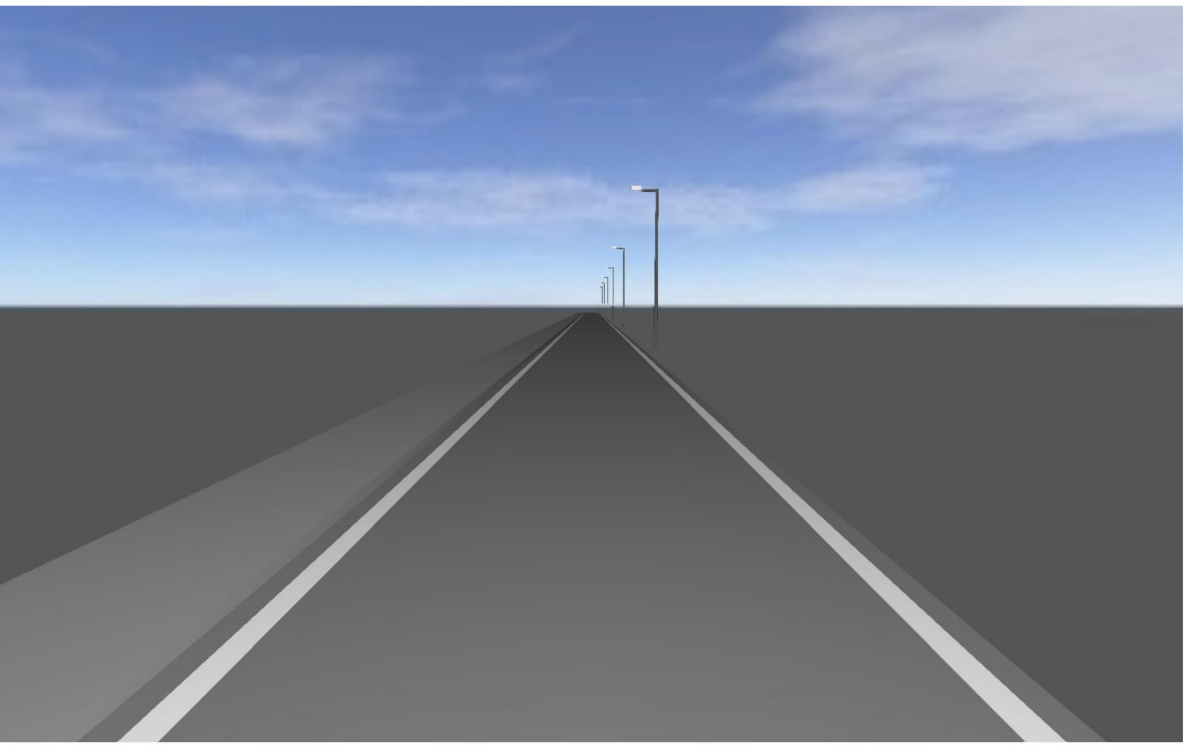
Date 01-Feb-24

CDGA Consultants



Project Name: Gerald Griffin Street Social Housing Development

Project Number: C49-23-01
Client & Appointing Party: Cork City Council
Lead Appointed Party: MMD Construction
Project Location: Gerald Griffin Street, Cork
Project Phase: Part 8 Application

Object
Gerald Griffin Street, Cork, Ireland

Table of Contents

Cover 1
Table of Contents 2
Contacts 3
Description 4

Product data sheets

Thorn Lighting - CQ 24L50 730 RC BS 3550 CL2 M60 GY-S [STD] (1x LED 38 W) 6

Burkes Avenue · Alternative 4

Description 7
Summary (according to EN 13201:2015) 8
Sidewalk 1 (P2) 11
Roadway 1 (M4) 13
Sidewalk 2 (P2) 17

Gerald Griffin Avenue · Alternative 3

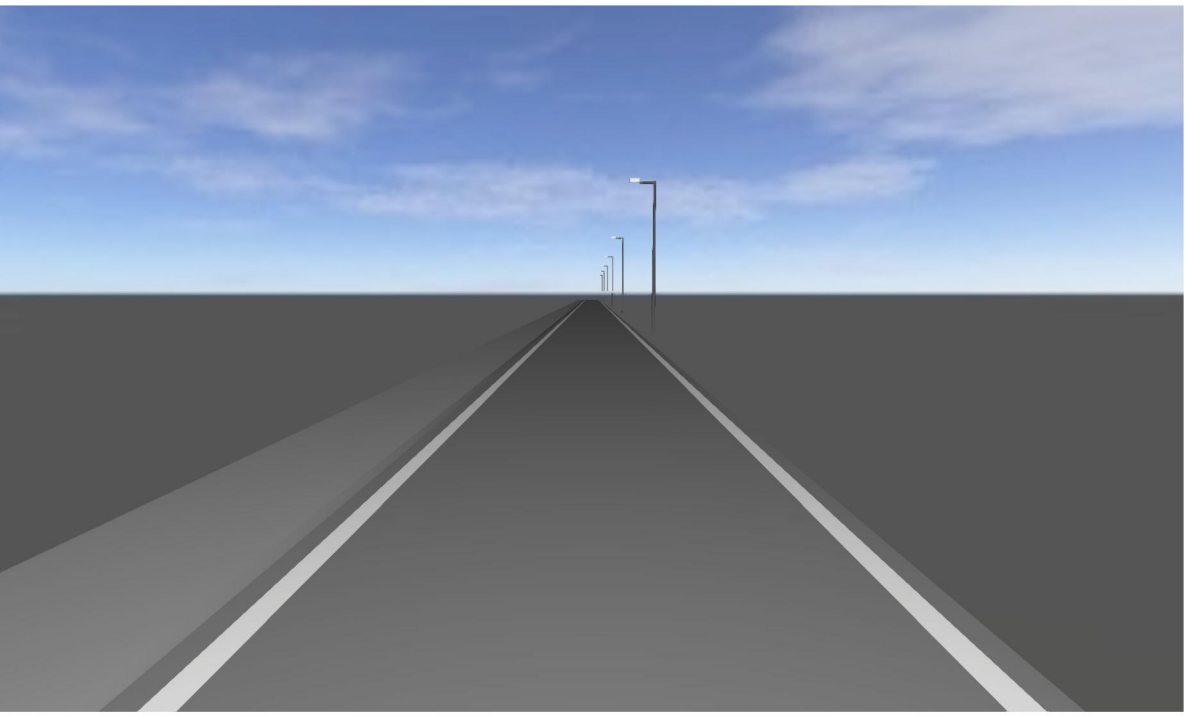
Description 19
Summary (according to EN 13201:2015) 20
Sidewalk 1 (P2) 23
Roadway 1 (M4) 24

Contacts

Design Engineer
Preslav Radev

CDGA Consultants
Unit 3012, Block 3
Euro Business Park, Little
Island, Co Cork, Ireland

T +353 21 455 2955
info@cdga.ie



Description

1.1 This report aims to determine the classification of both existing and new roads in proximity to the future Gerald Griffin Street Social Housing Development. The assessment focuses on establishing the necessary lighting levels and parameters to facilitate a high-quality street lighting design.

1.2 Environmental stewardship and biodiversity preservation are prioritized in compliance with key directives and regulations. The report ensures adherence to established guidelines to promote efficient and sustainable public road lighting.

1.3 The report adheres to the following standards and guidelines,including:

- EN-13201-1 to 5 European Standards for Road Lighting
- National Rules for Electric Installations (IS-10101)
- ILP Technical Report PLG-23 "Guidance on the Lighting of Cycle Tracks"
- Cork City Council Guidelines for Public Road Lighting
- CCC Public Lighting Design Guidance Document
- CCC Public Lighting Manual and Product Specification

1.4 Lighting calculations utilize fixtures specified within the CCC Exterior Lighting Design Requirements, Guidance & Specification Manual for Lighting Equipment Supply, Installation & Maintenance, Appendix 4.

Design Engineer
Preslav Radev

CDGA Consultants
Unit 3012, Block 3
Euro Business Park, Little Island, Co Cork, Ireland

T +353 21 455 2955
info@cdga.ie

1.5 Road lighting requirements followed:

- Classification of the area based on existing ambient lighting levels as Environmental Zone E4/Surrounding - Urban/Environment with High District Brightness and a required glare rating of G2 or higher.

- A recommended color temperature of 3000K for public lighting luminaires in City/Town/Village Centres.

- Prescribed lighting classes for Main Roads ≤50km/h: P2 / M4 / C4.

- Disability Glare Restriction: LED luminaires must belong to Installe Luminous Intensity Class G1 to restrict disability glare.

- Color Quality: LED modules should adhere to a color temperature of 3000K and a minimum Color Rendering Index (CRI) of 70 (Ra ≥ 70

- Luminous Efficacy: Minimum lighting luminous efficacy for the complete luminaire at proposed driver current should be 120lm/W.

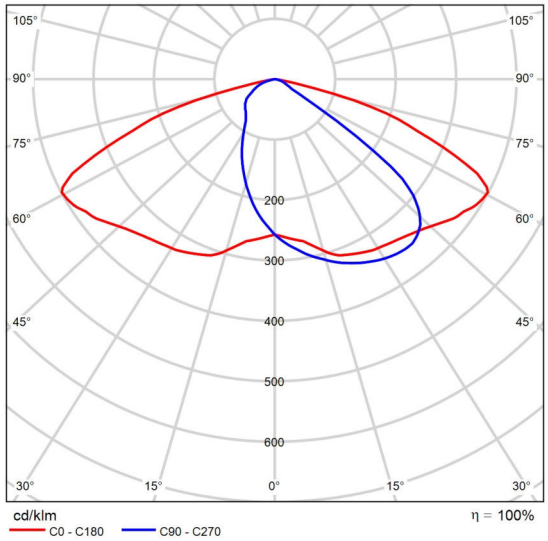
- Light poles for residential and low volume subsidiary roads - 6m.

By incorporating these additional points, the report provides a comprehensive overview of the specific lighting requirements, ensuring a balanced approach to both functional and aesthetic aspects of public road lighting.

Product data sheet

Thorn Lighting - CQ 24L50 730 RC BS 3550 CL2 M60 GY-S [STD]

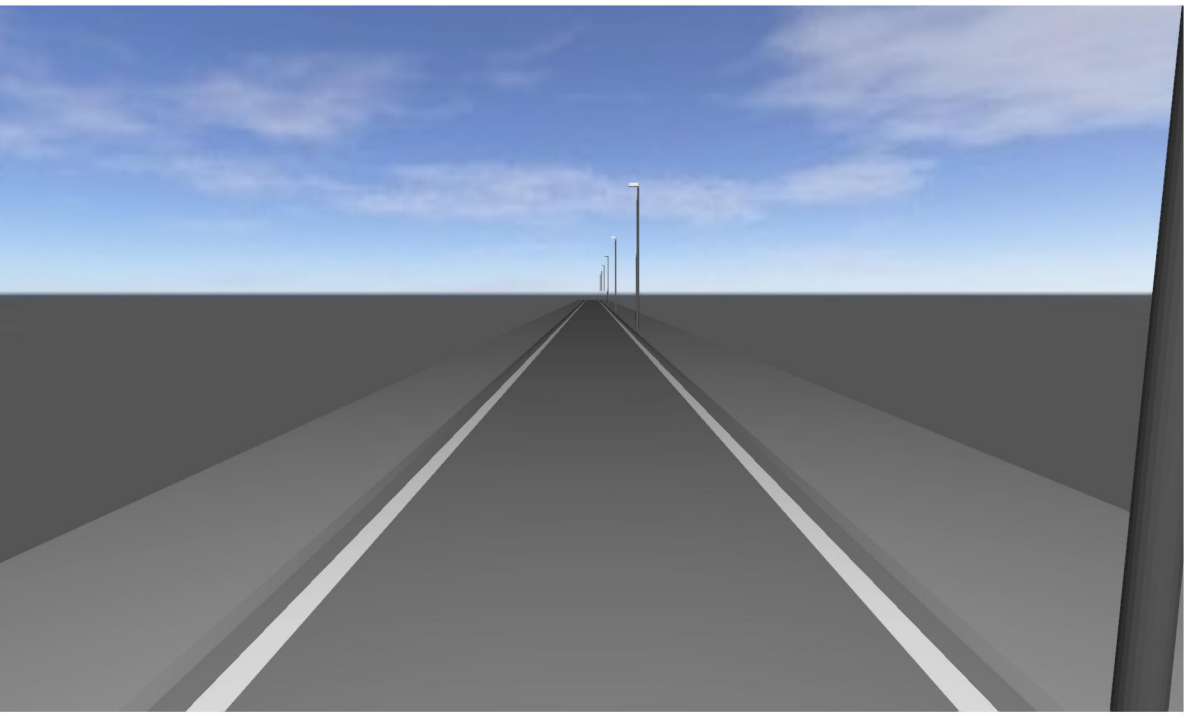
Article No.	96628704
P	38.0 W
Φ_{Lamp}	5347 lm
$\Phi_{Luminaire}$	5347 lm
η	100.00 %
Luminous efficacy	140.7 lm/W
CCT	3000 K
CRI	70



Polar LDC

A small size LED road lighting lantern with 24 LEDs driven at 500mA with Road & Comfort optic. Electronic, fixed output control gear. Class II electrical, IP66, IK08. Housing: die-cast aluminium (EN AC-44300), Light grey 150 sanded textured (close to RAL9006). Enclosure: toughened flat glass. Screws: stainless steel, Ecolubric® treated. Supplied with Ø60mm spigot adaptor which can be fitted for post-top (0°/5°/10° tilt) or side-entry (-20°/-15°/-10°/-5°/0° tilt). 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. Surge protection: 10kV single pulse common mode and 8kV multipulse common mode and 6kV multipulse differential mode. If permanent DALI system is connected, 6kV multipulse common and differential mode.

Dimensions: 390 x 230 x 133 mm
Luminaire input power: 38 W
Luminaire luminous flux: 5347 lm
Luminaire efficacy: 141 lm/W
Weight: 5.6 kg
Scx: 0.077 m^2

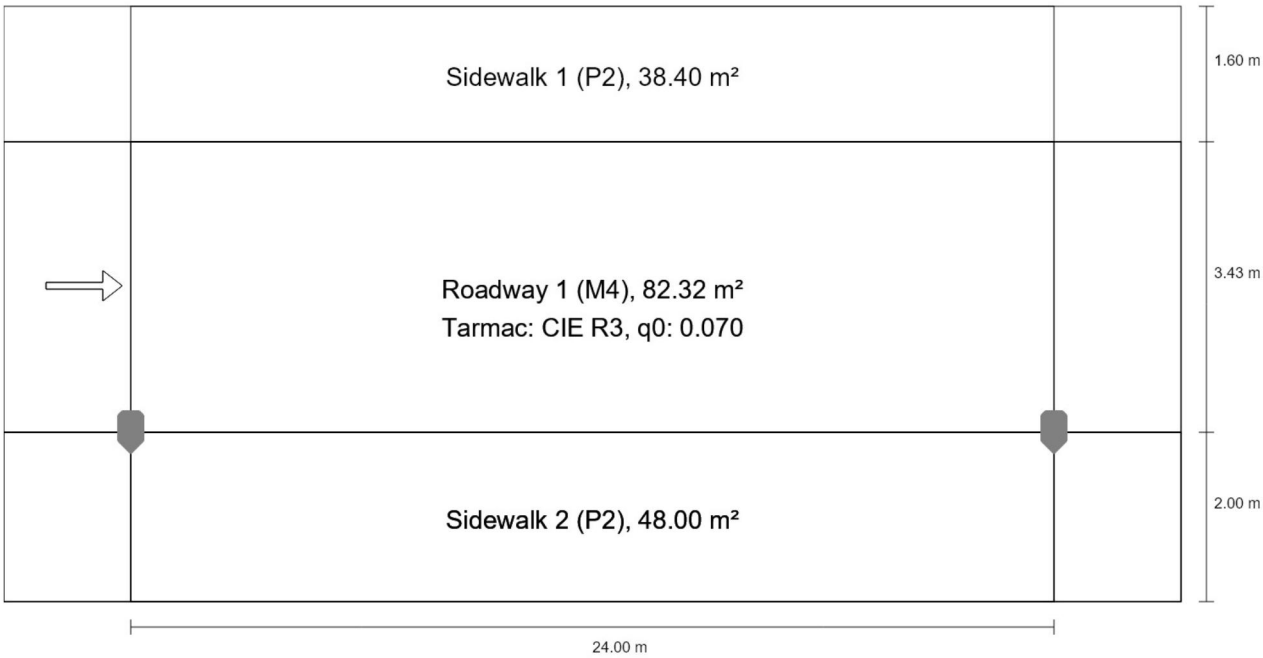


Burkes Avenue

Description

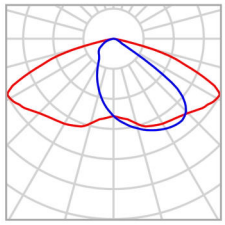
Burkes Avenue

Summary (according to EN 13201:2015)



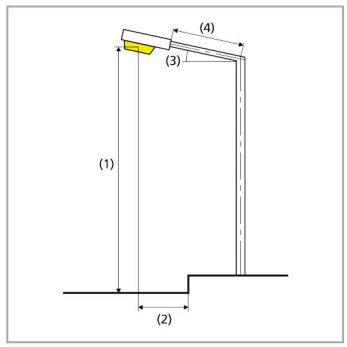
Burkes Avenue

Summary (according to EN 13201:2015)



Manufacturer	Thorn Lighting	P	38.0 W
Article No.	96628704	Φ_{Lamp}	5347 lm
Article name	CQ 24L50 730 RC BS 3550 CL2 M60 GY-S [STD]	$\Phi_{Luminaire}$	5347 lm
		η	100.00 %
Fitting	1x LED 38 W		

CQ 24L50 730 RC BS 3550 CL2 M60 GY-S [STD] (single side bottom)



Pole distance	24.000 m
(1) Light spot height	6.000 m
(2) Light point overhang	0.000 m
(3) Boom inclination	0.0°
(4) Boom length	0.005 m
Annual operating hours	4000 h: 100.0 %, 38.0 W
Wattage / route	1596.0 W/km
ULR / ULOR	0.00 / 0.00
Max. luminous intensities Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	≥ 70°: 346 cd/klm ≥ 80°: 41.2 cd/klm ≥ 90°: 0.00 cd/klm
Luminous intensity class The luminous intensity values in [cd/klm] for calculation of the luminous intensity class refer to the luminaire luminous flux according to EN 13201:2015.	G*6
Glare index class	D.6
MF	0.80

Burkes Avenue

Summary (according to EN 13201:2015)

Results for valuation fields

A maintenance factor of 0.80 was used for calculating for the installation.

	Symbol	Calculated	Target	Check
Sidewalk 1 (P2)	E_{av}	14.85 lx	[10.00 - 15.00] lx	✓
	E_{min}	8.93 lx	≥ 2.00 lx	✓
Roadway 1 (M4)	L_{av}	1.21 cd/m²	≥ 0.75 cd/m²	✓
	U_o	0.60	≥ 0.40	✓
	U_l	0.62	≥ 0.60	✓
	TI	9 %	≤ 15 %	✓
	R_{EI}(1)	0.64	–	
Sidewalk 2 (P2)	E_{av}	14.97 lx	[10.00 - 15.00] lx	✓
	E_{min}	5.25 lx	≥ 2.00 lx	✓

(1) Informative, not part of the valuation

Results for energy efficiency indicators

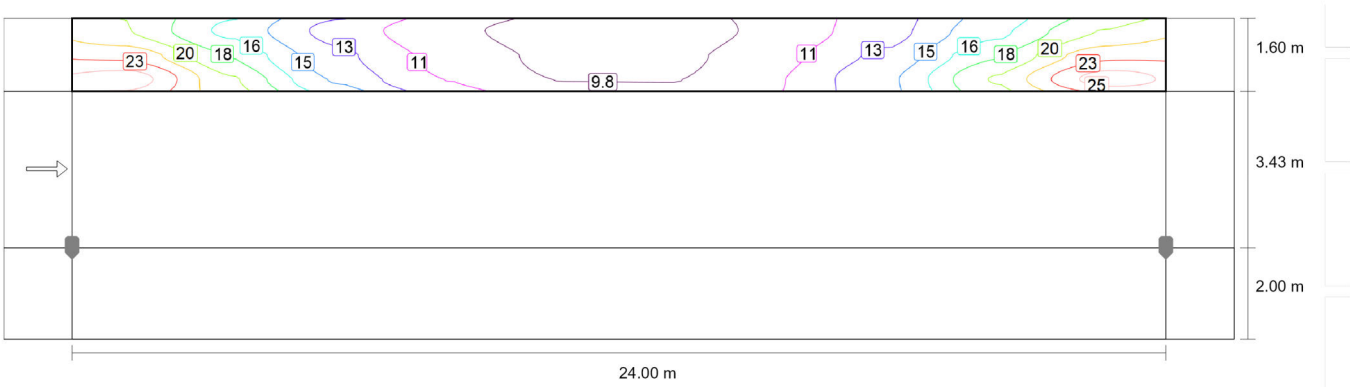
	Symbol	Calculated	Energy Consumption
Burkes Avenue	D_p	0.013 W/lx*m²	–
CQ 24L50 730 RC BS 3550 CL2 M60 GY-S [STD] (single side bottom)	D_e	0.9 kWh/m² yr	152.0 kWh/yr

Burkes Avenue

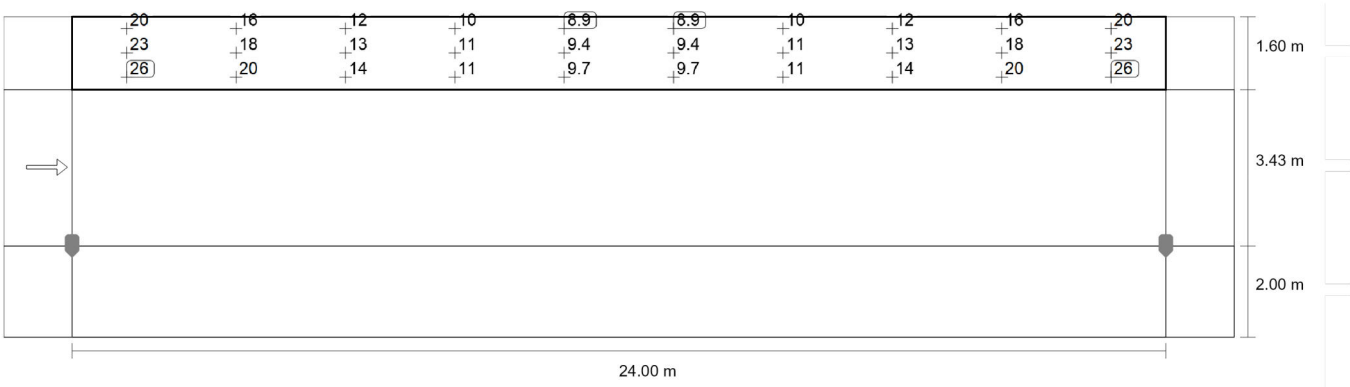
Sidewalk 1 (P2)

Results for valuation field

	Symbol	Calculated	Target	Check
Sidewalk 1 (P2)	E_{av}	14.85 lx	[10.00 - 15.00] lx	✓
	E_{min}	8.93 lx	≥ 2.00 lx	✓



Maintenance value, horizontal illuminance [lx] (Iso-illuminance curves)



Maintenance value, horizontal illuminance [lx] (Value grid)

Burkes Avenue

Sidewalk 1 (P2)

m	1.200	3.600	6.000	8.400	10.800	13.200	15.600	18.000	20.400	22.800
6.763	19.84	16.00	12.43	10.24	8.93	8.93	10.24	12.43	16.00	19.84
6.230	22.63	17.92	13.47	10.89	9.39	9.39	10.89	13.47	17.92	22.63
5.697	25.52	19.89	14.45	11.36	9.72	9.72	11.36	14.45	19.89	25.52

Maintenance value, horizontal illuminance [lx] (Value chart)

	E_{av}	E_{min}	E_{max}	U_o (g_1)	g_2
Maintenance value, horizontal illuminance	14.8 lx	8.93 lx	25.5 lx	0.60	0.35

Burkes Avenue

Roadway 1 (M4)

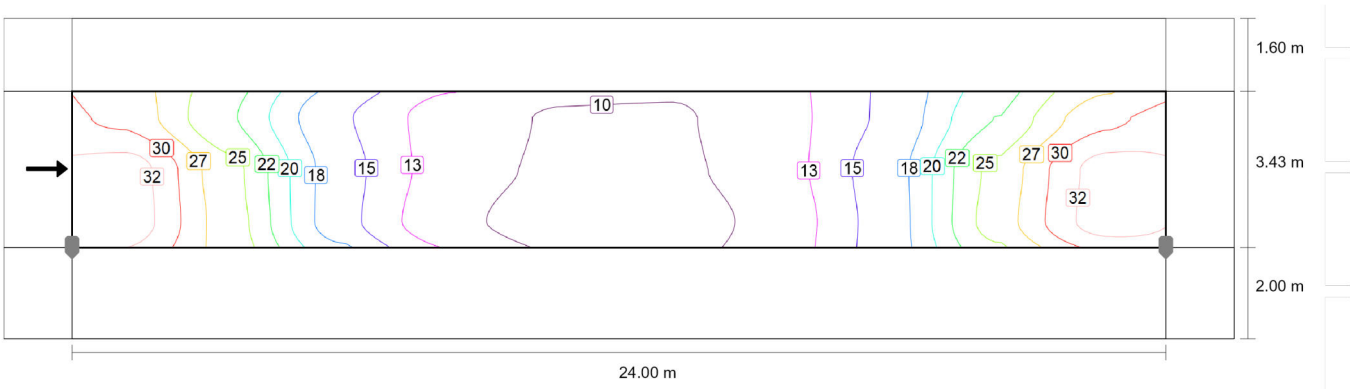
Results for valuation field

	Symbol	Calculated	Target	Check
Roadway 1 (M4)	L_{av}	1.21 cd/m²	≥ 0.75 cd/m²	✓
	U_o	0.60	≥ 0.40	✓
	U_l	0.62	≥ 0.60	✓
	TI	9 %	≤ 15 %	✓
	R_{EI}(1)	0.64	–	

Results for observer

	Symbol	Calculated	Target	Check
Observer 1 Position: -60.000 m, 3.715 m, 1.500 m	L_{av}	1.21 cd/m²	≥ 0.75 cd/m²	✓
	U_o	0.60	≥ 0.40	✓
	U_l	0.62	≥ 0.60	✓
	TI	9 %	≤ 15 %	✓

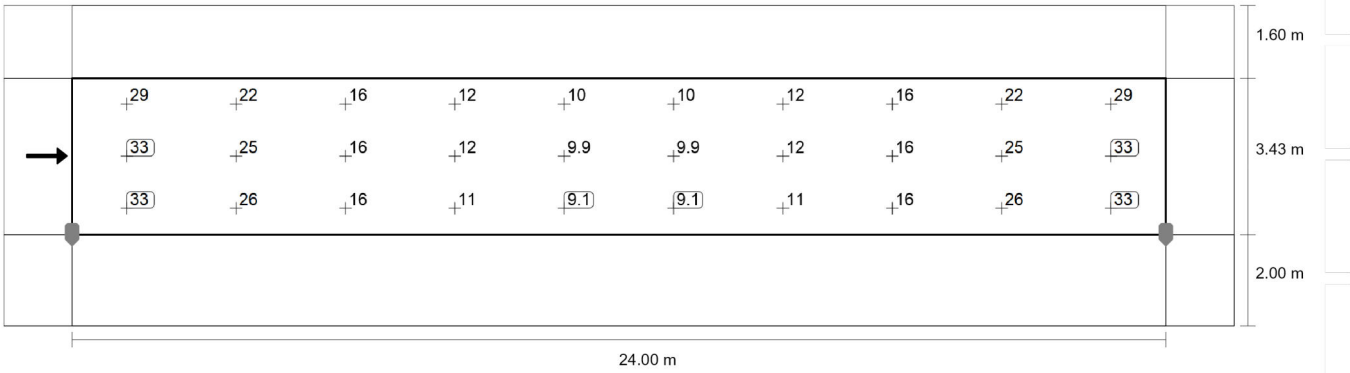
(1) Informative, not part of the valuation



Maintenance value, horizontal illuminance [lx] (Iso-illuminance curves)

Burkes Avenue

Roadway 1 (M4)

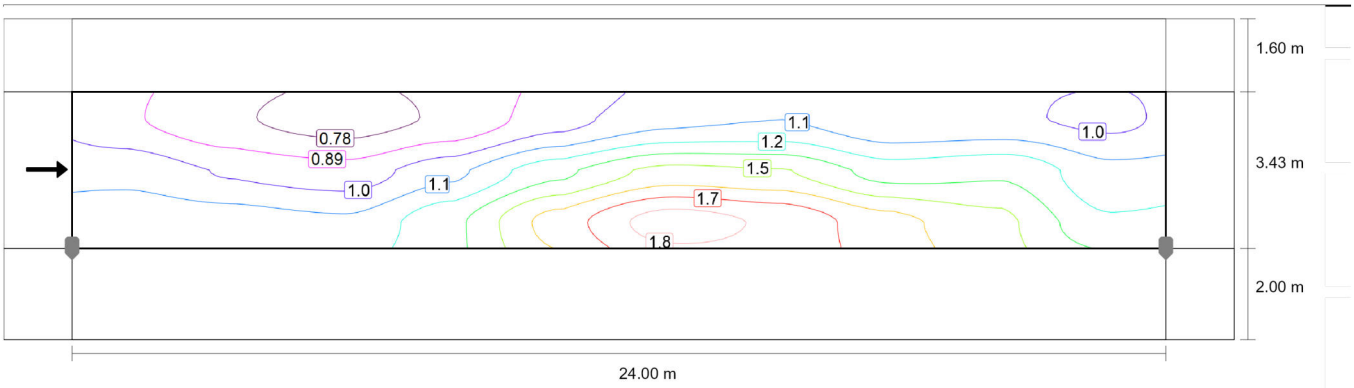


Maintenance value, horizontal illuminance [lx] (Value grid)

m	1.200	3.600	6.000	8.400	10.800	13.200	15.600	18.000	20.400	22.800
4.858	29.07	22.50	15.51	11.76	10.12	10.12	11.76	15.51	22.50	29.07
3.715	33.12	25.47	16.35	11.74	9.89	9.89	11.74	16.35	25.47	33.12
2.572	33.29	25.93	16.13	11.16	9.11	9.11	11.16	16.13	25.93	33.29

Maintenance value, horizontal illuminance [lx] (Value chart)

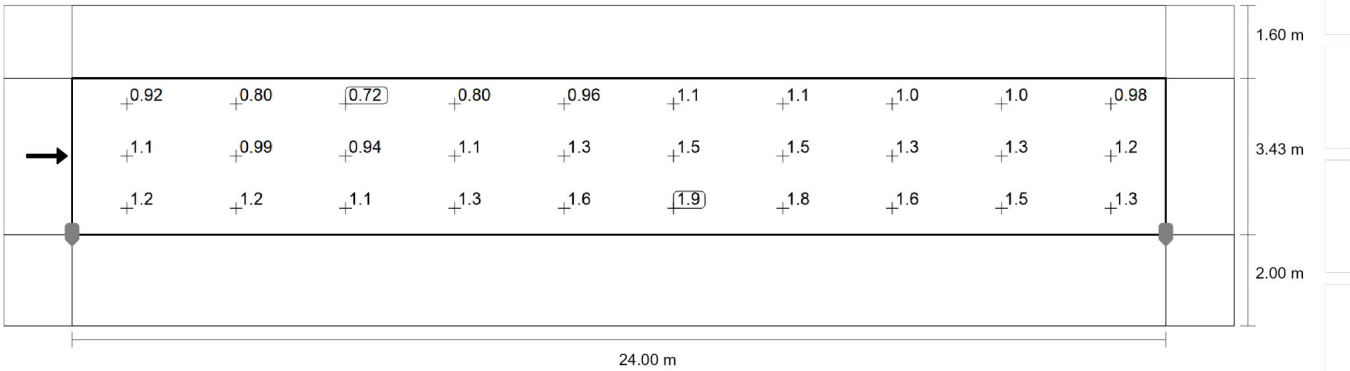
	E_{av}	E_{min}	E_{max}	U_o (g_1)	g_2
Maintenance value, horizontal illuminance	18.7 lx	9.11 lx	33.3 lx	0.49	0.27



Observer 1: Maintenance value, luminance with dry roadway [cd/m²] (Iso-illuminance curves)

Burkes Avenue

Roadway 1 (M4)

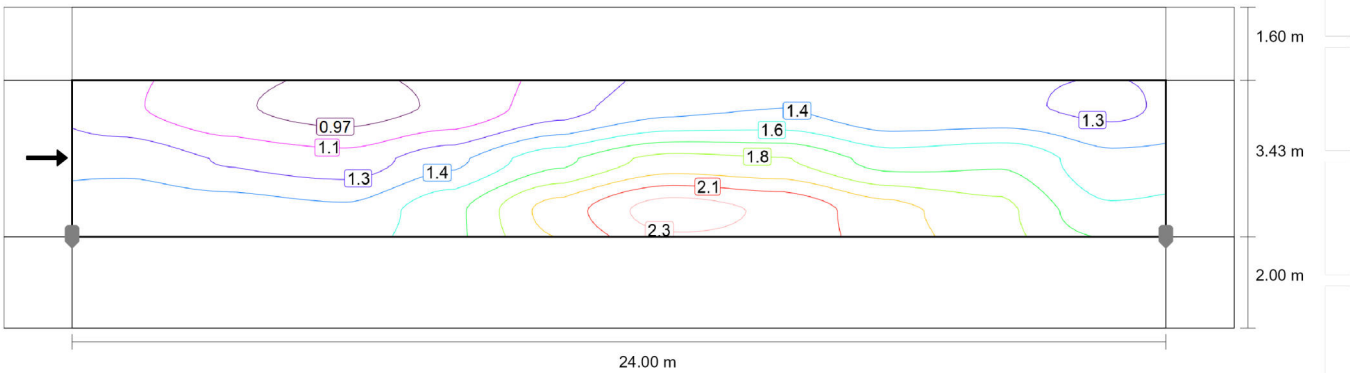


Observer 1: Maintenance value, luminance with dry roadway [cd/m²] (Value grid)

m	1.200	3.600	6.000	8.400	10.800	13.200	15.600	18.000	20.400	22.800
4.858	0.92	0.80	0.72	0.80	0.96	1.09	1.12	1.03	1.03	0.98
3.715	1.09	0.99	0.94	1.09	1.33	1.51	1.48	1.31	1.34	1.16
2.572	1.19	1.18	1.15	1.33	1.64	1.88	1.80	1.63	1.51	1.27

Observer 1: Maintenance value, luminance with dry roadway [cd/m²] (Value chart)

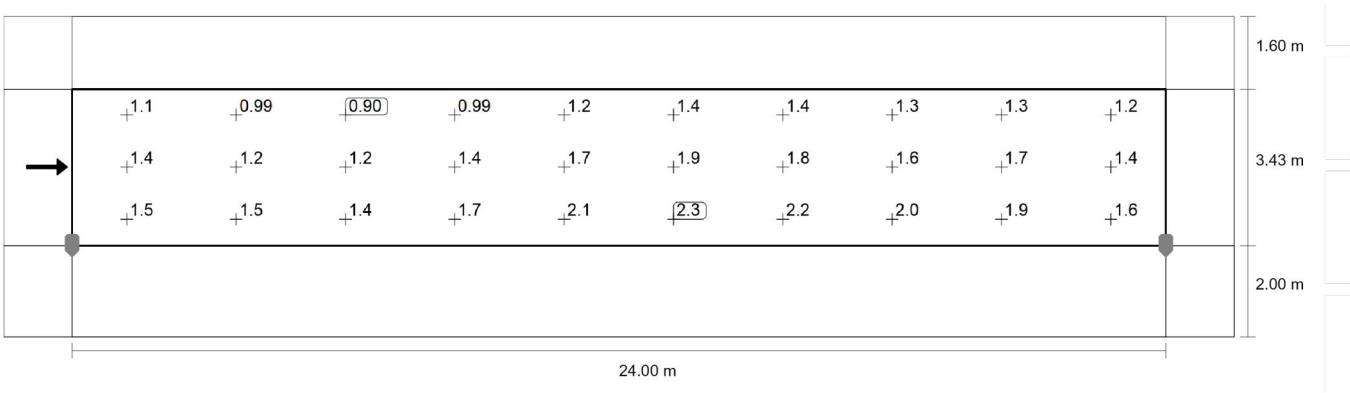
	L_{av}	L_{min}	L_{max}	U_o (g_1)	g_2
Observer 1: Maintenance value, luminance with dry roadway	1.21 cd/m²	0.72 cd/m²	1.88 cd/m²	0.60	0.38



Observer 1: Luminance with new installation [cd/m²] (Iso-illuminance curves)

Burkes Avenue

Roadway 1 (M4)



Observer 1: Luminance with new installation [cd/m²] (Value grid)

m	1.200	3.600	6.000	8.400	10.800	13.200	15.600	18.000	20.400	22.800
4.858	1.14	0.99	0.90	0.99	1.20	1.36	1.40	1.28	1.28	1.22
3.715	1.36	1.24	1.18	1.37	1.66	1.89	1.85	1.63	1.67	1.45
2.572	1.49	1.47	1.44	1.66	2.05	2.35	2.25	2.04	1.88	1.58

Observer 1: Luminance with new installation [cd/m²] (Value chart)

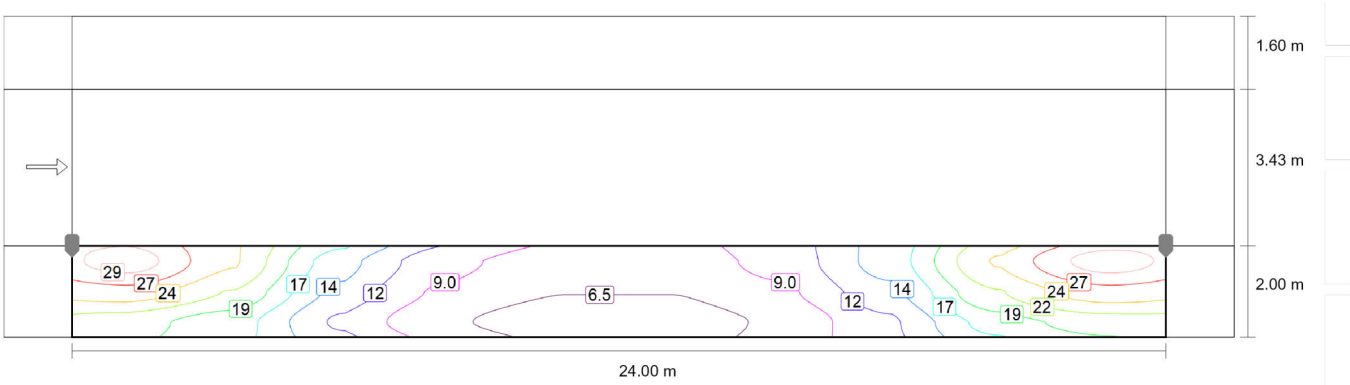
	L_{av}	L_{min}	L_{max}	U_o (g_1)	g_2
Observer 1: Luminance with new installation	1.51 cd/m²	0.90 cd/m²	2.35 cd/m²	0.60	0.38

Burkes Avenue

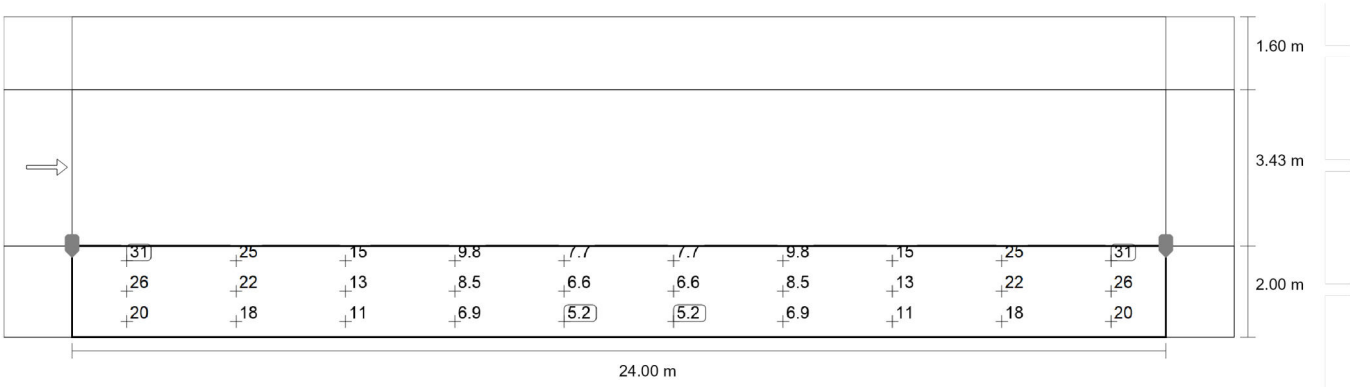
Sidewalk 2 (P2)

Results for valuation field

	Symbol	Calculated	Target	Check
Sidewalk 2 (P2)	E_{av}	14.97 lx	[10.00 - 15.00] lx	✓
	E_{min}	5.25 lx	≥ 2.00 lx	✓



Maintenance value, horizontal illuminance [lx] (Iso-illuminance curves)



Maintenance value, horizontal illuminance [lx] (Value grid)

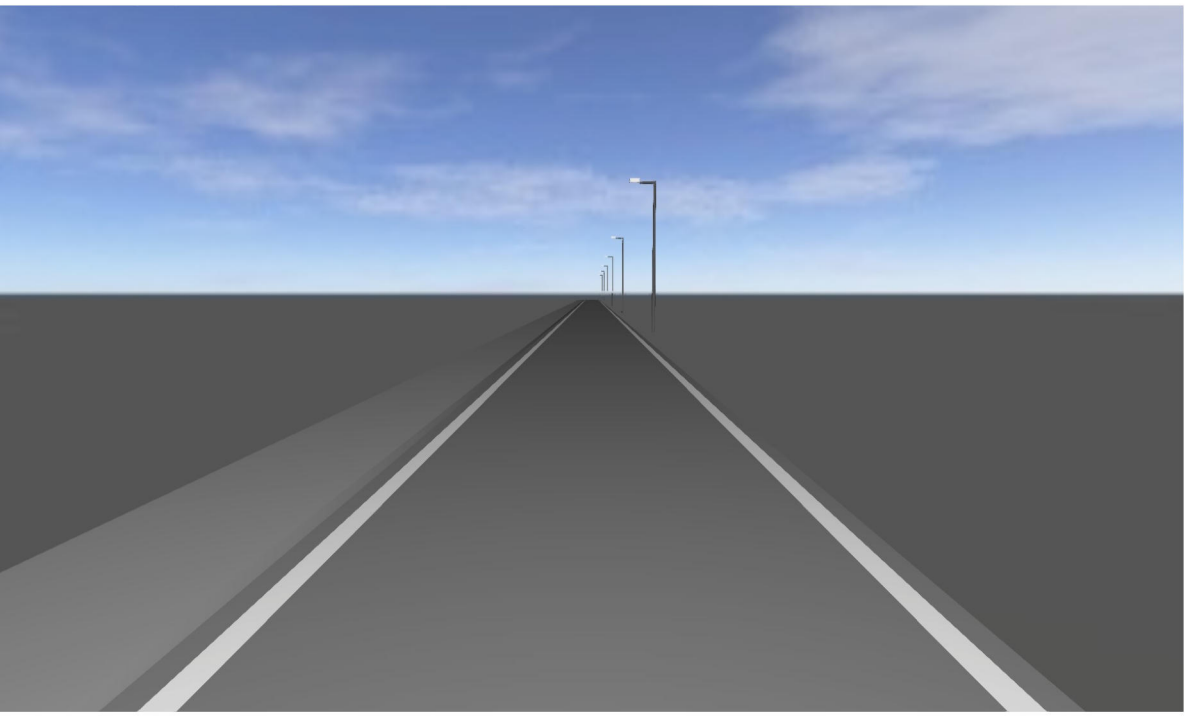
Burkes Avenue

Sidewalk 2 (P2)

m	1.200	3.600	6.000	8.400	10.800	13.200	15.600	18.000	20.400	22.800
1.667	30.57	24.50	15.14	9.83	7.70	7.70	9.83	15.14	24.50	30.57
1.000	25.61	21.53	13.33	8.46	6.56	6.56	8.46	13.33	21.53	25.61
0.333	20.29	17.79	11.15	6.91	5.25	5.25	6.91	11.15	17.79	20.29

Maintenance value, horizontal illuminance [lx] (Value chart)

	E_{av}	E_{min}	E_{max}	U_o (g_1)	g_2
Maintenance value, horizontal illuminance	15.0 lx	5.25 lx	30.6 lx	0.35	0.17

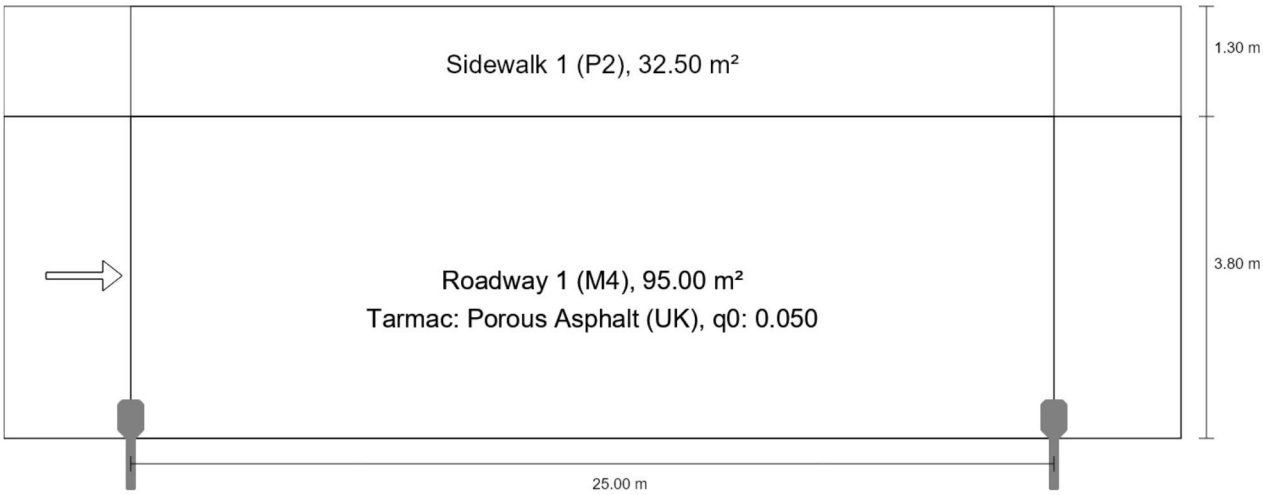


Gerald Griffin Avenue

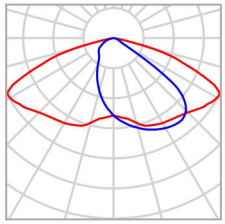
Description

Gerald Griffin Avenue

Summary (according to EN 13201:2015)

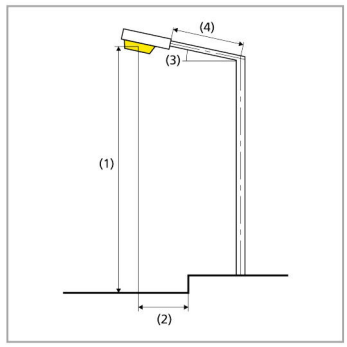


Summary (according to EN 13201:2015)



Manufacturer	Thorn Lighting	P	38.0 W
Article No.	96628704	Φ_{Lamp}	5347 lm
Article name	CQ 24L50 730 RC BS 3550 CL2 M60 GY-S [STD]	$\Phi_{Luminaire}$	5347 lm
		η	100.00 %
Fitting	1x LED 38 W		

CQ 24L50 730 RC BS 3550 CL2 M60 GY-S [STD] (single side bottom)



Pole distance	25.000 m
(1) Light spot height	6.000 m
(2) Light point overhang	0.200 m
(3) Boom inclination	0.0°
(4) Boom length	0.605 m
Annual operating hours	4000 h: 100.0 %, 38.0 W
Wattage / route	1520.0 W/km
ULR / ULOR	0.00 / 0.00
Max. luminous intensities Any direction forming the specified angle from the downward vertical, with the luminaire installed for use.	≥ 70°: 346 cd/klm ≥ 80°: 41.2 cd/klm ≥ 90°: 0.00 cd/klm
Luminous intensity class The luminous intensity values in [cd/klm] for calculation of the luminous intensity class refer to the luminaire luminous flux according to EN 13201:2015.	G*6
Glare index class	D.6
MF	0.80

Gerald Griffin Avenue

Summary (according to EN 13201:2015)

Results for valuation fields

A maintenance factor of 0.80 was used for calculating for the installation.

	Symbol	Calculated	Target	Check
Sidewalk 1 (P2)	E_{av}	14.21 lx	[10.00 - 15.00] lx	✓
	E_{min}	8.01 lx	≥ 2.00 lx	✓
Roadway 1 (M4)	L_{av}	0.86 cd/m²	≥ 0.75 cd/m²	✓
	U_o	0.67	≥ 0.40	✓
	U_l	0.61	≥ 0.60	✓
	TI	12 %	≤ 15 %	✓
	R_{EI}	0.57	≥ 0.30	✓

Results for energy efficiency indicators

	Symbol	Calculated	Energy Consumption
Gerald Griffin Avenue	D_p	0.018 W/lx*m²	–
CQ 24L50 730 RC BS 3550 CL2 M60 GY-S [STD] (single side bottom)	D_e	1.2 kWh/m² yr	152.0 kWh/yr

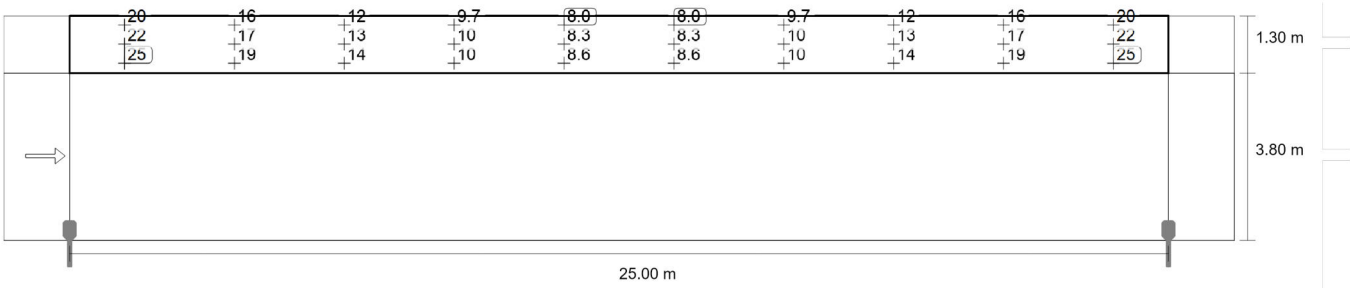
Gerald Griffin Avenue

Sidewalk 1 (P2)

Results for valuation field

	Symbol	Calculated	Target	Check
Sidewalk 1 (P2)	E_{av}	14.21 lx	[10.00 - 15.00] lx	✓
	E_{min}	8.01 lx	≥ 2.00 lx	✓

Maintenance value, horizontal illuminance [lx] (Iso-illuminance curves)



Maintenance value, horizontal illuminance [lx] (Value grid)

m	1.250	3.750	6.250	8.750	11.250	13.750	16.250	18.750	21.250	23.750
4.883	20.11	15.83	12.11	9.69	8.01	8.01	9.69	12.11	15.83	20.11
4.450	22.41	17.35	12.89	10.13	8.33	8.33	10.13	12.89	17.35	22.41
4.017	24.75	18.87	13.66	10.49	8.58	8.58	10.49	13.66	18.87	24.75

Maintenance value, horizontal illuminance [lx] (Value chart)

	E_{av}	E_{min}	E_{max}	U_o (g_1)	g_2
Maintenance value, horizontal illuminance	14.2 lx	8.01 lx	24.8 lx	0.56	0.32

Gerald Griffin Avenue

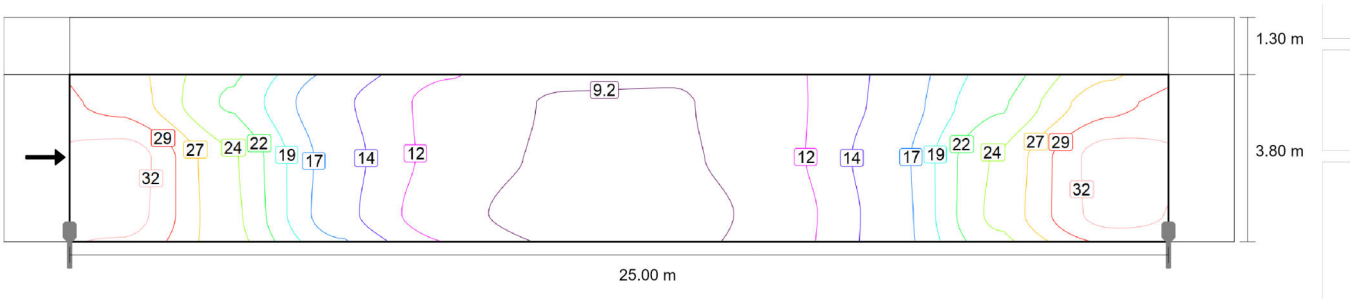
Roadway 1 (M4)

Results for valuation field

	Symbol	Calculated	Target	Check
Roadway 1 (M4)	L_{av}	0.86 cd/m²	≥ 0.75 cd/m²	✓
	U_o	0.67	≥ 0.40	✓
	U_l	0.61	≥ 0.60	✓
	TI	12 %	≤ 15 %	✓
	R_{EI}	0.57	≥ 0.30	✓

Results for observer

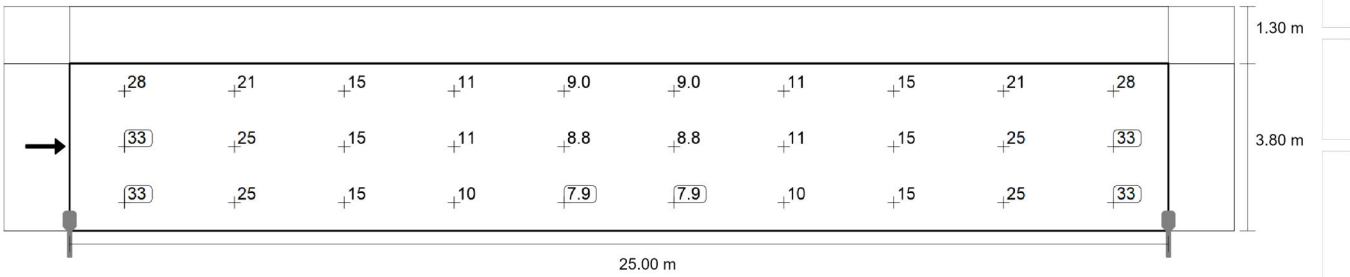
	Symbol	Calculated	Target	Check
Observer 1 Position: -60.000 m, 1.900 m, 1.500 m	L_{av}	0.86 cd/m²	≥ 0.75 cd/m²	✓
	U_o	0.67	≥ 0.40	✓
	U_l	0.61	≥ 0.60	✓
	TI	12 %	≤ 15 %	✓



Maintenance value, horizontal illuminance [lx] (Iso-illuminance curves)

Gerald Griffin Avenue

Roadway 1 (M4)

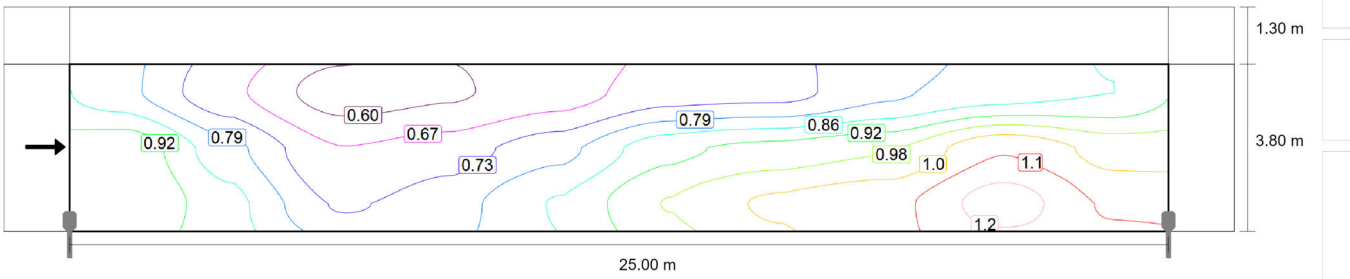


Maintenance value, horizontal illuminance [lx] (Value grid)

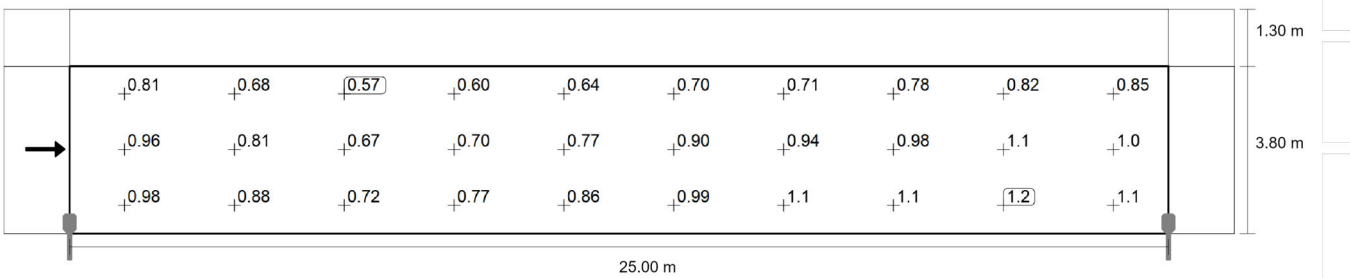
m	1.250	3.750	6.250	8.750	11.250	13.750	16.250	18.750	21.250	23.750
3.167	28.45	21.42	14.67	10.89	9.01	9.01	10.89	14.67	21.42	28.45
1.900	33.04	24.60	15.45	10.87	8.78	8.78	10.87	15.45	24.60	33.04
0.633	32.78	24.94	15.11	10.15	7.93	7.93	10.15	15.11	24.94	32.78

Maintenance value, horizontal illuminance [lx] (Value chart)

	E_{av}	E_{min}	E_{max}	U_o (g_1)	g_2
Maintenance value, horizontal illuminance	17.9 lx	7.93 lx	33.0 lx	0.44	0.24



Observer 1: Maintenance value, luminance with dry roadway [cd/m²] (Iso-illuminance curves)



Observer 1: Maintenance value, luminance with dry roadway [cd/m²] (Value grid)

m	1.250	3.750	6.250	8.750	11.250	13.750	16.250	18.750	21.250	23.750
3.167	0.81	0.68	0.57	0.60	0.64	0.70	0.71	0.78	0.82	0.85

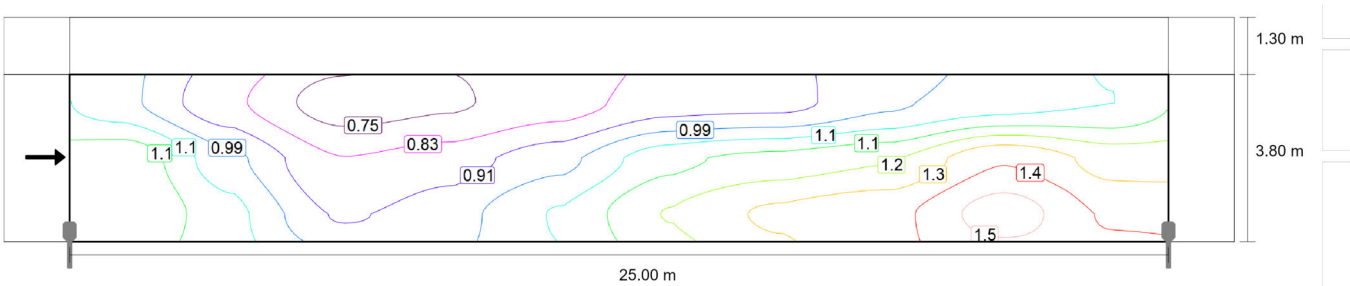
Gerald Griffin Avenue

Roadway 1 (M4)

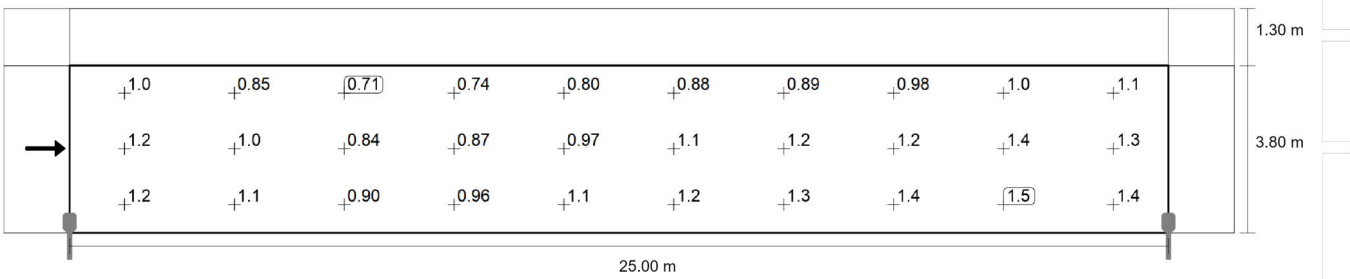
m	1.250	3.750	6.250	8.750	11.250	13.750	16.250	18.750	21.250	23.750
1.900	0.96	0.81	0.67	0.70	0.77	0.90	0.94	0.98	1.10	1.02
0.633	0.98	0.88	0.72	0.77	0.86	0.99	1.06	1.09	1.20	1.10

Observer 1: Maintenance value, luminance with dry roadway [cd/m²] (Value chart)

	L_{av}	L_{min}	L_{max}	U_o (g_1)	g_2
Observer 1: Maintenance value, luminance with dry roadway	0.86 cd/m²	0.57 cd/m²	1.20 cd/m²	0.67	0.48



Observer 1: Luminance with new installation [cd/m²] (Iso-illuminance curves)



Observer 1: Luminance with new installation [cd/m²] (Value grid)

m	1.250	3.750	6.250	8.750	11.250	13.750	16.250	18.750	21.250	23.750
3.167	1.02	0.85	0.71	0.74	0.80	0.88	0.89	0.98	1.03	1.07
1.900	1.20	1.02	0.84	0.87	0.97	1.13	1.18	1.22	1.38	1.28
0.633	1.23	1.09	0.90	0.96	1.08	1.23	1.32	1.36	1.50	1.37

Observer 1: Luminance with new installation [cd/m²] (Value chart)

	L_{av}	L_{min}	L_{max}	U_o (g_1)	g_2
Observer 1: Luminance with new installation	1.07 cd/m²	0.71 cd/m²	1.50 cd/m²	0.67	0.48