

Preparation of Pavements for Priming and Primersealing

pavement work tips – No 49

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INTRODUCTION

The performance of sprayed seal or asphalt surfaces applied to granular pavements is dependent on the adequacy of the underlying pavement surface in respect to condition, strength and stability. Hence, it is essential for the pavement to be:

- structurally sound
- uniform in layer thickness and compacted density
- finished to the correct line and level
- of the specified ride quality
- uniform in surface texture
- dried back to the specified moisture content
- free from contaminating materials and surface defects.

PAVEMENT CONSTRUCTION

Controlling quality requires attention to a number of areas. Key areas include:

- controlling segregation
- controlling moisture content
- level and thickness control
- compacted density
- surface finish and dry back.

Controlling Segregation

Segregation in the form of an accumulation of the coarser particles often occurs as the material is unloaded from the delivery truck into a windrow and again when the material is spread across the pavement to form the required loose layer thickness.

It is important that a homogenous layer of even surface texture is achieved such that the subsequent bituminous prime or primerseal is able to effectively adhere to the constructed granular surface in a consistent manner.

Controlling moisture content

Generally, pavement materials should be compacted at, or slightly below, (within 85%) Optimum Moisture Content (OMC).

Uniformity of moisture content in the material is important as variations will affect compactability, leading to variable densities and hence likelihood of not achieving the specified requirements for acceptance.

Level and thickness control

Pavement materials should be spread uniformly across the pavement width to a constant depth such that, after compaction, the specified layer thickness is achieved.

Compaction

Optimum compaction is achieved with layer thicknesses in the range of 100–150 mm. This requires establishment of the loose to compacted thickness ratio and constant checking of the loose spread thickness.

Compaction procedures typically use a combination of static and vibrating steel wheel rollers followed by pneumatic tyred rollers operating with high tyre pressure to knead the surface into a tight, evenly textured finish that is most beneficial for sprayed sealing.



Key Summary

This issue of “pavement work tips” provides guidelines for the preparation of granular pavements prior to priming or primersealing.



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Finishing

The pavement surface needs to be prepared to produce a hard dense surface capable of being swept with a rotary road broom to leave a tight surface free of loose and foreign materials. Further, the surface so prepared needs to be free of tearing and scabbing and should be uniform in texture with no lamination within 75 mm of the finished surface. The surface also needs to be true to the specified shape and level. Pavement surfaces that do not meet these requirements should be rejected and satisfactorily reworked before being accepted as suitable for sealing.

It is good practice to direct traffic onto the compacted pavement surface prior to sealing. This will identify any weak or soft areas which may not have been visible during proof rolling. Should the surface remain out of specification for ride quality, tining up the top 50 mm to 75 mm of crushed rock surface and adopting a long grading process without the control of level pegs will produce excellent results provided that the loosened material is compacted back to specified standard. Care must be taken however, to ensure against lamination of this reworked layer.

Addition of a thin layer of material to overcome poor texture or surface level without tining of the underlying layer is poor practice that can result in lamination and poor performance

Hungry, coarse textured surfaces may be reworked by adding additional water as part of the long grading process, with moisture rolled out by trafficking or use of pneumatic multi-tyred rollers. However, over-working can sometimes produce excessive fines resulting in a “glassy” surface finish that is undesirable for priming purposes.

Dry-back

A critical step in preparing pavements for sealing is to achieve a condition known as dry-back. Dry-back involves removal of sufficient moisture from the compacted and prepared base course upper pavement layer to present a suitably hard surface.

Typically, high quality crushed rock pavement materials should be dried back to a maximum moisture ratio of 60% of OMC or to a maximum Degree of Saturation (DoS) of 65%.

Higher moisture ratios may be acceptable for natural gravel materials, particularly on more lightly trafficked pavements.

A guide to control of moisture and measurement of DoS is provided in Austroads APRG Technical Note 13 – *Control of moisture in pavements during construction*.

A nuclear gauge provides a convenient non-destructive test for moisture content.

A further indicator of surface hardness is the Austroads ball penetration test, AG:PT/T251. This test method describes the procedure for measuring the depth of penetration into a road surface from a steel ball under the impact of a standard load. The results from this test are a measure of pavement hardness that is an indication of the likely embedment of sealing aggregate into the pavement surface.

A guide to application of results from the ball penetration test is contained in the Austroads Sprayed Seal Design Method (AP- T68/06). In general terms, the risk of embedment under subsequent traffic is increased with ball penetration values greater than 2 mm. However, any pavement with a result greater than 4 mm should not be sealed and be allowed to further dry-back until a satisfactory result is obtained.

Properly interpreted, the distinctive ring that can be heard when the pavement is struck with the handle of a heavy hammer or mattock can be another indicator of surface hardness, particularly variability and presence of isolated areas of poor compaction. Should a dull sound be heard, the pavement has not dried out sufficiently and should not be submitted for sealing.

REFERENCES

Pavement Work Tip No 1, Priming of pavements.

Pavement Work Tip No 18, Sprayed sealing – Selection of initial treatments.

Pavement Work Tip No 43, Primersealing of pavements.

Austroads Pavement Technical Note 13 – Controlling moisture in pavements.

Austroads Test Method AG:PT/T251 – Ball Penetration Test.

Update of the Austroads Sprayed Seal Design Method (AP-T68/06).

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

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