

THE COMMON, LIFFORD

ELECTRICAL DESIGN STATEMENT.

ROAD LIGHTING

The road lighting design is based on the environmental zone in which the roadway is located.

Environmental Zone

The location has been assessed in relation to the Institution of Lighting Professionals (ILP) Guidance Notes for the reduction of Obtrusive Light GN01:2011 (Table 1) below.

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

TABLE 1

The location has been assessed as Environmental Zone E2 with low district brightness associated with a relatively dark outer suburban location.

Roadway Illuminance Level

The illuminance level for the roadway has been taken from BS 5489–1:2013 Table A.6.

Table A.6 Lighting classes for subsidiary roads with mainly slow-moving vehicles, cyclists and pedestrians

Traffic flow	Lighting class	
	Ambient luminance: very low (E1) or low (E2)	Ambient luminance: moderate (E3) or high (E4)
Busy ^{A)}	S4 or P4	S4 or P4
Normal ^{B)}	S5 or P5	S5 or P5
Quiet ^{C)}	S6 or P6	S6 or P6

NOTE 1 If facial recognition is important then an E5 lighting class from BS EN 13201-2:2003, Table 5, or an E_{sc} lighting class from CIE 115:2010 [N1], Table 7, can be selected as an additional criterion. Good colour rendering contributes to a better facial recognition. (The E5 lighting class in BS EN 13201-2:2003 is expected to be replaced by SC upon publication of the revised edition.)

NOTE 2 To ensure adequate uniformity, the actual value of the maintained average illuminance is not to exceed 1.5 times the value indicated for the class.

NOTE 3 It is recommended that the actual overall uniformity of illuminance U_o be as high as reasonably practicable.

NOTE 4 Grey highlighting indicates situations that would not usually occur in the UK.

NOTE 5 The ambient luminance descriptions E1 to E4 refer to the environmental zone as defined in ILP GN01 [NS].

^{A)} Busy traffic flow refers to areas where the traffic usage is high and can be associated with local amenities such as clubs, shopping facilities, public houses, etc.

^{B)} Normal traffic flow refers to areas where the traffic usage is of a level equivalent to a housing estate access road.

^{C)} Quiet traffic flow refers to areas where the traffic usage is of a level equivalent to a residential road and mainly associated with the adjacent properties or properties on other equivalent roads accessed from this road.

The illumination level recommended for a busy roadway within an E2 environmental zone is P4 (5.0 lux average, 1.0 lux minimum) as defined in BS EN 13201 part 2 : 2015.

Due to the potential for large vehicles and a neighbouring housing development, the illuminance level has been assessed as P3 (7.50 lux average, 1.50 lux minimum).

Conflict Area.

The new junction where the proposed roadway meets the existing N14 road has been assessed as a conflict zone.

Where traffic routes having different lighting classes meet, the higher lighting class determines the class at the conflict area.

The lighting class of the existing N14 road is M4, which equates to an illuminance level at the conflict area of C3 (15.0 lux average, 0.4 minimum uniformity).

Pole Mounted Luminaire

Luminaire Details

Philips Luma Gen 2 pole-top LED luminaire with asymmetrical flat beam light distribution.

Colour temperature 3000 K.

Colour rendering index (RA) > 80.

LED output drops to 90% after 100,000 operating hours.

Impact strength IK09.

Ingress Protection class IP 66.

Photocell control

Luminaire colour – Grey (RAL 7040).

Luminaire manufactured from powder coated aluminium.

Glass Lens optic.

Beam direction angle adjustable from 0° in 2.5° steps.

Pole Mounting Height – 6 Metres.



Luminaire Illustration

Column Details

Steel column certified to BS 5649.

Tubular stepped pattern.

Base diameter (BD)140 mm, shaft diameter (SD) 76 mm.

Interior and exterior hot-dip galvanised to BSEN 1461:2009.

Column height above ground 6000 mm, with planting depth (PD) 1000mm.



Column Illustration

SPORTS PITCH FLOODLIGHTING

Sports Pitch Illuminance Levels.

The large sports pitch has been designed for an average maintained illuminance of 250 lux by means of 6 No 18 metre high floodlighting columns supporting 1500 watt LED floodlights.

The small sports pitch has been designed for an average maintained illuminance of 150 lux by means of 4 No 15 metre high floodlighting columns supporting 1500 watt LED floodlights.

Floodlight Illustration



Floodlight Details

Philips OptivisionLED BVP528 A55-NB 5700k 1500 watt.

Colour temperature 5700 K.

Colour rendering index (RA) > 70.

LED output 202000 lumens.

Impact strength IK08.

Ingress Protection class IP 66.

Luminaire colour – Grey (RAL 7040).

Luminaire manufactured from powder coated aluminium.

Light Spill from Sports Pitch Floodlighting.

The floodlights will be directed towards the centre of each pitch to minimise light spill to the surrounding area, and each floodlight will have a peak beam angle of 55 degrees to minimise sky glow.

It has been assessed that the horizontal illuminance at a distance of 75 metres from the large sports pitch in the direction of the N14 road will be 0 lux, therefore the existing residential properties will not be impacted by light spill.

REDUCTION OF OBTRUSIVE LIGHT

Obtrusive light includes sky glow or brightening of the night sky, light intrusion into windows and the intensity of light in the potentially intrusive direction.

The reduction of obtrusive light has been assessed in relation to the Institution of Lighting Professionals (ILP) Guidance Notes for the reduction of Obtrusive Light GN01 : 2011 (Table 2).

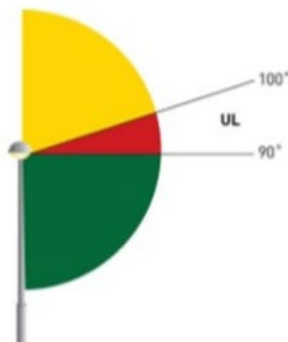
Environmental Zone	Sky Glow ULR [Max %] ⁽¹⁾	Light Intrusion (into Windows) E_v [lux] ⁽²⁾		Luminaire Intensity I [candelas] ⁽³⁾		Building Luminance Pre-curfew ⁽⁴⁾
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average, L [cd/m ²]
E0	0	0	0	0	0	0
E1	0	2	0 (1*)	2,500	0	0
E2	2.5	5	1	7,500	500	5
E3	5.0	10	2	10,000	1,000	10
E4	15	25	5	25,000	2,500	25

TABLE 2

The location has been assessed as Environmental Zone E2.

Sky Glow

Sky glow or brightening of the night sky becomes an issue when the light output from a luminaire is close to or above horizontal as illustrated in Figure 15 below.



The specified column mounted luminaires for the road lighting have an adjustable beam angle of between 0 and 15 degrees to vertical. The upward light output will therefore be negligible.

The sports pitch floodlights will have a peak beam angle of 55 degrees to vertical, therefore the upward light output will be negligible.

Light Intrusion into Windows

The location has been assessed as Environmental Zone E2 and the suggested curfew time is 23.00 Hrs.

The acceptable light intrusion into windows after 11pm is 1 Lux, which is the vertical illuminance at the centre of a glazing pane.

The road way lighting luminaires are column mounted at six metres above ground level.

The Luma Gen 2 LED lantern is designed to throw light forward onto the road and minimise back light.

The vertical illuminance in front and behind the lantern will gradually reduce as the distance from the lantern increases.

The sports pitch floodlights are directed downwards towards the centre of each pitch to minimise light spill.

It has been assessed that the vertical illuminance on the existing properties located in the vicinity of the road or sports pitches will be negligible and therefore below the maximum allowable value of 1 lux.