

## Sprayed Seals - a brief description

pavement work tips — no. 32

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### INTRODUCTION

The basic term used in Australia for an application of bituminous binder and aggregate is **sprayed seal**, commonly shortened to **seal**. When placed as a retreatment of an existing bituminous surfaced pavement it is referred to as a **reseal**.

In New Zealand, the terms **bituminous seal** and **chipseal** are also used. The term **chip** is used in reference to the term for aggregate particles used in sealing work.

### INITIAL TREATMENTS

Initial treatments on unbound granular, concrete or timber surfaces generally require the use of either a **primer** or **primerseal**.

A **primer** (Figure 1) is the application of a bituminous material of suitable viscosity to a prepared pavement prior to the application of the next bituminous surfacing.



Figure 1: Prime

A **primerseal** is the application of a suitable primerbinder and fine cover aggregate to a prepared pavement. It is used as a temporary treatment prior to applying the next bituminous surfacing.



Figure 2: Primerseal

### NUMBER AND SEQUENCE OF BINDER AND AGGREGATE APPLICATIONS

The basic form of sprayed seal is a single application of binder followed by a single application of aggregate, also called a **single/single seal** (Figure 3). It is generally assumed that a seal is single/single unless specifically stated otherwise.

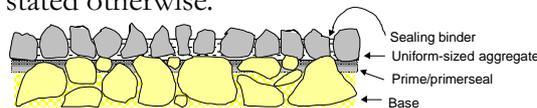


Figure 3: Single/single Seal (single application of binder and single application of aggregate)

**Multiple application** seals are generally described in the sequence of application of binder and aggregate, eg:

**Double/Double** = two applications of binder and two applications of aggregate.

**Single/Double** = a single application of binder and a double application of aggregate.

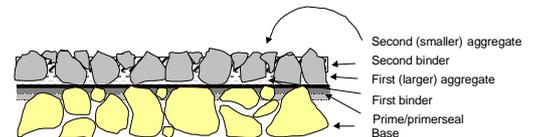


Figure 4: Double/double seal

The design of a **double/double seal** (Figure 4) requires the application rates for both layers of binder and aggregate to be determined as an integrated treatment. The first application normally comprises a large size aggregate, with the second application being typically half the nominal size of the first.

The use of a small size aggregate in the first application is more commonly termed an **inverted seal** or **upside down seal** (Figure 5). This is a technique sometimes used to reduce embedment of the second (larger) aggregate into a flushed surface or soft base.

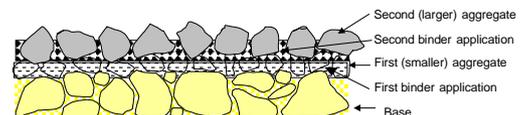


Figure 5: Inverted seal

In a **single/double seal**, the particles in both applications of aggregate are incorporated into a single application of binder to form a permanent part of the seal. The result is similar to Figure 4 except that there is no second application of binder. Success with this type of seal requires careful design of binder application rate and control

*continued on reverse*

### Key Summary

*This issue of 'pavement work tips' provides a guide to some of the basic terms commonly used in describing sprayed seals in Australia and New Zealand*

of aggregate spread rates to ensure the particles in the second application are held in the spaces between the particles in the first application. This should not be confused with a scatter coat or racked in treatment.

A **scatter coat** is a light application of small size aggregate to a single/single seal to temporarily “lock in” the larger size aggregate and reduce aggregate movement during rolling and initial trafficking (Figure 6). It is expected that most of the scatter coat aggregate will be lost during the early service life of the seal. This is also termed a **racked in** treatment or, in New Zealand, **dry lock** process.

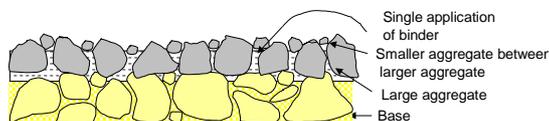


Figure 6: Single/single seal with a scatter coat

A scatter coat is applicable to high stress areas, particularly when using bitumen emulsion binders.

**Dry matting** is a form of single/double seal in which no binder is used with the first application of aggregate but is applied prior to the second aggregate application.

One approach is to apply a small size aggregate (dry) to fill spaces in a coarse textured or partially stripped seal, followed by the binder and another small size aggregate to hold the initial application in place (Fig. 7).

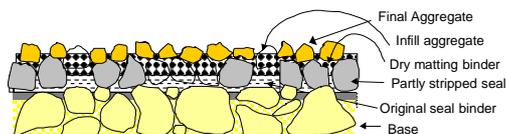


Figure 7: Dry matting technique

An alternative form of dry matting, used for treating flushed or bleeding surfaces, is to use a larger aggregate in the first (dry) application.

## SPECIAL USES & MATERIALS

### High Stress Seal (HSS)

A seal or reseal treatment that uses a modified binder to resist heavier than normal traffic loading such as that applied by braking, accelerating and turning vehicles.

### Strain Alleviating Membrane (SAM)

A sprayed seal with the binder containing a relatively high concentration of rubber or polymer modifier to absorb strains that occur in a road pavement and thereby reduce reflection cracking.

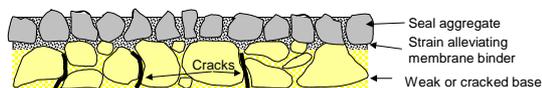


Figure 8: Strain Alleviating Membrane (SAM)

### Strain Alleviating Membrane Interlayer (SAMI)

Similar to a SAM, but provided as an interlayer before placing an asphalt overlay.

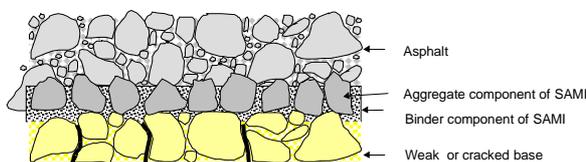


Figure 9: Strain Alleviating Membrane Interlayer (SAMI)

### Fibre Reinforced Sprayed Seal (FRSS)

A product that uses a specially formulated polymer modified emulsion binder with chopped glass fibres to provide a reinforced bituminous layer for the control of reflection cracking, usually as a SAM or SAMI treatment.

### Geotextile Reinforced Seal (GRS)

A seal incorporating a layer of geotextile fabric. The first application of binder (bond coat) is used to hold the geotextile fabric in place while the second (main) application holds the aggregate (Figure 10).

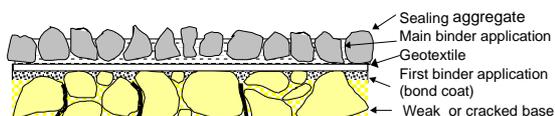


Figure 10: Geotextile Reinforced Seal

A GRS is used to provide enhanced levels of performance in SAM and SAMI applications and can also incorporate polymer modified binders to further improve waterproofing membrane performance. Both single/single and double/double seals can be used in GRS but the latter is preferred due to improved aggregate retention and better performance under traffic.

## REFERENCES

- Austrroads Guide to the Selection of Road Surfacing, Austrroads, 2000.
- Pavement Work Tip No. 25 – Geotextile Reinforced Seals AS 1348 Road and traffic engineering – Glossary of terms

For more information on any of the construction practices discussed in "pavement work tips", please contact either your local AUSTRROADS Pavement Reference Group representative or AAPA —  
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