

Appendices

- A:** Surfaces paved with stone paving slabs or precast concrete paving slabs
- B:** Cobbles
- C:** Stone Setts
- D:** Insitu Concrete
- E:** Bituminous Surfacing Materials
- F:** Kerbing

Appendix A

Surfaces paved with stone paving slabs or precast concrete paving slabs

Pavement design

Pavement design shall be in compliance with *BS7533: Part 8 Guide for the structural design of lightly trafficked pavements of precast concrete flags or natural stone slabs*, unless otherwise required by Suffolk County Council.

Materials

Precast concrete paving slabs shall comply with BS EN 1339 with the following classification:

- 1) Tolerances for work dimensions (Table 1) – Class 2
- 2) Maximum differences (Table 2) – Class 2
- 3) Weathering resistance (Table 4.2) – Class 3
- 4) Bending strength (Table 5) – Class 3
- 5) Abrasion resistance (Table 6) – Class 2

Natural stone slabs shall be selected sawn or riven slabs as required on the approved drawings, free from structural flaws. Surface tolerances for sawn slabs shall comply with BS EN 1339 Table 3. For riven and other specified finishes the flatness tolerance requirements of BS EN 1339 Table 3 may be increased by 1.5 mm, for specified allowable variations of 2.5 mm and 4.0 mm and 1.0 mm for specified allowable variations of less than 2.5 mm.

Unless otherwise agreed with Suffolk County Council natural stone slabs shall meet the bending strength requirements of BS EN 1339 Table 5 Class 3. Where slabs greater than 450 mm x 450 mm are to be placed in locations where they may need to be trafficked by emergency vehicles the mean and minimum strength requirements shall be increased by 2.0 MPa.

Construction

The works shall be carried out in compliance with *BS7533: Part 4 Code of practice for the construction of pavements of precast concrete flags or natural stone slabs*. For the purposes of Suffolk County Council approved works the following specification definitions shall apply.

1. Flags and slabs larger than 450 mm x 450 mm shall not normally be used in areas that can be accessed by vehicular traffic. Where it is necessary to use slabs larger than 450 mm x 450 mm in vehicular trafficked areas special conditions of unit thickness and bedding will need to be established. Generally this will entail the use of thicker flags or slabs or reinforced units, in the case of precast concrete flags. Suffolk County Council may be consulted about any special requirements prior to submission of formal proposals.
2. Flags or slabs of 450 mm x 450 mm or smaller shall be laid on a sand laying course and with narrow sand filled joints except where they are required to bond in with larger units. Where smaller units are required to bond in with larger units the bedding and jointing requirements shall be the same as the requirements for the larger units.
3. Flags or slabs greater than 450 mm x 450 mm shall be laid on a full mortar bed using 1:3 lime/sand mortar. A documented and comprehensive method of working shall be available on site, for inspection, for the whole duration of the laying process and all operatives should be fully aware of the detailed contents. The document should include procedures for assuring that the mortar bed is fully compacted and providing even support to the units. This requirement shall be deemed to have been satisfied if the units have full continuous edge support, a minimum of 90% area contact with the mortar bed, and have no single area of greater than 0.02 m² without mortar contact. The method of working should include provision for lifting slabs to check the integrity of the bedding contact.
4. Flags or slabs greater than 450 mm x 450 mm shall be provided with wide joints using either of the methods described in BS 7533-4 Cl. 6.8.3. Where a total length in any direction exceeds 12 m, provision shall be made for thermal expansion to be accommodated. For work wholly carried out between June and September the total length criterion may be extended to 20 m.

Appendix B

Cobbles

General

This Suffolk County Council Specification shall apply only to surfaces which are not trafficked either by vehicles or pedestrians. It provides for the setting of cobbles in a concrete surfacing layer, which it is assumed will not contribute to the structural strength of the supporting pavement structure.

The supporting pavement must be sufficiently strong to resist deformation due to climatic effects and overrunning vehicles and to avoid settlement, which could crack the decorative surface. Where a single area of cobbled surface exceeds 400 m² then a pavement and decorative surface design will be required to allow for the specific site thermal and loading.

For areas of 400 m² or less the concrete supporting matrix shall have a minimum depth of 200 mm.

Concrete

The concrete shall conform to BSEN 206:2002. The minimum fresh and hardened concrete requirements shall be:

1. Exposure class XF3.
2. Consistency class – To be declared by the concrete supplier or, in the case of site mixes, the slump to be measured and recorded. Slump classes greater than S2 shall only be used where the water cement ratio is 0.55 or less. The consistency shall be chosen to allow the cobbles to be hand placed and packed without sinking and to allow full closure of the mix around the sides of the cobbles, without shrinkage gaps.
3. Plasticiser and retarders complying with EN 934-2 shall be permitted.
4. Cement shall comply with EN 197, type CEM I, from a UK Works. Other types and sources will be permitted where the contractor is able to demonstrate that a consistent and acceptable colour can be obtained.
5. The maximum nominal aggregate size shall not exceed 8 mm.

Cobbles

The cobbles should be naturally occurring flint. Other rock types may be permitted, subject to the aesthetic properties and sustainability of the source being approved by the Overseeing Authority.

2. Particle size shall comply with table 1, below.

Table 1 Particle size distribution for decorative cobbles

EN sieve size	Percentage passing, by mass
125mm	100
90mm	90-100
63µm	0-2

3. Particle shape shall comply with table 2 below. The specified properties shall be measured using the procedures of EN 933 except that the number of particles assessed in each sample may be reduced to 25% of the requirements of EN 933.

Table 2 Particle shape requirements for decorative cobbles

Flakiness index (max)	25%
Elongation index (max)	50%
Proportion (by mass) of rounded particles	70-100%
Proportion (by mass) of sub-angular particles	0-30%
Proportion (by mass) of angular particles	0-10%

4. Particle surface- not more than 25% of the aggregated flint surface shall exhibit cortexing.

Laying

Prior to commencing construction of the layer the substrate shall be swept and, if permeable, sprayed with bitumen road emulsion at a rate of not less than 0.35 l/m² or covered with 1000g polythene sheeting. 50 mm, side dimension, bottom crack inducers shall be provided at 3 m spacing, longitudinally and laterally. The boundaries of the area to be concreted shall be contained by permanent edging or temporary vertical formwork.

Each cobble shall be pushed into the wet concrete with its longest axis vertical, so that a minimum of 75% of the length of each cobble is below the finished level of the concrete. The cobbles shall be so selected and arranged that the density of packing is not less than 75% of the shoulder-to-shoulder coverage. The wet concrete shall be worked between the cobbles, compacted and finished to produce a fully closed dense layer and surface.

The surface between the cobbles shall be within ±15 mm, at any point, of the designed level and so finished as to allow the free drainage of surface water. The surface of the highest point of any

cobble shall be within ± 20 mm of the designed level. The amplitude of the surface texture shall be 30 ± 10 mm, measured from the concrete surface

to the adjacent highest cobble at 10 randomly selected points in any 200 m^2 of completed surface.

Appendix C

Stone setts

General

The design and construction of the surface shall, unless otherwise stated below, conform to the advice given BS 7533-7:2002, *Pavements constructed with clay, natural stone, or concrete pavers – Part 7: Code of practice for the construction of pavements of natural stone setts and cobbles*.

The base and foundation courses, below stone setts surfacing should be designed and constructed in conformity to the SCC standards for the appropriate carriageway, footway or parking area. Reference should be *SCC Design Guide for Development and Estate Roads* or *The Highways Agency Design Manual for Roads & Bridges Vol. 7*, as appropriate for the area to be treated. Alternatively BS 7533-10 *Natural stone setts – Guide for the structural design of trafficked paved areas* may be used subject to the agreement of the SCC Area Maintenance Manager.

Frost resistance shall be required for all materials less than 300 mm below the finished surface on sand and gravel sub-grades and 350 mm and 400 mm respectively for surfaces over clayey and chalky sub-grades.

Selection of laying method

1. Rigid laying systems shall only be used on new pavement structures designed to carry greater than one million standard axles or over existing pavements capable of sustaining a similar loading and also having greater than 150 mm of sound asphalt or concrete to remain below the bottom of the new laying course.
2. Where a flexible laying technique is to be used over a previously cracked surface a membrane capable of resisting the migration of laying sand should be provided. Note: A 50 mm layer of hot

rolled asphalt with a strain absorbing membrane may be suitable.

3. Mixtures containing cement shall only be used for laying courses or joint filling where there is adequate water in the mixture to enable complete hydration of the cement to take place during the laying procedure. Cement or other hydraulic binder shall not be used in any materials for the laying courses or joint filling in flexible systems.
4. Where a flexible surface is to be cleaned by suction sweeper a joint stabiliser to the approval of the SCC Area Maintenance Manager should be provided.
5. Proprietary laying systems may only be used with the approval of the SCC Area Maintenance Manager.

Materials

Setts

Natural stone setts shall be granite or from a related acid igneous medium grained rock group. Other rock types may only be used with the approval of the SCC Area Maintenance Manager.

Bedding and joint filling sand

SCC wish to promote the use of recycled aggregates and would be prepared to consider the use of crushed and ground glass having the same measured bearing and flow characteristics as that of the specified sand.

Concrete

Bedding concrete shall comply with BS7533-7, C.2.1 except that the flexural strength and modulus of elasticity requirements shall not apply. The compressive strength prior to trafficking shall be a minimum of 7 MPa.

Jointing concrete shall comply with BS7533-1 C.2.2 except that the flexural strength and modulus of elasticity requirements shall not apply. The compressive strength prior to trafficking shall be a minimum of 3.5 MPa.

Appendix D

Insitu Concrete

Footways with Exposed Aggregate Concrete Surface

Design requirements

1. The minimum nominal slab thickness shall be 150mm.
2. Unreinforced slabs shall have a maximum horizontal dimension, between induced cracks, of 4.0 m in any direction and a length: width ratio of not greater than 3:2.
3. Reinforced slabs shall have a maximum length, between induced cracks, of 12.0m, a maximum width of 3m and a length: depth ratio of not greater than 4:1.
4. Reinforced slabs shall have a minimum area of longitudinal steel reinforcement of 500mm² per metre width of slab and minimum area of transverse reinforcement of 200 mm² per metre length of slab
5. Joints shall be constructed with lower triangular crack inducers 30% of the slab thickness high and 10mm sealed grooves 25% to 30% of the slab thickness deep. The groove seal shall be a proprietary non-bituminous filler to the approval of the SCC Area Maintenance Manager.
6. Dowel bars 20mm dia. shall be provided at all joints and induced cracks at 400mm centres. They shall be secured on self-supporting reinforcing cages during concreting and provided with an approved sleeve system. The dowel bars shall be aligned parallel, to within ± 3mm horizontally and vertically. The contractor provides independent evidence by intrusive or non-intrusive methods that the required alignment has been achieved in the hardened concrete.
7. As an alternative to the use of dowel bars the minimum slab depth may be increased to 220mm, provided that a minimum 200 mm deep cement or hydraulically bound sub-base, with minimum 28 days strength to the requirement C5/6, complying with of BS EN 14227-1,2 or 3 is also provided.

General

The concrete slab shall be laid in either a single layer or in two layers. If laid in two layers the surface layer shall be laid monolithically with the lower layer.

Slab Concrete

The surface layer concrete shall comply with the following requirements:-

1. The surface layer shall be not less than 40 mm thick.
2. The coarse aggregate shall comply with the size requirements of BS EN 12620. 10/20 mm natural flint coarse aggregate shall be used. The amount of aggregate retained on the 20 mm sieve shall not exceed 3% by mass. The aggregate passing the 10 mm sieve shall not exceed 5% by mass. The coarse aggregate shall have water absorption not exceeding 2% when tested in accordance with BS EN 1367
3. The fine aggregate grading shall comply with the 0/2 (FP) or 0/1 (FP) grading in BS EN 12620 except that not less than 98% of the mass of the material shall pass the 2 mm sieve.
4. The coarse aggregate shall comprise at least 60% by mass of the oven dry constituents of the concrete.
5. The Category of flakiness index of the aggregate is FI25.
6. The type of cement used in the concrete shall be limited to Class 42.5N/42.5R Portland cement CEM I complying with BS EN 197-1. The minimum cement content of the concrete shall be 375 kg/m³ and the maximum free water/cement ratio shall be 0.45.
7. The air content of the mixture at point of delivery to the site shall be not less than 2%, and strength shall comply with BSEN 206 – C32/40.

General Construction Requirements

1. The concrete paving equipment shall be approved by the SCC Area Maintenance Manager before the work commences. The general construction requirements shall be in accordance with the requirements of the Highways Agency – Specification for Highway Works (HA-SHW) 1000 Series except where otherwise stated in this Specification.
2. The spread concrete shall be compacted in such a manner that base layer concrete is not drawn into the surfacing and selected aggregate is uniformly present in the finished road surface;
3. The surface layer shall be compacted and shaped to line and level by a combination of either internal vibration and fixed conforming plate or vibrating conforming plate;
4. The final regulation of the surface layer shall be provided by a transverse tamping or

finishing screed in advance of rotary finisher and before the application of a retarder complying with BS EN 934-2.

Finished Surface Requirements

The finished surface of the pavement shall comply with the requirements of Clause 702 of the HA-SHW. Where a pavement area does not comply with the Specification for regularity, surface tolerance, thickness, material properties or compaction it shall be replaced with a new slab. The slab shall be replaced over the whole area between joints.

Production of an Exposed Aggregate Surface

In order to obtain a suitable exposed aggregate surface the main requirement shall be the removal of the surface mortar from the top of the slab to produce an exposed aggregate finish. This objective may be achieved by use of a scabber or the application of suitable cement set retarder, which is sprayed on the surface of the fresh concrete immediately after it has been levelled and finished. Retarded mortar shall be removed by wet or dry brushing, generally no sooner than when the surface concrete has reached a maturity of 16 hours at 20°C or after a suitable interval determined by trial to achieve the requirements of this Clause.

Retarder

1. The composition and viscosity of the retarder shall be such that it can be spread at an adequate and uniform rate over the surface of the concrete slab in order to ensure adequate aggregate exposure during the subsequent brushing operation.
2. The retarder shall contain a pigment in sufficient quantity to give an even uniform colour after it has been sprayed on to the slab surface. The pigment shall be fully degradable by exposure to ultra-violet light without leaving any residue that is detrimental to the surface of the concrete.
3. The chemical composition of the retarder and of the curing compound shall be such that they do not react adversely following the application of the curing compound to the exposed aggregate surface.
4. The Contractor shall use the retarder, to the approval of the Area Manager. This shall be of a type and composition to satisfy the requirements of this Specification.

Application of the Retarder

1. The retarder shall be spread evenly on to the surface of the wet concrete slab as

soon as practicable after the surface layer has been levelled and finished, by a spray bar over the full width of the slab in one pass. For small works, of less than 400m², a hand lance may be used subject to satisfactory results being obtained on the demonstration panel and being replicated during the works. Temporary works materials and equipment shall be chosen in order to permit inspection to ensure adequate coverage of retarder immediately after spraying and before protection of the surface.

2. Before commencing work, the level of the spray bar, the rate of delivery of the retarder from the nozzles of the spray bar, and the forward speed of the spraying machine shall be adjusted to achieve the required rate of spread. Means shall be provided and steps shall be taken to avoid excess retarder flowing on the surface of the slab.
3. Back-up spraying equipment shall be available on the Site at all times for use in case of a breakdown of the spraying machine.

Protection of the Surface after the Application of the Retarder

1. The finished surface of the pavement concrete after application of retarder shall be protected against precipitation, moisture loss, contamination and dispersal of the retarder by air movements. This protection shall be applied immediately after the application of the retarder.
2. Where waterproof sheeting is used it shall be laid onto the surface of the concrete immediately after the retarder has been sprayed. It shall be retained in position until immediately prior to exposing of the aggregate.
3. The protection system shall not adversely affect the finish, the line or the level of the concrete surface or the even distribution of the retarder in any way. Where sheeting is used, any air bubbling or blistering shall be prevented.

Exposing the Aggregate Surface

1. Brushing equipment shall be used to expose the concrete surface aggregate. Where the brushing equipment runs on the slab the concrete shall have gained sufficient strength to avoid any damage to the concrete. Hand brushing is permissible for small works.
2. Removal of the protection system shall take place as brushing proceeds. If waterproof sheeting is used as a protection system it

shall be maintained in position until immediately in advance of the brushing operation.

3. The Contractor shall complete the process of exposing the aggregate before the retarder becomes ineffective.

Brushing System

1. Sufficient brushing capability shall always be maintained on Site to complete the exposure of the aggregate before the retarder becomes ineffective. An adequate back-up brushing facility shall be available on the Site at all times for use in case of a breakdown of the brushing equipment.
2. The brushing equipment shall be used to produce an even macrotexture on the surface of the slab. Brushing shall be carried out so as to produce a uniform appearance over the slab.
3. Adequate dust suppression and collection measures shall be in operation at all times.
4. The wheels of any brushing equipment which may run on the slab shall be fitted with tyres with a shallow tread pattern and a low inflation pressure and be sufficiently wide to avoid damage to the concrete.

Protection of the Surface Layer After Exposure of the Aggregate

Within one hour of completing exposure of the aggregate the surface shall be dampened with water. A curing compound shall be applied to the entire exposed aggregate surface of the slab in accordance with HA-SHW Clause 1027. In wet weather the curing compound shall be applied as soon as practicable after the rain stops. The surface may, alternatively, be covered by hessian provided it is maintained in a wet condition at all times during the curing period of the concrete.

Surface Macrotexture Depth and Remedial Measures

1. The texture depth of the surface of the concrete shall be measured by the

volumetric patch technique described in BS EN 13036-1. The average macrotexture depth of each 50m² section of carriageway lane shall be within the range 0.4mm to 1.2mm.

2. During brushing, initial interim spot check measurements of the surface macrotexture depth shall be made as soon as it is considered that the required texture depth has been reached. This shall continue until the specified macrotexture depth has been achieved.

Demonstration Area

1. A demonstration area shall be constructed off-site but within 10 miles of the site using the labour, plant, materials and documented procedures to be used in the works. Where satisfactory work can be demonstrated to have been completed, using the same labour, plant, materials and procedures within the previous 18 months, the SCC Area Maintenance Manager may waive the requirement to construct a demonstration area.
2. Preliminary trial panels shall be constructed incorporating a top surface of exposed aggregate concrete similar to that specified for the permanent works. These panels shall each be not less than 20m² and not less than 100 mm deep. Where dowelled joints or induced cracks are to be used the demonstration panels shall include at least 3 m of joint or induced crack. The panels shall be used to enable the Contractor to determine the required application rate of the retarder and the amount of brushing required to achieve the specified macrotexture depth and an appearance of exposed flint to the approval of the SCC Area Manager.
3. The trial panels may alternatively be constructed on-site, but in this case, they may only form part of the permanent Works if they meet all the requirements of the Specification, otherwise they shall be removed after they have served their purpose.

Appendix E

Bituminous Surfacing Materials

Asphalt Surfacing

I. Base and Foundations

The base and foundation courses below asphalt surfacing should be designed and constructed in conformity to the Suffolk County Council standards for the appropriate carriageway, footway or parking area. Reference should be Suffolk County Council Design Guide for Development and Estate Roads or The Highways Agency Design Manual for Roads & Bridges Vol. 7, as appropriate for the area to be treated.

2. Surfacing

2.1 General

The three principle surfacing materials are bitumen coated macadam, manufactured to conform to BS 4987, hot rolled asphalt (HRA) in conformity with BS 594 and proprietary thin surfacing certified by the British Board of Agreement (BBA) under the Highways Authorities Product Approval Scheme (HAPAS).

East Anglian sands are only rarely suitable for the manufacture of coated macadam surfacing. Consequently the predominant local surfacings are HRA or proprietary thin surfacing. The preferred type of thin surfacing is dense medium depth material, known as stone mastic asphalt (SMA). Dense materials such as HRA and SMA are generally more durable than the open graded and voided variants. However they tend to produce a uniform black surface appearance, particularly when first laid. The appearance can be enhanced as described in examples in section 2.2.

2.2 Examples of visual enhancement of asphalt surfacing

2.2.1 Soft grey appearance on footways and other pedestrian areas

Selected grey carboniferous limestone aggregate may be used in HRA. Limestone from approved quarries in Derbyshire has been found to be satisfactory when used in coarse aggregate.

Limestone polishes readily and can produce a surface which will become relatively slippery in wet conditions. Care should be used to assure that such materials are not used where there are risks associated with slipperiness e.g:

- Sea walls or quay side locations
- Significant gradients. It should never be used for gradients steeper than 10%
- Areas of pedestrian vulnerability eg footways outside schools or close to heavy or fast moving traffic
- Areas of mixed pedestrian, cycle or motor vehicle usage

The above list is not exhaustive and consideration must be given to the risks of slipping in wet weather.

The limestone aggregate HRA should be manufactured in conformity with BS594-1:2003 Table 6 Co. 6.3 and laid 35 mm thick. Laying should conform to BS594-2:2003 and with the Highways Agency Specification for Highway Works (SHW). The material retained on the 2mm BS scene should be hard grey carboniferous limestone. The bitumen penetration grade should be 40/60. Where the surface is likely to be subjected to indentation by stiletto heels the added fines (<2.0mm) should contain not less than 50% of crushed rock.

The surface appearance may be improved, particularly in early life by the addition of clear polymer coated 8/14 size carboniferous limestone chippings into the hot material at a rate of $5 \pm 1 \text{ Kg/m}^2$. The limestone chippings should be to the same standards as the coarse aggregate.

2.2.2 Gravelled appearance areas not requiring significant skid resistance

Local flint gravel can be used to enhance the appearance of the otherwise dull black uniformity of asphalt. Unfortunately flint gravel, like limestone, has a very poor skid resistance.

Gravel enhancement should not be used where:-

- Speeds are in excess of 10 mph
- There are vulnerable users, such as children likely to be playing in the area
- The location presents particular risk eg adjacent to water course or a steep embankment, etc.
- There are steep gradients, say greater than 10%

The above list is not exhaustive.

The gravelled asphalt should consist of HRA complying with BS 594-1:2003 Table 3 Col. 3/2 laid 40mm thick. Laying should conform to BS594-2:2003 and with the Highways Agency Specification for Highway Works (SHW).

The coarse aggregate (>2.0mm) should be flint gravel. The bitumen penetration grade should be 40/60.

The stability should be 4 to 8 KN and the maximum flow should be 5mm.

Clear polymer coated 10/20 sieve angular or sub angular flint aggregate with flakiness under less than 35 should be rolled into the surface at a rate of 7 ± 1 Kg/m².

2.2.3 Red granite appearance

Two expedients are available to produce a 'natural' red appearance to a bituminous surface ie:-

- (1) The application of *Harden Red* clear-coated chippings to a conventional HRA

- (2) As (1) but the further addition of a coloured coarse aggregate either
 - (i) pink granite, or,
 - (ii) *Harden Red* aggregate

For trafficked areas within 40 mph speed restricted zones the specification should include :-

- (a) For option 1 above, the surfacing material should consist of HRA complying with BS594-1: 2003 Table 3, Col 3/2 laid 40mm thick. Laying should conform to BS594-2: 2003 and with the SHW. The coarse aggregate should be crushed rock, but gravel may be used subject to the approval of the Area Maintenance Manager.

The bitumen grade should be 40/60, the stability should be 3-8 KN. Chippings should be 14/20 size F125 (BSEN 13043, Clause.4.1.6) and clear coated chippings sourced from Harden Quarry, Northumberland, supplied under the trade name of *Harden Red*. They should be laid at a rate of 70% of shoulder-to-shoulder coverage, for speed-restricted areas of 30 mph or below. For 40 mph zones the texture depth should comply with the SHW Clause 921 except that the 1.5mm and 1.2mm requirements in the SHW should be reduced to 1.2mm and 0.9mm respectively on roundabouts.

- (b) For option (2) the specification should require the use of pink granite for the coarse aggregate or, where a stronger colour is required, the use of *Harden Red* coarse aggregate.

¹Where there are features such as roundabouts, pedestrian crossings, poor visibility junctions, traffic lights etc the Area Maintenance Manager should be consulted about the chipping PSV and texture depth to be provided.

2.2.4 Gravel tinted thin surfacing

Where a surface is to be trafficked by slow moving and/or heavy vehicles a thin surfacing may be laid using one of the dense thin proprietary surfacings but incorporating a 50% of flint gravel. The 'harmonised' appearance may be achieved by the integral mixing of flint gravel and gritstone coarse aggregate. As the binder in thin surfacing is very tenacious it will usually take some years for the aggregate surface to wear sufficiently for the natural colour of the gravel to become apparent. Thin surfacing systems are certified by BBA and significant variations will invalidate the certificate. Consequently it will be necessary to negotiate a suitable specification with the supplier. The essential points for the agreed requirements are:-

- Traffic at the end of the guarantee period
- Traffic at the end of the design life
- Site category as defined in the Notes for Guidance for the HA-SHW
- Wheel tracking level

- Polished stone value of the gravel/grit stone 50/50 sample, not less than 50
- Aggregate abrasion value of the grit stone component – not greater than 12
- Larger thickness, 35mm
- Texture depth category 2
- Guarantee period, 2 years
- Declaration of design is required
- Binder to be elastomeric polymer modified of a type approved by the SCC Area Maintenance Manager
- Coarse aggregate to be 50/50 mixture of 14mm nominal size angular or sub angular flint gravel and gritstone

Note this specification is not suitable for fast moving traffic or hazardous locations. As the gritstone is softer than the flint, with time the gritstone will wear to leave the harder and less polish resistant flint exposed. Whereas this will be aesthetically acceptable the skid resistance will fall. Such surfaces need regular and systematic monitoring to assure that they do not present a safety hazard.

Appendix F

Kerbing

Introduction

Kerbing shall be either precast concrete or natural stone. The foundation depth shall be not less than 150mm or the depth of the kerb whichever is the greater.

Precast concrete kerbs

New materials - Where new materials are to be provided the whole of the kerbing works shall comply with Highways Agency Specification for Highway Works Clause 1101 and SCC Standard detailed drawings.

Reused materials – Where it has been agreed to reuse recovered precast concrete kerbs the acceptance procedure shall be adopted. All recovered kerbing shall be examined for frost, scuffing and other damage and any kerbs damaged to the extent that the structural integrity, durability or appearance is impaired shall be rejected.

1. In the event of a group of kerbs being considered to be structurally marginally acceptable, three samples shall be subjected to testing using the procedure complying with BS7263-3 Annex E, 'method for measuring bending strength', except that the test shall be stopped once the bending stress has reached a strength equivalent to a bending stress of 3.0 MPa then the whole batch shall be rejected. Individual kerbs from the batch may then only be reused subject to a site test being carried out on each kerb to assure that it complies with the required 3.0 MPa bending stress capacity requirements. Such testing may be a loading or other non-destructive tests to the approval of the SCC Area Maintenance Manager.
2. Where durability is in doubt the water absorption shall be measured in

accordance with BS EN 1340 and the kerbs rejected if the average of three samples exceeds 3.0%.

3. Appearance shall be assessed for cleanliness, uniformity and damage to the visible surfaces.

Kerb laying shall comply with the Highways Agency Specification for Highway Works Clause 1101 and SCC Standard detailed drawings.

Natural stone kerbs

Natural stone kerbs shall be supplied from an approved quarry and shall not be sourced from more than a single quarry for each project to ensure consistency from both a visual and technical aspect. The rock type shall be either acid or intermediate igneous (e.g. granite types). Basic (e.g. basalt, gabbro, etc.) may be used where approved by the SCC Area Maintenance Manager in conjunction with the SCC Conservation Officer. Sedimentary rock types may only be used where agreed with SCC at planning approval stage.

Dimensions shall comply with the nominal dimensions stated on the drawings within the tolerance limits of:

- Length \pm 75 mm
- Width \pm 7 mm
- Depth \pm 30 mm

Dimensional compliance for each kerb relative to its mean dimension shall be within the tolerance limits of:

- Length \pm 5 mm
- Width \pm 3 mm
- Depth \pm 10 mm

Kerbs shall be laid on a wet concrete bed or mortar bed. In the event of a mortar bed being used the method of laying shall facilitate the lifting of selected kerbs immediately after laying to allow the continuity of contact to be assessed. Kerbs with less than 90% of continuous contact shall be rejected.

