Economy Transport and Environment Department

Guidance Document for Footway & Cycleway Pavement Options

2022 Edition

CONTENTS

NOTE: This document is based upon standards, best practice and specifications current at the time of writing. Hampshire County Council may, from time to time, review, vary and amend this guidance as circumstances dictate. Accordingly, the contents are to be treated as guidance only and should not be relied upon as definitive or binding.

Formal approval of designs or proposals relying, or based upon this guidance, should be obtained before any contractual or other form of binding commitment is entered into.

Introduction

The length of footway,* footpath or other routes for use by pedestrians, owned and maintained by Hampshire County Council is surprisingly large, it is 6,896 km (4,285 miles) long. The surface area is approximately 4,047 acres.

This represents a substantial asset which needs to be maintained as economically and efficiently as possible. The correct choice of construction design and maintenance techniques are essential to ensure the safety of users, the minimisation of disruption and value for money, on a whole life cost basis.

To assist those engaged upon designing and/or maintaining Hampshire's network of footways, Hampshire has issued, in addition to this guidance, various other directives, and policies. References to these are included within this document as and when appropriate.

This revision of the document is intended as a guide to the selection of appropriate options or treatments. The aim is to provide Engineers with information, advice, and guidance on the common options available to them.

Construction options must be considered against the need for affordability and avoidance of ongoing maintenance liabilities.

*A ***footway*** either forms part of a highway, or runs alongside it, and limits the width of a highway which is carriageway. Although ***footways*** are commonly referred to as '***footpaths***', in law ***footpaths*** are paths away from the highway, not alongside them.* **The term Footway in this document is used to cover all types.**

1.0 General Guidance

The existing highway network requires on-going maintenance to keep it functioning efficiently and effectively. However, new infrastructure and highway improvement schemes continually add to the highway extents, increasing maintenance requirements. The future maintenance costs of any new infrastructure are a prime consideration given on-going funding pressures.

Scheme development should focus on delivering the identified aims and objectives whilst minimising network disruption and lifecycle costs, without compromising other important aspects such as access arrangements and environmental or sustainability considerations.

There are many cases where careful consideration of maintenance implications at the design stage will provide an equally effective outcome, without maintenance requirements increasing costs or introducing practical difficulties that compromise the effectiveness of the asset.

Disproportionately costly or problematic maintenance requirements may inhibit or prevent maintenance taking place. Failure to carry out this maintenance adversely effects the performance and value of the infrastructure asset.

As a result of the climate emergency as declared by Hampshire County Council in June 2019, options that include substantial environmental benefits that are referred to within this document, should be used whenever possible, subject to contractual acceptance.

1.1 Considerations for Designers

The majority of the HCC network is surfaced with bitumen bound products, i.e. asphalt*. This is referred to as 'flexible' construction and is the **preferred option**. This should be the construction type used, unless specific reasons justify a departure from this stated preference.

Consideration has been given for use by those with disabilities. HCC standard details referred to below have been amended to reflect the guidance found within the Department for Transport publication, "Inclusive Mobility" section 3.

Hampshire County Council have a series of 'standard details' illustrated within three drawings **HCC11/C/045, 050 & 055**, for various types of footway construction. Details of these construction types are summarised later within this document.

The link below for these drawings also includes relevant standard details for kerbs, edgings etc, incidental to the construction of footways and footpaths.

www.hants.gov.uk/transport/developers/standard-details

For the purposes of this document the term 'asphalt' is used in the generic sense to refer to the range of bituminous mixtures used in the UK: Asphalt Concrete (AC), Hot Rolled Asphalt (HRA) & Stone Mastic Asphalt (SMA including proprietary products).

1.2 Commuted Sums

Based upon whole life costs and asset management principles, as defined within published policies, HCC has identified the relevant cost impact of differing options for footway construction.

For options that are more expensive or problematic to maintain than the 'preferred' options, HCC will require developers to pay a commuted sum to cover increased maintenance costs. Where appropriate, Section 278 and Section 38 Agreements, will include provision for commuted sums towards maintenance.

Asphaltic concrete (bituminous macadam) and tactile paving will not incur commuted sums. However, block paving, modular paving flags and pigmented surfacing for cycleways will incur commuted sums due to the associated increased maintenance costs. Pigmented surfacing for footways should not be used.

www.hants.gov.uk/transport/developers/commuted-sums

1.3 Skid/Slip Resistance

Materials used for the surface of footways and cycleways must be shown to have the required degree of slip resistance.

For flexible pavements the aggregate used in the surface course must have an acceptable **Polished Stone Value (PSV)** as per Table 2 (section 2). Where the pavement is to be used by cyclists, the higher PSV value in Table 2 shall be specified.

For block pavers and flags the requirement is stated in terms of **Polished Pendulum Test Value (PPTV).** Note: Some manufacturers only give figures for PTV or Pendulum Test Values, however the requirement needs to be the stated figure for PPTV as this is indicative of the surface characteristics after some degree of usage and is therefore more representative.

To reduce the risk of slipping, correct levels of skid resistance must be specified. **An absolute minimum PPTV of 45 shall be specified for new works**.

For heavily pedestrianised area, locations likely to be used by vulnerable people *e.g. outside a care home for the elderly*, **or where gradients steeper than 5% exist, a minimum PPTV of 55 shall be specified for blocks/pavers/slabs/flags whether manufactured from clay, concrete or natural stone.**

High PPTVs on their own do not necessarily provide sufficient protection from slipping. Paving materials should have some texture to provide sufficient contact area with footwear so that there is enhanced slip resistance in wet conditions. Polished and semi-polished products should be avoided.

If a paving product is used which has inadequate resistance to polishing the only long term solution will be to replace it with a more suitable product. **The design and installation of block paving schemes shall be carried out in accordance with BS 7533.**

Clay pavers are not to be used in the footway without a full risk assessment including confirmation of Polished Pendulum Test Value (PPTV) criteria and satisfactory evidence of long term performance elsewhere.

For further information regarding the measurement of slip resistance (especially for non-standard or bespoke solutions) further guidance can be obtained from **BS EN 16165 - Determination of slip resistance of pedestrian surfaces. Methods of evaluation.**

All cycleways/cycletracks (both shared use and segregated) shall have a minimum PSV of 55. Cycle lanes (i.e. as part of the carriageway) shall have the same PSV as the adjacent carriageway to avoid the risk of differential skidding.

1.4 Control of Weeds, Roots & Other Vegetation

The need for weed control in footways should be considered on a site-specific basis. All topsoil must be removed in the construction of the footpath (even if this requires excavation over and above the depths specified within the appropriate standard details). If there is a likelihood of weed growth, a thermally bonded non-woven separation membrane (geotextile), should be used, to cover the full width of the footway construction at formation level, including beneath edgings and kerbs where possible.

At sites where 'Japanese Knotweed' or other invasive species are, or have been present, a root barrier membrane must be used. It is recommended that a black root barrier be used where Japanese Knotweed is or has been present.

Soil or plant material contaminated with non-native and invasive plants/roots e.g. Japanese knotweed, can cause ecological damage and are classified as a 'controlled waste'. Arisings must be disposed of by a registered waste carrier to an authorised landfill or suitable disposal site. Refer to https://www.gov.uk/guidance/prevent-the-spread-of-harmful-invasive-and-non-native-plants

For guidance on the need for root barrier (geotextiles) due to the presence of trees, tree roots or other vegetative growth, advise should be taken from a qualified arboriculturist.

Chemical weed killers shall only be considered as a 'last resort.

1.5 Pavement Foundations

Foundation Class

The specified construction depths are based upon a dry (adequately drained) and reasonably solid foundation. The designed thicknesses for both 'light vehicles' and 'heavy vehicles' are sufficient for occasional use by such traffic. **THEY ARE NOT SUITABLE FOR REGULAR REPEATED USE BY VEHICLES**.

Regular trafficking puts a loading onto the pavement structure that should be dissipated through deeper layers of construction which need to be designed accordingly (refer to CD225).

Consideration should be made for areas that will frequently be used for parking. This constitutes 'use by' the type of vehicle included in the above descriptions (light or heavy).

Current standards now place reliance upon the foundation stiffness measured in Megapascals (MPa) rather than a relationship between force applied and the resultant displacement; the California Bearing Ratio* (CBR)

The surface modulus for the formation upon which the HCC options are based, should achieve no less than Foundation class 1 i.e. not less than 50 MPa. This is not a particularly 'hard' surface and many commonly occurring clays, chalks or other sub soils **(IF DRY)** may achieve this standard.

The current edition of CD225, in line with other amendments within the Manual of Contract Documents for Highway Works (MCDHW) and some British Standards, are based upon the 'stiffness' of the underlying strata, measured in Megapascals (MPa), in preference to the previously relied upon CBR. The following classification of stiffnesses are used:

Foundation class	Assumed long-term confined foundation surface modulus (MPa)
1	≥ 50
2	≥ 100
3	≥ 200
4	≥ 400

Table 1

Whilst these two methods of assessment are fundamentally different and there is no precise correlation for CBR to MPa there is an approximate conversion that can be used for CBR readings of between 2% and 12% as contained within CD225 (see below).

$$E = 17.6\,(CBR)^{0.64}$$

where: *E* is the estimated subgrade surface modulus (MPa) & CBR is the California Bearing Ratio (CBR) of the subgrade

NOTE: Equation is valid for CBR values in the range 2 to 12 per cent

Where the formation does not meet the requirements set out above, additional thickness of the specified base or sub base material can be used as is necessary to achieve the requirement for surface modulus. In areas of particularly poor ground, especially where the existing material is wet (above its optimum moisture level), a geosynthetic membrane can assist in load dissipation and restricting the migration of moisture and fine particles. This would otherwise make adequate compaction of overlying layers difficult or impracticable and could lead to a premature failure of the pavement.

The California Bearing Ratio (CBR) test is a simple test that compares the bearing capacity of a material with that of a well-graded crushed stone. It is primarily intended for evaluating the strength of cohesive materials having maximum particle sizes less than 20mm.

For the construction of footways where there is a likelihood of movement caused by clay shrinkage or consolidation, adequate mitigation should be considered to avoid severe, premature cracking. Such mitigation should be included in the following scenarios:

- *Areas of highly plastic clays*
- *Where there is frequent inundation, e.g. flood plains.*
- *In the vicinity of trees, especially species with a high-water demand*
- *Near to and/or on top of or near to embankments*
- *On soils with a low bearing capacity generally*

To further mitigate the risk of premature failure in areas considered to be susceptible to shrinkage or movement, the construction can be reinforced through the incorporation of geotextiles/geogrid to be placed at sub grade or formation level. In extreme cases a bi-axial or tri-axial geogrid can be incorporated within the subbase layer. **Such products should be of a minimum tensile strength of 8kN/m with maximum tensile elongation 60% and permeability of 90/m²/s.**

2.0 Footway Options

Standard Detail drawing No. HCC 11/C/	Footway Type	Description	Surface	Skid Resistance	Binder	Base/Sub base
045	1A	**Flexible Construction**	20mm of AC 6	45 or 55psv	**50mm of CRBM** class B4	100mm of SB
	1B	Alternative Flexible Construction	20mm of AC 6	45 or 55psv	50mm of AC 20	100mm of SB
	2	Concrete Flagstone Paving	Flag stone	45 pptv	25mm sand bed	100mm of SB
	3	Concrete Block Paving	Block paver (min 60mm)	45 pptv	30mm sand bed	100mm of SB
050	4	Rural	10mm 'topping' layer	N/A	75mm path gravel	100mm of SB
055	5	**Strengthened Flexible Construction**	20mm of AC 6	45 or 55psv	**90mm of CRBM** class B4	150mm of SB
	5A	Alternative Strengthened Flexible Construction	20mm of AC 6	45 or 55psv	90mm of AC 20	150mm of SB
	6A	Strengthened Concrete Block Paving	Concrete Block (80mm)	45 or 55 pptv	30mm sand bed	150mm of SB
	6B	Strengthened Concrete Flagstone Paving	Flag stone	45 or 55 pptv	25mm sand bed	150mm of SB
NA		**Flexible Construction** *(where existing foundation is suitable)*	20mm of AC 6	45 or 55psv	**100mm of CRBM** class B4	

In accordance with the foundation requirements as described within section 1.5 above, this construction can only be used where there is evidence of suitable stiffness of the existing formation

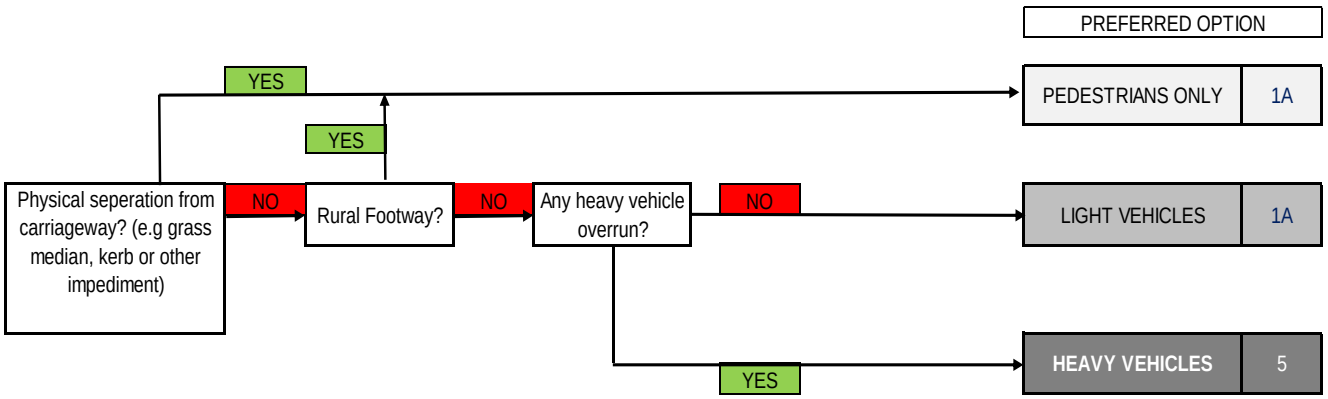
Key:	
	PEDESTRIANS ONLY
	LIGHT VEHICLES
	HEAVY VEHICLES

Text in **bold** indicates **'preferred'** option.

Table 2

Type 1A = *Preferred Flexible Option & Type 5 = 'Preferred Strengthened Flexible Option.*

The diagram below gives indicative guidance on the selection of the correct footway option and is explained in greater detail below:



Pedestrian
The pedestrian (and cyclists) category can only be used where the footway/cycleway is physically separated from the carriageway (i.e. where there is a barrier or other permanent obstruction to stop vehicular traffic mounting the footway/cycleway or where there is a verge of width 3m or greater).

Light Vehicle
This classification applies where only occasional overrun by HGVs is likely (i.e. as might occur two or three times in a year by delivery vehicles). Light-vehicle overrun shall be assumed at domestic crossings, access to private driveways, where occasional access by delivery vehicles is likely or, for footways/cycleways that are not physically separated from the carriageway and are adjacent to roads through residential areas.

Heavy Vehicle
For use where there is significant overrun by HGVs (i.e. allowing for one vehicle per working day over the design life time), or where footways/cycleways are adjacent to, but not physically separated from the carriageway in areas where deliveries take place and for footways/cycleways where there is uncertainty about the frequency of HGV overrun.

2.1 'Flexible' Footways (preferred options)

Type **1A, 1B** (Drawing HCC11/C/045) and Type **5** (Drawing HCC11/C/055)

Where it is practical to do so, asphalt (binder and/or surface course) should be laid by paving machine, as this results in a better quality and more durable pavement. For areas where it is not practical to use such equipment all other aspects of the specification must be complied with. Asphalt must be placed and compacted in accordance with BS 594987 and any contract specific constraints or specifications.

Sub Base layer: In accordance with SHW clause 803 Type 1. **Any HCC approved recycled option is the preferred option.**

Binder course: CRBM in accordance with BS9228 & SHW clause 948 **Quick Visco-Elastic (QVE)** bituminous binder conforming to class B4. **(PREFERRED OPTION)** *or* AC 20 dense bin (100/150 or 160/220* penetration grade bitumen) BSEN13108-1, clause 906 SHW.

Surface course : AC 6 dense surf (100/150 or 160/220* penetration grade bitumen) BSEN13108-1, clause 906 SHW. Minimum PSV 45.

Vehicle Crossings - Additional thickness

When a dropped crossing in Footway Type 1A or 1B is providing access to a domestic driveway, subbase thickness should be increased to 150 mm for the full width of the crossing. When providing access to commercial properties a design should be detailed appropriate to the anticipated usage (see drawing HCC11/C/130 for further information).

* *the softer bitumen option referred to should only be used for hand lay applications.*

Warm Mix Asphalts

For asphalt mixes in accordance with **BS EN 594987** (surface, binder and base materials), 'Warm Mix' in accordance with **Clause 908** of the Specification for Highway Works: July 2021, should be used in preference to traditional hot mix alternatives whenever available.

Traditionally, hot mix asphalt is manufactured at temperatures of between 150 and 200°C. However, this high-temperature process inevitably creates challenges relating to energy consumption, stressing of the bitumen, and a risk of contact burns. By the addition of a surfactant additive the material can be produced and laid at temperatures 20 to 40°C lower than the 'hot mix' alternatives

For these reasons, producers are turning to warm mix asphalt: a popular, greener product that uses additives to produce asphalt at an overall lower temperature. Warm mix asphalts have many benefits over standard bitumen and hot mix asphalt:

- *environmental benefits*
- *reduced costs*
- *health and safety benefits*
- *enhanced technical performance*

Bond/Tack Coats for use on flexible footways

A good bond between bound pavement layers is important. So the use of a tack or bond coat (emulsified bitumen) is essential

Whilst Bond coats have higher bitumen content than the traditional tack coat and are often polymer modified, they can cause issues with application via the hand sprayers as commonly used on footways. Accordingly tack coats are permitted but they must be applied at a sufficient rate to achieve the specified amount of 'residual' bitumen.

The rate at which bond coat is to be applied is given as a measure of the residual bitumen in kg/m² left after the emulsion has broken i.e. the water has evaporated.

Bond/Tack coats are denominated using the following four factors;

C or A for cationic or anionic (UK products are cationic)
Nominal binder content (as a %)
Type of binder (B=paving grade, P=polymer, F= 2% fluxing agent)
Breaking behaviour (classes 1 to 7 with 1 highest & 7 the lowest).

A typical Bond coat could be described thus: C 50 BP 3 with the percentage of bitumen shown as 50%.

BS EN 594987 specifies that the rate of spread of bond coat shall be at least 0.35 kg/m² of residual binder for planed surfaces and at least 0.20 kg/m2 when laid on to new binder course or existing asphalt.

For use in the construction of footways the specified rate of spread should be 0.2kg/m² residual bitumen. For the example of the C 40 tack coat, most commonly used, this would require **0.5 litres of tack coat per m²**

Where CRBM *(see below)* is required and tack coat is used to promote curing then the volume applied can be included within the assessment of residual bitumen required' as long as the surface is protected to prevent removal of that bitumen prior to the placing of the relevant asphalt layer.

Ex Situ Cold Recycled Bound Material

It is the stated policy of HCC to increase the use of recycled materials within the maintenance and reconstruction of the highway infrastructure, thereby significantly reducing environmental impact.

This objective relies heavily upon the initiative to utilise material arising from resurfacing and reconstruction schemes by processing them to convert waste or arisings of low value into usable construction materials.

HBM material (clause 894AR) has been produced and used successfully within footway schemes and elsewhere. However to further increase the use of the recycled materials the focus is now upon the production of ex situ cold recycled bound material (CRBM) complying with SHW clause 948 which is the preferred option.

SHW clause 948 comprises base and binder courses produced in a fixed or mobile mixing plant from graded aggregate, processed from arisings from the excavation of roads and similar sources, blended if necessary with other aggregate and bound with cementitious, hydraulic or bituminous binders, separately or in combination.

These materials can specifically include RAP (recycled asphalt pavement) which include hazardous quantities of tar. This significantly reduces disposal costs and is a clear environmental gain.

*The preferred material will be a **Quick Visco-Elastic (QVE)** bituminous binder conforming to class B4 (the Design Stiffness for Class **B4** material when installed is 4700MPa, equivalent to standard hot mix AC20 Dense binder course).*

The use of this material shall be considered the preferred option as indicated within Table 2 *ante*.

2.2 Flagstone Paving

Type **2** (Drawing HCC11/C/045) and Type **6B** (Drawing HCC11/C/055)

Concrete paving flags should comply with BS EN1339:2003.

Natural stone flags should only be specified where they are a site specific requirement e.g. sites with 'listed' status or particular, historical or aesthetic importance.
When specifying flagstones it is important to assess the risks associated with the manual handling implications, in line with Manual Handling Regulations and HSE Guidance. Details are to be included within the Health & Safety Hazard Identification sheets, where

appropriate. Generally, depending on thickness, slabs or flags greater than 450 mm x 450 mm plan area, will require mechanical lifting devices.

Concrete Flagstones

Precast concrete flagstones are not recommended where they are likely to be trafficked as they are susceptible to damage when vehicles park or run on them.

Using slabs is undesirable for 'trafficked' areas as they are vulnerable to breaking when trafficked. If this is unavoidable in such areas, it is recommended that slabs to be over-run are heavy duty, may incorporate fibre reinforcement and are of a maximum size of 450 x 450mm.

Flagstone options should be avoided where numerous vehicular dropped crossings are required. Where it is appropriate or necessary to install such a crossing point within a flag paved footway, it is recommended to substitute concrete block paving for flags as shown on drawing HCC11/C/060. This provides clear delineation and a more robust surface which will be less susceptible to damage from vehicle wheel loading.

Natural Stone Flagstones

Natural flagstone paving should be specified in accordance with BS EN 1341:2012 *'Slabs of natural stone for external paving'.*

Particular consideration should be given to resistance to Skid resistance/polishing, water absorption, flexural strength and frost resistance.

When considering samples it is important to understand that the sample is only a small representation of a naturally occurring material. Colour and appearance may be difficult to replicate precisely. This is especially pertinent for products where there are significant striations or other geological features. Where possible sufficient quantities (including a reasonable allowance for 'wastage') should be procured to enable the works to be completed with materials sourced by a single order.
Sources of natural stone products that have the required physical properties and are appealing aesthetically that are particularly remote, need to be considered carefully in terms of practicality and the impact environmental.

2.3 Block Paving

Type **3** (Drawing HCC11/C/045) and Type **6A** (Drawing HCC11/C/055)

Block Paving should comply with **BS EN 1338:2003**

Where block paving is the selected option (subject to considerations above) concrete block shall be specified unless clay pavers have to be used (e.g. to match existing blocks). Clay pavers tend to 'polish' more than concrete pavers, and are more susceptible to the growth of moss, lichens or algae. This can result in an increased risk of slipping, especially when wet. For this reason concrete pavers are preferred where paving blocks are to be used.

The quality of bedding sand is critical to the performance of block paved roads. **Sands shall be specified to comply with the relevant category in BS 7533: Part 3 Table D.1** Many commonly occurring building sands do **not** comply with the carriageway grades of sand in that they have excessive fines and insufficient resistance to wear. Once paving blocks have been laid for a while, particularly after significant rainfall, it may be necessary to 'top-up' after an initial application. For further guidance and recommendations regarding the laying of modular footways the following elements of BS7533 should be referred to.

BS 7533:		Guidance	Code of Practice
2021	101		Pavements constructed with clay, concrete or natural stone paving units and for the structural design of pavements using modular paving units
2005 +A1: 2009	3*		Laying clay or concrete pavers for flexible pavements
2006	4*		Construction of pavements of concrete slabs and natural stone slabs
2003	11		Opening, maintenance and reinstatements of pavements of concrete, clay and natural stone
2006	12	The design of trafficked pavements constructed on a bound base using concrete paving flags and natutal stone slabs	

Note: * Part 102 is due to replace these documents

Table 3

An appropriate sealant may be specified to prevent loss of sand in the early life of block paving. The sealant may initially reduce the skid resistance of the blocks but should wear off relatively quickly. Where skidding is likely to be a problem signs should be erected. Advice should be sought from the sealant manufacturer; some materials do not affect the skid resistance.

2.4 Rural Footway

Type **4** (Drawing HCC11/C/050)

Footway Type 4 is appropriate for use in rural settings where other types referred to above, would be inappropriate on aesthetic grounds or where pedestrian use doesn't warrant one of those (slightly) more expensive options. It is not suitable where there is likely to be regular use by wheelchairs, prams or pushchairs.

It is not an appropriate option where there is not good drainage or where there will be heavy leaf litter during autumn/winter months.

Self-bonding gravel as required for the finished surface will be a close graded material (Typically 10mm to dust) with sufficient 'fines content' to provide a smooth finish on completion.

The successful laying of such gravels is dependent on the material being at or close to its optimum moisture content to allow compaction without segregation, whilst still 'moist'.

The finished product will often be dusty for quite some time after completion so is not suitable for use in residential areas.

2.5 Micro-asphalt

Micro-asphalts for footways have been developed as an alternative to surface dressing and in appropriate scenarios, resurfacing. Whilst it is not specified as a construction option and is unlikely to be used in new construction, it is a useful maintenance option for refurbishment or repair.

The installation of micro asphalt can be a cost effective treatment for aged and worn pedestrian areas. It should not be considered as a structural repair material, although minor depressions or undulations can be treated within the process.

It may be appropriate to undertake some 'patching' of footways prior to treatment with the application of the micro asphalt surface material.

The design and application of micro asphalts should only be permitted by accredited installers (Highway Sector Scheme 13).

2.6 Tactile Paving

(Drawings HCC/11/C/60,65 & 70)

The Equalities Act 2010 requires Highway Authorities, to pay due regard to the design and delivery of services to minimise disadvantages suffered by people due to their protected characteristics. In the case of pedestrian crossings, cycleways and ramps, appropriate tactile paving should be provided.

Only the 400mm x 400mm size of Tactile flags, or 200mm x 133mm Tactile paving blocks, should be used. The installation of tactile paving should follow the advice given in the DfT publication *'Guidance on the use of Tactile Paving Surfaces'* particularly, the Introduction and the relevant sections of Chapter 1.

3.0 Maintenance Options

The following section, lists commonly occurring 'problems' and proposed solutions for various type of footway:

Maintenance Treatments Common to All Types of Footway

Defect	Problem	Treatments	
		Temporary	Long-term
Depressions & bumps	Hazard for users	Fill or ramp. Contact appropriate Statutory Undertaker if cause is failed utility reinstatement	Reshape surfacing
Rutting	Hazard for users	Fill	Reshape surfacing. Prevent overrun & reconstruct if necessary.
Slippery surface	Hazard for users	Warn users or restore macro and/or micro texture	Clean, restore texture by cleaning or renew surfacing (environmental disposal to be considered when treating or washing the surface)
Surface contamination	Hazardous Unsightly	Clean or neutralise	Replace surfacing if necessary. Clean with suitable products (environmental disposal to be considered)
Vegetation	Tree roots cause trips	Warn users or ramp trees	Reshape surfacing. Consider replacing with a more suitable material or system. (Specialist advice to be sought from Arboriculturist)
	Vegetation obstructs footway	Trim growth	Consider increasing frequency of maintenance (Specialist advise to be sought from Arboriculturist)
Water	Surface water	Salt if freezing	Reshape surfacing to correct gradients and cross-falls. Check maintenance of drainage systems.
	Blocked drainage	Clear blockage	'Jet' & survey system. Rectify any damage found.
	Burst mains	Inform Undertaker, make safe	

Table 4

Flexible Footways

Mosaic cracking (alligator cracking) Structural failure	Embrittled surfacing	Seal – (limited use for extensive cracking)	Replace surfacing (consider whether this should include binder and surface course).
Linear cracking	Water ingress, trips		Seal, replace surfacing or reconstruct if necessary
Loss of surface aggregate	Loose or uneven surface		Replace surfacing, consider micro-asphalt where appropriate
Potholes	Trips, water ingress	Fill holes (Approved pothole repair products)	Patch or replace surfacing if more than a single isolated defect.

Table 5

Modular Footways

Broken or damaged modules	Unsightly appearance, water ingress. Significant trip hazard		Replace damaged modules, resurface or reconstruct depending on overall condition
Loss of jointing material	Water ingress, modules can move/rotate		Replace jointing material, (ensure correct material is used) and/or seal joints
Rocking modules	Hazard to users	Relay modules	Reconstruct if problem is due to overrun and consider design to reduce/avoid overrun
Spalling of arrises or surfaces	Unsightly appearance		Replace damaged modules
Trips	Hazard to users	Relay modules	Reconstruct if problem is due to overrun
Widening of joints	Water ingress, modules can move/rotate	Fill wide gaps if a hazard	Relay surfacing and edge restraint if necessary
Discoloration	Unsightly appearance	Consider if significant enough to warrant any action	Only treat is structural or safety concerns apparent.

Table 6

Annex 1

External References

This document represents the policies and preferences of Hampshire County Council. The following documents have been used in the compilation of this guidance and may be useful for more detailed advice and direction.

1	**BS EN 13043**	Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas
2	**BS 594987**	Asphalt for roads and other paved areas. Specification for transport, laying, compaction and product type testing protocols
3	**BS EN 1344**	Clay pavers. Requirements and test methods
4	**BS EN 1338**	Concrete paving blocks. Requirements and test methods
5	**BS EN 1339**	Concrete paving flags. Requirements and test methods
6	**CD 225**	Design for new pavement foundations
7	**CD 143**	Designing for walking, cycling and horse riding (vulnerable users)
8	**DETR PPU 1622RB**	Guidance on the use of Tactile Paving Surfaces
9	**MCHW Series 1100**	Kerbs, Footways & Paved Areas
10	**MCHW Series 900**	Road Pavements – Bituminous Bound Materials
11	**MCHW Series 800**	Road Pavements – Unbound Materials
12	**BS EN 14231**	Natural stone test methods. Determination of the slip resistance by means of the pendulum tester.'
13	**BS 7533-3**	Pavements constructed with clay, natural stone or concrete pavers. Part 3: Code of practice for laying precast concrete paving blocks and clay pavers
14	**BS 7533-4**	Pavements constructed with clay, natural stone or concrete pavers. Part 4: Code of practice for the construction of pavements of precast concrete flags or natural stone slabs.
15	**BS EN 1342**	Setts of natural stone for external paving. Requirements and test methods
16	**BS EN 1341**	Slabs of natural stone for external paving. Requirements and test methods
17	**UK Roads Board**	Application Guide 26:2003
18	**UK Roads Liaison Group (UKRLG)**	Asset Management Guidance for Footways and Cycle Routes: Pavement Design and Maintenance 2018
19	**BS 9228:2021**	Recycling of roads and other paved areas using bitumen emulsion or foamed bitumen. Materials, production, installation and product type testing. Specification