

Guidance Note on When to Surface Dress

1 INTRODUCTION

This guidance note consists of two sections, the first dealing with the selection of the optimum year to apply a dressing to a road surface and the second which considers the times of the year in which dressings on different categories of road should be undertaken.

2 PAVEMENT MANAGEMENT SYSTEMS CONDITIONS

United Kingdom Pavement Management System (UKPMS) accredited condition surveys are now widely used as a method of assessing priorities for highway maintenance expenditure on the main road network, and have been responsible for a more formal approach to setting maintenance priorities. Pavement Management Systems are also available as a tool for decision making on road maintenance strategies. These surveys are often supplemented by deflectograph and SCRIM surveys, which respectively help to identify sections of road which have insufficient strength to carry the traffic of the day and sections where the resistance to skidding under wet conditions is below recommended limits^{1,2}. These measurements are of great value to highway maintenance engineers responsible for assessing priorities for expenditure but do not replace the need for the application of judgement by experienced highway maintenance engineers. This need is particularly appropriate when deciding the optimum time to surface dress roads and footways. Where a blacktop surface is not deforming under the weight of traffic and where there is no evidence of surface deterioration, the United Kingdom Pavement Management System (UKPMS) accredited systems will not indicate a priority, or indeed a need, for surface treatment. In some cases, a SCRIM survey will indicate the need for surface treatment in order to restore a satisfactory resistance to skidding, but there are a substantial number of sites where blacktop surfaces show, under particular conditions, the first signs of deterioration unlikely to be recorded or even noticed by a survey technician.

- 2.1 These signs are often only apparent after periods of rain when the road surface is drying out. Any hairline cracks in the surface will retain the moisture and will be the last to dry out. By inspecting at these times, hairline cracks can be recorded. Similar evidence is often apparent at the time when road surfaces have been treated with salt during the winter period when hairline cracking can, for a few days, become even more evident than under the circumstances outlined above. Although these first signs of distress will not be recorded by highway assessment systems, they should alert the highway engineer to the need to apply a surface treatment to seal the cracks and to prevent deterioration which, if delayed, would require patching or even more extensive repairs before a surface dressing could be carried out satisfactorily.

- 2.3 The Code of Practice for Highway Maintenance Management (“Well Maintained Highways”) published in 2005³ obtain good advice on the use of surface dressing.
- 2.4 Enquiries made by this Association suggest that many Highway Authorities spend more money on “patching prior to surface dressing” than on the surface dressing operation itself. It follows, therefore, that if surface dressing is carried out some 12 months before any patching is necessary, substantial sums of money could be saved and far greater lengths of road could be treated. In addition to this financial saving, interruptions to the smooth flow of traffic resulting from lane closures in order to carry out patching operations will be avoided, which will represent an important safety factor, as well as avoiding increased business costs resulting from delays.
- 2.5 A switch from a maintenance regime determined by immediate need to one based on the principle of preventative maintenance cannot be easily achieved in a single season, but with careful planning should be achievable over a period of three or four years. This approach is particularly important when local authorities are being asked by the government to restrict their expenditure, or where highway maintenance funds are restricted in other ways.
- 2.6 Surface dressing is not a panacea for every highway maintenance need. It cannot, for example, repair a foundation failure or deformation such as rutting in the wheel tracks. These are deficiencies which may require, in extreme cases, reconstruction, and in less serious cases, the application of a blacktop surface to both strengthen the road and to remove rutting. Although surface dressing in itself does little to increase the load carrying capacity of a road in the way that a blacktop surface can do, the fact that a dressing will make a road surface much less permeable than almost any other treatment can result in some improvement to the capability of the surface to carry traffic loads. This results from keeping the moisture content at road construction and formation levels to a minimum, where even a 0.5% increase in moisture content can prove very damaging.
- 2.6.1 It must, however, be noted that waterproofing a road surface and preventing ingress of water from the surface to the structure and formation will be of little value if the water table extends into those levels. In these circumstances, the provision of permeable drainage systems on one or both sides of the road is called for. Under English law, roadside ditches, other than those provided by the highway authority when the road was constructed, are normally the responsibility of the owner of the adjoining land. Under the provisions of Section 100 of the Highways Act 1980, local authorities have the power, but not a duty, to maintain these ditches where, in their view, this is necessary for highway maintenance purposes. Under these circumstances, there is a marked reluctance of either landowners or highway authorities to maintain roadside ditches and it is perhaps regrettable that a clear statutory duty has not been laid on either the highway authority or the landowner.
- 2.6.2 Many highway engineers would agree that the neglect of highway drainage systems, particularly on the minor road network, has resulted in considerable structural

damage and maintenance expenditure, which may not have been required if ground water levels had been maintained at an appropriate level.

- 2.7 The cost of a surface dressing can vary from £1.50 per square metre to over £15 per square metre in extreme cases involving the use of special binders and aggregates applied at night in city areas. This prime cost is one factor only in priority decision making, the key factor being the efficiency of the treatment measured in terms of cost per square metre per annum of satisfactory life.

The most efficient maintenance system is that which has the lowest cost life index and this is usually achieved by selecting the appropriate surface dressing system taking account of the factors considered in Road Note 39 6th edition and ensuring that the dressing is properly designed, executed and given appropriate aftercare for the first few hours after the completion of the work.

It is also important that the selected dressing is applied at the optimum time and that time is **before** any pre-patching becomes necessary. The cost of patching 10% of an existing surface, spread over a number of small patches, can easily exceed the cost of dressing the whole area and the time taken to carry out this patching operation can take four or five times the time taken to surface dress the whole area.

If the cost of pre-patching is added to the cost of surface dressing, the cost per square metre will have more than doubled, as will the cost life index. The savings accruing by surface dressing before patching becomes necessary would thus more than pay for a second dressing, perhaps after a gap of seven years or so. During this whole period, the surface of the road will have had a good texture providing resistance to skidding.

The most cost effective maintenance treatment is to apply a surface dressing before the point where deterioration is picked up by a maintenance survey system and before the need for other than minimal patching is required. In this way disruption to traffic during patching operations is avoided and the skid resistance of the road is maintained at an optimum.

3 THE SURFACE DRESSING SEASON

The first part of this guidance note has dealt with the advantages of applying surface dressing as a preventative maintenance operation. We now turn to consider the question of the best time of the year to carry out surface dressing work.

Road Note 39 Table 7.3.2 identifies the surface dressing season in the United Kingdom as lying between the second half of April and the first half of September inclusive.

In the north of Scotland, temperatures may not reach a satisfactory level until May and by the end of August, temperatures may have started to drop rapidly, reducing the length of the surface dressing season by a total of some five or six weeks.

The best periods of weather for surface dressing lie within the period May to mid July and this is when the most important roads should receive their dressing. Road surfaces during this period should have become warm and somewhat softer than during the winter period. It must always be remembered that the ability of the binder to “wet” the applied chippings and to stick to them quickly, falls rapidly with loss of temperature. Main road surface dressings carried out between May and the end of July will receive some initial embedment under the action of traffic. It is particularly important that such dressings using larger aggregates are executed well within this period. Roads which hardness probe tests (BS 598-112: 2004) have shown to be “soft”, and are therefore to be dressed with a larger size chipping and lower rate of spread of binder than would be the case for roads of “normal” hardness, should be dressed early in the season in order to achieve maximum embedment before the winter. The rate of embedment will fall rapidly as roads cool down after September, and it is for this reason that working beyond the end of September with traditional binders is not recommended, irrespective of the weather conditions prevailing at the time.

One of the problems with the British climate, however, is that it is very unpredictable and in some years the number of days when dressing can be carried out on main roads is substantially reduced due to adverse weather conditions and, of course, by the need to avoid working on these roads during the Bank Holiday periods. In recent years, weather forecasting has become much more accurate and by taking advice from local meteorological forecasting centres, the risk of new dressings being spoilt by early rainfall can be substantially reduced.

In years when the spring and summer have been badly affected by wet weather, the autumn is often quite good and some days in October can be as good as in a normal August or September. However, surface dressing in October is not recommended with traditional surface dressing binders on any category of road, simply because there will be insufficient time for chipping embedment to occur before the onset of winter when binders become more brittle, and chipping loss on dressings which have not become embedded are far more likely. Although there will be no embedment of chippings when concrete roads are dressed, dressing of concrete roads should be undertaken during ideal weather conditions using a polymer modified binder. An inverted double dressing (pad-coat) should be used under these circumstances.

Year by year, surface dressing binders are improving but even using these improved binders, surface dressing on main roads is not advisable after the first half of August.

These factors should be carefully discussed with your surface dressing contractor who may well be reluctant to give the normal guarantees for work done outside the normal season.

References

- 1 TRL Research Report 296 1991
“The Relation between the Surface Texture of Roads and Accidents”
by P G Roe, D C Webster and G West
Transport Research Laboratory
- 2 TRL Research Report 322 (1998)
“The Polished Stone Value of aggregates and in-service skidding resistance”
by P G Roe and S A Hartstone
- 3 Code of Practice for Highway Maintenance Management 2005
The Stationery Office London
- 4 Road Note 39
Design Guide for Road Surface Dressing (Sixth Edition) 2008
Transport Research Laboratory

Other RSTA publications available are:

Code of Practice for Surface Dressing
Advice Note on Surface Dressing Binders
Guidance Note on Racked-in Surface Dressing
Operators’ Guide to the Safe Use of Surface Dressing Sprayers
Preparing Roads for Surface Dressing
Guidance Note on Surface Dressing Aggregates
Guidance Note on Quieter Road Dressing