

## BRITISH STANDARDS FOR ASPHALT AND OTHER PRODUCTS

Where a product is the subject of a European Standard, the document is prepared by a CEN Technical Committee. Standardisation commenced in 1992 and a large number of standards were produced subsequently including for Asphalt (as EN 13108) and published in support of the Construction Products Directive.

Where the standard is produced under a Mandate from the Commission these are Harmonised Standards [hEN] and compliant products could apply a CE mark. Whilst in some countries this was mandatory, it was only voluntary in UK, but many producers signed up. Other non-harmonised standards have been produced by the CEN Committees to satisfy a market demand e.g. Unbound mixtures to BS EN 13285

Until a Standard is approved and advertised in

the European Journal, is it not a Harmonised Standard, these are now mandatory in UK as a result of the Construction Products Regulations [CPR] 2011]. The CPR harmonises the methods of assessment and test, the means of declaration of performance and the system of conformity assessment of construction products. However, it is possible for a standard to be published and not be advertised in the European Journal, these are not harmonised standards.

ONLY Harmonised European Standards [hEN] can be used by Public Bodies for procurement if they BS EN 13108 Series of 2006 are hEN.

Unfortunately, the latest BS 13108 series of standards for asphalt, published by BSI in 2016, are not Harmonised Standards, and **MUST NOT BE USED** generally by public pro-

curers.

However, it is not that simple to identify if a BS EN standard is harmonised or not. Harmonised Standards will normally have a paragraph in the Foreword such as: *'This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).'* In addition, and perhaps more obviously, a hEN will have an Appendix ZA listing the key minimum parameters defined by the mandate to enable the product to be out on the Market. This may not be all that a customer needs for a particular contract.

When a new standard is published, previous versions like the BS EN 13108-2006 documents have been withdrawn but are still available from BSI. Products Certifi-

cated to older versions not superseded by a hEN can still be CE marked and the Declaration of Performance will show compliance with the parameters in Annex ZA in the case of asphalt, the 2006 versions.

Also Clients may, on a scheme by scheme basis, and only if based upon a technical justification which may be challenged, add any EN test method for the required parameter into Appendix 7/1, using for example the non-harmonised BSEN or other technical information as a guide.

IDW  
22/08/2018

## SPECIFICATION FOR THE REINSTATEMENT OF OPENINGS IN HIGHWAYS

The next edition of Specification for the Reinstatement of Openings in Highways is currently being drafted. The DfT appointed Arup Aecom

as consultant to help take the process forwards. The main focus for the review has been to make the document clearer, less open to misinterpretation and

more open to innovation, and to review the range of permitted materials while ensuring all requirements are achievable and verifiable.

The document will be

finalised by December with consultation taking place between January and March 2019. The aim is to publish in April 2019 with full implementation by October 2019.

## UPDATE TO THE SPECIFICATION FOR HIGHWAY WORKS SERIES 900

The Specification for Highway Works 900 Series, which covers Road Pavements – Bituminous Bound Materials, was revised dated 05/18. It is available from <http://www.standardsforhighways.co.uk/ha/standards/>

Nearly every clause has some wording amendments to comply with EU CPR directive. A number of test method clauses have also been withdrawn as the tests are now in BS EN documents and in addition there were significant changes to the RTFOT test method in Clause 955.

Clauses 903 and 921 now incorporate the contents previously in IAN 154.

Clause 923 (05/18) Cold Applied Ultra-Thin Surfacing is a new Clause which separates out Cold Thin Surfacing from Clause 942. It is an alternative to Clause 918 (Microasphalt) and Clause 922 (Surface Dressing). As before it requires the product to be either CE marked if it complies with BS EN 12271 (Surface Dressing), BS EN 12273 (Microasphalt) or have a HAPAS Certificate or

equivalent. It shall be produced and installed by organisations that are registered to the National Highways Sector Scheme 13 for The Supply and Application of Surface Treatments to Road Surfaces.

The Clause states that it is suitable for all types of roads excluding motorways and high risk sites such as bends, roundabouts and approaches to crossings and traffic lights. There is no requirement for it to be a quiet surfacing.

Clause 942 (05/18) Thin Surface Course Systems has been significantly enlarged, at least in part at the request of ADEPT, in an endeavour to make the material more durable and suitable for a lower speed network. It also now includes the requirements previously contained within the HAPAS Guideline. Engineers are recommended to ask for the CE Declaration of Performance as it may give more detail than the HAPAS Certifi-

cate.

Tables have been provided for maximum aggregate size, excluding 14mm aggregate from bends roundabouts and junctions, and for minimum binder content. The latter may require the supplier to reformulate his mix. Where the Client requires it, he can use Appendix 7/1 to ask for the design air voids to be in the range 1% to 5%. I suggest that this should only be invoked for lower speed roads, as it may affect the ability to achieve high texture depth, and/or where the Client does not have evidence of satisfactory performance for that material.

An important new Table 9/13, has been provided for Initial Texture Depth for Roads other than Trunk Roads and Motorways. A minimum texture depth of 0.8mm [Patch] is all that is now needed. Retained texture depth is now included within the clause, with

0.6mm [Patch] minimum required.

A 2yr installation trial [SIPT] is still required, Clients should ensure that the data is for a site with Site Category [Stress Level] and traffic at least as onerous as the proposed works.

Clause 946 has been renamed Local repairs and completely revised to be much clearer. Up to 1 sq.m inset patching is specified using standard and propriety materials. Greater than 1 sq.m replacement for minimum length of 5m or 15m in accordance with sub-Clause 702.10 (iv) [2016] that give very detailed requirements.

IDW

28/08/18

## ROAD NOTE 39: - DESIGN GUIDE FOR ROAD SURFACE DRESSING SEVENTH EDITION

Surface dressing, the application of a sprayed bituminous binder to the road surface, immediately followed by a layer of chippings is a maintenance technique deployed by most local highway authorities. Well-designed and installed surface dressing provides a durable and aesthetically pleasing veneer to roads.

Surface dressing is used to seal the existing road surface, potentially improving skid resistance through the deployment of appropriate chippings and provide a road surface of uniform appearance.

Road Note 39 is the design guide for surface dressing. It is produced by a panel of practitioners representing all aspects of the process.

Continuing refinement of the components used in surface dressing and the techniques for its application and after care results in the need to keep the Road Note up to date. The current version, Edition 7, was published in March 2016

The Road Note includes guidance to enable the successful installation of surface dressing on roads with traffic levels from the minimal, less than 20 commercial vehicles per lane per day (cv/l/d) to those carrying in excess of 3250 (cv/l/d).

The guidance defines the various surface dressing types available and gives advice about the appropriateness of the use of particular surface dressings for a range of site conditions and equally, if not more importantly, the conditions where the use of surface dressing is not advised.

A criticism of previous editions of the Road Note was the unsubtle approach it adopted towards the selection of Polished Stone Value (PSV) for more lightly trafficked roads. The previous edition made reference to National Guidance such as that given in the Design Manual for Roads and Bridges.

This national guidance has its lowest traffic category as 0-250 (cv/l/d). Many Local Highways Authorities have networks where the majority of their network carries less than 250 (cv/l/d). The Road Note now recognises the skid resistance policies of Local Highway Authorities are likely to subdivide the 0-250 (cv/l/d) category to match the traffic levels of their networks.

This latest edition of the Road Note recognises this reality and now offers guidance on the selection of PSV's for roads carrying 250 (cv/l/d) or less. This can be found in Table 7.3 of the Road Note. Guidance on PSV Selection for traffic levels of 0-20, 21-100, 101-250 (cv/l/d) is given.

It is stressed Road Note 39 is a design guide, not a specification but ADEPT urges practitioners to follow the guidance in the Road Note to optimise the deployment of this

valuable but sometimes misused highway maintenance technique.

## REPORT ON SMDS TRAINING DAY

Stephen Child

A day was spent considering changes to documentation interspersed with other topics. From Well Managed Highways and what risk will you take in Cornwall to plastic roads in Cumbria to innovation in the highway industry and network resilience. All fascinating and current topics that had the audience thinking and questioning. The main content of the day was to consider the changes that are coming up around documentation that highway practitioners use on a daily basis as follows:

**SHW – SMDS** has worked continuously with HE to update and enhance SHW clauses and we were reminded of the changes that are in hand regarding the 900 series

**DMRB – HE** is updating the Manual to make it clearer, more consistent and easier to understand and implement for the national road network. There will be a UK wide document that is then supplemented by National Annexes for use in mem-

ber countries. If local roads are to be covered specifically then Local Authority Annexes will need to be developed unless fully covered in the other documents. There are a number of very relevant standards that will need to be considered by Local Authority users to determine if it meets their needs. SMDS seeks to be involved in all relevant standards such that the needs of local roads can be met and a proliferation of standards or use of inappropriate standards through lack of expertise occurs.

**MCHW - HE** is collecting the industry view on usability, structure and content of the MCHW. This will be used to inform the recommendations for the future of the MCHW.

**SROH – Arup/Aecom** are undertaking an update of the SROH and it is anticipated that a 4<sup>th</sup> edition will be published in January 2019 for comment.

## SCANNER Weighting Sets Andy Stevenson

Most Local Highway Authorities (LHA's) use SCANNER surveys in one form or another, and the gathering, processing and management of the data comes at a considerable cost in these straightened financial times. So why is it that many only use the data gathered to produce the national indicators that are reported to DfT?

One reason often proffered is that the road condition indicator (RCI) generated is not representative of what engineers see on the ground and therefore it is concluded that the SCANNER is wrong. Sound familiar? Well it doesn't have to be like that!

SCANNER picks up what the scanning lasers see on the road that the survey vehicle passes over. This raw data is then processed into a useable form by running the raw data through a series of nationally agreed

weighting sets. These weighting sets are, by and large, unaltered from the original weighting sets derived from a relatively small sample of readings made many years ago. Additionally they are ordered by road class i.e. A, B and C roads but crucially, not U roads.

So when was the last time you managed your highway network by road class? The concept of a maintenance hierarchy has been enshrined in the national code of practice since 2004, so why are we still sticking to analysing SCANNER by road class?

Cornwall Council has used a series of locally derived weighting sets based around hierarchy for the last 6 years. We went back to basics and having spoken to Andrew Gallagher, who derived the original weight sets for TRL, we used that same methodology to derive meaningful weighting sets that gave us RCI's which made sense of what we saw on the ground.

The results were spectacular. No more issues with

longitudinal profile variance (LPV 10 is a particular “problem” in urban areas and for different reasons on lower hierarchy C roads in rural areas) because we had now defined the thresholds to suit the nature of our roads, not those roads which were used for the original weighting sets (Buckinghamshire if you’re interested).

So if, like Cornwall, your network bears no resemblance to the leafy Home Counties you might like to consider embracing the same methodology. We still use the national weighting sets for benchmarking and Cornwall’s roads are upper quartile for A, B & U roads. Our C roads are in the third quartile, not because they are any worse than the rest of our network, rather because the national C road weighting set is totally unrepresentative of your average Cornish C road. And that perfectly illustrates the perceived “problem” with the current way of analysing our SCANNER data.

## HOT ROLLED

### ASPHALT

Ian Walsh

Until recently, HAPAS Thin Surface Course Systems [TSCS] and Stone Mastic Asphalt [SMA]

were the automatic choice for carriageway surfacing materials. However as these have aged the rapid development of potholes and surface fretting, particularly at joints and especially in winter, has caused Councils to carry out extensive and expensive patching programmes.

A number of Councils have chosen to revert to a Hot Rolled Asphalt [HRA] surface, usually HRA 35/14 or 55/14, laid 45mm thick. An advantage of this is that it completely replaces the existing surface course, where the TSCS or an old HRA surface would have been laid 40mm thick.

There is a choice of three materials in the Specification for Highway Works (SHW) Clause 910 Hot Rolled Asphalt Surface Course (Recipe Mixtures), Clause 911 Hot Rolled Asphalt Surface Course (Design Mixture) and Clause 943 Hot Rolled Asphalt Surface Course and Binder Course (Performance-Related Design Mixtures)

The Notes for Guidance to the Specification give some guidance as follows :

Recipe HRA mixtures should generally only be used in relatively lightly trafficked situations and where there is some knowledge of the performance expected from local mixtures. Where more detailed knowledge exists, design mixtures to Clause 911 can be specified or for the most onerous conditions performance related mixtures to Clause 943.

*For design mixtures, in the past, Marshall properties, such as stability and flow, were used as indicators of resistance to permanent deformation, but this is no longer included as an option in the BS EN 13108 standards. In very heavily trafficked situations, where resistance to permanent deformation is of high importance, it is recommended that performance related Hot Rolled Asphalt to Clause 943 is used*

Using hot rolled asphalt surface course to Clause 943 will en-

sure a good level of resistance to permanent deformation within the surface course itself. Designers should be aware that significant rutting often occurs in the lower layers of the pavement and use of a performance designed surface course on an inadequate substrate will not protect against this. In almost all cases, the use of a modified binder or binder modifier will be required in order to achieve the more onerous (Class 2) performance level (c.f PD 6691 Table C.3)\*

NOTE\* Attention is drawn in the Note to Table B.3 for Asphalt Concrete which states: *NOTE Classification 2 is intended for normal highway traffic. For very slow moving/ stationary traffic in bus lanes, bus stops, major stop lines, docks and airport taxiways and stands, an enhanced deformation resistance might be necessary. The same applies to HRA.*

ADEPT has previously recommended that in these circumstances, half the values in the Tables may be appropriate.

Design Mixtures have

less binder content than C1 910 mixtures, with a consequent likely loss of durability, especially for high stone content mixtures or chipping retention. Clause 910 mixtures are also very flexible and will help to resist cracking due to deflection under traffic on the 'evolved' road network. They are therefore strongly recommended for the C and U network where a life of well in excess of 30yrs could be expected

Clause 943 material is recommended for other road classes where a life to replacement in excess of 25-30yrs could be expected. In order to design the mix the supplier must carry out a Marshall Design procedure and supplement it with a wheel tracking test. This test is readily available and not expensive, and it gives additional safeguards against rutting - the Achilles heel of HRA. Given the high cost of Polymer Modified binder it is important not to over-specify the Wheel Tracking rate and SHW NFG Table NG9/33 gives good guidance for normal traffic speeds.

## MODULAR PAVING

Ian Walsh

Modular paving uses concrete blocks and flags, clay paving and stone setts and slabs. Concrete and clay modules are manufactured in a limited range of sizes, thicknesses and shapes; stone paving is cut to the required dimensions. A pavement design involves the selection of the laying methodology; whether rigid; i.e. with more mortar joints and a fine concrete bedding, or flexible i.e. with sand filled joints and a sand bedding. Grit is used instead of sand for cropped setts. Under no circumstances should a different combination of bedding and jointing be used; it will lead to rapid failure. Joint widths should be narrow (2-5mm) for flexible laying and 8-12mm for rigid and cropped setts. All paving requires an adequately strong base, for trafficked areas this may be of asphalt or concrete.

Normally concrete and clay blocks are laid flexibly, though they have been successfully laid rigidly like stone setts. Small square concrete flags, up to

450mm square, are laid flexibly and can be trafficked; larger units can be used in footways and are laid rigidly. Rectangular units with a length to width ratio of greater than 2:1 are weak and must be bedded on fine concrete on a strong foundation. Stone setts and slabs are normally laid rigidly. For lightly trafficked areas cropped stone setts are available laid flexibly to produce a continental road appearance.

The selection of the module type is generally made by the landscape architect, but for housing developments concrete blocks laid on sand in herringbone pattern are often preferred as they are cheap to lay and look good, some Local Authorities also accept them as part of a SUDS design. For trafficked areas, concrete blocks with a 2:1 ratio in plan, with dimensions of around 200mm x 100mm are used. Units with other than this ratio are only satisfactory for use in lightly trafficked and pedestrian areas but they don't form a well-

interlocked structure as they cannot be laid in an effective herringbone pattern. Blocks with shaped sides or bases offer no significant structural advantage. The bedding (laying course) sand must be clean and hard; the Cat1 sand to BS 7533-3 Table D.2 is particularly important for heavily trafficked situations, but is hard to find.

Stone modules can have cropped or sawn sides and upper surface and a very wide range of plan sizes and thickness. The plan size is generally specified by a landscape architect to suit his concept of the development. The thickness is determined by the plan size and laying method. The fine concrete (mortar) bedding for trafficked sites is a proprietary product that has to be elastic to withstand deflection under traffic. It is fully specified in accordance with BS7533- 7 Annex C and must be mixed freshly and used in accordance with the manufacturers' instructions and sampled and tested in accordance with the Quality Plan and NHSS 30. Some fine concrete materials are sensitive to excess water but all must be fully compacted be-

neath the modules to give a full contact and have sufficient strength. Site proportioning of bedding material is not suitable for use in trafficked areas. Joint widths must be strictly adhered to and the jointing mortar used as a slurry to fully fill the joint. Excess material is squeegeed off to give a clean finish.

All paved areas must have good edge restraints. Kerbs and channels, especially if overrun, should have a reinforced foundation installed in advance and the units laid on the propriety fine concrete. Excellent standard details are given in BS7533-7 Annex D

NHSS 30, the QA document for the Installation, Maintenance and Repair of Modular Paving, available from UKAS, ensures competent CSCS Card-holding operatives are used. There are now an adequate number of companies Certificated to provide a tender list. NHSS are mandatory for schemes based on the SHW

MANAGING  
RECLAIMED  
ASPHALT  
Andy Simms

This ADEPT Guidance Note is intended as an aid to classifying and reusing arisings from bituminous bound road materials. The main aim is to reduce the amount of hazardous, or non-hazardous, waste being sent to landfill, and allow industry to reuse as much of this valuable material as possible in a sustainable way, or to save time and money. The most common issue relates to the presence of road tar, which may have been used in all pavement layers (including surface dressings) as recently as the mid-1980s. Road tar is a complex mixture of hydrocarbons, some of which have been shown to be carcinogenic and or toxic to aquatic life.

The guidance outlines requirements and recommendations for sampling and testing strategies in order to correctly identify the arisings as product wherever possible. Additional clarification would nevertheless be useful and Skanska's Waste and Resource Management

team, who are specialists in this area, have drafted a 'Process Map' currently awaiting agreement with the Environment Agency. The Process Map is intended to provide a practical guide to enable Clients and Contractors to make correct decisions in compliance with Waste Legislation, whilst maintaining operations on site.

If there is insufficient information on the nature of potential arisings, it must be assumed that they are hazardous by anyone producing, handling or processing them. Evidence of accurate classification of arisings should be made available to others who may be involved in handling or processing the arisings.

The current document does not attempt to cover the matter of permits or licences for transfer, transport, storage, or processing, of waste materials. It is proposed that an updated version of the guidance will be drafted to address these fundamental issues and to make it more of a compliance guide

for Local Authorities.

The proposed update is to bring the standards up to compliance levels as well as including sustainable methodology and pragmatism when it comes to sampling and testing.

Discussions are ongoing with the Environment Agency and the Chartered Institution of Waste Management regarding endorsement of the updated document by the Regulator, and CIWM and its Construction and Demolition Waste Forum.

The current guidance document is not intended as a complete guide to managing waste materials and must be read in conjunction with the Regulations and guidance issued by local Environmental Regulators. These will take precedence over this guidance in all cases, as well as the proposed updated version as and when it is issued.

Horses and Highway  
Surfacing

Stephen Child

In January 2006 the then CSS, now ADEPT, worked with the British Horse Society to produce

Guidance Notes for Highway Authorities entitled “horses and highway surfacing“. This has not been reviewed since that date however little has changed that would amend the content and it still contains good advice to both Highway Authorities and Horse Riders.

## CUMBRIA’S ISSUES WITH THE D400 MANHOLE COVERS

Keith Field

Over the years most highways engineers have had to deal with failures of manhole covers in the carriageway. Many of the failures encountered are due to foundation, sinking manhole covers, or the cover & frame seating arrangement. Typically the construction of these carriageway manholes often pre-date BS EN 124 *Gully tops and manhole tops for vehicular and pedestrian areas* or guidance like HA104/09 *Chamber Tops and Gully Tops for Road Drainage and Services: Installation and Maintenance* and are coming to the end of their service life.

So when one of Cumbria highways area teams reported a series of failed D400 manhole covers with service lives ranging

from 3 months to 2 years on a particular section of the Cumbria Highway network a full investigation was undertaken. During this investigation it soon became clear that the typical failure modes described above were not the culprits and the metal covers themselves were failing.

The investigation found that:-

In all 8 D400 type manhole covers have failure at 4 different locations around Cumbria.

Due to Cumbria County Council’s [CCC] procurement arrangements all the D400 manhole covers are from the same supplier.

All manhole covers were replaced but unfortunately some of these products have also failed.

According to CCC records the manhole covers have not subjected to abnormal traffic loads passing over them.

3 of the 8 covers have failed catastrophically under normal traf-

fic loads. 2 of the 3 catastrophic failures are from the sasame location.

In February 2018 CCC asked via ADEPT and the wider highways engineering community if there were any other highway authorities around the country similar issues with carriageway grade manhole and gully covers.

The response was very good to this question [thank you to all who responded] and this particular issue seems generally isolated to Cumbria. However what also became clear from some of the responses received and also from CCC’s investigation, was that the current version of BS EN 124 has gaps in the testing of performance requirements particularly in replicating in service conditions. It is believed that revision of BS 7903 *Guide to Section and use of gully tops and manhole covers for installation within the highway* is underway to address these gaps for UK market.

As a result of CCC’s investigation the following actions have been taken:-

CCC published an internal service procedure: - *Chambers, Frames and Covers – Installation and Maintenance* to raise awareness and standardise the design, specification, installation and maintenance of these products.

CCC highways have also started a county wide inspection of carriageway manhole and gully covers.

Continue to monitor the quality of new manhole and gully cover installations.

Amended CCC’s contract documentation and specifications to address the gaps in the current standard. In particular specifying that the units must be dynamically tested in a controlled environment to replicate in service conditions, such as a rolling road, for a minimum of 1 million cycles with an 8T load on a double truck

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Due to the raised awareness of CCC's highways engineers the D400 carriage manhole cover pictured opposite was reported at the time this article was being written.

This D400 manhole cover was installed on the Cumbria network during December 2014 by 1 of CCC's surfacing contractors, was procured using their system and was from a

Due to the raised awareness of CCC's highways engineers the D400 carriage manhole cover pictured opposite was reported at the time this article was being written.

This D400 manhole cover was installed on the Cumbria network during December 2014 by 1 of CCC's surfacing contractors, was procured using their system and was from a different supplier to the one CCC has been using.

As can be seen for the photograph the failure mode seems similar to the original failed manhole covers and is currently being investigated.



## ADEPT Selection Surfacing Document

The ADEPT Soils and Materials Design and Specification Group commissioned a guidance document on Selection Surfacing to assist non-specialist engineers with this task when selecting and specifying maintenance works.

The purpose of this report is to:

1. Provide a guidance document which will allow the knowledge of a few specialist pavement engineers to be disseminated to a wider audience including asset managers to enable 'best value' choices to be made without risking premature failures
2. The document will also encompass all the current thinking on the effects of climate change, skid resistance and durability obtained from other ADEPT research work.
3. The Best Practice guidance document will help protect LA's to not only provide safe highways for the public but also to defend claims made against the authority

The report presumes some knowledge of the design and specification of surfacing, but a high quality pavement depends upon

correctly specifying in detail all the necessary requirements to meet the design objectives and in the case of a maintenance project to solve the defects found in the existing pavement

No materials have excellent properties for every characteristic that may be required, and some properties are expensive to deliver, particularly flexibility or crack resistance. Over-specification can be expensive, but under specification will lead to loss of durability and possibly a poor safety record. As far as is practicable given the number of parameters involved the document aims to provide guidance on materials' characteristics to enable an informed choice to be made. It complements national HA guidance and is particularly relevant to Maintenance works.

The document has been circulated to all members of the group from whom copies can be sought

IDW