



**Transportation Division
Roads and Transportation Directorate
City Hall
Cork**

**Exterior Lighting Design Requirements, Guidance & Specification Manual
For Lighting Equipment Supply, Installation & Maintenance**

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<u>Contents:</u>	<u>Page:</u>
1. Introduction	3
2. General Technical Specification, Luminaries and LEDs	4
3. Exterior Lighting Columns & Brackets	15
4. Lighting Design, Cable Design & Electrical Service Design	28
5. Small Civil Works – Access Chambers & Ducts	35
6. Electrical Supply – Metered & Un-metered	36
7. Lighting Engineering Consultants	39
8. Street Lighting – Equipment Manufactures & Suppliers	39
9. Electrical Contractors	39
10. Temporary Lighting and power Supplies	40
11. Night-time Lighting of Buildings & Structures	42
12. Floodlighting Schemes	44
13. Review of Exterior Lighting Schemes	45
14. Taking in Charge	45
15. Warranties	52
16. Further Information	53
17. Appendices	54

1. Introduction

Cork City Council is seeking to foster coordination and consistency in design for the installation and maintenance of high quality street lighting throughout the urban and sub-urban area in Cork. This document outlines the minimum standard for lighting schemes in Cork City to provide high quality, energy efficient, future proofed road lighting for public lighting in Cork City.

Lighting is a highly valued and visible service with the potential to make a significant contribution to the wider corporate objectives prepared by Cork City Council. The Manual has accordingly been developed to follow closely the principles of Best Value, to facilitate the conduct of Best Value reviews involving public lighting, and to provide a stimulus to the pursuit of continuous improvement.

Cork City Council is seeking to ensure that lighting equipment is selected from the higher quality grade, as against the standard range, of equipment available from various exterior lighting or street lighting manufacturers to enhance the streetscape, ensure longevity and provide an energy efficient lighting scheme.

The lighting design for all new schemes and modifications to existing developments must cater for the need to up-grade lighting on existing junctions, entrances and access roads in addition to any lighting being provided for the development.

Where suitable, low brightness energy efficient lighting schemes should be considered with a view to enhancing the nighttime scene and improved security with attractive modern street furniture. Cork City Council, Transportation Division shall be consulted at the design stage in this regard.

Well maintained road lighting can change our communities, make the night time environment a safer place to be, encourage regeneration and investment, leading to an improved local economy and at the same time contributing to a more inclusive society. However, these benefits are only achievable if the right decisions are made. This Code comprises a framework of guidance and standards, the application of which will make a significant contribution to the decision making process.

All queries pertaining to the design and maintenance of exterior lighting installations in Cork City should be directed to Cork City Council, Transportation Division as detailed on the cover sheet of these guidelines.

Cork City Council is currently implementing a 5 year Energy Action plan to implement a 33% saving in overall Electricity consumption by 2020. It is envisaged that new public lighting schemes and replacements would take cognisance of this target as part of the design process.

2. General Technical Specification, Luminaries and LEDs

2.1 Equipment Environmental Working Conditions

All equipment specified must be suitable for outdoor use. They will be installed outdoors in Ireland in locations less than 1,000 meters above sea level.

The following air temperatures apply:

- Maximum ambient temperature 40°C
- Maximum daily average ambient temperature 30°C
- Annual average ambient temperature 20°C
- Minimum ambient temperature -25°C

Equipment will be exposed to:

- Salt Laden Atmosphere
- Windblown salt deposits occur throughout the year
- Wind Driven Rain Rainfall average 1000mm per annum
- Rainfall Frequency Once every two days on average
- Atmospheric Pollution Heavy
- Solar Radiation 420 – 870 W/m²
- UV Light Exposure Daily
- High Humidity up to 95%
- Maximum wind (gust) velocity 50m/s

The humid salty atmosphere in Ireland is particularly severe on non galvanised ferrous parts and on aluminium and its alloys.

2.2 General Requirements

Cork City Council requires that the following general specifications be followed in the design and installation of exterior lighting schemes in Cork City.

2.2.1 Luminaires shall comply with I.S. EN 60598-2-3.

2.2.2 The lighting scheme shall incorporate LED/SON sources approved by Cork City Council.

2.2.3 Cork City Council does not accept SOX sources replacements or new installs in exterior lighting Schemes.

2.2.4 All luminaires shall incorporate electronic control gear/drivers (*see note) as manufactured by SELC Ireland, Havard, Philips or approved similar and shall incorporate SELC solar cell switches as standard.

2.2.5 It is a requirement to incorporate a factory set dimming regime on the electronic ballast. Our common regime is to dim to 70% of output (dim by 30%) from 12am – 7am. Cork City Council, Transportation Division, can

advise at design stage.

- 2.2.6** All photocells should have a 35/18lux ratio switching utilizing a green colour code to visually identify the switching regime.
- 2.2.7** Decorative or period style lanterns shall incorporate SELC sub-miniature solar cell Model number 8482 and will be approved by Cork City Council. A green lock nut will be utilized or in the case of a sub-miniature cell.
- 2.2.8** All other photocells shall be mounted utilizing a Nema socket with cork washers utilizing SELC Ireland model number 8481 photocell or approved with a green colour base section.
- 2.2.1** SON type hid lamps must have a minimum life to 5% failures of 48,000 hours i.e. Aura Sodinette Long life or as approved by CCC.
Metal Halide type hid lamps must have a minimum life to 10% failures of 43,000 hours i.e. Aura Crystal Long life or as approved by CCC.
- 2.2.2** All luminaires shall be sealed to the appropriate rating and shall incorporate ingress protection to a minimum of IP65 for the lamp enclosure.
- 2.2.3** All luminaires shall have a polycarbonate or toughened safety-glass lens / shallow bowl or approved similar. In any event the proposed luminaire shall have a minimum impact resistance rating of IK08 or greater as defined by EN 50102. This is to ensure a suitable level of robustness of the lens / bowl to vandalism. Most good quality luminaires meet this requirement, however Cork City Council reserve the right to receive confirmation of this from the manufacturer at the Exterior Lighting Scheme design review stage.
- 2.2.4** Cork City Council requires engineering best practice to be applied in the exterior lighting design of residential and commercial developments. This includes a requirement that exterior lighting schemes should be designed from junctions and traffic (both Pedestrian and Vehicular) conflict areas back. E.g. T-junctions, pedestrian crossings etc.
- 2.2.5** The illuminance / luminance at conflict areas should be of the average level or greater than that specified in BS5489-1:2013 and EN13201 for the particular design objective rather than the minimum.
- 2.2.6** A maintenance factor based on a cleaning cycle of four years shall be incorporated into the design. In the event that this information is not available from the lamp and / or luminaire manufacturer(s) a maintenance factor of not more than 0.8 shall be applied to all exterior lighting scheme designs utilising SON sources. Cork City Council may require a different maintenance factor to be applied in areas of high pollution, vandalism etc.

- 2.2.7** The lamp flux maintenance factor can be established from the lamp manufacturer's data, and suggested luminaire maintenance factors are given in Table D1 of Appendix D (informative) typical luminaire maintenance factors of BS 5489–1:2013.
- 2.2.8** Ongoing improvements in lamp technologies such as increased lamp life, reducing lumen depreciation and amendments to initial lumen outputs, together with the reductions in atmospheric pollution, may allow the luminaire maintenance period and group lamp replacement period to be adjusted in the future, whilst still maintaining the overall maintenance factor used in the design to be retained. The effect on the overall maintenance factor can be calculated in accordance with principles of design in BS 5489–1:2013. This shall be advised at the design review stage.
- 2.2.9** Steps should be illuminated from the bottom up to highlight the step edges, e.g. the lighting column should be erected at the bottom of the steps where possible and practicable. In some cases it may also be necessary to erect columns along the length of the steps.
- 2.2.10** Cork City Council aims to keep the number of diverse luminaire models within reasonable limits in its inventory. This is to allow economies of scale to be achieved in the maintenance (replacement, spares etc.) of its exterior lighting assets. Cork City Council, following an equipment prequalification process utilizes the luminaires in new and / or upgrades of exterior lighting schemes defined in Appendix 4. Cork City Council already has significant numbers of the following good quality luminaires in its inventory. Use of other luminaires (including others supplied by listed suppliers), whilst not prohibited, requires the explicit approval of Cork City Council, Transportation Division.
- 2.2.11** 250 Watt luminaires are generally only used where the use of 150 Watt luminaires result in a greater overall scheme total wattage.
- 2.2.12** Cork City Council may also consider luminaires produced by other suppliers/manufacturers provided that the proposed lantern meets the minimum technical requirements as set out in this document, with a demonstrated regard for thermal management of heat for electronic control gear and as reliable as those recommended and being economically feasible to maintain.
- 2.2.13 *Note:** All luminaires being used on the proposed scheme shall incorporate **electronic** control gear in all lanterns up to 250W. This is a well established lighting control technology as manufactured by SELC Ireland amongst others specifically for street lighting use. Electronic control gear ensures greater efficiency, energy saving and enhanced lamp lifetimes with consistent performance. Cork City Council, Transportation Division, is aware of a number of instances where Luminaire suppliers are only in a position to supply proprietary electronic control gear. In this regard Council approval shall be obtained at the design review stage.

2.2.14 Luminaires should be manufactured in accordance with the European Directive on Waste Electrical and Electronic Equipment.

2.2.15 All luminaires shall be fitted with surge protection as per IEC 61643-11 and be rated 10kA/6kV.

2.2.16 All luminaires should be capable of communicating with a Central Management System (CMS) via single management open platform software interface that commands, controls, monitors and configures networks of smart public lighting (PL), as well as other devices connected to the PL network, through any protocol or control technology, including power-line (such as SLV iLON) or wireless based technology (such as Harvard LeafNut). The following must be noted:

- Compliant with TALQ standard and interoperable with TALQ compliant field devices
- Secure two way communication with GPS location
- Capable of real-time control (on/off, dimming - levels), scheduled programmed control (time based profiles) and also event based scheduled control
- Dynamic (adaptive) sensor based lighting control
- Nominal sunrise and sunset times (astronomical clock) and ambient light (photocell)
- Parameters : lamp status (on/off), lamp power, lamp voltage, mains supply voltage, lamp cumulative run hours, consumption (from installation), faulty lamp, weak lamp, ballast status (voltage/current/temperature/run-time), high lamp voltage, brown outs, power cycle, high run hours
- Built in Energy Meter measuring (per lighting point, cumulative) : KWh, IRMS, VRMS, PF, instantaneous power, average power
- Automatic alarming (warnings, errors) and notification (failure) system (via SMS/e-mail alerts)
- Built-in redundancy (comms network failure) with lantern reverting to autonomous control
- Compatible and interoperable (synchronised asset information) with PL inventory asset management database tools (such as DeadSure)
- Capable (comms) of delivering PL firmware upgrades

2.3 Compatibility of Components

There is a significant issue of compatibility in choosing appropriate replacement components or assemblies. Generic substitutes may not have the same visual appearance or give the same lighting performance as the original equipment. The main issues to be considered are:

2.3.1 Due to the impact of the lighting on sky-glow, luminaires should be specified with semi-cut-off bowls.

- 2.3.2** Many high-speed roads are often subject to restrictions on the times that access can be made available for maintenance activities and therefore every effort must be made to ensure that lights not working are repaired and put back into full operation in the shortest time on-site. This often leads to luminaires being replaced rather than repaired on-site. However, this is not an excuse to use the incorrect fitting type, make or model of luminaire. Maintenance activities on restricted access roads have to be planned in advance and this should allow the purchase of the correct luminaires to replace those that need replacement. Care should be taken when ordering replacement luminaires to ensure that the correct body type, reflector type and bowl type are specified to match those in situ on the road. In this way the aesthetics and the performance of the lighting system will be maintained. Good records and knowledge of the lighting system will provide good guidance as to the quantity of units needed for maintenance purposes.
- 2.3.3** Care should be taken when replacing luminaires fixed to bracket arms with post-mounted luminaires to ensure that optical performance is maintained.
- 2.3.4** Mechanical performance will also be affected by changes in mounting height, bracket out-reach, spigot angle and through the incorrect alignment of bracket and luminaire relative to the lit area.
- 2.3.5** Lighting column replacement has to be considered on an individual basis as movement to a different location may affect light distribution and potentially reduce performance.
- 2.3.6** Replacement control gear must be capable of operating the lamp no less efficiently than the original control gear. New or revised circuit wattages must be recorded in the inventory.
- 2.3.7** All luminaires shall be CE marked.
- 2.3.8** Photocells have standardised switching levels relating to a total number of operating hours per annum. The cells also have specific characteristics relating to power consumption, reliability and stability that effect the operating hours and the charging regime. Changes in photocell types and/or operating hours must be recorded in Cork City Council's inventory database.
The replacement of older photocells can bring improved accuracy in switching, reducing operating hours and energy consumption.

2.4 LIGHT EMITTING DIODE (LED) PUBLIC LIGHTING LUMINARIES

2.4.1 LED Luminaire Specification

Cork City Council supports the use of LED fittings on a case by case basis subject to design and lifetime cycle costs. All LED designs for residential estates are subject to the Transportation Division approval and the adhering and the minimum standards of specification:

Description	Standard
General lighting Light emitting diode (LED) products and related equipment - Terms and definitions	IEC 62504:2014
LED Luminaires	BSEN 60598-1
LED Luminaire Performance	IEC/PAS 62722-2-1
Control Gear for LED Modules	IEC 61347-2-13 2006 and IEC 62384
Radio Frequency Interference (R.F.I)	BSEN 55015 + A2 (2009)
Harmonics	EN 61000 / IEC 1000
Road Lighting	BSEN 13201-2/3/4:2003
Surge Voltages in Low Voltage AC Power Circuits	ANSI 62.41
Roadway Luminaire Vibration	ANSI C136.31 2001
Electric & Photometric Measurements for LEDs	IES LM-79-08
Electronic Equipment Reliability Standard for MTBF	Telcordia SR-332
Luminaires: General requirements and tests	EN 60598-1:2013
Miscellaneous lampholders. Particular requirements. Connectors for LED modules	EN 60838-2-2:2006 + A1:2012
LED modules for general lighting. Safety specification.	EN 62031:2008 + A1:2013
Lamp controlgear: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules	IEC 61347-2-13: 2014
Photobiological safety of lamps and lamp systems Product performance standards	EN 62471:2008
DC or AC supplied electronic control gear for LED modules. Performance requirements	EN 62384:2006 + A1: 2009
Digital Addressable Lighting Interface. General requirements: System	EN 62386-101:2009
Digital Addressable Lighting Interface. Particular requirements for control gear. LED modules (device type 6)	EN 62386-102:2009
LED. Binning. Part 1. General requirements and white grid	EN 62707-1:2014
LED modules for general lighting. Performance requirements	C/PAS 62717*

Luminaire performance. Particular requirements for LED luminaires	IEC/PAS 62722-2-1*
Limits and method of measurement of radio disturbance characteristics of electrical lighting and similar equipment	EN 55015:2013
Equipment for general lighting purposes. EMC immunity requirements	EN 61547:2009

- 2.4.1.1** The lantern shall be designed and constructed to operate in Irish climatic conditions for a minimum period of 20 years.
- 2.4.1.2** The lantern housing shall be of single-piece die-cast aluminium. It shall not contain extruded aluminium inserts or multiple pieces screwed or bolted together.
- 2.4.1.3** The lantern shall be suitable for side entry mounting on a plain bracket spigot of the following sizes 42mm x120mm and 60mm x 120mm with a minimum tilt of +/-5°.
- 2.4.1.4** Housing shall have a maximum windage of 0.07m².
- 2.4.1.5** Powder-coated finishes and/or mill finish shall be available. The paint finish/colour shall not adversely affect the heat dissipation of the luminaire.
- 2.4.1.6** The heat sink fins shall be designed to be self-cleaning in order to prevent the build-up of debris and ensure that the overall thermal performance of the lantern remains within specification.
- 2.4.1.7** Terminal block compartment to be accessible via tool-less entry system.
- 2.4.1.8** Lanterns shall incorporate NEMA 3-pin twist lock photocell socket with approved photocell or approved similar sub-miniature solar cell switches.
- 2.4.1.9** All grub screws, earthing screw and hinges shall be fabricated from corrosion resistant material which shall have a resistance to deterioration for a minimum of twenty years.
- 2.4.1.10** The lantern shall be protected against the ingress of dust and water and shall have an IP66 rating as a minimum for the optical and driver compartments. Gaskets shall not deteriorate in service life over the normal life of the lantern. Material employed in all gaskets shall be stated.

2.4.1.11 Luminous intensity class shall according to EN13201:2 be Class 3 or greater

2.4.1.12 The luminaires shall be classified into a Risk Group as per EN 62471:2008 – Photobiological Safety of Lamps and Lamp Systems. This risk group classification is to be advised by the tenderer.

2.4.1 Thermal Management System

Unlike conventional lamp source luminaires the performance of an LED luminaire is dependent on many more complex factors in addition to the LEDs themselves, such as heat transfer, optical control, mechanical support and protection. The performance of an LED is dependent on its operating temperature. The design of the luminaire housing will greatly influence the operating temperature and the performance of the LED.

2.4.1.1 Heat sinks fins shall be provided as part of a single-piece cast body. Convection cooling based systems requiring venting holes, grills, or slots are not permitted.

2.4.1.2 The LED light engine shall consist of aluminium core circuit boards clad directly to the die-cast housing. Fibre-glass circuit boards are not permitted.

2.4.1.3 The system shall maintain LED junction temperature at or below those listed in the Table as follows, assuming 20°C ambient temperature:

Operating Current	LED T_j (junction temperature)
350mA	55°C
525mA	70°C

2.4.2 Fixture Design & Performance

2.4.2.1 The light engine compartment shall be IP66 rated. Gasket or sealants shall not cause the release of chemicals which can affect the performance of the LEDs

2.4.2.2 The power supply compartment shall be IP66 rated.

2.4.2.3 LED fixture efficacy (minimum) shall be as per Table below (5000°K ±300, 240V), accounting for optical, driver and thermal losses

LED Driver Operating Current	Min. LED Fixture Efficacy
350mA	70 Lm/W

525mA	60 Lm/W
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- 2.4.2.4** The total rated power of luminaire, including driver losses, shall be measured under standard operating conditions and expressed in Watts
- 2.4.2.5** A power factor of 0.92 or better shall be provided for all lantern powers
- 2.4.2.6** The luminaire operating temperature range shall be -20°C to +60°C.
- 2.4.2.7** The spigot entry shall be die-cast aluminium alloy suitable for accepting spigot sizes:
Side entry – 32mm x 76mm long to 42mm x 100mm long
Post-top entry – 60mm x 115mm long to 76mm x 115mm long
- 2.4.2.8** The light output ratio of the luminaire shall be greater than 90% with an Upward Light Output Ratio of no more than 0.5%.

2.4.3 Power Supply Driver

The power supply and electronics must provide a well controlled DC source over a range of currents and should be of comparable rated life to that of the luminaire. The failure rate of the driver and associated replacement costs should be included in any whole-of-life cost assessment of LED luminaries.

- 2.4.3.1** The LED modules shall be manufactured by Nichea, Cree, Philips Lumileds or approved equivalent.
- 2.4.3.2** LED power supply drivers shall provide a well controlled DC source up to 600mA. Control options to allow part-night dimming shall be available.
- 2.4.3.3** All capacitors shall have a minimum life rating of 110,000 hours at 85°C
- 2.4.3.4** Drivers shall have a Minimum Mean-Time-Between-Failure (MTBF) of 500,000 hours. The MTBF shall be independently verified by an approved test house to Telcordia SR-332 or equivalent.
- 2.4.3.5** Drivers shall not contain commercial-grade electrolytic capacitors, potentiometers, optical couplers or potting compounds.
- 2.4.3.6** Drivers shall be designed for ease of replacement with pluggable connectors.

- 2.4.3.7** The LED Driver shall be enabled for use with a Central Management System (CMS) with the data cable pre-wired and the driver must be fully compatible with the CMS system Streetlight Vision or Harvard Leafnut to allow for full reporting, diagnostics and dimming functions.

2.4.1 Colour Temperature

The initial colour point (x,y) of the LED and the colour temperature derived from it or bin class related to C78.377-2008.

For optimum efficacy, colour rendering and efficiency considerations in whole-of-life costing LED colour temperature shall be 5000°K (± 300), with a minimum CRI of 65. An option for 4500°K shall also be available.

NOTE: In general, a drop of 500°K in LED colour temperature leads to a drop of 10% in efficacy

2.4.2 Colour Maintenance

The colour shift is assessed by the colour point shift at 6,000 hours compared to the initial colour point (x,y) of the luminaire.

2.4.3 Colour Temperature Tolerance

Tolerance (categories) of nominal x & y values measured at both initial and at 25% of rated life (with a maximum duration of 6,000 hours) within a 1, 3, 5, 7 step ellipse.

Tolerances beyond a 4-step ellipse are unacceptable.

2.4.8 Colour Rendering Index of Luminaire

The initial Colour Rendering Index (CRI) of the luminaire is measured. A second measurement is made after a total operation time of 25% of rated life (with a maximum duration of 6,000 hours). The measured CRI values shall not have decreased by more than 3 points from the rated CRI tolerance (categories) of nominal x & y values measured at both initial and at 25% of rated life (with a maximum duration of 6,000 hours) within a 1, 3, 5, 7 step ellipse. LEDs shall be multi-die chips (i.e. 3 or 6 die). Single die LEDs shall not be permitted.

2.4.9 Lifetime

Life is the length of time during which a LED light source, LED module, or LED luminaire provides more than the claimed percentage of the initial luminous flux, under standard conditions. A LED product has thus reached the end of its life when it no longer provides the claimed percentage of the initial luminous flux, lx.

Life time is a combination of claimed lumen maintenance and failure fraction F_y , at the time of reaching the claimed percentage of the initial luminous flux L_x .

Life testing of the LED light source is carried out according to LM-80 up to 6,000 hours. Beyond these values statistical predictions are made.

Lumen depreciation rate is determined by the light output at 25% of rated life (or a maximum duration of 6000 hours) compared to the initial input.

The classifications are :

Code 1: Light Output > 90% of initial

Code 2: Light Output > 80% of initial

Code 3: Light Output > 70% of initial

LM-80 data shall be provided demonstrating a lumen maintenance of 99% or greater at 55°C @ 6,000 hours

3. Lighting Columns/poles and Brackets

3.1 General Requirements

Tapered tubular or tapered hexagonal / octagonal / hexadecagon (16-sided) galvanised lighting columns shall be selected for use on new schemes and all columns shall be galvanized on both the inside and outside to BS EN ISO 1461: 1999.

Exterior lighting columns shall be designed to the BS-EN 40 family of standards, Viz.:

(a)	IS EN 40-1:1992	Lighting Columns. Definitions and terms.
(b)	IS EN 40-2:2004	Lighting Columns. General requirements and
(c)	IS EN 40-3-1:2000	Lighting Columns. Design and verification. Specification for
(d)	IS EN 40-3-3:2003	Lighting Columns. Design and verification. Verification by calculation.
(e)	IS EN 40-3-2:2000	Lighting Columns. Design and verification. Verification by testing.
(f)	IS EN 40-5:2002	Lighting Columns. Requirements for steel lighting
(g)	BS PD 6547:2004	Guidance on the use of BS EN 40-3-1 and BS EN 40-3-
(h)	IS EN 1991-1-4:2005	Eurocode 1: Part 1.4. Basis of design and actions on structures. Actions on structures. Wind actions.
(i)	BD 94/07	DMRB Vol.2 Highway Structures Design (Substructures and Special Structures), Materials. Section 2 Special Structures Part 1 BD 94/07 Design of Minor Structures (Formerly BD 26/99 & 26/04)
(j)	NRA BD 26/04	NRA Addendum to BD 26/04
(k)	BS EN 287-1	Qualification test of welders. Fusion welding. Steels
(l)	BS EN 288-9	Specification and approval of welding procedures for metallic Specification and approval of welding procedures for metallic materials. Welding procedure test for pipeline welding on land and offshore site butt welding of transmission pipelines. Welding procedure test for pipeline welding on land and offshore site butt welding of transmission pipelines.
(m)	BS EN 1011-1	Welding. Recommendations for welding of metallic
(n)	BS EN 1011-2	Welding. Recommendations for welding of metallic
(o)	BS 7371-6:1998	Coatings on metal fasteners. Specification for hot dipped
(p)	BS EN 10025-	Hot Rolled Products of Structural Steels – Part 2.
(q)	BS EN 10210-	Hot finished structural hollow sections of non-alloy and
(r)	BS 3643 - 2007	ISO Metric Screw Threads
(s)	BS 4190	ISO Metric Black Hexagon Bolts, Screws and Nuts.
(t)	ISO 1461	Hot dip galvanized coatings on fabricated iron and steel
(u)	ISO 10474	Steel and steel products -- Inspection documents

* **Note:** Where contradictions or ambiguities arise between the standards, the standard listed higher in the order of precedence shall govern.

- 3.1.1** The lighting column manufacturer shall be registered with and certified by either NSAI, British Standards Institute of Quality Assurance Services or Lloyds Register Quality Assurance Register for the design, manufacture, supply and verification of road lighting columns and brackets under their quality assessment schedule to ISO 9001.
- 3.1.2** The quality assurance certification shall relate to the specific lighting column material being proposed. Cork City Council reserves the right to request proof of certification from the proposed column manufacturer.
- 3.1.3** Plain tubular stepped columns, widely used to date, are not acceptable to Cork City Council. (This condition applies to all Exterior Lighting Schemes designed since the issue of Revision 1 of this document in January 2009).
- 3.1.4** An earthing connection shall be provided in the base compartment. The fastening screw for this connection shall be stainless steel with an M8 coarse thread.
- 3.1.5** The structural loading on the columns and brackets shall be calculated by the proposed column manufacturer / supplier in accordance with IS EN 40-3-1, using the Rationalised Wind Factor calculation as described in BS PD 6547.
- The Rationalised Wind Factor (RWF) shall be: 587N/m² and the exposure category shall be Category II. (Note: Calculations using the 60 minute storm or the 3 second gust wind speed will not be acceptable.)
- 3.1.6** The structural design of the columns and brackets shall be verified by calculation by the proposed column manufacturer / supplier in accordance with IS EN 40-3-3.
- The partial safety factors used in the calculations shall be:
- | | | |
|----|--------------------------------------|------|
| a. | Partial safety factor for materials | 1.15 |
| b. | Partial safety factor for dead loads | 1.20 |
| c. | Partial safety factor for live loads | 1.40 |
- 3.1.7** Designers shall take into consideration the location at which an exterior lighting column is to be installed. The level of vandalism likely should be considered , more robust columns are required in areas of high instances of vandalism. Cork City Council Transportation Division shall be consulted on this point prior to selection of column.
- 3.1.8** Columns that are to be installed in locations inaccessible to a maintenance truck, e.g. on steps / embankments / narrow laneways etc. shall be of a hinged design to allow for maintenance.

- 3.1.9** Outreach brackets are to be used in all instances except where Cork City Council's Transportation Division explicitly permit direct pole top mounting of luminaires.
- 3.1.10** Outreach Bracket designs are to be approved prior to installation, particularly where decorative brackets are being used.
- 3.1.11** Exterior Lighting columns and ducts to be taken in charge for maintenance by Cork City Council shall not be erected on ground likely to remain private / inaccessible, e.g. private gardens, ESB / Bord Gáis Substation enclosures etc.
- 3.1.12** Account shall be taken of any traffic management measures that may be required during the installation of exterior lighting schemes including compliance with Chapter 8 of the Traffic Signals Manual published by the Department of Transport. This includes the requirement that a traffic management plan by a holder of a current valid Traffic Management Designer CSCS card and implemented on site by a current valid FÁS CSCS Signing, Lighting and Guarding on roads license holder. Any non-lighting equipment (including signs etc.) may only be installed on exterior lighting columns with the explicit permission of Cork City Council Transportation Division or ESB Networks where applicable. All column design calculations shall consider the inclusion of a sign measuring 300mm x 300mm or CCTV for wind loading of calculations.
- 3.1.13** Proposed column suppliers shall confirm that their columns have a design life of a minimum of 25 years in accordance with IS EN 40-3-3.
- 3.1.14** When rooted columns are proposed, the column planting depth to be treated with a bituminous preservative on both inside and outside surfaces. The bitumen shall extend to 250mm above ground level.
- 3.1.15** A marine plywood baseboard is to be fitted in each column. Three coats of intumescent varnish shall be applied to the baseboard in order to prevent fire propagation. The varnish shall be as manufactured by Hamron (type WD-05) or approved equivalent. The rate of coverage shall be 2.5 square meters per litre in order to provide class 0 protection. The clearance between baseboard and inside face of door when secured to be not less than 100mm.
- 3.1.16** The column and bracket assemblies shall conform with the deflection requirements of Class 2 as defined in IS EN 40-3-3.
- 3.1.17** Design calculations are subject to review by Cork City Council and shall be submitted with proposed exterior lighting scheme designs if requested.
- 3.1.18** Cork City Council may require banner arms to be installed on exterior lighting columns at main city centre locations. The dimensions of these banners shall be specified and both the column and foundation shall be designed and proposed to Cork City Council for approval.

3.1.19 Lighting columns and brackets need to be protected from the effects of the weather, pollution and other environmental elements. Steel lighting columns will quickly deteriorate if they are not provided with, as a minimum, a protective system such as hot dipped galvanising. Further protection may also be given by the application of an additional protective system such as paint or powder coating.

3.1.20 Lighting columns manufactured from aluminum, stainless steel or composite materials generally require no additional protective coatings to be applied. To maximise the life of the lighting column, any protective systems need to be maintained throughout its life.

3.1.21 In environmentally sensitive areas such as conservation areas and town/city centres, the application of additional protective coatings may be carried out to provide a more decorative and aesthetically pleasing finish to the lighting columns as well as providing protection. The negative impact poorly maintained public lighting equipment can have on an area should not be overlooked and should be taken in to account when determining maintenance and reapplication of protective coating intervals

3.2 Welding

Longitudinal welds shall have a real penetration of over 60% and have a smooth external surface. The welding process shall be documented and controlled by the manufacturer's quality control department.

Welding of metallic components shall comply with the appropriate design codes and standards, and include the requirements prescribed in, or equivalent to, the following;

- EN 287: Approval Testing of Welders – Fusion Welding (Parts 1)
- EN 288: Specification and Approval of Welding Procedures for Metallic Materials (Parts 9).
- Arc Welding shall be in accordance with; BS EN 1011-1 and BS EN 1011-2.

3.2.1 Weld Procedures Specifications and Documentation

On request the Manufacturer shall submit to the Purchaser for review and comment, the following documents:

- Welding Procedure Specification (WPS)
- Weld Procedure Approval Records (WPAR)
- Welder Qualification Records (WQR)
- Inspection schedule including quality assurance and quality control requirements
- Third Party inspection authorities and / or Authorised Bodies
- Non-Destructive Examination and testing procedures
- Standard weld repair procedures

3.2.2 Welding Procedures

All welding procedures including those proposed in repair situations shall be qualified as required by EN288 or approved equivalent and all qualified procedures shall be available upon request by the Purchaser for review and comment.

3.2.3 Welder Certification

Welders shall be in possession of current Qualification Certificates (EN 287, or approved equivalent, international standard) for the welding procedures, which they will use. The Manufacturer shall produce these Certificates for inspection by the Purchaser at the latter's request.

3.2.4 Inspection of Welding

All welding inspection shall be performed by Welding Inspectors that are suitably qualified to perform inspections. The Manufacturer shall maintain, at manufacturer's facilities, adequately indexed records of all welding, weld inspection and repairs which shall be available to the Purchaser on request, together with facilities for viewing of x-ray photographs.

3.2.5 Weld Repairs

In the case of weld cracking, the Purchaser shall require a full investigation to the cause of the cracking prior to any repair procedures. The cost of all such investigations and reports shall be wholly borne by the Manufacturer.

3.3 Specific poles for Overhead Network Public lighting (Tubular Steel Poles Unstayed, for Low Voltage Overhead Electric Power Lines)

Currently overhead all overhead distribution poles are owned by ESB Networks until such time as they are formally handed over to Cork City Council and bear a Cork City Council Deadsure Asset number and logo.

Cork City Council do wish to promote the installation of new public lights on poles which are fed over head by an overhead distribution system. The following specification outlines the requirements for existing public lights which are fed overhead by an overhead distribution system and is provided for maintenance purposes only.

3.3.1 Specification Codes and Standards

Parameter Networks	Description
Nominal Voltages	< 1kV
Rated Voltage	0.423/0.244kV
No. of Phases	3
Frequency	50Hz
Neutral Point Earthed	Directly
3 phase Short Circuit (rms)t Duration of Short Circuit	37kA (Ind)1s
Dynamic current (peak)	9kA Dom

Insulation Levels Power Frequency 1 min (rms)	3kV
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The following specification relates to hot rolled steel poles and gives requirements for cylindrical and multi-sided steel poles. The design is not limited to a one piece section. The enquiry documents set out the particular requirements

No	Pole description
1	10M Steel Pole Galvanised Class 2
2	10M Steel Pole Galvanised Class 3

No	Length	Max ext diameter at butt	Gnd line dist from butt	External Ground line diam mm ₁		Minimum Internal Pole Top Diameter (mm) ₁	Maximum External diameter 125mm from pole top ₂
				Min	Max		
1	10M	360mm	1.65m	200mm	315mm	95mm	135mm
	class 2					120mm	165mm
						175mm	220mm
2	10M	360mm	1.65m	250mm	330mm	95mm	135mm
	class 3					120mm	165mm
						175mm	220mm

₁ Dimensions are taken across angles for multi-sided cross sections.

₂ Dimensions are taken across flats for multi-sided cross sections.

Item	Tolerance
Length	Upper Limit: +255mm Lower Limit: 0mm
Diameter	Upper Limit: +20mm Lower Limit: 0mm
Hole Diameter	Upper Limit: +1mm Lower Limit: -0.5mm
Hole Position	± 1mm between centres
Straightness	<5mm/1000mm length

All steel poles shall be free from unnecessary bends and twists other than those inherent in the design. Steel poles shall have a neat finish.

Fabrication shall be carried out exactly in accordance with the approved drawings in a neat workmanlike manner in accordance with best modern practice so as to facilitate cleaning, painting and inspection and to avoid spaces in which water or other matter can lodge.

All holes shall be cylindrical and perpendicular to the poles. Holes shall be true to form, free from rags and distortion and all burrs and sharp edges removed. Holes shall not be punched in material thicker than 12mm. The use of a torch for cutting holes shall not be permitted. Incorrectly drilled or punched holes may not be refilled by welding. Where necessary, to avoid distortion of holes, holes close to bends shall be made after bending.

Where holes are punched the edges of the rim of the holes shall be flush with the face of the steel pole. If this cannot be achieved, the holes shall be drilled.

No heating or cold working shall be permitted which would cause embrittlement of the steel.

The steel poles listed in this specification shall be manufactured from steel of an approved grade listed as follows:

Specification	Steel Grade
EN 10025-2	S275JR
EN 10025-2	S355JR
EN 10210-2	S275JOH
EN 10210-2	S355JOH
ASTM A570/ASTM A607	GR 50 / 55

3.3.2 Steel Pole Loading Requirements

Each type of Steel Pole manufactured under this specification shall be designed to meet the three loading conditions below. The design shall assume that the load shown in each load condition is applied within 200mm of the top of the pole.

The design shall also assume that the support at the butt of the pole does not extend past the applicable ground line distance

3.3.3 Loading condition 1 – Temporary Deflection

Each Steel Pole type offered shall be designed to withstand the applicable Temporary Deflection loads given in Table 2.5 column 4.

The amount by which the pole deflects under this load shall be known as the Temporary Deflection.

The Steel Pole shall be designed so that the Temporary Deflection is less than the corresponding Maximum Allowable Deflection values given in Table below. On removing the Temporary Deflection loads the poles must return to their original position with no permanent deflection present.

3.3.4 Loading condition 2 – Permanent Set

Each Steel Pole type offered shall be designed to withstand the applicable Permanent Set loads given in Table below

The Permanent Set is defined as the residual deflection of the pole from its original position after the Permanent Set load has been applied to the pole for 1 minute and then removed.

The Poles shall be designed so that the Permanent Set measurement shall be less than 10% of the maximum deflection measured under the Permanent Set load.

The maximum deflection shall be taken as the maximum deflection measured during the 1 minute interval that the Permanent Set load is applied.

3.3.5 Loading condition 3 – Minimum Ultimate Strength

Each of the Steel Poles offered shall be designed to withstand all loads up to the applicable Minimum Ultimate Strength load given in Table 2.5 column 8.

No	Pole type	Temp deflection loading condition 1		Permanent set loading condition 2		Minimum ultimate strength load (KN) loading condition 3
		Load (KN)	Max allowed mm	Load (KN)	Max allowed mm	
1	9M class 2	9	300mm	11.5	Permanent Set shall be 10% of measured on application of load	14.5
2	9M class 3	18	450	23		29

3.3.6 Earthing / Grounding Terminal Requirements

Both an earthing terminal and a threaded insert for earthing shall be provided. The location of the earth terminal and threaded insert shall be as shown in the drawing, in line with one set of bolt holes.

The earthing terminal shall be suitable for the connection of to an Earthing lug, which has a 13mm hole in the palm. The earthing terminal shall be fitted with a 12mm x 25mm earthing bolt with washers and spring washers as shown in the drawing. Bolts, nuts and washers used for the earth terminal shall be of either grade 304 austenitic stainless steel or galvanised in accordance with section 2.06.01.

The earth terminal shall be compatible with copper, stainless steel and aluminium earthing lugs without any risk of corrosion in salt polluted conditions.

The threaded insert shall be suitable for use with stainless steel and galvanised bolts without any risk of corrosion in salt polluted conditions. It shall also be suitable for use with copper and aluminium earthing lugs which have a 13mm hole in the palm.

3.3.7 Isolation Box

An electrical isolation boxes (IP 65) (as produced by Killarney Plastics Limited) shall be fitted to the pole to provide the supply connection to each luminaire. These isolator boxes shall be approved for use by ESB Networks and shall meet the requirements set out in the National Code of Practice for Customer Interface as published by ESB Networks. Cork City Council can advise the Developer with further information if required.

3.4 Pole/Column Protective coatings and their application

Columns proposed to be installed in city centre locations or at locations as directed by Cork City Council shall have a finish with a proprietary paint to an agreed BS or RAL colour which takes account of the surrounding environment and shall be installed as agreed by Cork City Council, Transportation Division at the design review stage.

Lighting columns and brackets are subject to high levels of pollution from traffic spray, animals and other environmental factors. All too often lack of preparation before the application of a protective system leads to failure of the new coating. When selecting a suitable paint finish for application to *in situ* lighting columns and brackets, care should be taken to ensure that the existing finish is sound, well adhered to the substrate and compatible with the proposed new paint system. Adhesion of the existing paint system can be checked by carrying out a crosshatch test on a representative selection of units to be painted and compatibility checked by applying a small patch of the proposed new paint system over the existing protective system.

When preparing *in situ* lighting columns or brackets for the application of a new protective system, the complete surface of the unit should be cleaned, de-greased and any corrosion treated before the new protective system is applied. Failure to carry out these tasks may result in the breakdown, de-lamination or peeling of the new protective coating and the need for further maintenance.

The frequency for the reapplication of protective systems to lighting columns and illuminated traffic sign posts should be determined taking account of the following matters:

- Condition and age of equipment.
- Level of atmospheric pollution.
- Location of equipment.
- Type of protective system used.
- Other environmental factors

In aesthetically sensitive areas, the frequency of maintenance and reapplication of the protective coatings may need to be reduced from that used for protection only, to maintain the decorative and aesthetic appearance of the lighting columns.

Further guidance on the application and maintenance of protective coatings can be found in the Institution of Lighting Professionals " *Technical Report No. 26 A Practical Guide to the Painting of Steel Lighting Columns and Bracket Arms*.

Lighting columns are particularly vulnerable to corrosion underground and consideration must be given to extra protection to the root section and proportion of column directly above the ground. Treatments available are standard bitumen coating, epoxy coatings, glass flake and fusion bonded coatings. These treatments will extend the life of the root of the column considerably.

3.4.1 Zinc Coating

Each Pole shall be hot dip galvanised inside and outside to a minimum average coating thickness of 140 microns irrespective of the pole thickness at each point. The minimum average coating thickness is defined as the average of 7 to 10 individual local area measurements taken across the length of the pole with a minimum of 2 measurements taken at the butt of the pole, 1 from the middle section of the pole and 2 measurements taken at the top of the pole. 2 measurements shall be taken from the inside of the pole, one at the butt and one at the top. Testing of the coating shall generally be to BS EN ISO 1461.

Individual local area measurements shall be an average of 3 to 5 measurements taken over a local area of 10cm². The lowest individual local area measurement achieved shall not be less than 133microns and shall be noted in the Technical schedules.

Additional measures such as surface preparation or grit blasting may be required to achieve the higher thickness on both the interior and exterior surfaces of the poles. The surface of the steel pole shall receive any additional measures (preparation, blasting, etc) recommended by the coating supplier, or required to achieve the appropriate level of zinc adhesion. The thickness of the zinc coating shall be uniform across the length of the steel pole. All poles shall have a smooth finish free from nicks, cracks, chipping in the zinc coating and any other visible defects.

Galvanised bolts, nuts and washers, were supplied, shall be galvanised to a minimum average local coating thickness of 50 microns for threaded items and 55microns for washers in accordance with BS 7371-6 2011.

The lowest individual local area measurement achieved shall not be less than 43 microns for threaded items and 48microns for washers. The lowest individual local area measurement shall be noted in the Technical schedules.

3.5 Top Cap Requirements

All columns/poles must be provided galvanised steel cap shall be permanently secured to the top of the steel pole either through a designated cap insert, the bracket or by pole top fitting. The provision of a stand-alone cap is to be provided for OH network mounted poles and should be made of steel cap shall be galvanised in accordance with 2.06.01. The coating finish shall be in accordance with specification 05030. The cap shall prevent water ingress. The bolt, nut and washer used to secure the top cap shall be of either grade 304 austenitic stainless steel or galvanised in accordance with section 2.06.01.

3.6 Aluminium Columns

3.6.1 Aluminium Columns may be installed on new schemes on approval by Cork City Council.

3.6.2 Aluminium lighting columns to be manufactured in accordance with **BS EN 40-6:2002** Requirements for Aluminium Lighting Columns & **BS EN 40-3:2013**.

- 3.6.3** Columns shall be tubular one piece aluminum complete with double flush fitting vandal resistant doors fitted with anti-vandal stainless steel M8-8mm centre pin recessed socket screw lock door bolts.
- 3.6.4** All aluminium columns to have a **50** year design life.
- 3.6.5** The standard surface finish of aluminium columns is to be a natural aluminium brushed finish. Other surface finishes, such as painted, anodized or electrostatic powder coated, may be permitted with the agreement of Cork City Council Public Lighting Office.
- 3.6.6** The exterior and interior surfaces of the intended planted depth of an aluminium alloy lighting column shaft and a length of 250 mm above the ground level shall be coated with a non-porous electrically insulating bitumen with a minimum layer thickness of 250 microns. The coating shall only be applied after degreasing and after an approved preliminary treatment in order to ensure adhesion.
- 3.6.7** The underside of an aluminium alloy flange plate shall be treated before erection with bituminous paint complying with BS 3416 or BS 6949.

3.7 Quality Assurance

3.6.1 Material Workmanship

All materials and workmanship shall be of a suitable type and quality to ensure that the poles can be easily erected and that they will operate satisfactorily over their design life in accordance with the specification.

3.6.2 Quality Assurance System

Registration to ISO 9001 (most recent version) or equivalent is required. Fabricators shall provide evidence of current registration to this or other quality standards and shall provide a Quality Manual and an outline of the manufacturing process controls in English. Detailed information on Quality Procedures and Work Instructions shall be made available and provided as requested:

- Details of particular quality requirements must also be observed, such as:
Maintenance of a risk register
- Tests on raw materials used for hot rolled steel and each coil of raw material used for cold formed steel shall be carried out and the quality assurance procedure for this shall be supplied to the purchaser
- Recording of non-conformances and follow-up corrective action.
- Evidence of continuous improvement and reviewing of targets and objectives.
- Procedures and work instructions to ensure quality production and good traceability.
- Statistical records of Quality Control Tests

- Sample copies of completed statistical records on tests and quality control checks.
within the factory should be provided, in order to provide confirmation of Quality Control Procedures.
- Auditing.

3.6.3 Sub-Suppliers

The manufacturer shall fully declare all sub-suppliers of material associated with or used in the final product. This declaration shall include the sub-suppliers name and country of origin. All sub-suppliers shall have an implemented Quality Assurance system conforming to ISO 9001 ~ 2000 or similar standard.

Each batch of poles shall have welding quality validation by sufficient random testing e.g. ultrasonic testing, fluorescent particle/dye penetration testing (ASTM E164/E138/E165) or destructive testing (hardness, micrographic, flattening etc, refs. EN 1043-1 / 1321 / 10233.

As a minimum, special attention shall be given to the following areas:

- 100% visual Inspection on all items in the consignment prior to corrosion protection (including removal of spatter)
 - 1% NDE (Radiographic Inspection RT) on all items prior to corrosion protection
 - 10% visual on all items after corrosion protection
- NDE = Non Destructive Examination.

3.6.4 Nameplate/Markings

Every pole supplied to Cork City Council shall have embossed nameplate attached to the steel pole at a height of between 1.5 and 3m from the butt of the pole. The information should not be embossed on the inspection door

The nameplate shall have the following information attached:

- Date of Manufacture
- Manufacturer
- Length (M)

3.7 Delivery

All packing for delivery shall be robust and strong enough to protect against transport risks, damage by water and open air storage. The packing method must be resistant to impact damage from handling equipment and suitable for the applied weight load. Packaging shall not have unnecessary potential to cause injury – e.g. protruding nails. All packing shall be suitable for lengthy storage (typically 5 years) without danger of white rust being formed. Skids or any other timber in contact with steel poles shall not be fresh lumber or of a type of wood that's very resinous which might affect the zinc coating on steel items. All banding shall be strong enough to withstand transport and handling loads. Steel poles shall be bundled together fair ended (Broad end to tapered end) in pairs using steel banding with a width of at least 20mm and thickness above

2mm. Rubber patches shall be placed between steel banding and points of contact on steel poles to prevent damage to the zinc coating. Steel Poles shall be wrapped in a waterproof protective cover (rigid foam or equivalent) of 6m in width. The cover shall be centred on the pole to prevent possible damage from lifting by forklift or crane. The protective cover shall be banded to the pole using strong waterproof banding and red tape shall mark the fulcrum point. During handling of steel pole bundles, care shall be taken to avoid abrasion or damage to the poles and their coatings by cranes, forklifts, slings and ropes etc. Loads shall be balanced to avoid the slippage. When lifting and setting down poles, care shall be taken not to distort the pole or damage the packaging or the zinc coating. Steel poles must be shipped on flatbed trailers with side supports and without a roof to facilitate removal by forklift over the side. Clearances from the walls of the trailer of 500mm shall be maintained at both ends of the steel poles to prevent instability due to contact between the pole and the trailer during unloading by forklift. During transport bundles shall be spaced with care to avoid the steel poles rubbing against the trailer or other steel poles. During storage and transportation the steel poles shall be adequately ventilated to protect the zinc coating against white rust. This is particularly important where poles (or bolts etc.) are stored and transported in conditions of high humidity, especially when transported in closed containers. Refer to Clause 2.06.01. If steel poles are transported by ship, they shall be protected from contact with salt water and sea spray.

3.7.1 Installation

The equipment will be installed by the Purchaser in accordance with the manufacturer's instructions. These instructions shall be clear, weatherproof and shall be specific to the poles being supplied. They shall cover all aspects of pole installation up to and including putting into service. Each steel pole supplied shall be accompanied by a set of installation instructions. A copy shall be forwarded to Cork City Council on installation

3.7.2 Rejection of Work

Cork City Council shall have the right to reject any work which is not carried out in accordance with this or any other agreed specification. The cost of re-doing the work including the material cost and coating of the material shall be borne by the developer/contractor.

4. Lighting Design, Cable Design and Electrical Service Design

4.1 Lighting Design

It is essential that all exterior lighting schemes comply with the current Code of Practice BS5489-1:2013

In particular, Cork City Council wishes to promote the installation of energy efficient exterior lighting schemes. Measures required to achieve this include the use of lanterns with efficient optics which would minimize light pollution, optimization of scheme layout, use of energy efficient lamps and electronic control gear, implementing dimming (CMS or factory set) and trimming, complying with best practice and taking account of the 'Campaign for Dark Skies' issues where appropriate. Therefore all lighting schemes shall incorporate the requirements of, "Guidance notes for the Reduction of Light Pollution" issued by the Institution of Lighting Professionals and available as a download from its website Professionals www.ilp.org.uk.

Street Lighting design has to be undertaken to meet the requirements of the CEN code of practice EN 13201: 2003 and BS5489-1: 2013. Furthermore, ESB Networks (DSO) requirements for supply shall be undertaken with reference to conditions being established by the Commission for Energy Regulation, CER in Ireland.

4.1.1 Lighting Performance

The original design for lighting any given road, footpath or area usually depends on optimising a number of factors, environmental, optical and functional (relating to anticipated use). From this process the optimum choice of luminaire and their spacing and mounting heights will be determined to achieve a specific performance in accordance with the requirements of BS 5489-1: 2013 and BS EN 13201. It is important that maintenance repairs do not introduce components (particularly luminaires) or carry out adjustments (reflector positions, lamp positions) that affect the designed optical performance. Changes in luminaire type will require assessment, prior to installation, to establish that the distribution and light control are at least equivalent to that of the original installed, e.g. full cut-off (flat glass) luminaires, which have been installed to reduce the nighttime visual

4.1.2 Light Measurement

Verifying the lighting on the streets - The process for measuring lighting performance in CEN13201 is complex and time consuming. The ILP Technical Report 28 Measurement of Road Lighting Performance on site; is a simplified methodology for assessing the street lighting performance on the streets. This report has been widely accepted as a robust approach for PFI contracts. The ILP report adopts a proven yet simplified process that records some 15 points on the road and verifies the design has been installed correctly or otherwise. Designers should take every opportunity to review their designs once installed and TR28 enables an easy method to record the site measurements.

4.2 Cable and Electrical Design

The installation of schemes in residential areas shall comply with the Code of Practice for Public Lighting ET211: 2003, the National for Electrical Installations (ET 101: 2008) current at time of issue and shall include the provision of a Customer Service Pillar(s) in line with the requirements of ESB Networks National Code Of Practice For Customer Interface (current edition).

The electrical services design for the scheme shall be undertaken to comply with the relevant sections of ETCI National Rules, viz ET: 101 and ET: 211. In particular the requirements set out in section 714 of ET: 101 as well as all of the requirements set out in ET: 211 shall be complied with. The detailed cable design shall be undertaken to match the calculated electrical load which would typically allow between 4 and 8 fittings to be supplied per phase. The provision of earth loop / fault level calculations and circuit disconnection (fuse rupture times) shall also be completed at the design stage. Exterior lighting schemes requiring cable lengths in excess of 200 meters require careful design to meet the earth loop impedance requirements of ET: 101.

Disconnection / fuse rupture times shall be in compliance with those set out in ET: 101 (National Rules for Electrical Installations) rather than those specified in BS 7671 for Public Lighting and Street Furniture.

Note: In some cases Cork City Council may refer the electrical services designer to other Irish, UK or European Electrical Design Standards, e.g. BS7671 (UK wiring Regulations and / or associated guidance notes) etc.

4.2.1 In all cases install power supply cable from the following shall be installed:

- SWA Cable to BS 6346 (0.6 / 1kV);
- SWA Cable to BS5467 / I.S. 273 (0.6 / 1kV);
- NYCY cable to DIN VDE 0276 – 603 (0.6 / 1kV).

4.2.2 Where ESB high voltage cables (11 KV / 22 KV) cables run in parallel with Exterior Lighting cables in ducts a minimum segregation of 300 mm shall be maintained. Where ESB high voltage cables and Exterior Lighting Cables cross they shall do so at right angles. The requirement of crossing at right angles also applies to gas mains.

4.2.3 Fuses and circuit breakers shall have a minimum rupture capacity of 16 kA.

4.2.4 Generally, the main customer service pillar customer fuse rating shall not be greater than 25 Amps.

4.2.5 C-Type circuit breakers shall be used.

- 4.2.6** The use of circuit breakers (MCB's) in exterior lighting columns is not permitted by Cork City Council, Transportation Division. Fused isolators / disconnectors, such as Lucy MC040SLF fused isolators / fused cut outs, shall be used in Exterior Lighting Columns.
- 4.2.7** Exterior Lighting cables shall not be jointed in inaccessible locations particularly where water ingress is likely. Inspection chambers / draw pits shall be installed at both sides of under carriageway crossings, at every 50m length of duct and at every change of direction $> 30^{\circ}$.
- 4.2.8** The availability of electricity supplies shall be confirmed by the Distribution System Operator (DSO) ESB Networks prior to design of the exterior lighting scheme.
- 4.2.9** Where upgrades to exterior lights on overhead network poles is being undertaken electrical isolation boxes (IP 65) (as produced by Killarney Plastics Limited ref to Appendix 7) shall be fitted on the supply connection to each luminaire. These isolator boxes shall be approved for use by ESB Networks and shall meet the requirements set out in the National Code of Practice for Customer Interface as published by ESB Networks. Cork City Council can advise the Developer with further information if required.
- 4.2.10** All upgraded luminaries shall be controlled via an integral photocell and not make use of the switchwire as was the practice the past. The switchwire shall be removed when and where required by Cork City Council by ESB Networks.
- 4.2.11** Main road exterior lighting schemes shall have power supply infrastructure installed with a minimum of 25% spare capacity (Maximum Installed Capacity at Customer Service).
- 4.2.12** Pillar, Cables to be sized for 25% additional load (and at least 25% additional length) to allow for future extension. The spare capacity requirements shall be advised by Cork City Council at the design review phase.
- 4.2.13** Cork City Council does not accept exterior lighting schemes that are centrally controlled from a contactor in the interest of energy conservation, scheme reliability and public safety. As mentioned previously, each luminaire shall have a photocell or sub-miniature photocell.
- 4.2.14** The installation of schemes in Residential Areas shall comply with the Code of Practice for Public Lighting ET211: 2003. All exterior lighting schemes shall include the provision and installation of a Customer Service Pillar (Micro Pillar).
- 4.2.15** Designers of Electrical schemes must take cognizance of the many external factors of installing equipment in an outdoor environment including members of the public.

4.2.16 All equipment must be provided with a local means of isolation. The established practice of using a fuse carrier as the isolation and switching device is allowed for TN systems provided only authorized maintenance personnel carry out the works.

4.2.17 The designer shall design the neutral conductor size as per the relevant standards in particular in relation to use of 3 phase cabling in the use of discharge lighting which create significant third harmonic currents.

4.2.18 The designer shall design all circuit lengths in accordance with the required tripping times and voltage drops as stated in the standards.

4.2.19 The designer should divide circuits such that

- It avoids hazards and minimizes inconvenience in the event of fault or overcurrent
- It facilitates safe inspection, testing and maintenance
- It take account of danger that may arise from the failure of the circuit
- It reduces the possibility of unwanted tripping of RCDs due to excessive protective conductor currents produced by equipment in normal operation
- It mitigates the effects of electromagnetic interferences
- It prevents the unintentional energisation of a circuit that is intended to be isolated.

4.3 Pillars

4.3.1 Feeder pillars shall comply with IP 34 of IS EN 60529. They shall include a full size back board of varnished (intumescent) marine plywood at least 15 mm 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 root.

4.3.2 The distribution MCBs or fuse boards shall have 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). All components secured to the back board shall be neatly arranged and securely attached ensuring that there shall be at least 25% spare space on the back board.

4.3.3 The pillar doors shall be fitted with tamperproof locks, all locks being identical in pattern and two sets of keys shall be provided to Cork City Council & ESB. All hinges and locks shall be of stainless steel to BS 6105 or BS 970.

4.3.4 Distribution boards where used shall be provided with an external earth, phase barriered and colour coded. They shall be fitted with the same number of live and neutral bus bar terminals as there are outgoing circuits

plus at least one spare way.

- 4.3.5** Circuit details and labelling shall be provided in each feeder pillar with a circuit drawing provided as part of the safety file or take in charge procedure.
- 4.3.6** Feeder pillars shall be mounted as per manufacturers specification on a 150 mm thick foundation of mix ST2 concrete. After completion of the cabling the feeder pillar base shall be filled to 25 mm below the door with rounded coarse aggregate conforming to BS 882 graded aggregate 14 mm to 5 mm.
- 4.3.7** A durable warning sign indicating “Danger 400 Volts” or “Danger 230 Volts” as appropriate, in 5 cm high letters (or other size as specified in **Appendix 14/4**), shall be fixed to the front of the pillar where applicable. Each pillar shall have a permanent label fixed externally which identifies it as a public lighting pillar.
- 4.3.8** All pillars to be taken in charge by Cork City Council will be marked with a Deadsure Asset number to be indicated by Cork City Council.
- 4.3.9** A durable warning sign indicating “Danger 400 Volts” or “Danger 230 Volts” as appropriate, in 5 cm high letters (or other size as specified in **Appendix 14/4**), shall be fixed to the front of the pillar where applicable. Each pillar shall have a permanent label fixed externally which identifies it as a public lighting pillar.
- 4.3.10** For all maintenance works, a Lock out and tagging system of power isolation must be used in all power supply points. The tag must provide contact details of the Electrician who put in the tag in place and the date.

4.4 Isolation and Earthing

- 4.4.1** All earthing and bonding shall comply with the requirements of the National Rules for Electrical Installations and with any additional requirements. Circuit protective and equipotential conductors shall be installed and shall be green/yellow PVC or XLPE insulated or sleeved. Where bolted connections are required, these conductors shall be terminated in accordance with manufacturers’ instructions in correctly sized purpose made lugs. Such connections shall be made with non-ferrous nuts, bolts and washers.
- 4.4.2** The circuit protective conductor shall be of equal cross-sectional area to the associated circuit conductor except where it is contained within a composite cable when its cross-sectional area may be reduced as permitted in the National Rules for Electrical Installations.
- 4.4.3** A circuit protective conductor shall connect the earth terminal on each lantern to the main earth terminal associated with the service cut-out unit.
- 4.4.4** A separate circuit protective conductor of not less than 2.5 mm² cross-sectional

area shall connect all metal enclosures of all electrical components to the main earth terminal.

- 4.4.5** All extraneous conductive parts, as described in the National Rules for Electrical Installations shall, where required in these Rules, be bonded to the main earth terminal in accordance with these Rules.
- 4.4.6** Earth values must be in accordance with the requirements of Table 41.1 of BS7671:2008
- 4.4.7** Equipment installed on the street requires a means of local isolation
- 4.4.8** Earth electrodes shall be as per ET 101 Sect. 542.2.3. All power supply pillars must have an independent earth utilising
- a) **Solid Copper Lattice Mat** 600mm X600mm X3mm (refer to Appendix 8) - Solid copper lattice mats are often used for potential grading and are a preferred option on installations where touch and step potential could cause problems. Cork City Council recommend this earth for installation in Urban environments with the provision of an adjacent chamber where the bond to the lattice can be inspected.
 - b) **25mm Earth strap** – The length of selection is dependent on the resistivity of the ground and should be installed in a trench which is situated at 180 degrees from the DSO earth.
 - c) **Earth bar**
A driven earth bar must only be undertaken with a full knowledge of the Utilities in the area including a full risk assessment. Earth electrodes shall be of the Cu. plate type with an area of 1/ 2 m² and set vertically at a minimum depth of 600mm. from the ground surface to the top of the plate to ensure that the soil in close proximity is sufficiently damp as per IEE Guidance Note 8. Earthing & Bonding

5. Small Civil Works – Access Chambers & Ducts

- 5.1** Exterior Lighting ducting shall be 100mm diameter red polythene with smooth interior to IS 135 Class B / BS5306 Class B. Ducts shall be buried to the correct depths as specified in the ETCI National Rules (ET: 101). Minimum cable bending radii shall be observed.
- 5.2** **Note:** UK standards specify orange ducts for Exterior Lighting cables; this is not compliant with the Irish ET: 101 requirements that red ducts be used for exterior lighting cables.
- 5.3** Decorative Inspection Chamber: All access chamber covers on the footpath to cater for a change of direction shall be ductile iron as per Cavanagh Celtic or similar approved with frame opening 600mm x 600mm to EN 124 B125 with M16 stainless steel locking bolt or similar approved. Lock shall make provision for nut and bolt if damaged. Tapping of the frame is not permitted. If similar approved it shall be certified by an accredited Third party.
- 5.4** Large Inspection Chamber: All access chamber covers on the footpath to cater for a change of direction shall be ductile iron with galvanized steel frame as per Cavanagh Antelope JB5 or similar approved with frame opening 615mm x 615 mm to EN 124 B125 marked “Public Lighting” or “Traffic” with M16 stainless steel locking bolt, or similar approved. Lock shall make provision for replacement of bolt and nut if damaged. Tapping of frames is not permitted. Cover & frame shall be certified by an accredited Third party.
- 5.5** Medium Inspection Chamber: Access chamber covers on the footpath for straight through services shall be ductile iron with galvanized steel frame as per Cavanagh Viper Traffic JB2 or similar approved with frame opening 720mm x 260 mm to EN 124 B125 marked “Public Lighting” or “Traffic” with M16 stainless steel locking bolt or similar approved. Lock shall make provision for replacement of bolt and nut if damaged. Tapping of frames is not permitted. Cover and frame shall be certified by an accredited Third party.
- 5.6** Small Inspection Chamber: Access chamber covers on the footpath for straight through services shall be ductile iron with galvanized steel frame as per Cavanagh Viper Traffic JB1 or similar approved with frame opening 385mm x 260 mm to EN 124 B125 marked “Public Lighting” or “Traffic” with M16 stainless steel locking bolt or similar approved. Lock shall make provision for the replacement of bolt and nut if damaged. Tapping of frames is not permitted. Cover and frame shall be certified by an accredited Third party.
- 5.7** All Inspection Chambers on carriageways shall have the same dimensions as those listed small, medium and large above. In all cases the chamber shall be to EN 124 Group 4.
- 5.8** High strength engineering brick or in situ concrete may be used to make up the

manhole walls directly under the frame. Standard concrete blocks or bricks will **not** be allowed. Chamber covers and frames shall be manufactured by Kavanagh Foundry. Where alternative chamber covers are used they shall be approved by a suitably licensed third party (NSAI, Lloyds Register or British Standards Institute of Quality Assurance Services). The engineering bricks shall comply with BS EN 772 (formerly British Standard 3921:1985). Mortar shall have 1:3 cement sand dry volume ratios. The sand shall comply with BS EN 13139, BS 1200: 1996.

- 5.9** ESB Networks Mini-Pillars and Customer Service Pillars (Exterior Lighting Micro-Pillars) shall be installed a minimum of 2m apart. If this is not physically possible and only with the explicit permission of ESB Networks and Cork City Council Transportation Division these may be installed closer together and equipotentially bonded in accordance with ET:101. **In all cases it is forbidden to utilise the same chamber to service both an ESB Networks (DSO) Mini-Pillar and Customer Service Pillar (Micro-Pillar).** If this is found to be the case ESB Networks will likely refuse to connect the Customer Service Pillar and Cork City Council will not be in a position to take the scheme in charge.

6. Electrical Supply (Metered & Un-Metered)

All equipment supplied to Cork City Council is required for operation on an Electricity Supply Board supply which is declared at 230 Volts, $\pm 10\%$ i.e. from 207 Volts to 253 Volts, at 50 Hertz.

Cork City Council Transportation Division will advise the type of electrical supply required either an un-metered supply for schemes with an energy demand of less than 2kVA or a metered supply point in an approved galvanised steel cabinet as appropriate. The connection from the ESB mini-pillar to the meter cabinet shall be provided through a continuous length of red coloured polythene ducting (100mm diameter) at a depth of 600mm. The details on Customer Service Pillar's may be found in The National Code of Practice at www.esb.ie/esbnetworks

The Developer shall bear the cost of the new electrical power supply connection and shall pay for all outstanding energy bills up to the date the scheme is taken in charge (this is generally the first Monday of the calendar month). For the avoidance of doubt, new electricity supply connections are to be applied for in the name of the Developer and not Cork City Council Transportation Division. ESB Networks will not make a new connection in the name of Transportation Division without the approval of Transportation Division.

6.1 Un-Metered – Schemes less than 2 KVA

6.1.1 Red coloured duct (100mm diameter depending on length of run), with smooth interior wall, polythene ducting shall be installed to cater for supplies to any micro-pillars specified from the un- metered supply cabinet.

6.1.2 Red coloured 100mm duct, with smooth interior wall, polythene ducting shall be installed to cater for connections to each of the columns.

6.2 Metered Supplies – Schemes greater than 2 KVA

6.2.1 Red coloured duct (100mm diameter depending on length of run), with smooth interior wall, polythene ducting shall be installed to cater for supplies to metered supply cabinet.

6.2.2 Red coloured 100mm duct, with smooth interior wall, polythene ducting shall be installed to cater for supplies to micro-pillars from the metered supply cabinet.

In the case of metered supplies, it is recommended that location of the meter cabinet be selected to cater for all further up-grades to lighting, traffic signals and signs etc. in the area with details to be agreed with ESB Networks.

An additional 100mm twin wall orange duct shall be install in tandem with the exterior lighting ducting when and where directed by Cork City Council. This shall be

advised at the design phase.

6.3 ESB Power connection Procedure

The following items are required to allow ESB Networks to undertake a connection to an on street electrical power supply:

6.3.1 MPRN

A power supply application form must be submitted to ESB Networks which when processed releases both a job number and a MPRN number. The MPRN relates to the point of supply and must be recorded for all future transactions in relation to the supply. The address submitted with the MPRN must always remain the same in future paperwork.

All customers are required to enter into a connection agreement with the Distribution Network Operator (DNO). This agreement sets out the terms and conditions under which a supply is taken from the DNO's network. The major part of the connection agreement will deal with the validation of the load connected to the network. It is essential that the inventory fairly represent the customer's connected load, as it can be subjected to audit by the UMR. Any inaccuracies in the inventory could result in a factor being applied to the inventory to compensate for them. Power factor correction is one source of possible inaccuracy in measuring the electricity consumed and the DNO have the right to apply a factor to compensate for low power factor if they can demonstrate that it is below the level specified in the agreement.

6.3.2 Ducting Certificate

A ducting cert must be submitted to ESBN in reference to the Job number to certify the duct clearance between the ESB point of supply and the customer service pillar.

6.3.3 RECI Certificate

The electrical contractor shall provide a Completion Certificate for the exterior lighting scheme and shall be responsible for progressing the application for supply to completion and switch-on of the scheme. The customer copy of the electrical test certificate shall be retained and submitted to Cork City Council, Transportation Division with the completed take in charge form as detailed below.

6.3.4 Energy Supplier Nomination

The customer must enter into a supply contract with their chosen supplier of electrical energy prior to connection. Since 2000 the market for unmetered electricity supplies has been gradually de-regulated to allow electricity to be purchased from any licensed electricity supplier.

6.3.4.1 Unmetered supplies

Non-half-hourly. The non-half hourly market requires the calculation of an Estimated Annual Consumption (EAC) by the unmetered supplier operator

(UMS) at the distribution network operator (DNO) to enable the consumption to be settled through the Balancing and Settlement Procedures.

Trading methods require the customer to submit an accurate inventory to the UMR for validation. There are UMR tables of approved equipment, charge codes (with watt ratings) and switching regime codes which must be used by customers in their inventory data. On validation of the inventory, the DNO will issue an Unmetered Supplies Certificate (UMSC), which must be made available to the prospective Electricity Supplier. Currently, all unmetered loads can be considered for inclusion on the Unmetered Supplies Certificate provided the equipment has a predictable load and operating hours and is less than 2kVa.

6.3.4.2 Metered installations

UMR will require metering for equipment with an installed load greater than 2kVa. This is particularly relevant for equipment fed via highway power supplies from a feeder pillar. These types of supply should be discussed with the DNO before the inventory is submitted and at the time the application is being made for new supplies.

7. Lighting Engineering Consultants

The Transportation Division require that Engineering consultants to be competent in undertaking lighting and electrical supply design for street lighting, sports lighting and or floodlighting schemes in accordance with the CEN code of practice, national rules for electrical installation “ETCI regulations” and Cork City Council requirements.

The Developer can contact the Transportation Division of Cork City Council for information.

8. Street Lighting – Equipment Manufacturers and Suppliers

Lighting schemes implemented by Cork City Council have included equipment manufactured by various suppliers. The Developer can contact the Transportation Division of Cork City Council for information. Refer to Appendices.

9. Electrical Contractors

Electrical Contractors shall be in a position to supply and install a complete Exterior Lighting scheme to comply with ETCI National Rules and shall be responsible for coordinating the application to ESB Networks for the connection and to an energy supplier for the supply of electrical power. The Developer shall bear the cost of the new connection fee and will pay the energy bill until the scheme is taken in charge by Cork City Council Transportation Division. Refer to Appendices.

10. Temporary Lighting and Power Supplies

Temporary Lighting

- 10.1.1** In the cases where a Development will include for the replacement of a exterior lighting scheme Cork City Council may require that a temporary exterior lighting scheme be installed whilst construction works are undertaken. Instances where this may be required include but are not limited to:
- Where building supported exterior lighting fittings are removed to facilitate the development;
 - Where extensive excavations are likely on “brown field sites” or where demolition of existing buildings is taking place. (In this case Cork City Council and / or ESB Networks may deem that the risk of a live underground cable being excavated and damaged is high and arrange that the cable is isolated. In this case the Developer shall be responsible for the provision of temporary exterior lighting until such time as the new scheme is installed and commissioned).
- 10.1.2** Temporary lighting installations must take account of section 704 of the National Rules for Electrical Installations pertaining to construction sites. Account also needs to be taken of the positioning and angles of temporary lights so as to minimize glare and prevent dazzling drivers and pedestrians.
- 10.1.3** **Exterior Lights may only removed with the permission of Cork City Council. The Developer shall, prior to removing a exterior light, commission into service and maintain operational temporary lighting until such time as he replaces the removed light(s) with a new scheme. Failure to do this will likely result in the Developer being liable in the event of any Public Liability claim against him / the Council where exterior lighting is cited as a contributing factor.**

Temporary Power Supplies

- 10.2.1** The Transportation Division do not provide temporary power supplies on street.
- 10.2.2** Illegal connections to Cork City Council’s power infra-structure will be deemed a criminal damage and Cork City Council will undertake appropriate proceedings.
- 10.2.3** Events organizers must appoint an Event Manager and are fully responsible for the provision for a protected and appropriate power supply in accordance with the relevant standards. (including BS7909 Code of Practice for temporary electrical systems for entertainment)
- 10.2.4** Portable Generators are permitted with agreement with Cork City Council.

The dbA noise level under full load and nominal load must be advised to Cork City Council during the licensing process.

- 10.2.5** The zone in which the temporary power supply provision is to be provided must be advised to ESB Networks.
- 10.2.6** The provision of a temporary power supply must provide earthing in accordance with BS7430 Code of practice for earthing. It is not permissible to utilize street furniture i.e. street lighting for the provision of an earth.
- 10.2.7** Lighting protection when provided must comply to BS EN62305 -1to 4 Protection against Lighting.

11. Night Time Lighting of Buildings and Structures

Proposals to light buildings and bridges of particular merit are of interest to Cork City Council in an effort to promote an enhancement to the night-time scene in Cork. These Guidelines have been drawn up as part of a strategy to ensure that lighting schemes are designed & implemented in line with sustainable development policies.

- 11.1** It is envisaged that the design proposals would meet Best Practice criteria to provide a “Low Brightness” approach to lighting thus ensuring that an energy efficient scheme can put in place from the outset.
- 11.2** The design should be undertaken by a professional lighting designer, being a service that is often made available by Engineering and Architectural Consultants, in liaison with lighting equipment manufacturers.
- 11.3** Selective highlighting of a building or feature should be considered as against floodlighting. It is often the case that far too much light is projected onto a building destroying an appreciation of its architecture.
- 11.4** LED lighting and fiber-optic sources can be used to highlight architectural features with much lower energy levels being required to deliver the desired impact. Luminaires should incorporate electronic control gear to improve energy efficiency and improve the operational lifetime of lamps.
- 11.5** Choose lamp type and colour temperature sympathetic to the building material being lit. In general terms, high pressure sodium used on its own is a poor choice for many building materials, as it flattens textures and some colors.
- 11.6** Avoid using a small number of high wattage, wide-angle luminaires which will flatten the façade and wash out its features.
- 11.7** Avoid mounting fittings parallel to the building – improved modeling of buildings will usually be achieved by lighting at an angle.
- 11.8** Daytime appearance of fittings and cable is an important consideration – if possible try to conceal fittings behind shrubs, trees or building features.
- 11.9** Consider glare to people inside the building looking out through windows – down- lighting and spotlights or ground recessed fittings located at close-offset positions to the wall or building will usually avoid such glare.
- 11.10** Where possible, spotlights or floodlights should be fitted with louvers and cowls to control the beam and avoid sideways light spill.
- 11.11** Ensure that beams do not spill over the roof or around the side walls as this will create light pollution or glare nuisance to neighbours.

11.12 For schemes being proposed for church buildings, the feasibility of providing back- lighting of the Stained Glass windows could be considered if the particular feature is visible to the public.

11.13 Amenity lighting may also have to be considered at the design stage to compensate for glare and ensure safe access to the building after dark when the floodlighting is in operation.

11.14 It is proposed that copies of the Floodlighting Design would be handed over the Engineering Consultant or to the Electrical Contractor, as nominated by the church authority or building owner, with a view to agreeing a detailed design and providing a budget estimate for the proposal.

11.15 Typically, copies of the following Ordnance Survey Ireland Maps and drawings identifying the site location and elevation details would be required to undertake a Lighting design.

OS Site Location Map Scale 1:1000

OS Site Detail Drawing Scale 1:500 or 1:250

Front Elevation of the Building & Side Elevations of the building if necessary.

11.16 Floodlighting schemes should in general be designed to switch-on at dusk with photo-cell control and be switched off at mid-night using a time-clock or part night photocell.

11.17 It is accepted that floodlighting schemes can be modified to take account of changes recommended at the final installation stage as a result of on-site trials and therefore some details may have be confirmed at that stage.

11.18 A visualization software suite shall be utilized to demonstrate the floodlighting scheme on submission of the design.

Cork City Council, through the Transportation Division is available to discuss proposed floodlighting schemes in the city with a view to insuring that a “Low Brightness” approach is adopted. Lighting Design for new and replacement schemes should take account of these Guidelines to ensure that attractive energy efficient schemes are implemented.

12. Floodlighting Schemes

Where floodlighting schemes of playing fields, pitches or courts etc. are being proposed by sports clubs, schools etc. it should be noted that these are subject to the planning process. Cork City Council has the following requirements in the implementation of such schemes:

- 12.1** The energy efficiency of the proposed scheme must be central to the design process. The use of energy efficient floodlighting lamps and control gear is required. This will have obvious benefits to the scheme owners.
- 12.2** Use shall ideally be used of a competent lighting designer, this may include the use of the lighting suppliers in-house design service.
- 12.3** The choice of light source will depend on the type of colour rendering required.
- 12.4** The scheme designer shall demonstrate to Cork City Council by way of a design submission that minimizes light pollution, eliminates as far as is possible light spill into neighboring property and takes account of the "Campaign for Dark Skies".
- 12.5** The scheme designer will aim to minimize or eliminate glare from the proposed lighting scheme.
- 12.6** The scheme designer shall take account of the location of the proposed scheme in relation to the requirement for an aircraft warning light on the top of the light support structure (e.g. in the case of high structures). In this regard the Irish Aviation Authority may need to be consulted.
- 12.7** Account shall be taken pertaining maintainability of the scheme following commissioning including site access etc.
- 12.8** The flood lighting scheme shall incorporate the facility to cater for training rather than against competition events, viz. the scheme shall allow for a reduced level of lighting to be achieved when full illumination levels are not required. This is in the interest of reducing energy consumption.
- 12.9** Schemes shall be designed to BS EN 12193: 2007 Light & Lighting –Sports Lighting.
- 12.10** Floodlights shall be in accordance with BS EN 60598-2-5.
- 12.11** Schemes shall incorporate recommendations of ILP
Guidance Notes for the Reduction of Obtrusive Light GN01:2011

13. Review of Exterior Lighting Schemes

Street lighting designs must be submitted to Cork City Council, Transportation Division for approval in line with Planning Conditions prior to commencement of construction on site. Transportation Division will advise the Developer if the proposed exterior lighting layout meets the requirements of this guidance document and the standards specified within it. The lighting design details submitted for approval shall comprise the following:

- Lighting layout drawings (in .dwg format to allow for design verification);
- Exterior lighting specification;
- Appropriate Standard Construction Details (SCD's);
- Electrical drawings (schedules and layouts);
- Details of proposed columns and brackets;
- Exterior Lighting Design Report (see note).

Cork City Council will on receipt of the submitted material advise if any changes are required and if the scheme is acceptable to proceed to construction stage. Cork City Council, Transportation Division endeavors to advise of its review of exterior lighting scheme designs within three to four weeks of receipt of all required information.

Note: Cork City Council use Lighting Reality software for exterior lighting scheme design undertaken in house. In this regard, Exterior Lighting designs in .RTMA format shall be submitted to the Council at the design review stage and if applicable again at the take in charge stage.

14. Taking in Charge

The taking in charge of a lighting scheme is a separate procedure whereby the Developer shall satisfy Cork City Council and the DSO (ESB Networks) that the scheme conforms to the ETCI National Rules for Electrical Installations, and the Developer shall also satisfy Cork City Council that the layout and levels of lighting conforms to the CEN Code of Practice.

The take in charge form is available on the Cork City Council website. A Developer wishing to have a exterior lighting scheme taken in charge for energy and maintenance shall complete this form and submit it to Cork City Council, Transportation Division, along with the following (if not previously submitted):

- As built Lighting layout drawings (in .dwg format to allow for design verification);
- Appropriate Standard Construction Details (SCD's);
- As Built Electrical drawings (schedules and layouts);
- Exterior Lighting design;

- A signed copy of the electrical test certificate for the exterior lighting installation
- An energy supply bill showing the account cleared to date.
- A steel pole drawing where installed shall be provided with physical dimensions including all details necessary for the design of foundations, support fixings, high voltage connections, and equipment layout. These drawings shall be labelled clearly in a legible font size.

Cork City Council, Transportation Division, endeavors to undertake an inspection of a exterior lighting scheme following receipt of a correctly completed request for take in charge of exterior lighting schemes within three to four weeks.

On completion of the inspection which will typically be undertaken by both City Council Staff and / or Maintenance Contractor staff (or another electrically competent agent of Cork City Council), we shall compile a snagging list of outstanding issues if any are found.

When the Developer confirms that the snagging list has been completed a further inspection will be undertaken. In the event that the snagging list has not been completed to the satisfaction of Cork City Council, Transportation Division, the Developer shall be informed. Should further intrusive inspections be required, Cork City Council reserves the right to charge the inspection cost to the Developer, to be paid prior to commencement of the inspection. This shall be charged at the discretion of Cork City Council, Transportation Division at a rate of not less than €200 Excl VAT per inspection. Inspections requiring significant time and resources may be charged at a higher rate at the discretion of Cork City Council.

When Cork City 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. The Planning and Development Directorate (which oversees the entire take in charge procedure for developments) may request that the Exterior Lighting Scheme in a development is taken in charge at the same time as the remainder of the Public Domain in that development.

Typically in this case Cork City Council, Transportation Division, requires that the Exterior Lighting Scheme be maintained operational and in the same condition as it was when the snagging list was completed to Transportation Divisions satisfaction by the Developer.

Cork City Council will also require that each column and customer service pillar installed have "Cork City Council" style 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 Cork City Council's Exterior Lighting Asset Management Database.

Geographical Data**No. Category**

1. Road name
2. Lighting standard (e.g. ME/CE/S Class)
3. Compliance certificate date (date when compliant with 5 above)

Asset Data

7. Ordnance Survey positional data x.y
8. Column numbers
9. Lighting column manufacturer
10. Lighting column cross-section shape
11. Lighting column mounting height
12. Lighting column material
13. Lighting column protective coating
14. Lighting column fixing
15. Lighting column root protection
16. Lighting column flange base
17. Date unit commissioning
19. Bracket type
20. Number of brackets
21. Bracket projection
22. Bracket colour
23. Number of luminaires
24. Luminaire manufacturer
25. Luminaire model reference
26. Luminaire distribution and profile
27. Luminaire setting
28. Luminaire ingress protection

29. Lamp type

30. Lamp wattage

31. Lamp control gear type

32. Total circuit wattage

33. Number of lamps per luminaire

34. Control type

35. Control location

36. Service owner

37. Supply point

38. Number of outgoing circuits at the supply points

39. Number of approved attachments (if fitted)

40. Type of approved attachment (if fitted)

41. Feeder pillar body manufacturer

42. Feeder pillar body material

43. Feeder pillar body protection

44. Number of phases

45. Isolator rating

46. Number of outgoing circuits

47. Outgoing circuit protection device

48. Feeder pillar drawing no

Operational Data.

No. Category

1. Date of last cyclic maintenance visit

2. Date of last group lamp replacement

3. Date of last re-application of protective coating

4. Date of last structure inspection and condition level

5. Structure inspection and condition level

6. Structural test certificate reference no.

7. Date of last electrical test and test results

8. Electrical test certificate reference no.

9. Date of last electrical test to cable network by circuit

10. Cable network electrical test certificate reference no.

11. Date of last fault including emergency faults

12. Fault type and history including emergency faults

14.1 General

This data is managed as part of an asset management system, which also manages fault repairs and cyclical maintenance as specified in the ILE Technical Report No. 22 as part of the assessment of the risk of structural failure of the public lighting stock.

14.2 Underground Cables

All power supplies shall be recorded in accordance with IS EN 50110-1: 2004 and the SHAWW (General Application) Regulations 2007

It is necessary to record accurately underground cable networks so that:

- Repairs to power supplies can be carried out effectively and safely in compliance with the Safety Legislation.
- Testing of cable networks is facilitated.
- Extensions or alterations to power supplies can be adequately designed.
- "Supply point" data can be entered on the asset management system enabling supply failures at supply points to be treated as priorities for repair.
- Information showing highway power supplies can be provided to any organisation excavating in the highway.
- Joint repairs can be identified as weak points of failure in the cable network for future maintenance faults.

Power supply records should record the following information:

- Source of supply (supply point).
- Route of cables.
- Position of cables (including offset and depth).
- Type and size of cables.

- Position of cable joints.
- Three-phase or single-phase.
- Location, type and rating of protective devices.
- Feeder pillars shall be fitted with cable circuit schedules

14.3 Format of Drawings

To manage the highway power supply effectively a GIS system or stand alone AutoCAD drawing file system shall be submitted to record electric equipment on layout drawings.

14.4 Electrical Inspection and Testing

The SHAWW Act 2005 states that “As may be necessary to prevent danger, all systems shall be maintained so as to prevent, so far as is reasonably practicable, such danger”.

To demonstrate that an installation meets the necessary safety standards, electrical inspection and testing comparable to any other fixed equipment installation should be carried out. Electrical inspection and testing should be carried out at intervals of up to six years in accordance with the requirements of ET 101: 2008.

The frequency of the electrical inspection and testing should be determined taking account of the following:

- The type of installation.
- The use and operation it is subject to.
- The frequency of maintenance.
- Any external influences which exist.
- Past history of inspection and repair.

The co-ordination of electrical inspection and testing with other cyclic maintenance activities should be considered to help reduce disruption to the public; however this may not be the most cost effective means of carrying out this operation and separate personnel may be needed for this purpose.

14.5 Visual inspection of electrical equipment

The nature and location of public lighting installations is such that visual inspection of the electrical equipment and wiring is of paramount importance. The condition of the electrical equipment and wiring should be visually checked at each cyclic maintenance or repair visit and its condition reported back to the client. So far as reasonably practicable, the visual inspection should verify that the health and safety of persons, animals and property is not endangered.

The general visual conditions of the electrical installation should be noted on the inspection report. However, if any particular item causes concern, it is recommended that the problem be detailed on an appropriate supporting schedule.

During the visual inspection, any dangers should be identified that may arise during the testing procedure. The operative should take any necessary action and implement safety precautions to avoid danger. Where a problem is considered as dangerous, the item of equipment should be repaired immediately or taken out of service by removing the main fuse from the supply termination until the fault has been rectified. Under no circumstances should an electrically dangerous item of equipment be left in operation.

Fuses or other circuit protection devices should be checked for correct type and value and if necessary replaced.

The presence of electronic devices on the system should be identified and recorded as such items may be damaged during testing. Such items may have to be disconnected from the circuit to allow testing of the remaining installation.

Failure to carry out an electrical inspection must be recorded in the operative's report. A record should be made of any departure from the regulations.

Operatives should be trained and competent to carry out visual inspections and recognise any potential dangers

14.6 Testing

Testing should only be carried out by a competent person with sufficient training and experience to interpret the test results and identify any inherent problem within the installation. All test equipment should be suitable for the test intended, correctly calibrated and regularly certified.

14.7 Electrical testing records

The results of periodic electrical inspection and testing must be recorded on an inspection certificate.

Records of maintenance, including electrical test results, should be kept throughout the life of the installation, enabling the condition of the equipment and the effectiveness of maintenance policies to be monitored. A computerised asset management system will allow electrical test certificates to be linked to the specific individual item of equipment, thus meeting the demands of the regulations and providing an efficient maintenance system.

All information will be collated on Cork City Councils Deadsure Asset Management system.

14.8 Access/Modifications to the Power supply network

All access to Cork City Council's power supplies is forbidden without express written approval. To undertake any work on any power supply, the following is required:

- Written Permission
- Full description of the nature of the work
- Full design to be forwarded for any works to be undertaken
- A Registered Contract Electrician must originate the request
- A method statement and risk assessment must be submitted
- Full insurance requirements
- Proof of contact with ESBN where applicable

All modifications to Cork City Council's power supplies is forbidden without express written approval. Once the above steps are submitted and approval has been received, any additional circuit added to the point of supply requires a sub system cert in accordance with Annex 63A Sub-system completion certificate in the National Rules for electrical installations 4th Edition ET101:2008.

All installations which are requested to be taken in charge 12 months following installation require the submission of a periodic inspection to CCC in accordance with Annex 62A of the National Rules for electrical installations 4th Edition ET101:2008. As per Appendix 10.

15. Warranties

Cork City Council requires a collateral warranty of equipment from the manufacturers prior to take in charge of schemes for maintenance and energy supply. The following warranty details will be required:

15.1 Steel Poles and brackets

The steel poles shall be designed to provide a minimum 25-year lifetime when operated in the environment conditions as described in this document. The poles, including all components and accessories, shall be fully guaranteed against all defects arising from faults in design, manufacture and workmanship for a period of 12 months from commissioning and up to a maximum period of 36 months from delivery. This period shall be extended to 5 years to cover all defects attributable to inadequate corrosion protection. All defects notified within the above warranty periods shall be rectified entirely at the Installers expense.

15.2 Photocells

A minimum warranty of 10years is required on all installed photocells

15.3 Electronic Ballasts

A minimum warranty of 5years is required on all installed electronic ballast

15.4 Lamps

CDMT/SON-T HID	-	12months from installation
Aura Longlife HID lamps	-	60months from installation
LEDS	-	60months from installation

15.5 CMS Systems

A min warranty of 5years is required on all installed CMS systems

15.6 LEDs including drivers

All Led equipment provide a full warranty period offered on the complete luminaire (including LED modules, LED Driver and photocells) of a minimum of 8 years.

16. Further Information

Cork City Council reserves the authority to ensure that exterior lighting schemes are installed to the required Code of Practice before the scheme can be taken in charge with the purpose of providing for energy and maintenance costs.

Further requests for information should be directed to Cork City Council, Transportation Division (Electrical Engineering Section). We can give further guidance on exterior lighting scheme design layouts etc. and answer questions pertaining to the two exterior lighting standards covered in this guidance manual, viz. BS5489-1: 2013 and EN 13201: 2003.

Cork City Council Transportation Division wish to work with Developers to help deliver high quality, energy efficient, exterior lighting installations which meet the relevant standards and which improve the general ambiance of the city and help to reduce energy consumption.

The electrical section is also available to advise on any other electrical installations that may require Cork City Council input and are contactable as follows:

Transportation Division (Electrical Engineering Section),
Roads and Transportation Directorate,
Cork City Council,
City Hall,
Cork.

Phone: 021 492 4452
Fax: 021 492 4495
Email: traffic@corkcity.ie

Appendices

Appendix 1

Electronic Control Gear Manufacturers

The following manufacturers, among others, are in a position to supply electronic control gear for street lighting luminaires.

<u>SELC</u> SELC Ireland Limited, Industrial Estate, Belmullet, Co. Mayo. Phone: 097 81200 Fax: 097 81400 Email: info@selc.ie Web: www.selc.ie	<u>Harvard</u> Street & Park Equipment Co. Limited, P.O. Box 2134, Swords, Co. Dublin. Phone: 01 8400633 Fax: 01 8079787 Email: info@streetandpark.com Web: www.streetandpark.com www.harvardeng.com
<u>Philips</u> Philips Ireland Ltd. Philips House South County Business Park, Leopardstown Dublin 18 Phone: 087 2380913 Email: Dermot.deely@phips.com	<u>Osram</u> Edmundson-EWL Cork Unit B1 Doughcloyne industrial Estate, Sarsfield rd, Wilton Cork Phone: 021 4546566 Email: ewlcork@eircom.net

Appendix 2

Decorative Street Lighting – Columns & Equipment Manufacturers and Suppliers

Decorative Lighting schemes previously implemented by Cork City Council have included equipment manufactured by various suppliers including the following.

- **NERI Lighting**

NERI Lighting,
Bradgate Lighting & Furnishings Ltd.,
PO Box 45837,
London,
E11 2WN
England.

Contact: Brian Bradley
Phone: (0044) 7860 58 3361
Email: neri@bradgateltd.com
Web: www.neri.biz

- **Siteco**

Edmundson- EWL Cork
Unit B1 Doughcloyne Industrial Estate,
Sarsfield Road,
Wilton,
Cork.

Contact: Frank Davis
Phone: 021 454 6566
Email: ewlcork@eircom.net
Web: www.siteco.co.uk

- **DW Windsor Lighting & Valmont Exterior Lighting Columns**

Street & Park Equipment Co Ltd.,
P.O. Box 2134,
Swords,
Co. Dublin.

Contact: Colm Carton
Phone: 01 8400633
Email: info@streetandpark.com
Web: www.streetandpark.com
www.dwwindsor.com

Appendix 3

Lighting schemes previously implemented by Cork City Council have included columns and brackets manufactured by various suppliers including the following.

- **Lampost Construction Components Ltd.**

5m – 12m Tapered hexagonal and 16-sided columns

Lampost Construction Components Ltd.,
Greenore,
Co. Louth.

Contact: Oliver Murphy
Phone: 042 9373554 / 042 9373283
Email: lampost@iol.ie
Web: www.lampost.ie

- **Piltown Engineering**

5m & 6m columns only

Piltown Engineering,
Kildalton,
Piltown,
Co. Kilkenny.

Phone: 051 643131
Email: info@piltownengineering.ie
Web: www.piltownengineering.ie

- **Valmont Exterior Lighting Columns**

Street & Park Equipment Co Ltd.,
P.O. Box 2134,
Swords,
Co. Dublin.

Contact: Colm Carton
Phone: 01 8400633
Email: info@streetandpark.com
Web: www.streetandpark.com

Appendix 4

Approved Exterior Lighting Contractors for ESB network mounted lighting inventory upgrades

- **Airtricity Utility Solutions Ltd.**

Airtricity Utility Solutions Ltd.,
Unit 7/8 Waterfront Business Park,
Little Island,
Cork.

Contact: Kevin Canny
Phone: 021 4520135
Email: kevin.canny@airtricitysolutions.com
Web: www.airtricitysolutions.com

- **ESB Networks**

Wilton,
Sarsfield rd,
Cork City
Tom Power

Phone: Emergencies 1850 372 999
Enquiries 1850 372 757
Email: esbnetworks@esb.ie

Service locations centralsiterequests@esb.ie

Appendix 5

Cork City Council, Transportation Division

Electrical Pre-Qualification Panel

The following contractors have been prequalified to carry out Electrical Works on public lights not mounted on the ESB distribution system for Cork City Council

Contractor
O'Sheas Electrical Ltd., Euro Business Park, Little Island, Co. Cork. Contact: Brian Nolan Tel: 021 4510700 Fax: 021 4510739 Email: bnolan@joneseng.com
Airtricity Utility Solutions Ltd, Unit 7/8 Waterfront Business Park, Little Island, Cork. Contact: Michael Hogan Tel: 087-2635754 Email: michael.hogan@airtricitysolutions.com
McSherry Electrical Ltd., IDA Industrial Estate, Mallow, Co. Cork. Contact: Neil McSherry Tel: 022 42100 Fax: 022 42409 Email: n.mcsherry@mse.ie ; info@mse.ie
Sean Ahern Electrical Ltd., 16 Southlink Park, Ballycurreen, Co. Cork. Contact: Michael Ahern Tel: 021 4273227 Fax: 022 4318845 Email: info@ahernelec.ie
Al Read Electrical Co. Ltd. Damastown Way, Damastown Industrial Park, Mulhuddart, Dublin 15. Contact: Philip Read Tel: 01 8614844 Fax: 01 8614845 Email: phil@alreadelectrical.com

Appendix 6

**Comhairle Cathrach Chorcaí****Cork City Council**

EXTERIOR LIGHTING TAKE IN CHARGE FORM

This form must be submitted to the Transportation Division, Cork City Council prior to an estates exterior lighting being taken in charge.

Date of Application		
Planning Ref. Number		
Development Details	Name	
	Address	
Developer Details	Name	
	Address	
	Tel. No.	
	Email	
Civil Contractor Details	Name	
	Address	
	Tel. No.	
	Email	
Electrical Contractor Details	Name	
	Address	

	Tel. No.	
	Email	
Date of Installation of Exterior Lighting		
Type of Installation (tick applicable)	New ☐ Alteration ☐	
Quantity of Exterior Lights to be taken in charge	Column Mounted	
	Network Pole Mounted	
	Wall Mounted	
Lantern Details	Manufacturer	
	Model	
	Lamp Type (e.g. SON,CDMT etc)	
	Wattage	
	Ballast Type (magnetic,SELC4000 etc)	
Column Details	Manufacturer	
	Type (e.g. tubular, hexagonal etc)	
	Height	
	Bracket outreach length	
Energy Supply Details	MPRN	
	Current Energy Supplier	
	Supply Point (Metered, Unmetered Micro Pillar)	

	etc)	
Meter Details (if applicable)	MIC	
	Phases	
	DUoS	
Electrical Details	Protective Device Rating	
	Cable Size (Pillar to Column)	
	ETCI Form No.	
	Certifying Electrician	
	Min Insulation Resistance	
	Max Resistance of Protective Conductor	
	Max Fault Loop Impedance	

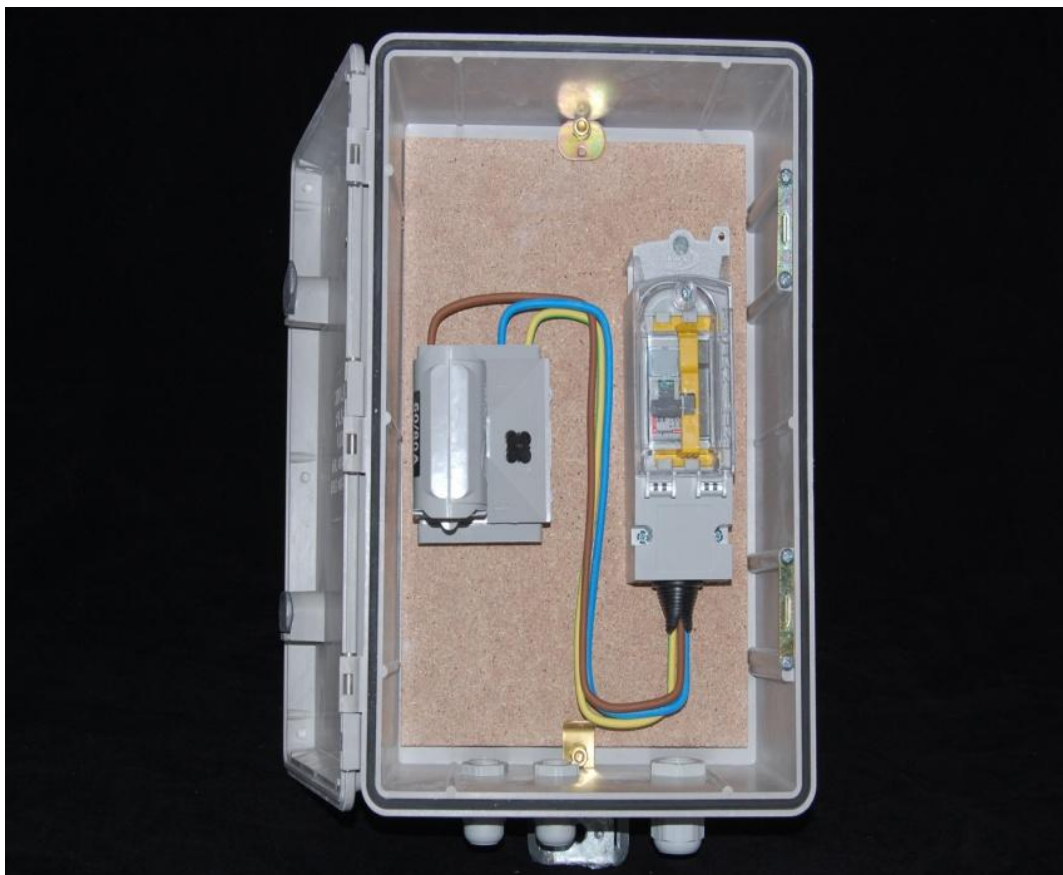
- Please ensure that all Planning issues have been addressed prior to submitting this form
- The following items, including this form, must be submitted in order to complete this application for Exterior Lighting taking in charge; (tick box)

1. A paper **and** a digital copy (in .dwg or .dxf format) of an as-built drawing of the development detailing the column positions, column numbers, power supply locations and exterior lighting circuits. Paper: ☐
Digital: ☐
2. A copy of the Exterior Lighting design, showing that the installed scheme meets the required standards for Exterior Lighting as in BS:5489 & EN13201 ☐
3. A copy of the latest energy bill for the Exterior Lighting (in the last two months) showing that payment has been completed up to date of application for taking in charge. ☐
4. A completed electrical test certificate for the Exterior Lighting installation. ☐

Submit completed taking in charge forms to:

Exterior Lighting Taking In Charge,
Cork City Council,
Transportation Division,
City Hall,

Appendix 7



Distribution Pole Isolation Box

Dimensions (Minimum working envelope):

320mm High x 220mm Wide x 120 Deep

Equipment shown:

ESB Networks Single Phase Cut Out

ESB Networks Single Phase Isolator

See page IX section 4 for requirements in relation to protection against corrosion.

- Warning label “Live electricity” required on doors.
- 8mm triangular locks required on doors.
- Fire retardant back plate.
- Enclosure should have no sharp edges
- Suitable for Wall/Pole mounting
- **N.B. Outside enclosures used for housing ESB Networks’ equipment must be either non-metallic, stainless steel or hot dip galvanised and have a Minimum IP44 rating. See specific requirements 4 (b) page IX**

Appendix 8

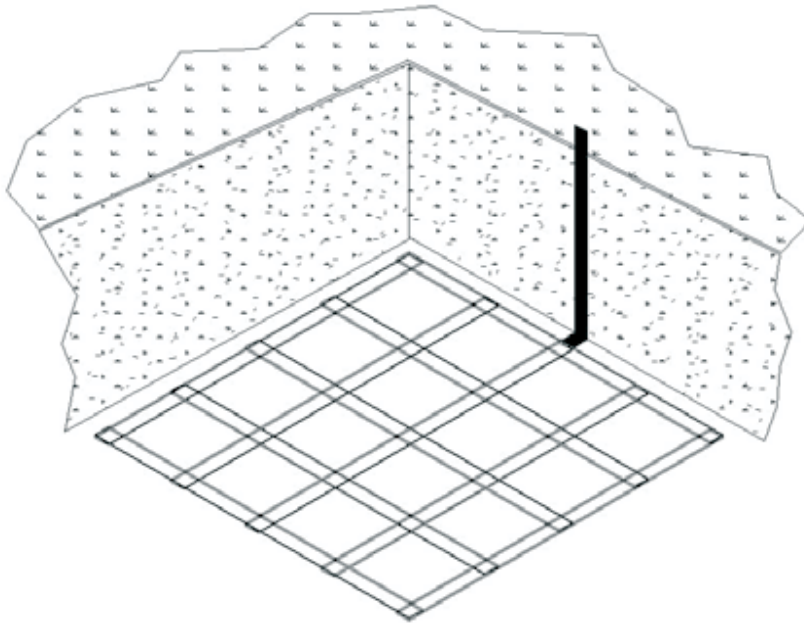


Fig 1 Earthing Copper lattice installation with Strap

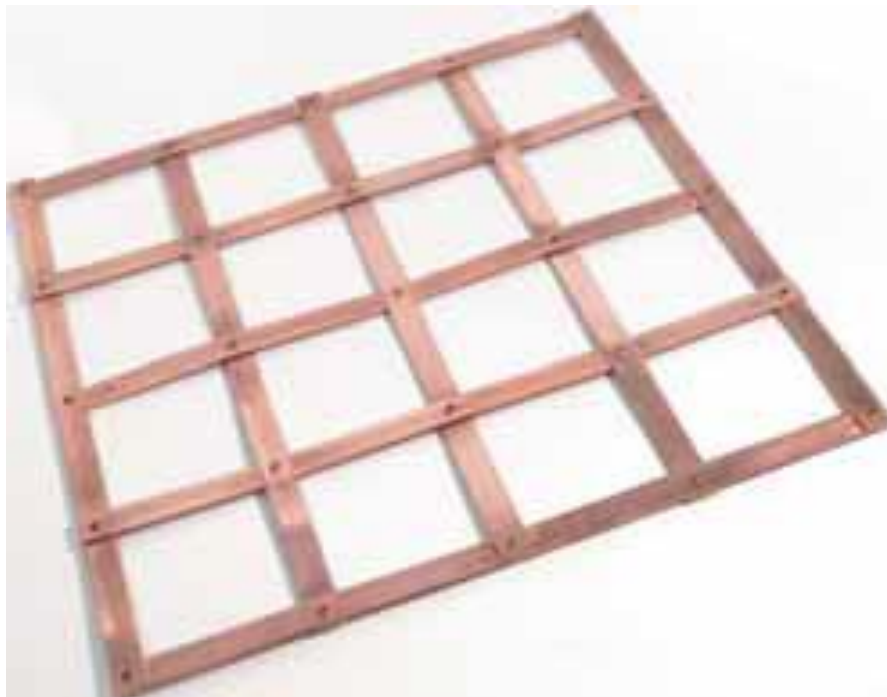


Fig 2 Earthing copper lattice

Appendix 9

Unmetered Pillar



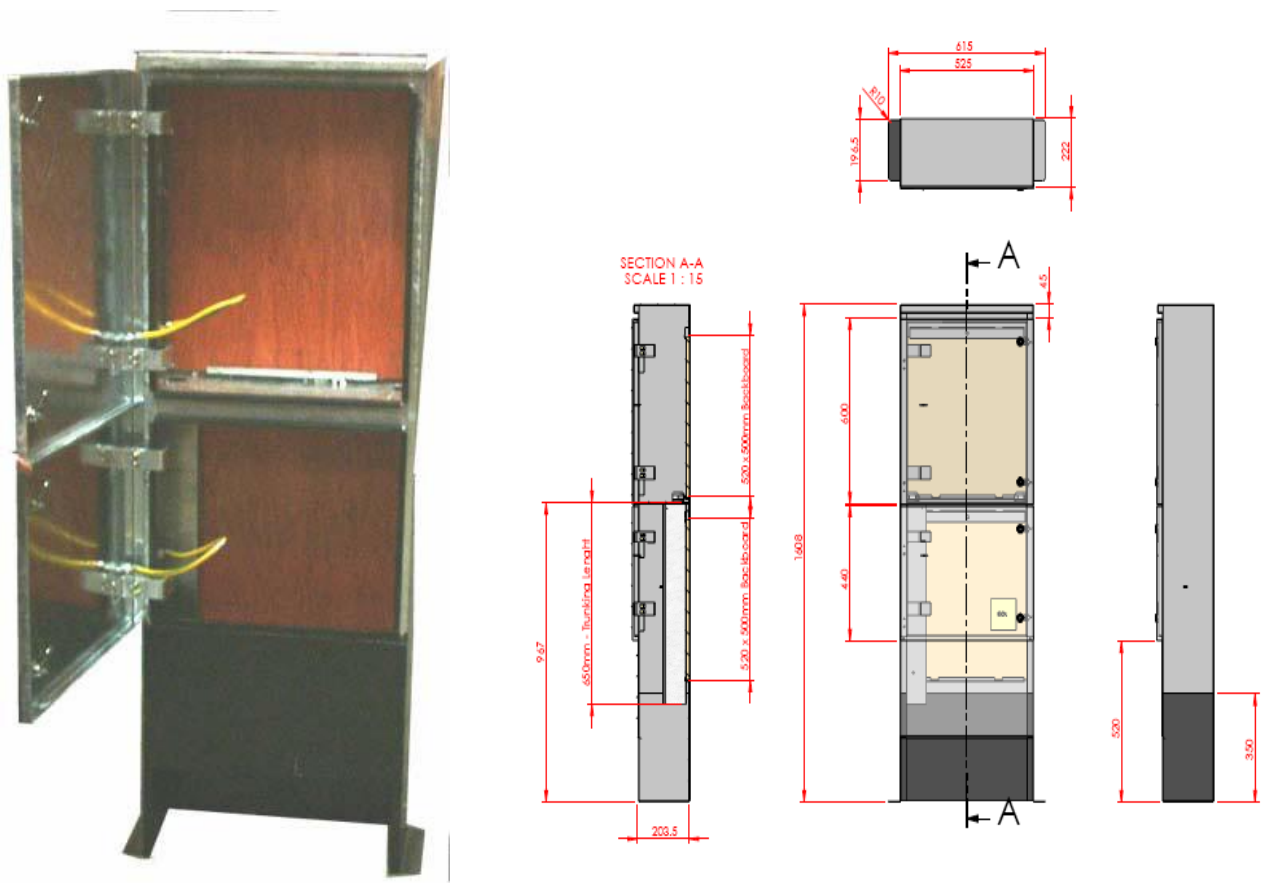
	Single Phase unmetered Supply	Three Phase unmetered Supply
Minimum Dimensions	150mm deep x 250mm wide x 600mm	215mm deep x 370mm wide x 660mm
Root depth	320mm	360mm
Minimum opening size	220mm wide x 510mm	330mm wide x 480mm high
Space requirements	ESB Networks: 125mm wide LHS Customer: 125mm wide RHS	ESB Networks: 230mm wide LHS Customer: 140mm wide RHS

Equipment includes

ESB Networks Single Phase Cut Out
ESB Networks Single Phase Isolator

- Warning label "Live electricity" required on doors.
- 8mm triangular locks required on doors.
- Fire retardant back plate.
- Enclosure should have no sharp edges.

Metered Pillar

**Minimum overall dimensions:**

500mm wide x 1250mm high x 225mm deep.

600mm Minimum to bottom of Meter.

Root depth 350mm

Minimum dimensions for ESB Networks equipment:

465mm wide 600mm high x 225 deep.

Note: Vertically hinged door for access to ESB Networks equipment

- Warning label "Live electricity" required on doors.
- 8mm triangular locks required on hinged doors.
- Fire retardant back plate.
- Enclosure should have no sharp edges.
- **Gland plate must be fitted to prevent moisture ingress and allow for minimum dimensions for ESB Networks equipment**
- **Trunking to enclose Networks cables required**
- **Approved sealant must be installed in base of pillar.**

Appendix 10

REGISTERED

National Rules for Electrical Installations Sub-System Completion Certificate

Serial No. 000001

Associated ETCI Completion Certificate No (if applicable):

CUSTOMER NAME (Block Capitals):

ADDRESS OF INSTALLATION (Block Capitals):

Concise Installation Description (e.g. Lift, Air Conditioning, etc)[†]

Date of Installation:

✓ Tick boxes as appropriate:
THIS SUB-SYSTEM CERTIFICATE IS IN RESPECT OF: CONSTRUCTION & TEST OF INSTALLATION ☐
OR TEST ONLY OF THE EXISTING INSTALLATION ☐

TEST RESULTS

POLARITY AND EARTHING OF ALL OUTLETS VERIFIED (a tick indicates yes) ☐ MAIN EQUIPOTENTIAL BONDING VERIFIED FOR: ☐

GAS	YES	NA [‡]
WATER		
OTHER (specify)		

TESTS (please insert values)
RESISTANCE OF PROTECTIVE CONDUCTOR (max) Ω INSULATION RESISTANCE (min) MΩ

[†] See Chapter 63 "National Rules (ET101)"
[‡] NA means Not Applicable

DETAILS OF TESTS ETC., ARE GIVEN IN TEST RECORD SHEET TYPE/NO.

ALL NEW WORK MUST BE CERTIFIED IN RESPECT OF CONSTRUCTION & TESTING

COMMENT OR DETAILS:

.....

.....

.....

.....

REGISTERED CONTRACTOR (Block Capitals)

Name:

Address:

Tel: Reg No.

CERTIFICATION

I certify that the electrical-sub system installation at the above address has been constructed, and/or pre-connection tests have been carried out, in accordance with the National Rules for Electrical Installations (current issue at date of contract) published by the Electro-Technical Council of Ireland, and has been found to be satisfactory. This Certificate and Test Record Sheets associated with it shall be submitted to the Project Supervisor Construction and included in the Project Safety File.

PRE-CONNECTION Pre-connection tests completed and found to be satisfactory

Signed : For Sub-System Electrical Installation: Constructor ☐ Tester ☐

Qualification: Certifier's No. Date:

MAX FAULT LOOP IMPEDANCE Ω

OPERATION OF ALL RCDS VERIFIED ☐

N.B. THESE TESTS MUST BE COMPLETED IMMEDIATELY AFTER SUPPLY IS MADE AVAILABLE

RATING & TYPE OF THE ASSOCIATED PROTECTIVE DEVICE

30 mA RCD Max Trip Time @ 30mA ms

100 mA RCD Max Trip Time @ 100mA ms

300 mA RCD Max Trip Time @ 300mA ms

500 mA RCD Max Trip Time @ 500mA ms

RCD CIRCUIT DESCRIPTION

.....

RCD TRIPPING TIME TESTS

POST-CONNECTION Post-connection tests completed and found to be satisfactory

Signed : For Sub-System Electrical Installation: Constructor ☐ Tester ☐

Qualification: Certifier's No. Date:

NOTE: This certificate is issued and signed by the person responsible for the constructing and testing, or testing only of the sub-system installation or a person duly authorised.

This Document is a certificate for the purpose of the energy (Miscellaneous Provision) Act 2006.

The Electro-Technical Council of Ireland is not responsible for the electrical installation or for the accuracy of the information given on this certificate. Electrical installations should be inspected periodically.

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Appendix 11

List of Cork City Council (Transportation Division)**Exterior Lighting Functional Luminaire Framework & Suppliers****(Lot: 1, 2, 3)**

The following fittings are prequalified equipment suppliers of equipment to Cork City Council for new exterior lighting schemes and exterior lighting maintenance.

LOT 1 (50-70W HID)	LANTERN NAME	SUPPLIER
URBIS	EVOLO 2	Urbis Schreder
SITECO	SQ50	Edmundson-EWL Cork
PHILIPS	KOFFER ² SGP070	Philips Lighting Ireland
DW WINDSOR	DW400	Street & Park Equipment

LOT 2 (100-150W HID)	LANTERN NAME	SUPPLIER
URBIS	EVOLO 2	Urbis Schreder
SITECO	SQ100	Edmundson-EWL Cork
PHILIPS	KOFFER ² SGP100	Philips Lighting Ireland
DW WINDSOR	STRATUM	Street & Park Equipment

LOT 3 (250W HID)	LANTERN NAME	SUPPLIER
URBIS	EVOLO 3	Urbis Schreder
SITECO	SQ200	Edmundson-EWL Cork

- **URBIS SCHRÉDER**

Urbis Schröder,
Sapphire House,
Lime Tree Way,
Hampshire Int Business Park,
Chineham,
Basingstoke,
Hampshire,
RG24 8GG
England.

Phone: + 44 1256 354446

Email: sales@urbis-schreder.com

Web: www.urbislighting.com

- **DW Windsor Lighting**

Street & Park Equipment Co. Limited,
P.O. Box 2134,
Swords,
Co. Dublin.

Contact: Colm Carton

Phone: 01 8400633

Fax: 01 8079787

Email: info@streetandpark.com

Web: www.streetandpark.com
www.dwwindsor.com

- **Siteco**

Edmundson- EWL Cork
Unit B1 Doughcloyne Industrial Estate,
Sarsfield Road,
Wilton,
Cork.

Contact: Frank Davis

Phone: 021 454 6566

Email: ewlcork@eircom.net

Web: www.siteco.co.uk

- **Philips**

Philips Electronics Ireland Ltd.,
Philips House,
South County Business Park,
Leopardstown,
Dublin 18.

Phone: 01 7640000/087 2380913

Email: dermot.deely@philips.com

Web: www.philips.ie

**List of Cork City Council (Transportation Division) in conjunction
with DCC framework Exterior Lighting Functional LED Luminaire
Framework & Suppliers
(Lot: 4,5)**