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INSPECTOR SEAL TRAINING

CMAA

Advancing Professional Construction and Program Management Worldwide

Purpose and Learning Objectives

- Provide guidance and instruction to inspectors involved in the construction of seal coats
- Help inspectors learn the various aspects of what is involved in a seal coat operation
- Become familiar with seal coat inspection duties
- Assist inspectors in recognizing problems during a project and offering solutions

Agenda

- Types of Seals
- Materials
- Equipment
- Application
- Role of the Inspector
- Problems and Solutions

Disclaimer

- *Remember, this training is not to be all inclusive of your duties as an Inspector, but rather it is only the START of things to know, items to track and ideas on which to expand to become a better Inspector!*
- *The two most important items for an inspector after safety are documentation and photos!!*

Keys to Success

- Good specifications and enforcement
- Proper roadway preparation
- Accurate mix design
- Accurate equipment calibration
- Material consistency free of contamination
- Contractor performance – well trained staff
- Quality project inspection/testing

Seal Treatments

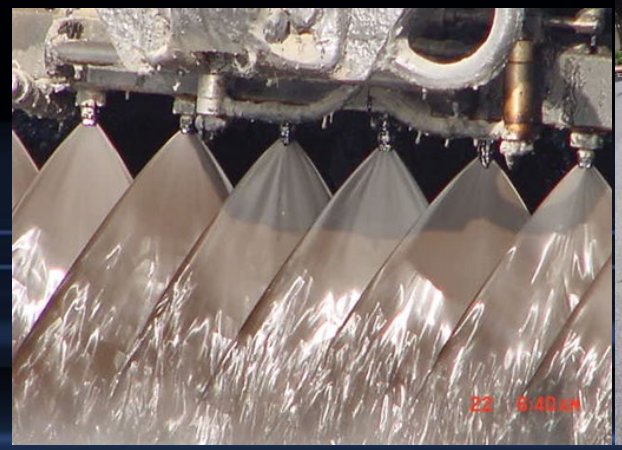
- Seal coats are a versatile & low-cost surface treatment system used for preventing issues in newly laid pavements, correcting problems in the older pavement and improving the aesthetics of pavements.
- The average life of a seal coat or surface treatment is about six to eight years; however, some have performed successfully for periods of up to 20 years.
- *These types of treatments add no structural capacity to a pavement and will not correct excessive ride quality problems*

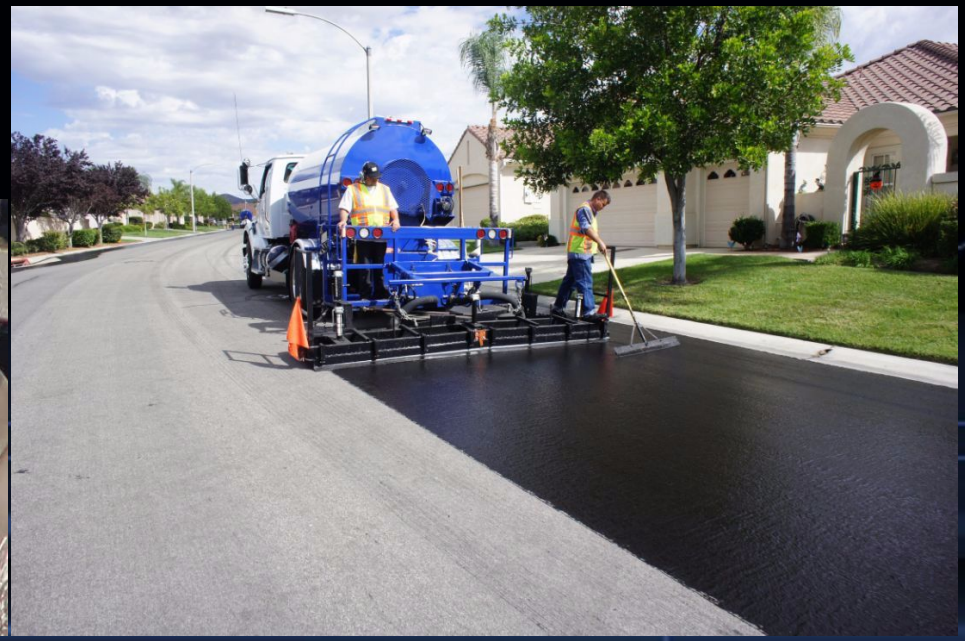
Types of Seals

- Fog Seals
- Slurry Seals
- Microsurfacing
- Chip Seals
- Scurb Seals
- Cape Seals

Slurry Seal

A slurry seal is the application of a mixture of water, asphalt emulsion, aggregate (very small crushed rock), and additives to an existing asphalt pavement surface. Polymer is commonly added to the asphalt emulsion to provide better mixture properties.





Slurry Seal - Material

- Emulsion – can be polymer modified
- Aggregate – Type I (1/8”), II (1/4”), or III (3/8”) - can use Reclaimed Asphalt Pavement (RAP) aggregate
- Set Control Agents/Additives such as aluminum sulfate and/or Portland cement to control the breaking and curing times
- Additives – Up to 1.5% by weight of dry aggregate

Slurry Seal - Equipment

- Continuous Self-Loading Mixing Machine
  - Automatically Sequenced and Self Propelled
  - Discharge on a continuous flow basis
  - Self loading without interrupting placement

Slurry Seal – Application Rates

- Caltrans Section 37-2.06
  - Existing Pavement or Micro-Milled Pavement

Slurry Type	Range	Mean Rate (Initial Rate)
Type II	10-15lb/syd	12.5
Type III	20-25lb/syd	22.5

  - Chip/Scrub Sealed Pavement

Slurry Type	Range	Mean Rate (Initial Rate)
Type II	13-17lb/syd	15.0
Type III	25-28lb/syd	26.5

Microsurfacing

Microsurfacing is similar to slurry seal. It consists of the application of a mixture of water, asphalt emulsion, aggregate (very small crushed rock), and **chemical additives** to an existing asphalt concrete pavement surface.

Chip Seal

A chip seal is a two-step process which includes first an application of asphalt emulsion and then a layer of crushed rock to an existing asphalt pavement surface.

Chip Seal - Material

- Emulsion – can use Polymer Modified and shall be cationic (positive charge)
- Screenings “Medium Fine” (M-F) or Medium (Med)

Chip & Scrub Seal - Equipment

- Distributor Truck - ***Calibrated***
- Haul Truck
- Chip Spreader
- Roller
- Broom

Chip & Scrub - Finishing (Rollers)

- Rollers shall be pneumatic-tired type. A minimum of 2
- Initial rolling shall consist of one complete coverage and shall begin immediately behind the spreader
- Secondary rolling shall begin immediately after completion of the initial rolling. The amount of secondary rolling shall be sufficient to adequately seat the screenings and in no case shall be less than 2 complete coverages.

Chip & Scrub - Finishing (Sweeping)

- Sweep all roads prior to commencing scrub seal
- Brooms for finishing and maintaining seal coat screenings shall be the self-propelled type
- The surface of the seal coat shall be broomed as often as necessary during the 4-calendar day maintenance period to maintain the surface free of loose screenings. At the end of the 4 consecutive calendar day maintenance period, any excess screenings shall be removed from paved areas.

Scrub Seal

A scrub seal is an application that is very close to a chip seal treatment except the asphalt emulsion is applied to the road surface through a series of brooms placed at different angles. These brooms guide the asphalt emulsion into the pavement distresses to ensure sealing the road.

Scrub Seal - Material

- Emulsion – can use Polymer Modified
- Screenings “Medium Fine” (M-F)
- Chip Retention – 95%

Stockpiles – Material and Equipment Storage

- Very Important to keep clean and contamination free
- Centralized location
- Gravel or hard surface
- High and dry
- Not too close to houses
- Easy access to project
- Access to water

Roadway Preparation

- Pruning & Herbicide
- BMPs
- Plane Asphalt Concrete Pavement (Full, Edge, Profile)
- Digouts
- Repair Surface Distress
- Repair Pavement Edge
- Leveling – over ½” in depth - level or fill wheel ruts and edges
- Removal of Pavement Markers
- Protection of Iron
- Sweeping

Role of the Inspector

The primary responsibilities for an inspector include:

- Plan Familiarity
- Work Done Without Inspection
- Contract Compliance
- Unacceptable Work
- Testing
- Daily Diary

Duties Typically Performed

- Checking
- Observing
- Sampling & Testing
- Documentation & Reporting
- Photo Documentation

Detailed Duties

- Monitor the binder application and make sure the contractor is in control of the rate
- Monitor the aggregate application and the spread rate based on contract
- Inspect the rolling and sweeping operations
- Ensure that aggregate stockpiles are adequate and are conveniently located
- Sample both aggregate and asphalt materials as required
- Monitor the temperature of the pavement surface, air, and asphalt binder
- Make sure adjustments are being made of the binder and aggregate application rates as needed.
- Inspect the quality of the finished project and bring any deficiencies to the attention of the contractor and engineer.

Problem Solving

- Non-Uniform Appearance – Proper Calibration of Placement Machines
- Raveling – Adherence to Job Mix Formula (JMF), ambient conditions, application rates, over watering in residential and opening to traffic
- Bleeding – Machine calibration and minimize overlaps
- Blotching at Beginning and End of Passes – Newer machines have automatic sequenced starts that can be set
- Breaking Too Fast – Operator adjustment of water and additives to slow the break and keep asphalt emulsion temperature workable

Problem Solving

- Breaking Too Slow – Suspend operations until temperature is within the recommended application rate
- Unsatisfactory Surface Finish from Handwork – Handwork is best done when ambient and pavement temperatures are cooler which allow extra time for the mixture to set. Squeegees should have mops that closely match the ones used on the box. Spray water on surface prior to placement. Breakdown large areas of handwork into smaller areas for placement of materials.

Problem Solving

- Tire Marks and Surface Abrasions (Scuffing) – Rolling with rubber tire rollers, placing during cooler months of the year, broadcasting of sand
- Bond with Existing Pavement – Clean any grease spots or oil saturated surfaces prior to placement
- False Break – Hot surface temperatures contribute to accelerating break set. Use of water or working earlier in the day when temperatures are better
- Cul-de-sacs – More cure time is needed because of the higher stresses applied by tight turning vehicles

Additional Resources

- Los Angeles County Public Works
- https://pw.lacounty.gov/gmed/lacroads/Treatment.aspx
- Pavement Interactive
- https://pavementinteractive.org/

Questions?

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