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1 Street Geometry

Street Character Types

1.1 A number of street character types have been defined based primarily on those listed at paragraph 4.7.2 of MfS1. However, whereas the main focus of MfS is on the creation of new residential streets, the purpose of this Specification is to cover all transport and highway issues that might relate to new development and so all highways that are maintainable at public expense need to be considered.

1.2 In Gloucestershire there are motorways and Trunk Roads that fall within the jurisdiction of the Highways England, other highways where the 'movement' of traffic is the primary function, and highways that are restricted to specific types of users (for example, public footpaths and bridleways). There are also highways that have to cater for larger vehicles, such as buses and goods vehicles, and highways that although not intended to be adopted and maintained at public expense can have implications for the public highway and certainly need to be assessed in design terms.

1.3 For the purposes of this Specification, the streets and other highways can be summarised as set out in Table 1.1 below:-

<table>
<thead>
<tr>
<th>Highway Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streets</td>
</tr>
<tr>
<td>High Street</td>
</tr>
<tr>
<td>Boulevard</td>
</tr>
<tr>
<td>Square</td>
</tr>
<tr>
<td>Street</td>
</tr>
<tr>
<td>Private streets</td>
</tr>
</tbody>
</table>
1.4 Further details of the criteria that the Council would expect to be followed in terms of proposals incorporating any of those street character types is set out on the following pages together with a photograph giving a typical example and an indicative cross-section. It should be noted that these criteria are intended for guidance only, and the Council would be willing to consider proposals that depart from them as long as the Developer can produce reasoned justification for such departure.
High Street

<table>
<thead>
<tr>
<th>Specification Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Traffic Speed</strong></td>
<td>32kph [20mph]</td>
</tr>
<tr>
<td><strong>Maximum No. Of Dwellings</strong></td>
<td>No limit but subject to modelling</td>
</tr>
<tr>
<td><strong>Frontage Access</strong></td>
<td>Restricted at junctions</td>
</tr>
<tr>
<td><strong>Carriageway Width</strong></td>
<td>6.5m minimum (6.75m if a bus route) Subject to swept path analysis</td>
</tr>
<tr>
<td><strong>Footways</strong></td>
<td>Minimum 2m wide both sides</td>
</tr>
<tr>
<td><strong>Cycleways</strong></td>
<td>In accordance with Council Cycle Facility Guidance.</td>
</tr>
<tr>
<td><strong>On street parking</strong></td>
<td>1.8m wide on either or both sides. To be provided in addition to carriageway and amount to be determined subject to local requirements</td>
</tr>
<tr>
<td><strong>Gradients</strong></td>
<td>8% maximum, 0.8% minimum</td>
</tr>
<tr>
<td><strong>Horizontal Curve Radius</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street</td>
</tr>
<tr>
<td><strong>Vertical Curve Lengths</strong></td>
<td>30m desirable</td>
</tr>
<tr>
<td><strong>Forward Visibility</strong></td>
<td>25m (27m on bus routes)</td>
</tr>
<tr>
<td><strong>Speed Restraint Centres</strong></td>
<td>70m maximum</td>
</tr>
<tr>
<td><strong>Junction Radii</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street</td>
</tr>
<tr>
<td><strong>Junction ‘X’ Distance</strong></td>
<td>2.4m</td>
</tr>
<tr>
<td><strong>‘Y’ Distance for Side Roads</strong></td>
<td>22m (24m on bus routes)</td>
</tr>
<tr>
<td><strong>Absolute Minimum Junction Spacing for Side Roads</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street Crossroads permitted in some circumstances – dependent on vehicle swept path analysis</td>
</tr>
</tbody>
</table>

Table 1.2
<table>
<thead>
<tr>
<th>Specification Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Traffic Speed</strong></td>
<td>32kph [20mph]</td>
</tr>
<tr>
<td><strong>Maximum No. Of Dwellings</strong></td>
<td>No limit but subject to modelling</td>
</tr>
<tr>
<td><strong>Frontage Access</strong></td>
<td>Restricted at Junctions</td>
</tr>
<tr>
<td><strong>Lane Widths</strong></td>
<td>3.5m minimum (4m if a bus route) Subject to swept path analysis</td>
</tr>
<tr>
<td><strong>Central reservation</strong></td>
<td>2.5m minimum, with trees permitted</td>
</tr>
<tr>
<td><strong>Footways</strong></td>
<td>3m wide both sides, with trees permitted</td>
</tr>
<tr>
<td><strong>Cycleways</strong></td>
<td>In accordance with Council Cycle Facility Guidance.</td>
</tr>
<tr>
<td><strong>On street parking</strong></td>
<td>1.8m wide on either or both sides. To be provided in addition to carriageway and amount to be determined subject to local requirements</td>
</tr>
<tr>
<td><strong>Gradients</strong></td>
<td>8% maximum, 0.8% minimum</td>
</tr>
<tr>
<td><strong>Horizontal Curve Radius</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street</td>
</tr>
<tr>
<td><strong>Vertical Curve Lengths</strong></td>
<td>30m desirable</td>
</tr>
<tr>
<td><strong>Forward Visibility</strong></td>
<td>25m (27m on bus routes)</td>
</tr>
<tr>
<td><strong>Speed Restraint Centres</strong></td>
<td>70m maximum</td>
</tr>
<tr>
<td><strong>Junction Radii</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street</td>
</tr>
<tr>
<td><strong>Junction ‘X’ Distance</strong></td>
<td>2.4m</td>
</tr>
<tr>
<td><strong>‘Y’ Distance for Side Roads</strong></td>
<td>22m (24m on bus routes)</td>
</tr>
<tr>
<td><strong>Absolute Minimum Junction Spacing for Side Roads</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street. Crossroads permitted in some circumstances – dependent on vehicle swept path analysis</td>
</tr>
</tbody>
</table>

**Table 1.3**
<table>
<thead>
<tr>
<th>Specification Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Traffic Speed</strong></td>
<td>32kph [20mph]</td>
</tr>
<tr>
<td><strong>Maximum No. Of Dwellings</strong></td>
<td>No limit but subject to modelling</td>
</tr>
<tr>
<td><strong>Frontage Access</strong></td>
<td>Restricted at Junctions</td>
</tr>
<tr>
<td><strong>Carriageway Width</strong></td>
<td>5.5m minimum (6.75m if a bus route) Subject to swept path analysis</td>
</tr>
<tr>
<td><strong>Footways</strong></td>
<td>2m wide all sides</td>
</tr>
<tr>
<td><strong>Cycleways</strong></td>
<td>In accordance with Council Cycle Facility Guidance.</td>
</tr>
<tr>
<td><strong>On street parking</strong></td>
<td>If parallel 1.8m wide and if perpendicular 4.8m long and 2.4m wide. To be provided in addition to carriageway and amount to be determined subject to local requirements.</td>
</tr>
<tr>
<td><strong>Gradients</strong></td>
<td>8% maximum, 0.8% minimum</td>
</tr>
<tr>
<td><strong>Horizontal Curve Radius</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street</td>
</tr>
<tr>
<td><strong>Vertical Curve Lengths</strong></td>
<td>30m desirable</td>
</tr>
<tr>
<td><strong>Forward Visibility</strong></td>
<td>25m (27m on bus routes)</td>
</tr>
<tr>
<td><strong>Speed Restraint Centres</strong></td>
<td>70m maximum</td>
</tr>
<tr>
<td><strong>Junction Radii</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street</td>
</tr>
<tr>
<td><strong>Junction ‘X’ Distance</strong></td>
<td>2.4m</td>
</tr>
<tr>
<td><strong>‘Y’ Distance for Side Roads</strong></td>
<td>22m (24m on bus routes)</td>
</tr>
<tr>
<td><strong>Absolute Minimum Junction Spacing for Side Roads</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street Crossroads permitted in some circumstances – dependent on vehicle swept path analysis</td>
</tr>
</tbody>
</table>

Table 1.4
## Cul-de-Sac

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Traffic Speed</strong></td>
<td>32kph [20mph]</td>
</tr>
<tr>
<td><strong>Maximum No. Of Dwellings</strong></td>
<td>No limit but subject to modelling</td>
</tr>
<tr>
<td><strong>Frontage Access</strong></td>
<td>Restricted at Junctions</td>
</tr>
<tr>
<td><strong>Carriageway Width</strong></td>
<td>5.5m minimum. (6.75m if a bus route) Subject to swept path analysis</td>
</tr>
<tr>
<td><strong>Footways</strong></td>
<td>2m wide all sides</td>
</tr>
<tr>
<td><strong>Cycleways</strong></td>
<td>In accordance with Council Cycle Facility Guidance.</td>
</tr>
<tr>
<td><strong>On street parking</strong></td>
<td>If parallel 1.8m wide and if perpendicular 4.8m long and 2.4m wide. To be provided in addition to carriageway and amount to be determined subject to local requirements.</td>
</tr>
<tr>
<td><strong>Gradients</strong></td>
<td>8% maximum, 0.8% minimum</td>
</tr>
<tr>
<td><strong>Horizontal Curve Radius</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street</td>
</tr>
<tr>
<td><strong>Vertical Curve Lengths</strong></td>
<td>30m minimum</td>
</tr>
<tr>
<td><strong>Forward Visibility</strong></td>
<td>25m (27m on bus routes)</td>
</tr>
<tr>
<td><strong>Speed Restraint Centres</strong></td>
<td>70m maximum</td>
</tr>
<tr>
<td><strong>Junction Radii</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street</td>
</tr>
<tr>
<td><strong>Junction 'X' Distance</strong></td>
<td>2.0m</td>
</tr>
<tr>
<td><strong>'Y' Distance for Side Roads</strong></td>
<td>22m (24m on bus routes)</td>
</tr>
<tr>
<td><strong>Absolute Minimum Junction Spacing for Side Roads</strong></td>
<td>To be determined by swept path analysis of vehicles likely to use the proposed street. Crossroads permitted in some circumstances – dependent on vehicle swept path analysis</td>
</tr>
<tr>
<td><strong>Turning Facilities</strong></td>
<td>Turning areas suitable to accommodate a large refuse vehicle must be provided if the adjoining street is a Class 3 highway (or higher classification) or if the length of the cul-de-sac exceeds 20m. Examples of turning areas are set out in Figure 8.5</td>
</tr>
</tbody>
</table>

### Table 1.5
Bus Route

1.5 Bus routes should be agreed with the Council. The **minimum** carriageway width for a bus route is 6.50m, but localised widening may be required, for example on bends or where on-street parking can be expected. A swept path analysis will be required to demonstrate that buses can pass each other.

Private Streets

1.6 Private streets should conform to the relevant design criteria set out in Tables 2.2 to 2.5 above.

1.7 A Private Street Agreement will be required to allow for an exemption to be given to the application of the Advanced Payment Code and ensure that that residents are unlikely to require the County Council to adopt the street in the future.

Road Character Types

1.8 In general terms, development that involves roads with a low place function/high movement function will be outside some or all of the principles contained within **MfS** (dependent on Local Context), and so will utilise the guidance contained within **DMRB**. However, due to **DMRB** being written primarily for use when looking at Trunk Roads, those standards may be excessive for use in the design of industrial estate roads, particularly in built-up areas where vehicle speeds are relatively low.

1.9 Industrial estate roads must be designed specifically to cater for use by large commercial vehicles. Mixed use developments, or commercial developments with a high proportion of light goods and/or car movements, should be designed in accordance with **MfS** or **DMRB** as appropriate. Particular attention will be paid to the following points when assessing industrial development proposals:

- the manoeuvring characteristics of heavy commercial vehicles;
- peak hour vehicle flows;
- the minimisation of vehicle speeds in the interests of highway safety;
- operation and requirements with specific reference to the provision of parking, turning, loading, and storage facilities within the site curtilage which shall be identified at the planning application stage;
- provision of facilities for pedestrians and cyclists and public transport links.

1.10 In developments likely to generate more than 250 commercial vehicle trips per day, a number of Minor Industrial Roads should feed to the Industrial Access Road which should not provide direct access to individual factory units. A looped arrangement is preferable so as to prevent the possibility of creating a ‘rat run’ for main road traffic.
Private Commercial Road

1.11 Adoption may not be required for small pockets of light industrial units and/or nursery units served by an enclosed courtyard type layout. However, the following points apply:

<table>
<thead>
<tr>
<th>Design Parameters</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrance radii</td>
<td>7.5 - 15 [see Note 1 below]</td>
</tr>
<tr>
<td>Access Width</td>
<td>6.1m</td>
</tr>
<tr>
<td>Entrance Gates</td>
<td>10-15m back from carriageway edge</td>
</tr>
<tr>
<td>Gradient</td>
<td>5% [1:20] max</td>
</tr>
<tr>
<td>Visibility</td>
<td>x – 2.4m</td>
</tr>
<tr>
<td></td>
<td>y - refer to MfS2 and dependent upon Target Speed</td>
</tr>
</tbody>
</table>

Table 1.8

**NOTE 1:** Depending on the type of site development and the form and frequency of traffic movement.

For developments fronting Major Industrial Access Roads and most Industrial Access Roads, on site HGV manoeuvring facilities must be provided.

Loading areas away from the highway are required.
**Industrial Access Road**

![Industrial Access Road Image](image)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Traffic Speed</td>
<td>30mph</td>
</tr>
<tr>
<td>Carriageway Width</td>
<td>7.3m</td>
</tr>
<tr>
<td>Max. Carriageway Length</td>
<td>Unrestricted with Secondary Access</td>
</tr>
<tr>
<td>Cycleway</td>
<td>In accordance with Council Cycle Facility Guidance.</td>
</tr>
<tr>
<td>Footways</td>
<td>2m</td>
</tr>
<tr>
<td>Marginal Strips</td>
<td>1.5m</td>
</tr>
<tr>
<td>Gradients</td>
<td>0.8% to 4.0 %</td>
</tr>
<tr>
<td>Horizontal Curve Radius</td>
<td>60m minimum</td>
</tr>
<tr>
<td>Vertical Curve Lengths</td>
<td>30m minimum</td>
</tr>
<tr>
<td>Forward Visibility</td>
<td>47m</td>
</tr>
<tr>
<td>Junction Radii</td>
<td>15m</td>
</tr>
<tr>
<td>Junction ‘X’ Distance</td>
<td>2.4m</td>
</tr>
<tr>
<td>‘Y’ Distance for Side Roads</td>
<td>45m</td>
</tr>
<tr>
<td>Junction Spacing for Side Roads – absolute minimum</td>
<td>90m [adjacent] 45m [opposite]</td>
</tr>
<tr>
<td>Carriageway Widening on Bends</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 1.9

Visibility requirement calculated using a reaction time of 1.5 seconds and a deceleration rate of 3.68m/s.
## Minor Industrial Road

<table>
<thead>
<tr>
<th></th>
<th>Through Road</th>
<th>Cul-de-Sac</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Traffic Speed</strong></td>
<td>30mph</td>
<td>25mph</td>
</tr>
<tr>
<td><strong>May Take Access From</strong></td>
<td>MIAR</td>
<td>MIAR</td>
</tr>
<tr>
<td><strong>Carriageway Width</strong></td>
<td>7.3m</td>
<td>7.3m</td>
</tr>
<tr>
<td><strong>Maximum Carriageway Length</strong></td>
<td>Unrestricted</td>
<td>250m</td>
</tr>
<tr>
<td><strong>Cycleways</strong></td>
<td>In accordance with Council Cycle Facility Guidance.</td>
<td>In accordance with Council Cycle Facility Guidance.</td>
</tr>
<tr>
<td><strong>Footway/ Cycleway</strong></td>
<td>1.5m + 1.5m =3m</td>
<td>1.5m + 1.5m =3m</td>
</tr>
<tr>
<td><strong>Footways</strong></td>
<td>2m</td>
<td>2m</td>
</tr>
<tr>
<td><strong>Marginal Strips</strong></td>
<td>1.5m</td>
<td>1.5m</td>
</tr>
<tr>
<td><strong>Gradients</strong></td>
<td>0.8% to 4.0%</td>
<td>0.8% to 4.0%</td>
</tr>
<tr>
<td><strong>Horizontal Curve Radius</strong></td>
<td>60m minimum</td>
<td>60m minimum</td>
</tr>
<tr>
<td><strong>Vertical Curve Lengths</strong></td>
<td>30m minimum</td>
<td>30m minimum</td>
</tr>
<tr>
<td><strong>Forward Visibility</strong></td>
<td>47m</td>
<td>36m</td>
</tr>
<tr>
<td><strong>Junction Radii</strong></td>
<td>15m to MIAR</td>
<td>15m to MIAR</td>
</tr>
<tr>
<td></td>
<td>12m to IAR</td>
<td>12m to IAR</td>
</tr>
<tr>
<td><strong>Junction ‘X’ Distance</strong></td>
<td>2.4m</td>
<td>2.4m</td>
</tr>
<tr>
<td><strong>‘Y’ Distance for Side Roads</strong></td>
<td>45m</td>
<td>34m</td>
</tr>
<tr>
<td><strong>Junction Spacing for Side Roads – absolute minimum</strong></td>
<td>90m [Adjacent]</td>
<td>90m [Adjacent]</td>
</tr>
<tr>
<td></td>
<td>45m [Opposite]</td>
<td>45m [Opposite]</td>
</tr>
<tr>
<td><strong>Carriageway Widening on Bends</strong></td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 1.10

Visibility requirement calculated using a reaction time of 1.5 seconds and a deceleration rate of 3.68m/s.
**Street Dimensions**

*Swept Path Analysis*

1.12 All internal estate roads should be tracked using a 3 axle refuse vehicle. The swept path should be no closer than 500mm from any kerb, vertical structure, tree, or formal parking space.

1.13 Car parking spaces should be tracked using an estate car (1715 mm width x 4223mm length).

*Carriageway Widening at Bends*

1.14 The swept path of vehicles on bends is greater than the width of the vehicle itself. To enable vehicles to pass, curve widening in accordance with the swept path analysis of the vehicles likely to use the proposed street is required.

*Vertical Alignment*

1.15 The vertical alignment of a road must provide the minimum stopping sight distances in accordance with Manual for Streets.

A visibility envelope shall be measured from a minimum drivers eye height of between 1.05m and 2.0m to an object height of between 0.6m and 2.0m all above the road surface. It shall be checked in both the vertical and horizontal planes between any two points.

*Vertical Curves*

1.16 Vertical curves should be provided at all changes in gradient. To ensure reasonable standards of comfort at sag curves and to provide the appropriate visibility at crests, vertical curves should be the greater of either:

i] indicated by the formula $L = KA$, where $L$ is the curve length in metres, $A$ is the Algebraic difference in gradients (expressed as a percentage) and $K$ has a value selected from Table 8.1 or

ii] shown in the fifth column of Table 1.11.
Table 1.11 – Vertical Curves

<table>
<thead>
<tr>
<th>Design Speed (kph)</th>
<th>Desirable min. Crest K value</th>
<th>Absolute min. Crest K value</th>
<th>Absolute min. Sag value</th>
<th>Min. Vertical curve length (m)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>10</td>
<td>65</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>32</td>
<td>65</td>
<td>65</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>24</td>
<td>65</td>
<td>65</td>
<td>9</td>
<td>30</td>
</tr>
</tbody>
</table>

*With evidence based justifications relaxations may be permitted

**Gradient at Junctions**

1.17 The maximum longitudinal gradient on a minor road approach to a junction should not exceed 5% (1 in 20) for the distance specified in Table 8.2 measured from the nearside edge of the major carriageway. It should be noted that when the minor road approach to the junction is downhill rather than uphill a longer distance with a gradient not exceeding 5% is required. This is intended to reduce the risk of vehicles sliding onto the major road in icy conditions.

Table 1.12 - Maximum Distance for Longitudinal Gradient at 5%

<table>
<thead>
<tr>
<th>Minor Road</th>
<th>Major Road</th>
<th>Distance along Minor Road measured from nearside edge of Major Road Carriageway [metres]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Road</td>
<td>Residential Road</td>
<td>Downhill Approach: 15m, Uphill Approach: 10m</td>
</tr>
<tr>
<td>Residential Road</td>
<td>Local Distributor</td>
<td>Downhill Approach: 20m, Uphill Approach: 15m</td>
</tr>
<tr>
<td>Local Distributor</td>
<td>District and Distributor</td>
<td>Downhill Approach: 30m, Uphill Approach: 15m</td>
</tr>
</tbody>
</table>

**Frontage Access**

1.18 The Council will not usually consider a private access serving fewer than 6 dwellings (inclusive of any existing dwellings) for adoption. However, the Council will apply the Advanced Payment Code to all development comprising 2 or more buildings. You are encouraged to create layouts and construct the street to an adoptable standard regardless of whether the access is to be offered to us for adoption.

1.19 The Council cannot insist that an access serving a development is adopted, but a developer should consider the following factors when deciding whether to offer an access for adoption or whether to retain it as a private access:
1.20 Poorly maintained private areas can also detract from the quality and visual appearance of a development. The maintenance of private roads is a very common cause of neighbour disputes.

1.21 Developments served by a private access should be designed to avoid use as a through route by general traffic, as such use could add to the liabilities and responsibilities of future owners and residents.

1.22 On residential and commercial developments where it is necessary to protect frontagers’ interests the Council will serve a notice on the person by or on whose behalf plans were deposited with the local authority in accordance with building regulations relating to the erection of a building/s. Following an assessment of the cost of the proposed road works under the Advance Payments Code (APC) procedure a notice will be issued which will include a sum that is required to be paid/secured by the person named in the notice. More detailed information on the APC procedure can be found at Sections 219 - 225 of the Highways Act 1980.

1.23 If a developer clearly indicates that the development roads are to remain private, the Council may also require that:

- Road signs indicating that the roads are unadopted should be erected and maintained by the developer for as long as the road remains private,
- The developer should provide evidence that they have clearly stated to potential purchasers of the dwellings what the implications for purchasing a property fronting a private road are,
- The developer should provide evidence that future maintenance of the roads and associated infrastructure has been secured, for example through an unilateral undertaking under Section 106 of the Town and Country Planning Act 1990 to set up a maintenance company,
- The developer should indemnify the Council against future petitioning by residents to adopt their road. This should normally be a legal covenant placed on the properties to prevent petitioning. The wording of the covenant must be approved by the Council,
- The boundary between the private access and the publicly maintained highway is clearly marked by a concrete edging, boundary posts or similar.
1.24 If the access to a single dwelling crosses a footway or footpath then minimum levels of pedestrian to driver visibility must be provided and kept clear from obstruction, with no planting within these areas (see Figures 5.1 and 5.2).

1.25 The Council requires that a private access is surfaced in a bound material over at least the first 5 metres adjacent to the public highway to minimise the risk of loose material being carried onto the highway.

1.26 The gradient of a private access must not be steeper than 7% [1:14] within at least 6 metres where it adjoins the public highway.

1.27 If the access is gated, the gates must only open away from the public highway onto the private land being accessed. Gates should normally be set back at least 5 metres from the carriageway edge to allow vehicles to pull off the highway (in order to open the gates) without causing disruption to the flow of traffic.

1.28 The Council may allow the distance the gates are set back to be reduced to 2.4 metres in lightly trafficked urban environments (for example, where peak hour traffic flows are less than 300 vehicles per hour) where highway safety is not considered to be compromised.

General Layout of Frontage Access

1.29 A private access should not be located closer than 20 metres to any junction.

Vehicle Crossovers

1.30 In built up areas it will be more appropriate for the access to a development comprising more than one dwelling to be formed using a vehicle crossover rather than a conventional bell mouth. This arrangement assists with maintaining pedestrian priority along the front of the development and reduces vehicle speeds whilst entering the development (see Figure 8.3 below)

Private Access Remote From The Highway:

1.32 Where a development of more than one dwelling is situated off a Class 1 or 2 road or a Class 3 highway subject to a 40mph speed limit (or higher), the access and any turning areas should be constructed so that they can cater for an emergency, commercial or service vehicle. The minimum width for access should be at least 5.0 metres (with additional allowance on a bend, and with walls or boundary fences set back a further 0.5 metres on each side) and fire vehicles should not have to reverse more than 20 metres. Your development must be in line with British Standard BS5906, 2005 and Building Regulations Approved Document B, Fire Safety 2006.

Construction Standards for a Private Access
1.33 All works within the public highway (whether a dropped kerb or new junction) must be constructed to the County Council’s requirements. Where the private access serves more than two dwellings, all of the access should be constructed to a standard suitable for adoption as public highway.

1.34 A vehicle crossover will need to be constructed in accordance with the Council's vehicle crossover construction specification.

**Figure 1.1 – Standard private access for one dwelling**

![Diagram of Standard Private Access for One Dwelling]

**Figure 1.2 – Alternative private access for one dwelling**

![Diagram of Alternative Private Access for One Dwelling]
NOTES TO FIGURES 1.1 and 1.2:

1) A surface water catch drain shall, where required, be located across the width of the driveway just behind the entrance gate position
2) The splayed area within at least five metres of the carriageway edge shall be hard surfaced in an approved bound material
3) The entrance gates shall be located at least five metres back from the nearside carriageway edge and hung so as to open inwards away from the highway

For ease of illustration the above layout does not include the visibility sight lines, further advice on the appropriate design standard to apply can be found in section 3.0
Figure 1.3 – Standard private access for more than one dwelling in urban area
**New Footway/Verge Crossings**

1.35 Regardless of whether or not planning permission is required and/or obtained for a new vehicular access, the Developer will need authorisation from the Council before a private vehicular access (also known as a dropped kerb) can be constructed from the highway into a private property, or before carrying out works to an existing one, unless it is included within works being carried out under a Highway Works Agreement.

1.36 Before approval can be given for a new access, or for alterations to an existing access, the Council will need to ensure that the site does not detrimentally affect the safety of other highway users.

1.37 The construction of a dropped kerb for a vehicular access is governed by the *Highways Act 1980* and the *New Roads and Street Works Act 1991*. Such construction is controlled, approved and licensed by the Council.

1.38 Planning permission may be required from the Local Planning Authority (the relevant District/Borough/City Council). The contact details for each of the relevant Councils can be found within the Contacts Section.
Checking Underground Utility Services

1.39 The Developer will need to contact each of the Public Utility Companies to determine details (position and depth) of any services that they may have in the ground at the location to be excavated (contact details will be provided in the application pack).

Choosing a Contractor

1.40 The Developer is advised to obtain at least 3 different quotes for the works. The chosen contractor will need to hold a valid accreditation under the New Roads and Street Works Accreditation Scheme to work within the public highway.

1.41 The Developer will also need to have in a place a current Public Liability Insurance Policy providing cover for up to £10m.

Safety Considerations

1.42 The Developer must ensure that any gates that are installed on private land must not open outwards over the carriageway, footway or verge.

1.43 Surface water from a private paved area must not be allowed to flow out across the footway or onto the carriageway.

1.44 Vehicles on the access must not obstruct pedestrians.

1.45 Where there is a significant change in gradient directly adjacent to a proposed highway a 1m wide level area shall be provided prior to the change in gradient.

Funding the New Access

1.46 The Developer will need to fund all costs involved in the construction of the access, there are no grants or loans available from us for such works.

1.47 The Developer will need to pay fees to cover the cost of inspecting the proposed site, processing the application and inspecting the works whilst they are carried out. Full details of the current fees are provided within the application pack.

Request an Application Pack
1.48 Applications for new Footway Crossings are dealt with by Amey Highways Gloucestershire. To request an application pack, or to obtain further information a Developer should contact Amey Highways Gloucestershire on 08000 514 514.

Turning Areas

1.49 If a private access:

- serves more than one dwelling, and;
- adjoins a class 3 highway with a speed limit greater than 30mph, or adjoins a class 1 or 2 highway,

then a vehicular turning area must be provided that enables a vehicle that are likely to use the access to leave and enter the highway in a forward gear. If a Developer proposes not to provide a turning area where the above criteria are met, then early discussion with the Council’s HDM Team is recommended and the reasoned justification for the proposal should be supplied. The Council may require a safety audit to be undertaken on such proposals.

1.50 If an adoptable cul-de-sac is accessed off a Class 1, 2 or 3 highway or is greater in length than 20m then a vehicular turning area must be provided suitable to accommodate a large refuse vehicle.

1.51 Where a turning area is required then a tracking assessment should be provided indicating the largest type of vehicle that will be making a three point turn manoeuvre.

1.52 Paragraph 7.10.2 of Manual for Streets provides further information on designing vehicular turning areas. See also Figures 8.5 and 8.6 for potentially adoptable turning heads that cater for some refuse vehicles - you should consult the relevant Local Authority to establish their requirements for refuse, and recyclables, collection and the sizes of vehicle used.

1.53 The layout of the development should include measures to make sure that parked vehicles do not prevent the proper use of any turning areas.

Figure 1.5 - Example Turning Head Dimension
Figure 1.6 - Alternative Turning Head Dimension
Highway Parking

1.54 Parking bays adjacent to the adoptable highway are the only type of parking area considered by the Council as adoptable. The number of bays will be dependent upon the overall parking requirements and layout for the development and the Developer will need to provide reasoned justification for the proposed provision to the Council’s HDM Team. The bays should be designed so as to fit well within the development layout, and consideration should be given to the sub-division of parking bays into smaller clusters using build outs with hard or soft landscaping.

1.55 Parking Bays should have the following dimensions:

- When parallel and adjacent to a footway, they should be 6m long and 2m wide;
- When parallel and adjacent to a boundary structure set back at least 1.8m, they should be 6m long and 2m wide;
- When parallel but adjacent to a boundary structure set back less than 1.8m, they should be 6m long and 3.2m wide;
- 45 degree splayed ends;
- When at right angles to and contiguous with carriageways they should be at least 4.8m long and 2.4m wide;
- Larger parking spaces should be provided for use by disabled people.

1.56 For bays at right angles to the carriageway there should be 6m of vehicular use road surface in front of the bays to allow for access movement. An additional 800mm paved strip shall be added to the width of any footway that abuts the back edge of a parking space to allow for vehicular overhang.

Disabled Parking Provision

1.57 The minimum acceptable dimension for a single widened bay should be 3.6m wide by 6.0m long. In most cases this will provide sufficient room for the car door to be fully opened, enabling easier access.

1.58 Where the parking bay is located at a right angle to a street with high vehicular usage then it should be 6.6m long to enable sufficient room to access the boot of the car and remove/replace a wheelchair.

1.59 In areas where there is the requirement for multiple widened bays then the use of shared transfer zones helps to reduce the total land area required.

Visitor Parking
1.60 No special provision needs to be made for visitors when the carriageway is at least 5.5m wide and where at least half of the parking provision associated with the development is unallocated.

1.61 In all other circumstances, an additional provision of well designed and legible parking bays must be provided within the highway at a minimum ratio of 0.2 spaces per dwelling.
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2 Traffic Management Systems

Introduction

2.1 Traffic management systems include travel signals, pedestrian crossings, and other traffic control systems such as Variable Message Signs, Closed Circuit Television (CCTV) cameras and other camera based vehicle monitoring systems. These systems are maintained and managed by the Network Management Team at the Council, and are intended to ensure sound traffic management to reduce traffic congestion and improve road safety for all road users.

Traffic Signals

2.1 The Council has a requirement under the Traffic Management Act 2004 to ensure the expeditious movement of all road users and to provide a safe environment for all.

2.2 Intelligent Transport Systems (ITS) are an important tool in the monitoring and management of the highway network. The Council is committed to the installation, where appropriate, of ITS equipment including CCTV, Automatic Number Plate Recognition (ANPR), Journey Time Management Systems (JTMS), Car Park management systems, Variable Message Signs (VMS) and communication cable ducts at or in the vicinity of any new junction onto the highway network. Alternatively, a financial contribution to a wider route/area based ITS strategy may be required.

2.3 All junctions will be either part of the Urban Traffic Control System (UTC) in place within the main urban areas, or, if a standalone junction, then MOVA will be the preferred control system. At key junctions both UTC and MOVA may be requested.

2.4 The current requirement for signal aspects is that they shall be all LED type. Signal controllers and installation cables will be Extra Low Voltage (ELV) unless otherwise agreed by the Council. Only equipment approved by the Council will be permitted for use on the highway.

2.5 Where a signal controlled pedestrian crossing is proposed, it should be noted that the Council has a policy of not installing Pelican crossings - only Puffin and Toucan crossings are accepted. Zebra Crossings will also be considered in the appropriate setting.

2.6 The Developer Information Pack (available in Appendix G) sets the standards and requirements for the supply, installation and maintenance of traffic signal equipment and associated minor civil engineering works. The Pack is intended as an aid to developers helping them to meet the required standards. The Pack is not a design guide in its own
right and should be read in conjunction with this manual and the *Design Manual for Roads and Bridges*.

2.7 One of the aims is to ensure that any new type of junction proposed for the installation on the highway network is the most appropriate type of junction or combinations of junction type both in the short and long term.

2.8 Developers and their design consultants / contractors are encouraged to contact the Council’s Network Management and Major Projects Unit or the Development Management Team to discuss proposals at the earliest possible opportunity.

**Variable Message Signs**

2.9 Variable Message Signs (VMS) are often used to inform drivers of traffic conditions, car parking availability or other useful information that might assist them with their journey. On the local highway network, three main forms of VMS are currently in use.

2.10 On some approaches to Gloucester City Centre, VMS systems are in place giving driver information predominantly on car parking availability, although other road safety and driver information can be displayed. For major city centre development, especially where new or improved car parking provision is involved, financial contributions may be sought from the Developer to enable the Council to extend or upgrade this system.

2.11 Mobile VMS, generally mounted on trailers, are often used to provide driver information at the roadside, generally where major roadworks are taking place. Where a development requires significant roadworks on the existing highway network, the Council may require the use of mobile VMS to pass information to drivers in advance of the works taking place. Such a requirement would be agreed as part of the traffic management plan for the highway works.

2.12 Vehicle Activated Signs (VAS) are used to tackle local traffic management issues, such as speeding, by seeking to amend driver behaviour through the use of informative messages. Where such signs are proposed as part of a development, the type and location of the signs should be agreed with the HDM Team and Gloucestershire Highways, and a commuted sum based on inspecting and maintaining the equipment over 60 years will be required to offset future operational costs associated with the equipment. Early discussion with the Council’s HDM Team is recommended.

**Traffic Signs**

2.13 Traffic signs play an important role in assisting road users by:

- Providing warnings of potential hazards (e.g. a tight bend or steep gradient).
- Providing instructions that need to be followed (e.g. speed limits or one-way streets).
2.14 The Developer will be expected to identify what signs are required as part of the design process, in accordance with the *Traffic Signs Manual* (TSM) as published by the Department for Transport (www.dft.gov.uk).

2.15 The Government and the County Council are committed to reducing sign clutter. The over-provision of traffic signs can have a detrimental impact on the environment and can dilute more important messages. Traffic Advisory Leaflet 1/13 gives practical advice on reducing sign clutter. It emphasizes that designers should use their engineering judgment and local knowledge to ensure signing solutions are effective.

Copies of TAL 1/13 can be found at:-

2.16 The Council will expect that traffic signs will only be specified where the need is absolute to fulfil the requirements of TSM.

2.17 Where works are required on the existing local road network, the Council will expect the design process to include a review of existing signing, and will expect the Developer to remove, replace or upgrade road signs as appropriate to accommodate the requirements of the new development.

**Road Markings**

2.18 Road markings are also important to road users by:

- Providing clear directions to specific destinations (route signing to villages, towns or specific attractions).

- Providing warnings of potential hazards (e.g. by notifying drivers where it is safe to overtake).

- Providing instructions that need to be followed (e.g. by indicating where drivers should remain in a specific lane).

- Providing clear directions on which lane drivers should use to reach specific destinations, especially on the approach to junctions.

2.19 The Developer will be expected to identify what road markings are required as part of the design process, in accordance with the *Traffic Signs Manual*.

2.20 The Council will expect road markings to be provided on major roads, notably the A and B Road network. On minor roads it may be that certain road markings, such as centre line markings, will not be required. The Council’s Development Management Team should be consulted on these requirements at an early stage of the design process.
Street Furniture and Other Roadside Equipment

2.21 A wide range of street furniture and roadside equipment might be required to address specific issues in relation to traffic management. These include:

- Pedestrian guardrails
- Road Restraint Systems
- Bollards
- Verge Marker Posts
- Grit Bins
- Cattle Grids

2.22 Where the need for such street furniture is identified and has been agreed by the Council, the design should be in accordance with this guidance.

2.23 Pedestrian Guardrails – see Appendix H Detailed Design Guidance to this guidance.

2.25 **Bollards** - should be cylindrical, fabricated from passively safe material and provided with retroreflective materials as recommended in Table NA1 of the National Annex of BS EN 12899-1:2007 Fixed Vertical Road Signs

Bollards can be a rebound type and should meet the following specification:

- **Height above ground level**  1005mm
- **Maximum diameter**  220mm
- **Banding diameter**  1 x 63mm and up to 3 x 12mm
- **Socket depth below ground**  350mm
- **Extended base depth below ground**  300mm

Bollards should be installed to the manufacturers’ instructions.

GLASDON Manchester Bollard (or similar)
2.26 **Verge Marker Posts** – should be manufactured from robust material that will withstand multiple vehicle impacts and provided with retroreflective materials as recommended in Table NA1 of the National Annex of BS EN 12899-1:2007 Fixed Vertical Road Signs

Posts should meet the following specification:

- Height above ground level: 905mm
- Width: 150mm
- Depth below ground: 405mm (standard fixing), 40mm (advanced fixing)

Posts should be installed to the manufacturers’ instructions

GLASDON Flexmaster Marker Post (or similar)

2.27 **GRIT BINS** – should be provided in accordance with the Council’s Winter Maintenance Policy

2.28 **CATTLE GRIDS** - see TA 57/87 of the Design Manual for Roads and Bridges and the Guidance
Road ‘Un-Adopted’ Signs

2.29 Once a new road is open so that the public can access it freely, the Developer must ensure that contact signs are prominently displayed in locations to be agreed with the Council's HDM Team, generally where the extent of public highway terminates.

2.30 The signs must be in accordance with the following specification:

- Signs shall be 600mm x 600mm
- They must feature the developer’s corporate logo
- They must contain the following information:

  The roads on this development have not been adopted and remain the responsibility of [Developer's name]. Your initial enquiry should be made to:

  - Company Name
  - Address of Local Office
  - Telephone number/e-mail
  - Contact Name
  - Site telephone number/e-mail
  - Contact name

Tactile Paving Surfaces

2.31 Tactile paving surfaces should be provided in accordance with the DfT’s - Guidance on the use of tactile paving surfaces.

2.32 Blister tactile paving should be provided at vehicle crossovers accesses serving more than 1 dwelling.
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3 Street Furniture and Street Lighting

General

3.1 In almost all cases the Council will require the Developer to provide a system of street lighting for streets, footpaths and cycle tracks that are to be adopted as public highway. The street lighting proposals shall include a drawing that indicates the positions of lighting units, types and specification of columns, types and specification of lanterns, types of electricity supply, specification and location of any private cable networks required including electrical equipment.

3.2 All requests from Developers for street lighting design approvals, and inspections must be submitted in writing to the appropriate Highways Development Management Development Co-ordinator. The Street Lighting Team will not act on any requests that are submitted direct from Developers.

Electrical Design

3.3 Where the Developer submits an electrical/street lighting proposal, this submission will be assessed and technically approved by the Council as part of the highway works technical approval process.

Technical Approval

3.4 The Developer is to submit a copy of their street lighting / electrical design proposals in accordance with the technical submission package requirements checklist (see Appendix C). This drawing must indicate the positions of all proposed lighting units, illuminated signs, illuminated bollards, private cable networks (if they are applicable), electrical feeder pillars and detail whether the electrical supplies will be provided by a DNO (Distribution Network Operator) or IDNO (Independent Distribution Network Operator). It must also have a key and specification showing the different types of apparatus proposed. Where there is a necessity to have private cable networks the drawing must incorporate a schematic diagram for each circuit that indicates the electrical apparatus (including fuse ratings), isolation points and cable types and sizes. See Appendix J - Drawing No. Appendix G/01 for an example.

3.5 The technical submission shall include a set of design calculations showing proposed illumination levels. Where private cable networks are necessary a set of electrical design calculations in accordance with BS7671 Regulations (IEE) shall be submitted.

3.6 All submissions for approval should be in electronic PDF format, and sent to Highways Development Management. Once approved, an ‘Approved’ copy will be returned to the Developer.

3.7 The fee structure in Appendix D – Part 1 covers the costs of the Council to assess two submissions for technical approval; the initial submission and one subsequent re-submission. Where the Developer submits an amended electrical and/or street lighting
design for a third time, an additional fee, to that of the original fee, will be charged for that submission (and each subsequent submission). Refer to Appendix D – Part 2 for additional submission fees. An hourly charge out rate will be applied (with a minimum of three hours charged). A quotation will be provided, which will need to be agreed in writing and paid by the Developer, prior to additional approval work being carried out.

3.8 Failure to seek approval for the electrical and/or street lighting design will prevent any part of the proposed highway works obtaining technical approval and could result in significant delays.

Standards of Service

3.9 Where a Developer has made a technical submission or requested a street lighting/electrical apparatus inspection the following service standards will apply:-

- Response to a technical submission: 20 Working Days
- Substantial Completion Inspection (each request): 20 Working Days
- Completion Inspection (each request): 20 Working Days
- Final Inspection (Prior to Adoption) (each request): 20 Working Days

The fee structure in Appendix D – Part 3 cover the costs of the Council to undertake two inspections per stage (Substantial Completion, Completion and Final). Any additional inspection will not commence until additional payment has been received in accordance with Appendix D – Part 4. Failure to pay these fees will result in significant delays to the issuing of Certificates and could result in a breach of planning conditions.

Siting of Apparatus

3.10 All street lighting and associated cable networks and ancillary apparatus shall only be installed within the area of development that it is proposed to dedicate as public highway. It should be positioned so as not to cause any obstruction to highway users, for example, pedestrians, disabled and parked vehicles.

Apparatus Types
3.12 It is important that the apparatus used on any street lighting installation is of a type that is aesthetically most suited to the area, whilst remaining optically and energy efficient and easily maintainable.

3.13 Where a Developer requests the use of non-standard ‘Heritage’ or ‘Contemporary’ style apparatus in an area that is not designated as a ‘Conservation Area’, the Council will require a commuted sum based on inspecting and maintaining the equipment and eventual replacement.

3.14 The Developer can obtain advice on the process and cost implications for ‘Commuted Sums’ from the ‘Association of Directors for Environment, Economy, Planning and Transport’ (ADEPT). ADEPT have published a guidance document on the subject, entitled ‘Commuted Sums for Maintaining Infrastructure Assets’ that is available through their website www.cssnet.org.net.

3.15 The Council is currently forming a ‘Carbon Trading Strategy.’ As part of this strategy the Council are committed to making a reduction in their carbon emissions. To facilitate this policy the Council has already implemented a number of initiatives and is currently investigating numerous others, including dimming and LED light sources.

3.16 Developers shall provide an LED light source for all new street lighting installations.

3.17 A Central Management System (CMS) is to be provided within all LED street lights in Cheltenham and Gloucester. Such systems will allow the Council to centrally manage, its street lighting asset. Such a system will enable the Council to receive fault reports remotely, manage lighting levels and monitor energy consumption. Outside these areas CMS is not required at this time. The Council currently has an infrastructure for its own CMS provision based on the Telensa system. This is the preferred system for use. See Appendix J – Drawing No. Appendix G/03 for CMS coverage plan.

**Design Requirements**

3.18 All street lighting design proposals must comply with the current edition of BS5489-1-:2013 and the lighting classes detailed in Appendix J – Drawing No. Appendix G/04. Furthermore proposals must take into consideration the recommendations and best working practices detailed in the various Technical Reports/Guidance published by the Institution of Lighting Professionals.

3.19 Where there are trees or other obstructions, the Council is likely to require the gaps between proposed street lighting columns to be reduced. Similarly the need to illuminate traffic calming measures is also likely to require gaps to be reduced and create the need for additional lighting units. Failure to show such significant features on the electrical /street lighting submission for technical approval may result in the need for expensive relocation of lighting units once they have been erected (at the expense of the Developer) prior to the issuing of a **Substantial Completion Certificate**.
3.20 Where a development is located beyond the limits of an existing street lighting system it may be necessary, in the interests of highway safety, for the intervening section to be lit at the Developer’s expense. Early consultation through Highways Development Management is essential.

3.21 Where a proposed development involves the construction of a new junction onto an existing public highway that was previously unlit (or lit to a lower standard than that of the new development), or where the new junction requires an existing street lighting column to be re-located, the proposed street lighting scheme for the new development will need to include the entire new junction, including, where appropriate, improvement/replacement/relocation of existing equipment on the existing public highway. The need for these works will be identified in the Council’s response to the initial submission for technical approval. The categories of lighting in Appendix J – Drawing No. Appendix G/04 will apply.

3.22 No existing street lighting equipment will be permitted for re-location or re-use without consent from the Council, through Highways Development Management.

Construction of Street Lighting Works

3.23 The installation of new street lighting apparatus must take into account the need to light phases within a development that are occupied or require access by residents. There should not be gaps in the lighting installations between phases of developments. The Council requires all streets on a new development, between a dwelling and the existing public highway, to have an approved and working street lighting scheme in place before that dwelling is first occupied.

3.24 The Developer shall be responsible for the implementation of all work required in the removal, replacement or re-siting of all existing electrical apparatus made necessary by the development.

3.25 No existing street lighting shall be switched off, relocated, dismantled or removed without prior written approval by the Council through Highways Development Management. This approval shall normally only be granted if the Developer can provide evidence that arrangements have been made for either immediate installation and energising of new apparatus or the immediate provision and energising of temporary lighting.

3.26 Where temporary lighting is installed it must be approved by the Council and provide illumination to the standard that will be achieved by the permanent street lighting layout.

3.27 Temporary lighting shall not include the use of cross road catenaries’ and shall be positioned, such that it does not cause glare, distraction or discomfort to any highway users.
Liaison with Residents

3.28 The Developer should show all proposed positions of lighting units and other illuminated apparatus (signs, bollards etc) on all layout plans (including sales and legal/conveyancing literature.) This is in order that prospective residents are aware that there may be apparatus placed adjacent to, or outside any given plot or property. The Council will not involve itself in any dispute between the Developer and prospective resident. The Council may however agree to an alternative position for a lighting unit, or other item of electrical apparatus. This is only feasible where the Developer is prepared to bear the full cost of such requests. The Developer will be charged for approval and inspection fees in accordance with Appendix D.

Inspection of Electrical Apparatus (Substantial Completion Inspection)

3.29 Prior to the issue of the Substantial Completion Certificate, the Developer will submit a formal request to Highways Development Management (by e-mail or in writing) for an inspection of all the electrical and lighting apparatus. This inspection will ensure that:

a). all lighting units, illuminated signs, illuminated bollards and electrical feeder pillars have been installed in the correct positions according to the approved drawing;

b). all lighting units, illuminated signs, illuminated bollards and electrical feeder pillars have been installed to the correct specification including equipment planting depth;

c). the correct type of ducting and electrical services have been installed; and

d). the street lighting, signs and bollards are operational.

A minimum notice period of twenty working days will be required, to enable Highways Development Management to arrange these inspections.

3.30 Should it be necessary to undertake more than two inspections before the issuing of the Substantial Completion Certificate, due to their being remedial works required, there will be an additional inspection fee payable by the Developer in accordance with Appendix D – Part 3.

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<tr>
<th>Certificate</th>
<th>Inspections Included in Appendix D - Part 1 fees</th>
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<tbody>
<tr>
<td>Substantial Completion</td>
<td>Day / Night Inspection (2no. each)</td>
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Table 3.1
Inspection of Electrical Apparatus (Completion Inspection)

3.31 Prior to the issue of the Completion Certificate, the Developer will submit a formal request to Highways Development Management (by e-mail or in writing) for a further inspection of all the electrical and lighting apparatus. This inspection will ensure that all lighting units, illuminated signs and illuminated bollards are in good working order and suitable to go on to maintenance.

A minimum notice period of twenty working days will be required, to enable Highways Development Management to arrange these inspections.

3.32 Should it be necessary to undertake more than two inspections before the issuing of the Completion Certificate, due to their being remedial works required, then their will be an additional inspection fee payable by the Developer in accordance with Appendix D – Part 3.

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Table 3.2

Adoption of Apparatus & Final Certificate

3.33 Every item of electrical apparatus and underground cable, upon request a Final Certificate shall be tested to verify that the requirements of BS 7671 (IEE Wiring Regulations) have been met. The test results shall be submitted to Highways Development Management at the time of requesting a Final Certificate, for the works. Upon completion of the installation and prior to adoption, ‘as built’ drawings shall be forwarded to Highways Development Management showing the positions and specification of electrical apparatus, isolation points, fuse sizes, The Council cable routes, sizes and positions of service cables and details of any other electrical apparatus. See Appendix J – Drawing No. Appendix G/05 for an example electrical certificate.

3.34 Where LED equipment has not been specified, prior to issue of the Final Certificate, the Developer will ensure that all street lighting units, illuminated signs and illuminated bollards are 'Bulk lamp changed and Cleaned.' Written evidence is to be provided by the Developer to Highways Development Management prior to issue of the Final Certificate.

3.35 The following certificates will be required prior to the issue of a Final Certificate:

- 40 year column guarantee
- Electrical Test Certificate
Extended Guarantee Certificate detailing remaining period of guarantee for any of equipment including luminaires, sign lanterns, and illuminated bollards (see below for details).

3.36 All maintenance and energy costs will be the responsibility of the Developer until the Final Certificate has been issued.

3.37 Following issue of the 'Final Certificate', the Council will assume ownership of all electrical street furniture within the public highway boundary and therefore all future maintenance and energy costs.

Dimming

3.38 In order to meet their carbon footprint reduction requirements the Council have a policy to dim all street lights as follows:

   a). Traffic Routes by 50% (by stepping down to a lower wattage) between the hours of 10pm and 5:30 am using a pre programmable driver. The Council’s preference is the Xiitanium Ballast Driver. The Developer may specify alternatives that will be assessed as part of the technical approval process; and

   b). Where an LED luminaire is provided in residential areas, pre-programmable ballast or a CMS system shall be installed, (depending on geographical area) that dims the light output by 50% between the hours of 12am an 5:30am.

Lantern Apparatus for Street Lights and Illuminated Signs

3.39 All lanterns for street lighting shall be of a type approved by the Council and shall conform to BS4533, have an aluminium canopy and a minimum overall IP rating of IP66. They will accommodate post top (76mm) mounting or side entry (34 or 42mm.) Where LED lanterns are designed to have an individual lens there will not be a requirement for lantern bowls.

3.40 Where LED light sources are specified, they shall meet with the specification published by the ILP and the Electrical Association. This document is titled ‘A Guide to the Specification of LED Lighting Products 2012’. As part of this specification, the Council will require that the LED meets the requirements of L70 of this document. The specification submitted must also include the B10 figure for the specific lantern being used (L70 – B10 is a measure of when 10% of the individual LED’s in a product have dropped to 70% of initial lumens).

3.41 Lanterns shall be fitted with integral control gear or in the case of LED, a Dali enabled programmable dimming ballast. The control gear shall be mounted on a tray which shall be easily removable by a plug and socket arrangement for maintenance or replacement purposes.
3.42 Where CMS is fitted, the lantern shall come complete with telecell. Where CMS is not fitted, all lanterns shall have a NEMA socket. See below for details of preferred CMS system.

3.43 Lanterns for illuminated signs shall comply with the requirements of Chapter 11 and 13 of the Traffic Signs Manual and BS EN 12899 and shall be fixed to the supporting posts by means of a post top spigot.

3.44 Lanterns for illuminated signs shall be of an LED type (with 3no. 1 Watt LED’s) The Council currently prefers the Signature ‘Delta’ sign lantern. These must not exceed five circuit watts

**Extended Guarantee**

3.45 Any electrical apparatus that has a guarantee period remaining, at the time of adoption, *(Extended Guarantee)*, shall be transferred to the Council when adopted.

3.46 The Developer shall provide the Council with written confirmation, including a manufacturer’s certificate, for all apparatus that is subject to an extended guarantee, which details the original guarantee period and the amount of guarantee remaining, at the time of requesting the ‘Final’ inspection.

**Lamps (Where applicable)**

3.47 Lamps shall comply with British Standard (BS EN 62035), and be compatible with the control gear specified.

**Internal Wiring/Conductor Requirements for Street lights/Illuminated Signs**

3.48 All cables between the DNO/IDNO isolation point and the lantern shall be installed in accordance with BS7671 Regulations 17th Edition, and subsequent revisions (IEE) and be single core copper, PVC/PVC double insulated grey sheathed 660/1000V, rating to BS6004 (Cable Type 6491X). Exceptions to this shall be for the earth continuity conductor that shall be PVC insulated only (Cable Type 6181Y). See Appendix J – Drawing No. Appendix G/06 for general detail arrangements.

3.49 Composite cables that include an earth continuity conductor will not be permitted, unless prior approval has been granted.

3.50 Minimum conductor sizes provided shall be as follows:-

- **Earth Continuity Conductor** – 2.5mm Sq.
- **Main Earth Conductor** – 6.0mm Sq. (or larger if specified by DNO).
- **All other conductors within assembly** – 2.5 mm Sq.
3.51 Insulation for conductors shall be colour coded as follows:-

- **Live** – Brown
- **Neutral** – Blue

3.52 The Developer is not permitted to joint any of these conductors/cables and any surplus must be taped in an ‘S’ formation in the base compartment.

**Control Gear**

3.53 For all LED luminaires, a DALI compatible ballast/driver that allows for a dimming facility shall be required unless otherwise agreed by the Council. The Council’s preference is the Philips Xitanium driver. Where High Pressure Sodium lanterns are used, the Council’s preference is the Philips Extreme Ballast Driver.

**Switching On / Off**

3.54 In Gloucester and Cheltenham, it will be necessary for the Developer to provide the lantern complete with a CMS unit of an approved type, a lantern canopy, in place of the Nema socket, suitable to incorporate the integrated CMS/Dimming apparatus unless otherwise agreed by the Council. The Council’s preference is Telensa conduit type with dimming facility.

3.55 Outside of Gloucester and Cheltenham, it will be necessary for the Developer to provide a lantern with a standard NEMA socket, allowing the lantern to be switched on/off using a one part Photo-Electric Control Unit (PECU). This shall be set to **35 LUX ON and 18 LUX OFF**.

3.56 Unless otherwise agreed, all illuminated sign lanterns will be switched on/off. The Council’s preference is a SELC 101 miniature One Part Photo Electric Control Unit (PECU) located on the canopy of the lantern. Photo Electric Control Units (PECU’s) for all apparatus shall be manufactured to BS5972 and shall be marked with the switching regime and manufacture date.

3.57 Photo Electric Control Units (PECU’s) for signs only, shall have no thermal components and shall be set to **70 LUX ON and 35 LUX OFF**.

3.58 Photo Electric Control Units (PECU’s) shall be of a type capable of producing a switching regime satisfying Appendix II of the Second Tier Unmetered Supplies Procedure for switch type code 808.
Street Lighting Columns and Illuminated Sign Posts

3.59 All street lighting columns will consist of a column, hydrosopic back board and where applicable an integrated ‘Reducer Post Top Spigot.’ All columns shall be post top and brackets will not be permitted.

3.60 All street lighting columns shall be constructed to meet the structural design criteria specified in BSEN40, but shall have a minimum wall thicknesses and nominal shaft diameters as detailed in this document.

3.61 All street lighting columns and Illuminated sign posts are to be hot dipped galvanised to BS EN ISO 1461.

3.62 After galvanising all items are to have the root protected internally and externally at the place of manufacture. This Council’s protection preference is one coat of ‘SIKA’ Duplex Coating System Icosit PUR SW one part polyurethane finish to wet film thickness 200 to 250 microns (dry film thickness 172 microns.) This protection is to extend 0.25 metres above ground level.

3.63 All steel used in the manufacture is to be grade S235 for all illuminated sign posts and 5/6m mounting heights. A steel grade of S335 is to be used for 8 to 12m mounting heights.

3.64 All street lighting columns and Illuminated sign posts shall comply with the British Standard BS EN 40, to the BSI National Application Document PD 6547 and the DETR Memorandum BD26/04. They must also recognise the maximum combination of both lantern weight/s and windages applicable to respective column heights below and the specified lantern type:-

<table>
<thead>
<tr>
<th>Nominal Column Height</th>
<th>Lantern effective Windage (m2)</th>
<th>Lantern weight (KGS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5m</td>
<td>0.150</td>
<td>8</td>
</tr>
<tr>
<td>6m</td>
<td>0.150</td>
<td>10</td>
</tr>
<tr>
<td>8m</td>
<td>0.175</td>
<td>15</td>
</tr>
<tr>
<td>10m</td>
<td>0.225</td>
<td>18</td>
</tr>
<tr>
<td>12m</td>
<td>0.225</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 3.3

3.65 All items supplied must be manufactured to the quality standard ISO 9002.
3.66 ‘A Guaranteed LifeExpectancy of 40 years’ Certificate shall be required for each street lighting column and illuminated sign post, prior to issue of a Final Certificate. All apparatus shall carry a unique identification mark that is clearly visible once the column or sign post has been installed. This will indicate the column/post manufacturer, year of production and the column/post data sheet reference number. This Certificate must be provided to Highways Development Management prior to the Final Certificate being issued.

3.67 Column construction requirements are detailed in the table below:

<table>
<thead>
<tr>
<th>Column Height</th>
<th>Shaft Diameter</th>
<th>Base Steel Thickness (no less than)</th>
<th>Shaft Steel Thickness (no less than)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3m, 4m, 5m &amp; 6m</td>
<td>76mm</td>
<td>3mm</td>
<td>2.5mm</td>
</tr>
<tr>
<td>8m</td>
<td>90mm</td>
<td>3.6mm</td>
<td>3.2mm</td>
</tr>
<tr>
<td>10m &amp; 12m</td>
<td>114mm</td>
<td>5mm</td>
<td>3.6mm</td>
</tr>
</tbody>
</table>

Table 3.4

3.68 Column/post base compartments are to have a line of weld applied externally before galvanising to indicate the planting depth.

3.69 Where a Developer wishes to attach a traffic sign onto a Street Lighting Column, they should be in accordance with the table below:

<table>
<thead>
<tr>
<th>Nominal Column Height in Metres</th>
<th>Minimum Clearance of Sign Plate to Ground Level</th>
<th>Maximum Sign Surface Area (Sq m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5, 6 and 8</td>
<td>2.3</td>
<td>0.3</td>
</tr>
<tr>
<td>10 and 12</td>
<td>2.4</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Table 3.5

3.70 Where there are 2 no. back to back signs on a column, the second sign may be ignored for the purposes of determining the total signage area. Where signs exceed 0.3m², they will be refused approval unless a reinforced column is provided accompanied with design calculations that indicate that the proposed column is suitable for the proposed signage area.

3.71 All column/post doors shall be fitted with a stainless steel 8mm Allen bolt with an Anti-Vandal Centre Pin. Any variations should be agreed with GCC.
Raise and Lower Street Lighting Columns

3.72 Raise and Lower columns shall be provided by the Developer in all locations where maintenance vehicular access is limited, for example, footpaths, cycle paths, canal tow paths or where the presence of an appropriate maintenance vehicle (MEWP) may impede the free flow of traffic. Refuge beacons may fall into this latter category. The Council preferred column manufacturer is ‘Fabrikat’. The model to be specified incorporates a separate door, so that electrical equipment housed within the column can be accessed for maintenance purposes, without the requirement to lower the column.

3.73 All such columns shall be installed in accordance with the ‘Column Installation Requirements’ detailed in this document and any additional instructions or requirements that may be published by the manufacturer.

Passively Safe Street Lighting Columns and Sign Posts

3.74 On highway of 50mph or over, a Risk Assessment should be submitted to determine if passively safe equipment is required. It may be necessary for the Developer to provide ‘passive safety’ street lighting columns or sign posts. A copy of the Risk Assessment is to be submitted to Highways Development Management as part of any technical submission.

3.75 All such columns or sign posts shall comply with BS EN 12767:2000 and shall be approved by the Council as part of the technical approval process.

3.76 Where such columns or sign posts are appropriate the Developer shall incorporate as part of their design solution a suitable ‘Auto Disconnect’ electrical network system. The Council's preference is NAL.

3.77 All ‘Passive Safety’ columns /posts shall be manufactured from an energy absorbent material and when installed shall allow slower vehicular impact deceleration and reduced risk of injury.

Installation of Electrical Apparatus

3.78 The Developer shall install all electrical apparatus in the locations shown on the approved drawings. Where there are engineering difficulties or customer requests that result in this not being desirable, then the Developer can seek the agreement of the Council on an alternative location for the apparatus. All costs associated with these alterations shall be payable by the Developer. Should the Developer propose an alternative location, this shall be formally submitted to Highways Development Management. An estimate of the additional Council costs to assess, approve and inspect such alterations will be issued to the Developer by Highways Development Management in advance of any costs being incurred by the Council. Written agreement will be required from the Developer that they will pay all associated costs for this request, before approval is given and any construction work is undertaken.
3.79 All street lighting columns shall be planted to depths detailed in Appendix J – Drawing No. Appendix G/07.

3.80 All illuminated sign posts shall be planted to depths detailed in Appendix J – Drawing No Appendix G/07.

3.81 All street lighting columns and illuminated sign foundation excavations shall have Type 1 or Type 2 foundations as detailed in Appendix J – Drawing No Appendix G/08.

3.82 Where an illuminated sign requires an additional support post this shall be a straight post having a suitable diameter for the size of sign plate. The post shall be galvanised to BS EN ISO 1461 and have root protection as detailed in this document.

3.83 Where a straight post is specified on a development it shall have foundation excavation as detailed in Appendix J – Drawing No Appendix G/09.

3.84 Where street lighting columns / illuminated sign posts are located in a grass verge or unmade ground they shall have a concrete collar as detailed in Appendix J – Drawing No Appendix G/08.

Street Lighting and Illuminated Sign Post – Paint System

3.85 All Street lighting columns, Illuminated sign posts and straight posts shall have a paint system applied on completion of their installation and prior to the issue of the Substantial Completion Certificate.

3.86 Once installed all new street lighting columns and Illuminated sign post surfaces shall be freed of contamination, with clean swabs soaked in white spirit that shall frequently be changed and allowed to dry. All surfaces of the apparatus shall then be T-Washed and allowed to dry before the top coat of paint is applied. Evidence should be provided that the ‘T Wash’ has been applied.

3.87 All paints shall be obtained from a single manufacturer, or as specified/agreed with the Council, to ensure compatibility and shall be brush applied. The use of rollers is not permitted.

3.88 All access doors must be removed on each item of apparatus and the internal surface of the door shall receive the same surface preparation/treatment and paint system as the outside surface.

3.89 Painting of all apparatus shall extend from top of column/post shaft or welded post top spigot to ground level. A paint system, as detailed in this document for ‘Below Ground’ shall be applied by the column and/or post manufacturer.

3.90 The Council’s preference for column/post protection ‘Above Ground’ is the ‘SIKA’ Duplex coating system comprising of one coat of ICOSIT 6630 one pack urethane alkyd paint, applied to a wet film thickness of 200-250 microns and dry film thickness of 172 microns.
3.91 Where a Developer is required to re-paint existing street lighting columns and/or Illuminated signs then the following procedure shall apply:-

   a). Before any new paint systems are applied all columns/posts shall have their surfaces prepared and treated in accordance with BS EN 12944;

   b). Prior to re-painting all surfaces, including the inner door surface and door abutment of the base compartment shall be prepared by wire brushed using a mechanical/power wire brushing tool and a hard steel scraper. The wire brushing must remove:-

      i) Obvious surface contamination – dirt, grease etc

      ii) All loose rust

      iii) Mechanically bonded rust

      iv) Laminated rust corrosion

3.92 Where a column/post is to be re-painted and following the surface preparation procedure described above, the Developer shall apply a paint system as detailed in this document.

3.93 Unless otherwise agreed at the time of technical approval, or written permission has been granted by the Street Lighting Team the following paint colours will be applied:-

   a). Street Lighting Columns (All areas with the exception of Cheltenham and Gloucester) – BS4800 12B29 (Dark Green);

   b). Street Lighting Columns (Gloucester) – BS4800 12B21 (Light Green);

   c). Street Lighting Columns (Cheltenham) – Column Shaft BS4800 12.B21 (Light Green), Column Base BS4800 12.B29 (Dark Green);

   d). Illuminated Sign Posts – BS693 (Aircraft Grey)

Reference Numbers for Street Lighting Columns, Illuminated Signs and Bollards

3.94 All street lighting columns, illuminated signs and bollards shall be given a unique reference number by the Council as part of the technical approval process and it is the responsibility of the Developer to mark the street furniture in accordance with this numbering scheme as part of the works.

3.95 Where this information has not been provided at the time of technical approval process, the Developer shall submit a request for a numbering schedule to the Council through Highways Development Management prior to a Completion Certificate being issued.

3.96 Street Lighting columns shall have an adhesive reference number applied, using a black 50mm height number/s on a yellow colour square background. A suitable product type is ‘Nikalite’ that is manufactured by Graficom Ltd (Tel: 01707 391621). Equivalent products
can be specified by the Developer and will be subject to approval by the Council as part of the technical approval process.

3.97 Illuminated sign posts shall have an adhesive reference number applied, using a series of individual yellow 30mm height numbers on a black square background. This shall be applied on the sign plate in a vertical plane and will start at the top of the sign plate. Where several illuminated signs are mounted on one post only one identification number shall be used. A suitable product type is ‘Nikalite’ that is manufactured by Graficom Ltd (Tel: 01707 391621). Equivalent products can be specified by the Developer and will be subject to approval by the Council as part of the technical approval process.

3.98 Illuminated bollard shells shall have an adhesive reference number applied, using a series of individual black 30mm height numbers on a white square background. This will be mounted on a galvanised numbering plate (See Appendix J – Drawing No. Appendix G/10).

3.99 Street lighting column reference numbers shall be mounted on the column shaft, at 1.5 metres from ground level.

3.100 Illuminated Sign reference numbers shall be mounted on the post shaft, at 1.5 metres from ground level.

3.101 Illuminated bollard reference numbers will be mounted on the back and close to the top of the bollard shell. The exception to this shall be where the bollard has multiple aspects, when the reference number shall be immediately below the yellow panel on any face.

3.102 Unless otherwise specified by the Council, all reference numbers, where possible, shall face oncoming traffic.

Illuminated Traffic Bollards

3.103 Where required on central traffic islands, splitter islands, and build-outs etc. the Developer shall provide illuminated traffic bollards in accordance with the ‘Traffic Sign Regulations and General Directions 2002’.

3.104 In certain circumstances and with the approval of the Council it may be acceptable for the Developer to specify ‘Reflective’ non-illuminated bollards instead of Illuminated bollards. The following criteria apply:-

   i) The bollard must only require a ‘Plain Aspect’, or:

   ii) The bollard must be located on an island that has a traffic signal head. This must face and be no greater than three metres from the bollard location.

   iii) Non street lit areas.

3.105 Where approval has been granted by the Council for a non illuminated reflective bollard to be specified, the Council currently prefer the ‘Pudsey Diamond, Visabol’ type
complete with the ‘NAL RS50x50’ socket and adapter plate (See Appendix J – Drawing No. Appendix G/11).

3.106 With exception of the above, conventional illuminated bollards are to be specified and the Developer shall use a base lit illuminated type bollard with two No. 11 Watt fluorescent lamps mounted on a reflective and removable gear tray. GCC currently prefer the Simmonsigns Ltd ‘Global Plus’ base and flexible bollard shell (GLP211/CAB) sealed to IP67.

3.107 The Developer shall use a orange ducted base light foundation and cable management system. The Council currently prefer the Simmonsigns Ltd ‘Cabex’ type (See Appendix J – Drawing No. Appendix G/13).

3.108 All specified bollard assemblies shall have high frequency control gear which shall be wired to British Standard BS7671 Regulations (IEE) and have separately fused circuits such that one lamp remains lit in the event of failure of the other lamp. Lamps and control gear shall be removable by means of a plug and socket for easy maintenance.

3.109 All illuminated bollard assemblies are to be supplied with a sealed light tray housing the lamps and control gear. This shall have a 5mm thick domed polycarbonate clear lens cover. The lens cover must be able to withstand vehicle impact.

3.110 All bollard shells shall be attached to the base using stainless steel nuts and bolts.

3.111 Where a reflective bollard has two aspects their yellow reverse panels shall mirror the front face, and shall include side bibs and spots.

Cut Outs and Isolators

3.112 All street lighting columns and Illuminated signs shall incorporate double pole isolation and comply with ESI 12-19 and to current BS7671 Regulations and be suitable for BS88 fuses. This isolation shall take the form of a switch (securable on/off) with an integral separate BS88 fuse carrier for the lantern and any outgoing circuits. It is to have a lockable cover.

3.113 All conventional illuminated bollards shall incorporate double pole isolation and comply with ESI 12-19 BS7671 Regulations and be suitable for LST BS88 fuses. This is to be provided using a miniature cut out incorporating a lockable/removable blade type fuse carrier.

3.114 All fused double pole isolators and/or cut outs shall be suitable for terminating the specified cables via gland terminations and shrouds, with base connection boxes if necessary.

3.115 All fused double pole isolators and/or cut outs shall be suitable for use with a PME electrical system.
Fuse Ratings

3.116 All street lighting apparatus shall be in accordance with the table below:

<table>
<thead>
<tr>
<th>Lamp Wattage</th>
<th>Fuse Rating (Amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 150W (inclusive)</td>
<td>6</td>
</tr>
<tr>
<td>Over 150W to 250W (inclusive)</td>
<td>10</td>
</tr>
<tr>
<td>Over 250W to 400W (inclusive)</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 3.6

3.117 Where the wattage exceeds 400 Watts, the Developer shall contact the Council through the Development Management Team for advice.

Electricity Supplies

3.118 All street lighting columns, illuminated signs and electrical pillars that are located in a footway and/or grass verge adjacent to the carriageway and/or footpath/cycleway shall have a Distribution Network Operator (DNO) or IDNO live electricity supply. See Appendix J – Drawing No. Appendix G/06 for general arrangement details. There are three different DNO’s that operate within Gloucestershire (See Appendix J – Drawing No. Appendix G/12).

3.119 The Developer is permitted to employ a private organisation to provide an independent distribution network. These are known as ‘Independent Distribution Network Operators’ (IDNO)and they will provide networks that will predominately be network extensions to the existing distribution networks. IDNO’s shall be appropriately licensed and regulated by ‘Ofgem’ in the same manner that DNO’s are.

3.120 Where the Developer nominates the use of an IDNO they must meet with the specification of GCC. This specification includes Standards of Service for the implementation of new services and future faults that may occur on the network, prices for work and contact information for services. The specification requirements of GCC are based on and comparable with the main Distribution Network Operators (DNO) that operates within the County and have historically been used for the majority of new connections. This is Western Power Distribution. The Developer will be responsible for notifying Development Management of the IDNO to be used as part of that Street Lighting Technical Approval Submission, that will include contact details for new services and fault repairs, an up to date (dated) standards of service document that details the timescales for completing various types of new work and fault rectification and emergency call outs, and up to date (dated) price list. If any of the above information is
not submitted as part of the submission, the Technical Approval Submission will be rejected.

3.121 If any of the above details are unacceptable to the authority, e.g. costs, then the developer will be advised of this at the time Technical Approval is granted. Should the developer wish to use an IDNO, then the Authority will refuse their use or require a commuted Sum from the Developer to cover the additional costs likely to be incurred by the Council.

3.122 All DNO/IDNO’s are subjected to National Guaranteed standards of services for non-metered electricity supplies. These are detailed in document ‘DPCR5 Guaranteed Standards of Performance review’ produced by their regulating body ‘Ofgem’ and is available on their website ofgem.co.uk.

3.123 It is the Developer’s responsibility to undertake all liaison and negotiation with the relevant DNO/IDNO.

3.124 Where an item of electrical apparatus is located within a build-out, splitter island, pedestrian refuge or central reservation, the Developer shall provide an electrical service that is sub fused in accordance with BS 7671 Regulations (IEE), from an adjacent item of electrical apparatus that is located in a footpath/verge that shall have a DNO/IDNO service. See Appendix J – Drawing No. Appendix G/06 for general arrangement details. These services are known as Highway Authority Connections (HAC) and will be under the ownership of the Council on successful completion of the ‘Adoption’ process. The Developer shall provide details of all such electrical services in their electrical/street lighting design, which is submitted to Highways Development Management as part of the technical approval process.

**Network Cables and Service Ducting Requirements**

3.125 Where an item of electrical apparatus has a DNO/IDNO electrical service, the DNO/IDNO will be responsible for determining the specification (as part of their design) for all network cables, including their position and size.

3.126 Where an item of electrical apparatus has a DNO/IDNO electrical service, the DNO/IDNO will be responsible for providing a specification (as part of their design) for all necessary service ducting.

3.127 Due to construction timescales, it may be appropriate for the Developer to install any DNO/IDNO service ducts (black) that are required. In these circumstances it shall be the responsibility of the Developer to obtain the relevant DNO’s approval for the completed works prior to the base course being laid.

3.128 Where an item of electrical apparatus requires a Highway Authority Connection (HAC), the cable shall be of a (PVC/XLPE/PVC) 3 core type, having a minimum size of 6sq mm. All cable sizes and positions shall be determined by the Developer (accompanied by
design calculations) and submitted to Highways Development Management for approval, as part of the technical approval process.

3.129 Where the Developer provides a cabling network for electrical apparatus that shall be owned by the Council (HAC), underground cable joints shall not be permitted.

3.130 Where an item of electrical apparatus requires a Highway Authority Connection (HAC), then prior to issue of the Final Certificate, the Developer shall provide Highways Development Management with details of the installation date and an electrical test certificate, in respect of each item of apparatus.

3.131 Where an item of electrical apparatus requires a Highway Authority Connection (HAC) the service shall be protected within an orange coloured continuous service duct. Installation requirements are detailed in Appendix J – Drawing No. Appendix G/14. All service duct details including size and location shall be submitted to Highways Development Management, as part of the technical approval process.

3.132 All service duct systems shall include for manufacturer couplings/joints, draw ropes/cords fastened at each end to the base compartment of the electrical apparatus. All service duct ends shall be sealed to prevent loose material or water entering the service duct.

3.133 All service ducts provided for Highway Authority Connections (HAC) shall have a marker tape to specify their ownership. This shall be yellow PVC tape with black lettering stating ‘Electricity Cable’ and shall be installed with the wording uppermost at approximately 250mm above the service duct.

3.134 All service ducts provided by the Developer, for Highway Authorities Connections (HAC), shall have a 75mm sand surround and bed comprising lightly compacted material passing clear sharp sand BS sieve.

3.135 All service ducts for DNO/IDNO/Highway Authority use shall extend through the cable entry slot provided within the street lighting column or wide base illuminated sign post and shall extend to a height of 150mm above ground level (See Appendix J – Drawing No. Appendix G/08).

3.136 Although the DNO/IDNO and/or the Council shall be responsible for determining/approving the specification and installation details for their respective service duct networks, unless otherwise specified the following type and minimum cover of service ducts shall be provided:-

<table>
<thead>
<tr>
<th>Excavation In</th>
<th>Depth of cover (mm)</th>
<th>Type and size of duct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verge/unmade Ground</td>
<td>450</td>
<td>50mm internal diameter (Flexible Duct)</td>
</tr>
</tbody>
</table>
### Table 3.7

<table>
<thead>
<tr>
<th>Footway under Vehicle crossings</th>
<th>450</th>
<th>50mm internal diameter (Flexible Duct)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carriageway (longitudinal)</td>
<td>750</td>
<td>100mm internal diameter (Flexible Duct)</td>
</tr>
<tr>
<td>Carriageway (90 degree crossings)</td>
<td>900</td>
<td>100mm internal diameter (Rigid Duct)</td>
</tr>
</tbody>
</table>

3.137 Highways Development Management reserve the right to inspect all service duct networks that are installed for their apparatus and that will be within the Council’s ownership following successful completion of the ‘Adoption’ process. Therefore on completion of any service duct network and before they are covered, the Developer shall provide Highways Development Management with the opportunity to inspect all such installations. The Developer will provide notification that the installation is complete and will allow a minimum of two working days notice, so that Highways Development Management may undertake an inspection if require.
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4 Carriageway Construction Standards

Background

4.1 This chapter outlines the Council's standard requirements for the construction of roads and associated infrastructure such as footways, drainage and structures.

4.2 These standards have evolved as a result of local and national guidance, and through previous experience and best practice. They ensure a measure of uniformity, predictable performance and cost effectiveness throughout the Council's highway network, whilst helping the Council to prevent the construction of schemes that are high maintenance or unsuitable.

4.3 For the reasons detailed above, the majority of highway schemes must be constructed in accordance with these standards. Appendix H contains a full series of drawings that illustrate these construction standards.

4.4 However, the Council appreciates that the materials detailed in the standards do not always contribute aesthetically to the street scene and the surrounding area. This can be particularly important in the historical localities throughout the county. In these limited circumstances the Council may permit the use of some enhanced materials and apparatus to complement the surroundings and create a sense of place. If you are considering the use of non-standard materials then please read the Enhanced Materials Policy at Appendix I.

Materials and Construction

4.5 What follows is the Council's 'deemed to satisfy' construction specification. It is important to note that these are not standards to be rigidly applied. The aim is to provide developers with a benchmark of what is acceptable when proposing new schemes for adoption. The Council will consider alternative proposals and innovations, for which further guidance is provided in the Enhanced Materials Policy at Appendix I.

4.6 You should, wherever possible, adhere to the current version of Manual of Contract Documents for Highway Works - Volume 1 Specification for Highway Works.

4.7 Unless otherwise stated the clauses, tables and appendix numbers in Tables 4.1 and 4.2 refer to those within the Manual of Contract Documents for Highway Works.
### Table 4.1 - Paviours and Other Hard Landscaping

<table>
<thead>
<tr>
<th>Type</th>
<th>Layer</th>
<th>Thickness (mm)</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Carriageway</td>
<td>Surface</td>
<td>80</td>
<td>80mm (min) thick paver block</td>
</tr>
<tr>
<td></td>
<td>Laying Course</td>
<td>35</td>
<td>Clean sharp sand to BS EN 12620 grading C</td>
</tr>
<tr>
<td></td>
<td>Sub base</td>
<td>390</td>
<td>Granular sub base material type 1 laid in two equal or near equal layers</td>
</tr>
<tr>
<td>Footways / cycleways</td>
<td>Surface</td>
<td>80</td>
<td>80mm (min) thick paver block</td>
</tr>
<tr>
<td></td>
<td>Laying Course</td>
<td>35</td>
<td>Clean sharp sand to BS EN 12620 grading C</td>
</tr>
<tr>
<td></td>
<td>Sub base</td>
<td>225</td>
<td>Granular sub base material type 1</td>
</tr>
<tr>
<td>All verge types</td>
<td>Same specification as Pedestrian, Cyclist - or alternative to be approved by the Development Management Team</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 4.2 – Carriageway and Footway/Cycleway

<table>
<thead>
<tr>
<th>Type</th>
<th>Construction Layer</th>
<th>Thickness (MM)</th>
<th>Material</th>
<th>Binder (Penetration Grade Macadam)</th>
<th>Min PSV of Coarse Aggregate</th>
<th>Max AAV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Carriageway (Boulevard)</td>
<td>Surface course</td>
<td>40</td>
<td>AC 14 Close Surf</td>
<td>100/150</td>
<td>100/150</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Binder course</td>
<td>60</td>
<td>AC 20 Open Bin</td>
<td>100/150</td>
<td>i) 65</td>
<td>ii) 55</td>
</tr>
<tr>
<td></td>
<td>Base course</td>
<td>110</td>
<td>AC 32 Dense Base</td>
<td>100/150</td>
<td>ii) 55</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Sub base</td>
<td>390</td>
<td>Granular Sub Base Type 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential Carriageway (High Street and Square)</td>
<td>Surface course</td>
<td>30</td>
<td>AC 10 Close Surf</td>
<td>100/150</td>
<td>i) 65</td>
<td>ii) 55</td>
</tr>
<tr>
<td></td>
<td>Binder course</td>
<td>60</td>
<td>AC 20 Open Bin</td>
<td>100/150</td>
<td>ii) 55</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Base course</td>
<td>110</td>
<td>AC 32 Dense Bin</td>
<td>100/150</td>
<td>iii) 50</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Sub base</td>
<td>Granular Sub Base Type 1*</td>
<td>Binder course</td>
<td>Surface course</td>
<td>Base Course</td>
<td>Sub base</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------</td>
<td>--------------------------</td>
<td>---------------</td>
<td>--------------</td>
<td>------------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Residential Carriageway</strong></td>
<td>390</td>
<td></td>
<td></td>
<td>100/150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Street and cul-de-sac)</td>
<td></td>
<td></td>
<td></td>
<td>AC 10 Close Surf</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Surface course</strong></td>
<td>30</td>
<td></td>
<td></td>
<td>100/150</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Binder course</strong></td>
<td>90</td>
<td></td>
<td></td>
<td>AC 20 Open Bin</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Base Course</strong></td>
<td>-</td>
<td></td>
<td></td>
<td>100/150</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sub base</strong></td>
<td>390</td>
<td>Granular Sub Base Type 1*</td>
<td></td>
<td>100/150</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Industrial Carriageway</strong></td>
<td></td>
<td></td>
<td></td>
<td>40/80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/ Works on Main Road Carriageway</td>
<td></td>
<td></td>
<td></td>
<td>40/80</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Surface course</strong></td>
<td>45</td>
<td>&gt;40mph - HRA 55/14F Surf&lt;40mph – HRA 35/14 F Surf +14/20PCC (max 10PCC on roundabouts and approaches)</td>
<td></td>
<td>40/80</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Binder course</strong></td>
<td>55</td>
<td>AC 20 Open Bin</td>
<td></td>
<td>100/150</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Base Course</strong></td>
<td>110</td>
<td>AC 32 Dense Base</td>
<td></td>
<td>100/150</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sub base</strong></td>
<td>390</td>
<td>Granular Sub Base Type 1*</td>
<td></td>
<td>100/150</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Footways and cycleways</strong></td>
<td></td>
<td></td>
<td></td>
<td>70/100</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Surface course</strong></td>
<td>25</td>
<td>AC 6 Dense Surf</td>
<td></td>
<td>70/100</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Binder course</strong></td>
<td>50</td>
<td>AC 20 Open Bin</td>
<td></td>
<td>160/220</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sub base</strong></td>
<td>250</td>
<td>Granular Sub Base Type 1</td>
<td></td>
<td>160/220</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
* Laid and compacted in two equal, or near equal, layers  
** If trafficked by public then as above
(i) Approaches to roundabouts, traffic signals, pedestrian crossings and the like. In some cases an additional surface treatment may be required to improve skid resistance.  
(ii) On gradients of 5% to 10%  
(iii) Elsewhere
The information contained in Table 4.2 is taken from BS 59487:2007 ‘Asphalt for Roads and Other Paved Areas – Specification for Transport, Laying and Compaction and Type Testing Protocols’. For additional information on asphalt mixes and products please refer to BS EN 13108.

**Over Dig Requirements**

4.8 Due to our experience from other development sites within Gloucestershire in respect of the settlement of kerbing and edging adjacent to non-highway construction, the Council requires, in such circumstances, the concrete bedding and haunching to be supported in accordance with the details shown in Figure 4.1 below.

![Figure 4.1](image)

**California Bearing Ratio (CBR) Requirements**

4.9 The `deemed to satisfy` pavement designs include a sub-base thickness of 390mm. This assumes formation sub-grade strength of CBR of 2% and greater. Sub-grade bearing capacity will vary from site to site dependent on soil type and to a great extent on its moisture content. The developer may arrange for geotechnical investigations to determine the CBR of the sub-grade at the formation level in agreed positions on the proposed carriageway centre lines.
4.10 Provided that the Council has previously approved the geotechnical laboratory which conducted the site investigations, then a road pavement design based on the equilibrium CBR results will be considered. Specific capping and sub-base layers appropriate to the site may then be agreed generally in accordance with Table 4.3.

**Table 4.3 - Deemed to Satisfy CBR Values**

<table>
<thead>
<tr>
<th>Sub grade CBR%</th>
<th>Sub base Thickness</th>
<th>Sub base and Capping Layer Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;15</td>
<td>150mm</td>
<td>NOT USED</td>
</tr>
<tr>
<td>5-15</td>
<td>225mm</td>
<td></td>
</tr>
<tr>
<td>&gt;3.5 to 5</td>
<td>310mm</td>
<td>150mm type 1 sub base on 350mm capping layer</td>
</tr>
<tr>
<td>2 to 3.5</td>
<td>390mm</td>
<td>150mm type 1 sub base on 600mm capping layer &lt;sup&gt;1)&lt;/sup&gt;</td>
</tr>
<tr>
<td>1 to 2</td>
<td>150mm type 1 sub base on 600mm of granular material backfill &lt;sup&gt;4)&lt;/sup&gt; or 750mm type 1 or type 2</td>
<td></td>
</tr>
<tr>
<td>Below 1</td>
<td>No deemed to satisfy standard, ground conditions not suitable for road construction</td>
<td></td>
</tr>
</tbody>
</table>

**NOTES -**

1) The capping layer may be reduced to 450mm where drainage is good
2) Capping shall comply with Clause 613 and Table 6/1.
3) If the subgrade is frost susceptible the pavement shall comprise of a minimum 450mm thickness of material not susceptible to frost action.
4) Backfill shall comply with Clause 608 and Table 6/1. Suitable granular backfill material shall include the following characteristics:
   a) 10% fines value must exceed 40kN tested on a soaked basis in accordance with BS812
   b) Maximum particle size not to exceed 63mm
   c) Generally well-graded (coefficient of uniformity >10) and with not more than 10% passing um sieve
   d) The material shall not contain any clay lumps or any other foreign matter
Surfacing Materials Specification:

- Granular sub base material Type 1 shall comply with Clause 803SR
- Dense Asphalt Concrete Base shall comply with Clause 906
- Dense Asphalt Concrete Binder Course shall comply with Clause 906
- Hot Rolled Asphalt Surface Course, shall comply with Clause 943
- Rolled Asphalt Surface Course shall comply with Clause 943
- 6mm Dense Asphalt Concrete Surface Course shall comply with Clause 909SR Close Graded Asphalt Concrete Surface Course shall comply with Clause 912
- Precast concrete kerbs, channels, edgings and quadrants shall comply with Clause 1101 Precast Concrete Flags shall comply with Clause 1104.
- Precast Concrete Blocks shall comply with Clause 1107.
- Clay Pavers shall comply with Clause 1108

Using Enhanced Surfacing Materials

4.11 The Council acknowledges the contribution that appropriate material selection can make to the function, character and local identity of schemes that are to be adopted.

4.12 Traditional, proven highway materials provide uniformity of appearance and predictable performance characteristics and maintenance requirements when designed and constructed in accordance with published standards and acknowledged best practice. However, these standard materials can do little to enhance the street scene in particular locations.

4.13 In circumstances where standard materials do not fulfil the aesthetic design aspirations the use of enhanced materials may be appropriate. Such enhanced materials offer variations in patterns, textures and colours that can complement the surroundings and local context, creating a sense of place.

4.14 Permitting the use of an unrestricted palette of enhanced materials presents the possibility of an incoherent visual appearance across the county along with uncertainty in long-term performance, maintenance requirements and lifecycle costs.

4.15 Therefore, Gloucestershire Highways has developed an Enhanced Materials Policy to provide guidance for Developers outlining the requirements for the approval and
adoption of surfacing materials used in highway infrastructure. This policy can be found in Appendix I.

**Advice for the Use of Recycled Materials for Sub Base and Capping in Road Construction**

4.16 Gloucestershire County Council is committed to increasing the use of recycled and secondary aggregates in its road maintenance and new road construction programmes. Developers are encouraged to put forward for approval highway construction designs that will support such an approach.

If the Developer proposes to use recycled materials on any area which is to be adopted as highway maintainable at public expense, the following information may be helpful.

- The appointed Highway Inspector must be informed before the use of the material.
- Prior to materials being delivered to site the Developer must provide an accreditation certificate from the material supplier (to be no more than 28 days old and legible).
- The material must meet the specification for 6F5 (Selected Granular Material [Coarse Grading] – imported onto site) based on the November 2009 amendments of the Specification for Highway Works, Series 600 (Manual of Contract Documents for Highway Works: Volume 1 (MCHW1)). Class 6F5 covers coarse-grained capping imported onto the site. It can include any combination of permitted materials including recycled aggregates with not more than 50% by mass of recycled bituminous planings and granulated asphalt. It must not include any materials that contain tar and tar-bitumen binders, un-burnt colliery spoil, argillaceous rock and chalk (Table 6/1, Series 600, Vol 1 (MCHW1)). The composition of all Recycled aggregate (RA) and Recycled concrete aggregate (RCA) shall have been tested in accordance with Clause 710 (MCHW1 Nov 09). Clause 710 requires that the composition be determined in accordance with BS EN 933-11. The content of other materials (Class X), including wood, plastic and metal, shall not exceed 1% by mass.

In terms of tests required, a typical regime is as follows:-

- One test during the first 100T (should be witnessed by Inspector)
- Two tests for 500T
- Three tests for 1000T
- Three tests for every 1000T thereafter.

However, at the discretion of the Inspector the frequency of the tests may vary. The Inspector may also wish to witness tests as required.

Test results to be sent directly from the test centre to the Council, at the address below, to prevent delay. If the Inspector is concerned and suspects material is being cleaned up before testing, he/she may require every load thereafter to be tested.

Highways Development Management  
Gloucestershire County Council
5   Highway Structures

Introduction

5.1 The Council requires that all proposed structures that support the public road are subject to Technical Approval. This may include structures proposed for adoption and also those associated with private developments. Structures include bridges that carry the highway over or under another feature, footbridges and subways carrying pedestrian or cycle routes over or under another feature, tunnels, and culverts, walls and embankments where they meet the criteria for adoption set out below.

5.2 The Council’s objectives are to ensure that all highway structures are:

- Safe and serviceable in use,
- Fit for their intended function,
- Built to an appropriate standard,
- Constructed so that future maintenance requirements are kept to a minimum, by ensuring this is given full consideration at the earliest possible stage and then throughout the design process.

Criteria for adoption

5.3 The following will be adopted as individual structures:

- Road bridges and culverts with a span greater than 0.9m
- Walls and reinforced earth structures that support the highway and that retain greater than 1.5m and, which are within a 1:1.5 slope from the edge of the highway.

5.4 The following will not generally be adopted, but the approval process will need to be followed:

- Walls and similar structures above the highway,
- Walls that support the highway but also form part of a building,
- Embankments supporting the highway and any toe walls at their bases

5.5 All structures supporting the highway, whether they are to be adopted or not, are subject to the Council’s technical approval process and procedures.
Technical Approval Procedure

5.6 The Council’s technical approval procedures are taken from BD2/05 ‘Technical Approval of Highway Structures’. This document forms part of the Design Manual for Roads and Bridges and can be obtained from the Department for Transport website (www.dft.gov.uk). The Council will issue technical approval only after all of the procedures and standards have been met.

Design Requirements

5.7 The technical requirements for the design of highway structures will generally comply with the relevant standards and advice notes in the Design Manual for Roads and Bridges and shall be constructed in accordance with the Specification for Highway Works.

Categories and Proposals

5.8 Proposed structures will be placed in one of four categories according to the criteria detailed within BD2 “Technical Approval of Highway Structures”.

- Category 0 and 1 structures require a combined design and check certificate.
- Category 2 and 3 structures require separate design and check certificates.
- Category 1, 2 and 3 structures will require a full Approval in Principle (AIP) submission.
- Category 0 structures that have Departures from Standards may require a full AIP submission, please contact Gloucestershire Highways if you feel a structure falls within this criteria.

5.9 Copies of the relevant certificates can be obtained from Gloucestershire Highways (Tel 08000 514514).

Loading Standards

5.10 The design loading of the structure must be in accordance with the current Highways Agency Standards.
Departures from Standards

5.11 Sometimes it is not appropriate or practical to install systems that are fully compliant with the standards explained in this manual. This is particularly applicable to parapets. The Council will consider departures from standard providing they are justified and backed with clear evidence.

5.12 This may include:

- RRRAP assessments
- Road Safety Audits
- Review of accident history

Detailing

5.13 Cladding materials should be durable and tied in to the structure.

Consents

5.14 If consent is required from the Environment Agency or any other public body and relevant owners and licensees, then this must be received prior to the Council granting technical approval for any highway structures.

5.15 Written evidence of the relevant consents is a pre-requisite to any approval by the Council.
Future Maintenance

*Whole Life Costing*

5.16 The Council will require payment of a commuted sum based on the costs of inspection and maintenance over 125 years and eventual replacement for any highway structures that are to be adopted. Therefore, it is recommended that the Developer considers the whole life costing of the proposed structure. The following should be considered as soon as possible during the design process:

- The use of integral structures (i.e. without bearings or expansion joints)
- The use of durable materials such as weathering steel
- Steel parapets, which can be galvanised and then painted
- If bearings are required, then consideration should be given to their life span and how they will be replaced
- Include scaffolding fixing points on large steel structures, to make future inspection and painting easier
- When proposing confined drainage systems consider how they will be maintained
- Weep holes should not drain onto footways as this will create a slip hazard
- To help deter graffiti consideration should be given to the use of textured concrete finishes, anti-graffiti treatments or including “artwork” within the structure.

5.17 The amount of commuted sum is determined on a scheme specific basis and it is recommended that discussions are held with HDM as early as possible.

*Access for Inspection and Maintenance*

5.18 It is crucial that all structures are easily accessible to enable a comprehensive inspection.

5.19 Long culverts are categorised as confined spaces and these should have sufficient ventilation points within the construction.

5.20 Highway walls will require a 3 metre maintenance strip between the wall and land outside the ownership of the highway authority.
Construction

5.21 The Developer should not start construction on any highway structure until technical approval, specifically relating to it, has been obtained. The level of supervision and inspection required throughout construction will vary dependent on what is to be built, and so will be determined on a case by case basis.

5.22 This is entirely separate, and additional to, the supervision that the Developer should undertake on the works.

5.23 Prior to adoption of a structure it is necessary for the Developer to supply the Council with a copy of the Construction Compliance Certificate.

Health and Safety

5.24 It is important that all structures are compliant with the current Construction Design and Management (CDM) Regulations. This includes provision of full Health and Safety Files and As-built drawings. The Developer must provide the Council with copies of the design calculations in an agreed format.
6  Landscaping

Selection of Plant Species

6.1 To ensure that new planting establishes well and thrives within a new development it is important that the correct species are selected.

*Extra Heavy and Heavy Standard Trees*

6.2 The Council looks to promote tree planting of this nursery class in the urban and rural environment, particularly in areas of high vandalism, where smaller stock would be vulnerable. Average spacing of street/avenue trees should be around 8-10 metres depending on the ultimate size and habit of the tree involved.

6.3 Rootballed trees at this size are preferable, but the use of containerised nursery stock is also acceptable especially for key specimen trees.

*Standard and Feathered Trees*

6.4 To be planted in areas of lower vandalism risk. Standard trees with tree guards may be used in urban areas. Feathered trees may be planted as groups within shrub barrier mixes at closer spacing to create heightened impact. Standards should be rootballed and, where space is restricted, all the sizes planted in a root containment system as specified in Section 11.11.

*Whips and Transplants*

6.5 To be planted in rural situations where there is little risk of vandalism and where forestry cover is desirable. Tree guards or areas protected by rabbit or deer fencing should be used to protect against the risk of vermin damage.

6.6 Transplants used as a Barrier Mix or forestry planting should contain lower shrub species as understorey as well as main tree species.

6.7 Whips and transplants may be bare rooted and use of a mycorrhizal root dip prior to planting is encouraged.

*Ordinary Nursery Stock: Shrubs*

6.8 The choice of shrub material should be appropriate to the local environment and relate to existing species.

6.9 Thorny shrubs should be used where barriers are needed or in areas of high vandalism risk, but care should be taken to keep thorny species from growing across pedestrian footways and cycleways. Consideration shall be given to shrub flower and foliage colour when viewing the landscaping scheme as a whole. All shrubs should be container grown in peat free planting medium where possible.
Specialist Planting

6.10 The planting of species which are less robust or that require specialist or skilled maintenance, or more frequent service visits, are unlikely to be considered for adoption by the Council and should be avoided.

Root Containment

6.11 Ideally development of tree roots should be unrestricted, allowing them to spread as far as necessary to maximise structural stability and nutrient uptake. However, in many highway situations growing space is limited and underground utilities or adjacent structures require the root system to be restricted. The use of root deflectors or barriers in conjunction with root cells can prevent surface roots disrupting footways and/or carriageway whilst allowing a healthy root system to establish.

Tree Guards

6.12 In areas of high vandalism risk, trees should be protected using a tree guard. The guard should be appropriate to the local environment and not in itself be likely to cause any damage to the tree.

Irrigation System

6.13 The tree pits of advanced and standard nursery stock should be fitted with an easy-watering system to ensure rapid penetration of water to the tree root system especially for dry weather watering.

6.14 A simple corrugated plastic land drain (60mm) with cap, spiralled around the root ball to the base of the pit is acceptable.

6.15 The Council will consider the provision of and adoption of ‘raingardens’ and ‘bioretention planters’, including small footprint pre-fabricated systems.

Mulch and Compost

6.16 Growth of tree and shrub planting should be promoted wherever possible by the use of a bark or bio mulch layer, effective at suppressing weeds and retaining moisture. Mulch depth should be between 50 - 75mm.

6.17 Where compost is to be mixed with existing soils for planting, the use of peat free products is a must.

6.18 It is the sustainability policy of the Council to obtain products such as mulch and compost from within the County whenever it is reasonably practicable.
Stakes and Ties

6.19 Stakes and ties should be to British Standard and installed at the time of planting without causing damage to the root system or bark of the tree.

6.20 Double staking should be used for extra heavy and heavy trees with the tie acting as a cross piece braced by two spaces either side. Underground guying may also be used where appropriate. Stake height should be no more than 600mm above ground level.

6.21 Single staking and a single spacer bracing the tie should be used when planting standard and feathered trees.

Suppliers

6.22 It is the sustainability policy of the Council to obtain nursery stock from within the County whenever it is reasonably practicable and where stock is of the appropriate quality.

6.23 The Council is a key initiator of the Peat Free Charter and supports peat-free growers.

Standards and Quality

6.24 All elements used in a landscaping scheme on a new development should be supplied by an appropriate supplier and meet the requirements of the following British Standard (BS) specifications:-

<table>
<thead>
<tr>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS 3936: Nursery Stock</td>
</tr>
<tr>
<td>BS 3998: Recommendations for tree work</td>
</tr>
<tr>
<td>BS 4428: Recommendations for general landscape operations</td>
</tr>
<tr>
<td>BS 4043: Transplanting root-balled trees</td>
</tr>
<tr>
<td>BS 5236: Cultivation and planting of trees in the advanced nursery stock category</td>
</tr>
<tr>
<td>BS 5837: Trees in relation to construction</td>
</tr>
<tr>
<td>BS 3969: Recommendations for turf</td>
</tr>
</tbody>
</table>

Maintenance

6.25 Generally, any planting within the highway should be capable of regeneration or easy replacement if vandalised.

6.26 All planting should be designed for minimal maintenance. New trees should have a weed free area at their base and no strimming should be undertaken within 300mm of the base of a tree, due to the high level of trunk damage caused to young trees by strimming. Strimmer guards should be fitted to protect against trunk damage.
6.27 All maintenance should be carried out to the highest standards as required by the Council and should comply with the latest editions of the British Standards BS 7370 Part 4 (1973): Grounds Maintenance.

6.28 Prior to the adoption of the highway by the Council, all maintenance works will be the responsibility of the Developer. This responsibility will continue throughout the one year maintenance period, or until the expiry of any maintenance periods specified within planning conditions or planning obligations, whichever is the longer.

Implementation

6.29 All soft landscaping areas are to be kept free of weed growth and litter and where mulch has been used, this should be topped up whenever necessary.

6.30 Any dead or damaged parts of trees and shrubs are to be pruned back to sound wood or replaced where plants have failed. Tree stakes should be reaffirmed or replaced and tree ties regularly checked and adjusted as necessary.

6.31 Trees and shrubs lost through theft or malicious damage should be replaced. These replacements should take place during the appropriate planting season and in accordance with the original planting specification.

6.32 Trees and shrubs should be kept free of weed growth by hand and not by use of herbicides. Herbicides may also kill the tree or shrub, particularly during the establishment phase.

6.33 All trees and shrubs should be regularly irrigated in dry weather conditions and a programme of irrigation should be agreed as part of the maintenance plan, particularly for the initial 24 month establishment period.

Adoption

6.34 The Council will normally adopt well-designed landscaping on highway verges and other highway-related land providing that the Developer pays a commuted sum to cover the long-term maintenance of the scheme.

6.35 However, the Council will not adopt any new landscaping within a development where the plants are either dead, stressed or failing to establish due to poor design, planting practices or lack of maintenance.

6.36 In circumstances where landscaped areas are proposed but are deemed to not relate to the highway function, the Council may require adoption of the area by another public body or maintenance by a private management company.
7 Drainage

7.1 To promote the use of SUDS within Gloucestershire, the County Council intends to publish local SUDS guidance.

7.2 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.

7.3 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 that the sewers have been constructed to their satisfaction.

7.4 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:

i. 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.

ii. the internal condition of the existing highway drain is suitable.

7.5 This submission will include the provision of appropriate design calculations, catchments area plans, and a copy of the internal condition report of the drain including a copy of a CCTV survey. The carrying out of any works required will be at the expense of the developer.

7.6 Any highway drainage system should be designed to accept the following storm (without surcharging):

- Sites with average ground slopes greater than 1% 1 year
- Sites with average ground slopes 1% or less 2 year
- Sites where consequences of flooding are severe 5 year

7.7 The system should also be designed not to flood any building in a 1:100 (+30%) year return period design storm.
7.8 Excluding soakaways, all prospectively maintainable 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. Only in exceptional circumstances will they be permitted within 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, which will be binding on successors in title. The Developer is strongly advised not to sell any land which will contain highway drainage before completion of such an Agreement. The Easement is a standard document prepared by the County Solicitor and the Council will not accept any different form of undertaking, which dilutes the rights conferred by it.

7.9 Gully positions shall be chosen so that no gully has a catchment area of impermeable surface exceeding that shown in Table 15.1 below or alternatively the gully positions shall be determined in accordance with the Design Manual for Roads and Bridges HA 102/00. The design parameters shall be 0.5m width of flow and a one year storm. If central drainage is proposed, the maximum area per gully for a standard street can be utilised.

Table 7.1 - Maximum area to be drained by one gully [m²]

<table>
<thead>
<tr>
<th>Maximum Area Per Gully</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral Fall – 2.5% (1:40) (Camber or crossfall)</td>
</tr>
<tr>
<td>Standard Street</td>
</tr>
</tbody>
</table>

7.10 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.

7.11 Roads will be the subject of a wet weather inspection and will not be adopted until the Council is satisfied that the drainage system is performing in a satisfactory manner.
Soakaways

7.12 If soakaways are approved by the Council, they should be positioned outside the carriageway, normally at least 5 metres behind the footway [i.e. outside the adoptable highway]. In such cases adequate formal easements and rights shall be provided in perpetuity for the Council to:

i. discharge the highway drainage system without any liability for nuisance or damage outside the prospectively maintainable highway;

ii. have assured and unencumbered access to the soakaway and all prospectively maintainable highway drains to maintain free flow of the discharge.

7.13 Developers will be required to pay a commuted sum for the future maintenance of soakaways. The level of commuted sum has been set taking into account an effective annual interest rate of 2.2%, a life of 25 years and an inspection, cleaning and desilting cost of £850. The current commuted sum per soakaway is £3,103.

7.14 Soakaway chambers, where permitted, can be constructed of honeycombed brick or blockwork or perforated concrete rings. The chamber shall be surrounded with porous clean stone and appropriate grade geotextile. A typical soakaway construction is shown in Figure 15.1.

7.15 The soakaway chamber must be positioned entirely above the water table level.

7.16 A separate, non-porous silt chamber with a 1.2m deep sump shall be provided, at a readily accessible position within the highway with a minimum diameter of 1.5m.

12.17 The required capacities shall be calculated in accordance with the recommendations of Building Research Establishment Digest 365 Soakaway Design. The highway drainage system (including any soakaways) should be designed not to flood any part of the site in a 1:30 (+40%) year return period design storm

7.18 Where soakaways are positioned behind the highway the connections into them must not pass along the footway or service strip but must cross at right angles so as to minimise the length of pipe which lies beneath statutory undertakers plant.

7.19 Soakaways and silt chambers often contain a substantial depth of water and this can represent a hazard to children. Soakaway manhole covers, even when not subject to vehicular loading, must be of sufficient weight to deter unauthorised personnel from lifting them and will require easements where sited outside highway limits.
Highway Drainage Manhole Design

7.20 Manhole chamber design shall be in accordance with the types illustrated in Sewers for Adoption – Seventh Edition.

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

7.22 Manholes shall be provided at maximum intervals of 90m and at every pipe junction, change of pipe size, direction or gradient.

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

7.24 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.

7.25 Consideration must be given to reducing the opportunity for informal access to underlying apparatus by unauthorised personnel.
Figure 7.1 - Typical Soakaway Construction
Detail

Soakaways

Discharge of highway surface water into soakaways will only be considered in exceptional circumstances, where evidence of extensive investigation into alternative means of disposal has been supplied and considered.

NOTES

1. Volume shall be 5.8m$^3$ approximate capacity to invert level.
2. Normally only 2 no. road gullies shall drain into each soakaway with 2.5m$^3$ capacity required for each gully. Gullies shall drain 180m$^2$ of paved highway, including footway.
3. In exceptional circumstances 3 no. gullies shall be permitted to drain into a soakaway.
4. A layer of “Terram” or similar material shall be used as a membrane between the soakaway and the surrounding backfill material to prevent ingress of material.
Pipeline Design

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

7.27 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.

7.28 For all pipes [except UPVC] 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 the activities of statutory undertakers etc.

7.29 For UPVC pipes concrete surround is not acceptable, a reinforced concrete slab bridging the trench will be necessary for the shallower depths of pipe. However, it must be noted that this detail is not generally acceptable to the Water Companies.

7.30 All trenches under or adjacent to the paved highway shall be backfilled with Type 1 stone. 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.

Subsoil Drainage

7.31 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 Council where:

- the sub-soil is unstable due to waterlogging; or
- the sub-grade could be altered due to groundwater; or
- the height of the winter water table is within 600mm of the formation level of the road; or
- water could run from or out of adjacent land; or
- the finished road level is below the existing ground level, regardless of the water table; or
- springs, land drains or watercourses are present.

Flood and Water Management Act 2010

7.32 The Flood and Water Management Act 2010 designates the Council as a Lead Local Flood Authority and the SuDS Approving Authority and makes the Council, both in this capacity and as Local Highway Authority, a Risk Management Authority. These duties will be phased in over a number of years, and MiGS will be updated as necessary when specific duties become operational.
7.33 The Council has identified areas within the County that are at risk of flooding. The Council is in the process of creating a digital drainage map of the County’s Highways although this will be some time yet before the map is complete.

7.34 New national standards will be identified governing the way in which surface water drainage systems from new roads and buildings in England & Wales must be constructed and operate. These standards will reflect the need to mitigate flood damage, improve water quality, protect the environment, protect health & safety and ensure the stability and durability of drainage systems.
8 Services and Utilities

Service Corridors

8.1 The layout of all new estate roads should be designed to accommodate services. It is essential that the developer contact all the relevant statutory undertakers at the early design stages. This is to ensure that their apparatus can be installed in an efficient and economic sequence, and to comply as much as possible with the recommendations of the National Joint Utilities Group (Fig 16.1)

Figure 16.1 - Recommended Arrangement of Mains in Two Metre Service Corridor

Routing of Services

8.2 The statutory rights by which utility companies lay and maintain their apparatus are based on the assumption that they will be laid in adopted highways and other publicly owned land.

8.3 The Council will not generally accept the laying of apparatus within the carriageway, with the exception of public sewers.
8.4 When deciding routes for services, please note that the Council prefers dual mains installations as they avoid carriageway crossings weakening the structure of the road and ensure there is no future need to excavate the carriageway.

Service Corridors

8.5 The minimum requirement for the provision of service corridors is two metres and these will be within the footway.

8.6 The developer should endeavour to position apparatus in accordance with Figure 8.1. Where this is not possible, it is essential that the developer ensures that services do not conflict with each other.

8.7 Service corridors must be in areas clear of trees, hedges and walls. Any trees must be located so that their root systems, when mature, will not damage apparatus or be damaged during the laying and maintenance of apparatus. For this reason root deflection barriers must be used and the developer should consider the location of existing trees and other planting.

8.8 The developer is strongly advised to check with the Local Planning Authority regarding the location of any trees, the locality of any Tree Preservation Orders and any relevant planning conditions relating to the severing of roots.

Ownership of Service Corridors:

8.9 Service Corridors should be located within the public highway.

8.10 The Council reserve the right to remove any structure or planting that it considers may damage the services below.

8.11 If the service corridor is located within a highway verge adjacent to other grassed areas it must be delineated using the standard Highway Marker Blocks.

Laying Ducts

8.12 The Developer should try and determine the location of all ducts required for services at the earliest opportunity. They must be installed prior to the laying of the surface course.

8.13 Utility companies generally prefer to lay all apparatus serving more than one customer in the public highway where they have statutory powers of access.

8.14 Where services have to cross a carriageway, they should be in ducts and the duct positions agreed by the Council at an early stage.

Fire Hydrants
When a new development within the county is planned, Gloucestershire Fire and Rescue Service should be given the opportunity to determine the risk and recommend the number and position of fire hydrants. Each hydrant will need to be strategically placed, to ensure the minimum provision is made, whilst delivering the optimum supply of fire fighting water delivered from a mains system. Where necessary, a planning condition will be recommended to the LPA requiring details of fire hydrants to be submitted and agreed and for the hydrants to be provided prior to occupation of any buildings.

If a “wash-out” facility is positioned at the end of a cul-de-sac, adequate drainage facilities must be provided.

Placing or Altering Apparatus in the Road

For most developments the Developer will need to place new utilities and services in the highway, as well as altering services that are already there.

A Section 50 Licence (under the New Roads and Street Works Act 1991 [NRSWA]) allows the Developer to place, retain and remove apparatus within the existing highway and to carry out the work necessary to do so.

When the Developer carries out works under a Section 50 License they are effectively operating as a statutory undertaker. The Developer is therefore governed by the obligations imposed under the NRSWA and the Traffic Management Act 2004.

The Council is responsible for issuing and monitoring Section 50 Licenses. If the Developer requires one for any development then it is recommended to start discussions early to ensure it does not delay construction.

Co-ordination of Street Works for a New Development

Whenever a new development is started, there is a requirement for many services to be brought onto site. In most cases, the provision of those services requires works on the roads in the vicinity of the site.

Electricity, Gas, Water and Telecommunications companies are not generally aware of each other’s plans or proposals before work commences.

What can the Developer do to help?

The Developer is often the only person who is aware of all the planned service works.

The Developer and their site agent should check the routes that the service providers are taking. If there are elements of the routes which overlap, it may be possible for the service providers to share trenching and reduce the impact of the works on the local residents and travelling public.
8.25 Where trench sharing is not possible, there may be an opportunity to complete all road works within any road closure planned by a single service provider.

Contacts

8.26 If there is an opportunity for routes to be shared, please inform the local contact from each relevant service provider. Tell them who else is involved and they will be able to discuss options between themselves.

8.27 The developer is best placed to co-ordinate this dialogue because individual service providers are unable to share the developer’s details without their permission. In addition, please contact the Council Streetworks Team as they will be able to assist with the coordination of the scheme.

Benefits of Co-ordination

8.28 The most immediate benefit of co-ordination is that the works being undertaken in the roads around a development site are done so to make best use of open trenches.

8.29 This means local residents will see less disruption as a result of development works. In some cases, it may even be possible that the combined connection charges of all the service providers will reduce as a result of shared excavations. The date of any combined works and connections may vary from individual dates that may have been quoted, and all dates will be set with your agreement.

Consideration

8.30 All works must be undertaken within the guidelines of current Streetworks Legislation.

8.31 New estate roads should be designed to accommodate services and liaison with all statutory undertakers and communications providers should be done at the earliest stage possible to ensure that their equipment is installed in an efficient manner and as much as possible to comply with the recommendations of the National Joint Utilities Group.

8.32 Although this idea is not always possible it is important to ensure that services do not conflict.

8.33 When selecting routes for services, dual mains installations should be the norm to prevent carriageway crossings weakening the road structure and preventing the need to dig up the carriageway.

8.34 Trench sharing, trench less technology or any other innovative ways of working should be encouraged to minimise the disruption to the road user, examples of which are given in Figures 8.2 and 8.3 below:
Figure 8.2 - Two Utility Trench Share Arrangement

Utility 1

Utility 2

*Works in RED* noticed and completed by each utility under their statutory obligations

*Works in GREEN* undertaken by the cheaper of utility 1 and 2

Development

Figure 8.3 - Three Utility Trench Share Agreement

Utility 1

Utility 3

Utility 2

*Works in RED* noticed and completed by each utility under their statutory obligations

*Works in GREEN* undertaken by the cheaper of utility 1 and 2

*Works in BLUE* included in the price of utility 1 or 2 and completed by them
9 Legal Processes and Adoption Process

The Advanced Payments Code

9.1 The Advance Payments Code (APC) is a legal requirement under Sections 219 - 225 of The Highways Act 1980. It aims to ensure that security is provided for any new street works that may be carried out as part of a new residential or commercial development.

9.2 The security acts as surety, so that in the event of a landowner/developer defaulting, there is sufficient money in place to protect owners of properties fronting the street from being liable for the costs to complete the works to an adoptable standard.

Initiating the APC

9.3 The APC process is triggered once the relevant District Council has notified the Council of details having been submitted to them in respect of qualifying residential or commercial development.

9.4 The Council will serve an APC Notice on all development comprising two or more buildings.

9.5 The Council is under a duty to serve an APC Notice on the person who submitted or on whose behalf details were submitted to the District’s Building Control. The Notice requires financial security to be provided that is sufficient to cover the cost of any street works. The local land charges office is notified, who in turn make an entry onto the local land charges register.

Exemption Notices

9.6 Certain criteria may exempt a landowner/developer from having to provide security. A full list of exemptions is detailed in Section 219(4) of the Highways Act 1980. If the Developer / Landowner consider there to be grounds for an exemption, an application for an exemption should be made in writing to the Council, stating under what grounds an exemption is being sought, and if the Council agrees, then it will serve an Exemption Notice on the landowner/developer.

Landowners/Developers obligations

9.7 If the Council has served an APC Notice, then the landowner or developer are legally obliged to provide the security stated within the Notice before any building works begin on site. Security is usually provided in the form of a Bond or as a cash deposit, but other means of security may be allowed at the Council’s discretion.

9.8 The landowner or developer will be liable to prosecution if they commence building works prior to providing the requested security.
Reducing the APC Bond/Cash Deposit

9.9 The APC Notice usually refers to plot numbers and it is to these plots that the security relates. If at the time of a request from the developer to reduce the bond/cash deposit the developer has sold the plots off, under Section 221 of the Highways Act 1980 a reduction shall not be made unless the owners of the plots have been notified of the proposal to reduce the security and have been afforded an opportunity of making representations to the Street Works Authority in relation to it. Depending on the representations received a decision then will be made on whether or not to allow the reduction.

Releasing the APC Notice and Financial Security:

9.10 The completion of a Section 38 Agreement will release the landowner or developer from their APC obligations. Any financial security provided will be released or transferred to make up part of the bond for the Section 38 Agreement. The Local Land Charge Office will be asked to remove the Notice regarding the APC from the land charges register once the Section 38 Agreement is complete.

9.11 Completion of the ‘street’ to an adoptable standard (subject to the Council having approved the specification for the street and having inspected the works) prior to any building serviced by that street being sold, would enable the APC Notice to be released.

Section 38 Agreements (Adoption of New Roads)

9.12 Section 38 of the Highways Act 1980 gives the Council the ability to secure the adoption of a private street that it to be constructed as part of a development. The street can serve either residential or commercial development. The adoption of a street means that the Council becomes responsible for its future maintenance.

9.13 The Council will normally consider the following areas for adoption:

- All carriageways and footways adjacent or related to them, and any structures which are a necessary part of the highway;
- Lay-bys, turning areas and unallocated on-street parking spaces;
- Margins adjacent to carriageways and footways designed as an integral part of the highway;
- Service margins, strips or areas required by utility companies;
- Visibility splays and sight lines;
- Landscape works within the boundaries of the proposed public highway;
- Footpaths and cycleways; and
- SuDS, gullies, manholes, soakaways, headwalls and pipes concerned with the drainage of the highway.
9.14 Please note that surface water and foul water systems will not be adopted by the Council and must be subject of a legal agreement under Section 104 of the Water Industry Act 1991 with the relevant Water Company. Similarly private water systems will not be adopted by the Council.

9.15 In order for the Council to consider a site for adoption the design and construction of the new street, or highway improvements, must be approved and inspected by the Council under a legal agreement.

_Private Street Works Code – Highways Act 1980_

9.16 In exceptional circumstances where land ownership cannot be determined, the Council will consider adoption by way of the Private Street Works Code. This procedure involves the Street Works Authority agreeing to apply the Code, approving the highway scheme (including its cost) and apportioning those costs to the Developer. Once the scheme has been completed, the street can be adopted by displaying notices in prominent positions in the street. These notices will declare the street to be a highway maintainable at the public expense on the expiration of one month from the date on which the notice was first displayed subject to no objection from either the Landowner or the majority of the Landowners being received.

**Highway Works Agreements (Works on the Existing Highway)**

9.17 The Council secures works on the existing highway by means of a Highway Works Agreement. The agreement will consist of standard clauses but the clauses to be used in the Agreement will be dependent upon the scale and complexity of the works.

9.18 Each agreement will be tailored using standard clauses depending on the work in question (for instance traffic signal clauses will not be included if a new footway is the subject of the works).

9.19 The standard clauses have been formulated by experience through the years and are constantly reviewed to take account of new and emerging national and local policies and highway law.

9.20 Some of the clauses will be found in every Agreement through necessity.

9.21 Before the Council's Legal Team will send out a draft agreement they will need to receive two things from the landowner/developer's solicitor, namely an undertaking for abortive costs and title to the land in question.

**Costs**
9.22 The undertaking for abortive costs is sought to cover the Council in the event that for some reason the agreement is not concluded. It enables the Council’s Legal Team to recover any costs that have been incurred. Normally it is advisable to start off with an undertaking for £1,500 (although the Council’s Legal Team may advise that this figure should be greater depending on the complexity of the agreement envisaged). Should the Council’s legal costs exceed this amount then a further undertaking will be sought beforehand.

9.23 It is worth mentioning at this time that if the draft is accepted costs will be lower. Charges are made on a time basis and the longer time taken to negotiate changes to standard clauses, the more the cost to the landowner or developer will escalate. This obviously applies two fold as the landowner/developer will also be paying their own solicitors costs!

9.24 Legal fees will be payable at the completion of the agreement on a time charged basis. Hourly rates are not given as they vary depending on the level of person dealing with the case and whether other staff have given assistance. These charges are separate from the fees payable to the Council as Local Highway Authority for their time in the administration, checking and inspection of the agreement which are based on a sliding scale which can be found in Appendix J.

Providing Title

9.25 As previously mentioned it will be necessary to provide title to the area of the application for planning permission before a draft agreement can be sent out. All those with an interest in the land (i.e. if the land is mortgaged, the mortgagee (the Bank or Building Society) or, if leased, the Leaseholder) will be required to enter into the agreement.

Prior to commencing works

9.26 Certain clauses with a completed Agreement must be satisfied before any works can commence on the public highway. For example, you must have:-

- Obtained technical approval;
- Booked the road space with streetworks@gloucestershire.gov.uk;
- Submitted a photographic condition survey of the surrounding road network;
- Submitted to full sets of the approved programme plans and drawings together with electronic copies;
- Submitted details of the proposed traffic management;
- Submitted details of the contactors’ operative’s accreditation;
- Liaised with all Statutory Undertakers and Public Utilities;
- Given 3 months notice of commencement to streetworks@gloucestershire.gov.uk;
- Provided a surety (bond or cash deposit);
- Obtained any necessary Traffic Regulation Orders and had any Notices published and representations considered by the Council;
- Put in place the necessary Insurance cover as specificed in the Agreement and provided the Policy (and receipts for payment of current premiums) to the Council; and
- Paid the Council's design approval and inspection charges.

The Council as the Developer

9.27 In certain circumstances, for example constructing a new school, the Council will be the developer. Due to the scale of these projects there will invariably be works required on the existing highway.

9.28 In these situations it is not possible for the Council to enter into a Highway Works Agreement with itself. However, it is crucial that the same system of approval and inspection is followed to ensure accountability and consistency with other works carried out by private developers.

9.29 The Council’s Highways Development Management (HDM) Team will require the relevant internal department to obtain their conditional consent, which stipulates that a full technical submission will be made to them, technical approval issued prior to works commencing and that inspections are requested at the relevant stages. In addition the Team’s administration and inspection fees must be paid and security agreed by way of an undertaking to ensure the department instructing the works is responsible for payment should the contractor default.

Works Inspections

9.30 In order for the Council to be able to issue stage certificates (if requested to do so by the Developer) and agree to the associated reduction in the bond amount, it requires works to be approved by one of its Inspectors, who will need to be satisfied that all materials and construction are in accordance with the Technical Approval before signing them off.

9.31 It is the Developer’s responsibility to arrange Inspections with the Council's HDM Team. Inspections need to be carried out at each designated stage of construction, as outlined in Table 17.1 below. It is also the Developer's responsibility to give sufficient advanced notification in accordance with the periods set out below.

Table 9.1 - Designated Stages and Notification Periods
Designated Stage | Minimum Notice Required by HDM Team
--- | ---
Excavate Foundation | 7 days
Drainage Excavation | 7 days
Backfill Drainage Excavation | 7 days
Pipework Laying | 7 days
Sub Base | 7 days
Kerbing | 7 days
Base Course | 7 days
Binder Course | 7 days
Surface Course | 10 days

9.32 The Developer must give the HDM Team at least 48 hours notice if any works temporarily cease or restart.

9.33 If the Developer fails to give sufficient notice then the HDM Team may need to request site tests (including coring of the road construction) to confirm that the works conform to the Technical Approval. All costs involved with these tests, including the reinstatement, will be at the Developer’s expense.

9.34 The Council must be notified in advance of any contractor who will supply or lay materials. References may be sought. Contractors working on the public highway must be NRSWA accredited.

9.35 The Developer must contact all relevant service providers 14 days prior to laying the surface course. The HDM Team must be satisfied that any work that may affect the integrity of the surface has been completed prior to allowing final surfacing to commence.

9.36 The HDM Team may require a CCTV inspection and written report of the drainage before final surfacing and at the end of the maintenance period. If any defects are found then a further inspection may be required once the required works have been completed. All costs involved with this process will be at the Developer’s expense.

*Maintenance and Adoption*
9.37 Notwithstanding approval of stages of work as per Table 11.2 certification of the elements of work identified within the legal agreement will be carried in accordance with the appropriate Clauses with the bond reduced to satisfy the legal agreement.

9.38 In order for this to be done;

- All of the highway works have to be approved by the Highways Development Management Team; and
- the ancillary matters upon which adoption is dependent but not within the control of the Council as Local Highway Authority have to be approved by the responsible Agency or Authority. e.g. SuDS, Sewers or Public Open Space.

9.39 These Certificate stages are as follows and require the necessary approvals:

<table>
<thead>
<tr>
<th>Certificate Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Substantial Completion Certificate (formerly Part 1)</strong></td>
<td>Works to be completed to a point where the highway is a safe and suitable environment for all roads users (i.e. footways and carriageways surfaced in a bound material, no trip hazards, working surface water drainage and street lighting.) Interim Stage 3 Road Safety Audit required and any works identified therein completed. Certificate is required prior to occupation of any buildings. A Non Motorised Users Audit will be required stating how consideration of NMUs has been incorporated into the design process and how the objectives set out in the NMU Context Report have been achieved.</td>
</tr>
<tr>
<td><strong>Completion Certificate (formerly Part 2)</strong></td>
<td>Full completion of the approved highway works, including works identified in a full Stage 3 Road Safety Audit and Non Motorised Users Audit. Provision of written confirmation from the adopting water company regarding 'intention to adopt' the sewers. Allows the highway works to go onto maintenance.</td>
</tr>
<tr>
<td><strong>Final Certificate</strong></td>
<td>All remedials completed. Stage 4 Road Safety Audit required. Vesting Declaration of sewers completed. CDM file &amp; as-built plans submitted.</td>
</tr>
</tbody>
</table>

9.40 It should be noted that no certificates will be issued until the legal agreement is completed. It should further be noted that no occupations should occur until a Substantial Completion Certificate (formerly a Part 1) has been issued in respect of new streets and a Completion Certificate issued in respect of other highway works, where these works are required in advance of occupations.

9.41 It should also be noted that no works shall take place on a public highway until a legal agreement has been completed and technical approval has been issued.
9.42 Gloucestershire Highways' Street Lighting Team must be immediately advised of each new adoptable lighting system. This advice must be supported by the Electricity Company installation certificate.

9.43 The development will be adopted by the Council in accordance with the Legal Agreement provided that the works are completed in accordance with the requirements of the Agreement and that any remedial works identified have been completed to the Council's satisfaction.

9.44 If the developer does not secure a legal agreement, the Council will not be bound by any of the procedures as described.

9.45 The Council will be prepared to issue Certificates on a phased basis, provided that:

- The highway works on that length of road have reached a stage where the criteria for issuing a Certificate has been met; and
- The road is connected to an existing publicly maintained highway either directly or via a road which is the subject of a Section 38 agreement;

9.46 During the maintenance period, the Developer will be responsible for supplying ‘as-built’ plans (wording as description in the Legal Agreement.) These plans must also indicate the names of roads and the postal number of each dwelling.

9.47 One month prior to the expiry of the maintenance period, the Developer must make arrangements with the Council for the inspection of the works. The Developer must provide sufficient labour attendance and equipment for the lifting of covers. For this inspection, drains, manholes, gullies and chambers must be perfectly clean, drains rodded or jetted where necessary and flushed, and carriageway, channel, footway and footpath surfaces swept to the satisfaction of the Council’s HDM Team.

9.48 The Developer must remedy and complete all outstanding works identified by, and to the satisfaction of, the Council’s HDM Team prior to the commencement of the formal adoption procedure.

Health and Safety File

9.49 As part of the adoption process the Developer is required to provide a post construction Health and Safety File (in accordance with the Construction Design and Management Regulations 2007).

9.50 The Health and Safety File should inform the Council of any potential hazards that may be encountered in the future maintenance of the highway, and also provide advice on
any special procedures that need to be adhered to when working with site specific apparatus or services.

9.51 The Developer is responsible for ensuring that their Principle Designer has prepared and revised the Health & Safety File and that it is sufficiently comprehensive and that the file has been submitted to the Developer at the end of the construction phase. The Council expects that the following list of items should be included within the Health and Safety File.

Information about all of the following topics, where these may be relevant to the health and safety of any future construction works. The level of detail should be proportionate to the risks likely to be involved in such works.

- A brief description of the works carried out and completed including construction details.
- Residual hazards and how they have been dealt with (for example, surveys or other information such as buried services).
- Key structural principles incorporated in the design of any adoptable structures.
- Any hazards associated with the materials used.
- Information regarding the removal or dismantling of installed plant and equipment.
- Health and safety information and maintenance information for any adoptable structures.
- The nature and location of all services including street lighting (location plans to be provided).
- Information regarding any items encountered in the area of the works during construction and whether removed or left in-situ.
- As-built plans.

In addition, any other matters which the Principle Designer considers should be contained within the Health and Safety File.

Marking the Highway Boundary

9.52 Where the boundary of the adopted highway is not clear (for example there is no footway edge, wall, fence etc) highway boundary marker blocks should be installed to denote the highway boundary.

9.53 Markers should comply with the general requirements for precast concrete blocks and include “Highway Boundary” cast in the top face - see photograph below. Other types of
highway marker block can be used subject to prior written agreement with the Council. The block must be set in a minimum of 150mm bed and haunch with C15P concrete. The haunch must come to within 50mm of the top face of the block (see Figure 17.1).

9.54 When located within the carriageway the block must be laid at 90° to the kerb. The blocks should not be removed without the Council’s written permission.

Figure 9.1 Standard Construction Detail for Highway Marker Block

Residents Maintaining Highway Verge
9.55 On some developments it may be necessary for the Developer to place some of the underground utilities and services in the grass verge adjacent to the carriageway (called a service strip).

9.56 In these situations it is common for the service strip to be located at the start of resident’s front gardens. The extent of the service strip will be identified by a highway marker block or similar form of demarcation (as detailed above in Section 6.8).

9.57 The service strip will be adopted as public highway at the same time as the rest of the carriageway and so becomes the Council’s responsibility to maintain. However, due to the proximity of these service strips to their front gardens, some residents may like to cut the grass more regularly than the Council would normally do as part of routine maintenance, or plant some bulbs or shrubs.

9.58 In this situation, **Section 142 of The Highways Act 1980** allows property owners, adjacent to highway land, to apply for a **Licence to Cultivate** to maintain areas of highway verge. The licence gives the landowner permission to plant bulbs, shrubs, and in some cases trees on the highway, subject to certain conditions which are based upon highway safety and maintaining adequate visibility for all road users.

9.59 A Licence to Cultivate is granted with the following conditions:

- The applicant must consult with relevant utility companies before commencing work on site to prevent damage to any utility services within the ground.
- No holes should be greater than 0.25m depth.
- Minimum of 1m from the edge of the carriageway.
- To ensure an adequate visibility splay is maintained at all times. This may require plants to be removed or trimmed.

9.60 The applicant will also be required to provide details of the proposed planting scheme as well as indemnifying the Council from any future claims arising from the maintenance activity.

9.61 Licences can be terminated by the Council:-
(i) after having given at least seven days notice if any condition of the Licence is contravened; or

(ii) after having given at least three months notice if the Council consider the withdrawal of the Licence necessary for the purpose of the exercise of their functions as a Highway Authority; or

(iii) after having given at least seven days notice in the event of the land subject to the Licence ceasing to be public highway.

9.62 Licences can be terminated by the Licensee after having given at least one month’s notice in writing of such termination.

9.63 A charge will be made for processing the application for a licence to cover the administrative costs associated with reviewing and considering the application. This will be in accordance with the schedule set out in Appendix D – Fee Schedule.
## Revisions Table

<table>
<thead>
<tr>
<th>Date of Revision/s</th>
<th>Revision/s Made</th>
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<tbody>
<tr>
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</tbody>
</table>
APPENDIX A

GLOUCESTERSHIRE HIGHWAY NETWORK

Gloucestershire’s Local Highway Network is shown on the Council’s website alongside this document.

This map shows the hierarchy of routes with the Class One and Two routes (shown in red and blue respectively) being those where, in general, greater emphasis will be placed upon ensuring the safe and expeditious passage of traffic in accordance with the requirements of the Traffic Management Act 2004.

It should be noted that this map does not show the Trunk Road network that is managed by the Highways Agency. Within Gloucestershire, this network comprises:

- The M5 and M50 motorways.
- The section of the A40 from M5 Junction 11 westwards to the County boundary with Herefordshire.
- The section of the A46 eastwards from M5 Junction 9 to the County boundary with Worcestershire.
- The section of the A417 and A419 south-eastwards from the M5 Junction 11A to the County boundary with Wiltshire.
APPENDIX B

ROAD SAFETY AUDITS GUIDELINES

The Council will require a Road Safety Audit to be carried out, at the appropriate stages of the design and construction process.

It is recommended that any departure from this guidance is agreed with the Council as part of the TA scoping report prior to any work being carried out that might trigger the need for a Road Safety Audit to avoid the risk of abortive work, and costs, being incurred by the Developer.
APPENDIX C

HIGHWAY AGREEMENT SUBMISSION PACKAGES

(HIGHWAY WORKS,
PERMISSIONS AND LICENCES)
APPENDIX D

SCHEDULE OF FEES AND CHARGES

The Council will seek to recoup costs associated with the officer time and administrative costs required to enter into Legal Agreements, review Highway Works submissions with a view to issuing Technical Approval, provide transport data to assist with the preparation of Transport Assessment and Travel Plans, and the supervision and monitoring of Highway Works construction and Travel Plan implementation.

Details of these fees and charges are included below. These will be periodically reviewed and updated as necessary to reflect the costs associated with providing this service.

Scale of Charges Incurred to obtain technical approval

Part 1

INITIAL FEE REQUIRED AT THE TECHNICAL SUBMISSION STAGE FOR HIGHWAY WORKS AGREEMENTS (INCLUDING STREET LIGHTING FEES)

<table>
<thead>
<tr>
<th>Estimated Cost of Highway Works</th>
<th>Initial Fee Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to £50,000</td>
<td>£1,000</td>
</tr>
<tr>
<td>£50,001 to £200,000</td>
<td>£2,000</td>
</tr>
<tr>
<td>£200,001 to £500,000</td>
<td>£5,000</td>
</tr>
<tr>
<td>£500,001 to £2,000,000</td>
<td>£10,000</td>
</tr>
<tr>
<td>Above £2,000,000</td>
<td>£30,000</td>
</tr>
</tbody>
</table>

Table K1

Note: No work will be carried out on a technical submission until these fees have been received and banked.
Part 2

ADDITIONAL FEE REQUIRED AT THE TECHNICAL SUBMISSION STAGE FOR THIRD SUBMISSION (AND ANY SUBSEQUENT SUBMISSION THEREAFTER) FOR TECHNICAL APPROVAL

<table>
<thead>
<tr>
<th>Highways Works Submission</th>
<th>Street Lighting Submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum fee (3 hrs)</td>
<td>£232</td>
</tr>
<tr>
<td>Hourly charge out rate thereafter</td>
<td>At cost</td>
</tr>
</tbody>
</table>

Table K2

Note: No work will be carried out on a subsequent technical submission until these fees have been received and banked.

Part 3

FULL FEE REQUIRED AT THE TECHNICAL APPROVAL STAGE FOR HIGHWAY WORKS AGREEMENTS (INCLUDING STREET LIGHTING FEES)

<table>
<thead>
<tr>
<th>Administration Charge as a Percentage of Estimated Cost</th>
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</thead>
<tbody>
<tr>
<td>9% flat rate subject to the minimum fees set out below.</td>
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</tbody>
</table>

Table K3

<table>
<thead>
<tr>
<th>Estimated Cost of Highway Works</th>
<th>Administration Charge as a Percentage of Estimated Cost</th>
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</thead>
<tbody>
<tr>
<td>Up to £50,000</td>
<td>Minimum of £1,000</td>
</tr>
<tr>
<td>£50,001 to £200,000</td>
<td>Minimum of £5,000</td>
</tr>
<tr>
<td>£200,001 to £500,000</td>
<td>Minimum of £15,000</td>
</tr>
<tr>
<td>£500,001 to £2,000,000</td>
<td>Minimum of £30,000</td>
</tr>
<tr>
<td>Above £2,000,001</td>
<td>Minimum of £100,000</td>
</tr>
</tbody>
</table>

Table K4

Note:- The full fee includes any Initial Fee paid at technical submission stage under Part 1 but not any Additional Fees paid under Part 2.
Scale of Charges Incurred to for additional site inspections

Part 4

ADDITIONAL FEE REQUIRED FOR THIRD (AND ANY SUBSEQUENT) INSPECTION AT EACH STAGE OF CERTIFICATION

<table>
<thead>
<tr>
<th></th>
<th>Highways Works Submission</th>
<th>Street Lighting Submission</th>
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</thead>
<tbody>
<tr>
<td>Minimum fee (3 hrs)</td>
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</tr>
<tr>
<td>Hourly charge out rate thereafter</td>
<td>£111</td>
<td>£77</td>
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</table>

Table K5

Note: No further inspections will be carried out until these fees have been received and banked.

Scale of Charges Incurred in Licence to Cultivate Applications made under Section 142 of the Highways Act 1980

A charge of £100 will be made for the review and consideration of the Licence application. A cheque payable to Gloucestershire County Council should be included with the application.

Traffic Signals

Commuted sums for the ongoing maintenance of installations will be required to be paid by the Developer to GCC covering a period of 15 years.

The rates payable are reviewed annually on 1st April. The current rates are:

- Standard Signal controlled installation £3,500.00 pa
- Standard Pedestrian crossing installation £2,250.00 pa

For sites where installations include variable message signs, CCTV, fibre communications or any other non typical piece of hardware etc.there is likely to be an increased commuted sum charge. This will be reviewed on an as and when basis.
APPENDIX E

BUS STOP DESIGN SPECIFICATION

It is recommended that if the Developer wishes to provide an alternative design for any bus stops being provided as part of a new development, then early discussion is held with the Council’s Highways Development Management Team.
APPENDIX F

GLOUCESTERSHIRE CYCLE FACILITY GUIDELINES

It is recommended that if the Developer wishes to provide an alternative design for any cycle facilities being provided as part of a new development, then early discussion is held with the Council’s Highways Development Management Team.
APPENDIX G

TRAFFIC SIGNALS - DEVELOPER PACK
APPENDIX H
DETAILED DESIGN DRAWINGS
APPENDIX I

ENHANCED MATERIALS POLICY
APPENDIX J

STREET LIGHTING DRAWINGS