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19074-ER-02

Street Lighting Report

RE: Proposed Residential Development

Coolcarron, Fermoy, Co. Cork

The design of the street lighting has been carried out in accordance with the following document, "Cork County Council Policy Guidelines for Exterior Public Lighting Design and Product Specification Manual 2021".

The primary performance criteria to be met as set out in the above mentioned document include the following:

1. Use of LED lighting for any new street lights
2. Recommended outreach distance required for each lighting standard
3. The recommended spacing distance between each light
4. The tilt angle for which the outreach arm should be set
5. The height above the ground for each light
6. Maintained average illuminance Lux levels
7. Maintained minimum illuminance Lux levels
8. Uniformity
9. S/P Ratio

The street lighting has been designed using specialist design software by Lighting Reality Pro. This software allows the user to select a lighting standard from an up to date database of all the latest luminaires. The Thorn R2L2 S 24L35 WR 730 CL2 CLO (28W) was selected for the proposed luminaires within the estate and Thorn R2L2 S24L70 WR 730 CL2 CLO (53W) was selected for the proposed luminaires at the entrance junction to the site from the main road. These lighting standards have a maintenance factor of 0.83, have an individual photocell, and are Top Mounted with Flat Tempered Glass Diffuser & Grey Finish with Warm White LED's. The luminaires were positioned around the site at approximately 30m ± 5m centres for straight roads with closer centres along bends and at junctions as recommended in the CCC street lighting guidelines. The position of each lighting standard was set to the rear of the footpath as per CCC recommendations; however in certain areas were a grass verge is present the lighting standard has been set within the grass verge.

With these luminaires in place a grid was placed over the site. Within the grid we masked out any areas not relating to the calculations (by shading out a portion of the grid the software establishes the actual LUX levels in the areas of direct interest). The resulting maximum, minimum & average illuminance along with uniformity values within this grid were then produced but only relate to the unmasked area as required (see attached report). We have chosen a luminaire with a 6 m standard, an outreach of 0.5m and a minimum tilt angle of 5 degrees. The complete design output along with the Lux contours of the proposed luminaires within the site can be seen with the attached report. The report should be read in conjunction with the attached site lighting plan drawing (19074–P–004(a) & 19074-P-004(b)).

The maintained average illuminance and maintained minimum illuminance values have been met as set out in table 5.2 of the Guidelines for lighting class P3 within the site. The required figures shown in the Lighting P3 class (within estate) & P2 class (entrance junction) tables have been adjusted according to Cork County Council recent policy, where the S/P ratio can be taken into account when designing future Housing Estates/minor road lighting schemes

using the S & P Classes. This adjustment will reduce down both the required Emin and Eav respectively. The S/P ratio is dependent on the specific lantern used.

For the Thorn R2L2 range utilising the 3000K colour temperature (Warm white), this equates to an S/P ratio of 1.23, as stated in the attached street lighting report. This results in the maintained average illuminance and the maintained minimum illuminance required being reduced from 7.5 lux to 6.2 lux and 1.5 lux to 1.25 lux for class P3 and from10.0 lux to 8.6 lux and 2.0 to 1.7 lux for class P2.

Lighting Class P3

Lighting Class	Maintained Average Illuminance, lx SON/LED	Maintained Minimum Illuminance, lx SON/LED	Uniformity
P3	7.5 reduced to 6.2	1.5 reduced to 1.25	0.2
P2	10.0 reduced to 8.6	2.0 reduced to 1.7	0.2

The underlined values represent the figures that we were required to meet with the proposed LED Luminaires for this lighting class in relation to the S/P ratio.

See below for a specification for the proposed luminaires.

Luminaire A has the following proposed specification:

Manufacturer: Thorn (Thorn UK)

Model: Thorn R2L2 S 24L35 WR 730 CL2 CLO (28W), Top Mounted with Flat Tempered Glass Diffuser with Warm White LED's (3000K) with a Lamp Flux 3.65klm

Lighting Column: 6m high lighting column with 0.5 m outreach and a 5° tilt, galvanised steel with a grey finish

Spacing: Approximately 30m ± 5m centres for straight roads with reduced centres for bends / junctions,

Appearance: As per Figure 1.

Figure 1: Thorn R2L2 Street Light

Luminaire B has the following proposed specification:

Manufacturer:	Thorn (Thorn UK)
Model:	Thorn R2L2 S 24L70 WR 730 CL2 CLO (53W), Top Mounted with Flat Tempered Glass Diffuser with Warm White LED's (3000K) with a Lamp Flux 6.53klm
Lighting Column:	6m high lighting column with 0.5 m outreach and a 5° tilt, galvanised steel with a grey finish
Spacing:	Approximately 30m ± 5m centres for straight roads with reduced centres for bends / junctions,
Appearance:	As per Figure 1.

Figure 1: Thorn R2L2 Street Light

Yours Sincerely,

Luke Bridgeman CEng MIEI
For and on behalf of
Walsh Design Group Consulting Engineers

DATE:	**2 March 2022**
DESIGNER:	**WDG**
PROJECT No:	**19074**
PROJECT NAME:	**Coolcarron, Fermoy, Co. Cork**

LIGHTING REALITY

Street Lighting Report

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	580931.00	597203.00	420.00	605.00	1.68	2.42
2	Grid 2	580950.00	597317.00	72.00	60.00	1.50	1.50

Luminaires

Luminaire A Data

Supplier	Thorn UK
Type	R2L2 S - 24 x Warm White 3000K LED 350 mA - WR Optic - Anti-re
Lamp(s)	LED_3000K
LampFlux(klm)/Colour	3.65 3000/70
File Name	RS24L35WR730G35_DC.LDT
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	487.1, 90.8, 0.0
Lamp S/P Ratio	1.23
No. in Project	146

Luminaire B Data

Supplier	Thorn UK
Type	R2L2 S - 24 x Warm White 3000K LED 700 mA - EWR Optic - Anti-r
Lamp(s)	LED_3000K
LampFlux(klm)/Colour	6.53 3000/70
File Name	RS24L70EWR730G35_DC.LDT
Maintenance Factor	0.83
Imax70,80,90(cd/klm)	615.4, 67.1, 0.0
Lamp S/P Ratio	1.23
No. in Project	2

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	581020.96	597354.92	6.00	105.00	5.00	0.00	0.50			
2	A	581038.19	597372.12	6.00	340.00	5.00	0.00	0.50			
3	A	581053.40	597354.74	6.00	215.00	5.00	0.00	0.50			
4	A	581061.46	597329.04	6.00	200.00	5.00	0.00	0.50			
5	A	581071.76	597304.31	6.00	200.00	5.00	0.00	0.50			
6	A	581077.04	597349.48	6.00	105.00	5.00	0.00	0.50			
7	A	581101.07	597365.34	6.00	285.00	5.00	0.00	0.50			
8	A	581076.03	597283.02	6.00	175.00	5.00	0.00	0.50			
9	A	581079.46	597259.64	6.00	190.00	5.00	0.00	0.50			
10	A	581083.91	597237.78	6.00	130.00	5.00	0.00	0.50			
11	A	581086.35	597217.84	6.00	185.00	5.00	0.00	0.50			
12	A	581094.95	597254.45	6.00	280.00	5.00	0.00	0.50			
13	A	581116.25	597243.96	6.00	100.00	5.00	0.00	0.50			
14	A	581095.40	597294.08	6.00	285.00	5.00	0.00	0.50			
15	A	581118.17	597292.10	6.00	140.00	5.00	0.00	0.50			
16	A	581102.63	597270.61	6.00	15.00	5.00	0.00	0.50			
17	A	581137.63	597253.27	6.00	280.00	5.00	0.00	0.50			
18	A	581164.70	597252.16	6.00	105.00	5.00	0.00	0.50			
19	A	581135.70	597231.35	6.00	10.00	5.00	0.00	0.50			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
20	A	581166.12	597277.33	6.00	195.00	5.00	0.00	0.50			
21	A	581187.42	597263.52	6.00	275.00	5.00	0.00	0.50			
22	A	581233.18	597272.28	6.00	280.00	5.00	0.00	0.50			
23	A	581213.06	597260.60	6.00	100.00	5.00	0.00	0.50			
24	A	581220.00	597288.30	6.00	20.00	5.00	0.00	0.50			
25	A	581258.11	597271.73	6.00	115.00	5.00	0.00	0.50			
26	A	581217.15	597317.67	6.00	195.00	5.00	0.00	0.50			
27	A	581205.34	597340.72	6.00	15.00	5.00	0.00	0.50			
28	A	581127.44	597362.42	6.00	55.00	5.00	0.00	0.50			
29	A	581134.45	597341.87	6.00	15.00	5.00	0.00	0.50			
30	A	581139.92	597320.30	6.00	10.00	5.00	0.00	0.50			
31	A	581155.66	597297.03	6.00	195.00	5.00	0.00	0.50			
32	A	581156.66	597358.40	6.00	285.00	5.00	0.00	0.50			
33	A	581204.98	597365.86	6.00	190.00	5.00	0.00	0.50			
34	A	581178.39	597364.21	6.00	285.00	5.00	0.00	0.50			
35	A	581197.58	597391.21	6.00	285.00	5.00	0.00	0.50			
36	A	581145.64	597377.73	6.00	285.00	5.00	0.00	0.50			
37	A	581172.42	597384.24	6.00	285.00	5.00	0.00	0.50			
38	A	581228.80	597389.76	6.00	105.00	5.00	0.00	0.50			
39	A	581250.70	597405.60	6.00	285.00	5.00	0.00	0.50			
40	A	581277.44	597290.27	6.00	300.00	5.00	0.00	0.50			
41	A	581301.26	597303.50	6.00	300.00	5.00	0.00	0.50			
42	A	581279.84	597312.35	6.00	10.00	5.00	0.00	0.50			
43	A	581323.64	597307.16	6.00	120.00	5.00	0.00	0.50			
44	A	581334.85	597292.08	6.00	30.00	5.00	0.00	0.50			
45	A	581278.49	597338.39	6.00	195.00	5.00	0.00	0.50			
46	A	581271.82	597363.42	6.00	195.00	5.00	0.00	0.50			
47	A	581265.03	597388.62	6.00	195.00	5.00	0.00	0.50			
48	A	581065.74	597367.71	6.00	105.00	5.00	0.00	0.50			
49	A	581096.00	597374.95	6.00	105.00	5.00	0.00	0.50			
50	A	581110.90	597402.57	6.00	200.00	5.00	0.00	0.50			
51	A	581129.69	597386.79	6.00	280.00	5.00	0.00	0.50			
52	A	581158.91	597391.12	6.00	100.00	5.00	0.00	0.50			
53	A	581014.92	597379.37	6.00	15.00	5.00	0.00	0.50			
54	A	581035.97	597396.69	6.00	195.00	5.00	0.00	0.50			
55	A	581027.22	597419.15	6.00	205.00	5.00	0.00	0.50			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
56	A	580996.59	597446.62	6.00	290.00	5.00	0.00	0.50			
57	A	581020.77	597455.24	6.00	295.00	5.00	0.00	0.50			
58	A	581092.43	597424.37	6.00	25.00	5.00	0.00	0.50			
59	A	581091.65	597455.79	6.00	200.00	5.00	0.00	0.50			
60	A	581068.39	597484.90	6.00	50.00	5.00	0.00	0.50			
61	A	581042.21	597449.38	6.00	105.00	5.00	0.00	0.50			
62	A	581015.08	597437.56	6.00	20.00	5.00	0.00	0.50			
63	A	581056.70	597473.62	6.00	290.00	5.00	0.00	0.50			
64	A	581047.80	597489.68	6.00	20.00	5.00	0.00	0.50			
65	A	581056.57	597519.95	6.00	195.00	5.00	0.00	0.50			
66	A	581032.21	597533.06	6.00	345.00	5.00	0.00	0.50			
67	A	581052.14	597544.54	6.00	110.00	5.00	0.00	0.50			
68	A	581054.27	597565.54	6.00	200.00	5.00	0.00	0.50			
69	A	581046.40	597584.40	6.00	195.00	5.00	0.00	0.50			
70	A	581030.29	597603.82	6.00	20.00	5.00	0.00	0.50			
71	A	581022.22	597626.86	6.00	25.00	5.00	0.00	0.50			
72	A	581016.42	597649.81	6.00	355.00	5.00	0.00	0.50			
73	A	581019.90	597667.45	6.00	150.00	5.00	0.00	0.50			
74	A	581184.24	597399.34	6.00	105.00	5.00	0.00	0.50			
75	A	581213.01	597409.99	6.00	105.00	5.00	0.00	0.50			
76	A	581229.84	597443.17	6.00	210.00	5.00	0.00	0.50			
77	A	581244.37	597423.12	6.00	240.00	5.00	0.00	0.50			
78	A	581220.33	597469.00	6.00	205.00	5.00	0.00	0.50			
79	A	581210.69	597495.91	6.00	200.00	5.00	0.00	0.50			
80	A	581194.85	597517.70	6.00	230.00	5.00	0.00	0.50			
81	A	581168.41	597413.79	6.00	20.00	5.00	0.00	0.50			
82	A	581164.47	597439.52	6.00	200.00	5.00	0.00	0.50			
83	A	581148.54	597468.04	6.00	15.00	5.00	0.00	0.50			
84	A	581143.95	597495.40	6.00	200.00	5.00	0.00	0.50			
85	A	581132.94	597510.13	6.00	105.00	5.00	0.00	0.50			
86	A	581119.36	597521.31	6.00	290.00	5.00	0.00	0.50			
87	A	581081.98	597500.30	6.00	290.00	5.00	0.00	0.50			
88	A	581156.06	597518.68	6.00	110.00	5.00	0.00	0.50			
89	A	581172.20	597533.36	6.00	280.00	5.00	0.00	0.50			
90	A	581194.24	597532.04	6.00	115.00	5.00	0.00	0.50			
91	A	581078.19	597554.84	6.00	110.00	5.00	0.00	0.50			

Layout Continued

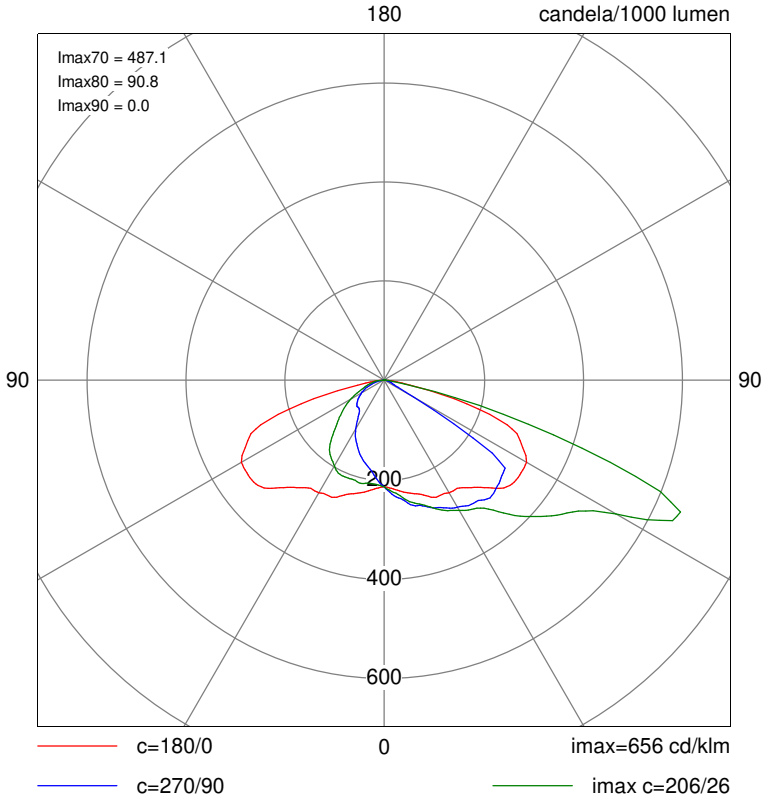
ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
92	A	581105.99	597573.80	6.00	290.00	5.00	0.00	0.50			
93	A	581134.67	597574.97	6.00	55.00	5.00	0.00	0.50			
94	A	581131.17	597590.52	6.00	195.00	5.00	0.00	0.50			
95	A	581121.45	597608.12	6.00	15.00	5.00	0.00	0.50			
96	A	581046.72	597620.46	6.00	290.00	5.00	0.00	0.50			
97	A	581065.55	597617.88	6.00	110.00	5.00	0.00	0.50			
98	A	581104.38	597642.96	6.00	250.00	5.00	0.00	0.50			
99	A	581118.12	597653.70	6.00	205.00	5.00	0.00	0.50			
100	A	581087.88	597660.45	6.00	20.00	5.00	0.00	0.50			
101	A	581078.88	597682.70	6.00	20.00	5.00	0.00	0.50			
102	A	581058.89	597692.94	6.00	290.00	5.00	0.00	0.50			
103	A	581078.05	597705.52	6.00	205.00	5.00	0.00	0.50			
104	A	581066.98	597733.29	6.00	200.00	5.00	0.00	0.50			
105	A	581052.52	597739.39	6.00	110.00	5.00	0.00	0.50			
106	A	581008.61	597722.82	6.00	110.00	5.00	0.00	0.50			
107	A	580987.62	597719.90	6.00	30.00	5.00	0.00	0.50			
108	A	581009.82	597745.53	6.00	195.00	5.00	0.00	0.50			
109	A	580979.62	597742.39	6.00	290.00	5.00	0.00	0.50			
110	A	581005.32	597761.74	6.00	195.00	5.00	0.00	0.50			
111	A	581301.88	597336.19	6.00	240.00	5.00	0.00	0.50			
112	A	581287.39	597354.68	6.00	25.00	5.00	0.00	0.50			
113	A	581273.61	597379.58	6.00	20.00	5.00	0.00	0.50			
114	A	581245.79	597431.98	6.00	25.00	5.00	0.00	0.50			
115	A	581231.98	597458.38	6.00	20.00	5.00	0.00	0.50			
116	A	581218.57	597483.69	6.00	20.00	5.00	0.00	0.50			
117	A	581204.59	597508.93	6.00	35.00	5.00	0.00	0.50			
118	A	581163.14	597543.18	6.00	50.00	5.00	0.00	0.50			
119	A	581149.45	597559.02	6.00	235.00	5.00	0.00	0.50			
120	A	581122.28	597537.07	6.00	20.00	5.00	0.00	0.50			
121	A	581092.87	597526.16	6.00	160.00	5.00	0.00	0.50			
123	A	581116.98	597559.51	6.00	205.00	5.00	0.00	0.50			
124	A	581122.20	597630.38	6.00	165.00	5.00	0.00	0.50			
125	A	581086.38	597626.38	6.00	110.00	5.00	0.00	0.50			
126	A	581103.16	597671.24	6.00	35.00	5.00	0.00	0.50			
127	A	581096.46	597699.53	6.00	195.00	5.00	0.00	0.50			
128	A	581079.29	597727.25	6.00	25.00	5.00	0.00	0.50			

Layout Continued

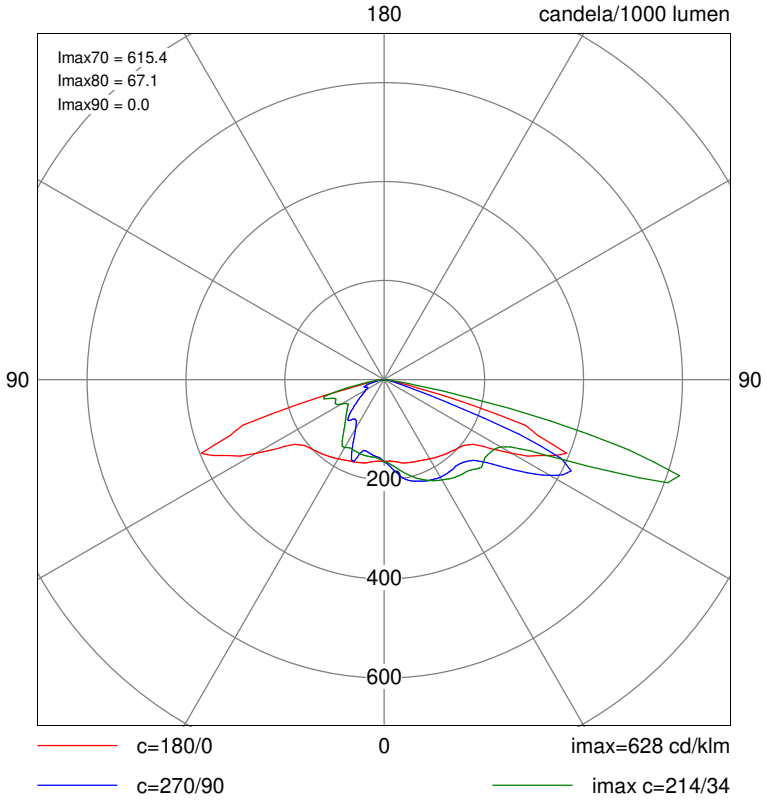
ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
129	A	581067.58	597757.31	6.00	230.00	5.00	0.00	0.50			
130	A	581063.80	597773.59	6.00	350.00	5.00	0.00	0.50			
131	A	581071.94	597790.58	6.00	208.00	5.00	0.00	0.50			
132	A	581004.22	597773.91	6.00	295.00	5.00	0.00	0.50			
133	A	581023.67	597761.52	6.00	20.00	5.00	0.00	0.50			
134	A	581028.60	597741.67	6.00	300.00	5.00	0.00	0.50			
135	A	581026.17	597781.01	6.00	285.00	5.00	0.00	0.50			
136	A	581063.30	597503.49	6.00	195.00	5.00	0.00	0.50			
137	A	581040.66	597508.47	6.00	25.00	5.00	0.00	0.50			
137	A	581056.02	597797.43	6.00	20.00	5.00	0.00	0.50			
140	A	581084.83	597473.89	6.00	195.00	5.00	0.00	0.50			
141	A	581317.10	597324.13	6.00	220.00	5.00	0.00	0.50			
142	B	580960.71	597365.09	6.00	355.00	5.00	0.00	0.50			
143	A	581152.49	597273.57	6.00	15.00	5.00	0.00	0.50			
144	A	581070.43	597535.59	6.00	15.00	5.00	0.00	0.50			
145	A	581107.36	597500.98	6.00	120.00	5.00	0.00	0.50			
146	A	581098.90	597511.48	6.00	120.00	5.00	0.00	0.50			
147	A	581102.40	597552.51	6.00	335.00	5.00	0.00	0.50			
146	A	581041.06	597677.61	6.00	115.00	5.00	0.00	0.50			
147	A	580996.19	597732.89	6.00	105.00	5.00	0.00	0.50			
148	B	580986.17	597367.46	6.00	275.00	5.00	0.00	0.50			

Polar Diagrams

Luminaire A R2L2 S - 24 x Warm White 3000K LED 350mA - WR Optic - Anti-re



Luminaire B R2L2 S - 24 x Warm White 3000K LED 700mA - EWR Optic - Anti-r



8514899039

Horizontal Illuminance (lux)

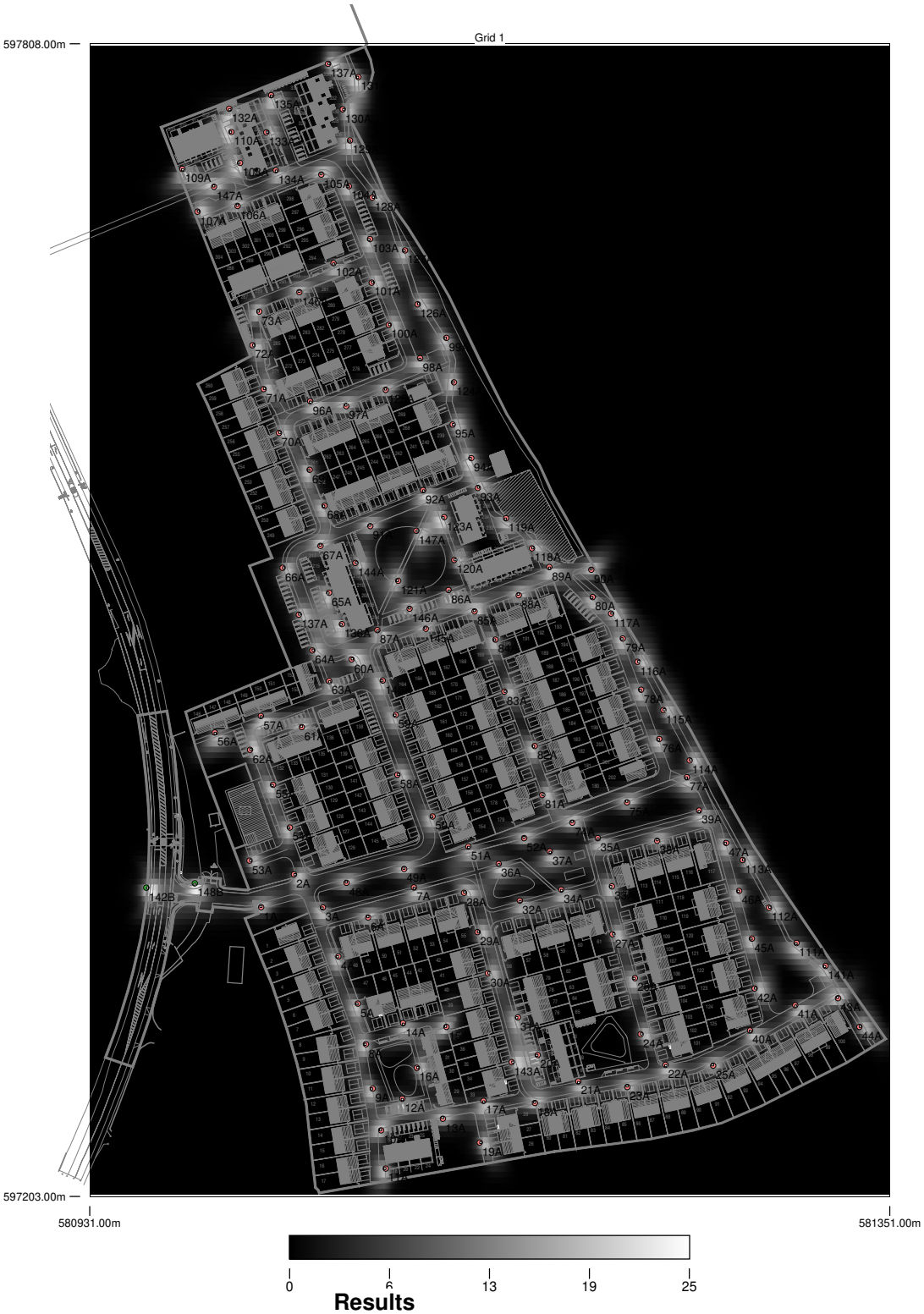
Grid 1

Results

Eav	9.66
Emin	1.90
Emax	24.66
Emin/Emax	0.08
Emin/Eav	0.20

Horizontal Illuminance (lux)

Grid 1



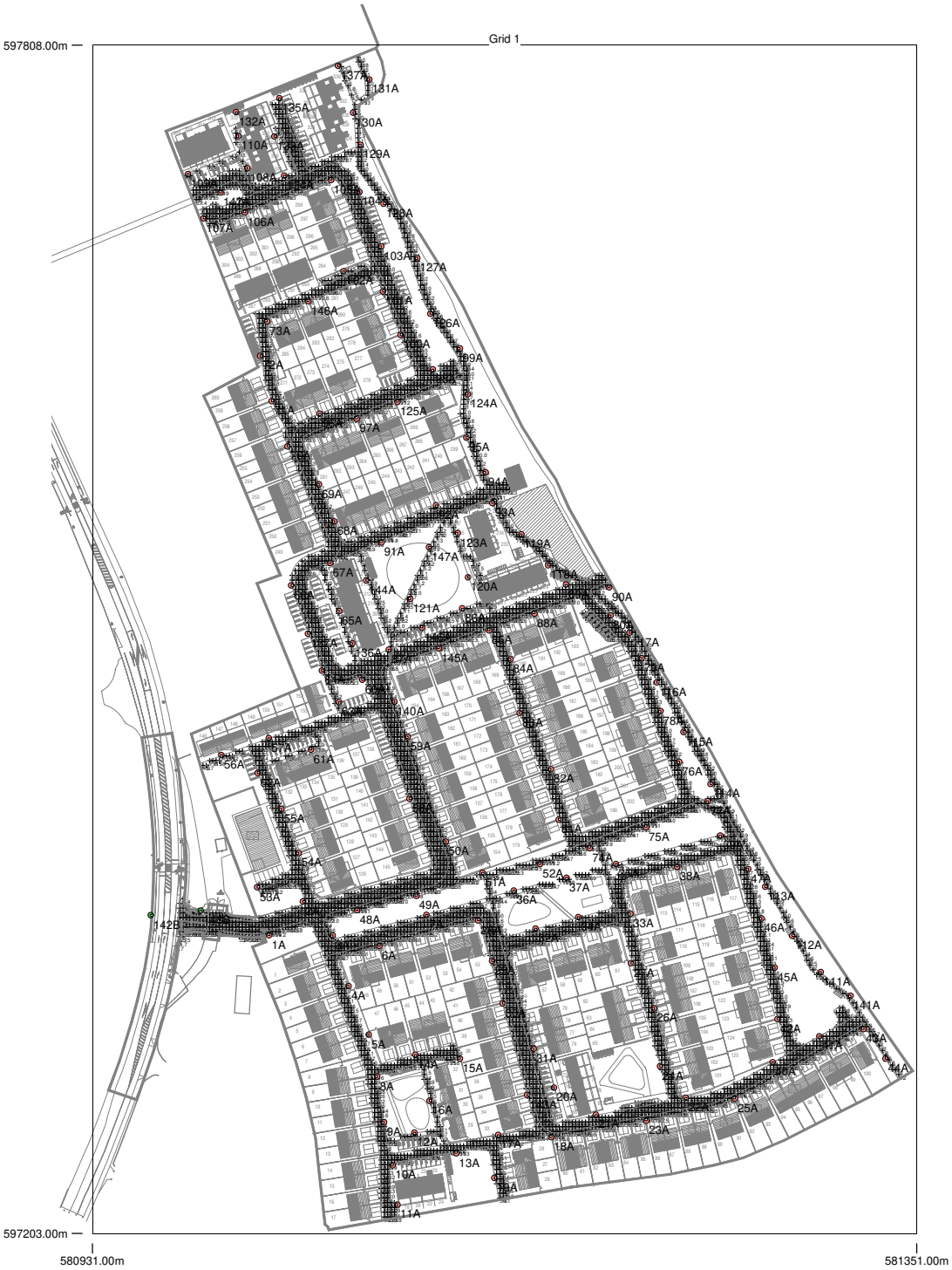
Results

Eav	9.66
Emin	1.90
Emax	24.66
Emin/Emax	0.08
Emin/Eav	0.20

8514899039

Horizontal Illuminance (lux)

Grid 1



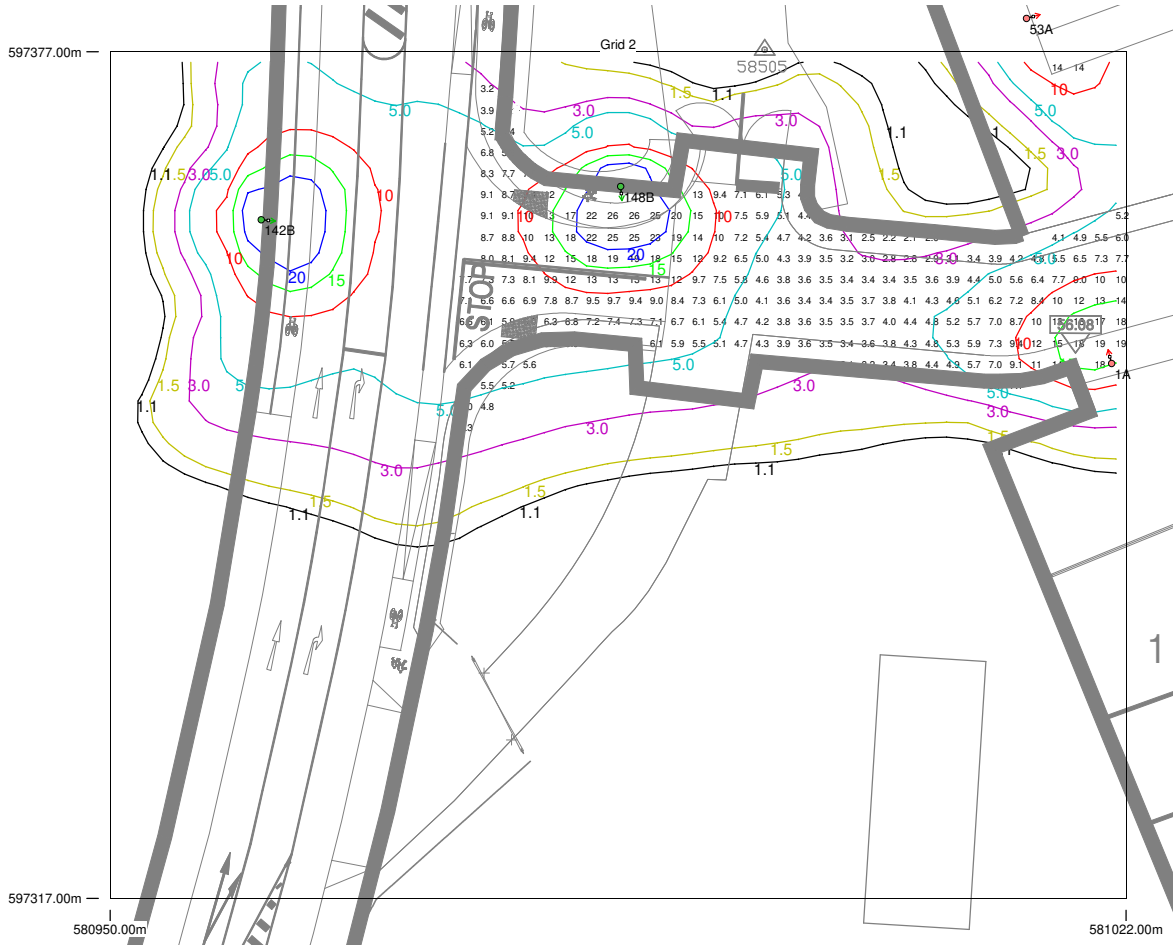
Results

Eav	9.66
Emin	1.90
Emax	24.66
Emin/Emax	0.08
Emin/Eav	0.20

8514899039

Horizontal Illuminance (lux)

Grid 2

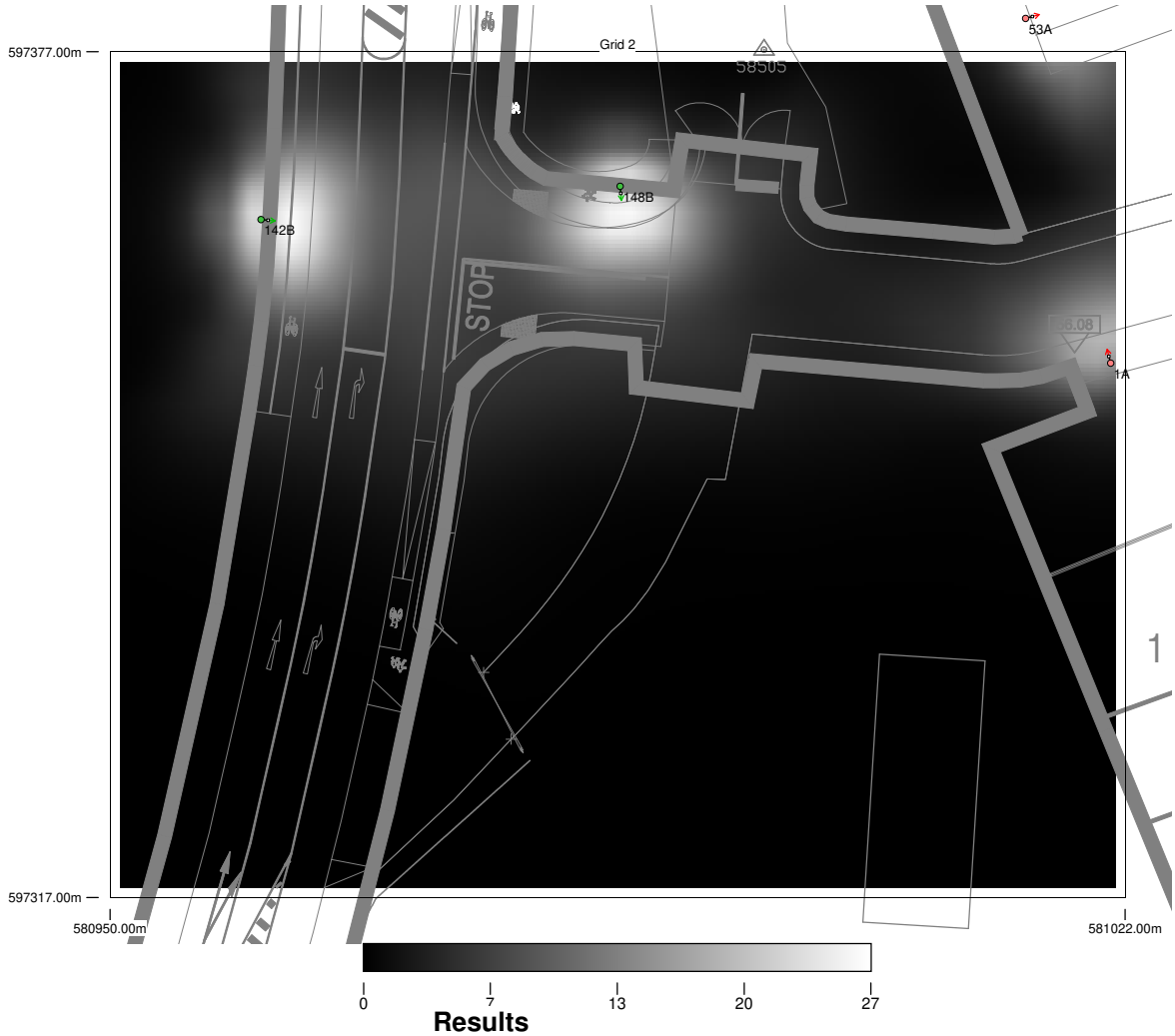


Results

Eav	7.89
Emin	2.02
Emax	26.44
Emin/Emax	0.08
Emin/Eav	0.26

Horizontal Illuminance (lux)

Grid 2



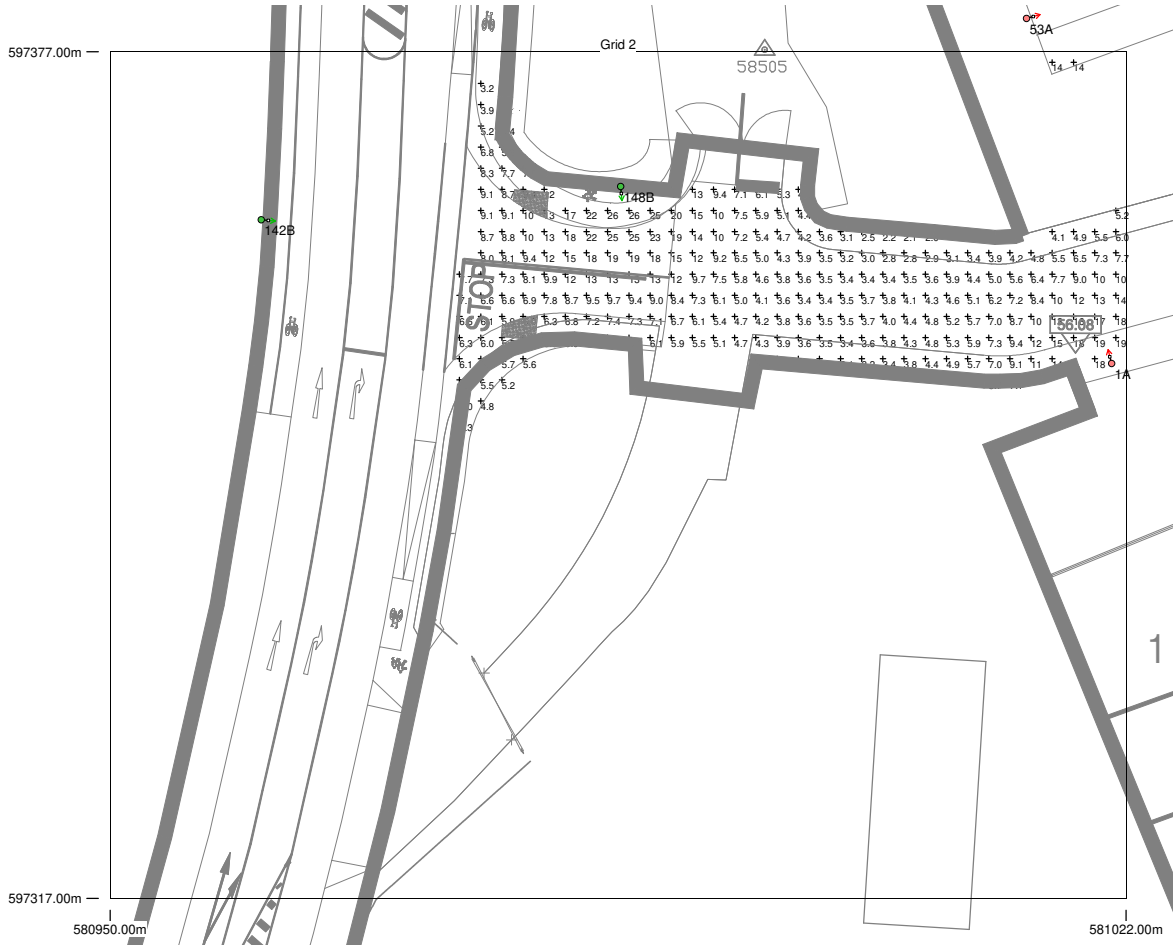
Results

Eav	7.89
Emin	2.02
Emax	26.44
Emin/Emax	0.08
Emin/Eav	0.26

8514899039

Horizontal Illuminance (lux)

Grid 2



Results

Eav	7.89
Emin	2.02
Emax	26.44
Emin/Emax	0.08
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8514899039