metec
CONSULTING ENGINEERS

LIGHTING REPORT

for the

DALGUISE HOUSE DEVELOPEMENT

at

MONKSTOWN,
Co. DUBLIN.

for

GEDV MONKSTOWN OWNER LIMITED

La Vallee House
Upper Dargle Road
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1. INTRODUCTION

Our client, GEDV Monkstown Owner Limited., are proposing the development of the subject site at Dalguise House Development, Monkstown, Co. Dublin. which consists of 11 blocks of residential accommodation, 3 new houses located in the northwest corner of the site, and 3 existing structures undergoing major renovation totalling to 491 no. units and shared amenity spaces.

The Proposed lighting for the site has been designed to provide a safe environment for pedestrians, cyclists and moving vehicles. The lighting design also takes into consideration and is adequately placed for safety and to minimise light pollution to the adjacent areas.

The works will include for the installation of new lighting columns, Bollard lighting, Handrail lighting, wall lighting and feature lighting.

2. DESIGN CONSIDERATIONS

2.1 Road Usage

When designing the proposed lighting scheme for Dalguise House Development the following traffic classifications have been considered:

- Vehicular Traffic
- Pedestrian Traffic
- Cyclist Traffic
- Car parking

2.2 Existing Trees

The site includes an existing established treeline. This made the avoidance of tree positions difficult. Further analysis may be required to optimise positions of columns. The spacing identified within the design allows for flexibility. The column positions can be single side or staggered if better suited to the tree positions. Input from other stake holders will be required.

2.3 Bat Conservation

When designing the proposed road lighting scheme, consideration has been given to best practice as outlined in Bat Conservation Ireland's Bats & Lighting Guidance Notes with regards to reducing impact on bat population. The following have been considered:

- Column height ≤6m
- Directional lighting to prevent light spillage & light pollution.
- All street lanterns calculated at 0° tilt
- All street lanterns available in 3000K LED (warm White)
- Modern light technology to restrict the horizontal plane of luminaires.

3. LIGHTING DESIGN

The lighting design has considered the current Dun Laoghaire Rathdown County Council Public Lighting Technical Specification & Requirements and EN 13201-2. Based on the guidelines set out in these documents the parameters applicable to the site are set out below:

LOCATION – Main Road – Lighting Class P4
Maintained (Eave) Lux Level - 6.92 Lux at (at 30m spacing)
Maintained (Emin) Lux Level – 1.82 Lux (at 30m spacing)

LOCATION – General pathways – Lighting Class P4
Maintained (Eave) Lux Level - 5 Lux (at 30m spacing)
Maintained (Emin) Lux Level – 1 Lux (at 30m spacing)

LOCATION – Car parking – 5 – 10 lux
Maintained (Eave) Lux Level - 6.78 – Lux (typical)
Maintained (Emin) Lux Level – 3.7 Lux (typical)

LOCATION – Forest pathways – Lighting Class P7
The design strategy for the forest pathways is to provide localised lighting to provide visual guidance and to help identify changes in elevation and direction.
Maintained (Eave) Lux Level - 30 – Lux (steps & ramp areas as per BS8300, BS5489)

The proposed lighting scheme for main road and car parking consists of 6m pole mounted fittings as indicated on the drawings. The Luminaire selected is the Performance in Lighting Kreos.

- Low level lighting
- Minimal upward light spill
- LED lamps

Figure 1: Kreos/Pila

The proposed lighting scheme for general pathways consists of 4m pole mounted fittings as indicated on the drawings. The Luminaire selected is the Performance in Lighting Hedo+FT.

- Low level lighting
- Minimal upward light spill
- LED lamps

Figure 2: HEDO+FT/Pila

The proposed lighting scheme for forest pathways consists of bollard fittings as indicated on the drawings. The Luminaire selected is the iGuzzini iWay Super-Comfort.

- Low level lighting
- Zero upward light spill
- LED lamps`

Figure 3: iWay Super Comfort/Piatto

The proposed lighting scheme for ramp and step areas consists of handrail LED lighting and wall mounted fittings as indicated on the drawings. The Luminaires selected are the KKDC Duo Luna LED and the iGuzzini Walky Square.

- Low level lighting
- Minimal upward light spill
- LED lamps`

Figure 4: Dua Luna/Walky Square

4. LIGHTING SIMULATION RESULT

Roadway & Pathways:

The lighting class is determined using the Standards for road lighting Part 2: Performance requirements – EN 13201-2.

- Class P4 along roadway. Optimised spacing calculations to 30m achieves a maintained average illuminance of 6.92 Lux and minimum illuminance of 1.82 Lux.
- Class P4 along pathways. Optimised spacing achieves a maintained average illuminance of 5 Lux and minimum illuminance of 1 Lux.

Car Park:

- A maintained average illuminance of between 5 and 10 lux and minimum uniformity of 0.25 as per BS 5489. Th values of 6.78 lux and minimum uniformity of 0.55 have been achieved.

Forest Pathways:

- Results vary. Localised lighting to provide visual guidance and to help identify changes in elevation and direction.

5. LIGHTING CONTROL

Roadway, Carpark & Pathways:
Each light fitting shall be controlled via an individual Photoelectric Control Unit (PECU). The operation of the lighting shall be on a dusk-dawn profile, 35 lux on/18 lux off.

Other landscape elements (spike lights, inground up-lights, bollards & feature lighting):
Light fitting shall be controlled via an astronomical clock which is built into the Site lighting distribution board.

6. CONCLUSION

The proposed lighting installation achieves the following:

- Luminaire selection limits upward light spill.
- The lighting scheme achieves the recommended lux levels in accordance with current regulations and standards.
- The lighting scheme achieves good uniformity throughout the development to ensure good visibility at night.

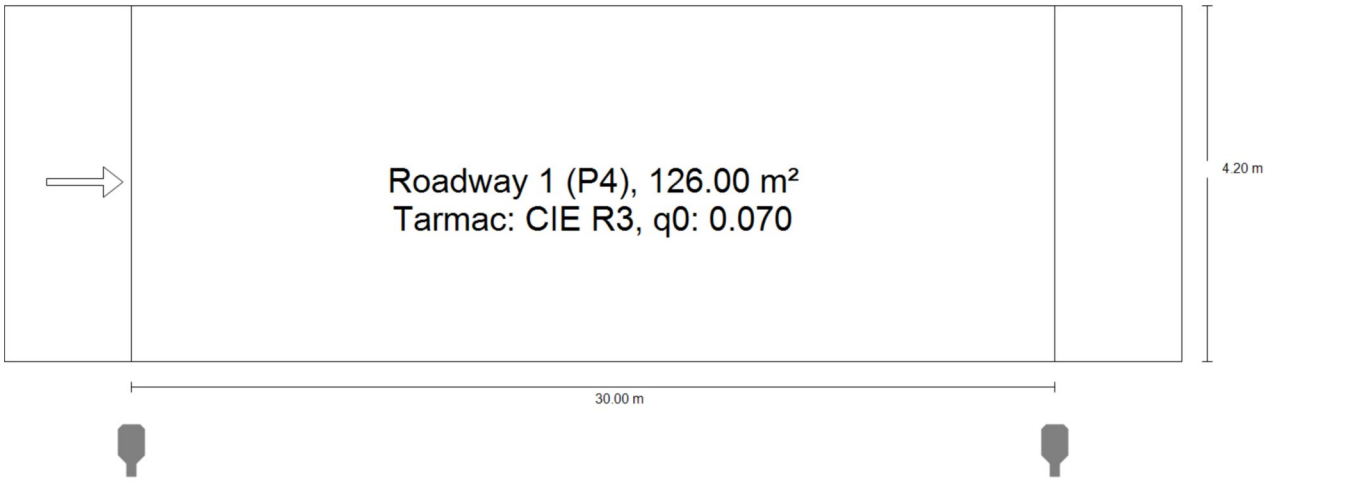
APPENDIX 1

OPTIMISED SPACING CALCULATIONS/OPTIONS TO 30m

DIALux

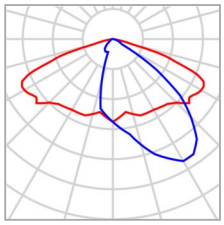
Street 1

Summary (according to EN 13201:2015)



Street 1

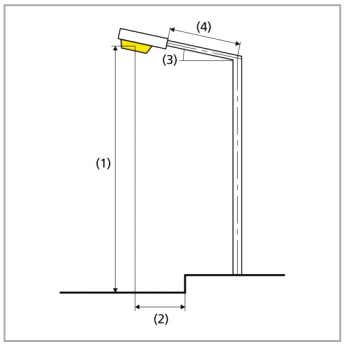
Summary (according to EN 13201:2015)



Manufacturer	Performance in Lighting
Article No.	3106154
Article name	KREOS SR/100 16W 730 AN-96 DALI NEMA Socket
Fitting	1x KREOS SR/100 16W 730

P	16.0 W
$\Phi_{Luminaire}$	2089 lm

KREOS SR/100 16W 730 AN-96 DALI NEMA Socket (single side bottom)



Pole distance	30.000 m
(1) Light spot height	6.000 m
(2) Light point overhang	-1.000 m
(3) Boom inclination	0.0°
(4) Boom length	0.000 m
Annual operating hours	4000 h: 100.0 %, 16.0 W
Consumption	528.0 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°: 637 cd/klm ≥ 80°: 94.4 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*3
Glare index class	D.5

Street 1

Summary (according to EN 13201:2015)

Results for valuation fields

	Symbol	Calculated	Target	Check
Roadway 1 (P4)	E_{av}	5.10 lx	[5.00 - 7.50] lx	✓
	E_{min}	1.72 lx	≥ 1.00 lx	✓
	TI(1)	12 %	-	-

(1) Informative, not part of the valuation

A maintenance factor of 0.67 was used for calculating for the installation.

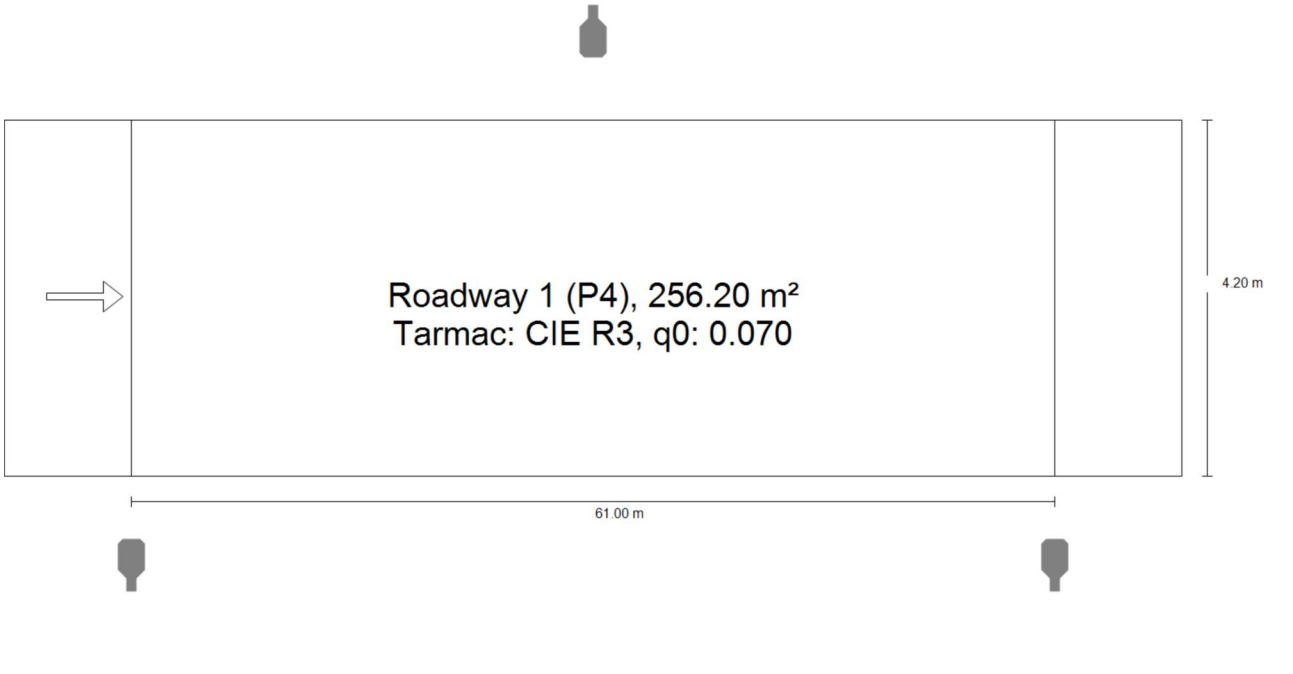
Results for energy efficiency indicators

	Symbol	Calculated	Consumption
Street 1	D_p	0.025 W/lx*m²	-
KREOS SR/100 16W 730 AN-96 DALI NEMA Socket (single side bottom)	D_e	0.5 kWh/m² yr,	64.0 kWh/yr

DIALux

Street 1

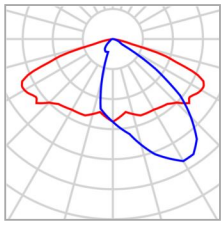
Summary (according to EN 13201:2015)



DIALux

Street 1

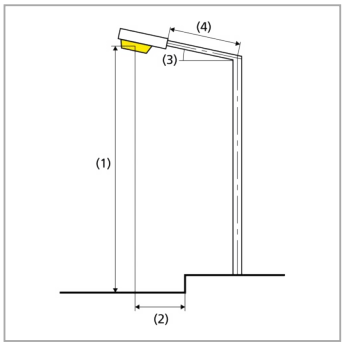
Summary (according to EN 13201:2015)



Manufacturer	Performance in Lighting
Article No.	3106154
Article name	KREOS SR/100 16W 730 AN-96 DALI NEMA Socket
Fitting	1x KREOS SR/100 16W 730

P	16.0 W
$\Phi_{Luminaire}$	2089 lm

KREOS SR/100 16W 730 AN-96 DALI NEMA Socket (both sides offset)



Pole distance	61.000 m
(1) Light spot height	6.000 m
(2) Light point overhang	-1.000 m
(3) Boom inclination	0.0°
(4) Boom length	0.000 m
Annual operating hours	4000 h: 100.0 %, 16.0 W
Consumption	512.0 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°: 637 cd/klm ≥ 80°: 94.4 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*3
Glare index class	D.5

Street 1

Summary (according to EN 13201:2015)

Results for valuation fields

	Symbol	Calculated	Target	Check
Roadway 1 (P4)	E_{av}	5.07 lx	[5.00 - 7.50] lx	✓
	E_{min}	1.87 lx	≥ 1.00 lx	✓
	TI(1)	13 %	-	-

(1) Informative, not part of the valuation

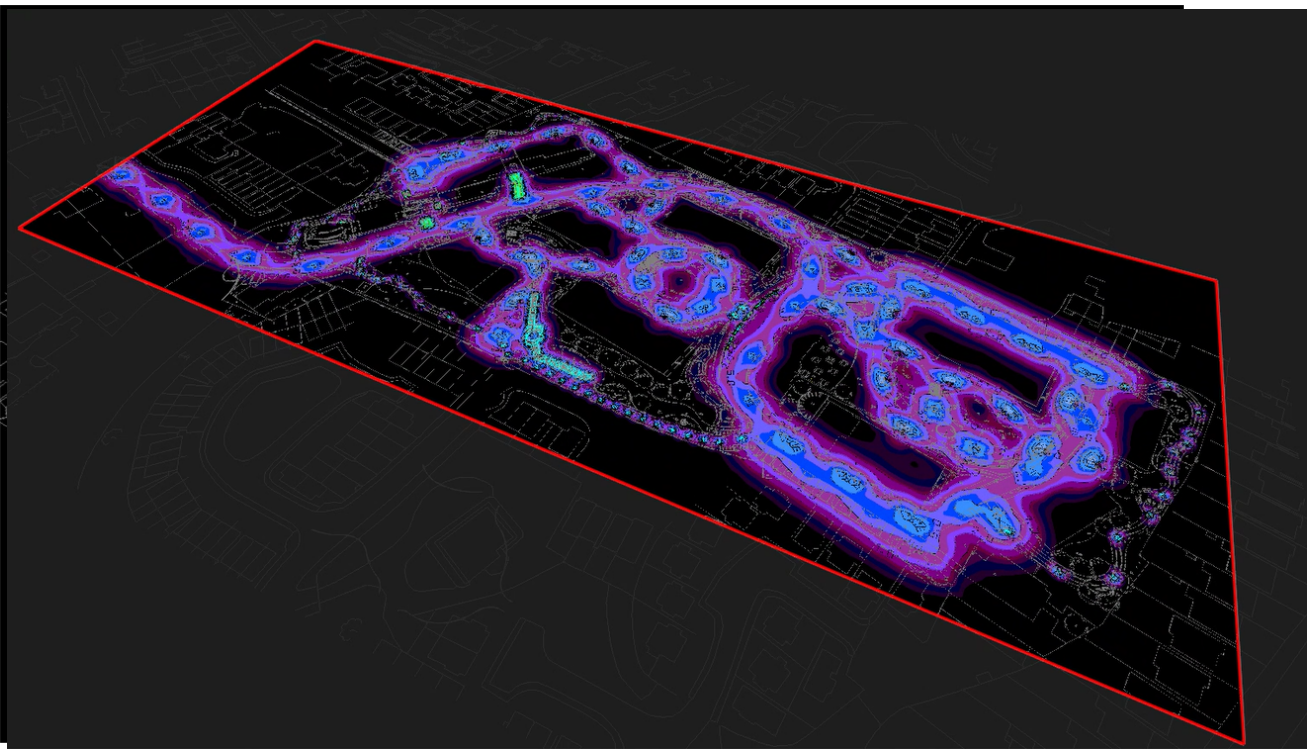
A maintenance factor of 0.67 was used for calculating for the installation.

Results for energy efficiency indicators

	Symbol	Calculated	Consumption
Street 1	D_p	0.025 W/lx*m²	-
KREOS SR/100 16W 730 AN-96 DALI NEMA Socket (both sides offset)	D_e	0.5 kWh/m² yr,	128.0 kWh/yr

APPENDIX 2

SITE LIGHTING REPORT & LUMINAIRE SCHEDULE



GL Metec Dalguise Landscape Lighting 23.09.22

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Content

Product data sheets

Site 1

DIALux

Site 1

Luminaire list

Φ_{total}	P_{total}	Luminous efficacy
199132 lm	2747.7 W	72.5 lm/W

pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
10	Not yet a DIALux member	ATO.03.M40XX.0	Aton 3x 24V 10° 4000K	5.0 W	341 lm	68.2 lm/W
780	Not yet a DIALux member	Duo Luna 3000K (1 modules per m) 12v DC	Duo Luna 3000K (1 modules per m) 12v DC	0.5 W	35 lm	66.2 lm/W
9	Performance in Lighting	3106062	HEDO+ FT 18W 740 C/EW NEMA - Anthracite grey	18.0 W	2185 lm	121.4 lm/W
26	Performance in Lighting	3106066	HEDO+ FT 14W 740 SR/075 NEMA - Anthracite grey	14.0 W	1696 lm	121.1 lm/W
19	Performance in Lighting	3106154	KREOS SR/100 16W 730 AN-96 DALI NEMA Socket	16.0 W	2089 lm	130.6 lm/W
10	Performance in Lighting	3106268	KREOS SR/150 34W 730 AN-96 RPA	34.0 W	3764 lm	110.7 lm/W
7	iGuzzini illuminazione S.p.A	EH91-01_X253-04_X245-01	Palco iNOut - ø83mm - Strahler mit Anschlussdose - LED Warm White - eingebaute elektrische Versorgungseinheit - Medium-Optik 10.9W	10.9 W	560 lm	51.4 lm/W
15	iGuzzini illuminazione S.p.A	EI32-15_X338-15	Walky - square - EI32.15 - Square optic assembly 180x180mm – AL optic – Warm White LED – 220÷240Vac - 9.9W 1550lm - 3000K - Grey	11.5 W	419 lm	36.4 lm/W
2	iGuzzini illuminazione S.p.A	EN97-15_EP17-15_B513-00	iWay Super comfort - Round - Leuchtengehäuse Ø180mm - Led Warm White - 220÷240Vac DALI - Optik 360° Super Comfort 13.1W	13.1 W	680 lm	51.9 lm/W
62	iGuzzini illuminazione S.p.A	EP04-15_EP17-15_B513-00	iWay Super comfort - Round - Leuchtengehäuse Ø180mm - Led Warm White - 220÷240Vac DALI - Optik 180° Super Comfort- Full Cut-Off 12.3W	12.3 W	223 lm	18.1 lm/W

DIALux

Site 1

Luminaire list

pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
7	iGuzzini illuminazione S.p.A	ER44-13_X488-04	Light Up Earth - flush frame - ER44.13 - Recessed luminaire Earth D=239 mm - Flush-mount stainless steel frame -Warm White - Diffuse Optic - DALI - 12W 1850lm - 3000K - Steel	14.3 W	277 lm	19.4 lm/W

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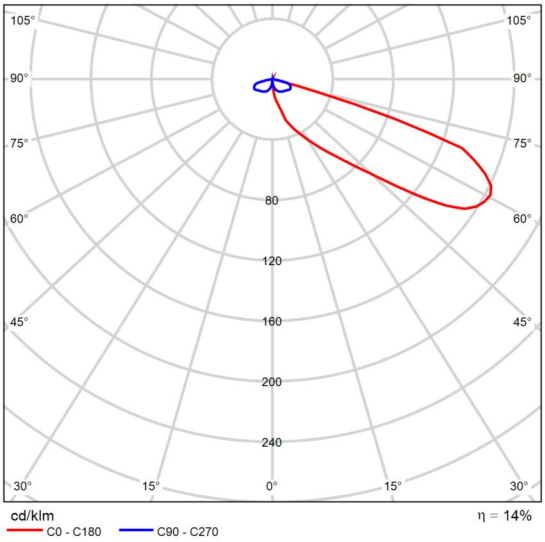
Product data sheet

iGuzzini - iWay Super comfort - Round - Leuchtengehäuse Ø180mm - Led Warm White - 220÷240Vac DALI - Optik 180° Super Comfort- Full Cut-Off 12.3W

Article No.	EP04-15_EP17-15_B513-00
P	12.3 W
Φ_{Lamp}	1650 lm
$\Phi_{Luminaire}$	223 lm
η	13.50 %
Luminous efficacy	18.1 lm/W
CCT	3000 K
CRI	80



Polar LDC

EP04 :
Outdoor, ground or pavement-mounted direct light luminaire, designed to use LED lamps, with a 180° asymmetric optic. The complete product consists of an optical assembly and a cylindrical post to be ordered separately. The optical assembly is made up of various parts, including a top cover made of painted aluminium; a PMMA flux enhancer; a transparent polycarbonate emission lens with an extruded internal bracket and an LED circuit fixed in radial mode; a black-painted, die-cast aluminium cone; a die-cast aluminium lower box for housing the control gear; and silicone seals to guarantee a watertight seal between the top cover, the lens and the cone. The external aluminium parts have been subjected to a multi-step, pre-treatment process, in which the main phases are degreasing, fluorozirconation (a protective surface film) and sealing (with a nano-structured silane layer). The following painting stage consists of a primer and a liquid acrylic paint, cured at 150°C, with a high level of weather and UV ray resistance. At the bottom, the optical assembly is completed by a nickel-plated brass cable clamp and an H07RN-F 4x1mm rubber outlet cable L=1700 mm. The electrical connection requires IP or BOX IP connectors that need to be ordered separately. All external screws used are

DIALux

Product data sheet

iGuzzini - iWay Super comfort - Round - Leuchtengehäuse Ø180mm - Led Warm White - 220÷240Vac DALI - Optik 180° Super Comfort- Full Cut-Off 12.3W

made of AISI 303 (A1) stainless steel.

EP17 :
The post is cylindrical and made of extruded aluminium. It houses the three stainless steel rods fixed to the base, which give the product such a high level of impact resistance. The post is anchored to the ground by a fixing base made of corrosion-resistant low copper content die-cast aluminium alloy. The base and post are subjected to a multi-step, pre-treatment process, in which the main phases are degreasing, fluorozirconation (a protective surface film) and sealing (with a nano-structured silane layer). The following painting stage consists of a primer and a liquid acrylic paint, cured at 150°C, with a high level of weather and UV ray resistance. All external screws used are made of A2 stainless steel.

B513 :
Fixing plate with anchor bolts

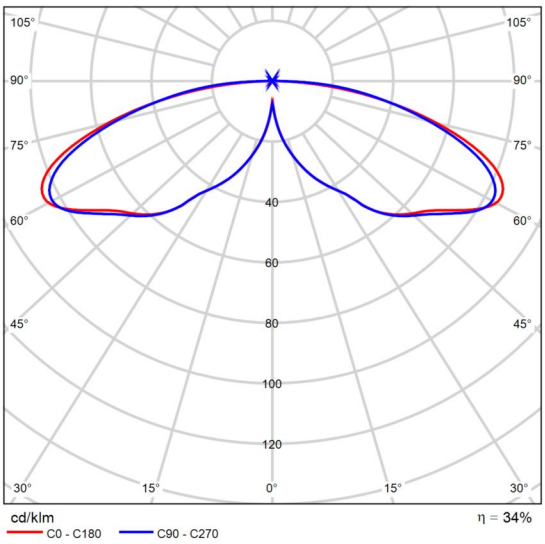
EP04.15 - Ø180mm optical assembly - Warm White LED - 220÷240Vac DALI - Super Comfort 180° optic - Full Cut-Off - 9.6W 1650lm - 3000K - Grey
EP17.15 - Post for iWay optical compartment Ø170 mm - h = 919 mm - Grey
B513.00 - Counter-plate with anchor bolts - Indeterminate
C52P - Lamp LED Warm White CRI>80

DIALux

Product data sheet

iGuzzini - iWay Super comfort - Round - Leuchtengehäuse Ø180mm - Led Warm White - 220÷240Vac DALI - Optik 360° Super Comfort 13.1W

Article No.	EN97-15_EP17-15_B513-00
P	13.1 W
Φ_{Lamp}	2000 lm
$\Phi_{Luminaire}$	680 lm
η	34.00 %
Luminous efficacy	51.9 lm/W
CCT	3000 K
CRI	80



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	22.3	24.0	22.6	24.3	24.6	22.2	24.0	22.6	24.3	24.6
	3H	25.5	27.1	25.8	27.4	27.7	25.4	27.0	25.7	27.3	27.6
	4H	26.7	28.3	27.1	28.6	28.9	26.6	28.1	27.0	28.5	28.8
	6H	27.6	29.1	28.0	29.4	29.8	27.5	29.0	27.9	29.3	29.7
	8H	28.0	29.4	28.4	29.7	30.1	27.9	29.3	28.3	29.6	30.0
	12H	28.2	29.5	28.6	29.9	30.3	28.2	29.5	28.6	29.9	30.3
4H	2H	23.5	25.1	23.9	25.4	25.7	23.5	25.1	23.9	25.4	25.7
	3H	26.7	28.0	27.1	28.4	28.8	26.7	28.0	27.1	28.4	28.8
	4H	28.0	29.3	28.5	29.7	30.1	28.0	29.2	28.4	29.6	30.0
	6H	29.1	30.2	29.5	30.6	31.0	29.1	30.1	29.5	30.6	31.0
	8H	29.5	30.5	29.9	30.9	31.4	29.5	30.5	29.9	30.9	31.4
	12H	29.8	30.7	30.2	31.1	31.6	29.8	30.8	30.3	31.2	31.7
8H	4H	28.6	29.6	29.0	30.0	30.5	28.5	29.6	29.0	30.0	30.4
	6H	29.8	30.6	30.3	31.1	31.6	29.8	30.6	30.3	31.1	31.6
	8H	30.3	31.1	30.8	31.5	32.0	30.4	31.1	30.9	31.6	32.1
	12H	30.7	31.4	31.2	31.9	32.4	30.8	31.5	31.4	32.0	32.5
12H	4H	28.6	29.6	29.1	30.0	30.5	28.6	29.5	29.1	30.0	30.5
	6H	29.9	30.7	30.4	31.2	31.7	29.9	30.7	30.4	31.2	31.7
	8H	30.5	31.2	31.0	31.7	32.2	30.6	31.2	31.1	31.7	32.2
Variation of the observer position for the luminaire distances S											
S = 1.0H		+0.1 / -0.1					+0.1 / -0.1				
S = 1.5H		+0.1 / -0.2					+0.1 / -0.2				
S = 2.0H		+0.3 / -0.3					+0.4 / -0.3				
Standard table		BK09					BK10				
Correction summand		9.9					10.5				
Corrected glare indices referring to 2000lm Total luminous flux											

UGR diagram (SHR: 0.25)

EN97 :
Outdoor, ground or pavement-mounted direct light luminaire, designed to use LED lamps, with a 360° symmetrical optic. The complete product consists of an optical assembly and a cylindrical post to be ordered separately. The optical assembly is made up of various parts, including a top cover made of painted aluminium; a PMMA flux enhancer; a transparent polycarbonate emission lens with an extruded internal bracket and an LED circuit fixed in radial mode; a black-painted, die-cast aluminium cone; a die-cast aluminium lower box for housing the control gear; and silicone seals to guarantee a watertight seal between the top cover, the lens and the cone. The external aluminium parts have been subjected to a multi-step, pre-treatment process, in which the main phases are degreasing, fluorozirconation (a protective surface film) and sealing (with a nano-structured silane layer). The following painting stage consists of a primer and a liquid acrylic paint, cured at 150°C, with a high level of weather and UV ray resistance. At the bottom, the optical assembly is completed by a nickel-plated brass cable clamp and an H07RN-F 4x1mm rubber outlet cable L=1700 mm. The electrical connection requires IP or BOX IP connectors that need to be ordered separately. All external screws used are

DIALux

Product data sheet

iGuzzini - iWay Super comfort - Round - Leuchtengehäuse Ø180mm - Led Warm White - 220÷240Vac DALI - Optik 360° Super Comfort 13.1W

made of AISI 303 (A1) stainless steel.

EP17 :
The post is cylindrical and made of extruded aluminium. It houses the three stainless steel rods fixed to the base, which give the product such a high level of impact resistance. The post is anchored to the ground by a fixing base made of corrosion-resistant low copper content die-cast aluminium alloy. The base and post are subjected to a multi-step, pre-treatment process, in which the main phases are degreasing, fluorozirconation (a protective surface film) and sealing (with a nano-structured silane layer). The following painting stage consists of a primer and a liquid acrylic paint, cured at 150°C, with a high level of weather and UV ray resistance. All external screws used are made of A2 stainless steel.

B513 :
Fixing plate with anchor bolts

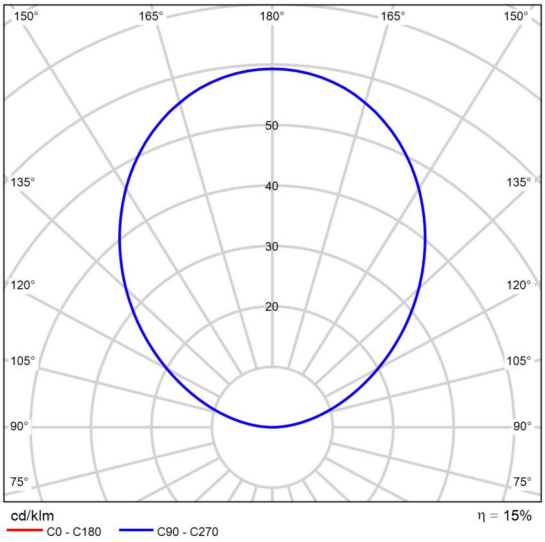
EN97.15 - Ø180mm optical assembly - Warm White LED - 220÷240Vac DALI - Super Comfort 360° optic - 10W 2000lm - 3000K - Grey
EP17.15 - Post for iWay optical compartment Ø170 mm - h = 919 mm - Grey
B513.00 - Counter-plate with anchor bolts - Indeterminate
C45P - Lamp LED Warm White CRI>80

DIALux

Product data sheet

iGuzzini - Light Up Earth - flush frame - ER44.13 - Recessed luminaire Earth D=239 mm - Flush-mount stainless steel frame -Warm White - Diffuse Optic - DALI - 12W 1850lm - 3000K - Steel

Article No.	ER44-13_X488-04
P	14.3 W
Φ_{Lamp}	1850 lm
$\Phi_{Luminaire}$	277 lm
η	15.00 %
Luminous efficacy	19.4 lm/W
CCT	3000 K
CRI	80



Polar LDC

ER44 :
Recessed luminaire applicable to the floor or ground, designed for fitting monochrome white LED sources, for illumination, fixed optic, with DALI dimmable incorporated electronic control gear. The round frame has a diameter D=239 mm; the body and frame are made of AISI 304 stainless steel with anti-slip glass (conforming to Class R13 pursuant to DIN 51130), 15 mm thickness and internal methacrylate opal diffuser. Stainless steel body coated with black paint. The luminaire is fixed to the outer casing by means of two TORX-type screws that ensure proper anchoring. Inclusive of LED circuit. The product is wired using an A2 stainless steel cable gland, with type A07RNF 4x1 mm^2 outgoing power cord having L=1191 mm. The cable is equipped with an anti-transpiration device (IP68) consisting of a silicone seal placed on the power cable and housed inside the product. The outer casing for installation can be ordered separately from the plastic optical assembly. The assembly made up of the frame, optical assembly and outer casing guarantees 5000 kg resistance to static loads. Maximum glass surface temperature is lower than 40°C.

X488 :
Made of plastic (polypropylene). Inclusive of front cap with system

DIALux

Product data sheet

iGuzzini - Light Up Earth - flush frame - ER44.13 - Recessed luminaire Earth D=239 mm - Flush-mount stainless steel frame -Warm White - Diffuse Optic - DALI - 12W 1850lm - 3000K - Steel

for extracting the cables and double cable entry.

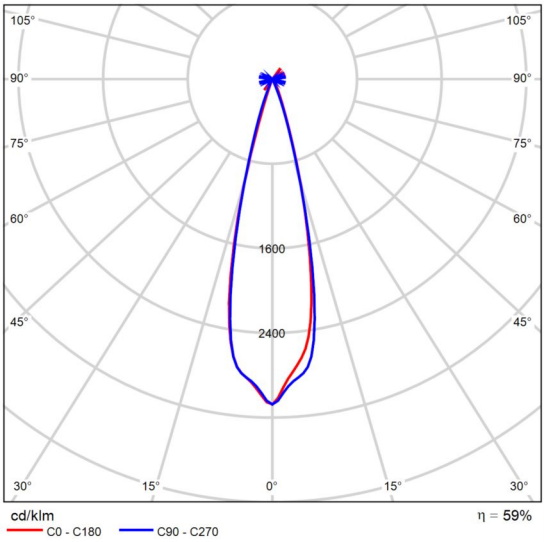
ER44.13 - Recessed luminaire Earth D=239 mm - Flush-mount stainless steel frame -Warm White - Diffuse Optic - DALI - 12W 1850lm - 3000K - Steel
X488.04 - Outer casing - Black
C02M - Lamp LED Warm White CRI>80

DIALux

Product data sheet

iGuzzini - Palco iNOut - ø83mm - Strahler mit Anschlussdose - LED Warm White - eingebaute elektrische Versorgungseinheit - Medium-Optik 10.9W

Article No.	EH91-01_X253-04_X245-01
P	10.9 W
Φ_{Lamp}	950 lm
$\Phi_{Luminaire}$	560 lm
η	58.93 %
Luminous efficacy	51.4 lm/W
CCT	3000 K
CRI	80



Polar LDC

Cone diagram

EH91 :
Spotlight designed to use LED lamps and a Medium optic. The optical assembly and base is made of EN1706AC 46100LF aluminium alloy and subjected to a multi-step, pre-treatment process, in which the main phases are degreasing, fluorozirconation (a protective surface film) and sealing (with a nano-structured silane layer). The following painting stage consists of a primer and a liquid acrylic paint, cured at 150°C, with a high level of weather and UV ray resistance. 5 mm thick tempered sodium-calcium closing glass. Double adjustability allows a 360° rotation about the vertical axis and 90° tilting relative to the horizontal plane. Mechanical aiming locks for rotation on both the vertical axis and horizontal plane. Complete with a monochrome LED circuit and an Opti Beam Lens optic system. The product includes a PG13.5 cable gland. Electronic On/Off ballast integrated in product. Option of using optic accessories assembled via an accessory holder frame. All external screws used are made of A2 stainless steel.

X253 :
Cylindrical screen with a 45° cut for a Ø 80 mm spotlight. The

DIALux

Product data sheet

iGuzzini - Palco iNOut - ø83mm - Strahler mit Anschlussdose - LED Warm White - eingebaute elektrische Versorgungseinheit - Medium-Optik 10.9W

cylindrical screen is made of steel with a zinc-nickel treatment and corrosion-proof passivation. It is painted black. The screen has openings so that water can flow out in applications in upward pointing applications. It has fixing screws that are hidden when the accessory is installed. The screen has internal cover plates that prevent the light from shining out sideways through the water outlet openings. To prevent illuminated cracks, there is a gasket for fastening it to the accessory holder (for X251-X252-X253-X247-X248-X249 only). The screen is supplied with protective glass for the accessory holder, which gives it a protection level of IP66 so that water does not collect inside. It is painted with a liquid coating.

X245 :
Accessory Support Frame

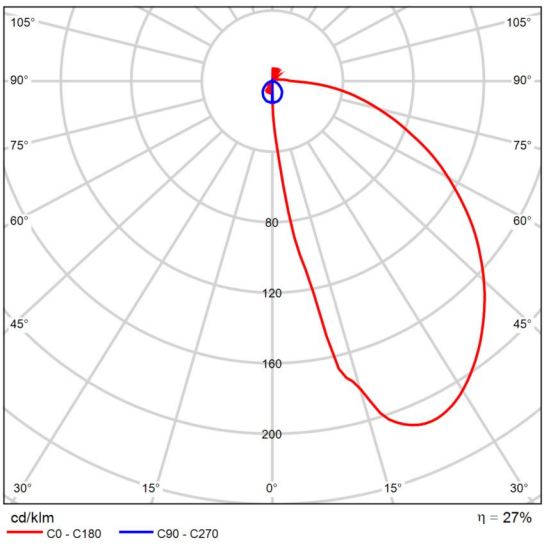
EH91.01 - Spotlight with base - Warm White Led - integrated electronic control gear - Medium optic - 9.1W 950lm - 3000K - White
X253.04 - 45° cylindrical screen - Installation with accessory frame - Black
X245.01 - Accessory support frame - White
B81B - Lamp LED Warm White CRI>80

DIALux

Product data sheet

iGuzzini - Walky - square - EI32.15 - Square optic assembly 180x180mm – AL optic – Warm White LED – 220÷240Vac - 9.9W 1550lm - 3000K - Grey

Article No.	EI32-15_X338-15
P	11.5 W
Φ_{Lamp}	1550 lm
$\Phi_{Luminaire}$	419 lm
η	27.00 %
Luminous efficacy	36.4 lm/W
CCT	3000 K
CRI	80



Polar LDC

EI32 :
Luminaire for walkways designed to use high visual comfort LED lamps. Ceiling and wall-recessed installation. It consists of an optical assembly with an IP66 protection rating and an outer casing or wall-mounted base to be ordered separately. The optical assembly and base are made of aluminium alloy treated with powder paint, which provides a high level of resistance to weather and UV rays. Plastic closure guard at the rear of the optical assembly. Complete with plastic cable gland and outlet cable. Sodium-calcium tempered satin finish safety glass. Luminaire with no visible screws and an anti-vandal system that uses an opening key to access the rear wiring compartment (supplied in the package). All external screws used are made of A2 stainless steel.

X338 :
Wall base for square Walky optical assembly 180x180mm. Made of die-cast aluminium and treated with powder paint, which provides a high level of resistance to weather and UV rays.

EI32.15 - Square optic assembly 180x180mm – AL optic – Warm White LED – 220÷240Vac - 9.9W 1550lm - 3000K - Grey

DIALux

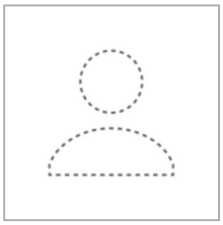
Product data sheet

iGuzzini - Walky - square - EI32.15 - Square optic assembly 180x180mm – AL optic – Warm White LED – 220÷240Vac - 9.9W 1550lm - 3000K - Grey

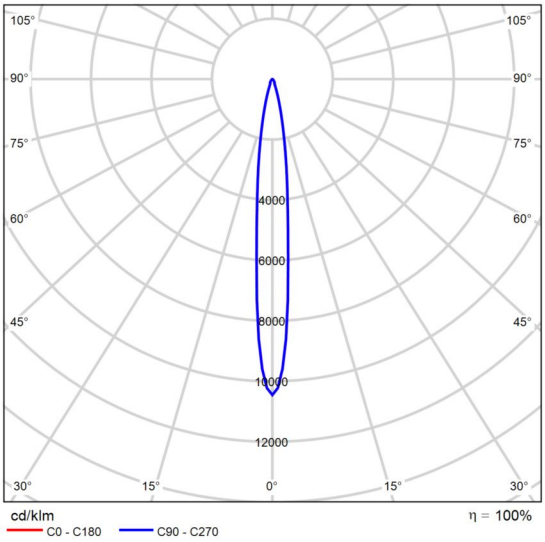
X338.15 - Wall base - square - Grey
B28P - Lamp LED Warm White CRI>80

Product data sheet

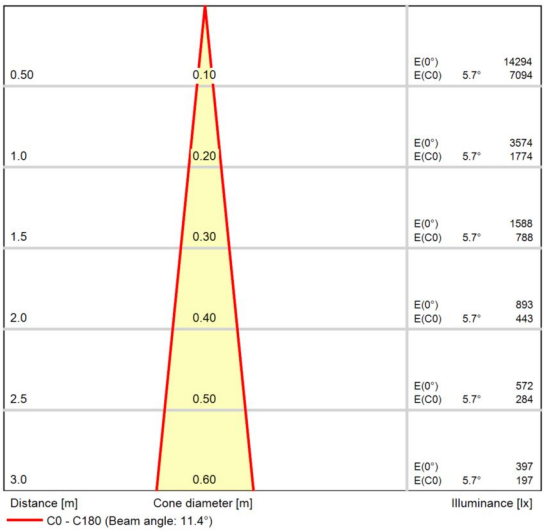
Not yet a DIALux member - Aton 3x 24V 10° 4000K



Article No.	ATO.03.M40XX.0
P	5.0 W
Φ_{Lamp}	342 lm
$\Phi_{Luminaire}$	341 lm
η	99.75 %
Luminous efficacy	68.2 lm/W
CCT	3000 K
CRI	100



Polar LDC

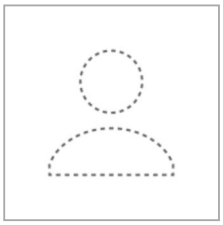


Cone diagram

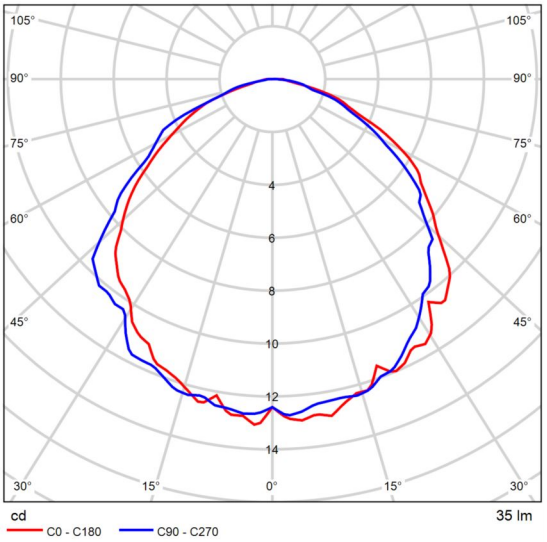
DIALux

Product data sheet

Not yet a DIALux member - Duo Luna 3000K (1 modules per m) 12v DC



Article No.	Duo Luna 3000K (1 modules per m) 12v DC
P	0.5 W
$\Phi_{Luminaire}$	35 lm
Luminous efficacy	66.2 lm/W
CCT	3000 K
CRI	100



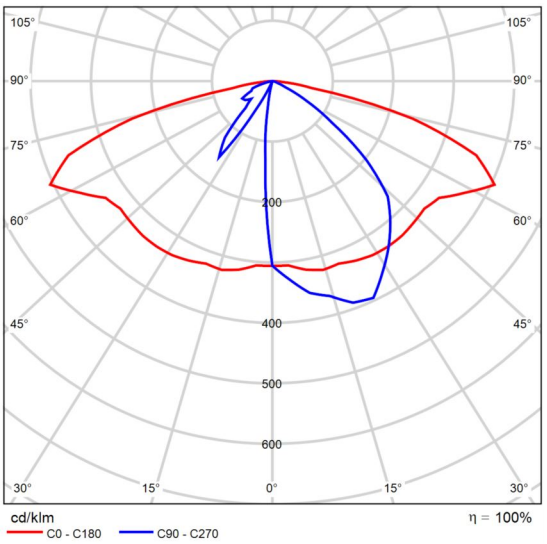
Polar LDC

DIALux

Product data sheet

Performance in Lighting - HEDO+ FT 14W 740 SR/075 NEMA - Anthracite grey

Article No.	3106066
P	14.0 W
Φ_{Lamp}	1697 lm
$\Phi_{Luminaire}$	1696 lm
η	99.91 %
Luminous efficacy	121.1 lm/W
CCT	4000 K
CRI	70



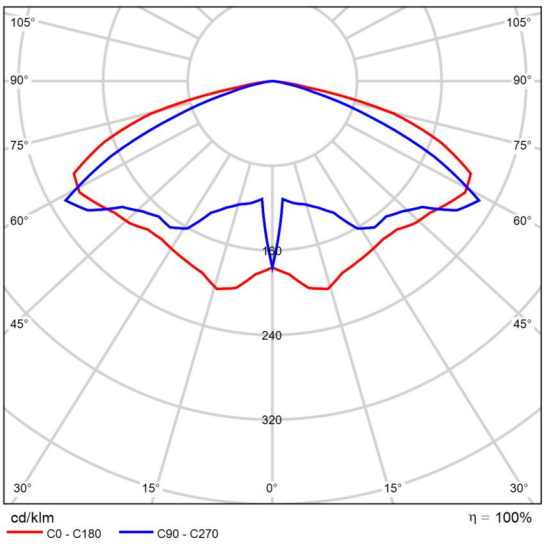
Polar LDC

DIALux

Product data sheet

Performance in Lighting - HEDO+ FT 18W 740 C/EW NEMA - Anthracite grey

Article No.	3106062
P	18.0 W
Φ_{Lamp}	2185 lm
$\Phi_{Luminaire}$	2185 lm
η	100.00 %
Luminous efficacy	121.4 lm/W
CCT	4000 K
CRI	70



Polar LDC

Glare evaluation according to UGR

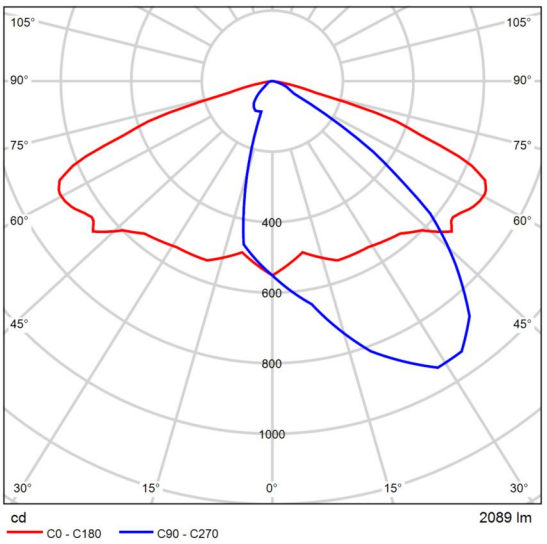
ρ Ceiling		70	70	50	50	30	70	70	50	50	30
ρ Walls		50	30	50	30	30	50	30	50	30	30
ρ Floor		20	20	20	20	20	20	20	20	20	20
Room size X	Y	Viewing direction at right angles to lamp axis					Viewing direction parallel to lamp axis				
2H	2H	28.5	30.1	28.8	30.3	30.6	27.8	29.4	28.1	29.7	30.0
	3H	30.8	32.3	31.2	32.6	32.8	29.4	30.8	29.7	31.1	31.4
	4H	31.5	32.9	31.8	33.1	33.5	29.6	30.9	29.9	31.2	31.5
	6H	31.7	32.9	32.0	33.3	33.6	29.6	30.8	29.9	31.2	31.5
	8H	31.6	32.9	32.0	33.2	33.5	29.5	30.8	29.9	31.1	31.4
	12H	31.6	32.8	32.0	33.1	33.5	29.5	30.7	29.9	31.0	31.3
4H	2H	29.7	31.1	30.0	31.4	31.7	29.3	30.7	29.6	31.0	31.3
	3H	32.1	33.2	32.4	33.6	33.9	30.9	32.1	31.3	32.4	32.8
	4H	32.7	33.8	33.2	34.2	34.5	31.1	32.2	31.6	32.6	32.9
	6H	33.0	33.9	33.4	34.3	34.7	31.2	32.1	31.6	32.5	32.9
	8H	33.0	33.8	33.4	34.2	34.6	31.2	32.0	31.6	32.4	32.8
	12H	32.9	33.7	33.4	34.1	34.6	31.1	31.9	31.6	32.3	32.8
8H	4H	32.9	33.8	33.4	34.2	34.6	31.5	32.4	31.9	32.8	33.2
	6H	33.2	33.9	33.6	34.3	34.8	31.6	32.3	32.0	32.7	33.2
	8H	33.2	33.8	33.7	34.2	34.7	31.6	32.2	32.1	32.6	33.1
	12H	33.2	33.7	33.7	34.2	34.7	31.6	32.1	32.1	32.5	33.0
12H	4H	32.9	33.7	33.4	34.1	34.5	31.5	32.3	31.9	32.7	33.1
	6H	33.2	33.8	33.6	34.2	34.7	31.6	32.2	32.1	32.6	33.1
	8H	33.2	33.7	33.7	34.2	34.7	31.6	32.1	32.1	32.6	33.1
Variation of the observer position for the luminaire distances S											
S = 1.0H		+0.2 / -0.2					+0.2 / -0.2				
S = 1.5H		+0.4 / -0.5					+0.7 / -0.7				
S = 2.0H		+0.8 / -1.0					+1.4 / -1.7				
Standard table		BK05					BK04				
Correction summand		15.8					14.0				
Corrected glare indices referring to 2185lm Total luminous flux											

UGR diagram (SHR: 0.25)

Product data sheet

Performance in Lighting - KREOS SR/100 16W 730 AN-96 DALI NEMA Socket

Article No.	3106154
P	16.0 W
$\Phi_{Luminaire}$	2089 lm
Luminous efficacy	130.6 lm/W
CCT	3259 K
CRI	70



Polar LDC

Part number: 3106154. Series: KREOS.
LED street luminaire, comprising: Die-cast aluminium housing and cap, chemical pre-treated and painted polyester powder coat finish ISO 9227. Painted die-cast aluminium pole-top adaptor for pole Ø 60 / 76 mm. Pure aluminium high-performance reflectors, polished, oxidised, PVD 99.99% silver treated. This treatment creates a surface with greater than 97% reflectance and iridescence- free. Compliant with the UNI 10819 standards on light pollution. High resiliency anti-ageing silicone gasket with high elastic return capacity. Extra clear, tempered, toughened flat glass diffuser. Switch splitter automatically disconnects the power supply when the cable cover is opened. Die-cast aluminium retaining clip with stainless steel spring allows quick and tool-free access to the fixture for extraordinary maintenance. Removable galvanized sheet metal gear tray. Built-in driver. Integral surge protection device (SPD) against mains overvoltages up to 10 kV . Complete with 1 meter H07RN-F 2x1.5 mm2 or H07RN-F 4x1.5 mm2 cable for dimmable versions, which allows connection to the mains without opening the luminaire. Stainless steel external screws. NEMA versions are complete with NEMA SOCKET connected to a DALI driver and a watertight short-circuit cap allowing the on-off operation of the luminaire. These versions are designed for mounting SMART-compatible solutions. KREOS versions can be manufactured with all optics available for the series. Consult Factory. For other colour temperatures and different colour rendering index consult factory.

DIALux

Product data sheet

Performance in Lighting - KREOS SR/100 16W 730 AN-96 DALI NEMA Socket

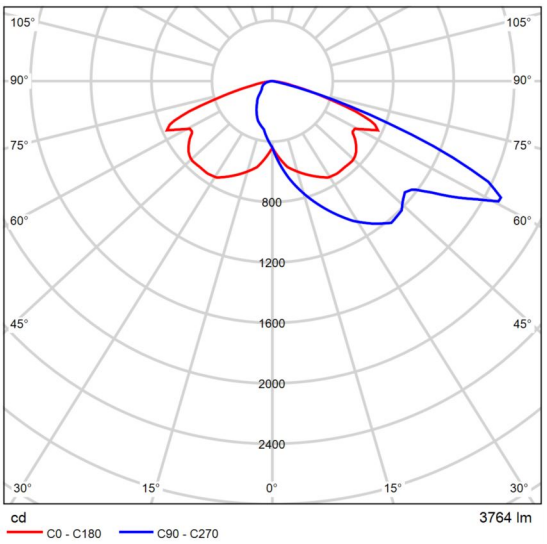
Mounting type: Street lighting. Colour/Finish: AN-96 / Anthracite gray / Textured. Shape: Rectangular. Net weight: 6.225 kg. International protection marking: IP66. IK08 9J xx5. Glow wire resistence: 960 °C. Ta MIN luminaire: -40° C. Ta MAX luminaire: 50° C. Optic: Road reflector - SR/100. Full cut-off. Lamps: 1. Lampholder: LED. Light Source: LED. ILCOS: DSS. Lightsource lumen output: 2562 lm. Luminaire lumen output: 2090 lm. Efficiency: 130 lm/W. Kelvin: 3000. CRI 70. MacAdam: 5. L90B10 @ 100000h. Insulation class: II. Supply voltage: 0/50/60. Wattage: 16 W. Power factor / COS Φ: 0.9. Dimmable DALI. CE certified. Mountable on normally flammable surfaces. EAC certified. RCM certified

DIALux

Product data sheet

Performance in Lighting - KREOS SR/150 34W 730 AN-96 RPA

Article No.	3106268
P	34.0 W
$\Phi_{Luminaire}$	3764 lm
Luminous efficacy	110.7 lm/W
CCT	3259 K
CRI	70



Polar LDC

Part number: 3106268. Series: KREOS.
LED street luminaire, comprising: Die-cast aluminium housing and cap, chemical pre-treated and painted polyester powder coat finish ISO 9227. Painted die-cast aluminium pole-top adaptor for pole Ø 60 / 76 mm. Pure aluminium high-performance reflectors, polished, oxidised, PVD 99.99% silver treated. This treatment creates a surface with greater than 97% reflectance and iridescence- free. Compliant with the UNI 10819 standards on light pollution. High resiliency anti-ageing silicone gasket with high elastic return capacity. Extra clear, tempered, toughened flat glass diffuser. Switch splitter automatically disconnects the power supply when the cable cover is opened. Die-cast aluminium retaining clip with stainless steel spring allows quick and tool-free access to the fixture for extraordinary maintenance. Removable galvanized sheet metal gear tray. Built-in driver. Integral surge protection device (SPD) against mains overvoltages up to 10 kV . Complete with 1 meter H07RN-F 2x1.5 mm2 or H07RN-F 4x1.5 mm2 cable for dimmable versions, which allows connection to the mains without opening the luminaire. Stainless steel external screws. KREOS versions can be manufactured with all optics available for the series. Consult Factory. For other colour temperatures and different colour rendering index consult factory.
Mounting type: Street lighting. Colour/Finish: AN-96 / Anthracite gray / Textured. Shape: Rectangular. Net weight: 6.035 kg. International protection marking: IP66. IK08 9J xx5. Glow wire resistence: 960 °C. Ta MIN luminaire: -40° C. Ta MAX luminaire: 50°

DIALux

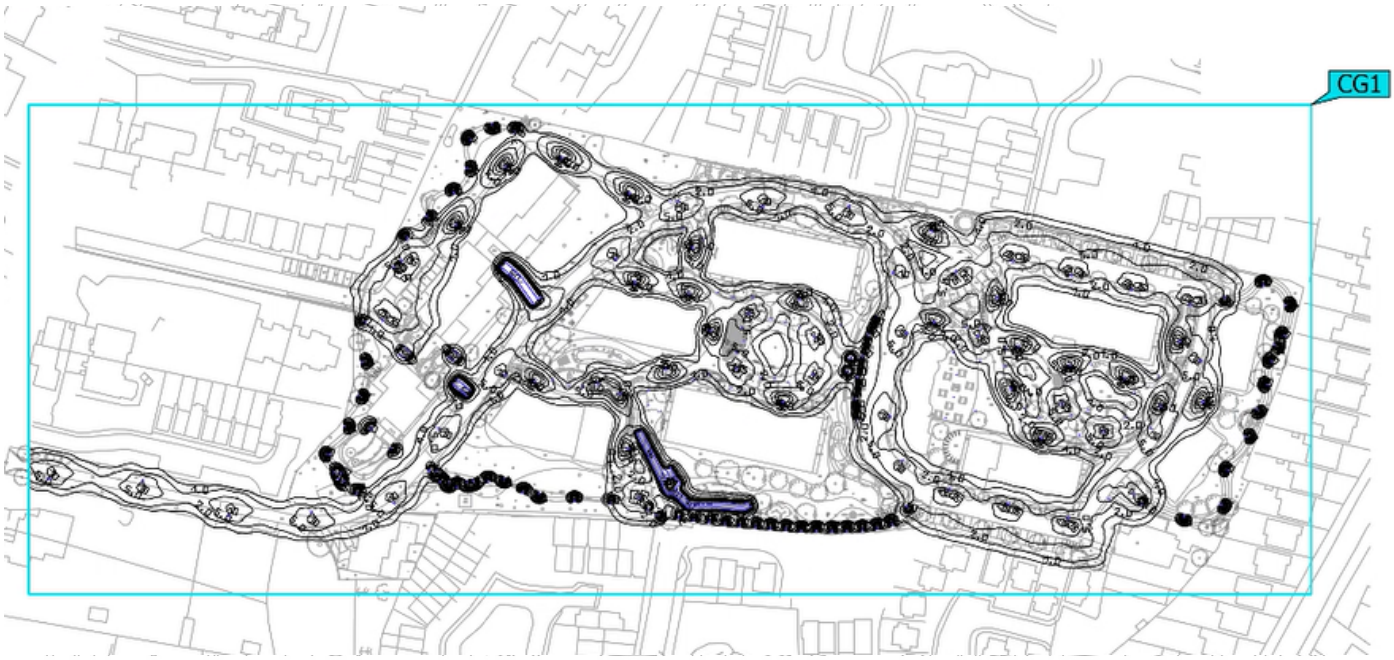
Product data sheet

Performance in Lighting - KREOS SR/150 34W 730 AN-96 RPA

C. Optic: Road reflector - SR/150. Full cut-off. Lamps: 1. Lampholder: LED. Light Source: LED. ILCOS: DSS. Lightsource lumen output: 5062 lm. Luminaire lumen output: 3757 lm. Efficiency: 110 lm/W. Kelvin: 3000. CRI 70. MacAdam: 5. L90B10 @ 100000h. Insulation class: II. Supply voltage: 50/60. Wattage: 34 W. Power factor / COS Φ: 0.9. Automatic derating. CE certified. Mountable on normally flammable surfaces. EAC certified. RCM certified

Site 1

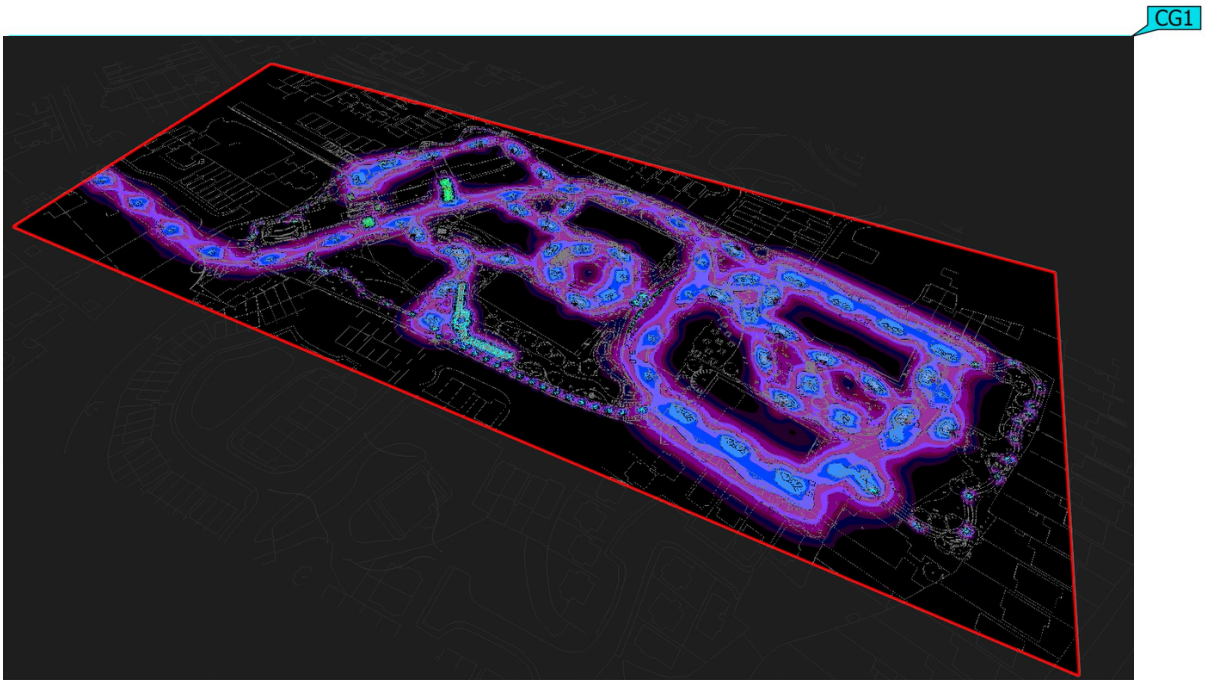
Calculation objects

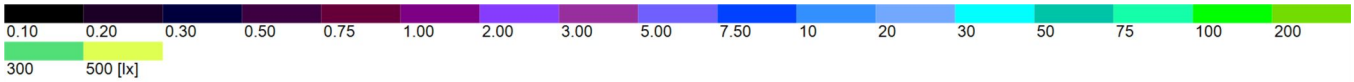


Site 1

Calculation objects

Calculation Surface





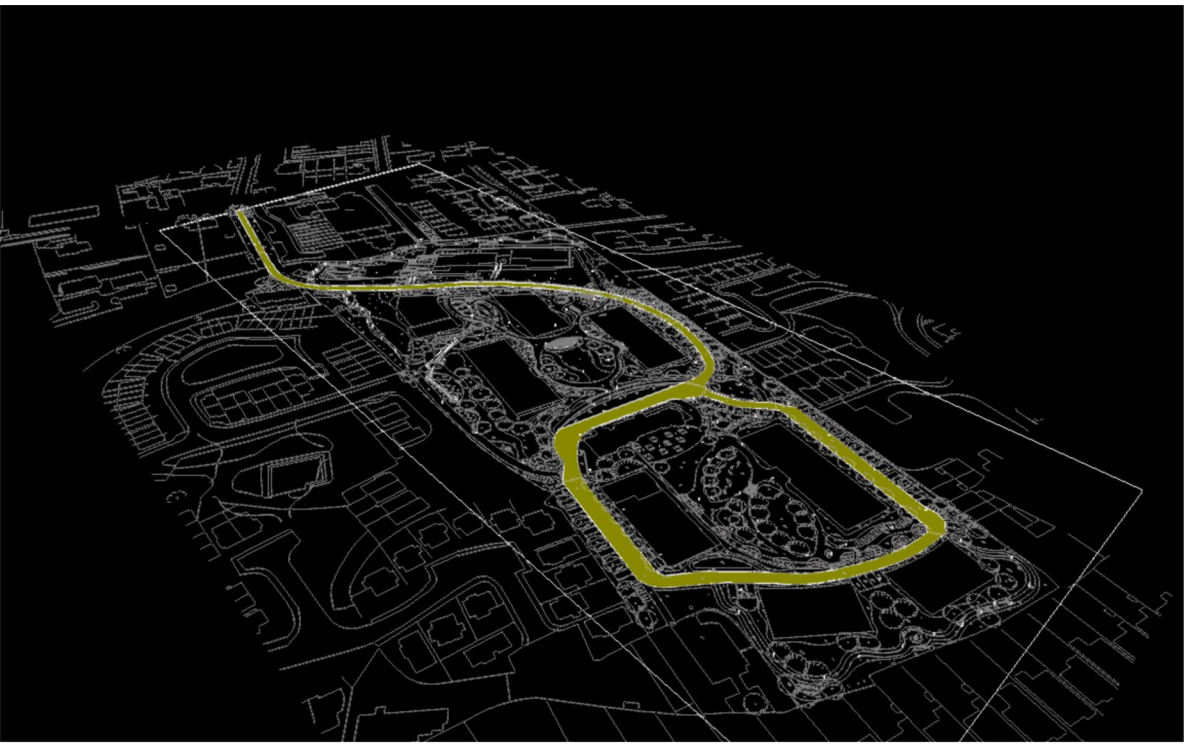
Properties	Ē	E_{min}	E_{max}	g_1	g_2	Index
Calculation Surface Perpendicular illuminance (adaptive) Height: 0.002 m	1.93 lx	0.000 lx	361 lx	0.00	0.00	CG1

APPENDIX 3

ROAD LIGHTING REPORT

Date 30/09/2022

DIALux



GL Metec Dalguise Landscape Lighting Road P4 30.09.22

Created with DIALux

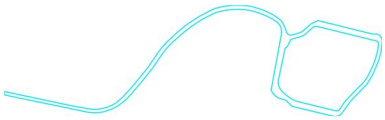
Content

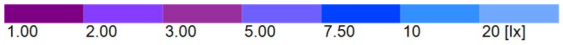
Site 1

DIALux

Site 1

Calculation Surface - Roadway P4





Properties	Ē	E_{min}	E_{max}	g_1	g_2	Index
Calculation Surface - Roadway P4 Horizontal illuminance Height: 0.002 m	6.92 lx	1.83 lx	18.0 lx	0.26	0.10	CG1

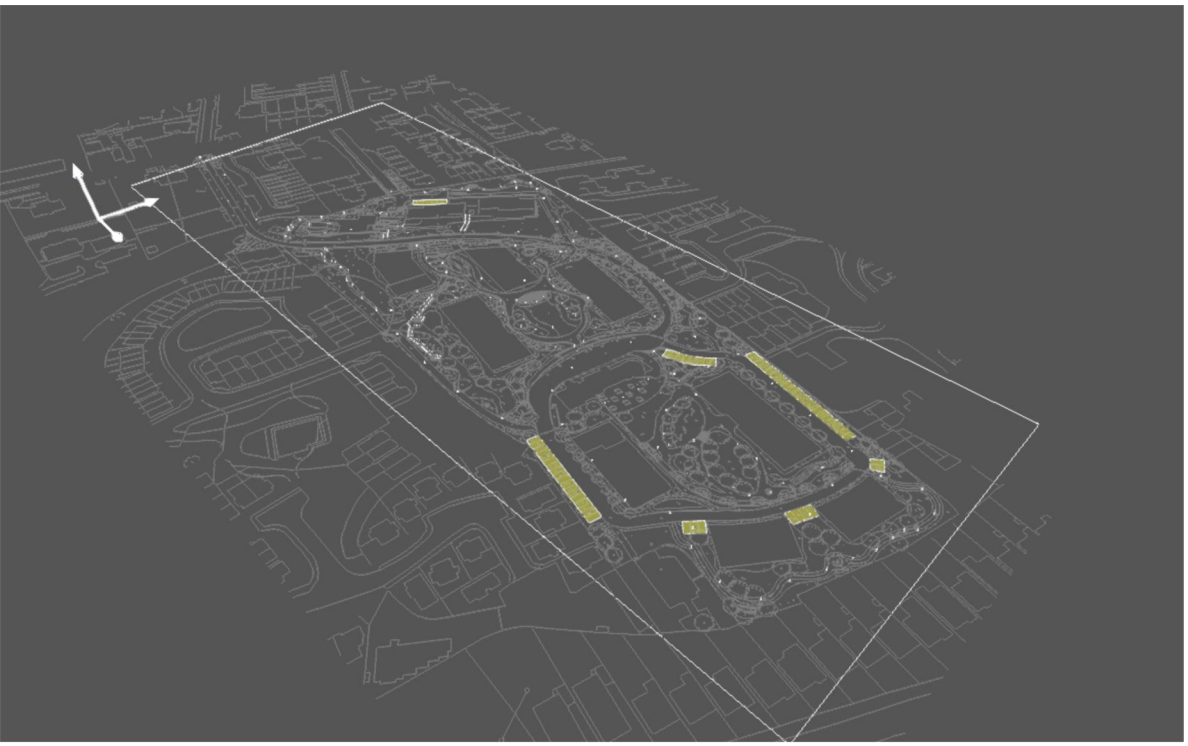
Utilisation profile: DIALux presetting, Standard (outdoor transportation area)

APPENDIX 4

CAR PARKING LIGHTING REPORT

Date 30/09/2022

DIALux



GL Metec Dalguise Landscape Lighting Car Parking 30.09.22

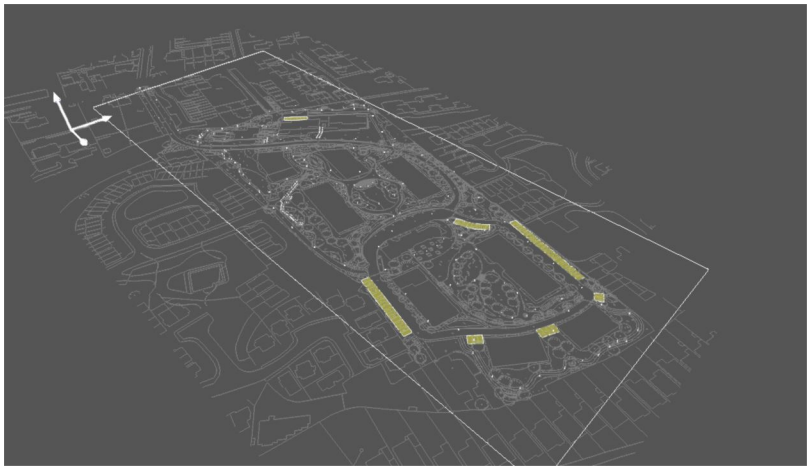
Created with DIALux

Content

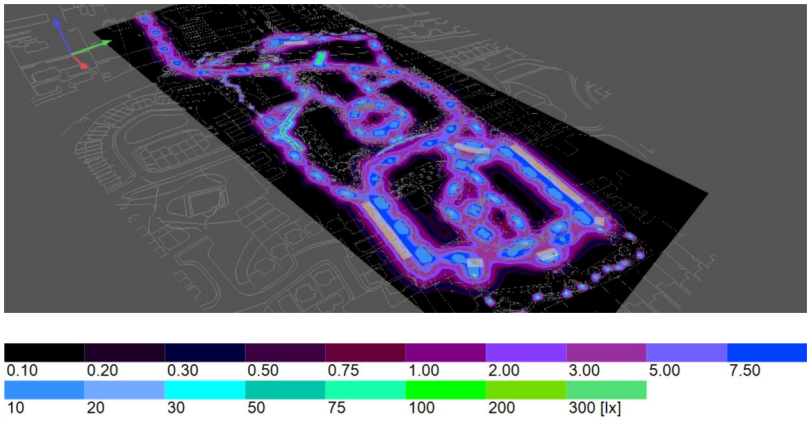
Site 1

Images

Site 1 (180)

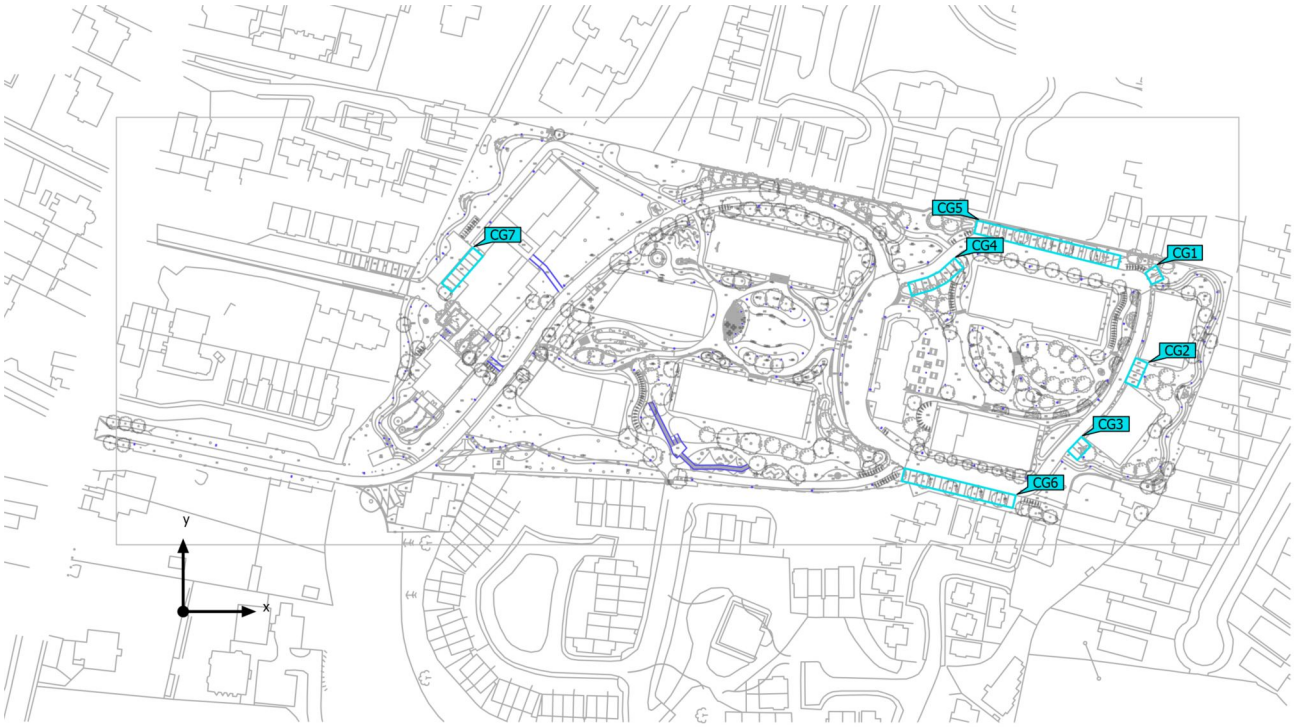


Site 1 (181)



Site 1

Calculation objects



Site 1

Calculation objects

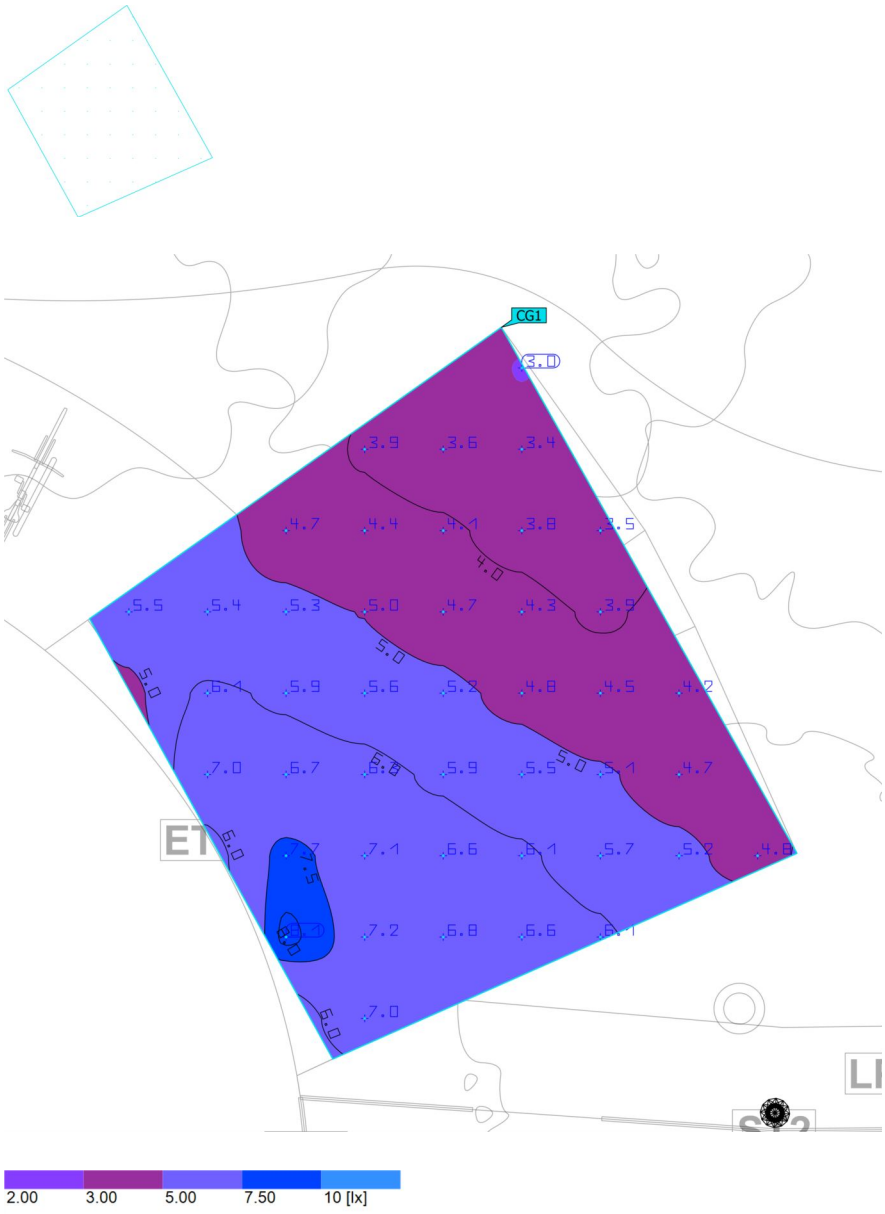
Calculation surfaces

Properties	$\bar{E}$	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 1 - Car Parking / 2 Bays Perpendicular illuminance Height: 0.001 m	5.38 lx	2.98 lx	8.09 lx	0.55	0.37	CG1
Calculation surface 2 - Car Parking / 4 Bays Perpendicular illuminance Height: 0.001 m	10.2 lx	4.06 lx	23.4 lx	0.40	0.17	CG2
Calculation surface 3 - Car Parking / 3 Bays Perpendicular illuminance Height: 0.001 m	9.38 lx	5.33 lx	15.8 lx	0.57	0.34	CG3
Calculation surface 4 - Car Parking / 8 Bays Perpendicular illuminance Height: 0.001 m	6.86 lx	4.66 lx	10.5 lx	0.68	0.44	CG4
Calculation surface 5 - Car Parking / 17 Bays Perpendicular illuminance Height: 0.001 m	5.24 lx	3.27 lx	8.60 lx	0.62	0.38	CG5
Calculation surface 6 - Car Parking / 15 Bays Perpendicular illuminance Height: 0.001 m	5.29 lx	3.36 lx	8.64 lx	0.64	0.39	CG6
Calculation surface 7 - Car Parking / 7 Bays Perpendicular illuminance Height: 0.001 m	5.11 lx	2.28 lx	8.68 lx	0.45	0.26	CG7

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

Site 1

Calculation surface 1 - Car Parking / 2 Bays

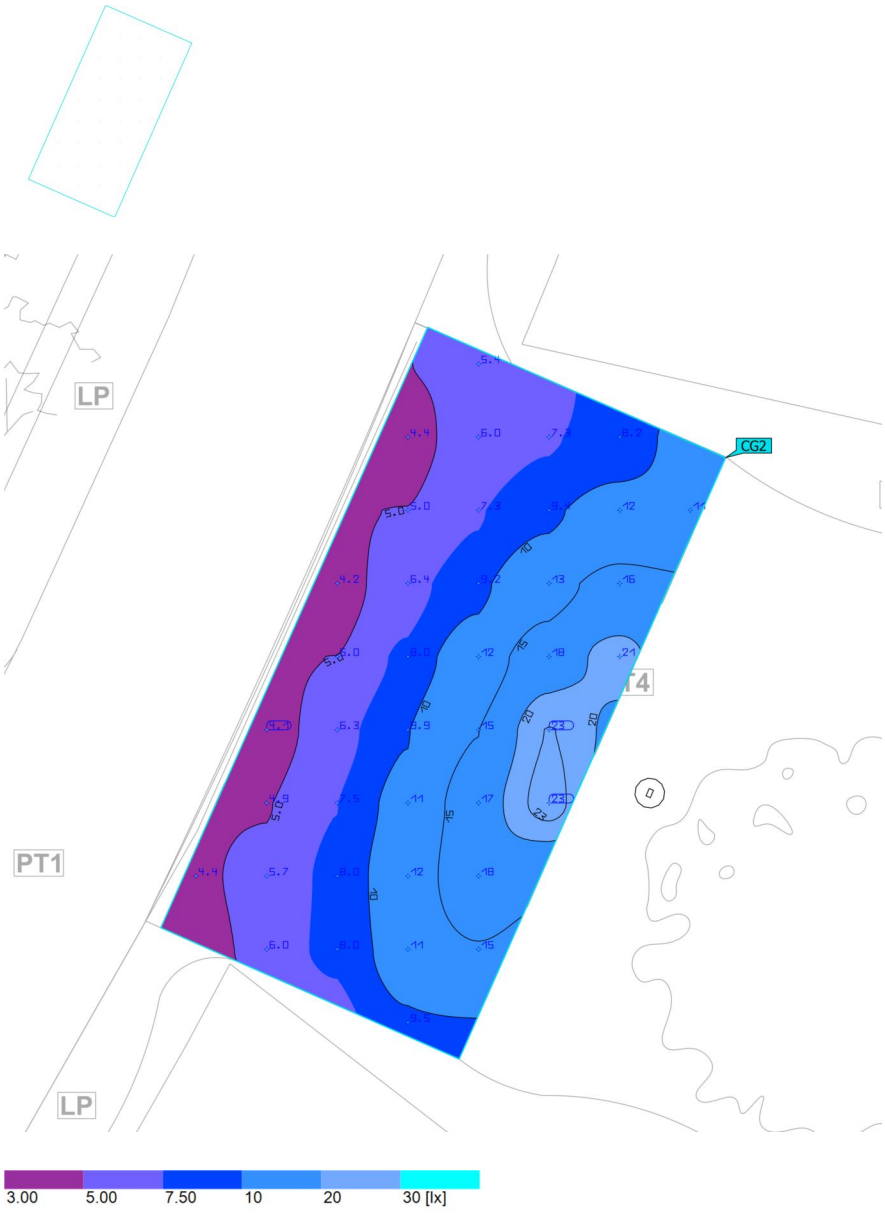


Properties	Ē	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 1 - Car Parking / 2 Bays Perpendicular illuminance Height: 0.001 m	5.38 lx	2.98 lx	8.09 lx	0.55	0.37	CG1

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

Site 1

Calculation surface 2 - Car Parking / 4 Bays

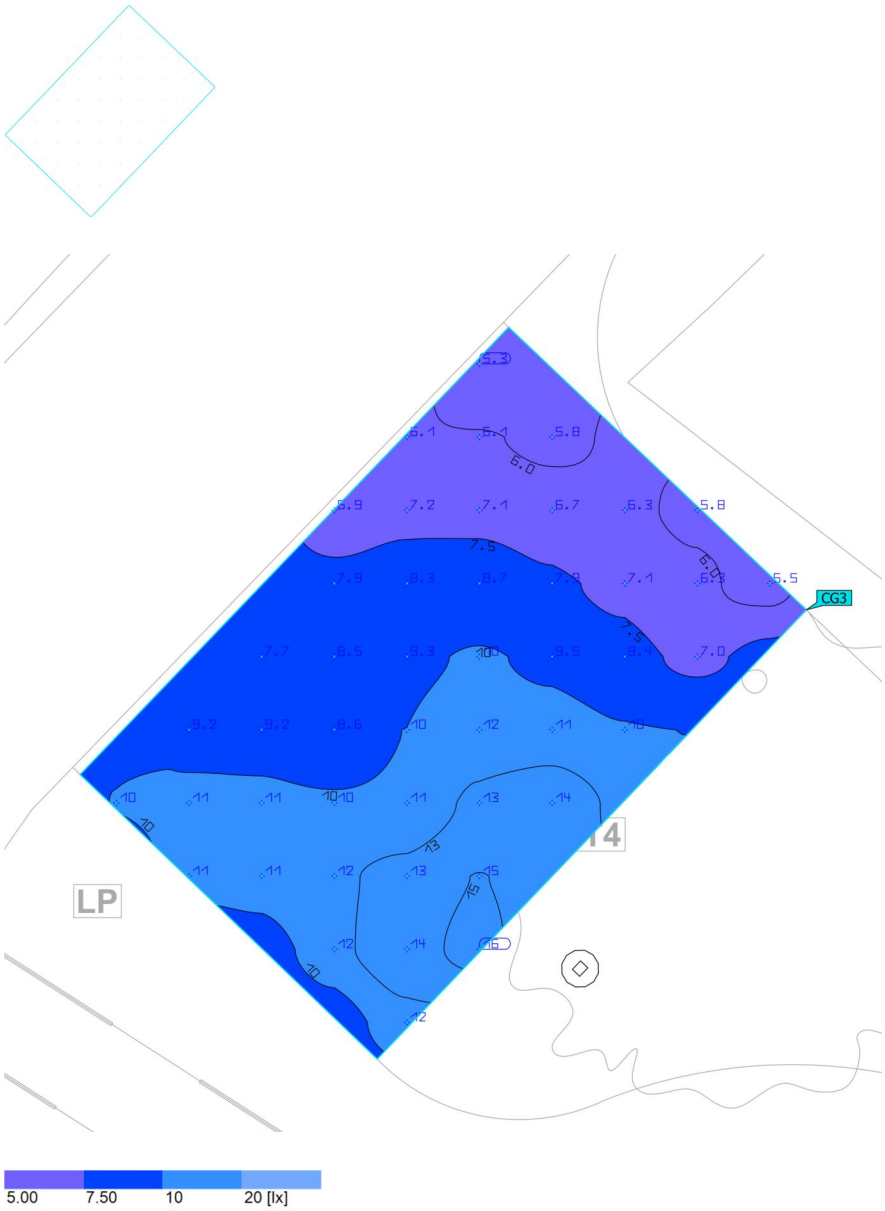


Properties	Ē	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 2 - Car Parking / 4 Bays Perpendicular illuminance Height: 0.001 m	10.2 lx	4.06 lx	23.4 lx	0.40	0.17	CG2

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

Site 1

Calculation surface 3 - Car Parking / 3 Bays

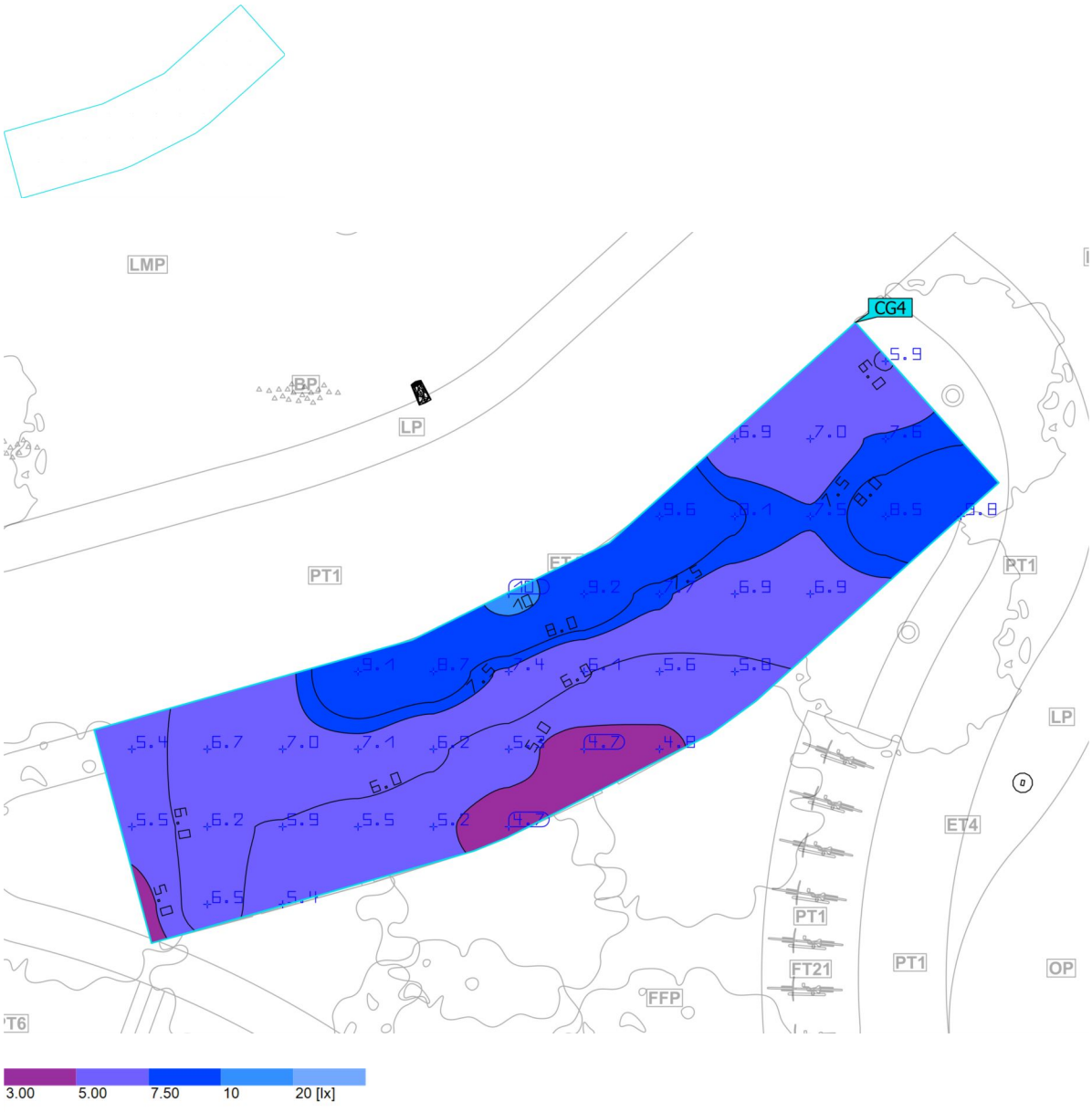


Properties	Ē	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 3 - Car Parking / 3 Bays Perpendicular illuminance Height: 0.001 m	9.38 lx	5.33 lx	15.8 lx	0.57	0.34	CG3

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

Site 1

Calculation surface 4 - Car Parking / 8 Bays

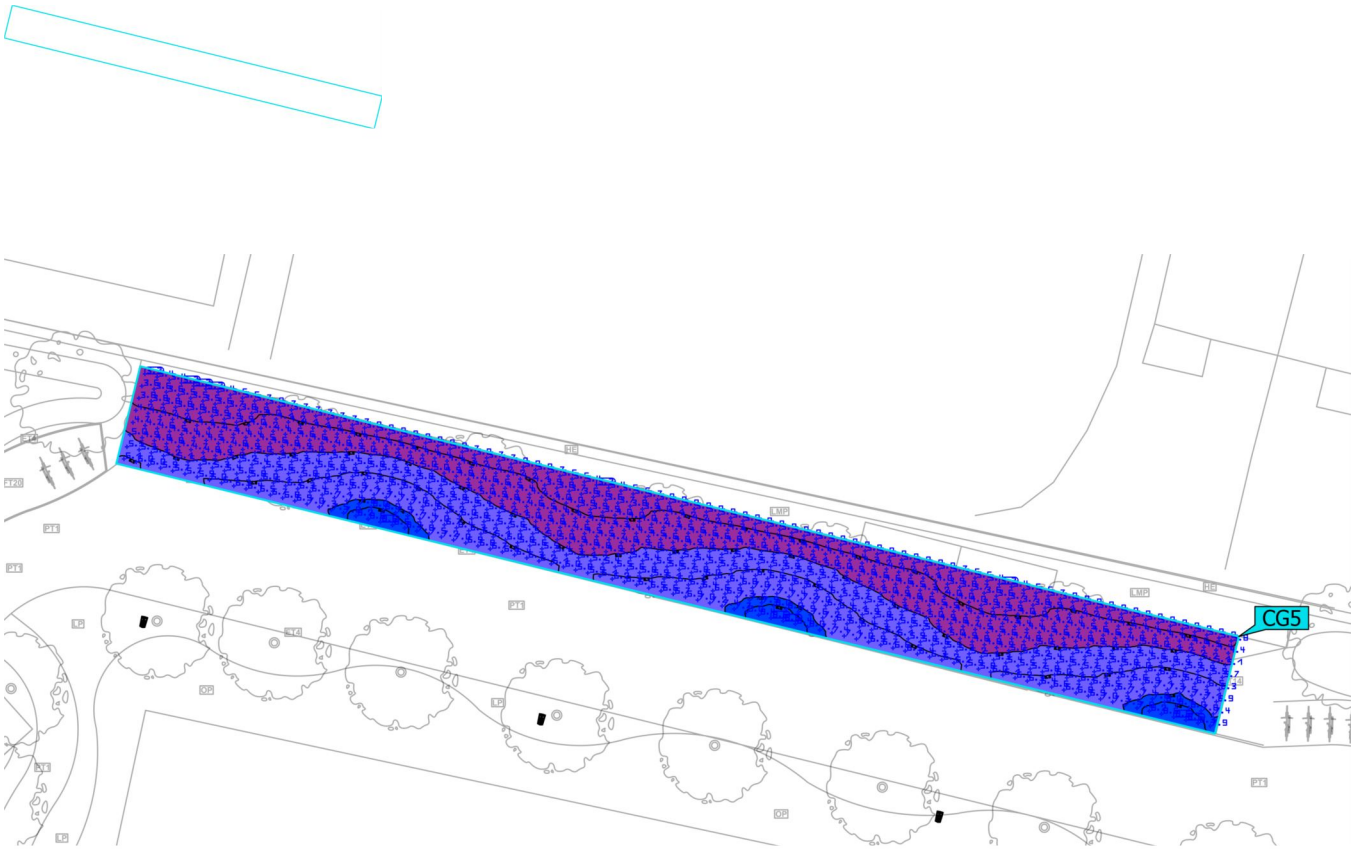


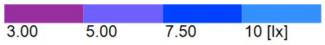
Properties	Ē	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 4 - Car Parking / 8 Bays Perpendicular illuminance Height: 0.001 m	6.86 lx	4.66 lx	10.5 lx	0.68	0.44	CG4

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

Site 1

Calculation surface 5 - Car Parking / 17 Bays



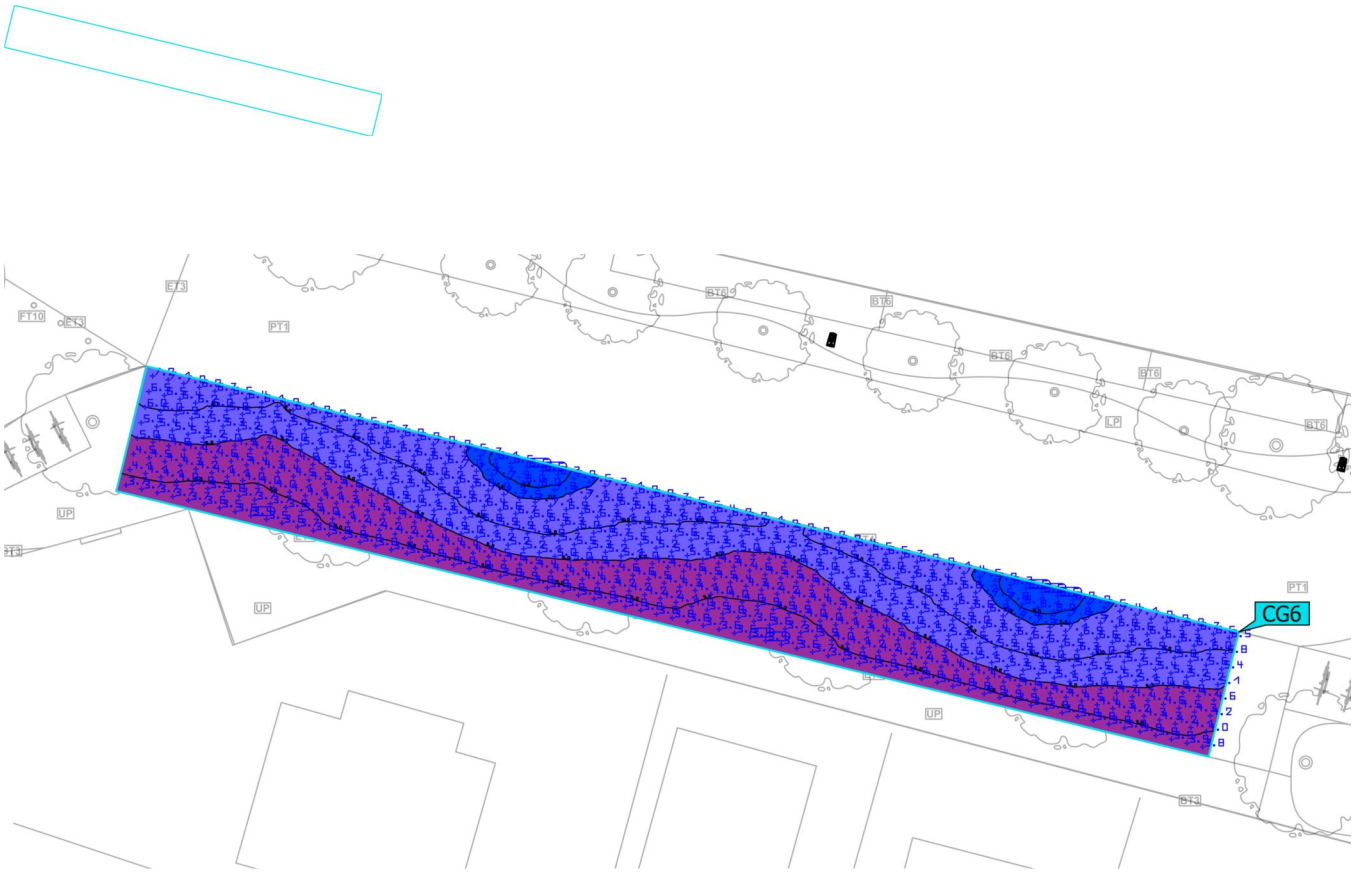


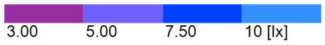
Properties	Ē	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 5 - Car Parking / 17 Bays Perpendicular illuminance Height: 0.001 m	5.24 lx	3.27 lx	8.60 lx	0.62	0.38	CG5

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

Site 1

Calculation surface 6 - Car Parking / 15 Bays



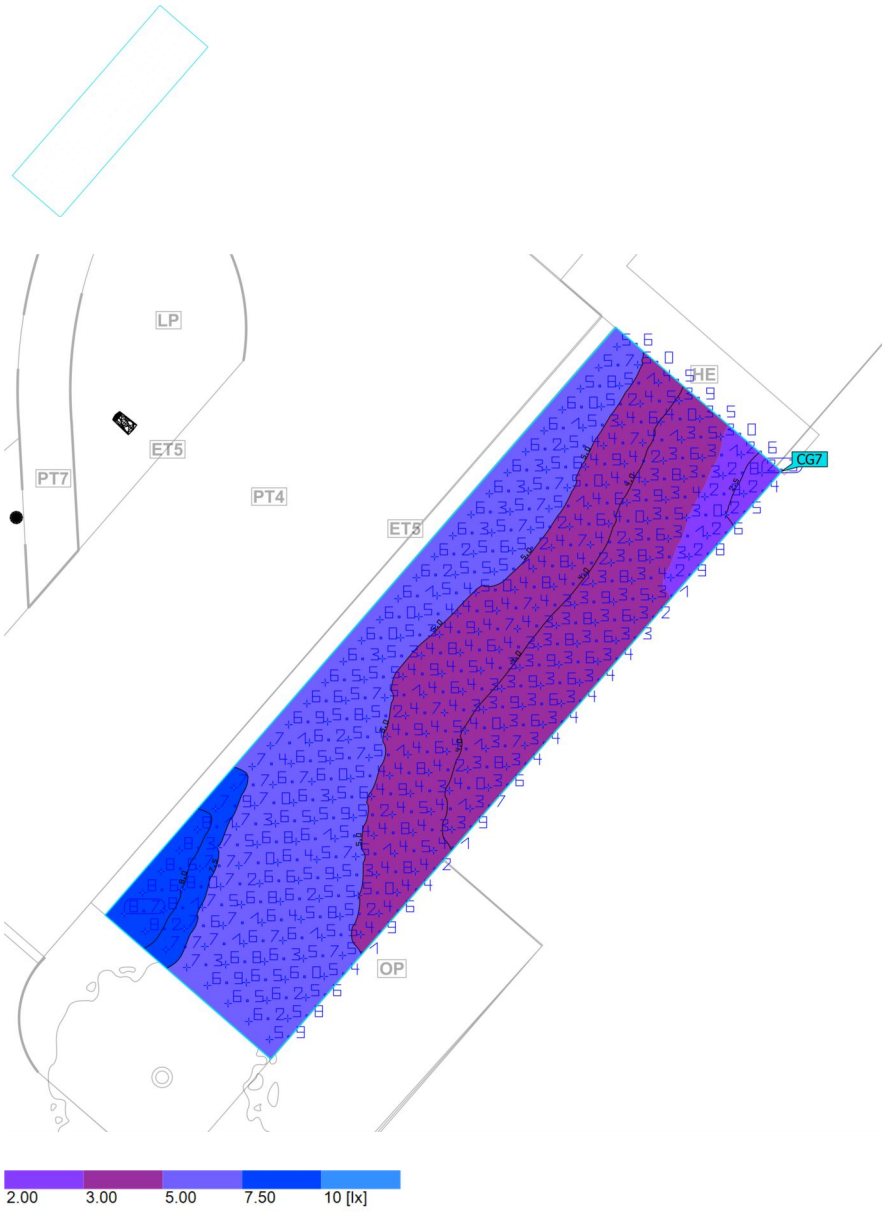


Properties	Ē	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 6 - Car Parking / 15 Bays Perpendicular illuminance Height: 0.001 m	5.29 lx	3.36 lx	8.64 lx	0.64	0.39	CG6

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

Site 1

Calculation surface 7 - Car Parking / 7 Bays



Properties	Ē	E_{min}	E_{max}	g_1	g_2	Index
Calculation surface 7 - Car Parking / 7 Bays Perpendicular illuminance Height: 0.001 m	5.11 lx	2.28 lx	8.68 lx	0.45	0.26	CG7

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