

**ENFIELD**  
Council



## **LONDON BOROUGH OF ENFIELD**

Street Lighting and Traffic Signage  
Design Guide including Developers  
Specification and Process for Adoption



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## Introduction and Contact Details

London Borough of Enfield (LBE or Authority) operates a Street Lighting Private Finance Initiative (PFI) Contract for all of its street lighting, other illuminated street signs and bollards.

The PFI service provider (Bouygues E&S) provides all the street lighting services (Design, Build and Commissioning) to the authority under the PFI contract. The service provider is also able to offer Design, Build and commissioning services as required to any external parties or developers.

Prior to any works commencing it shall be necessary to arrange a pre-paid meeting, between the Developer, their chosen designer and contractor, the Authority and the PFI Service Provider, to discuss and agree on all pre-design considerations and requirements.

Prior to the meeting, scheme overview drawings showing the relevant adopted/adoptable highway shall be sent to the authority and the service provider for review.

Contact details for all parties:

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## AMENDMENTS

Clause	Amendment	Date Amended
-	Document Creation	April 23

## 1 Adoption Process

The Authority encourages developers to utilise the PFI Service Provider for the design and installation of street lighting and highway signage where adoption is required. This simplifies the adoption process including application requirements, design and specification review along with the requirements for site and works inspection/certification. As such there are two routes or processes for adoption of street lighting within Enfield.

### 1.1 Standard Process for Adoption (works undertaken by PFI Contractor)

Adoption of street lighting, traffic signage and other highway electrical assets is extremely straightforward when undertaken by the PFI Contractor Bouygues E&S. The contractor will guarantee adoption through their works.

As soon as assets are installed Bouygues will capture and add all relevant asset data to the Council's asset management systems.

No further inspections or surveys are required and assets will be immediately adopted.

There will be no 12 month maintenance period applicable following completion.

### 1.2 Alternative Process for Adoption (works undertaken by Developer)

For developers choosing to undertake installation and commissioning work themselves or with a HEA competent subcontractor a number of additional processes are required.

The Council's PFI Contractor shall carry out random checks to ensure the installation works are being carried out in accordance with Good Industry Practice and the Required Standards are being met.

When the Council's PFI Contractor is satisfied (acting reasonably) that the Required Standards are met the Authority shall inform the developer, allowing the developer to carry out the installation works;

Following notification by the developer that the installation works have been completed, the Authority shall satisfy itself that such works have been completed and instruct the PFI Contractor to carry out a detailed inspection.

The PFI Contractor shall inspect the relevant Apparatus and serve a written notice on the Authority either:

- a) confirming that the Apparatus inspected achieves the Required Standards to the Service Provider's satisfaction (acting reasonably) (an "Apparatus Acceptance Notice"), or
- b) stating that the Required Standards have not been achieved to the Services Sub-Contractor's satisfaction (acting reasonably) and setting out the way in which the Required Standards have not been achieved;

The Authority will then require the developer to rectify such failure(s) so that the Required Standards are met to the PFI Contractor's satisfaction (acting reasonably). When the Authority is satisfied that the failure(s) are rectified the Authority shall inform the PFI Contractor of such, whereupon the PFI Contractor shall repeat the procedure set out above.

## 2 Costs

There are several costs associated with the design, installation and adoption of street lighting with Enfield. Many of these costs can be avoided or minimised by commissioning the PFI contract for the design and installation of any street lighting within the borough.

### 2.1 Design Review Costs

If the developer chooses to carry out street lighting design rather than commission the PFI Contractor, a design review cost will be applicable. The value of which will be dependent on the size and scale of the project among other factors.

Costs will be conveyed shortly after the planning meeting usual at the same time as the Design Specification Document is issued.

**Design review costs are not applicable should the PFI Contractor be utilised for design.**

### 2.2 Fees

For developers, adoption fees for street lighting will usually form part of Section 38 Agreements. Information of Section 38 fees can be found on the Authorities website or by contacting the planning department. The fees applicable to any Section 38 agreement will involve the following elements:

- Authority legal costs to draw up the agreement
- Bond. This is the surety that is required to cover the works and can either be arranged with a financial institution or as a deposit made to the council. This will probably depend on the size of the development. The bond is calculated on the construction costs based on the Council's contractor's rates and is usually reduced by 90% when the site starts the twelve-month maintenance period.
- Supervision Fee. This covers the checking of all drawings to ensure that all proposals will meet adoptable standards and the supervision of construction along with the formal adoption process. The Supervision fee will be calculated on the size and complexity of the development using the Council's contractor's rates at that time.

The Supervision Fee will also include the costs associated with street lighting and street furniture etc. which are to be adopted and integrated into the existing Council PFI contract.

There are additional costs associated with the inspection and verification of installation works undertaken by anyone other than the current Street Lighting PFI contractor Bouygues E&S. Additional costs may be applicable for repeated inspections or any remedial works required to achieve required standards.

## 2.3 Commuted Sums

Commuted maintenance payments may be required for adoption of assets which do not fully comply with the Authorities specifications, whereby, in the opinion of the Local Authority, any assets will require premature or more costly replacement or incur additional maintenance costs.

For the following, provide examples of where commuted sums would be required:

- Where additional or higher wattage lanterns are used to provide greater lighting levels above standard requirements.
- Where non-standard equipment is used where this leads to possible increased maintenance costs

The extra-over cost of ownership shall be calculated by comparing the proposed equipment with that required during the notional whole life cost of ownership of more conventional road Lighting Equipment or street furniture.

Thus, the required commuted sum represents the additional cost of ownership incurred by the Local Authority compared with the maintenance or replacement expenditure it would otherwise have incurred if more equipment to the specification had been used;

### 3 General Considerations

All 'off-site' (outside the development Boundary) works are to be carried out by the PFI service provider as they will be best placed to coordinate works and obtain the necessary permits. The Developer may sub-contract "on-site" works.

Unless otherwise stated, the Highway Authority will require the developer to provide a street lighting system for roads, paths, cycle tracks, parking areas and all areas to be adopted as highway maintained at the public expense.

The street lighting system must be an integral part of the estate design with implications for security as well as road safety taken into account. It is important that the equipment used on any installation should be compatible with the rest of the borough for ease of maintenance.

In conservation areas, or very close to them and in other environmentally sensitive areas heritage style equipment may, at the complete discretion of the authority, be required.

The lighting design classification and type of lighting equipment specified will vary with the type and use of the road, path, cycle track, parking area or area to be adopted as highway maintained at the public expense. This will be agreed at the pre-design meeting

The positioning of equipment will be in accordance with BS 5489\_1-:2013 Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas. Due consideration is to be given to trees and their growth, traffic calming, parking and pedestrians. It will be the developer's responsibility to ensure that prospective purchasers are fully aware of the locations of all street lighting furniture and any relocation of equipment will be at the developer's expense prior to handover and must be within design parameters or included in a complete re-design.

Within certain criteria, the developer may be charged for alterations to existing street lighting where, at the authorities' discretions, it is deemed necessary. Early consultation with the Street Lighting Engineer is essential. Where the development forms a new junction with an existing highway the provision of lighting for the new development will be deemed to include the new junction and its approaches.

The phasing of a new development must take into consideration the need to light, within the development, all roads, pathways, cycle tracks, parking areas or areas to be adopted as highway maintained at the public expense, which are required to access occupied properties.

No adoptable lighting shall be installed onto buildings. All adoptable lighting shall be within the area of the adoptable highway or within a service strip. Where this can be shown to be not possible the developer must arrange appropriate covenants or agreements with the landowners or property owners and any such covenants or agreements shall be binding on the successors in title. The covenants or agreements will apply to an area of one square metre around the installation and allow the authority the right, in perpetuity, to provide power, across said private property if required, install, operate, maintain, remove, affix signs, displays and notices, and to provide sub-feeds to adjacent equipment, across said private property as and if required.

As a standard practice, the minimum mounting height for lanterns will be 6 metres. In exceptional circumstances, a lowering to 5 metres may be considered. This will be at the complete discretions of the authority.



All equipment shall be supplied in new and unused condition in so far as it has been tested in the course of manufacture and, where deemed necessary by the Street Lighting Engineer, shall be stored in weatherproof accommodation.

The Developer shall ensure that the equipment supplied is compatible with all other equipment with which it is associated.

All lighting designs are required to meet the adoptable standards for the borough and will be detailed in the pre-design meeting with all parties and, at the complete discretions of the authority. Designs shall be such as to minimise the amount of light pollution in the form of spill light beyond the boundary of the adoptable highway, and to minimise the amount of obtrusive light trespassing into adjacent properties.

The developer shall bear the costs for any and all works required in the removal, replacement or re-positioning of any and all existing lighting equipment made necessary by the site works. This work may involve the total removal and disposal of units from site and/or the replacement and/or re-positioning of units within the general area of site works. It may include the temporary removal, replacement and re-positioning of existing equipment and its return subsequent to works being carried out.

No existing lighting shall be switched off, dismantled or removed without the prior written approval of the Street Lighting Engineer. This approval will not normally be granted unless temporary lighting or the commissioning of the new permanent system is in place and working.

The developer shall be responsible for the complete installation and commissioning of each unit. It is required that actual installation is carried out by a specialist contractor who is a member of the HEA – Highways Electrical Association (formerly ASLEC -Association of Street Lighting Electrical Contractors and HEMSA – Highway Electrical Manufacturers and Suppliers Association), and that their operatives are suitably qualified under the sector scheme.

All PN (Private Network) cables, (non-DNO – Distribution Network Operator), are to be ducted with a minimum depth of cover of 450 millimetres within grass or footways and 600 depth of cover under crossovers, parking areas and roads. All private cable networks (non-DNO) are to be designed with armoured cables.

During the construction process, if any of the originally agreed design parameters and column/lantern locations are altered on site, written approval will be required from the authority or their delegated representative.

The Street Lighting Engineer shall be notified when the installation is complete and ready for an adoption inspection. This inspection will attract a fee. This notification shall include a schedule confirming the technical details, equipment details, location details and electrical test certificates.

When the installation has been adopted by the authority, which may be prior to the adoption of the road, the authority will assume responsibility for energy and routine cyclic maintenance. However, the developer will remain liable for any defect or damage until the road has been adopted. Adoption of the lighting will incur the developer an accrual fee and a commuted lump sum maintenance payment.

### 3.1 Warranties and Guarantees

Warranties and guarantees shall be retained by the PFI Service Provider for and on behalf of the Authority.

If the equipment to be adopted has not been procured by the PFI Service Provider the developer is required to ensure novation of any Guarantees or Warranties to the PFI Service Provider on the adoption of equipment.

The Authority currently requires a 30-year minimum warranty from column manufacturers and a 12-year minimum warranty on LED lanterns including drivers and any other internal parts.

For the acceptance of the unit, the developer must supply a warranty from the manufacturer that is either parent company or insurance bond backed that is capable of novation to the authority or chosen representative.

## 4 Street Lighting Design

In order to avoid additional costs and possible issues in relation to road adoptions, we would encourage all street lighting design works to be undertaken by our Street Lighting PFI Contractor Bouygues E&S.

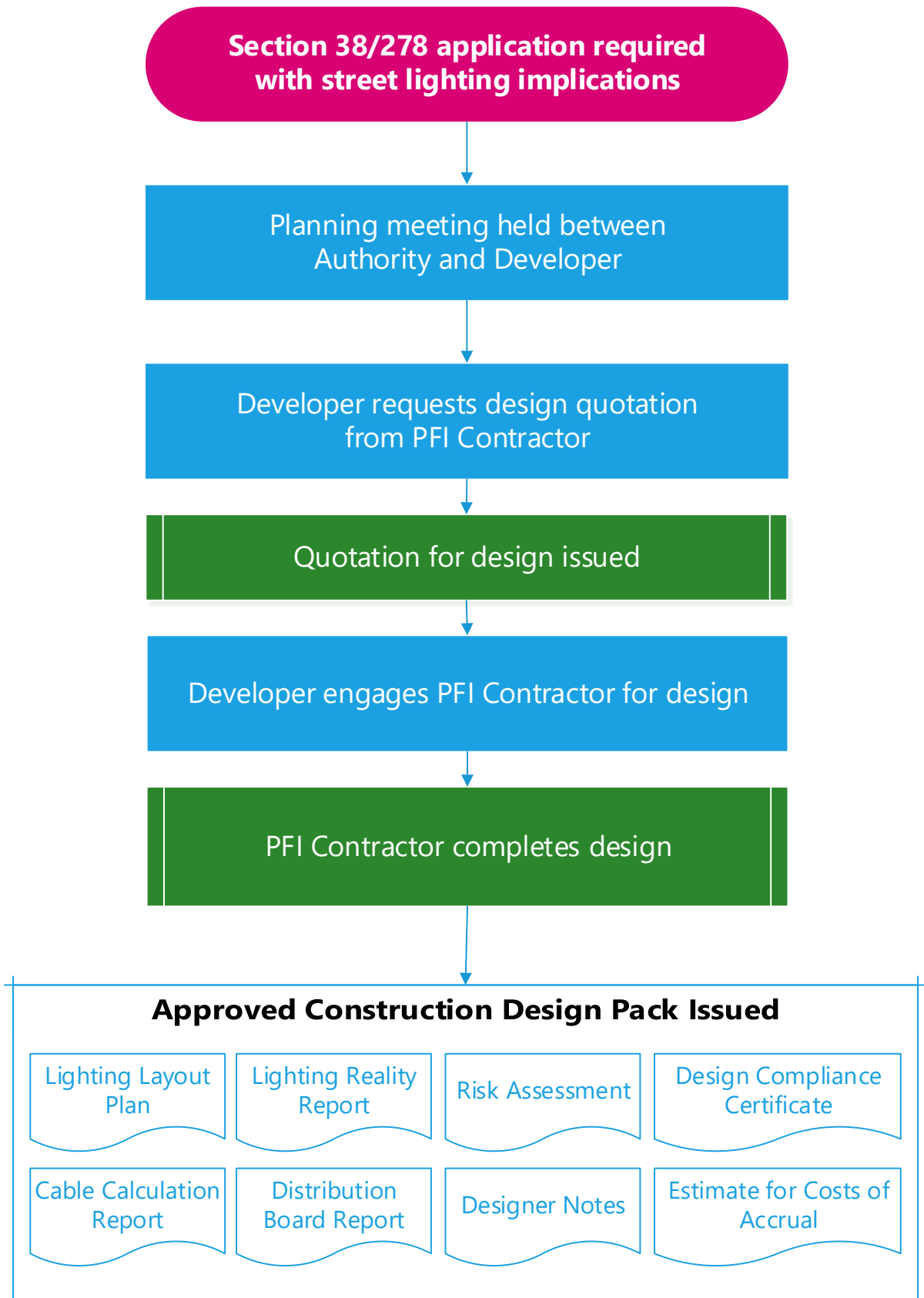
Installations which do not meet the Council's specifications will be subject to additional delays, commuted sums and additional accrual costs prior to adoption.

Equipment may also possibly need to be replaced as part of the adoption if incorrect equipment is installed.

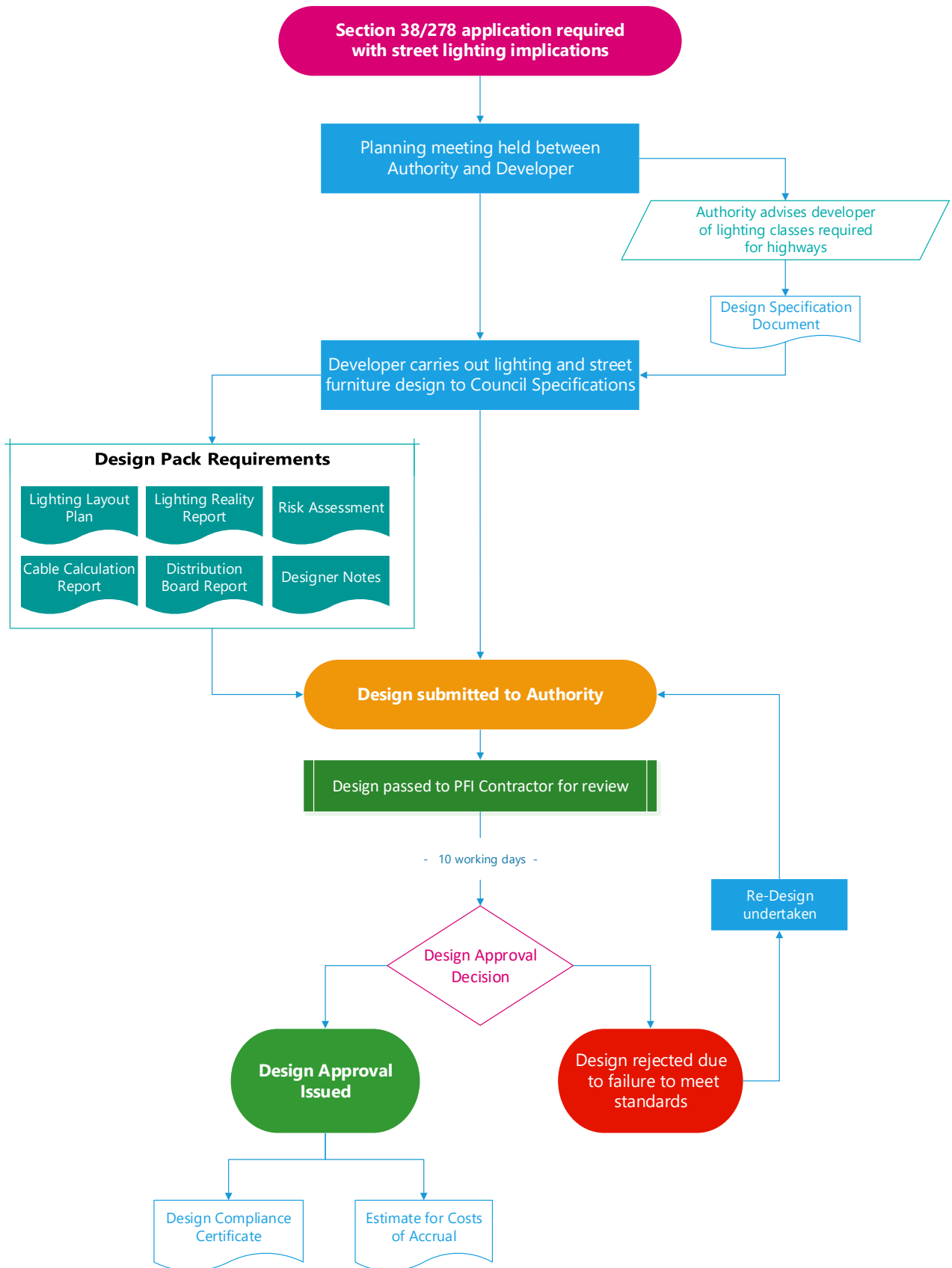
It is worth noting that additional costs can also result from the liability for energy costs, which will remain the developer's responsibility up until formal adoption.

The following processes outline the requirements for design when using 3<sup>rd</sup> party designers and the simplified process if utilising the Council's own design resource with Bouygues E&S.

#### 4.1 Usual process for design



4.2 Process for designs not carried out by the Council/PFI Contractor



### 4.3 General Design Information

The preferred light source for all lighting equipment within the borough shall be LED in type. SON-T lighting will not usually be accepted unless where lighting is being altered on an existing network. This will be confirmed through consultation and agreement with the authorities Street Lighting Engineer.

It should be noted that only through the start of the design process might it become clear that "Off-Site" alterations may be required to the street lighting network.

Any lighting design for developments will be in accordance with BS 5489\_1-:2013 Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas

Lighting columns shall be sited at the back of footways or verges and against the property line where the footpath is no wider than 3 metres. Where the footpath is greater than 3 metres the new columns shall be sited at a distance of no less than 0.8 metres from the edge of a Carriageway or hardened edge strip.

For designs undertaken by Developers, the Street Lighting Engineer will provide a class assessment and design brief as part of the technical approval procedure. If the developer considers that an alternative class is appropriate then it should be referred in writing to the Street Lighting Engineer whose decision will be final and binding.

All final designs submitted for approval shall be accompanied by computer-aided design drawings, lighting calculations indicating the surround ratio, the maintained average minimum and minimum levels of illuminance or luminance as appropriate, the achieved TI value for luminance calculations, along with the achieved uniformity factors as applicable to each, specification sheet justifying the selection of all lighting classes and any other design constraints or parameters and a column schedule detailing all proposed and existing equipment located within the scheme extents

Isometric diagrams containing contour lines for 1 lux, 3 lux and 5 lux as a minimum may also be requested if there are objections to the proposed lighting.

Full details of the design pack requirements will be explained within the predesign meeting.

Any use of any non-standard road lighting lanterns or use of flood lighting is to include intrusive light calculations and prior approval by the authority.

Variations in bracket arm length will not be permitted and post top mounting is to be encouraged.

Where an LED light source has been utilised calculation shall be based on an overall maintenance factor determined by a high pollution maintenance factor taken from BS5489-1:2013 Table B.1 and the manufacturer's LED light loss factor specification. The designer should assume a maintenance regime of 6-year intervals for luminaire cleaning and inspection to tie-in with the requirements for electrical inspection and testing of the latest edition of BS7671- Requirements for Electrical Installations.

Where a SON-T light source has been utilised, it shall have a minimum Ra value of 20, and calculation shall be based on an overall maintenance factor determined by a high pollution maintenance factor taken from BS5489-1:2013 Table B.1 and the manufacturer's lumen output specification. The designer should allow a 0.9 ratio for lamp lumen depreciation and assume a maintenance regime of four yearly bulk clean and change.

As previously mentioned, the choice of light source will be at the complete discretions of the Street Lighting Engineer.

### **Lighting Layout Drawing Requirements**

Typical requirements for Lighting Design construction - drawings shall;

- I. Be no larger than A1
- II. Be at a scale of 1:500 or less (i.e. 1:200 etc.)
- III. Have a minimum text size of 2.5mm for A1 drawings and 1.8mm for A3 drawings
- IV. Have cut lines where required
- V. Have a North point
- VI. Shall have a key where symbols can be identified when the drawing is printed in colour or black and white
- VII. Show overhead lines (LV, HV and BT), and major services (e.g. HV cable, High/medium pressure gas, fibre optic cable etc.)
- VIII. Highlight significant hazards that the installer of the street lighting furniture and Lighting

## **4.4 Prospective Residents Liaison for Housing Developments**

The developer shall show all lighting units and other illuminated equipment (signs and bollards) on all construction/layout plans (including sales and legal/ conveyancing literature) in order that prospective residents are aware that there may be equipment placed adjacent to any given plot or property.

The Authority will not involve itself in any dispute between the developer and the prospective resident. Neither will the Authority entertain any request to move or alter any equipment arising from any such dispute arising from the developer not appraising the prospective resident of the proximity of any equipment in relation to a plot or property.

## 5 Electrical Design

All columns will have a direct, Distribution Network Operator (DNO) electricity power supply. All signposts and beacons further than 10 metres from a column and not within the carriageway shall have a direct, DNO electricity power supply.

All direct DNO power supplies for connection to the street lighting system will be arranged and paid for by the developer. These connections can be carried out by the current Authority Service Provider, Bouygues E&S due to their status as an independent connections provider (ICP). Connections can also be provided by the DNO or any other qualifying ICP contractor.

All signposts and beacons within 10 metres of a column will be fed via a private network of duct and armoured cable. All private cable networks shall be identified and labelled. All private cable networks shall be looped within assets. The use of below-ground cable joints is not permissible.

All equipment erected within the kerbstones of the roadway, for instance, on an island, shall be fed via a private network of duct and cable from an adjacent column. Should a suitable column not be available a mini pillar will be substituted which shall have a direct DNO power supply. All private cable networks shall be identified and labelled.

All traffic, trans-illuminated bollards shall be base lit. The shells shall be flexible and deformable and consistent in design to those already installed within the borough. Bollards shall always be fed first as a priority over beacons and signs. Source lighting shall be LED. Bollards shall be specified.

All units shall have secondary isolation with fuse discrimination and composite double pole units to take multiple fuseways if required. Secondary isolation shall be specified.

## 6 Material and Equipment Specifications

All products complying with British Standards are not necessarily acceptable and therefore proposals must be submitted at an early stage to the Engineer for approval.

If you wish to use non-standard equipment, you must obtain permission to do so from the Authority. We may also require you to pay a commuted sum to cover future maintenance costs.

### 6.1 Corrosion Protection

All lighting columns, sign poles, Belisha beacons and feeder pillars shall benefit from the Authority's specification for corrosion protection of street furniture.

Assets are to be galvanised to BS1461 with a minimum average coating of between 100-120 microns.

In addition to the galvanising process the apparatus will be treated with a T-wash solution and one coat of Thermoplastic cross-linked co-polymer applied using an inline electrostatic spray to the external surface. This will provide a uniform coating of not less than 600 microns.

This will provide a manufacturers life expectancy of 35-40 years to first maintenance for columns and poles.

Additional root protection shall be provided a root protection system comprising Two Pack Extended Cure Epoxy MIO (Item 121) applied at 100 microns dry film thickness and Two Pack Glass Reinforced Epoxy applied at 200 microns dry film thickness, giving a total dry film thickness of 300 microns.



## 6.2 Lighting Columns and Brackets

Lighting Columns shall be in keeping with the local topography of the area and be in scale and sympathy with adjacent buildings.

No Lighting Column shall exceed six (6) metres in height in residential areas. The only exception will be where the prior approval of the Authority has been obtained. No approval will be given (and no consultation shall take place) where roads are less than thirteen (13) metres in width. Where such approval is required, the Developer and Designer shall demonstrate:

- a) that the use of Lighting Columns in excess of six (6) metres will not be detrimental to the aesthetics of the road by means of a full consultation exercise involving local residents and Councillors has been carried out and the outcome of such consultation clearly demonstrates that an alternative solution would be acceptable to all residents and Councillors; or
- b) that the existing height of columns exceeds six (6) metres in height;

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

All columns, poles, posts and brackets are to be galvanised and have further root protection. All columns, poles, posts and brackets are to be erected complete with a factory finish in the appropriate colour. All columns, poles, brackets and posts are to be tagged and/or numbered to allow for an audit trail back to manufacturing batch. All columns, poles, posts and brackets shall be specified.

Types and sizes of columns and brackets will be supplied to provide a mounting height for the lantern above the carriageway as specified.

All columns, poles, posts and brackets shall conform to BS EN 40.

Lighting columns manufactured from alternative materials including stainless steel, extruded 6000-grade aluminium and polymer composite materials may be considered based on application but would be subject to additional approval by the Engineer.

### 6.2.1 Column and Bracket Data Sheets

When columns are offered for adoption the developer shall provide a design and check certificate for each column type in the data sheet format below as per the Specifications for Highway Works Appendix 13/2:

# TYPICAL LIGHTING COLUMN AND BRACKET DATA - SHEET 1

Name of Manufacturer:

Column Reference No.

Revision No.

Date

NAME OF CONTRACT

**Part A General**

Column nominal height  (m)

Column material

Material design strength  (N/mm<sup>2</sup>)

No. of door openings

Door opening size - Height  (mm)

- Width  (mm)

Cross-section of base compartment	Height (mm)	Width (mm)	Depth (mm)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Acceptable positions of bracket arms relative to door position

Door Opening

Any

Manufacturer's drawing ref. no.

(11/03) Corrosion protection (steel columns only) - basic system type (sub-Clauses 1911.9 and 1911.10)

(11/04) Reference Wind Velocity  $V_{ref.o}$  as defined in BS EN 40-3-1

m/s

Details of signs and attachments allowed for in the design Area (mm<sup>2</sup>), Eccentricity (mm), Height

- additional sacrificial steel thickness, above that needed in the design, from the bottom of the column to at least 250 mm above the anticipated ground level

(mm)

**Part B Foundation Data**

Planted base

Planting depth  (m)

Standard Soil Type Factor G

630	390	230
<input type="text"/>	<input type="text"/>	<input type="text"/>

Diameter of concrete surround (if any)

(1103) Flange plate

Bolt hole centres	Bolt Hole diameter	Design load/bolt
<input type="text"/> (mm)	<input type="text"/> (mm)	<input type="text"/> (N)

Relevant forces and moments at ground level

Line of action of max. moment relating to door opening

NOTE: For flange plates with slotted holes a diagram shall be included with this Data Sheet.

# TYPICAL LIGHTING COLUMN AND BRACKET DATA - SHEET 2

(11/03) Part C Acceptable Luminaires

Luminaire: Maximum Characteristics

	(11/04) Terrain Categories as defined in BS EN 40-3-1					
	I	II	III	IV		
Post Top Column	Luminaire Max Wt (kg)	(11/04) Maximum Windage Area (m <sup>2</sup> ) for Terrain Categories as defined in BS EN 40-3-1				
	Luminaire Connection					
	Diameter	Length				
Single Arm Bracket Column:	Luminaire Lever Arm (mm)					
	Due to wt. of luminaire	Due to windage on luminaire				

Bracket Projection (m)	Ref No.	Drawing No.	Material		Luminaire Fixing Angle	Luminaire Connection		Luminaire Maximum Wt (kg)	(11/04) Maximum Windage Area (m <sup>2</sup> ) for Terrain Categories as defined in BS EN 40-3-1				
			Grade	Design Strength (N/mm <sup>2</sup> )		Diameter (mm)	Length (mm)						

Double Arm Bracket Column:	Luminaire Lever Arm (mm)	
	Due to wt. of luminaire	Due to windage on luminaire

Bracket Projection (m)	Ref No.	Drawing No.	Material		Luminaire Fixing Angle	Luminaire Connection		Luminaire Maximum Wt (kg)	(11/04) Maximum Windage Area (m <sup>2</sup> ) for Terrain Categories as defined in BS EN 40-3-1				
			Grade	Design Strength (N/mm <sup>2</sup> )		Diameter (mm)	Length (mm)						

**Part D Certification**

It is certified that the information given in this Data Sheet has been obtained in accordance with Departmental Standard BD 26 (DMRB 2.2.1) and the Specifications.

Signed on behalf of the Contractor ..... Date .....

## Instructions for completion of data sheets

### General:

1. When information is not required a dash shall be inserted in the appropriate boxes.
2. Where a Data Sheet is amended it shall be given a new revision number with a date.
3. The revision numbers shall be consecutive letters of the alphabet, commencing with "A".
4. The date of the revision shall agree with the date of the Contractor's signature.
5. The column or bracket material shall be steel, aluminium, glass fibre reinforced plastic or any other suitable material.
6. The material design strength shall be the minimum specified in the design. Where more than one material is used values for all materials shall be given.
7. All relevant entries shall be made on the Data Sheet before the document is certified by the Contractor.

### Column Data

8. The number of door openings shall agree with the manufacturer's drawing.
9. The cross-section of the base compartment shall be indicated by a dimensioned diagram/sketch.
10. The acceptable positions of bracket arms relative to the door position shall be indicated on the diagram. Where all positions are acceptable the box noted "ANY" shall be ticked.
11. Where concrete is necessary around the planted base the minimum diameter shall be entered.
12. For flange bases, all forces and moments used in the design of the foundations, anchorages and attachment systems shall be given.
13. The corrosion protection system used on the column when new shall be recorded. Where additional steel is provided for sacrificial purposes the amount shall be recorded.
14. The signs and attachments surface area, eccentricity from the centre line of the column to the centre of area of the sign and height above ground level to the centre of area of the sign shall be stated.

### Bracket Data

15. The luminaire lever arms, weight and maximum windage area quoted shall be based on the most adverse loading on the bracket when it is attached to any of the columns quoted in the compatible column sections.

(Note: The luminaire lever arms are the horizontal distances from the centre of gravity of the luminaire and, if applicable, the centroid of the windage surface area to the end of the bracket joint).

## 6.2.2 Attachments to Columns and Posts Signs

The Authority reserves the right to fix, or to instruct or permit others to fix Attachments onto street lighting columns, sign posts or any other posts (including signs fitted at the time of installation, or retrospectively).

All columns and posts installed shall, in addition to the lighting equipment attached, be designed to carry additional signs up to the area specified in Table 1 below.

**Table 1: Design Requirements of Columns and Posts in relation to additional signs to be attached**

Column / Post Height	Sign area	Sign position
Columns up to and including 6m	0.5sq.m	Symmetrical or Offset
Columns over 6m and up to and including 9 metres	1.0sq.m	Symmetrical or Offset
Columns over 9 metres	2.0sq.m	Symmetrical or Offset

The position of offset signs, and the height of symmetrical signs shall be as in clause 7 of BD 26/99 or its relevant successor standard, and the other provisions of clauses 7.1 and 7.2 of that document shall apply.

## 6.2.3 Lighting Columns (Tubular Steel Raise and Lower)

Where vehicular access for maintenance is not possible or desirable hinged columns shall be installed. The developer may be required to install hinged columns in other areas.

All columns shall be erected in accordance with the manufacturer's instructions and the oiling point provided for the lubrication of the hinged cam shall be attended to during erection.

Any special equipment required to raise and lower columns shall be provided by the Developer and used in full accordance with the manufacturer's instructions.

Hinged columns shall be specified.

## 6.3 Luminaires / Lanterns

### All lanterns to be specified.

All new lighting within the borough is to be designed based on LED light sources and shall conform to IEC 60598-1.

#### 6.3.1 General Specification

Luminaires shall be supplied with an SR Socket suitable for the CMS system used on the network where the luminaires will be installed.

Luminaire correlated colour temperature shall be 4000°K and have a CRI of no less than Ra. 60.

Luminaire efficacy must be above a minimum of 90 lm/W

LED driver/s, any other internal parts and a design life of 20 years/100,000 hours.

Luminaires shall be Class I insulation and be made of Aluminium.

Luminaires for road lighting shall have a degree of protection rating of at least IP66 to BS EN 60529 for Luminaires, LED optics and LED Drivers. They should also have an IK Rating (Impact Resistance) of IK08 or better.

Luminaires shall be of a totally enclosed design, shall be of sound construction and be capable of being easily dismantled for maintenance. LED drivers shall be replaceable throughout the design life of the luminaire.

Luminaires shall be fitted with integral driver, contained within a separate compartment to the LED's.

The canopy, hinges, toggle catches, captive screws and nuts shall be of a cast aluminium or similar non-corroding material.

The luminaire shall have a tilt adjustment of -10 to +5 degrees to enable adjustment when fitting to the existing bracket arms.

Minimum useful life should be L90B10@100,000hrs at 25deg C ambient temp. A six-year cleaning cycle should be used for all maintenance factor calculations.

Luminaires to be EMC Test Compliant / RoHS Compliant / CE compliant / WEEE compliant.

Luminaires are to be supplied with approved unmetered supply charge codes (ELEXON Codes). LED shall be tested in accordance with IEC/PAS 62717(LED Modules) and 62722(LED Luminaires) performance requirements.

All lanterns shall have a Luminous Intensity class of G4 or better. All lanterns shall have a Glare Index class of D4 or better. All lanterns used on M and C classification roads or areas shall have flat glass protectors. All lanterns used on P1 and P2 classification roads or areas shall have either low profile bowls or flat glass protectors, or curved tempered glass or dished polycarbonate type bowls.

### 6.3.2 Warranty Requirements

LED luminaires shall have a warranty of no less than 12 years on all parts including luminaire body, For the acceptance of the unit, the developer must supply a 12-year warranty from the manufacturer that is either parent company or insurance bond backed that is capable of novation to the PFI Service Provider.

Warranties and guarantees shall be retained by the PFI Service Provider for and on behalf of the Authority under the PFI Agreement.

### 6.3.3 Drivers and Control Gear

It is the preference of the Authority that all new lighting to be installed within the borough is to be designed to comply with the Zhaga Consortium smart outdoor connected lighting specifications. This ensures universal compatibility with all LED luminaires with a standardized Zhaga socket – ensuring a level of future-proof investment for the borough.



Smart LED drivers are now available such as Philips SR and OSRAM DEXAL drivers with approved drivers listed below:

All Control Gear shall conform to IEC 61347-2-13.

The installer must ensure that the equipment is not connected to electrical supplies unless they comply with the requirement of BS EN 50160.

The insulation test shall be carried out in accordance with the requirements of EN 60598-1.

Where required shall be pre-programmed as per Design Specification Document.

LED drivers shall be supplied with Constant Light Output (CLO) function.

## 6.4 Lighting Control and Switching (CMS System)

Unless otherwise stated all lighting shall be controlled by the authorities CMS and when the scheme is handed over for adoption the relevant information should also be provided to allow the service provider to accrue the units onto the CMS database. Switching will then be programmed by their service provider and this charge for this will be included in the Pre-design meeting fees.

### 6.4.1 Enfield Street Lighting Central Management System (CMS)

Enfield Council current controls and monitors all street lighting through a Central Management System. All new street lighting to adopted by the Authority must be placed on this system for future maintenance and control.

The system is provided by Signify (formally Philips Lighting) and utilises control nodes installed onto each luminaire. A CMS node is required to be mounted to the upward-opening canopy of every luminaire via a Zhaga book18 low voltage socket. The node will communicate with the Luminaire driver using the DALI2 communications protocol.

Nodes must be ordered using a specific part code unique for Enfield which takes account of our current agreement with Signify and includes for our ongoing connection costs.

Contact must be made with the Local Authority Lighting Service Provider prior to any installation of CMS nodes to ensure that the CMS node is correctly configured;





#### 6.4.2 Photo-electric Control Units (PECU)

Photo-electric control will still be required under some rare circumstances where the use of CMS control is not appropriate. In these cases, the preferred method of control is via Photo-electric Control Units in conjunction with pre-set dimmable drivers.

Where PECUs are used they shall comply with the following requirements:

- Have an LED pulse-encoded to indicate current operating status
- Be one part and SR Socket based or if this option is no available, 7 pin NEMA socket type. Miniature style with mounted in luminaire canopy may be appropriate for certain heritage or special treatment lighting (where agreed by the lighting authority).
- Be fully solid state with a self-test on initial power up with an output via a bi-stable relay and a filtered silicon photo diode sensor.
- Be protected to at least IP 65.
- Have a power consumption of less than 0.25 watts but preferable a zero rating under UMSUG.
- Be capable of switching a 5A load.
- Include a delay device so that the lamps are not switched on by transient changes in the illuminance, switching delay 10 - 20 seconds.
- Sealing rings shall be provided to prevent dirt and moisture from entering into the photocell and luminaire.
- Have sensor drift of zero over 10 years.
- Have a minimum guarantee of 10 years.
- Comply with BS EN 60068 and EN 50081-1 Emissions and EN 61000 Immunity.
- Have an operational temperature range of -20 °C to + 80 °C.

Required switching profiles for the installation shall be communicated in the Design Specification Document.

#### 6.5 Wiring, Earthing and Bonding

All installations shall conform to the latest edition of BS7671 IEE Wiring Regulations.

All cables must be BASEC approved and be manufactured with copper cores.

All wiring within the units shall be with 3 core 2.5 mm butyl flex. Bonding to columns/posts from the earth marshalling point shall be with 6mm twisted multi-strand single core cable. No redundant colour schemes for cabling are to be used.

All cables must be correctly colour coded. Unsupported lengths of wiring must be kept to a minimum and not allowed to come into contact with components by their freedom of movement.

Double insulated 6mm<sup>2</sup> tails with inner and outer sheaths of correct colour coding and of sufficient length to reach from the secondary isolator unit to the service cut-out, must be provided.

All metal work other than that intended to carry current must be earthed using PVC insulated copper cable colour coded green and yellow.

A 1.5mm<sup>2</sup> circuit protective conductor must connect the earth terminal in each luminaire to the earth terminal associated with the service cut-out unit.

A separate 2.5mm<sup>2</sup> circuit protective conductor must connect all metal enclosures of all electrical components to the main earth terminal.

All extraneous conductive parts, as described in BS 7671 must be bonded to the main earth terminal using an equipotential bonding conductor of 6mm<sup>2</sup>. Column doors must be bonded using 6mm<sup>2</sup> flexible cable.

All earth connections must be made by means of a crimped lug type termination.

All terminals are to be shrouded to a value of 1P2X.

Cable for wall mounted solutions shall be HI-TUF, PVC/PVC multicore Copper Cable 70°C to BS5497 rated 600/1000V. But note the intention is that for new installations not to use third-party building-mounted luminaires.

In private cable arrangements with two or more columns; supply point and the last column shall be earthed with an earth rod and pit arrangement.

Cable armouring shall be terminated in CET clamps.

#### 6.5.1 Cable Identification

All cables into (and out of) a unit shall be labelled to indicate where the cable comes from or what it supplies, respectively.

The supply source point of isolation shall also be indicated.

The labelling shall take the form of K-type markers on universal carrier strip fixed to the cable with using self-locking plastic cable ties or similar.

## 6.6 Feeder Pillars

Feeder pillars must be constructed to our standard detail. Further information is available on request.

Distribution fuse boards must be provided with an external earth, phase barriered and colour coded. They must be fitted with the same number of live and neutral bus bar terminals as there are outgoing circuits, plus sufficient spare capacity to accommodate at least one extra circuit. (One three phase spare way on a three-phase distribution unit and one single phase spare way on a single phase distribution unit).

There must be at least 25% spare space on a backboard.

Pillar doors must be fitted with tamper-proof locks. All locks must be identical in pattern and 2 sets of keys must be provided.

All hinges and locks must be of stainless steel and on larger pillars, a staple and clasp suitable for a chubb security lock must be fitted.

Circuit details and wiring schematics must be laminated or made weatherproof by other means and placed in a pocket attached to the inside of the feeder pillar door.

The main earthing terminal in each feeder pillar must be connected to earth.

A durable warning sign indicating 'Danger 415 Volts' or 'Danger 240 Volts' and "Danger of Death" as appropriate, must be fixed to the front of the pillar together with an ID number to be provided by the PFI Contractor.

### 6.6.1 Mini-Pillars

For mini-pillars, a minimum wall thickness of 3mm is acceptable. They must comply with IP34 of BS EN 60529 and include a full-size backboard of varnished marine plywood at least 15mm thick or other approved non-hygroscopic material.

### 6.6.2 Standard Pillars

Feeder pillars of up to 600mm wide shall be fabricated from a minimum of 3mm steel and larger pillars shall be fabricated from a minimum of 5mm steel.

A hard standing must be provided in front of any pillar in the verge to enable safe access, the size to be agreed.

Internal equipment located in feeder pillars shall be housed in an arrangement of IP54 modular enclosures, occupying no more than 75% of the backboard, with at least 10% spare capacity in the enclosures, and 20% additional electrical capacity.

Feeder pillars shall incorporate an RCD socket outlet and shall be connected to the DNO cut-out via an isolation switch.

There shall be a lockable isolator wired in between the DNO supply and the distribution panel and shall be rated for its intended use in accordance with BS7671.

The following standards should be met:

- Fuse switch disconnectors BS EN 60947-3
- Switch disconnectors BS EN 60947-3
- Distribution boards BS EN 60439-3
- Fuse holders BS88-2.2
- Fuse links BS88-2.2
- Miniature circuit breakers BS EN 60898 or BS EN 60947-2
- Contactors BS EN 60947-4-1
- RCCBs BS EN 61008-1
- RCBOs BS EN 61009-1

## 6.7 Underground Cables (Private Network Cabling)

Underground cables shall be laid in duct except where they leave the duct to enter the cable slot of the apparatus, and consist of stranded copper conductors, XLPE insulated, PVC extruded bedding, a concentric layer of steel wire armour, overall PVC sheathing suitable for operation in an earthed system and of rated voltage 600/1000 volts at 50HZ, all in accordance with BS 6346 for metric cable, have BASEC approval under the product certification scheme and produced by a manufacturer who has been awarded a Certificate of Assessed Quality Management, to BS 5750, by BASEC.

All cores shall be of equal cross-sectional area of 6sq mm minimum and be of such a size that the requirements of the current IEE Wiring Regulation, BS 7671, are met and allow for a disconnection time not exceeding 5 seconds.

All underground cables (except Distribution Network Operator cables) shall be identified as to their origin and destination.

All private cables shall be labelled (source and destination) as shown in the standard details All cables into (and out of) a unit shall be labelled to indicate where the cable comes from or what it supplies, respectively.

The supply source point of isolation shall also be indicated.

The labelling shall take the form of K-type markers on universal carrier strip fixed to the cable with using self-locking plastic cable ties or similar.

All incoming and outgoing private supplies shall be connected securely using C.E.T glands.

Buried cable shall have a minimum length of 2m left as a loop at all feeder pillars.

All supplies to traffic signs and bollards shall be sub-fused.

**Cable joints are not allowed on the network unless agreed by the Lighting Authority. Where the cable joints are authorised by the lighting Authority the location of the cable joint shall be marked with a joint marker block and recorded on the "as build" drawings.**

### 6.7.1 Cable Ducts

Cables shall be installed in ducts under all carriageways, vehicular crossings, private drives and planted areas incorporating shrubs, bushes, trees, etc.

Cable ducts across private drives and planted areas as above shall have an internal diameter of not less than 50mm and a minimum wall thickness of 5mm and be manufactured from polythene.

Cable ducts across carriageways, vehicular crossings or other areas subject to use by heavy vehicles shall have an internal diameter of not less than 100mm and a mean wall thickness of 2.5mm and be manufactured from UPVC.

All ducts used for the installation of public lighting cables shall be through-coloured orange and have the legend 'STREET LIGHTING' printed or embossed along its length at intervals not greater than 1m.

Where more than one duct is to be installed in a trench the clearance between ducts shall be as the manufacturer's recommendation.

Where ducts are required under any footway/footpath or carriageway under construction all work on laying the duct and installing such public utility services as may be required must be completed prior to the final surfacing being laid.

Where 100mm cross road ducts and 50mm ducts across private drives (footway ducts), are installed they shall extend 600mm beyond each kerb face, and either side of the drive respectively. A suitable draw wire shall be installed and each duct shall be stoppered until the cables are drawn in.

The position of 100mm cross road ducts shall be indicated with permanent markers set in the kerb backings immediately over the centre line of the duct on each side of the carriageway under which they are constructed. The markers shall be identified with the distinguishing letter 'L'.

Each duct must be fitted with a pigmented, stranded polypropylene or equivalent rot-proof material draw rope of 5kN breaking load, the ends of which must project from the duct and be secured to marker posts or blocks. The ends of the duct must be sealed by removable stoppers immediately after it has been laid.

#### 6.7.2 Plastic Tape for Cable Marking

Plastic tape shall be laid above all cable runs, and shall be at least 150mm wide yellow self-coloured PVC or polyethylene not less than 0.1mm thick printed 'STREET LIGHTING CABLE' along its full length. The wording shall occur at least at 1m intervals and shall occupy not less than 75% of the available length.

## 6.8 Illuminated Traffic Sign

Illumination of sign plates shall be external and overhead mounted unless directed otherwise by the Lighting Authority. One piece light units with integral brackets shall be mounted directly on the sign post and/or on luminaire support posts or as directed by the Lighting Authority.

All lit traffic signs shall comply with Class RA 2 of BS EN 12899 and sections 7.4.1.2 – Mean Illuminance and 7.4.1.2 – Uniformity of Illuminance.

All sign and luminaire fixings shall have a guarantee of 25 years on site life.

Signs which require illuminating shall be mounted on a wide-based post

The orientation of sign post doors shall be in accordance with Standard details.

### 6.8.1 Attachments on Columns

Where signs are to be attached to Lighting Columns, the column shall be designed by the manufacturer to take the sign size, if the sign is larger than maximum as specified in this specification, this must be highlighted on the drawing and in the scheme contract documents.

Signs may be attached to existing columns subject to the following:

- a) The sign is no larger than the attachment size that the column is designed for. Typically this will be 0.3m<sup>2</sup>.
- b) Approval is granted by the lighting authority.

### 6.8.2 Sign Posts

Sign Posts shall conform to BS EN 40, BS12899

Caps shall be applied to the top of the post to prevent the ingress of water.

Posts shall be galvanised and finished to the same paint specification as lighting columns

### 6.8.3 Passively Safe Sign Posts

Tubular passively safe sign posts shall be provided with a purpose made post cap, coloured to match the post, to prevent the ingress of water.

Only signposts that have been independently tested by an approved testing organisation and certified to comply with the appropriate class in BS EN 12767 shall be permitted.

Where signs on passively safe posts require power supply cables for illumination, the cables must be supplied with a pull-out plug or equivalent arrangement in accordance with BS EN 60309 Parts 1 and 2 and paragraphs 1.2 and 1.3 of TD 89/08.

#### 6.8.4 Wide Based Sign Posts

The housing shall have an aperture of not less than 400mm x 115mm and be fitted with a weatherproof metal door having a vandal-resistant lock with key. The door and housing shall have the same finish as the post, both inside and out.

Wide based posts shall have an access door and cable entry slot. The cable entry slot shall be 75mm wide and 150mm high and shall be 500mm below ground level.

The support posts and fittings shall comply with the requirements for sign posts and shall be fixed directly to the sign stiffening members.

Caps shall be applied to the top of the post to prevent the ingress of water.

#### 6.8.5 Traffic Sign Luminaires

Luminaires should be selected according to the compliance requirements of EN 12899 Parts 1 & 2

#### 6.8.6 Sign Plates

Signs shall comply with Class RA 2 of BS EN 12899 with a retro-reflective material with a warranted life of not less than ten years and shall fulfil the requirements of BS EN12899-1:2007.

Sign plates must have a guaranteed on-site life of not less than 25 years and shall be made from composite material.

All signs shall be manufactured and erected in accordance with BS EN 12899-1:2007, Traffic Signs Regulations and General Directions 2016, Traffic Signs Manual, Specification for Highway Works, location plan and associated sign schedules and the following specification.

Signs shall be stiffened such that post fixings may be positioned at any point across the width of the sign without the need for drilling of the stiffening to permit erection onto posts of unspecified spacing

### 6.9 Bollards

All bollards shall be Self-righting.

All plain face bollards shall be reflective.

Where there is a requirement for illuminated bollards, LED bollards with solar power and below ground battery packs are to be used. In addition to the bollard itself, any batteries must have a design life in excess of 5 years. A 5-year manufacturer's warranty is also required.



## 7 Identification numbering

Columns, sign posts and beacons shall be identified by using weatherproof self-adhesive white plastic tiles with black numbers of 50 x 50mm (for columns or posts less than 8m), or 85 x 85mm black numbers (for columns and posts 8m and over). These are to be fixed at 2.0-metre height and arranged vertically facing the road or footpath.

Signs not affixed to a separate post shall have their identification number affixed to the reverse of the sign plate and arranged vertically.

Traffic bollards shall have their identification number affixed to the reverse of the shell in the top left-hand corner and arranged vertically. An alternative location may be selected by the Street Lighting Engineer should the traffic bollard have multiple faces.

Feeder pillars and electrical enclosures shall have their identification number affixed to the side facing the road as high as possible.

The numbering schedule is to be agreed by the Engineer at the design approval stage prior to construction. In addition, labels will identify the owner and maintenance operator and include a contact telephone number for reporting faults.

Templates for number are available on request.

The identification badge must clearly display:

- (i) the unique column reference number;
- (ii) the logos of the Authority and the Service Provider; and
- (iii) the free phone telephone number for the Customer Care System;



## 8 Special Requirements for Conservation and Heritage Areas

All products complying with British Standards are not necessarily acceptable and therefore proposals must be submitted at an early stage to the Engineer for approval.

Additional requirements for columns may apply when installing in areas where festive lighting is to be deployed. This can include additional requirements for electrical connection such as external IEC 60309 sockets (commando sockets). These columns are often much more heavy duty allow for catenaries and other attachments.

Details of full design requirements for columns in any special areas will be confirmed by the Council's Engineer during the pre-design meeting.

## 9 Current Approved Materials

### 9.1 Luminaires

Luminaires shall be sourced from the following families of luminaires as per the table below unless otherwise agreed with the Lighting Authority.

All Luminaires must be equipped with Philips Xitanium SR Drivers and come complete with the SR connector which is a universal socket from Zhaga Book 18.

Product Family	Manufacturer	Product Code
Digistreet	Signify/Philips	<u>TBA</u>
Kirium Pro	DW Windsor	<u>TBA</u>

### 9.2 Central Management System – CMS

Product	Manufacturer	Product Code
CityTouch OLC COM SR DG	Signify/Philips	LLC7270/00
CityTouch OLC COM SR LG	Signify/Philips	LLC7271/00

### 9.3 Photo-electric Control Units (PECU)

Product	Manufacturer	Product Code
PrecizionHALO – Zhaga socket Ultra low power PEC	Lucy Zodion	F6365-0001
ZCELL LED Part Night	Lucy Zodion	F6251

## 9.4 Lighting Columns

Product	Manufacturer	Product Code
<b>6M Post Top Functional Column</b>	Mallatite	<b><u>TBA</u></b>
<b>8M Post Top Lighting Functional Column</b>	Mallatite	<b><u>TBA</u></b>
<b>10M Post Top Lighting Functional Column</b>	Mallatite	<b><u>TBA</u></b>
<b>12M Post Top Lighting Functional Column</b>	Malatite	<b><u>TBA</u></b>
<b>6m Light Duty Base Hinged Column (Steel)</b>	Abacus	T061RLS
<b>8m Light Duty Base Hinged Column (Steel)</b>	Abacus	T081RLS
<b>6m Light Duty Base Hinged Column (Aluminium)</b>	Abacus	AL061RLS
<b>6m Light Duty Base Hinged Column (Stainless Steel)</b>	Abacus	SL51RLS
<b>6m Medium Duty Base Hinged Column (Steel)</b>	Abacus	T068RLH
<b>8m Medium Duty Base Hinged Column (Steel)</b>	Abacus	T088RLH
<b>6m Heavy Duty Base Hinged Column (Steel)</b>	Abacus	T067RLH
<b>8m Heavy Duty Base Hinged Column (Steel)</b>	Abacus	T087RLH
<b>10m Heavy Duty Base Hinged Column (Steel)</b>	Abacus	T107RLH
<b>12m Heavy Duty Base Hinged Column (Steel)</b>	Abacus	T127RLH
<b>Spring Counterbalance Unit</b>	Abacus	RLS168
<b>Hydraulic Counterbalance Unit</b>	Abacus	RLH168
<b>Hydraulic Counterbalance Unit (Heavy Duty Columns)</b>	Abacus	RLH2M

*Flange plated versions of the above are also acceptable if necessary due to locational factors.*

## 9.5 Electrical Feeder Pillars / Enclosures

Product	Manufacturer	Product Code
<b>Fortress Single Door</b>	Lucy Zodion	<b><u>TBA</u></b>
<b>Fortress Double Door</b>	Lucy Zodion	<b><u>TBA</u></b>
<b>Fortress Mini Pillar</b>	Lucy Zodion	<b><u>TBA</u></b>
<b>300 Series Feeder Pillars</b>	Tofco CPP	<b><u>TBA</u></b>

## 9.6 Traffic Sign Lights

Product	Manufacturer	Product Code
LUA LED Integrated Light Unit – 3x 1W LED (240V)	SimmonSigns	<u>TBA</u>
LUA LED Integrated Light Unit – 6x 1W LED (240V)	SimmonSigns	<u>TBA</u>
LUB 900 Integrated Light Unit (240V)	SimmonSigns	<u>TBA</u>
LUB 1200 Integrated Light Unit (240V)	SimmonSigns	<u>TBA</u>
LUB 1500 Integrated Light Unit (240V)	SimmonSigns	<u>TBA</u>
TMP Apollo Alpha Sign Light	TMP	<u>TBA</u>

## 9.7 Traffic Sign Poles

Product	Manufacturer	Product Code
<b>5M Post Top Functional Column</b>	Mallatite	<b><u>TBA</u></b>

## 9.8 Traffic Bollards

Product	Manufacturer	Product Code
Global Plus with Cabex System (Low Voltage)	Simmons signs	<b><u>TBA</u></b>
Contour Flexible Safety Bollard Shell	Simmons signs	<b><u>TBA</u></b>
Lumiflex 300 (Low Voltage)	Simmons signs	<b><u>TBA</u></b>
Lumiflex 600 (Low Voltage)	Simmons signs	<b><u>TBA</u></b>

## 9.9 Belisha Beacons

Product	Manufacturer	Product Code
Modupost	Simmons signs	<b><u>TBA</u></b>
Midubel	Simmons signs	<b><u>TBA</u></b>
Modubel	Simmons signs	<b><u>TBA</u></b>
Centrenol	Simmons signs	<b><u>TBA</u></b>

## 9.10 Heritage Style Lighting Columns and Brackets

Product	Manufacturer	Product Code
<b>6m Decorative Column with embellishments</b>	DW Windsor	6M Newcastle
<b>8m Decorative Column with embellishments</b>	DW Windsor	8m Edinburgh
<b>1m Scroll Bracket to suit 8m Edinburgh column</b>	DW Windsor	To suit 8M Edinburgh
<b>Swan Neck Bracket to suit Newcastle column</b>	DW Windsor	To suit Newcastle Column

*Flange plated versions of the above are also acceptable if necessary due to locational factors.*

## 10 Appendix 1 – Definitions

<b>Adoption or Adopted</b>	The transfer of ownership of Lighting Equipment on the satisfactory completion of a Developer Agreement from the developer to the Local Authority. Upon Adoption the Local Authority will accept responsibility for payment of the on-going energy charges and future maintenance costs at public expense. This can include Lighting Equipment for the Local Authority accepts responsibility for under the terms of a Commuted Sum.
<b>Central Management System or CMS</b>	Means an electronic system for transmitting, recording and analysing data to record electrical faults on street lighting apparatus and to control and switch light output and measure consumption.
<b>Commuted Sum</b>	A sum paid by the developer to the Local Authority for the extra-over through life cost of ownership associated with the installation of Lighting Equipment of a style or type that is a departure of the normal standard, not being a condition of the Local Authority as the Planning Authority. A commuted sum may also be applied where Lighting Equipment is transferred to the Local Authority, being installed in areas that are not Highway.
<b>Conflict Area</b>	Means any of: (a) complex road junctions; (b) roundabouts and mini roundabouts;
<b>Design Specification Document</b>	A document signed by Authority Project Representative outlining the standards to be achieved, the extents of the areas to be lit, the acceptable materials to be used and any requirements for alterations to existing Lighting Equipment affected by the development proposals.
<b>Developer Agreement</b>	An agreement between a developer and the local authority entered into under: (a) Section 38 of the Highways Act 1980; (b) Section 278 of the Highways Act 1980; (c) Section 106 of the Town & Country Planning Act 1990
<b>Environmental Zone</b>	As defined in Institution of Lighting Professionals: 'Guidance Notes for the Reduction of Light Pollution' available at <a href="http://www.theilp.org.uk">www.theilp.org.uk</a>
<b>HEA</b>	The Highway Electrical Association - formed by the amalgamation of ASLEC, the Association of Signals, Lighting and other highway Electrical Contractors and HEMSA (the Highway Electrical Manufacturers and Suppliers Association) in 2011.
<b>Highway or Adopted Highway</b>	Roads, footways, footpaths and cycleways and other areas owned by the Local Authority as the Highway Authority as defined in the Highways Act 1980.
<b>Lighting Equipment</b>	Includes: (a) Lighting on all roads, footways, footpaths and cycleways the responsibility of the Local Authority as the Highway Authority either now or as part of a Developer Agreement; (b) Amenity lighting, located in areas not defined as Highway for the purpose of lighting other public areas, access ways and footpaths etc., the responsibility of the Local Authority either now or as part of a Developer Agreement; (c) Internally and externally lit traffic signs and lit traffic bollards to meet the requirements of the Traffic Signs General Directions; (d) Subway and underpass lighting provided for roads and areas defined in a) and b); (e) Pedestrian (zebra) crossings on the roads and areas described in a); (f) Feeder pillars and cable networks whose purpose is to supply electrical energy to a), b), c), d) and e).
<b>LED</b>	Light-Emitting Diode

<b>Local Authority or the Authority</b>	London Borough of Enfield Council
<b>Ra</b>	Colour Rendering Index Ra (sometimes called CRI), is a quantitative measure of the ability of a light source to reproduce the colours of various objects faithfully in comparison with an ideal or natural light source.
<b>RCD</b>	Residual Current Device.
<b>Sensitive Areas, Heritage Areas or Special Treatment Areas</b>	<ul style="list-style-type: none"> <li>a) Countryside Heritage Areas;</li> <li>b) Environmentally Sensitive Areas;</li> <li>c) Areas of Outstanding Natural Beauty;</li> <li>d) Sites of Special Scientific Interest;</li> <li>e) Listed and Registered Historic Parks and Gardens;</li> <li>f) City, Town and District Centres;</li> <li>g) Statutory Conservation Areas, Scheduled Ancient Monuments, Listed and Registered Historic Parks and Gardens, Listed Buildings and areas abutting their boundaries;</li> <li>h) categories described above but some will have their own requirements;</li> </ul>
<b>PFI Contractor / Street Lighting Service Provider</b>	Bouygues E&S Infrastructure UK who is contracted by the Local Authority under a 25 year PFI Agreement to maintain and manage the street lighting.