

Sprayed Sealing - Initial Treatment of Stabilised Pavements

pavement work tips - No 54

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INTRODUCTION

Granular pavements to be surfaced with a bituminous wearing course require the application of either a prime or primerseal as an initial treatment prior to the application of a final sprayed seal or asphalt wearing course.

General requirements for initial treatments on granular pavements, including surface preparation, are described in Pavement Work Tip Nos. 1, 18, 43 and 49 (see references) as well as more detailed Austroads guides. Specific guidelines for the design of sprayed seal initial treatments are provided in the *Update of the Austroads Sprayed Seal Design Method (APT68/06)* and *Update of Double/Double Design for Austroads Sprayed Seal Method (AP-T236/13)*.

The purpose of this work tip is to provide guidelines for those issues to be particularly considered when selecting and applying sprayed seals to stabilised base materials.

Different issues apply to basecourse materials treated with lime or cementitious materials to that of foamed bitumen and these are discussed separately below.

CONSTRUCTION OF STABILISED PAVEMENTS

Guidelines for the construction of stabilised pavements are described in detail in the AustStab *Pavement Recycling and Stabilisation Guide* as well as the Austroads *Guide to Pavement Technology Part 8: Pavement Construction*.

Issues common to preparation of all granular pavement types for bituminous surfacing, as described in Work Tip No.49, include control of segregation, control of moisture, control of level and thickness, compacted density, surface finish and dry back. Surface finish requirements include a hard dense surface capable of being swept with a rotary road broom to leave a tight surface, free of loose and foreign materials.

Surfaces need to be uniform in texture and free of laminations.

A further issue specific to stabilised pavements is that of curing of the stabilised material.

Curing time may not be critical for pavements stabilised with lime or cementitious materials where a prime or primerseal may assist curing by controlling moisture content in the pavement, provided that dry back conditions have been achieved. Foamed bitumen pavements, however, should be cured, generally for a minimum of around 48 hours, before surfacing. The extent of curing can be monitored using ball penetration testing to ensure that the pavement surface is sufficiently hard prior to surfacing.

SURFACING LIME AND CEMENT STABILISED PAVEMENTS

Well prepared surfaces on pavements stabilised with lime, cement and/or other cementitious materials generally result in hard, dense surfaces of low porosity.

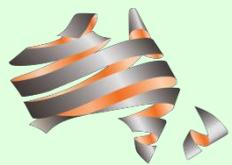
Priming usually requires a light to very light grade of primer. Care should be taken when using bitumen emulsion primers due to the combined effect of low porosity of the base and rapid breaking of the bitumen emulsion, leaving most of the bitumen binder on the surface with little or no penetration of the base.

For primersealing, either cutback bitumen or bitumen emulsion binders are suitable, although the influence of the stabilising materials on accelerated breaking of emulsion, and hence the time available for spreading and rolling of aggregate, should be considered.

Particular attention must be paid to the potential for reduced adhesion due to the presence of surface dust, which may require a slight dampening of the surface before applying primerbinder.

Key Summary

This issue of "pavement work tips" provides a guide to the use of priming and primersealing as initial treatments on stabilised pavements



Austroads



continued on reverse

SURFACING FOAMED BITUMEN STABILISED PAVEMENTS

The particular feature of foamed bitumen stabilised pavements influencing the design of bituminous surface treatments is the presence of bitumen in the mixture.

Typically, the bitumen content of foamed bitumen stabilised base is around 2.5–3.5% by mass. Up to 2% cement or lime may also be included to assist curing rates and development of base stiffness. Bitumen is largely combined with the fines proportion of the granular material, resulting in materials of low permeability and low moisture sensitivity.

Where the foamed bitumen stabilised base course is to be trafficked before surfacing, it is important to control speeds and avoid concentration of traffic in defined wheel paths. It is also necessary to consider the potential for ravelling or shape loss in areas of higher traffic stress. Unsealed surfaces are particularly vulnerable to traffic damage during periods of rain.

It is generally undesirable to apply a primer or high cutter oil content primerseal to foamed bitumen stabilised base course due to the potential for such cutbacks to soften the bitumen in the surface of the base course. This can lead to excessive aggregate embedment and/or flushing in a following sprayed seal.

A small size (e.g. 7 mm) cutback bitumen or bitumen emulsion primerseal may be preferred as a preliminary treatment to protect the base course and provide a good key for the next bituminous treatment, although local sealing practice for foamed bitumen stabilised base may vary between individual road agencies.



Fig 1 Core sample showing well bonded sprayed seal on bitumen stabilised base

Cutback bitumen primerseals require a period of curing but emulsion primerseals can be resurfaced without delay.

Bitumen already in the base may permit a reduction in primerbinder application rates as outlined in AP-T68/06, provided that there is sufficient binder to maintain the integrity of the primerseal. The cutter oil content of cutback bitumen primerbinders should be based on the weather conditions expected during construction and the initial curing period.



Fig 2 Foamed bitumen stabilisation process

REFERENCES

- Austrroads/AAPA 2010, *Pavement Work Tip No 1, Priming of Pavements*
- Austrroads/AAPA 2010, *Pavement Work Tip No 18, Selection of Initial Treatments*
- Austrroads/AAPA 2010, *Pavement Work Tip No 43, Primersealing of Pavements*
- Austrroads/AAPA 2010, *Pavement Work Tip No 49 Preparation of Pavements for Priming and Primersealing*
- Austrroads 2006, *Update of the Austrroads Sprayed Seal Design Method (APT68/06)*
- Austrroads 2013, *Update of Double/Double Design for Austrroads Sprayed Seal Method (AP-T236/13)*
- Austrroads 2009, *Guide to Pavement Technology Part 4K: Seals*
- Austrroads 2009, *Guide to Pavement Technology Part 8: Pavement Construction.*
- AustStab (2011), *Pavement Recycling and Stabilisation Guide*, AustStab Limited, North Sydney.

For more information on any of the construction practices discussed in "pavement work tips", please contact either your local Austrroads representative or AAPA:
tel (03) 9853 3595;
fax (03) 9853 3484;
e-mail:
info@aapa.asn.au.

A complete list of "pavement work tips" is available on the AAPA website:
www.aapa.asn.au
or the Austrroads website :
www.austrroads.com.au.

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For more information on the Association, contact the CEO, AustStab, PO Box 738, Cherrybrook, NSW 2126 or visit the web site:
www.auststab.com.au

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