

## Section 8

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# The Technical Specification

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### 8.1 Road Geometry and Cross Section

#### 8.1.1 General Requirements

The geometry and cross-section of roads to be constructed as part of any development shall generally follow the principles set out in MfS2 and the design standards set out in the DMRB.

Where it is the intention to consider variations to these documents it is recommended that early discussions are sought with the Council.

#### 8.1.2 Swindon Backways

It is the Borough's policy that any development, (normally garages) that will be accessed via an existing backway shall be constructed at least 3m back from the backway centreline. This is to ensure adequate space to manoeuvre in and out of the property. At junctions between two backways, no development should occur within the area defined by a circle, with a 5m radius, measured from the junction in the centrelines of the two backways.



*Swindon Backways are narrow access routes and appropriate design measures are required.*

### 8.2 Pavement Design

#### 8.2.1 General Requirements

Pavement design shall generally be in accordance with the requirements and specifications set out on the Council's 700 series Standard Detail drawings (SBC/STD/700/01-07).

Where any proposed development is not covered by the categories set out on the aforementioned Standard Details, designs should generally be prepared in accordance with the DMRB, although advice and agreement on the appropriate standards should be sought from the Council prior to the commencement of design work.



*Swindon's soil is primarily clay, therefore designs need to combat heave so as to prevent cracking and slippage*

## 8.2.2 Rigid Pavements

Whilst Highways England expects that the developer is given a free choice of pavement construction options between flexible, flexible/composite and rigid pavement for their schemes, in the Borough of Swindon the use of the rigid options is not permitted for a highway. Design guidance for Rigid Pavements is therefore not included.



## 8.2.3 High Friction Surface Policy

For the purposes of this document HFS means specialised high friction surfacing, incorporating calcined bauxite aggregate, specified and conforming to Clause 924 of the Specification for Highway Works (MCHW Volume 1).

Full compliance with current versions of highway design standards as described within this document, is the minimum requirement. The Borough Council will not accept any proposal to use HFS (or any other similar risk mitigation measures) to compensate for sub-standard highway layout proposals.

### Determining the Need for High Friction Surfacing:

- The requirement to install HFS shall depend on the required carriageway skid resistance performance, road geometry and traffic flows using the Design Manual for Roads & Bridges (DMRB) standard HD 36/06: Surfacing Materials for New & Maintenance Construction as amended by Interim Advice Note 156/12: Revision of Aggregate Specification for Pavement Surfacing (or current version of standards as of the date of technical approval).
- Notwithstanding the above, for sites where this document requires the proposed development to be designed to be in accordance with DMRB standards, HFS must be installed on the approach to all traffic signal controlled pedestrian crossing facilities, at all traffic signal controlled junctions with a pedestrian phase and at all zebra crossings. For the same high risk site categories on lower hierarchy distributor/ bus route roads (non-DMRB standard roads) the designer shall follow the requirements of the above mentioned DMRB documents, except the absolute minimum PSV requirement for the approach length shall be 65.
- HFS must not be used to highlight specific areas of carriageway such as gateway features. In these instances, coloured surface material of an equivalent depth to the required surface course material should be used. Approval for any such proposals must be sought from the Borough Council on a site by site basis as part of the formal Technical Approval process.

### Geometric requirements:

- Guidance on the minimum length of HFS to be applied is contained within the above mentioned DMRB design standards. It is recognised that this guidance was not written for local roads or a more urban environment. Therefore, for urban sites with a speed limit of less than 50mph the Borough Council will consider individual proposals for risk assessed design departures from this standard, with an absolute minimum approach length of HFS as follows:
  - 40mph speed limit road = 40m HFS
  - 30mph speed limit road = 30m HFS
- For all sites, specific conditions (such as approach speed, accident record, average queue length) should be considered in design which may then require an additional length of HFS.
- At all traffic signal controlled pedestrian crossing sites the minimum approach length of HFS must be applied ahead of the stop line on all lanes on an approach to traffic signals. The HFS must be continued past the stop line to the second line of studs demarking the crossing point.
- To avoid the potential for differential braking, HFS must be laid across the full approach width of a carriageway/lane as applicable, including within hatched areas. However, HFS must not be laid within the carriageway channel for a width of 200mm.

## Specification, Classification, Certification & Guarantees:

- Only HFS systems to Type I BBA HAPAS can be installed in Swindon Borough.
- All HFS treatments specified for use shall be specified to Clause 924 (MCHW Volume I) and must have a current British Board of Agreement HAPAS Roads & Bridges Certificate, and shall only be installed by a Contractor approved by both the BBA and the Certificate Holder. The Contractor shall provide a two-year guarantee as per SHW clause 924.

## Colour:

- HFS must be installed in full compliance with the Road Surface Treatments Association (RSTA) Code of Practice (CoP) for High Friction Surfacing (version as current at the time of application). The Contractor shall provide a five-year performance guarantee in accordance with section 4 of the RSTA CoP.
- HFS when required on approaches to junctions, approaches to traffic signals including pedestrian crossings must be black/grey in colour.

## Installation & Aftercare:

- Where HFS is required to be laid on an existing carriageway, the existing surface course beneath the proposed HFS extents must be fully replaced before application of HFS.
- HFS must not be laid on chipped Hot Rolled Asphalt. Where this document would normally require chipped Hot Rolled Asphalt surface course this should be amended to High Stone Content Asphalt (HRA 55/10F or similar approved) for the extent of HFS installation only.
- HFS treatments should not generally be laid upon freshly surfaced carriageway until adequately trafficked and where practicable, newly laid surfacing should be used by traffic prior to the application of HFS for the minimum periods as recommended within Section 10, Table 1 of the RSTA CoP.
- Road markings will need to be applied to any new surface course as soon as practical after the surface is laid. Ideally road markings shall not be placed on top of HFS. It is therefore anticipated that masking of the road markings will be required in order to subsequently install the HFS.
- All Traffic Signal induction loops within areas of HFS must be cut after the HFS has been installed to ensure surface visibility of all loop locations.
- For each location where HFS is applied, the total quantities of each system component used, the measured area of the surface treated and the calculated coverage rate in kg/m<sup>2</sup> shall be supplied to the Borough Council within seven days of completion at that location.
- Because of the loose nature of the HFS material the site must be swept at the completion of the works, and at least one further sweep shall be allowed within 48/72 hours of the application.

## 8.2.4 Latent defects

### The Developer is expected carry out the highways works:

- in accordance with the specification, the letter of technical approval, the section 38 agreement, the plans and any other relevant documents,
- with skill and care,
- good quality materials,
- complying with any other requirement set out or referred to the relevant documentation.

If the Developer fails to carry out the highways works in accordance with these requirements, the Council will normally require that the problem is rectified or require that full compensation is paid to it in order to protect the general interests of Council Tax payers, residents and businesses.

## 8.2.5 Macadam Testing Requirements

All materials being delivered to sites being offered for adoption shall:

Be tested for compliance with the relevant BS/BS EN specifications.

- Be tested for compliance with the relevant BS/BS EN specifications.
- Be temperature tested on arrival at the site and be documented.
- Be temperature tested on site after 30 minutes and documented.
- Be temperature tested immediately prior to the laying process and be documented.
- Be temperature tested at 15 minute intervals during the laying process and documented
- All layers shall be nuclear density tested at 10m intervals on all roads (with exception to HRA with chips)
- Test reports to be issued to Swindon Borough Council upon completion for file record and review.
- Tests to be undertaken by a UKAS testing laboratory.

Swindon Borough Council's Clerk of Works must be invited to site to monitor and agree surface depth dips. Copies of the contractor dip sheets to be provided to Swindon Borough Council. A copy of delivery tickets to be provided to Swindon Borough Council within 5 days of surfacing works completion.

## 8.3 Management of Traffic

### 8.3.1 Traffic Regulation Orders

A Traffic Regulation Order (TRO) is the legal document required for traffic restrictions which govern the use of a public road and include:

- Waiting restrictions - Double and single yellow lines
- Loading restrictions
- One way streets
- Prohibitions of driving and turns
- Bus lanes, bus only roads and bus gates
- Speed Limits
- Length, Height and Weight Restrictions

The statutory process, including timescales for consultations, for making a traffic regulation order is set out in The Local Authorities Traffic Orders (Procedure) (England and Wales) Regulations 1996.

Developers will be expected to pay all costs associated with the introduction of any required permanent TRO's in relation to their development. The estimated costs cover Officer time and the advertising costs required by the statutory legal process. These costs will be outlined by TDM at the planning approval stage.

Any necessary TRO's will be identified by TDM in liaison with TM at the planning approval stage. As part of the Technical Approval package the following documents will need to be provided in relation to any intended TRO's:

- Plan(s) showing proposed new restrictions, including any required amendments to existing. Please note these plans will be used for public consultation so will need to be clearly legible.
- Written description of proposed restrictions including appropriate dimensions.
- Written description of why restrictions have been included as part of the development.



- Traffic sign and road markings schedule of any proposed signs for indicating the restriction(s).

All signs and lines for the above restrictions must comply with the Traffic Signs Regulations and General Directions 2016 and its subsequent amendments.

In some instances, once the development is nearing completion, it may be identified that a restriction is required which was not identified at the Planning and Design stage. An example includes a residential estate where the properties have been occupied and due to issues with parking it has emerged waiting restrictions are required. An Officer from the Transport Development team will advise you if this is the case and what costs are involved. Details of the identified TRO as outlined above will need to be provided for the Council to commence the TRO process.

Any signs placed on street in relation to a traffic regulation order prior to the completion of the statutory process will need to be covered until the traffic regulation order has been formally made. It may be appropriate that no traffic signs or road markings are placed on street prior to the Council beginning the TRO process. The same traffic regulation process of introducing a restriction must be followed when revoking an existing restriction.

A temporary Traffic Regulation Order is used for temporary road closures or other traffic restrictions required for a short term basis to enable works to be carried out on the highway and on the grounds of health and safety. For details of the procedures relating to Temporary Traffic Regulation Orders (TTRO), refer to Section 9.

### 8.3.2 Speed Management by Design

Where the use of traffic calming measures are required to influence vehicle speeds consideration may be given to the use of:

- Horizontal traffic calming
- Vehicle activated signs (VAS)
- Road markings



*Typical chicane traffic calming feature*



*Landscape built out*

A variety of factors should be given thought when considering the introduction of traffic calming, including:

- The local environment - noise, vibration and emissions levels
- Traffic composition, buses, HGV's, motorcyclists & cyclists
- Vulnerable road users
- Emergency services
- Public opinion

Whilst a little dated guidance may be sought from Local Transport Note 1/07: Traffic Calming and Manual for Streets although it is recommended early discussions are had with the Transport Development Management team on any proposals.

## 8.4 Traffic Signs and Road Markings

### 8.4.1 Existing signs and markings survey

A survey shall be undertaken of all existing signs and markings, recording as a minimum their type, position, dimensions, letter x-height, mounting arrangements and post sizes.

The position of all existing signs shall be recorded on a plan of the site and consideration given to which signs require replacing as part of the development and where signs may be retained but require repositioning.

### 8.4.2 Traffic signs - General

All traffic signs, whether, permanent, temporary, prescribed or non-prescribed shall comply with the requirements of Clause 1201 of the Specification for Highway Works.

The manufacture and installation of traffic signs shall be in accordance with the quality management relevant scheme described in Appendix A of the Specification for Highway Works and conform to the Construction Products Directive. Traffic sign manufacturers must have their products assessed by a third party to the performance requirements of the relevant standard; for most signs this is BS EN 12899-1:2007. They must also have carried out Initial Type Testing of their products in accordance with BS EN 12899-5 and have implemented a Factory Production Control system in accordance with BS EN 12899-4. This system will be assessed by a Notified Body appointed by the Department for Business Innovation and Skills. The notified bodies responsible for implementing CE marking of traffic signing standards are BSI, SGS and LRQA.

Before the commencement of fabrication of any traffic sign, the developer shall submit the following to Swindon Borough Council for approval:

- scheme layout plans identifying the location of all new and existing traffic signs to remain or to be relocated
- fabrication drawings for all directional or informative signs
- a sign schedule which has the following information; unique sign identification reference, Traffic Signs Regulations and General Directions diagram number, face dimensions (x-height, width, height and area), mounting height, post details (type, number, size, length and spacing between posts), foundation details (type, number, width and length or diameter and depth), illumination requirements, whether or not sign is new or existing and a column for any additional information.

Signs must be numbered consecutively with the following prefixes, which identify the type of sign:

- ADS – advanced direction signs
- DS – direction signs
- RCS – route confirmatory signs



- WS – warning signs
- RS – regulatory signs
- B – bollards

This list is not exhaustive; please contact Swindon Borough Council for further guidance.

### **Traffic sign mounting heights**

All signs must be erected at a mounting height appropriate to their location. Please refer to standard detail drawing number SBC/STD/I200/02 for details.

### **Mounting signs on light columns**

No temporary or permanent signs of a surface area greater than 0.3m<sup>2</sup> shall be attached to a lighting column except in circumstances where the lighting column and foundation is proven structurally acceptable and where the express consent of the Overseeing Organisation has been attained.

### **Traffic sign clearance from edge of carriageway**

All signs must be positioned with a minimum clearance of 450mm between the edge of sign face and edge of carriageway, refer to SBC/STD/I200/02.

### **Siting of traffic signs – Regulatory and warning signs**

Signs must be sited in accordance with the siting distances set out in the Traffic Signs Manual, Chapter 3 (regulatory signs) and Chapter 4 (warning signs) and the 85<sup>th</sup>ile speed limit for the road on which the signs are to be erected. Any departures from this standard must be agreed by the Traffic Engineer.

### **Siting of traffic signs – Advanced direction and direction signs**

Signs must be sited in accordance with the siting distances set out in the table Appendix A, LTN 1/94 appropriate to the 85<sup>th</sup>ile speed limit for the road on which the signs are to be erected. Any departures from this standard must be agreed by the Traffic Engineer.

### **Tourist and attraction signs**

Any tourist signs must comply with Swindon Borough Council's tourism signing policy and be approved by the Traffic Engineer. Authorised tourism signs must be designed as separate signs to the ADS/LDS at corresponding junctions.

Please note that the Council now operates (ANPR) camera enforcement of Swindon's bus lanes, which include bus only roads and bus gates. All applicants will be advised of any additional signage required for this.



*Camera monitored bus gate in North Swindon.*

## **Trial Holes**

Trial holes are to be undertaken at the start of works at the sign locations where statutory undertakers' plant may require further consideration or attention. The council is to be notified of any potential conflicts between statutory undertakers' equipment and the sign foundations.

## **Temporary covering of permanent traffic signs**

Temporary covering of permanent traffic signs shall be in accordance with the Specification for Highway Works Clause 1209.

### **8.4.3 Permanent traffic signs – Sign face**

#### **Sign face design**

- All signs shall be prescribed and be comply with the requirements of the Traffic Signs Regulations & General Directions (TSRGD) 2016 and any subsequent amendments.
- All advanced direction signs, direction signs and lane information signs should list destinations only, no distances should be included. Where available, junction names should be included on all types of advanced direction signs.
- All signs containing text must be designed with letter x-heights appropriate to the 85<sup>th</sup>ile or posted speed limit for the road on which the signs are to be erected as set out in the Traffic Signs Manual, Chapter 3 (regulatory signs) and Chapter 4 (warning signs) and the table in LTN 1/94 Appendix A. Any departures from this standard must be agreed by the Traffic Engineer.

#### **Non-prescribed traffic signs**

- Justification must be provided for the use of any signs not prescribed in Traffic Signs regulations and General Directions 2016 and its subsequent amendments. Any designs must be submitted to Swindon Borough Council for approval by the Traffic Engineer.

#### **Sign face material**

- Sign faces materials shall be constructed using Class RA2 retro-reflective material in accordance with BS 12899-1:2007, except for advanced direction and direction signs on classified routes or were advised by the traffic engineer, which should be manufactured with Micro-prismatic retro-reflective material as a minimum.
- Sign face material shall comply with the requirements of the National Annex NA.1 from BS EN 12899-1 : 2007 – Recommended classes or values for visual performance, with a Guaranteed life of not less than 10 years and fulfilling the requirements of either:-
- Glass Beaded material with a minimum Performance Class of Class RA2 (in accordance with BS EN 12899-1:2007, National Annex NA.1
- Microprismatic material with a minimum Performance Class to BS 8408:2005 (in accordance with BS 8408:2005 & BS EN 12899-1:2007
- In accordance with TD25/01, the sign face material shall be guaranteed to exceed the minimum intervention levels after 10 years meeting the requirements of BS EN 12899- 1:2007.
- Where any sign face material applied in accordance with a manufacturer's application and fabrication procedures fails in terms of its guaranteed performance levels during the first three quarters of its warranty period, the manufacturer shall be liable for returning the sign to its original effectiveness.
- All traffic signs shall be manufactured using sheeting from a single sign face-sheeting manufacturer. The inclusion of a single source sheeting manufacture guarantee's all sheeting warranties.
- Joints in the sign face shall be in accordance with the Specification for Highway Works Clause 1206. The number of joints in the sign face shall be kept to a minimum. The sign face sheeting shall not overlap any joint in the sign face and shall be cut in accordance with the manufacturer's instructions.

## Anti-graffiti film

- Anti-graffiti film should be applied to any signs mounted at less than 2.0m to underside.

## Dew resistant film

- A dew resistant film of 3M Dew resistance sheeting (or similar) is to be installed on all sign faces. This film is to be applied onto smooth, clean reflective sign surfaces when air and surfaces temperatures are above 16°C. The sign face is to be clean and the printed colours completely dry prior to application of the overlay during the manufacturing process.
- The expected dew resistant performance life is 7 years and the water contact angle at which the dew resistant overlay film is considered to be at a static water contact angle of <25°, when performing satisfactorily.
- If the finished signs are exposed to moisture or stored for long periods, then remove the packaging to allow for air circulations.

After installation, the protective coating is to be removed using a sponge and water. Only water is to be used to clean the signs with dew resistant overlay film. Solvents or detergents are not recommended for cleaning signs with anti-dew film on the sign faces.

## 8.4.4 Permanent traffic signs – Sign plate

- All sign plates shall be aluminium and comply with BS EN 12899-1:2007 for manufacturing requirements and Clause 1205.
- In accordance with Clause 1205.2 plate signs not exceeding 1.2m in height x 2.4m width shall be made from a single sheet. Where more than one sheet is used to make up a sign, the number of sheets shall be kept to a minimum and the sheets shall be rectangular and of comparable size and shape.
- Plank signs shall not be permitted unless specified on the drawings. For the purposes of this specification plank signs are defined as any module less than a 1.2m x 2.4m sheet.
- All vertical joints shall be covered with a strip of the same material as the sign plate. This strip shall be not less than 50 mm wide.
- All sign panels shall meet the impact requirements of BS EN 12899-1:2007.
- All traffic signs including regulatory plates shall be stiffened with a minimum of 2 channels.
- All stiffening channels and frames shall be provided and used in accordance with the manufacturer's recommendations, for the proposed post spacing.
- Stiffening of the sign face shall be constructed and applied in accordance with the manufacturer's recommended spacing in order to meet the mechanical properties and construction requirements of BS EN 12899-1:2007. Where sign plates need to be stiffened this shall be achieved in a manner such that the sign face is not punctured or otherwise damaged to accommodate the stiffening.
- Preparation of the base material prior to the application of the sheeting shall be in accordance with the sheeting manufacturer's instructions.

## 8.4.5 Permanent traffic signs – Sign posts

- The number, type, size, of each post for all sign assemblies shall be as detailed in the traffic signs schedules.
- Unless otherwise stated, all posts shall be tubular (circular hollow section - CHS) in accordance with the requirements in clause 1204 and be manufactured from steel CHS S275, galvanised and painted RAL colour 'Grey' and shall comply with the requirements of BS873: Part 6 and 7 and Clause 1911.

- All posts should be a minimum diameter of 76mm.
- All posts should be fitted with a post cap.
- The use of any alternative colour must be agreed with the Traffic Engineer. Passive posts should be used in accordance with the Passive Safety UK Guidelines.

## 8.4.6 Permanent traffic signs – Sign foundations

The design of concrete foundations should be in accordance with the wind loading described in BS EN 12899-1:2007.

- The foundation size of each sign is detailed in the traffic signs schedule and shall comply with the requirements as specified in Clause 1203 and must be designed for each sign either as, individual pad or planted for each post, or shared spread foundation for multiple posts whichever is appropriate. Preference is given to the option which results in the smaller volume of concrete, where achievable.
- Single post sign assemblies shall be as Clause 1203. A minimum of 75mm depth of concrete shall form the foundation beneath the base plate of the sign post.
- Multiple post sign assemblies shall be as above but with Clause 2602, Grade ST4 concrete.
- Only sulphate resisting cement shall be used in concrete mixes. Unless otherwise stated, Grade ST4 concrete shall be used for sign assemblies.
- Where required, mesh for reinforcement shall be reinforcement mesh to BS 4483 Table 1. Foundations for Permanent Illuminated Traffic Signs
- Typical foundation details for illuminated traffic signs are shown on details included in Section 10.
- A suitable duct shall be provided (when required) in the foundation block where the sign is to be illuminated. The foundation block may be to a support post, or to a freestanding post containing the electrical control gear.

## 8.4.7 Permanent traffic signs – Construction and assembly

### Construction and Assembly

- Traffic signs and traffic sign posts shall be erected in accordance with Chapter 1 of the Traffic Signs Manual and the Specification for Highway Works Clause 1208.
- Where signs are to be erected on two posts, the distance from the outer edge of each post to the edge of sign plate shall be 150mm minimum, unless stated otherwise in the appropriate sign schedule.
- All sign plates shall be provided with stiffening or framing, unless otherwise specified on the sign schedule.
- Channel clips shall be manufactured from stainless steel or extruded aluminum alloy. The channel clips shall be from the same manufacturer as the stiffening channels.

Anti-rotational clips to be used on single posts and lighting columns. Also the preferred method for two or more posts

### Marking

- All permanent traffic signs shall be marked in accordance with BS EN 12899-1:2007.
- All posts for permanent traffic signs shall be marked in accordance with BS EN 12899-1:2007.
- Identification marking reference numbers for each lit unit will be provided by Swindon Borough Council.

## Identification Markings

- The back of the sign is to carry the following information:-
- The number of the British Standard;
- The name, trademark or other means of identifying the manufacturer;
- The class of retro-reflective material used;
- The month and year of manufacture.

The sign face material manufacturer's instructions regarding transportation, storage, erection and cleaning shall be adhered to.

## 8.4.8 Permanent traffic signs – Illumination of signs

All signs must be illuminated and /or retro-reflective in accordance with the TSRGD 2016 and any subsequent amendments, and with section 6.10.3 above.

Lit traffic signs shall comply with the requirements of Category I Luminance of BS EN 12899-1:2007 unless otherwise described in this Appendix.

All electrically illuminated traffic signs are to have a double pole isolator installed after the Regional Electricity Company's cut-out. The Site Team shall liaise with the appropriate Regional Electricity Company for the installation and connection of service cables.

### Lighting units

- Lighting units, control gear and associated wiring shall conform generally with the I400 Series Clauses, BS 7671 and the ILE Code of Practice for Electrical Safety in Public Lighting Operations.
- Overhead lighting units shall comply with the requirements of BS EN 12899-1:2007 except where modified or extended below.
- Lighting units shall preferably be of die cast aluminium construction; zinc chromate primed with powder coated polyester finish. The finish colour shall be grey unless shown otherwise on the drawings.
- The lighting unit and its connecting cable shall be tested in accordance with IEE 16th, or subsequent, Edition Wiring Recommendations.
- Lighting units shall be fitted with 1 x 3 LED or 6 x 1 LED. A suitable connector block with fuse carrier for the lamp shall be fitted in the lighting unit adjacent to the incoming cable.
- Lanterns shall be top mounted or free standing and positioned as shown in sign schedules in Table 12/1/1. All units shall be fitted with vandal resistant light panels. Lanterns and brackets shall not be attached to the post until the concrete has set.
- All lighting units shall be fitted with an integral one-part miniature fully electronic photocell having a negative switching differential with a switching level of 35 lux +/- 10% with a ratio of 1:0.5.

### Wiring

Wiring between the post base compartment and the lighting unit shall be a minimum 1.5 mm<sup>2</sup> x 3 core flexible cable to BS 6500 300 - 500 volt grade.

The wiring shall be terminated and connected in the lighting unit and adequate surplus left in the base for future connections to the service cut out.

## 8.4.9 Permanent traffic signs – Bollards

The use of bollards should be kept to a minimum to avoid unnecessary street clutter, however bollards may be required as follows;

- Illuminated bollards with Traffic Signs Regulations and General Directions Diagram number 610, for use

for refuges and splitter island noses,

- Non-illuminated bollards with Traffic Signs Regulations and General Directions Diagram numbers 956 and 560, to mark the start/end of shared cycle-ways.

### **Non-illuminated bollards**

- Bollards are to be black, Morpeth style or similar approved by Swindon Borough Council. For further details, please refer to section 10, I200 series.
- Any bollards within the town centre should be in accordance with Swindon's central area Public Realm Strategy and Palette of Materials.

## **8.4.10 Temporary traffic signs**

All temporary traffic signing must be designed, installed, maintained and removed in accordance with Chapter 8 of the Traffic Signs Manual and removed within the agreed timescale.

Temporary traffic signs shall be manufactured as for permanent signs. Performance Classes; Class RA2 (Glass Beaded materials) or Performance class to BS 8408:2005 (Microprismatic materials) retroreflective material shall be used on all temporary signs.

## **8.4.11 Road markings**

All permanent and temporary road markings shall be in accordance with Clause 1212 of the Specification for Highway Works.

A schedule of all proposed road markings should be submitted for approval with every application.

Unless otherwise stated, permanent road markings shall be thermoplastic road marking material to sub-clause 1212.2(i) material in accordance with BS EN 1871:2000.

Road markings are to have the road performance as detailed in Clause 1212 and BS EN1436.

The width tolerances and thickness of white and yellow lines shall be in accordance with the Traffic Signs Regulations and General Directions 2016 and any subsequent amendments.

Unless otherwise stated, road markings shall not be laid more than 6mm thick.

Any temporary road markings proposed by the Contractor shall comply with BS EN 1790 and must be approved by the Overseeing Organisation before they can be applied.

Temporary covering of road markings shall be by means of temporary pre-fabricated road markings in accordance with CI 1212. Black paint is not acceptable.

The contractor shall take measures to prevent pollution of the drainage system by heavy metals such as arsenic from road marking beads.

It will not be permitted to install permanent road markings on the new surfacing to the original layout and remove them to install the new layout.

Temporary road markings shall be approved as above. Temporary road markings may be used where necessary with prior approval by the Traffic Engineer

The use of road markings in residential areas should be kept to a minimum.



## White Road Markings

Property	BSEN 1436:2007 Reference	Requirement	Value
Colour	Table 6	White	x,y coordinates given
Luminance	Table 2	Class B3	≥ 0,40
Skid Resistance	Table 7	Class S3	≥ 55
Retro-reflectivity	Table 3, Classes of RL for dry markings	Class R2	≥ 100
Retro-reflectivity	Table 4, Classes of RL for road markings during wetness	Class RW3	≥ 50
Retro-reflectivity	Table 5, Classes of RL for road markings during rain	Class RR3	≥ 50

## Yellow Road Markings

Property	BSEN 1436:2007 Reference	Requirement	Value
Colour	Table 6	Yellow	x,y coordinates given
Luminance	Table 2	Class B2	≥ 0,30
Skid Resistance	Table 7	Class S3	≥ 55
Retro-reflectivity	Table 3, Classes of RL for dry markings	Class R1	≥ 80

### 8.4.12 Road studs

All studs; permanent and temporary (whether retro-reflective or non retro-reflective) shall be in accordance with Clause 1213 of the Specification for Highway Works, Traffic Signs Regulations and General Directions and The Traffic Signs Manual Chapter 5.

Where it is intended to use road studs a schedule (outlining the proposed spacing arrangement and product details) and a drawing showing types and locations should be provided.

### 8.4.13 Controlled Crossings

There are a variety of controlled crossings that can be utilised to manage speed as well as provide a safe location to cross the road:

- Puffin – refer to Appendix I
- Toucan – refer to Appendix I
- Pegasus – refer to Appendix I
- Zebra - All proposed zebra crossings should be designed in accordance with the Traffic Signs Regulations and General Directions (TSRGD) 2016.

#### 8.4.14 Speed and number plate recognition cameras

Where these are required developers shall liaise with the Council Traffic Engineer to determine the current specification.

### 8.5 Structures

#### 8.5.1 Introduction

This guidance provides developers an overview of the procedure for obtaining Technical Approval (TA) for new highway structures from the Council (as Highway Authority), highlights the essential design criteria for such structures with references to published national good practice guidance and standards, and provides supplementary design guidance. The aim is to clarify how existing processes and practices fit together with respect to TA of highway structures. It is not intended to be a technical design manual, or to replace the existing documents to which it refers.

The aim of the Council in its capacity as Highway Authority is to ensure that all highway structures are fit for purpose, meet the needs of users, are safe & serviceable, are constructed to appropriate standards and are durable with minimal future maintenance liability.

#### 8.5.2 Technical Approval Procedure

The TA procedure is based on the Highways England Departmental Standard, 'BD2/12 Technical Approval of Highway Structures' (Design Manual for Roads and Bridges Volume 1, Section 1, Part 1). The Council as Highway Authority undertakes the role of the Technical Approval Authority (TAA). The TA procedure is administered by the Transport Development Management team (TDM) with detailed technical support provided by the Bridges & Structures Manager in the Highway Infrastructure Asset Management Team (HIAM).

TA will generally be required for any structure supporting the highway with a span greater than 0.9m or retained height greater than 1.5m and for structures spanning over the highway or supporting land above it. Full details of structures requiring TA are given in BD2/12 along with the four Categories into which they are classified. These categories range from Category 0 for minor structures up to Category 3 for complex structures.

The Developer/Designer is advised to discuss their concept for the proposed structure with the SBC Bridges and Structures Manager at the earliest opportunity, ideally before producing the Approval in Principle document (see below). It should be noted that Planning and Technical Approval are separate development processes. Planning Approval does not take precedence over TA requirements and design standards. Where Planning and TA design requirements are in conflict, it may be necessary to reapply for Planning Permission such that the required TA design standards can be met.

The following three stages of the TA procedure give an overview of the process:

##### AIP Stage

- The Designer of the structure shall seek Approval in Principle (AIP) for his design from the
- TAA by the formal submission of the standard AIP document including General Arrangement drawings, ground investigation reports and any further information that may be requested by the TAA (e.g. EA consents, Utility company permissions, Whole Life Cost information, Designer's preliminary risk assessment and any proposals for Departure from Standards where applicable etc.). This stage of the process usually takes up to four weeks although can take longer depending on complexity of proposal and quality of submission.
- Category 0 structures do not require an AIP, however, it is recommended that Designers discuss their outline proposals with the Bridges & Structures Manager and reach informal agreement on proposals.

This will help expedite TA, avoid potential disputes and abortive design work. Category 1, 2 & 3 structures require an AIP.

- All structures shall be designed in accordance with current Highways England Standards contained within the Design Manual for Roads and Bridges (DMRB) and shall be constructed in accordance with the Specification for Highway Works (SHW).
- Note: At the time of writing, the DMRB may not yet be fully aligned with Eurocode requirements. Attention is drawn to Interim Advice Note IAN 124/11 – 'Use of Eurocodes for the Design of Highway Structures' which provides additional guidance. Where there is confusion or conflict between DMRB and Eurocodes requirements the advice of the Bridges & Structures Manager shall be sought.
- Eurocodes must be used for the design of new highway structures (including geotechnical works). Designs to the superseded BS 5400 bridge design code or building codes, either current or withdrawn, e.g. BS8110 will not be accepted.
- The Designer and the TAA shall agree the classification of the proposed structure for checking purposes.
- When all design criteria and parameters have been agreed, the TAA will accept in principle for the design to proceed to detailed design stage by signing the AIP document. A signed copy of the AIP will be returned to the Designer.

### **Detailed Design/Check Stage**

- With the acceptance of the AIP, detailed design of the structure may proceed. The design and check shall be carried out in accordance with the requirements of the category to which the structure has been classified in the accepted AIP.
- On completion of the detailed design and the design check, the Designer shall submit to the TAA the duly signed Design/Check or Design and Check Certificates (depending on the category of the structure), including a copy of the structural design calculations with a complete set of construction drawings, specification appendices, bar bending schedules and the Designer's risk assessment.
- On receipt, the TAA will review the adequacy of the design submitted and on acceptance sign the Certificates and return copies to the Designer. This will signify the approval of the Design/Check stage of the TA procedure. Please note that it will usually take a minimum of 4 weeks for this audit review by the TAA and depending on the complexity of the structure and the quality of the Designer's submission, it may take longer than the 4 week period.
- Model Templates for AIP and Certificates are contained within BD2/I2.

### **Construction Stage**

- With the acceptance of the Design / Check Certificates, construction of the structure can
- now commence, subject to the submission for agreement of the site phase quality plan and evidence that the Developer/Designer/Contractor have adequate control and supervision is in place. On completion of the construction of the structure, the Developer /Designer/Construction Supervisor shall submit the Construction Compliance Certificate to the TAA. On acceptance, the Construction Compliance Certificate will be signed by the TAA and returned to the Designer/Construction Supervisor. This will signify the completion of the full Technical Approval procedure.

### **The Developer/Designer should note the following requirements:**

- The TA procedure does not in any way modify the contractual and statutory responsibilities
- of any party for the works carried out
- The agreement of the AIP or acceptance of the Certificates by the TAA does not relieve the
- Designer/ Checker of their responsibility for the validity and arithmetical correctness of the calculations, nor their translation into design details and drawings, specification clauses or assessed capacities.
- Detailed design of the structure should not commence until the Approval in Principle (AIP) is obtained.

- No construction of the structure is to proceed until the Design / Check stage of the Technical Approval procedure is completed.
- The TAA (SBC) is not directly responsible for supervision and will only audit the construction phase to satisfy itself that appropriate site supervision is in place. The Developer / Contractor are required to provide evidence of appropriate quality checking, e.g. records of inspection, compliance testing etc. during the construction phase. Critical information such as concrete mix design is to be submitted to the TAA during construction for agreement 7 days in advance of placing concrete.
- Adequate processes must also be in place for off-site activities – e.g. steelwork fabricator QA plan and independent checking of off-site process as appropriate.
- Design Certificate and Check Certificate – model certificates may need to be 'modified' (or additional separate certificates provided) to include for other significant contributors to the process, e.g. where a significant element of the construction takes place off-site, e.g. precast units or steelwork fabrication. In those cases, format of certificates shall be agreed with the TAA.

### 8.5.3 Additional Requirements for Adoptable Structures

When the structure is to be adopted by the Council the following will also apply:

- Drawings required for the relevant legal Highway Agreements shall be prepared and submitted.
- A full set of approved structural design calculations are to be submitted to the Bridges & Structures Section of the Highway Infrastructure Asset Management Team for record purposes.
- Designer's Risk Assessments shall be provided and should give commentary and assessment of risks associated with the fundamental basis of design, in service risks, maintenance activities and decommissioning. The Designer's RA should be supported with other relevant Risk assessments such as RRRAP, PRRSLAR and Departures from Standard.
- Prior to start of construction, two sets of Construction Issue drawings are to be forwarded to the Bridges & Structures Section.
- The Bridges & Structures Section will arrange to visit site during various stages of construction and will require 48 hours (two clear working days) notice when an inspection is required. The inspection schedule listed below is indicative only and is not intended to be comprehensive as the inspection regime will be specific to the type of structure under construction:
  - formation level prior to the placement of blinding concrete
  - reinforcement steel in all elements, sections, components of the structure prior to pouring of concrete
  - concrete immediately after striking of shutters
  - application of the waterproofing system (where appropriate)
  - drainage system prior to backfilling (where appropriate)
  - application of any protective systems (where appropriate)
- copies of contractor approved fabrication drawings shall be submitted to the TAA (SBC) 14 days in advance of fabrication for prior agreement.

For large developments with multiple structures, a construction programme should be submitted to help assist with the planning of inspections and allocation of SBC TA resource.

On completion of construction, a hard copy and electronic format of As-built drawings are to be submitted to the Bridges & Structures Section. Drawings shall be in AutoCAD format.

To comply with the requirements of the CDM Regulations the Health and Safety File is to be passed to the Bridges & Structures Section. The format of such file should generally follow the requirements of BD62/07, As Built, Operational and Maintenance Records for Highway Structures (without HE Forms). All materials and components need to be traceable and accompanied with the appropriate test certificates. Each structure requires its own stand alone As-built records. The format and content of the As-built information should be

agreed with the Bridges & structures Manager during the construction phase.

On completion of the TA procedure and on receipt of full approval, the structure will be adopted by the Council on expiry of the agreed maintenance period, subject to the necessary Part 2 Final Inspection, any necessary remedial works and payment of Commuted sums.

## 8.5.4 Consultation

The Developer is strongly advised to seek advice from the Council's Bridges and Structures Manager at the beginning of the Approval in Principle stage. Early engagement will facilitate development of the AIP and avoid potentially abortive work by the developer. This is also helpful to ensure all appropriate information is obtained prior to selection of the appropriate engineering solution.

## 8.5.5 Specific Design Criteria

### General Design Criteria

- Eurocodes must be used for the design of new highway structures (including geotechnical works) unless agreed otherwise at the Approval in Principle stage
- DMRB standards generally apply to motorways and trunk roads and it is therefore acknowledged that certain aspects of these standards may not always be practical or appropriate in the urban environment. In these cases, the TAA will consider Departures from Standards providing that they are fully justified and agreed at the Approval in Principle stage. Further guidance and procedures can be found in the document 'Departures from Standards: Procedures for Local Highway Authorities' published by the UK Roads Liaison Group.
- Durability is a key issue throughout the design, detailing and construction phases and the principles of whole life costing must be adopted. Examples of good detailing practice can be found in CIRIA Publication 'C543 - Bridge Detailing Guide'.
- Developers should ensure that sufficient space is provided to allow future inspection and maintenance of the structure to be carried out safely. This might include provision of easement strips and/or other appropriate provisions to ensure the safety of maintenance personnel.
- Details of SBC specific requirements for certain types of structure are given in the following sections. This information is provided for guidance purposes and is intended to supplement existing design standards.

## Bridges



- The primary purpose of bridges is to provide a safe passage for vehicles and pedestrians. However, it is also important that bridges are designed aesthetically to compliment or enhance their surroundings. Recommendations for good design are given in Advice Note 'BA4I - Guidance on the design and appearance of bridges'.
- Developers and Designers are advised to consult with Planning Team and the Bridges & Structures Manager to discuss the aesthetic aspects of their outline proposals.
- Consideration must be given to the overall setting of the structure and immediate environment to ensure it is in harmony with its surroundings. For example, secluded areas below large structures can be uninviting and attract anti-social behaviour if not appropriately considered. Vegetation growth in shaded areas can be restricted and alternative treatments and finishes may be necessary to ensure long term acceptability of reinstatements and low maintenance.
- Bearings and expansion joints in bridge decks create significant durability and maintenance issues. Bridges with overall lengths not exceeding 60m and skews not exceeding 30 degrees should be designed as integral bridges, with abutments connected directly to the deck without movement joints and bearings for expansion and contraction of the deck. Additional guidance is given in CIRIA Document 'C543 – Bridge Detailing Guide' and SCI Publication 340.

## Footbridges

- Footbridges shall be designed in accordance with Design Standard 'BD29/04 - Design Criteria for Footbridges'. Aesthetic considerations are equally applicable to footbridges and the general points noted for Bridges above also apply.
- Footbridges in the urban environment shall generally be constructed in reinforced concrete unless agreed otherwise with the Bridge and Structures Manager. The choice of material and structural form shall take into account future maintenance costs and whole life costing.
- In certain circumstances, steel or timber footbridges may be permitted in the urban environment subject to the agreement of an appropriate commuted sum to compensate for the increased maintenance costs.
- The use of innovative materials is encouraged particularly where the benefits of reduced Whole life Costs can be substantiated. Proposals for the use of innovative materials will be favourable considered providing robust evidence in support of the benefits is provided.
- Footbridges and their approaches shall be fully compliant in respect of the Equalities Act. Proposals for footbridges with only stepped access will not be accepted and DDA compliant ramps must also be provided.
- Footbridges can be prone to various forms of damage, misuse and vandalism by users. Consideration should be given to likely vandalism at the location and the structure designed accordingly to minimise the likelihood of damage and associated repair costs.
- Protection measures including security fixings, vandal resistant coatings etc. should be provided. Materials vulnerable to fire damage, graffiti and of high scrap value should be avoided at high risk locations.

## Additional Requirements for Timber Footbridges

- Timber elements of footbridges shall be designed and detailed to achieve a minimum design life of 30 years. Timber footbridges are less durable than other types of structure and commuted sums will be required to cover the increased maintenance and future replacement costs.
- For the purpose of calculating Commuted Sums the replacement interval for timber superstructure elements, e.g. deck beams and parapets shall be 30 years. Timber decking will be assumed to need replacing at 15 year intervals due to the high wear and expected in service lifespan.
- All timber including beams, decks and parapets shall be FSC Ekki hardwood from a sustainable source.
- Foundations and substructures supporting timber footbridges shall be constructed in reinforced concrete to achieve a design life of 120 years.





- Abutments shall be detailed to include ballast walls and bearing shelf drainage where appropriate to improve durability and prolong the life of the timber structure.
- Timber footbridges in urban or residential areas shall have hardwood timber parapets with vertical infill bars at maximum 110mm spacing. Horizontal rails are not permitted.
- Parapets with a minimum of three horizontal rails will usually be acceptable for timber footbridges on less formal footpaths, e.g. rural areas, subject to approval by the Bridge & Structures Manager. Developers are advised that most timber footbridge manufacturers detail three horizontal rails as standard, but timber footbridge offered to SBC for adoption shall have a minimum of four horizontal rails to reduce penetrability.
- All vulnerable details including parapet infill and all accessible fixings shall be vandal resistant as far as is reasonably practicable.
- Decking shall be continuous sheets of proprietary load bearing panels in preference to individual timber deck boards. Panels may be composite materials or laminated ply with an appropriate anti-slip surface.
- Timber decking boards, where accepted, shall be hardwood timber with a non-slip coating to achieve a mean corrected pendulum test value of 45 units.
- Footbridges carrying cycle routes shall have bonded resin/aggregate overlays to the whole deck surface. Footbridges which will only be used by pedestrians may have fully bonded or grooved timber decks with non-slip resin inserts.
- In addition to the pedestrian live loading given in current design standards, timber footbridge decks shall also be designed for loading from maintenance vehicles as agreed with the Bridges & Structures Manager.

## Pedestrian Subways

- The minimum cross section of subways for use by pedestrians only and combined pedestrians and cyclists use shall be in accordance with Design Standard 'TD36/93 - Subways for Pedestrians and Pedal Cyclists - Layout and Dimensions' unless agreed otherwise with the planning authority.
- Pedestrian subways shall generally be precast or insitu reinforced concrete box or portal frame structures. Other structural forms may be acceptable (e.g. masonry arches) subject to prior agreement with the Bridges & Structures Manager.
- The finishes to internal walls and soffits of subways shall be selected to discourage graffiti and aid cleansing of surfaces. Plain concrete finishes are more likely to attract graffiti and should be avoided.
- Subway headwalls and wing walls shall generally be reinforced concrete with brick facing unless agreed otherwise by the Bridges and Structures Manager.

- Subway lighting shall be vandal resistant and shall not encroach into the minimum cross section described above. The design of the subway lighting shall be approved by the Street Lighting Asset Manager.

## Culverts



- Culverts may comprise rigid pipes, precast or insitu reinforced concrete boxes, corrugated steel or other appropriate structural forms.
- The internal dimensions and hydraulic capacity shall be agreed with the Environment Agency and/or SBC's Drainage Engineer depending on the status of the watercourse carried prior to submission of the Approval in Principle.
- Designers should give consideration to the future maintenance and inspection of culverts. Creation of confined spaces or the provision of soft beds within culverts shall be avoided as these can significantly increase the costs of inspection and maintenance during the life of the structure.
- Culvert headwalls and wing walls shall generally be reinforced concrete with brick facing unless agreed otherwise by the Bridges and Structures Manager.
- In some circumstances, brick headwalls may be acceptable for small structures. Headwalls and wing walls constructed in concrete bagwork will not usually be accepted.
- Additional requirements for trash screens and/or wildlife corridors (e.g. mammal shelves) should usually be agreed with the Environment Agency and/or SBC Drainage Engineer. Details of these features should be included in the TA submission.

## Flood Attenuation Cells

- Flood attenuation cells (e.g. Aqua cell, storm cells, soak away crates) should be located outside of trafficked areas, areas subject to highway surcharge loading or at risk from accidental wheel loading.
- Flood attenuation cells proposed to be located within the highway will require Technical Approval including calculations to demonstrate that they can carry full highway loading for the normal 120 year design life of highway structures.

## Road Restraint Systems

- Provision of Parapets and safety barriers shall be in accordance with DMRB requirements.

## Vehicle Parapets



- Vehicle parapets shall be provided on all adoptable structures which carry public roads including bridges, subways, culverts and retaining walls.
- Vehicle parapets shall generally be constructed in aluminium or painted galvanised steel, as agreed with the Bridges & Structures Manager, secured to parapet edge beams using proprietary cast in anchorages with appropriate certification.
- Vehicle parapets shall be designed to satisfy the containment level, impact severity level and working width appropriate to the speed of road.
- Where post and rail type vehicular parapets are located adjacent to footpaths, they shall be fitted with anti-climb mesh in accordance with the manufacturer's standard details. Infill mesh shall be fabricated in stainless steel or galvanised steel and shall be vandal resistant and easy to replace.
- Headwall and wing walls shall include a reinforced concrete parapet beam of sufficient width to accommodate the parapets and fixing system including appropriate edge distances.
- Reinforced concrete parapets with brick facing may be permitted in certain circumstances, subject to prior approval by the Bridge and Structures Manager, where aesthetic considerations dictate. Requirements for fixings, bed reinforcement, pointing and finishes shall be in accordance with TDI9/06.

## Pedestrian Parapets

- Pedestrian, cycleway and/or bridleway will generally be constructed in aluminium or painted steel secured to parapet edge beams using proprietary cast in anchorages or drill and fix bolts with appropriate certification.
- Metal parapets are high value items which are prone to theft. Generally, the use of aluminium parapets shall be restricted to built-up areas where there is less risk of theft and painted galvanised steel parapets should be provided in more secluded or isolated areas. Bolted fixings to rails and baseplates shall have an appropriate number of secure anti-theft fixings.

## Safety Barriers

- Safety barriers shall usually be provided on the approach and departure end of vehicle parapets to prevent errant vehicles from impacting with the end of the parapet.
- Safety barriers shall be designed to satisfy the containment level, impact severity level and working width appropriate to the speed of road in accordance with current standards.
- For any roads where the AADT will be greater than 5000 and the speed limit is higher than 50mph, the requirements for safety barriers shall be in accordance with DMRB TD19/06 (and any subsequent amendment of TD19 current at the date of implementing the proposals).
- For all other roads the need for safety barriers should be considered in accordance with the guidance provided in the UK Roads Liaison Group publication 'Design & Maintenance Guidance for Local Authority Roads – Provision of Road Restraint Systems on Local Authority Roads' (PRRSLAR), dated October 2011 (and any subsequent amendment of this document).
- Developers should note that use of PRRSLAR will be treated as a departure from standard and must be agreed at the Approval in Principle stage.

## Retaining Walls Supporting the Highway

- Retaining walls supporting the highway with a retained height of 1.5m or greater will be subject to full Technical Approval in accordance with the requirements of BD2/12 and this document.
- Retaining walls shall generally be reinforced concrete with brick facing unless agreed otherwise by the Bridges and Structures Manager.
- Developers should seek advice from the Bridges and Structures Manager in order to agree the reduced Technical Approval process for small retaining walls supporting the highway with a retained height of less than 1.5m.

Developers should note that retaining walls of any height may require parapets, pedestrian guardrails or fencing appropriate to the location where the retained height results in a safety hazard.

## Retaining Walls Above the Highway

Walls above the highway will not usually be considered for adoption by the Highways Authority, but in accordance with Section 167 of the Highways Act 1980, the Highway Authority will require design details and calculations for approval for any length of retaining wall whose:-

- cross section is wholly or partly within 3.66m of a street, and
- which is at any point of greater height than 1.37m above the level of the ground at the boundary of the street nearest that point.

## Rock Filled Gabion Baskets

The use of rock filled gabion baskets will not usually be permitted in areas adjacent to footpaths or with public access, due to the risk of vandalism and anti-social behaviour.

## Crib Walls

The use of crib walling will not usually be permitted in areas adjacent to footpaths or with public access, due to the risk of vandalism and anti-social behaviour.

## Reinforced Earth

The use of reinforced earth structures with or without hard facing may incur additional commuted sums due to their high maintenance cost and/or shorter design life.

## Basements and Cellars

- Basements and cellars which form part of private buildings and which also support the public highway will not be adopted by the TAA, but will be subject to the Technical Approval process if they have a span of 0.9m or greater or a retained height of 1.5m or greater.



- For the purposes of Technical Approval the basement or cellar shall be treated as a bridge, buried structure or retaining structure as appropriate to the type of construction.

### **Lighting Columns, Cantilever Signal Masts, CCTV Masts and Road Traffic Sign Posts**

- The design of lighting columns, cantilever signal masts, CCTV masts and road traffic sign posts shall be designed in accordance with the requirements of Design Standard 'BD94/07 Design of Minor Structures'.

### **Small Structures**

- Small structures which fall outside of the scope of BD2/12 will not usually require full Technical Approval by the Bridge and Structures Manager but may still require approval by the relevant Council Officer; e.g. small headwalls might not be classified as a highway structure but may still require approval by the Drainage Manager.
- Examples of small structures falling outside of the scope of BD2/12 include small bridges, buried structures, pipes, culverts and any other structures supporting the highway with a clear span or internal diameter of less than 0.9m and earth retaining structures with an effective retained height of less than 1.5m.
- Developers are advised to seek guidance from the Bridge and Structures Manager to agree an appropriate level of Technical Approval in order to demonstrate appropriate design and detailing for safety and durability of small structures.

### **Utility and Service provisions**

Adequate provision shall be provided for proposed and future utility services across structures. This may take the form of dedicated service bays and/or provision of service ducts in verges/footways. Provisions for services including spare ducts shall be agreed with the Bridges & structures Manager. The proposed placement and protection of services across structures shall have due consideration for future maintenance activities such as re-waterproofing.

## **8.5.6 Construction Materials**

Construction materials and testing requirements shall be in accordance with the Specification for Highway Works (SHW). Where the SHW requires testing of materials including concrete, waterproofing and backfill by the developer, the frequency and method of testing shall be agreed with the TAA. Failure to provide satisfactory test certificates may result in non-adoption of the structure or an increased commuted sum.

Choice of materials and the structural form for the bridge construction will depend on the intended function of the highway carried by the bridge, and on the long term maintenance requirements by the local Highway Authority. SBC requires that this is assessed using a whole life costing approach. Further guidance on whole life costing is provided in the following section.

The minimum criteria for typical construction materials are described in the following paragraphs.

Concrete exposure classes shall be in accordance with current standards and shall be agreed at the Approval in Principle stage.

Steel grades and finishes shall be in accordance with current standards and shall be agreed at the Approval in Principle stage.

All timber shall be FSC certified hardwood from a sustainable source.

Protective paint systems shall be in accordance with Series 1900 of the Specification for Highway Works and shall be designed for 'inland difficult access' with no maintenance for 12 years, minor maintenance after 12 years and major maintenance after 20 years. Paint colours and finishes shall be agreed with the Bridges & Structures Manager.

The use of other protective coating systems for steel such as Weathering steel, galvanising, stainless steel etc. will be evaluated with due consideration to Whole Life Cost aspects, aesthetics and maintenance considerations.

The choice of brick / masonry finishes, bond and mortar class shall be agreed with the TAA.

Reinforced concrete walls with brick facing shall be capped off with reinforced concrete copings/edge beams which are monolithic with the wall stem. The copings shall be detailed with sufficient width and depth to accommodate parapet fixing bolts and a suitable drip chase.

Requirements for anti-graffiti coatings shall be agreed with the Bridges and Structures Manager.

Bridge decks and buried concrete subway or culvert roof slabs shall receive a spray applied waterproofing membrane to extend a minimum of 300mm down the back face of abutments or sidewalls.

All other buried concrete surfaces shall receive two coats of bitumen emulsion.

Buried concrete structures shall be backfilled with Class 6N material in accordance with Series 600 and Table 6/1 of the Specification for Highway works.

Requirements for bridge deck surfacing shall be agreed with the Highway asset Manager.

## 8.5.7 Whole Life Costing

The traditional method of option/scheme appraisal in the construction industry focused solely on the capital works cost and neglected the long term maintenance requirements and cost. As a result, a cost effective solution was considered inappropriately to be the one with a low construction cost. This approach resulted in many cases in the development of many short-term solutions that proved to be expensive in the longer term due to durability and maintenance problems. Whole Life Costing (WLC) is used to assess the financial merits of a scheme over the long term, thus preventing short term expenditure from skewing decisions.

WLC should be used to assess maintenance needs that have more than one solution, i.e. option appraisal, and to determine the most cost effective schemes.

For guidance on assessment of maintenance costs, please refer to Highways England's departmental documents 'BD 36/92 and BA 28/92: Evaluation of Maintenance Costs in Comparing Alternative Designs for Highway Structures'.

Further guidance on WLC can be found from the published national good practice guide 'Management of Highway Structures – A Code of Practice (ACOP)'. The Council, in accordance with the national ACOP on management of highway structures and the Highways England standards requires that alternative design proposals for all new bridges within the Borough shall be justified by an adequate WLC assessment in accordance with the above guidance and standards. Where a design does not have the lowest WLC, SBC will require a commuted sum in accordance with the National Code of Practice to cover future maintenance, inspection and replacement costs.

## 8.5.8 Commuted Sums

A Commuted Sum to cover the cost of inspection and maintenance over the 120 year design life of highway structures and the eventual cost of replacement will be payable by the Developer or each adoptable structure.

Guidance on Commuted sums can be found in Section 8.14.

## 8.6 Street Lighting

### 8.6.1 Adoptable street lighting – general considerations



Unless otherwise stated, the Highway Authority will require the developer to provide a street lighting system for roads, footpaths and cycle tracks which are to be adopted as highway maintained at the public expense. However, the views of the Parish Council will be considered and subject to approval by the Street Lighting Engineer, lighting may not be required in some rural locations.

The street lighting system must be an integral part of the estate design, with implications for pedestrian security as well as road safety taken into account. However, street lighting is specifically designed for both safe navigation of traffic, and pedestrian movement during the hours of darkness. It is NOT provided, or designed for security of premises.

It is important the equipment used on any installation should be the type that is aesthetically most suited to the area, whilst remaining optically efficient and easily maintainable.

The level and type of lighting installed will vary with the type of road class on the development, and the local needs. The choice of lighting equipment and its positioning may be affected by the following, and special consideration should be given to:

- The character of the area
- The quantity of light required for the particular purpose
- The direction and control of light
- The colour of the light source

In conservation areas, or very close to them, and in other environmentally sensitive areas, the Highway Authority, may, in liaison with the Local Planning Authority and others, require a higher standard of design for the column and lantern. Additionally, within rural areas, or close to open countryside where street lighting is proposed the developer shall ensure full consultation with the AONB board has been carried out and a written report provided to the Lighting Engineer. Special consideration must also be given to the habitat of wildlife & bats etc. that are sensitive to frequencies that are emitted by lanterns.

Where there are trees or other obstructions, spacings may need to be amended accordingly.

Failure to show significant features on a lighting plan may result in the Street Lighting Engineer requesting relocation of columns before the commencement of the maintenance period. The developer shall be responsible for the full cost of any such work.

It will be the responsibility of the developer to ensure that all prospective property purchasers are fully aware of the location of all street lighting furniture.

On new developments where trees are already present or to be planted, the lighting should be designed first and the planting sites fixed afterwards. Where conflict is unavoidable, future growth must be taken into consideration including the effect it will have upon the distribution of light and the potential for branches to strike the lighting asset during heavy winds. When determining the position of low planting, consideration should also be given for access to columns for annual maintenance.

Where a site lies beyond the limits of the existing lighting scheme, it may be necessary, in the interests of highway safety, for the intervening section to be lit at the developer's expense. Early consultation should take place with the Street Lighting Engineer.

Where the proposed development involves the formation of a new road junction with an existing highway which was previously unlit (or to a lower standard), or where the new junction interferes with the existing lighting, the lighting provision for the new development will be deemed to include the whole of the junction.

The phasing of a development must take into consideration the need to light, within the development, all roads and footpaths which are required for access to occupied properties.

Wherever possible, lighting installations must be within the area of adoptable highway. Where this is not

practicable the developer must arrange appropriate covenants or agreements with the landowners or property owners. This shall include lanterns that are mounted onto private structures. Any such covenants or agreements shall be binding on the successors in title, allowing the highway authority the continued right to install, operate, maintain and remove such equipment.

All lighting designs must aim to produce little, or no light intrusion into surrounding properties, and where this is not practicable the characteristics of the installation shall be referred to the Street Lighting Engineer.

Where a scheme is ongoing from an existing installation it will be in the developers responsibility to determine the lighting equipment already installed and indicate this information on the drawings. In consultation with the Street Lighting Engineer, and where practicable, the same type of equipment shall be used for the continuation of the road.

The developer will be responsible for the complete installation, testing and commissioning of each unit. It is a requirement of this Council that any street lighting work shall be carried out by a member of the Highway Electrical Association (HEA). The contractor must also be registered, and work in accordance with, the Highways Electrical Registration Scheme (HERS) Sector 8 NHSS. Adequate provision must also be made for road crossing ducts that may be necessary for electricity services. All road crossing ducts shall be twin walled 100mm minimum diameter, and all crossings shall be installed in accordance with both current NRSWA & HAUC requirements. All DNO supplies must be installed within BLACK ducting, all Private Cable Network supplies must be installed within ORANGE ducting. Positions of all crossings must be accurately marked on the final 'as-built' drawings.

## 8.6.2 Existing street lighting

Where a developer undertakes to redevelop a site where lighting is an existing feature, they shall first determine ownership of the lighting and, in case of Highway Authority owned units, will assume full responsibility for their security, operation and maintenance during the redevelopment. Such units will be deemed 'new' where applicable and may be re-adopted.

No existing lighting shall be switched off, dismantled or removed without prior written approval of the Street Lighting Engineer. This approval shall normally be granted only if the developer can show that arrangements have been made for either the immediate installation of temporary lighting or the early commissioning of the new permanent system.

The developer shall be responsible for the implementation of all work required in the removal, replacement or resiting of any existing lighting equipment made necessary by the site works. This work may involve the total removal and disposal of units from site and/or the replacement/resiting of units within the general area affected by the works.

Throughout the duration of the works, the developer will ensure all lighting levels are maintained to the standard or lighting level agreed by the Street Lighting Engineer prior to commencement of the works.

Where the extent of the removal of existing lighting is temporary to facilitate other works, the developer will be responsible for the safe storage and subsequent return to working operation.

## 8.6.3 General design standards

Lighting design shall be in accordance with the relevant parts of BS5489-1:2013 and BS EN13201-2 :2015

Prior to commencement of the design, the developer shall determine from the Street Lighting Engineer the BS classes to be applied to schemes, noting that different parts may require different categories.

It should be noted that for lighting designs within residential areas every attempt should be made to situate lighting columns on the boundary between properties.

For external designs, the Street Lighting Engineer will provide a preliminary class assessment and design brief as part of the technical approval procedure.

If the developer considers that a different class is more appropriate, it should be referred in writing to the Street Lighting Engineer, whose decision will be based on performance, future maintenance and aesthetics, and will be final and binding.

Unless otherwise stated lighting calculations shall be based on a maintenance factor derived from the light source and lantern manufacturers' and the method defined in BS5489-1 Annex B.

The lighting layout shall be on the plan to scale of not less than 1:500, additionally a

All designs submitted for approval shall be accompanied by associated computer aided design calculations indicating the uniformity or minimum and average levels of luminance or illuminance (as appropriate). Where requested the submission shall include the calculated values for up to three different types of lanterns.

## 8.6.4 Luminaires and lanterns

### All luminaires shall be:

- manufactured to BS EN 60598-2
- CE approved and marked.
- suitable for exterior road lighting as defined in the BS5489 and BS EN 13201.
- designed specifically for LED Light source.
- capable of full and stable operation over a temperature range of -25C to +35C
- IP66 rated minimum.
- light grey (RAL 9002) finished, unless otherwise specified.
- luminaires are to be fitted with 'DALI' enabled electronic drivers (or similar appropriate) with Central Management System capability.
- Step dimming regimes:
  - Principal routes (ME class)
    - Dusk to 22:00hrs 100% output;
    - 22:00hrs to 00:00hrs 80% output;
    - 00:00hrs to 06:00hrs 60% output;
    - 06:00hrs to switchoff 100% output.
  - Residential (P class)
    - Dusk to 22:00hrs 100% output;
    - 22:00hrs to 00:00hrs 50% output;
    - 00:00hrs to 06:00hrs 30% output;
    - 06:00hrs to switchoff 100% output.
- provided with a relevant Elexon/UMSUG charge code approved for use on unmetered supplies.
- recyclable in accordance with WEE regulations.

All luminaires up to 6m mounting height (S or P class Lighting) are to be controlled by a 1 part electronic photo cell set at 35/18lux All luminaires over 6m mounting height (M or ME lighting class) to be controlled by a photo electric cell set at 20/20 lux, and fitted with a seven pin NEMA socket.

All LED's to be run at no more than 750mA, unless otherwise specified.

All LED modules shall deliver light with a correlated colour temperature (CCT) of no more than 4000k.

Minimum required operating life of the LED module shall be 100,000 hours at L80B50 at an ambient temperature of 25°C

Where appropriate, consideration should be given to mounting lanterns on structures, although the position in relation to upper floor windows must be taken into account. Approval must be sought from the Street Lighting Engineer before the design process is completed.

Lanterns fixed to buildings will be at the discretion of the Borough Lightin Engineer.

Generally, lantern mounting heights below 5m will not be acceptable, except in the case of covered passages/ subway which are to become part of the public highway.

## 8.6.5 Columns and brackets

### Columns shall be:

- Manufactured in accordance with BS EN 40-5:2002 Cold sectioned
- Designed to a mean hourly wind speed of 24m/s
- Designed with a site altitude of < 260m
- Of the following heights and types for the appropriate road type:
  - Principal routes (ME classes) - octagonal mid-hinged 10 or 12m or with approval by the Street Lighting Engineer tubular 10 or 12 m
  - Minor access or secondary distributor routes (ME/P classes) - octagonal mid-hinged 8m or with Street Lighting Engineer approval tubular 8m
  - Residential distributor route (P class) - tubular 5 or 6 m
  - Residential roads (P class) - tubular 5m
  - Residential footpaths with NO vehicular access (P class) - tubular 5m mid-hinged
  - All cycle tracks up to 2m width (P class) - 5m tubular mid-hinged
  - Cycle tracks greater than 2m width (P class) - 6m tubular mid-hinged
- Galvanised finish to BS EN ISO 1461 2009
- Erected with only an MIO factory applied primer, and undercoat where a paint specification is stipulated. All finished coats (sheen only) shall be applied on site, and not factory finished, unless written consent is given by the Street Lighting Engineer.
- Root protected using a two pack extruded glass flake cure with a minimum dry film thickness of 250µm or thermoplastic. Root protection should extend for the full length of the column root upto 250mm above ground level, on both the interior and exterior surfaces
- Fitted with doors with a M10 hexagonal centre pin door bolt lock (SL2)
- Any proposals for lanterns weighing in excess of 10kg or for multiple lanterns to be installed on a single column should include provision for structural enhancement including a welded web gusset or similar approved.
- Erected in accordance with SBC SC6 planting specification. Under no circumstances are columns to be erected in vertical ducts or sleeves, however sockets may be used for shallow foundations with approval from the Street Lighting Engineer.
- Column planting depths are detailed below:

3M	600mm
5M	800mm
6M	1000mm
8M	1200mm
10M	1500mm
12M	1700mm

Post top mounted for columns up to and including 6m in height. Outreach brackets will only be accepted on 8 -12m columns if they are situated in excess of 2m back from the kerb edge or there are other external factors, but this must be discussed and approved with the Street Lighting Engineer.

Designed taking into account the following standard pattern of brackets:

Colum Height	Maximum Bracket Projection
12M	1.5M
10M	1.0M
8M	0.75M
6M	Post Top
5M	Post Top

Wherever possible, columns are to be installed with their access door facing away from oncoming traffic. Columns doors shall have safe, clear access routes, free from excessive vegetation.

Columns located in planted areas shall have a concrete collar at ground level at least the diameter of the column at ground level plus 300mm in diameter

Mid-hinge columns should be installed adjacent to high capacity, high speed roads wherever possible in order to reduce risk for maintenance operatives and remove the requirement to work at height adjacent to live traffic lanes.

Road geometry and asset positions should be designed to obviate the requirement for passive safety equipment wherever possible. Any proposals to use passive safety equipment should include a comprehensive risk assessment, detailing:

- An assessment of whether the existing geometry of the road and position of the street furniture has historically found to be a contributory factor in previous collisions;
- An assessment of whether incidents are more or less likely to occur with the new geometry and column positions;
- An assessment of the level of risk posed by the design of the junction with and without passive safety equipment;
- Costed options to establish the maintenance cost/risk benefit ratio of installing standard or passively safe equipment.

The assessment should include for any street lighting; traffic signal; signage or other street furniture assets that the Designer considers may pose a risk to highway users.

### 8.6.6 Electrical supply and connection

Unless approved in writing by the Street Lighting Engineer, all columns and posts for illuminated signs will have direct live unmetered service connections, as provided by the District Network Operator (DNO), and shall be terminated into a suitable DNO double polecut-out.

All street lighting columns, illuminated signs and bollards situated within a central reservation, roundabout, splitter island, or refuge island shall be fed by means of a Private Cable Network (PCN) via either the nearest DNO fed street light not situated within the locations listed, or an appropriate feeder pillar. All PCN isolation points shall be isolated by means of a double poleisolator, or similar. All PCN circuits shall be fed in Steel Wire Armoured Cable (SWAC) in accordance with BS 7671:2008, and enclosed within 50mm (minimum)



twin walled orange duct All ducting shall be buried, and marked in accordance with current HAUC & Buried Services requirements. All PCN cables feeding a column, illuminated sign post, or illuminated bollard shall be terminated into a double pole isolator; secondary isolation is not required. All PCN routes must be marked on the final 'As-built' drawing. Further guidance may be sought from the Street Lighting Engineer.

Cross road ducts shall be as above but minimum 100mm internal diameter. Any cross road ducts shall be provided with 50% spare ducts e.g. if 2 ducts are required 4 shall be installed.

All internal wiring within the columns and brackets shall be 2.5mm<sup>2</sup> three core blue arctic flex with copper conductors.

All internal cables shall have insulation of the appropriate colour, and in accordance with the current BS7671:2008 IET Wiring Regulations and any current documents

All installations should be earthed in accordance with the current edition of BS7671:2008 (IET Wiring Regulations) and BS 7430:2011 + A1:2015 (Code of Practice for protective earthing of electrical installations). This shall include a supplementary bonding conductor between the earthing stud in the base of the column and the door.

Earth bonding shall be 6.0mm<sup>2</sup> PVC single core cable as a minimum.

Cut out to be a maximum of 20amp, unless approved by the street lighting engineer.

Any contracts placed with an IDNO (Independent District Network Operator) service provider should ensure the service failures are responded to within the following timescales:

- Immediate danger – Attend site within 2hrs
- High priority fault repair - Restore within 10 working days o Multiple unit failure – Restore within 20 working days
- Single Unit Failure – Restore within 25 working days

## 8.6.7 Numbering system

Each lighting column, lit sign post or bollard is to carry a unique identification number comprising the full road and unit number (number to be allocated as part of the Technical Approval process). The numbers shall be printed onto a thermal transfer heat printed system of self-adhesive exterior vinyl. Refer to standard detail SBC/STD/I300/01.

Identification number labels are to be fixed to lighting columns 2.4m above ground level, facing the highway (i.e. perpendicular to the direction of travel). On lit sign posts the ID label should be fixed to the post as high as possible up to a maximum of 2.4m facing the opposite direction to the sign face. On bollards the ID label shall be fixed as high up as possible on the rear face of the bollard.

## 8.6.8 Inspection and testing of the installed apparatus

The street lighting engineer shall be notified when the installation is complete and ready for inspection. The notification shall include a schedule confirming the technical details and location of each unit, together with copies of the EAWR test certificate.

All electrical circuits within either a street lighting column, illuminated sign, or illuminated bollard shall be tested in accordance with BS7671:2008 17th Edition IET Wiring Regulations, & Electricity at Work Regulations 1992 (EAWR).

All test results shall be recorded on a test certificate (sample attached) which shall include the lighting contractors NICEIC number, and shall be signed by the contractors approved tester, or validator. All completed test certificates must be forwarded to the Street Lighting Engineer for their inspection, and

approval. Please note, no lighting inspection shall take place until the Lighting Engineer is in receipt of these certificates.

The developer shall ensure, and at their expense prior to a Final Inspection request any installation which has been operational for 3 years or more, and is not LED must be re-lamped, electrically inspected and tested in accordance with BS7671:2008, and cleaned by an HEA approved contractor prior to adoption. In the instance of LED lighting, the luminaire shall be cleaned, and electrically tested and inspected in accordance with BS7671:2008 only. Any defects found during the Final inspection must be rectified to the Lighting Engineer's complete satisfaction prior to adoption; this will include whole paint finishes, lanterns, numbering etc. Without prejudice this list is not exhaustive and all records cards to be updated accordingly.

When the installation has been accepted by the Council, (generally on issue of a Part 2 certificate) which may be prior to adoption of the road, the council will assume responsibility for energy and ad-hoc failure maintenance (lamp failure) of the lighting system, however the developer will remain responsible for any defect or damage to either the column, lantern, sign light, sign plate, bollard shell and base chamber until the road is adopted.

A maintenance card shall be fitted into the base compartment of every column & illuminated sign upon installation. This will detail the history of the column and lamp, including the installation, testing and connection dates, also any maintenance work carried out prior to adoption. Please note the developer must ensure all maintenance cards are up to date prior to completion of the Final Certificate.

## 8.7 Traffic Signals



*Where any development requires the use of traffic signals, refer to Appendix I for the latest copy of the 'Developer's Pack'.*

## 8.8 Public Rights of Way

Public footpaths are public highways over which the public have a right of way on foot only not being a footway.

Public bridleways are public highways over which the public have a right of way on foot, on horseback, leading a horse and on a pedal cycle.

Restricted byways are public highways over which the public have a right of way on foot, on horseback, leading a horse, on a pedal cycle and for non-mechanically propelled vehicles, ie horse drawn vehicles.

Byways Open to All Traffic (BOATs) are public highways, which are also carriageways, over which the public have a right of way for vehicular and all other kinds of traffic, but which is used by the public mainly for the purpose for which footpaths and bridleways are so used. There is no obligation on the highway authority to provide a surface suitable for vehicles.

The Borough's public rights of way are all recorded in the Definitive Map and Statement. This legal document is conclusive to the rights and routes shown on it but there may be other routes that the public have been using that have yet to be recorded. A proposal for a development can often prompt an application to the Council for a Definitive Map Modification Order to record additional public rights of way. Processing any such application can take two years or more to conclude and may have to be decided at a public inquiry. Developers are recommended to establish the routes and status of all public rights of way in the vicinity of their property, along with any potential routes, at the earliest opportunity by contacting the Rights of Way Officer.

The granting of planning consent does not permit any public right of way to be obstructed, diverted or altered in any way. Those processes are completely separate to the planning consent process.

Where possible all public rights of way should be accommodated through development sites on their current alignments as green corridors. Existing public rights of way cannot be developed as carriageways or footways. Depending on the location type and scale of the development, developers may be required to physically improve the condition of the routes by the addition of a rolled stone surface or other works. These works should be discussed and agreed with the Rights of Way Officer before any works commence on site.

Where it is not possible to accommodate public rights of way on their current alignment the developer should apply to the Council for the necessary legal order to extinguish or divert part or the entire route. There is no guarantee that any such application will be successful and processing those applications can take two years or more to conclude and may have to be decided at a public inquiry. Developers are recommended to discuss their proposals at the earliest opportunity with the Rights of Way Officer. The Council incurs costs in processing an application for a legal order to change a public right of way and these costs are recovered from the applicant for the change irrespective of whether the application is concluded to the applicant's satisfaction.

The applicant for a diversion of a public right of way will be responsible for bringing the new route up to the standard required by the Council. Diverting the route along a footway with a black top surface will not normally be acceptable. If the new route requires any new structures, eg bridges and retaining walls, those structures will require Technical Approval through the process outlined elsewhere in this document. The applicant will be required to cover the Council's costs associated with that process and is recommended to contact the Council's Structures Engineer at the earliest opportunity to minimise those costs.

As part of a development the Council may require the developer to provide additional public footpaths or bridleways within the associated land holding. The developer will be responsible for bringing those routes up to the standard required by the Council and to enter into the associated legal agreement to create the route as a public right of way.

Public rights of way can be closed, via a legal order, on a temporary basis to safeguard users of the route due to planned works or other dangers. If it is necessary to close a public right of way for those grounds then an application should be made to the Council at least 12 weeks in advance of when it is required. The applicant will be responsible for meeting the Council's costs in processing such an application and providing a signed alternative route. These legal orders for public footpaths and bridleways can last up to 6 months, 18 months for byways, and can be extended by the Secretary of State for an additional cost.

## 8.9 Road Safety Audits (RSA)

### 8.9.1 Road Safety Audits - General

Developers will be required to submit Road Safety Audits undertaken in accordance with HDI9/15 from the Design Manual for Roads and Bridges (DMRB) or any standard that supersedes HDI9/15 and the CIHT requirements. Developers will be expected to submit audit reports for Stages 1, 2 and 3 as set out in HDI9/15 and where deemed necessary by the Highway Authority, Stage 4. Any deviation from this will need to be agreed with the Highway Authority in advance. Audits will be required on all categories of roads within Swindon.

The Highway Authority will approve or disregard those Recommendations identified in the Road Safety Audit Report as it considers appropriate.

All works required to be undertaken as a result of any Recommendations shall be implemented by the developer at their own cost.

## 8.10 Street Naming and Numbering

### 8.10.1 Street Name and Numbering Process

The process for naming a street and determining street numbers and the associated charges are set out at the following link: [http://www.swindon.gov.uk/info/20031/roads\\_parking\\_and\\_transport/321/apply\\_for\\_street\\_name\\_or\\_number](http://www.swindon.gov.uk/info/20031/roads_parking_and_transport/321/apply_for_street_name_or_number)



*Typical Street Name Plate style, detailing optional PRIVATE ROAD and culdesac information.*

### 8.10.2 Standard plate design

**Nameplates shall be designed in accordance with the following:**

- All street nameplates shall be constructed of 11 swg aluminium, to BS1470: 1987 Ref. 1050.A.H14
- Plates shall be supplied with smooth edges and with corners of radius 20mm
- Plates will feature a 12.5mm wide polycarbonate material border
- Characters shall be formed by die-pressing to semi-shear
- All characters shall be centrally positioned on the plate
- The character typer will be Kindersley, 90mm capital height
- Plates will be degreased, primed, stove enamel in colours specified below and over lacquered using clear stove lacquer
- Colours used will be BS4800: Black 00.E.53 and White: 00.E.55
- The colour combination will be black characters and border on a white background, the back of the

plate to be finished in black

- The depth of the plate will be a minimum of 200mm, length dependent on the number of characters. As a guide the following should be adhered to:
- Length – multiply number of characters by 90mm and round up to the nearest 100mm
- Depth – for one line of 90mm characters the plate depth will be 200mm. For one line of 90mm characters and one line of 50mm characters (e.g. numbers), the plate depth will be 225mm. For two lines of 90mm characters, the plate depth will be 250mm.
- If a road is not to be adopted the new street plate will need to include the text (Private Road), text at height of 50mm.
- For no through roads, the plate must include the 'no through road' sign (diag 816.1), of minimum size 165mm and maximum 275mm.

### 8.10.3 Standard frame design

#### **Frames shall be designed as follows:**

- Frames shall be constructed of 3mm box section steel, 50mm by 50mm nominal section in a black stove enamelled colour. This applies to both the back support and legs. The length of the frame will be determined by the length of the plate (as above), the height will be 1300mm.
- Frames will be finished in gloss black paint, primed as per the manufacturer's recommendations.

Frames are to be erected as shown on Standard Detail SBC/SD/I200/03.

## 8.11 Drainage

### 8.11.1 General

- The Flood and Water Management Act 2010 designates the Council as a Lead Local Flood Authority and makes the Council, both in this capacity and as Local Highway Authority, a Risk Management Authority. Associated duties will be phased in over a number of years, and TRfD will be updated as necessary.
- An adequate system of drainage must be provided for the collection and disposal of surface water from roads, footways and cycleways. It is absolutely essential that the means of surface water disposal be investigated with the Highway Authority at the preliminary stage of any development scheme.
- All highway drainage should be designed and constructed in accordance with the latest Sewers for Adoption.
- It will not be acceptable for the highway to drain onto private land or vice versa; this includes rain water run-off. The Council will not consider the road for adoption if an adequate highway drainage system to a suitable piped outfall or watercourse cannot be provided.
- 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.
- Adoptable highway drainage should be made from clay or concrete only. Plastic pipes are not permitted.
- All adoptable highway drainage systems shall be located within land which is to be adopted by the Council or that would be under the control of a public body.
- It is important that footways and footpaths have sufficient drainage to prevent standing water. They should not allow water run-off onto private land.
- Adoptable areas will be the subject of a wet weather inspection and will not be signed off at Part 2 Certificate or Final Certificate until the Council is satisfied that the drainage system is performing in a satisfactory manner.
- As Built records and inventory required in geo-spatial format to allow for importing into Map Info.

## 8.11.2 SuDS

- SuDs are the Environment Agency & LLFRA's preferred way of draining development and are a key component of the NPPF to meet objectives.
- The primary guidance for the design and implementation of SUDS is set out in **The latest CIRIA Guidance**.
- As SuDS become more commonplace, new guidance and legislation in the future will be introduced which will reinforce the requirements set out in this guidance.
- For further information regarding SuDS and a guide to how the Council expect SuDs to be implemented, please review the Council's **SuDS vision for NEV**.
- Notwithstanding the above, it should be noted that permeable paving and attenuation crates are not permitted solutions for adoptable highway schemes.

## 8.11.3 Soakaways

- Due to the soil type across much of Swindon (Oxford Clay), it is unlikely that soakaways will be an acceptable drainage method for developments.
- Thorough ground investigations should be undertaken to determine suitability, in accordance with the recommendations of **Building Research Establishment Digest 365 Soakaway Design**.

## 8.11.4 Gullies

- It is the responsibility of the Developer to demonstrate and ensure that the number and positioning of the gullies are adequate to drain all areas of carriageways, footways, footpaths and cycle tracks.
- Gullies should be positioned upstream of all controlled and uncontrolled crossing points.
- Gully positions shall be chosen so that no gully has a catchment area of impermeable surface exceeding 150 square metres.
- Alternatively the gully positions shall be determined in accordance with the Design Manual for Roads and Bridges HA 102/00.
- 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.
- Plastic gullies will only be permitted in exceptional circumstances on a site by site basis.

## 8.11.5 Manholes

- Manhole chamber design shall be in accordance with the latest edition of Sewers for Adoption.
- Manholes shall not be placed in footways, service strips or any other areas required for use by the Statutory Undertakers.
- When manholes are located in carriageways they shall be located such that their use during inspection and maintenance work will not prevent the free passage of vehicles or cause a hazard to cycles or motorcycles.
- Manholes shall be provided at maximum intervals of 90m and at every pipe junction, change of pipe size, direction or gradient.

## 8.11.6 Pipes

- Pipe design shall be in accordance with the latest edition of Sewers for Adoption.
- No plastic pipes are permitted for use in adoptable highway drainage systems.
- No gradient is to be flatter than 1:300 unless agreed



## 8.11.7 Section 104 Agreements

- Where public foul and surface water sewers and lateral drains are to be laid under the adoptable highway (or where the highway drainage is to be connected into a surface water sewer) then written assurance must be obtained beforehand from the Water Company that it will adopt the sewers and drains subject to compliance with its requirements in the current version of Sewers for Adoption. The Developer shall apply for the adoption of the sewers under Section 104 of the Water Industry Act 1991
- The Highway Authority will normally decline to adopt any road until the Water Company has confirmed the adoption of all sewers within the street, although in exceptional circumstances, the Council may be willing to enter into a section 50 Licence, subject to confirmation from the Drainage Company that the sewers have been constructed to their satisfaction.

## 8.11.8 Connection to existing highway drains

- It is the responsibility of the developer to ensure adequate outfall arrangements for highway drainage.
- It must not be assumed that permission will automatically be granted by the Highway Authority to make connections to the existing highway drainage system in adjacent maintained roads.
- Where an outfall is proposed to be through an existing highway drain, before approval for the connection can be given, the Developer will be required to prove:
  - The existing highway drain has the capacity to cope with the surface water discharge from both the existing highway areas and the additional areas that are the subject of the application;
  - The internal condition of the existing highway drain is suitable.
- This will require the designer to submit:
  - Appropriate design calculations;
  - Catchments area plans;
  - An internal condition report of the drain including a copy of a CCTV survey, from the proposed point of connection to the point of outfall.
- Any works required to upgrade or repair the existing system will need to be carried out at the expense of the developer and included on the Agreement plans.

## 8.11.9 Land Drainage

- 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.
- 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 main river ditch or watercourse, or the LLFRA for ordinary watercourses, in accordance with Section 23 of the Land Drainage Act 1991.

## 8.11.10 Backfilling trenches

You must backfill all drainage, utility and other trenches in the highway for industrial and commercial premises up to formation level with GSB type I 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 I or material graded to 6F1).

## 8.12 Landscape Design

### 8.12.1 Introduction

The design of landscape can have a great influence on the final appearance and general acceptability of a new development. It should be considered at the earliest opportunity as an integral part of the overall scheme.

It is recommended that the developer employs a qualified Landscape Architect to ensure that landscape proposals for the development are of an adequate standard and appropriate to the site.

### 8.12.2 Landscape Design Objectives

The vision for the landscape design should be a statement which relates closely to the overall project vision and one which is agreed by the whole project team. Objectives should describe the approach and outcomes for the road landscape which will be used to achieve the project vision. The designer should prepare landscape objectives which provide direction and guidance, inform strategies and the landscape design and help deliver a sustainable solution.

### 8.12.3 Surveys

Prior to any development a full survey of the site is required. This should ensure that any development will reflect as well as possible the existing character of the site. The survey shall show levels, significant landscape features, and features to be retained. It should also show existing vegetation, in particular species, location, condition, canopy size and diameter at breast height (DBH) of all existing trees.

### 8.12.4 Planting Design and Selection of Species

The planting design should be informed by the vision and clear objectives defined and described during the development of the vision for the road or street. The objectives should be aspirational with a clear mechanism to ensure that they can be delivered.

A successful landscape requires space and adequate space should be allocated for the road, clear zone, and public realm for the planting at its mature size. The vision for the road and its landscape objectives should inform how much space is required. Narrow strips of land and steep slopes will generally result in a poor landscape.

The planting design also needs to consider underground utilities and the potential constraints which they apply to landscaping, in particular tree planting. The position of trees and other features needs to work with utility corridors, and equally utility corridors may need to change to enable the landscape to be built at the surface. The coordination between underground utilities and planting at the surface requires cooperation between the utilities and the road designers. Access and easement requirements of utility companies can severely restrict the potential for planting and therefore the quality and character of the road landscape.

Trees are the most memorable aspect of roadside planting design. They have an appropriate scale for a road corridor, are clearly noticed, and are the best means of softening the hard built elements of the road and create character. An avenue can create a distinctive character for example. They should be the primary element of a landscape design. Trees should be located carefully and deliberately, creating character and establishing a balance between enclosure and allowing or framing views from the road.

Tree species should also be carefully selected so that the landscape design objectives are achieved. They should relate to context, possible design themes, arranged in rows for formal landscapes and in groups for informal landscapes. The use of a single species can have a powerful effect, and the use of a range of species can create diversity and contrast.

The planting design should respond to the speed of the viewer. Large scale, single patterns using bold shapes

and colour can be appreciated by motorists travelling at speed who will not be able to see small scale and complex patterns. In contrast, pedestrians and cyclists will have the time in moving at slower speeds to see and enjoy individual plants, leaves and flowers and the planting design should be at an appropriate scale to allow for this.

Trees in grass or low ground cover planting are generally preferable in urban areas to allow views and provide good visibility in urban areas.

Native plants can be used to protect and enhance local biodiversity and to create distinctive landscapes, and may also have cultural significance. Native plants can be used on their own or within mixes of more decorative plants and can create equally distinctive and attractive landscapes in the way that they are used and arranged. Ornamental plants can be used to create attractive and unusual features within the road landscape.

The landscape planting design should consider the mature size of plants and their lifetime, and the maintenance regime. Short lived plants, shrubs and ground covers should be used in areas where they can be maintained effectively and their replacement is planned for.

Soil conditions are an important element in establishing planting successfully and if the soil is damaged through compaction or pollution for example, then it may be impossible to establish the planting. Planting adjacent to roads creates harsh growing conditions for plants. Plant species which can thrive in the highway environment should be used to minimise failures and to create successful and sustainable landscapes. Compacted ground, limited space for soil and root zones, proximity to paved areas and run off from storm water for example should all be considerations in the design of the planting.

Road medians present a means to visually break up the expanse of hard surfacing and help the road corridor. The planting design needs to take into account the particular conditions with limited soils, lighting, barriers, access for maintenance, visibility requirements and other constraints.

Planting themes can be a useful tool to help define landscape concepts and treatments, and describe the broad character of the planting design approach. The landscape theme should be informed by the landscape character assessment, urban context appraisal, policies and plans, the vision for the project and the landscape objectives. The landscape theme may respond directly to the character for the landscape the road passes through, using existing features and elements within the proposed landscape design, or to create a new character for the road landscape. Planting themes may not be appropriate or support the landscape objectives, but care should be taken to avoid a disjointed and poorly designed landscape as a result.

If visual screening is required as a mitigation measure through the landscape assessment process, then the designers should design an appropriate visual screen. The selection of plants should respond to the landscape and urban context, the amount of space available and the level of screening required. If necessary to achieve the screening objective, the landscape designer should make recommendations for acquiring additional land for screen planting. When planting is used in combination with walls or fencing, the planting design should reflect the character of the landscape on either side of the wall. When selecting plant material for screening the designer should consider the following:

- the space available for planting and other site constraints such as visibility splays and set backs
- planting should be close to the road so that it is effective
- the height of the screening required and the ultimate height of the plants
- the growth rate of the plants using fast growing species if required
- mix of plant species to create visual interest or single species for a bold simple effect
- considering the long term with the potential to remove quick growing trees in the short term
- allowing slower growing plants time to mature
- creating a hierarchy of plants with tall, medium and low plant species to create a screen at all levels

- vegetation needs to be a minimum of 5m tall to be able to screen trucks
- using plants with thick and dense foliage can be more effective in blocking a view.

Planting design should be appropriate to the location. Particular account should be taken of existing or adjacent vegetation and, where relevant, native species appropriate to the existing soil conditions and other site conditions should be used. Planting in spaces within the development may have a more ornamental character but only long-lived robust plant species needing minimal maintenance should be used.

### 8.12.5 Landform

Sensitive modelling of earthworks and careful planting design can provide a landscape framework for the development. However, the use of excess 'spoil' on development sites solely as a means of losing spoil rather than removal from site is unacceptable.

Shallow slopes and gradients are more suitable for planting and the long term sustainable maintenance of the planting. Planting on steep slopes is less likely to be successful in its establishment and maintenance.

### 8.12.6 Specific design issues

The following factors shall be considered in developing the landscape design:

- Trees, shrubs or other plant material with a mature height of more than 600mm may not be planted in any visibility splay at road junctions, roundabouts or bends.
- Particular care should be taken when planting trees within verges. Appropriate species of tree should be selected dependent upon specific constraints such as type of road, use of high sided vehicles, services, microclimate and adjacent foundations. However, the existence of some of these constraints should not be used as a reason not to plant trees, as there are various proprietary root barriers available.
- No tree species may be planted in service strips within areas which will be adopted highway, nor within 3m of the route of major underground services or sewers.
- Dense or particularly thorny planting is not acceptable adjacent pedestrian/cycle routes.
- Small and isolated shrub beds or grass areas must not be created. Shrub beds less than 1m in width will not be adopted.
- Care must be taken when choosing species for planting within service strips to ensure a shallow root system thus avoiding potential damage to services.
- No tree or shrub species may be planted where, at their mature size, they will obstruct street lights or road signs. Poor design and choice of plant species can produce security problems both for parked cars and also personal security. Care should be taken not to create areas that give cover to those with criminal intent. To this end both hard and soft landscape should be kept below, or above, a height or density that would shield people moving around car parks (i.e. no dense planting 1-2m high). However, tree planting is acceptable provided suitable species are chosen, i.e. clear stems, non dripping species and no heavy fruiting trees.
- Existing trees or other vegetation to be retained shall be protected with temporary protective fencing to BS 5837:2012 "Trees in Relation to Design, Demolition and Construction – Recommendations"

## 8.12.7 Quality Management for Landscape and Tree Works

The developer must comply with the recommendations of:-

- BS 5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations
- BS 3936 -Nursery Stock – 1992
- BS 3998 - Recommendations for Tree Work – 2010
- BS 2248 -Recommendations for General Landscape Operation
- Swindon Borough Council Supplementary Planning Guidance -Tree
- Protection on Development Sites - July 1999

## 8.12.8 Maintenance

Good maintenance is an essential part of creating a cared for public realm. To ensure that the quality of public realm provision can be sustained in the long term, management and maintenance should be considered from the outset.

The management of the planting should always be considered early on in the planting design stages so that the planting design objectives can be achieved through proper and appropriate maintenance operations which are safe.

The choice of street furniture and paving materials, for example, can make cleaning easier, as can the location of columns and posts. The aim of any improvement scheme should be to provide a quality of maintenance and management which is consistent across all ownerships and management systems.

The design should consider how the planting will change over time and what the maintenance implications are likely to be. The designer should ensure that the design is sustainable through the specification of long lasting, durable and robust materials, thus taking account of lifetime costs and not just simply construction costs. The aim should be to encourage a high quality of maintenance and management which is consistent across all ownerships and management systems.

## 8.13 Advertising on the Highway

### 8.13.1 General

Within Swindon Borough Council, we offer a number of advertising options to businesses, including roundabout and lamppost advertising. Roundabouts are popular with local businesses as the advertising signs are very visual and some are located in prime locations of traffic flow around the borough. Dependant on location, size and look of the roundabout determines the advertising pricing structure.

### 8.13.2 Roundabout Advertising

SBC have in excess of 50 roundabouts with the majority accommodating advertising signs, a uniform support panel is displayed on each with the SBC logo.

Roundabouts are offered to clients at a cost that includes the maintenance; however, there are a few where the maintenance is carried out by the client, a prime example of this is the Tadpole Lane roundabout where Crest Nicholson have purchased a cultivation licence.



They wanted to advertise the new development and utilise the roundabout to do so and also landscape the maintain the area, by purchasing a cultivation licence for a 5 year period they have been able to do this and they also pay an annual fee to the Council for advertising on the asset.

## 8.14 Commuted sums

### 8.14.1 General

- Section 278 (3) and Section 38 (6) of the Highways Act 1980 enables a Highway Authority to seek commuted sums from developers.
- Swindon Borough Council will require developers to pay a commuted sum towards maintenance of items that have a higher maintenance cost compared with conventional materials or items, or would not be required save for the development.
- Where appropriate, Section 278 and Section 38 Agreements will include provision for commuted sums towards maintenance.
- A non-exhaustive schedule of items for which commuted sums will be sought from developers is shown in 8.14.2.
- The rates represent the most typical values that Local Highway Authorities apply over a 30 year calculation period. They are based on a survey of councils that have adopted the County Surveyors Society Commuted Sums for Maintaining Infrastructure Assets, published in 2009.
- The requirement for commuted sums will be assessed for each site prior to the drafting of the Section 278 and Section 38 Agreements.
- The process for calculating, processing and obtaining commuted sums is as follows:





Feature	Units	Commuted sum per unit (£)
High Friction or Coloured Surfacing	Square metre	80.00
Knee rail fencing	Linear metre	25.00
SuDS	Each	Site specific quotation
Soakaways	Each	5000.00
Petrol & Oil interceptors	Each	5000.00
Combined kerb drainage systems	Linear metre	15.00
Trees	Each	300.00
Traffic signal junction	Each	Site specific quotation or £45,000
Traffic signal crossing	Each	Site specific quotation or £25,000
Structures	Each	Site specific quotation (120 years)
Illuminated street furniture	Each	15.00 + 375 (25 year maintenance)
6M lighting column	Each	34.74 + 868 (25 year maintenance)
8M & 10M lighting column	Each	40.21 + 1005.25 (25 year maintenance)