

LIGHTING REPORT

for

PROPOSED CLONBURRIS RESIDENTIAL DEVELOPMENT

at

SITE 4 CLONBURRIS HOUSING DEVELOPMENT KISHOGE CO. DUBLIN

for

SOUTH DUBLIN COUNTY COUNCIL

La Vallee House Upper Dargle Road Bray, Co. Wicklow A98 W2H9 Ireland

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Table of Contents

1.	INTRODUCTION	. 4
2.	DESIGN CONSIDERATIONS	. 5
3.	LIGHTING DESIGN	. 5
4.	LIGHTING SIMULATION RESULT	6
5.	LIGHTING CONTROL	6
6.	CONCLUSION	. 7



1. INTRODUCTION

This Lighting Report was compiled by METEC Consulting Engineers in January 2025 on behalf of our client, South Dublin County Council, as part of the planning submission for the proposed development of the residential development

The proposed development will consist of the following:

- Construction of residential development consisting of:
 - 2 Storey House
 - 3 Storey House
 - Duplex
 - Triplex
 - Age Friendly Residents
 - Garden Apartments
 - 1 Bedroom Apartments
 - 2 Bedroom Apartments
 - Community/ Retail Buildings
- Construction of ancillary buildings and structures including ESB Substation buildings,

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 security and to minimise light pollution to the adjacent areas.

The works will include for the installation of new lighting columns to the main entrance and main car parking areas. The works will also include for the installation of new lighting columns around the perimeter of the site and fire tender access route.

It must be noted that the school site will be subject to a future application whilst the Southern Link Street has already been permitted and would have already been subject to a RSA.



2. DESIGN CONSIDERATIONS

2.1 Road Usage

When designing the proposed lighting scheme the following traffic classifications have been considered:

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

2.2 Existing Trees

Co-ordination with the existing trees is necessary to ensure the following:

- Luminaires and tree positions do not overlay.
- Luminaires should be located outside the branch width of the tress to avoid damage to the light fitting from falling branches and to avoid the need to regularly trim back.
- Avoid obstructions to lighting by reducing the height of lighting columns.

2.3 Bat Conservation

When designing the proposed lighting scheme, consideration has been given to perimeter hedgerow with regards to bat roosts, commuting habitats and foraging habitats. the following have been considered:

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

3. LIGHTING DESIGN

The lighting design is based on EN 13201-2 Road Lighting - Part 2: Performance requirements and Bats and artificial lighting in the UK (Bat Conservation Trust) Guidance Note 08/18. Lighting calculation results are based on direct illuminance only and a maintenance factor of zero. It is important that architectural finishes are considered with regards to material reflectance.

In addition, the general guidance offered in BS 5489-1 Code of Practise for the Design of Road Lighting, current edition and the council's public lighting specification has been observed.

Standard LED Street lighting has been designed to utilise 3000K colour temperature to protect the existing bio-diversity within and around the site



Based on the guidelines set out in the above-mentioned documents the parameters applicable to the site are set out below:

The scheme has been designed to:

- Roads // BS 5489-1:2020, P4, 5.00 7.50 lux average, 1.0 lux minimum
- Footpaths // BS 5489-1:2020, P5, 3.00 4.50 lux average, 0.60 lux minimum

The proposed lighting scheme for the site consists of Schreder Axia 3.1 pole mounted fittings as indicated on the drawings. The pole heights are 6m throughout the residential development and is in line with the adjacent site development not only in mounting height, but also make manufacturer and in lumen output so providing uniformity across all other residential site development in the area.

LIGHTING SIMULATION RESULT

Refer to appendix A – for results

Southern link Road (excluding residential areas):

• A maintained average illuminance of 10 lux and minimum illuminance of 1 lux (0.1 uniformity). While this does not comply fully with EN 12464-2 for medium traffic parking areas (10 lux average, 0.25 uniformity), this is due the future school development which has yet to be included in the overall calculations.

Residential road ways:

- A maintained average illuminance of 6.5 lux and minimum illuminance of 1 lux (0.22 uniformity). While this does not fully comply with EN 12464-2 for light traffic parking areas (5 lux average, 0.25 uniformity), this is due the future school development which has yet to be included in the overall calculations.
- •

4. LIGHTING CONTROL

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. Dali Lighting control shall be provided to reduce lighting levels to 30% at a predetermined time to be agreed with the ecologist.

Light fitting shall be controlled via an astronomical clock which is built into the Site lighting distribution board.



5. 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, standards and Bats and artificial lighting Guidance Notes.
- The lighting scheme achieves good uniformity throughout the development to ensure good visibility at night.

6. Details of light fittings layouts







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IK 10

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PRO

Engineered for performance, designed for the customer experience

With customer feedback playing a critical part in our innovative design process, we developed AXIA 3. More than a luminaire, it is a platform delivering sustainability, costeffectiveness and customer experience all while supporting smart city frameworks. Based on experience from the hundreds of thousands AXIA luminaires installed worldwide, this third generation luminaire pushes the boundaries with photometric innovation, ease and speed of installation and FutureProof connectivity.

Available in three sizes, AXIA 3 enables towns and cities to maximise efficiency when lighting numerous environments, from bike paths, squares and car parks to residential streets, carriageways, urban roads and large boulevards. This lightweight and compact luminaire combines quality of light with a minimal carbon footprint. It excels in easy installation and carefree maintenance, reducing operating costs.





AXIA 3 | SUMMARY

Schréder

Concept

AXIA 3 is a robust yet compact luminaire, designed with a focus on miniaturisation and superior efficiency. Composed of high-pressure die-cast aluminium, as well as composite materials, AXIA 3 is available in three sizes. Thanks to its reduced weight, this road luminaire is easy to handle during installation. The AXIA 3.1, which can be fitted with up to 16 LEDs, is perfectly suited to low-height applications, whereas AXIA 3.2 and 3.3, with up to 32 or 64 LEDs, are ideal for lighting urban and large roads, carriageways and avenues. The AXIA 3 range is equipped with ProFlexII photometric engines, providing the highest efficiency thanks to their ability to maximise the lumen output and to provide very extensive light distributions.

AXIA 3 comes pre-cabled, hence there is no need to open the luminaire. The complete range is available with an integrated universal fixation part adapted for post-top and side-entry mounting on various spigots (Ø32mm with adapter, Ø42-48mm, Ø60mm and Ø76mm). The inclination angle can be adjusted on-site for both post-top (-5°/+15°) and side-entry (-10°/+10°) configurations to optimise lighting, reduce power consumption and control light pollution.

This highly efficient, cost-effective and connected-ready luminaire, offers towns and cities the ideal solution to improve lighting levels, increase safety, generate energy savings and reduce their ecological footprint. AXIA 3 is the ideal tool to provide another 25 years of efficiency, sustainability and safety.



The ProFlex® photometric engine provides the highest efficiency.



The AXIA 3 range has a universal fixation part for spigots ranging from Ø32 to Ø76mm.

TYPES OF APPLICATION

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

KEY ADVANTAGES

- Maximised savings in energy and maintenance costs
- ProFlex® photometric engines offering high efficiency lighting, comfort and safety
- 3 sizes to provide the most accurate solutions for numerous road and urban applications
- Easy installation: pre-cabled and equipped with universal fixation part adapted for side-entry and post-top mounting
- Adjustable inclination for optimised photometry and uniformity
- Connected-ready



The inclination is adjustable on-site for optimised photometry and further energy savings.



AXIA 3 is connected-ready and can operate with various sensors and control systems.



AXIA 3 | PHOTOMETRY

Schréder



The ProFlex**D** photometric engine integrates the lenses into a polycarbonate protector. This integration increases the output and reduces the reflection inside the optical unit. The polycarbonate used for the ProFlex**D** photometric engine offers essential characteristics such as high optical clarity for a superior light transmission, better impact resistance compared to glass and a long life span with UV-stabilisation treatment. The ProFlex**D** concept enables a compact design with a thin optical compartment. It provides extensive light distributions so that the spacing between the luminaires can be increased.





AXIA 3 | CONTROL SYSTEMS

Schréder



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



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.





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.





AXIA 3 | Schréder EXEDRA



Schréder

Schréder EXEDRA is the most advanced lighting management system on the market for controlling, monitoring and analysing streetlights in a userfriendly 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 Microsoft0 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



Schreider 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 endusers take the right actions.

Protected on every side



Schréder EXEDRA provides state-of-theart 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.









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.



AXIA 3 | PureNight PURE

Schréder

With the PureNight concept, Schréder offers the ultimate solution for restoring the night sky without switching off cities, while maintaining safety and well-being for people and preserving wildlife. The PureNight concept guarantees that your Schréder lighting solution satisfies environmental laws and requirements. Welldesigned LED lighting has the potential to improve the environment in all respects.



Direct the light only where it is wanted and needed



Schréder is renowned for its expertise in phatemetry. Our optics direct light only where it is wanted and needed. However, light brespass behind the luminaire might be a key concern when it comes to protecting a sensitive wildlife hebitat or avoiding intrusive lighting towards buildings. Our fully integrated backlight solutions easily address this potential risk.

Protect wildlife



If not well designed, artificial lighting can backy affect wildlife. Blue light and excessive intensity can have a damaging affect on all types of life. Blue light radiation has the ability to suppress the production of melatonin, the hormone that contributes to the regulation of the circadian rhythm. It can also alter the behavioural patterns of animals including bats and moths, as it can change their movements towards or away from light sources. Schréder

favours warm white LEDs with minimal blue light, combined with advanced control systems including sensors. This enables permanent adaptation of the lighting to the real needs of the moment, minimising disturbance to the fauna and flora.

Choose a Dark Sky certified luminaire



The International Dark-Sky Association (IDA) is the recognised authority on light pollution. It provides leadership, tools and resources to industries and companies willing to reduce light pollution. The IDA's Fixture Seal of Approval programme certifies outdoor lighting fatures as being Dark Sky Friendy. All products approved by this programme must comply with the following criteria:

 The light sources shall have a maximum correlated colour temperature of 2000K;

- Uplight allowance limited to 0.5% of total output, or 50 lumens, with no more than

10 lumens in the 90-100 degree UL zone;

- The luminaires must have a dimming capability to 10% of full rating:
- The luminaires must be equipped with a fixed mounting option;

- The luminaires must have Safety Certification by an independent laboratory.

This approved Schréder range of luminaires complies with these regulirements.

1. Without backlight 2. With backlight

Offer maximum visual comfort to people



Because of the lower installation height compared to road lighting, visual comfort is an essential aspect of urban lighting. Schreder designs lenses and accessories to minimise any type of glare (distracting, disconforting, disabling glare and blinding glare). Our design offices harness a range of possibilities to find the best solutions for each project and ensure that we provide a gentle light that delivers the losst night-time experience.



AXIA 3 | CHARACTERISTICS

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GENERAL INFORMATIO	DN	ELECTRICAL INFORMA	TION	
Recommended	4m to 12m 13' to 39'	Electrical class	Class I EU, Class II EU	
installation height		Nominal voltage	220-240V - 50-60Hz	
Driver included	Yes	Power factor (at full	0.9	
CE mark	Yes	load)		
ENEC certified	Yes	Surge protection	10	
ENEC+ certified	Yes	options (kv)		
ROHS compliant	Yes	Electromagnetic compatibility (EMC)	EN 55015 / EN 61000-3-2 / EN 61000-4-5 / EN 61547	
Dark Sky friendly	Yes	Control protocol(s)	1-10V, DALI	
certification)		Control options	Bi-power, Custom dimming profile, Photocell, Remote management	
Zhaga-D4i certified	Yes	Contrat		
Testing standard	LM 79-08 (all measurements in ISO17025 accredited laboratory)	SUCKEL	znaga (optional) NEMA 3-pin (optional) NEMA 6-pin (optional)	
			NEMA 7-pin (optional)	
HOUSING AND FINISH		Associated control	Schréder EXEDRA	
Housing	Aluminium Composite materials	system(s) Sensor	PIR (optional)	
Optic	Polycarbonate			
Protector	Polycarbonate (with integrated lenses)	OPTICAL INFORMATIO	N	
Housing finish	Polyester powder coating	LED colour	2700K (Warm White WW 727)	
Standard colour(s)	RAL 7040 window grey RAL 9005 Jet black	temperature	3000K (Warm White WW 730) 4000K (Neutral White NW 740)	
Tightness level	IP 66	Colour rendering	>70 (Warm White WW 727)	
Impact resistance	IK 10	index (only	>70 (Warri White WW 730) >70 (Neutral White NW 740)	
Vibration test	Compliant with modified IEC 68-2-6	ULOR	0%	
	(0.5G)	ULR	0%	
OPERATING CONDITIO	NS	Meets IDA Dark Sky requirements when fitted with LEDs of 3000K or less. ULOR may be different according to the configuration. Please consult us. ULR may be different according to the configuration. Please consult us.		
Operating	-30°C up to +45°C / -22°F up to 113°F			

temperature range (Ta)

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

LIFETIME OF THE LEDS @ TQ 25°C

All configurations	100,000

0h - L90



AXIA 3 | CHARACTERISTICS

Schréder

DIMENSIONS AND MOUNTING	
AxBxC (mm inch)	AXIA 3.1 : 513x130x191 20.2x5.1x7.5 AXIA 3.2 : 585x130x191 23.0x5.1x7.5 AXIA 3.3 : 550x130x277 21.7x5.1x10.9
Weight (kg lbs)	AXIA 3.1 : 3.6 7.9 AXIA 3.2 : 4.8 10.6 AXIA 3.3 : 6.0 13.2
Aerodynamic resistance (CxS)	AXIA 3.1 : 0.03 AXIA 3.2 : 0.03 AXIA 3.3 : 0.04
Mounting possibilities	Side-entry slip-over – Ø32mm Side-entry slip-over – Ø42mm Side-entry slip-over – Ø48mm Side-entry slip-over – Ø60mm Post-top slip-over – Ø60mm Post-top slip-over – Ø76mm



AXIA 3 | MOUNTING

Schréder

AXIA 3 | Post-top - Slip-over mounting for Ø60 or Ø76mm spigot - 2xM10 screws









AXIA 3 | PERFORMANCE

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		Lu	minaire ou	itput flux (I	.m)		Po	wer	Luminaire
	Warm W 7	/hite WW 27	Warm W 7	/hite WW 30	Neutral \ 7	White NW 40	(W)		(lm/W)
Number of LEDs	Min	Max	Min	Max	Min	Max	Min	Max	Up to
8	600	2500	700	2600	800	3000	8	23	152
16	900	5100	900	5400	1100	6100	11	44	159

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

AXIA 3 | LIGHT DISTRIBUTIONS

Schréder







Luminaire C Data

Supplier	Schréder	
Туре	AXIA 3.1 5267 Integrated lenses 16 OSLO N SQUARE GIANT LED@37	
Lamp(s)	16 OSLON SQUARE GIANT@370mA WW 730 230V 1x01-11-802 - DRIVER_	
LampFlux(klm)/Colour	2.73 3000K/70	
File Name	AXIA 3.1 5267 16 OSLON SQUARE GIANT Drv 370mA WW 730 19W 614432 Integrat	
Maintenance Factor	0.81	
lmax70,80,90(cd/klm)	993.0, 97.5, 0.0	
No. in Project	87	



Overall Lighting calculations







Calc (Perper	ndicular illu	iminanci
	Actual	Targe
Average	5.73 k	
Min	1.03 k	
Max	11.5 k	
Min/average	0.18	
Min/max	0.090	





•	🎐 🛛 7.50 🛛	0.079	1
	Calc (Perpe	ndicular illu	minanc
		Actual	Targe
	Average	7.50 k	
	Min	0.59 b	
	Max	14.0 k	
	Min/average	0.079	
	Min/max	0.042	





•	Þ	8.91 k	0.056	<u>//</u> •
	Calc (Perpe		ndicular illu	minancı
			Actual	Targe
	Aw	erage	8.91 k	
	Min		0.50 k	
	Ma	x	25.3 k	
	Mir	n/average	0.056	
	Mir	n/max	0.020	





▼	4.93	bx	0.00	1
	Surf (Pe	rpe	ndicular illu	mina
			Actual	Tar
	Average		4.93 bx	
	Min		0.000 b	
	Max		25.4 k	
	Min/averag	je	0.00	
	Min/max		0.00	











