

ADEPT

Association of Directors of
Environment, Economy, Planning & Transport

Guidance Note on the treatment of melted Surface Dressed roads

1. The problem

Surface Dressing has been a most effective sealer, dust suppressant and skid resistance enhancement treatment for over 70 years.

It has been widely used on the B, C and Unclassified network within Local Highway Authorities.

As the treatment has been carried out repeatedly, in many rural areas there may be 10mm - 30mm of bound material built up over the years on top of the original unbound aggregate road metal.

Summer road surface temperatures of over 50°C are now common place when experiencing hot periods of weather in the UK with the impact of climate change these temperatures are likely to increase further. At these temperatures the Surface Dressing binder can become liquefied.

Rural traffic loads have significantly increased particularly with the increase in weight of private and commercial vehicles.

As a result of this fattening up of the surface occurs leading to;

- Poor skid resistance in the dry and possibly dangerous levels when wet
- Pick up of binder on car and cycle tyres and by pedestrians
- Surface deformation in the wheel tracks which could potentially hold water – this may not always occur if the traffic levels are low



The binder may be bitumen with the addition of a light oil flux, bitumen cut-back with creosote, or tar. The last two are no longer used but may exist within the bound layers; they are carcinogenic and treated as hazardous waste. Any volatile materials can be trapped within the overlays by subsequent treatments.

The scale of the potential problem is very large with thousands of kilometres of roads possibly at risk in the UK

2. Identification of the problem

The problems are easy to detect either by visual inspection, by using machine surveys such as SCANNER and SCRIM, by public complaint or from accident records.

3. Possible remedial works

Remedial works can be categorised with strengths and weakness as follows.

1. Remove excess binder from the surface

Treatment	Benefits	Additional benefits	Disbenefits
Remove excess binder from the surface using hydro-retexturing (medium pressure water jetting).	<ul style="list-style-type: none"> • Provides a short term increase in surface texture • Ability to treat the affected areas only • Treats only those areas that need it 		<ul style="list-style-type: none"> • Repeated applications are normally required during alternate summers so overall cost needs to be considered • Will not improve any deformation of wheel tracks. • If deformation also present treats only the surface layer

2. Treat melted layers

Treatment	Benefits	Additional benefits	Disbenefits
Repeated application of 3mm down Granite/Gritstone dust (Not sand)	<ul style="list-style-type: none"> • Makes the existing open graded mixture more dense and like an asphalt concrete • Can be carried out using winter gritting vehicles, where available • Ability to treat the affected areas only. 		<ul style="list-style-type: none"> • Repeated applications will be necessary, dependant on the severity of the current weather conditions • May not be successful in solving the problem
Sandwich Dressing (a dry layer of stone placed and compacted in the fatted area prior to another layer of dressing over the whole road	<ul style="list-style-type: none"> • Stone stabilises the soft areas preventing further deformation • Finished road has uniform appearance 	<p>Seals whole road surface</p> <p>Designed in accordance with RN 39</p>	<ul style="list-style-type: none"> • May possibly bleed through again in later years
Retread: Pulverise the top [75mm] of material and add lime/cement/ bitumen emulsion and recompact. Surface dress to seal.	<ul style="list-style-type: none"> • Solves the problem provided HGV volumes are low 	<p>Solves rutting, cracking and poor profile at the same time</p>	<ul style="list-style-type: none"> • Areas not requiring treatment also treated for practicality thus increasing cost • Road markings need reinstatement

3 Cover melted layers

Treatment	Benefits	Additional benefits	Disbenefits
Microasphalt in two layers incorporating fibres	<ul style="list-style-type: none"> Resolves skid resistance and any deformation issues Not subject to H&S issues 	<ul style="list-style-type: none"> Transverse profile benefit Some longitudinal profile benefit Some crack sealing 	<ul style="list-style-type: none"> Does not reduce temperatures in the lower layers so any deformation could possibly continue. A light colour may be beneficial Possible bleeding through of the fatted surface dressing below Areas not requiring treatment also treated for practicality Road markings need reinstatement
Thin surface course overlay 35mm thick.	<ul style="list-style-type: none"> Resolves skid resistance, any deformation and some cracking issues 	<ul style="list-style-type: none"> Transverse and longitudinal profile benefit Some structural strength improvement Reduced peak temperatures in lower layers Quiet surface provided 	<ul style="list-style-type: none"> Very Costly May suffer from fatigue cracking and delamination where high points in existing surface make the layer too thin. This may be resolved by increasing the nominal thickness at greater cost Drainage, verge and road marking work also required Site investigation necessary to see if road needs structural strength improvement (visible cracking)

4 Remove soft material and replace with hot mix

Treatment	Benefits	Additional benefits	Disbenefits
Thin surface course inlay with binder course	<ul style="list-style-type: none"> Resolves skid resistance and any deformation issues All poor material likely to be removed 	<ul style="list-style-type: none"> Transverse and longitudinal profile benefit Structural strength improvement (if required) Quiet surface provided 	<ul style="list-style-type: none"> Extremely Costly Drainage, verge and road marking work also required Possible H&S issues with removed material if it contains tar

4. Decision tree

