



Project:	NRM Locomotion
Project No:	22049
Description:	External Lighting Design Calculations
Doc Ref:	22049-GWC-ZZ-XX-CA-E-1002

Revision History						
Revision	Issue Date	Stage	Issue Status	Suitability	Engineer	Checked
P01	19/01/2023	Stage 4	For review & comment	S4	DF	KF
P02	03/03/2023	Stage 4	For review & comment	S4	DF	KF
C01	12/05/2023	Stage 4	For Construction	A5	DF	KF
C02	25/05/2023	Stage 4	For Construction	A5	DF	KF
C03	26/06/2023	Stage 4	For Construction	A5	DF	KF
NOTES						

NRM External Lighting Calculations

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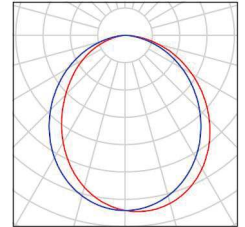
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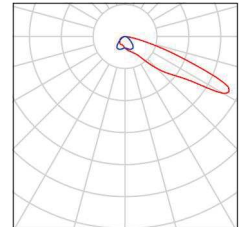
NRM External Lighting Calculations / Luminaire parts list

18 Pieces Performance in Lighting 3100842 QUASAR 60 M
19W 830 GR-94 EM3h / Mains
Article No.: 3100842
Luminous flux (Luminaire): 1631 lm
Luminous flux (Lamps): 1631 lm
Luminaire Wattage: 19.0 W
Emergency Lighting: 1631 lm, 19.0 W
Luminaire classification according to CIE: 100
CIE flux code: 50 81 96 100 100
Fitting: 1 x QUASAR 60 M 19W 830 / Mains
(Correction Factor 1.000).



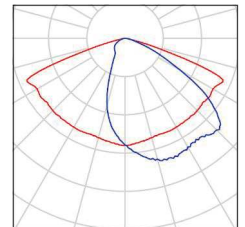
3 Pieces THORN Lighting AFP S 36L50-730 A6-I AFLOOD
PRO S - 36 x Warm White 3000K LED CRI70
500mA - A6-I Optic
Article No.: AFP S 36L50-730 A6-I
Luminous flux (Luminaire): 7806 lm
Luminous flux (Lamps): 7806 lm
Luminaire Wattage: 55.0 W
Luminaire classification according to CIE: 100
CIE flux code: 28 66 96 100 100
Fitting: 1 x LEDs (Correction Factor 1.000).

See our luminaire catalog
for an image of the
luminaire.



5 Pieces WE-EF;Eulumdat2 108-1480 VFL520 [S60]
IP66:LED-12/12W/3K;VFL520, Street and Area
Lighting
Article No.: 108-1480
Luminous flux (Luminaire): 1722 lm
Luminous flux (Lamps): 1860 lm
Luminaire Wattage: 13.9 W
Luminaire classification according to CIE: 100
CIE flux code: 39 74 97 100 93
Fitting: 12 x LED-12/12W/830 - 3000K (Correction
Factor 1.000).

See our luminaire catalog
for an image of the
luminaire.



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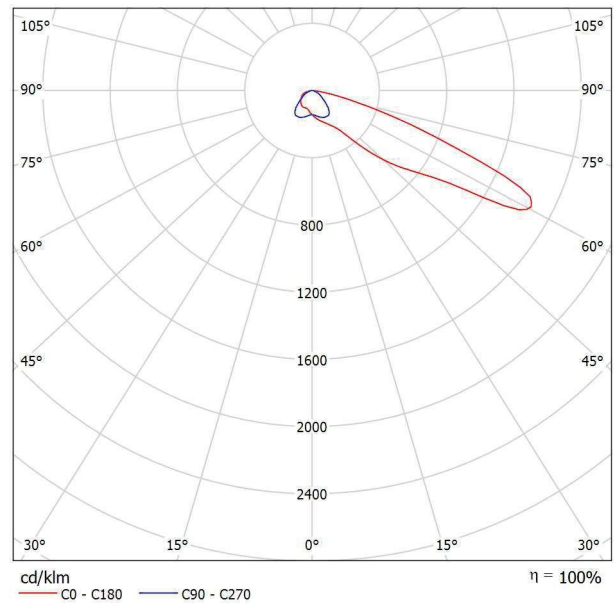
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THORN Lighting AFP S 36L50-730 A6-I AFLOOD PRO S - 36 x Warm White 3000K LED CRI70 500mA - A6-I Optic / Luminaire Data Sheet

Luminous emittance 1:

See our luminaire catalog for an image of the luminaire.



Luminaire classification according to CIE: 100
CIE flux code: 28 66 96 100 100

Due to missing symmetry properties, no UGR table can be displayed for this luminaire.

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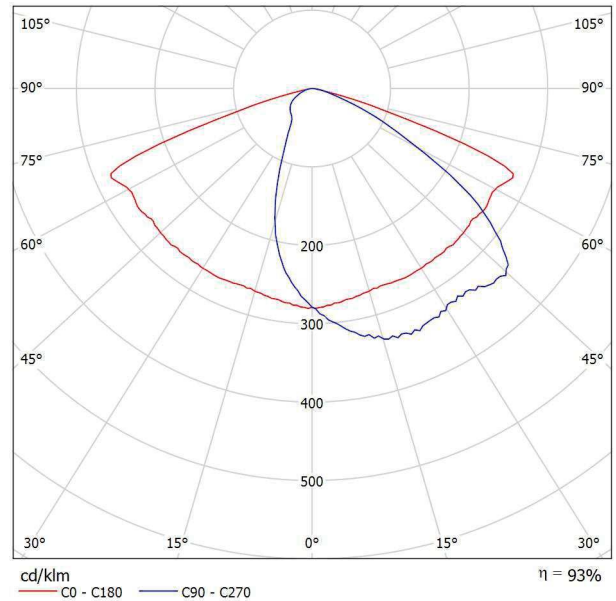
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WE-EF;Eulumdat2 108-1480 VFL520 [S60] IP66:LED-12/12W/3K;VFL520, Street and Area Lighting / Luminaire Data Sheet

Luminous emittance 1:

See our luminaire catalog for an image of the luminaire.



Luminaire classification according to CIE: 100
CIE flux code: 39 74 97 100 93

Due to missing symmetry properties, no UGR table can be displayed for this luminaire.

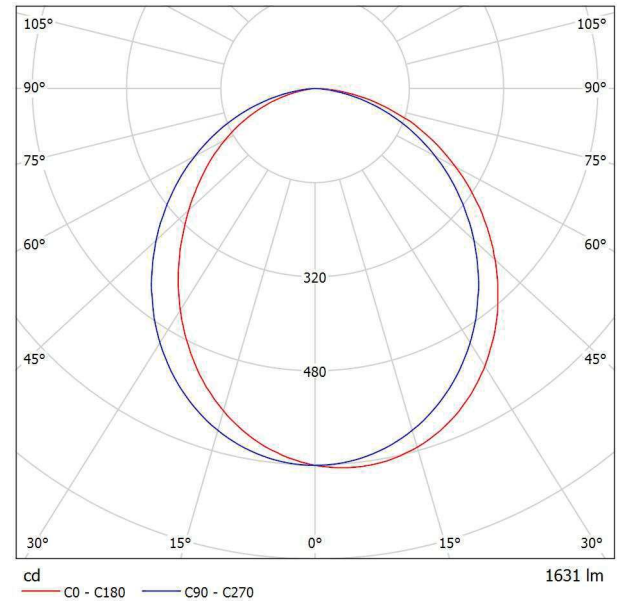
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Performance in Lighting 3100842 QUASAR 60 M 19W 830 GR-94 EM3h / Mains / Luminaire Data Sheet

Luminous emittance 1:



Luminaire classification according to CIE: 100
CIE flux code: 50 81 96 100 100

Due to missing symmetry properties, no UGR table can be displayed for this luminaire.

Part number: 3100842. Series: QUASAR.
Wall-mounted LED luminaire, comprising: Die-cast aluminium housing, polyester powder coat finish ISO 9227/12944. ISO 9223 (C5) . Toughened flat glass diffuser, internally coated, for homogeneous light distribution . Microprismatic, toughened, flat glass diffuser, silk-screened on the inside (TECH versions). Satin finish pure aluminium reflector (Al 99.98). Anti-ageing custom moulded silicone sealing gasket(s). Built-in driver. Stainless steel locking hardware. EM/3P version is designed for multipurpose 3 hours sustained emergency lighting. Openable and maintainable luminaire (future-proof).
Colour/Finish: GR-94 / Metallic grey / Textured. Shape: Rectangular. Net weight: 4.793 kg. International protection marking: IP65. IK06 1J xx3. Ta MIN luminaire: 0° C. Ta MAX luminaire: 35° C. Optic: Asymmetric Extra-Wide - A7/EW. Lamps: 1. Lampholder: LED. Light Source: LED. ILCOS: DSL. Lightsource lumen output: 2554 lm. Luminaire lumen output: 1631 lm. Efficiency: 85 lm/W. Kelvin: 3000. CRI 80. MacAdam: 3. L80B10 @ 130000h. Insulation class: I. Supply voltage: 50/60. Wattage: 19 W. Power factor / COS Φ : 0.9. Emergency luminaire 3 hours. Loop through. CE certified. Mountable on normally flammable surfaces. EAC certified. RCM certified

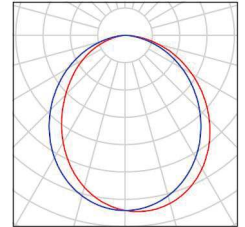
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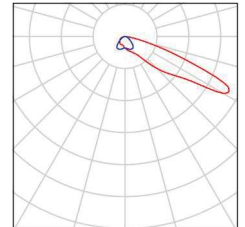
Exterior Scene 1 / Luminaire parts list

18 Pieces Performance in Lighting 3100842 QUASAR 60 M
19W 830 GR-94 EM3h / Mains
Article No.: 3100842
Luminous flux (Luminaire): 1631 lm
Luminous flux (Lamps): 1631 lm
Luminaire Wattage: 19.0 W
Emergency Lighting: 1631 lm, 19.0 W
Luminaire classification according to CIE: 100
CIE flux code: 50 81 96 100 100
Fitting: 1 x QUASAR 60 M 19W 830 / Mains
(Correction Factor 1.000).



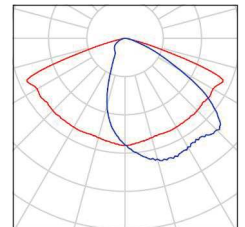
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PRO S - 36 x Warm White 3000K LED CRI70
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See our luminaire catalog
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5 Pieces WE-EF;Eulumdat2 108-1480 VFL520 [S60]
IP66:LED-12/12W/3K;VFL520, Street and Area
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Luminous flux (Lamps): 1860 lm
Luminaire Wattage: 13.9 W
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CIE flux code: 39 74 97 100 93
Fitting: 12 x LED-12/12W/830 - 3000K (Correction
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See our luminaire catalog
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luminaire.

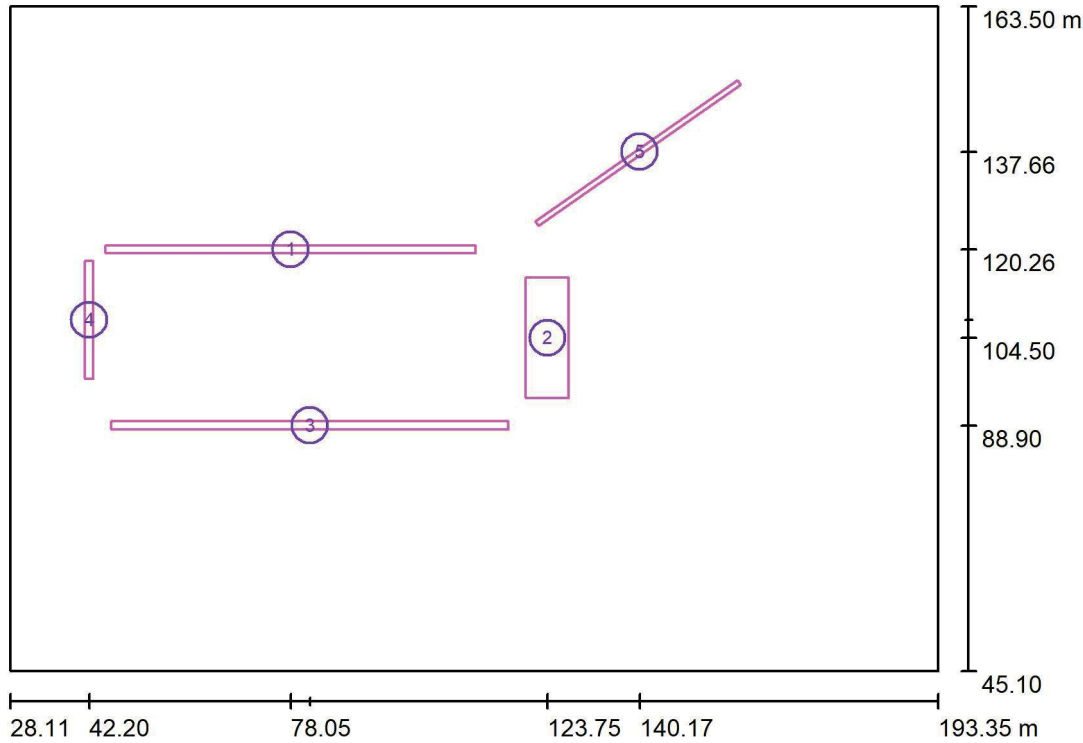


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Exterior Scene 1 / General / Calculation surfaces (results overview)



Scale 1 : 1348

Calculation Surface List

No.	Designation	Type	Grid	E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0	E_{min} / E_{max}
1	North Walkway	perpendicular	128 x 128	11	3.24	27	0.286	0.120
2	Loading Bay	perpendicular	64 x 128	52	22	78	0.430	0.285
3	South Walkway	perpendicular	128 x 128	9.77	3.18	21	0.325	0.151
4	West Walkway	perpendicular	8 x 64	13	4.14	26	0.323	0.159
5	Walkway to Building One	perpendicular	128 x 16	17	8.66	30	0.510	0.288

Summary of Results

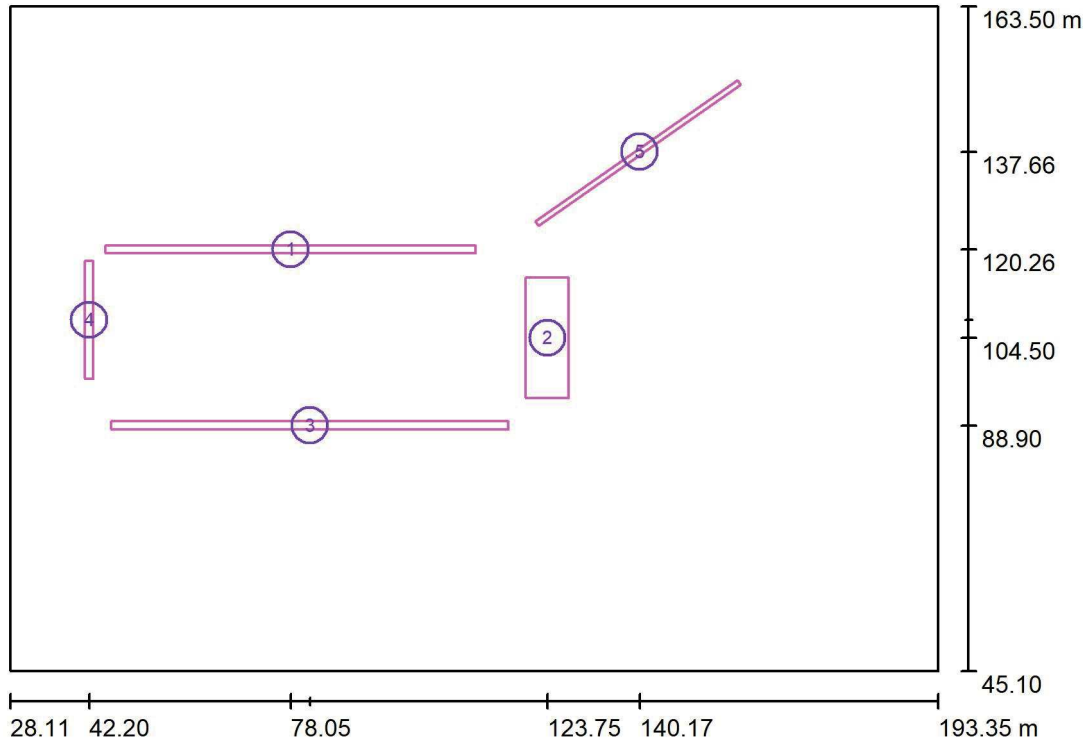
Type	Quantity	Average [lx]	Min [lx]	Max [lx]	u0	E_{min} / E_{max}
perpendicular	5	27	3.18	78	0.12	0.04

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Exterior Scene 1 / EM / Calculation surfaces (results overview)



Scale 1 : 1348

Calculation Surface List

No.	Designation	Type	Grid	E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0	E_{min} / E_{max}
1	North Walkway	perpendicular	128 x 128	3.86	1.10	9.22	0.285	0.119
2	Loading Bay	perpendicular	64 x 128	18	7.56	27	0.430	0.285
3	South Walkway	perpendicular	128 x 128	3.32	1.08	7.16	0.323	0.150
4	West Walkway	perpendicular	8 x 64	4.36	1.41	8.84	0.323	0.159
5	Walkway to Building One	perpendicular	128 x 16	2.44	1.19	4.28	0.487	0.278

Summary of Results

Type	Quantity	Average [lx]	Min [lx]	Max [lx]	u0	E_{min} / E_{max}
perpendicular	5	8.75	1.08	27	0.12	0.04