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# Lucan Community College Extension

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## Public Lighting Planning Report

REP008

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**DOCUMENT CONTROL SHEET**

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# BDP.

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## 1. INTRODUCTION

The following report outlines findings of an initial site inspection commissioned to investigate the existing street lighting installation and other electrical services installations at Lucan Community College.

The new lighting design shall:

- Promote easy movement of pedestrians and cyclists, provide a general feeling of security and wellbeing
- Create an inviting and attractive night time environment that encourages people to visit and make use of the facilities.
- Be robust, low energy and maintainable.
- Cool and warm colour temperatures will be used to differentiate between cycle and pedestrian paths.

## 2. REQUIRED ILLUMINATION LEVELS

The proposed Public Lighting design has been developed in accordance with a number of different standards and codes of practise, including BS 5489:2013, BS EN 13201:2015 and local County Council specific road lighting guidelines. All new lighting installations shall also comply with the National Rules for Electrical Installations ET101:2008 and ESB National Code of Practice for Customer Interface 4<sup>th</sup> Edition 2008.

The SLL (Society of Light and Lighting) have developed a Lighting Handbook in order to consolidate the various standards and codes of practise into one physical document.

BDP have developed and refined our designs in accordance with this publication. SLL Lighting Handbook contains the following recommendations with respect to light levels appropriate to an external environment.

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Ref No	Type of area, task or activity	$E_{av}$ (lx)	$L_r$	$GR_2$	$R_s$	Remarks
3.5.1	Walkways exclusively for pedestrians	5	0.25	50	20	Where there are other hazards present higher values of $E_{av}$ are required. For example in water and sewerage treatment works 20 lx, on building sites 20–50 lx and in petroleum and chemical works 50 lx
3.5.2	Traffic areas for slowly moving vehicles (max. 10 km/h), e.g. bicycles, trucks and excavators	10	0.40	50	20	
3.5.3	Regular vehicle traffic (max. 40 km/h)	20	0.40	45	20	At shipyards and in docks, $GR_2$ may be 50
3.5.4	Pedestrian passages, vehicle turning, loading and unloading points	50	0.40	50	20	For reading labels and signs: $E_{av}$ 50 lx

BS 5489: 2013 further refines the above by describing illumination requirements associated typical town centre roads.

Road Type	Lighting Class	Maintained Average Illuminance	Maintained Minimum Illuminance	Uniformity
Roads Where: <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> </ul>	C2	20.00	8.00	0.4

In order to achieve the above requirements, the proposed LED luminaires have been spaced between 10-15 meters apart. This is dependent on a number of factors including overshadow from foliage, street orientation, junction location and pedestrian crossing locations.

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## 3. LUMINAIRES

The proposed luminaires shall consist of IP66, robust 6.0-metre high column mounted high specification LED luminaires, with carefully controlled optics to focus the light where required.



Typical Column Mounted LED Streetlight with a range of optics to allow precise control of light

## 4. LIGHT POLLUTION

Light intensity and distribution need to be carefully considered to ensure that upward light spill is minimised and that light distribution cut-offs from luminaires do not result in severe light trespass either onto the water or into the sky.

Luminaires, lamps, optics and equipment should be specified and located to minimise any unnecessary indirect upward light component in order to reduce light pollution. In addition light trespass and light spill will be, wherever possible, prevented. It is the intention for the new installation to minimise any light ingress.

Key Considerations:

The following steps have been undertaken to keep light pollution and effects of external lighting on the environment to the minimum:

- Where applicable mounting heights will be set at a uniform height to maintain consistency in light levels though out the design.
- The use of uplight will be contained to key features only and focused such as to have as little impact on the sky as possible.
- Angle of tilt will be restricted to maximum 30° to minimise source intensity glare.

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- Minimal and simple light fittings will be used for a pleasing day and night time aesthetic. This has an important implication in terms of how well the lighting is received by users.
- Low level lighting will be either recessed or use appropriate glare shielding to minimise light source visibility.
- Over-lighting: This is avoided by designing to the minimum levels prescribed in the codes and standards, whilst maintaining safety and carefully selecting the most appropriate lighting equipment and lamp types.
- Luminaires will be specified for their photometric performance, with suitable distribution, efficiency and appropriate glare control (louvres, cowls or glare shields) for effective illumination of a particular task or space.
- Lamp selection will be determined by luminous output, longevity, colour appearance, colour stability and colour rendering ( $Ra > 80$ ).

Only manufacturers of quality LEDs, produced by well known, industry respected manufacturers will be specified.

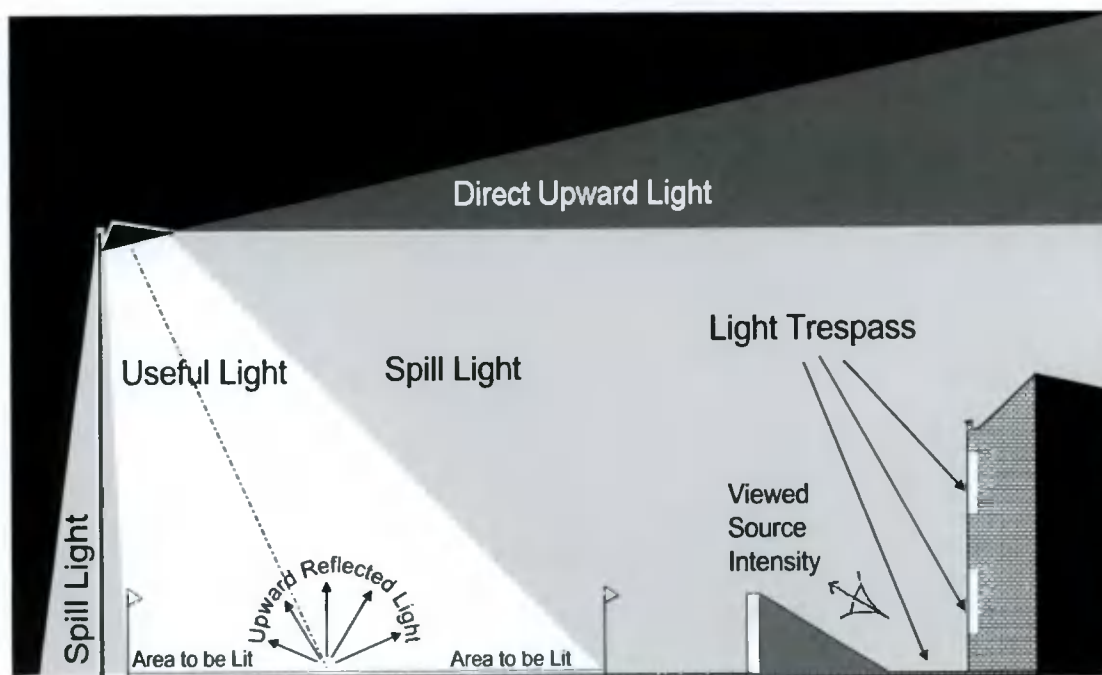


Fig 1. ILP GN01:2011 - Guidance Notes for the Reduction of Obtrusive Light

## Ecology:

If not correctly designed artificial lighting can have a negative impact on the ecology of a site. This is usually caused by light spill from a site into the surrounding area.

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Ecological issues have been a key consideration in the design of this area. The preliminary ecological assessment of the site has identified a number of species that may be present and has recommended further surveys to determine this. These include:

- Birds
- Insects
- Bats

All lighting shall be designed to minimise light pollution with particular attention to the sensitive nature of the site ecology. By minimising light spill we will ensure that any impact on surrounding wildlife habitats is mitigated.

These may include, but are not limited to, the review of the following:

- Type of light source
- Colour Temperature
- Height of the lighting
- Light levels
- Time of lighting

LED lighting is available in a number of colour temperatures. Older installations tend to use 'cool white' (blueish colour) at 5700°Kelvin. More recently, 4000°K has become more commonly used. 'Warm white' (more yellow/orange colour) at around 3000°K and as low as 2700°K can now be used with little reduction in lumen output. LED typically features no UV component and research indicates that while lower UV components attract fewer invertebrates, warmer colour temperatures with peak wavelengths greater than 550nm (~3000°K) cause less impacts on bats (Stone, 2012, 2015a, 2015b).

## 5. ENERGY SAVING

Energy saving in the form of dimming shall also be incorporated to reduce the lighting intensity during periods when there is little pedestrian or vehicular movement. Ever-improving technology has allowed for more flexibility in the variation of lighting level dependant on usage at any one time. As the usage is reduced, typically the lighting level can be reduced, unless there are over-riding reasons not to do so (such as high accident rate or crime rate).