

## PRE-SPRAYING OF SPRAYED SEAL SURFACES

### 1. INTRODUCTION

Pre-spraying (Photo 1) is used in conjunction with conventional sealing operations to provide a varying binder application rate across a pavement:

- to make allowance for transversely non-uniform surface textures and thereby avoid future flushing or stripping problems;
- to improve quality and production by eliminating longitudinal joints by permitting increased width of spraying at one application rate; and
- to allow the field application of a sprayed seal on a traffic lane as well as the adjacent shoulder to be placed as one operation.



Photo 1 - Pre-sprayed road surface

### 2. TREATING TRANSVERSELY NON-UNIFORM SURFACES

#### 2.1 General

The surface texture of a sprayed seal can change across the width of the pavement. In the wheel paths the surface may be flushed or full while in other areas the surface may be coarse. This change in texture is often due to one or more of the following:

- embedment of the aggregate (in the wheel paths) due to soft or wet pavement materials;
- aggregate wear or breakdown in the wheel paths;

- poor pavement condition or surfacing practices; and
- poor or uneven preparation of the pavement when it was constructed.

The varying texture transversely across a sprayed seal surface makes it difficult to successfully reseal with one pass of a conventional sprayer because the application rate across the spray bar is designed to be uniform. Pre-spraying a pavement surface involves an additional pass of a sprayer to apply additional binder in the coarse areas of the pavement. This process enables more binder to be placed in the coarse areas (outside of the wheel path) than in less textured or flushed areas (wheel paths) by:

- turning off spray jets in wheel paths and spraying part of the required binder in the coarse areas outside the wheel paths with one pass of the sprayer; and
- spraying the remainder of the binder required with a second pass of the sprayer with a uniform application rate across the whole width (i.e. all spray jets turned on).

The pre-spraying treatment, if applied properly, ensures that the flushed areas in the existing surfacing are not “reflected” through the new sprayed seal surfacing treatment and that there is sufficient binder to prevent stripping outside of the wheel paths.

It has been VicRoads’ experience that if the surface texture outside the wheel paths is more than 20% different to the surface texture in the wheel paths, it is advisable to consider using the pre-spraying treatment.

#### 2.2 Design of the Pre-spray Binder Application Rate

The areas outside the wheel paths often require more binder because:

- the texture is coarser than areas in the wheel paths; and
- there is less trafficking of the seal outside the wheel paths than in the wheel paths.

The application rate for the pre-spraying should be sufficient to make up for the difference in texture (at the design traffic) and should include up to an additional 0.2 litres/m<sup>2</sup> to allow for less traffic outside the wheel paths. This would

mean a pre-spray application rate of 0.6 litres/m<sup>2</sup> for an area assessed as requiring 0.4 litres/m<sup>2</sup> to provide uniform texture.

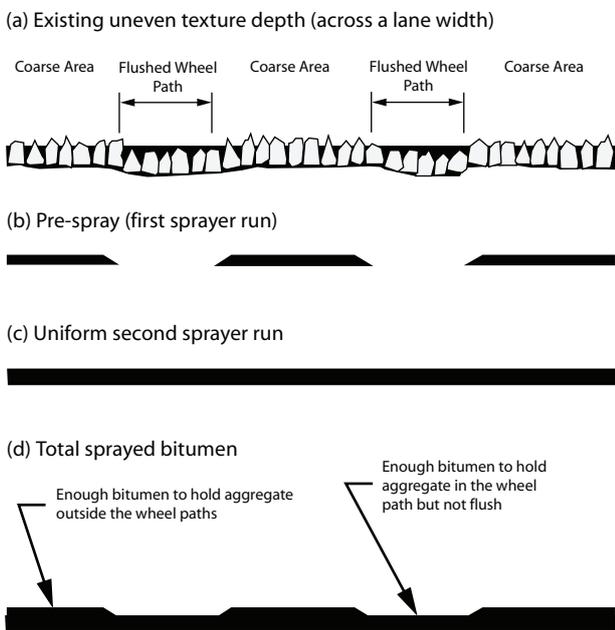
**2.3 Setting Up A Spray Bar for Pre-spraying.**

The following factors need to be considered when setting up a spray bar for pre-spraying:

- the location of wheel paths are dependent upon pavement geometry (straight or curved) and whether or not there are sealed shoulders. This is particularly noticeable on curves, where traffic often travel close to the inside of the curve thereby varying the distance of the wheelpath from the marked centreline; and
- the width of the wheel path nearest the centre line of a road is generally narrower than the wheel path furthest from the centre line of the pavement. (This is due to the different spacing of car and truck tyres.)

As a result of these factors the location of wheels paths vary along the length of a road. Consequently, it is necessary for the seal designer and operational personnel in charge of the sealing operation to observe the behaviour of traffic when designing the spray bar setup for pre-spraying.

A sketch showing the basic steps in the pre-spraying process for treating non uniform texture across a pavement is given in Figure 1.



**Figure 1 - Treating Non-Uniform Surfaces**

**3. PRE-SPRAYING OF SHOULDERS**

On roads where the shoulder is sealed, it is possible to spray

a shoulder and a trafficked lane without a longitudinal joint by using the pre-spraying process.

The advantages of the process are:

- improved quality of the sealing project by eliminating a longitudinal joint;
- improved productivity of the sprayed sealing team; and
- reduced delays to the travelling public.

The process involves:

- spraying the shoulder (which requires significantly more binder than the trafficked lane) with a designed amount of binder; and
- spraying the trafficked lane and the shoulder with an off-set spray bar with the binder application rate of the trafficked lane.

This results in the correct application of binder on the trafficked lane and the two amounts of binder adding up to the correct application rate of binder for the shoulder.

**4. OTHER TREATMENT OPTIONS**

In addition to pre-spraying techniques other treatment options that provide a uniform surface texture that could be considered are:

- the use of chemical solvents;
- High Pressure Water Retexturing (HPWR); and
- the use of variable application rate bitumen sprayers (not currently available in Australia).

Further information on these processes can be found in Technical Notes 18 and 62 .

**5. PRECAUTIONS**

Pre-spraying to correct texture variation cannot be applied through intersections where wheel paths cross, or on tight curves where the wheel paths are not well defined. At these locations it may be necessary to apply a size 7 mm or smaller sprayed seal to correct variable pavement texture.

**6. CONTACT OFFICERS**

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