Part 4 – Materials and construction

Section MC1: General

4.1 The standard construction requirements and materials set out in this Part are based on national standards and advice used for constructing and maintaining highways throughout the region. They should normally be applied to **all** highway works and have been chosen to make sure the highways function safely and that they can be maintained in the most cost-effective way. To achieve these ends, we have considered the principles of quality, durability, maintainability and sustainability.

4.2 This Part also provides details on our commuted sums policy, including setting out the legal background and how we calculate the sums.

4.3 This part should also be read together with relevant standards drawings and accompanying notes and Specification.

Using alternative materials

4.4 We recognise however that applying strict standards for construction details and materials may not always be appropriate to streets in new housing layouts. Among other requirements, the aim in building new developments should be to create places and spaces (including adoptable highway areas) which are attractive, of high quality and have their own distinctive identity while respecting and enhancing local character. The Manual for Streets sets out that using local materials can strengthen local character by relating a layout to neighbouring developments.

4.5 To recognise and overcome some of the inflexibility that results from using standard materials and so on, we are prepared to allow you to use some alternative materials, landscaping treatment and features. However, if alternative materials and so on are to be used they will need to be:

- To a BS/EN standard
- easy to maintain and replace;
- durable;
- safe for purpose;
- sustainable;
- appropriate to the local character;
- durable and suitable for the hierarchy of the road/ footway section and the anticipated traffic/ pedestrian flows;

- provide a sustainable solution, including the ability to replace components to maximise the life of the asset;
- accord to the principles of Asset Management and provide good "Whole of life" cost value in terms of replacement, serviceability and maintenance regimes
- the use of recycled materials will be considered where appropriate; and
- supported by a commuted sum to meet the additional costs in maintaining and replacing non standard assets.

Any alternatives should also not place a burden on our budget. So, where we agree in principle to you using alternative materials and features, we will normally require you to pay a commuted sum to cover any additional maintenance costs. (Please see Section MC18 for further details on our commuted sums policy.)

Using alternative materials in conservation areas

4.6 If you need to use traditional or other agreed non-standard surfacing and kerbing materials in a conservation area, to comply with the requirements of the planning authority you will not normally have to pay a commuted sum. (Please see Section MC18 for further details on our commuted sums policy.)

4.7 A characteristic of many villages is the informal appearance of the highway edge which consist of grass verges without kerbs. In these areas standard pre-cast concrete kerbs may not be appropriate and you could use natural stone or riven or exposed aggregate kerbs to prevent overriding. It may be desirable to upgrade verges to include kerbs to improve pedestrian safety, drainage and to discourage parking.

Using new materials and construction methods

4.8 We will consider new or innovative materials, construction methods and solutions where this is not likely to increase future maintenance costs or detract from the quality and sustainability of the environment. Where maintenance costs would be increased, but the materials are otherwise acceptable, we will require the payment of commuted sums. Please see Section MC18 for further details on our commuted sums policy.

Marking the highway boundary

4.9 It is important that there is clear demarcation between public and private space. You must define the highway boundary by continuous 50mm x 150mm edging type EF to BS7263 unless we agree otherwise. Alternative approaches to demarcation will be considered on a site by site basis, for example, in conservations areas.

Section MC2: Designing and managing the environment

4.10 You can find guidance on environmental design and construction of road schemes in volume 10 of the Design Manual for Roads and Bridges (DMRB). You should use the guidance to help you to identify areas and issues where you need to carefully consider environmental factors. The guidance has been written for trunk road schemes but can be applied to other roads. So we will normally require you to follow it.

4.11 Some plants and animals are given special protection under UK and European law, and volume 10 of DMRB will give you detailed information and advice. HA 84/01 Nature Conservation and Biodiversity (DMRB volume 10 Section 4 Part 1) will give you information on who you need to consult, together with other advice including:

- Annex 1 - Seasonal constraints on animals including birds and fish.
- Annex 2 - List of the relevant conventions and legislation.
- Annex 3 - Species advice.
- Annex 4 - Habitat advice.

Section MC3: Specification

4.12 All highway works must normally be in accordance with:

- the ‘Specification for Highway Works’ (SHW), published by Her Majesty’s Stationery Office as Volume 1 of the Highways Agency’s Manual of Contract Documents for Highway Works;
- must comply with the ‘Notes for Guidance on the Specification for Highway Works’ published by Her Majesty’s Stationery Office as Volume 2 of the Highways Agency’s Manual of Contract Documents for Highway Works; and
- our ‘Specification for Highway Works for Development’.

You should use the copies of the document that are current when you design works under Section 38 or Section 278 agreements.

4.13 Some of the clauses and Appendices in our Specification contain additions and amendments to the SHW. Where the Specification clauses and Appendices in our document vary from the SHW, the ones in our document will apply.

Section MC4: Standard drawings

4.14 All works must normally comply with our standard drawings. You can find these for the region at www.leics.gov.uk/standard_drawings.htm. You should check that you are using current drawings.

4.15 The standard drawings include extensive notes, including notes about construction, which supplement the drawings and Specification. You should read these notes when you refer to standard drawings.

4.16 If your proposals are not covered by the standard drawings, you will need to submit scheme-specific drawings to us for approval. You should do this at the earliest opportunity in the design process.

Section MC5: Site surveys, tests and investigations

4.17 You must arrange any site surveys, tests and investigations that we need before you submit your design to us. These must cover:

- a land survey including features such as:
  - watercourses;
  - ditches;
  - existing drainage systems and outfalls; and
  - services and existing foundations;
- a survey of existing trees and other soft landscape features including:
  - the condition of each tree;
  - its size and form; and
  - details of tree preservation orders and so on;
- nature-conservation surveys;
- details of how surface water run-off will be dispersed;
- consultation with the Environment Agency;
- the depth of the water table and perched water tables;
- the impact on adjacent developments and land;
- a risk assessment of chemical contamination;
- the presence of hazardous materials;
- the stability and acceptability of earthworks;
- an assessment of subgrade strength;
- the frost susceptibility of subgrade;
- the suitability of subgrade soils for lime or cement stabilisation (if required); and
- the possible recycling of on-site materials.

4.18 You must submit the results of the tests to our Engineer before you begin construction.

Section MC6: Sampling and testing goods and materials

4.19 You must arrange and pay for all the sampling and testing outlined in Appendix 1/5 of our Specification. You must also submit one copy of these test results to our Engineer.

4.20 Our Engineer reserves the right to carry out any sampling and testing he or she feels is necessary to confirm that the goods and materials meet with the Specification. They can also core through any pavement construction at any stage to check the thickness of the layers and the type and standard of construction. If we find the work does not meet the Specification, you will be required to pay for the associated costs to the authority. You can find a list of the samples of goods and materials which we may ask you to supply to check you are meeting the Specification in Appendix 1/6 of our Specification.

Section MC7: Fencing and barriers

General

4.21 We will not adopt any fencing erected on the highway boundary unless it:

- is provided as a safety feature at the top of any structure retaining the highway;
- provides protection against a hazard existing on the adjacent land; or
- is a noise barrier (See Section MC17).

In other circumstances it will be necessary to establish who is responsible for maintaining the fencing in the early stages of our discussions with you.

4.22 For works that we are to adopt, you can find details of fencing, including brook railings, boundary markers, gates and stiles and pedestrian guardrails in the standard drawings and Appendices 4/1 and 4/2 of our Specification.

Safety fences and barriers

4.23 Safety fences and barriers must comply with Section 2 of ‘Highway Construction Details’ published by Her Majesty’s Stationery Office as Volume 3 of the Highways Agency’s Manual of Contract Documents for Highway Works. Safety Fencing should not generally be included within residential developments as the need should be designed out to provide layouts that provide places for living. Where safety fencing is unavoidable or required to address existing situations where problems exist or circumstances have changed then reference should be made

to the RRRAP (Road Restraint Risk Assessment Process) contained in TD 19/06 where flows are appropriate. In the event that flows are not sufficient to meet the thresholds in this guidance then individual risk assessment should be made in conjunction with Road Safety / Safety Audit. Care should be taken to avoid the use of safety fencing to protect road users from the dangers of other objects or hazards within the highway boundary by first determining whether the objects in question could be relocated to remove the hazard

Pedestrian barriers

4.24 Where a footpath joins a road you must provide staggered barriers to:

- prevent pedestrians running straight out into the road; and
- reduce the likelihood of misuse by cyclists.

You can find details of these barriers in the standard drawings.

4.25 Where using a staggered barrier is not appropriate, you must provide an agreed length of pedestrian guardrail which runs parallel to the edge of the road, leaving a clearance of 450mm from the carriageway. You may need to widen the footway to maintain the standard footway width past the guardrail.

Pedestrian guardrails

4.26 You must use guardrails where the number of pedestrians makes it necessary for you to channel them to the appropriate crossing point. You should take care to make sure that the guardrails do not interrupt visibility. You should normally use high-visibility pedestrian guardrail.

Noise fencing

4.27 Unless we agree otherwise, you should treat noise fencing as a highway structure. As such, it must meet the design requirements for a structure and you must pay us design checking fees and a commuted sum for its future maintenance. You can find more information on noise fencing in Section MC17. Please see Section MC18 for further details on our commuted sums policy.

Figure MC1 Example of noise fencing

Section MC8: Drainage

General

4.28 Normally the highway drainage on new developments is connected to a drainage system that is adopted by the water company and is subject to a Section 104 agreement under the Water Industry Act 1991. You must provide evidence of this agreement before we will agree to sign a Section 38 agreement. We will not adopt the roads until the water company has issued a provisional certificate of adoption for the drainage system or it is to be adopted by us as a highway drain.

4.29 All highway drains should be located within land that we are adopting. Only in exceptional circumstances will we permit them in land that is to remain private. You must cover any adoptable highway drain outside the limits of the adoptable highway by an easement agreement. This should be in place before, or be a condition of, the Section 38 or 278 agreement.

4.30 You must provide written evidence of the right to discharge water from a highway drain into any receiving ditch or watercourse with no liability on us. The Environment Agency will approve all such discharges and you must provide us with written evidence that you have received any approval and consents you need.

4.31 Where a piped system discharges into an existing ditch or watercourse, the pipe invert (bottom of the inside of the pipe) must not be lower than the level of the average flow in the ditch or watercourse and it should always be at least 150mm above the ditch or watercourse invert. You must direct the end of the pipe so it discharges at an angle less than 60 degrees to the direction of flow in the ditch or watercourse. The end of the pipe must have a headwall and apron which supports the bank above and adjacent to the pipe and prevents any scouring underneath the pipe. You must protect the banks of the ditch or watercourse from

scouring. You must meet any requirements laid down by the Environment Agency.

4.32 You must install oil interceptors as required by the Environment Agency.

4.33 If the outfall is to an existing highway drain, you will have to prove its capacity and condition before we can approve the connection. For all works incorporating highway drainage you will need to carry out and provide a copy of a CCTV survey and report. You must carry out any improvement works found necessary, all at your expense.

4.34 We will not normally accept drainage of other non-adopted areas into an existing or adoptable highway drain.

4.35 Where private non-adoptable drives and other surfaces fall towards the adoptable highway, you must prevent surface water run-off from reaching the highway boundary and entering the highway drainage system.

Land drainage

4.36 Where there is or is likely to be run-off from landscaped areas, open spaces and adjoining land, you must make appropriate arrangements for land drainage. This can include providing intercepting drains and ditches with satisfactory outfalls.

Existing drainage systems

4.37 You must deal with any drainage systems existing within the development site, including any land drains, ditches, watercourses, outfalls from adjacent land or drainage systems, to our satisfaction and that of the Environment Agency and the owner of the systems. You must have the consent of the Environment Agency for piping an existing ditch or watercourse, in accordance with Section 23 of the Land Drainage Act 1991.

Sustainable urban drainage systems (SUDS)

4.38 Where you are proposing SUDS for highway drainage, you must enter into discussions with all relevant parties at an early stage (and certainly before any planning application) to agree ownership and responsibility for the facility. (You may need to address this as part of a concept proposal that you are required to prepare for your proposed development. Please see Part 2, Section PDP2 for further information on concept proposals.). We will not adopt your road unless we are satisfied with the design of the system and that satisfactory arrangements are in place to cover its future maintenance.

4.39 If we are to adopt SUDS and non-standard drain elements, including above-and below-ground flow attenuation systems and pollution control devices, we will require you to pay a commuted sum to cover future maintenance. (Please see Section MC18 for further details on our commuted sums policy).

The hydraulic design of adoptable highway drains

4.40 The hydraulic design of adoptable piped highway drains must meet the requirements of the current edition of ‘Sewers for Adoption’ published by WRc plc..

4.41 You must submit calculations using the specified method of calculation and format. We will accept output from an approved computer programme using the specified method and parameters.

Hydraulic design – protection against flooding

4.42 The system must be designed to meet the requirements of the current edition of ‘Sewers for Adoption’ published by WRc plc..

4.43 The system should be designed not to flood any part of the highway or site in a 1 in 30 year return period design storm or any other return period that is set out in any latest version of ‘Sewers for Adoption’.

4.44 Your design should also show the line and extent of flow paths and the potential effects of flooding if storms are greater than those allowed for by your design.

Minimum pipe size

4.45 The minimum pipe diameter for adoptable highway drains, other than gully connections, is 225mm. The minimum size for a road gully connection is 150mm.

Use of combined kerb and drainage systems

4.46 You must consider a combined kerb and drainage system where the minimum longitudinal carriageway gradient is less than 1 in 100 for flexible surfaces and less than 1 in 80 for block paved surfaces. Please see our standard drawing for details. We will normally require you to pay a commuted sum to cover any additional maintenance where a combined drainage system is used.

Figure MC2 Example of a combined kerb and drainage system

Approving drainage structures

4.47 Any:

- drain, piped or box culvert, sewer or drainage structure that has a clear span or internal diameter of greater than 900mm; and
- headwall greater than 1.5m retained height;

will be classified as a highway structure and be subject to the specific requirements that apply to highway structures.

Catchpits

4.48 Unless otherwise specified, you must use catchpits and not manholes on adoptable highway drainage systems. SUDS structures (typically over-sized chambers and cover slabs which are greater than 1050mm in diameter), even if they are to be adopted by the relevant water company, must still be designed to the relevant standards for retention within the highway (British Standard 5400). You will need to demonstrate to us that this has been achieved.

4.49 You must provide a catchpit (an access chamber, with sump, on a drainage system) where there is any discharge into an existing ditch or watercourse.

4.50 On all drainage runs we are to adopt where the pipe diameter is 900mm or less, you must provide a catchpit at:

- every change of alignment or gradient;
- the head of all main pipelines;
- every junction of pipelines except for single-gulley connections;
- every change in pipe diameters; and
- a maximum spacing of 90 metres.

Catchpit and manhole positions

4.51 You should normally locate catchpits or manholes within the verge, and not the carriageway, on classified roads and other roads with a higher status than a residential access road or industrial access road. The outside of catchpits and manholes should be at least 500mm from the kerb line or the edge of the carriageway. Any catchpits or manholes within a carriageway must be located so that they can be accessed while providing the necessary safety zones and without preventing traffic from passing. This will generally mean that you should not site them at or near the centre of the carriageway or within a width restriction. You should also take care when locating catchpits or manholes within junctions or roundabouts, based on the same criteria.

Positioning and alignment of highway drains and storm and foul sewers

4.52 Highway drains must be laid:

- in straight lengths;
- to straight grades between catchpits; and
- within the carriageway or verge.

You must not lay drains and sewers and their associated catchpits or manholes in footways as this space is required for other utility apparatus. As described in paragraph 4.29, all highway drainage should be located within land that we are adopting.

Gullies

4.53 All gullies should be trapped and the maximum length of gulley connection should not be more than 15m. It will not normally be acceptable to connect one gulley connection directly into another. Gully spacing should be calculated from Table MC1 and the accompanying notes:

Table MC1: Gully spacing				
Carriageway gradient	1/100	1/80	1/60	1/40 or steeper
Area drained (including footways and so on) (m^2)[a]	170[b][c]	180[b] [c]	200[b] [c]	240[b] [c]

[a] When calculating the areas drained, you must make allowances for all footways, footpaths, paved areas and verges that fall towards the carriageway.

[b] Gullies must not be spaced more than 40m apart, irrespective of the areas drained, except at summits where the first gully should not be more than 40m from the high point.

[c] Double gullies must always be provided at sag points and low points and each must have its individual connection to the main sewer or highway drain.

4.54 In footpaths, footways and cycleways separated from carriageways, you must provide gullies or channels connected to the highway drainage system where surface water would otherwise discharge onto adjacent property or cause flooding of footpaths, footways or carriageways.

4.55 You should site gullies upstream of the tangent point at road junctions so that surface water in the channel does not flow across the junction. You should take care to avoid ponding near the mid-point of radius kerbs. Where the road is super-elevated, you should site a gully just before the point where the adverse camber is removed to prevent water in the upstream channel flowing across the carriageway.

4.56 You should take care to avoid ponding in the transition length, when the longitudinal gradient is flat or where there are traffic islands, central reserves or traffic-calming measures. You must not site gullies within

pedestrian crossing points. Where possible, locate them directly upstream of the crossing point.

4.57 You should not site gullies where traffic would be prevented from passing while they are being emptied, for example within a carriageway width restriction.

4.58 You will need to provide us with a contour plan to show that gullies are located in the correct position as part of your design submission for works under Section 38 or Section 278 agreements.

Providing sub-soil drainage

4.59 You must construct a system of sub-soil drainage to a suitable agreed outfall all to our satisfaction where:

- the winter height of the water table is within 600mm of formation level; or
- the sub-soil is unstable because of being waterlogged; or
- there is a likelihood of water running from or out of adjacent ground; or
- springs, land drains or watercourses are present; or
- the finished road is below existing ground level, regardless of the water table; or
- the sub-grade is likely to be altered due to groundwater.

Backfilling trenches

4.60 You must backfill all drainage, utility and other trenches in the highway for industrial and commercial premises up to formation level with GSB type1 granular sub-base material. Backfill on residential sites should be a granular material to the approval of the highway authority (acceptable material will typically include GSB type 1 or material graded to 6F1).

Section MC9: Earthworks

General

4.61 All earthworks must comply with Series 600 and Appendices 6/1, 6/2, 6/7 and 6/8 of our Specification.

4.62 Embankments and other areas of fill must:

- be formed of acceptable material excavated from within the site or imported on to the site;
- meet the requirements of Appendix 6/1 of our Specification for use in the permanent works; and
- have the approval of our Engineer to be used in that particular location.

Section MC10: Road pavements

Constructing the site access and roads external to a development

4.63 The design and construction of works on classified roads and other roads (existing or proposed) not covered by this design guide must normally comply with the ‘Design Manual for Roads and Bridges’ published by Her Majesty’s Stationary Office.

Internal development roads

4.64 Listed below are the road types covered by this design guide. The construction varies according to the road type. It is essential that you mark the road category clearly on the plans you submit for approval in line with the abbreviations in Table MC2. You can find further details of the road types in Part 3, Section DG2.

Table MC2: Development road types

Road category	Abbreviation
Residential access road	RAR
Residential access way	RAW
Major industrial access road	MajIAR
Minor industrial access road	MinIAR

Subgrade assessment

4.65 For design purposes, you must estimate the CBR before you begin construction. You should notify us in advance of site tests to establish the subgrade strength and give us the opportunity to be present at such tests. You should provide the highway authority with copies of all test results.

4.66 You should use soil-classification tests to give the types of soil an 'Equilibrium CBR' based on material type, using Table MC3 unless we agree otherwise.

Table MC3: Equilibrium CBR values to be used for design purposes[(a)]		
Type of soil	**Plasticity index**	**Equilibrium CBR %**
Heavy clay	50 or greater	Less than 2
Heavy clay	40 to 49	2
Heavy clay	30 to 39	2
Silty clay	20 to 29	3
Sandy clay	10 to 19	4
Silt	Less than 10	1
Sand (poorly graded)	Non-plastic	20
Sand (well graded)	Non-plastic	40
Gravel (poorly graded)	Non-plastic	40
Sandy gravel (well graded)	Non-plastic	60

[(a)] Based on Design Manual for Roads and Bridges 7.2.2 HD 25/94.

Carriageway sub-base and capping layer

4.67 Use Table MC4 to find the thickness of capping and sub-base you need to use. When the subgrade CBR is between 3% and 15%, you can use either:

Option A: 150mm of sub-base on a varying thickness of capping depending on the CBR value; or

Option B: an increasing thickness of sub-base with the decreasing CBR, with no requirement for capping.

CBR Value	**Min 450mm Frost Susceptibility (see clause 4.68)**					
	Access Road 250mm (Bituminus layer		Access Way (200mm Bituminus layer		Industrial Road (300mm Bituminus	
	Capping	Sub Base	Capping	Sub Base	Capping	Sub Base
Less than 2%	550	200	500	250	600	150
2%	400	200	350	250	450	150
3%	300	200	250	250	350	150
4%	250	200	200	250	300	150
5% to 15%	200	200	200	250	250	150
More than 15%		200		250		150

(a) The foundation design should not vary frequently along the road. You should select an appropriate value for each significant change in the subgrade properties.

(b) Where the equilibrium CBR falls between values in the above table, you should round down the value to the lower value.

(c) When the subgrade CBR is sufficiently below 2% that capping with sub-base is not sufficient to support the pavement, special measures will be required. You can find advice in DMRB 7.2.2 HD25/94.

Frost susceptibility

4.68 Material within 450mm of the finished road surface must not be frost susceptible.

Capping materials

4.69 You will need approval for each site for the capping layer which must comply with our SHW Table 6/1, Type 6F2 or 6F3. You must test the capping layer as necessary to demonstrate that it has an in-situ CBR of 15% (or equivalent test result). We may approve other materials as long as you have previously demonstrated to us that they will achieve an in-situ CBR of 15% (or equivalent test results).

Sub-base

4.70 Sub-base must be Type 1 to Clause 803 of the Highway Agency Specification.

Surface and binder courses and bases

4.71 Table MC5 gives the:

- required minimum design thicknesses; and
- options you have for the flexible and modular (block) materials you should normally use for different development road types.

Roads not covered by this table should be designed on a site-by-site basis to Design Manual for Roads and Bridges, Volume 7. Where it is necessary to alter or improve an existing road to serve a development, in all cases the *minimum* depth of surface course, binder course and base layer should normally not be less than that of the site access road, as given in Table MC5. (For example, if you are widening a road to serve a housing development accessed by a 'residential access road', then the material depth should not be less than 250mm - equal to 40mm+60mm +150mm. It may be necessary to overlay the existing carriageway to achieve the required depth.)

Table MC5: Road carriageway construction materials and depths

	Residential access roads				Residential access ways				Industrial access roads		
	Bituminous			Block	Bituminous			Block	Bituminous		
			notes				notes				notes
Surface course	40mm	SMA 10 surf 40/60 (PSV 55)	1,2	80mm	40mm	SMA 10 surf 40/60 (PSV 55)	1,2	80mm	50mm	HRA 35/14 F surf 40/60 des (20mm pre-coats)	1
	40mm	HRA 55/10 F surf 40/60 des	2		40mm	HRA 55/10 F surf 40/60 des	2				
	40mm	AC 10 Close surf 100/150	2		40mm	AC 10 Close surf 100/150	2				
Binder course	60mm	AC20 dense bin 100/150 rec		30mm sand 60mm AC20 dense bin 100/150 rec MHA material reference BC2	50mm	AC 20 dense bin 100/150 rec		30mm sand 110mm AC20 dense bin 40/60 rec HMA material reference BC1	60mm	AC20 dense bin 40/60 rec	
									60mm	AC20 HDM bin 40/60 des	
Base	150mm	AC 32 base 40/60 rec		100mm AC32 base 40/60 rec MHA material reference B1	110mm	AC32 base 40/60 rec			190mm	AC32 base 40/60 rec	3
										AC32 HDM base 40/60 des	3

	Polished stone value (PSV) of course aggregate in surfacing course shall be determined from the Table of Investigatory Levels, see DMRB Part 1 HD 36/06
1	(http://www.dft.gov.uk/ha/standards/dmrb/vol7/section5/hd3606.pdf) however Leicestershire use the table in Appendix M, but should not be less than 55
2	HRA 50/10 bin 40/60 (material ref REG1) may be used for hand laying speed tables.
3	Subgrade assessment capping layer/sub-base design are covered in Section MC10 paras 4.65-4.7
4	However for Leicestershire any Binder course material laid as a running surface prior to the final surface course being laid must have a minimum PSV of 55 and a AAV of 7 this includes under block paved surfaces in carriageways

Key

HRA = Hot rolled asphalt;
CGM = Close graded macadam;
HSCA = High stone content asphalt;
DBM = Dense bitumen macadam

Note: We will not usually accept the use of block-paving for industrial roads.

4.72 We may agree to you using stone mastic asphalt (SMA) as an alternative surface course material. You must make up any reduction in thickness of the surface course by increasing the thickness of the binder course by an equal amount. If you use SMA, we will require you to pay a commuted sum for the additional maintenance cost. (Please see Section MC18 for further details on our commuted sums policy).

4.73 You can find full details of the permitted standard materials in Appendix 7/1 of our Specification.

Concrete-block paving

4.74 Where we agree that it is appropriate, you may lay concrete-block paving to carriageways, shared surfaces and other areas used by vehicles. This should be laid instead of the surface course and binder course on the standard thickness and materials for the sub-base and base layers for the road type in question. The concrete block paving must comply with and be laid in accordance with the requirements of Appendix 11/1 of our Specification for concrete-block paving in carriageways.

4.75 If you use block paving you may need to pay a commuted sum as indicated in Table MC6.

High friction surfacing

4.76 You are required to provide high friction surfacing on the approaches to signal-controlled junctions, roundabouts and pedestrian crossings unless we agree otherwise. This will be either hot applied (thermoplastic) or cold applied (thermosetting) and must be in accordance with Appendix 7/1 of our Specification.

4.77 High friction surfacing must be applied for a minimum length of 50m ahead of the stop-line on roads subject to a 30 mph limit, but an increased length may be required due to the approach speed, accident record, average queue length, proximity of side roads and mix of traffic. Outside 30mph limits you should provide a minimum length equal to the stopping distance for the approach speed plus 10 m. On approaches to pedestrian crossings the high friction surfacing must be continued past the stop-line to the first line of crossing studs.

4.78 Hot applied systems can take advantage of smaller ’windows’ of good weather in the winter period. They also need only a short period of time before the road can be re-opened to traffic because they cool to ambient road temperature quite quickly. This can be an advantage in traffic-sensitive situations (for example, where a prolonged closure would result in major traffic diversions and disruption). The length of time needed for a cold applied system to set can be typically three to six hours at a reasonable ambient air temperature (above 10 ºC). This makes it less suitable for applying in winter and applying in areas where closure for long periods would cause problems.

4.79 To reduce the risk of high friction surface systems failing too soon after application, they are best applied to surface courses that have been used by traffic for some weeks before the surfacing is installed. Further advice is included in DMRB volume 7 section 5 part 2 (HD 37/99).

Coloured surfacing

4.80 This will be either hot applied (thermoplastic) or cold applied (thermosetting) and must be in accordance with Appendix 7/1 of our Specification.

4.81 Hot applied systems can take advantage of smaller ’windows’ of good weather in the winter period. They also need only a short period of time before the road can be re-opened to traffic because they cool to ambient road temperature quite quickly. This can be an advantage in traffic-sensitive situations (for example, where a prolonged closure would result in major traffic diversions and disruption). The length of time needed for a cold applied system to set can be three to six hours at a reasonable ambient air temperature (above 10 ºC). This makes it

less suitable for applying in winter and applying in areas where closure for long periods would cause problems.

4.82 To reduce the risk of coloured surfacing systems failing too soon after application, they are best applied to surface courses that have been used by traffic for some weeks after the surfacing is installed.

4.83 We will require the payment of commuted sums to cover the future maintenance of such surfacing. Please also see Section MC18 for further details on our commuted sums policy.

Alternative materials for carriageways and shared surface areas

4.84 Where for aesthetic, environmental, or other such reasons you propose to use an alternative surfacing material, we will be prepared to consider its use so long as:

- we have agreed its use at an early stage;
- the material meets the requirements of quality, durability, maintainability and sustainability; and
- in the interest of highway safety the material must meet Specification requirements in terms of polished stone value (PSV), aggregate abrasion value (AAV) and so on as specified for surfacing materials in Appendix 7/1 of our Specification unless otherwise agreed.

To ensure that the surface can be kept safe and durable, we will need you to pay a commuted sum to cover the excess maintenance costs of most alternative materials and surfaces. Table MC6 gives a guide to indicate the types of materials you will have to pay a commuted sum for. Please also see Section MC18 for further details on our commuted sums policy.

Table MC6: Alternative surfaces for road and shared surface areas and commuted sums requirements

Normal alternative surfacing materials[(a)]	**Commuted sums payable?**
Surface dressing using locally-sourced granite aggregate chippings	No
Surface dressing using crushed rock aggregate from a specific non-local source	Yes
Surface dressing using pea gravel aggregate from a local source	Yes
Surface dressing using pea gravel aggregate from a non-local source	Yes
Surface dressing using crushed gravel aggregate from a local source	Yes
Surface dressing using crushed gravel aggregate from a non-local source	Yes
Stone mastic asphalt	Yes
Hot or cold applied coloured surfacing (resin system)	Yes
Standard surface course materials using a coloured binder and coloured aggregate or chippings	Yes

'Imprint' or other similar approved hot-applied, polymer-modified, synthetic bitumen-based compound, surface-applied block paving alternative finish	Yes
Standard 80mm concrete-block paving surface course	Yes for other than shared surface areas
'Tegula' or similar approved concrete-block paving surface course	Yes

[(a)] We will be prepared to consider other materials not listed above, so long as, among other things:

- you meet the requirements listed in paragraph 4.84;
- you can provide evidence of where the material has been used in similar circumstances and how durable it has been;
- the safe and satisfactory operation of the highway would not be threatened;
- accessibility is not threatened, including for pedestrians, cyclists and people with disabilities; and
- you pay a commuted sum where the future maintenance costs are greater than they would be if you used the more usual surfacing instead.

Resurfacing carriageways at junctions with existing roads and widening existing roads[(a)]

4.85 Where a new carriageway meets an existing county road or an existing adopted road is widened and:

- the construction joint falls within the running lane of the existing adopted road; or
- involves any changes to the adopted road carriageway, including additional areas of carriageway;

you must overlay or resurface the whole of the altered or widened carriageway unless we agree otherwise. At junctions, you must carry this out over the length from tangent point to tangent point of the junction radii. However, if the junction includes acceleration and deceleration splays (lanes) on the main carriageway, the full overlay or resurfacing of the whole carriageway must also include the full length of the splays, unless we agree otherwise.

(a) This applies to any adopted *see glossary]* road, other than those maintained by Highways England.

Speed control humps

4.86 You should only use vertical speed control measures where it has been agreed that vehicle speeds cannot be controlled either through site layout or horizontal speed control measures. (See Part 3, Section DG5 for further details).

4.87 On bus routes speed control humps must comply with paragraph 3.96 of Part 3.

4.88 Other than on bus routes, speed control humps must be flat topped humps or junction tables with a minimum plateau length of 7m and height of 75mm. Approach ramps should normally have a gradient of 1 in 13. Where the carriageway has a longitudinal gradient approaching the maximum allowed then the 'uphill' ramp gradient should be 1 in 15 and the 'downhill' ramp gradient should be 1 in 13.

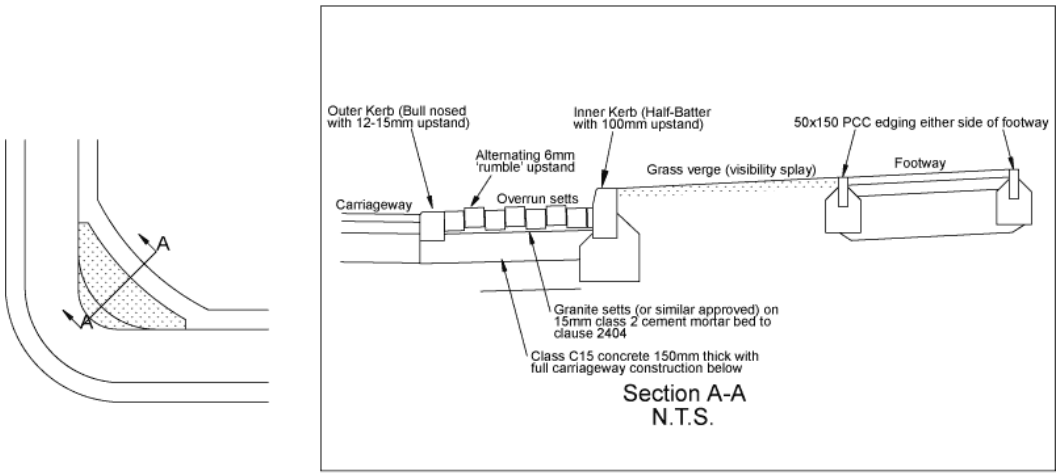
4.89 The humps and tables must be constructed in bituminous material (unless used on a block-paved carriageway or shared surface where they should be constructed in the same material as the carriageway), using 55%/10mm medium temperature asphalt to BS 594 column 3/4 unless otherwise agreed.

4.90 We will require the payment of commuted sums to cover the future maintenance of speed control humps and similar vertical traffic calming measures. Please also see Section MC18 for further details on our commuted sums policy.

Speed control bends

4.91 An overrun area must be provided to the inside of speed-control bends (a bend with an inside radius of 8m or less). It should normally be constructed as follows.

- The outer kerbline should be formed using 125mm x 150mm bull-nosed kerbs with 12mm to 15mm upstand.
- The inner kerbline should be formed using 8m radius 125mm x 225mm half-batter kerbs.
- It should be surfaced using granite setts (or other approved material) of a colour which contrasts with the main carriageway.
- Setts are to be laid with a 6mm level difference between rows to form a rumble area.
- Setts are to be laid with Class 2 cement mortar bed to Clause 2404 of the Highways Agency Specification, minimum thickness 15mm, on a 150mm thick C15P concrete bed with full depth road construction below.
- It should have a crossfall of 1 in 30 towards the other kerbline.



Notes:
1. Change in direction to be not less than 70° or more than 100° within a distance of 32m measeured along the inside kerb
2. The through view beyond the bend on to the approach should be blocked by buildings walls or dense planting etc.
3. A 15m separating straight is required after the speed control bend if the road curves in a reverse direction
4. There should be no vehicular accesses over the length of the forward visibility curve

Figure MC3 Overrun areas

Entry ramps

4.92 Entry ramps should normally have a gradient of 1 in 13 and a height between 75mm and 100mm.

Section MC11: Kerbs, footways, footpaths, cycleways and other similar paved areas

General

4.93 The construction should be in line with Table MC7. You should also refer to the standard drawings and Appendix 11/1 of our Specification.

Residential footways

Table MC7 : Residential Footways - construction materials and depths				
		Bituminous		Block Paving
Surfacing	20mm	AC 6 dense surf 100/150	90mm	60mm blocks on 30mm bedding sand (compacted)
		(MHA material reference SC12)		
Base course	50mm	AC20 dense bin 160/220 rec	70mm	AC20 dense bin 160/220 rec
		(MHA material reference BC3)		(MHA material reference BC3)
Sub-base	160mm	Granular Type 1	150mm	Granular Type 1
		(MHA material reference SB1)		(MHA material reference SB1)
	OR 225mm	Granular Type 1		includes vehicular crossings serving 5 or less dwellings
		(MHA material reference SB1)		
		vehicular crossi mc7 serving 5 or less dwellings		

DBM = Dense bitumen macadam GSB = Granular sub-base

(1) Footway crossing construction to serve developments of more than five dwellings. See Table DG15.

Concrete-block paving

4.94 Where we agree that it is appropriate, you may lay concrete-block paving to footways and other paved areas. The concrete block paving must comply with and be laid in line with the requirements of Appendix 11/1 of our Specification for concrete-block paving in footways.

4.95 If you use block paving you may need to pay a commuted sum as indicated in Table MC9.

4.96 **Pedestrian-deterrent paving**

4.97 You should use approved pedestrian-deterrent paving in areas where pedestrians are to be discouraged.

Strengthening footways to accommodate heavy-vehicle parking or over-running

4.98 You must strengthen residential footways where heavy vehicles such as delivery (service) and maintenance vehicles, refuse lorries and buses are likely to be park on them or overrun them. See Table MC7a for details.

Table MC7a : Strengthening Residential Footways - construction materials and depths

	Bituminous		Block Paving	
Surfacing	25mm	AC 6 dense surf 100/150	90mm	60mm blocks on 30mm bedding sand (compacted)
		(MHA material reference SC12)		
Base course	90mm	AC20 dense bin 160/220 rec	90mm	AC20 dense bin 160/220 rec
		(MHA material reference BC3)		(MHA material reference BC3)
Sub-base	270mm	Granular Type 1	270mm	Granular Type 1
		(MHA material reference SB1)		(MHA material reference SB1)

[(a)] The sub-base is to be increased to 365mm for CBRs of 2% or less

Footways and other hard-paved areas on industrial access roads

4.99 The construction should be in line with Table MC8. Where a footway crossing is to be used to access an employment or commercial development (as allowed for in Part 3, Section DG19), the footway crossing must be constructed in line with industrial access road requirements given in Table MC5.

Table MC8 : Footways and paved areas on industrial access roads - construction

	Bituminous	
Surfacing	40mm	HRA 55/10 F surf 100/150 des
		(MHA material reference SC8)
Base course	75mm	AC20 dense bin 160/220 rec
		(MHA material reference BC3)
Sub-base	270mm	Granular Type 1
		(MHA material reference SB1)

[(a)] The sub-base is to be increased to 365mm for CBRs of 2% or less

4.100 Where there is a likelihood of regular parking on hard-paved areas or areas that would otherwise be grassed, you should use high-relief contour paving to deter vehicles.

Additional paved areas

4.101 Where the overall layout of the development includes areas which exceed normal requirements for the safe and satisfactory operation of the highway but which we have agreed to include in the adoptable area, you will have to pay a commuted sum for the cost of maintaining that area. This will include the costs of using any permitted alternative surfacing materials. Please also see Section MC18 for further details on our commuted sums policy.

4.102 If you need to provide additional width for visibility at junctions, inside bends and for other reasons, you must hard pave any small ‘verge’ areas that result. Normally this would apply to a minimum width of 1m and a minimum area of 10m2 for grass and 6m2 for shrub and ground-cover planting. However, ‘verge’ areas bigger than 10m2 should not normally be hard paved, instead they should be soft landscaped (grassed or planted and so on) unless the paving forms part of the design concept and we have agreed it at an early stage.

Flush dropped pedestrian and cyclist crossing points

4.103 You must provide these at all points where pedestrians and cyclists cross or join a carriageway (including any access more than a simple vehicular footway crossing). These crossing points will normally be constructed to our normal standard drawing. You should only construct crossings to our alternative standard drawing at locations we have agreed.

Tactile paving surfaces

4.104 You should construct tactile paving surfaces at all controlled and uncontrolled crossing points in accordance with the government publication ‘Guidance on the use of Tactile Paving Surfaces’ and our standard drawings.

Alternative surfacing materials for footways and cycleways

4.105 Where for aesthetic, environmental, or other such reasons you propose to use an alternative surfacing material, we will be prepared to consider its use so as long as:

- we have agreed its use at an early stage; and
- the requirements of quality, durability, maintainability and sustainability are met.

To make sure that the surfaces can be kept safe and durable, we will need you to pay a commuted sum to cover the excess maintenance costs of most alternative materials and surfaces. Table MC9 is a guide to indicate the types of materials you will have to pay a commuted sum for. Please also see Section MC18 for further details on our commuted sums policy.

Table MC9: Alternative footway, cycleway and hard-paving surfaces and commuted sums requirements	
Normal alternative surfacing materials[(a)]	**Commuted sums payable?**
Surface dressing using locally-sourced granite aggregate chippings	No
Surface dressing using crushed rock aggregate from a specific non-local source	Yes
Surface dressing using pea gravel aggregate from a local source	Yes
Surface dressing using pea gravel aggregate from a non-local source	Yes
Surface dressing using crushed gravel aggregate from a local source	Yes
Surface dressing using crushed gravel aggregate from a non-local source	Yes
Hot or cold applied coloured surfacing (resin system)	Yes
Standard surface course materials using a coloured binder and coloured aggregate or chippings	Yes
'Imprint' or other similar approved hot-applied, polymer-modified, synthetic bitumen-based compound, surface-applied block paving alternative finish	Yes
Standard 60mm concrete-block paving surface course	Yes
'Tegula' or similar approved concrete-block paving surface course	Yes

[(a)] We will be prepared to consider other materials not listed above, so long as, among other things:

- you meet the requirements listed in paragraph 4.104;
- you can provide evidence of where the material has been used in similar circumstances and how durable it has been;
- the safe and satisfactory operation of the highway would not be threatened;
- accessibility is not threatened, including for pedestrians, cyclists and people with disabilities; and
- you pay a commuted sum where the future maintenance costs are greater than they would be if you used the more usual surfacing instead.

Widening existing footways, footpaths and cycleways

4.106 You must overlay or resurface full width any existing footway, footpath or cycleway that is widened, unless we agree otherwise.

Section MC12: Traffic signs, road markings, studs and traffic signals

General

4.107 All traffic signs you use (including bollards, retroreflecting road studs and road markings), whether permanent or temporary, must be the size, shape, colour and type prescribed in The Traffic Signs Regulations and General Directions 2002 (Statutory Instrument 2002 No. 3113), the Zebra, Pelican and Puffin Pedestrian Crossings Regulations and General Directions 1997 (Statutory Instrument 1997

No. 2400) and any later amendments. Other relevant requirements are included in the above Regulations and General Directions.

Traffic regulation orders

4.108 Traffic regulation orders (TROs) are required for cycleways and may be required for footpaths, to stop motor vehicles or cyclists using them. They may also be required for certain traffic signs and road markings. The successful making of an order is not guaranteed. But, you must pay any costs we incur in making these orders or alterations to existing orders, whether or not the order is successfully made. Our information leaflet provides further details on TRO procedures.

Public consultation

4.109 Before we make a TRO we have to carry out a public consultation. This gives members of the public the opportunity to raise objections. Because of this, the time it takes to complete the process can vary. You must pay any costs we incur carrying out these consultations. We also have to carry out public consultations for traffic-calming and other works on the existing highway. You are responsible for the cost of these consultations also. The successful outcome of consultations is not guaranteed, but you must still pay our costs even if there is not a successful outcome.

Traffic signs

4.110 You must show the details of individual traffic signs, including their posts and foundations, on the traffic sign schedule sheets included in Appendix 12/1 of our Specification. These must comply with Appendix 12/1 of our Specification and the standard drawings.

Changes to original road layout

4.111 You must provide signs to diagram 7014 of the Traffic Signs Regulations and General Directions 2002 using the appropriate permitted variant on all approaches to a permanent alteration to the original road layout as soon as it is brought into use. You must maintain these signs for three months and remove them at the end of that time.

The electricity supply to illuminated traffic signs

4.112 Most illuminated signs are to be fed by an electricity company supply. However, certain signs must be fed by a highway authority private supply, for example, a bollard on a traffic island in the middle of the road.

4.113 Your layout plan must show the location of all signs and bollards that need illumination so that we can identify the requirements for the electrical supply. We will incorporate these requirements into the street-lighting design we will provide for you.

4.114 You are responsible for:

- arranging for the electricity company to provide the electricity supply to the illuminated signs or arranging for a highway authority private supply;
- providing test certificates in accordance with BS7671; and
- paying for all aspects of the works including paying energy charges and maintenance of the illuminated signs before we issue the final certificate.

Road markings

4.115 You must provide road markings in accordance with the Traffic Signs Manual Chapter 5 and the Traffic Signs Regulations and General Directions 2002.

4.116 You must show the location, colour and type of permanent road markings on your drawings.

4.117 The markings must comply with Appendix 12/3 of our Specification.

Street name plates

4.118 You are required to apply to the district council as the street-naming authority for names to be given to any new lengths of road. The district council will specify the details that they require, and you may be able to submit suggested names for consideration.

4.119 The district council will advise you of the names chosen, following the necessary consultations. It is your responsibility to erect the street name plates which the district council has chosen.

4.120 Any street name plates on private drives or unadopted ‘roads’ should clearly state that drive is ‘private’ or the road ‘unadopted’.

Road studs

4.121 You must:

- provide road studs in accordance with the Traffic Signs Manual, Chapter 5;
- show the locations and positions of road studs on your drawings;
- use road studs that comply with Appendix 12/3 of our Specification; and
- use stainless steel non-reflective road studs at pedestrian, cyclist and equestrian crossings to form marks as shown in diagrams 1055.1 and 1055.2 of the Traffic Signs Regulations and General Directions 2002.

Traffic signal equipment

4.122 We will normally design the traffic signals within the highway works based on detailed road layout drawings you have supplied.

4.123 We will normally supply and install all permanent traffic-control equipment to be installed as part of the highway works. You must pay the reasonable cost to us for designing, supplying and installing the equipment.

4.124 You must normally pay us a commuted sum towards the future maintenance of the traffic-signal equipment. Please also see Section MC18 for further details on our commuted sums policy.

4.125 You must allow us access at all reasonable times to any part of the site on which cables, pipes, ducts or other apparatus associated with the traffic-signal equipment is to be installed or is located so we can carry out any works we need to do to install and maintain the cables, pipes ducts or other apparatus.

Section MC13: Street lighting

General

4.126 After we have issued technical approval for your highways works (for Section 38 works see Part 5, Section ANR5 and for Section 278 works see Part 6, Section WEH4), a street-lighting design must be provided in accordance with:

- BS5489; and
- the Highways Agency Specification for Highway Works, Series 1300 and 1400.

Please contact us for further details on procedures and the design service that we provide.

For example, the Highway Development Management Team will contact the street-lighting section directly, you do not need to approach them independently. As well as providing a layout plan, Leicestershire County Councils street-lighting section will provide the specification of the equipment to be installed and a designer’s risk assessment (these items together are known as the ‘data sheet’)

4.127 You are responsible for:

- ensuring that the street lighting design is undertaken; (please contact us for further details on procedures and the design service we provide.
- ensuring that the specification of equipment is in accordance with the ‘data sheet’ that we issued for the lighting scheme;
- marking the exact position of the street lights on site for the street-lighting contractor;
- arranging for the electricity company to provide the electricity supply to the street lights;
- providing test certificates in accordance with BS7671; and
- paying for all aspects of the works including paying energy charges and maintenance of the street lights before we issue the final certificate of completion.

Alternative ‘heritage’ street lighting

4.128 The street lighting specification we provide will use ‘standard’ galvanised steel columns with road-lighting lanterns of the appropriate height and wattage. However we do have a limited range of “heritage” street-lighting columns and lanterns which you can specify as long as you pay a commuted sum to cover the increased costs of maintenance and replacement associated with this type of equipment. Please also see Section MC18 for further details on our commuted sums policy.

4.129 If you want to request this option, you should tell us when you submit layout drawings for technical approval. This will allow us to establish information about commuted sums and styles of lighting columns before we design the street lighting.

Section MC14: Street furniture and street art

General

4.130 It is important to establish at an early stage (and certainly before any-planning application) what street furniture and so on is proposed within areas that are intended to be adopted as publicly-maintained highway, and who would be responsible for it. You may need to include this as part of a concept proposal that you are required to prepare for your proposed development. (Please see Part 2, Section PDP4 for further information on concept proposals).

4.131 Table MC10 sets out details of who would normally accept future responsibility and whether or not a commuted sum is payable. You must

confirm that you have reached agreement with the organisations concerned before we can agree to your proposals.

Table MC10: Future maintenance responsibilities and commuted sums requirements			
Item of street furniture and so on	**Organisation normally responsible for future maintenance**	**Commuted sums payable?**	**Formal agreement required between responsible body and us**
Bollards	HA	Yes	N/A
Knee-rail fencing	HA	Yes	N/A
Seats	TC/PC[(a)]	N/A	Yes
Cycle stands	HA	No	N/A
Bus-stop poles and flags	HA	No	N/A
Bus shelters	TC/PC[(b)];DC/BC/HA[(c)(d)]	Yes	Yes
Bus gates	HA	Yes	N/A
Planters and raised beds	TC/PC	DC/BC[(b)]/HA[(c)]	Yes
Tree grills	HA	Yes	N/A
Street art	TC/PC	N/A	Yes
Village and town features	TC/PC	N/A	Yes
Memorials and commemorative items	TC/PC	N/A	Yes
'Heritage' direction signs	HA	Yes	N/A
Flagpoles and similar structures	TC/PC	N/A	Yes
Information boards	Depends on information	If HA responsible	Yes
Litter bins	DC/BC	N/A	Yes
Dog-litter bins	DC/BC	N/A	Yes

Key:

HA = highway authority (us); DC = district council; BC = borough council; TC = town council: PC = parish council.

(a) Where no town or parish council exists, responsibility for items normally maintained by the town or parish council will generally pass to the district or borough council.

(b) Organisation normally responsible.

(c) Alternative organisation who may accept responsibility.

(d) Please contact us to discuss requirements for undertaking responsibility for future maintenance. For example, we generally only assume responsibility for bus shelters if they are provided on a County Council 'route development' route

Section MC15: Highway related structures

Definition

4.132 Highway related structures will normally include the following:

- bridges;
- tunnels;
- retaining walls;
- corrugated-steel buried structures;

- reinforced soil and anchored earth structures;
- reinforced clay brickwork retaining walls of pocket-type and grouted-cavity construction;
- crib wall retaining walls of concrete or timber construction;
- environmental barriers (including noise barriers and fencing); and
- all drains, piped and box culverts, sewers and drainage structures, other than bridges, that have a diameter or clear span of more than 900mm.

4.133 A highway related structure can fall into one of three types, either:

- any structure built in, under, or over, the highway; or
- any retaining wall or structure which supports the highway and where the distance between the highway boundary and the rear face of the wall or structure is less than twice the difference in level between the ground at the front of the wall and the highest level of the adjacent highway at any point along the length of the wall or structure; or
- any retaining wall built within 3.65m of the highway boundary where the retained height above the adjacent highway is 1.4m, or more.

Note: The definition of ‘highway’ used above includes the carriageway, footway and all verges.

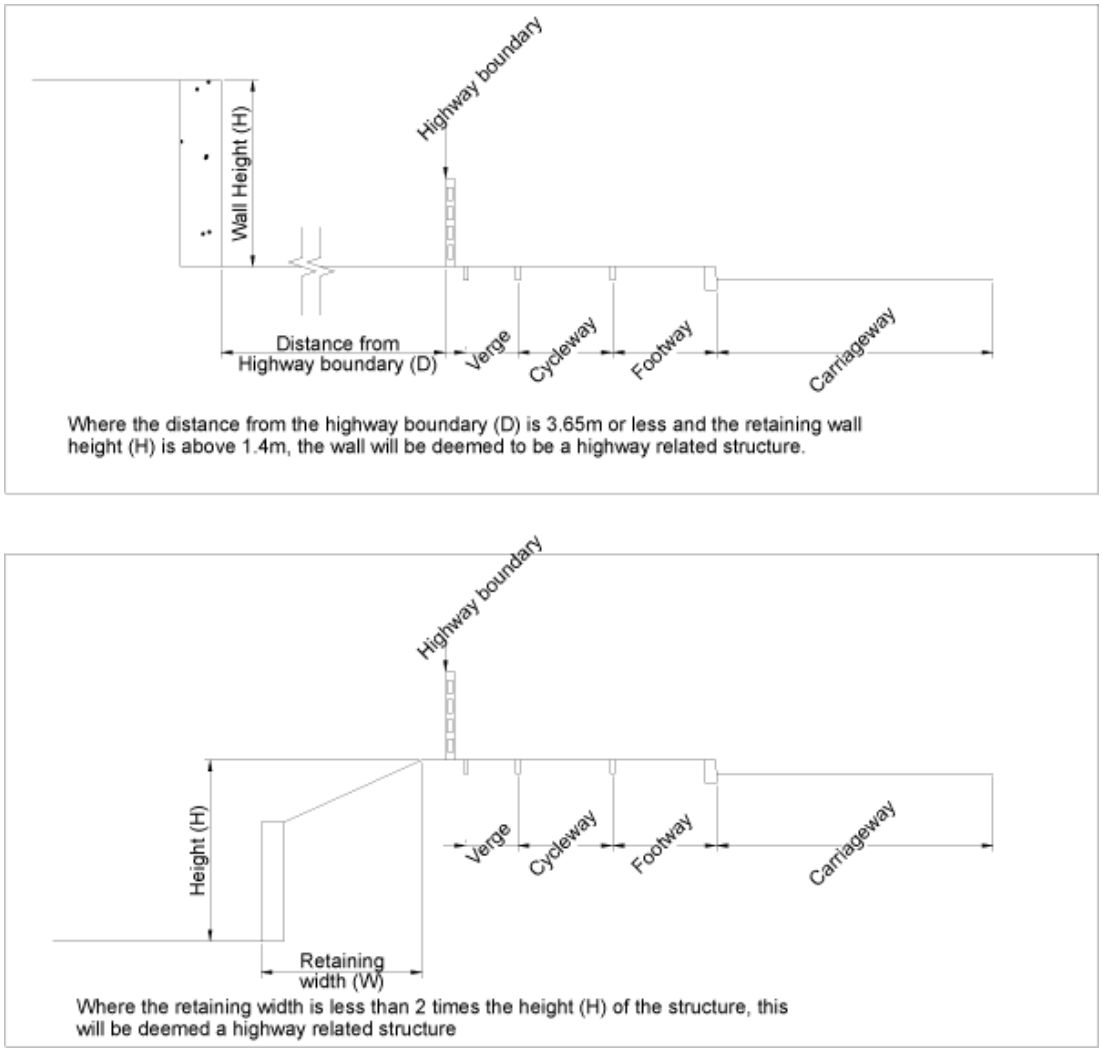


Figure MC4 Highway related structures

Design

4.134 All highway related structures, whether we are to adopt them or not, must be designed and constructed in accordance with the current relevant Highways England standards, codes of practice and technical memoranda. The design will be subject to the technical-approval procedure set out in the Department of Transport Standard BD 2/12 “Technical Approval of Highway Structures on Motorways and Trunk Roads” (Highways Agency Design Manual for Roads and Bridges Vol. 1 Sect. 1 Part 1), except that the Technical Approval Authority will be LCC.

4.135 You must employ a chartered civil or structural engineer with experience in highway structures and be approved by LCC to carry out the design and oversee construction.

Supervision of the construction

4.136 The construction must be carried out under the direction of an independent chartered civil or structural engineer, approved by us, and with substantial experience of the construction of highway structures.

4.137 Before construction begins, you must provide a programme of supervision for our approval. The programme must give details of the level and amount of supervision that will be provided so we are confident that the structure will be built in accordance with the approved design and specification. The programme must also contain proposals for materials testing.

4.138 At regular intervals, we will audit the supervision of a scheme to make sure that you are meeting the agreed programme of supervision. However, it is the developer's responsibility to keep us informed of the proposed programme (4.139). Before adoption, you must give us copies of approved design calculations (if not already received), inspection certificates, material-testing certificates, digital photographs on CD (*.JPG or*.BMP format), as-built drawings preferably in an electronic form, (for example Autocad file) on CD, maintenance manuals and a Construction Compliance Certificate in accordance with Annex C6 of BD 2/05 'Technical Approval of Highway Structures' (Design Manual for Roads and Bridges)." This information should be submitted in advance of a request for a final certificate of completion to LCC (full adoption certificate). Failure to accord to the approved design and insufficient collation of the required evidence will jeopardise the ability of the LCC to adopt structures.

Fees

4.139 You will have to pay the additional design checking and inspection fees for any highway structure. This is charged at 'actual' rate and we will give you an indication of the likely fee at our earliest opportunity.

Adopting structures

4.140 There should be discussion at an early stage (and certainly before any-planning application) to agree which structures we are to adopt.

4.141 You must pay a commuted sum for future maintenance of any highway structure to be adopted. Please also see Section MC18 for further details on our commuted sums policy.

Section MC16: Soft landscaping and trees

General

4.142 Soft landscaping within highway areas can be as important in determining the character of the development and integrating it into its surroundings as landscaping elsewhere within the site. You should not underestimate how important it is to create an attractive environment. Planning authorities are unlikely to favour developments that lack quality design and layout.

4.143 You should prepare landscaping proposals at the pre-application stage so we can consider their suitability in good time and so the utility providers (for example gas, water, cable TV) can be consulted over the proposals. We must approve the landscaping proposals within the development whether or not they form part of a landscaping scheme which you have submitted to the planning authority for approval.

4.144 You should engage a chartered landscape architect to advise you and prepare landscaping proposals for the development.

4.145 While planting and trees can enhance the street scene, you must take care to make sure that building frontages and parking areas can still enjoy good natural observation from areas of potential activity such as roads and footways.

4.146 Soft landscaping must comply with Series 3000 and Appendices 30/1 to 30/10 of our Specification.

Considering existing features

4.147 **Protecting and preserving existing trees:** Requirements for protecting and preserving existing trees are contained in appendix F, ‘The Preservation of Trees in Connection with Roadworks and New Development’.

4.148 **Existing boundary hedges and fences:** You must make it clear to purchasers of individual property at the time of sale that you are transferring ownership and responsibility for existing highway boundaries to them. The lack of maintenance and cutting back of hedges is a common problem for us, particularly where the hedge had enclosed farmland or had not been regularly maintained previously. If you erect new fencing to the inside of existing hedges and fences the purchaser may mistakenly believe that the original hedge or fence is our responsibility.

4.149 **Bird nesting season:** You must not remove or carry out work to existing or planted trees, shrubs, hedges and other vegetation during the bird nesting season. This is generally considered to be from March until the end of July but can cover a longer period. You should check for the presence of active nests outside that period.

New feature design considerations

4.150 **Preparing the ground:** You must prepare the ground of all areas to be grassed or planted in accordance with clause 3004 of the

Highways Agency Specification and Appendix 30/4 of our Specification.

4.151 **Grass seeding and turfing:** You must seed or turf grassed areas in accordance with clause 3005 of the Highways Agency Specification and Appendix 30/5 of our Specification.

4.152 **Minimum grass verge and planting bed sizes:** Narrow grass strips between footways and carriageways and small isolated shrub beds are often neglected and over-run by vehicles. You will normally have to use hard paving in these locations. Normally you should provide a minimum width of 1m and minimum area of $10m^2$ for grass and 1m and $6m^2$ for shrub and ground-cover planting.

4.153 **Reinforcing verges:** Where it is necessary to reinforce verges to prevent erosion where vehicles are likely to be parked, including maintenance vehicles, you must use an approved system of reinforcement.

4.154 **Plants and planting:** All plants and planting works must be in accordance with clause 3006 of the Highways Agency Specification and Appendix 30/6 of our Specification.

4.155 **Tree planting in grilles with guards within paved areas:** Trees within hard-paved areas should normally be planted in tree grilles with tree guards. These should normally be in accordance with the details included in Appendix 30/12 of our Specification.

4.156 **Planting within visibility splays:** You must not normally plant new trees within any visibility splays (including at junctions and on bends). Only in exceptional circumstances will we permit existing trees to be retained, following an examination on site. Any new trees must be of a species we approve to make sure that they have slender trunks when mature and which are clear of side growth to a height of 2m and, when planted together, allow adequate visibility.

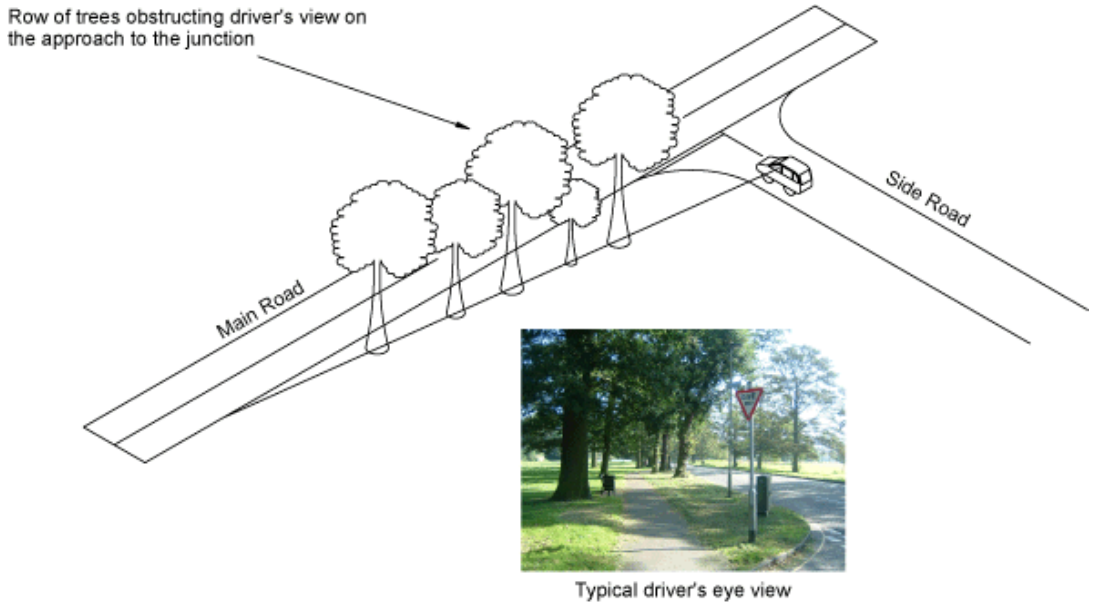


Figure MC5 Example of unacceptable tree planting in a visibility splay

4.157 Any landscaping (planting, shrubs and so on) within visibility splays should not normally be expected to grow to more than 600mm in height above the adjacent carriageway level where the carriageway gradient is level. We will assess planting in locations where the carriageway is on a slope or there are crests or sags in its vertical alignment, on a site-by-site basis.

4.158 **Additional information about landscape planting:** Additional information on landscaping, including choice of species, is contained in appendix G, 'Landscaping on New Developments and in Highway Improvement Schemes'.

Peat

4.159 You must not use peat or peat-based products except where peat is excavated on the site.

Applying pesticide

4.160 All pesticides, methods of application, materials and tank mixes, methods of working, transportation, storage and records must be strictly in accordance with current legislation and codes of practice and also in accordance with clause 3001 of the Highways Agency Specification and Appendix 30/2 of our Specification.

Controlling weeds

4.161 You must control weeds in accordance with clause 3002 of the Highways Agency Specification and Appendix 30/2 of our Specification.

Landscaping and tree maintenance issues

4.162 **Maintaining existing trees, shrubs and hedges:** All existing trees, shrubs and hedges that are to be retained within the existing highway or areas to be adopted must be maintained in accordance with clause 3010 of the Highways Agency Specification and Appendix 30/10 of our Specification until the issue of the final certificate. This includes any required arboricultural work including tree surgery.

4.163 **Establishing and maintaining new landscape planting:** Planted landscaping areas, trees, shrubs and so on that we are to adopt must be fully planted before we issue a provisional certificate of completion. This planting must be maintained until the issue of the final certificate, including any necessary replacements for whatever reason, to make sure that it is fully established.

4.164 Maintenance of such planting must be in accordance with clauses 3008 and 3009 of the Highways Agency Specification and Appendices 30/8 and 30/9 of our Specification.

4.165 **Grassed areas:** You must satisfactorily maintain any existing grass areas and satisfactorily establish any new grassed areas before we will issue you with a provisional certificate. You must maintain grassed areas throughout the maintenance period and until issue of the final certificate in accordance with clause 3007 of the Highways Agency Specification and Appendix 30/7 of our Specification.

Adopting the landscape and trees

4.166 Areas we are prepared to adopt as highway should preferably be concentrated into larger areas, to provide economies of scale and to avoid small or remote areas which are difficult to maintain. Small and remote areas can actually result in the very opposite of what is intended of creating an attractive and well-cared-for environment.

4.167 Generally, you should lay out verges, embankments and other areas of open space forming part of the adoptable highway as amenity grass areas unless we agree to some other form of landscaping to help enhance the quality and appearance of a development. You will have to pay us a commuted sum where we are to take on the maintenance of such landscaping where it falls within an existing or proposed area of highway. As an alternative, the district, town or parish council may agree to maintain the planting under a licence granted under Section 96 of the Highways Act 1980.

4.168 In general, we will accept responsibility for new or retained trees we have approved if you pay a commuted sum towards future maintenance and inspection costs.

4.169 Public open spaces, including amenity open spaces and children’s play areas, will normally be adopted by the district, town or parish council.

4.170 We will only normally consider adopting an area of open space that:

- is next to but not an essential part of the adoptable highway;
- is not going to be adopted as public open space by the district, borough or parish council;
- cannot be designed out; and
- may not be safely and satisfactorily maintained if it becomes part of the adjacent property.

4.171 You will need to pay us a commuted sum for any such open space we adopt. Please also see Section MC18 for further details on our commuted sums policy.

Sponsorship

4.172 We may allow you to enter into a sponsorship agreement for maintaining of certain landscaped areas either direct with us or with a town, parish, borough or district council where a maintenance agreement with that council exists.

Section MC17: Noise barriers, screening and bunding

4.173 You should design environmental barriers, including earth mounds, associated planting and noise barriers in accordance with HA 65/94 and HA 66/95 ‘Design Guide for Environmental Barriers’ (Highways Agency Design Manual for Roads and Bridges Volume 10 Section 5 Parts 1 and 2).

4.174 Where your proposal includes earth mounds and any associated landscape planting and noise barriers, you must clarify and agree details of ownership and arrangements for future maintenance at an early pre-application stage.

4.175 Purchasers of individual dwellings are unlikely to accept ownership and responsibility for environmental barriers. This is because maintenance liability is often beyond the means of the individual. If environmental barriers are transferred to purchasers of individual dwellings you **must** make this clear to purchasers at the time of sale and include such details in conveyances.

4.176 In general, the district, town or parish council will be expected to adopt and maintain earth mounds and any associated landscape planting and noise barriers. We may consider adopting these areas if you pay a commuted sum. Please also see Section MC18 for further details on our commuted sums policy.

4.177 Where we agree to environmental barriers within existing highway limits, you must pay a commuted sum.

4.178 Unless we agree otherwise, we will treat noise fencing as a highway structure and it will be subject to the design requirements, design checking and inspection fees and commuted sums for future maintenance required for highway structures. (Please see Section MC15 for further information on highway structures).

Figure MC6 Example of noise fencing

Section MC18: Commuted sums and how we calculate them

4.179 In this Section we set out the basis of payment and how we calculate commuted sums you must pay us towards the cost of maintaining certain adoptable highway infrastructure provided for new developments.

Background

4.180 **The legal basis:** Circular 1/97 Planning Obligations refers to the payment of commuted maintenance sums where specifically provided for in legislation (the Highways Act 1980).

4.181 Section 38 of the Highways Act 1980, sub-section (6) provides for paying expenses to us for maintaining any highway, road, bridge or viaduct covered by an agreement made under that section.

4.182 Section 278 of the Highways Act 1980, sub-section (3) provides for you (the other party to the agreement) making payments to us for maintaining the works the agreement relates too.

4.183 **Regional discussions and agreement:** Because there is no national guidance at present, the Midlands Regional Service Improvement Group – Development Regulation, has sought to reach agreement on applying and calculating commuted sums to achieve a consistent approach throughout the region. There has been a high level of agreement on this between the highway authorities concerned. We

have adopted the generally-agreed application and method of calculation.

Application

4.184 The need for paying commuted sums can be divided into four broad categories.

(a) The cost of maintaining areas and construction which, under our normal design guidance given in Part 3, are not required for the safe and satisfactory functioning of the highway. Examples are additional areas of carriageway, such as a 'square' surrounding a turning head (see figure MC7a), hard landscaping, grass verges (see figure MC7b) and so on:

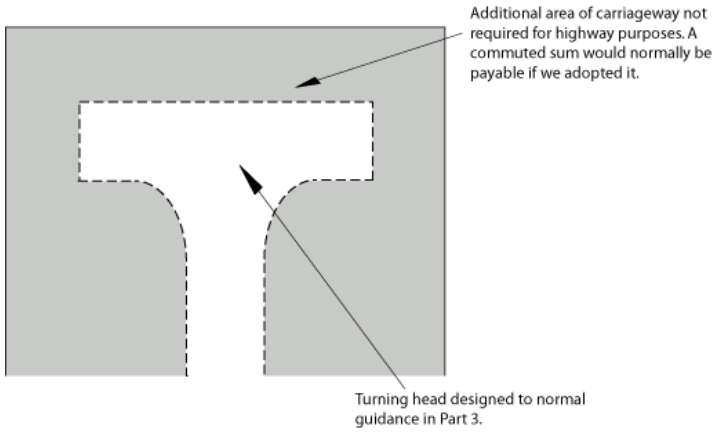


Figure MC7a Example of turning head within a 'square'

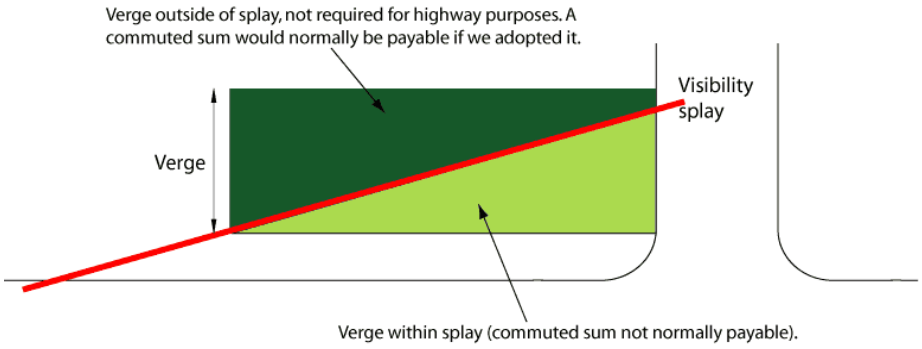


Figure MC7b Example of additional area of grass verge adopted under a commuted sum

Under this category you may need to pay commuted sums for:

- new adoptable highways generally constructed under S38 agreements, if any additional areas and construction which result from the overall development layout design, are over and above what we would normally require to satisfy safety and operational requirements; and
- alterations to existing highways, carried out under S278 agreements, which are required only to serve the development and provide no general benefits. We will consider individual cases on

their merits where there is some general benefit. We will not normally require a commuted sum where the alterations have already been programmed for construction.

(b) The cost of maintaining some features of the adoptable works which can be considered as **extra over**. Examples include highway structures, public transport infrastructure, landscaping, trees, shrubs and so on, additional or non-usual street furniture and noise fencing.

- These costs represent an increase in our future maintenance liability which will be more than the anticipated normal funding generated by the development.

(c) The additional cost of maintaining permitted alternative materials and features which are extra over. Examples include surfacing materials and street lighting equipment.

- These additional costs are in excess of what we would have incurred if the materials and features used had been to the standard Specification.

(d) Sustainable drainage systems (SUDS), for example, flow-attenuation devices, swales and storage areas.

Note: Where you are proposing SUDS, you must hold discussions with all relevant parties at an early stage (and certainly before any planning application) to agree ownership and responsibility for the facility.

This is not an exhaustive, detailed list. It is only intend to illustrate broad principles. Cases where commuted sums will normally be required are set out in other parts of this document. You should always discuss with us where commuted sums might be required at the earliest possible opportunity and certainly before any planning application.

Calculating commuted sums

4.185 We work out the cost your maintenance obligation using this formula:

Commuted sum = $\sum Mp/(1 + D/100)^T$

Mp = Estimated periodic maintenance cost
D = Discount rate (effective annual interest rate) (%)
T = Time period before expenditure will be incurred (years)

Maintenance unit costs (Mp)

4.186 Maintenance unit costs are based on contract rates current at the time of calculation and the frequency of treatment or intervals of replacement, based on planned frequencies or historic information. A sum of 10% of the works costs will be added to cover our design and supervision costs.

Discount rate (D)

4.187 The discount rate (effective annual interest rate) is worked out as follows:

$$D = (1.045/1.0225) - 1$$
$$= 2.2\%$$

where

1.045 is the interest rate (4.5% based on long-term neutral base rate)
1.0225 is the inflation rate (2.25% based on RPI-X that is RPI excluding mortgage payments)

Time period (T)

4.188 There is a case for using a time period equal to the expected life of the development in the case of development roads. However, for the time being, a time period of 60 years (maximum) will be used to calculate the commuted sums, with the exception of highway structures when a 120-year period will apply, in accordance with the standard design life requirement. The 60 year period reflects the recommendation of the CSS publication 'Commuted Sums for Maintaining Infrastructure Assets'.

Schedules of commuted sums payable

4.189 You can find schedules of commuted sums for various additional areas, additional features, and alternative surfaces and specifications in Section MC19. We will add other commuted sums values and additional items as the need arises. The commuted sums in the schedules have been calculated at a particular date as indicated and will need to be index-linked to the date of the agreement. We will calculate some commuted sums specifically for certain sites.

Calculating the actual commuted sums to be paid

4.190 You will be required by the relevant agreement with us to pay us a commuted sum. However, we may not know the full cost implications of the site at that stage. So, we will calculate the final commuted sums value immediately before we adopt the development. This will be based on the 'provisional' commuted sums agreed when we complete the agreement. The agreement will contain provision for recalculating the 'provisional' commuted sums based on actual quantities and a price fluctuation factor specified in the agreement.

Bonding commuted sums

4.191 Any commuted sums you must pay will be included in the bond required under the Section 38 or Section 278 agreement. This will be based on the 'provisional' commuted sums that we calculate when we complete the agreement.

Timing of payments

4.192 The commuted sums will be payable before we issue the final certificate.

Section MC19: Schedules of commuted sums for maintenance of works under Section 38 and Section 278 agreements

4.195 Where no figure is shown, we will calculate as the need arises. N.B Please be aware that the rates detailed below are based upon the existing 60 year calculation period.

4.196 For Section 278 works we will not normally apply commuted sums for the existing area of carriageway unless it is a non standard material (in that case the commuted sum would be the difference between the commuted sum for the standard and non-standard material). A full commuted sum would be required for any additional carriageway created (e.g. right turn lane), or any new feature created (e.g. refuge/splitter island, additional lighting, bollards etc). This is because the additional carriageway and features created above those existing are only required to provide the access for the new development, and therefore it is reasonable to require a commuted sum to maintain them in the future.

Schedule 1: Commuted sums for extra over areas and features on new adoptable highways and alterations to existing highways (Section 38 and Section 278)		
Item	**Units**	**Commuted Sum from April 2012 (£)**
Carriageway and shared-surface surfacing materials		
Carriageway (standard bituminous materials and SMA) -residential estate roads	Sq m	16.89
Carriageway (standard bituminous materials and SMA) - classified/distributor/industrial roads JUNCTIONS	Sq m	52.73
Carriageway (standard bituminous materials and SMA) - classified/distributor/industrial roads NON JUNCTIONS	Sq m	20.6
Carriageway (hot rolled asphalt) - residential	Sq m	15.63
Carriageway (hot rolled asphalt)- classified/distributor/industrial roads JUNCTIONS	Sq m	33.21
Carriageway (hot rolled asphalt) - classified/distributor/industrial roads NON JUNCTIONS	Sq m	22.07
Surface dressing using crushed gravel aggregate from local source	Sq m	32.16

Hot or cold applied coloured surfacing (resin system) and high friction surfacing (anti-skid) - residential estate roads	Sq m	63.28
Hot or cold applied coloured surfacing (resin system) and high friction surfacing (anti-skid) - classified/distributor/industrial roads JUNCTIONS AND APPROACHES TO CONTROLLED CROSSINGS	Sq m	228.03
Hot or cold applied coloured surfacing (resin system) and high friction surfacing (anti-skid) - classified/distributor/industrial roads NON JUNCTIONS	Sq m	133.83
Carriageway (200 x 100 x 80 mm concrete block paving) - residential estate roads	Sq m	13.83
Carriageway (200 x 100 x 80 mm concrete block paving) - classified/distributor/industrial roads JUNCTIONS	Sq m	44.43
Carriageway (200 x 100 x 80 mm concrete block paving) - classified/distributor/industrial roads NON JUNCTIONS	Sq m	29.25
Carriageway (Tegula blockwork or similar) - residential estate roads	Sq m	22.46
Carriageway (Tegula blockwork or similar) - classified/distributor/industrial roads JUNCTIONS	Sq m	64.8
Carriageway (Tegula blockwork or similar) - classified/distributor/industrial roads NON JUNCTIONS	Sq m	32.45
Carriageway (Permeable block paving) - residential estate roads	Sq m	27.45
Footway and hard paving surfacing materials		
Footway (standard bituminous materials) - all roads	Sq m	14.97
Footway (200 x 100 x 60mm concrete block paving) all roads	Sq m	16.1
Footway (Tegula blockwork or similar) - all roads	Sq m	25.03
Surface dressing using crushed gravel aggregate from local source	Sq m	52.73
Hot or cold applied coloured surfacing (resin system) - all roads	Sq m	63.28
Conservation Slabs 450 x 450 x 70 - residential estate roads	Sq m	33.07
Conservation Slabs (Marshalls) 450 x 450 x 70 - classified/distributor/industrial roads	Sq m	69.94
Kerbs		

Conservation'/'Charnwood' type kerbs	Linear metre	1.08
Fencing		
Knee rail fencing	Linear metre	57.64
Typical 2m high acoustic fence to HA66/95	Linear metre	255.11
Post and rail fence	Linear metre	83.38
Structures		
Retaining wall		site specific calc
Drainage		
Sustainable urban drainage systems		not calculated
Hydrobrake	item	5890.82
Non-standard drainage system elements		not calculated
Culvert debris screen	Item	not calculated
Petrol and oil interceptors	Item	not calculated
Combined kerb and drainage systems - residential	Linear metre	33.42
Combined kerb and drainage systems - classified/distributor/industrial	Linear metre	67.2
Bollards and Street Furniture		
Typical Plastic Linpac / Glasdon Bollard	Item	1289.82
Concrete Bollard	Item	740
Wooden Bollard	Item	1124.33
Cast Iron Bollard	Item	site specific calc
Cycle stand	item	805.88
Trees, planting and landscaping		
Verges & other grassed areas	Sq m	8.2
Small Tree	Item	718.23
Medium Tree	Item	938.61
Existing Large Tree	Item	1538.22
Tree grills	Item	not calculated
Planters and raised beds		not calculated
Shrub / Ground Cover Planting	Sq m	71.3
Earthwork environmental bunds		not calculated

Speed restraint features		
Overrun areas to roundabout (granite setts)	Sq m	87.35
Overrun areas to speed control bends (granite setts)	Sq m	57.51
Mini roundabouts	Item	not calculated
Bus shelters	Item	not calculated
Bus gates	Item	not calculated
Street Lighting		
Standard 5m columns	Item	2122
Standard Raise and Lower 5m column	Item	2473.77
Standard 6m columns	Item	2420.74
Standard Raise and Lower 6m column	Item	2808.22
Standard 8m columns	Item	not calculated
Standard 10m columns	Item	not calculated
Heritage 6m (Newcastle) columns	Item	not calculated
Heritage 8m (Edinburgh) columns	Item	not calculated
Illuminated traffic signs		
Not exceeding $1m^2$ sign face	Item	not calculated
Illuminated more than $1m^2$ and not exceeding $3m^2$ sign face	Item	not calculated
Illuminated more than $3m^2$ sign face	Item	not calculated
Non-illuminated traffic signs		
Not exceeding $1m^2$ sign face	Item	not calculated
More than $1m^2$ and not exceeding $3m^2$ sign face	Item	not calculated
More than $3m^2$ sign face	Item	not calculated
Illuminated bollards	Item	not calculated
Traffic signals		site specific calc
Schedule 2: Commuted sums for using alternative materials on new adoptable highways and alterations to existing highways (Section 38 and Section 278). The commuted sum is the commuted sum from Schedule 1 minus the commuted sum for standard bituminous carriageways and footways as appropriate		
Alternative material	**Unit**	
Carriageway or shared-surface surfacing materials		
Carriageway (standard bituminous materials & SMA) - all roads	Sq m	Nil for S38 - CS for additional areas for S278 works see Schedule 1

Carriageway (hot rolled asphalt) - all roads	Sq m	Nil for S38 - CS for additional areas for S278 works see Schedule 1
Carriageway (200 x 100 x 80 mm concrete block paving) - residential estate roads	Sq m	Nil for S38 - CS for additional areas for S278 works see Schedule 1
Surface dressing using crushed gravel aggregate from local source	Sq m	32.16-16.89=15.27
Hot or cold applied coloured surfacing (resin system) and high friction surfacing (anti-skid) - residential estate roads	Sq m	63.28-16.89=46.39
Hot or cold applied coloured surfacing (resin system) and high friction surfacing (anti-skid) - classified/distributor/industrial roads JUNCTIONS	Sq m	228.03-52.73=175.30
Hot or cold applied coloured surfacing (resin system) and high friction surfacing (anti-skid) - classified/distributor/industrial roads NON JUNCTIONS	Sq m	133.83-20.6=113.23
Carriageway (200 x 100 x 80 mm concrete block paving) - classified/distributor/industrial roads JUNCTIONS	Sq m	Nil for S38 - CS for additional areas for S278 works see Schedule 1
Carriageway (200 x 100 x 80 mm concrete block paving) - classified/distributor/industrial roads NON JUNCTIONS	Sq m	29.25-20.6 = 8.65
Carriageway (Tegula blockwork or similar) - residential estate roads	Sq m	22.46-16.89=5.57
Carriageway (Tegula blockwork or similar) - classified/distributor/industrial roads JUNCTIONS	Sq m	64.80-52.73=12.07
Carriageway (Tegula blockwork or similar) - classified/distributor/industrial roads NON JUNCTIONS	Sq m	32.45-20.6=11.85
Carriageway (Permeable block paving) - residential estate roads	Sq m	27.45-16.89=10.56
Surface dressing using locally-sourced granite aggregate chippings	Sq m	not calculated
Surface dressing using pea gravel aggregate from local source	Sq m	not calculated
Surface dressing using pea gravel aggregate from non-local source	Sq m	not calculated
Surface dressing using crushed gravel aggregate from local source	Sq m	not calculated
Surface dressing using crushed gravel aggregate from non-local source	Sq m	not calculated

Standard surface course materials using coloured binder and coloured aggregate or chippings	Sq m	not calculated
'Imprint' or other similar approved hot-applied, polymer-modified, synthetic bitumen-based compound, surface applied block paving alternative finish	Sq m	not calculated
Footway and hard paving surfacing materials		
Footway (200 x 100 x 60mm concrete block paving)	Sq m	Nil for S38 - CS for additional areas for S278 works see Schedule 1
'Tegula' or similar approved concrete block paving surface course	Sq m	25.03-14.97=10.06
Conservation Slabs (Marshalls) 450 x 450 x 70	Sq m	33.07-14.97=18.10 (res) 69.94-14.97=54.97 (non-res)
Surface dressing using crushed gravel aggregate from local source	Sq m	52.73-14.97=37.76
Hot or cold applied coloured surfacing (resin system)	Sq m	63.28-14.97=48.31
Surface dressing using locally-sourced granite aggregate chippings	Sq m	not calculated
Surface dressing using crushed rock aggregate from specific non-local source	Sq m	not calculated
Surface dressing using pea gravel aggregate from local source	Sq m	not calculated
Surface dressing using pea gravel aggregate from non-local source	Sq m	not calculated
Surface dressing using crushed gravel aggregate from non-local source	Sq m	not calculated
Standard surface course materials using coloured binder and or coloured aggregate or chippings	Sq m	not calculated
'Imprint' or other similar approved hot-applied, polymer modified, synthetic bitumen-based compound, surface applied block paving alternative finish	Sq m	not calculated