Crack Sealing

Crack sealing is applied to
• Extend the service life of the existing HMA
• Prepare the existing pavement prior to construction of an HMA overlay

Thermoplastic Sealing materials

Bitumen-base materials that typically soften upon heating and harden upon cooling
• Hot applied
• Cold applied

Typically one or two-component materials that set by the release of solvents or cure through a chemical reaction
• Chemically Cured
• Solvent Release
Purpose and Application

Cracks allow moisture and debris to enter the pavement
- Contribute to stripping, spalling, cupping, lipping, delaminating, etc.
- Reduce pavement and base stiffness which contributes to further load related cracking

Purpose - Seal cracks
Application - Flexible

Effectiveness

There is a general consensus among states that supports sealing cracks as a cost effective rehabilitation or maintenance treatment.

Placement Configurations

Flush Fill

Material → Crack → Reservoir & Flush

Material → Reservoir → Crack
Placement Configurations

Cost Considerations

Information needed to determine costs

- Amount of crack to be filled, sealed
- Type of crack filler, sealer
- Equipment and personnel required
- Estimated performance of crack fill or seal
Crack Sealing - construction sequence

Crack refacing
Crack cleaning
Sealant Installation

Router

Router
Hot sealant

Use of polymers/fibers
Filler, fine aggregate/sand
Cover asphalt with sand

Squeegeed sealant

Crack Seal Applicator

Loopfill Melter Applicator
Bitumen Applicator
Patching with bituminous materials

Patching the existing pavement with bituminous materials

- Extends the service life of the existing HMA
- Used in the preparation of existing pavement prior to construction of an HMA overlay

Potholes Process

- Weak area defects
- Cracks
- Pieces pop out
- Potholes
Bituminous patching materials

• Cold-mix
  Used as temporary patches placed in stockpile and used over a period of time (Emulsion binders)
  Special open-graded mixes
• Hot-mix asphalt (NMA)
  Placed immediately while hot using Standard dense graded HMA

Patching of existing HMA to:

• Repair localized distress
• Improve motorist safety
• Reduced pavement roughness
• Reduce the rate of deterioration
• Repair pavement prior to overlay
Limitations and Effectiveness

Patching is used to treat structurally or functionally deteriorated pavement

- Application may not be appropriate
- Temporary patches are temporary
- Design may not be adequate
- Principal problem may not be corrected

Cost Considerations

Construction

Winter maintenance
- “Throw and go” the most cost effective

Summer maintenance
- Semi-permanent patch the most cost effective
- Found to be three times more cost effective when considering full life cycle costs in a Pennsylvania study
Construction - Poor Conditions

Construction

Procedure for construction of a semi-permanent patch

• Marking patch boundaries
• Cut Boundaries
• Clean and repair foundation
• Apply tack coat
• Fill the hole with patching material
• Compact the patch
• Cleanup

Marking Patch Boundaries

- Straight boundaries, recommended rectangular
- Consider width of equipment
- Adjacent area—sound pavement
Cut Boundaries

Do not rock

Begin at center

Saw cut at edge of hole

Remove Material
Clean Debris

Seal Edges

Material Placement
Finished Patch

Asphalt Pavement Evaluation and Preservation

Coffee Break