

## **Preservation Overlays**

## Increasing Performance Using Combination Applications

## Preservation Overlays

**Combination Applications** 

A combination of two or more preservation treatments to increase the functionality and longevity of the wearing course.

- Get creative with the options available in the PUB 408 and 447
- Successful applications annually within the Commonwealth
- Successful results in neighboring states

## **Treatment Options**



### Crack Seal

- PUB 408 section 469
- Routine maintenance
- Prep for wearing coarse





## Hot Pour Mastic

- Bulletin 15 MISC Hot Pour Mastics
- Cracking ¾" or greater
- Flexible binder
- Pothole repair
- Longitudinal joint failure







- Follow section 483
- Specify width
- Levels rumble strips
- Design or maintenance
- Prior to hot mix overlays





### Microsurfacing Rut Fill

- PUB 408 Section 483
  RF (Rut Fill)
- Rutting up to 2" in a single pass
- Type B





## Surface Preparation

## **Combination Applications**

- PAAMA recommends the sealing of cracks prior to any preservation wearing course
- Added protection if reflective cracking occurs
- NCAT study has proved the effectiveness of treating cracks prior to a wearing course.
  - Crackseal placed prior to a wearing course added at least 2 years of life extension over wearing course as a stand alone application.

## Selecting a Base Course

## **Pavement Condition?**

Crack Mitigation?

Leveling?

Surface Oxidation?

ADT?



- PUB 408 Section 470
- PUB 447 MS-0340-0005
- #8 Aggregate most common
- Clean, cubular aggregate



### Seal Coat

### High Performance Seal Coat

- High Polymer 88/22FR
- Hot Rubber Binder
- HIGHER ADT
- Quicker opening to traffic
- Sweep 2 hours after application



![](_page_10_Picture_7.jpeg)

## Scrub Seal

- NJDOT Scrub Seal CMS-1P
- Option for first app Capeseal or Double Chip
- Forces emulsion into cracks

![](_page_11_Picture_4.jpeg)

![](_page_11_Picture_5.jpeg)

### Fiber Mat

- PUB 447 MS-0360-0018
- Slows reflective cracking
- Higher distressed pavements

![](_page_12_Picture_4.jpeg)

![](_page_12_Picture_5.jpeg)

## Microsurfacing

- PUB 408 Section 483
- Type A rutting  $0 \frac{1}{2}$ "
- Type B rutting  $\frac{1}{2}$ " 1  $\frac{1}{4}$ "

![](_page_13_Picture_4.jpeg)

![](_page_13_Picture_5.jpeg)

## Selecting a Surface Course

## Loss of Friction?

ADT?

Speed of Traffic?

Longevity?

Aesthetics?

### Fog Seal for Seal Coat

- PUB 408 Section 472
- Weatherproofing membrane
- Aggregate retention
- Aesthetics
- Lessens complaints

#### TABLE A Fog Seal Materials

		Application Temperature (F)	
Class of Material	Type of Material	Minimum	Maximum
CSS-1h <sup>(1)</sup>	Cationic Emulsified Asphalt	70	150
SS-1h <sup>(2)</sup>	Emulsified Asphalt	70	150
SS-1hPM	Polymer-Modified Emulsified Asphalt	70	150
CSS-1hPM	Cationic Polymer-Modified Emulsified Asphalt	70	150

Dilute Material using 1 part emulsion to 1 part water. All dilution must be done by the emulsified asphalt supplier at the emulsified asphalt supplier plant location. Provide a Bill of Lading from the emulsified asphalt supplier certifying the base emulsified asphalt properties before dilution, the quantity of emulsified asphalt, and the water added for dilution, or certify the diluted product. Diluted emulsified asphalt must be applied within 48 hours after dilution. Dilution of asphalt emulsion in the field is not allowed.

#### Notes:

Material selection for the Fog Seal application:

- Use a Cationic Emulsified Asphalt material CSS-1h when a Cationic Emulsified Asphalt was used for the Asphalt Seal Coat.
- Use an Anionic Emulsified Asphalt material SS-1h when an Anionic Emulsified Asphalt was used for the Asphalt Seal Coat.

![](_page_15_Picture_13.jpeg)

Pre-Coated Aggregate

- PUB 408 Section 471
- Dirty stone source
- Aggregate retention
- Aesthetics
- Allows use of local sources

		Application	
		Temperature °F	
Class of Material	Type of Material	Minimum	Maximum
MC-30	Cut-back Asphalt	70	120
MC-70	Cut-back Asphalt	100	150
SS-1h (E-8A)	Emulsified Asphalt	70	150
CSS-1h (E-8C)	Cationic Emulsified Asphalt	70	150
PG 64S-22	Asphalt Cement	275	350
PG 58S-28	Asphalt Cement	250	325

![](_page_16_Picture_7.jpeg)

### Double Seal Coat

- PUB 447 MS-0340-0005
- Scrub seal or Fiber Mat option for first application
- Double #8
- #9 option for top course

![](_page_17_Picture_5.jpeg)

![](_page_17_Picture_6.jpeg)

### Cape Seal

- PUB 408 Section 483
- Microsurface for higher ADT
- Smoother riding surface
- Scrub seal option for first application

![](_page_18_Picture_5.jpeg)

![](_page_18_Picture_6.jpeg)

![](_page_19_Picture_0.jpeg)

- PUB 408 Section 482
- Slurry Seal Type II
- Smoother riding surface
- Increased longevity

![](_page_19_Picture_5.jpeg)

### Cape Seal

### Double Microsurfacing

- PUB 408 Section 483
- Increased leveling
- HIGHER ADT
- Increased skid resistance
- Recommended Type A application for top course

![](_page_20_Picture_6.jpeg)

STATE ROUTE	ADT	TRUCK TRAFFIC
PA TRPKE Mid County	72,206	16%
PA TRPKE Carlisle	24,124	34%

## Intermediate Courses

#### Microsurfacing

- Improves IRI in advance of surface coarse
- Prevents shoving / slipping
- Increases bond strength
- Levels rutting / slab settlement

#### Stress Absorbing Membrane Interlayer (SAMI)

- Slows reflective cracking
- Prevents shoving / slipping
- Used over higher distressed pavements

![](_page_21_Picture_10.jpeg)

![](_page_21_Picture_11.jpeg)

## Benefits

# **Combination Applications**

- Significantly increases service life of wearing courses
- Multiple treatments can address multiple pavement distresses
- Allows treatment options for roadways in poorer condition
- Significant cost benefit compared to hot mix applications
- Improve overall ride quality and project perception
- Allows for higher ADT applications

## Interested in Learning More?

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![](_page_24_Picture_0.jpeg)

# pennsylvania DEPARTMENT OF TRANSPORTATION

## **THANK YOU**