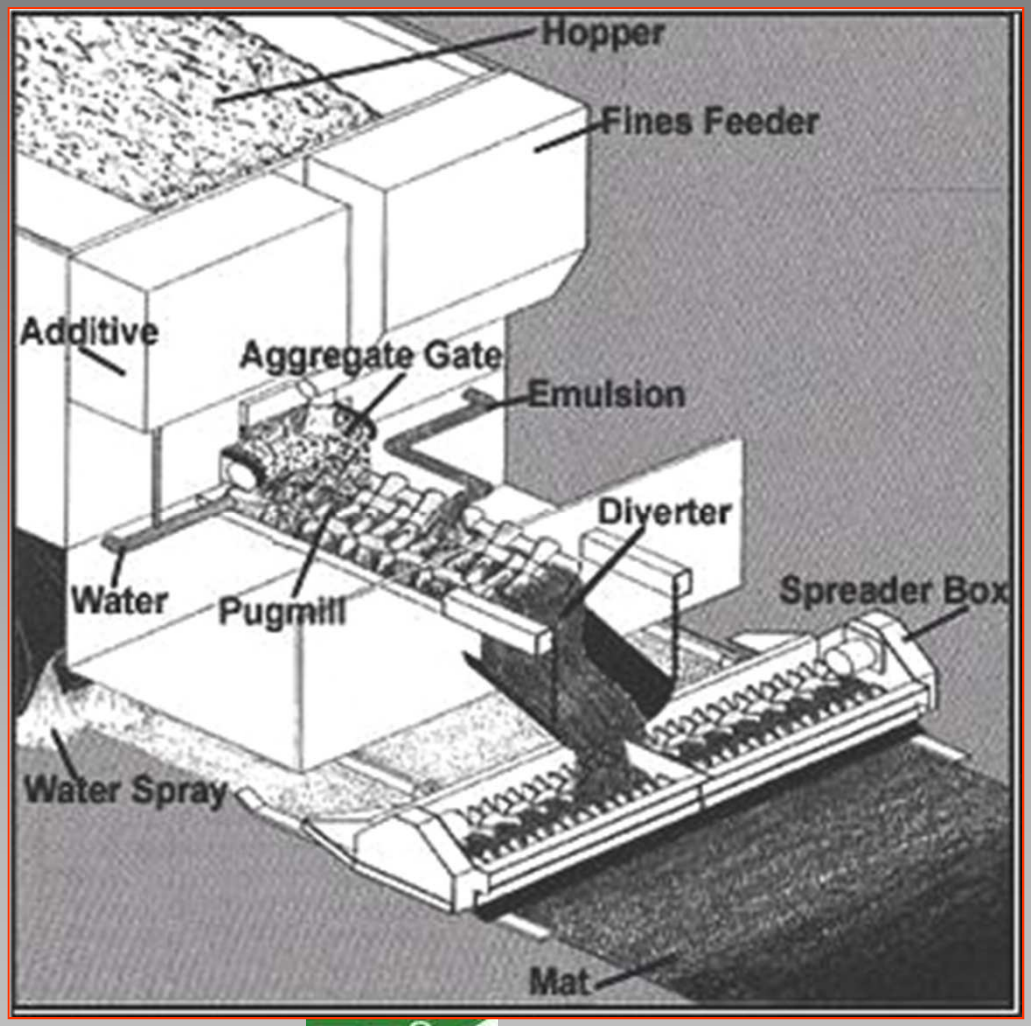
Slurry Seals or Microsurfacing are used to weatherproof and delay age hardening caused by oxidation, to maximize the life of existing pavements.

Surface Correction

To restore desirable functional surface characteristics such as:

- ✓ Skid resistance
- ✓ Crack filling
- ✓ Weatherproofing
- ✓ Raveling
- ✓ Aesthetics and uniformity

Slurry Seals



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History of Slurry Seals

- ✓ Developed in Germany early 1930's
- ✓ Mix of fine aggregate, binder, water
- ✓ Novel maintenance technique
- ✓ Marked the beginning of slurry seals
- ✓ Made more practical with improved emulsifiers and machinery in 1960's

Description of Slurry Seals

- ✓ Mixture of asphalt emulsion, graded aggregates, mineral filler & water
- ✓ Placed on continuous basis
- ✓ Portland cement, lime, fly ash used
- ✓ Free flowing consistency
- ✓ Does not add structural capacity
- ✓ ISSA - 105

Project Selection for Slurry Seals

- ✓ Sound, well-drained bases, surfaces and shoulders
- ✓ Free of distresses, potholes, cracking
- ✓ Appropriate for:
  - Raveling, Oxidized Pavement w/ Hairline Cracks
- ✓ Not Appropriate for:
  - Cracking, Base Failures, Distressed HMA Layers

Project Selection for Slurry Seals

Applications	Aggregate Type		
	I	II	III
Void Filling	X	X	
Wearing Course (ADT)			
< 100	X	X	
100 - 1,000		X	X
1,000 - 20,000			X
Minor Shape Correction			X

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Slurry Seal:

two primary applications

1. **Pavement Preservation**
   to prevent surface deterioration

2. **Corrective Maintenance**
   to renew surface characteristics

Local Streets

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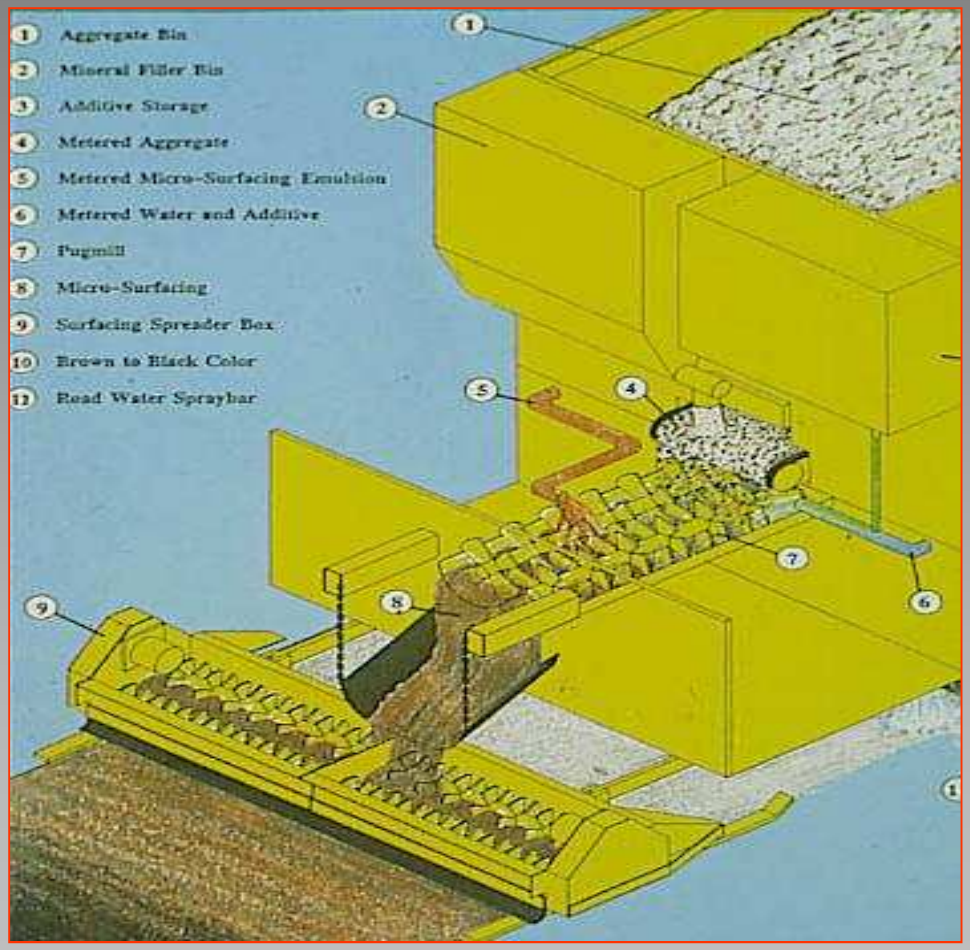
Microsurfacing



History of Microsurfacing

- ✓ Developed in Germany late 1960's
- ✓ Thicker version of conventional slurry
- ✓ Applied in narrow courses for ruts
- ✓ Incorporated special polymers to promote stability in multi-layers
- ✓ Introduced in the U.S. in 1980's

Description of Microsurfacing

"A designed mixture of polymer modified emulsified asphalt, mineral aggregate, mineral filler, water, or other additives, proportioned, mixed, and uniformly spread over a properly prepared surface."

- ✓ ISSA A-143
- ✓ State DOT Specifications
- ✓ ASTM D-6372

Project Selection for Microsurfacing

- ✓ Sound and well-drained surfaces
- ✓ No distresses, potholes, and/or cracking
- ✓ Appropriate for:
  - Raveling, Oxidized Pavement, Rutting, Rough Pavements w/ Short Wavelengths
- ✓ Not Appropriate for:
  - Cracking, Base Failures, Distressed HMA Layers

Project Selection for Microsurfacing

Applications	Aggregate Type	
	II	III
Void Filling	X	
Wearing Course (ADT)		
< 100	X	
100 - 1,000	X	X
1,000 - 20,000	X	X
> 20,000		X
Minor Shape Correction 0.4-0.8 inch (10–20 mm)	X	X
Rut-filling	X	X

Microsurfacing Advantages

- ✓ Mix can be placed in thicker lifts while remaining stable
- ✓ Macrotexture of the mix remains
- ✓ Quick setting for traffic
- ✓ Enhanced durability

Uses

Uses

Uses

Comparisons

Slurry Seals

- ✓ May use polymers
- ✓ Thickness equal to largest stone
- ✓ Evaporative break
- ✓ Environmentally-dependent curing
- ✓ Seals, restores surface texture, stops raveling

Microsurfacing

- ✓ Always use polymers
- ✓ Thickness is 2-3 largest stone size
- ✓ Chemical break
- ✓ Non-environment dependent curing
- ✓ Rut-filling, restores surface profile

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Expected Performance

Slurry Seals

- ✓ Life Extension 3-5 years (good road)
- ✓ Longevity 4 to 7 years

Microsurfacing

- ✓ Life Extension 4-8 years (good road)
- ✓ Longevity 6 to 10 years
- ✓ Rut-filling performance depends on underlying pavement condition
- ✓ Traffic is not a limiting factor

Typical Life Extensions

Treatment	Pavement Condition		
	Good (PCI=80)	Fair (PCI=60)	Poor (PCI=40)
Slurry Seals	3 – 5 yrs.	1 – 3 yrs.	0 – 1 yrs.
Microsurfacing	4 – 8 yrs.	3 – 5 yrs.	1 – 4 yrs.

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Application Rates

Treatment	Aggregate Type		
	I	II	III
Slurry Seals	8-12 lb/yd^2 (4.3-6.5 kg/m^2)	12-20 lb/yd^2 (6.5-10.8 kg/m^2)	18-30 lb/yd^2 (9.8-16.3 kg/m^2)
Micro-surfacing		10-20 lb/yd^2 (5.4-10.8 kg/m^2)	15-30 lb/yd^2 (8.1-16.3 kg/m^2)

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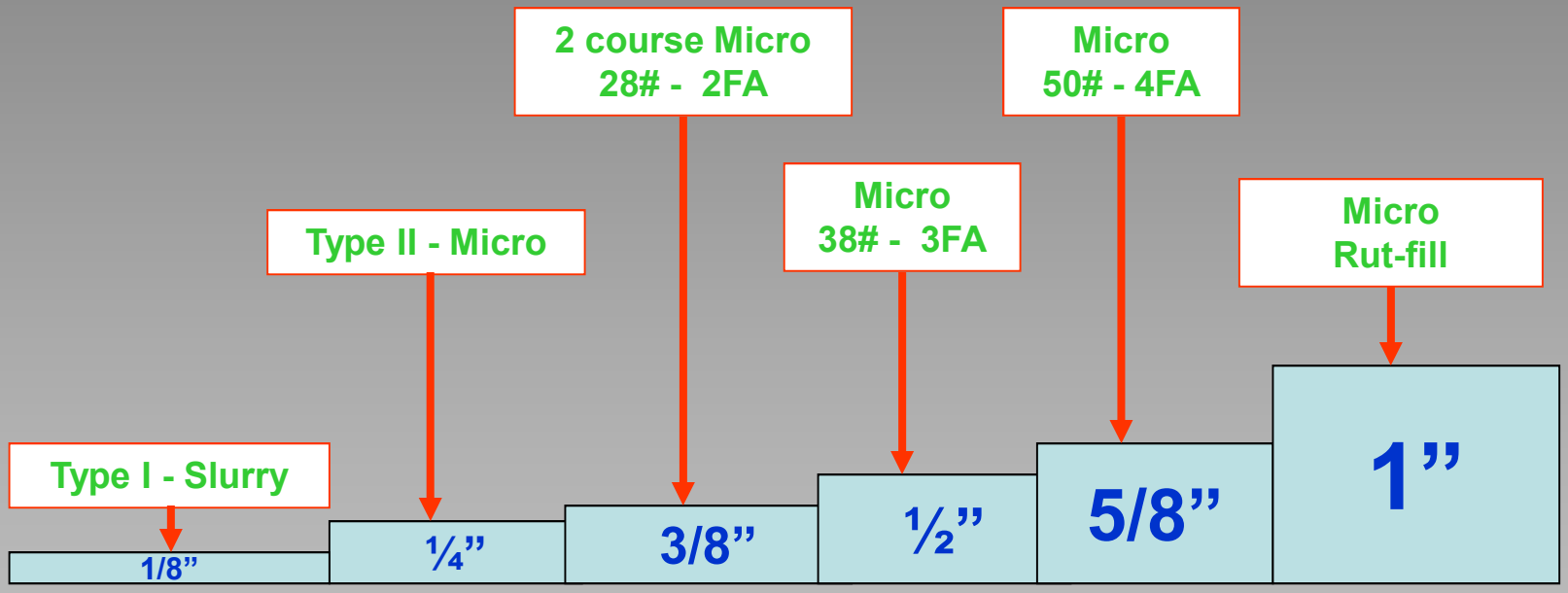
Application Thickness



Specifications

Method Based

- ✓ Design, materials, methods, payment

Performance Based

- ✓ Define outcomes
- ✓ Immediate response safety problems
- ✓ Flexibility
- ✓ Risk shifted to contractor
- ✓ Partnership between agency/contractor

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Specifications (cont)

Warranties

- ✓ Description of work, definitions
- ✓ Initial acceptance terms
- ✓ Warranty bond description
- ✓ Rights and responsibilities of parties
- ✓ Evaluation method
- ✓ Requirements and conflict resolution
- ✓ Non-extension of contract
- ✓ Measurement and payment

Responsibilities

Inspection

- ✓ Adherence to Specifications
- ✓ Document quantities
  - Placed versus planned
- ✓ Actual rate of spread
  - Too little or too much placement

Methods of Payment

Slurry Seal

- ✓ Materials, equipment, cleaning labor, bond coat, mix placement

Microsurfacing

- ✓ Standard: paid by area or weight
- ✓ Rut-filling: paid by weight
- ✓ Materials, equipment, labor, cleaning, marker replacement, tack coats if required

Keys To Success

- ✓ Site Selection
- ✓ Equipment Calibration
- ✓ Material Consistency
- ✓ Contractor Performance
- ✓ Project Inspection
- ✓ Information

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Questions?