

SAND SEALS

PROCESS DESIGN OVERVIEW

1 SCOPE

A sand seal is used as an economical maintenance treatment. A sand seal can be placed on an existing road that is starting to show some distresses. Sand seals are ideally suited for the following:

- To enrich a dry, weathered or oxidized surface.
- To prevent moisture and air from penetrating through the existing surface.
- To develop a skid resistant surface or improve the existing surface condition.

1.1 DEFINITIONS

Sand Seal:

A sand seal consists of a single application of asphalt emulsion on an existing road surface followed by a light application of a fine aggregate such as clean sand or screenings.

2 MATERIALS

2.1 Asphalt Emulsions:

A number of different grades of asphalt emulsion can be used in sand seals. The proper emulsion to be used has to be determined by running compatibility tests between the emulsion and the aggregate to be used. Typically the most common emulsions used are RS-1, RS-2, CRS-1 and CRS-2.

2.2 Cover Aggregate:

The type of cover aggregate used in sand seals must meet certain requirements of shape, size, cleanliness. The aggregate should have a maximum size of 4.75 mm and should have a relatively low amount passing the 75 micron sieve size (2 – 5%). Also the asphalt emulsion to be used and the aggregate must be compatible to ensure the asphalt-aggregate bond is effective.

3 DESIGN CRITERIA

When designing a sand seal a number of factors have to be examined and assessed to ensure a proper surface will be placed that will perform for its service life. The following factors can have a tremendous effect on the performance of a sand seal; traffic, aggregate shape, existing surface and residual asphalt content. If these factors are addressed the chances of a good sand seal being placed are greatly increased.

Traffic: The type and quantity of traffic will have a large effect on the amount of asphalt emulsion to be used as well as the emulsion type.

Aggregate Shape: The overall shape of the cover aggregate can influence the quantity of aggregate as well as the amount of asphalt emulsion to be used. The angularity of the aggregate will affect the performance of the finished seal.

SAND SEALS

PROCESS DESIGN OVERVIEW

Existing surface: The texture and condition of the existing road surface will affect the aggregate type, quantity and spray rate. A dry porous road surface may need a higher quantity of emulsion.

Asphalt Residual in the Emulsion: The quantity of asphalt residual in the emulsion can affect the quantity of emulsion needed to hold the cover aggregate. The lower the residual the higher the quantity of asphalt emulsion needed.

If these factors are taken into consideration in designing the sand seal then the chances of a successful seal are greatly improved. Typically a sand seal would require an emulsion application rate of 0.65 – 0.90 l/sqm and a cover aggregate quantity of 5 - 8 kgs/sqm.

4 RECOMMENDED PERFORMANCE GUIDELINES

In order to construct a proper well designed sand seal the following guidelines should be followed:

- Design a sand seal with aggregate to be used on job.
- Use a clean sand or screenings.
- Ensure compatibility of aggregate and emulsion
- Calibrate and inspect all equipment.
- Use sufficient number and properly pneumatic rollers.
- Follow proper construction techniques.
- Use traffic control to protect seal.
- Work only in weather suitable for type and grade of emulsion being used.

5 RESOURCES

1. "Basic Asphalt Emulsion Manual", Fourth Edition, Asphalt Institute and Asphalt Emulsion Manufacturers Association, 2008
2. "Recommended Performance Guidelines", Second Edition, Asphalt Emulsion Manufacturers Association, Annapolis Maryland, 2006



McASPHALT INDUSTRIES LIMITED

8800 Sheppard Avenue East T 416.281.8181 TF 1.800.268.4238
Toronto, ON M1B 5R4 F 416.281.8842 E info@mcasphalt.com

mcasphalt.com
ISO 9001/14001/45001