

## External Site Lighting Report

Project Ref.	Document Title	Rev	Prepared by:	Issue Date	Approved by:
1841	External Site Lighting Report	PL1	SS	24/01/2020	BH

## **CONTENTS**

- 1.1 Overview
- 1.2 Standard Recommendations and Guidelines
- 1.3 Conservation Areas
- 1.4 Hours of Operation
- 1.5 Proposed Site Lighting Installation
- 1.6 Proposed Fitting Types

### Appendix A – Drawings

- 1841-P-E1000 - Site Plan - External Lighting Layout
- 1841-P-E1001 - Path to DART - External Lighting Layout
- 1841-P-E1002 - Site Plan - Lighting Isolines Layout
- 1841-P-E1003 - Path to DART - Lighting Isolines Layout

## 1.1 Overview

The development is a residential development with a mixed housing consisting of social housing and apartments, rent control and private letting apartment blocks with a central external plaza area around local amenities including a creche, convenience stores and community spaces.

There are two area designations, each with specific design principles –

- Taking in Charge by Dún Laoghaire-Rathdown County Council – Roadways and path to proposed DART station.
- Private Areas - Carparks, central amenity areas, internal courtyards, walkways & external bike storage areas.

General design principles for the entire development are as follows –

- Provide adequate illumination to contribute towards the safe use of the site by both vehicles and pedestrians.
- Lighting need to enhance orientation, security and safe movement throughout including safe access to fire assembly points.
- Use enhanced base lighting for pedestrian and public spaces to reduce fear of crime and enhance sense of well-being.
- High colour rendering base lighting to unify elements across development.
- Achieve levels of illumination to improve CCTV camera imaging.
- Ensure design ensures reduced energy use, light pollution, sky glow, light spillage and visual glare.

Particular design principles for Dún Laoghaire-Rathdown County Council are as follows –

- Minimum mounting height for columns is 6 Metre.
- No fittings to be located within 3 Metres of trees.
- Isoline drawing to indicate cut off to 1 Lux.
- Cherry picker access needed for wall mounted luminaires for maintenance. This to be taken into consideration when placing fittings.
- Mini pillars, to DRL Co. Co. standards, be located with a maximum load of under 2kW with an unmetered supply
- (Note - Light from direction of bottom step to minimise glare with lamp mounted at a height of 2M above top step).
- Columns to be raise/lower type throughout for easy maintenance.
- Columns to be fitted with solar clock, wiring to be provided for this in design and CCTV operator informed there is no power to poles during daylight hours.
- Pay particular attention to ensure unobtrusive light as outlined in Guidance Document.
- Burn hour calendars to be as agreed as per the CRU guidelines (Commission for Regulation of Utilities).

## 1.2 Standard Recommendations and Guidelines

The lighting strategy has been developed in line with the following lighting standards and guidelines:

EN 13201-2:2015 Road lighting — Part 2: Performance Requirements

EN 13201-3:2015 Road lighting — Part 3: Calculation of performance.

EN 13201-4:2015 Road lighting — Part 4: Methods of measuring lighting performance.

BS 5489.1 2013 - Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas.

BS EN 12464-2:2007 Lighting of work places: Outdoor work places.

CIBSE Lighting Guide LG – 6

Building Regulations, Part M

DAC requirements specific for this development

Dún Laoghaire-Rathdown County Council Public Lighting Installation in Residential and Industrial Areas Guidance Document  
(February 2017)

Dún Laoghaire-Rathdown County Council specific conservation requirements for this development set out in planning application.

HSA Regulations for Electricity

ETCI National Rules for Electrical Installations ET 101 2008

## Proposed Lux Levels -

P4 Lowest lighting class accepted by Dún Laoghaire-Rathdown County Council for entire development which states a minimum of 1 Lux average, 0.25 Uniformity.

Conflict Area -	20 Lux (C4 Min)	0.40 Uniformity
Roadways main entrance to estate/ pedestrian crossing (Conflict Area) -	15 Lux average.	0.4 Uniformity
Roadways -	5 Lux average (P4 Min)	0.25 Uniformity
Footpaths/Cyclists -	2-3 Lux average	0.25 Uniformity
Pathway to proposed DART station - (to match footpath levels, 1 lux minimum to within 2m of the pathway edge)	2-3 Lux (P5 Min)	0.25 Uniformity
Carparks - (match adjacent road)	5 Lux average	0.25 Uniformity
Central Amenity Area -	10 Lux (C4 Min)	0.40 Uniformity
Central Amenity Area (increase when used for community events -	20 Lux (C4 Min)	0.40 Uniformity
Internal Courtyards -	5 Lux	0.25 Uniformity
Pedestrian Walkways -	2-3 Lux	0.25 Uniformity
External Bike Storage Areas -	10 Lux	0.25 Uniformity
Steps/Pedestrian Ramps -	10 Lux	0.25 Uniformity

Excerpts from EN 13201-2:2015 Road lighting — Part 2: Performance Requirements below –

The C classes in Table 2 are intended for drivers of motorized vehicles, and other road users, on conflict areas such as shopping streets, road intersections of some complexity, roundabouts, queuing areas, etc.

NOTE 1 Guidance on the application of these classes is given in CEN/TR 13201-1.

C classes can also be applied to areas used by pedestrians and pedal cyclists, e.g. underpasses.

The average illuminance ( $\bar{E}$ ) and the overall uniformity of the illuminance ( $U_o$ ) are to be calculated and measured in accordance with EN 13201-3 and EN 13201-4.

The road area for which the requirements of Table 2 apply can include the carriageway only, when applying separate requirements for the adequate lighting of other road areas for pedestrian and cyclists, or it can include also other road areas.

NOTE 2 Limitation of disability glare can be demonstrated by evaluating  $f_n$  values for all relevant combinations of observation directions and observer positions (see Annex C) or achieved by the selection of luminaires according to the classes G\*1, G\*2, G\*3, G\*4, G\*5 or G\*6 (see A.1).

**Table 2 — Lighting classes based on road surface illuminance**

Class	Horizontal illuminance	
	$\bar{E}$ [minimum maintained] lx	$U_o$ [minimum]
C0	50	0,40
C1	30	0,40
C2	20,0	0,40
C3	15,0	0,40
C4	10,0	0,40
C5	7,50	0,40

The P classes in Table 3 or the HS classes in Table 4 are intended for pedestrians and pedal cyclists on footways, cycleways, emergency lanes and other road areas lying separately or along the carriageway of a traffic route, and for residential roads, pedestrian streets, parking places, schoolyards, etc.

**Table 3 — P lighting classes**

Class	Horizontal illuminance		Additional requirement if facial recognition is necessary	
	$\bar{E}^a$ [minimum maintained] lx	$E_{min}$ [maintained] lx	$E_{v,min}$ [maintained] lx	$E_{sc,min}$ [maintained] lx
P1	15,0	3,00	5,0	5,0
P2	10,0	2,00	3,0	2,0
P3	7,50	1,50	2,5	1,5
P4	5,00	1,00	1,5	1,0
P5	3,00	0,60	1,0	0,6
P6	2,00	0,40	0,6	0,2
P7	performance not determined	performance not determined		

<sup>a</sup> To provide for uniformity, the actual value of the maintained average illuminance shall not exceed 1,5 times the minimum  $\bar{E}$  value indicated for the class.

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 <sup>A)</sup>	S4 or P4	S4 or P4
Normal <sup>B)</sup>	S5 or P5	S5 or P5
Quiet <sup>C)</sup>	S6 or P6	S6 or P6

NOTE 1 If facial recognition is important then an ES 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 ES 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 [N5].

<sup>A)</sup> 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.

<sup>B)</sup> Normal traffic flow refers to areas where the traffic usage is of a level equivalent to a housing estate access road.

<sup>C)</sup> 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.

Table 5 Maintained lighting levels for outdoor car parks

Type of area and usage	$\bar{E}$ lx	$U_o$
Light traffic, e.g. parking areas of shops, terraced and apartment houses; cycle parks	5	0.25
Medium traffic, e.g. parking areas of department stores, office buildings, plants, sports and multipurpose building complexes	10	0.25
Heavy traffic, e.g. parking areas of schools, churches, major sports and multipurpose sports and building complexes	20	0.25

Lighting for open roof level car parks should be carefully planned to avoid visual domination of the skyline by the components used to mount the luminaires during the day and by the light sources at night.

NOTE 3 Further information is given in ILP GN01 [N5].

The boundary of open roof level car parks should be well defined by illumination of the perimeter and rails. When selecting the location of luminaires and mounting components, access for maintenance should be taken into account.

### 1.3 Conservation Areas

A conservation report highlights the wild life on the development. We consulted The Bat Conservation Trust Guidance Note for 'Bats and artificial lighting in the UK'. The key recommendations are as follows which we comply with:

- Avoid or minimise lighting adjacent to features which are important to bats.
- Minimise disturbing light levels and reduce light spill onto habitats used by bats.
- LED lamps used throughout.
- Lamps illuminate in the red spectrum are preferable to those which emit white light.

- The use of low-level or bollard lighting units would potentially be useful. Otherwise, column height should be carefully considered to minimise light spills.
- As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only where it is needed.

## 1.4 Hours of Operation

BS 5489-1:2013 –

### 4.4.3 Hours of operation

#### COMMENTARY ON 4.4.3

*The question of whether or not to light a road is outside the scope of this part of BS 5489, which deals with technical matters, but the matters discussed in this subclause are relevant to its operation once the decision to light has been taken.*

*Road lighting where provided is normally required during all the hours of darkness, in operation from about 30 min after sunset to about 30 min before sunrise, although the controls are usually related to daylight illuminance levels, rather than time (see 4.4.2 for guidance on trimming).*

*See also Annex A.*

Lighting throughout the hours of darkness is particularly important as an aid to crime prevention, policing, and the general safety and comfort of the community. The level of lighting may vary during the night, dependent upon usage and other factors (see 4.4.4). In some limited situations, a lighting installation may be completely extinguished during certain periods of the night or the year when usage is very low. A risk assessment should be undertaken prior to making a decision for part-night lighting.

Dún Laoghaire-Rathdown County Council have confirmed their hours of operation are dusk to dawn with a setback to 75% from midnight to 6am.

## 1.7 Proposed Site Lighting Installation

Specific design principles are as follows –

### **Section of Dublin Road (Dún Laoghaire-Rathdown County Council Specifications) –**

Scheme consists generally of twin and single head 6 Metre lamp standards containing 89W LED lamps, cited at approx. 35 Metre intervals with automatic control all of which on completion will be taken in charge by Dún Laoghaire-Rathdown County Council. The photometric curve enclosed within Appendix 1 figure 1 for the proposed LED luminaire indicates how the light output is directed downwards with no risk of “sky glow”. Automatic control will be by Dún Laoghaire-Rathdown County Council.

### **Roadways (Dún Laoghaire-Rathdown County Council Specifications) –**

Scheme consists generally of twin and single head 6 Metre lamp standards containing 20W LED lamps, cited at approx. 35 Metre intervals with automatic control all of which on completion will be taken in charge by Dún Laoghaire-Rathdown County Council. The photometric curve enclosed within Appendix 1 figure 1 for the proposed LED luminaire indicates how the light output is directed downwards with no risk of “sky glow”. Automatic control will be by Dún Laoghaire-Rathdown County Council.



**Path to new DART station (Dún Laoghaire-Rathdown County Council Specifications) –**

Scheme consists generally of single head 6 Metre lamp standards containing 14W LED lamps, cited at approx. 35M intervals with automatic control all of which on completion will be taken in charge by Dún Laoghaire-Rathdown County Council. The photometric curve enclosed within Appendix 1 figure 1 for the proposed LED luminaire indicates how the light output is directed downwards with no risk of "sky glow". Automatic control will be by Dún Laoghaire-Rathdown County Council.

**Carpark Areas (Private Area) –**

Scheme consists generally consists of single head 6 Metre lamp standards, to match roadway lighting, containing 20W LED lamps, cited at approx. 35M intervals fed from landlord main distribution board with central BMS control.

**Central Amenity Area (Private Area) –**

Generally, a higher decorative specification for this central area. It consists generally of decorative 3.6 Metre wand type light fitting containing 56W LED lamp fed from landlord main distribution board with central BMS control.

**Apartment Internal Courtyard Areas (Private Area) –**

Generally, consists of decorative wall mounted light fittings consisting decorative wall mounted fittings, cited 6 Metre intervals and mounted at 4 metre height containing 46W LED lamp and fed from landlord main distribution board with central BMS control.

**Walkways/External Bike Storage Areas (Private Area) –**

Generally, consists of a mix of decorative light fittings consisting decorative wall mounted fittings, cited 6 Metre intervals and mounted at 4 metre height containing 46W LED lamp, decorative 4.2 Metre 50W post top lantern type light fittings, 900mm bollard type fittings containing 10W lamp, recessed wall washer type wall mounted fittings containing 22W LED lamp and recessed downlighters containing 14.5W LED lamp all fed from landlord main distribution board with central BMS control.

**1.7 Proposed Fitting Types**

**Luminaire Ref - EX1 – Roadways, main entrance to estate**

Description - LED 20 W luminaire mounted on a 6 Metre pole.





**Luminaire Ref - EX2 – Carparks, pathway to DART & walkways**

Description – LED 14 W luminaire mounted on a 6 Metre pole.



**Luminaire Ref - EX3 – Central Amenity Areas**

Description – LED 56 W decorative 3.6 Metre wand style luminaire



---

**Luminaire Ref - EX4 – Courtyards, Pedestrian/Cycle Routes & External Bike Stores**

Description – LED 46 W wall mounted luminaire



**Luminaire Ref - EX5 – Colonnades and Building Overhangs**

Description – LED 14.5 W decorative recessed ceiling mounted luminaire



**Luminaire Ref - EX6 – Central Amenity Areas & Pedestrian/Cycle Routes**

Description – LED 50 W decorative 4.2 Metre post top lantern type luminaire



**Luminaire Ref - EX7 – Central Amenity Areas & Pedestrian/Cycle Routes**

Description – LED 22 W decorative recessed wall mounted wall washer fittings

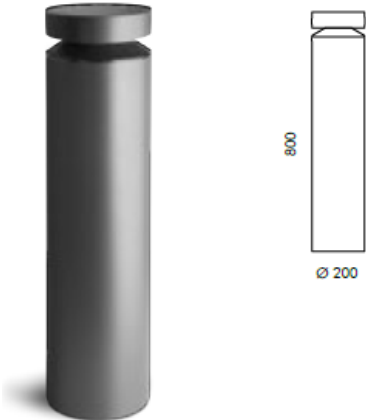


**Luminaire Ref - EX8 – External Bike Store & Creche Garden Area**

Description – LED 10 W decorative 900mm bollard fitting



360°



**Luminaire Ref - EX9 – Section of Main Dublin Road**

Description – LED 89 W luminaire mounted on a 6 Metre pole.

