



Highways Asset Management

Palette of Materials

Code of Practice for Developer and Third-Party Works

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1 Introduction

- 1.1 The Palette of Materials provides the requirements on the choice and use of materials for new developments including housing, industrial and other third party including public realm. The document avoids the detail regarding tolerance and other workmanship issues and concentrates on the specifics of the materials themselves with the focus being on sustainability, maintainability, and appearance.
- 1.2 The enhanced materials contained with section 3 are included with the aim of being sustainable in how they are sourced, have lower initial and life cycle embodied CO₂e, have a record of longevity in service and the ease of ongoing maintenance.
- 1.3 Any additional costs for enhanced materials will normally be a matter for discussion and negotiation during the consultation process for each individual scheme, subject to agreement that higher levels of enhancement will not impose an unreasonable burden of future maintenance on the county council. Where costs for enhanced materials are more than the agreed costs the developer or district council may be required to pay a commuted sum contribution to cover future maintenance.
- 1.4 The calculation of commuted sums, as presented in appendix B calculates the additional maintenance interventions and reactive/revenue maintenance costs required compared to standard materials, with the anticipated additional costs, whether yearly (for reactive/revenue maintenance costs) and/or at set maintenance intervention years then discounted over the life of the development to give a per m² or linear metre rate to be paid. This is in line with CSS Guidance Document 'Committed sums for maintaining infrastructure assets'.

2 Exemptions

- 2.1 Any deviation from the standard or enhanced palette must be submitted to the Highways Asset Management Team for review. Upon review, the Highways Asset Management team may at their discretion refer the decision for approval to the Highways Asset Management Strategy Board for approval.
- 2.2 Exemptions will only be considered in exceptional circumstances and the submission for approval must detail and demonstrate how:
 - A whole life reduction on carbon footprint will be made
 - A whole life reduction in maintenance and operation costs will be made
 - A clear maintenance strategy/manual detailing how repairs will be made by maintaining authority and statutory undertakers
 - Evidenced method for calculating quantities of material to be stored for future maintenance through the whole life of the schemes (i.e., if the scheme is designed for 40 years an evidence plan on the quantity of material required of 40 years' worth of maintenance must be provided)
 - Contractual agreements (i.e., bond) will be put in place to ensure storage of materials (at the scheme promoter's cost) for the duration of the scheme design, and how these materials will be made readily available to the maintaining authority and statutory undertakers.
 - Clear and precise extents and details of materials must be provided to the Highways Asset Management team so that this can be updated on the National Street Gazetteer under the 'Special Engineering Difficulty' designation.

3 Standard Palette of Materials

3.1 Lancashire county council's standard palette of surfacing materials is made up of the following:

- Thin Surface Course
- Stone Mastic Asphalt
- High Stone Content Hot Rolled Asphalt
- Chipped Hot Rolled Asphalt
- Close Graded Asphalt Concrete
- Dense Asphalt Concrete
- Precast Concrete Flags
- Precast Concrete Blocks
- Precast Concrete Kerbs
- Trees

3.2 These materials are easily available within the local supply chain, have a history of successful use in Lancashire and are easily maintainable.

3.3 Each material data sheet should be studied, with particular focus on any application restrictions. Any application of a material in a situation that is restricted will be classed as an enhanced material and as such will attract a commuted sum for the additional maintenance burden placed upon the authority.

Material	Thin Surface Course
Type and Finish	Proprietary mixes that must carry a HAPAS certificate and carry a 5-year guarantee. Standard material has no pigmentation/colour to any mixture component.
Application	Carriageway surface course for high speed roads (≥50mph)
Application restrictions	Suitable for roads of 50mph and above. No upper limit on traffic level
Design considerations	PSV and AAV requirements as per CD236 Min PSV = 60. Max AAV = 16 Warm Mix Asphalt (WMA) designation In high-risk locations an additional surface treatment may be required to provide enhanced skid resistance
Aesthetic considerations	Standard 'black-top' finish
Size considerations	Dependent upon site category, as per CD236. Minimum layer thickness of 30mm
Specification	MCHW CL942, CD236, CS228, BS 594987, BS EN 13108-5, PD 6691 The requirement for a 5-year guarantee will require a full CL942 appendix 7/1 specification for each scheme to be provided to the supplier to obtain a guarantee. The specification and guarantee information must be provided to LCC, although LCC will not take on responsibility for enforcing guarantee claims.
Maintenance requirements	Expected design life = 12 years
Sourcing and availability	Available locally through LCC supply chain
Sustainability considerations	Future availability of natural resources (bitumen and aggregate) High energy requirements to extract, mix, transport and compact 10% Reclaimed Asphalt permitted in the mixture Warm mix asphalt to be used

Material	Stone Mastic Asphalt
Type and Finish	Performance mixtures to LCC specification SMA 10 surf PMB WTA PMB65/105-70 grade bitumen PMB75/130-75 grade bitumen (ultra-high-specification for heavily trafficked and stressed areas) 10mm nominal aggregate size Standard material has no pigmentation/colour to any mixture component
Application	Carriageway surface course
Application restrictions	Suitable for roads of 40mph and below (N.B. may meet the texture depth requirements of roundabouts on high speed roads and high-speed lower-class roads) No upper limit on traffic level
Design considerations	PSV and AAV requirements as per CD236 Min PSV = 60. Max AAV = 16 Warm Mix Asphalt (WMA) designation In high-risk locations an additional surface treatment may be required to provide enhanced skid resistance
Aesthetic considerations	Standard 'black-top' finish
Size considerations	10mm size material
Specification	LCC Specification, BS 594987, BS EN 13108-5, PD 6691, MCHW CL902, CD236, CS228,
Maintenance requirements	Expected design life = 15 years
Sourcing and availability	Available locally through LCC supply chain
Sustainability considerations	Future availability of natural resources (bitumen and aggregate) High energy requirements to extract, mix, transport and compact 10% Reclaimed Asphalt permitted in the mixture Warm mix asphalt to be used

Material	High Stone Content Hot Rolled Asphalt
Type and Finish	Design mixture 100/150 grade bitumen HRA 55/10 F surf 100/150 des. or HRA 55/14 F surf 100/150 des Standard material has no pigmentation to any mixture component
Application	Carriageway surface course Can provide a 'flat' low texture base for application of HFS systems
Application restrictions	Carriageway use limited to estate roads and high stress locations such as mini roundabouts and parking areas where speeds are generally low, i.e. ≤30mph.
Design considerations	PSV and AAV requirements as per CD236 Min PSV = 60. Max AAV = 14
Aesthetic considerations	Standard 'black-top' finish
Size considerations	10mm aggregate size for areas of very tight radii and high scrubbing
Specification	BS 594987, BS EN 13108-1, PD 6691, MCHW CL911, CL902, DMRB CD236, CS228, CD239
Maintenance requirements	Expected design life = 15 years on carriageways
Sourcing and availability	Available locally through LCC supply chain
Sustainability considerations	Future availability of natural resources (bitumen, aggregate (inc. sand)) High energy requirements to extract, mix, transport and compact 10% Reclaimed Asphalt Permitted in the mixture

Material	Chipped Hot Rolled Asphalt
Type and Finish	Design mixture 40/60 grade bitumen HRA 30/14 F surf 40/60 des. or HRA 35/14 F surf 40/60 des., Coated chippings size: 14/20 mm Standard material has no pigmentation to any mixture component
Application	Carriageway surface course
Application restrictions	Not permitted for use on approaches to heavily trafficked junctions, bus stops and any other areas subject to repetitive stopping forces. Industrial estate roads and other heavily trafficked areas and bridge decks may require the use of a performance-related design mixture High noise generation may prohibit materials' use on higher speed roads (>40mph) in built up areas.
Design considerations	PSV and AAV requirements as per CD236 Min PSV = 60. Max AAV = 14
Aesthetic considerations	Standard 'black-top' finish
Size considerations	
Specification	BS 594987, BS EN 13108-1, PD 6691, MCHW CL911, CL902, DMRB CD236, CS228, CD239
Maintenance requirements	Expected design life = 15 years on carriageways
Sourcing and availability	Available locally through LCC supply chain
Sustainability considerations	Future availability of natural resources (bitumen, aggregate (inc. sand)) High energy requirements to extract, mix, transport and compact 10% Reclaimed Asphalt Permitted in the mixture

Material	Close Graded Asphalt Concrete
Type and Finish	AC10 close surf 100/150 100/150 grade bitumen 10mm or 14mm nominal aggregate size Standard material has no pigmentation to any mixture component
Application	Carriageway surface course Cycleway Surface Course machine laid Shared Footway/Cycleway Surface Course machine laid
Application restrictions	High void content means the material is permeable to air and water resulting in poor durability. Therefore, carriageway use is limited to minor roads and by agreement only
Design considerations	PSV and AAV requirements as per CD236 Min PSV = 60. Max AAV = 14 Warm Mix Asphalt (WMA) designation
Aesthetic considerations	Standard 'black-top' finish
Size considerations	10mm size material – bends and areas subject to light vehicle turning, cycleways, footway/cycleways 14mm size material – straight level sites
Specification	BS 594987, BS EN 13108-1, PD 6691, MCHW CL912, CL902, DMRB CD236, CS228, CD239
Maintenance requirements	Expected design life = 8 years on carriageways Expected design life = 15 years on non-trafficked areas
Sourcing and availability	Available locally through LCC supply chain
Sustainability considerations	Future availability of natural resources (bitumen and aggregate) High energy requirements to extract, mix, transport and compact 10% Reclaimed Asphalt Permitted in the mixture Warm mix asphalt to be used

Material	Dense Asphalt Concrete
Type and Finish	AC 6 dense surf 100/150
Application	Footway Surface Course
Application restrictions	Footway use only (at footway vehicle crossovers SMA 6 surf shall be used and throughout if there are numerous crossovers to avoid numerous joints/changes in material)
Design considerations	Min PSV = 50. Max AAV = 14 Warm Mix Asphalt (WMA) designation
Aesthetic considerations	Standard 'black-top' finish
Size considerations	25mm thick
Specification	BS 594987, BS EN 13108-1, PD 6691, MCHW CL909, DMRB CD239
Maintenance requirements	Expected design life = 10 years
Sourcing and availability	Available locally through LCC supply chain
Sustainability considerations	Future availability of natural resources (bitumen and aggregate) High energy requirements to extract, mix, transport and compact 10% Reclaimed Asphalt Permitted in the mixture

Material	Stone Mastic Asphalt for footways
Type and Finish	SMA 6 surf 100/150
Application	Footway Surface Course
Application restrictions	Footway use at vehicle crossovers and in between where there are numerous crossovers to avoid joints/changes in material types.
Design considerations	Min PSV = 50. Max AAV = 14 Warm Mix Asphalt (WMA) designation
Aesthetic considerations	Standard 'black-top' finish
Size considerations	25mm thick
Specification	BS 594987, BS EN 13108-1, PD 6691, MCHW CL909, DMRB CD239
Maintenance requirements	Expected design life = 12 years
Sourcing and availability	Available locally through LCC supply chain
Sustainability considerations	Future availability of natural resources (bitumen and aggregate) High energy requirements to extract, mix, transport and compact 10% Reclaimed Asphalt Permitted in the mixture

Material	Precast Concrete Flags
Type and Finish	Standard material is traditional grey (or buff) concrete utilitarian paving with a plain surface finish in the sizes described below. Photographs are provided overleaf. Any other variation would be considered as an enhanced material.
Application	Pedestrian footways, public realm, precincts
Application restrictions	<p>Pavements where heavy vehicle over-run will occur shall be constructed on a bound base. If significant heavy vehicle overrun is anticipated regularly then alternative surfacing material should be used, or alternative concrete elements. Must be bedded on a BS7533 compliant mortar system which incorporates a polymer modified cementitious priming slurry.</p> <p>Footways where vehicle over-run could become an issue should be protected by physical measures or if this is not possible designed as heavy-duty pavements, incorporating a bound base.</p> <p>Flags should not be used on pavements subject to dynamic loading (e.g. traffic calming or barrel deliveries). High point loads from outriggers such as those from MEWPs used for street lighting maintenance can also cause failure, the base design needs to consider such loads.</p> <p>Due regard to the type and flow of traffic shall be given when designed laying patterns.</p>
Design considerations	<p>Structural design is covered in DMRB CD239 (or alternatively BS EN 7533-101)</p> <p>Level of anticipated heavy vehicle over run</p> <p>Recommended skid resistance values measured in accordance with BS 7932</p> <p>Pedestrian use only – 40, slow-moving vehicle use – 45</p> <p>Intermediate restraints to be incorporated on steep slopes</p> <p>Abrasion resistance to be determined in accordance with BS EN 1341 and 1339</p>
Aesthetic considerations	<p>Utilitarian look.</p> <p>Any colour other than traditional grey or buff are considered an enhanced material.</p>
Size considerations	Standard sizes are (l x w x d); 300mm x 300mm x 60mm, 400mm x 400mm x 65mm and 450mm x 450mm x 70mm. Larger sizes are excluded due to manual handling issues and laying difficulties.
Specification	<p>Manufacturing: BS EN 1339</p> <p>CoP for laying: BS EN 7533-101</p> <p>MCHW: CL1104</p>
Maintenance requirements	<p>In areas subject to mechanical sweeping an elastomeric sealer should be applied to stabilise the jointing material.</p> <p>Expected design life = 20 years</p>
Sourcing and availability	Widely available and long-term availability is assured
Sustainability considerations	<p>Use of standardised units supports local recycling agenda.</p> <p>Fully engineered and manufactured under controlled conditions to deliver a consistent product with predictable performance characteristics.</p> <p>Exceptionally long service life if installed to a high standard.</p> <p>Low environmental impact in comparison with imported materials.</p> <p>100% recyclable.</p>

Material	Precast Concrete Blocks
Type and Finish	Standard 100mm x 200mm blocks in grey/buff/red/brindle with normal surface texture Standard material includes tumbled finishes Recycled/reconstituted concrete blocks are considered enhanced materials
Application	Carriageway or footway surfaces in the following categories: Lightly trafficked areas such as cul-de-sacs, car parks, precincts, lightly trafficked roads, and paved areas. Heavy duty pavements that carry numerous different axle loads such as buses, deliveries, multiple refuse etc (max. 12msa).
Application restrictions	Pedestrian areas – square edged blocks Due consideration given to longitudinal gradients and rainfall intensity and impact on sand laying course.
Design considerations	For lightly trafficked pavements (≤ 0.5 msa) use BS EN 7533-101. For heavy duty pavements (0.5 – 12msa) use BS EN 7533-101. Due consideration needs to be given in the structural design for the effects of any channelisation, dynamic loading or future potential vehicle overrun. Polished Paver Value (PPV) – 45min (55min on gradients $> 5\%$ or large portion of vulnerable users).
Aesthetic considerations	Trafficked concrete blocks should be laid in a herringbone pattern. Stretcher bond and basket weave patterns should only be used in pedestrian areas. Blocks should be through coloured/homogenous concrete to allow both faces to be used. Concrete blocks with tumbled finishes, different colours or decorative textures shall be considered enhanced materials. Consideration shall be given to the likelihood of staining of the blocks, in such scenarios multi-coloured blocks should be used.
Size considerations	Dimensions: (l x w x d) 100mm x 200mm x 80mm
Specification	Manufacturing: BS EN 1338 Code of Practice for laying: BS EN 7533-101 MCHW: CL1107
Maintenance requirements	In areas subject to mechanical sweeping an elastomeric sealer should be applied to stabilise the jointing material. Expected design life =20 years
Sourcing and availability	Widely available and long-term availability is assured
Sustainability considerations	Use of standardised units supports local recycling agenda. Fully engineered and manufactured under controlled conditions to deliver a consistent product with predictable performance characteristics. Low environmental impact in comparison with imported materials.

Material	Precast Concrete Kerbs
Type and Finish	<p>'British Standard' precast concrete kerbs produced by hydraulic pressing. Standard grey concrete finish with a plain texture. Includes the following standard profile types:</p> <ul style="list-style-type: none"> • Bull Nose • Half battered • 45°splayed • Radius • Drop • Transitions • Angles • Quadrants <p>Additionally, non-British Standard kerbs are also permitted and not considered enhance materials. However, the proposed specification shall be approved by LCC:</p> <ul style="list-style-type: none"> • Cycle demarcation • Cycle segregation • 'Dutch' Entrance • Bus Stop <p>The following types of kerbs are excluded from the standard palette of materials:</p> <ul style="list-style-type: none"> • High containment (e.g. trief) • Combined kerb and drainage unit (e.g. beany blocks)
Application	Provision of edge restraint to road pavements and footways/cycleways. Demarcation and segregation of different highway modes.
Application restrictions	<p>Any radius below 15m shall use radius kerbs.</p> <p>45°splayed kerbs shall not be used where a footway or cycleway is within 1.3m of the carriageway. Notwithstanding this when a footway or cycleway is greater than 1.3m away from the carriageway consideration needs to be given to likelihood of verge parking and the use of half battered kerbs as a deterrent and to reduce the likelihood of damage to the soft verge.</p> <p>At dropped crossings for pedestrians and cyclists' kerbs shall be laid flush. This can be achieved by using bull nose kerbs laid upside down so a flush edge is present for asphalt carriageway surfacing to be laid against. The traditional 15mm radius of bull nose kerbs results in a slight upstand that can prevent wheelchairs and mobility scooters from being able to leave the carriageway and presents a risk to cyclists when not exiting the carriageway perpendicular to the kerb.</p>
Design considerations	<p>Adequate slip/skid resistance, bending strength, abrasion resistance, resistance to freeze-thaw: BS EN 1340</p> <p>Upstands: Vehicular crossings – 25mm Pedestrian and cycle crossings – Flush Bus-stop – 160mm Directly adjacent to carriageway (Half Battered) – 100mm Over 1.3m away from carriageway (45° splay) – 75mm</p> <p>Footway/cycleway segregation kerb to be 45° splay with a 75mm upstand. Cycleway side of cycleway/carriageway segregation to be 45° splay with 75mm upstand.</p>
Aesthetic considerations	<p>Utilitarian look.</p> <p>Natural stone or reproductions are available but are considered enhanced materials.</p>
Size considerations	British Standard units are available in 914mm and 609mm in length. Lengths vary for radius and non-British Standard units.
Specification	<p>Manufacturing: BS EN 1340 CoP for laying: BS EN 7533-101 & for bond coat to adjacent asphalt surfaces BS 594987 and MCHW CI 920. Concrete bed and backing: BS 8500-2</p>

	MCHW: CL1101
Maintenance requirements	Expected design life = 20 years
Sourcing and availability	Widely available and long-term availability is assured
Sustainability considerations	Use of standardised units supports local recycling agenda. Fully engineered and manufactured under controlled conditions to deliver a consistent product with predictable performance characteristics. Low environmental impact in comparison with imported materials.

Material	Trees
Type and Finish	The specimen, and the preferred options would be slow growing species and require prior approval by the Highway Authority.
Application	The planting must form part of the highway function.
Application restrictions	LCC does not normally accept tree planting and all its liabilities and maintenance. If accepting trees LCC would require the relevant Borough, district or city council to take on maintenance responsibility under licence or under Section 96 of the Highway Act. This is in accordance with the Manual for Streets Section 11.6.4. This may be a very limited situation
Design considerations	The specimen, and the preferred options would be slow growing species and require prior approval by the Highway Authority The construction of adequate root barriers or tree pits to prevent root migration. Consideration could be given to planters above tree to avoid migration and increase locatability. Avoid planting trees within a distance of half of the full mature height adjacent.
Aesthetic considerations	Trees soften the effect of hard landscaping and can help to better create a sense of place.
Size considerations	Avoid planting trees within a distance of half of the full mature height adjacent to housing to avoid the crown touching the property.
Specification	To be agreed
Maintenance requirements	Trees give rise to long term liability, they include: <ul style="list-style-type: none"> • Increased street lighting and energy costs to compensate for the shade • Damage to footways and consequential accident damage claims • Damage to property from roots leading to claims It is expected that either the district or city council will be responsible for ownership and maintenance of the majority of trees within a new development. A commuted sum to cover the future maintenance costs will be required.
Sourcing and availability	Widely available and long-term availability is assured
Sustainability considerations	Provide a greener environment, soften the effect of hard landscaping, shield other urban surfaces from radiation and reduce the energy (heat) those surfaces store and release. Potential increase in street lighting costs to compensate for the shade created by trees. Increased secondary maintenance costs as a result of damage to other assets caused by trees (footways, properties, consequential claims)

4 Enhanced Palette of Materials

4.1 The Department for Transport's Manual for Streets advocates that:

“One way of enabling designers to achieve local distinctiveness without causing excessive maintenance costs will be for highway authorities to develop a limited palette of special materials and street furniture. Such materials and components, and their typical application, could, for example, be set out in local design guidance and be adopted as a Supplementary Planning Document”

4.2 In line with this DfT guidance the enhanced palette of materials has therefore also been developed to better balance the desire for local distinctiveness with sustainability, performance and on-going maintenance.

4.3 Lancashire county council's enhanced palette of surfacing materials is made up of the following:

- Coloured Stone Mastic Asphalt
- Coloured Chipped Hot Rolled Asphalt
- Coloured Dense Asphalt Concrete
- Porous Flexible Rubber/Aggregate Surfacing
- Unbound Gravel (self-binding gravel)
- Natural Stone Slabs
- Natural Stone Setts
- Natural Stone Kerbs
- Stone Reproduction Kerbs
- Precast Concrete Flags and Blocks incorporating Exposed Aggregate Top Layer

Material	Coloured Stone Mastic Asphalt
Type and Finish	Performance mixture to LCC specification PMB50/70-65 grade bitumen – general highway use (warm temperature) PMB35/50-65 grade bitumen – heavily trafficked areas such as bus lanes (Any colour other than dark red will normally require a synthetic binder) 10mm nominal aggregate size Enhanced material uses pigmented binders and/or pigmented/decorative aggregates for improved visual effect.
Application	Carriageway surface course material usually used in areas of prestige to provide delineation, such as public realm areas.
Application restrictions	Suitable for roads of 40mph and below No upper limit on traffic level
Design considerations	CD236 requirements still apply and performance of any decorative aggregates need consideration. Min PSV = 60. Max AAV = 16 Warm Mix Asphalt (WMA) designation In high-risk locations an additional surface treatment may be required to provide enhanced skid resistance
Aesthetic considerations	If a pigmented binder is used the binder film covering the aggregates will wear away over time under the action of traffic. Consideration therefore needs to be given to the type/colour of the aggregates to ensure continuity of long-term visual affect. Colour palette: Buff, Green, Grey, Natural, Red, Blue, Orange Lighter colours can reduce surface temperature during summer months and reduce energy required for street lighting.
Size considerations	Normally 10mm size material
Specification	LCC Specification, BS 594987, BS EN 13108-5, PD 6691, MCHW CL902, CD236, CS 228.
Maintenance requirements	Expected design life = 15 years Specialist reinstatement required after utility works. Installer must provide LCC information pertaining to aggregate source and binder manufacturer and type.
Sourcing and availability	Available locally through LCC supply chain for production, however aggregates and bitumen/binder normally hauled in specifically for the mixture. Specialist aggregates in particular are often hauled long distances.
Sustainability considerations	Future availability of natural resources (bitumen and aggregate) High energy requirements to extract, mix, transport and compact Additional processes to produce and incorporate pigmentation Coloured binders and pigmented/decorative aggregates may need to be transported greater distances 10% Reclaimed Asphalt permitted in the mixture (if suitable) Warm mix asphalt to be used

Material	Coloured Chipped Hot Rolled Asphalt
Type and Finish	Design mixture 40/60 grade bitumen HRA 30/14 F surf 40/60 des. or HRA 35/14 F surf 40/60 des. Coated chippings size: 14/20 mm Enhanced materials use coloured chippings
Application	Carriageway surface course
Application restrictions	CD236 requirements still apply and performance of any decorative aggregates need consideration. Not permitted for use on approaches to junctions, bus stops and any other areas subject to repetitive stopping forces. Industrial estate roads and other heavily trafficked areas and bridge decks may require the use of a performance-related design mixture High noise generation may prohibit materials' use on higher speed roads (>40mph) in built up areas.
Design considerations	PSV and AAV requirements as per CD236 Min PSV = 60. Max AAV = 14
Aesthetic considerations	Standard 'black-top' finish for asphalt, coloured chippings
Size considerations	
Specification	BS 594987, BS EN 13108-1, PD 6691, MCHW; CL911 & CL902, DMRB; CD236, CS228 & CD239
Maintenance requirements	Expected design life = 15 years on carriageways
Sourcing and availability	Available locally through LCC supply chain
Sustainability considerations	Future availability of natural resources (bitumen, aggregate (inc. sand)) High energy requirements to extract, mix, transport and compact 10% Reclaimed Asphalt Permitted in the mixture

Material	Coloured Dense Graded Asphalt Concrete
Type and Finish	Recipe mixture 100/150 grade bitumen 6mm nominal aggregate size
Application	Footway Surface Course machine laid
Application restrictions	Use limited to footways only
Design considerations	Min PSV = 50. Max AAV = 14 Warm Mix Asphalt (WMA) designation
Aesthetic considerations	If a pigmented binder is used the binder film covering the aggregates will wear away over time under the action of traffic. Consideration therefore needs to be given to the type/colour of the aggregates to ensure continuity of long-term visual affect. Colour palette: Buff, Green, Grey, Natural, Red, Blue, Orange Lighter colours can reduce surface temperature during summer months and reduce energy required for street lighting.
Size considerations	6mm size material
Specification	BS 594987, BS EN 13108-1, PD 6691, MCHW CL909, CL902, DMRB CD 236, CS 228, CD 239
Maintenance requirements	Expected design life = 15 years on non-trafficked areas
Sourcing and availability	Available locally through LCC supply chain
Sustainability considerations	Future availability of natural resources (bitumen and aggregate) High energy requirements to extract, mix, transport and compact 25% Reclaimed Asphalt Permitted in the mixture (if suitable) Warm mix asphalt to be used

Material	Porous Flexible Rubber/Aggregate Surfacing
Type and Finish	Recipe mixture 50/50 granulated rubber/aggregate mixture Polyurethane binder 10mm nominal coarse aggregate size
Application	Non-motorised user routes: Bridleways, Cycleway, Footways
Application restrictions	Use limited to off carriageway and non-vehicle trafficked areas
Design considerations	Aggregate: Min PSV = 50. Max AAV = 14.
Aesthetic considerations	Colour palette: The hardstone aggregate selected will impact the colour of the of the material. Acceptable coarse aggregates are: Basalt, Gabbro, Granite, Gritstone, Hornfels, Porphyry, Quartzite or Steel Slag
Size considerations	10mm size material 30-40mm thickness
Specification	Minimum target binder content: 12% Granulated Rubber: Granulated Styrene Butadiene Rubber complying with PAS 107:2012 'Specification for the manufacture and storage of size reduced tyre materials' Aggregate: Min PSV = 50. Max AAV = 14. LA = 40. Max. Flakiness Index = 20
Maintenance requirements	Expected design life = 15 years
Sourcing and availability	Available locally through LCC supply chain
Sustainability considerations	Future availability of natural resources (resin and aggregate) High energy requirements to extract, mix, transport and compact High recycled content and no upper limit on content Cold mix

Material	Unbound Gravel (self-binding gravel)
Type and Finish	Unbound limestone gravel with natural Marl binding agent
Application	Footways and tree pits
Application restrictions	Should not be used: <ul style="list-style-type: none"> • in areas prone to ponding/flooding. • in areas where mechanical sweeping is undertaken. • on steep slopes (greater than 1 in 15).
Design considerations	Finished levels must ensure effective drainage and prevent ponding/flooding.
Aesthetic considerations	Natural finish provided by the stone can be sympathetic and complement local surroundings.
Size considerations	0-12mm grading 50mm layer thickness
Specification	Normally laid on 150mm type 1 sub-base. Non-woven geotextile may be required in areas with poor ground conditions.
Maintenance requirements	Simple, low technology material that can be hand laid or machine laid. Natural action of weather can loosen the surface which may necessitate regular sweeping and it can be prone to weed growth. High capital cost
Sourcing and availability	Available locally through LCC supply chain Stockpile required to allow regular minor maintenance Long-term availability of aggregate not assured
Sustainability considerations	Natural material with relatively low carbon footprint 100% recyclable

Material	Natural Stone Slabs
Type and Finish	Sandstone and Yorkstone natural paving in various surface finishes and sizes, Granite paving slabs are not permitted as most granite products are imported from overseas.
Application	Pedestrian footways, public realm, precincts, lightly trafficked areas
Application restrictions	Pavements where heavy vehicle over-run will occur shall be constructed on a bound base. If significant heavy vehicle overrun is anticipated regularly then alternative surfacing material should be used, or alternative concrete elements. Footways where vehicle over-run could become an issue should be protected by physical measures or if this is not possible designed as heavy-duty pavements, incorporating a bound base. Slabs should not be used on pavements subject to dynamic loading (e.g. traffic calming or barrel deliveries). High point loads from outriggers such as those from MEWPs used for street lighting maintenance can also cause failure, the base design needs to consider such loads. Due regard to the type and flow of traffic shall be given when designed laying patterns.
Design considerations	Structural design is covered in BS EN 7533-101 Level of anticipated heavy vehicle over run In carriageway scenarios not to be used on approaches to high risk situations where high skid resistance is required. Recommended skid resistance values measured in accordance with BS 7932 Pedestrian use only – 40, slow-moving vehicle use – 45 Intermediate restraints to be incorporated on steep slopes Abrasion resistance to be determined in accordance with BS EN 1341 and 1339
Aesthetic considerations	The colour palette is limited to natural Sandstone, natural Yorkstone buff and Cotswold. Carefully selected natural stone can be more sympathetic to local surroundings. Future replacement of isolated areas may result in poor matching of stone due to inconsistency of supply.
Size considerations	British Standards define natural stone slabs as having a working width that exceeds 150mm and also generally exceeds two times the thickness. Larger units will generally need to be thicker to help prevent breakage on site when handling.
Specification	CoP for laying: BS EN 7533-101 MCHW: CL1104
Maintenance requirements	Retexturing and joint sealant replacement will be required periodically Natural stone surfaces should be protected by regularly applied surface coating/sealant.
Sourcing and availability	Many natural stone products, in particular granite, are sourced from overseas. This has obvious sustainability issues in addition to issues of sourcing any replacement units required in the future. Future maintenance is an issue as individual units are usually not available, so a whole pallet has to be ordered. (standard materials would be present in LCC stores as they are in constant use and are of consistent appearance)
Sustainability considerations	Use of standardised units supports local recycling agenda. Long service life if laid well Low environmental impact in comparison with imported materials.

Material	Natural Stone Setts
Type and Finish	Granite and Sandstone natural paving products in various sizes and surface finishes.
Application	Pedestrian footways, precincts, or very lightly trafficked roads.
Application restrictions	Sett sizes and pavement construction are determined by the traffic categories in BS EN 7533-101. Consideration should be given to the noise implications of the 'rumble' effect caused vehicles and potential nuisance caused.
Design considerations	Structural design: BS EN 7533-101 Setts that are subject to vehicle traffic are to be constructed on a bound base. On approach to high risk situations (e.g. pedestrian crossing), in most scenarios stone sett paving will not be suitable unless low speeds can be guaranteed and long term skid resistance can be assured.
Aesthetic considerations	Colour palette is limited to the natural colours of granite and sandstone. Natural stone paving can be more sympathetic to local surroundings.
Size considerations	Dimensions less than 300mm x 300mm in plan British standard sizes only shall be used to ensure simplification of future replacement.
Specification	Requirements and testing: BS EN 1342 CoP for laying: BS EN 7533-101 'Fine-picked' surface finish for granite setts that are to be trafficked.
Maintenance requirements	Retexturing and re-jointing may be required periodically
Sourcing and availability	Future maintenance can be an issue if suitable individual units cannot be sourced, so a whole pallet has to be ordered. Consideration should be given to using units where availability of reclaimed units is more widespread (standard materials would be present in LCC stores as they are in constant use and are of consistent appearance).
Sustainability considerations	If specified correctly natural stone setts can be very durable. Potential increased wastage over concrete alternatives due to greater dimensional tolerances. Natural stone setts can have variable performance.

Material	Natural Stone Kerbs
Type and Finish	Sandstone and Granite products in various sizes Sandstone – shot-blasted finish Granite – Fine picked for use in trafficked situations. Fine picked/flame textured for pedestrian applications.
Application	Provision of edge restraint to road pavements and footways/cycleways.
Application restrictions	The kerbs must be free from vents, cracks, fissures or defects which could affect strength of durability.
Design considerations	Adequate slip/skid resistance, bending strength, abrasion resistance, resistance to freeze-thaw: BS EN 1340 or BS EN 1343.
Aesthetic considerations	Natural stone kerbs can be more sympathetic to local surroundings.
Size considerations	Not usually sized as per British Standards, they are typically squarer.
Specification	Manufacturing: BS EN 1343 or BS EE 1340, BS 1217 for stone reproduction CoP for laying: BS EN 7533-101 & for bond coat to adjacent asphalt surfaces BS 594987 and MCHW CI 920. Concrete bed and backing: BS 8500-2 MCHW: CL1101
Maintenance requirements	Kerbs that are overridden or in pedestrianised zones may require retexturing Natural stone surfaces should be protected by regularly applied surface coating/sealant.
Sourcing and availability	Products imported from overseas are not permitted. Future maintenance can be an issue if suitable individual units cannot be sourced, so a whole pallet has to be ordered. Consideration should be given to using units where availability of reclaimed units is more widespread (standard materials would be present in LCC stores as they are in constant use and are of consistent appearance).
Sustainability considerations	If specified correctly natural stone kerbs can be very durable. Potential increased wastage over concrete alternatives due to greater dimensional tolerances. Natural stone kerbs can have variable performance. High environmental impact from imported materials.

Material	Stone Reproduction Kerbs
Type and Finish	Stone Reproduction (also known as conservation kerbs) Manufactured products incorporating recycled natural aggregate materials. The surface finish is produced by shot blasting process to give an exposed aggregate finish and enhance surface texture.
Application	Provision of edge restraint to road pavements and footways/cycleways.
Application restrictions	The kerbs must be free from vents, cracks, fissures or defects which could affect strength of durability.
Design considerations	Adequate slip/skid resistance, bending strength, abrasion resistance, resistance to freeze-thaw: BS EN 1340 or BS EN 1343.
Aesthetic considerations	If specified correctly can be more sympathetic to local surroundings.
Size considerations	Not usually sized as per British Standards, they are typically squarer.
Specification	Manufacturing: BS EN 1343 or BS EE 1340, BS 1217 for stone reproduction CoP for laying: BS EN 7533-101 & for bond coat to adjacent asphalt surfaces BS 594987 and MCHW CI 920. Concrete bed and backing: BS 8500-2 MCHW: CL1101
Maintenance requirements	Kerbs that are overridden or in pedestrianised zones may require retexturing Natural stone surfaces should be protected by regularly applied surface coating/sealant.
Sourcing and availability	Future maintenance can be an issue if suitable individual units cannot be sourced, so a whole pallet has to be ordered. Consideration should be given to using units where availability of reclaimed units is more widespread (standard materials would be present in LCC stores as they are in constant use and are of consistent appearance).
Sustainability considerations	Reproduction products utilise recycled materials.

Material	Precast Concrete Flags and Blocks incorporating Exposed Aggregate Top Layer
Type and Finish	Precast concrete units incorporating a top layer of exposed aggregate. A variety of surface colours and finishes can be provided and optional edge details such as chamfered, bull-nosed or square edge are available and may provide durability benefits depending on usage characteristics.
Application	Pedestrian footways, precincts, or very lightly trafficked roads.
Application restrictions	Should not be used in areas subject to heavy vehicle overrun. Footways where vehicle over-run could become an issue should be protected by physical measures or if this is not possible designed as heavy-duty pavements, incorporating a bound base. Flags should not be used on pavements subject to dynamic loading (e.g. traffic calming or barrel deliveries). High point loads from outriggers such as those from MEWPs used for street lighting maintenance can also cause failure, the base design needs to consider such loads. Due regard to the type and flow of traffic shall be given when designed laying patterns. Flag and Block sizes and pavement construction are determined by the traffic categories in BS EN 7533-101. Consideration should be given to the noise implications of the 'rumble' effect caused vehicles and potential nuisance caused.
Design considerations	Structural design is covered in DMRB CD239 (or alternatively BS EN 7533-101) Level of anticipated heavy vehicle over run Recommended skid resistance values measured in accordance with BS 7932 Pedestrian use only – 40, slow-moving vehicle use – 45 Intermediate restraints to be incorporated on steep slopes Abrasion resistance to be determined in accordance with BS EN 1341 and 1339 Must be bedded on sand
Aesthetic considerations	There is a large range of colour palettes available, many of which is specified well can be more sympathetic to local surroundings. Consideration shall be given to the likelihood of staining of the blocks, in such scenarios multi-coloured blocks should be used.
Size considerations	A range of sizes are available dependent on the manufacturer
Specification	UKCA/CE Marking Requirements and testing: BS EN 1338 and BS EN 1339 CoP for laying: BS EN 7533-101 – sand bedding only permitted for ease of future maintenance.
Maintenance requirements	
Sourcing and availability	Future maintenance can be an issue if suitable individual units cannot be sourced, so a whole pallet has to be ordered.
Sustainability considerations	If specified correctly such units can be very durable. Standard units and good dimensional tolerances result in lower wastage Up to 75% recycled aggregate can be incorporated into concrete units. Natural aggregates for top layer can be manufactured, secondary, recycled or recovered. Manufactured product that should have assured performance.

5 Commuted sums

5.1 Estimated periodic maintenance costs over a 40-year period for 1000m²/1000lm and subsequent commuted sums:

Material	Period Maintenance Cost over 40-year period	Additional Cost over 40-year period	E/O per m²	Commuted sum per m²
Carriageway Asphalts Standard	£68,047.32	N/A	N/A	N/A
Footway (AC or PCC)	£43,017.67	N/A	N/A	N/A
Pre-cast concrete kerbs	£992.63	N/A	N/A	N/A
Coloured SMA	£76,007.99	£7,960.67	£0.20	£5.28
Coloured HRA	£78,256.08	£10,208.76	£0.26	£6.87
Coloured AC for footways	£58,387.72	£15,370.05	£0.38	£10.15
Coloured SMA for footways	£62,968.13	£19,950.46	£0.50	£13.18
Unbound Gravel	£57,004.46	£13,986.79	£0.35	£9.24
Porous Flexible Rubber/Aggregate Surfacing	£76,720.04	£33,702.36	£0.84	£22.26
Natural Stone Flags	£94,300.54	£51,282.87	£1.28	£33.87
Natural Stone Setts	£96,122.16	£53,104.49	£1.33	£35.08
Material	Period Maintenance Cost over 40-year period	Additional Cost over 40-year period	E/O per m²	Commuted sum per lm
Natural Stone Kerbs	£1,267.81	£2,240.78	£0.06	£0.18
Stone Reproduction Kerbs	£1,267.81	£275.18	£0.01	£0.18

5.2 The derivation of estimated period maintenance costs for each material can be found in appendix A and subsequent commuted sum calculation can be found in appendix B.

Appendix A: Periodic Maintenance Costs

<u>Estimated periodic maintenance costs</u>			
Standard Asphalt Concrete - Expected design life 13 years			
Lifecycle plan for estimating periodic maintenance per 1000m ²			
1 pothole or other minor maintenance repair per year for years 1 to 6			
Surface dress in year 7, resurface in year 13			
Pothole or minor maintenance repair costs			
£30.00	Cost of material (1m ² of asphalt)		
£24.61	Labour cost (2 men 1 hour)		
£4.40	Consumables		
£1.70	Traffic Management (average cost)		
£7.18	Plant		
<u>£15.51</u>	Uplift for overheads (22.85%)		
£83.40			
Estimated resurfacing cost per m ²			
£18.60	Plane and inlay 40mm surface course		
Estimated surface dressing cost per m ²			
£7.00	Double dressing and lockdown		
Interventions			
Year	Cost	Year	Cost
1	£83.40	21	£83.40
2	£83.40	22	£83.40
3	£83.40	23	£83.40
4	£83.40	24	£83.40
5	£83.40	25	£83.40
6	£83.40	26	£18,600.00
7	£7,000.00	27	£83.40
8	£83.40	28	£83.40
9	£83.40	29	£83.40
10	£83.40	30	£83.40
11	£83.40	31	£83.40
12	£83.40	32	£83.40
13	£18,600.00	33	£7,000.00
14	£83.40	34	£83.40
15	£83.40	35	£83.40
16	£83.40	36	£83.40
17	£83.40	37	£83.40
18	£83.40	38	£83.40
19	£83.40	39	£18,600.00
20	£7,000.00	40	<u>£83.40</u>
		Total	£79,635.70

Estimated periodic maintenance costs

Standard Thin Surface Course & SMA - Expected design life 17 years

Lifecycle plan for estimating periodic maintenance per 1000m²

1 pothole or other minor maintenance repair per year for years 1 to 6

2 pothole or other minor maintenance repair per year for years 7-10

Surface dress in year 11, resurface in year 17

Pothole or minor maintenance repair costs

£30.00 Cost of material (1m² of asphalt)

£24.61 Labour cost (2 men 1 hour)

£4.40 Consumables

£1.70 Traffic Management (average cost)

£7.18 Plant

£15.51 Uplift for overheads (22.85%)

£83.40

Estimated resurfacing cost per m²

£20.00 Plane and inlay 40mm surface course

Estimated surface dressing cost per m²

£7.00 Double dressing and lockdown

Interventions

Year	Cost	Year	Cost
1	£83.40	21	£83.40
2	£83.40	22	£83.40
3	£83.40	23	£83.40
4	£83.40	24	£166.81
5	£83.40	25	£166.81
6	£83.40	26	£166.81
7	£166.81	27	£166.81
8	£166.81	28	£7,000.00
9	£166.81	29	£83.40
10	£166.81	30	£83.40
11	£7,000.00	31	£83.40
12	£83.40	32	£83.40
13	£83.40	33	£83.40
14	£83.40	34	£20,000.00
15	£83.40	35	£83.40
16	£83.40	36	£83.40
17	£20,000.00	37	£83.40
18	£83.40	38	£83.40
19	£83.40	39	£83.40
20	£83.40	40	<u>£83.40</u>

Total £57,669.73

Estimated periodic maintenance costs

Standard HRA - Expected design life 18 years

Lifecycle plan for estimating periodic maintenance per 1000m²

1 pothole or other minor maintenance repair per year for years 1 to 6

2 pothole or other minor maintenance repair per year for years 7-11

Surface dress in year 12, resurface in year 18

Pothole or minor maintenance repair costs

£30.00 Cost of material (1m² of asphalt)

£24.61 Labour cost (2 men 1 hour)

£4.40 Consumables

£1.70 Traffic Management (average cost)

£7.18 Plant

£15.51 Uplift for overheads (22.85%)

£83.40

Estimated resurfacing cost per m²

£24.50 Plane and inlay 45mm surface course

Estimated surface dressing cost per m²

£7.00 Double dressing and lockdown

Year	Cost	Year	Cost
1	£83.40	21	£83.40
2	£83.40	22	£83.40
3	£83.40	23	£83.40
4	£83.40	24	£83.40
5	£83.40	25	£166.81
6	£83.40	26	£166.81
7	£166.81	27	£166.81
8	£166.81	28	£166.81
9	£166.81	29	£166.81
10	£166.81	30	£7,000.00
11	£166.81	31	£83.40
12	£7,000.00	32	£83.40
13	£83.40	33	£83.40
14	£83.40	34	£83.40
15	£83.40	35	£83.40
16	£83.40	36	£24,500.00
17	£83.40	37	£83.40
18	£24,500.00	38	£83.40
19	£83.40	39	£83.40
20	£83.40	40	<u>£83.40</u>
		Total	£66,836.53

Estimated periodic maintenance costs

Standard AC6 dense for footways - Expected design life 15 years

Lifecycle plan for estimating periodic maintenance per 1000m²

1 pothole or other minor maintenance repair per year for years 1 to 9

2 pothole or other minor maintenance repair per year for years 10-14

Resurface in year 15

Pothole or minor maintenance repair costs

£30.00 Cost of material (1m² of asphalt)

£24.61 Labour cost (2 men 1 hour)

£4.40 Consumables

£1.70 Traffic Management (average cost)

£7.18 Plant

£15.51 Uplift for overheads (22.85%)

£83.40

Estimated resurfacing cost per m²

£19.00 Plane/remove and lay 20mm surface course

Interventions

Year	Cost	Year	Cost
1	£83.40	21	£83.40
2	£83.40	22	£83.40
3	£83.40	23	£83.40
4	£83.40	24	£83.40
5	£83.40	25	£166.81
6	£83.40	26	£166.81
7	£83.40	27	£166.81
8	£83.40	28	£166.81
9	£83.40	29	£166.81
10	£166.81	30	£19,000.00
11	£166.81	31	£83.40
12	£166.81	32	£83.40
13	£166.81	33	£83.40
14	£166.81	34	£83.40
15	£19,000.00	35	£83.40
16	£83.40	36	£83.40
17	£83.40	37	£83.40
18	£83.40	38	£83.40
19	£83.40	39	£83.40
20	£83.40	40	<u>£166.81</u>

Total £42,086.74

Estimated periodic maintenance costs

Standard SMA6 for footways - Expected design life 18 years

Lifecycle plan for estimating periodic maintenance per 1000m²

1 pothole or other minor maintenance repair per year for years 1 to 9

2 pothole or other minor maintenance repair per year for years 10-17

Resurface in year 18

Pothole or minor maintenance repair costs

£32.00 Cost of material (1m² of asphalt)

£24.61 Labour cost (2 men 1 hour)

£4.40 Consumables

£1.70 Traffic Management (average cost)

£7.18 Plant

£15.97 Uplift for overheads (22.85%)

£85.86

Estimated resurfacing cost per m²

£21.00 Plane/remove and lay 20mm surface course

Interventions

Year	Cost	Year	Cost
1	£85.86	21	£85.86
2	£85.86	22	£85.86
3	£85.86	23	£85.86
4	£85.86	24	£85.86
5	£85.86	25	£85.86
6	£85.86	26	£85.86
7	£85.86	27	£85.86
8	£85.86	28	£171.72
9	£85.86	29	£171.72
10	£171.72	30	£171.72
11	£171.72	31	£171.72
12	£171.72	32	£171.72
13	£171.72	33	£171.72
14	£171.72	34	£171.72
15	£171.72	35	£171.72
16	£171.72	36	£21,000.00
17	£171.72	37	£85.86
18	£21,000.00	38	£85.86
19	£85.86	39	£85.86
20	£85.86	40	<u>£85.86</u>

Total £46,636.43

Estimated periodic maintenance costs

Pre-cast concrete flags - Expected design life 40 years

Lifecycle plan for estimating periodic maintenance per 1000m²

1 minor maintenance repair per year for years 1 to 12

Replacement of 10% of all flags in year 13

1 minor maintenance repair per year for years 14 to 25

Replacement of 10% of all flags in year 26

1 minor maintenance repair per year for years 27 to 38

Replacement of 10% of all flags in year 39

1 minor maintenance repair per year for year 40

Minor maintenance repair costs

£12.00	Cost of material (1m ² of flags)
£50.00	Labour cost (2 men 2 hour)
£8.80	Consumables
£3.40	Traffic Management (average cost)
£14.36	Plant
<u>£20.24</u>	Uplift for overheads (22.85%)
£108.80	

Estimated resurfacing cost per m²

£2,400.00	Cost of material
£5,000.00	Labour
£880.00	Consumables
£340.00	TM
£1,436.00	Plant
<u>£2,297.80</u>	Uplift for overheads (22.85%)
£12,353.80	

Interventions

Year	Cost	Year	Cost
1	£108.80	21	£108.80
2	£108.80	22	£108.80
3	£108.80	23	£108.80
4	£108.80	24	£108.80
5	£108.80	25	£108.80
6	£108.80	26	£12,353.80
7	£108.80	27	£108.80
8	£108.80	28	£108.80
9	£108.80	29	£108.80
10	£108.80	30	£108.80
11	£108.80	31	£108.80
12	£108.80	32	£108.80
13	£12,353.80	33	£108.80
14	£108.80	34	£108.80

15	£108.80	35	£108.80
16	£108.80	36	£108.80
17	£108.80	37	£108.80
18	£108.80	38	£108.80
19	£108.80	39	£12,353.80
20	£108.80	40	<u>£108.80</u>
		Total	£41,086.84

Estimated periodic maintenance costs

Pre-cast concrete kerbs - Expected design life 40 years

Lifecycle plan for estimating periodic maintenance per 1000m

2m of kerbs to be replaced every 5 years

Minor maintenance repair costs for 1m kerbing

£11.00 Cost of material (1m of kerbing)

£20.00 Labour cost (2 men 0.5 hour)

£8.00 Consumables

£5.00 Traffic Management (average cost)

£6.50 Plant

£11.54 Uplift for overheads (22.85%)

£62.04 x2 for 2m

£124.08

Interventions

Year	Cost	Year	Cost
1		21	
2		22	
3		23	
4		24	
5	£124.08	25	£124.08
6		26	
7		27	
8		28	
9		29	
10	£124.08	30	£124.08
11		31	
12		32	
13		33	
14		34	
15	£124.08	35	£124.08
16		36	
17		37	
18		38	
19		39	
20	£124.08	40	<u>£124.08</u>
Total			£992.63

Estimated periodic maintenance costs

Pigmented SMA - Expected design life 14 years without surface treatment

Lifecycle plan for estimating periodic maintenance per 1000m²

1 pothole or other minor maintenance repair per year for years 1 to 6

2 pothole or other minor maintenance repair per year for years 7-13

Resurface in year 14

Pothole or minor maintenance repair costs

£45.00 Cost of material (1m² of asphalt)

£24.61 Labour cost (2 men 1 hour)

£4.40 Consumables

£1.70 Traffic Management (average cost)

£7.18 Plant

£18.94 Uplift for overheads (22.85%)

£101.83

Estimated resurfacing cost per m²

£35.00 Plane and inlay 40mm surface course

Year	Cost	Year	Cost
1	£101.83	21	£203.66
2	£101.83	22	£203.66
3	£101.83	23	£203.66
4	£101.83	24	£203.66
5	£101.83	25	£203.66
6	£101.83	26	£203.66
7	£203.66	27	£203.66
8	£203.66	28	£35,000.00
9	£203.66	29	£101.83
10	£203.66	30	£101.83
11	£203.66	31	£101.83
12	£203.66	32	£101.83
13	£203.66	33	£101.83
14	£35,000.00	34	£203.66
15	£101.83	35	£203.66
16	£101.83	36	£203.66
17	£101.83	37	£203.66
18	£101.83	38	£203.66
19	£101.83	39	£203.66
20	£101.83	40	<u>£203.66</u>
		Total	£76,007.99

Estimated periodic maintenance costs			
Coloured HRA (chippings only) - Expected design life 13 years without surface treatment			
Lifecycle plan for estimating periodic maintenance per 1000m ²			
1 pothole or other minor maintenance repair per year for years 1 to 6			
2 pothole or other minor maintenance repair per year for years 7-13			
Resurface in year 13			
Pothole or minor maintenance repair costs			
	£32.50	Cost of material (1m ² of asphalt)	
	£24.61	Labour cost (2 men 1 hour)	
	£4.40	Consumables	
	£1.70	Traffic Management (average cost)	
	£7.18	Plant	
	<u>£16.08</u>	Uplift for overheads (22.85%)	
	£86.47		
Estimated resurfacing cost per m ²			
	£24.50	Plane and inlay 45mm surface course	
Year	Cost	Year	Cost
1	£86.47	21	£172.95
2	£86.47	22	£172.95
3	£86.47	23	£172.95
4	£86.47	24	£172.95
5	£86.47	25	£172.95
6	£86.47	26	£24,500.00
7	£172.95	27	£86.47
8	£172.95	28	£86.47
9	£172.95	29	£86.47
10	£172.95	30	£86.47
11	£172.95	31	£86.47
12	£172.95	32	£86.47
13	£24,500.00	33	£172.95
14	£86.47	34	£172.95
15	£86.47	35	£172.95
16	£86.47	36	£172.95
17	£86.47	37	£172.95
18	£86.47	38	£172.95
19	£86.47	39	£24,500.00
20	£172.95	40	<u>£86.47</u>
		Total	£78,256.08

Estimated periodic maintenance costs			
AC6 dense coloured - Expected design life 15 years			
Lifecycle plan for estimating periodic maintenance per 1000m ²			
1 pothole or other minor maintenance repair per year for years 1 to 9			
2 pothole or other minor maintenance repair per year for years 10-14			
Resurface in year 15			
Pothole or minor maintenance repair costs			
£35.00 Cost of material (1m ² of asphalt)			
£24.61 Labour cost (2 men 1 hour)			
£4.40 Consumables			
£1.70 Traffic Management (average cost)			
£7.18 Plant			
<u>£16.66</u> Uplift for overheads (22.85%)			
£89.55			
Estimated resurfacing cost per m ²			
£27.00 Plane/remove and lay 20mm surface course			
Interventions			
Year	Cost	Year	Cost
1	£89.55	21	£89.55
2	£89.55	22	£89.55
3	£89.55	23	£89.55
4	£89.55	24	£89.55
5	£89.55	25	£179.09
6	£89.55	26	£179.09
7	£89.55	27	£179.09
8	£89.55	28	£179.09
9	£89.55	29	£179.09
10	£179.09	30	£27,000.00
11	£179.09	31	£89.55
12	£179.09	32	£89.55
13	£179.09	33	£89.55
14	£179.09	34	£89.55
15	£27,000.00	35	£89.55
16	£89.55	36	£89.55
17	£89.55	37	£89.55
18	£89.55	38	£89.55
19	£89.55	39	£89.55
20	£89.55	40	<u>£179.09</u>
Total			£58,387.72

Estimated periodic maintenance costs

SMA 6 coloured - Expected design life 18 years

Lifecycle plan for estimating periodic maintenance per 1000m²

1 pothole or other minor maintenance repair per year for years 1 to 9

2 pothole or other minor maintenance repair per year for years 10-17

Resurface in year 18

Pothole or minor maintenance repair costs

£37.00 Cost of material (1m² of asphalt)

£24.61 Labour cost (2 men 1 hour)

£4.40 Consumables

£1.70 Traffic Management (average cost)

£7.18 Plant

£17.11 Uplift for overheads (22.85%)

£92.00

Estimated resurfacing cost per m²

£29.00 Plane/remove and lay 20mm surface course

Interventions

Year	Cost	Year	Cost
1	£92.00	21	£92.00
2	£92.00	22	£92.00
3	£92.00	23	£92.00
4	£92.00	24	£92.00
5	£92.00	25	£92.00
6	£92.00	26	£92.00
7	£92.00	27	£92.00
8	£92.00	28	£184.00
9	£92.00	29	£184.00
10	£184.00	30	£184.00
11	£184.00	31	£184.00
12	£184.00	32	£184.00
13	£184.00	33	£184.00
14	£184.00	34	£184.00
15	£184.00	35	£184.00
16	£184.00	36	£29,000.00
17	£184.00	37	£92.00
18	£29,000.00	38	£92.00
19	£92.00	39	£92.00
20	£92.00	40	<u>£92.00</u>

Total £62,968.13

Estimated periodic maintenance costs				
Unbound (self-binding) Gravel - Expected design life 10 years				
Lifecycle plan for estimating periodic maintenance per 1000m ²				
2 pothole or other minor maintenance repair per year				
Scratch/scarify surface and relay every 10 years (assuming 50% material required)				
Pothole or minor maintenance repair costs				
		£15.00	Cost of material (1m ² of gravel, 100mm deep)	
		£24.61	Labour cost (2 men 1 hour)	
		£4.40	Consumables	
		£7.18	Plant	
		<u>£11.70</u>	Uplift for overheads (22.85%)	
		£62.89		
Estimated cost for replacement allowing 50%				
		£7,500.00	Material	
		£2,461.00	Labour	
		£718.00	Plant	
		<u>£2,990.12</u>	Uplift for overheads (28%)	
		£13,669.12	Total cost	
Interventions				
	Year	Cost	Year	Cost
	1	£125.77	21	£125.77
	2	£125.77	22	£125.77
	3	£125.77	23	£125.77
	4	£125.77	24	£125.77
	5	£125.77	25	£125.77
	6	£125.77	26	£125.77
	7	£125.77	27	£125.77
	8	£125.77	28	£125.77
	9	£125.77	29	£125.77
	10	£13,119.15	30	£13,119.15
	11	£125.77	31	£125.77
	12	£125.77	32	£125.77
	13	£125.77	33	£125.77
	14	£125.77	34	£125.77
	15	£125.77	35	£125.77
	16	£125.77	36	£125.77
	17	£125.77	37	£125.77
	18	£125.77	38	£125.77
	19	£125.77	39	£125.77
	20	£13,119.15	40	<u>£13,119.15</u>
			Total	£57,004.46

Estimated periodic maintenance costs			
Porous Flexible Rubber/Aggregate Surfacing - Expected design life 15 years			
Lifecycle plan for estimating periodic maintenance per 1000m ²			
7 Year guarantee therefore 0 maintenance cost 0-7			
1 pothole or other minor maintenance repair per year for years 8 to 14			
Resurface in year 15			
Pothole or minor maintenance repair costs			
£37.50 Cost of material (1m ² of gravel, 100mm deep)			
£24.61 Labour cost (2 men 1 hour)			
£4.40 Consumables			
£7.18 Plant			
<u>£16.83</u> Uplift for overheads (22.85%)			
£90.53			
Interventions			
Year	Cost	Year	Cost
1	£0.00	21	£0.00
2	£0.00	22	£0.00
3	£0.00	23	£90.53
4	£0.00	24	£90.53
5	£0.00	25	£90.53
6	£0.00	26	£90.53
7	£0.00	27	£90.53
8	£90.53	28	£90.53
9	£90.53	29	£90.53
10	£90.53	30	£37,500.00
11	£90.53	31	£0.00
12	£90.53	32	£0.00
13	£90.53	33	£0.00
14	£90.53	34	£0.00
15	£37,500.00	35	£0.00
16	£0.00	36	£90.53
17	£0.00	37	£90.53
18	£0.00	38	£90.53
19	£0.00	39	£90.53
20	£0.00	40	<u>£90.53</u>
Total			£76,720.04

Estimated periodic maintenance costs				
Natural Stone Flags - Expected design life 40 years				
Lifecycle plan for estimating periodic maintenance per 1000m ²				
1 minor maintenance repair per year for years 1 to 12				
Replacement of 10% of all flags in year 13				
1 minor maintenance repair per year for years 14 to 25				
Replacement of 10% of all flags in year 26				
1 minor maintenance repair per year for years 27 to 38				
Replacement of 10% of all flags in year 39				
1 minor maintenance repair per year for year 40				
Minor maintenance repair costs				
£80.00 Cost of material (1m ² of flags)				
£50.00 Labour cost (2 men 2 hour)				
£8.80 Consumables				
£3.40 Traffic Management (average cost)				
£14.36 Plant				
<u>£35.77 Uplift for overheads (22.85%)</u>				
£192.33				
Estimated resurfacing cost per m ²				
£16,000.00 Cost of material				
£5,000.00 Labour				
£880.00 Consumables				
£340.00 TM				
£1,436.00 Plant				
<u>£5,405.40 Uplift for overheads (22.85%)</u>				
£29,061.40				
Interventions				
Year	Cost	Year	Cost	
1	£192.33	21	£192.33	
2	£192.33	22	£192.33	
3	£192.33	23	£192.33	
4	£192.33	24	£192.33	
5	£192.33	25	£192.33	
6	£192.33	26	£29,061.40	
7	£192.33	27	£192.33	
8	£192.33	28	£192.33	
9	£192.33	29	£192.33	
10	£192.33	30	£192.33	
11	£192.33	31	£192.33	
12	£192.33	32	£192.33	

Palette of Materials – Code of Practice for Developer and Third-Party Works

13	£29,061.40	33	£192.33
14	£192.33	34	£192.33
15	£192.33	35	£192.33
16	£192.33	36	£192.33
17	£192.33	37	£192.33
18	£192.33	38	£192.33
19	£192.33	39	£29,061.40
20	£192.33	40	<u>£192.33</u>
		Total	£94,300.54

Estimated periodic maintenance costs			
Natural Stone Setts - Expected design life 40 years			
Lifecycle plan for estimating periodic maintenance per 1000m ²			
1 minor maintenance repair per year for years 1 to 12			
Replacement of 10% of all blocks in year 13			
1 minor maintenance repair per year for years 14 to 25			
Replacement of 10% of all blocks in year 26			
1 minor maintenance repair per year for years 27 to 38			
Replacement of 10% of all blocks in year 39			
1 minor maintenance repair per year for year 40			
Minor maintenance repair costs			
	£80.00	Cost of material (1m ² of flags)	
	£50.00	Labour cost (2 men 2 hour)	
	£13.20	Consumables	
	£3.40	Traffic Management (average cost)	
	£14.36	Plant	
	<u>£36.78</u>	Uplift for overheads (22.85%)	
	£197.74		
Estimated resurfacing cost per m ²			
	£16,000.00	Cost of material	
	£5,000.00	Labour	
	£1,320.00	Consumables	
	£340.00	TM	
	£1,436.00	Plant	
	<u>£5,505.94</u>	Uplift for overheads (22.85%)	
	£29,601.94		
Interventions			
	Year	Cost	Year
	1	£197.74	21
	2	£197.74	22
	3	£197.74	23
	4	£197.74	24
	5	£197.74	25
	6	£197.74	26
	7	£197.74	27
	8	£197.74	28
	9	£197.74	29
	10	£197.74	30
	11	£197.74	31
			£29,601.94

12	£197.74	32	£197.74
13	£29,601.94	33	£197.74
14	£197.74	34	£197.74
15	£197.74	35	£197.74
16	£197.74	36	£197.74
17	£197.74	37	£197.74
18	£197.74	38	£197.74
19	£197.74	39	£29,601.94
20	£197.74	40	<u>£197.74</u>
		Total	£96,122.16

Estimated periodic maintenance costs			
Natural Stone Kerbs - Expected design life 40 years			
Lifecycle plan for estimating periodic maintenance per 1000m			
2m of kerbs to be replaced every 5 years			
Minor maintenance repair costs for 1m kerbing			
£25.00 Cost of material (1m of kerbing)			
£20.00 Labour cost (2 men 0.5 hour)			
£8.00 Consumables		£8.00	
£5.00 Traffic Management (average cost)			
£6.50 Plant		£6.50 Plant	
<u>£14.74 Uplift for overheads (28%)</u>			
<u>£79.24</u> x2 for 2m		<u>£79.24</u> x2 for 2m	
£158.48		£158.48	
Interventions		Interventions	
Year	Cost	Year	Cost
1		1	
2		2	
3		3	
4		4	
5	£158.48	5	£158.48
6		6	
7		7	
8		8	
9		9	
10	£158.48	10	£158.48
11		11	
12		12	
13		13	
14		14	
15	£158.48	15	£158.48
16		16	
17		17	
18		18	
19		19	
20	£158.48	20	£158.48

Estimated periodic maintenance costs

Stone Reproduction Kerbs - Expected design life 40 years

Lifecycle plan for estimating periodic maintenance per 1000m

2m of kerbs to be replaced every 5 years

Minor maintenance repair costs for 1m kerbing

£25.00 Cost of material (1m of kerbing)

£20.00 Labour cost (2 men 0.5 hour)

£8.00 Consumables

£5.00 Traffic Management (average cost)

£6.50 Plant

£14.74 Uplift for overheads (28%)

£79.24 x2 for 2m

£158.48

Interventions

Year	Cost	Year	Cost
1		21	
2		22	
3		23	
4		24	
5	£158.48	25	£158.48
6		26	
7		27	
8		28	
9		29	
10	£158.48	30	£158.48
11		31	
12		32	
13		33	
14		34	
15	£158.48	35	£158.48
16		36	
17		37	
18		38	
19		39	
20	£158.48	40	<u>£158.48</u>
		Total	<u>£1,267.81</u>

Appendix B: Commuted Sums Calculation

Enhanced Material: Coloured SMA

Event	Year	Present Value		
			Mp	0.20
1	1	£0.20	T	1 year
2	2	£0.19	D	2.2 %
3	3	£0.19	Tmax	40 years
4	4	£0.18		
5	5	£0.18	Mp	Estimated periodic maintenance costs (£) (m2 for surfacing, lm for kerbs)
6	6	£0.18		
7	7	£0.17	T	Interval between periodic maintenance (years)
8	8	£0.17	D	Discount rate (%)
9	9	£0.16	Tmax	Time limit for commutation
10	10	£0.16		
11	11	£0.16		
12	12	£0.15		
13	13	£0.15		
14	14	£0.15		
15	15	£0.14		
16	16	£0.14		
17	17	£0.14		
18	18	£0.14		
19	19	£0.13		
20	20	£0.13		
21	21	£0.13		
22	22	£0.12		
23	23	£0.12		
24	24	£0.12		
25	25	£0.12		
26	26	£0.11		
27	27	£0.11		
28	28	£0.11		
29	29	£0.11		
30	30	£0.10		
31	31	£0.10		
32	32	£0.10		
33	33	£0.10		
34	34	£0.10		
35	35	£0.09		
36	36	£0.09		
37	37	£0.09		
38	38	£0.09		
39	39	£0.09		
40	40	<u>£0.08</u>		
		£5.28		

Enhanced Material: Coloured HRA

Event	Year	Present Value	Mp	0.26
1	1	£0.25	T	1 year
2	2	£0.25	D	2.2 %
3	3	£0.24	Tmax	40 years
4	4	£0.24		
5	5	£0.23	Mp	Estimated periodic maintenance costs (£) (m2 for surfacing, lm for kerbs)
6	6	£0.23		
7	7	£0.22	T	Interval between periodic maintenance (years)
8	8	£0.22	D	Discount rate (%)
9	9	£0.21	Tmax	Time limit for commutation
10	10	£0.21		
11	11	£0.20		
12	12	£0.20		
13	13	£0.20		
14	14	£0.19		
15	15	£0.19		
16	16	£0.18		
17	17	£0.18		
18	18	£0.18		
19	19	£0.17		
20	20	£0.17		
21	21	£0.16		
22	22	£0.16		
23	23	£0.16		
24	24	£0.15		
25	25	£0.15		
26	26	£0.15		
27	27	£0.14		
28	28	£0.14		
29	29	£0.14		
30	30	£0.14		
31	31	£0.13		
32	32	£0.13		
33	33	£0.13		
34	34	£0.12		
35	35	£0.12		
36	36	£0.12		
37	37	£0.12		
38	38	£0.11		
39	39	£0.11		
40	40	<u>£0.11</u>		
		£6.87		

Enhanced Material: Coloured AC for footways

Event Year	Present Value	Mp	0.38
1 1	£0.38	T	1
2 2	£0.37	D	2.2
3 3	£0.36	Tmax	40
4 4	£0.35		
5 5	£0.34	Mp	Estimated periodic maintenance costs (£)
6 6	£0.34		(m ² for surfacing, lm for kerbs)
7 7	£0.33	T	Interval between periodic maintenance (years)
8 8	£0.32	D	Discount rate (%)
9 9	£0.32	Tmax	Time limit for commutation
10 10	£0.31		
11 11	£0.30		
12 12	£0.30		
13 13	£0.29		
14 14	£0.28		
15 15	£0.28		
16 16	£0.27		
17 17	£0.27		
18 18	£0.26		
19 19	£0.25		
20 20	£0.25		
21 21	£0.24		
22 22	£0.24		
23 23	£0.23		
24 24	£0.23		
25 25	£0.22		
26 26	£0.22		
27 27	£0.21		
28 28	£0.21		
29 29	£0.20		
30 30	£0.20		
31 31	£0.20		
32 32	£0.19		
33 33	£0.19		
34 34	£0.18		
35 35	£0.18		
36 36	£0.18		
37 37	£0.17		
38 38	£0.17		
39 39	£0.16		
40 40	<u>£0.16</u>		
	£10.15		

Enhanced Material: Coloured SMA for footways

Event	Year	Present Value	Mp	0.50
1	1	£0.49	T	1 Year
2	2	£0.48	D	2.2 %
3	3	£0.47	Tmax	40 years
4	4	£0.46		
5	5	£0.45	Mp	Estimated periodic maintenance costs (£) (m2 for surfacing, lm for kerbs)
6	6	£0.44		
7	7	£0.43	T	Interval between periodic maintenance (years)
8	8	£0.42	D	Discount rate (%)
9	9	£0.41	Tmax	Time limit for commutation
10	10	£0.40		
11	11	£0.39		
12	12	£0.38		
13	13	£0.38		
14	14	£0.37		
15	15	£0.36		
16	16	£0.35		
17	17	£0.34		
18	18	£0.34		
19	19	£0.33		
20	20	£0.32		
21	21	£0.32		
22	22	£0.31		
23	23	£0.30		
24	24	£0.30		
25	25	£0.29		
26	26	£0.28		
27	27	£0.28		
28	28	£0.27		
29	29	£0.27		
30	30	£0.26		
31	31	£0.25		
32	32	£0.25		
33	33	£0.24		
34	34	£0.24		
35	35	£0.23		
36	36	£0.23		
37	37	£0.22		
38	38	£0.22		
39	39	£0.21		
40	40	<u>£0.21</u>		
		£13.18		

Enhanced Material: Unbound Gravel

Event	Year	Present Value	Mp	0.35
1	1	£0.34	T	1 year
2	2	£0.33	D	2.2 %
3	3	£0.33	Tmax	40 years
4	4	£0.32		
5	5	£0.31	Mp	Estimated periodic maintenance costs (£)
6	6	£0.31		(m2 for surfacing, lm for kerbs)
7	7	£0.30	T	Interval between periodic maintenance (years)
8	8	£0.29	D	Discount rate (%)
9	9	£0.29	Tmax	Time limit for commutation
10	10	£0.28		
11	11	£0.28		
12	12	£0.27		
13	13	£0.26		
14	14	£0.26		
15	15	£0.25		
16	16	£0.25		
17	17	£0.24		
18	18	£0.24		
19	19	£0.23		
20	20	£0.23		
21	21	£0.22		
22	22	£0.22		
23	23	£0.21		
24	24	£0.21		
25	25	£0.20		
26	26	£0.20		
27	27	£0.19		
28	28	£0.19		
29	29	£0.19		
30	30	£0.18		
31	31	£0.18		
32	32	£0.17		
33	33	£0.17		
34	34	£0.17		
35	35	£0.16		
36	36	£0.16		
37	37	£0.16		
38	38	£0.15		
39	39	£0.15		
40	40	<u>£0.15</u>		
		£9.24		

Enhanced Material: Porous/Flexible Rubber Aggregate Surfacing

Event	Year	Present Value	Mp	0.84
1	1	£0.82	T	1 year
2	2	£0.81	D	2.2 %
3	3	£0.79	Tmax	40 years
4	4	£0.77		
5	5	£0.76	Mp	Estimated periodic maintenance costs (£)
6	6	£0.74		(m2 for surfacing, lm for kerbs)
7	7	£0.72	T	Interval between periodic maintenance (years)
8	8	£0.71	D	Discount rate (%)
9	9	£0.69	Tmax	Time limit for commutation
10	10	£0.68		
11	11	£0.66		
12	12	£0.65		
13	13	£0.63		
14	14	£0.62		
15	15	£0.61		
16	16	£0.59		
17	17	£0.58		
18	18	£0.57		
19	19	£0.56		
20	20	£0.55		
21	21	£0.53		
22	22	£0.52		
23	23	£0.51		
24	24	£0.50		
25	25	£0.49		
26	26	£0.48		
27	27	£0.47		
28	28	£0.46		
29	29	£0.45		
30	30	£0.44		
31	31	£0.43		
32	32	£0.42		
33	33	£0.41		
34	34	£0.40		
35	35	£0.39		
36	36	£0.38		
37	37	£0.38		
38	38	£0.37		
39	39	£0.36		
40	40	<u>£0.35</u>		
		£22.26		

Enhanced Material: Natural Stone Flags

Event Year	Present Value	Mp	1.28
1 1	£1.25	T	1 year
2 2	£1.23	D	2.2%
3 3	£1.20	Tmax	40 years
4 4	£1.18		
5 5	£1.15	Mp	Estimated periodic maintenance costs (£)
6 6	£1.13		(m2 for surfacing, lm for kerbs)
7 7	£1.10	T	Interval between periodic maintenance (years)
8 8	£1.08	D	Discount rate (%)
9 9	£1.05	Tmax	Time limit for commutation
10 10	£1.03		
11 11	£1.01		
12 12	£0.99		
13 13	£0.97		
14 14	£0.95		
15 15	£0.93		
16 16	£0.91		
17 17	£0.89		
18 18	£0.87		
19 19	£0.85		
20 20	£0.83		
21 21	£0.81		
22 22	£0.79		
23 23	£0.78		
24 24	£0.76		
25 25	£0.74		
26 26	£0.73		
27 27	£0.71		
28 28	£0.70		
29 29	£0.68		
30 30	£0.67		
31 31	£0.65		
32 32	£0.64		
33 33	£0.63		
34 34	£0.61		
35 35	£0.60		
36 36	£0.59		
37 37	£0.57		
38 38	£0.56		
39 39	£0.55		
40 40	<u>£0.54</u>		
	£33.87		

Enhanced Material: Natural Stone Setts

Event Year	Present Value	Mp	1.33
1 1	£1.30	T	1 year
2 2	£1.27	D	2.2 %
3 3	£1.24	Tmax	40 years
4 4	£1.22		
5 5	£1.19	Mp	Estimated periodic maintenance costs (£)
6 6	£1.17		(m2 for surfacing, lm for kerbs)
7 7	£1.14	T	Interval between periodic maintenance (years)
8 8	£1.12	D	Discount rate (%)
9 9	£1.09	Tmax	Time limit for commutation
10 10	£1.07		
11 11	£1.04		
12 12	£1.02		
13 13	£1.00		
14 14	£0.98		
15 15	£0.96		
16 16	£0.94		
17 17	£0.92		
18 18	£0.90		
19 19	£0.88		
20 20	£0.86		
21 21	£0.84		
22 22	£0.82		
23 23	£0.80		
24 24	£0.79		
25 25	£0.77		
26 26	£0.75		
27 27	£0.74		
28 28	£0.72		
29 29	£0.71		
30 30	£0.69		
31 31	£0.68		
32 32	£0.66		
33 33	£0.65		
34 34	£0.63		
35 35	£0.62		
36 36	£0.61		
37 37	£0.59		
38 38	£0.58		
39 39	£0.57		
40 40	<u>£0.56</u>		
	£35.08		

Enhanced Material: Precast Concrete Flags and Blocks incorporating Exposed Aggregate Top Layer

Event	Year	Present Value	Mp	0.30
1	1	£0.30	T	1 year
2	2	£0.29	D	2.2 %
3	3	£0.28	Tmax	40 years
4	4	£0.28		
5	5	£0.27	Mp	Estimated periodic maintenance costs (£) (m2 for surfacing, lm for kerbs)
6	6	£0.27		
7	7	£0.26	T	Interval between periodic maintenance (years)
8	8	£0.26	D	Discount rate (%)
9	9	£0.25	Tmax	Time limit for commutation
10	10	£0.24		
11	11	£0.24		
12	12	£0.23		
13	13	£0.23		
14	14	£0.22		
15	15	£0.22		
16	16	£0.21		
17	17	£0.21		
18	18	£0.21		
19	19	£0.20		
20	20	£0.20		
21	21	£0.19		
22	22	£0.19		
23	23	£0.18		
24	24	£0.18		
25	25	£0.18		
26	26	£0.17		
27	27	£0.17		
28	28	£0.17		
29	29	£0.16		
30	30	£0.16		
31	31	£0.15		
32	32	£0.15		
33	33	£0.15		
34	34	£0.15		
35	35	£0.14		
36	36	£0.14		
37	37	£0.14		
38	38	£0.13		
39	39	£0.13		
40	40	<u>£0.13</u>		
		£8.03		

Enhanced Material: Natural Stone Kerbs

Event	Year	Present Value	Mp	0.06
1	1	£0.06	T	1 year
2	2	£0.06	D	2.2 %
3	3	£0.06	Tmax	40 years
4	4	£0.05		
5	5	£0.05	Mp	Estimated periodic maintenance costs (£)
6	6	£0.05		(m2 for surfacing, 1m for kerbs)
7	7	£0.05	T	Interval between periodic maintenance (years)
8	8	£0.05	D	Discount rate (%)
9	9	£0.05	Tmax	Time limit for commutation
10	10	£0.05		
11	11	£0.05		
12	12	£0.05		
13	13	£0.05		
14	14	£0.04		
15	15	£0.04		
16	16	£0.04		
17	17	£0.04		
18	18	£0.04		
19	19	£0.04		
20	20	£0.04		
21	21	£0.04		
22	22	£0.04		
23	23	£0.04		
24	24	£0.04		
25	25	£0.03		
26	26	£0.03		
27	27	£0.03		
28	28	£0.03		
29	29	£0.03		
30	30	£0.03		
31	31	£0.03		
32	32	£0.03		
33	33	£0.03		
34	34	£0.03		
35	35	£0.03		
36	36	£0.03		
37	37	£0.03		
38	38	£0.03		
39	39	£0.03		
40	40	<u>£0.03</u>		
		£1.59		

Enhanced Material: Stone Reproduction Kerbs

Event	Year	Present Value	Mp	0.01
1	1	£0.01	T	1 year
2	2	£0.01	D	2.2 %
3	3	£0.01	Tmax	40 years
4	4	£0.01		
5	5	£0.01	Mp	Estimated periodic maintenance costs
6	6	£0.01		(£) (m2 for surfacing, lm for kerbs)
7	7	£0.01	T	Interval between periodic maintenance (years)
8	8	£0.01	D	Discount rate (%)
9	9	£0.01	Tmax	Time limit for commutation
10	10	£0.01		
11	11	£0.01		
12	12	£0.01		
13	13	£0.01		
14	14	£0.01		
15	15	£0.01		
16	16	£0.01		
17	17	£0.01		
18	18	£0.01		
19	19	£0.01		
20	20	£0.01		
21	21	£0.01		
22	22	£0.01		
23	23	£0.01		
24	24	£0.01		
25	25	£0.01		
26	26	£0.01		
27	27	£0.01		
28	28	£0.01		
29	29	£0.01		
30	30	£0.01		
31	31	£0.01		
32	32	£0.00		
33	33	£0.00		
34	34	£0.00		
35	35	£0.00		
36	36	£0.00		
37	37	£0.00		
38	38	£0.00		
39	39	£0.00		
40	40	<u>£0.00</u>		
		£0.26		

Appendix C: Schedule of Enhanced Materials

Project Name:			
Material	Commuted sum per m²	Total (m²)	Commuted Sum
Coloured SMA	£5.28		
Coloured HRA	£6.87		
Coloured AC for footways	£10.30		
Unbound Gravel	£10.83		
Porous Flexible Rubber/Aggregate Surfacing	£22.19		
Natural Stone Flags	£36.46		
Natural Stone Setts	£37.78		
Precast Concrete Flags and Blocks incorporating Exposed Aggregate Top Layer	£8.03		
	Commuted sum per lm	Total (lm)	Commuted Sum
Natural Stone Kerbs	£1.59		
Stone Reproduction Kerbs	£0.26		
Total Commuted Sum			