Annex 3 – LCC Street Lighting Design Guide

Lincolnshire County Council

Street Lighting Design Guide

Version 6.0

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Street Lighting

Highways & Transportation

Place Directorate

Issue and Revisions Record

Revision	Date	Originator	Approved by	Details of Revision
1.0	April 2018	N Poundall	P Cant	First Edition
2.0	January 2019	N Poundall	P Cant	Minor amendments in accordance with Street Lighting Policy review
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5.0	November 2021	N Poundall	P Cant	General content reviewed with minor amendments
6.0	July 2022	P Cant	J Monk	Amendments to New Development Section in accordance with change in LCC Policy.

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Introduction

This is the first edition of the Lincolnshire County Council Street Lighting Design Guide. The purpose of this document is to provide guidance to street lighting designers, both internal and external, on the requirements and specification for street lighting installations within Lincolnshire.

It is intended that this document is read in conjunction with a number of documents (where applicable) consisting of, but not limited to:

- Lincolnshire County Council Street Lighting Policy
- BS5489-1:2020 Design of road lighting
- BS EN 13201-2:2015 Road Lighting Part 2: Performance Requirements
- Institution of Lighting Professionals Guidance Notes
- Institution of Lighting Professionals Professional Lighting Guides
- Institution of Lighting Professionals Technical Reports
- BS 7671:2018 Requirements for Electrical Installations IET Wiring Regulations Eighteenth Edition
- ILP GN01/21 Guidance Notes for the Reduction of Obtrusive Light

The above list of documents is not exhaustive and other documents may be relevant to the design of a specific street lighting scheme.

1. Design Guidance

1.1 Preliminary Tasks

The street lighting designer should receive a design brief from the client which clearly outlines the client's requirements for the scheme. If the brief is not clear, the designer should contact the client to discuss their requirements in further detail until both parties are satisfied.

Dependant on the nature and extents of the scheme, it may be necessary to consult with interested parties and stakeholders. These could include:

- Local residents and businesses
- Local councillors
- Utility companies
- Network Rail
- Highways officers
- Emergency services

Where the proposed street lighting scheme will affect existing street lighting equipment, the designer must visit the site to complete a site survey, and record all available information on the existing street lighting equipment: location; column type and condition; lantern types and condition; electricity supply details; illuminated signage equipment. The street lighting inventory may be able to assist with ascertaining certain information, although verification should always be completed on site.

Whilst on site, a risk assessment must be completed to capture the specific risks of the particular site. This will be required in order to complete a designer's risk assessment and hazard analysis (a requirement of CDM Regulations).

Information on hazards and constraints such as overhead lines, trees, hedges, bushes, driveways, accesses, bedroom windows and utilities should also be captured whilst on site.

Further to the information collected from the site survey, some further data collection may be required such as traffic flows and volume, crime statistics and accident statistics to support the lighting category selection process.

1.2 Lighting Category Selection

The lighting category selection process should be undertaken in conjunction with BS 5489-1:2020 Annex A Selection of Lighting Classes, with the performance requirements for traffic routes as per BS EN 13201-2:2015 Tables 1 & 2, and performance requirements for subsidiary roads as per BS EN 13201-2:2015 Table 3.

The chosen lighting class or classes (if the scheme covers an area with varying usage characteristics), should be documented and recorded in the scheme file (electronically or otherwise) using the Lighting Category Selection Form (Appendix A - available on request from Lincolnshire County Council Street Lighting).

1.3 Application of Adaptive Lighting Techniques

It is the intention of Lincolnshire County Council to provide the right level of light, in the right place, at the right time by applying appropriate and carefully selected adaptive lighting techniques. This will ensure the Council continue to deliver an efficient and effective street lighting service which provides best value to the residents of Lincolnshire.

Lighting in Lincolnshire is expected to be part of a sustainable network by managing energy consumption to a minimum, including applying the hierarchy described in the Street Lighting policy if lighting is required: part night lighting, dimmed lighting and as a last resort all-night full lighting.

1.3.1 Part Night Lighting

Street lighting in many areas of the County (generally but not exclusively residential areas), will be Part Night switched. Street lighting burning hours for Part Night lighting will be:

- Dusk (35 lux) until 00:00
- 06:00 until Dawn (18 lux)

Street lighting will not operate between 00:00 and 06:00.

However it is not appropriate to implement Part Night lighting in certain situations; therefore, lights will remain switched on all night where the location:

- Has a significant record of night-time road traffic accidents
- Has a significant record of night-time crime
- Has a care/nursing home, sheltered housing, or warden controlled accommodation
- Has an operational emergency service facility
- Has safety road features, such as traffic calming, speed humps, zebra crossings etc., as originally installed by the county council
- Is the centre of a major urban area or larger town as referred to in LTP4 with a night time economy
- Has permanent local authority or police CCTV surveillance equipment
- Is a footpath and/or cycleway that links to two separate roads that are lit all night
- Has a physically accessible AED defibrillator which has been notified to the Highway Authority
- Has been subject to third party Part Night reversal in accordance with LCC Street Lighting Policy Annex 1 Protocol for Reversal of Part Night Lighting

1.3.2 Dimming

Street lighting not in an area selected as suitable for Part Night (generally but not exclusively traffic routes, major urban routes, town centres and public amenity areas - usually mounted on lighting columns which are 8 metres or greater in height), shall remain lit all night and will be dimmed during the hours of operation, if appropriate.

The decision on whether it is suitable to dim the lighting on a particular site should be made in conjunction with BS 5489-1:2020 Section 4.3.4 and ILP PLG08 Guidance on the application of adaptive lighting within the public realm.

Where possible, it is desirable for the dimmed street lighting to comply with one of the Lincolnshire County Council approved dimming regimes, as below:

- 20:00 to 00:00 dimmed to 75% output then 00:00 to 06:00 dimmed to 50% output
- 22:00 to 06:00 dimmed to 75% output
- 00:00 to 06:00 dimmed to 75% output

Should one of the above dim regimes not be suitable for a particular street lighting scheme, contact Lincolnshire County Council Street Lighting to agree a suitable dimming regime.

1.4 Lighting Column Layouts and Setbacks

The general siting of lighting columns should be treated on an individual scheme basis and completed in conjunction with:

- BS 5489-1:2020 Section 6.1
- Professional Lighting Guide PLG 02 The Application of Conflict Areas on the Highway Annex A: 'Typical column and lantern arrangements for conflict areas'

Table 1: Recommended minimum clearances from edge of carriageway to face of lighting column, derived from BS 5489-1:2020 Section 6.1.3. **Note:** These clearances are **minimum** recommendations, and not target clearances. Increased clearances may be achievable on site.

Speed limit mph	Horizontal clearance m
≤30	0.8
40 to 50	1.0
60 to 70	1.5

Table 1

Lighting columns in footways should be sited at the rear of the footway where possible.

Lighting columns in cycleways should be sited with a 0.5m clearance (where possible) from the cycleway to ensure that they do not obstruct overhanging handlebars.

1.5 Lighting Design Calculations

The preferred applications for completing street lighting designs are the Lighting Reality software packages; Reality Roadway and Reality Outdoor. Other lighting design software packages may be used for street lighting designs.

Every street lighting design should have a straight road calculation in illuminance or luminance (Reality Roadway), or an area calculation in illuminance (Reality Outdoor). Ideally each street lighting design will have both a straight road calculation and an area calculation.

The lighting design calculation reports and original calculation files (RTMA & RTMR) should be made available to Lincolnshire County Council and stored within the particular scheme folder electronically.

Further guidance and advice on using the Lighting Reality design packages can be found by:

- Attending dedicated Lighting Reality training courses
- Liaising with the Lincolnshire County Council Lighting Reality champion
- Watching 'Nick Smith Associates Training' videos on YouTube

Table 2: Typical mounting height and LED lantern wattage combinations for a selection of street lighting classes.

BS category	Mounting height	Led wattage	Suggested lantern
M3	10 or 12m	86 to 131W	TRT Aspect 3 or Philips Medium Luma / Mini Luma
M4	8 or 10m	66 to 95W	TRT Aspect 2 / 3 or Philips Mini Luma
M5	8 or 10m	42 to 66W	TRT Aspect 2 or Philips Mini Luma
P1	8 to 12m	86 to 131W	TRT Aspect 3 or Philips Medium Luma / Mini Luma
P2	8 or 10m	55 to 95W	TRT Aspect 2 / 3 or Philips Mini Luma
P3	6 or 8m	35 to 66W	TRT Aspect 2 / Aspect Eco 1 / Optio or Philips Mini Luma / Micro Luma
P4	6 or 8m	18 to 35W	TRT Aspect Eco 1 / Optio or Philips Micro Luma
P5	5 or 6m	10 to 18W	TRT Aspect Eco 1 / Optio or Philips Micro Luma
P6	5 or 6m	10 to 13W	TRT Aspect Eco 1 / Optio or Philips Micro Luma

Table 2

The purpose of Table 2 is to provide general guidance for a designer with regards to mounting height and LED wattage combinations required to achieve a particular lighting class. The suggested combinations in Table 2 are not exhaustive and other combinations may be acceptable.

1.6 Energy Assessment

In accordance with the county council's sustainability programme to reduce carbon emissions, street lighting replacement schemes shall be designed with a view to optimise the reduction in energy in comparison to the original installation.

For all street lighting schemes, an Energy Assessment Pro-forma (Appendix B - available on request from Lincolnshire County Council Street Lighting) should be completed and submitted to Lincolnshire County Council.

1.7 Electricity Supply Details

The electricity supply for street lighting columns shall comprise of single phase 230V 50Hz Distribution Network Operator (DNO) supplies into lighting columns or feeder pillars (where applicable). The DNOs within Lincolnshire are Western Power Distribution and Northern Powergrid. All feeder pillar supplies will be specified as unmetered unless otherwise required by the DNO.

Where Independent Distribution Network Operator (IDNO) apparatus exists, contact Lincolnshire County Council Street Lighting.

It is preferred that equipment more vulnerable to damage such as illuminated traffic signs, bollards, beacon posts and other items on traffic islands will be fed via a private cable network. Where this is applicable, feeder pillars and suitable lighting columns shall provide a private 230V single phase fuse and switched outgoing cable network to the relevant equipment. Cable and duct specification is to be as per the Model Contract Document.

Three Phase supplies to feeder pillars may be required in certain circumstances; to be agreed with Lincolnshire County Council Street Lighting on an individual scheme basis.

2. Equipment Specification and Selection

This section of the Street Lighting Design Guide aims to provide the designer with an overview of LCC's equipment specification.

2.1 Light Source

To comply with Lincolnshire County Council's Sustainability Programme, new lighting installations should be designed with a view to optimise the reduction in energy in comparison

to the original installation. In order to achieve this, the preferred light source for new street lighting installations shall be LED.

The colour temperature for LEDs installed on traffic routes and within town centres shall be a maximum of 3000K (Warm White).

The colour temperature for LEDs installed in residential areas, on footpaths, cyclepaths and within areas where the surrounding environment could benefit from a warmer colour temperature shall be less than or equal to 3000K (Warm White).

The colour temperature for Lanterns associated with zebra crossings shall be agreed with Lincolnshire County Council.

The ambient operating temperature of the LEDs should be a minimum of -20°C and a maximum of +55°C.

The output of the LEDs should be commensurate with the street lighting category selection of the design area.

2.2 Luminaires

The luminaires should be constructed using high pressure die cast aluminium and provide an overall IP rating to a minimum of IP65.

The LEDs in the luminaire should be driven by a Constant Light Output (CLO) DALI enabled driver. Any proposed luminaire must have an available UMSUG code.

LED drivers should be electronic type (DALI enabled), with a minimum rating of IP65, manufactured by Philips or Osram.

The luminaire should operate at 220-240V / 50-60 Hertz.

Luminaires should allow for 60-76mm post top installation and 32-60mm side entry installation.

Luminaires should have the ability to provide mounting arrangements of -10° to +10° inclination.

Designs should incorporate lanterns at an inclination angle of zero degrees where possible, in order to reduce the effects of obtrusive light. Post top lanterns should sit at zero degrees and lanterns on outreach brackets should be tilted to a minus degree which negates the bracket incline and returns the lantern to zero degrees.

Luminaires shall typically be installed with a 7-pin NEMA socket. Heritage and contemporary luminaires, or luminaires installed in conservation areas, will normally require a 20mm diameter fixing hole to accept a miniature photocell. Luminaires installed as part of a group switched system do not need a NEMA socket or fixing hole, unless specified with a shorting cell.

Luminaires to be installed in residential areas, footpaths and cycle paths shall have a pre-programmed LCC Aggressive Dim Regime (20:00 to 00:00 dimmed to 75% output then 00:00 to 06:00 dimmed to 50% output) overridden by an internal wiring link.

2.3 Switching Controls

All luminaires shall be fitted with individual Photo-Electric Control Units (PECUs), except for luminaires installed as part of a group switched system where switching is provided from a dedicated PECU.

PECU switching for All Night lighting shall be 35 lux on / 18 lux off (ratio of 1:0.5).

PECU switching for Part Night lighting shall be 35 lux on / 00:00 off / 06:00 on / 18 lux off.

Luminaires with a 7-pin NEMA socket shall be typically fitted with a Westire 8480 or Lucy Zodion ZCell; both suitable for All Night and Part Night operation.

Heritage or contemporary luminaires using miniature cells shall be typically fitted with a Lucy Zodion SS12 HT where All Night lighting is in operation, or a Lucy Zodion SS19 where Part Night lighting is in operation.

Miniature photocells for illuminated signs shall be Lucy Zodion SS12 with Infra Red type specified for illuminated bollards where applicable.

2.4 Lighting Columns and Brackets

All lighting columns and brackets shall be supplied in accordance with the relevant requirements of BS EN 40.

Lighting columns and brackets selected for each scheme/area shall be the same or similar to existing equipment. This will typically be galvanised steel or aluminium, except for passively safe equipment (Section 2.5), conservation areas (Section 2.6) and some town centres (Section 2.7).

Lighting columns shall typically be designed to accept post top mounting of the luminaire. Where brackets are required, bracket arms shall be designed so that when assembled the arm and spigot shall be at an angle as shown within the works information.

Raise and lower lighting columns shall be as shown on LCC Standard Detail SD-14-2B and with galvanised finish to BS EN ISO 1461.

Lighting column root protection shall be to G1a (LCC) specification.

Internal column wiring shall conform to the requirements of BS 7671 and be as per Lincolnshire County Council Standard Detail SD-14-4 Series for electrical termination types.

Lighting column foundations are to be as per LCC SD-14-2A. In some instances an alternative lighting column foundation may be proposed, such as a duct socket arrangement or a retention socket. This must be agreed with Lincolnshire County Council Street Lighting prior to design submission.

Lighting columns are to be provided with unique identification numbers as per the works information.

Steel lighting columns shall be designed to accommodate the attachment of non-illuminated sign plates with a total area not exceeding 0.3m². Lighting columns which are known to require additional attachments in the future such as larger sign plates, flower baskets, banners or seasonal decorations, must be designed and manufactured to safely accommodate the additional load. The applicant must follow the Lincolnshire County Council Street Lighting Policy – Annex 5: Attachments to Street Lighting Assets process (available on request). Written confirmation and calculations from the column manufacturer must be obtained by Lincolnshire County Council.

Table 3: Schedule of Road Lighting Column Requirements – derived from BS EN 40-2:

Column height	**Planting depth (BS EN 40-2 4.5)**	**Minimum door opening (BS EN 40-2 4.3)**	**Column shaft diameter**
5m	800mm	500mm high x 100m wide	76mm
6m	1000mm	500mm high x 100mm wide	76mm
8m	1200mm	600mm high x 115mm wide	89mm
10m	1500mm	600mm high x 115mm wide	114mm
12m	1700mm	600mm high x 115mm wide	140mm

Table 3

Extended planted depth roots may be required if ground conditions dictate.

For information related to the design and installation of high masts, contact Lincolnshire County Council Street Lighting.

2.5 Passively Safe Lighting Columns

A passively safe lighting column is designed to yield when it is struck by an errant vehicle thus making the collision less severe.

The decision to implement passively safe lighting columns should be undertaken in conjunction with the following documents:

- BS EN 12767:2019 Passive safety of support structures for road equipment. Requirements, classification and test methods
- ILP Technical Report 30 Passive Safety: Guidance on the Implementation of Passively Safe Lighting Columns and Signposts
- UK Roads Liaison Group (UKRLG) 'Provision of Road Restraint Systems on Local Authority Roads' – Method A, B or C (as appropriate)

The final decision should be recorded on a Passive Safety Requirements Form (Appendix C - available on request from Lincolnshire County Council Street Lighting).

Passively safe columns can also be used in individual circumstances where a detailed risk assessment has taken place and there is an increased likelihood that the column may be struck by an errant vehicle. A column used as Passively Safe should have the relevant electrical disconnection system or private cable network design to allow 0.4 second electrical disconnection.

2.6 Conservation Areas

Street lighting equipment selected for conservation areas must be agreed with Lincolnshire County Council Street Lighting.

Preference is for the installation of standard equipment with a variance of colour and /or column profile to allow for a tapered column where appropriate.

Consideration will also be given to the use of Aluminium columns where appropriate.

Decorative embellishments, bracketry and heritage style lanterns are not encouraged due to increased maintenance, poorer lantern performance and increased levels of obtrusive light. Should the surrounding environment and/or other influences or constraints lead towards such equipment, the Client must obtain agreement from Lincolnshire County Council and agree to pay a suitable commuted sum.

Painted lighting columns shall comply with G2a specification as per Series 1900 from the Specification for Highway Works, with a suitable RAL number to be agreed with Lincolnshire County Council Street Lighting.

2.7 City and Town Centres

Whilst some city and town centres may be within conservation areas, contemporary or modern equipment could be more appropriate, depending on the nature of the area or whether the street lighting scheme is part of a wider regeneration scheme.

It is important to assess existing equipment in the area and continue with this approach if appropriate. It is also important to check whether there is a wider strategy towards the replacement of street lighting equipment within the city or town centre.

In order to reduce the presence of street furniture, it could be advantageous to attach lights to adjacent buildings. This would require a signed agreement between LCC and the building owner.

The specification of street lighting in town centres or public amenity areas must be agreed with Lincolnshire County Council Street Lighting prior to design submission. If not, this may prevent the units being adopted by LCC at a later date.

3. On Site Hazards and Constraints

3.1 Overhead Lines

Lighting columns should be sited away from overhead lines (power or BT) wherever possible. However due to the nature and characteristics of certain sites this is not always possible.

The siting of lighting columns within the vicinity of overhead power lines should be undertaken in conjunction with:

- HSE Guidance Note GS6 Avoiding danger from overhead power lines
- Engineering Recommendation G39/1 Model Code of Practice Covering Electrical Safety in the Planning, Installation, Commissioning and Maintenance of Public Lighting and Other Street Furniture

Where high voltage overhead power lines are present on site, the designer must liaise with the DNO immediately and contact Lincolnshire County Council Street Lighting.

Where low voltage overhead power lines are present, and in addition to maintaining the clearances documented in G39/1, the designer may wish to consider:

- Siting lighting columns on the opposite side of the road to the overhead power lines (if possible)
- Siting lighting columns at the front of the footway (if possible – giving consideration to vulnerability to traffic collision and also the hazard to footway users)
- Designing the scheme using lighting columns with a reduced mounting height
- Specifying raise and lower lighting columns to lower away from the power lines.

Where overhead BT lines are present, lighting columns should be sited to avoid conflict with the apparatus. There should be a minimum clearance of at least 1 metre between lighting columns and wooden poles, and ideally a minimum clearance of at least 0.3 metres between lighting columns/lanterns and the BT lines.

3.2 Trees

Trees adjacent to lighting columns can present a safety issue in terms of reducing the light reaching the footway and/or road but also prevent engineers from maintaining the light in the future. The designer may wish to consider:

- Utilising available locations away from trees and reconfiguring the design accordingly
- Siting lighting columns at the mid point between trees (if possible)
- Siting lighting columns at the front of the footway (if possible)
- Designing the scheme using lighting columns with a reduced mounting height
- Specifying lighting columns with outreach brackets

3.3 Bushes and Hedges

Bushes and hedges can prevent access to the lighting column door and siting lighting columns adjacent to bushes and hedges should be avoided wherever possible. If this cannot be avoided, the designer may wish to consider having the lighting column installed with the column door facing the carriageway and not facing the direction of oncoming traffic (standard practice), providing an onsite risk assessment permits this safe to do so.

3.4 Driveways and Accesses

Columns shall not be installed within dropped kerb areas and shall have a minimum clearance of 1.5m from driveways and accesses. Should this not be possible, Lincolnshire County Council Street Lighting and the affected property owner may agree an alternative location on site.

3.5 Bedroom Windows

Wherever possible, lighting columns should be sited away from bedroom windows. The ideal location for siting lighting columns is the boundary lines of properties. However this is not always possible due to the locations of trees, driveways, accesses, utility apparatus, etc.

The designer may wish to complete a lighting design calculation using a vertical grid to measure the illuminance on the facade of the property. See ILP GN01/21 Guidance Notes for the Reduction of Obtrusive Light for further advice and guidance.

The siting of lighting columns within the vicinity of bedroom windows must be undertaken on an individual site basis with all other on site hazards and constraints taken into account and the respective impact of each of these on the street lighting scheme.

The use of internal louvres within the luminaire, or rear shields, may be used to reduce the impact of light intrusion. Front light shields to reduce perceived intrusion to opposite properties shall not be permitted. It may be permissible to alter the inclination of the lantern accordingly, to avoid light intrusion.

3.6 Existing Utilities

The presence of existing underground utilities on site can present difficulties in siting lighting columns in desired locations. NRSWA records provide an initial indication of the presence of utilities but often the exact location of existing utility apparatus is only known once excavation works begin. Site surveys can provide initial indications of utility apparatus locations (markers, chamber covers, trenching, etc.).

Should existing utility apparatus prevent the siting of a lighting column in a desired location, a suitable alternative location away from the utility apparatus should be agreed on site, which may lead to a reconfiguration of the lighting design.

If alternative locations are not suitable, the designer may wish to consider:

- Installing a retention socket to the manufacturer's recommendations
- Installing a crank root lighting column (must be clearly marked on the column and the inventory)

Lincolnshire County Council Street Lighting must be contacted prior to the installation of a retention socket or crank root lighting column.

The above list is not exhaustive. Other hazards and constraints may be encountered on site that will require a design solution to mitigate the risks presented by the particular hazard or constraint. All lighting columns and wide base posts are to be installed within the Highway, unless a Wayleave agreement is in place with the landowner.

4. New Development Roads

The Authority's policy is that new Developments as part of the section 38 process will not have street lighting installed. This is the case unless the Authority deems that there is a Highway Safety need. Further information is available in the Document Annex 6 to the Street Lighting Policy.

Where street lighting is not required by the Authority the Developer may wish to propose lighting for footway or placemaking purposes – (It is not to be of a Highway lighting level which would be commensurate with BS5489.)

This will be adopted by the Authority subject to a commuted sum payment in accordance with the Authority's commuted sum policy providing compliance with all installation conditions and specifications as detailed in the Document Annex 6 to the Street Lighting Policy.

4.1 Approval of Footway or Placemaking Lighting

Before construction commences developers shall submit their proposals for footway or placemaking lighting, to the Highway and Flood Authority for approval. The lighting proposals shall be in accordance with the requirements of the Annex 6 document.
If the initial street lighting design submission is not acceptable, the Developer will need to incorporate LCC's comments from the design appraisal into revisions as required and resubmit proposals for further scrutiny, as necessary.

If the proposed highway features are altered at any stage prior to or during construction, then lighting column positions may need to be reconsidered by the designer. The Developer must supply revised design calculations and drawings.

Lighting columns must not impede drainage features such as swales which may form part of the Development design. Future maintenance access of the street light must also be considered when siting columns in the vicinity of drainage features.

Lighting columns installed within an area not to be offered for adoption as part of the Section 38 agreement shall remain private and not adopted by the Highway and Flood Authority. Future ownership details of these lighting columns must be submitted by the developer.

4.2 Electricity Supply Details

The developer shall be responsible for provision of electricity services to the lighting units or supply pillars other than equipment as detailed in Section 1.7. All services shall be laid underground.

The Distribution Network Operator (DNO) or Independent Distribution Network Operator (IDNO) shall provide electricity services to each lighting unit. The developer may be required to provide black service ducts for DNO/IDNO services cables. Such ducts shall be installed to the relevant DNO/IDNO specification.

Where an IDNO has been used, the cut out must be clearly and indelibly marked with the IDNO name and contact number.

In exceptional circumstances the Highway and Flood Authority may agree to the installation of a private service cable to supply street lighting units. Details are available from the Highway and Flood Authority upon request.

4.3 Equipment Specification

For details on Lincolnshire County Council Street lighting equipment specification suitable for footway or placemaking lighting please refer to the Annex 6 Document.

4.4 Installation

The methods used for installation and erection of highway lighting equipment shall be in compliance with the Code of Practice prepared by the Association of Street Lighting Erection Contractors.

4.5 Completion and Commissioning Maintenance

The developer shall inform the Highway and Flood Authority when each lighting unit is commissioned. The developer shall also provide Electrical Test Certificate for each lighting unit. The complete installation details including electrical test certificates shall be handed to the Highway and Flood Authority prior to adoption of the relevant sections of highway.

Where the Developer has entered into an Agreement under Section 38 of the Highways Act 1980, maintenance of the highway lighting installation will be governed by the Agreement, which provides for the Highway and Flood Authority developer paying energy charges from commissioning of a properly provided installation and for the installation to be adopted for operation and maintenance by the Highway and Flood Authority at the same time as all the other works in the development. Upon adoption the payment of the energy charges will transfer to the Highway and Flood Authority.

Where there is no Agreement under Section 38 of the Highways Act 1980 the Highway and Flood Authority will not maintain the lighting units until the highway has been inspected, adopted and/or has completed its maintenance period.

4.6 Commuted Sums

Commuted Sum Calculations can be requested from the Authority and will be provided with the accompanying Annex 6 Document.

5. Completion of Works

5.1 Inspection

Upon completion of the construction period, a street lighting inspection is required to assess the quality of the installation and ensure compliance with Lincolnshire County Council specification. The main aspects to consider when carrying out an inspection are:

- Ensure redundant equipment has been disconnected and removed
- Ensure proposed equipment has been installed as per the works information and issued Construction drawing (site clearance, location of equipment, equipment specification)
- Visual check of each lighting column (root protection, foundation, footpath re-instatements, planting depth of column)

- Check of electrical equipment in base compartment (grease on the column door lock, supply type, termination type, internal wiring specification)
- Ensure the lantern strikes up
- On new development roads, check that trees, hedges and bushes have not been planted within the vicinity of street lighting equipment

5.2 Electrical Test Certificates

The contractor or developer must supply fully completed electrical test certificates including measured earth fault loop impedance readings to BS 7671 for all associated equipment at the time of installation. Declared values are not permitted.

Lincolnshire County Council Street Lighting can provide a template electrical test certificate if required.

5.3 As-Built Details

In accordance with the CDM regulations, the Principal Designer has a duty to produce a Health and Safety File. This must include accurate details of street lighting apparatus and the as-built positions of cables.

As-built drawings shall be produced by the contractor and submitted to Lincolnshire County Council Street Lighting in electronic format.

5.4 Asset Inventory

Upon receipt of the As-Built information, the Lincolnshire County Council Street Lighting inventory will require an update to reflect the changes made by the completed street lighting scheme.

A link should be made electronically between each asset affected by the street lighting scheme and the location of the As-Built drawing.