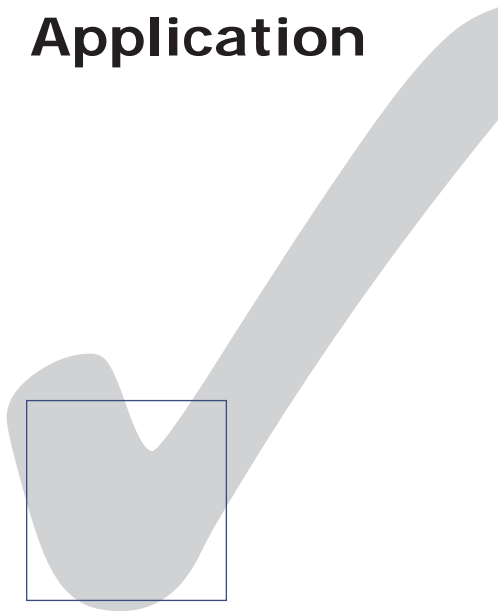


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Microsurfacing
Application



U.S. Department
of Transportation
**Federal Highway
Administration**

Microsurfacing Application Checklist

This checklist is one of a series created to guide State and local highway maintenance and inspection staff in the use of innovative pavement preventive maintenance processes. The series is provided through the joint efforts of the Pavement Preservation Program of the Federal Highway Administration (FHWA), and the Foundation for Pavement Preservation (FP²).

FHWA uses its partnerships with FP², the American Association of State Highway and Transportation Officials, and State and local transportation agencies to promote pavement preservation.

To obtain other checklists or to find out more about pavement preservation, contact your local FHWA division office or FP² (at www.fp2.org), and check into these FHWA Web pages:

www.fhwa.dot.gov/preservation

www.fhwa.dot.gov/infrastructure/asstmgmt/resource.htm

Microsurfacing Application Checklist

Preliminary Responsibilities

Project Review

- Is the project a good candidate for microsurfacing?
- How much rutting is present? What is the depth and extent?
- How much and what type of cracking exists?
- Is crack sealing needed?
- How much bleeding or flushing exists?
- Is pavement raveling?
- What is the traffic level?
- Is base sound and well drained?
- Review project for bid/plan quantities.

Document Review

- Bid specifications
- Special provisions
- Mix design information
- Construction manual
- Traffic control plan
- Manufacturer s instructions
- Material safety data sheets

Materials Checks

- A full mix design and compatibility test have been done.
- The asphalt emulsion is from an approved source (if required).
- The emulsion is sampled and submitted for testing.
- Aggregate meets all specifications.
- Aggregate is clean and free of deleterious materials.
- Aggregate is not wet.
- The emulsion temperature is within application temperature specification.

Pre-Seal Inspection Responsibilities

Surface Preparation

- The surface is clean and dry.
- All pavement distresses have been repaired.
- The existing surface has been inspected for drainage problems.

Equipment Inspections

Broom

- The bristles are the proper length.
- The broom can be adjusted vertically to avoid excess pressure.

Microsurfacing Machine

- The machine is fully functional.
- The machine has been calibrated and certified for the specific aggregate being used (T209).
- Spreader rubbers are clean and not worn.
- All paddles in the pugmill are intact.
- The spreader box is clean and is a microsurfacing type box.

Rollers (if used)

- Rollers should be unballasted, pneumatic-tired, 5 – 8 tonnes dead weight.
- The roller tire size, rating, and pressures comply with manufacturer's recommendations.
- Tire pressure is the same on all tires.
- All tires have a smooth surface.

Stockpile

- Stockpile site is well drained and clean.
- Contractor has the full line of equipment (loaders, tankers, etc.).

Equipment for Continuous Run Operations

- All equipment is free of leaks.
- Flow boys or other nurse units are clean and functional.
- There are enough units to allow continuous running with minimal stops for cleaning box rubbers.

Calibration of Equipment

- Each machine has been calibrated with the aggregate and emulsion to be used.
- The name of the person who carried out calibration and documentation has been provided.

Weather Requirements

- Air and surface temperatures have been checked at the coolest location on the project.
- Air and surface temperatures meet agency requirements.
- High temperatures, humidity, and wind will affect how long the emulsion takes to break.
- Application of emulsion does not begin if rain is likely.
- Application does not begin if overnight temperatures could be freezing.

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.
- More material is applied to dried-out and porous surfaces.
- More material is applied on roads with low traffic volumes.
- Less material is applied to smooth, nonporous, and asphalt-rich surfaces.
- Bulking has been measured.
- Moisture content has been adjusted for in the application rate.

Traffic Control

- The signs and devices used match the traffic control plan.
- The setup complies with local agency requirements or the Federal *Manual on Uniform Traffic Control Devices* (MUTCD).
- Flaggers do not hold the traffic for extended periods of time.
- The pilot car leads traffic slowly 40 kph (25 mph) or less over fresh microsurfacing.
- Signs are removed or covered when they no longer apply.
- Any unsafe conditions are reported to a supervisor (contractor or agency).*

Project Inspection Responsibilities

Microsurfacing 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).
- A leveling course is used with a steel strike-off for ruts less than 12 mm (1/2 in).
- Two courses are used where rut filling or leveling is employed.
- The application starts and stops on building paper.
- No drag marks are present due to oversize aggregate or dirty rubbers.
- Rubbers are cleaned regularly and at the end of each day.
- The machine takes a straight even line with minimal numbers of passes to cover the pavement.
- Mix is even and consistent.
- Mix does not float fines.
- The application is stopped as soon as any problems are detected.
- The application appears uniform.
- The surface has an even and uniform texture.

- Check application rate based on amounts of aggregate and emulsion used.
- What are the times between spreading, foot traffic, and opening to traffic?
- Work time or mixture is adjusted to acceptable times for trafficking.

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 kph (5 mph) maximum.

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.
- Trucks stagger their wheel paths when backing into the continuous unit.

Longitudinal Joints

- The meet lines are not made in the wheel paths.
- The meet lines are made at the center of the road, center of a lane, or edge of a lane.
- The meet 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.

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.
- Followup brooming should be done if ravel is high or if traffic is high.

Opening the Microsurfacing to Traffic

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

Cleanup Responsibilities

- All loose aggregate from brooming is removed from travelway.
- Excess emulsion and spills are removed.

Common Problems and Solutions

(Problem: Solution)

❑ **Drag marks:**

1. Clean rubbers, check aggregate grading.

❑ **Flush surface:**

1. Reduce asphalt content of mix.
2. Reduce water content and increase additive.
3. Increase cement.
4. Allow longer time before traffic.
5. Reduce total fluids.

❑ **Uneven surface washboarding:**

1. Spreader box is incorrectly set up.
2. Viscosity of the mix is too high.
3. Add extra additive or water.
4. Mix is breaking too fast.
5. Ambient temperature is too high.
6. Use water sprays on front of spreader.

❑ **Poor joints:**

1. Too much water at start-up.
2. Runners of spreader box running on fresh microsurfacing use water spray.

❑ **Excessive ravel:**

1. Mix is breaking and curing too slowly.
2. Make mix faster; add cement.
3. Control traffic.
4. Wait until cured to trafficking level.
5. Traffic or equipment speeds too high.
6. Brooming or trafficking before the emulsion is properly set.

Sources

Information in this checklist is based on or refers to the following sources:

ABC of Slurry Surfacing. 2001. G. Holleran in *Asphalt Contractor Magazine* (July).

Quality Control of Microsurfacing. 1992. Washington, DC: International Slurry Surfacing Association.

Recommended Performance Guidelines for Microsurfacing. 2000. Washington, DC: International Slurry Surfacing Association.

For more information about pavement preservation, visit these Web sites:

www.fhwa.dot.gov/preservation

www.fhwa.dot.gov/infrastructure/asstmgmt/resource.htm

www.fp2.org

For more information on the Pavement
Preservation Checklist Series, contact:

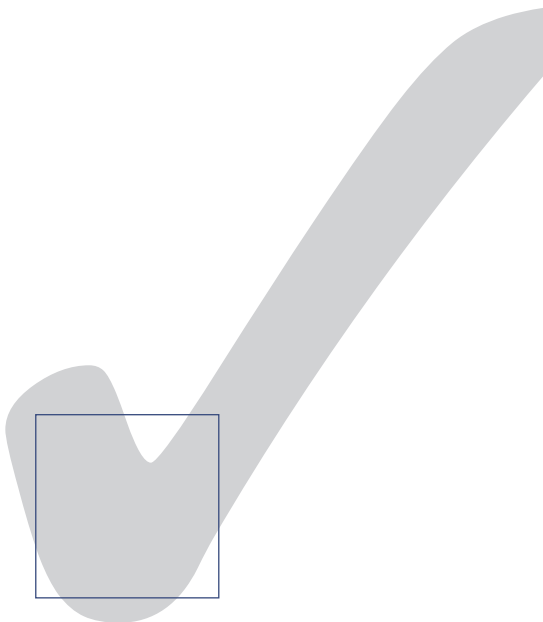
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