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Street Lighting Technical Specification

04/06/2019

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1. Introduction

1.1. Kildare County Council Lighting Policy

Kildare County Council's general principles and requirements for street lighting is set out in the Kildare County Council Lighting Policy (insert document ref) and can be obtained on Kildare County Council website.(www.kildarecountycouncil.ie)

2. Approval Process

2.1. Design Preparation

Prior to submitting the design it is expected that the designer uses a survey or attends the site to ensure that the existing lighting/electrical arrangement and its removal or re-use is considered and represented accurately. Where existing feeder pillars or columns are to be used as a supply point then the actual site source impedance shall be used when submitting electrical calculations. Permission must be sought from KCC prior to investigating the existing site electrical equipment.

2.2. Design Submission Costs

Checking of the first design submission shall be free of charge; however the checking of each subsequent re-submission shall incur a nominal charge.

2.3. Design Submission Checklist

Designs shall be submitted on drawings to a scale of 1:500 or greater and will include the following:

- Column positions, clearly numbered.
- Lantern orientation depicted by drawing symbol direction.
- Cable and duct routes
- Supply point(s) (Wiring Drawing showing Micro Pillar locations)
- Hazards (overhead lines, HV cable etc.)
- Schematic diagram of circuits including protective devices.
- North point.
- Legend
- Relevant drawing notes.
- Design calculations (Lighting Reality Report and Lux Contour Drawing)

BS5489-1:2013 lighting level calculations shall be carried out

using Lighting Reality Roadway format and for 'P' class designs shall clearly show the minimum and optimum spacing for the road widths. The method of calculating maintenance factors shall be shown within the drawing notes and based upon manufacturer data and KCC cleaning regimes.

2.4. Contact Information

For further information relating to this specification please contact:

Public Lighting Engineer,
Roads, Transportation and Public Safety,
Kildare County Council,
Áras Chill Dara,
Devoy Park,
Naas,
Co. Kildare.
Tel: 045-980421

3. Standards and Legislation

3.1. Table of Relevant Standards

All works and associated materials shall include, but not be limited to, the following legislation and regulations:

- Safety Health and Welfare at Work Act (General Application Regulations) 2007. Part 3 Electricity.
- ET 101:2008. National Rules for Electrical Installations 4th. Edition incl. Part 714.
- ET 211:2003. Code of Practice for Public Lighting Installations in Residential Areas.

3.2.

3.2.1. Operative Training

All operations connected with the works shall comply with the latest edition of S.I. No. 291 of 2013. Safety, Health, and Welfare at Work (Construction) Regulations 2013. Operatives shall be competent to carry out the tasks assigned to them whilst working on the public highway and may, at any time, be asked to produce evidence of competency by a Kildare County Council representative.

4. Design

4.1. General

Street lighting within the Kildare County may be replaced and upgraded in order to ensure the right light in the right place at the right time.

It is important that proposed light levels are balanced against the need to maintain adequate light to facilitate safe urban night time movements of vehicles and pedestrians and reduce the risk of road accidents. The developer may suggest appropriate lighting levels taking account of the following:

- Nature of Development
- Location of lamp columns
- Presence of late night or licensed premises
- Traffic flow

4.2. Lighting classes

4.2.1. Traffic Routes

Traffic routes should be designed using an M luminance class derived from BS5489-1:2013, BS EN 13201 and/or CIE115 taking into account all of the characteristics of the route to be lit. Traffic route lighting and lighting of residential estates should be powered by separate supplies.

4.2.2. Residential Areas

Residential areas should be designed using a 'P' illuminance class derived from BS 5489-1:2013, BS EN 13201 and/or CIE 115.

4.2.3. Car Parks

Car parks are to be lit in accordance with BS5489-1:2013. Group switching of car park lighting shall be facilitated via an astro-timer and a suitably rated contactor located within a feeder pillar or trip-lamp. Switching regimes are to be approved by Kildare County Council.

4.2.4. Pedestrian Crossings

Pedestrian crossings shall be lit in accordance with BS5489-1:2013 and ILP Technical Report 12.

4.2.5. Traffic Calming

Traffic calming areas shall be lit in accordance with BS5489-1:2013 and ILP Technical Report 25.

4.2.6. Cycleways

Cycleways shall be lit in accordance with BS5489-1:2013 and BS EN 13201-2. Lighting columns positioned on cycleways shall be set back a minimum of 1.0m to avoid contact with handlebars. Where the cycleway cannot be accessed by an elevated platform, raising and lowering columns shall be installed.

4.2.7. Footpaths and Inaccessible Areas

Footpaths and inaccessible areas are defined as anywhere where a lighting cannot be maintained using a mobile access platform. In these instances, a KCC approved raising and lowering lighting column shall be installed. Raising and lowering columns shall be orientated so that the lantern head can be lowered safely without obstruction and, when in its collapsed position, shall not cause an obstruction to road users and pedestrians.

4.3. Designing for Maintenance Strategy

Proposed street lighting designs shall consider the future ownership and maintenance impact that the designed installation will have on the County Council and its operatives. Lighting designs shall deliver a safe, financially viable and good quality solution that aligns to the values set out in the KCC street lighting policy document.

4.4. Electrical Calculations

All electrical design relating to the private cable network and its protection shall be carried out by the Contractor. All electrical calculations shall be carried out using an up-to-date and accredited electrical design software package conforming to ET 101:2008 4th edition.

Electrical calculations shall be presented both in paper and digital format to the Kildare County Council for approval prior to works commencement. All electrical calculations shall be in accordance with characteristics of the equipment supplied within each feeder pillar. All Electrical Equipment shall be installed so that the levels of radio interference given in BS EN 55014-1 or equivalent are not exceeded.

5. Lighting Columns, Foundations and Brackets

5.1. General

Lighting columns shall be designed in accordance with BS EN 40. All lighting columns shall have a cable entry slot width 'X' as follows:

- Nominal column height 8m or greater = 75mm
- Nominal column height of less than 8m = 50mm

The Contractor shall provide permanently fixed warning notices to all lighting columns in the vicinity of overhead lines. The earthing of lighting columns shall be in accordance with ET 101:2008.

5.2. Passive lighting columns

Passively safe lighting and traffic signs shall be considered in accordance with ILP Technical Report 30 and BS EN 12767:2007. The passive column rating and method of disconnection shall be subject to approval by Kildare County Council.

5.3. Column material and coatings

5.3.1. Painting

Steel Lighting Columns in Residential Schemes shall be protected against corrosion by galvanising only to BS EN ISO 1461.

Painting of columns is not permitted.

5.3.2. Root Protection

Internal and external surfaces of the roots of all Lighting Columns and Illuminated Traffic Sign posts will be protected at the factory to a height of 250 mm above ground level by the application of a two pack epoxy glass flake protective coating, Amercoat 4560 GF, or equivalent, on top of the galvanising.

5.3.3. Handling of Columns

Lighting columns with a factory coated finish shall be transported with protective wrappings and lifted into position on site using an appropriate vehicle fitted with straps and not chains.

5.4. Column Foundations

The lighting column foundation types shall be either planted or flange plated.

The Contractor shall design all foundations in line with manufacturer's recommendations for planted and flange plated lighting columns.

The design calculations and supporting information shall be submitted to Kildare County Council not less than seven days' before the installation of any lighting columns.

The contractor shall be responsible for determining soil types, however, if this is not possible then the soil type shall be assumed as poor.

Where a lighting column is planted in a grassed area, a concrete plinth of no less than 400x400mm shall be installed to avoid damage to the column protection when the grass is cut.

5.5. Column Erection

Lighting columns shall be erected with appropriate traffic management and the column shall be tethered to prevent falling during installation.

5.5.1. Erection within vicinity of overhead lines

Where lighting columns are to be installed within the vicinity of low voltage overhead lines, the lines shall be shrouded by the ESNB prior to installation. All works planned within the vicinity of low voltage lines should be done so in consultation with the ESNB.

5.5.2. Traffic Management

All traffic management shall be deployed in accordance with Regulation 97 – S.I. 291 of 2013 of the Construction Regulations.

5.6. Column Identification

Prior to adoption an external identification weatherproof adhesive label is to be provided at a mounting height of 2.5 metres and shall display a unique column reference number.

The label shall be 50mm in height and coloured white with black numbering. In addition to the above an Indelible label is to be secured onto the wooden back board inside the column indicating unique column reference number and column installation date.

5.7. Column Siting and Orientation

The Developer shall ensure that the lighting performance of Street Lights and the optical performance or visibility of Illuminated Traffic Signs and Illuminated Traffic Bollards is not adversely affected by trees and other vegetation. If the obstruction is due to Highway trees and vegetation, the Developer shall take necessary action to remove the obstruction by pruning back branches up to a maximum of 25mm diameter flush to a main branch or limb. Where heavier pruning is required the Developer, following consultation and agreement with the Kildare County Council, shall employ a qualified arborist to prune back the tree or vegetation.

A staggered lighting configuration should be considered where trees are present which will allow for adequate contribution between lanterns without the obstruction of tree canopies.

Consideration should be given when positioning a lighting column within the vicinity of a structure which may facilitate unwanted access to that structure e.g. a garden or yard boundary wall. Where columns are located close to scalable structures, anti-climb paint shall be applied from 2metres above ground level to a height which prevents access to that structure.

The siting of lighting columns in front of residential property windows shall, where possible be avoided. Columns shall be positioned so as not to cause obstruction on the highway and to driveways. Columns doors shall be orientated so that KCC operatives can perform maintenance whilst facing oncoming traffic.

5.8. Projection Brackets

Projection brackets shall not be used unless circumstances such as trees or other obstructions warrant their use. All luminaires should be post-mounted unless an ornate bracket is required for aesthetic reasons.

5.9. Attachments

No third party attachments are permitted to be on street lighting columns within Kildare County Council.

5.9.1. Traffic Signs

No traffic signs are permitted to be on street lighting columns within Kildare County Council.

5.9.2. Third Party Attachments

Flower baskets may be erected as long as the column to which they are mounted is specifically designed to accommodate them and prior approval must be sought from the public lighting engineer.

5.9.3. Lantern Conversions

Prior to any lantern conversion the existing lighting column and bracket shall be tested to ensure that it can safely accommodate the new lantern without compromising the column/bracket's structural design limitations. If there is any doubt as to the ability of the existing column to safely accommodate the new lantern then a new and compliant replacement lighting column shall be installed.

6. Luminaires

6.1. Light Sources

LED light sources are now the preferred solution for County Kildare, however, luminaires utilising lamps and electronic control gear may be used in certain circumstances. They shall only be permitted with the approval of Kildare County Council.

6.2. LED Luminaire Specification

All new luminaires shall be fitted with an LED light source having a minimum colour temperature of 3000 kelvin and shall have a minimum manufacturer warranty of 10 years.

All luminaires shall be constructed from LM6 marine grade aluminium or equivalent with a polyester powder coating, grey, silver or black, over a ROHS compliant chrome passivation substrate; the polyester powder coat paint finish shall withstand the standard cross cut tests as defined in BS EN ISO 2409 and BS3900.

The complete luminaire shall be 98% recyclable at the end of life.

Bowls/ protectors shall be vandal resistant and stabilised to minimise loss of transparency due to weathering and exposure to ultra violet light.

Luminaires shall have an integral flexible mounting system and be capable of being mounted 42mm to 60mm diameter side entry and 60mm to 76mm diameter post mounted without the need for separate spigots or adaptors.

Fully assembled luminaires shall weigh 18kg max with a maximum windage of 0.15sq m and the impact rating shall be IK08 minimum in accordance with BS EN 62262:2002.

Luminaires shall comply with BS EN 60598-1, BS EN 60598-2-3, BS EN 62722-2-1:2016, and the luminaire optical system and the control gear compartment have a minimum protection rating of IP66 to BS EN 60529.

Luminaires shall provide a light output ratio in excess of 90% with an upward light output ratio of no more than 0.5%.

The I_{max} above 95 shall be Zero. Luminaires shall have integral control gear.

Luminaires shall have an option to fit or retrofit proprietary front and/or rear shields, which shall reduce unwanted spill. The colour of the shields shall match the luminaire.

All luminaires shall have a facility to retrofit upgraded LED modules and, when post top mounted, must be capable of being set at adjustable inclinations.

The luminaire shall be fully compatible for dimming, allowing for diagnostic and dimming functions.

Photometric data must be based on test results from a verified testing lab using absolute photometry in accordance with methods and conditions detailed in LM-79-08 or equivalent; current valid certification must be provided.

Luminaires shall be designed to prevent jamming injuries during installation and be free from sharp edges.

Luminaires shall be designed to prevent the supply cable being damaged during installation.

Drivers shall comply with EN61000-3-2:2000, EN61347-2-13- 2006, EN61000-3-3:2001, BS EN 61347-1 BS EN 61347-2-1, BS EN 61347-2-8, BS EN 61347-2-9 and BS EN 60923 or equivalent and subsequent amendments and as appropriate and be tap selected to specified operating voltage.

All LED drivers and dimming modules shall be contained within the lantern housing and shall have a voltage range of 180-250 volts and conform to BS EN 61347-2-9:2001, BS EN 60921:2004 and BS EN 60923:1996, BS EN 62717:2017, and subsequent amendments.

The LED driver, operating at constant current, shall be separate to the LED modules (not on same circuit board). The driver shall have a minimum operating efficiency of 90%.

Shall be independently tested and EN-EC certified in accordance with EN60598-1:2008 and EN60598-2-3:2003 by an independent approval body recognised by the European Community; current valid certification must be provided.

Shall be tested in accordance with NEN-EN-IEC62471 (2006-07) for Photo-biological Safety and shall comply with Group 1 classification; current valid certification must be provided.

Drivers shall be electronic with the capability of being altered to multiple output levels in electronic, stepless 1% increments via a PDA, Central Management System, or similar device without having to change the driver.

Drivers shall be compatible with all other components including the LED and Photocell.

Drivers shall have stable power consumption over full operating voltage range.

Drivers shall indicate all wiring connections and operating voltages via indelible markings.

The LED driver shall be protected against overheating by an over-temperature sensing system have a surge protection of 6KV.

Lumen Maintenance life time testing shall be in accordance with LM80 or equivalent and extrapolated methodologies as per TM- 21; current valid certification must be provided.

Maintained Luminous Flux at 25% rated life shall be greater than 90%, i.e. Lumen Maintenance Code 9.

LED flux and luminaire data shall be presented for an ambient temperature of 15 degrees Celsius.

LED light source data shall be measured at an ambient temperature of 25 degrees Celsius.

Colour temperature (CCT) of the LEDs shall be equal to or greater than 4000K (Kelvin).

Colour Temperature tolerances beyond a 5 step MacAdam ellipse are not acceptable.

Rated Colour Rendering Index shall be code 7 (CRI range 67-76) or greater.

Each LED shall be mounted beneath an individual lens providing photometric footprint based on an overlay methodology be mounted within a self-contained module (LED module) that can be removed, replaced using simple tools and lenses shall be manufactured from optical grade Polycarbonate or PMMA acrylic thermoplastic.

6.3. LED Luminaire General Requirements

All equipment including LED, Luminaires, Drivers, and PECU's shall be approved for use under Unmetered Supplies Arrangements and shall have all necessary SEAI /TII Burning /Dimming Profiles.

All luminaires shall comply in all respects with the latest edition of the British Standard and European Norms, be suitable for residential

road lighting as defined in BS EN 5489-1:2014, BS EN13201-2:2015, BS EN13201-3:2015, and BS EN 13032-4:2015.

All Electrical Equipment shall be installed to that levels of radio interference given in BS EN 55014-1 or equivalent are not exceeded.

The system power factor shall be greater than 0.85 at full power and when dimmed.

Drivers shall be pre-set to dim in accordance with Kildare County Council's energy saving policies.

The developer/contractor shall apply for the required Multi-level Switch Regime for their equipment in accordance with Balancing and Settlement Code (BSC) procedures.

The Contractor will be responsible for making all necessary arrangements for the collection and disposal of all luminaires replaced during the contract period in accordance with WEEE directive; any WEEE charges shall be included in the Luminaire price.

The Contractor may be required to provide technical support with the design of luminaires to meet the requirements of the British and European Standards and subsequent amendments, following contract award. This must be provided throughout the period of the contract.

All luminaires shall be supplied fully assembled in all respects with LED, dimmable driver, 7-pin NEMA socket and a photo electric control unit at 35/18 lux.

The luminaire life in hours shall be 100,000 hours minimum. All luminaires shall be delivered pre-wired with:

6 metres of 1.5 mm² 3 core arctic flex for columns up to 6m mounting height

10 metres of 2.5 mm² 3 core arctic flex for columns greater than 6m mounting height.

Standards: BS7919 Table 44, VDE281.

Conductor: Class 5 flexible plain copper conductors to BS EN 60228:2005 (previously BS6360) 3 x 1.5 mm² or 2.5mm².

Insulation: Arctic grade PVC (Polyvinyl Chloride). Sheath:
Arctic grade PVC (Polyvinyl Chloride).
Sheath Colour: Blue. Voltage
Rating: 300/500V.
Temperature Rating: -40°C to +70°C.

6.4. Orientation and Glare Control

Lanterns shall be orientated as per the lighting design and shields shall be provided to the back of lanterns where they are positioned in close proximity to bedroom windows.

6.5. Control Methods and Switching

6.5.1. Photo Electric Cells

All Photo Electric Cell Units (PECUs) shall:

- Conform to BS 5972 and be manufactured under the QA System and Procedures of BS5750, ISO9002 or EN29002.
- Be suitable for mounting between 5 and 12 metres and be of a type suitable for fitting to the lantern via a 7-pin NEMA socket.
- Be guaranteed for a minimum life of 10 years from the date of manufacture and this date shall be clearly marked on the unit.
- Provide Class 2 protection against electric shock and have a minimum protection rating of IP67 to BS EN 60529.
- Operate on 220 to 270 volts 50Hz AC and shall be capable of switching a load of 500 watt with a pre-set switch on/off level of 3.5/18 lux and a negative switching differential of 1:0.5.
- Incorporate a time delay circuit to ensure lamps are not switched on by transient changes of illuminance; the delay shall be between 15 and 30 seconds.
- Be designed to fail in the ON position, such that in the event of a fault in the cell, the controlled lights will switch on.
- Be switched by relay assisted triac or a synchronous switch method and be fully solid state with switching activated by a filtered silicon photo diode to match the CIE photopic response.
- Have zero drift over its guaranteed life, have a power consumption not exceeding 0.5 watts under load conditions and be capable of operating within a temperature range of -20°C to +80°C, comply with European EMC Emission Directives and conform to BS2011 in respect to vibration.
- Shall be mounted upon a factory installed 7-pin NEMA socket.

6.5.2. Trimming

The switching levels for each photocell shall be 35lux ON and 18 lux OFF.

6.5.3. Part-Night Switch Off

In certain circumstances the lighting may be switched off for part of the night e.g. car parks or adopted access roads, however, the approval of Kildare County Council shall be sought in each instance.

6.5.4. Central Management System

Kildare County Council may, at a future date, introduce a central management system (CMS) to monitor its lighting asset. All lighting should be equipped with interoperable open source components which will allow for communication with a CMS.

6.6. Dimming

All lanterns shall be capable of dimming and trimming.

6.7. Shielding of Obtrusive Light

The contractor shall, where necessary, procure and install adequate shielding to the lantern to reduce or eliminate obtrusive light. The shielding shall under no circumstances affect the performance of the luminaire in terms of its prime function of lighting the adopted highway.

7. Electrical Installation

7.1. General

All electrical equipment shall be installed in accordance with the National Rules for Electrical Installations ET101: 2008.

7.2. Cabling

Underground cables shall be laid in duct except where they leave the duct to enter the cable slot of the apparatus, and shall be XLPE/SWA/PVC in construction with stranded copper conductors and shall 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.

Circuits shall have a separate integral CPC core which shall be cross-bonded to the cable armouring at termination points.

All cores shall be of equal cross sectional area of 6sq mm minimum and be of such a size that the requirements of ET 101:2008 are met and allow for a disconnection time not exceeding 0.4 seconds.

Cables shall be sized by the contractor allowing a further 20% spare capacity for future additional loading.

Jointing of cable is not permitted and only continuous lengths of cable between apparatus will be accepted.

Cables shall not be laid at a temperature below 0 degrees centigrade.

The cable shall be laid in such a way as to not cause damage either when drawing the cable through duct or by creating an internal bend radius that exceeds manufacturer's recommendations.

Any cabling attached to buildings or structures must be done so in such a manner as to minimise its aesthetic impact whilst complying with the relevant standards.

Cables shall be supported on the building surface using approved saddles, the spacing of which shall conform to the recommendations of ET 101:2008.

Cables shall be drawn through ducts and terminated into apparatus on the same day to reduce the risk of cable theft. Where cables cannot be terminated on the same day they shall be protected, coiled and buried until termination takes place.

7.3. Cut-Outs, RCDs and Terminations

All ESNB and private network cut-outs shall be clear and provide double-pole isolation via a switch complying with BS5419. All cut-outs shall have a minimum rating of 32 amps and fuse removal shall not be possible unless the isolation switch is in the 'OFF' position.

The cut-outs shall provide a minimum degree of protection to IP22 and have a high mechanical and dielectric strength. Incoming phase terminals shall be shrouded when all connections have been made and cables shall be terminated so as not to allow

accidental detachment.

Sub-circuits shall be protected by a separate second fuse link. Cut-outs shall be securely attached to the column backboard utilising a non-corrodible fixing.

Columns not directly supplied from ESNB supplies shall be supplied on a sub-circuit from the serviced column by means of the public lighting underground cable and looped from column to column. All looped connections shall be made in the bottom terminals of the fused isolator cut-out. The armouring of the underground cables shall be secured onto the gland plate of the cut-out or have a nonferrous sleeve fitted below the armouring and earthing clamps fitted to make a positive grip on the armour wires. The earthing clamps and gland plate shall be bonded to the main column earthing terminal with 10 sq mm single core PVC cable.

When terminating armoured cable the CPC core of the cable shall be cross-bonded to the armouring.

RCDs shall be 2 pole of 40 Amps rating and sensitive to 30 milliAmps. They shall have been type tested to BS EN 61008-1: 1995 and shall be suitable for mounting in an individual enclosure to give a degree of protection to IP23.

All SWA cables shall be terminated by means of an IP66 CW gland complying with BS6121-1, BS EN 50262 and a gland plate incorporating a non-ferrous earthing terminal.

All underground cables shall have the steel wire armouring cross-bonded to the CPC core of the cable at each point of termination.

7.4. Wiring

Internal wiring between the terminal block in the lantern and the components in the base of the column shall be PVC insulated and sheathed cable of 300/500 volt grade, have a copper conductor size of not less than 1.5 sq. mm.

All cores shall be correctly colour coded and cables for continuous earth bonding shall be green/yellow PVC insulated single core copper cable of minimum cross section 6 sq. mm 600 volt grade conforming to BS 6004.

7.5. Cut-Out labelling

All underground cables (except ESNB cables) shall be identified as to their origin and destination by labels affixed to the cut-out.

7.6. Trenching

Trenches shall be constructed to in accordance with the Kildare Specification for the Opening, Backfilling and Reinstatement of Trenches in Public Roads and shall be free from large debris that could damage or crimp ducting.

7.7. Ducting and Cable Identification

The Contractor shall determine a safe and economical route for all ducting with proposals to be submitted to Kildare County Council for approval.

Duct routes should be logical and perpendicular where necessary with consideration given to the possibility of future access for maintenance or upgrade.

All ducting shall be manufactured from high density polyethylene and coloured red with 9mm high lettering "STREET LIGHTING" at intervals of not more than 1.0m along its length.

Ducts shall be made from thermoplastic pipe complying with IS EN 50086-2-4 Type 450N. Duct shall be as specified in ET 101:2008 Sect. 522.6.8.3 ,smooth bore and free from burr which could damage cable sheaths. Duct shall be sufficiently rigid to experience no deformation during backfill and compaction, but be capable of bending. The duct shall be colour stabilised against weathering and shall have resistance to soil acids. Duct to be 100mm internal diameter across carriageways, footpaths and verges.

An extra two empty ducts complete with heavy duty nylon draw cord shall be provided where ducts cross a road.

The contractor shall allow a suitable length of 50 mm diameter ducting from the main duct to each lighting column to facilitate the looping in and looping out of supply cables. Reference: Appendix D&NRA DrawinG RSD/ 1400/1.

All ducts shall be laid at a depth of:

Verge and footways – 450mm minimum cover.

Carriageway – 750mm minimum cover.

A bright coloured warning marker tape containing two stainless steel wires and displaying, at 1.0m intervals, “Caution – Street Lighting Cable Below” shall be laid at a depth of 150mm below finished surface.

7.8. Reinstatements

Permanent ground reinstatements shall be in accordance with KCC standard detail drawing K14.003 Where the ground does not relate to drawing K14.003 a permanent reinstatement shall be carried out to ensure that the excavation is filled and the finished surface is restored to a standard equivalent to the immediate surrounding area. Temporary reinstatements shall only be permitted for the duration of the works and shall be sufficiently compacted to ensure a flush finish and no trip hazard.

7.9. Lantern Circuit Protection

Fuses are to be used within lighting column cut-outs and are to be HRC to BS88 Part 2 and shall not be re-wirable.

Fuse ratings shall be 6amps for light sources up to and including 100watts and 10amps for light sources greater than 100watts.

7.10. Earthing

Earth electrodes and inspection chambers (concrete type) shall be provided by the Contractor at each proposed feeder pillar location and at the end of each circuit (of 3 or more units).

Earth rods shall be manufactured from copper clad steel (copper shall be bonded to the steel core) and be no less than 16mm in diameter. Cable clamps shall have an aluminium bronze body and a phosphor bronze screw.

Earth rods shall be located in an earth rod core and surrounding housing.

All earth rods and installations shall conform to, and shall be tested by the approved method as stated in ET 101:2008.

The structure earth electrode resistance is to be below 20 ohms. Where ground conditions are adverse additional or large diameter rods are to be used. Additional Earth electrodes will be required on long cable runs in order to comply with Earth Electrode resistance requirements above.

7.11. ESBN Connections

The Developer shall effectively manage, for its own works, the Connection, disconnection, or transfer of the Apparatus to the electricity distribution network operated by the ESBN including all necessary service diversions and reinstatements. An appropriately rated ESBN low voltage metered supply shall be provided within feeder pillars where the connected load exceeds 2 kVA and direct unmetered supplies shall be provided within lighting columns. The ESBN shall be advised that the routing of their service cables through areas with finished surfaces that are expensive or onerous to reinstate shall be avoided unless there is no practical alternative route. Traffic Route lighting and lighting of residential estates should be powered by separate supplies.

7.12. Feeder Pillars

It is to be assumed that all feeder pillars are to be supplied and installed new and sized according to the electrical requirements of each location. Existing feeder pillars should be retained and utilised if they are of an appropriate size, have a suitable ESBN or sub-main source supply and are free from heavy corrosion or damage particularly around the base.

Where the size of an existing ESBN feeder pillar is not suitable it may, in certain circumstances, be used to electrically supply an adjacent proposed new sub-main feeder pillar (subject to approval).

The Contractor shall determine a safe and economical location for all feeder pillars with proposals to be submitted to Kildare County Council for approval.

The locations of ESBN supplies and the envisaged routes of private network cable should also be considered when selecting a feeder pillar location.

The contractor shall liaise with the ESBN to agree viable feeder pillar locations.

Feeder pillars must be located away from trees or shrubs and

orientated so that maintenance can be carried out safely and should be set back as far as practical from the highway to reduce the risk of collision.

Feeder pillars shall be mounted on a 250mm thick foundation of concrete ST2 mix complying with BS 5328 – 1:1997. They shall be rooted or provided with fixing bolts to enable the unit to be securely located. After completion of the cabling, any void under the feeder pillar base shall be filled to 25mm below the door with rounded aggregate, maximum size 14mm, and sealed overall with a cold pour compound of an approved type to prevent the ingress of moisture from below. A spare 100mm diameter cable duct shall be provided through the concrete surround from the base of the feeder pillar.

For feeder pillars sited in grassed areas, a 600mm width of hard surfacing shall be laid with the surface flush with the ground across the width of the feeder pillar in front of the door. The other sides of the feeder pillar shall be similarly surrounded with hard surfacing 200mm in width. All hard surfaced areas shall slope away from the feeder pillar.

Measures shall be taken to prevent the entry and infestation of vermin by means of a physical barrier.

Feeder pillars shall be constructed from not less than 5mm thick galvanised steel. They shall be sealed to minimum IP65 on the doors and IP45 on the vent louvers. They shall include a full size backboard of varnished marine plywood at least 15mm thick or other approved non-hygroscopic material. Alternatively, a purpose-designed equipment mounting system may be used. The entry for cables shall be via the roof.

Doors shall be fitted with “Tri-head” locks, all locks being identical in pattern. The locking mechanism shall be lubricated with grease immediately following installation. 15 sets of keys shall be provided to the KCC Street Lighting Engineer prior to the adoption of the installation.

A sturdy documentation pocket shall be provided on the inside of the feeder pillar door.

Ventilation shall be provided to prevent the build-up of condensation and, in certain cases, the feeder pillar shall be protected by vermin-proof screens.

Protection against corrosion shall be by hot-dip galvanising to BS EN ISO 1461, the minimum coating thickness to be approved by the

KCC Street Lighting Engineer .

All doors are to be provided with an earthing strap connected to the main earthing terminal.

There is no requirement for internal lighting within each feeder pillar.

Thermostat controlled internal heating shall be provided only to feeder pillars that contain electronic control e.g. Street Lighting Server, DALI and DMX control equipment.

A weatherproof 13amp three-pin socket shall be provided and securely mounted to the backboard.

Outgoing circuit protection shall be by means of Fuses(BS 88-2) or Miniature Circuit Breakers (Type D) within an appropriately rated distribution board. The Contractor shall make allowance for initial current inrush associated with LED drivers/control gear.

All distribution boards shall have the capacity to accommodate 20% or 2 spare outgoing circuit ways, whichever is greater.

A laminated and accurate schematic circuit diagram shall be provided and inserted into the documentation pocket of the feeder pillar door.

All feeder pillars shall be fitted with a durable warning sign, fitted externally and in a prominent position, indicating “DANGER 415 VOLTS” or “DANGER 230 VOLTS” as appropriate and a ‘lightning flash’ in black on yellow.

7.13. Chambers/Draw Pits

Chambers shall be the Cubis STAKKA box ‘MODULA’ Access Chamber (450mm x 450mm wide or 1200mm x 600mm wide) and (465mm or 775mm deep) and load rated at 250KN. Chamber lid and frame to be a Cubis AX-S Composite to match chamber dimensions. Chamber frame to be a Cubis AX-S Galvanised Steel Raiser. In verge or soft ground the chamber frame is to be secured to the chamber with self-tapping screws and surrounded with a flush 200mm width by 100mm depth concrete plinth having a 10mm fall tamped non-slip finish. Chambers frames that are set within paving shall be neat and flush with that paving so as to not create a lip or void around each edge.

Inspection chambers/draw pits shall only be installed at either side of road crossing points and where the length of circuit run offers a risk of damage to the cable being drawn through ducting.

8. Asset Inventory

8.1. Data Sets

Accurate as-fitted drawings and material specifications shall be provided by the contractor to Kildare County Council upon commissioning of the lighting installation. Information is to be provided in hard copy and digital format and shall comply with TII Standardised Public Lighting Inventory Template User Manual AM-LHT-06058 December 2017

9. Adoption of Installation

9.1. General

The developer shall ensure that prior to, and during construction of the works the following points will have been agreed:

- The lighting design has been approved.
- Materials have been approved.
- Column foundation details approved.
- Column positions agreed and marked on site by a representative of Kildare County Council street lighting section.
- Duct and cable installation checked by the highways inspector or a representative of Kildare County Council street lighting section before backfilling of tracks.
- The developer shall not carry out works to existing equipment until permission has been granted by Kildare County Council.
- The developer shall ensure all necessary traffic management measures are in place and in accordance with chapter 8 of the Traffic Signs Manual.
- Before any lighting is commissioned the Developer will carry out the necessary electrical tests, witnessed by a street lighting section representative, in accordance with BS7671 Requirements for Electrical Installations.

Where a new development or installation creates a new access point(s) linking an already adopted highway, the newly created junction will be designed and upgraded by the developer/contractor as a lighting conflict area as defined in BS5489-1:2013 and PLG02. This may require the modification of the existing adopted highway lighting and/or additional lighting required to raise the lighting levels accordingly. Lighting proposals for the newly created junction(s) shall be submitted to Kildare County Council for approval as part of the overall Section 38 lighting submission for the new development.

Where proposed electrical works affect the energising of existing

lighting on an adopted highway, the developer/contractor shall take steps to ensure that temporary lighting is provided for the duration of the works in accordance with the relevant British Standards.

9.2. Adoption Checklist

- Developer name and contact details
- Consultant/architect name and contact details
- Builder name and contact details if different from above
- Electrical contractor name and contact details
- AutoCAD (dwg) & PDF formats for street lighting layout complete with unique drawing number, including any revisions.
- Lighting calculations (Produced within Lighting Reality)
- Cable calculations for private network (Produced within accredited software to the latest IET BS7671 regulations)
- Proposed luminaire, light source, optic setting and reference including manufacturer details
- Details of electrical equipment used and manufacturer details
- Proposed low voltage distribution network
- Electrical test Results
- Cable schematics for private network
- ESBN/IESBN/ICP details
- Scheme detailed inventory

9.3. Inspection

Inspections of the installation shall be carried out by the Kildare County Council street lighting department in conjunction with representation from the contractor and/or developer.

9.3.1. Initial Inspection

An initial inspection of the installation is free of charge, however, in the event that further inspections are required by KCC, a fee will be chargeable. KCC require a minimum notice period of 10 working days when arranging a street lighting inspection. Earlier inspections may be possible at the discretion of KCC street lighting department.

9.3.2. Remedial Works

Remedial works shall be carried out within 14 days of the identifying inspection.

9.3.3. Charges for Subsequent Inspections

A nominal charge shall be applied by KCC for each subsequent inspection to the initial visit.

9.3.4. Final Inspection

If the initial inspection does not highlight and defects and is fully to the satisfaction of KCC then this will be deemed the final inspection and the scheme will be approved for adoption by KCC. The responsibility for the payment of street lighting electricity usage shall transfer from the developer/contractor to KCC from the date of approval. The responsibility for maintenance of the lighting installation will remain with the developer/contractor for 12 calendar months from the approval date.

9.4. Warranties

The contractor warranty shall be 12 calendar months from the date of KCC approval.

9.4.1. Material Warranties

Warranties for equipment/materials shall rest with the manufacturer, however, should a defect occur within 12 months from the date of

KCC approval, the contractor shall be responsible for the returning of equipment/materials to the manufacturer including but not limited to retrieval and reinstatement on site. Temporary equipment/materials shall be provided by the contractor until the defective equipment/materials have been replaced.

9.4.2. Contractor Installation Warranty Period

12 calendar months from the date of installation approval by KCC.

9.4.3. Payment of Energy Usage

Responsibility for payment of energy consumption will, in accordance with the Council's Section 38 Agreement, remain with the developer until formal adoption is completed.

9.5. Design and Materials Approval

All design and materials shall be approved by Kildare County Council prior to installation by the developer/contractor.

9.6. Overall Approval and Handover

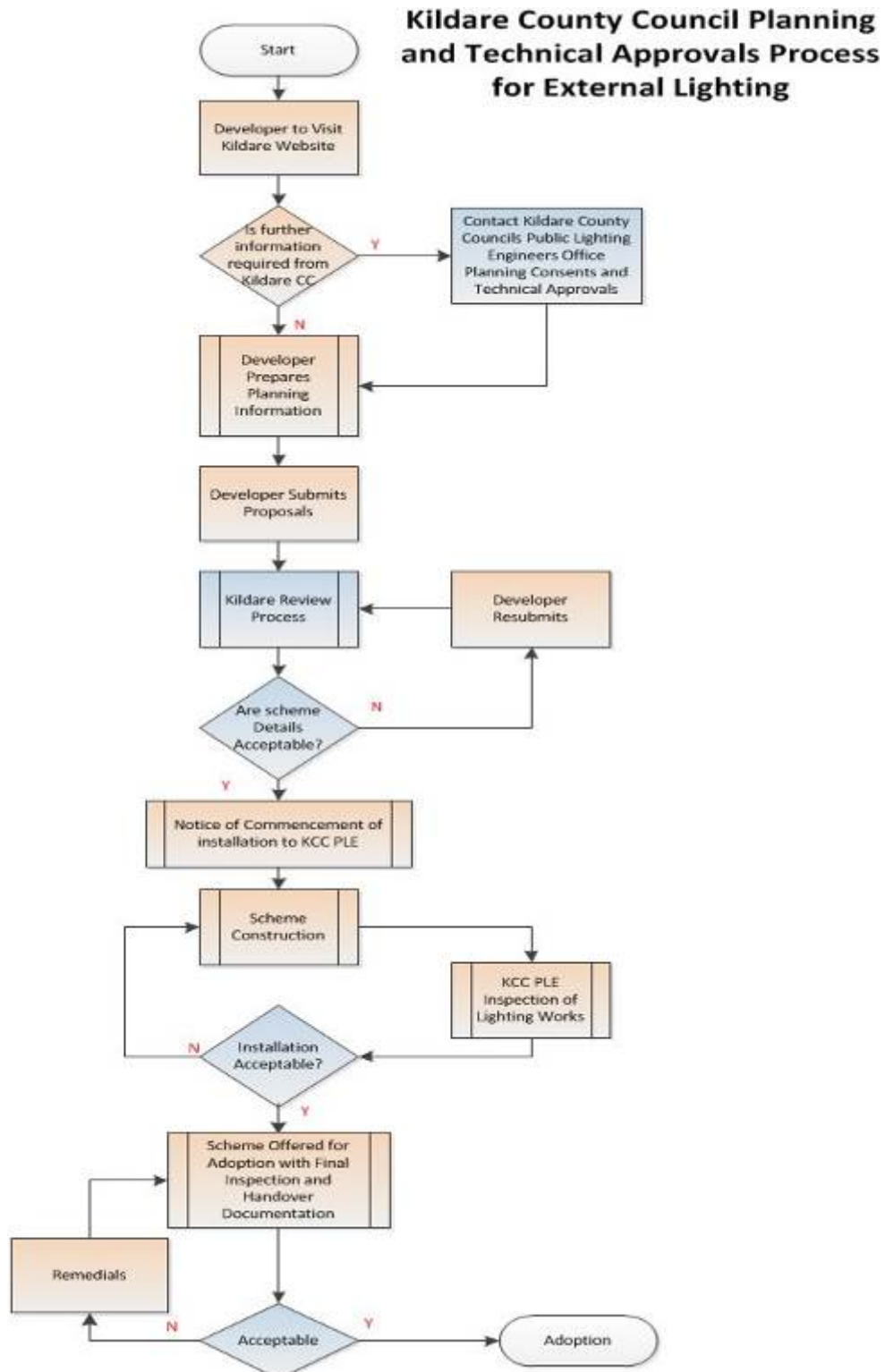
Upon successful inspection and handing over of as-built information the development will be adopted for energy consumption. The county council will gain full responsibility for the installation 12 months from the date of installation approval.

10. Waste Disposal

The contractor shall comply with the requirements of the Electronic Equipment (WEEE) directive when disposing of materials.

Appendix A: Kildare County Council Planning and Technical Approval Procedure

The procedures and processes for developers and designers to satisfy the planning application and technical approvals requirements for street lighting are set out in Kildare County Councils Street Lighting Policy and Planning Guidance document and can be obtained on Kildare County Council website. A summary of the process is depicted in the flow chart below:



Appendix B: Taking in Charge

The taking in charge of a lighting scheme is the procedure whereby the Developer shall satisfy Kildare County Council and the DSO (ESB Networks) that the scheme conforms to the ETCI National Rules for Electrical Installations, and the Developer shall also satisfy Kildare County Council that the layout and levels of lighting conforms to the BS EN 5489-1:2013 Code of Practice.

The taking in charge of Public Lighting in Estates is usually completed in conjunction with the full TIC of an estate or a completed phase. This procedure is administered by the Planning and Development Directorate of Kildare County Council.

The taking in charge request form for the public lighting element is available on the Kildare County Council website (www.kildarecoco.ie/publiclighting).

The current version is contained in Appendix C of this document.

A Developer wishing to have an exterior lighting scheme taken in charge for energy and maintenance shall complete this form and submit it to Kildare County Council, Planning and Development Directorate, along with the following;

- As built Lighting layout drawings (in .dwg format including plot of lux contours);
- Appropriate Standard Construction Details (SCD's);
- As Built Electrical drawings (schedules and layouts);
- Exterior Lighting design;
- Details of columns, brackets, and lanterns.
- A signed copy of the electrical test certificate for the exterior lighting installation (A copy of the signed original will suffice);
- An energy supply bill showing the account up to date.

On receipt of the completed forms Kildare County Council, Roads (Public Lighting) Division, will engage its Public Lighting Maintenance Contractor to undertake an inspection of an exterior lighting scheme, following which a Report will issue to Kildare County Council by the Maintenance Contractor.

A typical TIC Report form is contained in Appendix D.

When the Developer confirms that the snagging list as communicated to the applicant has been completed a further inspection(s) will be undertaken and the process will be repeated until a satisfactory conclusion has been achieved.

When Kildare County Council confirms that the exterior lighting scheme is in a suitable condition to be taken in charge, it shall inform the Developer by means of a formal letter, indicating the date on which Kildare County Council will assume responsibility for the scheme.

Kildare County Council will assume responsibility for the payment of the Energy bill from the date on which the lighting scheme is taken in charge.

It will not be responsible for any arrears on the bill in advance of that date.

Kildare County Council requires that the Exterior Lighting Scheme be maintained operational and in the same condition as it was when the snagging list was completed up until the date that the estate is formally taken in charge.

Kildare County Council will also require that each column and customer service pillar installed shall have a label attached with a numbering scheme agreed with the Developer at the taking in charge stage.

This is to allow for maintenance coordination, column / luminaire identification and recording of the individual column in Kildare County Council's Exterior Lighting Asset Management Database.

Appendix D Part 1

PUBLIC LIGHTING PRE-TIC INSPECTION CHECKLIST

General Information-Cover Sheet		
Estate Name		
Address		
Developer Name		
Planning Ref	:	
Inspection Requested by		
MPRN or TMRN /GMPRN		
Inspected by		
Date of Inspection		
Number of Public Lights in Estate		
Number of Pillars in Estate		
Are columns accessible with hoist		
Is distance between columns acceptable		
Are columns numbered		
PL Cable Size/Type (SWA/NYCY)		
Flex size/Type		
Night Survey carried out		
All lights operational		
Supply Type	Metered	Unmetered
Overall Summary of Work to be done prior to TIC by KCC (Costing to be provided on a separate sheet)		
Sign Off and Approval		
Signed anted by Inspecting Electrician		
Print name of Inspecting Electrician		
Checked, Signed by Manager		
Print Name of Manager		

Appendix E : NRA Drawing RCD1400/1. Lighting Column Connection

