Peterborough City Council

Street Lighting Specification

December 2017
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Specification Structure</td>
<td>1</td>
</tr>
</tbody>
</table>

## Appendices

### Appendix A  
**Section A** – General Specification: Street Lighting and Other Highway Electrical Equipment Installations

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1 Application of Specification</td>
<td>4</td>
</tr>
<tr>
<td>A.2 General Design Requirements and Approval Procedure</td>
<td>4</td>
</tr>
<tr>
<td>A.3 Designs</td>
<td>6</td>
</tr>
<tr>
<td>A.4 Electricity Supplies</td>
<td>9</td>
</tr>
<tr>
<td>A.5 Testing and Installation Records</td>
<td>9</td>
</tr>
<tr>
<td>A.6 Equipment</td>
<td>10</td>
</tr>
<tr>
<td>A.7 Finish of Columns</td>
<td>14</td>
</tr>
<tr>
<td>A.8 Installation</td>
<td>14</td>
</tr>
<tr>
<td>A.9 Energy and Maintenance</td>
<td>16</td>
</tr>
<tr>
<td>A.10 Existing Lighting</td>
<td>16</td>
</tr>
<tr>
<td>A.11 As-Built Drawings and Schedules</td>
<td>16</td>
</tr>
</tbody>
</table>

### Appendix B Section B – Street Lighting Specification: Residential Road Areas

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.1 Application of Specification</td>
<td>17</td>
</tr>
<tr>
<td>B.2 Equipment</td>
<td>17</td>
</tr>
</tbody>
</table>

### Appendix C Section C – Street Lighting Specification: Main Roads

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.1 Application of Specification</td>
<td>18</td>
</tr>
<tr>
<td>C.2 Equipment</td>
<td>18</td>
</tr>
</tbody>
</table>

### Appendix D Section D – Street Lighting Specification: Hampton Developments

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.1 Application of Specification</td>
<td>19</td>
</tr>
<tr>
<td>D.2 Equipment</td>
<td>19</td>
</tr>
</tbody>
</table>

### Appendix E Section E – Street Lighting Specification: Lighting Columns

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
</table>

### Appendix F Section F – Street Lighting Specification: Design Checklist

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
</table>
1. Specification Structure

1.1 The new specification has been created in Sections. The first (Section A) providing information that is applicable to all designs with the other Sections covering additional details of equipment applicable to particular situations.

1.2 Future revisions to any Section of the specification will therefore not affect other Sections.

1.3 The specification structure is as follows:

- Section A - General Specification: Street Lighting and Other Highway Electrical Installations
- Section B - Residential Area Roads
- Section C - Main Roads
- Section D - Hampton Developments
- Section E – Column specification
- Section F – Design Checklist
Appendix A  Section A – General Specification: Street Lighting and Other Highway Electrical Equipment Installations

A.1 Application of Specification

A.1.1 This specification shall apply to all schemes designed after 1st December 2017 and shall be referred to as Peterborough City Council’s General Street Lighting Specification dated December 2017.

A.1.2 This specification may not be fully applicable to the lighting of city and town centres, areas of civic importance, footpaths and cycle ways through important amenity areas or key parts of conservation areas. Lighting for any of these shall be fully discussed with the City Lighting Manager (referred to hereafter as the Engineer) and a specification and brief agreed before design work commences.

A.1.3 Detailed requirements for particular categories of area are in the following Appendices and are deemed an integral part of this general specification.

- Appendix B: Section B - Residential Area Roads
- Appendix C: Section C - Main Roads
- Appendix D: Section D - Hampton Developments
- Appendix E: Section E – Column Specification
- Appendix F: Section F – Design Checklist

A.1.4 Designers must include the version dates of both the General Specification and any site specific Specifications they used to support their design in their design report and on their lighting layout drawings.

A.1.5 For a particular scheme if, having studied this specification, designers have any doubts into which category the scheme’s roads fall then they should seek the guidance of the Engineer.

A.2 General Design Requirements and Approval Procedure

General Design Considerations

A.2.1 The Developer shall obtain at his own expense a design for a street lighting installation that conforms to this specification. The Developer shall submit the design with full supporting information to the Highway Control Case Officer for approval and shall at his own expense incorporate any required amendments. After two versions have been checked the City Council will recharge its reasonable costs of checking any further design submissions. The Developer shall remain responsible for the whole installation until the City Council formally adopts it.

A.2.2 Sustainability is a prime consideration for street lighting. Designs shall provide the lowest possible energy consumption and utilise equipment having the longest possible operational life. Long term reliability and minimised maintenance are important requirements, plus the ability to remotely monitor operation and manage energy consumption through applying variable lighting levels (dimming). LEDs are the choice of light source for all applications to comply with these requirements, LED drivers are to be run at 300/350ma (should a different driver current be
required this must be agreed with the City Council Engineer. Durable and recyclable materials shall be used.

A.2.3 Developers are advised to employ competent designers and site supervisors. Details of suitable consultants registered with the Institution of Lighting Professionals may be available from; Tel: (01788) 576492; Web link www.theilp.org.uk/

A.2.4 Designs for new developments shall cover all areas to be adopted by the City Council. They shall also include any length of existing public highway over the length of development abutting the existing highway, any length of existing public highway where the road alignment or road width is to change because of the development, any length of existing public highway where a new footpath is to be constructed in conjunction with the development and existing highway (distance of additional lighting to be in line with ILP PLG02 5 second rule) which connects or will connect the foregoing designated design areas or development to an existing lit or proposed to be lit length of existing or potential public highway.

A.2.5 The Developer must provide a new lighting system for the above described lengths of existing highway unless any existing lighting fully meets the design requirements of this specification.

A.2.6 Designs must take account of existing or proposed lighting, illuminated signs and bollards on existing roads and adjacent developments, cycle ways and remote footway/cycleway links and potential future developments. This may require establishing with other parties the stage their design process is at and equipment being considered. Details of these considerations and the adjacent equipment specifications must be included in the design report.

A.2.7 Where passively safe columns are proposed designers shall complete a risk assessment justifying their use and the category/categories of passively safe column scheduled by location.

A.2.8 Traffic Signs - only signs that are specifically required by the latest version of The Traffic Signs Regulations to be illuminated are to be provided with illumination. Directional or other information signs shall not be illuminated.

**Position of Lighting Columns**

A.2.9 Lighting must be planned as an integral part of an estate layout. Due consideration must be given to the provision of suitable locations for the street lighting columns. They should not cause undue obstruction to the passage of pedestrians, be vulnerable to accidental vehicle damage or cause nuisance to house owners by way of avoidable intrusive light spill.

A.2.10 Columns and other highway electrical equipment shall only to be installed on land adopted or to be adopted by the City Council.

A.2.11 Developers shall ensure that all prospective purchasers/occupants/tenants of property are fully aware of the proposed location of lighting equipment.

A.2.12 Hinged columns shall be specified wherever the column position will be inaccessible for maintenance from public land by a vehicle mounted access platform.

A.2.13 Road lighting designs shall avoid the placing of road lighting columns on splitter islands and other traffic islands unless they are protected by a safety barrier or the island's smallest dimension is 10m and any column is more than five metres from a splitter island nose and set back two metres from the island’s roundabout side kerb line and they provide lighting only to a roundabout periphery carriageway.

A.2.14 If it’s proposed to install any combined street lighting and electrical vehicle charging points, the City Council Engineer must be consulted regarding proposed positions of these units.
A.3 Designs

Lighting Designs

A.3.1 They shall be designed to BS5489-1:2013, BS EN 13201-2:2013 and BS EN 13201-3:2013 and take account of any applicable Institution of Lighting Engineers Technical Reports, Guidance on Dark Landscapes etc.

A.3.2 Single Sided designs for M and C Classes should be avoided and if used must be justified in the design report.

A.3.3 Illuminance designs should take account of the effects of shadowing by buildings and structures.

A.3.4 Designers shall assume

- E3/E4 category within Peterborough City and a E1/E2 category elsewhere and a lamp change and clean every 36 months for non-LED light sources.
- Annual burning hours as 4134 hours
- A Type C2 road surface with a Qo = 0.07
- A lamp maintenance factor for LED luminaries will be based on a routine maintenance visit every 72 months

A.3.5 For Subsidiary Roads traffic flows shall be based on the criteria in BS5489-1:2013 with the additional requirement that High/Busy Traffic Flow shall only be used where traffic flow is or is predicted to be greater than 7000 ADT (Average Daily Traffic)

A.3.6 Traffic Flow Data (Vehicles, Pedestrians or Cyclists) - Traffic flow information should be available from the site’s Developers as they should have taken account of it when designing the development’s roads, paths and accesses to existing highways.

A.3.7 For existing roads traffic flow information may be available from Peterborough City Council for which a charge may be made.

A.3.8 For urban areas where data is for 12 hour traffic flows a factor of 1.21 can be applied to give the ADT. If data is for morning and evening peaks only then these can be added together and multiplied by five to give the ADT.

A.3.9 Road Category - Designers shall determine for each of the roads to be lit if it falls into the road category of Traffic Route or If not the road shall be treated as a Subsidiary Road.

A.3.10 All cycleways and footways remote from carriageways (remote meaning will not be adequately lit from the carriageway lighting system) within otherwise lit areas shall be lit.

A.3.11 If a remote cycleway or footway is outside the lit areas but links two lit areas or will at a future date link to a lit area then it shall be lit for its full length unless its length outside these lit areas is more than 300m, this requirement is to be confirmed with City Council Engineer.

A.3.12 Designers shall also establish by consultation with the City Council Engineer if the scheme involves on-road parts of the Primary Cycle Route.

A.3.13 All other cycleways remote from carriageways, if they are to be lit, shall be lit with LED luminaires.

A.3.14 The number of different optic settings used for a design shall be minimised. For example no more than two different optics/optic settings (and preferably one) should be used for a roundabout and all its approach roads and specifically only one for the roundabout periphery. Whilst there may be different mounting heights on roads, footways or cycleways there shall also be a logical consistency for the mounting heights proposed for an installation or within a development.
A.3.15 The recommended design shall deliver the lighting requirements and, within the constraints of this specification, be the most economic in terms of energy consumption and maintenance over a 25 year period.

A.3.16 For any road if the existing lighting is clearly ‘special’ or ‘decorative’ then the equipment requirements for any new lighting shall be confirmed with the City Council Engineer.

A.3.17 Wall Brackets - Wall brackets are not permitted.

**Electrical Designs**

A.3.18 If electricity supplies are not directly from cables owned by the Distribution Network Operator (DNO), referred to in the remainder of this document as a private cable network, the electrical designs shall comply with the current edition of BS 7671 and to the requirements of this specification.

A.3.19 The maximum disconnection time for a passively safe column or sign post unit on a private cable network shall not exceed 0.4secs

**Lighting Design Data**

**Luminance Lighting Designs**

A.3.20 Lighting calculations for luminance designs to be supplied in the form of computer print outs showing

- Calculation grids and observer positions used
- Mounting height, bracket projections, column set backs, luminaire types, inclination and optic settings, lamp type and lumen output, road geometry, design spacing etc
- Luminaire and lamp depreciation factors
- Maintained average luminance
- Overall uniformity ratio
- Longitudinal uniformity ratio
- Threshold increment
- Surround ratio

A.3.21 Drawings are to be supplied showing the columns set out to the calculated design spacings. These may be the same drawings as fully detailed in section A.3.26.

**Illuminance Lighting Designs**

A.3.22 Lighting calculations for illuminance designs to be supplied in the form of computer print outs showing

- Mounting height, bracket projections, column set backs, luminaire types, inclination and optic settings, lamp type and lumen output, column locations etc
- Luminaire and lamp depreciation factors
- Maintained average illuminance (Eav) masked to the design boundaries
- Maintained minimum illuminance (Emin) masked to the design boundaries
- Emin/Eav masked to the design boundaries
A.3.23 Drawings are to be supplied showing
- The column locations and an isolux line set to the value of either the required minimum maintained illuminance or the illuminance calculated from the product of the achieved average maintained illuminance and the required overall uniformity as applicable
- The masked calculation areas and listing their average illuminance (Eav), minimum maintained illuminance (Emin), maximum maintained illuminance (Emax), Emin/Emax and Emin/Eav values.

A.3.24 These drawings shall be additional to those fully detailed in section A.3.26.

Electrical Design Data

A.3.25 Electrical calculations where a private cable network is proposed are to be supplied including
- Volt drops and cable sizes/types
- Earth loop impedances
- Fault current, disconnection times and protective device ratings

Drawings and Schedules

A.3.26 Two plans in paper format as well as digitally to a scale of at least 1:500 shall be provided showing the position and plan numbers of columns, orientation of bracket arms and luminaries for the final proposed design, the locations of all adjacent lighting units (existing and/or proposed by other Developers) together with full details of the equipment, any lighting units to be removed and the version date of both this General Specification and the site specific Specifications which have been used to support the design.

A.3.27 A schedule shall be included within the layout drawing of road lighting units, lit signs and bollards relating to their plan number. This shall include mounting height, bracket projections, bracket attitude, spigot attitude, passively safe category (if applicable), luminaire type, luminaire attitude, optical control matrix, lampholder/reflector position, lamp operating gear manufacturer/type/UMSUG code, photo-electric cell manufacturer/type and the unit’s Easting and Northing (to a minimum of six integers and one decimal place) using the British Coordinate System – British National Grid.

A.3.28 For proposed units on existing adopted highways designers shall determine appropriate unique lighting column and sign maintenance numbers which will logically integrate with existing unit numbers using suffix letters if necessary. These maintenance numbers shall also be included in the drawing schedule.

A.3.29 If the electricity supply to any unit is via a private cable network then cable calculations and schematic wiring diagrams shall be supplied. The wiring diagram shall include details of cable sizes and types, isolation, fusing and switching details including the DNO source supply requirements where applicable.

A.3.30 Where applicable, feeder pillar locations, indicative cable and duct routes and duct chamber locations shall be shown on the layout drawing.

A.3.31 If illuminated signs (which include centre island lamp units) are required these must be included in the drawing and schedules with appropriate references and cabling.

Design Report

A.3.32 A report shall be provided detailing the derivation of all matters affecting the lighting class selection and the lighting and electrical designs.

A.3.33 It shall include justification for any deviations from the design criteria, an environmental impact assessment/statement, recommendations for the provision of safety barriers and/or passively safe
columns, a design risk assessment and any matters covered by current Health and Safety legislation that may arise from the design, installation, maintenance or future demolition of the scheme.

A.3.34 The report shall also detail recommended maintenance and inspection intervals and requirements.

A.4 Electricity Supplies

A.4.1 Services to the lighting columns and lit signs shall normally be provided by the Distribution Network Operator (DNO) and will terminate in a service box in the base of each column/post. Space is to be left at the bottom of the baseboard in each column to accommodate the service box and service cable.

A.4.2 Any equipment sited on traffic islands, the central area of roundabouts or similar vulnerable locations must be fed via a fused private cable network from highway furniture or from a dedicated feeder pillar sited in a path or verge.

A.4.3 Any passively safe columns must be fed via a private cable network.

A.4.4 Illuminated signs (where required/agreed) on private cable networks must be supplied by a cable separate to that which supplies street lighting units and be isolated and fused at feeder pillars or other highway furniture.

A.4.5 Where an entire installation is remote from any existing or planned DNO supplies it shall be fed via a private cable network from a feeder pillar or pillars sited near the available supply.

A.4.6 All private cables shall use a loop in loop out arrangement. Cable joints are not permitted.

A.4.7 Where the source of a private cable network is a unit with a DNO supply or where a fused sub-circuit is otherwise required, then the outgoing circuits shall be protected by a double pole suitably fused isolator from the Toftco or Charles Endirect Ltd LSI-System range or similar approved by City Council Engineer.

A.4.8 Where passively safe columns are proposed the specified type must have been tested with underground cables installed (as BS EN 12767:2007) and their electrical supplies must have a maximum disconnection time of 0.4secs. There will also be a requirement for a physical connection/disconnection device which will readily disconnect the supply if the column suffers an impact, this will be via snatch plug arrangement in an adjacent duct/in-ground chamber all as per ELS Passive Safety Isolation Kit (or similar approved by the City Council Engineer) and meet chamber requirements A.6.31.

A.4.9 Earth Electrodes shall be installed to meet the requirements of BS7671 and the local DNO. As well as an earth electrode at any feed point supplying more than two units and at the ends of any radial circuit comprising two or more units.

A.5 Testing and Installation Records

A.5.1 The following applies to all highway electrical equipment installed for the scheme.

A.5.2 The completion of the work includes the testing of the installation to the satisfaction of the City Council Engineer. Completed test certificates for each installation shall be provided to the City Council Engineer by the developer together with a complete schedule detailing all the installed electrical equipment, including illuminated signs, bollards and feeder pillars.

A.5.3 The schedule shall confirm installed details such as mounting height, bracket projection, bracket attitude, spigot attitude, lantern type, lantern attitude, optical control matrix, lampholder/reflector position and the Easting and Northing (to a minimum of six integers and one decimal place) using
the British Coordinate System (British National Grid), control type, unit number and installation date.

A.5.4 A numbered installation drawing shall also be provided showing the final scheme including any private cable and duct details.

A.6 Equipment

General

A.6.1 All equipment and materials shall comply with the British or European Standards applicable at their date of purchase.

Lighting Columns and Traffic Sign Posts

General

A.6.2 See Appendix E for full specification details.

A.6.3 The minimum lighting column height to be used is 6m (unless agreed with the City Council Engineer).

Column Doors

A.6.4 See Appendix E for full specification details.

6 Metre Rigid Columns

A.6.5 See Appendix E for full specification details.

8, 10 & 12 Metre Rigid Columns

A.6.6 See Appendix E for full specification details.

A.6.7 Except for Hampton Developments, where special brackets are required, bracket projection shall be as short as the design will allow, or omitted completely if possible. Where a bracket arm is required by the design, see Appendix E. The column to bracket joint shall be flush and incorporate an anti-rotation device.

A.6.8 Where luminaries are to be post-top fixed the top of the column shaft shall be reduced by fabrication (i.e. not a detachable stub bracket) to a vertical spigot to be specified to suit the luminaire that is to be fitted.

Hinged Columns

A.6.9 Hinged columns shall be installed on remote footways/cycleways and wherever the column position will be inaccessible for maintenance from public land by a vehicle mounted access platform.

A.6.10 Except for Hampton Developments (see Section D) 6 metre Hinged Columns shall be of the following manufacture.

- Fabrikat Ltd. Type: 6m tubular mid hinged raise and lower column Ref. 6M01AMHRL or similar approved by City Council Engineer.

A.6.11 The specification for any higher mounting height hinged columns shall be agreed with the City Council Engineer.
Passively Safe Columns

A.6.12 Columns for roads in non-built up areas with speed limits of 40mph and above, unless the column locations are protected by a safety barrier provided for other reasons, shall be passively safe to BS EN 12767:2007 and shall be specified by manufacturer and model/type.

A.6.13 The required impact speed class, energy absorbing category and occupant safety level shall be assessed for each column location and scheduled within the layout drawing.

A.6.14 For passively safe columns, the protection system to the column root section shall be as section A.7, and if the column is to be installed in or adjacent to a verge additionally protected by a strimmer/mower guard.

Lamp Operating Gear

A.6.15 Lamp operating gear shall be housed in the lantern.

A.6.16 Lamp operating gear shall be fully electronic and have a voltage range of 190-250 volts and conform to BS EN 61347 and include suitable surge protection. Power factor shall be corrected to a value greater than 0.95.

A.6.17 All road lighting lamp operating gear shall be compatible with the Telensa CMS system and be capable of being dimmed/switch as required, when installed in an area not presently covered by a Telensa base station guidance should be sought from the City Council.

A.6.18 The manufacturer and type of lamp operating gear shall be specified by the designer and full details included on the layout drawing together with the lamp operating gear’s Unmetered Supplies User Group (UMSUG) approved lamp charge code.

Telecells (Photocells where required for illuminated signs)

A.6.19 Photocells shall be electronic one part units, guaranteed for a minimum period of 10 years, switch on point 35 lux, 1:0.5 negative differential.

A.6.20 Road lighting lanterns are to be fitted with seven pin NEMA sockets for use with Telensa Telecells, except Hampton Specification lanterns (Appendix D) which shall have Twig aerial type mini Telecells.

A.6.21 For illuminated traffic sign lanterns they shall be controlled via Royce Thompson Ltd Microstar Ultra or similar approved photocells.

A.6.22 All street lighting lanterns will be controlled via Telecells, if a proposed development is in an area not within current Telensa coverage, the designer/developer will need to allow for provision of a Telensa base station as part of the street lighting installation/infrastructure. There may be an additional charge for Telensa to carry out a coverage check/calculation, the City Council Engineer will advise accordingly.

Fused Switch Disconnectors and Override Test Switch

A.6.23 A suitably fused double pole switch disconnecter from the Tofco or Charles Endirect Ltd LSI-System range (or similar approved by City Council Engineer) shall be installed in the base compartment of all lighting columns and illuminated sign posts which are supplied directly by the Distribution Network Operator (DNO) and wired between the DNO cut out and the lantern. The unit shall also be fitted with a latching push-button test switch wired so that it overrides the lantern’s photo-electric cell / Telecell and energises the lantern circuit for test purposes.

A.6.24 For all lighting columns and illuminated sign posts which are supplied directly by DNO with outgoing private cable circuits to other equipment, each outgoing circuit shall also be fitted with a suitably fused double pole switch disconnecter from the Tofco or Charles Endirect Ltd LSI-System.
range (or similar approved by the City Council Engineer). This may be integral with the unit described in A.6.23 above.

A.6.25 Where columns or sign posts are supplied by a private cable then the lamp’s fused double pole switch disconnector, test switch and any outgoing private cable circuit’s fused double pole switch disconnector may all be integral with the cut out and be from the Charles Endirect Ltd LSI-System or Tofco Ltd range (or similar approved by the City Council Engineer).

**Cables and Terminations**

A.6.26 All private cables shall be of adequate cross-section (minimum size 4.0sqmm) and be three core (or five core if used in a passive safe installation using chambers and snatch plug disconnection system) XLPE insulated stranded plain copper conductors, polymeric bedding, steel wire armoured, PVC sheathed 600/1000v grade to BS 5467 or European equivalent and be terminated into cut-outs primarily for use in street lighting columns or in feeder pillars using glands to BS EN 50262:1999 and BS 6121:2005 (Type BW) complete with a plastic shroud.

A.6.27 The colours of the insulation of the three cores shall be Brown (Live), Blue (Neutral) and Green/Yellow (Protective conductor/Earth), for five cores the colours will be Brown L1, Black L2, Grey L3 (Live), Blue (Neutral), Green/Yellow (Protective conductor/Earth) and preferably but optionally with the outer black sheath embossed ‘Street Lighting’.

**Ducts and Marker Tape**

A.6.28 Ducting for private cables shall be 5.0mm wall thickness MDPE, coloured orange and embossed ‘STREET LIGHTING CABLE’. It is always to be installed under carriageways, industrial vehicular crossings, concreted accesses and in these locations shall be 100mm dia. Ducting in other locations (verges, longitudinal footpaths and flexible surfaced driveways) shall be 50mm dia.

A.6.29 Plastic tape shall be laid above all cable/duct runs, and shall be 150mm wide yellow self-coloured PVC or polythene not less than 0.1mm thick printed "Street Lighting Cable" along its full length. The wording shall occur at least at one metre intervals and shall occupy not less than 75% of the available length.

A.6.30 Ducts or cables shall have a minimum depth to soffit of 600mm beneath carriageways and 450mm elsewhere.

A.6.31 Duct Chambers will be as per ELS in-ground chamber and secure cover (or similar approved by City Council Engineer) and all to EN124 40 tonnes without the aid of concrete surround, chamber cover/frame to be attachable to the chamber and to minimum requirement of 40 tonnes.

**Feeder Pillars**

A.6.32 Feeder pillars shall be of 3mm (min) sheet steel, galvanised after fabrication, of weatherproof construction and shall be large enough to afford easy access to the control equipment. All fixings, hinges and locks shall be of stainless steel or non-ferrous metal. They shall be provided with a concrete foundation, be free standing with necessary ducts for incoming and outgoing cables and sealed with a bitumen or similar compound.

A.6.33 Doors shall be hinged and secured by security hexpin bolt type locks If the size of the feeder pillar is such that double doors are required then it shall also have an eye and slit to enable the doors to be padlocked.

A.6.34 Switchgear shall be fully enclosed. Switch disconnectors and, where practicable, each outgoing circuit protective device shall be lockable by means of a padlock. At least two spare ways per phase shall be provided on the distribution board.

A.6.35 Earth electrodes shall be installed at every feeder pillar.
A.6.36  The size of the feeder pillar shall be determined by the Developer or Designer as shall the internal layout, equipment and wiring, and it shall be the minimum size capable of housing the necessary equipment, DNO meters (if the feeder pillar’s electrical load exceeds the local DNO requirements for un-metered supplies), terminations plus 20% spare space.

A.6.37  If the size of the feeder pillar is such that double doors are required then it shall have a switched twin 7 watt PL-S or similar internal bulkhead fitting, RCD protected 13 amp socket and a thermostatically controlled 60 watt heater all supplied from the live side of the main switch disconnector via a 100 amp switch disconnector and 4 way suitably fused distribution board, Furthermore a hard standing area of a suitable size to allow full and proper operation/opening of the doors will be provided in front of the feeder pillar doors.

A.6.38  Provision shall be made via black ducts through the base of the pillar for the installation and termination of the incoming supply cable where this is provided by the DNO. The Contractor shall allow for cable termination and cable tails for connecting into the meters or service cut-outs of the DNO.

A.6.39  Internal wiring shall be carried out in single core PVC insulated cables to BS 6004 in galvanised steel trunking and shall be of suitable cross-sectional area to connect the in-coming DNO service to the out-going distribution cables.

A.6.40  All internal enclosures and auxiliary equipment shall be rated to a minimum of IP56 and be durably finished to withstand their permanently damp environment without visible corrosion for a minimum of 15 years.

A.6.41  A copy of the as-built layout and schematic drawings shall be encapsulated and fixed to the inside of the feeder pillar door.

A.6.42  All duct end to be suitably sealed.

**Illuminated Signs**

A.6.43  Type A traffic sign lighting units shall be suitably sized LED fitting single bracket or double bracket as required, with fitted with a Royce Thompson Ltd Microstar Ultra (35 lux, 1:0.5) miniature photo-electric cell.

A.6.44  Type B traffic sign lighting units shall be suitably sized LED fitting single bracket or double bracket as required, fitted with a Royce Thompson Ltd Microstar Ultra (35 lux, 1:0.5) miniature photo-electric cell.

A.6.45  Other traffic sign lighting lanterns shall be suitably sized LED fitting with electronic control gear and be fitted, with a Royce Thompson Ltd Microstar Ultra (35 lux, 1:0.5) miniature photo-electric cell.

A.6.46  Sign plate(s) with a total projected windage area in excess of 0.3 sq.m shall not be affixed to lighting columns.

**Traffic Bollards**

A.6.47  Traffic bollards will be un-illuminated, BS 8442 compliant, self-righting retro-reflective bollards without any additional illumination and shall be TMP Flecta type (or similarly approved) and installed with cast-in cage.

**Centre Island luminaires**

A.6.48  They shall be mounted on a suitable hinged, 6m mounting height galvanised steel column.

**LEDs & LED luminaires**

A.6.49  LED shall be the light source option.
A.6.50 Where LED lighting is proposed, details shall be provided to establish the likely performance of the luminaire and the individual LEDs within it.

- What is the manufacturer and model of LEDs used.
- What is the rated life of the LEDs.
- What is the rated life of the LED driver.
- What is the lumen depreciation.
- What is the colour rendering index (CRI)
- What ambient temperature is the luminaire performance based on.
- Driver current measured in mA (LED drivers are to be run at 300/350ma should a different driver current be required this must be agreed with the City Council).
- Power Factor – to be 0.85 or above.

Central Management System (CMS) for remote monitoring and dimming

A.6.59 All road lighting shall be compatible with the Telensa CMS system and be capable of being dimmed or switched as required.

A.7 Finish of Columns

Galvanised Steel Columns

Painted Columns

A.7.1 Columns and roots (only root section to be treated unless specified) are to be factory primed and finished. See Appendix E for full specification details.

A.7.2 Colours (unless otherwise specified by the City Council Engineer)

- Residential Roads Galvanised, root system only unless specified (Hampton columns will be finished as per Section D and to be confirmed by City Council Engineer)
- Main Roads and Industrial Estate areas Galvanised, root system only unless specified.
- All other locations as per Peterborough City Council require/instruct.

Passively Safe Aluminium Columns

A.7.3 The roots of the columns up to 250mm above ground level are to be factory protected with four layers of corrosion protective tape and an LDPE protector fitted to protect the column from strimmers or mowing machines at ground level. No further treatment is required.

A.8 Installation

Setting Out

A.8.1 This shall be carried out by a competent person who can ensure that the installed positions take proper account of local natural, ground and building features not apparent or advised at the design stage and that the lighting requirements are not compromised.

A.8.2 This may require a complete redesign and a repeat of the entire design approval process.
A.8.3 Any consequent amendments may make it appropriate to re-notify adjacent property owners/occupiers/tenants as section A.2.11.

Erection of Columns

A.8.4 Columns shall be erected at the back of the footway or at least 0.8 m from the edge of the carriageway. Installation and erection shall be carried out in compliance with the current edition of the ‘Code of Practice for the Erection of Street Lighting Equipment’ published by the Association of Street Lighting Contractors with the following amendments:

- Special attention should be given to the orientation of the base compartment doors to ensure wherever practicable that the maintenance operative shall face oncoming traffic.
- Special attention shall be paid to the siting of hinged columns to ensure that, within adopted areas, there are adequate clearances for lowering and maintenance access.
- PCC accept a planting depth tolerance of 100mm either side of the column manufactures stated planting depth, this is determined on site by measuring the door opening to finished ground level. Any columns that are outside of the allowed tolerance will need adjusting as required.

Concrete Filling

A.8.5 The concrete filling around each column shall be at least of the minimum quantity and proportions as per the column manufactures recommendations.

A.8.6 Selected excavated material shall then be well rammed around the column. Adequate provision shall be made for the entry of underground services to the columns. Where columns are sited in the verge or grassed areas, additionally protected by a strimmer/mower guard shall be provided where a build out has not been specified.

Numbering of Columns and Illuminated Signs

Self-Adhesive Numbers

A.8.7 Self adhesive labels must be printed in one piece on engineering grade reflective vinyl. All as standard detail drawing Standard detail drawing Appendix F2.1 Rev B and F2.2 Rev B.

Fitting of Lanterns, Lamps and Control Gear

A.8.8 All equipment shall be fitted in accordance with the manufacturers’ instructions. All equipment shall be indelibly marked with its date of installation.

Wiring

A.8.9 All wiring shall conform to BS 6004:2000, BS 6500: 2000 and BS7211: 1998 or European equivalents as applicable. 1.5sq mm non-hygroscopic cables shall be used for 5 metre and 6 metre columns and 2.5 sq mm cables for all other columns.

A.8.10 A separate dedicated earth terminal block shall be fixed to the baseboard of each column. All exposed and extraneous conductive parts (including the lantern and door) shall be bonded to this terminal block. Crimped connections are to be used and connections made between two brass washers. The main earthing copper conductor tail from the earth terminal block shall be either 6 mm² or equal in cross sectional area to the incoming phase conductor, whichever is the greater as shall the earth bond from the earth block to the column shaft earth. The earth bond from the earth block to the door earth shall be 4 mm sq. copper with length as short as possible to minimise possibility of being trapped when the door is closed but long enough to permit the door to be rested on the ground against the column without strain. Other earthing shall be in accordance with the current edition of BS7671 subject to a minimum size of 2.5 sq. mm.
A.8.11 The whole of the electrical installation shall comply with the current edition of BS7671 (the I.E.E Regulations for Electrical Installations) and requirements of the DNO.

A.9 Energy and Maintenance

Energy

A.9.1 The City Council will be responsible for the payment of the electricity energy charges to the lanterns and illuminated signs from the date of formal adoption of the installations as defined in the Highways Act, 1980.

Maintenance

A.9.2 The Developer shall remain responsible for the whole installation including triennial cleaning and in the case of LED luminaires replacement of faulty LED arrays and driver units until the date of formal adoption of the road.

A.9.3 Until formal adoption the developer shall arrange for the prompt repair of all faults, including vehicular and vandal damage, notified to him from any source.

A.9.4 In the event of an emergency situation arising, eg. Vehicular accident damage, column doors missing etc., and the Developer cannot be contacted within 15 minutes, the Engineer reserves the right at his sole discretion to arrange for the City Council’s own contractor to be dispatched to make the situation safe and to recharge the Developer with the costs incurred. This in no way absolves the Developer from any of his responsibility for the installation.

A.10 Existing Lighting

A.10.1 If lighting already exists at any development or site and it would serve a useful public lighting function during construction works it must be either maintained in operation or equivalent temporary lighting provided.

A.10.2 If existing units are to be resited they must be restored to lighting within seven days of their disconnection.

A.10.3 Existing units shall not be disconnected or removed until their replacements have been commissioned.

A.11 As-Built Drawings and Schedules

A.11.1 As-built drawings (layout, feeder pillars and wiring schematic as appropriate) with same full level of detail/information and in same format as design drawings must be provided upon substantial completion or when an inspection is requested. They shall be accompanied by an updated schedule similar to that required for the design submission and in particular with updated Eastings and Northings scheduled against the as-built drawing unit references.
Appendix B  Section B – Street Lighting Specification: Residential Road Areas

B.1  Application of Specification

B.1.1 This specification details specific requirements for Residential Area Roads and are additional to the requirements detailed in the Peterborough City Council’s General Specification for Street Lighting.

B.1.2 Designers must include the version dates of both the General Specification and this site specific Specification in their design report and on their lighting layout drawings.

B.1.3 This Section does not apply to Hampton (Section D) and Regeneration Areas.

B.1.4 The specifications in this Section are also applicable to remote cycleways and remote footways in and associated with Residential Areas, Main Roads (Section C).

B.2  Equipment

Column Heights

B.2.1 Basic residential roads, remote footways and remote cycleways designs shall use a column height of 6m.

B.2.2 It may be necessary to use 8m or 10m columns to obtain an effective design on wider routes through residential areas (for Main Roads with carriageway widths 7m and over or A class roads see Section C of this Specification).

B.2.3 Designs should be evaluated to achieve the required lighting class with the least number of lighting units and lowest scheme annual energy usage with a consistency of luminaries and mounting heights as Section A of the General Specification.

B.2.4 A brief justification of proposed column choice and design rational must be included in Design Report (Section A of the General Specification).

Luminaires

Mounting Height 6m

B.2.5 LED luminaries, shall be OrangeTek Ltd AriaLed Mini LED unit with factory applied polyester power finish RAL 9005 (Black).

B.2.6 For footways and cycleways remote from carriageways luminaries shall match the development luminaries, the appropriate number of LEDs in the luminaires will be used to provide the most economical design solution for the chosen lighting class.

B.2.7 Luminaries shall be post top mounted in all areas including on hinged columns.

B.2.8 Designs using various optic settings shall be considered and evaluated to achieve the required lighting class with least number of luminaires and lowest scheme annual energy costs using a single optic setting.

Lamps

B.2.9 LEDs shall be the light source (lamp) LED drivers are to be run at 300/350ma (should a different driver current be required this must be agreed with the City Council Engineer).
Appendix C  Section C – Street Lighting Specification: Main Roads

C.1 Application of Specification
C.1.1 This specification details specific requirements for Main Roads and are additional to the requirements detailed in the Peterborough City Council’s General Specification for Street Lighting.
C.1.2 Designers must include the version dates of both the General Specification and this site specific Specification in their design report and on their lighting layout drawings.
C.1.3 Main Roads are defined for the purpose of this specification as having a carriageway width equal or greater than 7m or if narrower have an A road classification.
C.1.4 The Specification applicable to remote cycle tracks and remote footpaths associated with Main Roads is in Section B Residential Area Roads.

C.2 Equipment

Column Heights
C.2.1 Designs should be evaluated using column heights of 8m, 10m and 12m and selecting the height (and luminaire/optic – see Luminaires below) which will achieve the required lighting class with the least number of luminaires and lowest scheme annual energy and maintenance costs with a consistency of mounting heights as Section A of the General Specification.
C.2.2 In urban areas if 12m columns are the most economic solution then the scheme together with the economic evaluations should be referred to the City Council Engineer for a decision on the mounting height to be used.
C.2.3 If columns greater than 12m are required then the scheme should be referred to the Engineer for full discussion and briefing.

Luminaires
C.2.4 LED luminaries shall be either the Urbis Lighting Ltd Ampera with factory applied polyester power finish AKZO grey 900 sanded.
C.2.5 In rural areas the luminaires shall be mounted horizontally. In urban areas they may be mounted with up to 5 degrees tilt.
C.2.6 Luminaires may be either side entry or post top mounted depending upon the column bracket configuration required by the design.
C.2.7 Designs using all luminaires and various optic settings (at various mounting heights – see Column Heights above) shall be considered and evaluated to achieve the required lighting class with the least number of luminaires and lowest scheme annual energy costs using one luminaires with a single optic setting preferably throughout but at least at a particular mounting height.
C.2.8 A brief justification of proposed column choice and design rational must be included in Design Report (Section A of the General Specification).

Lamps
C.2.9 LEDs shall be the light source, LED drivers are to be run at 300/350ma (should a different driver current be required this must be agreed with the City Council).
C.2.10 For cycleways and footways remote from carriageways refer to Section B of this Specification.
Appendix D  Section D – Street Lighting Specification: Hampton Developments

D.1 Application of Specification

D.1.1 This specification details specific requirements for Hampton Developments and are additional to the requirements detailed in the Peterborough City Council’s General Specification for Street Lighting.

D.1.2 Designers must include the version dates of both the General Specification and this site specific Specification in their design report and on their lighting layout drawings.

D.2 Equipment

Columns and Brackets

Rigid Columns

D.2.1 Columns shall be the plain tubular type as detailed in Section A with shaft heights/diameters specified so that they form an integrated assembly with the brackets detailed below and provide the required lantern mounting height of 6m, 8m or 10m.

Hinged Columns

D.2.2 6 metre Hinged Columns shall be of the following manufacture with shaft height/diameter specified so that they form an integrated assembly with the brackets detailed below and provide the required lantern mounting height of 6m. The developer is to provide lowering gear prior to formal highway adoption.

- Abacus Lighting Ltd. Type: Standard Range 168mm dia Flush Door Raise/Lower as Dwg No RL201/10/RANGE/FD except fitted with a galvanised chain securing the door and a “hexpin” type door security locking bolt.

Brackets

D.2.3 Brackets on 6m metre rigid and hinged columns shall be Urbis Lighting Ltd Cascade type with a 750mm outreach.

D.2.4 Brackets on 8m columns shall be DW Windsor Ltd Arc Plain type.

Column Heights

D.2.5 Basic residential roads, remote footways and remote cycle ways designs shall use a column height of 6m.

D.2.6 It may be necessary to use 8m or 10m columns to obtain an effective design on wider routes.

D.2.7 Designs should be evaluated to achieve the required lighting class with the least number of luminaries and lowest scheme annual energy and maintenance costs with a consistency of mounting heights as Section A of the General Specification.

D.2.8 A brief justification of proposed column choice and design rational must be included in Design Report (Section A of the General Specification).
**Luminaires**

D.2.9 Luminaires shall be of the following manufacture

- Urbis Lighting Ltd: At 8m - Albany Large with Teardrop bowl
  6m - Albany Small with Teardrop bowl
- DW Windsor Lighting Ltd 8m - Strand A with Teardrop bowl and Wide brim
  6m - Strand B with Teardrop bowl and Wide brim

D.2.10 Luminaires shall be finished with a factory applied paint finish RAL 6005 (Dark Green) and be fitted with Telensa “Twig” Telecell as Section A of this specification. Internal back-light shields shall be fitted by the manufacturer for all luminaires that are to be positioned adjacent to residential properties.

**Lamps**

D.2.11 LEDs shall be the light source, LED drivers are to be run at 300/350ma (should a different driver current be required this must be agreed with the City Council Engineer).
Appendix E Section E – Street Lighting Specification: Lighting Columns

E1.1 All components and brackets supplied must be manufactured by a company accredited under the quality assurance scheme ISO9001 and the contractor must, when requested to do so, supply to the Engineer a copy of the appropriate accreditation documentation prior to any purchases or erection of lighting columns and brackets under the contract.

E1.2 All columns and brackets shall be manufactured, supplied and installed in accordance with the requirements of BSEN40 and PD 6547 with a minimum design life of 40 years. Columns shall have a minimum base thickness of 3mm irrespective of design loading requirements.

E1.3 5m and 6m columns shall be designed to accommodate a sign of class ‘A’, in accordance with PD6547. 8m, 10m and 12m columns shall be designed to accommodate a sign of class ‘C’, in accordance with PD 6547.

E1.4 All lighting columns and brackets shall carry a unique identification mark which indicates the name of the manufacturer, the year of manufacture and an identification number to enable details of the column and bracket to be determined throughout the design life of the column. This information shall be clearly visible after erection of the column.

E1.5 The lighting columns and brackets shall be manufactured from steel which meets the requirements of BSEN40-5 2000. All columns shall be of tubular steel design and shall be manufactured from the following:

- Hot finished circular hollow sections to EN10210 Part 1 Grades S235, S275 & S355 JOH.
- Cold formed circular hollow sections without subsequent heat Treatment to the dimensional requirements of EN10219 Part 2 and the chemical and mechanical properties of EN10219 Part 1 Grade S235, S275 & S355 JOH.

The hot finished feedstock material shall comply with the yield, tensile and elongation requirements of the required grade specified in BSEN10025: 1993 Table 5.

E1.6 The thickness of the circular hollow section used in the manufacture of the columns shall be purchased such that the negative tolerance is limited to −5%.

E1.7 The manufacturer shall provide suitable scale drawings detailing the appearance and giving all measurements including tube diameters of the proposed columns and brackets. These shall be submitted for approval prior to the delivery of any columns or installation of such under the contract.

E1.8 The column base to shaft joint shall be of a hot swaged and welded construction with an internal centralising washer.

E1.9 The lighting column base compartment shall comply with the requirements of BSEN40 and shall have a minimum opening of:

- 500 mm x 100 mm (clear opening) for 5 m and 6 m columns.
- 600 mm x 115 mm (clear opening) for 8m 10m and 12m columns.

E1.10 Door openings shall be free from irregularities and burrs and all doors shall have a suitable earthing lug on their internal face.
E1.11 The door shall be a wrap around style with a single clamp fixing arrangement and M10 Hexagonal stainless steel anti-vandal bolt.

E1.12 The same pattern of door lock is to be used throughout on all columns supplied and the door shall come assembled on the columns, 2no. door lock keys to be provided for each development/adoptable land parcel.

E1.13 All columns shall be provided with and earth lug at the bottom left-hand side of the gear compartment to fit the earth wire.

E1.14 All lighting column welding procedures and welders/welding must be approved in accordance with current/required BS standards.

E1.15 8m/10m/12m column brackets when required shall be side entry with a welded gusset and have a 1.5 metre or 2.0 metre projection and 5° constant rise. The bracket spigot shall be 42.3 od x a minimum 100mm projection.

E1.16 There shall be no sharp edges within the columns or bracket arms which could damage electrical cables either during installation or while in service.

E1.17 A full length baseboard at least equivalent to the door size of treated hardwood shall be provided and fixed in the base compartment and shall be of sufficient size to accommodate all control equipment and service cut-outs.

E1.18 Columns and brackets shall be structurally designed to be capable of accepting lanterns with the following minimum weight and windage:

<table>
<thead>
<tr>
<th>Column Type</th>
<th>Weight (kg)</th>
<th>Windage (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 m post top</td>
<td>09</td>
<td>10</td>
</tr>
<tr>
<td>8 m post top</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>10 m post top</td>
<td>18.1</td>
<td>15</td>
</tr>
<tr>
<td>12 m post top</td>
<td>18.1</td>
<td>15</td>
</tr>
<tr>
<td>8m side entry (1.0m projection)</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>10m side entry (1.5m projection)</td>
<td>18.1</td>
<td>15</td>
</tr>
<tr>
<td>12m side entry (1.5m projection)</td>
<td>18.1</td>
<td>15</td>
</tr>
</tbody>
</table>

Please note:- where two or more luminaries are to be installed on a column the column must be suitable for the increase in weight and windage.

Columns to be designed in accordance with PD 6547 with reference to the Cambridgeshire administrative area.

E1.19 All columns shall be galvanised to BSEN1461 and shall be free from imperfections including porosity. Galvanising shall be fettled and rasped to remove all spikes and sharp edges and leave a smooth finish prior to the finishing application.

E1.20 Columns supplied under this specification will be periodically checked for compliance with the specifications.

E1.21 Manufacturers recommendations shall be adhered to regarding method of off-loading, storing and the assembly of the column and bracket in particular the method of securing the brackets to the columns.
**E2.0 Root Protection only (painted)**

- Pre-treat galvanised external surface of root to 250 mm above ground level with Dacrylate “T” Wash ref: 150-23 application to be fully in accordance with Dacrylate Technical Data Sheet (shop applied).

- Apply one coat of Epidac 2 Undercoat item 121 to the external surface of root to 250 mm above ground level minimum DFT 75 µm colour grey (shop applied).

- Apply one coat of Epidac 2 Glass Reinforced Epoxy to external surface of the column root to 250mm above ground level minimum DFT 200 µm, colour (Black) (shop applied).

**E2.1 Root and Upper Section (painted)**

- Pre-treat galvanised external surface of the column with Dacrylate “T” Wash ref: 150-23 application to be fully in accordance with Dacrylate Technical Data Sheet (shop applied).

- Apply one coat of Epidac 2 Undercoat item 121 to the external surface of the column minimum DFT 75 µm colour grey (shop applied).

- Apply one coat of Epidac 2 Glass Reinforced Epoxy to external surface of the column root to 250mm above ground level minimum DFT 200 µm colour Black (shop applied).

- Apply one coat Dac Sil Polysiloxane Finish on the upper section of the column to ground level minimum DFT 75 µm colour to be advised by City Council Engineer (shop applied).

**E2.2 Root Protection only (powder coated)**

- Performance Polymer Alloy coating “Plascoat PPA 571” (or equivalent).

- Applied to internal/external root section colour to be RAL 9005 (black).

- Durability of at least 25 years.

**E2.3 Root and Upper section (powder coated)**

- Performance Polymer Alloy coating “Plascoat PPA 571” (or equivalent).

- Applied to internal/external root and external upper section including face and rear of door, colour to be as advised by City Council Engineer.

- Durability of at least 25 years.
Appendix F Section F – Street Lighting Specification: Design Checklist

<table>
<thead>
<tr>
<th>CHECK POINTS</th>
<th>Date of check</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lighting Design</strong></td>
<td></td>
</tr>
<tr>
<td>Chosen correct lighting class chosen/ agreed?</td>
<td></td>
</tr>
<tr>
<td>Does the illuminance/luminance figures meet the chosen lighting class? EN 13201</td>
<td></td>
</tr>
<tr>
<td>Has justification in line with current BS5469 for chosen lighting class been supplied?</td>
<td></td>
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<tr>
<td>Have lighting calculations been supplied?</td>
<td></td>
</tr>
<tr>
<td>If LED light source not used has alternative been justified/ evaluated?</td>
<td></td>
</tr>
<tr>
<td>Have existing lighting units that are to remain been included in the lighting calculations?</td>
<td></td>
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<tr>
<td>Has correct lantern been chosen?</td>
<td></td>
</tr>
<tr>
<td>Has correct light source been chosen?</td>
<td></td>
</tr>
<tr>
<td>Is there a justification specified into why passive safe columns are been used? Does the area of the scheme have a speed limit equal or greater than 40mph?</td>
<td></td>
</tr>
<tr>
<td>All passive safe columns must be supplied from a private cable network with a circuit disconnection time less than 0.4 secs is this specified?</td>
<td></td>
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<tr>
<td>All units specified include Telensa compatible dimmable control gear, dimming module &amp; Telecell</td>
<td></td>
</tr>
<tr>
<td>Has the correct maintenance factor been used? 6 years for LED (full MF calculation required to be shown)?</td>
<td></td>
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<tr>
<td>Are grid point spacings correct (Should not exceed 1.5m)</td>
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<tr>
<td>Has the correct road width been used in lighting calculations (Roadway)</td>
<td></td>
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<tr>
<td>Has the correct areas masked off in lighting calculation (Area)</td>
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<tr>
<td>Has a Min Isolux line been included on the calculations?</td>
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<tr>
<td>Has correct outreach been used in calculations?</td>
<td></td>
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<tr>
<td>Has a environmental impact Statement and a Design Risk Assessment been included?</td>
<td></td>
</tr>
<tr>
<td>Have hinged columns been specified where required?</td>
<td></td>
</tr>
<tr>
<td><strong>Layout Drawing</strong></td>
<td></td>
</tr>
<tr>
<td>Has a column schedule been included on the layout drawing?</td>
<td></td>
</tr>
<tr>
<td>Are Easting and Northings in the schedule and correct?</td>
<td></td>
</tr>
<tr>
<td>Is there column symbols for all lighting units?</td>
<td></td>
</tr>
<tr>
<td>Do all columns reference numbers?</td>
<td></td>
</tr>
<tr>
<td>Has a detailed key been included on the layout drawing – should include Mounting height, bracket projection, optic, lantern, bowl, lamp, Telensa etc</td>
<td></td>
</tr>
</tbody>
</table>
Note:- A copy of this form is available in PDF or Excel format on request
GLOSSARY OF SPECIFICATIONS

EN10219 Cold formed welded structural hollow sections of non-alloy And fine grain steels
   Part 1 Technical delivery requirements
   Part 2 Tolerances, dimensions and sectional Properties

BSEN10025: Hot rolled products of non-alloy structural steels – Technical delivery conditions

BSEN1461 Hot dip galvanised coatings on fabricated iron and steel Articles – specifications and test methods

BSEN1011 Welded recommendation for welding of metallic materials
   Part 1 General guidance for arc welding
   Part 2 Arc welding of ferritic steels

BSEN287 Approval testing of welders for fusion welding
   Part 1 Steels

ISO9001 Quality Systems
   Model for quality assurance in production, installation and servicing

BSEN40 Specifications for lighting columns