



Construction Specification

Adoption Standards for carriageways
and other paved areas

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Economic Growth and Development

Transport and Infrastructure

Issue and Revisions Record

Revision	Date	Originator	Purpose of issue/Nature of change
0	19/12/11	A Stevenson	First issue
1	11/06/12	A Stevenson	Specification for carriageway construction, block paving, kerb heights and service strips revised.
2	22/04/13	S Bundy	Table 1.3 updated
3	09/05/14	S Bundy	Table 1.3 & 2.1, Paras 1.2 & 1.7 updated
4	22/05/17	S Bundy	Table 1.5, para 1.5 & 1.7 & 2.5, contact address updated

Construction Specification

Adoptions standards for carriageways and paved areas

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Introduction

This document sets out the specification for the construction of residential estate roads and all commercial and industrial estate roads within the County that will be offered for adoption as Highways to be maintained at public expense.

This document supersedes all previous Specifications for Estate Roads issued by Cornwall Council and is to be read in conjunction with the design guide and criteria set out in the in the associated documentation and the standard drawings which are available in pdf format at www.cornwall.gov.uk.

The Council's policy is that all new residential roads are designed to provide a maximum speed of 20mph, it will, therefore, be the developer's responsibility to fund the costs of all signing, carriageway markings and the Road Traffic Orders made necessary by the proposed development.

The specification for workmanship and materials is the Specification for Highway Works (SHW), issued in March 1998 (and subsequent amendments) by the Department for Transport and published by The Stationery Office. This is part of the Department for Transport's "Manual of Contract Documents for Highway Works". In this Specification the term "Council's Engineer" shall mean the Director for the Economic Growth and Development Service or their nominated representative, who is normally the relevant Estate Adoptions Officer; contact addresses are given at the end of this document.

The terms "Developer" or "Contractor" shall mean the person(s) who is (are) considered to be the Principal for the development, and with whom all negotiations are transacted. Developers and contractors are reminded that all work must be carried out in accordance with all Health and Safety legislation, specifically including the CDM Regulations and requirements of the New Roads and Street Works Act 1991, together with all other appropriate Codes of Practice.

The Council's Engineer will not enter any site for inspection purposes unless all appropriate safety standards have been complied with. An inspection fee will be required before any site inspections are commenced or the road is considered for adoption under any relevant Section of the Highways Act 1980 or any superseding legislation.

All materials and workmanship shall comply with the requirements of British Standards Institution ISO 9001 (Quality Assurance) and the appropriate National Highways Sectors Schemes (NHSS) as set out in Appendix A of the SHW

Section 1 Carriageway Construction

1.1 General Principles

Carriageway construction shall be designed in accordance with the principles laid down in "Design Manual for Roads and Bridges: Volume 7 - Pavement Design and Maintenance", published by The Stationery Office together with the Department for Transport's current technical design standards.

The design is based on two main factors: -

- The bearing capacity of the sub-grade materials, expressed in terms of the Californian Bearing Ratio (CBR), and
- The estimated usage of commercial vehicles.

To simplify this aspect the roads have been categorised in accordance with the designations evolved from the New Roads and Street Works categories: (see Table 1.1.)

Road Type	NRSW Designation	Standard Drawing No
Residential Distributor Roads / Bus Routes / All Industrial Roads	Type 2	7/100
Residential Access Roads	Types 3 & 4	7/101
Shared Surface Roads (accessways, mews courts and housing squares)	Type 4 Modular	7/102 (Modular)

Table 1.1: Road Types and Classifications

1.2 Design Process

The design processes to be followed are: -

- Establish the CBR value of the sub-grade by in-situ test;
- Apply this CBR value to Table 1.2 in order to ascertain the sub-base thickness and capping required for the appropriate Category;
- Obtain the base, binder course and surface course thicknesses appropriate to the Category of road from Table 1.3, and
- Assess whether the sub-grade is frost susceptible. No material within 300mm of the final surface should be susceptible to frost action.

CBR of Subgrade	Capping Layer (mm)	Sub-base (mm)	Overall Thickness (mm)
Under 2%	Design must be agreed with and approved by the Council's Engineer before any works commence.		
2% - 3%	350	150	500
3% - 4%	200	150	350
4% - 8%	150	150	300
8% - 15%	0	225	225
Above 15%	0	150	150

The capping layer shall consist of material in accordance with Clause 613 (Class 6 F2) OR RECYCLED MATERIAL to the satisfaction of the Council's Engineer

Table 1.2 Minimum Capping and Sub-base Thickness (mm)

Capping layers and Sub base for Permeable pavements shall be designed in accordance with BS7533-13:2009

1.3 Establishing the CBR Value

To ascertain the CBR value the developer shall either: -

- Arrange for in-situ tests to be carried out by a UKAS-accredited laboratory and provide the Council's Engineer with advance notification of the dates of the site test together with a copy of the Laboratory's report, or
- Employ a Consultant approved by the Council's Engineer to make an assessment.

The Council's Engineering Services Laboratory is UKAS-accredited. Contact details are given at Appendix 1.

1.4 Geological Reports and Sulphate Tests

In addition to the CBR tests detailed above the Council's Engineer may require a geological report and a more detailed site investigation to be submitted for his approval if the proposed development is located in proximity to old mineral workings or made up ground, or if the geological nature of the land is otherwise suspect.

The Council's Engineer may also require the testing of the sub-grade for the presence of sulphates, and if found, sulphate resisting cement or an equivalent shall be used in concrete, concrete products and cement mortar.

1.5 Carriageway Construction Thickness

The required minimum construction thicknesses for the various types of carriageway construction are shown in table 1.3 below.

Layer	Material	Road Category				
		2	3	4	4 shared use	4 Permeable
(Road) Base Course	32mm Asphaltic Concrete (AC 32 Dense Base 100/150 REC) to BSEN 13108 Pt1 (2006) & PD6691 (2007) Annex B	150	100	100	n/a	n/a
Binder Course	20mm Asphaltic Concrete (AC 20 Dense BIN 100/150 REC) to BSEN 13108 Pt1 (2006) & PD6691 (2007) Annex B	60	60	60	130	130
Surface Course	10mm SMA (SMA10 Surf 100/150) to BSEN13108 Pt5 (2006) & PD6691 (2007) Annex D	35	35	35	N/A	N/A
	10mm HRA (HRA55/10 F Surf 40/60 Des) to BSEN 13108 Pt4 (2007) & PD6691 (2006) Annex C	40	40	40	N/A	N/A
Paving Blocks	200 x 100 Concrete Paving Blocks to BSEN 1338: 2003 & BSEN7533: 2001 Pt2 or 200 x 100 Clay Paving Blocks to BSEN 1344:2002 & BSEN7533: 2001 Pt2	See Note 2			80	80
Laying Course	Natural sand conforming to BSEN 7533-3:2005 Category II & BSEN 12620:2002 (see note 1)				65	N/A
	6mm Grit conforming to BS7533-12:2009				30	N/A
				N/A	50	

Notes

- The use of sand derived from the processing of China Clay is not permitted, nor is the laying of paving blocks direct onto sub-base within the carriageway.
- Areas of block paving which are subject to high traffic flows will need to be designed in accordance with BSEN7533:2010 Part 10. Block paving other than in localised areas such as tables will not normally be permitted for type 2-3 roads.

Table 1.3 Carriageway Construction Thicknesses

Where surfacing layers are laid prior to the kerbs being laid then it is recommended that a temporary edge restraint is provided to ensure that adequate compaction of the surfacing layers is achieved and to protect the edge of the material from damage by construction traffic. Where adequate compaction of the material is not achieved or the material is damaged the surfacing materials shall be re-laid as directed by the Councils Engineer.

1.6 Polished Stone Value (PSV)

The skidding resistance of the finished surface of a carriageway surfaced with asphaltic materials is governed by the aggregate used in the surface course. Table 1.4 sets out the minimum PSV required in the respective location.

Road Type	Site Category (HD36/06)	Minimum PSV
NRSW Type 2	B,C, Q, G1/G2, S1 & S2	65
	S2 (<100m radius)	68
	Q (R'about approach), K(Pedestrian Crossing)	High Friction Surfacing
NRSW Type 3 & 4 (Residential Access)	K (Pedestrian Crossing)	High Friction Surfacing
	All other site categories	57
NRSW Type 4 (Shared Surface)	All categories	57

Table 1.4 Polished Stone Values

1.7 Binder course for Block Paved Areas in Carriageway

Where carriageways are constructed in concrete or clay paving blocks, a layer of 20mm Asphaltic Concrete Binder Course shall be laid to a minimum thickness of 130mm. Any damage or deformation to the carriageway shall be made good to the Council Engineer's satisfaction prior to the laying of the paving blocks and the bituminous layer shall have holes drilled where required by the Engineer. Such holes shall be filled with 6mm clean chippings prior to laying the paving blocks.

1.8 Block Paving

For areas subjected to vehicular traffic, blocks are to be laid in a herringbone pattern. The orientation of the herringbone pattern is usually set at 45 or 90 degrees to the longest straight edge of the pavement.

Stretcher course will not generally be permitted within carriageway areas, however it may be appropriate within footways and other areas which may be subject to occasional traffic. The stretcher course should not be in line with the general traffic flow and must not be used in areas subjected to turning movements, frequent braking or acceleration unless laid upon a

mortar bed. Specific approval from the Council's Engineer will be required where stretcher course is proposed within the adoptable area.

Lateral restraints are to be installed in all adoptable block paved areas where the gradient is steeper than 1:20, at a spacing not more than 3 X width of the carriageway. Block paving will not be permitted on roads where the gradient is steeper than 1:10.

Temporary restraints may need to be used to prevent paving units moving during construction and are particularly important if a partially completed carriageway is to be trafficked or when necessary to preserve the integrity of the laying face at the end of the working period.

1.9 Kerbs

Kerb upstands are dependant on the type of road, and are as follows:

Residential Distributor Road/Bus Routes/All Industrial Roads:	125mm
Residential Access Roads:	125mm
Table Top Junctions and Road Humps:	50mm
Shared Surface Roads and Mews Courts:	40mm
Vehicle Crossovers:	25mm
Pedestrian Crossing points without tactile pavings:	6mm
Pedestrian Crossing points with tactile pavings:	0mm

Where numerous vehicle crossing points are to be provided in a shared surface over a small area, the kerb upstand may be reduced to 25mm over its whole length.

Kerbs to shared surfaces can either be formed with a BN kerb or proprietary block kerbs as indicated on drawing 7/102, subject to approval.

Where bus boarders are required kerbs shall be as specified within the CC standard drawing.

Section 2 Footways, Cycleways and Service Strips

2.1 Footways, Cycleways and Hard Service Strips

Footways and footpaths may be either of flexible construction or paving blocks in accordance with Table 2.1 below. In all cases the outer edges will be defined by the use of 150mm x 50mm pre-cast concrete edging kerbs. Where the footway is provided on a level surface, kerbs shall be used in place of the concrete edging. Where the adjacent verge is not flush with the top edge of the kerb/edging kerb additional support may be required such as enhanced concrete backing and/or cobbles.

For vehicular crossings on residential estate roads the construction thickness will not alter. However for vehicular crossings on industrial or

commercial roads the crossovers shall be constructed in accordance with Tables 1.2 and 1.3.

Service strips and overrun strips may be either bituminous or block paved construction as per table 2.1. Where an overrun strip is constructed with 200 x100 block paviours the width of the strip may be reduced from 500mm to 475mm in order to remove the necessity to cut blocks. Where streetlights cannot be placed within the overrun strip then the overrun strip should be blocked out to include the streetlight and included within the adoptable area on the S38 agreement plan.

No loose gravel or chippings are permitted in or adjacent to a carriageway, footway or footpath or other areas which are to be adopted.

Other hard landscaped areas to be considered for adoption by the Council shall be paved with either concrete blocks or natural paving or concreted with cobbled inserts or setts.

Layer	Material	Minimum Layer Thickness		
		Bituminous	Block Paved	Level surface, trafficked
Sub-base	Type 1 Granular Sub-base to SHW Clause 803	150	150	Refer to Table 1.2 for capping and sub-base
Binder Course	20mm Asphaltic Concrete (AC 20 Dense BIN 100/150 REC) to BSEN 13108 Pt1 (2006) & PD6691 (2007) Annex B	60 (110) *see note 1	60 (110) *see note 1	Refer to Table 1.3 for base course, binder course and surface course
	Laying course for blocks - Natural sand conforming to BSEN 7533-3:2005 Category II & BSEN 12620:2002	N/A	30	
Surface Course	6mm Asphaltic Concrete (AC6 Dense Surf 100/150) to BSEN 13108 Pt1 (2006) & PD6691 (2007) Annex B	25	N/A	

	Concrete Paving Blocks to BSEN 1338: 2003 & BSEN7533:2001 Pt2 or Clay Paving Blocks to BSEN 1344:2002 & BSEN7533:2001 Pt2	N/A	60-65	
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Notes

1. For areas subject to vehicular traffic ie footway crossovers an additional 50mm binder course shall be laid.

Table 2.1: Minimum Footway, Footpath and Cycle Path Layer Thickness (mm)

2.2 Cycleway Construction

Cycleways within the normal housing estate layout will be of flexible construction in accordance with Table 2.1.

2.3 Grass Verges and Soft Service Strips

Grass verges shall be graded as for footways with the crossfall towards the carriageway in all cases. The service strip may either be turfed or finished with good quality topsoil, weed treated and sown with lawn grass-type seed and lightly rolled.

The rear edge of the service strip shall be defined as follows:

- Across driveways: by the laying of continuous pre-cast concrete back edging kerbs;
- Along garden frontages: as above or in a manner to be agreed with the Council's Engineer.

Other soft landscaped areas to be considered for adoption by the Council should be similarly treated.

2.4 Small Element Pre-cast Paving Slabs

Small element pre-cast concrete paving slabs may only be used on footpaths and cycleways with the express consent of the Council's Engineer.

This consent is likely to be extremely limited in situations such as Conservation Areas.

2.5 Visibility Splays

Visibility splays for adopted roads should be provided in accordance with the requirements shown in "Manual for Streets". For new roads the design speed shall be used to determine the appropriate visibility splay. For existing roads the 85th percentile wet weather speed shall be used to determine the length of splays (MfS para 7.5.2). Visibility splays for adopted roads shall be included within the adoptable area. In some cases

the council may also require visibility splays for private access roads to be included within the adoptable area however this will normally only be where significant use of the access is anticipated. Visibility splays for private access and accesses to private parking courts will not normally be adopted, however provision for these in accordance with MfS should be considered as part of the design. Where visibility splays form part of the adopted highway the limit of the highway should be clearly defined by either kerbs or continuous edging.

Minor footpath widening can be used where the splay extends behind the back of a proposed footpath, with precast concrete edgings used elsewhere. Hit and miss edgings or studs will not generally be acceptable. Any planting proposed in the visibility splay must be low growing and must not encroach into the vertical visibility envelope when fully grown. Planting must be approved by the Council's Engineer. Trees will not be permitted within visibility splays.

2.6 Pedestrian Crossing Points

Pedestrian footway crossings shall be provided at all junctions and crossing points in accordance with Drawing No. 11/106. In areas of busy pedestrian movement, as advised by the Council's Engineer, the developer shall provide tactile surfacing in accordance with the Department of the Environment, Transport and the Regions - Guidance on the use of tactile paving surfaces. Tactile will normally be buff however where the crossing is at signals, red tactile surfacing shall be laid. Any other colour of tactile surfacing will require the approval of the Council's Engineer. Stick on tactile paving tiles will not be accepted within the adoptable highway.

Where tactile paving is provided the kerb should be laid flush with the carriageway. In addition to this a gully should be provided on the higher side of the crossing to prevent ponding and/or water flowing across the crossing which may impede pedestrian movements.

Tactile pavings will not usually be required within new developments or in rural areas except where significant pedestrian movements are envisaged.

2.7 Pedestrian Barriers

Staggered pedestrian barriers shall be installed at all junctions between link footpaths and the main estate road footways in accordance with Drawing No. 4/100. Care needs to be taken when siting them on joint cycle/pedestrian links.

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Appendix 1 - Contact details

All enquiries concerning construction and adoption of Infrastructure

Cornwall Council
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Central Group Centre
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BODMIN
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Tel 0300 1234 222
Email highways-estates@cornwall.gov.uk

All enquiries concerning CBR and other testing

CORMAC
Engineering Services Laboratory
Western Group Centre
Radnor Road
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Redruth
TR16 5EH

Tel 0300 1234 222

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