

MICRO-SURFACING



Surface Correction

To restore desirable surface characteristics such as:

- ✓ Skid resistance
- ✓ Crack filling
- ✓ Weatherproofing
- ✓ Raveling
- ✓ Aesthetics and uniformity
- ✓ Leveling or rut-filling



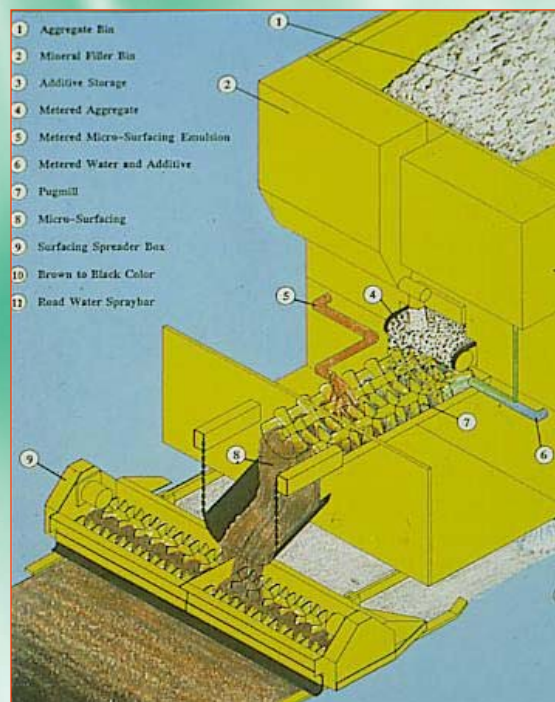
Micro-Surfacing:

two primary applications

1. Preventive Maintenance -
to prevent surface deterioration
2. Corrective Maintenance -
to renew surface characteristics
including rut filling



History of Micro-Surfacing



History of Micro-Surfacing

- 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 Micro-Surfacing

“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-6372-99**



Project Selection for Micro-Surfacing

- 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, HMA Layers



Project Selection for Micro-Surfacing

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



Micro-Surfacing Advantages

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



Interstate System



Major Arterials



Secondary System



Comparisons

Slurry Seals

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

Micro-Surfacing

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



Expected Performance

Slurry Seals

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

Micro-Surfacing

- ✓ 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.
Micro-surfacing	4 - 8 yrs.	3 - 5 yrs.	1 - 4 yrs.



Impact on Winter Maintenance

Both Slurry Seals and Micro-Surfacing

- ✓ Outstanding bare pavement friction is achieved due to the surface texture.
- ✓ Good friction achieved without deicing chemicals during the initial on-set of unexpected snowy or icy conditions.
- ✓ More salt and deicing chemicals may be needed after the on-set of snowy or icy conditions.

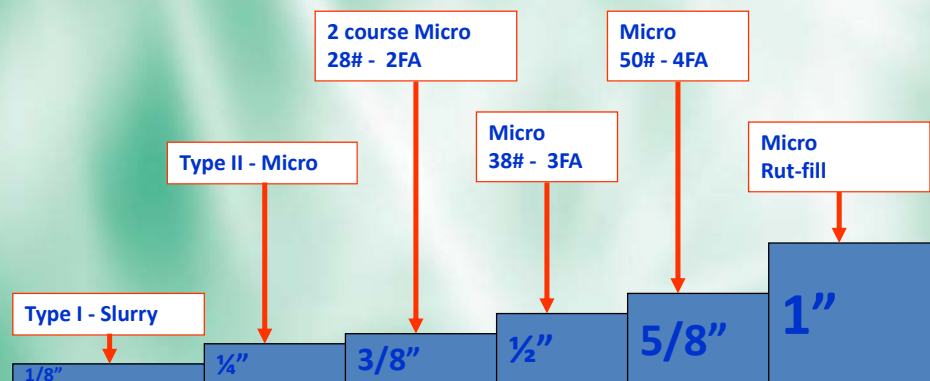


Application Rates

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)



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



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

Paving Inspector

- ✓ 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

Micro-surfacing

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



Keys To Success

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

