

**Comhairle Contae Chorcaí**

**Cork County Council**



## **Cork County Council Public Lighting Manual and Product Specification 2018 (2)**



January 2018

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Roads (Public Lighting) Division

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## **1.0 Introduction**

**1.1** The purpose of this manual is to outline Cork County Council policies and to offer guidance on design etc. to ensure the development of a sustainable energy efficient public lighting network. *Script in bold italics generally reflect specific Cork County Council policy.*

Cork County Council is seeking to foster coordination and consistency in the design, provision and maintenance of high quality street lighting throughout Cork County rural and urban areas. It seeks to avoid unnecessary and wasteful overlighting by ensuring that designs are completed for all new installations by a competent person using all available Lighting Design technology.

Lighting is a highly valued and visible asset with the potential to make a significant contribution to the wider community in terms of accessibility, security and the fostering of commercial activities. This Manual has accordingly been developed to provide a stimulus to the pursuit of continuous improvement and the flexibility to evolve with improving technology.

Cork County Council has achieved ISO 50,001 status on energy management and a key cornerstone of energy reduction is the gradual introduction of lower energy public lighting units across the county. Towards this end, ***Cork County Council policy requires the use of LED lighting on all new general public lighting schemes, inclusive of new housing estates.*** All new schemes are to be designed by a competent public lighting design professional, using appropriate software, ***incorporating the use of low energy, high quality recognised lantern brands, acceptable to the Cork County Council's Public Lighting Department and meeting the appropriate standards.***

All Street Lighting Schemes must meet the requirements of

- CEN code of practice EN 13201-1: 2015
- CEN code of practice EN 13201-5:2015 relating to Energy Benchmarking
- BS5489: 2013 (and any future updates to these documents).
- ET101: 2008 and ET211:2003.
- ESB National Code of Practice for Customer Interface 4<sup>th</sup> Edition 2008  
([http://www.esb.ie/esbnetworks/en/downloads/national\\_code\\_of\\_practice.pdf](http://www.esb.ie/esbnetworks/en/downloads/national_code_of_practice.pdf))

***Cork County 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, capable of factory set dimming, 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.theilp.org.uk](http://www.theilp.org.uk).

***The lighting design for all new schemes and modifications to existing developments must include the upgrade of the lighting on junctions from the public road in addition to any lighting being provided within the development.***

There is also a need to ensure a continuity of illumination between the development and the town/village core, in cases where the development is on the outskirts of the town/village. The latter can be achieved either by the developer directly extending the existing lighting network or by the levying of a special contribution which would enable the County Council to carry out the works.

Where suitable, low brightness energy efficient lighting schemes should be considered with a view to enhancing the night-time scene combining improved security with attractive modern street furniture.

The installation of schemes in residential areas shall comply with the Code of Practice for Public Lighting ET211: 2003, the National Rules 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).

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 Manual comprises a framework of guidance, specifications, and references to standards, the application of which will make a significant contribution to the decision making process.

It is hoped that the adoption of the recommendations in this Manual will assist in delivering a better and safer night-time environment on the Cork County Council road network.

All queries pertaining to the design and maintenance of exterior lighting installations in Cork County should be directed to Cork County Council, Public Lighting Division at the contact details advised in Chapter 24 of this manual.

There are a number of developing technologies which aim to create more energy efficient Public Lighting Systems, and these need to be assessed on a continuous basis and implemented where appropriate. Another simpler form of energy efficiency involves consideration of the time period for which lighting can logically be deemed necessary.

The lighting of amenity walks/playgrounds etc. should only be required on a dusk to midnight basis unless there is a very compelling reason to extend further.

The use of high wattage spotlights to light monuments/churches etc. is to discouraged in favour of low wattage LED equivalents which provide similar levels of illumination and the need or otherwise for such monuments to be lit right through the night must be carefully considered.

## **2.0 Public Lighting Terminology**

### **2.1 CMS**

Central Management Systems (CMS), also known as telemanagement, is the next step in remote dynamic street lighting control. Using a CMS, the operator can choose exactly when to switch each individual street light on or off and/or by how much to reduce the lamp power. This allows any number of switching events and/or dimming levels. CMS also provides other benefits such as fault detection. CMS systems can be enabled using wireless systems or mains power. Cork County Council do not presently use CMS systems but may do at some point in the future.

### **2.2 LEDs**

Relatively new street lighting technology, Light Emitting Diodes (LED) emit a white light that provides high levels of scotopic lumens allowing street lights with lower wattages and lower photopic lumens than traditional High/Low Pressure Sodium (SON/SOX) street lights. ***All new lights erected in Cork County are to be LED lights.***

### **2.3 METAL HALIDE LAMPS**

These were traditionally used predominantly in the lighting of pedestrian crossings. LED equivalents are now available and must be used in new installations.

### **2.4 CLO**

All light sources experience lumen depreciation - a reduction in light output over time. The Constant Light Output (CLO) functionality compensates for this light loss, ensuring LEDs will always deliver the necessary light level. By taking into account the lumen depreciation, the driver can be programmed to start at a dimmed level for a new luminaire and gradually increase power over the life of the light source, to maintain a constant light output, saving energy and extending the lifetime of the system.

***Such technology is to be incorporated into lanterns erected in Cork County.***

### **2.5 DIMMING & TRIMMING**

Dimming is the process of reducing the current and consequently the lighting intensity during periods where there is little vehicle or pedestrian movement.

Trimming is the process of shortening the period for which the lamp is lighting. Modern lights achieve full light output quickly as distinct from older technologies which took a longer period to reach full output. A number of burn profiles are currently being discussed between CCMA/TII/ESB for recognition by UMR when determining energy usage.

***Cork County Council's current policy is that all new LED installations incorporate trimming to 35/18 profile and dimming to one design class below ( corresponding to nearest dimming profile) in all bar Town Centre locations.*** Profile 2A is the most commonly used presently.

### **2.6 UMR**

The Unmetered Registrar (UMR), ESB Networks, Abbeyleix Road, Portlaoise, Co. Laois. operates within ESB Networks and is responsible for overseeing the Market and DNO Licence requirements pertaining to unmetered supplies (UMS). Unmetered Public Lighting

installations of less than 2kW are assigned a technical meter point registration number (TMPRN) by the UMR. TMPRNs are grouped under group meter point reference numbers (GMPRN) in the name of the relevant local authority. Billing takes place at the level of the GMPRN.

The asset owner is obliged to keep UMR's lighting database records for unmetered lights up to date. Public lighting generally uses unmetered tariffs as distinct from metered.

Based on annual burn hours (4,150 dusk to dawn or 2,600 dusk to midnight) the UMR calculates the billable wattage of every unmetered light and forwards this data monthly to the licensed energy suppliers so that the latter can bill their customers appropriately.

Lighting installations of greater than 2kW are required to be metered and are assigned a specific meter point reference number (MPRN) and each MPRN is billed monthly to the account holder.

TMPRNs and MPRNs when advised by ESB Networks must be registered with licensed electricity Suppliers.

Certification of completed installations by a contractor registered with ECSSA or RECI must be provided to ESB Networks in order for installations to be energised.

***Cork County Councils preference is for unmetered tariff and larger developments can achieve this by using multi connection points to keep each connection below 2kW.***

## **2.7 EFFICACY**

Efficacy (lm/watt) is a measure of the efficiency of the light in terms of output per energy consumption. The higher the efficacy the lesser the wattage lantern required to achieve a required lumens output.

## **2.8 COLOUR RENDERING**

A measure on a scale of 1 to 100 of a light source's ability to show object colors "realistically" or "naturally" compared to a familiar reference source, either incandescent light or daylight.

## **2.9 MAINTENANCE FACTOR**

The maintenance factor is a number (positive and less than 1) used in calculations to account for the depreciation in light output over time.

## **2.10 LIGHTING CLASS**

These are defined in BS5489 for residential (P/S Class) and traffic route lighting (M & C Class) situations.

## 2.11 UNIFORMITY

The relationship between the lowest maintained minimum illuminance (lux) value and the average maintained value. Relates to both light intensity and luminance.

## 2.12 LUX

Illuminance is a measure of how much [luminous flux](#) is spread over a given area. One can think of luminous flux (measured in [lumens](#)) as a measure of the total "amount" of visible light present, and the illuminance as a measure of the intensity of illumination on a surface. A given amount of light will illuminate a surface more dimly if it is spread over a larger area, so illuminance (lux) is inversely proportional to area when the luminous flux (lumens) is held constant.

One lux is equal to one lumen per [square metre](#):

$$1 \text{ lx} = 1 \text{ lm/m}^2 = 1 \text{ cd}\cdot\text{sr/m}^2$$

A flux of 1000 lumens, concentrated into an area of one square metre, lights up that square metre with an illuminance of 1000 lux. However, the same 1000 lumens, spread out over ten square metres, produces a dimmer illuminance of only 100 lux

Here are some examples of the illuminance provided under various conditions:

Examples	
Illuminance	Surfaces illuminated by:
0.0001 lux	Moonless, overcast night sky ( <a href="#">starlight</a> )
0.27–1.0 lux	Full moon on a clear night
1000 lux	Overcast day
10000–25000 lux	Full <a href="#">daylight</a> (not direct sun)
32000–100000 lux	Direct <a href="#">sunlight</a>
7.5 lux avg.	Typical Residential Street Lighting



Light Meter

### **2.13 LUMINAIRE**

A luminaire unit is the term used to describe the lantern itself.

### **2.14 PUBLIC LIGHTING UNIT**

Term used to describe the complete public lighting unit inclusive of luminaire, bracket and column.

### **2.15 LANTERN COMPONENTS**

The lantern components in an LED lantern comprise of the heat dissipation housing, the driver (electronic control unit), the lens, LED's and a photocell.

### **2.16 LANTERN FUSE**

The controlling fuse is located in the column base ,or in the case of overhead networks in the Pole mounted Isolation Box.

### **2.17 CIRCUIT FUSE**

Every lighting circuit must be protected by an appropriately rated fuse.

### **2.18 INTERFACE BOX**

This is a piece of electrical apparatus erected on ESB Network poles to segregate ESB Networks and the Local Authority electrical systems.

### **2.19 MINI-PILLAR**

These are ground mounted electrical distribution enclosures from which ESB Networks supplies emanate to Local Authority micropillars.

### **2.20 MOCROPILLAR**

These are ground mounted enclosures which receive electricity supplies for Public Lighting from ESB minipillars.

## **3.0 Objectives of Public Lighting**

### **3.1 Lighting Obstacles**

The main purpose of lighting in residential areas is to enable pedestrians to orientate themselves, to detect traffic and other hazards, and to discourage crime directed against people or property. Lighting of amenities such as walkways, cycle paths, playgrounds and monuments should be curtailed to dusk to midnight operation as against the normal dusk to dawn regime, unless there is a compelling reason to do otherwise, for energy conservation reasons.

### **3.2 Security**

An important purpose of lighting in housing estates is to create an environment in which the residents feel safe and secure. In areas where there is a high crime risk, care should be taken that any potentially dark areas are lit. More than one lighting unit at specific high-risk locations should be used so that a simple lamp failure does not leave an area in total darkness. Colour rendering is a help in crime detection and this should be taken into account when choosing a light source.

### **3.3 Pedestrian Safety**

Oncoming vehicles and bicycles must be easily recognised by pedestrians. It has to be possible for pedestrians to discern the features and intentions of a person who approaches them at night.

### **3.4 Road Safety**

The lighting on roads should provide guidance for motorists, but may be insufficient for revealing objects on the road without the use of headlights. Drivers must be able to distinguish pedestrians and oncoming vehicles.

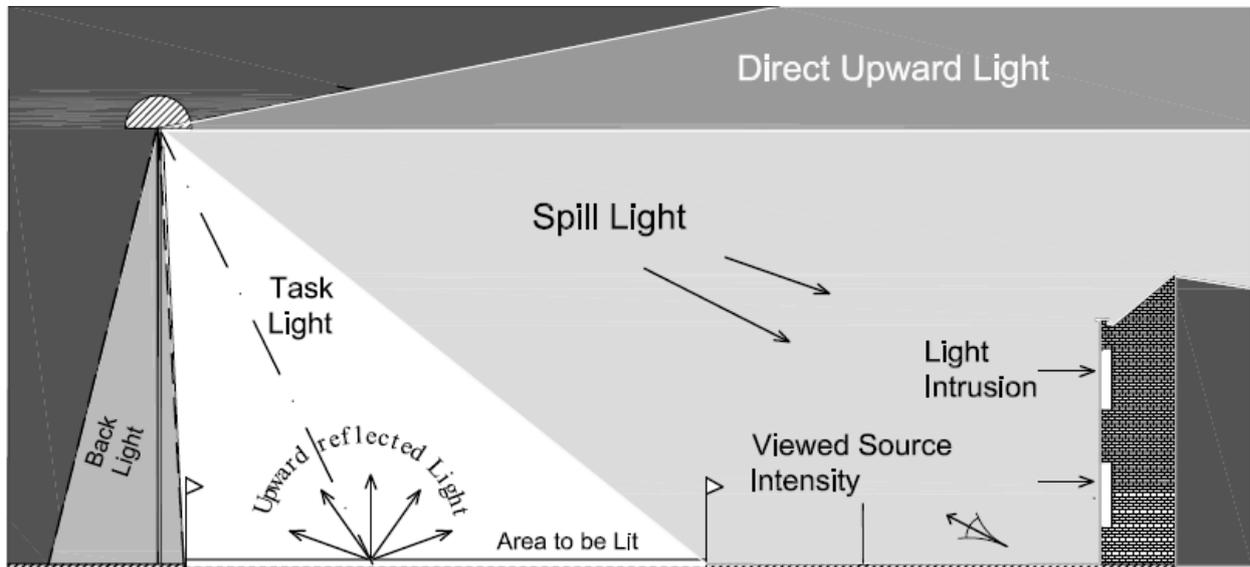
### **3.5 Social Benefits**

Lighting should provide visual guidance for visitors who are not familiar with the area and who are looking for the homes of friends or relatives. Street signs and name-plates should be easy to recognise and read.

### **3.6 Avoidance of obtrusive Lighting – *Extracted from Guidance Notes for the Reduction of Obtrusive Light GN01:2011***

If possible, light should not enter the bedrooms of residents and the fitting of cowls or some other measure may be required where a resident complains of light pollution.

**Obtrusive Light**, whether it keeps you awake through a bedroom window or impedes your view of the night sky, is a form of pollution, which may also be a nuisance in law and which can be substantially reduced without detriment to the lighting task.



**Figure 1 – Types of obtrusive light**

Do not "over" light. This is a major cause of obtrusive light and is a waste of energy. There are published standards for most lighting tasks, adherence to which will help minimise upward reflected light.

The spill of light onto buildings opposite can be controlled by lessening the tilt angle or by using a narrow optic which limits the lateral spread. Manufacturers generally have a narrow, medium wide optic options and also have optics which extend the light beam further or lesser in the longitudinal plane. **Generally, LED lanterns should be set in the range 0-5 degrees and the optic type should determines the lateral spread thereafter.**

### 3.7 ENVIRONMENTAL ZONES

Table 1 – Environmental Zones			
Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, Dark Sky
E1	Natural	Intrinsically dark	National Parks, Areas of Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark suburban roads
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres, high levels of night activity

## **4.0 Types of Lighting Equipment**

This chapter contains the following:

- Types of Lamp's
- Typical lamp Wattage's
- Lanterns
- Switches &Control Gear
- Columns

### **4.1 Types of Lamps**

Historically the most common Types of lamps installed in residential areas and on traffic routes were high pressure sodium lights (SON), which replaced Low Pressure Sodium (SOX), and to a lesser degree Metal Halide (MH).

***Cork County Council's policy is now to only to use low energy LED lighting on all new schemes/retrofits. Hence, new lights in both residential schemes and on new traffic routes shall be of LED type.***

The most commonly used lamps are described below:

#### **4.1.1 Light Emitting Diode Lamps (LED)**

LED lighting is the preferred technology for outdoor lighting based on the energy efficiency achievable compared to current HID technology and reflecting the need to accord with government energy reduction policy.

Colour Rendering (Ra) is of the same quality as for Metal Halide lamps and lifetime is projected to 50,000 to 100,000 hours or 12 years of dusk till dawn lighting.

LEDs can be acquired in cool (5000K), neutral (4000K) and warm (3000K) white.

***Cork County Council currently requires the use of LEDs lights in all schemes to be at 4,000K, neutral white but this may change as industry standards change.***

#### **4.1.2 High Pressure Sodium Lamps (SON)**

High pressure sodium lamps were the most commonly used in street lighting. These lamps were developed in the early 1970's. Whilst they are marginally less efficient than SOX lamps they provided a much better quality of light in terms of colour rendering, making it possible to distinguish different colours though not to the extent with LEDs.

#### **4.1.3 Metal Halide Lamps (MH)**

Metal Halide lamps have a colour rendering (Ra) of 70 compared with an Ra of 20 for SON lamps. Consequently they are specified for urban commercial outdoor locations and remain the preferred light type for larger sports applications, but not for general use.

#### 4.1.4 Low Pressure Sodium Lamps (SOX)

These lamps which emitted a yellow/orange light with very poor colour rendering were historically installed extensively in residential areas (55 Watt) and on Traffic Routes (135Watt). ***It is the intention that the remaining number of these type of inefficient lights will be phased out completely over the next few years.***

#### 4.2 Typical Lamp Wattages

The equivalent wattage's of the older type lamps are given in the table below. Lamps on the second row were those generally used in housing estates. Lamps on the third row were mainly used for urban routes and the ones on the fourth row for busy traffic routes.

Table 4.2: Indicative only, Equivalent Wattages of Different Lamps

SON/MH (Nominal Wattage)	Unmetered Billed Wattage (SON) (Electromagnetic/ Electronic)	SOX Nominal Wattage	Unmetered Billed Wattage (SOX) (Electromag. / Electronic)	Burn Hours (Dusk/Dawn)/ (Dusk/Midnight)
50	62/56	35		4150/2600
70	85/79	55	80/55	4150/2600
100	117/113	90	115	4150/2600
150	170/166	135	165/150	4150/2600
250	275/270	180	220	4150/2600
400	440			4150/2600

It is not possible to definitively state the LED equivalent of the above lanterns as the efficacy of LED lights varies considerably by brand and with ever improving technology, the equivalent LED lantern wattages are dropping all of the time.



## 4.3 Switches & Control Gear

### 4.3.1 Photocell

This system switches on the street light when the ambient light falls below a certain intensity and likewise switchoff when the light level resumes. The traditional ratio was 70/35 for SON lights but LED lights operate on the basis of 35/18 as they reach full output capacity instantly. Photocells normally fail in the on position enabling faulty photocells to be easily identified and replaced as the light will remain lit during daylight hours.

Photocells can operate individual lights, groups of lights or the whole system. Photocells/timers can also be supplied to provide part night switching from dusk to midnight. In the case of group lighting one photocell centrally located turns on/off the supply to a series of lights.



Typical Photocell

***Cork County Council's policy is to install a separate photocell controlling each light.***

### 4.3.2 Cables & Circuits

An appropriately rated circuit fuse should be used in the installation circuit.

When the power supply is from underground and where dusk to dawn lighting is provided, an appropriately sized fuse should be provided in the base of each column.

## 4.4 Columns

### 4.4.1 Types of columns

- **Galvanised steel:** These can be of the root type mounted in sockets or flange type mounted on concrete foundations, fed through underground ducted cables.
- **Aluminium:** These columns have the advantage of being light and easy to handle, and they give way in the event of an accident. These columns are quiet expensive.
- **Mid/Base Hinged:** Hinged columns should be used in areas of < 3.5m road width which are inaccessible to maintenance vehicles. These allow the upper portion of the column to be lowered by hand to make the lantern accessible. Typical applications are amenity walks or narrow laneways.

- **Passively Safe:** Passively safe columns are specified in accordance with the requirements of BS 12767:2007. These are designed to yield in a safe manner when struck by a vehicle.



- **Decorative/Architectural:** Should be confined to town centre streetscape areas only. Still required to be manufactured to EN 40 series.



***In general, Cork County Council policy is to use underground ducted supplies and galvanised steel/aluminium columns, within 60kph zones. Passively safe columns should be used in higher speed zones, as appropriate in accordance with Standards.***

#### **4.4.2 Lamps Fittings on Columns**

Lamps can be installed on columns either directly post-top, on an extended upright arm or with an outreach or combined extended outreach bracket. With LED Lights, post-top or vertical extension brackets are preferred, especially on ESB Network poles, as insisted upon by ESB Networks.

Outreach arms can be installed at tilt angles of 0, or 5 degrees to the horizontal. Tilt angles of 0 degrees should only be used on very narrow streets, as the light emitted by the lamp does not reach as wide an area as with larger tilt angles. Outreach arms used should ideally be used generally.

LED lanterns may be more suited to post top mounting and the lantern itself can be tilted to achieve an adequate design.

#### **4.4.3 Column Construction**

Columns for public lighting should be manufactured from steel or aluminium alloy and certified to ISEN 40 Series. Columns are generally octagonal with a minimum wall thickness of 3mm. Steel columns and brackets should be hot-dip galvanised. Columns should be coated outside with a protective coating to at least 150mm above planting depth. Such coating is usually this is applied to the bottom 1250 mm of the pole, but may be more for

higher columns. Where columns are not erected at the same time as cables are laid, great care should be taken that an adequate loop of cable is left at the exact position of the proposed columns.

#### 4.4.4 Rooted/flanged

**Columns should generally be rooted but flanged types can otherwise be specified for particular locations.** Base details should be designed in accordance with the column manufacturer recommendation. Indicative minimum base dimensions are detailed in Appendix D, Fig. 13 a) & b), but foundations should be designed for specific site conditions.

#### 4.4.5 Mounting Heights

Typical mounting heights are 6 m for residential and subsidiary roads, 8 m, 10 m and for normal traffic routes, and 12 m and higher for high-speed dual carriageways and motorways.

In special situations where particular aesthetic or environmental factors apply, the use of other mounting heights might be more appropriate. (ref:-BS 5489-1:2013 BRITISH STANDARD)

#### 4.4.6 Lateral offsets

BS 5489-1:2013, Section 4.3.3.3, Table 2 provides guidance/standards for lateral offsetting of columns to ensure;

- a) that they are unlikely to be struck by wing mirrors of lorries/wide loads etc. and
- b) that the set-back should be sufficient to allow the free passage of all people on any footway.

**Cork County Council favours lighting being located at the rear of the footpath, where one exists** or that the minimum offset outlined in Table 2 of section 4.3.3.3 be observed in rural locations where a footpath is unlikely to be installed at any stage in the future. In urban locations where build-outs etc. allow the column to be located in an area which does not interfere with the footway a different location may be appropriate.

Under no circumstances must a column be located in the middle of a footway/cycleway, where it likely to be a hazard for pedestrians/cyclists/vulnerable road users.

extract from Table 2 – Recommended minimum clearances from edge of carriageway to face of column

Design Speed km/h	Minimum horizontal clearance (m)
<= 50	0.8
80	1.0
100	1.5
120	1.5

## **5.0 Public Lighting Design Criteria for New Schemes or Additional Lighting in Partly Completed Schemes**

### **5.1 Introduction**

The pattern of light emitted from a lantern is generally T shaped (though LED lights footprint varies with lens type and should be chosen to suit the application) and of greatest intensity directly beneath the lantern. The aim of public lighting design is to achieve fringe overlapping of the T- shaped streaks to light the surface as evenly as possible and to produce an illuminance level and uniformity to meet the lighting class for the area.

This chapter outlines general lighting requirements and how these requirements can be met. It provides simple rules of thumb for basic initial estimates of the number of lights required. Modern lighting design software enables the Designer to ensure that the lighting criteria are achieved in carriageways and footways.

***Cork County Council insist that all new designs/retrofits be designed by a competent professional using appropriate software.***

Designs shall be carried out to the appropriate latest BS & EN standards and the extracts below are samples merely for indicative purposes only.

The Design process should follow a logical procedure of;

a) selecting the appropriate Lighting Design Class based on BS 5489-1:2013 *Code of Practice for the design of road lighting* by the selection of the appropriate Table from annex A, which guides the designer to the appropriate Table (A2 – A8) and

b) applying the Environmental Zones factor i.e.

E0	‘Dark Skies Reserve’	
E1	Intrinsically Dark	Rural Area
E2	Low District Brightness	Town
E4	High District Brightness	City

c) once the appropriate class has been decided upon, applying the other factors which influence the design such as ‘maintenance factor’, S/P ratio etc. to determine the minimum maintained average & minimum Lux and the appropriate Uniformity.

Alternatively, the appropriate Design Class may be selected by the process outlined in EN 13201-1:2014, Table 1 for M Class, Table 3 for C Class and Table 4 for P Class.

d) proceed to locate the columns appropriately and run the design through the software package, adjusting as appropriate until the design parameters are met using a particular lantern.

e) plot the lux levels and check that the minimum lighting level is achieved everywhere and that there is minimal overlapping.

It is acknowledged that in a retrofit situation, where it is not feasible to install additional poles, that there needs to be some relaxation on some of the parameters such as the acceptance of a reduced level of uniformity, which still achieving a lighting standard at least equivalent to what is existing.

## 5.2 Lighting Requirements.

### 5.2.1 Lighting Requirements for housing estates, subsidiary roads and associated pedestrian areas.

There are six different P Classes defined in BS 5489, the most common of which are P2 & P3. P3 is the normally selected Lighting Class for Residential Housing Schemes, though P4 & P5 classes may be appropriate in terms of dimmed periods.

Typical requirements are set out in Table A5 of BS 5489:2013, an extract from which is given in Table 5.2.1 below.

**Table 5.2.1 – Typical Housing Estate Lighting Classes**

Road Type	Lighting Class	Maintained Average Illuminance, lx SON/LED(with S/P ratio, neutral /warm)	Maintained minimum illuminance, lx SON/LED(with S/P ratio, neutral /warm)	Uniformity Emin/Eav
Roads where <ul style="list-style-type: none"> <li>- Night-time public use likely to be high</li> <li>- Or the crime risk likely to be high</li> <li>- Or the traffic usage is likely to be high</li> </ul>	P2	10.0/8.1*/8.6*	2.0/1.6*/1.7*	0.2
Roads where <ul style="list-style-type: none"> <li>- Public use is likely to be moderate</li> <li>- Or the crime risk is average to low</li> <li>- Or traffic usage is of a level equivalent to that of a housing estate access road.</li> </ul>	P3	7.5/5.9*/6.2*	1.5/1.2*/1.25*	0.2

*\*Indictative only, determined by S/P ratio*

***Cork County Council is amenable to considering the use of warm white (3,000k) LED lanterns in Housing estate developments, subject to prior consultation with Public Lighting Department.***

***Lighting in housing estates in Cork County is generally designed to P3 standard. Within a residential development, the requirement generally is to light the road, verge and footpath to at least the minimum level, as far as the adjacent boundary line of the properties. Also, to ensure that the access roadway and any walkways across green areas etc. are adequately lit.***

***This would need to be demonstrated at planning stage, by the submission of a lux contour drawing, showing contour lines at the minimum level and thereafter at 1.5 lux, 3.0,5.0,10.0,15.0 etc.***

***The number of optics should be minimised for the particular schemes to assist future maintenance and the specific optic/lantern code should be identifiable on a label within the lantern. The brand type should remain the same throughout a confined development, in so far as practical.***

***Cork County Council policy is to incorporate factory set dimming to the next lower Lighting Class between 24.00hrs. and 06.00hrs in non-town center locations (and housing estates). Housing estates should generally be dimmed to Profile 2A.***

Conflict Class Design is generally only required on traffic routes and does not generally apply to junctions within housing estates, with the exception of the junction between the housing estate and the public roadway.

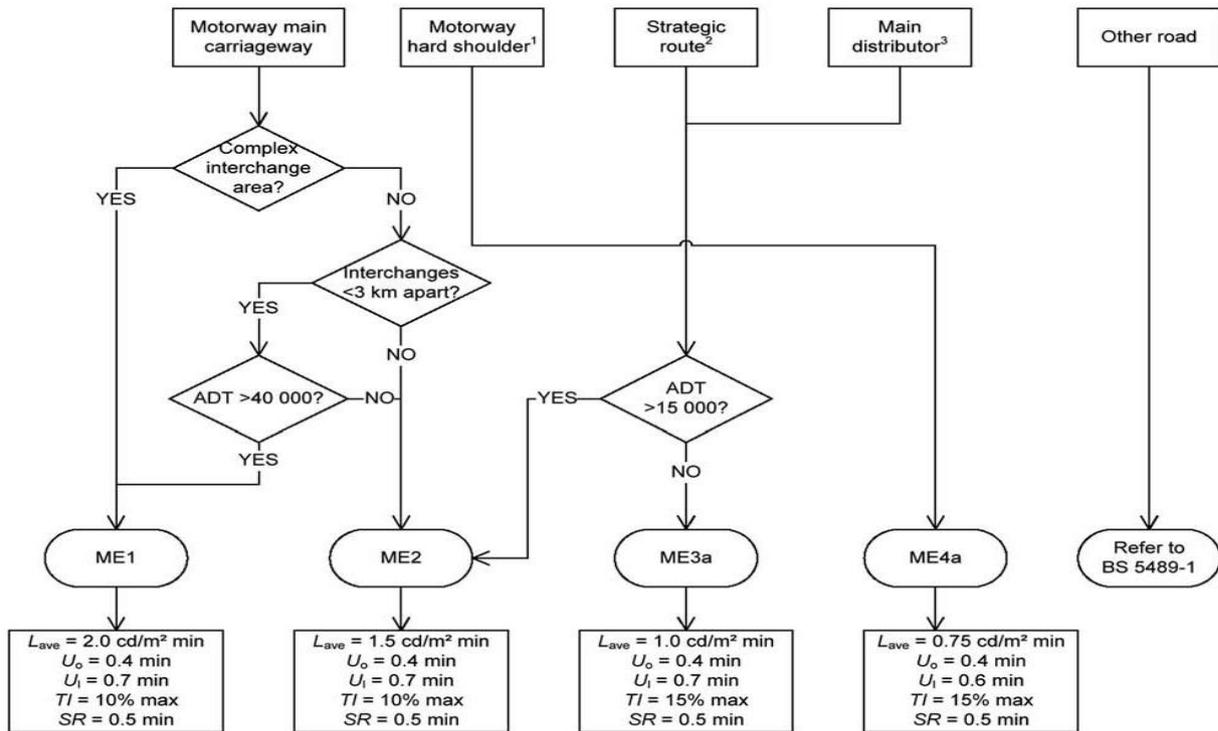
### **5.2.2 Lighting Requirements for traffic route lighting design**

Typical requirements are set out in Tables A2 and A3 of BS 5489: 2013 and are selected from a range of 6 No. ME & CE Classes by reference to BS EN 13201-1: 2004, a sample of which are outlined in Table 5.2.2 below.

**Table 5.2.2 – Typical Traffic Route Lighting Classes**

Road Type	Lighting Class	Lav in cd/m <sup>2</sup> (min maintained)	Maintained Average Illuminance (Lux)	Maintained minimum illuminance, lux	Uniformity
- Traffic Routes	ME2	1.5	20	8	0.4
	ME3a	1.0	15	6	0.4
	ME4a	0.75	10	4	0.4
- Motorway	ME1	2.0	30	12	0.4

Traffic Route lighting on National Roads should be designed to TII Publications DN-LHT-03038 Feb 2012. Figure B.1, extracted below, indicates the appropriate class for design.



<sup>1</sup>Motorway hard shoulder: where not used as a running lane

<sup>2</sup>Strategic route: Single or dual carriageway road carrying fast moving long distance traffic

<sup>3</sup>Main distributor: Single or dual carriageway road between strategic routes and linking urban centres to the strategic network

Conflict Class Design is generally only required on traffic routes, at junctions, roundabouts and town centre locations (where pedestrians are likely to be present). Where applicable the conflict class should generally be one class higher than the M Class. e.g. Design to Me3, conflict zones to C2.

**Cork County Council policy is to incorporate factory set dimming to the next lower Lighting Class between 24.00hrs. and 06.00hrs in non-town center locations (and housing estates)** in accordance with the guidance given in Institution of Lighting Engineers (ILP) TR27 and Annex A of BS 5489: 2013 and recently agreed burn Profiles 1, 2A, 2B, 2C. Further burn profile alternatives may be available at some stage in the future.

### 5.2.3 Lighting Requirements for City and Town Centres

Requirements are set out in Tables A8 of BS 5489: 2013 and are selected from a range of 4 No. C Classes and 2 No. S Classes by reference to BS EN 13201-1: 2004. C classes refer to conflict areas such as junctions or roundabouts etc.

**Table 5.2.3 – Typical Town Centre Lighting Classes**

Road Type	Lighting Class	Maintained Average Illuminance, lx	Maintained minimum Point illuminance, lx	Uniformity
Determined based on factors such as <ul style="list-style-type: none"> <li>- Night-time public use is likely to be high</li> <li>- Or the crime risk is likely to be high</li> <li>- Or the traffic usage is likely to be high</li> <li>- With mixed vehicle and pedestrians on separate footpaths.</li> </ul>	C2 (City/Town Centre with high traffic flows)	20	8	0.4
	C3 (Town Centre with low flows/Approaches to Town Centre /sidestreets)	15	6	0.4

For security and for visual guidance purposes the full street width building facade to building facade should receive some light: In locations where a wide pedestrian area exists, a separate P Class may be more appropriate to apply to such areas.

***Cork County Council's current policy is that dimming of Town Centre lighting shall not be incorporated into the design.***

#### 5.2.4 Lighting Requirements for Public Car Parks

Requirements for the lighting of Car parks are set out in Table 5 of BS 5489-13, which is extrapolated from BS EN 12464-2:2007. The requirements are measured in term of Eav and uniformity. ***In general Public Car Parks serving Towns would fall into the middle category outlined below;***

**Table 5.2.4 – Typical Lighting requirements for Car parks**

Car park Type	Maintained Average Illuminance lx,	Uniformity U0
Light traffic, parking for shops, terraced and apartment houses, amenity car parks etc.	5	0.25
Medium Traffic, parking for department stores, office buildings, sports arenas etc.	10	0.25
Neavy Traffic, parking for schools, churches, major sports and building complexes	20	0.25

***Cork County Council's policy is that dimming of Car parks should be incorporated into the design, unless there are good reasons not to.***

#### 5.2.5 Lighting Requirements for Recreational Areas (Town park walks/playgrounds/footbridges)

Requirements are set out in in Tables A6 & A7 of BS 5489: 2013 but *in view of the diverse nature of each particular site, no uniform method of lighting provision is suggested, and an individualized approach needs to be taken for each site. For this reason, only basic guidance is given with regard to the overall lighting provisions related to each area. This guidance is given in Annex A of BS 5489:2013.*

***Cork County Council's current policy is that unless otherwise justified, tariff's for recreational areas should be dusk to midnight and if necessary signs should be erected indicating that the lighting will go off at midnight.***

**Table 5.2.5 – Typical Recreational Area Lighting Classes**

Lighting classes for subsidiary roads with mainly slow moving vehicles, cyclists and pedestrians	Lighting Class	Maintained Average Illuminance, lx SON/LED	Maintained minimum Point illuminance, lx SON/LED
Recreational Areas	P4:S4	5.0/3.4	1/0.7

Special care and attention should be given to the illumination of steps/stairs and ramps. These should be lit from below so that a person descending is not shadowing the light onto the next step. Lighting of a footbridge can either be by columns or inbuilt in the railing.

### 5.2.6 Maintenance factor for Design

A **maintenance factor** based on a cleaning cycle of six 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 0.76 shall apply to columns < 6m high and 0.84 to columns > 6m high*** in an E3/E4 environment. (Ref; Annex C, BS 5489-1:2013) For LED's the basis for the selection of the maintenance factor should be indicated.

The lamp flux maintenance factor can be established from the lamp manufacturer's data, and typical luminaire maintenance factors are given in BS 5489–1: 2013 Table B1 of Appendix B (informative) and Annex C (informative) Maintenance Factors for LED luminaires.

Consideration will be given to manufacturer's data regarding maintenance factors for conventional LEDs.

### 5.2.7 General

Design submissions for all new schemes should include the isolux contours on a map to demonstrate that the required Class has been achieved throughout and shall be accompanied by a lighting design report indicating that the minimum lighting class requirements have been achieved. ***The isolux contours should extend to the modelling of existing adjacent lights to ensure that both systems mesh together to give continuous lighting to the required standard.*** A Design report and schedule of proposed lights should also be submitted. The Design report should contain details of the light proposed to be used within the development.

***Cork County Council favour using lanterns with an efficacy in excess of 110 lm/CLO W at all lumen outputs and drive currents up to and including 700mA.*** Further details of the minimum standard of lantern/luminaire are outlined in Chapter 7.

Given the concentrated light emitted by LEDs care should be taken to achieve the required Glare Rating (GR) as per BS EN 13201-2: 2003 for residential schemes and BS 5489: 2013 for traffic route lighting. If necessary some form of cowling may be necessary in particular situations.

#### **5.2.8 Constant Light Output CLO**

***Cork County Council require lights to be designed for constant light output (CLO). The wattage of the light shall be stated as that associated with constant light output over the expected lifetime of the fitting.***

#### **5.2.9 Dimming and Trimming**

LED lights, by their nature, lend themselves to trimming as they reach full potential very quickly when compared to conventional lights. A number of burn profiles, incorporating trimming to 35/18, have been agreed between ESB and CCMA/SEAI with further profiles due to be agreed in the future.

These burn profiles allow for dimming to different percentages. Examples are profiles, 2A, 2B & 2C which are currently available for use and should be incorporated into the design where appropriate. Each profile involves the dimming of lights between 12 midnight and 6 am to different extents, (75%, 67% and 50% respectively) to correspond with one lighting class drop per Class.

***Cork County Council's policy currently, is not to dim in Town Centre locations ( principally Main St. and sidestreets off) but to install factory set dimmed drivers elsewhere on all new installations set to the profile which dims the light to one design class below, between . For simplicity Profile 2A may be used in housing estates.***

***LED Lighting shall have a 35Lux on/18Lux off dusk to dawn photocell controlled switching regime on roads and 35 lux on to midnight off on amenity walks/playgrounds/monument lighting etc.***

## 5.3 Light Spacing, Arrangements and Tilt Angle

### 5.3.1 Spacing

All lighting should be designed by a competent Public Lighting Designer using specialised software. The following rules of thumb are indicative of design outputs and should be used only for initial estimates.

**Straight roads:** In residential schemes with a straight 6m wide roadway with a 2m footpath on either side, the minimum standard of illuminance considered acceptable can be provided by the installation of lights at 25-35m spacings with 6m mounting height and zero or 0.5 meter outreach arm.

**Bends and Junctions:** At bends and junctions, the distance between two adjacent poles should be considerably shorter than the above recommended value for straight roads. In bends, the poles should be located on the outer side of the bend. The sharper the curve, the closer the poles should be to each other.

**T-Junctions:** It is recommended that a light be placed on the main road, opposite the centreline of the minor road. The distance between the pole at the junction and first pole on the minor road should be less than half the distance between two adjacent poles in places where there is no junction.

### 5.3.2 Arrangements

**Single Sided:** In a single sided arrangement, all the lights are located along the same side of the road.

**Opposite:** The lights are placed opposite each other on both sides of the road, resulting in good longitudinal luminance along the length of the road.

**Staggered:** the lights are placed alternately on both sides of the road in a zigzag pattern. The spacing between two poles may be increased when this arrangement is used, but the longitudinal luminance along the road will be low.

### 5.3.3 Tilt Angle

The outreach arm can be installed at tilt angles of either 0 or 5 degrees. A 0 degree tilt will allow the lamp emit light only to a small area of road just below the lamp. A tilt angle of 5 degrees is generally recommended.

***Cork County Council favour post top rather than outreach on new LED installations.***

## 5.4 Lights Fixed to Buildings

Public Lights can be fixed to buildings, usually in streets where space is limited. The permission of the building owner and that of ESNB is required before lights can be attached to buildings. A wayleave agreement should be signed by the consenting owner to ensure continuity in the event of future transfer of ownership of the property.



## 5.5 Lighting of Steps

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. *Light units built into walls or low level bollards are to be avoided, in so far as possible, due to maintenance /vandalism issues.*

## 5.6 Verification of Designs

Light Measurement to verify the lighting levels achieved should be carried out on new schemes on a sample basis.

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 Maintenance 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.



## **6.0 Installation Procedures**

### **6.1 Connection Arrangements**

#### **6.1.1 Overhead Mains Cable**

Where mains cables are overhead- carried on ESB Networks Ltd. wood or steel poles – it has been normal practice to provide street lighting from lanterns mounted on brackets fixed on these poles. As these brackets are always close to live ESB networks, only duly qualified persons, authorised by the Local Authority are permitted to install or work on this type of installation. Since 2010 ESB has discouraged the erection of new assets on its Network Poles and ***hence a ducted underground supply feeding stand-alone public lighting columns is the preferred option for new installations.***

An interface box is required for new or replacement lanterns or brackets erected on ESB Network poles. . Ref. ESB Requirements for Work on Public Lighting on ESB's Networks 2010. A typical interface box is illustrated in Appendix D, Figure 9.

#### **6.1.2 Underground Mains Cable**

Underground mains cables are to be laid in accordance with ET210: 2003 Code of Practice for Public Lighting Installations in Residential Areas. A separate underground cable to be used exclusively for public lighting supply is necessary. This cable shall be installed in a duct (to facilitate replacement) in accordance with the requirements of Table 52B of Sect. 522.6.8.3 of ET101: 2008 or as per scheme design as appropriate.

It is essential that public lighting columns should be erected at the same time or very shortly after the cable is laid. Where columns are not erected at the same time as cables are laid, great care should be taken that an adequate loop of cable is left at the exact positions of the proposed columns and does not constitute a tripping hazard.

At this stage, the cable is particularly susceptible to damage by machinery and builders' equipment. It is strongly recommended therefore, that the loops be clearly marked and enclosed in a short concrete pipe or other similar protection which will draw attention to the presence of the cable.

It is also advisable to liaise with ESB Networks with regards to agreeing suitable supply points.

## 6.2 Installation Procedures for Columns

### 6.2.1 Foundations for columns

Columns should be erected in the following ways:

- **Rooted** : A concrete or corrugated PVC pipe of approximately 300mm diameter is installed in a foundation excavation and then surrounded by concrete prior to the erection of columns. The root depth and extent of concrete surround is dictated by the column height and ground conditions. Typical values are given in Appendix D. Fig. 13.(a)
- **Flanged**: A concrete base is laid and a flange type column is used. Holding down J-bolts are incorporated into an in-situ concrete base and a flange type column is subsequently erected and secured by nuts. The size of the base varies with size of column. Ref. BS EN 40-3-1/3 and PD6547>:2004 and Appendix D. Fig. 13.(b)

***Cork County Council favour rooted columns generally, unless there is a specific reason for using flanged.***

***All columns in housing areas should be erected at the back of the footpath on public ground, (i.e. not on private property). It should follow logical routes and not simply the shortest distance.***

For traffic routes columns should be erected at an offset as specified in BS 5489 (paragraph 4.3.3.3, Table 2) for Traffic Routes.

***The set-back of lighting columns should be sufficient to allow the free passage of all people on any footway. Columns should never be located within likely pedestrian/cycle pathways where an unsuspecting person would be at risk of inadvertently colliding with the column.***

***Landscape designs need to take cognizance of public lighting layout and vice versa. Trees/shrubs/hedges should not be planted in locations where they are likely to interfere with the required spread of light from public lights, over time. Ideally, tree planting should be located at the opposite side of the road to the lights and the expected upper/lower level of the foliage (determined by choice of tree type) should be such as would not interfere with the expected light distribution pattern, either laterally or longitudinally. Trees should never be planted longitudinally, within 10m of a lighting column, on the same side of the road.***

Columns should have a double locked framed door and should be galvanised. Doors should face oncoming traffic perpendicular to the road edge.

### **6.3 Provision of Ducting.**

Excavation and backfilling of roads/verges etc. for ducting shall be carried out in accordance with DTTAS Guidelines for Managing Openings in Public Roads Second Edition, April 2017 (or latest version). Openings on public roads, in the charge of the Council, require a licence from the local authority.

#### **6.3.1 Standards of Ducting**

Ducting should be made of PVC to IS135 Class B having a minimum 50mm diameter for public lighting cable and 100mm diameter for ESB network supply distribution cable to lighting micropillar. Ref ET101: 2008 Sect. 522.6.8.3. & Table 52 B.

Ducting shall be red coloured and have the words “Street Lighting” stamped on it in 9mm high lettering at 1m intervals, with the lettering labels facing upwards in the trench. Ducting for street lighting should be located relative to other services as indicated in Figure 4 and 5, Appendix D. Warning tape must always be used.

#### **6.3.2 Ducting in Verges/Footpaths**

Ducting should be laid in a bed and surround of Clause 503 material at a minimum depth of cover as specified in ‘Managing Openings in Public Roads Second Edition, April 2017 (or latest version of what is commonly referred to as ‘the purple book’). Warning marker tape shall be laid in the trench at an appropriate level above the duct. Ducts should be installed complete with 6mm diameter polypropylene rope for subsequent pulling of supply cable. The ESB require that a 6mm diameter rope be provided to draw-in their connecting cable to lighting pillars from supply distribution points.

#### **6.3.3 Ducts under Roads**

Ducts laid in roads should be adequately protected by a cover of cement bound material as outlined in ‘the purple book’. Road crossing ducts should generally be 100mm diameter and may require a junction box either side for future replacement of cables. . The duct ends shall be protected from ingress of rubble or other material. Cross road ducts should extend a minimum of 300mm into the grass margin beyond the edge of the hard shoulder or kerb and should end in a chamber either side of the road.

#### **6.3.4 Ducting Surround**

The compacted thickness of CI 503 material above and below the duct should be a minimum of 50mm. The remainder of the trench should be backfilled to ground level using imported compacted crushed stone or as specified in the *Guidelines for Managing Openings in Public Roads* and any Road opening license special conditions.

### 6.3.5 Connections from Ducting to Columns

Ducting setback in relation to road edge will vary depending on the setback of foundation blocks and/or rooted lighting columns. In general, the ducting should either run directly from column to column or alternatively 500mm in front of the block/column positions, with a minimum 150mm between centre of duct and front face of foundation block or root type column.

Cables should be fed from supply ducts to foundation block duct opening or cable slots of root column, both in and out, through short lengths of flexible stub duct such as hydrodare. In the case of root columns, this flexible stub duct should be sufficiently long to project into column at least 300mm above top of cable slot. In the case of flange plate columns, flexible stub duct through foundation block should be sufficiently long to project 100mm above top of block. Reference Fig. 10 Appendix D. ***The coupling should be such that the cabling can be easily withdrawn at some future stage.***

Ducting should be properly coupled. Longitudinal ducts should be laid in fully coupled unbroken lengths, which are accessed at the cable drawing-in stage by cutting at each lighting column or other access point. Reducer couplers should be used to connect 100mm ducts and 50mm continuation ducts. In residential schemes direct coupling from column to column in 50mm duct is also acceptable.

All duct runs should be marked with electrical marking tape at a level of 350mm below finished ground level or as outlined in the *Guidelines for Managing Openings in Public Roads*

### 6.3.6 Manhole Chambers

At road junctions or sharp changes in direction chambers will be required. Further detail on manhole chambers is outlined in Chapter 11.

### 6.3.7 Time Schedule

It is recommended that ducting be laid as late as possible in the road construction programme, just prior to footpath construction or final landscaping if possible, in order to minimise exposure to damage by other operations.

***Note: All ducts shall be proven, with brush and mandrill, polypropylene roped and plugged, and compliant with the Irish ET: 101 requirements that red ducts be used for exterior lighting cables.***

## 6.4 Customer Service Pillars

ESB Networks Mini-Pillars and Customer Service Pillars (Exterior Lighting Micro-Pillars) shall be installed a minimum of 2m apart as illustrated in Appendix D, Figure 6. If this is not physically possible and only with the explicit permission of ESB Networks and Cork County Council Public Lighting Division these may be installed closer together and equipotentially

bonded in accordance with ET: 101.

Earthing for ESB Minipillar should be in accordance with ESB National Code of Practice for Customer Interface 4<sup>th</sup> Edition 2008, i.e. lay a minimum of 25m of 25mm. sq. copper wire (ESB free issue) directly in the cable trench between the ESB pillar and the local authority lighting pillar.

The internal layout of a typical unmetered pillar is illustrated in Appendix D, Figure 8.

**In all cases it is not acceptable 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 refuse to connect the Customer Service Pillar and Cork County Council will not be in a position to take the Scheme in charge.

Separate lighting pillars are also required when the public lighting is installed in conjunction with an unmetered pedestrian crossing.

To ensure public safety and for safe operation of the electrical network it is a requirement that an earth is installed at each minipillar location to ensure safe operation of the electrical supply system. ESB Networks will provide all necessary earthing materials.

#### **6.5 Earthing requirements for an ESB mini-pillar/micropillar**

- Provide an open trench 15 metre long x 300mm wide x 450mm deep beside each minipillar. The adjacent mains cable duct trenches may be used for this purpose.
- Following earth installation by ESB Networks, cover the earth conductor with a layer of fine topsoil / clay and the trench, and then reinstate the trench.
- Provide ESB Networks with photographic evidence that the minipillar earths have been installed as per ESB Networks specification.
- The minimum earthing requirements for a micro-pillar are of the order of 4m long x 25mm cable earthed in a trench.

NOTE:

**In certain locations with very poor earthing conditions, an additional earthing system may be required to be installed for public safety. This may require extra trenching or installation of additional earth rods etc.**

Earthing systems are vital for public safety. Minipillars cannot be connected until the earthing system is correctly installed.

## **7.0 General Technical Specification for Luminaries**

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

- 7.1 Luminaires shall be LEDs** and shall comply with I.S. EN 60598-2-3 and IEC 62722-2-1 Luminaire Performance – Part 2-1: Particular requirements for LED luminaires.
- 7.2** All new luminaires shall incorporate **electronic control gear** and a photocell in each lantern as standard.
- 7.3 Decorative, architectural** or period style lanterns shall be LED and shall incorporate sub-miniature photocells.



- 7.4** All **photocells** should be manufactured to accord with BS 5972 and have a 35/18 Lux switching on LED lanterns.
- 7.5** All overground luminaires shall be **sealed to the appropriate rating** and shall incorporate ingress protection to a minimum of IP65 for the lamp enclosure in locations other than sea-wall areas where IP 66 is required. All underground luminaires shall be sealed to IP67.
- 7.6** All non-LED luminaires shall have a **polycarbonate or toughened safety-glass lens** 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 County Council reserve the right to receive confirmation of this from the manufacturer.
- 7.7** ***Cork County Council Maintenance obligations, aim to keep the number of diverse luminaire models within reasonable limits in its inventory. (Cork County Council's Public Lighting Department can advise on this). Lanterns shall comply with the appropriate standards BSEN60598 and IEC62722-2-1: 2014 and only brands for***

***which spare parts will be readily available for many years to come will be accepted.*** This is to allow economies of scale to be achieved in the maintenance (replacement, spares etc.) of its exterior lighting assets. Cork County Council may seek validation of certificates by an independent accreditation body. ***New or unusual brands may be considered where they are certified to be in accordance with aforementioned standards but evidence of this certification and component quality will have to be issued to the public lighting engineer for approval before incorporation into the design. In the main such diverse brands should be avoided.***

#### 7.14 LED Lantern Specification

***LED Lanterns which are to be taken in charge by Cork County Council shall be commonly used reliable brands & shall comply with the following requirements:***

- a) The lanterns shall be tested and approved by an independent 3rd Party ENEC (European Norms Electrical Certification) national Certification Body and awarded the ENEC mark in accordance with CENELEC Operational Document CIG 021 & evidence of same to be provided.
- b) The manufacturer shall be accredited to the following standard: BS EN IEC/ISO 17025, General requirements for the competence of testing and calibration laboratories, BS EN ISO 9001, Quality management systems, Requirements with guidance for use, BS EN ISO 14001, Environmental management systems.
- c) Lanterns shall be designed for LED light sources only. Lanterns originally designed to be used with conventional light sources and subsequently modified or updated to accommodate LED light sources will not be accepted.
- d) The lantern shall be fully compliant with all relevant European/British standards and EC Directives as required to demonstrate full compliance with the CE Directive and be clearly marked accordingly. Certificates of compliance for all lanterns shall be submitted.
- e) ***The lanterns shall deliver an efficacy in excess of 110 CLO lm/W at all lumen outputs and drive currents up to and including 700mA.***
- f) ***Lanterns shall not be driven at their maximum drive currents to allow the facility to increase ( in the region of 25%) the output on site, post installation, should a justifiable low level lighting complain arise. For example, within the Philips Luma type lantern, Cork County Council only allow the use of Luma micro between 0-5,000 lumens range, Luma mini, within the 5,000-10,000 range and Luma 1 between the 10,000-20,000 lumen range.***
- g) The lanterns shall be designed, manufactured and tested in accordance with the essential requirements of:
  - i. BS EN 60598-1, Lanterns, General requirements and tests.
  - ii. BS EN 60598-2-3, Lanterns, Particular requirements. Lanterns for road and street lighting.
  - iii. BS EN 62031, LED modules for general lighting, safety specifications.
  - iv. BS EN 55015 - Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment.
  - v. BS EN 61547, Equipment for General Lighting Purposes – EMC Immunity

- Requirements.
- vi. BS EN 61000-3-2, Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions. (equipment input current  $\leq 16$  A per phase)
  - vii. BS EN 61000-3-3, Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection.
  - viii. BS EN 62471, Photobiological safety of lamps and lamp systems. And shall meet the requirements of risk group 'Exempt'.
  - ix. BS EN 62262, Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts. (IK Code) And, shall meet a rating of at least IK08 for the whole lantern. (including the housing, gear canopy and glass cover)
  - x. BS EN 60529, Degrees of protection provided by enclosures. (IP Code) And shall meet a rating of at least IP66 for the whole lantern. (including the housing, gear canopy and glass cover)
- h) The luminaries shall be suitable for operation within ambient temperatures between  $-20^{\circ}\text{C}$  and  $+35^{\circ}\text{C}$ .
  - i) All LED life extrapolations must be based upon the Illuminating Engineering Society (IES) standard LM-80 provided by the LED source manufacturer. The LED source manufacturer must use a valid method for projecting LM 80, or equivalent, with test results to LM-80 based on recommended operating conditions.
  - j) Long term life projections must be developed in accordance with the Illuminating Engineering Society (IES) recommendations contained in TM-21 or equivalent using data obtained in accordance with LM-80.
  - k) All testing and certification, including lifetime projections shall have been undertaken with the lanterns mounted within a controlled environment at an ambient operating temperature of  $+25^{\circ}\text{C}$  with the LED chipset installed within the lanterns.
  - l) Any testing undertaken or data acquired at lower temperatures, or based upon LED manufacturer's lifetime projections calculated at a nominal LED junction temperature ( $T_j$ ) must not be used to demonstrate compliance with any of the minimum requirements herein.
  - m) The minimum performance requirements of the lantern shall be L90B10 at 100,000hrs across the full range of outputs including the maximum drive current of 700mA and a lumen output of 35klm when subjected to a lantern outside ambient temperature of  $25^{\circ}\text{C}$ .
  - n) All energy consumption values provided must be based upon system power (i.e. the power consumed by the lantern when measured operating as a complete unit) at the average CLO level configured for a 100,000 hour period.
  - o) Lanterns shall be WEEE and RoHS compliant.
  - p) The lanterns shall be available with internal and external shield options.
  - q) The lantern housing shall be constructed from die cast corrosion resistant marine grade aluminium alloy in accordance with: BS1490:1988\_LM6 (EN1706:2010 / EN AC-44100) and be powder coated conforming to appropriate European standards – final colour (grey, black if requested eg. Heritage

lanterns).

- r) Lanterns shall be finished in a high quality, ultra-durable and textured powder coating in a neutral RAL colour.
- s) The coatings shall meet the requirements of: Qualicoat Class 1 Coatings BS EN 12206, Paints and varnishes. Coating of aluminium and aluminium alloys for architectural purposes. Coatings prepared from coating powder.
- t) Access to the gear compartment shall be via a hinged canopy that shall be secured when in the closed position via a robust closing catch that facilitates tool-less operation.
- u) The closing catch, hinges, exposed screws and other fixings shall be manufactured from a corrosion resistant material and protected in a manner commensurate with the lantern housing.
- v) The lantern shall incorporate a robust bracing arrangement that shall securely support the canopy when open.
- w) The lantern shall include a flat toughened glass cover to protect the LED module. Lanterns with exposed LED modules.
- x) All lanterns must be maintainable on site with interchangeable parts i.e. the lantern does not have to be sent back to the factory for maintenance.
- y) The lantern shall facilitate mounting via an integral spigot manufactured from corrosion resistant material and protected in a manner commensurate with the lantern housing. Fixing to the column or bracket shall be via a minimum of two separate stainless steel fixings or via threaded connection for top mounted Heritage lantern.
- z) When mounted, the lantern shall be capable of facilitating each of the following tilt settings:

Side entry tilt angle	-10o, -5o, 0o, +5o, +10o
Post top tilt angle	-5o, 0o, +5o, +10o

- aa) The lantern shall include a mechanism to achieve the various tilt angles that shall be secured in the final position using two separate fixings accessible without opening the lantern. Lanterns that rely upon the insertion of additional elements (such as metal washers or spacers), or that require the opening of a cover in order to set/fix the tilt angle are not acceptable.
- bb) The tilt angle settings shall be clearly and indelibly marked on the spigot or lantern, and shall be clearly visible without opening the lantern to ensure the correct angle can be set and checked easily.
- cc) The lanterns shall have a maximum windage as per the following requirements:

Column Height	Maximum Windage (m <sup>2</sup> )
<= 6m	0.15
<= 8m	0.17
<=10m	0.22

- dd) Cable entry shall be via a single M20 cable gland with strain relief, for cable diameters between 10-14 mm.
- ee) The control gear components shall be integral to the lantern housing and mounted within a gear compartment separated from the LED module.

- ff) The lantern shall provide a connection facility for the main incoming supply cable. (marked L,N,E)
- gg) The lantern shall be suitable for connection to a single phase electrical supply with a nominal voltage of: 230Vac +10% to -6% at 50Hz
- hh) The lantern must be available with optics that can meet a glare classification of at least G4 if necessary, complete with a range of optics.
- ii) Lantern maximum upward light output ratio (ULOR) shall be a maximum of 0% when mounted in a horizontal position.
- jj) The LEDs shall be arranged on a suitable PCB such that they align behind dedicated lens-style optics which shall be designed to each provide the required light distribution footprint of the lantern; known as the overlay principal.
- kk) The LED modules shall be replaceable during maintenance events or for lantern upgrades.
- ll) Levels of uniformity should not be significantly adversely affected in the event of individual LED failures.
- mm) The LEDs shall have a Correlated Colour Temperature (CCT) category of Neutral White and have a nominal initial value of 4,000Kelvin, +/- 200K, unless otherwise stated.
- nn) The initial Colour Temperature tolerance shall be no more than 5-step MacAdam Ellipse
- oo) The colour rendering index (CRI) shall be a minimum of Ra 70
- pp) The lanterns shall have an S/P ratio of at least 1.45

## **8.0 Exterior Lighting Columns and Brackets**

### **8.1 General Principals**

- Design calculations for columns and brackets are subject to review by Cork County Council and shall be submitted with proposed exterior lighting scheme designs if requested;
- Public lights should not be erected beneath or adjacent to HV & LV overhead powerlines without explicit approvals from ESB Networks. Ref. ESB Code of Practice for Avoiding Hazards from Overhead Electricity Lines.
- Hanging baskets are not permissible on any columns to be taken in charge by Cork County Council.
- The designer shall specify the use of passively safe columns where setback of 7m for conventional columns cannot be achieved on routes with design speed of 80kmph and as appropriate per the requirements of BS EN 12767: 2007, NRA & ILP Technical Report 30 Passive Safety. Guidance on the Implementation of Passively Safe Lighting Columns and Signposts.
- On traffic routes passively safe columns may be required within Urban Zones subject to a Risk Assessment as outlined in BSEN 12767.

### **8.2 Lighting Columns**

Lighting columns shall be designed and certified to EN40 Series. Lighting columns 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 galvanizing. Further protection or visual enhancement may also be given by the application of an additional protective system such as paint or powder coating.

Lighting columns manufactured from aluminium, 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.

***Generally, lighting columns within housing estates should be 6m high.***

***Generally, lighting columns on Local and Regional Roads should be 8m/10m high.***

***Generally, lighting columns on National Roads should be 10m high.***

***Generally, lighting columns on Motorways/dual carriageways should be 12m high.***

### 8.3 Protective coatings and their application to Columns

Site-applied protective coatings vary from the simple oil-based paint system up to highbuild multiple coat systems. Many of the high-build protective coatings provide superior protection and life to the simple oil-based paints, but do not have the same overall high quality of finish. New high-build multi-coat systems which have a higher quality of finish are now available and should be utilised.

The frequency for the reapplication of protective systems to lighting columns 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

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.*”

Columns located in a marine environment where they will be likely to experience wind borne water spray should be treated with an extra coating as outlined in Appendix D, Figure 12.

### 8.4 Design Standards for Columns

Lighting columns selected for use on new schemes shall, in general, be tapered hexagonal / octagonal / hexadecagonal (16-sided) galvanised type and all columns shall be galvanized on both the inside and outside to BS EN ISO 1461: 1999.

Columns shall have a double locking access door positioned facing oncoming traffic. Ref Appendix D, Fig 11. Deviations from these types of columns will required the prior approval of the public lighting engineer.

Passive columns will be required under certain circumstances as outlined in TII standards. Designers to check on the most up to date requirements when carrying out designs. Currently,

*UK DMRB Standard TD 89/08 – Use of Passively Safe Signposts, Lighting Columns and Traffic Signal Posts to BS EN 12767:2007 – is not formally implemented by the NRA but should be considered as “background reading” indicating good practice.*

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

(a)	IS EN 40-1:1992	Lighting Columns. Definitions and terms.
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(b)	IS EN 40-2:2004	Lighting Columns. General requirements and dimensions.
(c)	IS EN 40-3-1:2000	Lighting Columns. Design and verification. Specification for characteristic loads.
(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 columns.
(g)	BS PD 6547:2004	Guidance on the use of BS EN 40-3-1 and BS EN 40-3-3
(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
		BS EN 12767: 2007 & NRA & ILP Technical Report 30

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

Decorative columns may be acceptable in other shapes/materials as long as they comply with EN40 and receive prior approval by the Council's Public Lighting Engineer.

Columns proposed to be installed in town centre locations or at locations as directed by Cork County Council may be required to be finished with a proprietary paint to an agreed BS or RAL colour which takes account of the surrounding environment.

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.

The quality assurance certification shall relate to the specific lighting column material being proposed. Cork County Council reserves the right to request proof of certification from the proposed column manufacturer.

- ***Plain tubular stepped columns, are not favoured by Cork County Council due to issues with deterioration of the welded joint.***
- An earthing connection shall be provided in the column base compartment. The fastening screw for this connection shall be stainless steel with an M8 coarse thread.
- 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:  $587N/m^2$  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.)

- 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:

Partial safety factor for materials	1.15
Partial safety factor for dead loads	1.20
Partial safety factor for live loads	1.40

- All columns in urban areas must be designed to include the possible future mounting of a stationary sign 450 mm. sq. mounted at a height of 2m.
- Any non-lighting equipment (including signs etc.) may only be installed on exterior lighting columns or poles with the explicit permission of Cork County Council Roads (Public Lighting) Division or ESB Networks where applicable.
- Columns shall have a design life of a minimum of 25 years in accordance with IS EN 40-3-3; and shall be certified.
- When rooted columns are proposed, the column planting depth is to be treated with a bituminous preservative on the outside surfaces. The bitumen shall extend to at least 150mm above ground level.
- 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 rate of coverage shall be 2.5 square metres 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;

## 8.5 Maintenance of Columns

Developers shall take into consideration the location at which an exterior lighting column is to be installed with a view to the following:

- The level of vandalism likely. More robust columns are required in areas of high instances of vandalism.
- Columns that are to be installed in locations inaccessible to a maintenance truck, e.g. on steps / embankments / narrow laneways etc. must be of a hinged design to allow for maintenance. The minimum paved width required for a truck/van fitted with a hoist is 3.5m. If this is not possible, then hinged columns shall be installed as the alternative.

- Columns erected in coastal area likely to be affected by sea water, breezes shall be painted as well as galvanised. Ref. Appendix D, Figure 12.
- • Exterior Lighting columns, micro pillars and ducts, likely to be taken in charge by Cork County Council, shall not be erected on ground likely to remain private / inaccessible, e.g. private gardens, ESB / Bord Gais Substations, enclosures etc.;

## 8.6 Outreach Brackets

- Outreach brackets may be used. ***In general Cork County Council favour either post-top, a vertical extension or a max outreach of no more than 1m.***
- New/replacement over the conductor brackets on ESB Network poles shall be of 1m x 1m (max.) type for SON lighting but 1m up x 0m out (i.e. pole top & tilt) only with LED lights, as specified currently by ESBN.
- Non-standard Outreach Bracket are to be designed and certified prior to use, particularly where decorative brackets are being used; Evidence that such brackets meet the standard shall be forwarded to the Public Lighting Engineer for approval before they are incorporated into the works.
- The column and bracket assemblies shall conform with the deflection requirements of
- Class 2 as defined in IS EN 40-3-3;

## 8.7 High Masts

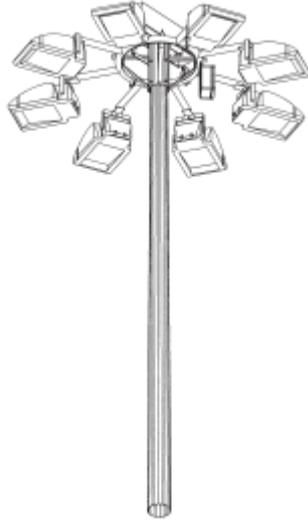
This is the term used to describe masts used to mount floodlights at heights ranging from 10m to 60m which are designed for 25 year life spans.

Typical applications are docks, harbours, railyards, airport aprons ,sports arenas, and motorway interchanges where large areas are required to be lit.

High masts can be of the base hinged type or have an electric motor with winch installed to facilitate lowering of floodlights to ground level for maintenance. Rigid platform types are also used with access for maintenance by mobile elevated work platform (MEWP).

Latterly TII have discouraged the use of high masts at interchanges due to the high maintenance costs involved in their certification & maintenance.

ILP Guide 07 “High Masts for Lighting & CCTV 2013 “ provides full details on the specification and design of High Mast Installations .



High Masts with lowering type lantern carriage & Rigid Platform are subject to inspection, testing & operation of winches in accordance with requirements of SHAWW (General Application) Regulations 2007, S.I. 299 of 2007.

EN40 standard applies up to 20m high masts. ILP Technical Guidance Document 07 applies thereafter.

***Cork County Council does not favour the use of high mast lighting as an alternative to conventional column lighting except in exceptional circumstances and with the prior approval of the Public Lighting Engineer.***

## **9.0 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:

### **9.1 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 night time visual impact of the lighting and sky-glow, should not be replaced with semi-cut-off bowled luminaires during maintenance activities.

LED luminaires may be specifically designed to varying pole intervals and any replacements should be of compatible design.

### **9.2 Maintenance**

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 wrong 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.

**9.3 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.

**9.4 Lighting column replacement** has to be considered on an individual basis as movement to a different location and may affect light distribution potentially reduce performance.

**9.5 Electrical performance.**

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.

**9.6 UMR – Unmetered Registry**

All changes to lanterns which affect their burn wattages or timings, on unmetered supplies, must be notified to the UMR so that the appropriate energy savings/costs are accrued.

**9.6 Operating hours**

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 the inventory. The replacement of older photocells can bring improved accuracy in switching, reducing operating hours and energy consumption.

***Cork County Council policy is to use dusk/midnight photocells for amenity walks, decorative lighting of historic buildings and other locations likely to be used only during early hours of nighttime e.g. sports facilities and rural schools.***

***Cork County Council does not favour the lighting of playgrounds.***

## **10. Cable Design and Electrical Service Design**

**10.1** The electrical services design for a 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, with cable lengths in excess of 200 meters require careful design to meet the earth loop impedance requirements of ET: 101.

Disconnection / fuse fault disconnection times ( 0.5 secs) 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 it may be prudent to refer the electrical services designer to other Irish, UK or European Electrical Design Standards, e.g. ILP Guidance Notes.

**10.2** In all cases power supply cable from the following categories shall be installed:

- SWA Cable to BS 6346 (0.6 / 1kV);
- SWA Cable to BS 5467 / I.S. 273 (0.6 / 1kV);
- NYCY cable to DIN VDE 0276 – 603 (0.6 / 1kV).

Normal mains cable size used in residential schemes is a minimum of Single Phase 6 sq.mm. as supply up to column fuse board and 2.5 sq.mm from fuse unit to lantern, (1.5mm<sup>2</sup> is acceptable only on columns <8m high).

Good practice restricts the number of lights per circuit to a maximum of 20 lights so as to ensure that excessive lengths of roadway are not left in darkness as a result of an electrical fault.

Protection of service pillar cable circuits shall be by BS 88 -3 Type C fuses rather than MCBs which are subject to degeneration in service pillars.

***Underground cables shall always be contained in red coloured recognisable ESB ducting at appropriate depth as outlined in the latest version of the ‘purple book’, Guidelines for managing Openings in Public Roads –DoTTaS and always protected by a warning tape indicating buried electrical services.***

### 10.3 Micropillars

New Public Lighting installations, using an underground supply, must always be connected through a micro-pillar, serving public lighting installations only. ***It is not acceptable to connect any other type of installation (e.g. pedestrian crossing lights) through a PL micro-pillar. Public Lighting installed along the Public road at the curtilage of a development shall be connected via a separate micro-pillar (and MPRN) to any lights with the development itself. Micro-pillars shall be separated from mini-pillars by a distance of at least 2m.***

**10.4** Where ESB high voltage cables (11 KV / 22 KV) cables run in parallel with Exterior Lighting cables in ducts a minimum separation 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;

**10.5** Fuses shall have a minimum rupture capacity of 16 kA;

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

**10.8** ***The use of circuit breakers (MCB's) in exterior lighting columns is not permitted by Cork County Council.*** Fused isolators / disconnectors, such as Lucy MC040SLF fused isolators /or equivalent, shall be used in Exterior Lighting Columns.



Column Base Fuse Cut –Out

**10.9** 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 of duct and at every > 90° direction change

**10.10** The availability of electricity supplies shall be confirmed by the Distribution System Operator (DSO) ESB Networks, prior to design of the exterior lighting scheme; Proposed locations for micropillars, agreed with ESB Networks, shall be shown on drawings.

**10.11** Where upgrades to exterior lights on overhead network poles is being undertaken

electrical isolation boxes (IP 65) approved by ESB Networks shall be fitted on the supply connection to each luminaire. These isolator boxes shall meet the requirements set out in the National Code of Practice for Customer Interface 4<sup>TH</sup> Edition 2008 as published by ESB Networks.

**10.12** All upgraded luminaries shall be controlled via an integral photocell and not make use of the switchwire as was the practice in the past.

**10.13** Main road exterior lighting schemes shall have power supply infrastructure installed with a minimum of 25% spare capacity (Maximum Installed Capacity at Customer Service Pillar, Cables to be sized for 25% additional load and at least 25% additional length) to allow for future extension.

**10.14** *Cork County Council does not accept exterior lighting schemes that are centrally controlled in the interest of energy conservation, scheme reliability and public safety. As mentioned previously, each luminaire shall have a photocell or sub-miniature photocell.*

**10.15** The installation of schemes in Residential Areas shall comply with the Code of Practice for Public Lighting ET211: 2003 or latest upgrade. All exterior lighting schemes shall include the provision and installation of a Customer Service Pillar (Micro Pillar).

## **11. Small Civil Works – Access Chambers & Ducts**

**11.1 Exterior Lighting ducting** shall generally be 50mm 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;

**11.2 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 with frame opening 615mm x 615 mm to EN 124 B125 marked “Public Lighting” or “Traffic” with M16 stainless steel locking bolt. Lock shall make provision for replacement of bolt and nut if damaged. Cover & frame shall be certified by an accredited Third party;

**11.3 Medium Inspection Chamber:** Access chamber covers on the footpath for straight through services shall be ductile iron with galvanized steel frame 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;

**11.4 Small Inspection Chamber:** Access chamber covers on the footpath for column connections shall be ductile iron with galvanized steel frame 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;

**11.5 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.

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. 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;

Chamber covers and frames shall be manufactured chamber covers shall be approved by a suitably licensed third party (NSAI, Lloyds Register or British Standards Institute of Quality Assurance Services).

## **12. Electrical Supply (Metered & Un-Metered)**

**12.1** The electrical supply shall incorporate 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. ***Cork County Council policy requires unmetered lights in residential estates.***

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 for connection to Single Phase Pillars, and 125mm. duct for connection to 3 Phase pillars. The details on Customer Service Pillar's may be found in The National Code of Practice at [www.esb.ie/esbnetworks](http://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. For the avoidance of doubt, new electricity supply connections are to be applied for in the name of the Developer and not Cork County Council Roads (Public Lighting) Division.

### **i. Un-Metered – Schemes less than 2 KVA**

- a) Red coloured duct (100mm diameter), with smooth interior wall, polythene ducting shall be installed to cater for supplies to any micro-pillars specified from the un- metered supply cabinet;
- b) Red coloured 50mm duct, with smooth interior wall, polythene ducting shall be installed to cater for connections to each of the columns.

### **ii. Metered Supplies – Schemes greater than 2 KVA**

- a) Red coloured duct (100mm diameter), with smooth interior wall, polythene ducting shall be installed to cater for supplies to metered supply cabinet;
- b) 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.

The metering pillar shall be located in a public area, adjacent to a footpath & at a level which is not liable to be effected by flooding.

## **12.2 Earthing & Bonding**

Earthing and bonding shall be in accordance with the requirements of section 714.54 of ET101:2008.

### 12.3 Unmetered supplies certificate

Trading methods require Cork County Council to submit an accurate inventory to the UMR for lighting under its control. The format of the inventory data required for each light is outlined in Appendix B, Figure 1. There are 106 attributes to be recorded, some deemed mandatory (M), some mandatory future (MF) and some optional. The MF attributes are now mandatory also at this stage and of the optional fields, those marked by an \* are deemed required by Cork County Council.

On validation of the inventory, the DNO (ESB Networks) 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 2,000 watts.

UMR will require metering for equipment with an installed load greater than 2000 w. 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 (ESB Networks) before the inventory is submitted and at the time application is being made for new supplies. ***Cork County Council require that all supplies in housing estates are unmetered by ensuring that sufficient micropillars are installed throughout the development to ensure that no particular supply will exceed 2,000 watts.***

### 12.4 Agreements

a) Connection Agreement. All customers are required to enter into a connection agreement with the Distribution Network Operator (ESB). This agreement sets out the terms and conditions under which a supply is taken from the ESB 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 ESB 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.

b) Supply Agreement. The customer must enter into a Supply Contract with their chosen supplier of electrical energy. This shall remain in the name of the Developer until the scheme is formally taken in charge.

### **13. Lighting Engineering Consultants**

Cork County Council aim to work with Developers and their lighting design specialists to help achieve design for street lighting in accordance with BS & EN codes of practice, national rules for electrical installation “ETCI regulations” and this document.

***Cork County Council requires that Public Lighting be designed by a competent Public Lighting Designer proficient in the use of Public Lighting Design Software. Lighting Reality is the preferred software but designs to other software packages will also be considered.***

The illuminance / luminance at conflict areas should be as per BS5489 and EN13201 for the particular scheme/location.

***Cork County Council require that Traffic Route Scheme designs be further checked and signed off by an Electrical Engineer who is experienced and competent in public lighting design incorporating the use of Public Lighting Design software.*** The Designer/Electrical Engineer may be required to demonstrate that he/she has an adequate knowledge and understanding of all current public lighting standards.

***Public Lighting Designers need to liaise with the development’s Architects, Landscape designers and the proposed Public Lighting installation contractor to ensure that conflict between elements is avoided so that each component can operate effectively, to its design standard.***

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 Map Scale 1:1000

OS Map scale 1:2500 where 1:1000 not available.

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

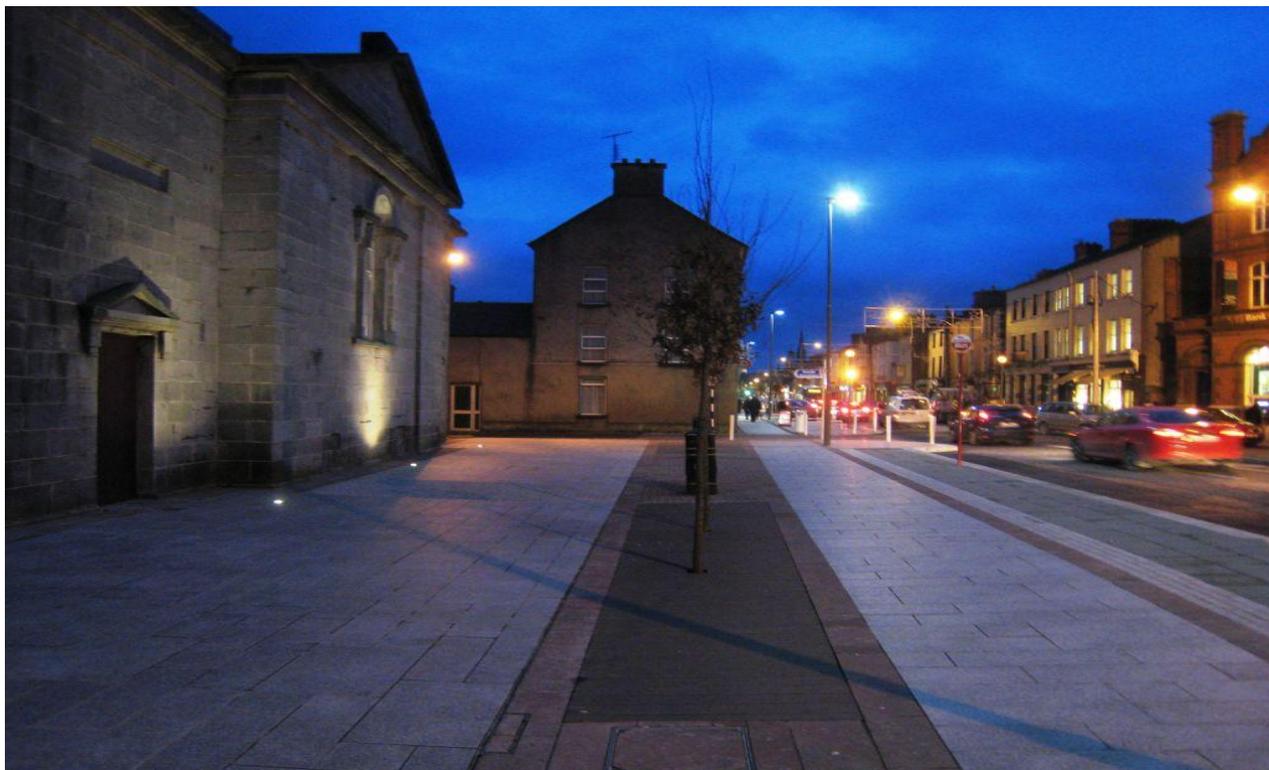
Front Elevation of the Building & Side Elevations of the building if necessary.

On site measurements of typical lantern offset and in the case of retrofit, the existing mounting height and bracket details.

## **14. Street Lighting – Equipment Manufacturers and Suppliers**

Lighting schemes in the charge of Cork County Council include equipment manufactured by various suppliers such as Phillips, Thorn, Cree and others. In order to facilitate maintenance Cork County Council recommend the use of common brands for which spare parts are likely to be available for the whole life duration of the asset.

Approval to the use of a proposed lantern brand, outside of the commonly used brands, should be sought from the Public Lighting Engineer at an early stage in the Design process.



## **15. Electrical Contractors**

Electrical Contractors shall be experienced in the supply supply and installation of exterior lighting schemes. They shall 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 County Council Roads (Public Lighting) Division.

Only Electrical Contractors registered with RECI or ECSSSA and authorised by Cork County Council are allowed to work on lights on ESB Network poles within the county as required by ESB Networks.

## **16. Lighting of Pedestrian Crossing & Traffic Island**

### **16.1 Definitions**

#### **Pedestrian Crossing**

A Pedestrian Crossing is a surface area provided across a carriageway as an amenity where pedestrians are encouraged to cross to give safe access and easier movement.

Without Markings	Central Refuge	
	Central Refuge with illuminated beacon	
With Markings	ZEBRA	with or without refuge
	PELICAN	With or without staggered refuge
	TRAFFIC SIGNALS	with or without pedestrian aspects
	PUFFIN	With pedestrian monitoring phase
	TOUCAN	Shared pedestrian & cycle facilities

Zebra crossings incorporate a day (LED) and nighttime flashing Belisha beacon



Where road width demands a Pedestrian Refuge a Belisha is also provided at the refuge point.

**16.2 Supplementary night time lighting** should be provided at all new zebra crossings, unless the requirement outlined below can be achieved through upgrading of existing adjacent lights, to :

- Make the crossing itself highly visible and distinguishable from the surrounding road.

- Provide visibility of pedestrians at the crossing and through visibility (to ensure motorists are also aware of pedestrian activity beyond or in front of the crossing).

To ensure that the approaching motorist clearly sees the place where pedestrians are to cross, the lighting must generate a defined luminous patch of light across the crossing carpet, with clearly delineated edges.

The approaches to the crossing marked by zig zag lines – the controlled area – and the adjacent footways should also be adequately lit; this should be to the appropriate CE or S class. Where the road is lit to an ME class then the pavements by the controlled area should be lit to the appropriate S class, at a minimum.

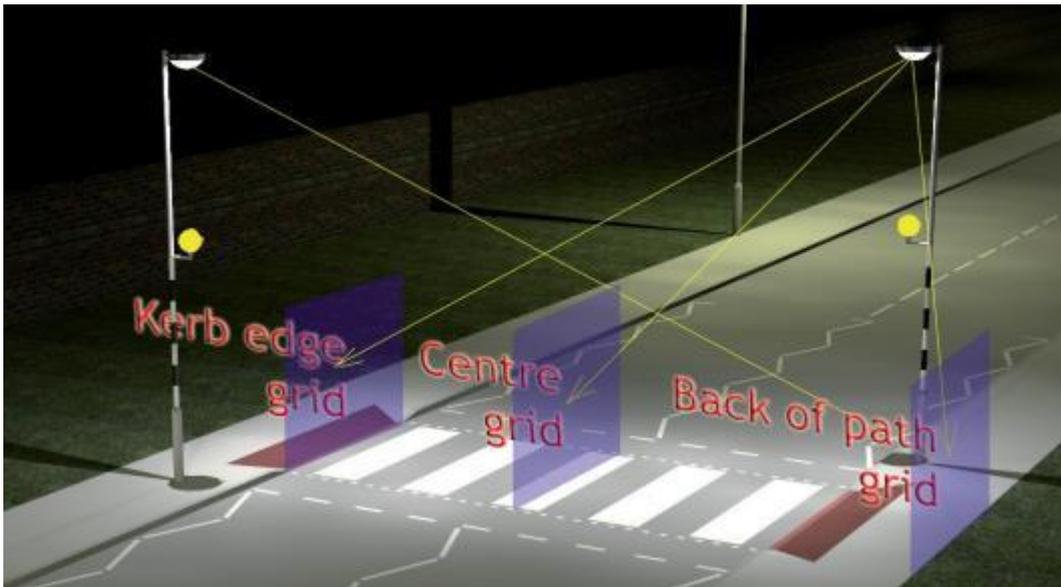
A mounting height of no more than 6 metres is usually most suitable to create this delineated carpet, while a different lamp colour from the surrounding road lighting is effective in helping highlight the carpet – for example white light (LED/metal halide) on the crossing in a channel pattern directed solely on the crossing.

Luminaires need to be as glare free as possible to ensure maximum through visibility through the crossing area – remember pedestrians will often try to cross short of the crossing itself. Flat glass luminaires are therefore best.

Supplementary lighting where provided will always be of the LED or Metal Halide type providing enhanced Colour Rendering ( $R_a > 60$ ).

These guidance parameters (explored in more depth in the ILP publication TR12) mean that the ideal pedestrian crossing luminaire will distribute most of its light in a concentrated pattern forward of the luminaire in a high enough beam spread to ensure that the complete height of the pedestrian is illuminated.

Road class (see also BS 5489-1:2003 table B1)	Carpet average (with 60% uniformity) [ Eave ] in lux	Centre and kerb edge grid minimum vertical illuminance [ Evmin ] in lux	Rear of waiting area grid minimum vertical illuminance [ Evmin ] in lux
CE1	105	60	45
CE2	70	40	30
S1	52.5	30	22.5
S2	35	20	15
S3	26.25	15	11.25
S4	17.5	10	7.5



Layout details as shown in Annex D Figs.( 16-21 ) of TR12.

Extra night time lighting is not as important at red/orange/green/pelican/toucan crossings as the traffic is more likely to stop on a red light but is an added safety measure where provided.

## **17. Temporary Lighting**

***In the cases where a Development will include for the replacement of an exterior lighting scheme Cork County Council 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 County 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).
- Relocation or temporary relocation of existing Public Lights.

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.

***Note: Exterior Lights may only be removed with the permission of Cork County Council. The Developer shall, prior to removing an 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 Council where exterior lighting is cited as a contributing factor.***

## **18. Night Time Lighting of Buildings and Structures**

- Design proposals should 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;
- 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;
- 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;
- LED lighting 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;
- The choice of lamp type and colour temperature should be 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 colours;
- The Designer should avoid using a small number of high wattage, wide-angle luminaires which will flatten the façade and wash out its features;
- The Designer should avoid mounting fittings parallel to the building – improved modelling of buildings will usually be achieved by lighting at an angle;
- Daytime appearance of fittings and cable is an important consideration – if possible try to conceal fittings behind shrubs, trees or building features;
- 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;
- Where possible, spotlights or floodlights should be fitted with louvers and cowls to control the beam and avoid sideways light spill;
- Ensure that beams do not cause glare to motorists or pedestrians.
- 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;
- 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;

- Night time lighting of buildings should be limited to a dusk to midnight unless located in a town center location likely to be occupied well after midnight.
- Building/monument lighting 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.
- It is accepted that such lighting 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;
- A visualization software suite shall be utilized to demonstrate the lighting scheme on submission of the design.
- 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;
- It is proposed that copies of the building/monument lighting Design would be handed over to 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;

Lighting Design for new and replacement schemes should take account of these Guidelines to ensure that attractive energy efficient schemes are implemented.

## **19. Floodlighting Schemes**

Where floodlighting schemes for 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 County Council has the following requirements in the implementation of such schemes:

- 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;
- The lighting should be designed by a competent lighting designer; this may include the use of the lighting suppliers in-house design service;
- The choice of light source will depend on the type of colour rendering required;
- ***The scheme designer shall demonstrate to Cork County 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";***
- The scheme designer will aim to minimize or eliminate glare from the proposed lighting scheme;
- 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;
- Account shall be taken pertaining maintainability of the scheme following commissioning including site access etc.
- The flood lighting scheme should incorporate the facility to cater for a reduced level of lighting for training as against that required for competition events in the interest of reducing energy consumption.
- Schemes shall be designed to BS EN 12193: 2007 Light & Lighting –Sports Lighting
- Floodlights shall be in accordance with BS EN 60598-2-5.
- Schemes shall incorporate recommendations of ILP *Guidance Notes for the Reduction of Obtrusive Light GN01:2011* taking account in particular of spill light into domestic premises.

## **20. Urban Street Lighting**

### **20.1**

Good quality lighting promotes a safer environment by ensuring inter-visibility between users. Poorly illuminated carriageways and cycle lanes can also make it difficult for users to identify potential hazards.

The quality of lighting will also have a major impact on perceptions of security. If lighting levels are not sufficient, a place may not be perceived as safe, particularly for pedestrians and cyclists. This may discourage people from walking and cycling, particularly in the winter months when days are shorter, and undermine the viability of public transport.

### **20.2**

The standards used for lighting within Ireland are generally taken from British Standard Code of Practice for the Design of Road Lighting (BS 5489). Whilst these documents should be referred to in regard to technical details, there are broader design considerations in regard to type of lighting used and the position and design of lighting columns.

### **20.3**

Lighting should be designed to ensure that both the vehicular carriageway and pedestrian/cycle path are sufficiently illuminated. On roads and streets within urban areas white light sources such as LED should be used. Where orange (SOX) or softer honey (SON) coloured lights are currently used, they should be replaced with white light LED's as part of any upgrade.

### **20.4**

- Heights should be sensitive to the scale of the adjacent built environment.
- In city, town and village streets, a lantern mounting height in excess of 8 metres is likely to be required.
- On Local streets, and in areas of heritage significance, mounting heights should be no greater than 8 metres.
- Where higher numbers of pedestrians are active, such as in town centres, consideration should be given to supplementing the traffic route lighting installation with lower intensity (perhaps decorative) pedestrian lighting lanterns mounted at a lower height on the same columns.

### **20.5**

In many cases, especially where streets/plaza's are being pedestrianised, Architects seek alternatives to standard light columns and fittings. Most of the recognised manufacturers also provide alternative decorative/architectural type lights. The we-ef brand which offers both traditional and modern alternatives is often the preferred choice of Architects and similarly other brands such as vfl are also used.

Samples of Light Types used in Cork County –to date



## 20.5

Lighting installations should generally be located within a verge and/or within build-outs that separate bays of on-street parking. They must be located on public ground.

Where no verge is available, lighting should be located at the back of footways, to minimise any disruption to pedestrian movement provided:

They should be positioned, where possible to coincide with property party lines to avoid obstructing entrances or windows.

They should not be located in close proximity to properties where they may compromise Security.

On narrow streets or streets with narrow footways, consideration should be given to using wall-mounted lanterns.

Lanterns should be selected and positioned so as to avoid creating obtrusive light spill on windows, particularly in the case of upstairs residential properties. Internal or external baffle plates can be fitted to lanterns to minimise nuisance light spill.

Lights should also be positioned at least 10m away from trees, (on same side), which in time may grow to envelop the lanterns or cast shadows which will render the lighting less effective.

## 20.6

CCTV cameras require columns, which need to be more rigid than lighting columns and hence are not suitable for mounting on public lighting columns. There are also health & safety reasons for not allowing other items to be mounted on public lighting columns. ***Cork County Council do not allow CCTV or other non public lighting implements, be attached to Public Lighting Units.***

***The electrical connection from Public Lighting micro-pillars and the supply at Public Lighting Units cannot be used for any other purpose, other than Public Lighting.***

Ancillary lighting equipment, such as electrical supply pillars, should also be located with a view to minimising their impact on the streetscape, while not creating an obstruction or hazard to pedestrians.

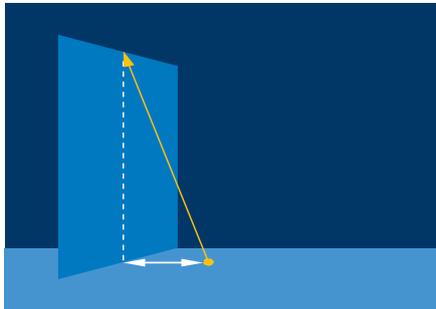
Metering cabinets in particular, which may be up to 1.5 metres high, should be located against walls, as unobtrusively as possible, while bearing in mind that they must be accessible for maintenance and meter reading.

## 20.8

Uplighters installed in footpaths can be used to enhance the architectural features of significant monuments and public buildings during periods when there will be significant presence on the streets. ***They should not be intended for use as a practical lighting source.***



IP67 Rated Uplighter .Maintenance of uplighters can be problematic as they are easily vandalised.Should ideally only be used in decorative Town Square pedestrian areas or close to buildings for illumination of facades.



Uplighter Washing Building Façade.



Multiple fittings on single support

## 20.9 Traffic Calming Gateway Lighting

In traffic calming schemes, the Gateway is generally placed at the start of the speed limited zone. It should mark a definite change in the character of the surrounding area from rural to urban. Therefore it needs to be conspicuous and the most prominent element in the transition zone. The tall signs positioned close to the driving lane narrow the optical width.

Gateways fall into two distinct groups, those with a solid kerbed central island and those with no island. The central island greatly increases the visual narrowing effect and the central lighting column, signs and bollards are directly in the centre of the driver's field of view.

The gateway is always lit to a high standard, with special gateway lanterns that shine directly onto the gateway signs. This is not only effective in the dark; during daylight hours the presence of lighting columns enhances the narrow optical width and is often noted subconsciously by the driver as an indication of an urban area. This lighting can be affected either by enhancing the existing lighting as indicated in the figure below or by the addition of LED/Halide type lighting in the central island where such exists, or by creating a bright lighting corridor by erecting lights at either side, which also serve to enhance the night-time view of the gateway signs.



Gateway with Supplementary Lighting (LED/Metal halide).



Gateway lighting using supplementary LED /150W Metal Halide lighting on double-headed column in central island. These should be hinged and socketed to allow the column to be lowered for Abnormal Loads

## **21. Photovoltaic Lanterns (Solar Powered)**

With the arrival of low wattage LED type luminaires, specific applications such as the recreational area illustrated, can be lit by a “stand alone” column and lantern, where a battery charged by the photovoltaic cell provides enough energy to deliver several hours of lighting. A presence detection system ensures that wasteful use of light is avoided.

These type of lights are under development and possibly not yet at a sufficient stage for widespread use but could possibly be considered in one-off rural locations as an economic alternative to traditional lighting systems, or where dusk to midnight lighting is acceptable.

In the Northern Hemisphere it is challenging during winter daylight hours to sufficiently charge batteries so that they will be capable of powering lights from dusk to dawn (16.5 hours approx on 21<sup>st</sup> December).

Initial investment is higher compared to conventional street lights.

Rechargeable batteries will need to be replaced several times over the lifetime of the fixtures adding to the total lifetime cost of the light.



***Cork County Council policy is not to allow such lighting as an alternative to lighting fed from an electricity supply except in exceptional circumstances where the prior approval of the Public Lighting Engineer has been achieved.***

## **22. Documentation required with planning applications involving Public Lighting**

***Cork County Council requires that Public Lighting be designed by a competent Public Lighting Designer proficient in the use of Public Lighting Design Software. Lighting Reality is the preferred software but designs to other software packages will also be accepted.***

Street lighting designs should be submitted to Cork County Council for approval via the Planning application procedure.

***The Public Lighting design/layout will be vetted by the Public Lighting Engineer and shortcomings will either be referred back to the applicant to address, via a deferral or by condition that the design/layout be agreed prior to commencement of development.***

***The former is the preferred option to allow for interaction to achieve an acceptable design and to allow the Applicant time to overcome long delivery periods for LED's.***

***The use of the latter procedure requires that Public Lighting design is submitted and approved before development commences on site and this is extremely important so that ducting routes and column locations are compatible with the scheme layout.***

The planning application/subsequent submission should comprise of the following requirements at a minimum;

1. An Exterior Lighting Design Report (see typical example in Appendix F, Figure 1). This report should state the design class and associated parameters and should demonstrate how these parameters have been achieved. It should also provide details of the proposed lantern(s) and column types etc.
2. If different elements of the development are to be designed to different classes ( e.g. P3 within the estate and M3 on the exterior road cartilage), then a separate report should be forwarded for each element indicating that the appropriate Class standards have been achieved. (The use of a grid system to combine two separate designs within one report would also be acceptable).
3. Lighting layout drawings to a scale of 1:500, on a scheme layout background on either A0 or A1 or A2 drawing (depending on the development size), inclusive of a plot of lux contours. In the case of a development with elements designed to separate classes, the lux drawings should be combined in a single layout drawing. ***The lux contours should be such to demonstrate that the minimum design lux level (Emin) has been achieved in all locations where lighting is required and should also show the lux contours at 1.5,3,5,10,15,20 lux etc.***
4. Luminaire Schedule using CLO wattages, and lumen outputs (see sample in Appendix F, Figure 2)
5. Appropriate Standard Construction Details (SCD's);
6. PL ducting layout drawings (see sample in Appendix F, Figure 3).
7. Details of proposed columns , brackets, and lanterns.

## **23. Taking in Charge**

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

The Electrical Contractor shall provide a Completion Certificate for the exterior lighting scheme and shall be responsible for progressing the application for supply. The customer copy of the electrical certificate shall be retained and submitted to Cork County Council at the taking-in-charge stage.

The taking in charge of Public Lighting in Estates is usually completed in conjunction with the full TIC of an estate or a completed phase. However, in certain limited circumstances Cork County Council may consider taking the lights in charge in advance of full takeover, where the estate (or a definitive part of) has been virtually completed, the lighting is up to standard and the partial take-over is recommended by the Council's Estates Engineer.

The taking in charge procedure of Cork County Council is administered by the Estates & Development/Planning Directorate of Cork County Council.

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

Cork County Council will also require that each column and customer service pillar installed shall have a label attached with a numbering scheme agreed with the Developer at the taking in charge stage. This is to allow for maintenance coordination, column / luminaire identification and recording of the individual column in Cork County Council's Exterior Lighting Asset Management Database.

The readiness of the Public Lighting, for takeover is determined by a 'taking in charge survey' carried out by the Council's Public Lighting maintenance contractor and Public Lighting Engineer.

The Applicant is also required to list/demonstrate on a drawing, the lights (and their numbers) that are connected to each individual micro-pillar.

The taking in charge request form for the public lighting element is available on the Cork County Council website ([www.corkcoco.ie/publiclighting](http://www.corkcoco.ie/publiclighting)). The current version is contained in Appendix B of this document. 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 County Council, Estates and Development Directorate, along with the following;

- As built Lighting layout drawings (in .dwg format including plot of lux contours);
- Appropriate Standard Construction Details (SCD's);
- As Built Electrical drawings (schedules and layouts);
- Exterior Lighting design report inclusive of a plot of lux levels;
- Details of columns ,brackets, and lanterns.
- A signed copy of the electrical test certificate for the exterior lighting installation  
(A copy of the signed original will suffice);
- An energy supply bill showing the account up to date .
- Details of each Light in accordance with SEAI/CCMA Standardised Public Lighting Inventory Template excel spreadsheet attached inclusive of M, MF and O, (asterisk).
- General date of installation of Public Lighting (year)
- Circuit drawings and fuse details
- Details of any warranties (inclusive of expiry dates) associated with component parts

On receipt of the completed forms Cork County Council, Roads (Public Lighting) Division, will either instruct the Applicant to engage Cork County Council's Public Lighting Maintenance Contractor to undertake an inspection of an exterior lighting scheme or will arrange this itself. On foot of such inspection, a Report is issued to Cork County Council by the Maintenance Contractor. A typical TIC Report form is contained in Appendix C.

In addition, the site will be visited by the Public Lighting Engineer to review non-electrical/structural aspects such as the appropriateness of the spacings and to check whether lights and micro-pillars are located on public ground.

Any snags required to be completed to bring the installation to an acceptable standard will be communicated to the applicant and the process will be repeated until a satisfactory conclusion has been achieved.

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

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

***The Developer is to ensure that energy costs and any arrears are paid, right up to the confirmation date on which the development is taken in charge and for the period thereafter until the energy account has been taken over.***

***Cork County Council will assume responsibility for the payment of the Energy bill from a date post the taking in charge, which allows time for the transfer of the account to be administered. It will not be responsible for any arrears on the bill in advance of that date.***

## **24. Conclusion**

Cork County Council reserves the right to ensure that exterior lighting schemes are designed and installed to the required standards/Codes of Practice before agreeing that the scheme can be taken in charge.

Cork County Council and their public lighting Unit wish to work with Developers and their lighting design specialists to help deliver high quality, energy efficient, exterior lighting installations which meet the relevant standards and which improve the general ambiance of the county and help to reduce energy and carbon consumption.

Roads (Public Lighting Department) Unit  
Cork County Council,  
Annabella,  
Mallow,  
County Cork  
Phone: 022 30472  
Fax: 022 21983

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## Glossary of Terms

<i>Candela</i>	Candela is the unit to express luminous intensity.
<i>Colour Impression</i>	Colour impression expresses the observer's perception of the light, e.g. golden white, warm white, cool white, yellow, etc. The colour impression can be chosen to suit the atmosphere of a specific area
Colour rendering	This parameter expresses the extend to which artificial light is able faithfully to render "true" colours of objects. Unlike in the city centres, in residential areas fair colour rendering is usually sufficient, except in areas, where crime risk is high.
<i>Glare</i>	Glare is the effect of strong bright light sources in the field of view. It can cause a feeling of unpleasantness but may even impair the visual performance and thus traffic safety. Care must be taken to limit glare as much as possible. However, a certain amount of sparkle can be desirable in pedestrian areas
<i>Illuminance.</i>	Illuminance is the luminous flux (i.e. quantity of light produced by the lamp), per unit of surface. It is expressed in LUX (lumen per square meter) <sup>(8)</sup>
<i>Longitudinal Uniformity (U)</i>	If a road is illuminated very unevenly, the driver perceives a series of bright and dark bands on the road surface. The light parameter used to describe this effect is longitudinal uniformity, and is the ration of minimum to maximum road surface luminance on a line which is parallel to the axis of the road and which passes through the position of the observer
<i>Lumen</i>	Lumen (lm) is the unit in which luminous flux (i.e. quantity of light produced by a lamp) is expressed
<i>Luminance</i>	the luminance of a surface is a measure of the brightness with which the surface is perceived by an observer. It is expressed in CANDELA PER SQUARE METRE ( $\text{cd}/\text{m}^2$ ) the luminance of the road surface plays an important role in the visibility of objects. The better the reflection property of the road surface, the more light will be reflected and the brighter the road surface will appear
<i>Luminous efficacy</i>	The luminous efficacy is a measure of the rate at which a lamp is able to convert electrical power into light, and is thus expressed in lumens per watt. (lm/W)
<i>Luminous Flux</i>	The luminous flux is the quantity of light produced

by a lamp. It is expressed in the unit LUMEN (lm)

*Luminous intensity*

Luminous intensity is a measure of how the luminous flux is emitted in a certain direction. It is expressed in CANDELA (cd)

*Luminous Intensity Distribution*

The luminous intensity distribution is the pattern in which a luminaire distributes the luminous flux of a lamp. As most luminaires do not distribute the luminous intensity in a symmetrical pattern, the luminous intensities are measured in different planes.

*Overall Uniformity ( $U_o$ )*

Overall uniformity is the ration of the minimum to the average luminance of the road surface. It its value is too low, the visual performance decreases which has a negative effect on road safety

*Surround ratio*

The ratio between the illuminance on two 5m wide strips either side of the edge of the carriageway.

## Appendix A

### The Ingress Protection (IP) System of Classification

Two tables shown here list degrees of protection certified for different sizes of solid bodies and type of moisture. For example a light classed as **IP65** offers level 6 protection against the Ingress of Solid Bodies and level 5 protection against moisture.

**Table 1 – Degree Protection Against Ingress of Solid Bodies.**

<b>First Characteristic Numeral</b>	<b>Degree of Protection And Short Description</b>	<b>Details of Solid Objects which will be Excluded From Luminaire.</b>
0	Non Protected	No Special Protection
1	Protected against solid Objects greater than 50mm	A large surface of the body, such as a hand, (but no protection against deliberate access); Solid objects Exceeding 50mm in diameter.
2	Protected against solid Objects greater than 12 mm	Fingers or similar objects not exceeding 80mm in length; Solid objects exceeding 12mm in diameter.
3	Protected again solid Objects greater than 3.5mm	Tools, wires etc, of diameter or thickness greater than 2.5mm; Solid objects exceeding 2.5 mm in diameter.
4	Protected against solid Objects greater than 1.0mm	Wires or strips of thickness greater than 1.0mm; solid objects exceeding 1.0mm in diameter.
5	Dust Protected	Ingress of dust in not totally prevented but dust does not enter in sufficient quantity to interfere with the satisfactory operation of the equipment
6	Dust tight	No ingress of dust.

**Table 2 – Degree Protection Against Ingress of Moisture.**

<b>Second Characteristic Numeral</b>	<b>Degree of Protection And Short Description</b>	<b>Details of the Protection from moisture provided by Luminaire</b>
0	Non Protected	No Special Protection
1	Protected against dripping water	Dripping Water (vertically falling drops) shall have no harmful effect.
2	Protected again dripping water when tilted up to 15°	Vertically dripping water shall have no harmful effect when the Luminaire is tilted at any angle up to 15° from its normal position.
3	Protected against Spraying Water	Water falling as spray at an angle of up to 60° from the vertical shall have no effect.
4	Protected against Splashing water	Water splashed against the enclosure from any direction shall have no harmful effect
5	Protection against water jets	Water projected by a nozzle against the enclosure from any direction shall have no harmful effect.
6	Protected again heavy seas	Water from heavy seas or water projected in powerful jets shall not enter the luminaire in harmful quantities.
7	Protected against the effects of immersion	Ingress of water in a harmful quantity shall not be possible when the luminaire is immersed in water under defined conditions of pressure and time
8	Protection against submersion	The equipment is suitable for continuous submersion in Water under conditions which shall be specified by the manufacturer.

## Appendix B



COMHAIRLE CONTAE CHORCAI

CORK COUNTY COUNCIL

### Application Form for taking in charge Public Lighting \_

#### General Information

1. Developer's Name: \_\_\_\_\_
2. Developer's Address: \_\_\_\_\_
3. Telephone No. \_\_\_\_\_ 4. Email Address: \_\_\_\_\_
5. Planning Ref. No. \_\_\_\_\_
7. Name of Housing Estate/Road: \_\_\_\_\_
8. Address: \_\_\_\_\_
9. No. of Housing Units: \_\_\_\_\_
10. Energy Supplier: \_\_\_\_\_
11. A/C Name & No. \_\_\_\_\_

#### MPRN Information (1<sup>st</sup> MPRN)

12. (T)MPRN No. \_\_\_\_\_
13. No. of Lights: \_\_\_\_\_ 14. Lantern Type & Wattage: \_\_\_\_\_

**2<sup>nd</sup> and subsequent MPRN information should be provided where applicable on a separate sheet**

#### **The following documents shall be submitted with the application:**

- RECI cert for the lights to be taken in charge, in paper and electronic format.
- Public Lighting Design Drawings indicating the lux level plots and associated Design criteria used.
- Drawings of the Housing Estate/Development (2 no. hard copies and 1 no. electronic copy in a suitable digital format e.g. in AutoCAD format drawn on the basis of National Grid Co-Ordinates to the Irish Transverse Mercator Projection, indicating as-built position of columns (incl. Col. Nos.), micro pillars, ducting Layout (on separate autocad layer), power supply location and circuits from each power source inclusive of an indication of the first pole on the circuit). Any existing public lights/minipillars that have been removed or relocated or lanterns changed as part of this development, must also be noted and submitted on a separate layer.

- Note: *Cork County Council will only take over street lights in occupied sections of a housing estate and provided that the lights in question do not constitute part of an MPRN. (i.e. if an MPRN contains some lights within occupied section and some lights in unoccupied section, Cork County Council will not take over any of the lights associated with that MPRN until all of those lights are within a section that is occupied). Where multiple MPRN's (within a particular estate) are proposed for take-over the drawings submitted must clearly show which lights are associated with which MPRN.*
- Copies of recent energy bill, including evidence that indicates that payments are up to date.
- Details of any warranties (inclusive of expiry dates) associated with component parts.
- Details of each Light in accordance with SEAI/CCMA Standardised Public Lighting Inventory Template excel spreadsheet attached inclusive of M, MF and O, (asterisk. A copy of the user manual terminology is also attached.
- General date of installation of Public Lighting (year)
- Circuit drawings and fuse details
- Applicants should note that any lights requested for taking-in-charge will be inspected by the Council's Public Lighting maintenance Contractor in advance and only schemes which are up to standard will be taken in charge. Otherwise the process will revert back until the lights are deemed to have been brought up to standard, by the Applicant.

Signed: \_\_\_\_\_  
Developer

Date: \_\_\_\_\_

Completed Application Forms for Housing Estates should be returned to:  
Estates Section, Planning Department, Co. Hall, Cork - for North & South Cork Divisions and Estates Section, Planning Department, Norton House, Skibbereen, Co. Cork - for West.

Completed Application Forms for new lights/schemes on public roads should be returned to the Public Lighting Engineer, Cork County Council, Annabella, Mallow, Co. Cork.

**Privacy & Data Protection:**

Personal information collected by Cork County Council is done so in order for us to process your application. Legally we can process this information as it is necessary for us to comply with our statutory / legal obligations. The protection of your personal data is a key priority for the Council and your data will be processed in line with our Privacy policy which is available at <https://www.corkcoco.ie/Privacy-Policy> or hardcopy from our offices at County Hall, Carrigrohane Road, Cork, Ireland. Should you have any questions about our privacy policy or the information we hold about you, please contact us by email to [dpo@corkcoco.ie](mailto:dpo@corkcoco.ie) or write to us at Data Protection Officer, Cork County Council, County Hall, Carrigrohane Road, Cork, Ireland.

Figure 1 : Inventory for Public Lighting Database

LIGHTING INVENTORY for ESTATE/ROAD NAME :			
	<b>LOCAL AUTHORITY : CORK COUNTY COUNCIL</b>	<b>COMPLETED BY : Contact No.</b>	<b>DATE of information:</b>
No	Proposed	Initial Data Capture Requirements M = Mandatory O = Optional MF = Mandatory for Future Installations	DATA ENTRY
<b>GEOGRAPHICAL DATA (STREET GAZETTEER)</b>			
1	Street name	M	Free Text
2	Road number	M	Free Text
3	Location	O	Free Text
4	Village, town or district	O	Free Text
5	Zone	O	Free Text
6	Local Authority lighting unit	M	Free Text
7	TII lighting unit	M	Yes
8	Flag	O	Free Text
<b>ASSET DATA</b>			
9	Equipment number	Automatically Generated	Automatically Generated
10	Unit number	M	Free Text
11	Unit Type	M	Raising and Lowering Column
12	Unit co-ord - Easting	M	Free Text
13	Unit co-ord - Northing	M	Free Text
14	Column manufacturer	MF	Lamp Construction
15	Column manufacturer type reference	MF	Free Text
16	Column cross sectional shape	M	Conical
17	Column height (m)	M	4m
18	Column material type	M	Aluminium
19	Column protective coating	O	G1
20*	Column base type	O	Sleeve Planted
21	Column installation date	MF	DD / MM / YY
22	Bracket installation date	MF	DD / MM / YY
23	Bracket material	M	Aluminium
24	Bracket type	M	Other
25	Bracket dimensions	M	1
26	Number of brackets	M	Other
27	Bracket tilt (degrees)	M	Other
28	Luminaire mounting height (m)	M	Other
29	Number of luminaires	M	3

Appendix B

30	Luminaire installation date	MF	DD / MM / YY
31	Luminaire manufacturer	MF	Orangetek
32	Luminaire model	MF	Free Text
33	Luminaire profile	MF	Other
34	Luminaire distribution	MF	Free Text
35	Luminaire warranty expiry date	MF	DD / MM / YY
36	Light source colour temperature	MF	Warm
37	Luminaire driver type	MF	700mA CLO
38	Lumen output	MF	Free Text
39	Light source type	M	Other
40	Light source wattage - actual	M	Other
41	Control gear type	MF	Electromagnetic
42	Lighting control	MF	Other
43	Control location	M	Individual PECU
44	Luminaire circuit protection rating	MF	Other Please Specify
45	Circuit ID	MF	Free Text
46	Supply from	MF	Free Text
47	Supply to	MF	Free Text
48	Electrical supply point installation date	MF	DD / MM / YY
49	Attachment/traffic sign size (if fitted)	O	Free Text
50	Number of approved attachments (if fitted)	O	Free Text
51	Type of approved attachment (if fitted)	O	Sign Class A
52	Interface pillar body manufacturer	MF	Free Text
53	Interface pillar body material	MF	5mm Steel
54	Interface pillar body protection	MF	Free Text
55	Interface pillar drawing number	MF	Free Text
56	Interface box installed	M	No
57*	Underground Cable Type (and size*)	O	Other Please Specify
58	Number of phases of electricity supply	MF	Single Phase
59	Outgoing circuit protection	MF	RCBO 30mA
60	Passive safe column type	MF	HE
61	Passive safe occupancy level	MF	0
62	Passive safe electrical disconnection type	MF	Electronic
63	Passive safe electrical disconnection manufacture and m	MF	Free Text
<b>RISK ASSESSMENT DATA</b>			
64	Ground conditions	O	Average
65	Salting of road	O	No
66	Road environment	O	Primarily vehicular
67	Environment situation	O	E1
68	Wind exposure	O	Free Text
69	Designed for fatigue	O	No

Appendix B

70	Traffic flow	O	Free Text
71	Traffic speed	O	30 km/ph
72	On a bridge	O	Free Text
73	Pedestrian density	O	Free Text
74	ESB network pole	M	No
75	ESB safety alert pole	M	No
76	ESB network pole Luminaire Location (over or under conductor)	M	Over conductor
<b>OPERATIONAL DATA</b>			
77	Date of last cyclic of maintenance visit	MF	DD / MM / YY
78	Date of last group lamp replacement	MF	DD / MM / YY
79	Date of last cycle of cleaning	MF	DD / MM / YY
80	Date of last re-application of protective coating	MF	DD / MM / YY
81	Basic structural inspection and condition level	MF	Free Text
82	Date of last structure inspection and condition level	MF	DD / MM / YY
83	Structural test certificate reference number	MF	Free Text
84	Date of Electrical Installation Test & Results	MF	DD / MM / YY
85	Electrical Installation Test Certificate Reference Numbe	MF	Free Text
86	Date of Last Periodic Electrical Inspection Test & Results	MF	DD / MM / YY
87	Periodic Electrical Inspection Test Certificate Reference	MF	Free Text
88	Date of last fault including emergency faults	MF	DD / MM / YY
89	Fault type and history including emergency faults	MF	Free Text
90*	Lighting standard	O	ME 3
91	Non destructive column testing type	O	Free Text
92	Non destructive column testing date	O	DD / MM / YY
93	In charge	O	Free Text
94	In charge date	O	DD / MM / YY
95	Patrol Scouting/Reported by Public	O	Patrol Scouting
<b>ENERGY DATA</b>			
96	Billable wattage (unmetered supplies only)	M	Free Text
97	Maximum Import Capacity (MIC) measured in kVA	O	Free Text
98	UMR billable code (unmetered supplies only)	(Reserved for possible future use )	(Reserved for possible future use )
99	Switching regime	M	Free Text
100	Annual burn hours on UMR	M	Free Text
101*	Electricity supply point coordinates ( Easting ) :	O	Free Text
102*	Electricity supply point coordinates ( Northing ) :	O	Free Text
103	Metered/Unmetered	M	Unmetered
104	Group Metered Point Reference No. GMPRN	M	Free Text
105	Metered Point Reference No: MPRN	M	Free text
106	Technical Metered Point Reference No: TMPRN	M	Free Text

\*deemed M by Cork County Council

## Appendix C

### Sample Taking in Charge Report

PUBLIC LIGHTING PRE-TIC INSPECTION CHECKLIST				
General Information - Cover Sheet				
Estate Name:				
Address				
Developer Name				
Planning Ref:				
Inspection Requested by		MPRN or GMPRN:		
Inspected by:		Date of Inspection:		
Number of Public Lights in Estate				
Number of Pillars in Estate				
Is the Distance Between Columns Acceptable	Yes <input type="checkbox"/>			No <input type="checkbox"/>
Columns Accessible with Hoist?	Yes <input type="checkbox"/>			No <input type="checkbox"/>
Are Columns Numbered:	Yes <input type="checkbox"/>			No <input type="checkbox"/>
PL Cable Size / Type (SWA/NYCY):		Flex Size / Type:		
Night Survey Carried out?	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
All Lights Operational	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Supply Type	METERED <input type="checkbox"/>	UNMETERED <input type="checkbox"/>		
<b>Overall Summary of work necessary to be done prior to TIC by CCC: (Costing to be provided on a separate sheet)</b>				
<b>Sign Off and Approval:</b>				
Signed and dated by Inspection Electrician:				
Print Name of Inspection Electrician:				
Checked, Signed and dated by Manager:				
Print Name of Manager:				

PUBLIC LIGHTING PRE-TIC INSPECTION CHECKLIST				
Estate Name:				
Address				
<b>Lighting Information</b>	<b>Page:</b>		<b>Of</b>	
<b>Item.</b>	<b>Pillar Reference No.</b>			
<b>Pillars</b>				
MCB / Fuse - Type / Size:				
MCB / Fuse Acceptable (Y/N):				
Bonding/Earthing acceptable (Y/N)				
Pillar Condition acceptable (Y/N)				
Remedial Action needed (if any):				
<b>Item:</b>	<b>Pole / Column Reference No.:</b>			
<b>Poles / Columns.</b>				
Material & Manufacturer (if known):				
Hinged / Standard				
Foundation Type: (Rooted / Flanged)				
Height. (Meters)				
Type (Hex./Round)				
Fuse Type / Size:				
Fuse Acceptable (Y/N)				
Bonding Acceptable (Y/N)				
Door Type (Single/Double Fixing):				
Energised (Y/N)				
Interface Box. (Y/N)				
Remedial Action needed (if any):				
<b>Lanterns.</b>				
Manufacturer:				
Model:				
Type: (Son/Sox/Led)				
Wattage:				
Remedial Action needed (if any):				
<b>Photocells:</b>				
Manufacturer:				
Model:				
Switching Ratio (D/D, D/M)				
Condition:				
Remedial Action needed (if any):				
<b>Brackets:</b>				
Bracket Type:				
Bracket Dimensions:				
Remedial Action needed (if any):				
<b>Sign Off and Approval:</b>				
Signed and dated by Inspection Electrician:				
Print Name of Inspection Electrician:				
Checked, Signed and dated by Manager:				
Print Name of Manager:				
<i>Note : Please use additional Sheets where required and number them.</i>				
<i>Note: Attach Map showing location of poles and pillars.</i>				

## Appendix D

### Figures & Drawings

Figure 1: Lantern on 6m Column



#### Steel Tapered Column

6 metre 16 sided rolled  
steel, tapered, galvanized

Root planted.

Base section : Ø140mm

Pole door aperture : 500 x100 mm

Weight: 71 kg

Figure 2: 10m Column with 5° tilt bracket

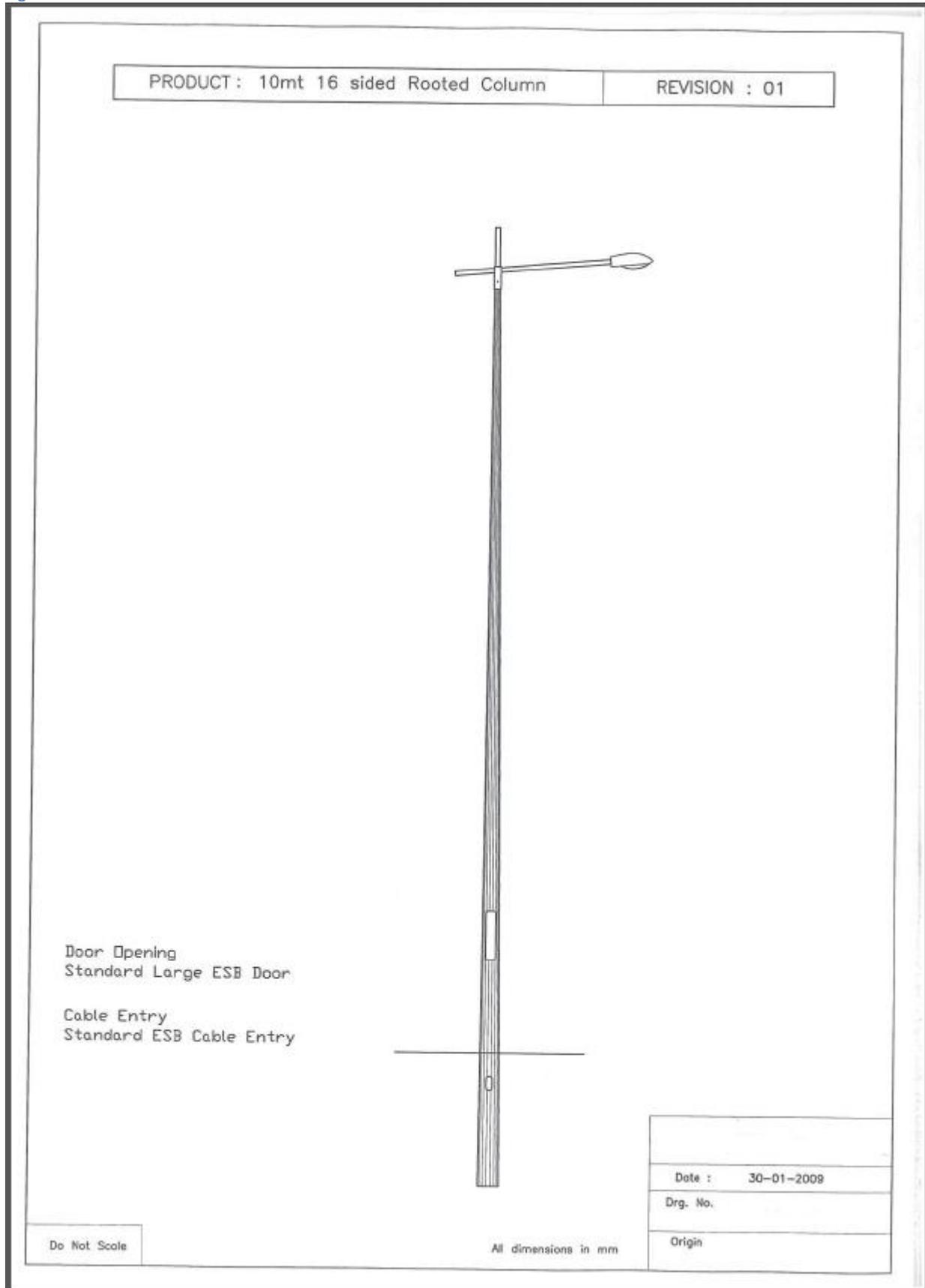


Figure 3: 32W LED lantern on 6m Column



Figure 4: ESB Minipillar & Preformed Vault with cover

Electrical Services Guidebook for Housing Schemes – Revision 4 – November 2012

Photo showing:

- correct use of PL tape
- correct use of ESBN tape
- approved prefabricated vault

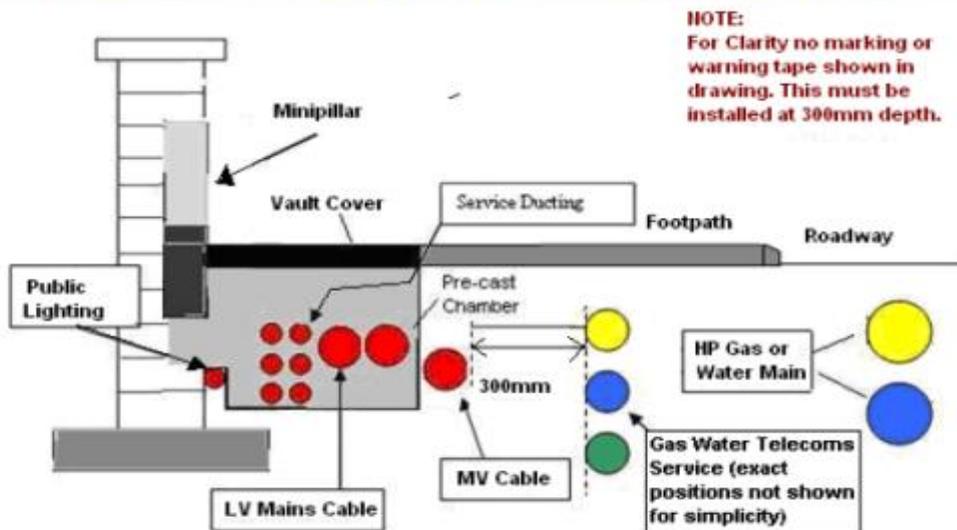
NB Block built minipillar vault is not acceptable



Figure 5: Services Ducts relationship.

Electrical Services Guidebook for Housing Schemes – Revision 4 – November 2012

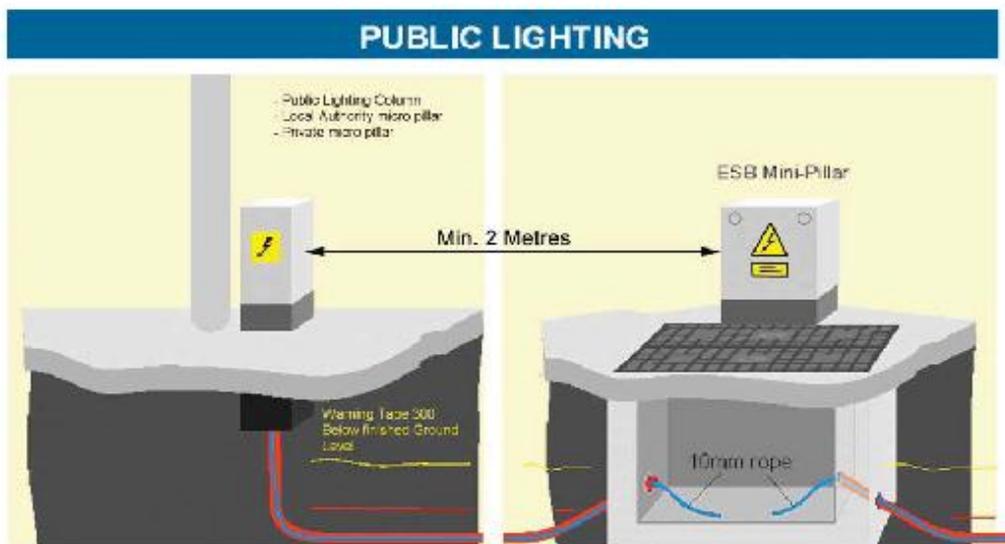
### Position and Spacing of ESB Networks Ducting in relation to other Utility Ducts and Pipes in Housing Schemes/Developments



Normal standard clearance = 300mm. Clearance from High Pressure pipes = 600mm

Figure 6: ESB Pillar (with 25m of free issue 25mm.sq. bare Cu. earthwire,) vault ,and cover + Lighting Pillar

Electrical Services Guidebook for Housing Schemes – Revision 4 – November 2012



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Figure 7: ESB Minipillar, vault, & cover frame

## PRE-FABRICATED MINIPILLAR VAULT

Prefabricated minipillar vault showing minipillar in place complete with cover frame.

Note knockouts are provided for entry of mains and service-cable ducts.

Should be installed according to instructions provided with the unit.



Free issue ESB minipillar and 25m of 25 sq mm copper. Vault frame, ducting and cover to be provided by Contractor

Figure 8: Unmetered/Metered Lighting Pillar with ESB equipment



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



250mm wide vault and cover located in front of minipillar



**Public Lighting**  
**Combined Networks/Customer Pillar**  
**Three Phase/Single phase (Metered)**



Dimensions  
 600mm wide x 1500mm high x 220mm deep.

Minimum ope size  
 518mm wide x 570mm high x 220 deep for Networks equipment.

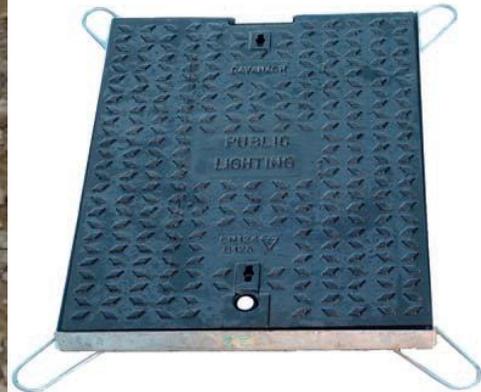
600mm Minimum to bottom of meter.

NOTES:  
 1. Hinged Door for access to Networks equipment.  
 2. Steel trunking (sealable) for Networks cable

Equipment shown  
 ESB Three Phase Cut Out  
 ESB Three Phase Meter  
 ESB Three Phase Isolator

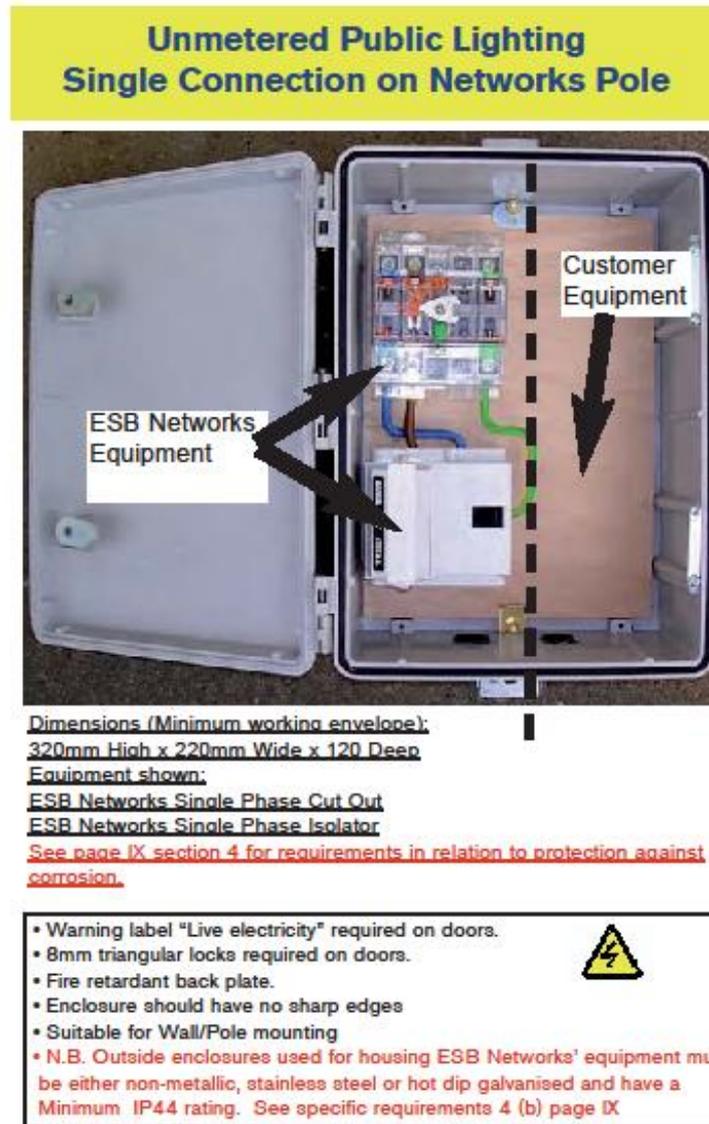
- Warning label "Live electricity" required on doors.
- 8mm triangular locks required on doors.
- Fire retardant back plate.
- Enclosure should have no sharp edges.

600mm wide vault and cover  
 Located in front of minipillar



1.2m 16 sq mm galvanised steel earth rod and chamber for neutralising connection at minipillar

Figure 9: Pole Mounted Interface box with ESB equipment



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Latest code @  
[www.esb.ie/esbnetworks/ncp](http://www.esb.ie/esbnetworks/ncp)

Figure 11: Lighting Column Door.

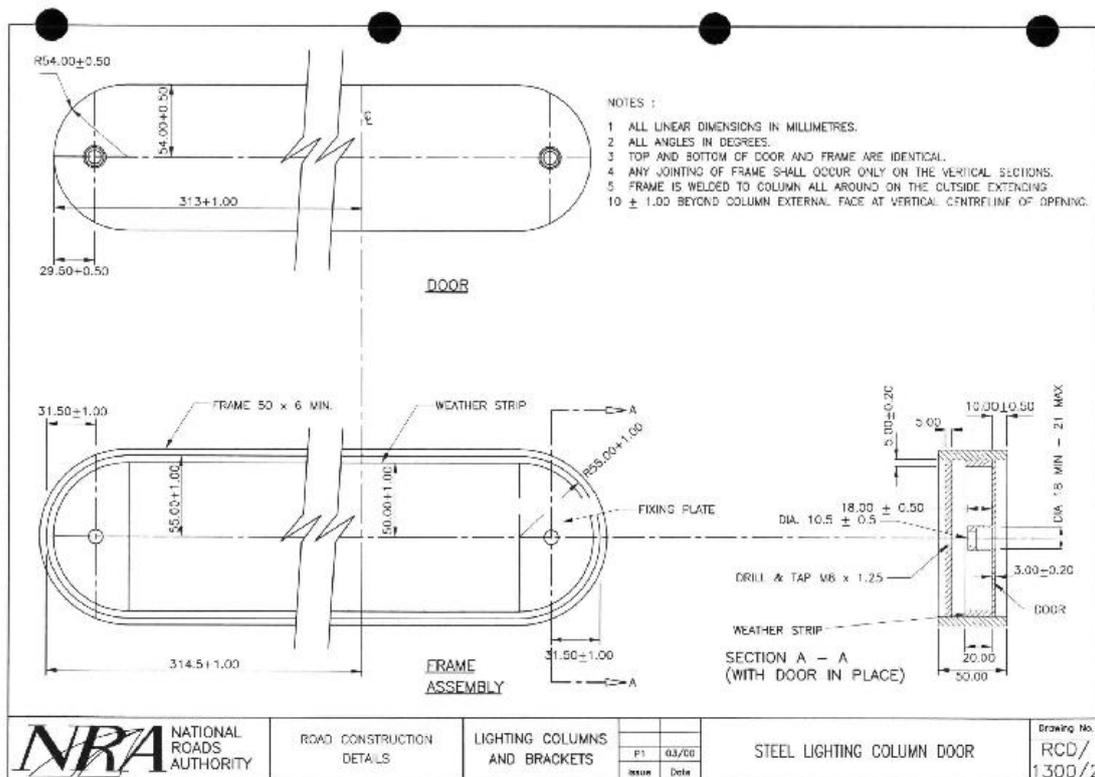


Figure 12: Painting Detail for Galvanised Column in Marine Environment

**Table 3**

Painting galvanized steel  
**for maximum long term protective life**  
 Exposure condition 3  
**Heavy industrial, marine exposure and possibility of abrasion**

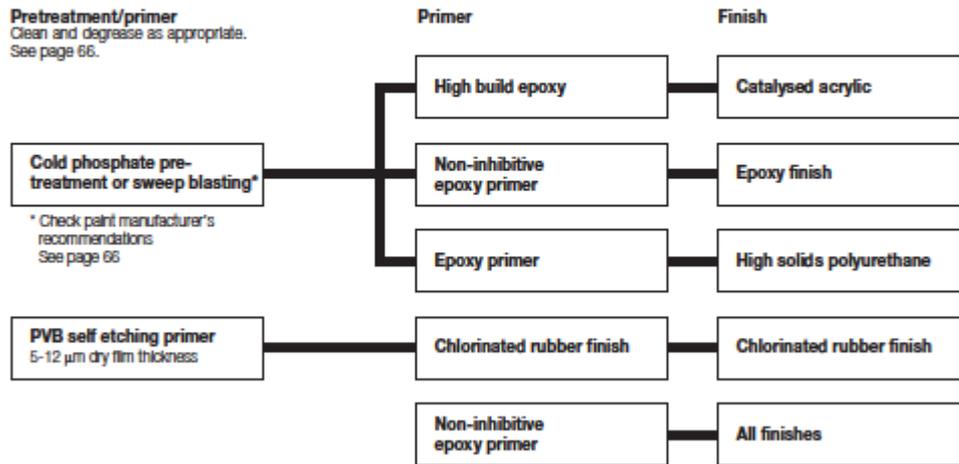
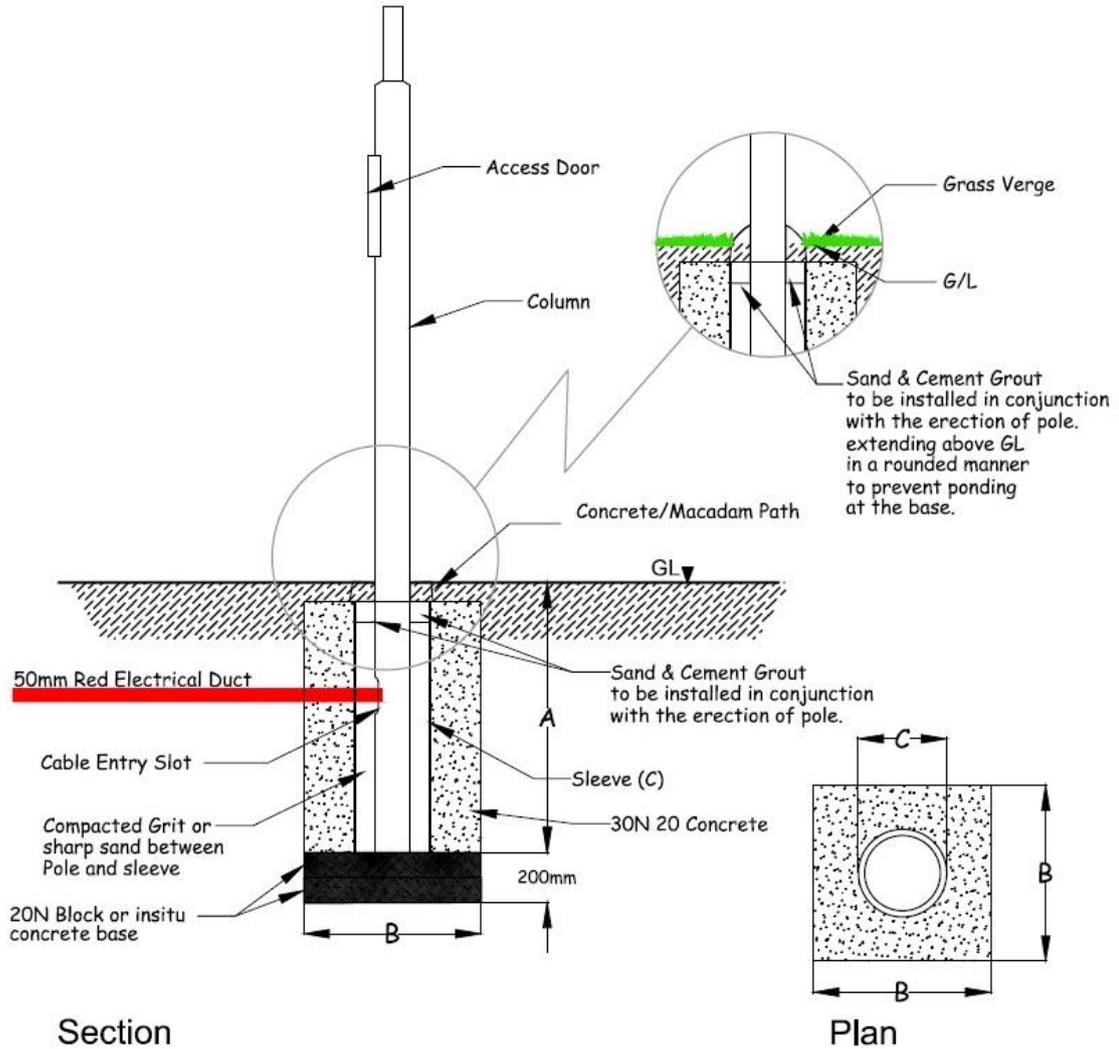


Figure 103a: Column Base Details

Notes : Typical foundation details are provided for guidance only and the soil conditions should be checked by the a qualified engineer on site.  
 Actual Foundation size and depth should be designed with reference to prevailing ground and wind conditions.  
 Foundations should be constructed using 30N20 Concrete.  
 A minimum curing period of 14 days should be allowed.  
 Special precautions must be taken where poor ground conditions exist.  
 Cable entry /exit ducts in the centre of the foundation.

		TYPICAL ROOTED COLUMN BASE SIZES				
Column Height		6m	8m	10m	12m	14m
Dim						
A		1000	1500	1800	1800	2000
B		700	800	800	1000	1300
C		300	375	400	400	



Not To Scale

Typical Rooted Column Foundation Details.



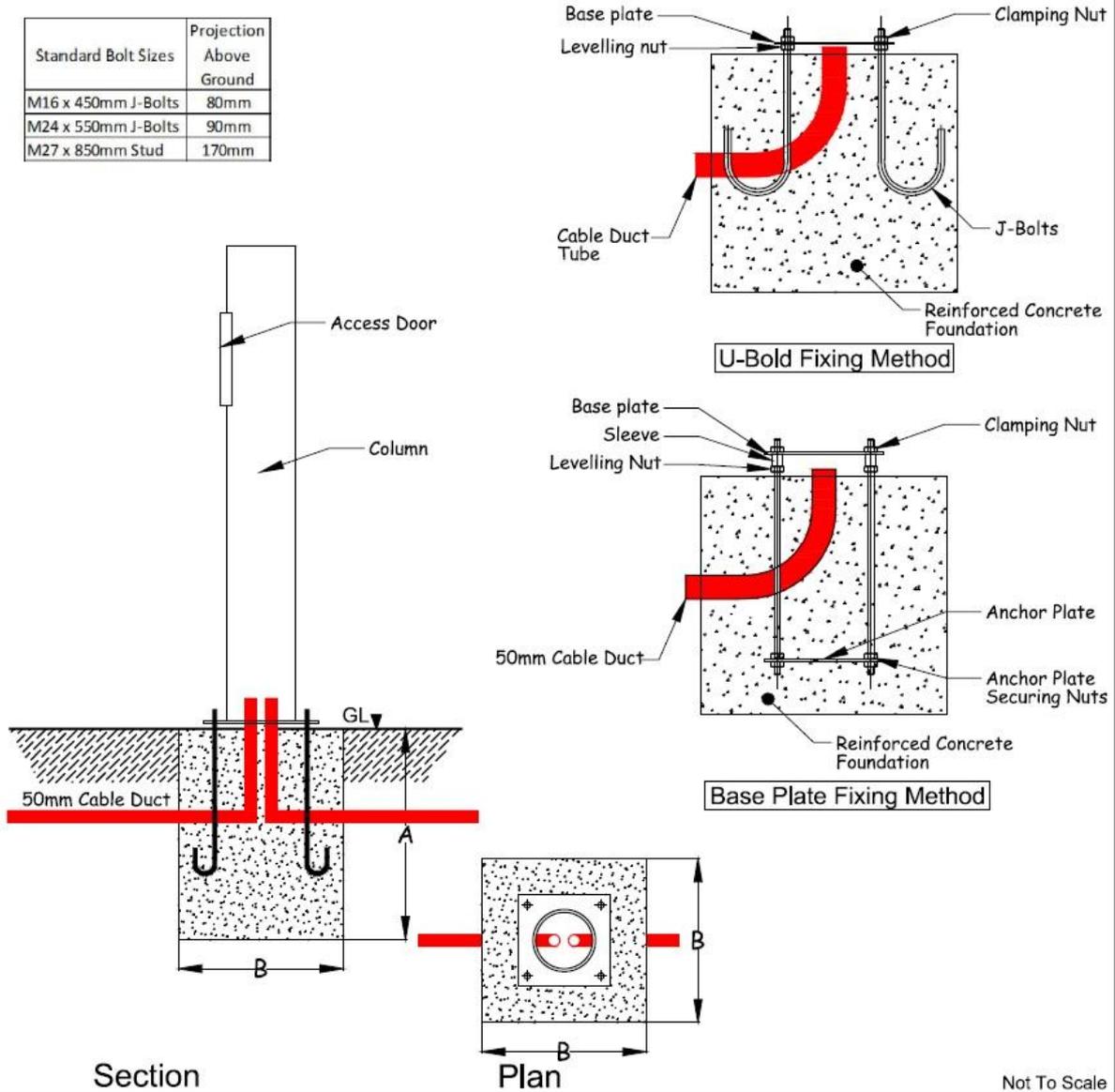
Cork County Council,  
 Management & Development Roads  
 (Public Lighting Section)  
 June 2018

Figure 113b: Column Base Details

Notes : Typical foundation details are provided for guidance only and the soil conditions should be checked by the a qualified engineer on site.  
 Actual Foundation size and depth should be determined with reference to prevailing ground and wind conditions.  
 Foundations should be constructed using 30N20 Concrete.  
 A minimum curing period of 14 days should be allowed.  
 Special precautions must be taken where aggressive ground conditions exist.  
 Cable entry ducts which should exit in the centre of the foundation.  
 Foundation bolts assembly must be fixed in the correct position.  
 The specified projection of bolts above the foundation must be observed.

TYPICAL FLANGED COLUMN BASE SIZES					
Column Height	6m	8m	10m	12m	14m
Dim A	625	825	1100	1150	1250
Dim B	950	1350	1900	2000	2100

Standard Bolt Sizes	Projection Above Ground
M16 x 450mm J-Bolts	80mm
M24 x 550mm J-Bolts	90mm
M27 x 850mm Stud	170mm



Not To Scale

Typical Flanged Column Foundation Details.



Cork County Council,  
 Management & Development Roads  
 (Public Lighting Section)

Figure 14: Zebra Crossing Detail

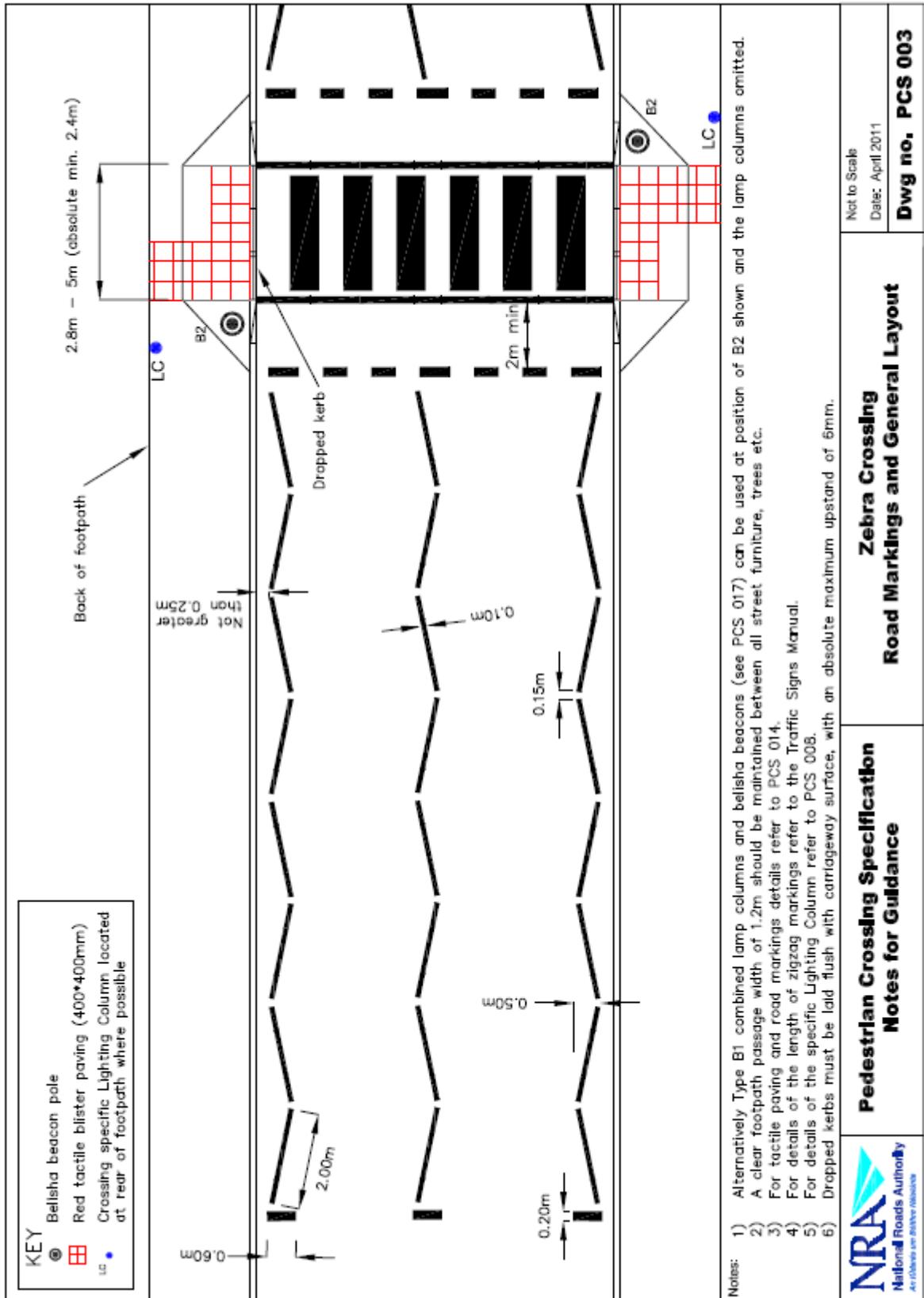


Figure 15: Zebra Crossing with Island General Layout

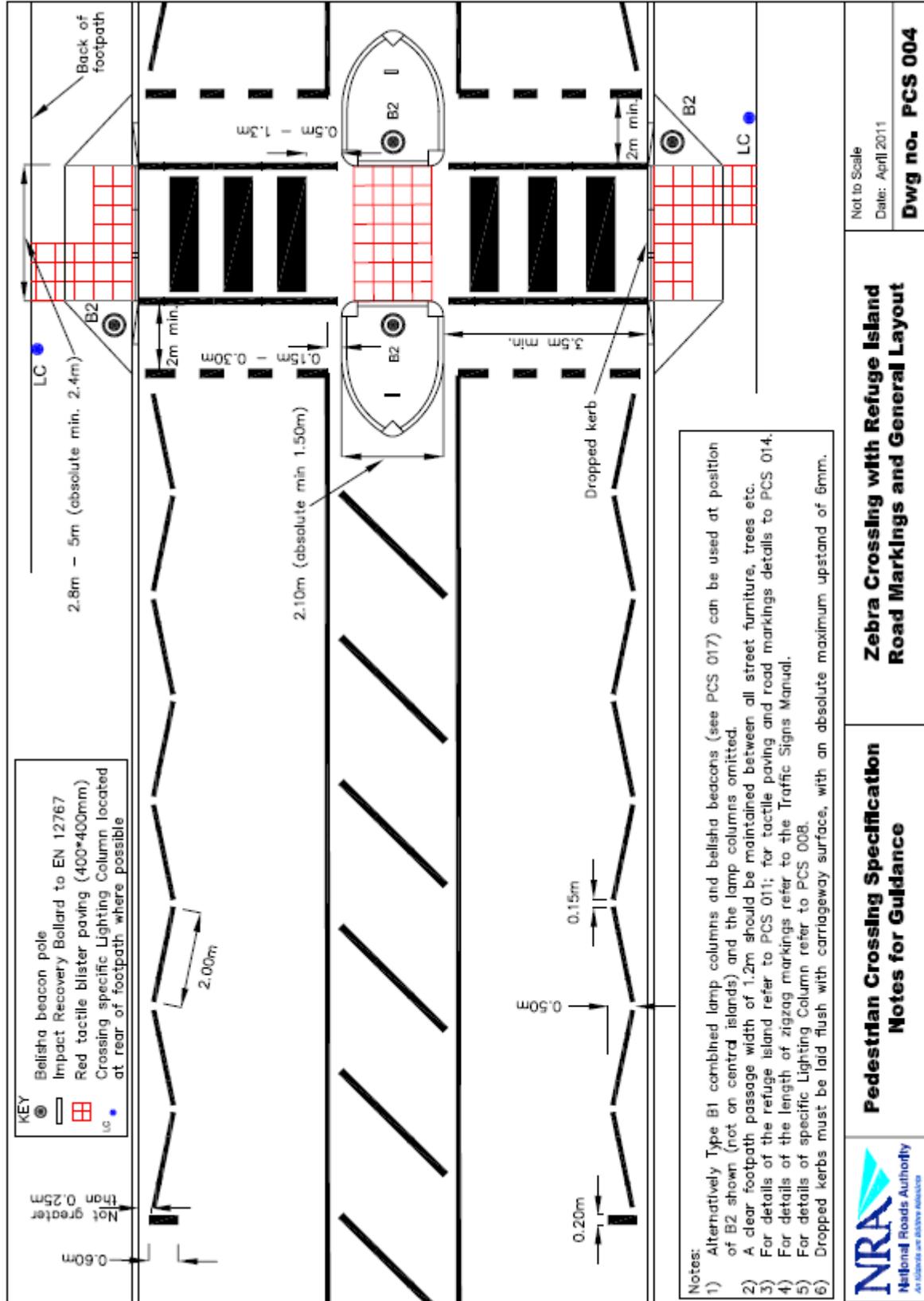


Figure 16: Supplementary Lighting Detail for all types of crossing

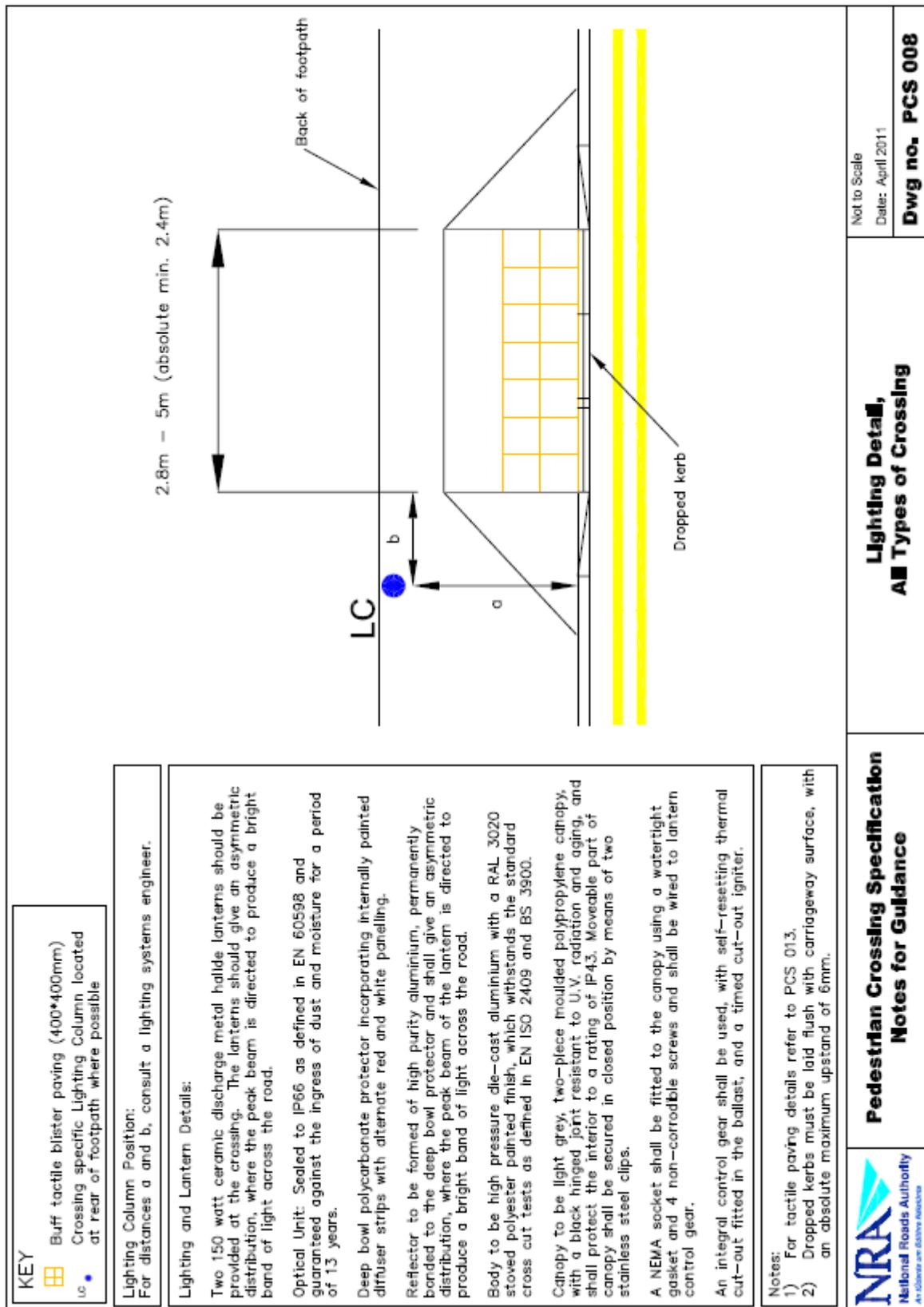
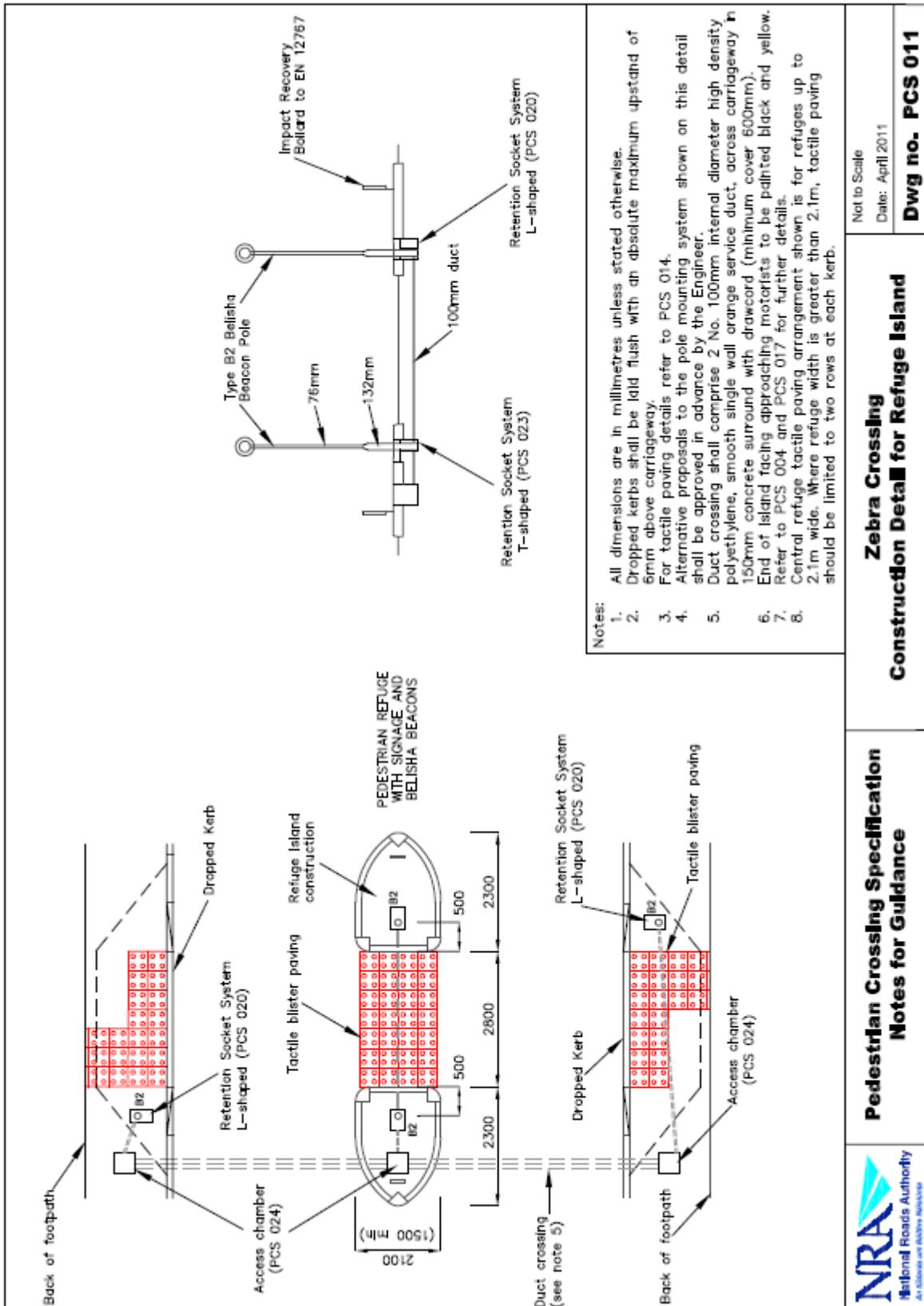


Figure 17: Construction Detail for Zebra Crossing Refuge Island



Not to Scale  
Date: April 2011  
**Dwg no. PCS 011**

**Zebra Crossing Construction Detail for Refuge Island**

**Pedestrian Crossing Specification Notes for Guidance**



Figure 18: Belisha Beacon Pole Detail

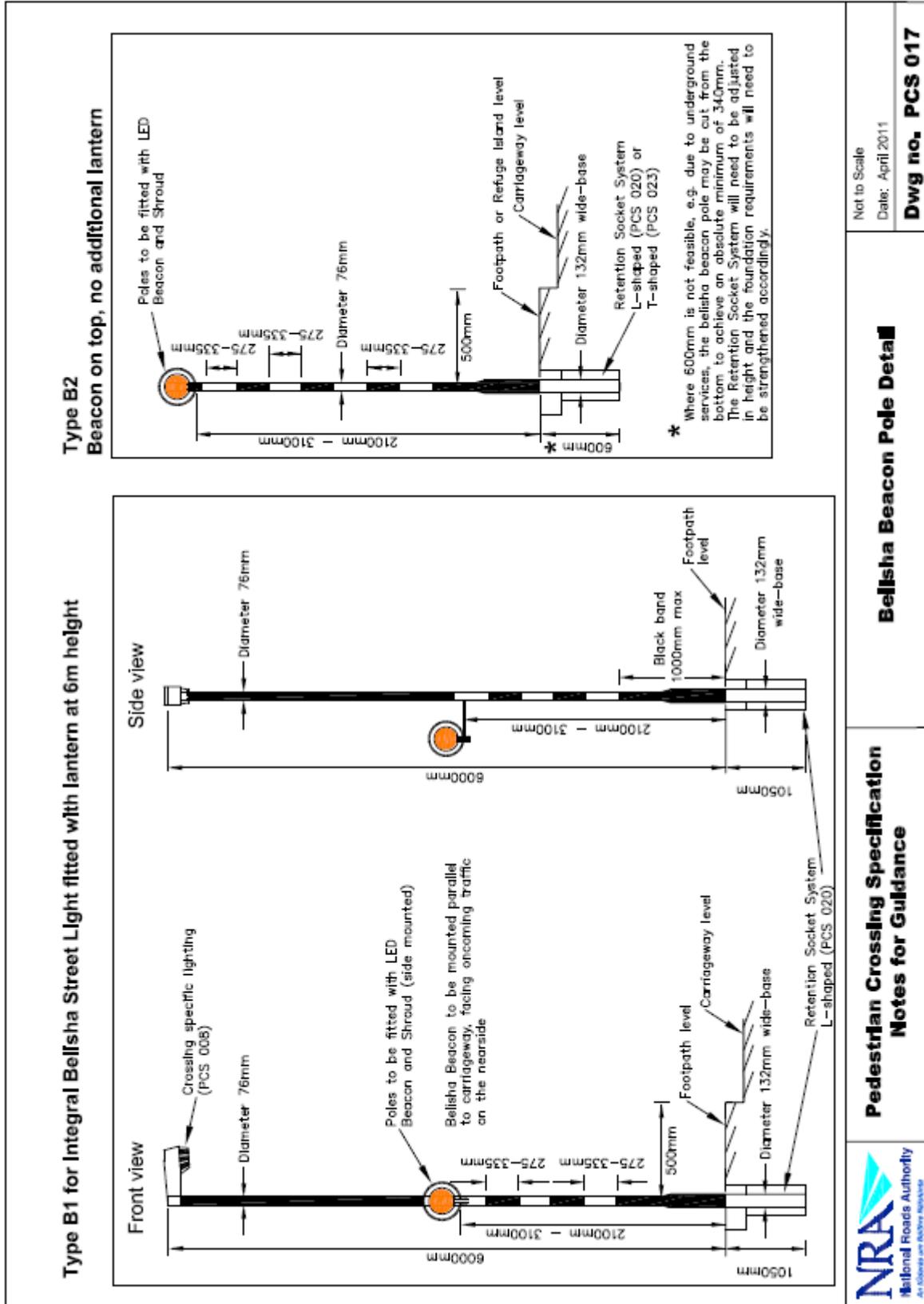
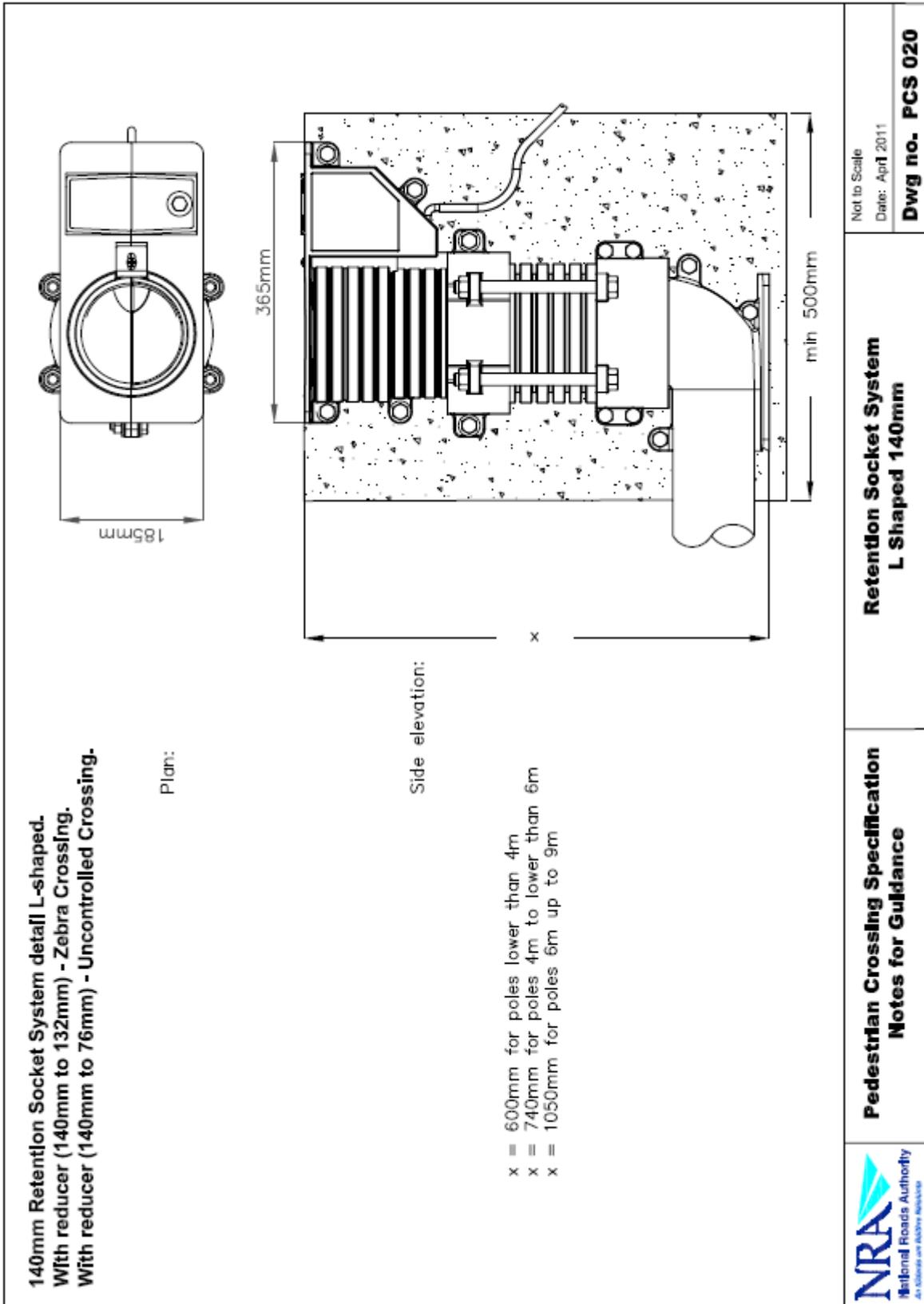


Figure 19: Retention Socket System for Zebra Crossing



# Appendix E – NC4 Unmetered Supply Application Form

Figure 1: NC4 Unmetered Supply Application Form

9806379-3 OUTPUT:Layout 1 24/09/2012 07:19 Page 1



Form NC4  
Unmetered  
Connection

**Unmetered  
Connection**

(includes public lighting)

Application for New or Changed  
Unmetered Connections (and Public Lighting or Changes to Unmetered Inventory)

PLEASE RETURN THIS FORM TO:  
UMR, ESB NETWORKS, ABBEYLEIX ROAD,  
PORTLAOISE, CO. LAOIS.

FOR OFFICIAL USE ONLY

NOTIFICATION NO.

Please fill in all sections in BLOCK LETTERS. INCOMPLETE APPLICATIONS WILL BE RETURNED

<b>1 Your Full Name</b> <small>(if a company or partnership, give the full corporate or trading name)</small>	
<b>2 Address / Registered Company Address</b>	Registered Company Number:
<b>3 Contact Details</b>	<p>Contact Name:</p> <hr/> <p>Address:</p> <hr/> <p>Landline: <span style="float: right;">Mobile:</span></p> <hr/> <p>Email:</p> <hr/>
<b>4 Existing customers only</b>	<p>If applicable, please provide the grouped MPRN (GMPRN) you wish to add the connection points to:</p> <div style="display: flex; justify-content: space-between; width: 100%;"> <div style="border-bottom: 1px solid black; width: 80%;"></div> <div style="border-bottom: 1px solid black; width: 15%;"></div> <div style="border-bottom: 1px solid black; width: 15%;"></div> </div>
<b>5 Development Address</b> <small>(where the connection points are to be provided)</small>	
<b>6 Site Plan &amp; Location of Connection Points</b>	<p>Please attach an Ordnance Survey map (scale 1:2500 - 1:10580) showing the location of your site and a site plan (scale 1:100 - 1:500) showing the location of the connection points. <b>Please note that we will not be able to process your application without these maps</b></p>
<b>7 Electricity Supply Account</b>	<p>This application is only for an electricity connection. You should also apply for an electricity supply account at the same time. We will not be able to connect you without this. You can get a list of suppliers on the Commission for Energy regulation website at <a href="http://www.cer.ie">www.cer.ie</a></p>



# Appendix F – Planning Application documentation and Menu of Standard Planning conditions

**Figure 1: Typical Outdoor Lighting Report**

## Layout Report

**General Data**  
 Dimensions in Metres Angles in Degrees  
 Grid Origin -1576429.8m x -324835.2m  
 Area 100.2m x 445.7m  
 Sample Spacing 1.49m x 1.78m

**Luminaire A Data**



Supplier	Philips
Type	BGP623 DW10
Lamp(s)	LED-HB 4S/740
Lamp Flux (klm)	14.00
File Name	Luma1_BGP623_DW10_14000_80LED_344mA_4S_CLO L90_NW.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	385.8, 389.0, 0.0
Lamp S/P Ratio	1.61
No. in Project	36

**Luminaire B Data**



Supplier	Philips
Type	BGP623 DW10
Lamp(s)	LED-HB 4S/740
Lamp Flux (klm)	20.00
File Name	Luma1_BGP623_DW10_20000_80LED_518mA_4S_CLO L90_NW.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	523.4, 90.0, 0.0
Lamp S/P Ratio	1.61
No. in Project	6

**Luminaire C Data**



Supplier	Philips
Type	BGP625 DW10
Lamp(s)	LED-HB 4S/740
Lamp Flux (klm)	34.00
File Name	Luma2_BGP625_DW10_34000_120LED_580mA_4S_CLO L90_NW.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	574.0, 158.1, 0.0
Lamp S/P Ratio	1.61
No. in Project	6

**Layout**

No.	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	-1576446.56	-325061.54	12.00	355.00	5.00	0.00	1.20			
2	A	-1576424.54	-325065.16	12.00	169.00	5.00	0.00	1.20			
3	A	-1576417.66	-325007.74	12.00	177.00	5.00	0.00	1.20			
4	A	-1576439.85	-325006.13	12.00	358.00	5.00	0.00	1.20			
5	A	-1576434.05	-324950.28	12.00	358.00	5.00	0.00	1.20			
6	A	-1576412.02	-324952.17	12.00	173.00	5.00	0.00	1.20			
7	A	-1576428.63	-324898.86	10.00	355.00	5.00	0.00	1.20			
8	A	-1576408.35	-324900.40	10.00	180.00	5.00	0.00	1.20			
9	B	-1576406.31	-324879.57	12.00	175.00	5.00	0.00	1.20			
10	B	-1576435.06	-324879.96	12.00	94.00	5.00	0.00	1.20			

6403210293

# Horizontal Illuminance (lux)

Grid 1



## Results

Eav	15.15
Emin	4.80
Emax	45.83
Emin/Emax	0.10
Emin/Eav	0.42

6493219525

Lighting Class	Maintained Average Illuminance, lx LED(with S/P ratio)	Maintained minimum illuminance, lx LED(with S/P ratio)	Uniformity Emin/Eav
Design P2	8.1	1.6	0.2
Achieved	9.3	1.65	0.2

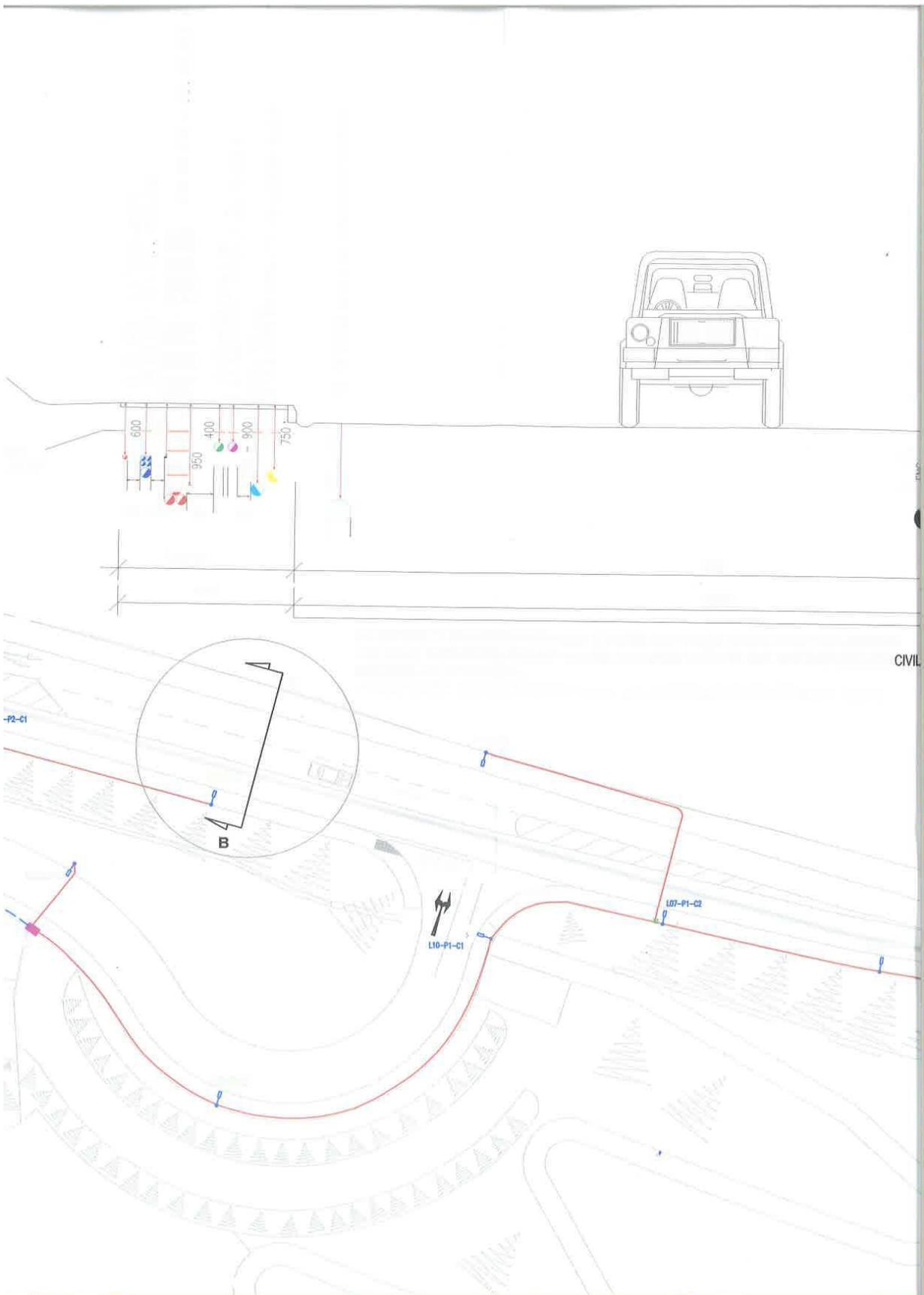
**Figure 2 : Typical Luminaire Schedule**

Location	Expected light Tag No.	LUMINAIRE TYPE	Luminaire CLO wattage	DIMMING REGIME D1A ... To 00am, 00am to 6am, 6am to ...
<b>Main Access Road</b>	1-2-3-4-5-6-7-8-9-10	(Philips Lumini) BGP621 T25 1 X LED 60-5S/740 DW10	38	100%-70%-100%
<b>Branch road to house Nos.....</b>	11-12-13-14-15-16-17-18	(Philips Lumamicro) BGP615 T25 1 X LED 32-5S/740 DW10	30	100%-70%-100%
<b>Branch road to house Nos.....</b>	19-20-21-22-23-24-25-26	Philips Lumamicro) BGP615 T25 1 X LED 32-5S/740 DW10	28	100%-70%-100%
<b>Branch road to house Nos.....</b>	27-28-29-30-31-32-	Philips Lumamicro) BGP615 T25 1 X LED 32-5S/740 DW10	28	100%-70%-100%
<b>Branch road to house Nos.....</b>	33-34-35-36-37-38-39-40	Philips Lumamicro) BGP615 T25 1 X LED 32-5S/740 DW10	28	100%-70%-100%

Light Nos. connected to micropillar 1 .....1,2,3,4,6,9,10

Light Nos. connected to micropillar 2 .....7,8,11,12,16,20

Light Nos. Connected to micropillar 3 .....9,10,13,14,15,17,18,19.



**Figure 3 Typical ducting and general circuitry drawing**

**Figure 4 Menu of Standard planning conditions relating to public lighting**

**General for Odyssey**

No.	Condition	Reason
1	Public Lighting in this development shall be designed and constructed in accordance with ' <b>Cork County Council Public Lighting Manual and Product Specification 2018</b> '; a copy of which is available on Cork County Council's website, <a href="http://www.corkcoco.ie">www.corkcoco.ie</a>	In the interest of consistency of design and compatibility for future maintenance.
2	Prior to the occupation of any houses / residences, within any phase of new development, the public lights shall be switched on in that phase and any access roads, kept active and maintained by the developer until taken in charge by Cork County Council.	In the interests of public safety.
3	<p>As part of the Planning process a public lighting design and layout drawing for the proposed development, (including the section of public road serving the site) shall be submitted to and agreed in writing with the Planning Authority.</p> <p>It is imperative that this is agreed before the development commences so that it will not delay the commencement of the development on site.</p> <p>The public lighting layout shall be designed (and signed) by a competent Lighting Design Engineer, in accordance with BS 5489:2013 and BS EN 13201:2003.</p>	In the interests of public safety.
4	<p>The applicant must submit a design and drawings in relation to the public lighting for this development and must allow for the following:</p> <ul style="list-style-type: none"> <li>- The minimum lux level on public roads, paths and playgrounds, etc. within the housing estate must be in accordance with BS5489-2013.</li> <li>- The S/P ratio of LED lanterns can be applied to the public lighting design for roads within a housing estate.</li> <li>- The lights are to be dimmable from 12.00 midnight to 06.00am as per dimming class 2A in housing estates.</li> <li>- The wattage of the lights must be stated in any proposal and must be the CLO wattage for whatever lumen output the design is based on.</li> </ul>	In the interests of Proper Design.
5	The Applicant must submit a design and drawings, to a scale of 1/500 and to a drawing size of A1 or A0 <b>only</b> , showing lux contour levels for the designed minimum lux level, 1.5, 3, 5, 10, 15 and 20 lux as appropriate.	In the interests of Proper Design.

6	The following Conditions as contained in <b>Appendix F, Figure 4 of the 'Cork County Council Public Lighting Manual and Product Specification 2018'</b> ; apply to this development.	In the interests of Proper Design, Planning and Development
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### Specific

No.	Condition	Reason
M1	All lighting within the site shall be directed and cowed if necessary so as not to interfere with passing traffic or cause any glare or additional light spill to adjoining residential property. The lighting must comply with requirements of the ILP Guidance Document for Spill Light being achieved in the development and that proof of same must be agreed with the public lighting engineer.	In the interests of residential amenity.
M2	The developer shall provide public lighting on the public road along the boundary of the site, designed (and signed) by a competent Lighting Design Engineer, which shall comply with BS5489: 2013 and BS EN 13201: 2015. The minimum uniformity for traffic routes shall be a Uo of 0.40.	In the interests of public safety
M3	<p>The Public Lighting design and drawing showing a plot of lux levels should ensure that there will be no dark areas (below the minimum illuminance lux level) along roads and footpaths, in particular, and the plots should extend to include the nearest existing light standard, either within the estate or on the public roadway as appropriate, to ensure that no gaps exist.</p> <p>The public lighting Layout, to a scale of 1/500 or 1/1000, shall indicate (a) the location of lighting columns, (b) their reference number, (c) the supply circuits, (d) ESB and Local Authority micro pillars and (e) shall include a schedule of lanterns to be installed within the development, inclusive of proposed lantern type. The lanterns shall be of the LED type, commonly used brands as per CCC Policy Document 2018.</p>	In the interests of public safety
M4	<p>All lighting points shall be accessible by means of a hydraulic hoist, for maintenance purposes. Such a hoist requires a minimum paved vehicular access of 3.5 metres.</p> <p>In exceptional circumstances, if such access is not available special arrangements shall be made such as the use of hinged columns.</p> <p>All public lighting columns, ducting for electric cables and the associated feeder pillars serving the public lights shall be installed in public areas, at the locations as per the agreed Public Lighting Layout, with</p>	In the interests of public safety.

	columns generally at the <u>back of footpaths and not in private property.</u>	
M5	All electrical work shall comply with the requirements of the (a) National Rules for Electrical installations of the Electro-Technical Council of Ireland, latest edition, including Part 7, Section 714, (b) External Lighting Installation of ET 101-2008, with minimum 6sq mm cable on mains and 2.5sq.mm flex in light standard from fuse. (c) ET211 : 2003 Code Of Practice for Public Lighting Installations in Residential Areas; (d) ESB Networks Code of Practice for Customer Interface 4th Edition 2008. Special Situations Public Lighting.	In the interests of public safety.
M6	The maximum power output connected to a mini/micro pillar shall not exceed 2KW so as to enable unmetered supply and the tariff shall be unmetered. The tariff shall be dusk to dawn for general street lighting, but dusk to midnight for recreational areas, (including recreational walkways).	In the interest of compatibility with existing Public Lighting arrangements.
M7	The Developer shall liaise with the Council's Public Lighting Engineer before removing any existing public light(s) and shall be responsible for the cost and execution of any such relocation, to a location agreed with the Council's Public Lighting Engineer.  The Developer shall demonstrate, using the services of a competent Public Lighting Engineer that the relocation of the light shall not result in any area not being adequately served by lighting, which was previously served, or shall suggest alternative/additional lighting to overcome such deficiency, if it arises.  The Developer shall ensure that the alternative lighting arrangements are in place and operating before removing any lights or alternatively shall agree a temporary lighting arrangement, in the interim with the Public Lighting Engineer.	In the interests of public safety.
M8	The Developer is to ensure that trees shall not be planted within 10m of a public lighting standard or in such a manner that the foliage is likely to obstruct the light in the future.	Canopy growth can limit the light spread and roots can disrupt underground cables.
M9	All underground public lighting cables shall be installed in their own duct.	in the interest of safety
M10	Any existing public lighting poles / columns which would end up within a private property as a result of the proposed development must be moved onto public property, in agreement with the Public Lighting Engineer.	To allow access for future maintenance.

M11	The public lighting will not be taken in charge by Cork County Council until all the sites have been developed and the roads, footpaths, services etc. are complete.	In the interests of Proper Planning and development
M12	The public lighting submitted is not acceptable. Applicant to consult with Public Lighting Engineer and re-submit new design.	In the interests of Proper Design
M13	The public lights to be installed along the public road are to be mounted on 8m high columns and to be designed to the relevant Class in accordance to BS5489 2013. Detailed design and drawings including lighting contours to be submitted prior to commencement of construction.  A separate micro-pillar, to that for the housing estate, must be installed for only these lights on the road.	In the interest of public safety
M14	Public lighting columns shall be located in areas where they do not interfere with traffic especially adjacent to driveways. Locations of columns must be agreed with the PL Engineer as part of the design process and prior to installation.	In the interests of H&S and to avoid potential damage to Public Lighting columns.
M15	Public Lighting to be provided on Pedestrian Paths and hinged columns to be used. Applicant to submit a design and drawings for approval.	In the interests of Public safety.

End of Document