Nottinghamshire County Council

Materials

Part 5.1

5.1.1 Our specification

All highway works must normally be in accordance with the 'Specification for Highway Works' published by Her Majesty's Stationery Office as Volume 1 of the Manual of Contract Documents for Highway Works (MCHW) and comply with the 'Notes for Guidance on the Specification for Highway Works' published as Volume 2 (NGHW) unless otherwise stated or amended by this guidance, 'Sewers for Adoption' published by Water UK/WRc plc where stated, as well as our standard drawings. If your proposals are not covered by the standard drawings, you will need to submit scheme-specific drawings to us for approval.

5.1.2 Site surveys, tests and investigations

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, Internal Drainage Board, and Lead Local Flood Authority as appropriate;
- 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.

5.1.3 Sampling and testing goods and materials

You must arrange and pay for all the sampling and testing outlined in our Specification. You must also submit one copy of these test results to our Engineer. Our Engineer reserves the right to carry out any sampling and testing deemed necessary to confirm that the goods and materials meet with the Specification including core samples. If we find the work does not meet the Specification, you will be required to pay for the associated costs to the authority. A list of the likely samples of goods and materials required can be found in the Specification.

5.1.4 Marking the highway boundary

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 BS EN 1340 unless we agree otherwise.

5.1.5 Fencing and barriers

We will not adopt any fencing erected on the highway boundary unless it is provided as a safety feature at the top of any highway structure or is a safety or noise barrier. A commuted sum would likely apply in all instances.

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 MCHW. Safety Fencing should not generally be included within residential developments.

5.1.6 Existing boundaries

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. Access to hedges should be available to both sides for maintenance.

5.1.7 Pedestrian barriers

It may sometimes be necessary to introduce barriers to pedestrian movement. Where they are required, consideration should first be given to amending the layout or the use of features that can guide pedestrian movement whilst also contributing to the amenity of the street.

5.1.8 Pedestrian guardrails

Where it is not possible to avoid the use of barriers by design and where using a staggered barrier is not appropriate at the ends of footpaths, you must provide an agreed length of pedestrian guardrail which runs parallel to the edge of the street, leaving a clearance of 450mm from the carriageway. You may need to widen the footway to maintain the standard footway width past the guardrail. 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.

5.1.9 Noise fencing

Unless we agree otherwise, noise fencing should be subject to a private maintenance agreement. However, it must meet the design requirements for a highway structure. Where it is necessary to adopt as a highway structure, you must pay us design checking fees and a commuted sum for its future maintenance.

5.1.10 Earthworks

All earthworks must comply with Series 0600 (MCHW) Table 6/1, 6/2, and 6/5, and the contract specific details; classification, definition, uses, compaction requirements, etc. should be set out in accordance with Series 0600 (NGHW) Appendices 6/1, 6/2, 6/7 and 6/8. Embankments and other areas of fill must be formed with acceptable material excavated from within the site or imported on

to the site, meet the requirements of our specification for use in the permanent works, and have the approval of our Engineer to be used in that particular location.

Street pavements

5.1.11 Constructing the site access and roads external to a development

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.

5.1.12 Internal development streets

Listed below are the street types covered by this design guide. The construction varies according to the street type. It is essential that you mark the street category clearly on the plans you submit for approval in line with the abbreviations in the table.

Table T5.1.1

Street & Road category	Abbreviation
Residential Street	RS
Residential access way	RAW
Major industrial access road	MajIAR
Minor industrial access road	MinIAR

5.1.13 Subgrade assessment

For design purposes, you must establish 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 County Council with copies of all test results.

You should use soil-classification tests to give the types of soil and 'Equilibrium CBR' based on material type, using the table below unless we agree otherwise. That is the soil strength when the material is neither gaining or losing moisture (equilibrium moisture content (EMC)).

Table T5.1.2

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

5.1.14 Carriageway sub-base and capping layer

Table T5.1.3

Use the table below to find the thickness of capping and sub-base you need to use.

CBR Value	**Materials within 450mm of surface must not be frost susceptible**					
	Residential Street (250mm Bituminous layer thickness)		Residential Access Way (200mm Bituminous layer thickness)		Industrial Road (300mm Bituminous layer thickness)	
	Capping	Sub Base	Capping	Sub Base	Capping	Sub Base
< 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
> 15%		200		250		150

The foundation design should not vary frequently along the street. You should select an appropriate value for each significant change in the subgrade properties. Where the equilibrium CBR falls between values in the above table, you should round down the value to the lower value. 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 to be approved by the County Council. Note that the use of geo-textile will only be acceptable in certain situations. You can find advice in DMRB IAN 73/06 Rev 1.

5.1.15 Capping materials

Permitted material for capping shall be Class 6F2 or recycled material to Class 6F3 complying with the MCHW Specification for Highway Works Table 6/1 and 6/2. 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 if you have previously demonstrated to us that they will achieve an in-situ CBR of 15% (or equivalent test results). Where specifically permitted by the Engineer, material stabilised using cement or lime or both shall comply with clauses 614, 615 and 643 of the MCHW.

5.1.16 Sub-base

Sub-base must be Type 1 to Series 800 MCHW, Clause 803, and NCC Appendix 7/1.

5.1.17 Surface, binder courses and bases

The table below gives the required minimum design thicknesses and options you have for the flexible and modular (block) materials you should normally use for different development street types. Permitted pavement options are specified in NCC Appendix 7/1. The use of Stone Mastic Asphalt (SMA) shall be in accordance with NCC Clause 971AR, and NCC Clause 972AR where appropriate.

Table T5.1.4

Road carriageway construction materials depth											
	Main street / Residential street				**Residential access way and shared surfaces**				**Industrial access road**		
	Bituminous			**Block**	**Bituminous**			**Block**	**Bituminous**		
			Notes				Notes				Notes
Surface course	40mm	SMA 10 surf 40/60 (PSV 55)	1,2,5	80mm	40mm	SMA 10 surf 40/60 (PSV55)	1,2	80mm	50mm	HRA 35/14 F surf 40/60 des (20mm pre-coats)	1
	40mm	HRA 55/10 Type 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 dense bin 100/150 rec	2				
Binder course	60mm	AC 20 dense bin 100/150 des	4	30mm sand 60mm AC20 dense bin 100/150 rec	60mm	AC20 dense bin 100/150 rec	4	30mm sand 110mm AC20 dense bin 40/60 rec	60mm	AC20 dense bin 40/60 rec	4
									60mm	AC20 HDM bin 40/60 des	4
Base	150mm	AC32 base 40/60 rec		100mm AC32 base 40/60 rec	110mm	AC32 base 40/60 rec			190mm	AC32 base 40/60 rec	3
									190mm	AC32 HDM base 40/60 des	3

1	Polished stone value (PSV) of course aggregate in surfacing course shall be determined from table of investigatory levels, see DMRB Part 1 HD36/06 but not less than 55
2	HRA 50/10 bin 40/60 (material ref REG1) may be used for hand laying speed tables
3	Subgrade assessment for capping layer and sub-base design are covered above
4	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 an AAV (aggregate abrasion value) of 7. This includes under block paved surfaces in carriageways
5	Block paving not to be used on bus routes

Higher category roads not covered by the above 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 most cases the minimum depth of surface course, binder course and base layer should normally not be less than that of the site access road unless otherwise agreed. For example, if you are widening a road to serve a housing development accessed by a 'residential street', 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.

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

5.1.18 Concrete-block paving

Where we agree that it is appropriate, you may lay concrete-block paving to carriageways, shared surfaces and other areas used by vehicles. The blocks should be laid instead of a bituminous surface course to the standard thickness and material specification including the sub-base and base layers for the street type in question. Note that a binder course will be required as per above table. Commuted sums may be payable.

5.1.19 High Friction Surfacing

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 our Specification.

High friction surfacing must be applied for a minimum length of 50m ahead of the stop line on streets subject to a 30mph limit, but an increased length may be required due to the approach speed, accident record, average queue length, proximity of side streets 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.

5.1.20 Coloured Surfacing

This will be either hot applied (thermoplastic) or cold applied (thermosetting) and must be in accordance with our Specification. We will require the payment of commuted sums to cover the future maintenance of such surfacing.

5.1.21 Alternative materials for footways, cycleways, carriageways, and shared surface areas

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. 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.

5.1.22 Resurfacing carriageways at junctions with existing roads and widening existing roads

Where a new carriageway meets an existing county road or an existing county road is widened and the construction joint falls within the running lane of the existing county road or involves any changes to the county-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 lanes on the main carriageway, the full overlay or resurfacing of the whole carriageway must also include the full length of the lanes, unless we agree otherwise.

5.1.23 Kerbs, footways, footpaths, cycleways and other similar paved areas

The construction should be in line with the two tables below. You should also refer to the standard drawings and our Specification.

Table T5.1.5

Residential Footways – construction materials and depths				
	Bituminous		**Block Paving**	
Surface Course	25mm	AC6 dense surf 100/150	90mm	60mm blocks on 30mm bedding sand (compacted)
Binder Course	90mm	AC20 dense bin 160/220 rec	90mm	AC dense bin 160/220 rec
Sub-base	225mm (see note below)	Granular Type 1	225mm (see note below)	Granular Type 1

Note: The sub-base thickness is to increase to 270mm if likely to be parked on or over-run by lorries and to 365mm if CBR values are 2% or less.

Table T5.1.6

Footway construction at vehicular accesses serving greater than 5 dwellings			
		Access serving less than 25 dwellings	Access serving more than 25 dwellings
Bituminous	Surface course CGM	30mm	40mm
	Binder course DBM	85mm	60mm
	Base DBM	-	150
	Sub-base & Capping	270mm Type 1 GSB (see note above)	See CBR table
Block Paving	Blockwork	60mm	80mm
	Bedding sand (compacted)	30mm	30mm
	Base DBM	90mm	150mm
	Sub-base & Capping	270 Type 1 GSB	See CBR table

5.1.24 Concrete-block paving

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 our specification for concrete-block paving in footways. If you use block paving you may need to pay a commuted sum.

5.1.25 Pedestrian deterrent paving

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

5.1.26 Footways and other hard-paved areas on industrial access roads

The construction should be in line with the below table. Where a footway crossing is to be used to access an employment or commercial development, the footway crossing must be constructed in line with industrial access road requirements.

Table T5.1.7

Footway and paved areas on industrial access roads - construction		
	Bituminous	
Surfacing	40mm	HRA 55/10 F surf 100/150 des
Binder course	75mm	AC20 dense bin 160/220 rec
Sub-base	270mm increasing to 365mm for CBR values of 2% or less	Granular Type

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.

5.1.27 Flush dropped pedestrian and cyclist crossing points

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 standard drawing.

5.1.28 Tactile paving surfaces

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.

5.1.29 Widening existing footways, footpaths and cycleways

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

5.1.30 Traffic signs, road markings, studs and traffic signals

All traffic signs you use (including bollards, retro-reflecting 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, and the Zebra, Pelican and Puffin Pedestrian Crossings Regulations and General Directions.

5.1.31 Traffic signs

You must show the details of individual traffic signs, including their posts and foundations to our standard drawings and specification including the making out of traffic sign schedule sheets.

5.1.32 Traffic Regulation Orders

Traffic regulation orders 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.

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 whether or not the making of an order is successful.

5.1.33 Changes to original road layout

You must provide signs warning of a new road layout in accordance with the Traffic Signs Regulations and General Directions on all approaches to all 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.

5.1.34 The electricity supply to illuminated traffic signs

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

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. These will require incorporating into the street-lighting design.

You are responsible for arranging for the electricity company to provide the electricity supply to the illuminated signs or arranging for a County Council private supply, providing test certificates in accordance with British Standards and paying for all aspects of the works including paying energy charges and maintenance of the illuminated signs before we issue the final certificate.

5.1.35 Bulk clean and lamp change' charges

Before we issue the final certificate of completion, you must undertake or meet the cost of a 'bulk clean and lamp change' for street lighting, illuminated signs and bollards if more than 3 years have elapsed since installation. .

5.1.36 Road markings

You must provide road markings in accordance with the Traffic Signs Manual and the Traffic Signs Regulations and General Directions. You must show the location, colour and type of permanent road markings on your drawings which must comply with our Specification.

5.1.37 Road studs

You must provide road studs in accordance with the Traffic Signs Manual, show the locations and positions of road studs on your drawings. These shall be cored and filled with white thermoplastic at

pedestrian, cyclist, and equestrian crossings to form marks as shown in the Traffic Signs Regulations and General Directions.

5.1.38 Street name plates

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. The district council will advise you of the names chosen, following the necessary consultations. It is your responsibility to arrange the erection of the street name plates which the district council has chosen. Any street name plates on private drives or unadopted 'roads' should clearly state that the road or drive is 'private' or 'unadopted'.

5.1.39 Traffic signal equipment

We will normally design the traffic signals within the highway works based on detailed road layout drawings you have supplied. 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 including a commuted sum towards the future maintenance of the traffic-signal equipment. 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.

5.1.40 Street lighting

The street lighting design will require technical approval as part of a Section 38 or Section S278 designed submission unless undertaken by us as well amendments or removal of existing street lighting. This shall be produced in accordance with the British Standard and Manual of Contract Documents for Highways Works. Ducts to be adopted by the County Council should be orange, have a nominal internal diameter of 100mm, and be solid. You should contact the Electricity Distribution Network Operator to determine their requirements.

You are responsible for ensuring that the street lighting design is undertaken, ensuring that the specification of equipment is in accordance with our specification, 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 up to date test certificates in accordance with the British Standard, 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.

5.1.41 Alternative street lighting

The street lighting specification we provide will use 'standard' galvanised steel columns with road-lighting lanterns of the appropriate height and luminance. The use of heritage or other non-standard street lighting columns and lanterns will require our approval at an early stage and will attract a commuted sum to cover the increased costs of maintenance and replacement associated with this type of equipment.

Streetlights may be mounted on buildings provided the necessary wayleave is secured for the lifetime of the development at no cost to the Council. In many settings, this may offer a better solution than providing columns and reduce street clutter.

5.1.42 Street furniture and street art

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. Details will be required as to who is to accept future maintenance responsibility. A commuted sum is likely to be payable for any assets not essential for highway purposes but to be maintained by us. The County Council does not adopt public art.

5.1.43 Landscaping

Streets, footways, footpaths, cycleways, grass, shrubs, and trees should complement the appearance of the development and the character of the surrounding area. The appropriate use of a variety of soft and hard landscaping materials, and the incorporation of existing trees and other features should be an integral part of the initial design.

Developers need to recognise that planted areas for adoption should be designed for minimal maintenance and may not be considered appropriate for highway purposes. Therefore, the overall use of materials, planting and landscaping of any new development should be discussed at an early stage with the local planning authority and us. However, it is important for developers to appreciate that the issue of planning consent does not imply that all proposed landscaping will be accepted for adoption by the County Council.

In residential and industrial areas environmental features such as planting boxes, public open spaces, grassed areas, existing trees, hedges and fences and landscaped areas will not normally be adopted by the County Council. Where such features are proposed, the developer must agree with the local planning authority future maintenance arrangements.

5.1.44 Hard Landscaping

It may be preferable to use hard landscaping rather than grass or ground cover planting in small areas of verge and within visibility splays particularly if this is more appropriate for example in an urban setting.

5.1.45 Grass

Grass is the normal acceptable treatment for service strips, verges, and rural visibility splays either by way of grass seeding or the laying of turf in accordance with our specification.

The use of verges between carriageways and footways will require careful consideration as grass at the side of a road can makes it difficult for some people to alight from cars, restricts pedestrian crossing movements, can become rutted due to on street parking, and can obstruct sight lines from junctions and accesses particularly when trees are incorporated within the verge. If verges are proposed, these may be located at the back of footways where they may cause issues if located at the edge of the carriageway and then can be maintained either by the frontages or by a management company. When highway adoption is considered appropriate, the County Council is likely to seek a commuted sum for future maintenance.

5.1.46 Trees

Trees on or next to the highway can be severely damaged by construction and maintenance work to streets and footways. Wherever possible, our policy is to retain, preserve and protect existing healthy highway trees when carrying out street construction. Protection measures must always be

thorough. You should put them in place before the works begin and maintain them until the works are finished.

Tree roots need to absorb oxygen to survive, so most of a tree's root system is found in the aerobic (oxygen-rich) soil within the 600mm immediately below the surface. The tree's roots absorb nutrients and moisture from the soil and can extend well beyond the area taken up by its crown.

Highway construction and maintenance design should allow for all healthy existing trees and where appropriate, the planting of new trees. You should involve our forestry officer or your consultant arboriculturalist who should advise at the planning and design stage on retaining existing trees and planting new specimens. You should consider the potential growth of retained trees, their future compatibility with new and existing highway features and how near new and existing service runs will be. You should identify an appropriate protection zone around the trees you are retaining and, wherever possible, you should exclude this area from the construction site. All necessary tree maintenance work, both before and after construction, should be carried out by trained operatives in consultation with our forestry officer.

We will adopt trees that have been successfully retained or have been planted in verges and other highway related land. We will not adopt any tree retained within a development if we know that it has been damaged by poor practices during construction and the appropriate protection measures have not been employed.

Trees should avoid sight lines from junctions and accesses and all new trees to be located in the highway should be within tree pits.

5.1.47 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.

[End]