Margam Port Talbot

Lighting Technical Note

On behalf of **National Grid Electricity Transmission**

Project Ref: 331201497 | Rev: 01 | Date: Aug 2025

Registered Office: Stantec House, Kelburn Court, Birchwood, Warrington, England WA3 6UT
Office Address: 7 Soho Square, London, W1D 3QB

Document Control Sheet

Project Name: **Margam Port Talbot**
Project Ref: **331201497**
Report Title: **Lighting Technical Note**
Date: **August 2025**

	Name	Position	Signature	Date
Prepared by:	Ethan Small	Environmental Consultant	*ES*	July 2025
Reviewed by:	James Mosses	Lighting Consultant	*JM*	July 2025
Approved by:	Neil Young	Senior Associate	*NY*	July 2025
For and on behalf of Stantec UK Limited				

Revision	Date	Description	Prepared	Reviewed	Approved
00	July	Draft	ES	JM	NY
01	August	First Issue	ES	JM	NY

Contents

1 Introduction

1.1 Background

1.1.1 This Technical Note has been prepared by Stantec UK Limited ('Stantec') to support the planning submission for the proposed extension to the Margam substation and underground cable route (the 'Proposed Development') at Margam, Port Talbot, South Wales (the 'Site') with regards to artificial lighting on behalf of National Grid Electricity Transmission (Client).

1.2 The Proposed Development

1.2.1 The Proposed Development has been described as the following:

Full planning application for the extension of the Margam 275kV substation including the erection of a gas insulated switchgear hall (GIS hall) and the demolition of the existing control and amenities buildings to enable the erection of a new amenities building. Works to include earthworks, surface water management and drainage infrastructure, lighting, CCTV, boundary treatment, car parking, ecological improvements including a wildlife tower and gabion baskets, improved internal access roads, diesel generator and hardstanding storage building and water storage tank, flood defence wall including flood gates and appropriate landscaping and other associated engineering operations.

1.2.2 A detailed overview of the proposed works to the existing Margam 275kV substation compound is provided below:

- Construction of a GIS hall to house 275 kV electrical switchgear and ancillary equipment;
- The GIS hall to include 12 bays with the provision of 3 spare bays;
- Mechanically Switched Capacitor with Damping Network;
- Realignment of the existing downleads and Super Grid Transformer circuits to new bays within the GIS hall;
- New amenities building to include welfare facilities, meeting room and ancillary office space;
- One diesel generator to be used in a backup situation only and hardstanding for a replacement freestanding diesel generator;
- Security fencing;
- Surface water management and drainage infrastructure including internal drainage systems;
- Flood defence wall (1150mm high and depth 1000mm) and flood gates at existing access points into the existing substation;
- Water storage tank (6m high and 6.1m diameter);
- CCTV;
- Lighting to include 6m medium duty, tilt down tubular steel constructure (exact location to be agreed), 27no. 'label C', 18no. 'label E' and 13no. 'label EX1), dark sky approved.
- Creation of new designated car parking area (four standard bays and two accessible bays).
- Landscaping to incorporate native planting / wildflowers.
- Ecological mitigation to include a wildlife tower and gabion baskets.

1.2.3 The Proposed Development will be located immediately to the east of the existing Margam Substation, towards the north-east of the Site. An amenity building containing ancillary office space alongside changing and WC facilities will also be developed.

1.3 The Site

1.3.1 The Site is located in Port Talbot, South Wales, approximately 14km southeast of Swansea. The Site is approximately 600m inland from the coastline of the Bristol Channel, and is located both within and immediately adjacent to the Tata Steelworks.

1.3.2 The nearest cluster of residential properties lies approx. 70m north of the access road, and approx. 450m to the northeast of the remainder of the Site.

1.3.3 The town of Margam is located approx. 1km north of the Site, and a smaller settlement is located approx. 500m to the east. Both are visually separate from the Site by dense trees and hedgerow.

1.3.4 The M4 and A48 bound the Site to the east, with both roads having streetlighting present. They are visually separated by dense trees and hedgerow.

1.4 Receptors

1.4.1 Sensitive lighting receptors potentially affected by the Proposed Development are anticipated to be primarily ecological, with limited potential for residential receptors in Margam and Eglwys Nunydd.

1.4.2 Residential dwellings near the Site and road users along the A48 & M4 may have a direct or partial view of the Site when the leaves fall during the autumn.

1.4.3 The closest national designated sites for nature conservation are Margam Moors SSSI and Eglwys Nunnydd Reservoir SSSI.

1.4.4 The proposed Margam substation extension and the first part of the cable route falls within an existing Site of Importance for Nature Conservation (SINC).

1.4.5 An ecological survey (UK HABS DEC 2024) completed suggests the surrounding area provides a low suitability for roosting bats, but some potential for supporting foraging horseshoe bats.

2 Scheme Design

2.1 Overview

2.1.1 The external lighting design of the Proposed Development has been prepared by BakerHicks., and can be found in **Appendix A.**

2.2 Standards & Guidance

2.2.1 The external lighting design has been developed as per the guidance set out in the following National Grid Technical Specifications (TS):

- TS 2.10.10 – GIS and Other Substation Buildings Design
- TS 3.10.13 – Minor Electrical Works
- TS 3.10.15 – Mechanical and Electrical Equipment
- TS 2.10.04 – Site Lighting

2.2.1 The access road & car park lighting has been designed to comply with the recommendations set in the following guidance:

- CIBSE LG06 Lighting in the Outdoor Environment
- BS 5489 – Road Lighting
- BS EN 12464-2 – Light and Lighting. Lighting of work places. Outdoor work places
- BS EN 13201 – Road Lighting (all relevant chapters)

2.2.2 In addition, the following guidelines have been considered by BakerHicks in developing the lighting design

- Institute of Lighting Professionals Guidance Note 01/2021 *The Reduction of Obtrusive Light*
- Institute of Lighting Professionals Guidance Note 08/2023 *Bats and Artificial Lighting,* which provides technical lighting guidance and mitigation strategies to protect bats from artificial lighting

2.2.3 Guidance set out by the Bat Conservation Trust (BCT), which provides guidance on bat roost and activity assessments.

2.3 Design Requirements

2.3.1 The external lighting design for the Proposed Development has been split into the following areas, and have been designed to comply with the requirements set out in **Section 2.2** as shown in **Table 1.**

Table 1 – Design Calculation Areas

Area	Required Illuminance Levels (lux)
Overall Site	Maintained average illuminance – **6.0 lux** Maintain minimum point illuminance – **2.5 lux**
External Road	Maintained average illuminance – **6.0 lux** Maintain minimum point illuminance – **2.5 lux**

2.4 Lighting Design

Drawings

2.4.1 The external lighting design has been presented over the following drawing submitted for planning:

- Site Plan Proposed External Lighting Layout – Doc No. **MARPT-BHK-01-XX-DG-E-320010**

2.4.2 The drawing includes a luminaire schedule showing the fittings used in the design.

Luminaires

2.4.3 The fittings that have been used within the external lighting design are shown in **Table 2.**

Table 2 – Lighting Design Luminaire Schedule

REF	Manufacturer	Product	Product Code	Qty
A	Schréder	AMPERA EVO 1 5393 Flat glass Back light Maxi 20 LEDs 3356lm	593122	7
B	Schréder	NEOS GEN2 2 5393 Flat glass Back light Maxi 3714lm	621362	27
C	Schréder	NEOS GEN2 2 5393 Flat glass Back light Maxi 6139lm	621362	20
EX1	Holophane	Denver iD Wall 799lm	DWL.1.LA012.HN.W007	14

2.4.4 The datasheets for the fittings shown in **Table 2** can be found in **Appendix B**

2.4.5 The Schréder luminaires (ref A, B & C), are mounted on columns 8m above finish floor level (AFFL) and are tilted upwards by 10º

2.4.6 The Holophane luminaires (EX1) are mounted to the façade of the main building at heights of 4m AFFL. These fittings are emergency luminaires, and as such, are not expected to be turned on during normal operations.

2.4.7 All lighting used within the design have a correlated colour temperature (CCT) of 2700K.

2.5 Operation & Maintenance

2.5.1 Site lighting will operate during periods of occupancy, which are anticipated to occur, on average, twice per month for routine inspections and general maintenance. Outside of these times, all lighting will remain switched off. It is also expected that the Site will only be in operation during the daytime hours, with lighting potentially only being required during the winter months or during an emergency in the hours of darkness.

2.5.2 Sensors are to be utilised, which will activate the fittings when motion is detected. After a preset period, these fittings will then deactivate if no further motion is detected. It is expected that these sensors will be positioned so that they are not inadvertently activated from the access road, or any other areas outside of the Site.

2.5.3 Light fittings are to be locked into position using the appropriate screws of the locking mechanism. This will ensure stability of the fitting and prevent them from moving, which could affect light levels and potential impact onto receptors.

2.5.4 Maintenance of the light fittings is to be undertaken during daytime hours. If this is not possible, and fittings need to remain in operation, then temporary shielding is to be used to minimise light egress out of the Site.

2.5.5 Any work required should be completed as quickly as and safely as possible to limit light exposure during maintenance.

2.6 Modelling & Assessment

2.6.1 The proposed lighting design of the substation has been modelled by BakerHicks using industry standard lighting calculation software. The illuminance levels of the proposed scheme have been recorded and presented in **Table 3**

Table 3 – Design Calculation Areas

Area	Parameter	Target Illuminance	Min Illuminance	Max Illuminance	Avg Illuminance
Overall Site	Perpendicular Illuminance	6.0 lux avg 2.5 lux min	2.92 lux	36.2 lux	14.1 lux
External Road	Perpendicular Illuminance	6.0 lux avg 2.5 lux min	5.59 lux	14.7 lux	10.4 lux

2.6.2 These illuminance levels comply with the requirements set out in the standards and guidelines shown in **Section 2.2.**

2.6.3 An additional calculation plane has been created to assess the amount of potential light that spills out of the Site as a result of the proposed lighting. This calculation plane covers an area that is offset up to 15m from the perimeter of the Site.

2.6.4 **1.0 lux** or higher has been recorded around most of the Site boundary but this only extend up to 5m from the boundary – beyond this, illuminance levels fall below **1.0 lux.**

2.6.5 However, there are two areas beyond the Site boundary where "hotspots" of light have been created, with illuminance levels exceeding **1.0 lux** being shown up to 15m from the boundary.

2.6.6 The first hotspot is at the access road to the north of the Site, whilst the second is the southeast corner of the Site, adjacent to the mechanically switched capacitors (MSC).

2.6.7 The higher levels of illuminance of these two areas are likely due to one or multiple of the following factors within the design:

- A large quantity of fittings illuminating a relatively small area.
- The upward tilt of the column luminaires.
- Sideward light spill from the column luminaires.

2.6.8 There is the potential for the lighting around the area of the MSC to have an adverse impact on the sensitive hedgerows to the southeast of the Site.

2.7 Monitoring & Mitigation

2.7.1 The lux levels should be monitored post-development to assess if the new lighting will impact the sensitive hedgerows. This should be done by undertaking the following:

- Illuminance meter readings to determine if there is any light spillage towards sensitive areas; and
- Ensuring the lighting conditions do not deviate from the design (e.g. unnecessary additional lighting, avoid tilting luminaires etc);

2.7.2 Where illuminance readings confirm readings of more than 1.0 lux more than 5m into the SINC, review the following mitigation measures to achieve a betterment and further minimise light spill into the SINC.

2.7.3 Side light shields could be fixed to the luminaires are that in close proximity to the corners of the Site. This will help to block horizontal light from spill over the flood wall into the SINC.

2.7.4 If feasible, steps could also be taken to reduce the quantity of light fittings, or lower the tilt angle to 0º. Care should be taken to ensure that the Site remains sufficiently lit to the required illuminance levels.

3 Conclusion

3.1.1 The external lighting design by BakerHicks meets the minimum requirements set out in the National Grid Technical Specifications, as well as the relevant British and ILP / BCT standards.

3.1.2 There will be 1.0 lux or greater within 5m of the site boundary. However, there will be two instances where high level illuminance levels will be present – the north of the Site and the southeast corner.

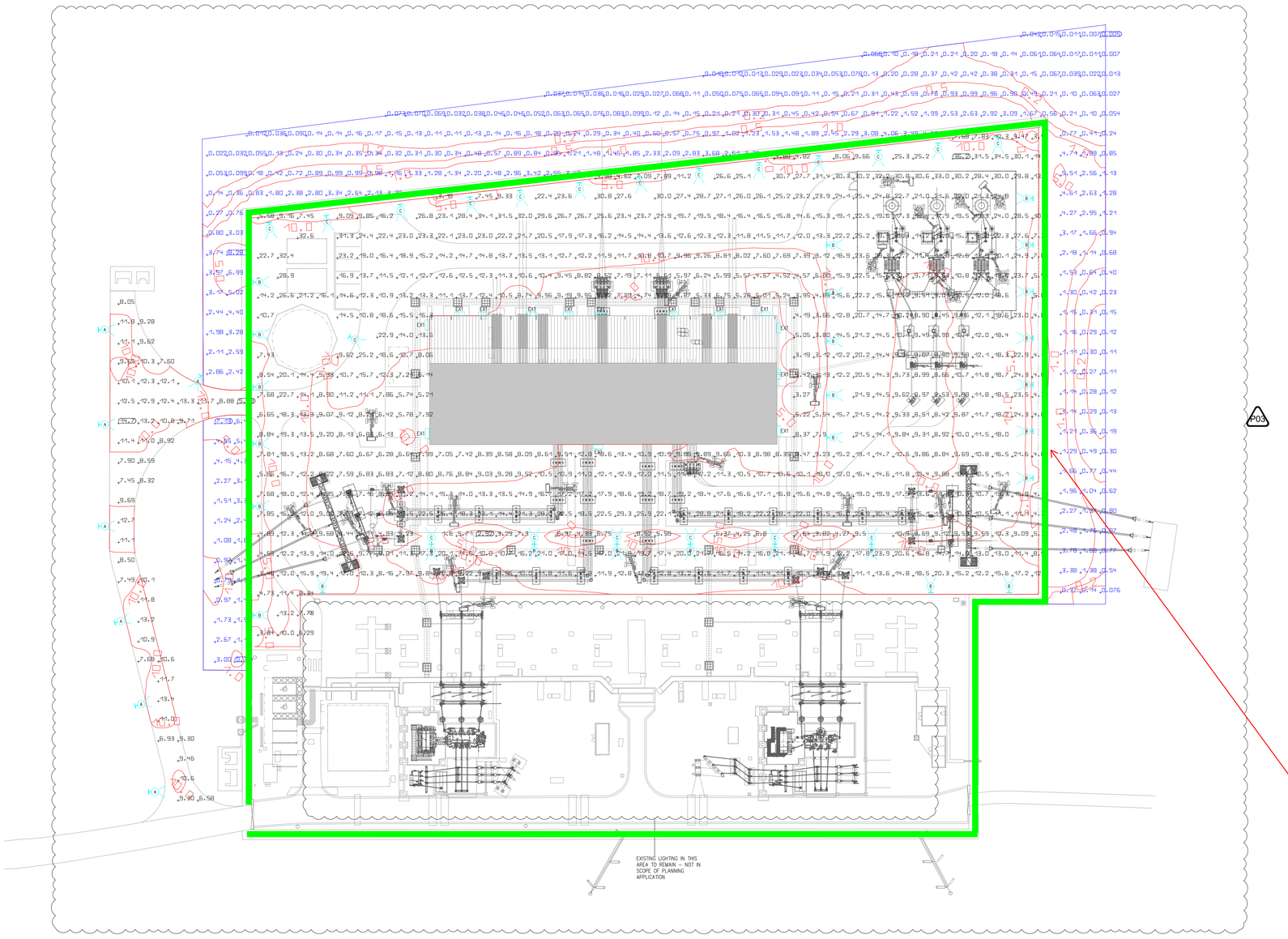
3.1.3 There is the potential for obtrusive lighting from the proposed development to impact the sensitive hedgerows. However, given the limited operation hours of the Site, it is expected that any adverse impact will be temporary.

3.1.4 The lighting levels should be monitored post-development to determine if the artificial lighting is impacting the behaviour of the bats and other species within the SINC. If impacts are recorded, then the mitigation measures outlined in **section 2.7** should be considered.

Appendix A Proposed External Lighting Design

LUMINAIRE SCHEDULE								
Index	Manufacturer	Article name	Item number	Description	Luminous flux	Maintenance factor	Connected load	Quantity
A	Schréder	AMPERA EVO 1 5393 Flat glass Back light Maxi 20 LEDs LED@700mA Driver@700mA WW 727 230V 03-55-868 593122	593122	High performance, high efficacy dark sky approved lighting luminaire. 0% ULOR 2700K IP65, IK07 with back light shield	3356 lm	0.80	46 W	7
B	Schréder	NEOS GEN2 2 5393 Flat glass Back light Maxi, Embellishment plate 40 LEDs LED@350mA Driver@350mA WW 727 230V 00-70-393 621362	621362	High performance, high efficacy dark sky approved lighting luminaire. 0% ULOR 2700K IP65, IK07 with back light shield	3714 lm	0.80	43.5 W	27
C	Schréder	NEOS GEN2 2 5393 Flat glass Back light Maxi, Embellishment plate 40 LEDs LED@620mA Driver@620mA WW 727 230V 00-70-393 621362	621362	High performance, high efficacy dark sky approved lighting luminaire. 0% ULOR 2700K IP65, IK07 with back light shield	6139 lm	0.80	78 W	20
EX1	Holophane	Denver iD Wall	DWL.1.LA012.HN.W007	Led wall luminaire Dark sky approved 0% ULOR, 2700K c/w 3hr Integral Emergency.	799 lm	0.80	6.5 W	14

Area	Parameter	Min	Max	Average	Min/average	Min/max
Overall Site	Perpendicular illuminance	2.92 lx	36.2 lx	14.1 lx	0.21	0.081
External Road	Perpendicular illuminance	5.59 lx	14.7 lx	10.4 lx	0.54	0.38
External Site spill	Perpendicular illuminance	0.78 lx	8.28 lx	2.64 lx	0.30	0.11



Health & Safety
CDM regulations 2015

Significant risks associated with this drawing are identified below and, where applicable, at specific locations on the drawing.
Refer to the CDM Regulation 9 Risk Register for full details.

NOTES

1. EXTERNAL LIGHTING DESIGN SHALL COMPLY WITH THE FOLLOWING NATIONAL GRID SPECIFICATIONS:
   - TS 2.10.10: GIS AND OTHER SUBSTATION BUILDINGS DESIGN
   - TS 3.10.13 MINOR ELECTRICAL WORKS
   - TS 3.10.15 MECHANICAL AND ELECTRICAL EQUIPMENT
   - TS 2.10.04 SITE LIGHTING
2. THE SITE WILL REMAIN UNLIT OUTSIDE OF OPERATIONAL HOURS. EXTERNAL LIGHTING WILL ONLY BE ACTIVATED WHEN OPERATIONAL OR MAINTENANCE PERSONNEL ARE PRESENT, OR IN RESPONSE TO A SECURITY ALERT.
3. CAR PARK AND ROAD LIGHTING WILL BE PROVIDED IN COMPLIANCE WITH THE GUIDE AND RECOMMENDATIONS AS PUBLISHED TO THE CHARTERED INSTITUTE OF BUILDING SERVICE ENGINEERS GUIDE FOR LIGHTING IN THE OUTDOOR ENVIRONMENT, BS5489, BSEN12464 AND BSEN13201.
4. ALL EXTERNAL LIGHTING DESIGNS MUST BE CARRIED OUT IN ACCORDANCE WITH THE INSTITUTE OF LIGHTING PROFESSIONALS (ILP) GUIDANCE NOTE 01/21 THE REDUCTION OF OBTRUSIVE LIGHT. ACCOUNT MUST BE TAKEN OF THE ENVIRONMENTAL LOCATION, ADJACENT OR NEARBY PROPERTIES, ULOR AND POSITIONING/AIMING OF LUMINAIRES. DESIGNS MUST ALSO CONSIDER BAT CONSERVATION TRUST (BCP)/ILP GUIDANCE NOTE 08/23 TO MITIGATE IMPACTS ON BAT HABITATS.
5. COLUMNS WILL BE MID HINGED 8M MEDIUM DUTY TILT DOWN TUBULAR STEEL CONSTRUCTION AND WILL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH BS5649 PARTS 1 & 2.
6. EXACT SETTING OUT OF ALL BUILDING MOUNTED FITTINGS TO BE AGREED WITH THE ARCHITECT BEFORE FIRST FIX TAKES PLACE.
7. EXACT SETTING OUT OF ALL LIGHTING COLUMNS TO BE AGREE WITH THE ARCHITECT BEFORE INSTALLATION COMMENCES.

NOTE - FOR CLARITY THIS DRAWING SHOULD BE PLOTTED IN COLOUR

FOR PLANNING

Rev	Description	Cnt'd	Chk'd	App'd	Date
P03	STANTEC COMMENTS ADDRESSED -S3 SUITABLE FOR REVIEW & COMMENT	EB / RS	SH	AF	26/06/2025
P02	STANTEC COMMENTS ADDRESSED -S3 SUITABLE FOR REVIEW & COMMENT	EB / RS	AF	VK	05/06/2025
P01	ISSUED FOR PLANNING	EB / RS	SH	VK	22/05/2025

nationalgrid

National Grid Electricity Transmission plc, Warwick Technology Park, Gallows Hill, Warwick. CV34 6DA

Master Scheme No:	Sub-Scheme No:	Site:
101667	N/A	MARGAM

Scheme Name: MARGAM CONNECTION

Document Title: SITE PLAN PROPOSED EXTERNAL LIGHTING LAYOUT

Created by:	Date:	Checked by:	Date:	Approved by:	Date:
EB / RS	22/05/2025	SH	22/05/2025	VK	22/05/2025

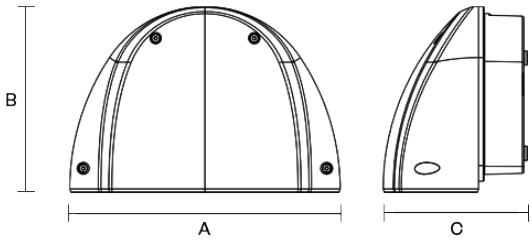
Development Eng:	Document Type:	Scale:	Format:	Sheet(s):	Rev:
-	DWG	1:500	A1	01 of 01	P03

National Grid Document Number: 32_LOR_0803

Document Number: MARPT-BHK-01-XX-DG-E-320010

Appendix B Luminaire Datasheets

Kirium Wall



Dimensions (mm):
A 340 **B** 235 **C** 182

Weight (kg):
3.5

DARKSKY APPROVED
Reduces light pollution
Certified by DarkSky.org

Sample Specification Text

Kirium Wall surface luminaire with 16 LED light engine. Constant light output enabled fully programmable DALI driver operating up to 700mA. 3,000K colour temperature using Diamond+ A1 optic technology. International Dark-Sky Association approved. LM6 high pressure die-cast aluminium body in RAL 7046 mid grey with a polyester powder coat finish and polycarbonate glazing. IP66 and IK10 protection. 100,000 hour (L90 B10) lifetime. For -40˚C to +40˚C ambient operating temperatures. Class I.

Performance

Output (luminaire flux)	3,989lm (max)
Power	37W (max)
Efficacy	172lm/W (max)
Number of LEDs	8 / 16
Colour Temperatures	2,700K 3,000K 4,000K
Colour Rendering Index (CRI)	70 / 80
Distributions	Narrow (Diamond+A1) Medium (Diamond+A5) Wide (Diamond+ C2)
Upward Light Output Ratio	0% ULOR
BUG Rating	B1 – U0 – G1
International Dark-Sky Association Approved	Yes (2,700K / 3,000K CCTs only)
Certifications	UKCA, CE

Electrical

Driver Options	DALI / 1-10V (fully Programmable with Constant Light Output Enabled)
Drive Current Range	300mA to 700mA
Operating Voltage	220-240V
Electrical Class	Class I / Class II
Operating Temperature Limit	-40˚C to +40˚C
Rated Lifetime	100,000 hours (L90 B10)

Mechanical

Mounting Options	Wall mount (option to mount over BESA box available)
Glazing	Clear / frosted polycarbonate
Housing	Die-cast aluminium
Colours	Mid Grey RAL 7046 Light Grey RAL 7035 Black RAL 9005 (Other RAL colours on request)
Finish	Polyester powder coat
IP Rating	IP66
IK Rating	IK10
Weight	3.5kg

Controls

Control Options	Photocell Part night switching Pre-programmed dimming Integral CMS Presence detector Integral 3-hour emergency

DW Windsor Ltd, Pindar Road, Hoddesdon, Hertfordshire, EN11 0DX, United Kingdom // +44 (0)1992 474600 // info@dwwindsor.com // www.dwwindsor.com

Schréder
Experts in lightability™

AREA

NEOS GEN2

Designer : Michel Tortel

LENSO FLEX™ 4

The most versatile solution for your road and urban lighting applications

The true successor to the renowned NEOS luminaires, NEOS GEN2 combines the most advanced LED technology with elegant design. Compact yet powerful, it offers versatile, energy-efficient lighting for a wide range of applications.

NEOS GEN2 not only illuminates but transforms spaces, providing both aesthetic appeal and functional performance.

IP 66 | IK 09 | IK 10

UL 1598
CSA C22.2 No. 250.0

URBAN & RESIDENTIAL STREETS | BRIDGES | BIKE & PEDESTRIAN PATHS | RAILWAY STATIONS & METROS | CAR PARKS | LARGE AREAS | SQUARES & PEDESTRIAN AREAS | ROADS & MOTORWAYS | SPORT F ACILITIES

Concept

The NEOS GEN2 luminaires are composed of a three-piece housing (the body, the cover and the glass frame) made of painted die-cast low-copper aluminium to meet the requirements of highly corrosive environments. These luminaires combine a refined yet strong shape, offering a high tightness level and strong impact resistance levels to withstand any type of outdoor environment.

NEOS GEN2 combines the energy efficiency of the latest LED technology with the photometric concepts developed by Schréder.

The LensoFlex®4 photometric platform offers flexible, energy-efficient photometric solutions that can be tailored to meet the specific lighting needs of any project. This range of photometric options gives NEOS GEN2 exceptional versatility, allowing it to efficiently illuminate a wide range of applications. From pedestrian crossings to urban squares and streets, and even major roads and large areas, NEOS GEN2 delivers optimal lighting performance in every setting. Dedicated collimator optics (BlastFlex) are also available to deliver the beams required for specific sport and architectural lighting applications.

Mounting by means of a fork enables the inclination to be precisely adjusted on-site. The versatility of this fork makes it perfect for mounting on a surface or wall, or on a pole/bracket.

As an option, these connected-ready luminaires can be equipped with a NEMA or a Zhaga socket, enabling them to be easily integrated with various connected lighting systems, and providing greater adjustability and control.

Various photometric distributions for numerous outdoor lighting applications.

NEOS GEN2 luminaires are easy to install and adjust on site.

TYPES OF APPLICATION

- URBAN & RESIDENTIAL STREETS
- BRIDGES
- BIKE & PEDESTRIAN PATHS
- RAILWAY STATIONS & METROS
- CAR PARKS
- LARGE AREAS
- SQUARES & PEDESTRIAN AREAS
- ROADS & MOTORWAYS
- SPORT FACILITIES

KEY ADVANTAGES

- Refined design
- LensoFlex®4 versatile solutions for high-end photometries maximising comfort and safety
- Sports optics based on BlastFlex technology offering a wide range of beams: very narrow to asymmetrical beams
- Connected-ready
- Numerous light distributions
- Zhaga-D4i certified
- Compact and versatile

As an option, NEOS GEN2 can be equipped with a NEMA or a Zhaga socket.

Tool-free opening for the greatest maintenance and servicing ease.

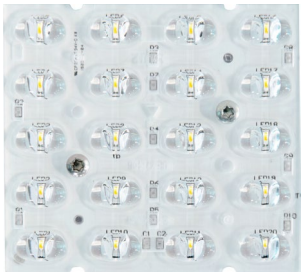
NEOS GEN2 | NEOS GEN2 1

NEOS GEN2 | NEOS GEN2 2

LensoFlex®4

LensoFlex®4 maximises the heritage of the LensoFlex® concept with a very compact yet powerful photometric engine based upon the addition principle of photometric distribution. The number of LEDs in combination with the driving current determines the intensity level of the light distribution. With optimised light distributions and very high efficiency, this fourth generation enables the products to be downsized to meet application requirements with an optimised solution in terms of investment.

LensoFlex®4 optics can feature backlight control to prevent intrusive lighting, or a glare limiter for high visual comfort.



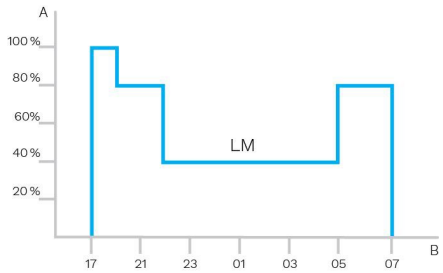
BlastFlex™

Using silicon collimators, the BlastFlex photometric engine offers the highest efficacy for directional beams dedicated to specific applications in architectural and sports lighting. The ability to control the light with the highest accuracy reduces the light spill in the surroundings and contributes to an optimal use of the energy consumed. Thanks to a superior thermal resistance, the BlastFlex optics can work with very high currents to provide large lumen packages and do not suffer from the yellowing effect over time.

Custom dimming profile

Intelligent luminaire drivers can be programmed with complex dimming profiles. Up to five combinations of time intervals and light levels are possible. This feature does not require any extra wiring.

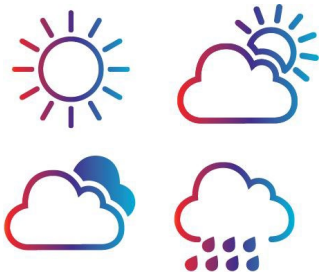
The period between switching on and switching off is used to activate the preset dimming profile. The customised dimming system generates maximum energy savings while respecting the required lighting levels and uniformity throughout the night.



A. Dimming level | B. Time

Daylight sensor / photocell

Photocell or daylight sensors switch the luminaire on as soon natural light falls to a certain level. It can be programmed to switch on during a storm, on a cloudy day (in critical areas) or only at nightfall so as to provide safety and comfort in public spaces.

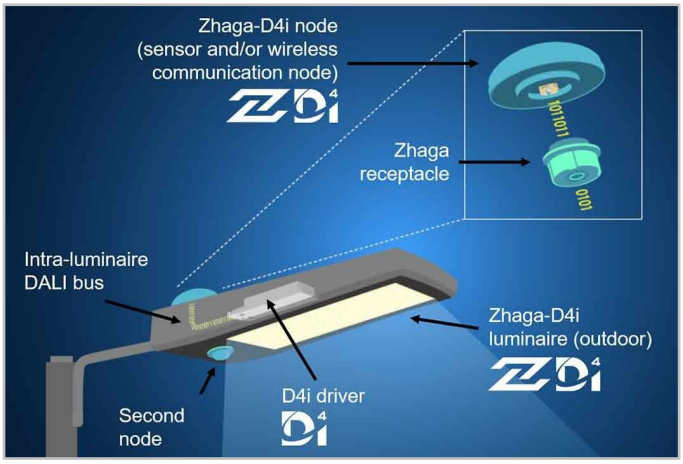


PIR sensor: motion detection

In places with little nocturnal activity, lighting can be dimmed to a minimum most of the time. By using passive infrared (PIR) sensors, the level of light can be raised as soon as a pedestrian or a slow vehicle is detected in the area.

Each luminaire level can be configured individually with several parametres such as minimum and maximum light output, delay period and ON/OFF duration time. PIR sensors can be used in an autonomous or interoperable network.

The Zhaga consortium joined forces with the DiiA and produced a single Zhaga-D4i certification that combines the Zhaga Book 18 version 2 outdoor connectivity specifications with the DiiA's D4i specifications for intra-luminaire DALI.



Standardisation for interoperable ecosystems

As a founding member of the Zhaga consortium, Schréder has participated in the creation of, and therefore supports, the Zhaga-D4i certification program and the initiative of this group to standardise an interoperable ecosystem. The D4i specifications take the best of the standard DALI2 protocol and adapt it to an intra-luminaire environment but it has certain limitations. Only luminaire mounted control devices can be combined with a Zhaga-D4i luminaire. According to the specification, control devices are limited respectively to 2W and 1W average power consumption.

Certification program

The Zhaga-D4i certification covers all the critical features including mechanical fit, digital communication, data reporting and power requirements within a single luminaire, ensuring plug-and-play interoperability of luminaires (drivers) and peripherals such as connectivity nodes.

Cost-effective solution

A Zhaga-D4i certified luminaire includes drivers offering features that had previously been in the control node, like energy metering, which has in turn simplified the control device therefore reducing the price of the control system.

2 sockets: top and bottom

The Zhaga socket is small and suited to applications where aesthetics is essential. The architecture of Zhaga-D4i also foresees the possibility of putting two sockets on one luminaire, allowing for instance, the combination of a detection sensor and a control node. This also has the added value of standardising certain detection sensor communications with the D4i protocol.

Schréder EXEDRA is the most advanced lighting management system on the market for controlling, monitoring and analysing streetlights in a user-friendly way.

Standardisation for interoperable ecosystems

Schréder plays a key role in driving standardisation with alliances and partners such as uCIFI, TALQ or Zhaga. Our joint commitment is to provide solutions designed for vertical and horizontal IoT integration. From the body (hardware) to the language (data model) and the intelligence (algorithms), the complete Schréder EXEDRA system relies on shared and open technologies. Schréder EXEDRA also relies on Microsoft Azure for cloud services, provided with the highest levels of trust, transparency, standards conformance and regulatory compliance.

Breaking the silos

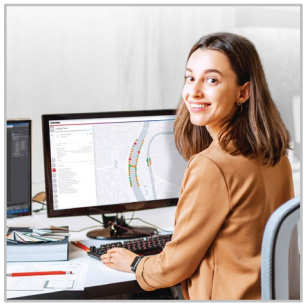
With EXEDRA, Schréder has taken a technology-agnostic approach: we rely on open standards and protocols to design an architecture able to interact seamlessly with third-party software and hardware solutions. Schréder EXEDRA is designed to unlock complete interoperability, as it offers the ability to:

- control devices (luminaires) from other brands
- manage controllers and to integrate sensors from other brands
- connect with third-party devices and platforms

A plug-and-play solution

As a gateway-less system using the cellular network, an intelligent automated commissioning process recognises, verifies and retrieves luminaire data into the user interface. The self-healing mesh between luminaire controllers enables real-time adaptive lighting to be configured directly via the user interface. OWLET IV luminaire controllers, optimised for Schréder EXEDRA, operate Schréder's luminaires and luminaires from third parties. They use both cellular and mesh radio networks, optimising geographical coverage and redundancy for continuous operation.

Tailored experience



Schréder EXEDRA includes all advanced features needed for smart device management, real-time and scheduled control, dynamic and automated lighting scenarios, maintenance and field operation planning, energy consumption management and third-party connected hardware integration. It is fully configurable and includes tools for user management and multi-tenant policy that enables contractors, utilities or big cities to segregate projects.

A powerful tool for efficiency, rationalisation and decision making

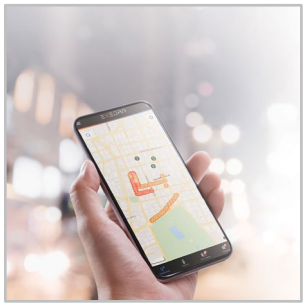
Data is gold. Schréder EXEDRA brings it with all the clarity managers need to drive decisions. The platform collects massive amounts of data from end devices and, aggregates, analyses and intuitively displays them to help end-users take the right actions.

Protected on every side

ISO 27001
BUREAU VERITAS
Certification

Schréder EXEDRA provides state-of-the-art data security with encryption, hashing, tokenisation, and key management practices that protect data across the whole system and its associated services. The whole platform is ISO 27001 certified. It demonstrates that Schréder EXEDRA meets the requirements for establishing, implementing, maintaining and continually improving security management.

Mobile App: any time, any place, connect to your street lighting



The Schréder EXEDRA mobile application offers the essential functionalities of the desktop platform, to accompany all types of operator on site in their daily effort to maximise the potential of connected lighting. It enables real-time control and settings, and contributes to effective maintenance.

NEOS GEN2 | CHARACTERISTICS

Schréder

GENERAL INFORMATION

Recommended installation height	8m to 15m | 26' to 49'
Circle Light label	Score ≥90 - The product fully meets circular economy requirements
Driver included	Yes
CE mark	Yes
ENEC certified	Yes
UL certified	Yes
Zhaga-D4i certified	Yes
UKCA marking	Yes

HOUSING AND FINISH

Housing	Aluminium
Optic	PMMA
Protector	Tempered glass Polycarbonate
Housing finish	Polyester powder coating
Standard colour(s)	AKZO grey 900 sanded
Tightness level	IP 66
Impact resistance	IK 09, IK 10
Vibration test	Compliant with modified IEC 68-2-6 (0.5G)
Access for maintenance	Tool-less access to gear compartment

· NEMA socket is only available for NEOS GEN2 size 2

OPERATING CONDITIONS

Operating temperature range (Ta)	-30°C up to +45°C / -22°F up to 113°F

· Depending on the luminaire configuration. For more details, please contact us.

ELECTRICAL INFORMATION

Electrical class	Class 1 US, Class I EU, Class II EU
Nominal voltage	120-277V – 50-60Hz 220-240V – 50-60Hz
Surge protection options (kV)	10
Electromagnetic compatibility (EMC)	EN 55015 / EN 61000-3-2 / EN 61000-3-3 / EN 61547
Control protocol(s)	1-10V, DALI
Control options	AmpDim, Bi-power, Custom dimming profile, Photocell, Remote management
Socket	Zhaga (optional) NEMA 7-pin (optional)
Associated control system(s)	Schréder EXEDRA Schréder ITERRA
Sensor	Motion sensor (optional)

OPTICAL INFORMATION

LED colour temperature	2200K (Warm White WW 722) 2700K (Warm White WW 727) 2700K (Warm White WW 827) 3000K (Warm White WW 730) 3000K (Warm White WW 830) 4000K (Neutral White NW 740) 4000K (Neutral White NW 840) 5700K (Cool White CW 757) 5700K (Cool White CW 857) 5700K (Cool White CW 957)
Colour rendering index (CRI)	>70 (Warm White WW 722) >70 (Warm White WW 727) >80 (Warm White WW 827) >70 (Warm White WW 730) >80 (Warm White WW 830) >70 (Neutral White NW 740) >80 (Neutral White NW 840) >70 (Cool White CW 757) >80 (Cool White CW 857) >90 (Cool White CW 957)

LIFETIME OF THE LEDS @ TQ 25°C

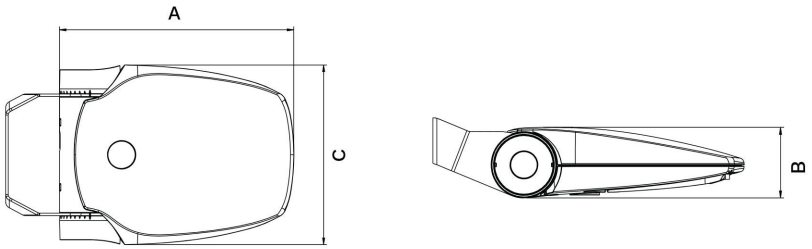
All configurations	100,000h - L92

· Lifetime may be different according to the size/configurations. Please consult us.

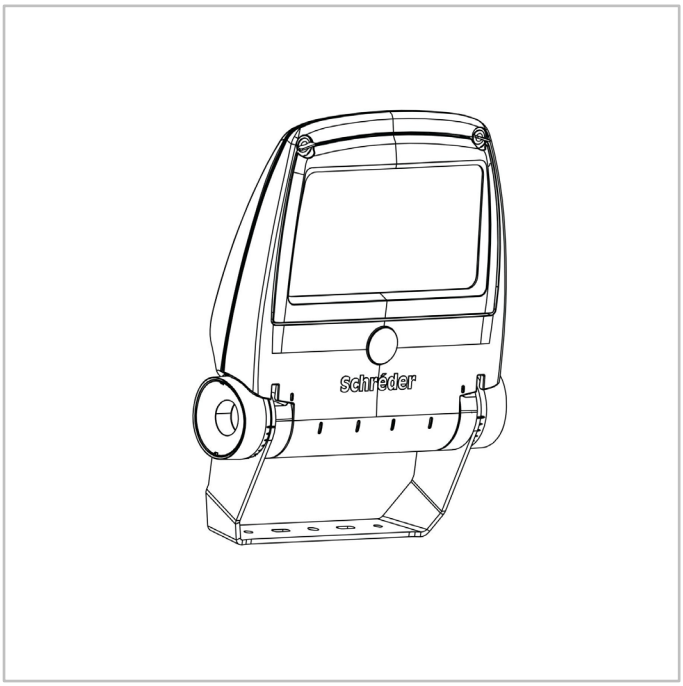
DIMENSIONS AND MOUNTING

AxBxC (mm | inch)	NEOS GEN2 1 : 383.5x107x293 | 15.1x4.2x11.5 NEOS GEN2 2 : 416x107x416 | 16.4x4.2x16.4
Weight (kg | lbs)	NEOS GEN2 1 : 7.1 | 15.6 NEOS GEN2 2 : 10.1 | 22.2
Aerodynamic resistance (CxS)	NEOS GEN2 1 : 0.13 NEOS GEN2 2 : 0.20
Mounting possibilities	Bracket enabling adjustable inclination

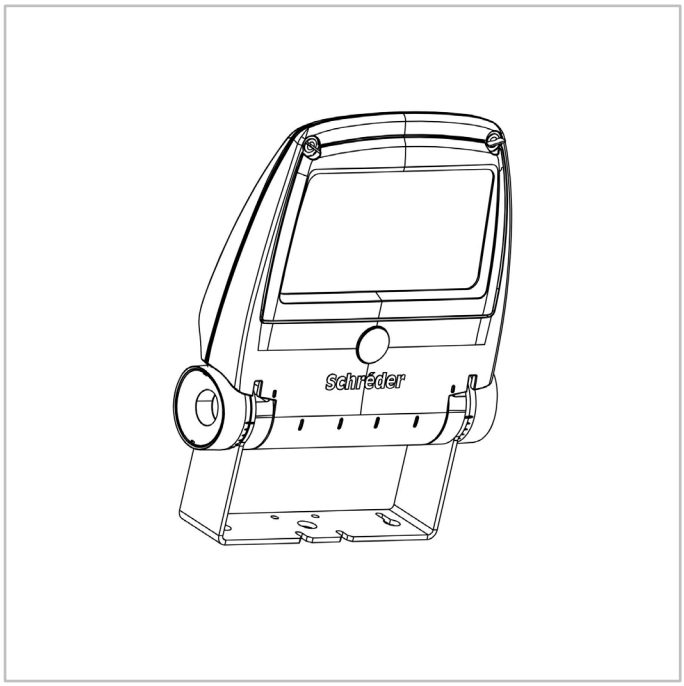
· *For more information about mounting possibilities, please consult the installation sheet.*



NEOS GEN2 | Surface and wall mounting



NEOS GEN2 | Bracket for post-top mounting



NEOS GEN2 1

Photometry

LENSO FLEX™4

	Luminaire output flux (lm)																				W		lm/W
	WW 722		WW 727		WW 827		WW 730		WW 830		NW 740		NW 840		CW 757		CW 857		CW 957				
Nbr of LEDs	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Up to
20	1900	6600	2200	7300	2000	6700	2300	7900	2200	7300	2500	8500	2300	7800	2400	8100	2300	7800	2000	6900	23	66	154
25	2700	7400	3000	8200	2700	7500	3200	8900	3000	8200	3500	9600	3200	8700	3300	9200	3200	8700	2800	7800	28	87	140

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %

NEOS GEN2 2

Photometry

LENSO FLEX™4

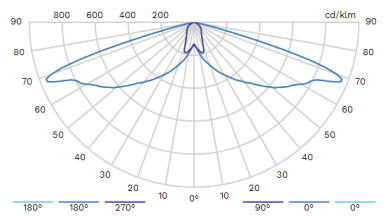
	Luminaire output flux (lm)																				W		lm/W
	WW 722		WW 727		WW 827		WW 730		WW 830		NW 740		NW 840		CW 757		CW 857		CW 957				
Nbr of LEDs	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Up to
40	3900	12900	4400	14500	4000	13200	4700	15600	4400	14500	5100	16800	4600	15300	4900	16100	4600	15300	4100	13600	44	132	162
50	5400	13000	6100	14500	5500	13300	6500	15600	6100	14500	7000	16900	6400	15400	6700	16200	6400	15400	5700	13700	54	145	147

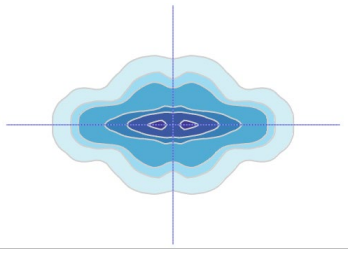
Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %

LensoFlex4

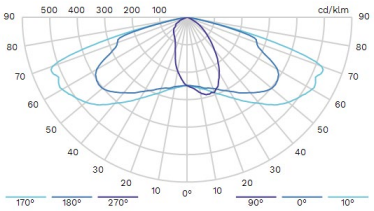
LENSO FLEX™4

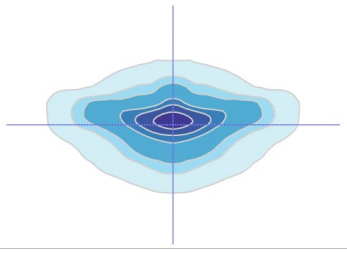
5300 Ultra-Narrow





5301 Narrow





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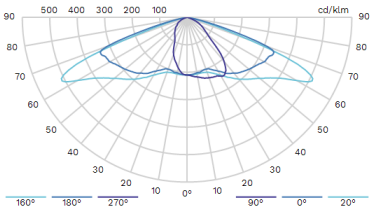

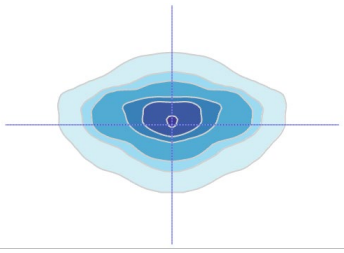

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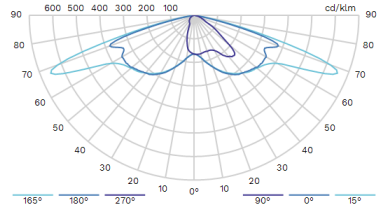

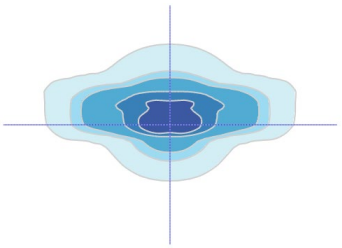

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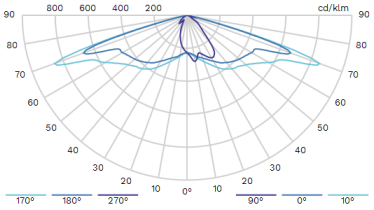
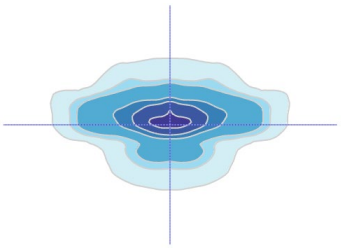
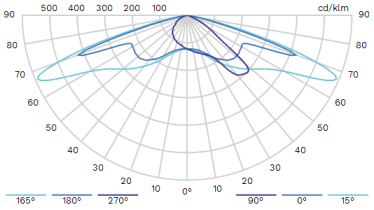
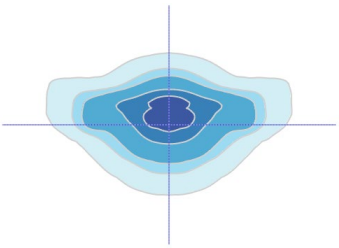


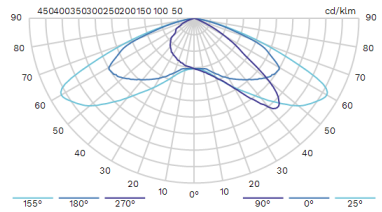


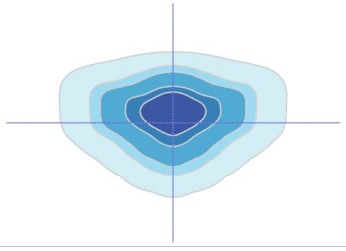
5307 Wide



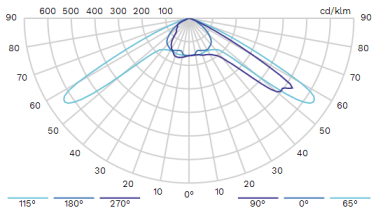


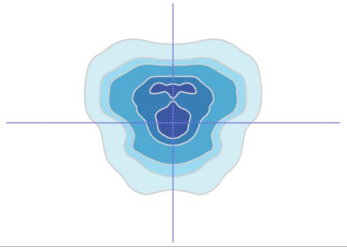
LENSO FLEX™4 5308 **Wide**



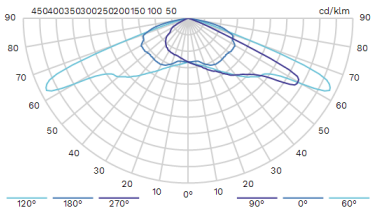


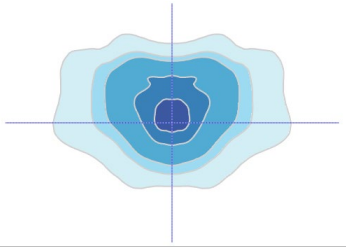
LENSO FLEX™4 5366 **Extra-Wide**



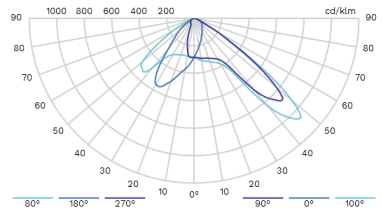


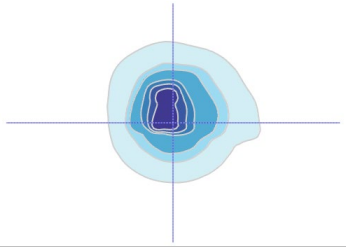
LENSO FLEX™4 5393 **Ultra-Wide**





LENSO FLEX™4 5370 **Zebra Left**





LENSO FLEX™4 5369 **Zebra Right**