Rocky Mountain West Pavement Preservation Partnership

Peppermill Hotel
Reno, Nevada
October 6, 2011

FOG SEALS

Fog Seal / Flush Coat

- Fog Seal - Definition
- Material choices
- Equipment
- Application
- Cost
- Traffic Control

AEMA Definition

- Fog Seal- A light spray application of dilute asphalt emulsion used primarily to seal existing asphalt surfaces to reduce raveling and enrich dry and weathered surfaces.

Emulsion Types

- **CSS-1, CSS-1H, SS-1 and SS-1H**
  - Slow setting, uses a soft pen AC
  - Good for filling small cracks and air voids
  - Availability
  - Stable Storage
  - Stable
  - Good for small cracks
  - Oxidation
  - Longer cure time
  - Can be sensitive on application rate
- **CRS-2, RS-2**
  - Faster cure time
  - Not as good for filling cracks and voids
  - Not as stable
- **CQS-FS**
  - Quick setting
  - Helps reduce water intrusion
  - Helps seal surface
- **CQS-1H**
  - Quick, good for cracks
  - Uses harder pen AC
  - Slightly higher price
  - May not be available in early spring

Sealers

TRMSS- Wright Asphalt

HA5- Holbrook Asphalt

Many products may work well. Consult your Suppliers

Dilution Process

- Always add water to the emulsion, not emulsion to the water
- Use clean water
- Use warm water if available
- Heat dilution to 120-160F
- Circulate while heating
- Shoot what you dilute

Best Dilution Process

- Have your supplier dilute the material at the plant

  - Controlled Environment
  - Consistent results
  - Higher production

Surface Preparation

- Surface should be free of dust, loose or foreign matter that would hinder adhesion of the emulsion
- If the dust is minimal and brooming is unavailable, a light (.15g/yd^2) application of water can improve adhesion (allow excess water to drain prior to fog seal application)

Equipment

- Hand Sprayer or Distributor
  - Properly calibrated
  - Free of harmful contaminants
    - Solvents, oppositely charged emulsions
- Spray Bar
  - Correct height for proper overlap
  - Nozzles
    - 1/8 to 3/16” according to desired rate
    - Adjusted angle for proper overlap

Distributor Trucks

- Tachometer, pressure gauges, accurate measuring devices, thermometer for measuring temperatures
- Insulated Tank
- Tank with baffles to prevent pressure surges from emulsion sloshing when starting and stopping
- Circulating spray bar with a positive shutoff valve


925
Vance Bros. Inc.
5201 Brighton
Kansas City, Mo.
GVW 54000

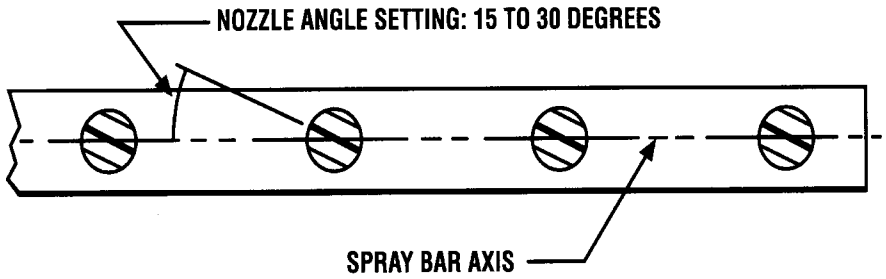

Figure 6.6 Proper Nozzle Angle Setting

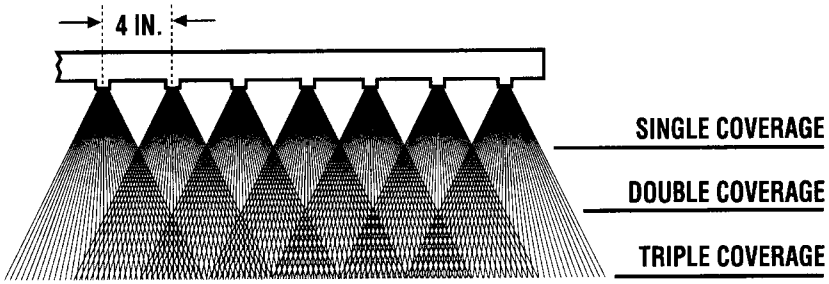

Figure 6.7 Spray Bar Height Must Be Set Exactly for Proper Coverage

Construction - Binder Application Overlap

When to Apply?

- Early Spring and Late Fall are ideal
  - Cracks are at their widest
  - Traffic is at its lightest
  - Equipment is most available
  - Contractors are least busy
  - Suppliers are most flexible
  - Cost to the Agency is at its lowest

Factors Affecting Cure Time

- Emulsion selected
- Dilution temperature
- Pavement temperature
- Weather conditions
- Application rate
- Dilution rate

Things to Avoid

- Over application
- Extremely wet pavements
- Ruts ½” or more
- Uncontrolled traffic
- Early traffic
- Overheating the dilution

Common Sense

- Goes a long way
  - ✓Have a sand truck available
  - ✓Perform a test strip
  - ✓Avoid high profile areas when using unproven or unfamiliar materials
  - ✓Mix materials to evaluate properties such as storage stability and compatibility in a container smaller than a distributor truck

Fog Seal

- 0.10 – 0.15 gals sq. yd. of CSS-1 dilute
- 1 mile x 24' = 14,080 sq. yds.
  - 1,408 gals @ 0.10 sq. yd.
  - 2,112 gals @ 0.15 sq. yd.
- 40 ton load = approx. $12,000/ emulsion
  - 94,000 sq. yds. @ 0.10 sq. yd.= $.12 sq. yd.

STOP

NO OUTLET

Other Uses

- Post construction improvements
  - Low asphalt HMA
    - Adds residual asphalt
  - Chip seals
    - Improves aggregate retention
    - Extends life expectancy
    - Raises public acceptance
  - Slurry and Micro-surfacing
    - Helps tie in any surface variations

Weather

- Avoid application when rain is likely prior to expected cure time or when freezing weather is forecast overnight
- Pavement and air temperature should be above 40F

- THANK YOU!

- Stu Zick
- Ergon Asphalt & Emulsions
- Stu.zick@ergon.com
- 801.510.1648