VOLUME 7 PAVEMENT DESIGN AND MAINTENANCE
SECTION 5 SURFACING AND SURFACING MATERIALS

INTERIM ADVICE NOTE IAN 49/03

USE OF WARNING SIGNS FOR NEW ASPHALT ROAD SURFACES

SUMMARY

This Interim Advice Note provides information about the use of warning signs in connection with the skid resistance of new asphalt surfaces.

INSTRUCTIONS FOR USE

This IAN should be read in conjunction with HD36/99 “Surfacing materials for new and maintenance construction” and HD28 “Skidding resistance”.

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DMRB VOLUME 7: SECTION 5: SURFACING AND SURFACING MATERIALS

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1. INTRODUCTION

1.1 Newly laid asphalt surfacings can exhibit lower skid resistance than the same surfacings after a period of trafficking, which could be because of the binder film that initially coats the aggregate particles. Measurements on a limited number of surfacings have shown that the skid resistance can be affected in both wet and dry conditions and this potentially gives rise to additional accident risk to road users. However, this characteristic of new surfaces is not fully understood, particularly in relation to the duration of the effect and the influence of different types of asphalt surfacing materials, and is the subject of ongoing research.

As an interim measure the strategy described in this document shall be followed to mitigate any additional risk to road users as a result of the lower skid resistance in this early life period. This applies to all new asphalt surfacings, including new and maintenance construction irrespective of whether maintenance treatment was triggered by the need to improve the skid resistance. As further information from on-going research becomes available this advice will be modified as appropriate or may be withdrawn. This does not affect the normal implementation of the skid resistance policy as described by HD28 of the Design Manual for Roads and Bridges, Volume 7.

2. RISK OF SKIDDING ON WET OR DAMP ROAD SURFACE

2.1 Current research shows that for newly laid asphalt surfaces in wet conditions, the low-speed skid resistance measured by SCRIM can occasionally be below 0.45. For sites that have been assigned an Investigatory Level (IL) of 0.45 or above as a result of applying HD28, this means that the skid resistance during the early life period could be below the IL. The procedure under HD28 is to alert drivers to the possibility of low skid resistance where this is found to be the case. Therefore, the following actions are required:

(i) The site characteristics must be reviewed to determine whether the IL currently assigned is appropriate. Advice on setting the IL is given in HD28, Volume 7 of the Design Manual for Roads and Bridges and other relevant information is given in Interim Advice Note 50/03 on the investigation of sites identified from skid resistance measurements. The action required depends on the IL determined.

(ii) Sites with IL set at 0.40 or lower - no other action is required.

(iii) Sites with IL set at 0.45 – the skid resistance should normally be above 0.45 but may reduce below this level for a short period. In practice, a short-term drop of skid resistance below the IL is not unusual for sites where the average skid resistance over the summer period is above the IL. On is own, this does not warrant the use of warning signs. However, where the skid resistance prior to maintenance was substantially above the IL, the new surface

could result in a significant reduction in skid resistance.

Drivers who are familiar with the road layout and who's driving style relies on a high level of friction to complete some manoeuvres successfully could be at greater risk following the surfacing treatment. Therefore, warning signs must be used, as described in section 5, if either:

(a) The treatment was triggered to increase the skid resistance, (ie the specific need to improve the skid resistance to a value above 0.45 has been demonstrated) or:

(b) The treatment was triggered for other reasons, e.g. improvement works, and the skid resistance before treatment is above 0.50 or is not known.

(iv) Sites with IL set at 0.50 or above – these sites are most likely to exhibit skid resistance below the IL during the early life period. Warning signs must always be used, as described in section 5.

3. RISK OF SKIDDING ON DRY ROAD SURFACE

3.1 The Agency has no skid resistance policy for dry conditions, because the skid resistance is generally high in this case. However, current research shows that locked-wheel friction on newly laid asphalt surfaces in dry conditions is lower than normal, although similar to or higher than that in wet conditions. Stopping distances under emergency braking conditions will therefore be increased in comparison to those on a dry road, but to no worse extent than on wet or damp road surfaces. Under normal braking conditions, dry friction should be adequate.

3.2 If warning signs are not required as described above, but there are reasons for believing the site to be particularly at risk of an emergency braking situation occurring then these must be put to overseeing organisation accompanied by appropriate supporting information.

3.3 This information must include a description of the site and details of the recent accident history plus other relevant information, such as where there have been repeated strikes to street furniture or other evidence that suggests that drivers repeatedly fail to cope with the road environment. SSR will determine whether warning signs are appropriate in each case and will ensure that a consistent approach is maintained for the whole network. If it is determined that warning signs will be used then they must be erected as described in section 5.

4. GENERAL

4.1 To date, wet skid resistance measurements made at high speed on newly laid asphalt surfacings have been towards the low end of the range of values observed on in-service surfacings. Without adequate texture depth, it is anticipated that much lower values could be observed.

4.2 The new surfacing must be checked by sand patch measurements or visual inspection to determine whether the texture depth is consistent with the requirements of the Specification for Highway Works. A coarse visual assessment of whether the texture depth appears to be "normal" for a newly laid surfacing to the given specification is adequate for this purpose. Bends must be checked carefully for the presence of localised areas where the texture depth is low. If the texture depth appears satisfactory then no further action is required. Otherwise, the road can still be opened upon completion of the works but warning signs must be erected subsequently, as described in section 5.

4.3 The change in skid resistance associated with the transition between a newly laid material and adjacent in service materials can give rise to added accident risk. Transitions must be avoided at sensitive locations such as on bends and where vehicles are braking for junctions or crossings.

5. USE OF WARNING SIGNS

5.1 Where warning signs are required, they will normally be erected at the time of resurfacing, before the new surface is opened to traffic. If the need for warning signs is established as a result of low texture depth then signs will be erected as soon as practicable after opening to traffic. Signs will normally be removed after six months, except for sites to be overlaid with high friction surfacing, in which case they will be removed when the high friction surfacing is in place. Although reduced skid resistance may be observed for a longer period than 6 months, the duration of the effect for different materials or under different traffic conditions is not fully understood at present. The period of six months has been chosen as a compromise between providing warning during the period when the greatest reduction in skid resistance is likely to occur and the risk of undermining the credibility of signs to drivers by leaving them in place for a longer period.

5.2 The sign used will be the slippery road warning sign (Diagram 557, Traffic Signs Manual, chapter 4) in connection with an appropriate supplementary plate (Diagram 570), to cover the extent of the new surfacing. It is recommended that supplementary plates with a range of distances are kept in stock so that they do not need to be specially ordered for each use. In this case, since the distance indicated may not be exact, it must be at least equal to the distance between the sign and the end of the new surfacing.

5.3 Signs will be erected in advance of the transition to the new surface and following junctions. The size, height and siting of signs in relation to the distance before the transition to the new surface will be as described in Chapter 4 of the Traffic Signs Manual. Signs will normally be mounted on the left-hand side of the carriageway when facing in the direction of travel. Where signs on the left-hand side could be obstructed by other traffic, eg where vehicles are permitted to overtake, signs must also be placed on the right-hand side of the carriageway or on the central reservation for dual carriageways. Where slippery road warning signs are present before maintenance, they may be left in place providing their location meets or exceeds the requirements described.

5.3 Subsequently, all warning signs must be subject to routine inspection and maintenance as directed by the Trunk Road Maintenance Manual.

6. PROCEDURE

6.1 The strategy described has been developed with the aim of providing, in locations where there may be added risk to road users, information about the location and nature of the risk so that drivers are able to modify their driving behaviour appropriately. While the strategy may be modified in response to further information, in the interim it is critical to the effectiveness of the strategy that warning signs are not allowed to proliferate in locations where they are not required and are not left in place for longer than the stated period. **The following procedure must be followed and will be subject to audit:**

6.2 Each contractor must notify SSR and the Area Manager of the person who will be responsible for ensuring this procedure is followed.

6.3 For any maintenance scheme that results in a new asphalt surfacing being laid, the need for warning signs must be assessed prior to treatment using the procedure described. The procedure will be applied for all new asphalt surfacings, including areas of patching, although patches in close proximity need not be itemised individually. The attached form will be used to record the assessment that has been made, supplemented by further information as required. Exceptional cases must be referred to the overseeing organisation for approval, at least four weeks prior to maintenance treatment occurring. This procedure will be implemented retrospectively for surfacings that are less than two months old at the time of going into operation.

6.4 On completion of maintenance, the texture depth will be checked and a record of the treatment will be entered onto the HA Pavement Management System. This is to ensure that the age and location of new surfacings is known if further research was to demonstrate that signs are needed for a longer period.

6.5 For any scheme where warning signs are required, their correct placement and adequate visibility must be checked on or before the day the surfacing is opened to traffic and this fact recorded. If warning signs were erected subsequently, because the need was established as a result of low texture depth, the placement and visibility must be checked as soon as possible after they are erected.

6.6 **After six months arrangements will be made for removal of the warning signs. After removal, a visual inspection will be made to check that all signs have been properly removed and this fact recorded.**

6.7 **All forms will be kept in a file by the person responsible and will be copied upon completion to the Area Manager and SSR. Forms not yet completed (ie where warning signs are still in place) will be made available for inspection by the Area Manager or for audit by SSR upon request. All current forms must be handed on if Agency arrangements change. Completed records will be kept securely by the Area Manager in case of claims against the Agency for a period of at least six years.**

7. CONTACT AND FURTHER INFORMATION

7.1 Completed forms, special cases requiring SSR assessment and requests for further information must be sent to Matthew Sweeting at the following address:

Room D1
5 Broadway
Broad Street
Birmingham
B15 1BL

Tel: GTN 6189 8301

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1. General information (to be completed before maintenance treatment)	
Agency Area	
Contractor	
Contact name	
Telephone number	
Email address	
Contractors reference	
Road number and location	
Section(s), start & end chainage, lanes surfaced	
Anticipated date of treatment	
Comments	

2. Requirement for warning signs (to be completed before maintenance treatment based on guidance given in this document)	
Investigatory Level (IL) after review specified in 2.1(i) or this guidance.	
Updated IL entered on HAPMS	Yes No
Other relevant factors	
Warning signs required	Yes No
Location of transition to and from new surfacing is satisfactory	Yes No
Comments	

Signature	Print Name	Date

3. Inspection (to be completed before opening to traffic)			
Date treatment completed			
Texture depth satisfactory	Yes	No	
Signs correctly installed and clearly visible	Yes	No	N/A
Set Date for removal of signs			
Maintenance recorded on HAPMS	Yes	No	
Comments			
Signature	Print Name	Date checked	
4. Removal (to be completed after removal of warning signs)			
Reason for removal	6 Month period complete Other		
Warning signs removed from site	Yes	No	
Comments			
Signature	Print Name	Date checked	
5. Exceptions (to be completed if an exception from the standard procedure is to be authorised by SSR)			
Nature of exception			
Reason for exception			
Comments			
Signature	Print Name	Date	
Approval by SSR			

Comments		
Signature	Print Name	Date