Slurry, Micro-Surfacing Systems

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TELFER CONSTRUCTION

Industry Goals & Challenges

- Improve Agency Awareness
- Educate Decision Makers
- Managing Your Road Infrastructure
- Budgets – Stagnate or Shrinking
- Set Product Expectations- Cost Effective
- “Raise the Bar” Materials & Workmanship (JITT)
- Improve Quality of Finished Product
- Increase product awareness along with expanded proper use of slurry seal and micro seals

Topics we will cover:

- Slurry Seal & Micro Systems
  - History
  - Equipment
  - Mix Designs
  - Application
  - Workmanship
  - Costs
  - Considerations for use

Factors to consider

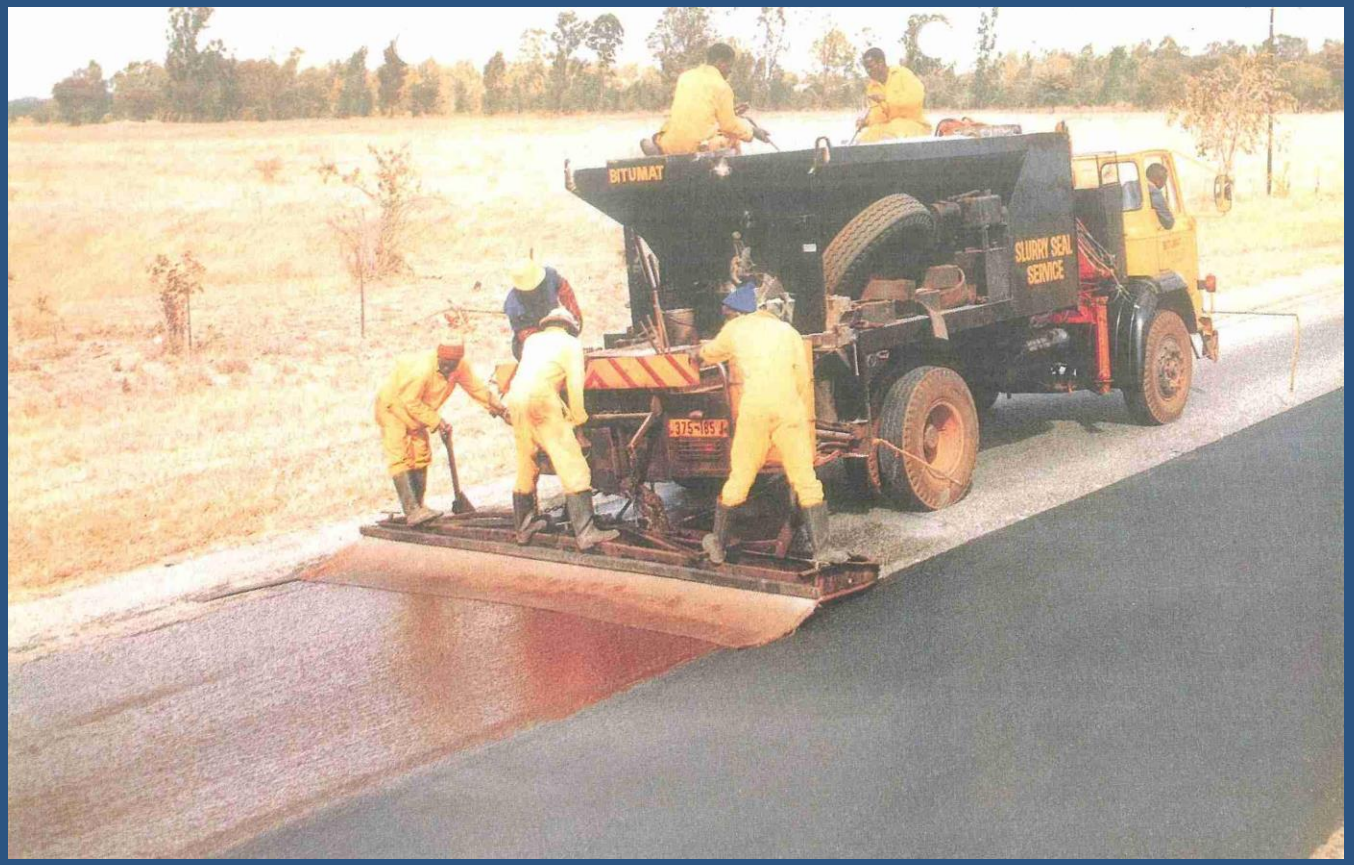
- Existing Pavement Condition
- Rutted or Distressed Pavements
- Public Reception to Products
- Ravel or shedding of product
- Traffic Levels and Traffic Control Requirements
- Urban vs. Rural Settings
- Climate and Weather Conditions
- Day or Night Application
- Reflective Cracking
- Budget- Buys you time

What does it take?

- Quality Aggregate
- Quality Emulsion
- Compatibility
- Working Mix Designs
- Equipment Calibrations / Verification
- Test Strips / Verification
- The Right Equipment
- Trained Personnel
- Not overstating product capabilities
- Partnership with owner, suppliers and crew
- Transparency, Self- Critique your own work!!!
- Product Performance

An Innovation: 1940's -1950's

Innovations 1960's thru 1970's



State of the Art Truck Mounted Pavers

Continuous Pavers

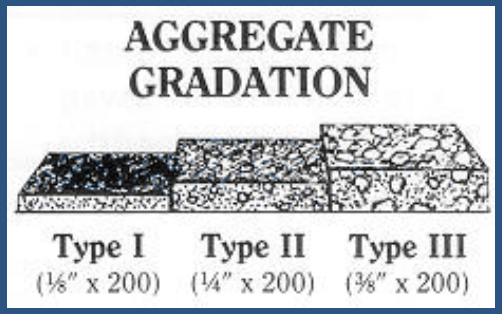
Equipment Types and Methods

- Continuous Mixer
- Common With Micro
- Reduces Transverse Joints

Typically Staging Area

Slurry Seals

- Used to correct minor defects:
  - Halts raveling, restores loss of matrix, improves skid resistance
- $1.50 - $2.25 /SY
- Low cost, good performance
- Expected Service Life: 4-7 Years



What Separates Micro Surfacing From Slurry Seal?

- Higher Polymer Content in the Emulsion
- Fast Setting Emulsion- Allows for Faster Break and Night Work
- Slurry Pavers with the Capability to mix the Micro are Necessary
- Augured Boxes are required
- Can be Placed in Multiple Lifts
- Is able to support traffic as quick as one hour after placement

Pre Seal Inspections

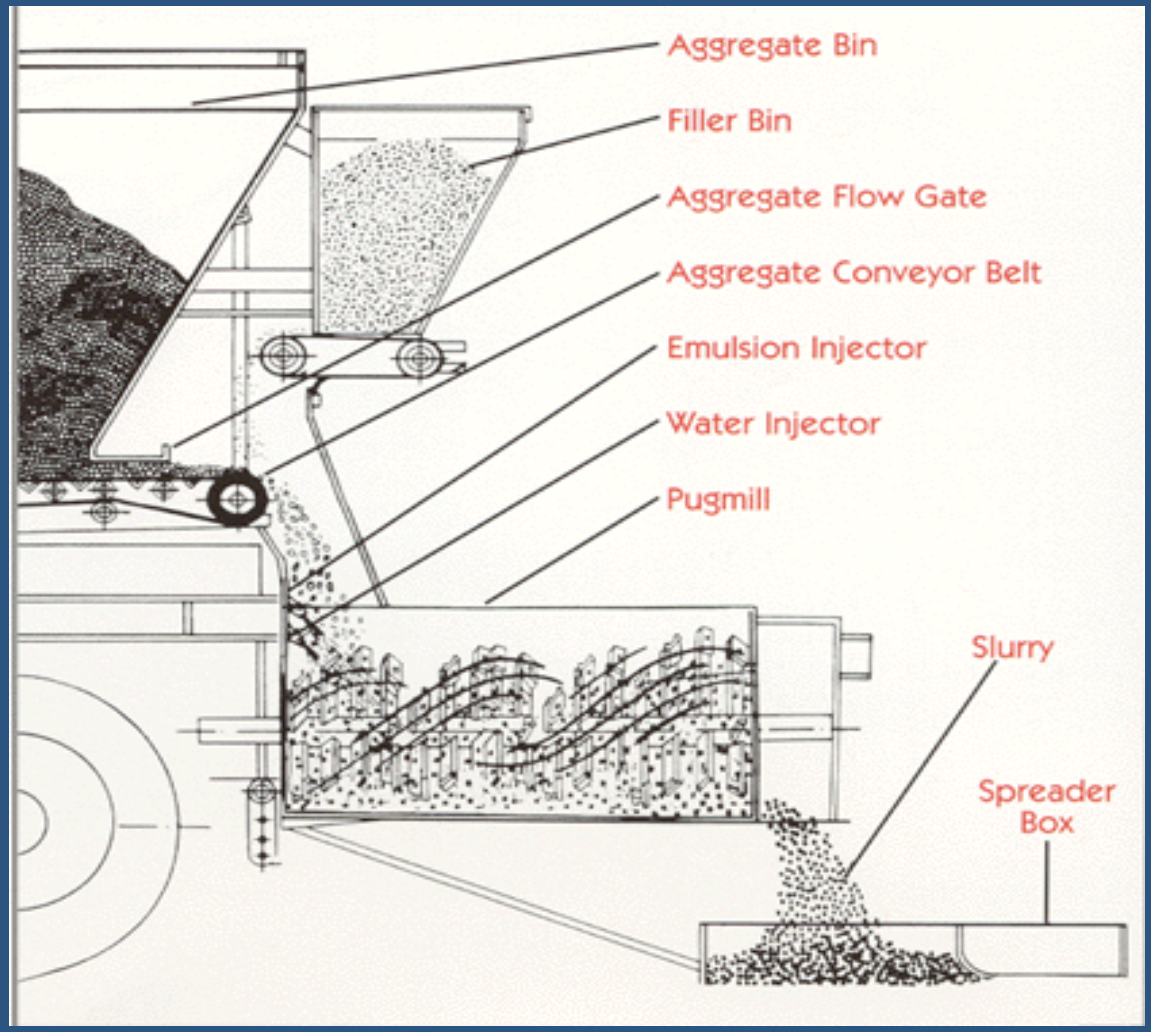
- Surface
- Equipment
- Materials
- Weather
- Determining Application Rates
- Traffic Control

What are Mix Designs ?

Formulations for a Specific Aggregate and Emulsion

- Grading Band of Aggregate
- Optimal Asphalt Content (Residual Asphalt)
- Wet Cohesion – Set Times
- Wet Track Abrasion testing (1hr) & (6day) Predicts Loss
- Excess Asphalt -Loaded Wheel test – Helps set Maximum asphalt content
- Successful Service Life
- Tied back into your Equipment calibrations

Calibrations



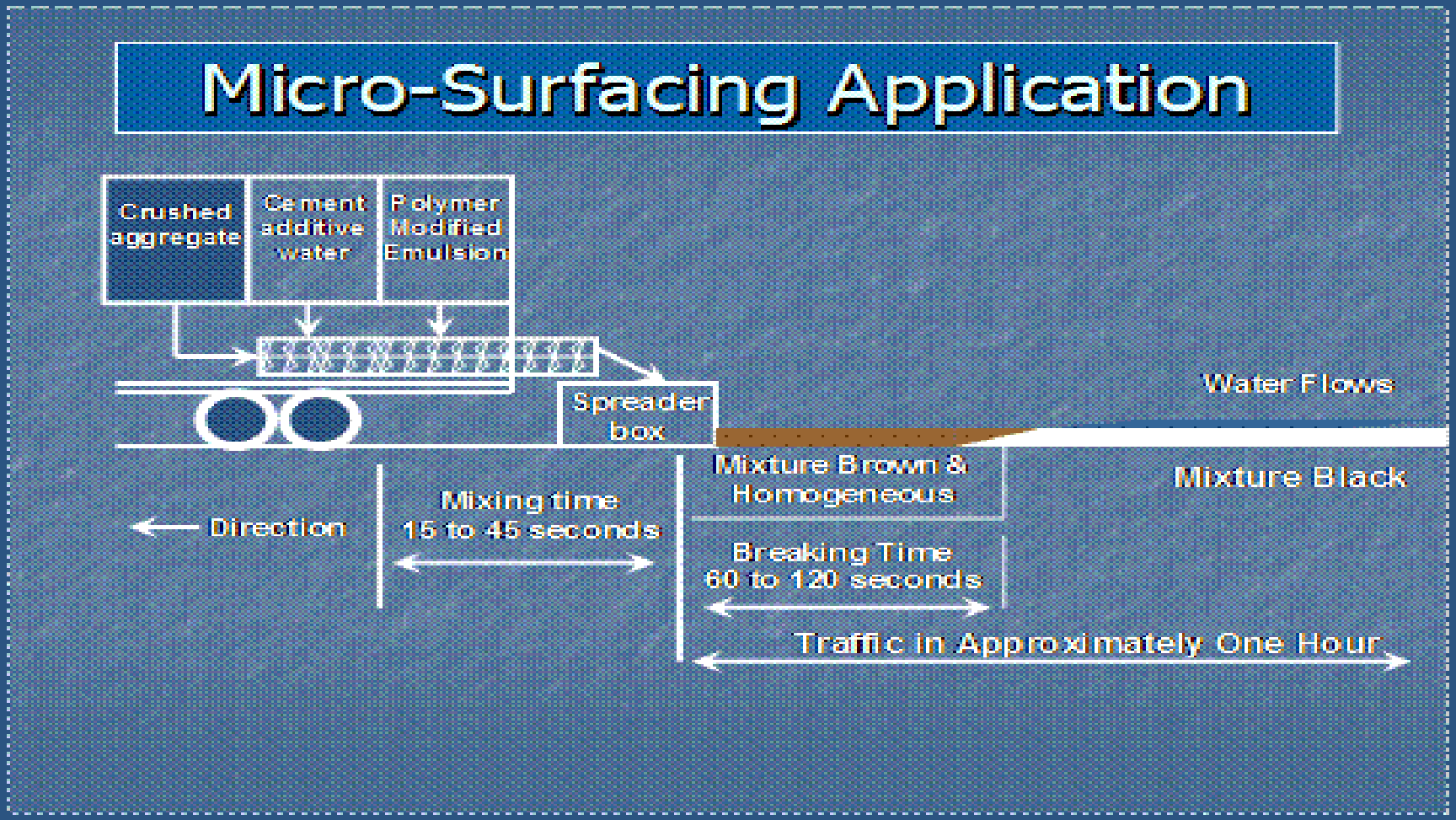
Equipment Inspections: Micro-Surfacing Machine

- The machine is fully functional.
- The machine has been calibrated (acceptance within 6 months).
- Spreader rubbers are clean and not worn.
- All paddles in the pug mill are intact.
- The spreader box is clean and is a microsurfacing type box.

Materials Checks

- A full mix design and compatibility test have been performed (approvals obtained).
- The asphalt emulsion is from an approved source (if required).
- The emulsion has been sampled and submitted for testing.
- Aggregate meets specifications.
- All material testing procedures and frequencies have been reviewed for all testing before and during construction.

Mixing Sequence



Determining Application Rates

- Agency guidelines and requirements are being followed.
- Required rates for rut filling and leveling have been calculated or estimated separately.
- A full mix design has been done. Note, the mix design does not quantify application rates.
- More material is applied to dried-out and porous surfaces.
- Aggregate Gradations

Where to use Micro surfacing Treatments

- Surface Treatments For High Volume Collectors, Arterials and Highways
- Rut Filling Applications
- Double Applications For Addressing Surface Irregularities
- Areas Where Fast Traffic Times Are of Concern or When Night Work is Preferred

Micro-Surfacing Application

- Rubbers are cleaned regularly and at the end of each day.
- The machine takes a straight even line with minimal number of passes to cover the pavement.
- Mix is even and consistent.
- Mix does not float fines.

Micro-Surfacing Application

- Has a test strip been done—is it satisfactory?
- Are field tests carried out—are they in specification?
- Enough trucks are on hand to keep a steady supply of material for the slurry machine.
- The application starts and stops with neat, straight edges. Will an edge box be used?
- A rut box is used for ruts deeper than 12 mm (1/2 in).

Truck Operation

- Trucks are staggered across the fresh seal coat to avoid driving over the same area.
- Trucks travel slowly on the fresh seal.
- Stops and turns are made gradually.
- Truck operators avoid driving over microsurfacing.
- All trucks involved in the Micro Surfacing application process should stagger their wheel paths when exiting and returning to the application site.

Rolling (if required)

- The rollers do not begin until the mat is stable.
- Rolling begins at one edge and moves to the other edge of the run, taking care to roll the joint. Overlap of runs is not a problem.
- The entire surface is rolled once.
- The rollers travel slowly—8–9 mph (5 mph) maximum.

Longitudinal Joints

- The match lines are not made in the wheel paths.
- The match lines are made at the center of the road, center of a lane, or edge of a lane.
- The match line is overlapped only 75 mm (3 in) maximum.
- The slurry unit spreader box runners do not run on fresh mat.

Transverse Joints

- All emulsion applications begin and end on building paper.
- Mixture is not overly wet at start-up.
- Building paper is disposed of properly.

Opening the Microsurfacing to Traffic

- The traffic travels slowly—40 mph (25 mph) or less—over the fresh microsurfacing.
- Reduced speed limit signs are used when pilot cars are not used.
- TEMPORARY pavement markings placed prior to application or TEMPORARY traffic paint prior to before opening pavement to normal traffic.
- All construction-related signs are removed when opening pavement to normal traffic.

Project Cleanup Responsibilities

- All loose aggregate from brooming is removed from travel way and has been properly disposed of
- Excess emulsion and spills are removed
- Stockpile has been returned to original condition
- Temporary delineation be it temporary markers or temporary striping is in place and will be maintained until permanent striping is complete

Brooming

- Brooming does not begin until sufficient bond has formed between the emulsion and the aggregate.
- Brooming begins after the microsurfacing is available for traffic.
- Brooming should not dislodge the microsurfacing.
- Follow-up brooming should be done if ravel is high or if traffic is high.

Common Problems and Solutions

- **Drag marks:**
  - Clean rubbers, check aggregate grading.
- **Flush surface:**
  - Reduce asphalt content of mix.
  - Reduce water content and increase additive. Increase cement.
  - Rutted Pavement
  - Allow longer time before traffic.
  - Reduce total fluids.

Common Problems and Solutions

- **Uneven surface—wash boarding:**
  - Spreader box is incorrectly set up.
  - Viscosity of the mix is too high.
  - Add extra additive or water.
  - Mix is breaking too fast.
  - Ambient temperature is too high.
  - Use water sprays on front of spreader.
  - Machine application speed is too fast.

Common Problems and Solutions

- **Poor joints:**
  - Too much water at start-up.
  - Runners of spreader box running on fresh micro surfacing—use water spray.
  - Micro-Surfacing aggregate and shedding is very common during the first 24 hours. Post Sweeping times should be discussed.

Common Problems and Solutions

- **Excessive ravel:**
  - Mix is breaking and curing too slowly.
  - Make mix faster; add cement.
  - Overworked mix (Hand Work)
  - Control traffic. Wait until cured to trafficking level.
  - Traffic or equipment speeds too high.
  - Brooming or trafficking before the emulsion is properly set.
  - Improper secondary strike-off angle/pressure can cause a raveling issue if texture is boney or rough.

Opening to Traffic

- Problem: The weather conditions can cause the micro surfacing not to break and cure quickly for traffic times.
- Cause: low ambient and pavement temperatures, field additives can slow the break times, emulsion not formulated correctly.
- Prevention: Placement within recommended temperatures. Increase or decrease Portland cement, reformulate emulsion.

Managing Residential Streets.


76
KING
Drive
Thru
Indoor
Playland


LOWE'S
USED CAR ZONE
Behind Walmart


ROSEVILLE


NO PARKING
8 A.M. TO 10 A.M.
2ND AND 4TH MONDAY OF THE MONTH
STREET CLEANING
SUSPICIOUS ACTIVITIES IMMEDIATELY REPORTED TO POLICE
911
WP09295


JELFER

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