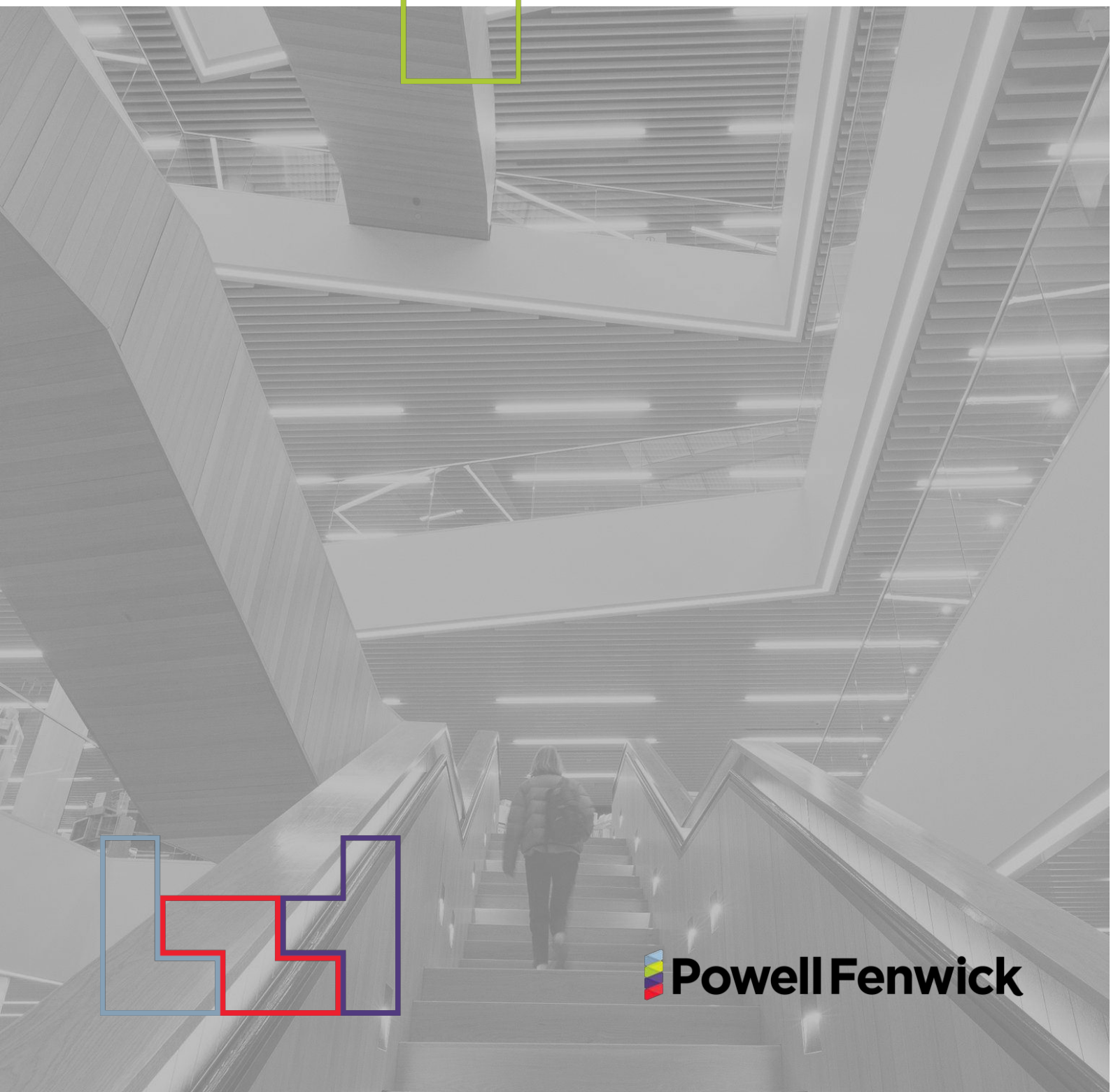
Exterior Lighting Calculations

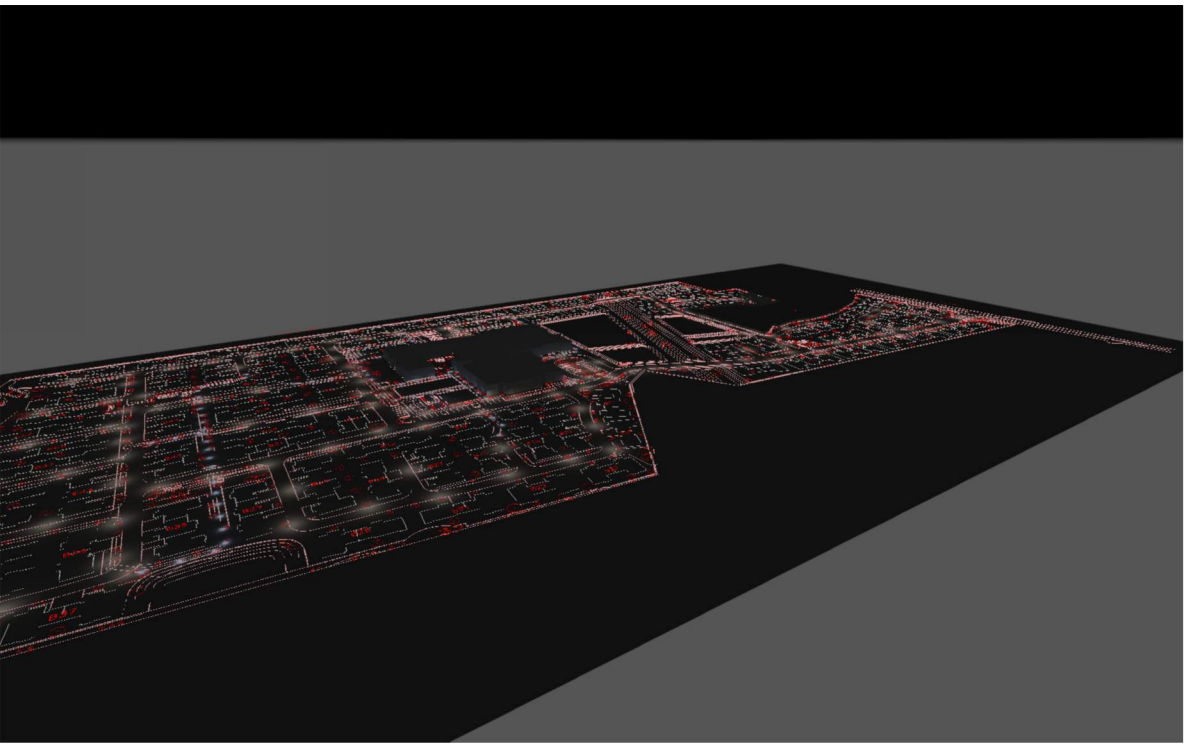
Summerset Otaihanga - 73 Ratanui Road, Otaihanga

Issue B

09 Oct 2026



Powell Fenwick



Summerset Otaihanga - Site Lighting

Created with DIALux

Luminaire list

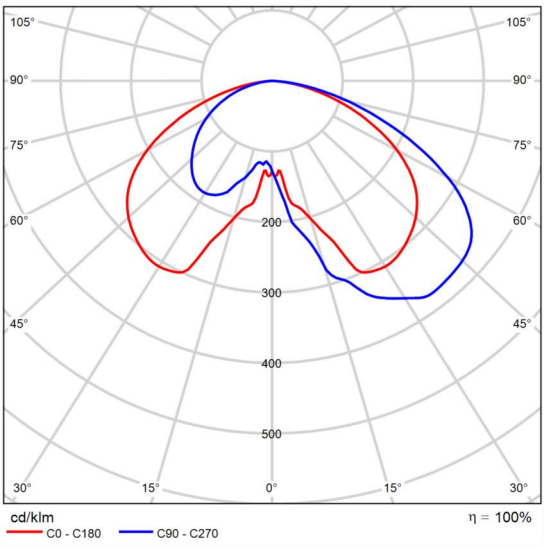
Φ_{total}	P_{total}	Luminous efficacy
431841 lm	5426.9 W	79.6 lm/W

pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
4	AEC ILLUMINAZIONE	STORY S 2F2H1 S05 3.15-4M	STORY S 2F2H1 S05 3.15-4M	17.0 W	1570 lm	92.4 lm/W
137	AEC ILLUMINAZIONE	STORY TP 2F2H1 S05 3.25-4M	STORY TP 2F2H1 S05 3.25-4M	28.5 W	2560 lm	89.8 lm/W
101	Lombardo-Cini&Nils	TOK H400 360° 4000K	TOK H400 4000K Emissione 360°	14.4 W	741 lm	51.5 lm/W

Product data sheet

AEC ILLUMINAZIONE - STORY S 2F2H1 S05 3.15-4M

Article No.	STORY S 2F2H1 S05 3.15-4M
P	17.0 W
Φ_{Lamp}	1570 lm
$\Phi_{Luminaire}$	1570 lm
η	100.00 %
Luminous efficacy	92.4 lm/W
CCT	3000 K
CRI	70

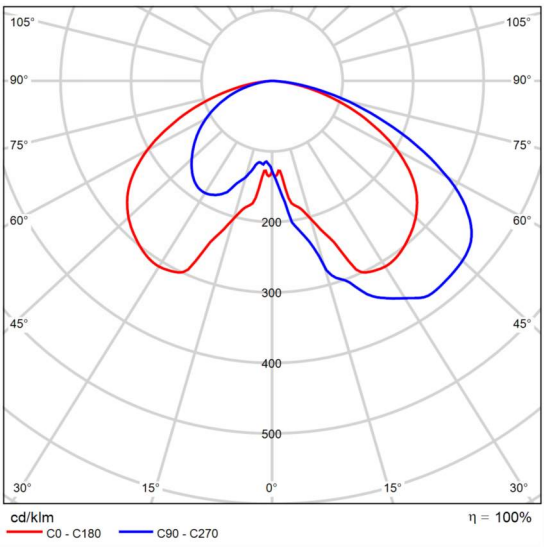


Polar LDC

Product data sheet

AEC ILLUMINAZIONE - STORY TP 2F2H1 S05 3.25-4M

Article No.	STORY TP 2F2H1 S05 3.25-4M
P	28.5 W
Φ_{Lamp}	2560 lm
$\Phi_{Luminaire}$	2560 lm
η	100.00 %
Luminous efficacy	89.8 lm/W
CCT	3000 K
CRI	70

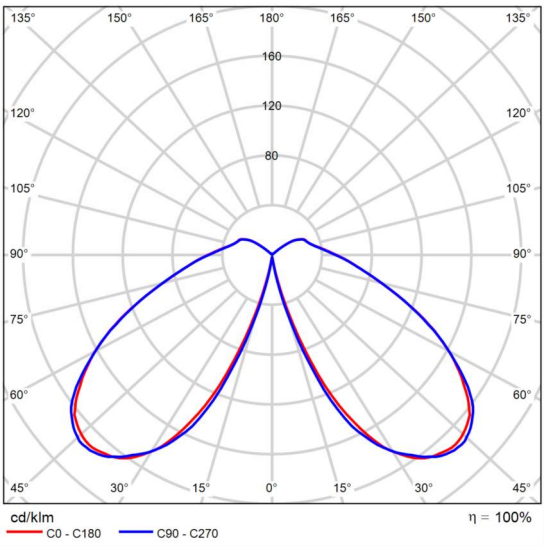


Polar LDC

Product data sheet

Lombardo-Cini&Nils - TOK H400 4000K Emissione 360°

Article No.	TOK H400 360° 4000K
P	14.4 W
Φ_{Lamp}	741 lm
$\Phi_{Luminaire}$	741 lm
η	100.00 %
Luminous efficacy	51.5 lm/W
CCT	4000 K
CRI	100



Polar LDC

Glare evaluation according to UGR

ρ Ceiling		70	70	50	50	30	70	70	50	50	30
ρ Walls		50	30	50	30	30	50	30	50	30	30
ρ Floor		20	20	20	20	20	20	20	20	20	20
Room size X	Y	Viewing direction at right angles to lamp axis					Viewing direction parallel to lamp axis				
2H	2H	21.4	22.8	21.9	23.3	23.8	20.9	22.3	21.4	22.8	23.3
	3H	23.0	24.3	23.5	24.8	25.3	22.5	23.8	23.0	24.3	24.9
	4H	23.7	24.9	24.2	25.4	26.0	23.2	24.4	23.7	24.9	25.5
	6H	24.2	25.4	24.8	25.9	26.5	23.8	24.9	24.4	25.5	26.1
	8H	24.5	25.6	25.1	26.1	26.8	24.1	25.2	24.6	25.7	26.3
	12H	24.8	25.8	25.3	26.4	27.0	24.4	25.4	24.9	26.0	26.6
4H	2H	22.0	23.2	22.5	23.7	24.3	21.6	22.8	22.2	23.4	24.0
	3H	23.8	24.8	24.4	25.4	26.0	23.4	24.4	24.0	25.0	25.6
	4H	24.6	25.5	25.2	26.1	26.8	24.2	25.1	24.8	25.7	26.4
	6H	25.4	26.2	26.0	26.8	27.5	24.9	25.8	25.6	26.4	27.1
	8H	25.7	26.5	26.3	27.1	27.8	25.3	26.1	25.9	26.7	27.4
	12H	26.1	26.8	26.7	27.4	28.1	25.7	26.4	26.3	27.0	27.7
8H	4H	24.9	25.7	25.5	26.3	27.0	24.5	25.3	25.2	25.9	26.6
	6H	25.9	26.5	26.5	27.2	27.9	25.5	26.1	26.1	26.8	27.5
	8H	26.4	26.9	27.0	27.6	28.4	26.0	26.6	26.6	27.2	28.0
	12H	26.9	27.4	27.5	28.1	28.8	26.5	27.0	27.2	27.7	28.4
12H	4H	24.9	25.6	25.6	26.3	27.0	24.6	25.3	25.2	25.9	26.6
	6H	26.0	26.5	26.6	27.2	28.0	25.6	26.2	26.3	26.9	27.6
	8H	26.5	27.0	27.2	27.7	28.5	26.2	26.7	26.9	27.4	28.1
Variation of the observer position for the luminaire distances S											
S = 1.0H S = 1.5H S = 2.0H		+0.1 / -0.1 +0.3 / -0.3 +0.4 / -0.7					+0.1 / -0.1 +0.2 / -0.3 +0.4 / -0.5				
Standard table		BK07					BK07				
Correction summand		10.0					9.6				
Corrected glare indices referring to 741lm Total luminous flux											

UGR diagram (SHR: 0.25)

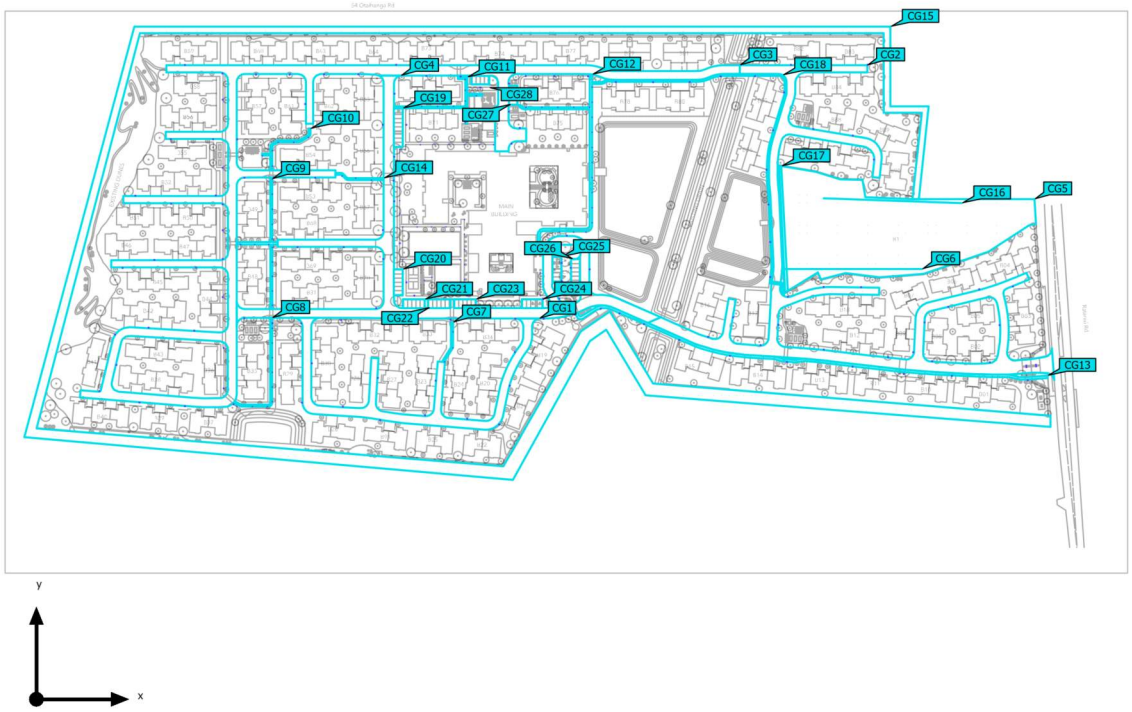
Site 1

Luminaire layout plan



Site 1 (Light scene 1)

Calculation objects



Site 1 (Light scene 1)

Calculation objects

Calculation surfaces

Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
81 Ratanui Rd - Spill Perpendicular illuminance Height: 0.000 m	0.011 lx	0.000 lx	0.94 lx Target < 10lux	0.00 Note 1	0.00	CG5
81 Ratanui Road - vertical spill Perpendicular illuminance Height: 5.000 m	0.17 lx	0.000 lx	0.72 lx Target < 10lux	0.00 Note 1	0.00	CG6
81 Ratanui Road - vertical spill Perpendicular illuminance Height: 5.000 m	0.029 lx	0.000 lx	0.14 lx Target < 10lux	0.00 Note 1	0.00	CG16
81 Ratanui Road - vertical spill Perpendicular illuminance Height: 5.000 m	0.39 lx	0.002 lx	1.45 lx Target < 10lux	0.005 Note 1	0.001	CG17
Carparking PC3 Perpendicular illuminance Height: 0.000 m	5.46 lx Target > 3.5lux	1.40 lx Target > 0.7lux	32.3 lx	0.26	0.043	CG19
Carparking PC3 Perpendicular illuminance Height: 0.000 m	6.32 lx Target > 3.5lux	1.06 lx Target > 0.7lux	32.6 lx	0.17	0.033	CG20
Carparking PC3 Perpendicular illuminance Height: 0.000 m	7.92 lx Target > 3.5lux	2.01 lx Target > 0.7lux	33.0 lx	0.25	0.061	CG21
Carparking PC3 Perpendicular illuminance Height: 0.000 m	8.57 lx Target > 3.5lux	2.16 lx Target > 0.7lux	34.7 lx	0.25	0.062	CG22
Carparking PC3 Perpendicular illuminance Height: 0.000 m	8.08 lx Target > 3.5lux	2.67 lx Target > 0.7lux	32.6 lx	0.33	0.082	CG23
Carparking PC3 Perpendicular illuminance Height: 0.000 m	8.02 lx Target > 3.5lux	0.77 lx Target > 0.7lux	45.8 lx	0.096	0.017	CG24
Carparking PC3 Perpendicular illuminance Height: 0.000 m	18.9 lx Target > 3.5lux	4.55 lx Target > 0.7lux	46.7 lx	0.24	0.097	CG25

Note 1:
Exterior lighting has been designed in accordance the Kapiti Coast District Council Plan, rule GRZ-R1.3 for over boundary light spill requirements.

Light level from the activity must not exceed 10 lux, when measured 1.5 metres inside the boundary of any other site located in the Residential Zones or Rural Zones.

Site 1 (Light scene 1)

Calculation objects

Carparking PC3 Perpendicular illuminance Height: 0.000 m	20.4 lx Target > 3.5lux	4.11 lx Target > 0.7lux	48.5 lx	0.20	0.085	CG26
Carparking PC3 Perpendicular illuminance Height: 0.000 m	12.8 lx Target > 3.5lux	5.62 lx Target > 0.7lux	36.7 lx	0.44	0.15	CG27
Carparking PC3 Perpendicular illuminance Height: 0.000 m	9.94 lx Target > 3.5lux	1.82 lx Target > 0.7lux	37.2 lx	0.18	0.049	CG28
Horizontal boundary spill Perpendicular illuminance Height: 0.000 m	0.030 lx	0.000 lx	4.49 lx Target < 10lux	0.00 Note 1	0.00	CG15
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	16.3 lx Target > 1.5lux	0.47 lx Target > 0.25lux	160 lx	0.029	0.003	CG7
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	20.3 lx Target > 1.5lux	0.54 lx Target > 0.25lux	167 lx	0.027	0.003	CG8
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	17.1 lx Target > 1.5lux	0.54 lx Target > 0.25lux	165 lx	0.032	0.003	CG9
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	19.3 lx Target > 1.5lux	0.56 lx Target > 0.25lux	164 lx	0.029	0.003	CG10
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	18.9 lx Target > 1.5lux	0.50 lx Target > 0.25lux	147 lx	0.026	0.003	CG11
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	15.8 lx Target > 1.5lux	0.37 lx Target > 0.25lux	159 lx	0.023	0.002	CG12
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	10.9 lx Target > 1.5lux	0.44 lx Target > 0.25lux	51.7 lx	0.040	0.009	CG13
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	15.4 lx Target > 1.5lux	0.54 lx Target > 0.25lux	159 lx	0.035	0.003	CG14

Note 1:
Exterior lighting has been designed in accordance the Kapiti Coast District Council Plan, rule GRZ-R1.3 for over boundary light spill requirements.

Light level from the activity must not exceed 10 lux, when measured 1.5 metres inside the boundary of any other site located in the Residential Zones or Rural Zones.

Site 1 (Light scene 1)

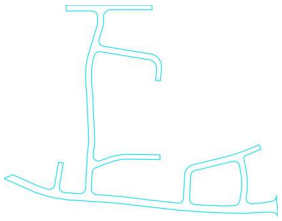
Calculation objects

Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	13.0 lx Target > 1.5lux	0.52 lx Target > 0.25lux	46.3 lx	0.040	0.011	CG18
Shared access roadway (PR3) Perpendicular illuminance Height: 0.000 m	7.31 lx Target > 1.75lux	0.33 lx Target > 0.3lux	46.5 lx	0.045	0.007	CG1
Shared access roadway (PR3) Perpendicular illuminance Height: 0.000 m	7.96 lx Target > 1.75lux	0.36 lx Target > 0.3lux	47.0 lx	0.045	0.008	CG2
Shared access roadway (PR3) Perpendicular illuminance Height: 0.000 m	7.99 lx Target > 1.75lux	0.31 lx Target > 0.3lux	47.2 lx	0.039	0.007	CG3
Shared access roadway (PR3) Perpendicular illuminance Height: 0.000 m	8.54 lx Target > 1.75lux	0.33 lx Target > 0.3lux	51.8 lx	0.039	0.006	CG4

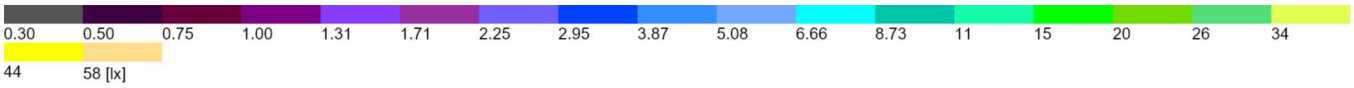
Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access roadway (PR3)





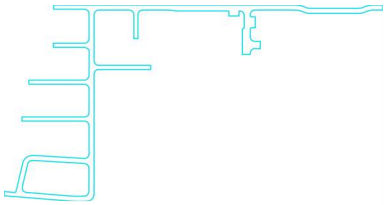


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access roadway (PR3) Perpendicular illuminance Height: 0.000 m	7.96 lx	0.36 lx	47.0 lx	0.045	0.008	CG2

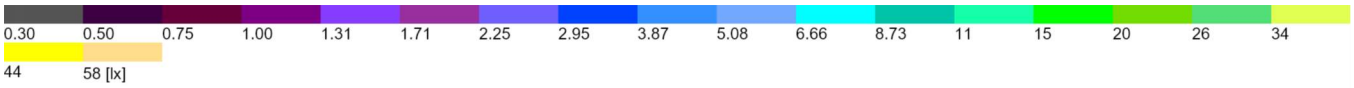
Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access roadway (PR3)





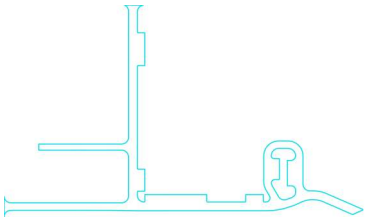


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access roadway (PR3) Perpendicular illuminance Height: 0.000 m	7.99 lx	0.31 lx	47.2 lx	0.039	0.007	CG3

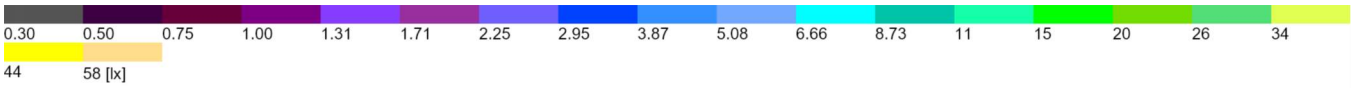
Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access roadway (PR3)





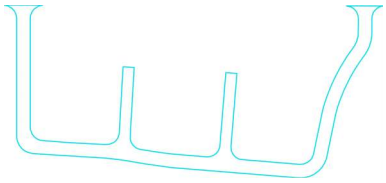


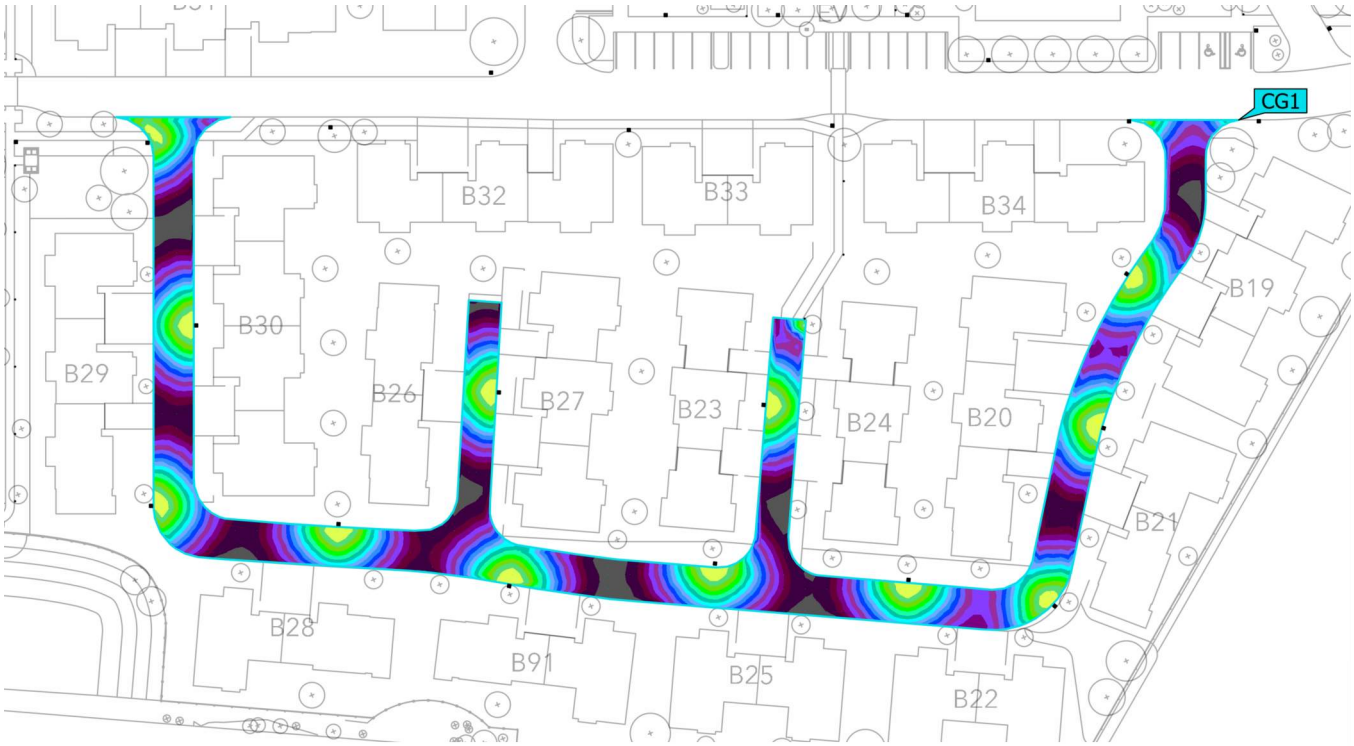
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access roadway (PR3) Perpendicular illuminance Height: 0.000 m	8.54 lx	0.33 lx	51.8 lx	0.039	0.006	CG4

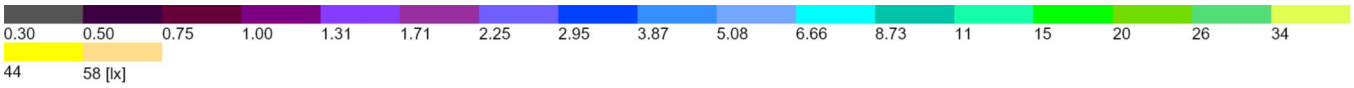
Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access roadway (PR3)







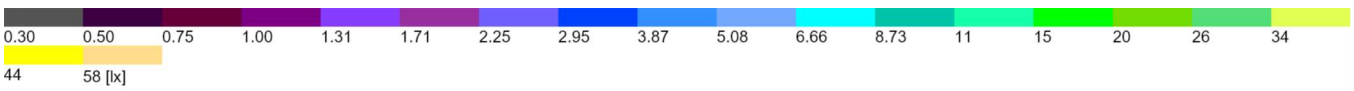
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access roadway (PR3) Perpendicular illuminance Height: 0.000 m	7.31 lx	0.33 lx	46.5 lx	0.045	0.007	CG1

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access pathway (PP4)



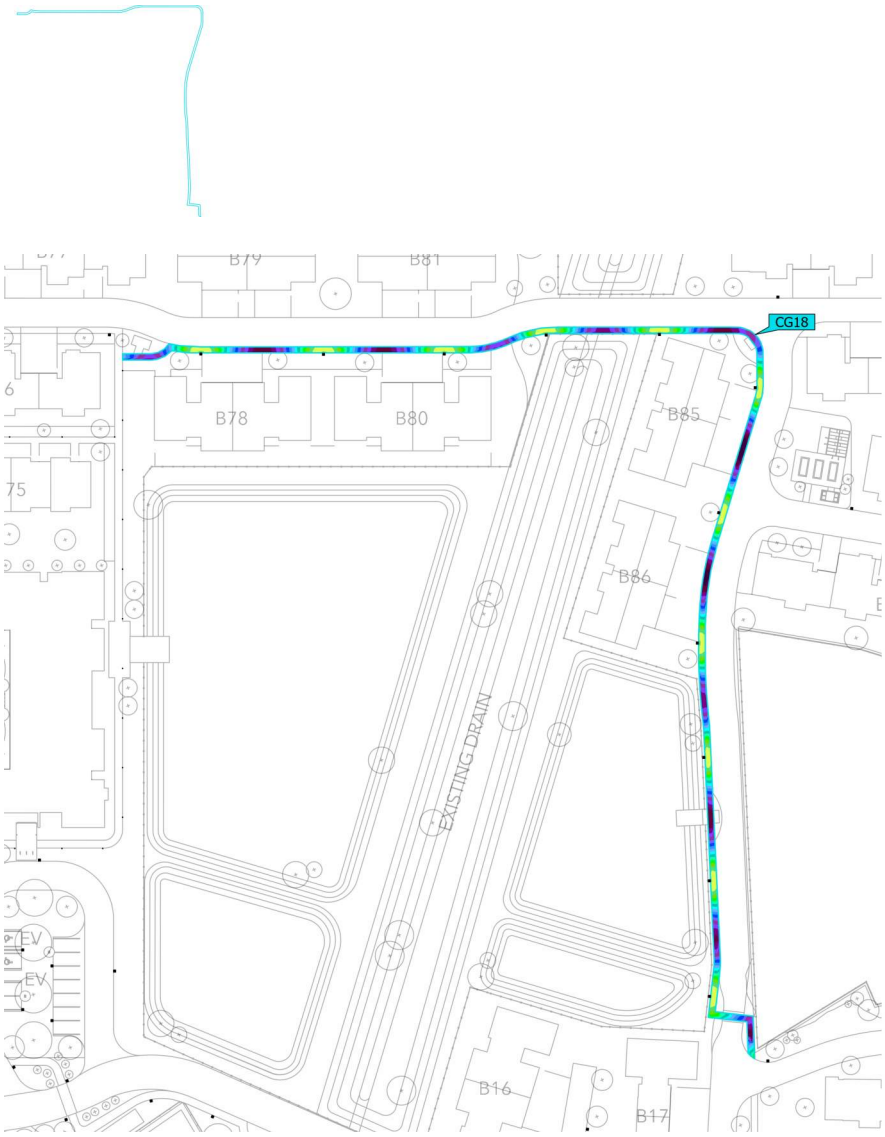


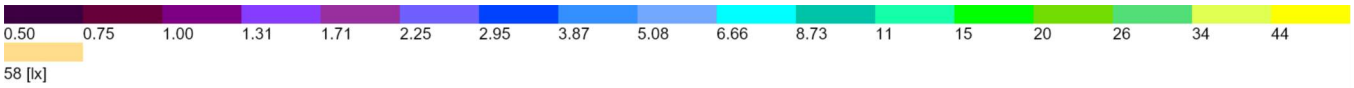
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	10.9 lx	0.44 lx	51.7 lx	0.040	0.009	CG13

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access pathway (PP4)



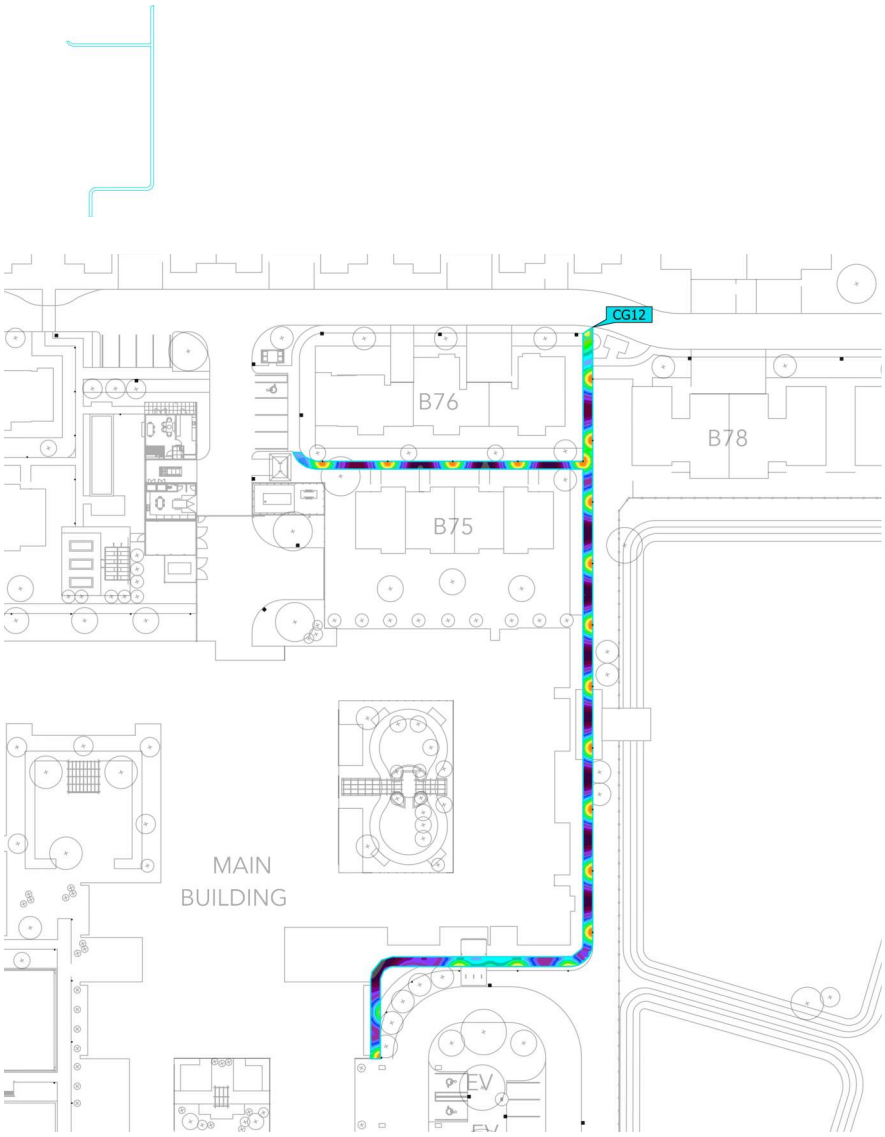


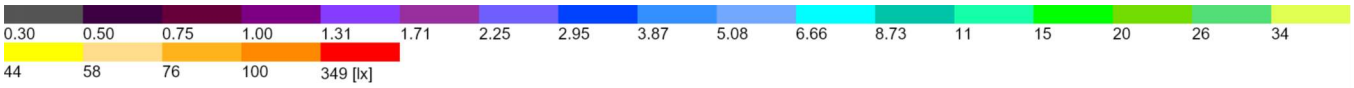
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	13.0 lx	0.52 lx	46.3 lx	0.040	0.011	CG18

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access pathway (PP4)



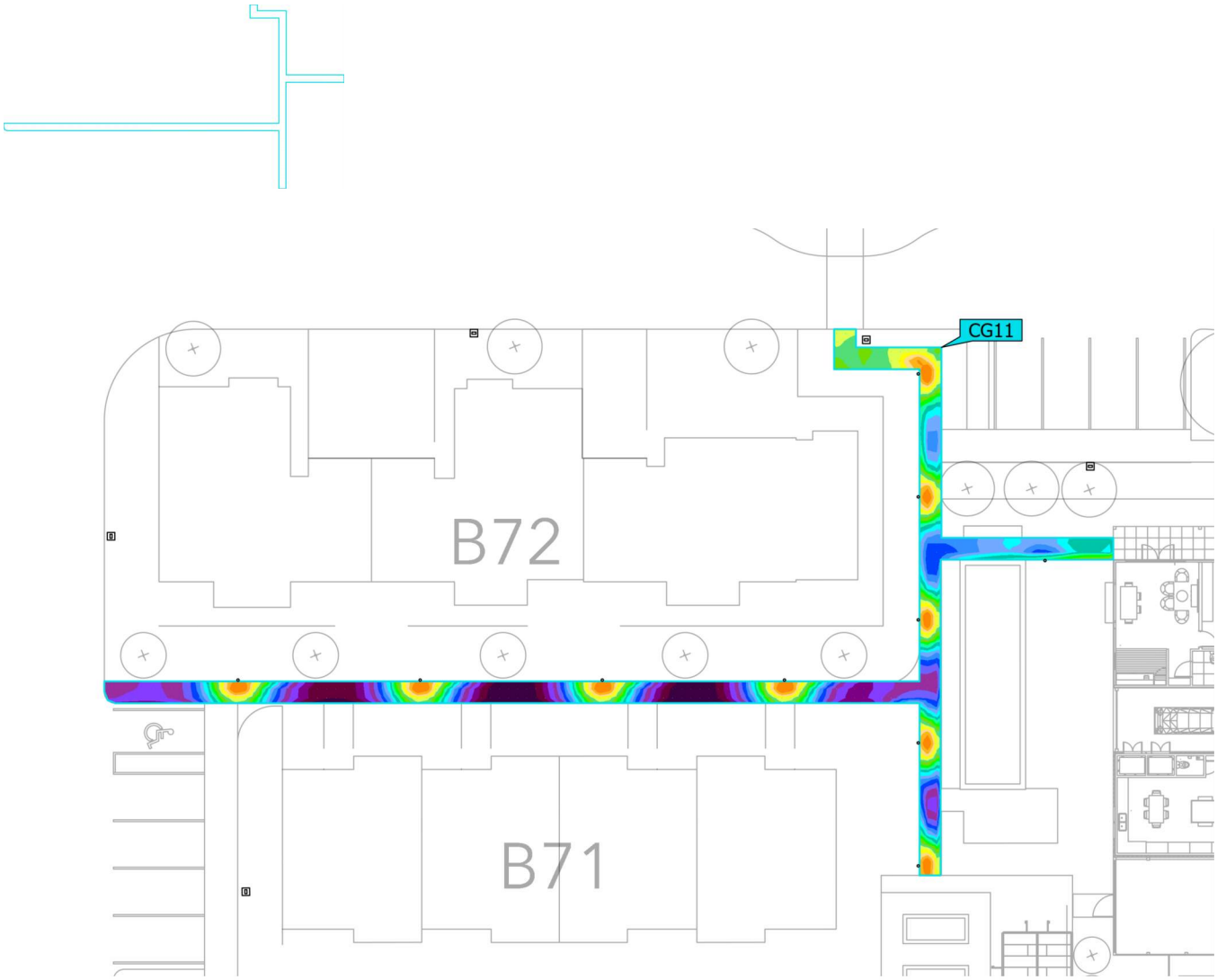


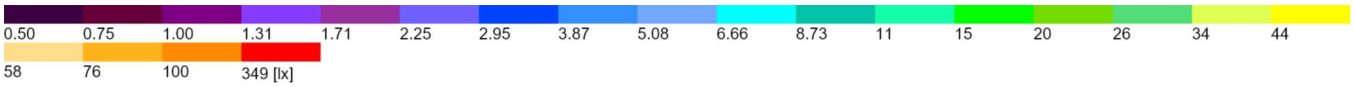
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	15.8 lx	0.37 lx	159 lx	0.023	0.002	CG12

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access pathway (PP4)



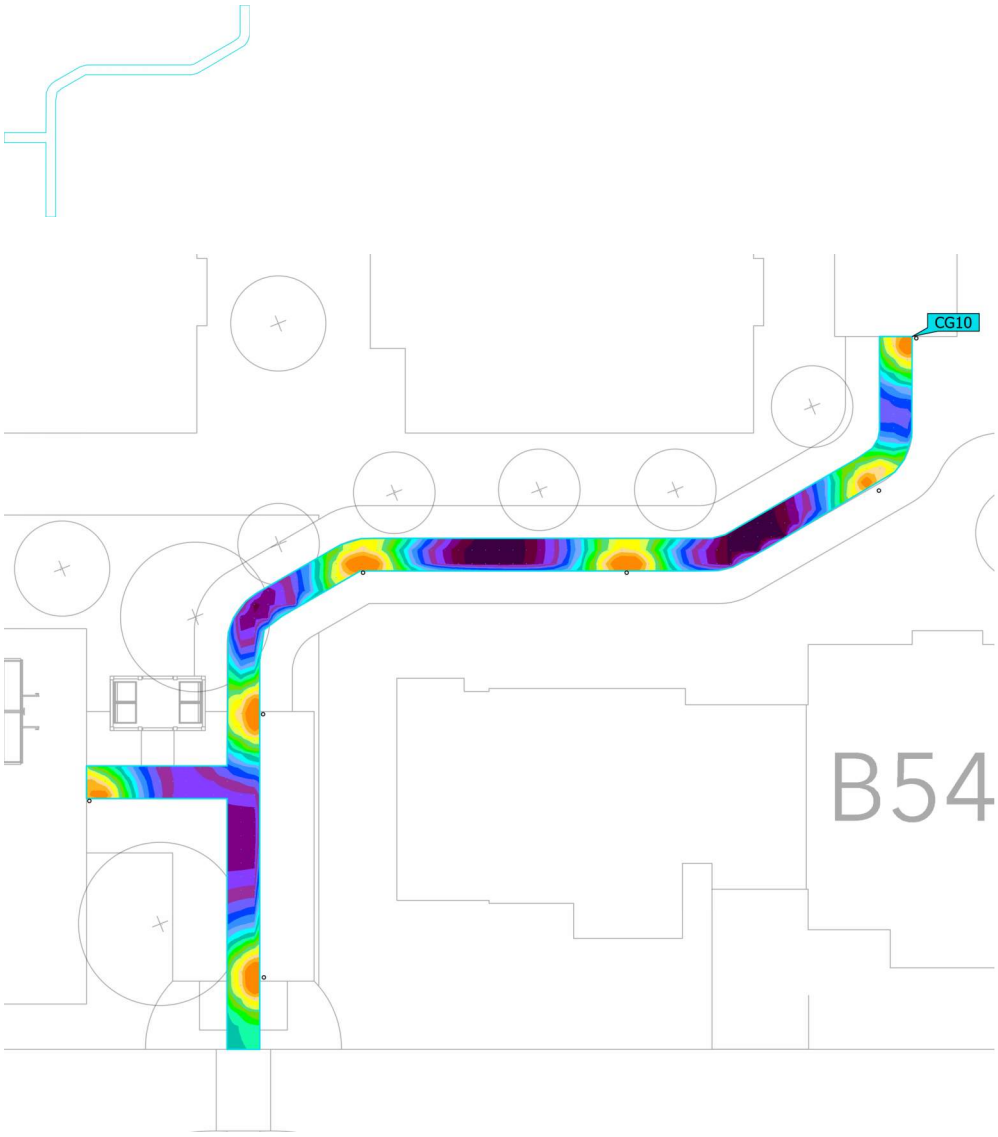


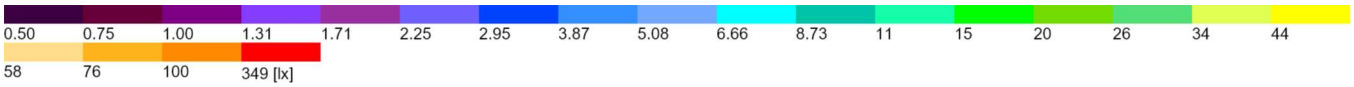
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	18.9 lx	0.50 lx	147 lx	0.026	0.003	CG11

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access pathway (PP4)



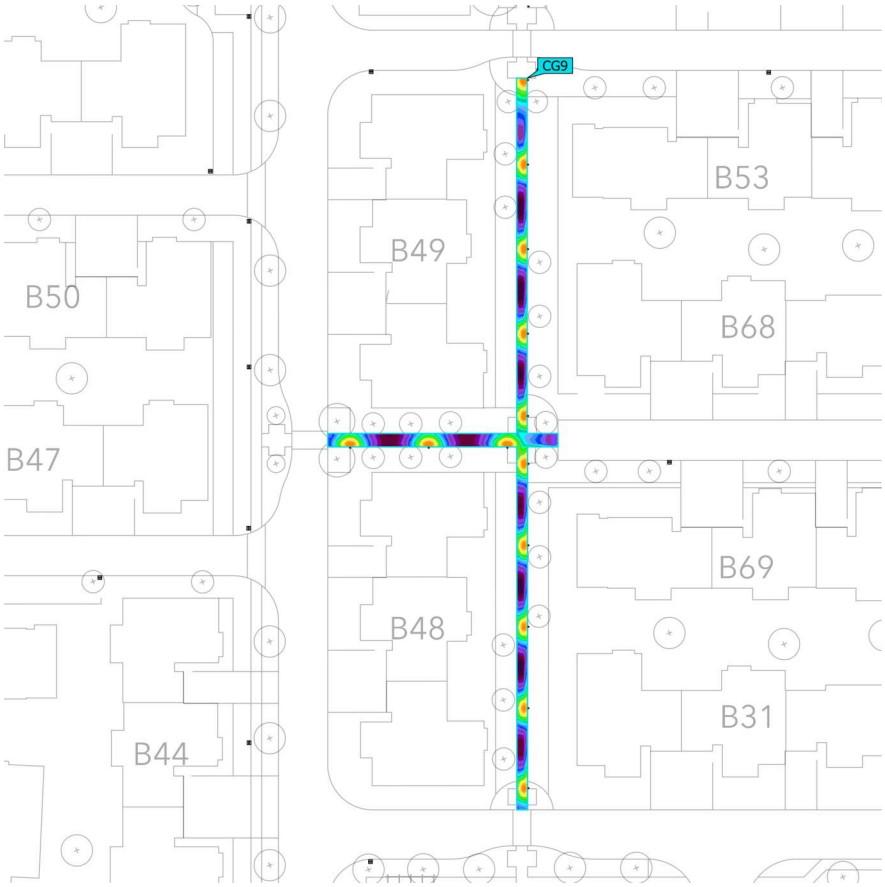


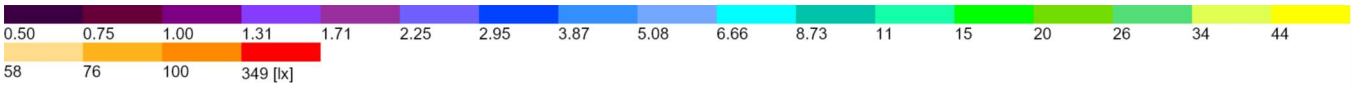
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	19.3 lx	0.56 lx	164 lx	0.029	0.003	CG10

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access pathway (PP4)



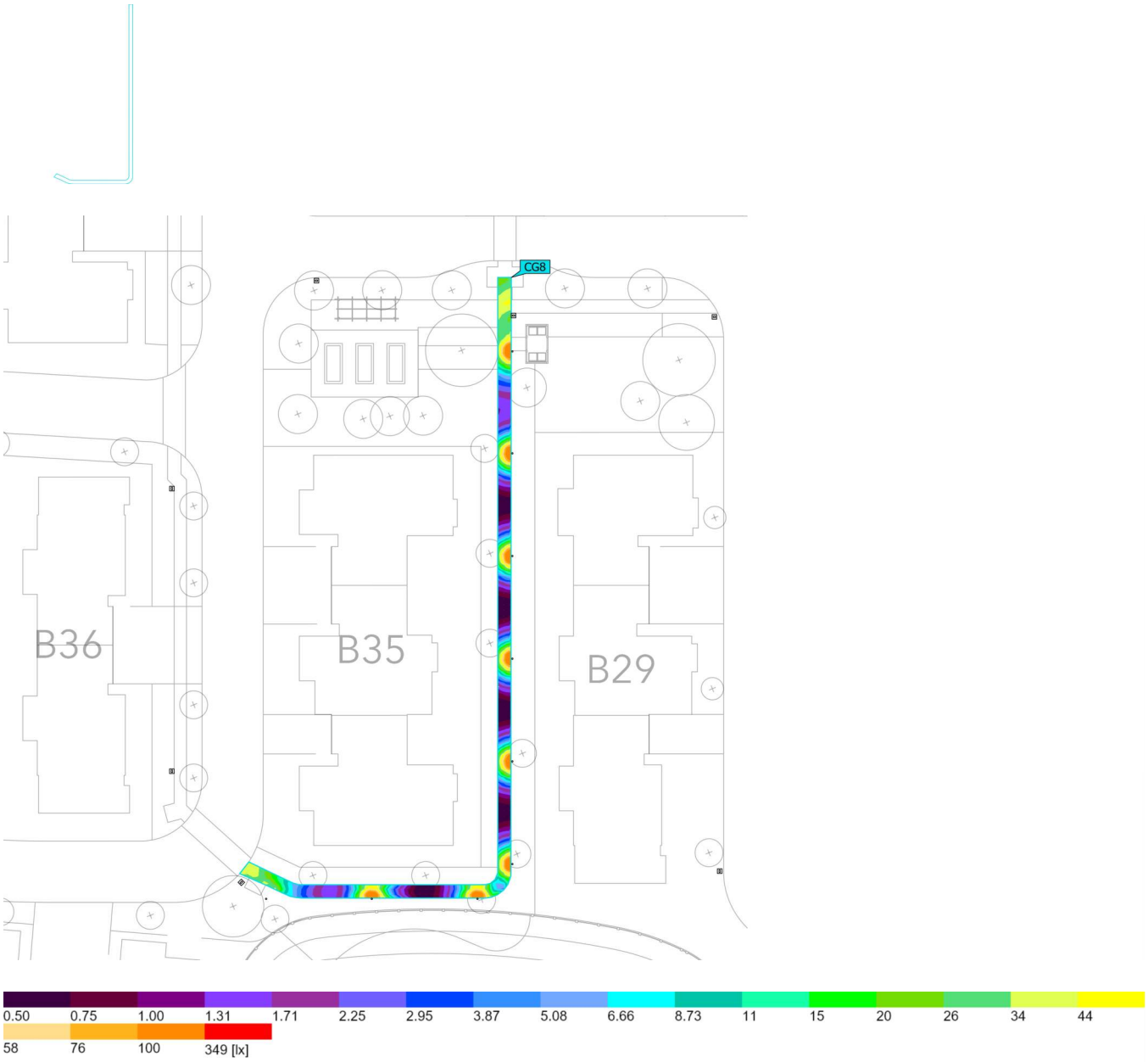


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	17.1 lx	0.54 lx	165 lx	0.032	0.003	CG9

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access pathway (PP4)

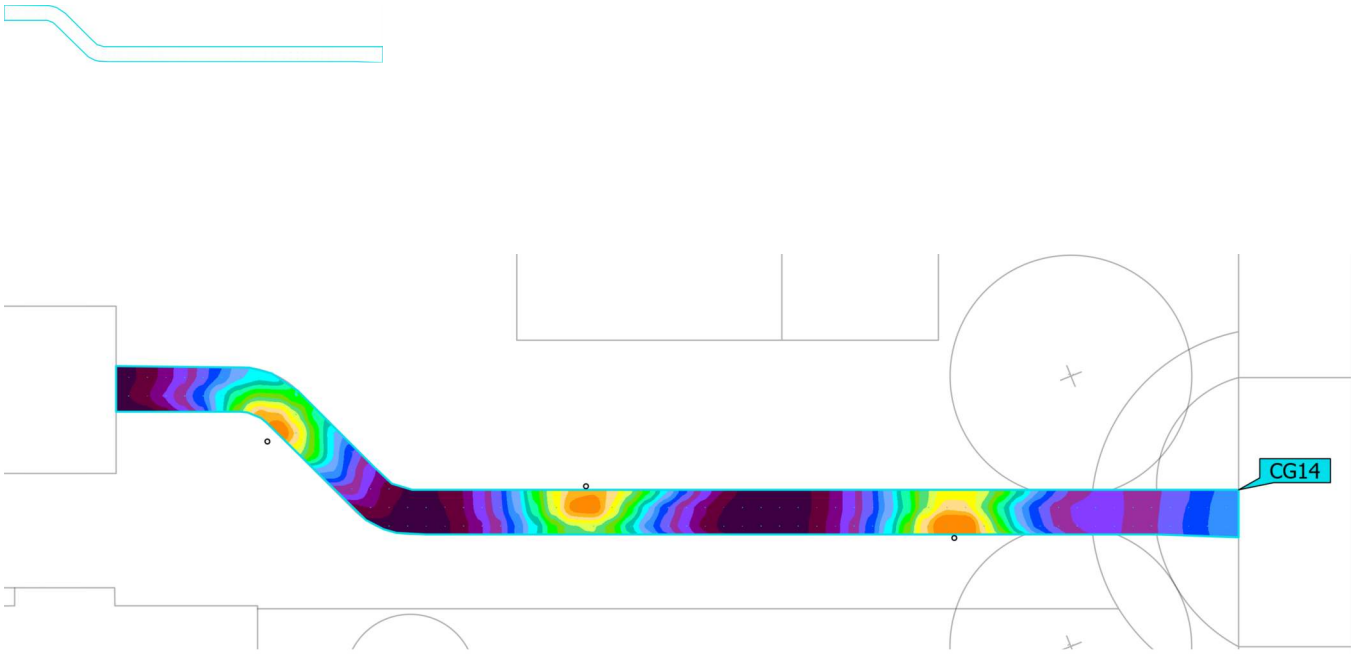


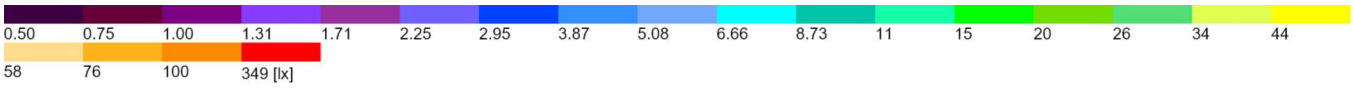
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	20.3 lx	0.54 lx	167 lx	0.027	0.003	CG8

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access pathway (PP4)



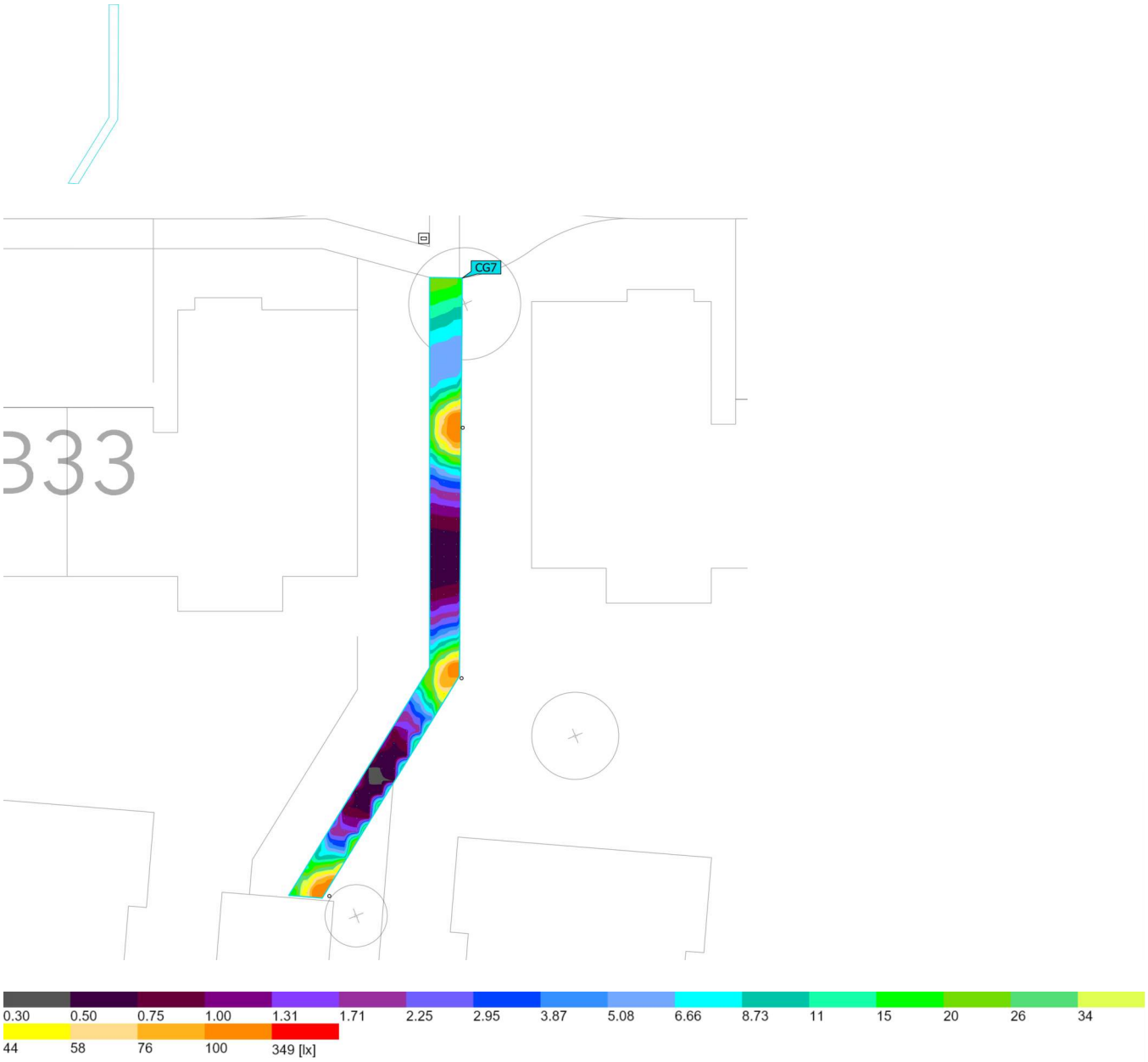


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	15.4 lx	0.54 lx	159 lx	0.035	0.003	CG14

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Shared access pathway (PP4)

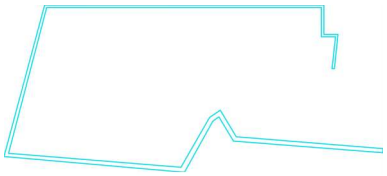


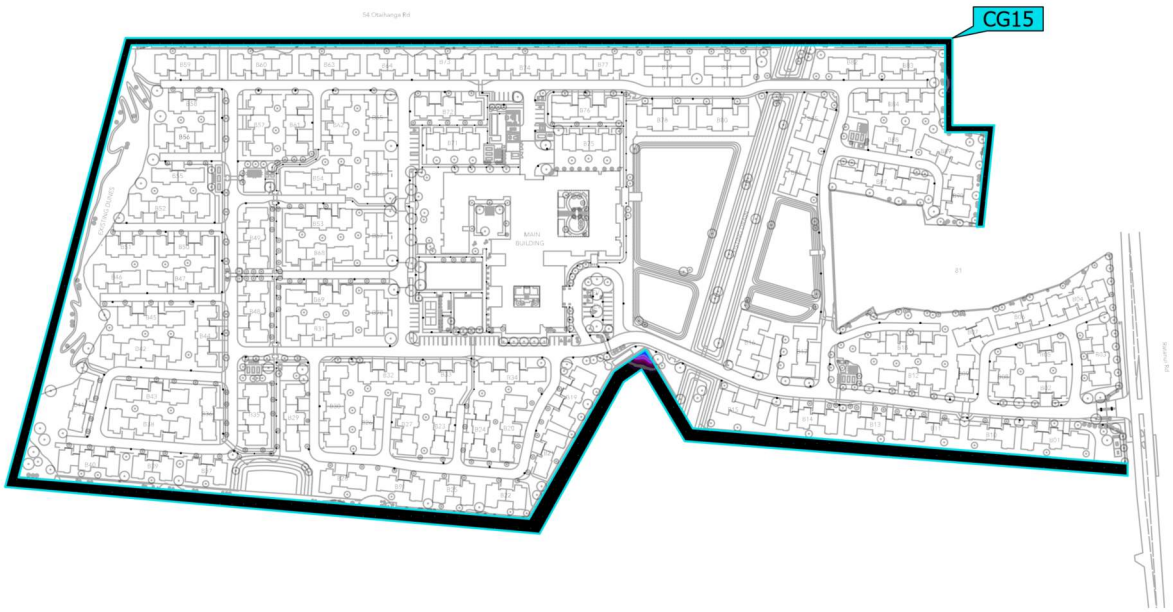
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Shared access pathway (PP4) Perpendicular illuminance Height: 0.000 m	16.3 lx	0.47 lx	160 lx	0.029	0.003	CG7

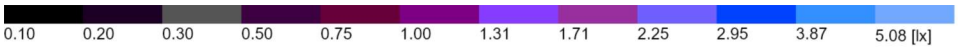
Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Horizontal boundary spill





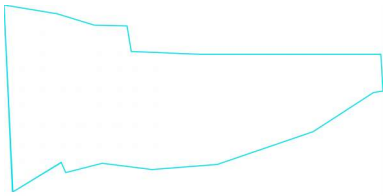


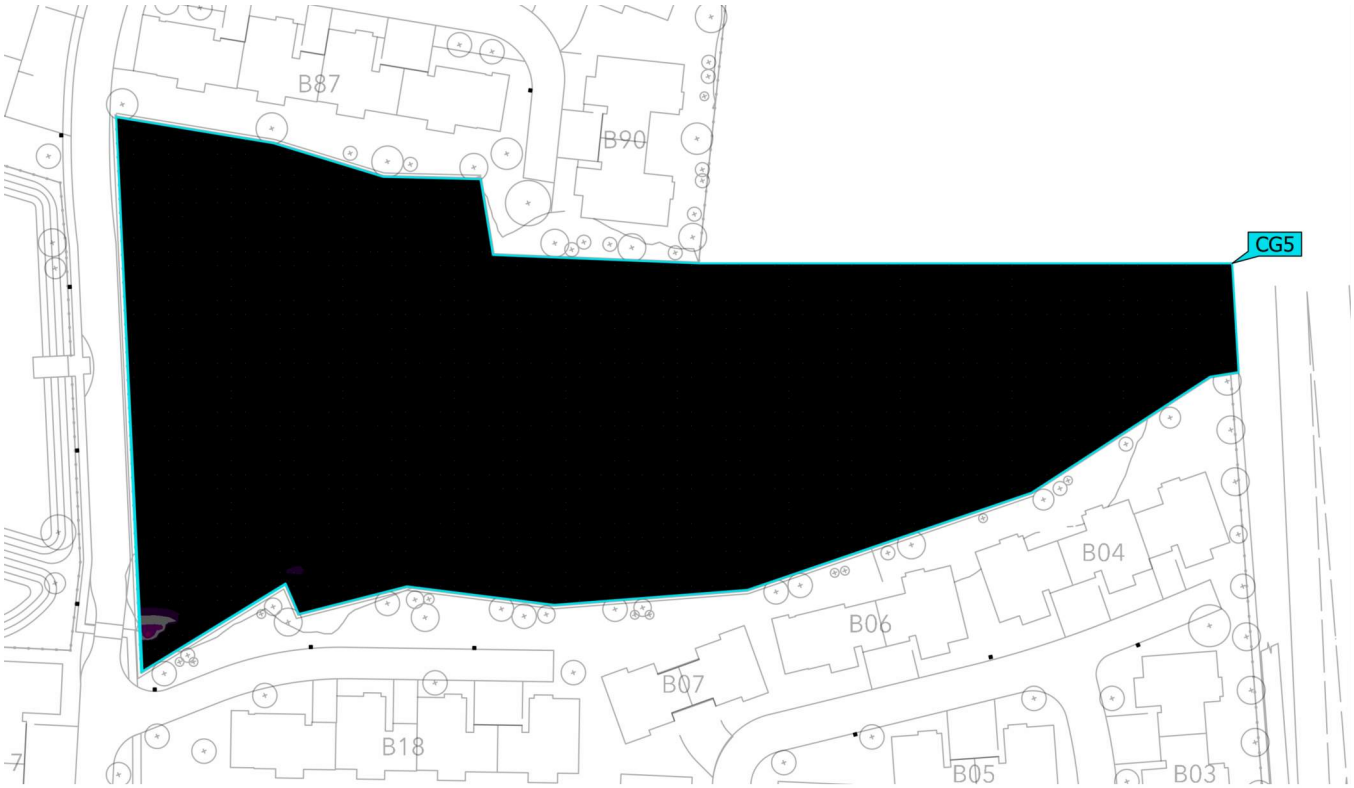
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Horizontal boundary spill Perpendicular illuminance Height: 0.000 m	0.030 lx	0.000 lx	4.49 lx	0.00	0.00	CG15

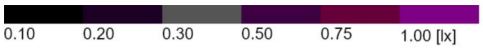
Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

81 Ratanui Rd - Spill







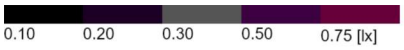
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
81 Ratanui Rd - Spill Perpendicular illuminance Height: 0.000 m	0.011 lx	0.000 lx	0.94 lx	0.00	0.00	CG5

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

81 Ratanui Road - vertical spill





Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
81 Ratanui Road - vertical spill Perpendicular illuminance Height: 5.000 m	0.17 lx	0.000 lx	0.72 lx	0.00	0.00	CG6

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

81 Ratanui Road - vertical spill





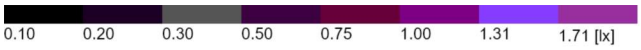
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
81 Ratanui Road - vertical spill Perpendicular illuminance Height: 5.000 m	0.029 lx	0.000 lx	0.14 lx	0.00	0.00	CG16

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

81 Ratanui Road - vertical spill



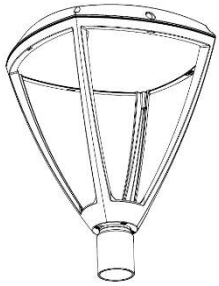


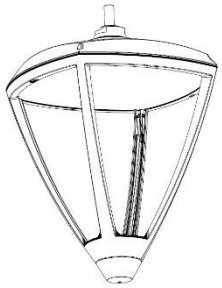
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
81 Ratanui Road - vertical spill Perpendicular illuminance Height: 5.000 m	0.39 lx	0.002 lx	1.45 lx	0.005	0.001	CG17

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Product Sheet

Type P1 & P2





Story

STORY	
MAIN CHARACTERISTICS	
Applications	Street and urban lighting.
Optic	HYPER COMFORT optic: HC-S: Hyper Comfort symmetrical optic for urban lighting and green areas. HC-ST: Hyper Comfort asymmetrical optic for urban lighting and green areas. TRIO optic: S05: Asymmetrical optic for street, urban and green areas lighting. S: Symmetrical optic for urban lighting and green areas. Colour temperature: 4000K (3000K optional) | CRI ≥ 70 LOR= 100%, DLOR= 100%, ULOR= 0% Photobiological safety class: EXEMPT GROUP LED source efficiency: 168 lm/W @ 525mA, Tj=85°C, 4000K
Insulation class	II, I
Protection degree	IP66 | IK08 total
Dimensions	*See the drawing*
Weight	max. 10 kg
Exposed surface	Side: 0.07m^2 – Top: 0.15m^2
Mounting	TP: post-top Ø60mm (Ø76mm optional). S: suspended on brackets 1/2'' GAS.
LED Modules	Removable / Replaceable.
Gear tray	Removable.
Operating temp.	-40°C / +50°C
Storage temperature	-40°C / +80°C
Main reference standards	EN 60598-1, EN 60598-2-3, EN 62471, EN 55015, EN 61547, EN 61000-3-2, EN 61000-3-3
IK08 IP66 EXEMPT GROUP HIGH HYPER	
ELECTRICAL CHARACTERISTICS	
Rated voltage	220÷240V 50/60Hz
Power factor	>0,9 (at full load, F, DA, DAC)
On-load switch	Included, with integrated cable clamp.
Mains connection	Cable H07RN-F nx1.5mm^2 Optional: connector M/F IP66/68 for cables max. 2,5mm^2, Ø max. 12mm
Surge protection	Up to 10kV | With SPD (optional) 10kV / 10kV CM/DM
SPD (optional)	10kV-10kA, type 2+3, with LED signal and thermo fuse to disconnect load at the end of life.
Control system (options)	F: Fixed power not dimmable. DA: Automatic dimming (virtual midnight) with default profile. DAC: Custom DA profile. FLC: Constant light flux. WL: Wireless single point communication system. DALI: Digital dimming interface DALI. NEMA: Socket 7 pin (ANSI C136.41). ZHAGA: Socket 4 pin (ZHAGA Book 18).
Optical unit lifetime (Tq=25°C)	>100.000hr L90B10 >100.000hr L90, TM21
MATERIALS	
Fixing	TP: Die-cast aluminum UNI EN1706 powder painted. S: Stainless steel.
Body	Die-cast aluminum UNI EN1706 powder painted.
Optic	99.85% aluminum with a surface finish in 99.95% with vacuum-sealed deposition. Aluminum grade class A+ (DIN EN 16268)
Screen	Flat tempered satin glass sp. 5mm.
Gasket	Polyurethane
Colour	Graphite - Cod. 01

GREENLIGHT

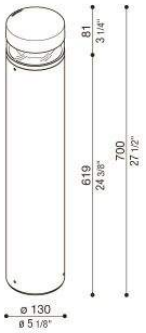
Tok H700

LL1280163

Type X1

Lombardo.

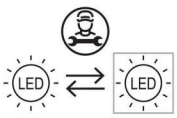




Technical information:

Installation:	Ground, Post Ø60
Material:	Aluminium
Finish:	Grey anthracite RAL 7021
Treatment:	Sea Treatment
Diffuser type:	PMMA
Lamp type:	LED
Energy performance class:	E
Colour temperature:	3000K
CRI:	>80
LB Factor:	L80B20 - 50.000h
Photobiological risk:	RG0
Power consumption (Watt):	14
Lumen:	1860
Real Lumen:	650
Power supply:	integrated
LED:	220-240 V
Circuit breaker B10 - C10 - B16 - C16	45-75-64-106
Insulation class:	CL.I
Power cable:	1 m H05RN-F
Type of protection:	**IP 66**
Resistance to breakage:	**IK 10 20J xx9**
Standards and Marks of Conformity:	CE UK CA

All parts in direct contact with the soil must never be covered by the soil itself or come into contact with aggressive chemicals (e.g. fertilisers, herbicides, pool and/or floor cleaning products, etc.). Clean parts covered with soil build-up or cement dust periodically . Outdoor products must be installed with the appropriate plastic accessories. They must not be installed directly on the ground or directly on concrete because contact between the two materials can create accelerated oxidation of the device.



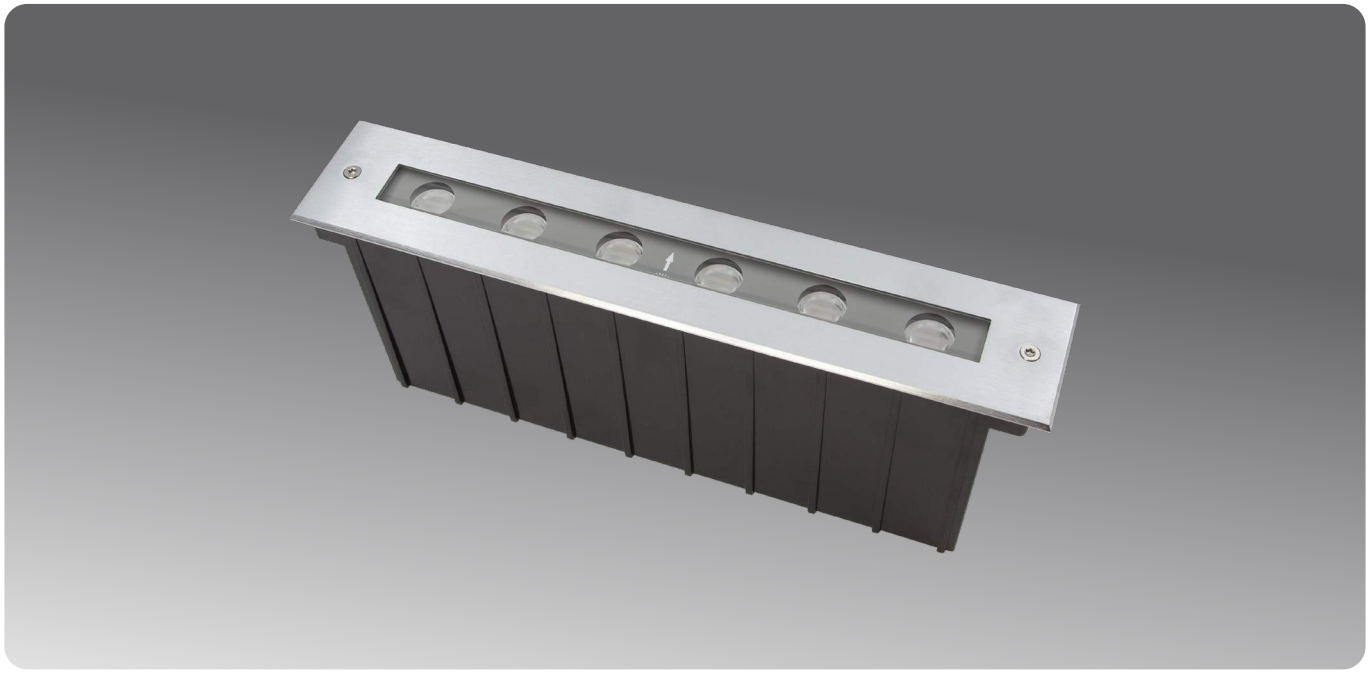


Lombardo S.r.l.
Via Pizzigoni 3, Villongo (BG) - 24060 - Italy - **T** 0039 035 939 411 - **E** info@lombardo.it

Exterior Recessed Inground/Wall
Linear

Type X2

EX311



SPECIFICATIONS

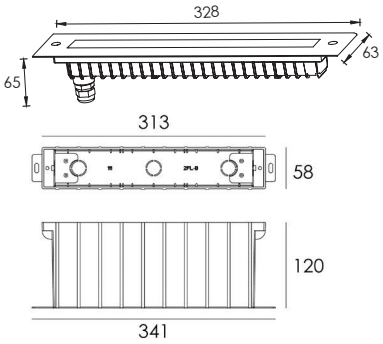
COLOUR TEMP	*2700K*
INPUT VOLTAGE	*24V DC*
CRI	*80*
LIFESPAN	*40,000 hours*
BEAM ANGLE	*Asymmetric - 45˚ | 35˚*
FRONT FACE	*316 Stainless Steel*
GLASS TYPE	*Step Tempered Glass T=8mm*
IP RATING	*IP67*
IK RATING	*IK08*
DRIVER	*Remote Driven, Sold separately 24V DC*
DIMMABLE	*Yes*
APPLICATION	*Exterior inground*
WORKING TEMP	*-20˚ to 40˚C*
WEIGHT CAPACITY	*< 3251kg*
COMPLETE WITH	*ABS Plastic Installation Sleeve (111)*
WARRANTY	*5 Year Warranty*

570 LUMENS | **6×2.2** WATTS | **24V** PARALLEL



Driver sold separately, specify when ordering.

DIMENSIONS



INSTALLATION NOTES

1/ Take pride with installation. All cable joints must be Resin or IP68 type. Standard crimps, terminal blocks and PVC tape are not suitable cable joining methods and will cause luminaire failure from water tracking up into fitting.
2/ When installing in concrete always install over a minimum 50mm drained substrate. Incorrect installation will result in water ingress and luminaire failure from water pooling in base. ***Warranty is void when installed directly into dirt.***
3/ Halcyon recommends using a Constant Voltage driver approximately double the wattage of the circuit load due to inrush current which can momentarily exceed the maximum amperage of the driver if the driver output is not high enough relative to the load. The inrush current may trigger the self-protection/reset function of the driver causing the circuit to flash on and off repeatedly.

AVAILABLE IN

DESCRIPTION	CODE
316 STS 2700K Asymmetric	EX311 ASTSL