



# **K455 – Blackglen Rd., Dublin 18**

## **Proposed Site Lighting Layout & Report**

Date: 22/08/2022

Status S4

Revision P01



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## DOCUMENT CONTROL & HISTORY

<b>OCSC Job No.:  K455</b>	<b>Project Code</b>	<b>Originator</b>	<b>Zone Volume</b>	<b>Level</b>	<b>File Type</b>	<b>Role Type</b>	<b>Number</b>	<b>Status / Suitability Code</b>	<b>Revision</b>
	K455	OCSC	XX	XX	RP	E	0001	S4	P02
<b>Rev.</b>	<b>Status</b>	<b>Authors</b>		<b>Checked</b>		<b>Authorised</b>		<b>Issue Date</b>	
P02	S4	G.M.		T.J.		W.F.		22/08/22	
P01	S2	G.M.		W.F.		W.F.		14/06/22	
<b>Rev</b>	<b>Suitability Code</b>	<b>Author</b>		<b>Checker</b>		<b>Authorised</b>		<b>Issue Date</b>	

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## 1. **SITE LIGHTING OVERVIEW**

The purpose of this report is to present the lighting design and its aims to achieve as follows:

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

This document shall be read in conjunction with the drawing number: K455-OCSC-XX-XX-SK-E-0001.

## 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<sup>1</sup>.

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.

OCSC 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**

- 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;
- Dun Laoghaire County Council.

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<sup>1</sup> Lighting Reality Version 2.1 – Software for development of Outdoor Site Lighting Design.

#### 4. LIGHT FITTINGS

##### R2L2

96265910 R2L2 S 12L50 730 NR BS 3550 CL2 GY

THORN

LED 20W R2L2_12L50-730NR	50 0775	C5	IP66	IK08	□	CE	RoHS	REACH	Energy	WEEE	Tu-25	45.1
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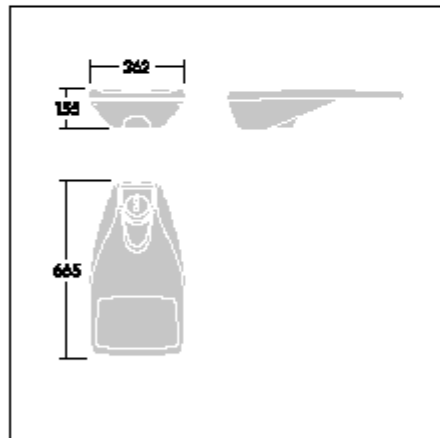
##### R2L2

A small size LED road lighting lantern with 12 LEDs driven at 500mA with Narrow Road 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.

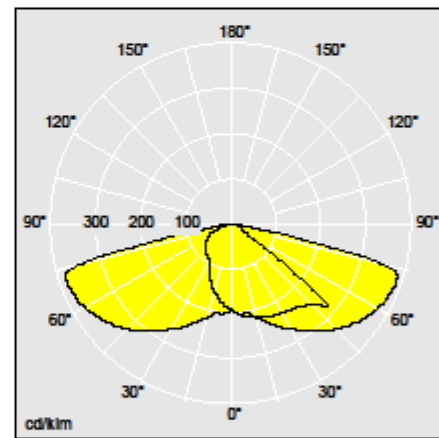
Dimensions: 655 x 362 x 155 mm  
Luminaire input power: 20 W  
Luminaire luminous flux: 2577 lm  
Luminaire efficacy: 129 lm/W  
Weight: 8.89 kg  
Sx: 0.05 m²



TLG\_R2L2\_F\_SPD8.jpg



TLG\_R2L2\_M\_LD8.wmf



TL\_RS12L50NR730.idt

Lamp position: STD - standard  
Light Source: LED  
Luminaire luminous flux\*: 2577 lm  
Luminaire efficacy\*: 129 lm/W  
Colour Rendering Index min.: 70  
Ballast: 1 x 87500884 LCO 40/200-1050/64 o4a NF C  
EXC3

Correlated colour temperature: 3000 Kelvin  
Chromaticity tolerance (initial MacAdam): 5  
Rated useful life (B10)\*:  
L90 100000h at 25°C  
Luminaire input power\*: 20 W Power factor = 0.95  
Dimming: PROG  
LOR: 1,00 ULOR: 0,00 DLOR: 1,00

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

All values marked with an \* are rated values. Thorn uses tried and tested components from leading suppliers, however there may be isolated instances of technology-related failures of individual LEDs during the rated product lifetime. International standards set the tolerance in initial flux and connected load at ±10%. Unless stated otherwise, the values apply to an ambient temperature of 25°C.

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## Flow

92922556 FW 12L35 730 NR BS 3550 CL2 T60F ANT

THORN

LED	15W FW12L35-730NR	30° beam	C3	IP66	IK10	CE	RoHS	WEEE	Energy	T <sub>a</sub> 30	40h
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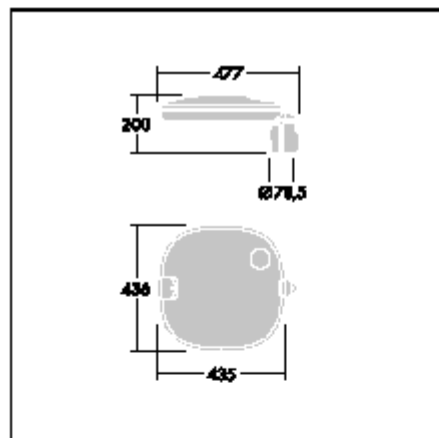
### Flow

A highly versatile LED lantern with a Narrow Road, asymmetric distribution. Electronic, DALI dimmable control gear driving 12 LEDs at 350mA. Compatible with PL, LRT, 7 pin Nema socket. Class II electrical, IP66, IK10. Housing, canopy and spigot: die-cast aluminium (EN AC-47100) powder coated anthracite (close to RAL7043). Enclosure: 6mm thick clear glass. BSxyz: Autonomous, physically disconnectable, bi-power reduction (x: hours before midnight, y: hours after midnight, z: reduction (%)) 10kV single pulse - 8kV multipulse when DALI used. Complete with 3000K LED. Post top mounting to Ø60mm column, tilt 5°, adjustable from 0° to +10°.

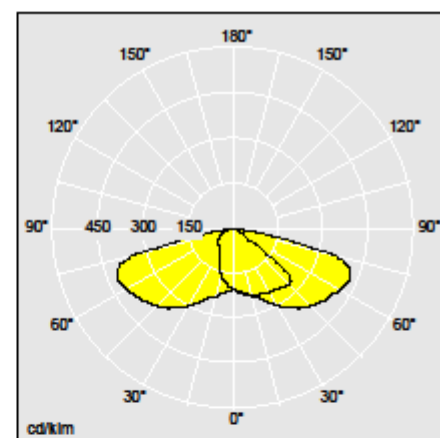
Dimensions: 435 x 436 x 200 mm  
Luminaire input power: 15 W  
Luminaire luminous flux: 1854 lm  
Luminaire efficacy: 124 lm/W  
Weight: 8.4 kg  
Sx: 0.054 m²



TLG\_FLOW\_F\_MTP\_CL.jpg



TLG\_FLOW\_M\_MTP60.wmf



TL\_FW12L35NR730.kdt

Lamp position: STD - standard  
Light Source: LED  
Luminaire luminous flux\*: 1854 lm  
Luminaire efficacy\*: 124 lm/W  
Colour Rendering Index min.: 70  
Ballast: 1 x 87500662 LCA 30W 250-700mA one4all C  
PRE OTD

Correlated colour temperature: 3000 Kelvin  
Chromaticity tolerance (initial MacAdam): 5  
Rated useful life (B10)\*: 5  
L85 100000h at 25°C  
Luminaire input power\*: 15 W  
Dimming: DA2  
LOR: 1,00 ULOR: 0,00 DLOR: 1,00

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

All values marked with an \* are rated values. Thorn uses tried and tested components from leading suppliers, however there may be isolated instances of technology-related failures of individual LEDs during the rated product lifetime. International standards set the tolerance in initial flux and connected load at ±10%. Unless stated otherwise, the values apply to an ambient temperature of 25°C. In most products the failure of one LED point causes no functional impairment to the lighting performance of the luminaire and is therefore no reason for complaint. Unless otherwise stated all Thorn LED products are suitable for unrestricted use (rated RGT) with regard photobiological blue light safety (IEC/EN60598-1).

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## Flow

92923042 FW 24L70 730 NR BS 3550 CL2 T60F ANT

THORN

LED	52W FW24L70-730NR	50° beam	C3	IP66	IK10	CE	RoHS	REACH	T <sub>a</sub> -30	40h
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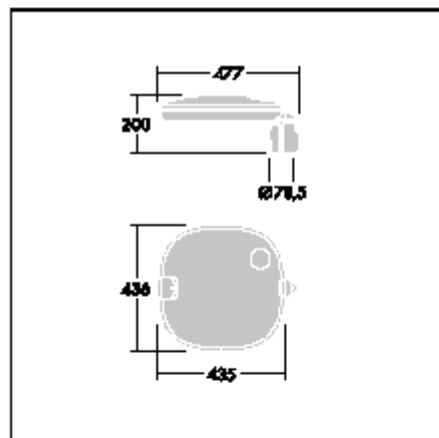
### Flow

A highly versatile LED lantern with a Narrow Road, asymmetric distribution. Electronic, DALI dimmable control gear driving 24 LEDs at 700mA. Compatible with PL, LRT, 7 pin Nema socket. Class II electrical, IP66, IK10. Housing, canopy and spigot: die-cast aluminium (EN AC-47100) powder coated anthracite (close to RAL7043). Enclosure: 6mm thick clear glass. BSxyz: Autonomous, physically disconnectable, bi-power reduction (x: hours before midnight, y: hours after midnight, zz: reduction (%)) 10kV single pulse - 8kV multipulse when DALI used. Complete with 3000K LED. Post top mounting to Ø60mm column, tilt 5°, adjustable from 0° to +10°.

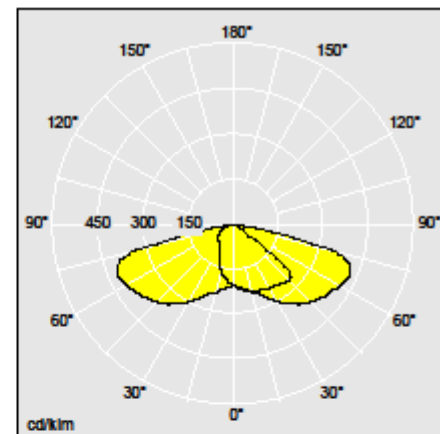
Dimensions: 435 x 436 x 200 mm  
Luminaire input power: 52 W  
Luminaire luminous flux: 6764 lm  
Luminaire efficacy: 130 lm/W  
Weight: 11.1 kg  
Sx: 0.054 m²



TLG\_FLOW\_F\_MTP\_CL.jpg



TLG\_FLOW\_M\_MTP60.wmf



TL\_FW24L70NR730.kdt

Lamp position: STD - standard  
Light Source: LED  
Luminaire luminous flux\*: 6764 lm  
Luminaire efficacy\*: 130 lm/W  
Colour Rendering Index min.: 70  
Ballast: 1 x 87500863 LCA 60W 350-1050mA one4all  
C PRE OTD

Correlated colour temperature: 3000 Kelvin  
Chromaticity tolerance (initial MacAdam): 5  
Rated useful life (B10)\*: 5  
L85 100000h at 25°C  
Luminaire input power\*: 52 W  
Dimming: DA2  
LOR: 1,00 ULOR: 0,00 DLOR: 1,00

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

All values marked with an \* are rated values. Thorn uses tried and tested components from leading suppliers, however there may be isolated instances of technology-related failures of individual LEDs during the rated product lifetime. International standards set the tolerance in initial flux and connected load at ±10%. Unless stated otherwise, the values apply to an ambient temperature of 25°C. In most products the failure of one LED point causes no functional impairment to the lighting performance of the luminaire and is therefore no reason for complaint. Unless otherwise stated all Thorn LED products are suitable for unrestricted use (rated RGT) with regard photobiological blue light safety (IEC/EN60598-1).

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## 5. RESULTS

### Layout Report

#### General Data

Dimensions in Metres Angles in Degrees

#### Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Grid 1	-78.54	-32.85	290.66	318.19	3.88	4.24
2	Grid 2	-56.04	-5.31	136.10	138.96	5.44	5.56
3	Grid 3	92.99	27.62	84.39	105.65	3.38	4.23
4	Grid 4	78.95	132.25	94.86	105.97	3.79	4.24
5	Grid 5	-34.47	35.27	73.60	90.73	2.94	3.63

#### Luminaires

##### Luminaire A Data

Supplier	
Type	R2L2 S 12L50 NR L730 CL2 BPS
Lamp(s)	R2L2_12L50-730NR 20W
LampFlux(klm)/Colour	2.58 3000/70
File Name	R2L2_96305810_(STD) (1).LDT
Maintenance Factor	0.82
Imax70,80,90(cd/klm)	602.6, 98.0, 0.0
No. in Project	31

##### Luminaire B Data

Supplier	
Type	FW 12L35-740 NR BPS HFX CL1 T60F ANT
Lamp(s)	FW12L35-740NR 15W
LampFlux(klm)/Colour	1.97 4000/70
File Name	96030536_(STD).LDT
Maintenance Factor	0.82
Imax70,80,90(cd/klm)	602.6, 98.0, 0.0
No. in Project	70

##### Luminaire D Data

Supplier	
Type	FW 24L70-740 NR BPS HFX CL1 T60F ANT
Lamp(s)	FW24L70-740NR 52W
LampFlux(klm)/Colour	7.19 4000/70
File Name	96631848_(STD).LDT
Maintenance Factor	0.82
Imax70,80,90(cd/klm)	602.6, 98.0, 0.0
No. in Project	11

#### Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	14.10	26.99	8.00	314.00	0.00	0.00	0.00			
2	A	104.02	84.11	8.00	157.00	10.00	0.00	0.00			
3	A	-5.34	7.02	8.00	336.00	0.00	0.00	0.00			
4	A	43.00	32.69	8.00	128.00	0.00	0.00	0.00			
5	A	48.05	53.28	8.00	312.00	0.00	0.00	0.00			
6	A	84.95	63.67	8.00	135.00	0.00	0.00	0.00			

**Layout Continued**

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
7	B	169.09	82.55	6.00	224.00	0.00	0.00	0.00			
8	B	142.53	105.21	6.00	60.00	0.00	0.00	0.00			
9	A	84.82	82.25	8.00	320.00	0.00	0.00	0.00			
10	A	97.21	123.64	8.00	332.00	0.00	0.00	0.00			
11	A	112.04	137.35	8.00	288.00	0.00	0.00	0.00			
12	B	134.38	119.86	6.00	302.00	0.00	0.00	0.00			
13	B	137.87	164.71	6.00	258.00	0.00	0.00	0.00			
15	A	140.55	130.31	8.00	259.00	0.00	0.00	0.00			
16	A	13.87	39.53	8.00	57.00	0.00	0.00	0.00			
17	A	64.75	47.81	8.00	127.00	0.00	0.00	0.00			
18	A	164.55	95.13	8.00	182.00	0.00	0.00	0.00			
19	A	119.32	254.08	8.00	0.00	0.00	0.00	0.00			
20	A	156.36	174.82	8.00	192.00	0.00	0.00	0.00			
21	A	158.98	136.33	8.00	162.00	0.00	0.00	0.00			
22	A	121.82	218.89	8.00	102.00	0.00	0.00	0.00			
23	A	160.49	152.63	8.00	171.00	0.00	0.00	0.00			
24	B	173.38	69.09	6.00	195.00	0.00	0.00	0.00			
24	A	130.08	242.52	8.00	180.00	0.00	0.00	0.00			
26	A	145.14	210.11	8.00	191.00	0.00	0.00	0.00			
27	A	113.91	207.85	8.00	189.00	0.00	0.00	0.00			
28	A	151.28	189.26	8.00	201.00	0.00	0.00	0.00			
30	A	147.55	88.42	8.00	308.00	0.00	0.00	0.00			
31	B	174.04	55.98	6.00	189.00	0.00	0.00	0.00			
33	B	171.39	44.59	6.00	157.00	0.00	0.00	0.00			
35	A	59.93	65.09	8.00	57.00	0.00	0.00	0.00			
36	A	162.91	111.60	8.00	183.00	0.00	0.00	0.00			
36	B	163.05	33.91	6.00	122.00	0.00	0.00	0.00			
37	B	147.92	28.57	6.00	87.00	0.00	0.00	0.00			
38	B	131.50	36.04	6.00	55.00	0.00	0.00	0.00			
36	D	109.95	108.13	6.00	280.00	0.00	0.00	0.00			
40	B	121.31	46.29	6.00	66.00	0.00	0.00	0.00			
41	B	122.36	56.76	6.00	322.00	0.00	0.00	0.00			
42	B	103.76	55.57	6.00	61.00	0.00	0.00	0.00			
44	B	103.15	76.67	6.00	334.00	0.00	0.00	0.00			
45	B	131.34	103.48	6.00	244.00	0.00	0.00	0.00			
46	B	114.27	96.29	6.00	334.00	0.00	0.00	0.00			

**Layout Continued**

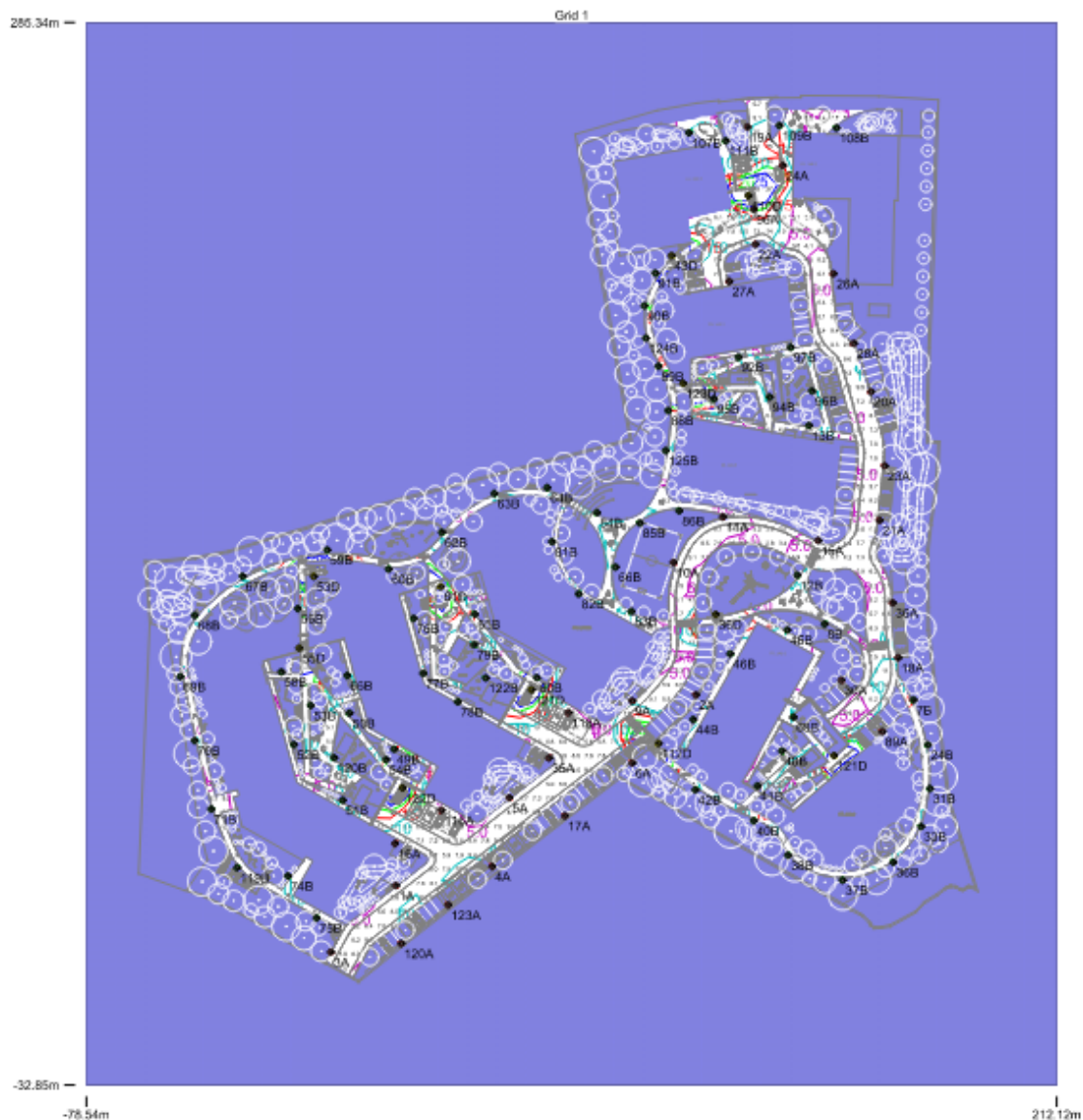
ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
43	D	96.66	215.53	6.00	325.00	0.00	0.00	0.00			
48	B	129.67	67.19	6.00	298.00	0.00	0.00	0.00			
49	B	13.62	67.77	6.00	58.00	0.00	0.00	0.00			
50	B	0.21	78.60	6.00	212.00	0.00	0.00	0.00			
51	B	-1.74	52.54	6.00	228.00	0.00	0.00	0.00			
52	B	-16.45	69.18	6.00	192.00	0.00	0.00	0.00			
53	B	-11.38	80.89	6.00	177.00	0.00	0.00	0.00			
54	B	11.18	64.70	6.00	230.00	0.00	0.00	0.00			
55	D	-14.88	98.02	6.00	0.00	0.00	0.00	0.00			
56	B	-15.19	109.84	6.00	350.00	0.00	0.00	0.00			
53	D	-10.49	119.44	6.00	90.00	0.00	0.00	0.00			
58	B	-20.18	90.91	6.00	270.00	0.00	0.00	0.00			
59	B	-6.41	127.38	6.00	275.00	0.00	0.00	0.00			
60	B	11.92	121.64	6.00	86.00	0.00	0.00	0.00			
61	D	27.59	116.42	6.00	206.00	0.00	0.00	0.00			
62	B	27.90	132.73	6.00	321.00	0.00	0.00	0.00			
63	B	43.58	144.33	6.00	293.00	0.00	0.00	0.00			
64	B	59.44	146.13	6.00	270.00	0.00	0.00	0.00			
65	B	37.74	108.22	6.00	117.00	0.00	0.00	0.00			
66	B	-0.49	89.82	6.00	24.00	0.00	0.00	0.00			
67	B	-31.82	119.59	6.00	291.00	0.00	0.00	0.00			
68	B	-46.13	107.89	6.00	319.00	0.00	0.00	0.00			
69	B	-50.46	89.43	6.00	0.00	0.00	0.00	0.00			
66	B	79.92	122.33	6.00	167.00	0.00	0.00	0.00			
71	B	-41.19	49.87	6.00	8.00	0.00	0.00	0.00			
68	B	133.21	77.39	6.00	153.00	0.00	0.00	0.00			
70	B	-46.19	70.31	6.00	8.00	0.00	0.00	0.00			
74	B	-18.21	29.86	6.00	317.00	0.00	0.00	0.00			
75	B	-9.64	17.15	6.00	62.00	0.00	0.00	0.00			
76	B	19.48	106.90	6.00	195.00	0.00	0.00	0.00			
77	B	22.29	90.43	6.00	0.00	0.00	0.00	0.00			
78	B	32.59	81.94	6.00	61.00	0.00	0.00	0.00			
79	B	37.59	99.04	6.00	316.00	0.00	0.00	0.00			
80	B	56.31	89.22	6.00	329.00	0.00	0.00	0.00			
81	B	60.90	129.86	6.00	0.00	0.00	0.00	0.00			
82	B	68.81	114.28	6.00	68.00	0.00	0.00	0.00			

**Layout Continued**

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
83	B	84.68	109.03	6.00	225.00	0.00	0.00	0.00			
84	B	74.38	138.63	6.00	229.00	0.00	0.00	0.00			
85	B	87.16	135.48	6.00	151.00	0.00	0.00	0.00			
86	B	98.93	139.11	6.00	106.00	0.00	0.00	0.00			
88	B	95.66	169.16	6.00	353.00	0.00	0.00	0.00			
89	B	92.73	182.40	6.00	29.00	0.00	0.00	0.00			
90	B	88.53	200.52	6.00	344.00	0.00	0.00	0.00			
91	B	91.82	210.30	6.00	312.00	0.00	0.00	0.00			
92	B	116.66	185.14	6.00	277.00	0.00	0.00	0.00			
89	A	159.81	72.95	6.00	135.00	0.00	0.00	0.00			
94	B	126.04	173.15	6.00	185.00	0.00	0.00	0.00			
95	B	109.41	172.61	6.00	248.00	0.00	0.00	0.00			
96	B	138.74	174.96	6.00	10.00	0.00	0.00	0.00			
97	B	132.35	188.07	6.00	291.00	0.00	0.00	0.00			
96	A	121.20	229.43	8.00	0.00	0.00	0.00	0.00			
116	A	27.74	49.52	8.00	241.00	0.00	0.00	0.00			
118	A	65.86	78.77	8.00	248.00	10.00	0.00	0.00			
119	B	-33.44	32.26	6.00	34.00	0.00	0.00	0.00			
120	A	15.65	9.56	8.00	132.00	0.00	0.00	0.00			
121	D	54.75	85.55	6.00	148.00	0.00	0.00	0.00			
122	D	16.20	56.14	6.00	153.00	0.00	0.00	0.00			
123	A	29.76	21.09	8.00	132.00	0.00	0.00	0.00			
120	B	-4.36	65.19	6.00	221.00	0.00	0.00	0.00			
121	D	145.34	65.87	6.00	308.00	0.00	0.00	0.00			
122	B	40.99	89.12	6.00	163.00	0.00	0.00	0.00			
123	D	100.16	177.31	6.00	266.00	0.00	0.00	0.00			
124	B	88.94	190.82	6.00	10.00	0.00	0.00	0.00			
125	B	94.88	157.17	6.00	354.00	0.00	0.00	0.00			
107	B	101.89	252.35	6.00	40.00	0.00	0.00	0.00			
108	B	146.09	253.73	6.00	150.00	0.00	0.00	0.00			
109	B	128.94	254.53	6.00	329.00	0.00	0.00	0.00			
110	D	119.75	233.46	6.00	95.00	0.00	0.00	0.00			
111	B	112.91	249.91	6.00	200.00	0.00	0.00	0.00			
112	D	92.79	69.53	6.00	220.00	0.00	0.00	0.00			



## Grid 1

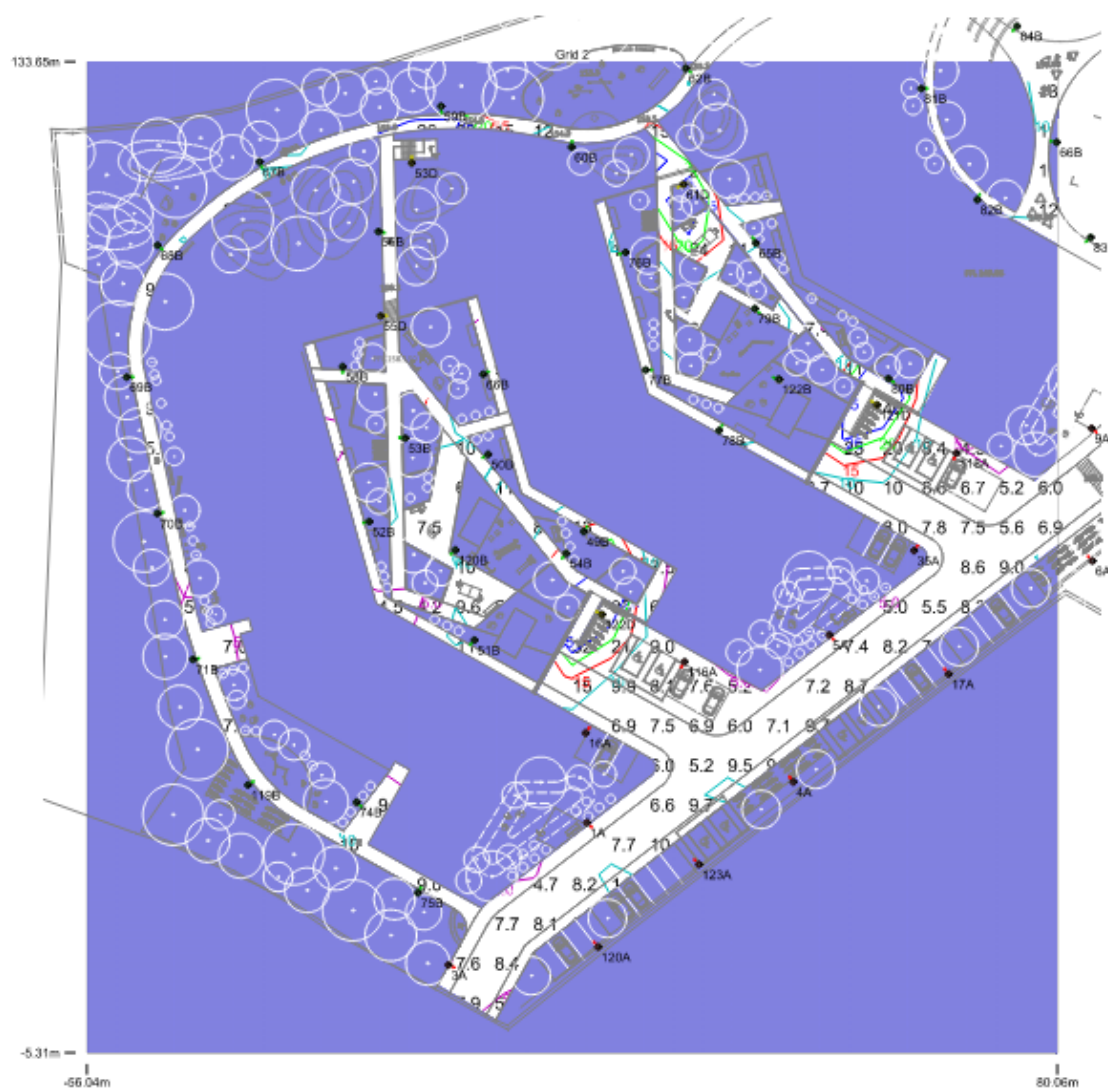


Eav	10.44
Emin	1.83
Emax	42.49
Emin/Emax	0.04
Emin/Eav	0.18

Class P4  
Minimum: 1.5Lux

## Horizontal Illuminance (lux)

Grid 2



### Results

Eav	10.11
Emin	3.23
Emax	40.10
Emin/Emax	0.08
Emin/Eav	0.32

Class P4  
Minimum: 1.5Lux

+

## Horizontal Illuminance (lux)

Grid 4



### Results

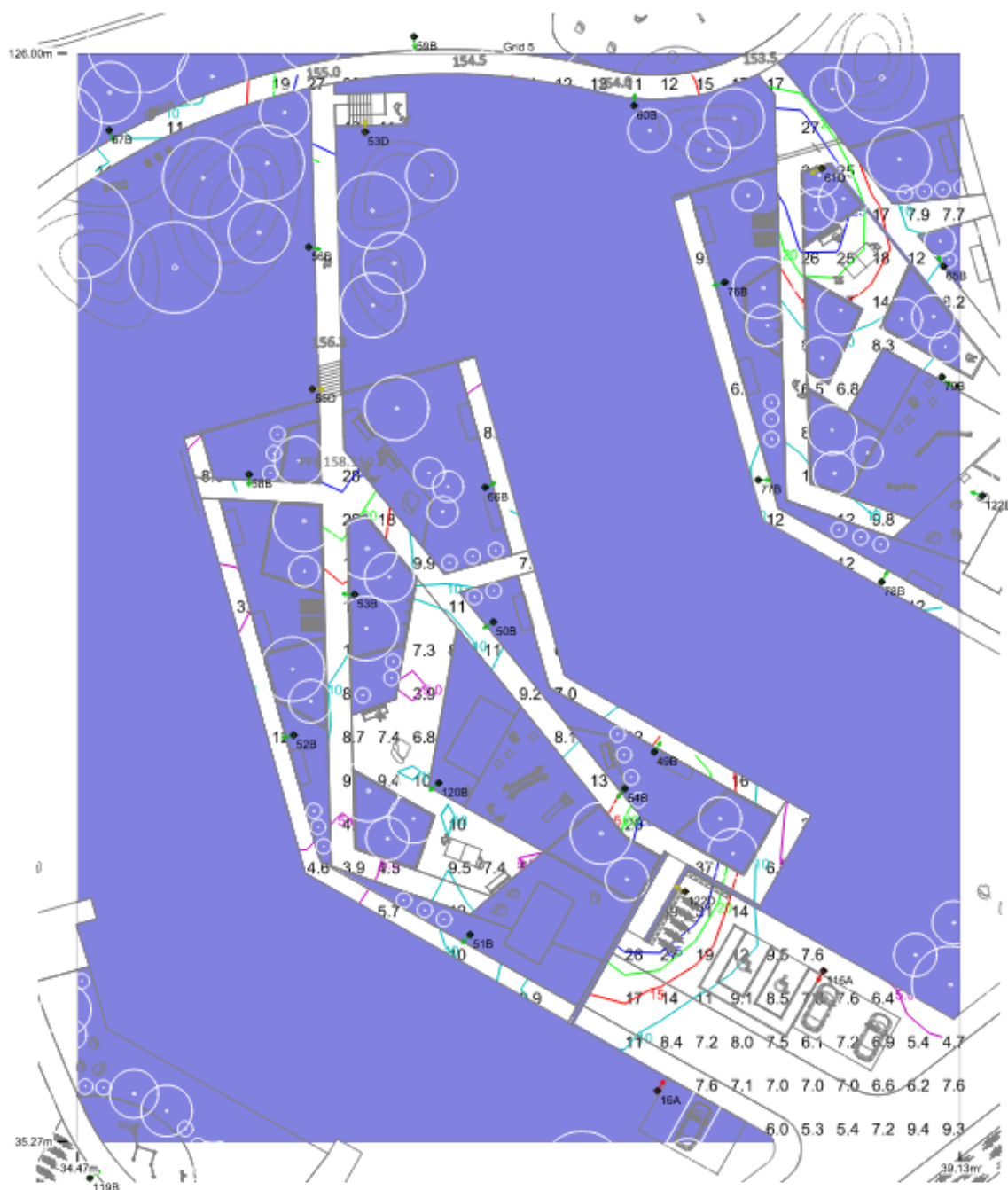
Eav	11.07
Emin	2.48
Emax	45.22
Emin/Emax	0.05
Emin/Eav	0.22

Class P4  
Minimum: 1.5Lux



## Horizontal Illuminance (lux)

Grid 5



### Results

Eav	12.76
Emin	3.21
E <sub>max</sub>	41.53
E <sub>min</sub> /E <sub>max</sub>	0.08
E <sub>min</sub> /E <sub>av</sub>	0.25

Class P4  
Minimum: 1.5Lux

## Conclusion

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

**Table 1 – EN 13201-1-5-Table 3 – Class P Lighting Table**

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.				

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

(13201-5, 2015) The P classes in Table 3 are intended for pedestrian and pedal cyclists 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