FIRHOUSE RESIDENTIAL

PUBLIC LIGHTING REPORT

2020 CIBSE BUILDING PERFORMANCE CONSULTANCY

2020 EXCELLENCE IN ENERGY AWARD

2019 ICE PROJECT OF THE YEAR

2017 EUROPEAN ENERGY AWARDS

LAWLER CONSULTING

A Future Built on Sustainable Design

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1 SITE LIGHTING OVERVIEW

The purpose of this report is to present the lighting design aiming to achieve as follows:

i. Provide adequate illumination to contribute towards the safe use of all public roads, footpaths, and cycle paths by vehicles and bicycles;
ii. Provide adequate illumination to contribute towards the safe use of all walkways and footpaths by pedestrians;
iii. Contain the lighting within the site boundary;
iv. Minimise light pollution and visual glare to residents and neighbouring areas; Take account of ecological factors such as local bat populations;
v. Provide a visually stimulating environment;
vi. Enhance security.

This document shall be read in conjunction with *Basis of Design* and *Site Utilities Report*.

2 DESIGN CRITERIA

The predicted performance of the external lighting installation has been assessed in detail using lighting simulation software. The software used for this study is Lighting Reality[1].

The design criteria applied to the proposed street lighting installation shall be in accordance with BS 5489-1:2003 Code of practice for the design of road lighting, CIBSE Guide to the Lighting of Urban Areas, NSAI EN I.S. 13201-2 Road Lighting Performance Requirements, General Specification for Public Lighting Design and South Dublin County Council Public Lighting Guideline. Additionally, the proposed design shall be compliant with the ecology report for the site.

Lawler Consulting calculations were carried out to evaluate the light levels within the premises. The light fitting was chosen to limit any excessive light trespass that may impinge upon the residential amenity of housing units sitting next to the development.

3 DESIGN PARAMETERS

The following design codes and design parameters were used:

- BS 5489-1:2003 Code of practice for the design of road lighting;
- CIBSE LG 9 Lighting for communal residential buildings;
- IS 10101: 2020;
- NSAI EN I.S. 13201-1 Part 2 Road lighting. Performance requirements;
- NSAI EN I.S. 13201-1 Part 3 Road lighting. Calculation of performance;
- NSAI EN I.S. 13201-1 Part 4 Road lighting. Methods of measuring lighting performance;
- Technical Guidance Document M – Access and Use;
- South Dublin County Council Public Lighting Guideline.

[1] Lighting Reality Version 2.1 – Software for development of Outdoor Site Lighting Design.

4 LIGHT FITTINGS

The following light fittings are proposed for the development.

THORN

R2L2

96265888 R2L2 S 12L35 730 WS BS 3550 CL2 GY

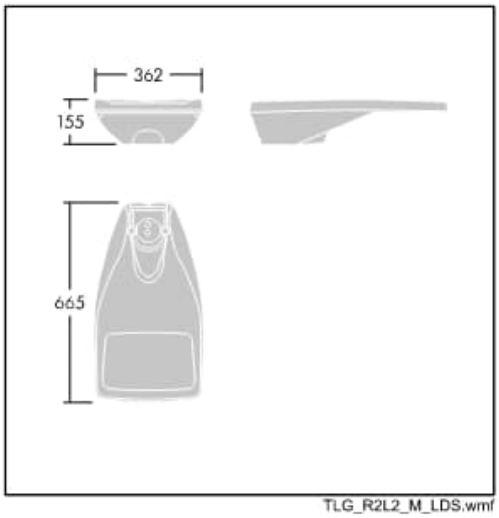
LED 15W R2L2_12L35-730WS | ISO 9223 C5 | IP66 | IK08 | T_a -25 +50

R2L2

A small size LED road lighting lantern with 12 LEDs driven at 350mA with Wide Street optic. LED driver Programmable. Class II electrical, IP66, IK08. Housing: die-cast aluminium (EN AC-44300), powder coated textured light grey. Enclosure: tempered flat glass. Screws: stainless steel, Ecolubric® treated. Post top (Ø60/76mm, tilted 0°/5°/10°) or lateral (Ø34/42/49/60mm, tilted 0°/-5°/-10°/-15°) mounting. For lateral mounting to Ø34/42mm spigots an adaptor (59005840 R2L2 MA34/42 NPA) should be ordered separately. Equipped with 50% power reduction circuit, effective 3 hours before and 5 hours after a calculated midnight. It can be deactivated at installation with an easily accessible internal switch. Complete with 3000K LED.

Dimensions: 655 x 362 x 155 mm
Luminaire input power: 15 W
Luminaire luminous flux: 1856 lm
Luminaire efficacy: 124 lm/W
Weight: 8.89 kg
Scx: 0.05 m²

TLG_R2L2_F_SPDB.jpg



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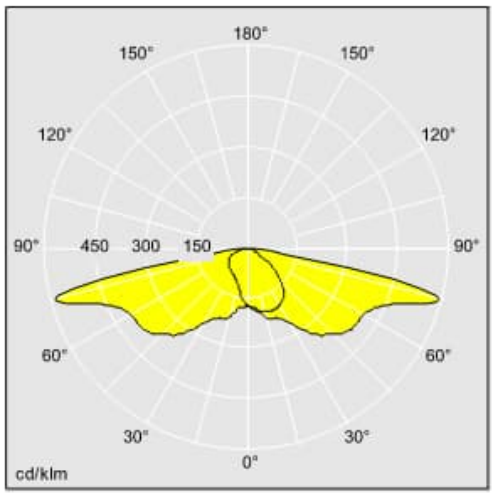


TL RS12L35WS730.ldt

Lamp position: STD - standard
Light Source: LED
Luminaire luminous flux*: 1856 lm
Luminaire efficacy*: 124 lm/W
Colour Rendering Index min.: 70
Correlated colour temperature: 3000 Kelvin

Chromaticity tolerance (initial MacAdam): 5
Rated useful life (B10)*:
L90 100000h at 25°C
Ballast: 1x LED_DRV OT 4DIM
Luminaire input power*: 15 W Power factor = 0.95
Dimming: PROG
LOR: 1,00 ULOR: 0,00 DLOR: 1,00

Figure 1 Thorn R2L2 light fitting.

EyeKon LED

THORN

92900866 EYE HA LED1050-840 COR MWS L ANT

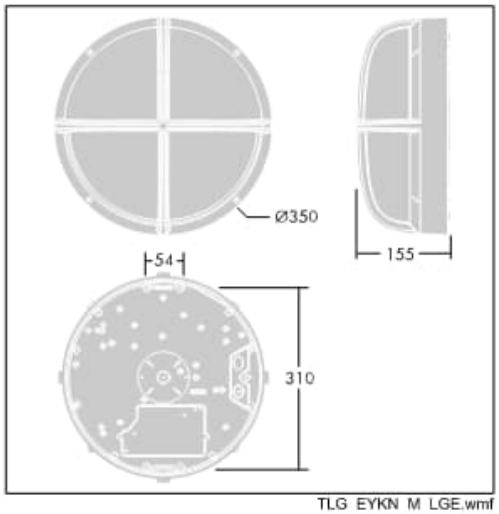
LED 16W EYKL_HALHO4K | EN 55015 | IP65 | IK10 | 850°C | T_a35

EyeKon LED

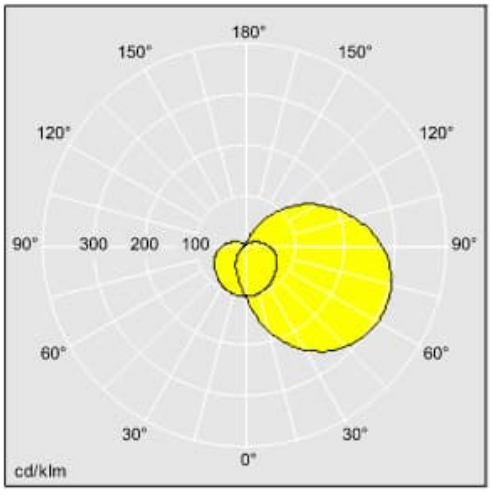
Round, impact resistant LED bulkhead luminaire. Electronic, fixed output control gear. Class I electrical, IP65, IK10. Body: large size, die-cast aluminium (LM6), powder coated anthracite. Diffuser: opal polycarbonate with die-cast aluminium halo-visor feature. Electrical connection via 3 x 2 x 2.5mm² terminal block. With integral motion sensor for corridor function control (master). Complete with 4000K LED

Dimensions: Ø340 x 155 mm
Luminaire input power: 16 W
Weight: 3.6 kg

TLG EYKN F LGHLOVSANTHOP.jpg



TLG EYKN M LGE.wmf



TLG_SP_0042778.ldt

Lamp position: STD - standard
Light Source: LED
Luminaire luminous flux*: 1050 lm
Luminaire efficacy*: 66 lm/W
Colour Rendering Index min.: 80
Ballast: 1 x 89800177 EMpowerLED 15W CLE CPS

Correlated colour temperature: 4000 Kelvin
Chromaticity tolerance (initial MacAdam): 3
Rated median useful life*:
L90 50000h at 25°C
Luminaire input power*: 16 W
Dimming: FO
LOR: 1,00 ULOR: 0,31 DLOR: 0,69

This product contains a light source of energy efficiency class C.

Figure 2 Thorn EyeKon LED light fitting.

Cesar Stroll Bollard

THORN

96700253 CESAR STROLL B H950 1L927 S/S HFX ANT

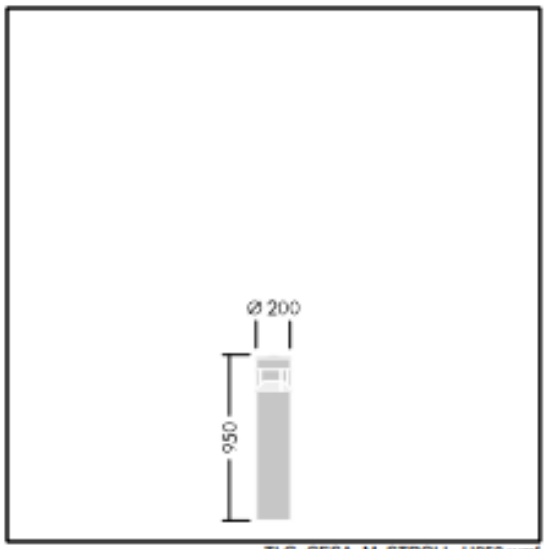
LED 35W CESA STROLL 927 | IP65 | IK10 | CE

Cesar Stroll Bollard

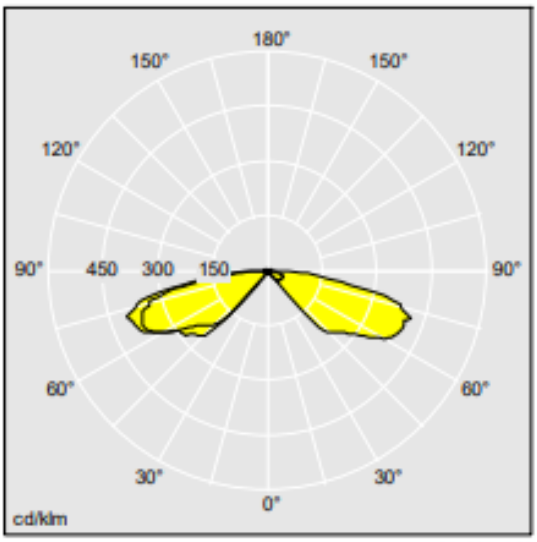
Cesar Stroll Bollard a free-standing, decorative LED bollard. Symmetric super-narrow distribution luminaire (superspot beam) distribution. DALI-2 dimmable LED driver. Class II electrical, IP65, Impact strength: IK10. Housing: Die-cast aluminium, powder coated anthracite. Working ambient temperature: -20°C to +50°C. Complete with 2700K LED.

Dimensions: Ø200 x 950 mm
Luminaire input power: 35.1 W
Luminaire luminous flux: 1843 lm
Luminaire efficacy: 53 lm/W
Weight: 10.61 kg

TLG CESA F STROLL B 950 ANT.jpg



TLG_CESA_M_STROLL_H950.wmf



96700253.ldt

Lamp position: STD - standard
Light Source: LED
Luminaire luminous flux*: 1843 lm
Luminaire efficacy*: 53 lm/W
Colour Rendering Index min.: 90
Correlated colour temperature*: 2700 Kelvin

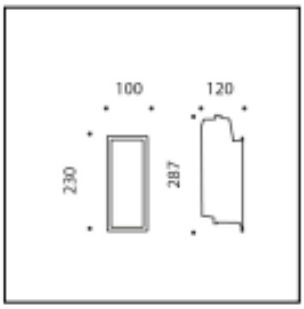
Chromaticity tolerance (initial MacAdam): 3
Rated useful life (B10)*:
L80 70000 h at 25 °C
Ballast: 1x LED_DRV
Luminaire input power*: 35.1 W
Dimming: Dali2Dim
LOR: 1,00 ULOR: 0,04 DLOR: 0,96

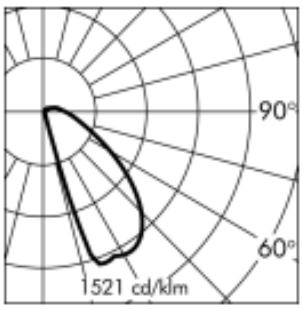
Figure 3 Thorn Cesar Stroll Bollard

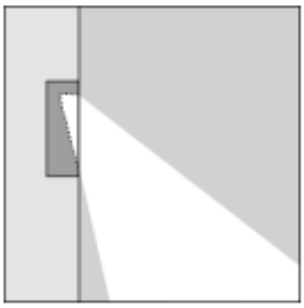
SIMES

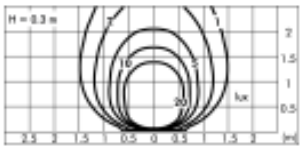
TECHNICAL DATA SHEET

MINIBLINKER









*Photometric measured using WHITE LED 3000K

Version available on request without price surcharge.

S.6070H.09 (Black)

1 module COB 2700K 220-240Vac DIMMABLE DALI2; PUSH

Step light wall recessed

Light Source Technical Data

Light source type:	COB
Colour temperature:	2700K
Rated module luminous flux:	1738lm
Rated luminaire luminous flux:	266lm
Rated module power:	13.6W
Rated luminaire power:	15.7W
Luminaire efficacy:	17lm/W
Color Rendering Index:	CRI 90
Standard Deviation Color Matching:	MacAdam step 3

Temperature and life time Technical Data

LED Lifetime:	L80 B10 70.000h Ta 25°C L80 B10 50.000h Ta 40°C
Lifespan of the LUMINAIRE:	min. 70.000h Ta 25°C min. 50.000h Ta 40°C
Performance ambient temperature:	Tq 25°C
Operating ambient temperature range:	da -20°C a +50°C
Storage temperature range:	da -20°C a +60°C

Power Supply Technical Data

Voltage (AC):	220-240Vac
Frequency (AC):	50/60Hz
Voltage (DC):	198-276Vdc (No PUSH DIM)
Dimmable:	DALI2; PUSH PUSH Synchronization: - Max 4 Luminaires, distance <15m; - Max 35 Luminaires, distance <300m with S.2490 accessory.
Inrush Current:	5A 50µsec
Max. quantity of fixtures for Minature Circuit Breaker type B16A:	50
Max. quantity of fixtures for Minature Circuit Breaker type C16A:	85
Surge protection (between L-N):	2kV
Surge protection (between L/N-PE):	4kV

Technical Installation Data

Electrical insulation class:	I
Protection class IP:	IP65
Mechanical resistance:	IK06
Weight:	2.1583Kg

Figure 4 Simes Minibinker

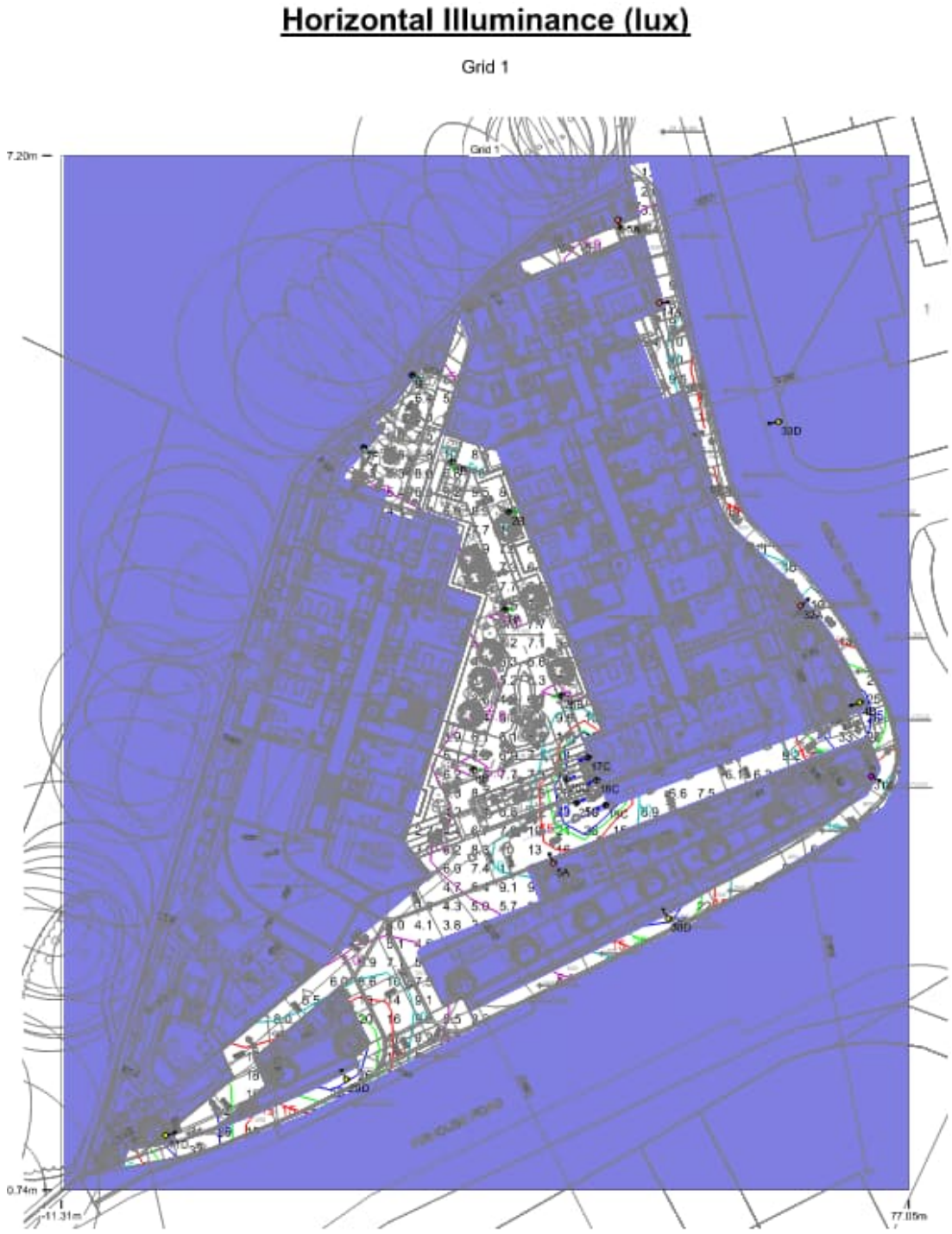
5 RESULTS

Lighting simulation results.

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	B	29.33	65.27	4.00	288.00	0.00	0.00	0.00			
2	B	35.29	60.06	4.00	0.00	0.00	0.00	0.00			
5	A	39.98	23.36	6.00	115.00	0.00	0.00	1.00			
4	D	71.94	40.14	8.00	202.00	0.00	0.00	1.00			
7	F	20.17	66.75	10.00	326.00	0.00	0.00	0.00			
8	F	25.21	74.30	10.00	340.00	0.00	0.00	0.00			
7	B	34.86	49.84	4.00	0.00	0.00	0.00	0.00			
8	B	31.58	33.14	4.00	0.00	0.00	0.00	0.00			
11	D	-0.46	-5.02	8.00	15.00	0.00	0.00	1.00			
14	A	50.99	81.81	8.00	4.00	0.00	0.00	0.90			
15	A	46.68	90.49	8.00	287.00	0.00	0.00	0.90			
17	C	43.57	34.41	1.80	200.00	0.00	0.00	0.00			
18	C	44.45	32.02	1.80	200.00	0.00	0.00	0.00			
19	C	45.39	29.43	1.80	200.00	0.00	0.00	0.00			
20	C	41.32	32.12	1.80	20.00	0.00	0.00	0.00			
21	C	42.34	29.64	1.80	20.00	0.00	0.00	0.00			
28	B	40.81	40.86	4.50	184.00	0.00	0.00	0.00			
29	D	18.38	0.81	8.00	120.00	0.00	0.00	1.00			
30	D	51.95	17.62	8.00	121.00	0.00	0.00	1.00			
31	E	73.10	32.43	8.00	330.00	0.00	0.00	1.00			
32	A	65.74	50.23	8.00	40.00	0.00	0.00	1.00			
33	D	63.45	69.41	8.00	191.00	0.00	0.00	1.00			

Table 1 Public lighting simulation results.



Results

Eav	10.56
Emin	1.55
Emax	58.80
Emin/Emax	0.03
Emin/Eav	0.15

Figure 4 Public lighting isolux plot. Class P4 minimum 1.5 lux.

6 CONCLUSION

The scheme has been designed to comply with Class P4 of EN 13201-1-5.

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		

[a] 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.

NOTE 4 A high colour rendering contributes to a better facial recognition.

Table 2 EN 13201-1-5-Table 3 – Class P Lighting Table.

The P classes in **Table 2** above are intended for pedestrian and pedal cyclist on footways, cycleways, emergency lanes and other road areas lying separately along the carriageway of a traffic route and for residential roads, pedestrian streets, parking places, schoolyards, etc

7 VERIFICATION

This report was compiled and verified by:

James Long
Public Lighting Report
Lawler Consulting