



5.0 Specialist Design Elements

5.1 Drainage

Drainage design

Types of Systems within the Highway.

5.1.1 highway drains

All pipes which only carry surface water from the adoptable highway are prospectively maintainable by the Highway Authority. Their design and construction shall comply in all respects with the standards required in this document.

5.1.2 surface water sewers

Pipes which carry surface water from the adoptable highway as well as other areas such as roofs, garages, private driveways etc., must be adopted by Thames Water and must therefore comply with its requirements.

[Sewers for Adoption 4th Edition](#)

5.1.3 foul sewers

Foul sewers which pass along the highway must be adopted by Thames Water and must therefore comply with its requirements.

5.1.4 Lateral connections

Lateral connections into public sewers (i.e. connections of the private drainage of single or small groups of houses) will remain private but shall be designed and constructed to the standards required for adoptable sewers. All such connections shall run approximately at right angles to the centreline of the road to minimise their length.

5.1.5 private drains

Private drains will not normally be allowed in the adoptable highway except that, with the written permission of the Highway Authority, a private drain may cross the road at right angles. Any such drain shall be constructed to the standards required for adoptable sewers; no privately maintainable manholes shall be constructed in the adoptable highway.

Approval of Sewers and Highway Drains

5.1.6 water company to approve sewer design

Where foul or surface water sewers are to be laid under the adoptable highway, or where the highway drainage is to be connected into a surface water sewer, written assurance must be obtained beforehand from Thames Water that it will adopt the sewers subject to compliance with its requirements. The developer shall apply for the adoption of the sewers under Section 104 of the Water Industry Act 1991.

5.1.7

The Highway Authority will normally decline to adopt any highway covered by a Section 38 agreement until Thames Water has confirmed the adoption of all sewers within the highway. This also includes any other sewers not within the adoptable highway, but which carry water from it.

5.1.8 right to discharge into pipe or watercourse

All drains that are intended to be adopted as highway drains shall discharge to a pipe or watercourse at a point approved by the Highway Authority. Evidence will be required that the developer has a right to discharge, free of any liability which may be binding upon the Highway Authority when the drain is adopted.

5.1.9 Environment Agency approval to be obtained

Where the outfall is into a ditch or watercourse the approval of The Environment Agency or, where appropriate, the Borough's Drainage Engineer, must be obtained in writing.

[Section 23 Land Drainage Act 1991](#)

5.1.10 developer to prove adequacy of outfall system

Where the outfall is proposed to be through an existing highway drain, the developer will be required to prove its capacity and condition before approval for the connection can be given. This will include a CCTV survey of the drain and the carrying out of any improvement works found necessary.

5.1.11 interceptors required on highway drainage

Where the proposed highway is to drain through a new or existing highway drain, an oil interceptor may be required at an accessible point near where that system discharges into a sewer, pond or watercourse.

5.1.12 easement required for highway drain in private land

All prospectively maintainable highway drains shall be located within land which is to be adopted by the Highway Authority. Only in exceptional circumstances will they be permitted in land which is to remain private. Where such circumstances do arise, the land owner at the time of completing a Section 38 Agreement will be required to give a grant of easement keeping 3m each side of the pipe clear of all obstructions, which will be binding on successors in title. The developer is strongly advised not to sell any land which will contain a highway drain before completion of such an Agreement. The Easement is a standard document prepared by the Borough Solicitor. The Highway Authority will not accept any different form of undertaking which dilutes the rights conferred by it.

Capacity of Highway Drains

5.1.13 drainage system to be in accordance with water companies recommendations

For a highway drain, where the proposed area of drained highway exceeds 650m² the developer must submit to the engineer hydraulic design calculations for the system. The parameters for these calculations shall be in accordance with the requirements of the current edition 'Sewers for Adoption' published by the Water Authorities Association. Where the Wallingford procedure is inappropriate then the use of a suitable iterative method may be permitted, with the parameters to be agreed beforehand with the Engineer.

Sewers for Adoption 4th Edition May 1995

5.1.14 minimum pipe size

The minimum internal diameter of any pipe shall be 150mm. The minimum gradient for a 150mm pipe shall be 1:150.

5.1.15

In certain cases the Engineer may require the provision of a larger capacity drain than would normally be needed, in order to accommodate the drainage of adjoining land and/or future development.

5.1.16 consideration to be given to flood levels

Where the highway drain discharges into a watercourse, the Calculations for this system shall take into account the possibility of flooding of the watercourse and the subsequent surcharging of the highway drain.

The hydraulic gradient for the purpose of design shall be taken from the level of the bank of the watercourse and this gradient is to be shown on the drawings and all calculations must take this into account.

5.1.17

Where a carriageway is to be constructed in an area liable to flooding it shall not normally be built below the 100 year flood level. However in some circumstances the water company may require overland flood routes and this will generally involve use of the highway. In these circumstances particular attention must be given to when designing and constructing to control the flow.

Gully spacing and position

5.1.18

Gully positions shall be chosen so that no gully has a catchment area of impermeable surface exceeding that shown in Table 5, or alternatively the gully position shall be determined in accordance with the recommendations of HA

102/00 'Spacing of Road Gullies'. The design parameters shall be 0.75m width of flow and a one year storm.

However, on shared surface roads pedestrians may need to Walk in the channel and the figure in brackets will apply unless centre drainage is provided.

TABLE 5 - Maximum area to be drained by one gully (m²)

Crossfall of Road	Gradient of Road	
	Steeper than 1 : 60	1 : 60 – 1 00
1/40	200 (75)	180 (60)

5.1.19

Gullies will be required immediately upstream of pedestrian crossing points and road junctions. At all low points where blockage of the gully outlet could result in damage to property, two gullies will be required connected separately into the main drain run. The second shall be slightly removed from the low point such that any run-off resulting from a blockage of the gully at the low point may be readily detected and will drain into the second without causing a nuisance to adjacent properties.

5.1.20

Gullies must not be positioned on pedestrian or vehicular crossing points. Any existing gully which lies in the bellmouth area of a proposed road must be repositioned, normally on the upstream side of the bellmouth.

5.1.21

It is the responsibility of the Developer to demonstrate and ensure that the number and positioning of the gullies are adequate to drain the carriageways, footways, footpaths, and cycle tracks. Roads will not be adopted unless this requirement is met.

Gully gratings and frames

5.1.22

Gully gratings and frames shall be manufactured from cast iron, be uncoated hinged and be to BSEN124.

Covers and frames in Distributor type carriageways shall be nominal 450mm size to Class A.

Covers and frames in other carriageways shall be nominal 450mm size to Class B.

Gully covers shall be end hinged, with hinged end laid facing oncoming traffic.

Covers and frames in shared space type carriageways together with those used in cycle tracks and footpaths, where positive

drainage is installed, shall be nominal 325mm size and have a grating pattern specifically designed as suitable for joint vehicular and pedestrian surface applications.

Manholes

5.1.23 design

Manhole chamber design shall be in accordance with the types illustrated in 'Sewers for Adoption'.

5.1.24

Where different sized pipes connect into a manhole, their soffits shall be laid level.

5.1.25

Manholes shall be provided at maximum intervals of 100m and at every pipe junction, other than for gully connections less than 10m long, and at every change of pipe size, direction or gradient.

5.1.26

Manholes shall not be placed in footways, service strips or any other areas required for use by the statutory undertakers.

5.1.27

Manholes in carriageways shall be located such that their use during inspection and maintenance work will not prevent the free passage of vehicles.

Pipeline Design

5.1.28

The design of all pipelines within the adoptable highway and any highway drain shall comply with 'A guide to design loadings for buried rigid pipes, HMSO 1983' and where pipes are to be adopted by Thames Water their requirements must be complied with.

[A guide to design loading for buried rigid pipes HMSO 1983](#)

The examples of design given in 5.1.29 and 5.1.30 below will be acceptable for highway drains provided that the pipes are protected from extraordinary loads during the road construction period.

5.1.29 pipes to be surrounded with aggregate

For pipes of less than 450mm diameter laid in a trench with cover of between 4.0m and 1.2m under carriageways (1.0m elsewhere) the pipe must be surrounded in clean, single-sized aggregate.

5.1.30 shallow pipes to be surrounded in concrete

For all pipes of less than 450mm diameter and laid with cover of between 0.6m and 1.2m, the pipe shall be bedded on and surrounded with concrete. Designers should make every effort to avoid pipes with less than 1.2m of cover because they are more expensive to construct and more likely to be accidentally damaged by activities of statutory undertakers etc.

5.1.3

All trenches under and adjacent the paved highway shall be backfilled with Type 1 granular material. Backfill is deemed to be the vertical zone between the top of any separate pipe surround or cover material and the underside of the road base.

Ducts

5.1.32

Ducts shall comply with drawing I2 of Highway Construction Details, Department of Transport 1991.

[Highway Construction Details 1991 DoT](#)

Subsoil drainage

5.1.33

If groundwater is likely to be present which may affect the integrity of the road or adjoining structures, a subsoil drainage system shall be provided to the satisfaction of the engineer.

Plastic Pipes

5.1.34

There is an ongoing discussion about the acceptability of plastic pipes, which has not been satisfactorily answered to date. Therefore, plastic pipes will not be deemed acceptable for adoptable highway drainage.

Sustainable Urban Drainage Systems (SUDS)

5.1.35

The Borough will accept the design of alternative means of controlling rain water run-off for developments. However, discussion with the Borough's Transportation Development Control Team is required to assess suitability, and each case will be judged on its own merits.

5.2 Street Lighting

General Considerations

5.2.1 street lighting required in some rural areas

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

5.2.1 security implications

The street lighting system must be an integral part of the estate design, with implications for security as well as road safety taken into account.

5.2.1 special requirements

It is important that 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.

5.2.4

In conversation 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.

5.2.5

The level and type of lighting installed will vary with the type of road on the development, and the local needs. The choice of lighting equipment and its positioning will be affected by:-

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

5.2.6 spacing to be reduced in certain circumstances

The siting of lighting units will generally be in accordance with BS 5489, but where there are trees or other obstructions, spacings may be reduced as appropriate. Similarly the requirement to illuminate traffic calming measures is likely to reduce spacings.

BS 5489

Where columns are to be positioned close to trees/planting, due account must be taken of future growth and the effect on the lighting distribution.

Failure to show such significant features on a lighting plan may result in expensive relocation of columns before the commencement of the maintenance period.

It will be the developers responsibility to ensure that prospective property purchasers are fully aware of the location of all street

lighting furniture. Any subsequent alterations to an approved layout due to site considerations will not be authorised unless the developer can demonstrate that this change has been brought to the attention of owners/prospective purchasers.

5.2.6 lighting may be required outside site

Where a site lies beyond the limits of an existing lighting scheme it may be necessary, in the interests of highway safety, for the intervening section to be lit at the developers expense. Early consultation with the Street Lighting Engineer is essential.

5.2.8

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 new junction.

5.2.9 phasing of development

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.

5.2.10 lamps mounted on buildings

Where appropriate the siting of lamps on structures should be considered, and the principal agreed by the Street Lighting Engineer prior to a design being completed. Lanterns fixed to buildings will not normally be acceptable if they are more than 2m from the carriageway edge or 3m from a footpath.

5.2.11 Wayleaves

Wherever possible lighting installations shall 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. 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 all such equipment.

5.2.12 minimum lantern height

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

5.2.13 light pollution

All lighting designs must aim to produce no light pollution, and where this is not practicable the characteristics of the installation shall be referred to the Street Lighting Engineer for further consultation.

5.2.14

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 site works.

5.2.15

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

5.2.16

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.

5.2.17

The developer will be responsible for the complete installation and commissioning of each light. It is recommended that the actual work be carried out by approved specialist sub-contractors and adequate provision must be made for road crossing ducts that may be necessary for electricity services.

5.2.18

The Street Lighting Engineer shall be notified when the installation is complete and ready for inspection. This notification shall include a schedule confirming the technical details and location of each lamp, together with copies of the NICEIC wiring certificate. A 'template' for this survey sheet is included in Appendix 2.

[Appendix 2](#)

5.2.19

The developer shall forward the wiring certificates to the Public Electricity Supplier (PES).

5.2.20 Highway Authority to pay for energy

When the installation has been accepted by the Council, (generally on the issue of part 2 certificate) which may be prior to adoption of the road, the Council will assume responsibility for energy and routine maintenance of the lighting system but the developer will remain responsible for any defect or damage until the road has been adopted.

A maintenance card shall be fitted into the base compartment of every column. (see Appendix 3 for 'template'). This will detail the history of the column and lamp prior to adoption.

The column grouping will **not** be adopted without this history.

5.2.21

Where a developer undertakes to redevelop a site where lighting is an existing feature, he shall first determine ownership of the lighting and, in case of Highway Authority owned lighting 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.

General Design Information

5.2.22

The lighting design shall be in accordance with the relevant parts of BS 5489.

BS 5489

Prior to commencement of the design, the Developer shall determine from the Street Lighting Engineer the B.S. category to be applied to schemes, noting that different parts may require different categories.

5.2.23

The lighting layout shall be on a plan to scale of not less than 1:500. Additionally a suitable location plan to scale of 1:2500 shall be provided.

5.2.24

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

If the developer considers that a different category is more appropriate, it should be referred in writing to the Street Lighting Engineer, whose decision will be final and binding.

5.2.25

Where a scheme is ongoing from an existing installation it will be 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.

5.2.26

All designs submitted for approval shall be accompanied by associated computer aided design calculations indicating the 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 lantern.

5.2.27

The Street Lighting Engineer will determine the final lighting

design which will be based on performance, future maintenance and aesthetics.

5.2.28

Variations in bracket arm length will not normally be permitted, although the use of post-top mounted lanterns is encouraged and should be discussed with the Street Lighting Engineer. The design must take into account the following standard pattern of brackets:-

Column Height	Maximum Bracket Projection
12m	2.00m
10m	1.50m
8m	1.00m
6m	0.75m
5m	0.50m

5.2.29

Lighting shall normally use lamps/lanterns as follows:-

- Low Pressure Sodium (SOX) LTI
- Tubular High Pressure Sodium(SON-T) LTI
- Consideration will also be given to 'White Light' in the form of CDM-T or compact fluorescent.
- MTI systems and/or alternative light sources may be permitted in certain circumstances, subject to prior written approval by the Street Lighting Engineer.

5.2.30

Lighting calculations shall be based on an overall maintenance factor of 0.85, and the lamp manufacturers stated lumen output at 100 hours

Electrical Design

5.2.31

Unless approved in writing by the Street Lighting Engineer, all columns and posts for illuminated signs will have direct service connection, as provided by the Public Electricity Supplier.

5.2.32

All bollards shall be baselit lit, (of a type as directed for each individual scheme) which shall be connected to a secondary PES service. This service will be sub-fused in a mini-pillar or nearby column for individual bollards, or within the column on refuge island crossings. The bollards on refuge islands shall be fed from a composite double pole isolation/fusing unit site within the column.

Steel Columns and Brackets

5.2.33

The lighting column manufacturer shall be registered with and certified by either 'BSI Quality Assurance Services' or 'Lloyds Registered Quality Assurance Limited' for the manufacture, supply and verification of lighting columns under BSEN ISO 9002

5.2.34

Steel columns and brackets shall be galvanised with 2-pack epoxy resin root protection. All columns and brackets shall have a factory applied primer/sealant finish. Prior to this, galvanised units shall have 'T' wash or similar treatment.

Column and Bracket Types

5.2.35

Types and sizes of columns and brackets will be supplied to provide a mounting height for the lantern above the carriageway as specified. All column and bracket shall comply with BS5649, and additionally the Department of Transport for designs to BS5489: Part 2. The manufacturers process shall be Quality Assured to BSEN ISO 9002.

5.2.36

Steel wall brackets and control gear shall be treated in every respect As for the steel columns, with regard to protection from corrosion.

5.2.37

Metallic wall brackets and control gear boxes shall be provided with an earth terminal block brazed or welded to the structure. Fibreglass or plastic boxes shall have suitable earth linking terminal blocks provided.

Lanterns

5.2.38

The lanterns offered should provide a minimum protection rating of IP65, and be of a type acceptable to the Street Lighting Engineer. The design and manufacture shall be certified by the British Standards Institution as complying with the requirements of BS 4533. They shall be of the totally enclosed type, designed for side entry or post top mounting (with adapter as appropriate), and be suitable for use with the lamps specified. The downward lighting output ratio shall be not less than 70% of the total lamp output. They shall provide for a light distribution as specified in accordance with BS 4533 and BS 5489.

BS 4533

5.2.39

Post-top type lanterns may be used in areas deemed suitable by the Street Lighting Engineer and should also comply with the requirements of BS 4533. They should also provide a minimum protection rating of IP65.

Lamps

5.2.40

Lamps shall be as specified and be of approved manufacture of Low Pressure Sodium Vapour (SOX) or High Pressure Sodium (SON) discharge types complying with BS 3767 for Sodium lamps.

BS 3769

The use of 'white' light in the form of ceramic discharge (CDM-T) or compact fluorescent (PLL) will be considered, subject to prior written approval from the Street Lighting Engineer.

Control Gear

5.2.42

All wire wound control gear shall be 'low loss' type, however the use of electronic (high or low frequency) is encouraged.

Switching Equipment

5.2.43

Unless stated otherwise, all lighting will be controlled by integral 1-part electronic photo cells with 1:1.5 positive switching differential 70 lux ON, from the current list of approved photo electric cell manufacturers.

5.2.44

Generally the photo cell will be mounted in NEMA sockets, although where appropriate (e.g. decorative lanterns & sign-lights) 1-part miniature units will be accepted, which must be secured by a locking nut, push-in type will not be accepted.

5.2.45

Bollards shall be controlled by infra-red type photo cells; it will be the developers responsibility to ascertain from the bollard and/or cell manufacturer that the cell is suitable for the purpose intended.

Column Finish

5.2.46

Within seven days of erection, columns shall be thoroughly cleaned in accordance with the paint manufacturers recommendation, i.e. T-wash and relevant numbers of prime, base and top coats. The preparation should pay particular attention to areas where the galvanised finish has been damaged and the bare metal exposed. Each column shall be inspected and suitable primer paint applied to all areas where clean bare metal exists.

BS 5252

5.2.47

In general galvanised columns will not require painting unless expressly specified. Lighting columns and street furniture colours shall be determined at Technical Approval stage unless otherwise specified in appropriate framework plan documents.

Numbering of Columns

5.2.48

Each column is to carry an identification number, these digits are to be 50mm high and to face road or footpath. The numbers shall be applied in white gloss paint on a black gloss paint patch for the road number, and yellow on black for the individual unit number. The digits shall be located a minimum of 2.4m above ground level. The use of self adhesive printed type labels is preferred, these shall also include the Council's Freephone number:- 08000 150096 (see Appendix 3)

Note bollards should be numbered using self adhesive labels that do not obstruct the sign and bases must be numbered independently, using e.g. a permanent marker pen. [Appendix 2](#)

5.2.49

Prior to adoption each column should have a label detailing who is responsible for the column and a telephone number to call in case of a fault. A 'template' is included in Appendix 3

[Appendix 2](#)

5.2.50

Prior to submitting the scheme to the Public Electricity Supplier for connection of the lighting equipment, it will be the developers responsibility to ensure that the identification numbers are included on the drawing, and all equipment is to be numbered on site.

Earthing and Bonding

5.2.51

All installations should be earthed in accordance with the current edition of the IEE Wiring Regulations; BS 7671. This shall include a supplementary bonding conductor between the earthing stud in the base of the column and the door.

Wiring

5.2.52

All wiring within columns and brackets shall be 2.5mm² PVC Twin + earth cable with copper conductors.

Earth bonding shall be 6.0mm² PVC single core cable as a minimum.

All internal cables shall have insulation of the appropriate colour. Connections onto lugs or studs shall be by means of a suitable crimped-on terminal.

Standard Detail Drawings Available

5.2.53

Construction details appropriate to lighting installations, illuminated signs and bollards are found on the following Borough Council standard detail drawings [CEC/T/C2407], copies of which may be obtained from the Street Lighting Engineer.

- SC6 - Column erection details
- S1 - Illuminated sign post erection detail
- TS2 - Illuminated sign foundation

- BL1 - Baselit bollard foundation

- ED3/4 - Feeder pillars

- ED1 - Double pole isolation and column wiring

Testing and Certification

5.2.54

All lamps, signs, bollards and highway electrical equipment shall be tested in accordance with Institution of Electrical Engineers, Institution of Lighting Engineers and local electricity company requirements.

5.2.55

Connection certificates for all adoptable equipment shall be submitted to the Street Lighting Engineer for approval prior to being forwarded to the electricity company. These shall include the Stage 1 test results for each unit. Stage 2 tests will be carried out by the local electricity company as part of the commissioning procedure and results submitted to the Street Lighting Engineer.

Lamp Renewal

5.2.56

Installations which have been operational for 3 years or more must be re-lamped and cleaned by the developer prior to adoption.

Pedestrian/ Cycle Routes

5.2.57

Where vehicular access, for maintenance' is not possible, hinged type lighting columns must be specified and installed.

5.3 Statutory and Other Services

5.3.1

General Requirements

The layout of all new estate roads should be designed to accommodate services. It is essential that all statutory undertakers are approached at the early stages of design so that their apparatus can be installed in an efficient and economic sequence.

5.3.2

When designing a residential development, suitable and adequate service provision will be one of the fundamental requirements. For this reason it is considered appropriate to include the details of the service provision on the plans submitted for approval at the earliest possible stage.

5.3.3

The overall design of the development will show the proposed highway network. This will generally provide the line for the services, and will take into account the existing landscape features and the proposed landscape scheme.

Designers should show service provision from the existing service locations to the dwellings at the planning application stage. This will avoid land being allocated for service reservations unnecessarily.

5.3.4

Routing Of Services

The statutory rights by which undertakers lay and maintain their apparatus are based on the assumption that they will be laid in highways and other public land. For this reason statutory undertakers normally prefer to locate their mains (and services to more than one dwelling) within the limits of the adoptable public highway. The laying of apparatus within the carriageway will generally not be permitted. This does not apply to public sewers. The initial required minimum provision for service reservations will be a 2 metre strip alongside the carriageway where residential properties front the road.

5.3.5

Whenever possible, the disposition of mains within footpaths, footways and service reservations will be in accordance with the standard drawing in Section 70.

5.3.6

Service reservations must be in areas clear of trees, hedges and walls. Any trees must be located so their root systems when mature will not damage apparatus, nor be damaged during the laying and maintenance of apparatus. The location of existing trees and other planting must be considered.

See 5.7.6

5.3.7

Developers are particularly advised to check the location of any trees, any Tree Preservation Order in being and to consider any relevant planning condition relating to the severing of roots.

5.3.8

The service reservations will not be conveyed with the adjoining dwellings but will be dedicated to the Highway Authority as part of the public highway. The Highway Authority will not object to the adjoining householder maintaining the service reservations as if they were part of their gardens, provided they do not erect walls or fences, or plant hedges, trees or shrubs in them.

5.3.9

The developer must stress to the purchaser that the service reservations do not form part of their curtilage and that the Highway Authority will remove any structure or any planting that it considers may damage either the services below or adjoining the carriageway. The service reservations will be delineated by the use of an edging kerb as a marker block.

5.3.10

Developers are reminded that certain plants and shrubs required by the Local Authority for landscaping may not be permitted within the adoptable service reservations.

5.3.11

The Highway Authority will generally find flowers, bulbs and heather acceptable for planting in service reservations, but other plants may be acceptable provided they have shallow roots, with a small spread, and a maximum full growth height of no more than 900mm. If there is any doubt about a particular plant species, the developer should advise the householder to contact the Borough's Landscape Section.

5.3.12

The location of services must be determined at the earliest opportunity. They shall be installed prior to the laying of bitumen macadam.

5.3.13

Laying of Services

In anticipation of the subsequent installation of new generation Communications services additional to the traditional statutory

Undertakers services in residential roads, developers shall provide and install additional ducting. This shall comprise of 2 x 100mm ducts completed with dedicated drawpits at either end located in a footway or service reservation verge.

Specific Requirements

5.3.14

Electricity and Telecommunication Companies

The Electricity and Telecommunication Companies normally Prefer to provide all plant serving more than one customer in The public highway, where they have statutory powers and where access is easier. They do not regard easements or restrictive covenants applied to privately or jointly owned land as an acceptable alternative.

5.3.15

Water and Gas

Thames Water and the Gas Companies expect to provide all plant serving more than one dwelling in adoptable highway where they have statutory powers and not in private land. Gas and water mains are to be laid in an adoptable footpath, footway or highway verge. Laying in the carriageway should generally be confined to road crossings at right angles to the line of the road and across turning heads. Where services have to cross the carriageway they should be in ducts and duct positions should be agreed at an early stage.

5.3.16

Where trees are to be planted in the vicinity of gas or water mains, the undertaking authorities must be consulted concerning the proximity, having regard to types of trees proposed and the depths of the mains. Water mains will not normally be laid closer than 2 m from any structure or building.

5.3.17

Stop cocks on individual water services will be provided for each unit, and located within the adopted area, as near as practicable to the highway boundary.

5.3.18

Special treatment may be required for stop cock surface boxes in grassed areas. Hydrants must be sited in accordance with Fire Service requirements. Where a wash-out facility is positioned at the end of a cul-de-sac, care must be taken to provide adequate drainage facilities.

5.4 Security from Crime and Vandalism

5.4.1

Two of the most common forms of crime are burglaries from private dwellings and theft from, and of, cars. This type of crime can be reduced or at least discouraged if the design and layout of new developments has crime prevention as one of its main design criteria.

5.4.2

To try and reduce the incidence of all forms of theft and attempted theft, estates should be designed that are unattractive to any potential thief.

5.4.3

One of the designer's main tools in achieving this objective is the effective use of 'natural surveillance'. The concept of natural surveillance is that people living in and around an area get to know each other so that strangers are easily identified. The concept of 'designing in' security can be applied to both residential and commercial developments.

5.4.4

It is recommended that the designer consult with the Police Architectural Liaison Officer from the earliest stage of the development to assess the local risk. The designer will then be able to incorporate the appropriate level of security measures outlined below.

5.4.5

When designing an estate the designer must avoid the creation of potential hiding places for intruders, especially adjacent to footpaths or in close proximity to dwellings.

5.4.6

The designer must also guard against unauthorised access to communal facilities by ensuring that, particularly flats and maisonettes, overlook such areas as communal parking courts.

Residential

5.4.7

To enhance security on new housing estates, the designer should endeavour to create small clusters of dwellings that encourage neighbourliness and surveillance and a degree of self-policing. These small areas should be easily identifiable by changes in road surface material or some other 'boundary marking' feature and ideally include a mix of house types that could give potential occupation throughout the day.

5.4.8

Within these areas there should be good street lighting and thereby the avoidance of dark or hidden areas where intruders might hide undetected. Any footpaths connecting cul-de-sacs should be as direct as possible and well lit.

5.4.9

The fronts of the dwellings themselves should generally be in open view with walls, fences or hedges kept to around waist height. The side and rear gardens should be designed so they face and adjoin each other rather than public open space or footpaths. They should also be bounded by a strong fence with a limited number of gates. Footpaths between two high walls which form alleyways should be avoided.

Commercial

5.4.10

Each development should have a 'defined perimeter' which can either be a physical boundary such as a wall, fence or hedge, or a psychological barrier such as a change in surface colour or the provision of a rumble strip. On larger developments, it may be appropriate to include a gatehouse at the main entrance, but this should be set far enough back from the existing highway to avoid the possibility of traffic queuing on the highway.

5.4.11

As with residential development it is important that the landscaping and lighting are designed with security in mind and avoid producing dark or hidden areas where intruders may hide.

5.4.12

It is important that the perimeter of each individual unit is clearly defined and includes its own parking and loading area to increase the natural surveillance on the site. The layout should ideally include back to back service yards with lockable gates to restrict access and the use of loading vehicles at the rear by intruders. In

order to increase effective natural surveillance, the number of through routes open to the general public should be kept to a minimum.

Car Parking

5.4.13

On residential development as much car parking as possible should be kept within the curtilages of the dwellings and even within the cartilage drives, paths, hard standings, car ports and garage entrances should be open to public view.

5.4.14

If communal car parking is to be provided, it should be in secure areas, as close as possible to the owner's dwelling, and where it can be seen by the owner from the dwelling. Communal car parking should be provided in small groups so people become familiar with the cars and their owners, and these areas should be well lit.

5.4.15

On commercial developments, it is vital that the car parking is either overseen by the owners or inaccessible to intruders. This can be achieved either by the provision of secured garaging, supervised, under lock and key, or electronic access control.

5.4.16

Remote car parks, unsupervised and out of sight of the building occupiers are at considerable risk and private car owners are unlikely to leave their vehicles in such conditions, and may park them on access roads causing unnecessary congestion.

5.4.17

When designing landscaping schemes for such car parks, care should be taken not to obstruct the natural surveillance from the buildings by the inappropriate selection of plant species.

[See 5.7.4](#)

5.5 Structures

Criteria for adoption

5.5.1 walls above the highway

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

- (a) cross-section is wholly or partly within 3.66m of a street; and
- (b) 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.

Highways Act 1980 Section 167

5.5.2 walls supporting the highway

Walls which support the highway will normally be adopted by the Highway Authority except for walls:-

- (a) Which retain less than 750mm (measured down from The surface of the nearest carriageway, footway, foot-path or cycletrack); and
- (b) lie more than 1.5m from the nearest carriageway or other adoptable area subject to vehicular loading.

5.5.3 toe walls

Embankments supporting the highway and any toe walls at their bases will not normally be adopted but their cross-sections must be submitted to and approved by the Engineer.

5.5.4 culverts and bridges

The design of all road bridges and culverts having a span/diameter greater than 1.2m must be approved by the Highway Authority.

5.5.5 land on which wall stands to be adopted

In the case of adoptable walls, these shall be clearly shown to scale on the final approved plans to be used for the Section 38 Agreement. All land on which the wall stands will be adopted as highway.

5.5.6

Where the Borough Council will or could be at some future date responsible for the maintenance of a wall, it should be

designed with a design life of 60 years.

Design Criteria for Bridges and Culverts

5.5.7

Consultation

The Developer or his Agent is strongly recommended to seek advice from the Borough's Highway Bridges and Structures Manager at the conceptual stage. This is to ensure all appropriate information is obtained prior to selecting the engineering solution.

5.5.8

Documentation

1. Approval in Principle (AIP) is required for all adoptable structures. This shall be in accordance with the Department of Transport Standard BD2/89 Part 1 and Advice Note BA32/89 Part 1, except the Technical Approval Authority (TAA) shall be Swindon Borough Council.
2. Design Check and Specification Certificates shall be submitted for each structure and in accordance with the Departmental Standard BD2/89 Part 1.
3. Drawings shall be to standard metric scales. They shall include the following details:-
 - i) A location plan, with Ordnance Survey reference.
 - ii) Construction Sequences and Construction Joints.
 - iii) Special Temporary Works.
 - iv) Traffic Management Details.
 - v) Plan Elevations and Sections.
 - vi) Reinforcement Details.
 - vii) Details of Finishes/Anti Graffiti Treatments.
 - viii) Details and Extent of Backfill.
 - ix) Waterproofing and Drainage.
 - x) Site Investigation/Borehole Details.
 - xi) Bearing Details.
 - xii) Material Characteristics.
 - xiii) Parapet Details.

- xiv) Setting our Details, Dimensions and levels relative to the adjacent highway.
- xv) Highway Design Loads.
- xvi) Bridge Joints.

A copy of 'as built' drawings preferably on paper and in an electronic format are to be provided for retention.

- 4. The Borough Council shall have copyright of the 'as built' drawings, specification and calculations for the purpose of future maintenance.
- 5. Any departure from the standard requested should be identified on the AIP for approval.

5.5.9

Approval

- 1. The Developer or his Agent must have agreement to the AIP from the TAA before submitting any drawings or calculations for approval.
- 2. Consent from the National Rivers Authority other governing bodies, owners and licensees must be obtained prior to seeking approval. Written evidence of such consent is a pre-requisite to any approval by the Borough Council. Consent may also be required for temporary work proposals.
- 3. Statutory Undertakers proposals for plant in or over the structure must be sought and approved by the Borough's Highway Bridges and Structures Manager.
- 4. Approval of the final drawings, calculations, specification and documentation must be obtained prior to commencement of the works. (Includes Temporary Works where they affect the highway.)
- 5. Traffic Safety and Control Measures for the Works are to be agreed with the Borough's Highway Bridges and Structures Manager prior to commencement.
- 6. On completion of construction, any outstanding works are to be agreed with the Borough's Highway Bridges and Structures Manager's Inspector. At the end of the maintenance period the works are to be inspected and approved by the Borough Council prior to formal handover of the responsibility for maintenance.

5.5.10

Site Investigation

The Developer or his Agent shall undertake the following for most structures:-

1. Topographical Survey.
2. Geotechnical/Geological Investigation.
3. Environmental Impact Assessment.
4. Drainage Survey Local to the Structure.
5. Statutory Undertakers Apparatus Survey.

The need for the above investigations should be agreed with the Borough's Highway Bridges and Structures Manager, and will be appropriate to the size and type of the structure proposed. Geotechnical and Geological surveys shall be sufficiently sensitive to enable overall stability to be calculated. Geotechnical surveys shall provide sufficient information to establish:-

1. Safe bearing capacities.
2. Identification of weaker underlying strata.
3. Slip circle/slope stability.
4. Water table.
5. Concentration of sulphates.
6. Properties of retained materials.

Wall Construction

5.5.11

Stability - Wall stability shall be checked in accordance with CP.2 using unfactored loads and active earth pressure.

CP.2 - Civil Engineering Code of Practice No.2 Earth Retaining Structures –
Inst. of Structural Engineering

5.5.12

Sliding - shall be resisted by base friction and/or by means of a positive shear key. Passive resistance in front of the wall shall not be considered. Shear keys shall be located under or behind the wall stem.

For cohesive strata a maximum shear strength of 50kN/sp.m shall be adopted in accordance with CP.2.

Minimum factor of safety = 2.0.

5.5.13

Overturning - Passive resistance shall be ignored. For mass walls on the resultant shall lie within the middle third. For re-enforced cantilever walls the minimum factor of safety = 2.0.

Where overturning is affected (i.e. determined by wall type and shape) locked in compaction pressures shall be considered based on the equivalent line load of 32 KN/m.

5.5.14

Bearing - The maximum bearing pressure under the base shall not exceed the safe bearing capacities quoted in CP.2.

5.5.15

Deep Seated Shear Failure - Where appropriate slip circle analysis shall be used.

Wall Section Design

5.5.16

Mass Walls - Shall be designed for unfactored loads with the resultant lying within the middle third.

5.5.17

Reinforced Cantilever Walls - Shall be designed at ultimate and serviceability limit state in accordance with BS 5400 Part 4 1990.

5.5.18

Reinforced Wall Stems and Bases - The following effects shall be considered:-

1. Self Weight
2. Fill
3. Surcharge
4. Earth pressure at rest
5. Compaction pressures (where appropriate)
6. Vehicular impact
7. Wind loading on support fences.

5.5.19

Reinforced Sections - Shall be designed for:-

1. Ultimate moments
2. Ultimate shear - particularly in the base and wall stem
3. Cracking in the tensile faces at serviceability limit state to comply with Table 1 of BS 5400 Part 4 1990. The effect of thermal cracking in accordance with Department of Transport Standard BD28/87 : Amendment 1 1989.

Design

5.5.20

Structures are to be designed to current and appropriate British Standards and Department of Transport and the

Regions (DETR) Standards. The standards used are to contain all amendments and technical memoranda that may not be available at the time of AIP/TAS submission.

The Developer or his Agent shall confirm with the Borough's Highway Bridges and Structures Manager that the Standards he is proposing to use from the base TAS, are appropriate and include the most recent DETR memoranda.

5.5.21

Highway Loading shall be in accordance with Departmental Standard BD37/88. The Borough's Highway Bridges and Structures Manager shall determine the minimum class of highway loading for design. Parapet impact load shall be in accordance with BE5.

5.5.22

Foundations shall be in accordance with CP.2

CP.2

5.5.23

Retaining walls and backfilled abutments shall be constructed using only granular fill materials.

5.5.24

Buried concrete box structures shall be designed in accordance with BD31/87.

5.5.25

Buried corrugated steel structures shall be designed in accordance with BD12/88.

5.5.26

Parapets shall be of aluminium, designed in accordance with BE5.

5.5.27

Reinforced concrete elements shall be checked for the effects of thermal cracking in accordance with BD28/87.

The above standards are to include those revisions and amendments current at the time of design.

5.5.28

days.

Specifications

5.5.35

The specifications for the work shall be the Department of Transport Specification for Highway works current at the time of design.

5.5.36

Abutments and wingwalls shall have a permeable backing constructed against the rear, in accordance with the DoT Specifications for Highway Works, with a positive means of drainage through the wall. Water from weepholes etc shall be prevented from wetting footways or carriageways. Back of wall drainage systems shall be maintainable by rodding.

5.5.37

Facing to walls shall comprise durable materials approved by the Highway Authority. Details of manufacture or natural source and where applicable the compressive strength, durability designation, water absorption, efflorescence category, colour and texture shall be submitted including their spacing. As a general guide 6 stainless steel ties per square metre should be a minimum.

5.5.38

The following requirements shall apply to concrete deck bridges and box culverts:

- Bridge decks shall be waterproofed in accordance with the current DoT Specification for Highway Works.
- Concrete surfaces exposed to de-icing salts shall be impregnated with saline.
- Carriageway surfacing shall be a minimum of 125mm thick (including waterproofing and protection).
- Deck waterproofing shall be protected by a 25mm red sand asphalt layer.
- Joints between abutments and the deck are to be sealed using asphaltic plug joints where practical

5.5.39

Anti-graffiti treatment shall be applied to all surfaces prone to vandalism.

5.5.40

All external concrete arrises shall be chamfered and exposed horizontal surfaces shall be weathered to shed water.

5.5.41

Parapets shall be of aluminium construction and appropriate to the traffic speed and degree of containment required by BE5.

5.5.42

Concrete surfaces in contact with fill materials shall receive two coats of bituminous emulsion.

5.5.43

Water from weepholes shall be prevented from wetting footways or carriageways.

Safety

5.5.44

The Developer or his Agent shall provide evidence in the form of a method statement, containing design and check certificates for temporary work to indicate safe modes of construction, where such temporary works will affect the highway.

5.5.45

Traffic safety and control measures for roadworks are to comply with chapter 8 of the Department of Transport's Signs Manual.

5.6 Traffic Management and Traffic Signals

5.6.1

Traffic Calming

Over the past decade traffic calming has become a high profile subject and has been dynamic in its form of implementation. As views and experience are still influencing the details of implementation, designers should consult the Borough's Transportation Development Control Team early in the design process to establish contemporary and preferred practices.

5.6.2

Speed Restraint By Design

On new developments, wherever possible, traffic speeds should be restrained by the arrangement of buildings and spaces. Physical speed restraints such as chicanes and road humps should only be considered when speeds can not be controlled by layout alone.

[Places Streets & Movement pp 60-61](#)

To achieve the above it is essential that traffic calming is considered at the earliest stages of design and is an integral part of the design. Speeds can be restrained by implementing:-

- smaller corner radii, rather than wide sweeping curves at junctions. This will force slower and more careful movements by all road users.
- speed control bends
- prominent placing of buildings. This has been shown to have a calming affect on the speed of motorists.
- use of a 'deformed grid'
- unrestrained lengths (see section 3.0) [Section 3.0](#)

5.6.3

Remedial Traffic Calming

In existing areas the use of more physical speed restraints will be required to reduce traffic speeds.

- Chicanes and pinch points
- Raised junctions - these also improve the opportunities for pedestrians to cross.
- In older existing streets considerations needs to be given to creating features out of traditional materials so they are appropriate to their location.

5.6.4

20mph Zones

All new residential developments should be designated as 20mph zones. As speeds are kept low, accidents are reduced.

These zones need to be designed so that traffic speeds on average are below 20mph, this can be done by design as detailed in 4.6.1 or by the use of speed restraints such as humps and chicanes.

20mph zone signs shall be erected at all entrances to the zone. Within the zone neither 20mph repeat signs nor traffic calming signs are required.

At all exits to the zone, a sign indicating the speed limit of the adjoining road must be displayed.

The creation of gateways is required at entrances to zones, along with a change in surfacing material and texture.

5.6.5

Traffic Regulation Orders (TRO's)

It is important that developers liaise with the Borough's Traffic Safety and Road Management Section at an early stage regarding the implementation of TRO's.

The developer is to pay a minimum charge of £1000 to cover the cost of making the orders.

The developer will also be required to pay for any associated lining and signing, which is associated with the TRO's.

The process by which TRO's are made is subject to public consultation, from which objections may be made. Due to this the period of time it takes to complete the process can vary.

5.6.6

Traffic Signals

All traffic signals shall be designed in accordance with The Code of Practice for Traffic Signals and Information Systems. Early consultation with the Borough Traffic Signals Engineer is recommended.

5.7 Landscape

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.

5.7.1

Design

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.

Further advice may be obtained from the Borough's Landscape Section (See 'Section 8.0 - Your Contacts' for details).

5.7.2

Plant-material Selection

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.

Where for example, the main footway from a school or shops runs alongside the main distributor road on a development, careful selection of plants in the verge can discourage pedestrians, particularly children, trying to cross the road in other than specifically designed crossing places. Such planting may also have the effect of discouraging indiscriminate parking on the public highway.

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.

5.7.3

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.

5.7.4

Restrictions

- 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 B.S. 5837 (1991) such as 1.2m high chestnut pale fencing on stout support posts. This is to be erected a minimum of 5m from the canopy edge of all large trees. No construction shall take place within this zone and the highway design shall take account of this.

(Large car parking areas and their associated landscape features are unlikely to be adopted by the Highway Authority. However, their design is of interest to the highway authority, as an insecure and thereby unattractive parking area inevitably leads to indiscriminate parking on the highway, where the natural surveillance is better - but to the detriment of highway safety).

5.7.5

Code of Practice for Trees

The developer must comply with the recommendations of:-

- BS 5837 - Trees in Relation to Construction - 1991
- BS 3936 - Nursery Stock - 1992
- BS 3998 - Recommendations for Tree Work - 1989
- BS 2248 - Recommendations for General Landscape Operations
- Swindon Borough Council Supplementary Planning Guidance - 'Tree Protection on Development Sites' - July 1999

5.7.6

Tree Surgery and Excavating Adjacent Existing Trees

Where existing trees are to be retained, the Developer must ensure that they are safe and have a minimum vertical clearance of 6m over roads and 3m over footpaths and gardens.

All surgery necessary to achieve these aims must be carried Out by properly qualified and competent tree surgeons at the Developer's expense before adoption.

Where branches are removed this must be done carefully to Avoid tearing of bark and the branch ridge and branch collar must be undamaged. **Wound sealant may not be used.** When excavating in the vicinity of existing trees the following points should be noted:-

- All operations within the rooting area of a tree to be performed by hand.
- The minimum distance between trees and any trench/foundation edge to be calculated as defined in BS 5837 (1991).
- All roots larger than 25mm must be retained and protected. Those below this size should not be damaged unless unavoidable.
- If roots more than 25mm in diameter are exposed for any length of time they should be covered in order to keep them cool and damp.
- If it is necessary to cut roots below 25mm then they should be cut cleanly to a smooth surface.

- ❑ No materials shall be stored within the rooting zone of any tree, hedgerow or other vegetation.
- ❑ Care should be taken not to pile debris against the base of the tree or to lean materials against the trunk. BS 5837 (1991)
- ❑ Backfill near trees by hand.

Where a tree, which was to be retained, has been substantially damaged to the extent that it is not considered suitable for adoption by the Council, the Developer will be responsible for its removal. This will include grinding out the roots to 600mm below adjacent levels, removal of all arisings, backfilling with topsoil and replacement planting with whatever size of tree the Council may require.

5.7.7

Recommended Trees and Shrubs

The ultimate mature height and form of a tree or shrub are extremely important in deciding on its suitability for planting in any position and must always be taken into account.

Plant material must be chosen on the basis of:-

- ❑ Design requirements
- ❑ Soil type and other site considerations
- ❑ Maintenance requirements

Species which produce suckers and trees which produce Shoots from the base and trunk should obviously not be used close to visibility splays.

5.7.8

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.

5.7.9

% for Art

The Council operates a Percent for Art Policy. Developers should contact the Borough's Public Arts Unit to discuss in detail any proposed public art to be incorporated as part of the landscape scheme.

5.7.10

Drawings:

Drawings will be required showing all proposed landscaping with a minimum scale of 1:200.

5.8 Parking Standards

5.8.0

The Borough's car, cycle and motorcycle parking standards for a range of use classes were originally included as Appendix 8 of the Swindon Borough Local Plan. These standards have subsequently been revised to reflect recent changes to PPG13 and PPG3, the Wiltshire Structure Plan 2011 and the "Parking in Wiltshire" study undertaken jointly by consultants for Swindon Borough and Wiltshire County Council. The revised standards, approved by the Borough's Planning Committee on 30 July 2001, are included in Appendix 3.

Structure Plan Policy T5 requires that these maximum parking standards be reduced to reflect the relative accessibility by other modes (i.e. non-car) in accordance with an accessibility framework and criteria. The method to be used for the determination of site accessibility and the appropriate discount factor is described in Appendix 4. This calculation will provide a reduced maximum parking standard for a particular development.

A worked example is also given in Appendix 4. The calculation of commuted sums, based on parking shortfalls, referred to in Local Plan Policies ST20 and ST24, has been suspended.

5.9 Disabled Access

5.9.0

In writing the guidance contained in previous sections of this document, consideration has been given to the needs of the mobility impaired. In particular, guidance in section 3.0 includes the needs of the mobility impaired in connection with the following design elements:-

- Parking design details
- Path width and gradient design details
- Cycletrack design details
- Kerb and ramp design details
- Road crossing design details

Developers should also be aware of the implications of the Disability Discrimination Act 1995, and their responsibilities outlined in it.

Further guidance can be obtained from Swindon Borough Local Plan supplementary planning guidance 'Access For All'.