Smart Preservation

Asphalt Maintenance - Patching, Crack Sealing, and Seal Coats

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Asphalt Maintenance Types

- Patching
  - Drop and Roll
  - Mill and Patch
  - Remove and Replace
  - Spray Patching
- Crack Sealing
  - Clean and Seal
  - Route and Seal
  - Mastic
  - Poly-Fiber
- Seal Coating
  - Rejuvenator
  - Fog Seal
  - Cold Seal
  - Chip Seal
  - Combinations

Patching Types and Things to Consider

- **Drop and Roll** – quick removal of liability
- **Spray Patching** – same applications as drop and roll, good option if chip sealing after.
- **Mill and Patch** – creates clean finished edges and repairs damaged surface.
- **Remove and Replace** – necessary when the damage is to base, or underlying issues.

- Severity of existing condition
- Underlying issues
- Customers goal and potential budget constraints

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Crack Seal

- Traditional Crack Sealing
  - Blow and Go vs. Rout and Seal
  - Used for cracks up to 1.5” wide
  - MnDOT spec 3723 (most common) more adhesion, 3725 more flexible.
  - Improper cleaning can lead to premature failure.
  - Alligator and black cracking not advised.
  - Should be considered annually

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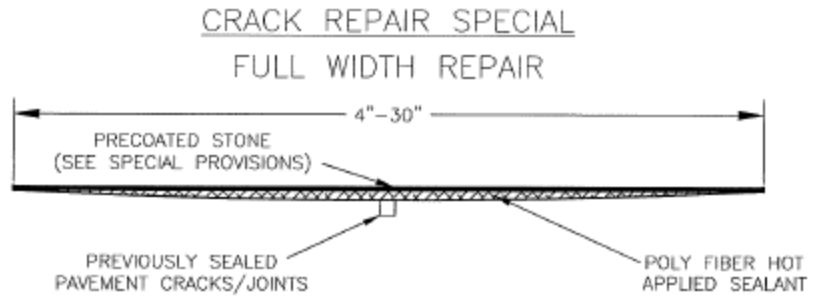
Crack Seal

- Mastic Crack Repair
  - For crack that are too large or cupped for traditional methods.
  - Hot-pour material with polymers and aggregates added.
  - Improves ride quality
  - Much stiffer material, susceptible to cracking at temps below zero

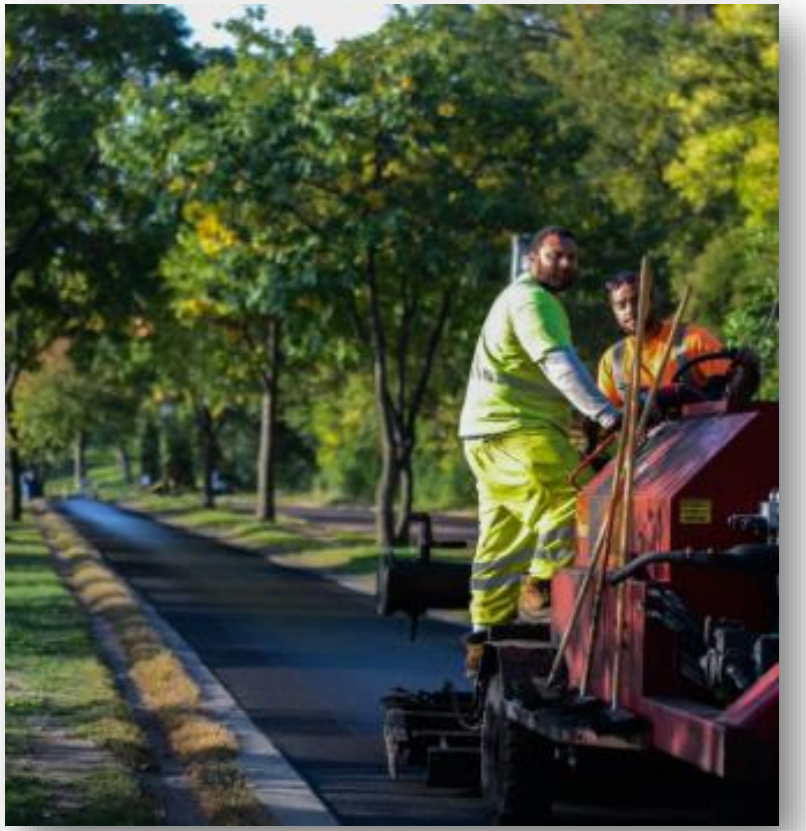
Crack Seal

- Poly Fiber
  - Asphalt sealant blended with polymers and polyester fibers (2% min.)
  - Aggregate applied to the surface for strength and traffic flow
  - Used for cupped cracks and alligatored areas
  - More flexible than mastic repair
  - Avoid longitudinal cracks



Seal Coats

- What is an Asphalt Seal Coat?
  - Emulsified AC with mineral fillers and aggregates
  - Wide range of products available
  - Works as a barrier against water, sun, and chemicals
  - Provides a new wear surface
  - Improves aesthetics
  - Options include single spray, double spray, or a slurry seal (squeegee and a spray).



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Seal Coats

- Extensive cleaning required prior to application
- Application should be done during daylight hours (cure time)
- Considerations – phasing, tree coverage/heavy shade, multiple coats?

Fog Seal

- What is a Fog Seal?
  - The application of a diluted asphalt emulsion, sometimes followed with sand.

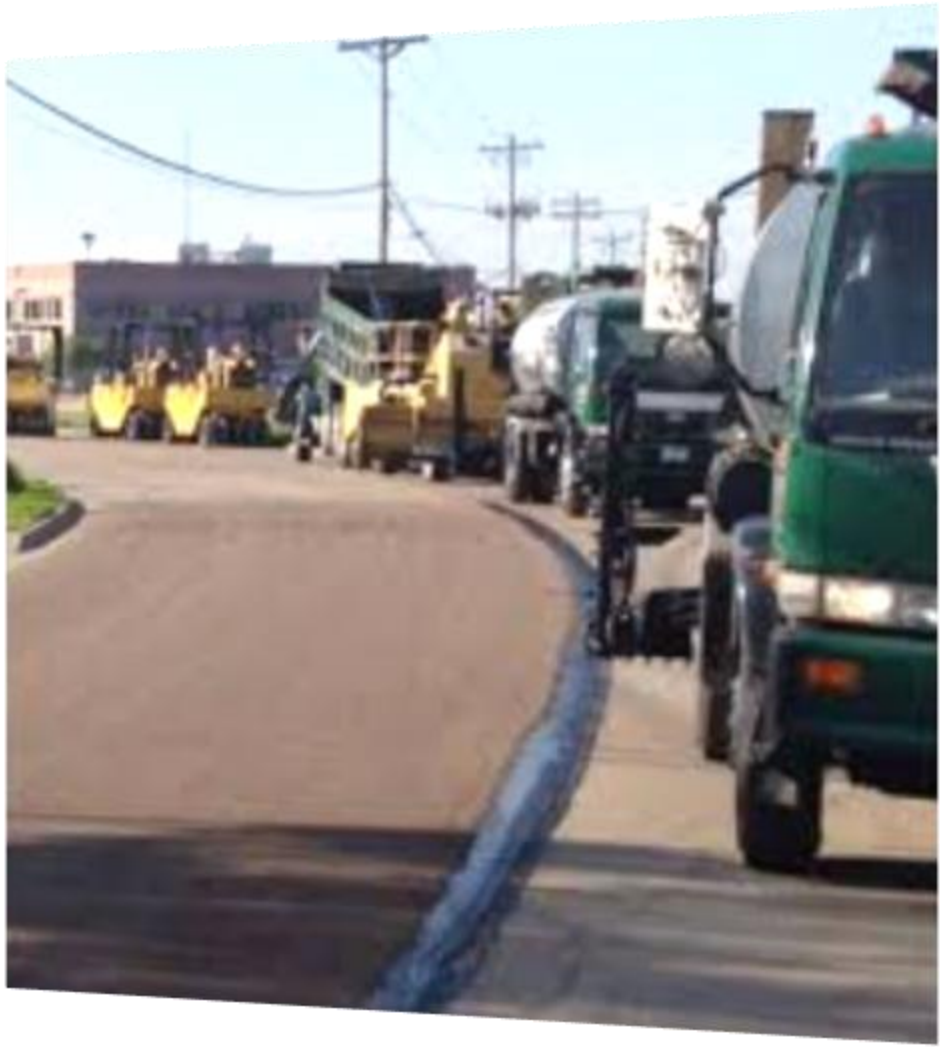
  - Diluted asphalt emulsion
    - CSS-1H
    - CQS-1H
    - CRS-2P
  - Application rates range from .08 - .18
  - Can be used on newer asphalt to rejuvenate and protect against water and oxidation.
  - Used on chip seals to promote rock retention.

Fog Seal

- Things to Consider
  - The existing surface conditions dictate application rate
    - New/smooth, oxidized, chip sealed
  - Time to cure can be 20 min – 3hrs
    - Ambient temp
    - Surface temp
    - Sun/Shade
    - Humidity
    - Wind

Chip Seal

- What is a Chip Seal?
  - The application of an asphalt emulsion binder followed with a cover aggregate.
  - Chip seals provide a new wear surface protecting the existing asphalt and increasing skid resistance.
  - Chip seals can have a wide variety of applications with small tweaks to the materials and process.



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Chip Seal Materials – Asphalt Binder

- Rates from .23 - .50
- Application rates based on emulsion typre aggregate size, pavement condition, and traffic volume.
  - CRS-2
  - CRS-2P
  - CMS-2
    - Used for Scrub Seals
  - HFMS-2S
    - Used for Otta Seals

Chip Seal Materials - Aggregates

- Sizes
  - 1/8”
  - FA-2 or ¼”
  - FA-2.5 or 3/8”
- Types
  - Class A – Crushed quarry or mine trap, quartzite or granite
  - Class B – All other crushed quarry or mine rock such as limestone, dolomite, rhyolite and schist.
  - Class C – Natural or partially crushed gravels

Chip Seal Variations

- Underseal
  - Same materials and process as a chip seal.
  - Apply prior to overlay to minimize reflective cracking.
- Double Chip Seal
  - Can be used existing asphalt or gravel roads.
  - On gravel roads you eliminate the need for dust control and grading.
  - Can be patched with HMA or spray patching.
- Otta Seal
  - Used to treat gravel roads.
  - Aggregate used can be crushed or uncrushed with up to 10% fines.
  - Much higher application rates than a chip seal.
  - Not commonly used.

Rejuvenators

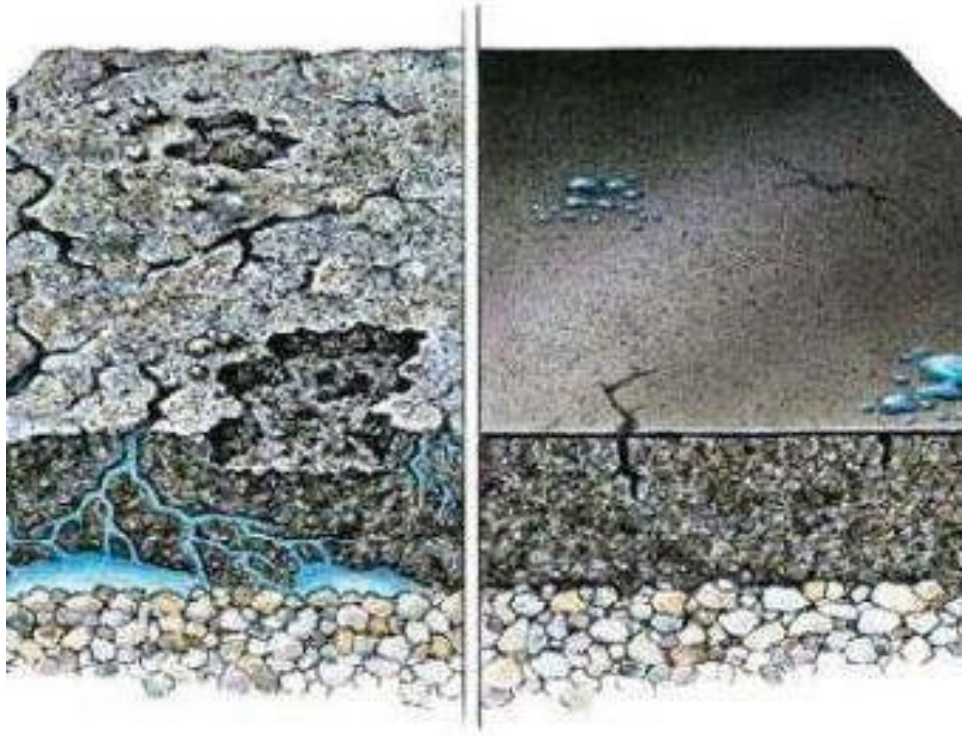
- Designed to penetrate the surface of the asphalt and reverse the effects of oxidation.
- Helps to soften the surface and slow down cracking.
- Several different products on the market. Both bio-based and petroleum-based products work to varying degrees.
- The application process is less intrusive than alternative surface treatments and allows for a quick return to traffic use.
- Most products dry “clear” saving cost on pavement markings.
- Should be applied within the first 2 years of life and repeat applications every 2-3 years.

General Notes

- All other maintenance and repair must take place prior to surface treatments.
- Seal coats will experience premature wear when applied to pavements in poor condition i.e. pocked, raveling, knobby.
- Goal is to keep water out, not trap it in!

Seal Coats will fix all of your asphalt problems!

BEFORE ***AFTER***



FALSE – SEAL COATS DO NOT FIX STRUCTURAL ISSUES

General Notes

- Consider a fog seal or cape seal over all chip seals for better aggregate retention
- Know your customer when considering what product will best fit their needs. Dealership? Shopping carts? Industrial?
- All variations of seal coats perform best when installed in the first 2-3 years of life.
  - Fog Seals, and Rejuvenators re-apply every 2-3 years
  - “Black Seals” re-apply every 3 years
  - Chip Seals re-apply every 4-6 years on gravel surfaces or 5-7 years on paved surfaces.

Questions