

BUILDINGS AND BUILT ENVIRONMENT

Miller Homes (Yorkshire) Ltd
Hermitage Park
Lepton
Lighting Impact Assessment

BUILDINGS AND BUILT ENVIRONMENT

Miller Homes (Yorkshire) Ltd
Hermitage Park
Lepton
Lighting Impact Assessment

Birmingham
Livery Place, 35 Livery Street, Colmore Business District, Birmingham, B3 2PB
T: 0121 233 3322

Leeds
Whitehall Waterfront, 2 Riverside Way, Leeds
LS1 4EH
T: 0113 233 8000

London
11 Borough High Street
London, SE1 9SE
T: 0207 407 3879

Manchester
4th Floor Carvers Warehouse, 77 Dale Street
Manchester, M1 2HG
T: 0161 233 4260

Nottingham
Waterfront House, Station Street, Nottingham NG2 3DQ
T: 0115 924 1100

December 2024

DOCUMENT ISSUE RECORD

Document Number:	HPL-BWB-ZZ-XX-E-RP-0001_LIA
BWB Reference:	244698

Revision	Date of Issue	Status	Author:	Checked:	Approved:
P1	02/12/2024	S2	Danny Alasfar	Peter Leonard	Peter Leonard

Notice

This document has been prepared for the sole use of the Client in accordance with the terms of the appointment under which it was produced. BWB Consulting Limited accepts no responsibility for any use of or reliance on the contents of this document by any third party. No part of this document shall be copied or reproduced in any form without the prior written permission of BWB.

CONTENTS

- 1. INTRODUCTION..... 5
 - Instruction 5
 - Proposed Development 5
 - Objectives 5
 - Scope of Works 6
- 2. RELEVANT POLICY AND GUIDANCE..... 7
 - International guidance 7
 - National guidance 7
 - British Standards 9
 - Kirklees Local Plan Strategy and Policies (Adopted 27 February 2019) 10
 - Ecologist Guidance 11
- 3. LIGHT POLLUTION 12
 - Types of Light Pollution 12
 - Design Aspects 13
 - Example Lux Levels 14
- 4. BASELINE..... 15
 - Introduction 15
 - Local Radiance 15
 - Environmental Zone..... 16
 - Ecology Receptors 17
 - Residential Receptors..... 18
 - Natural – Sky Glow Receptors 19
 - Transport Receptors..... 20
- 5. PROPOSED SITE LIGHTING..... 21
 - Design Parameters 21
 - Performance Requirements 22
 - Luminaire Selection 22
 - Obtrusive Light Assessment 24
 - Climate Change..... 25
 - Construction Phase Lighting..... 25
- 6. CONCLUSION 27

FIGURES

Figure 1. Types of Light Pollution

Figure 2. Radiance, in nanowatts per square centimetre per steradian (nW/cm²/sr)

Figure 3. Ecology receptors

Figure 4. Residential receptors

Figure 5. Transport receptors

Figure 6. Unshielded vs shielded luminaires

Figure 7. Selected colour temperature

TABLES

Table 1. Environmental Zones

Table 2. Obtrusive Light Limitations for Exterior Lighting Installations

Table 3. Lighting classes for subsidiary roads

Table 4. P Lighting class performance requirements

Table 5. Example lux levels

Table 6. Maximum values of vertical illuminance on residential properties

Table 7. Maximum values of upward light ratio (ULR) of luminaires

Table 8. Proposed external lighting design levels

Table 9. Street Lighting Luminaire

Table 10. Example luminaire – Dwelling Lighting

APPENDICES

Appendix 1: Proposed Development Masterplan

Appendix 2: Proposed External Lighting Layout

Appendix 3: Proposed External Lux Plot Layout

Appendix 4: Proposed Luminaire Type

1. INTRODUCTION

Instruction

- 1.1 BWB Consulting Ltd (BWB) has been appointed by Miller Homes (Yorkshire) Ltd (the Client) to prepare a Lighting Impact Assessment to support the reserved matters planning application for a residential development located at Hermitage Park, Lepton (the 'Site').

Proposed Development

- 1.2 The proposed development comprises a residential site and associated infrastructure.
- 1.3 The Proposed Development Masterplan is included within **Appendix 1**.

Objectives

- 1.4 This report has been produced to identify the proposed lighting strategy and subsequent impact of the external lighting installation on the existing site environment, sensitive ecology and the wider locality.
- 1.5 The report aims to provide the necessary information to discharge the following Planning Condition:

Plans and particulars relating to the Reserved Matters of landscaping, notwithstanding the submitted information, shall include a lighting design strategy. The strategy shall:

a) identify those areas / features on site that are particularly sensitive for local species and that are likely to cause disturbance in, or around their breeding sites and resting places, or along important routes used to access key areas of their territory, for example, for foraging; and

b) show how and where external lighting will be installed (through the provision of appropriate lighting contour plans and technical specifications) so that it can be clearly demonstrated that areas to be lit will not disturb or prevent the above species using their territory or having access to their breeding sites and resting places.

c) With due regard to the requirements of points a and b, detail how appropriate lighting would be installed to mitigate and protect against crime.

All external lighting shall be installed in accordance with the specifications and locations set out in the strategy, and these shall be maintained thereafter in accordance with the strategy. Under no circumstances should any other external lighting be installed on dwellings facing either Lepton Great Wood or areas of Public Open Space without prior consent from the local planning authority.

Reason: To avoid indirect impacts to bats and other local species in the interest of ecological mitigation, to comply with Policy LP30 of the Kirklees Local Plan.

- 1.6 A lighting installation is required to enable users to operate safely and reduce the fear of crime. Lighting is needed for both pedestrians and vehicle drivers. For pedestrians, lighting for good viewing conditions and avoidance of dark areas is necessary. For vehicle drivers the emphasis is on good lighting for vehicle movement and use of roads.
- 1.7 This report reviews the potential effects of new lighting and reviews methods of lighting the proposed external areas while limiting potentially obtrusive effects to receptors that may have a negative response to a change in their lighting condition. Nearby residential properties and wildlife / habitat which are found on, near or utilising the site are typical receptors considered for analysis.

Scope of Works

- 1.8 The Scope of work includes:
 - Identification and assessment of receptors and their sensitivity.
 - Identification of required / anticipated lighting provisions for the proposed development; and
 - Assessment of the potential effects created by a new lighting strategy with respect to the baseline condition.

2. RELEVANT POLICY AND GUIDANCE

International guidance

Commission Internationale De L'Eclairage (CIE 150)

- 2.1 The purpose of this guide is to help formulate guidelines for assessing the environmental effects of outdoor lighting and to give recommended limits for relevant lighting parameters to contain the obtrusive effects of outdoor lighting within tolerable levels. As the obtrusive effects of outdoor lighting are best controlled initially by appropriate design, the guidance given is primarily applicable to new installations; however, some advice is also provided on remedial measures which may be taken for existing installations. This guide refers to the potentially adverse effects of outdoor lighting on both natural and man-made environments for people in most aspects of daily life, from residents, sightseers, transport users to environmentalists and astronomers.

National guidance

National Planning Policy Framework (2021)

- 2.2 The Revised National Planning Policy Framework (NPPF) provides guidance relating to planning and pollution control for new development in England. The purpose of the planning system is to contribute to achievement of sustainable development. In relation to lighting, Paragraph 185 states: "Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation"

DEFRA's Lighting in the Countryside: Towards Good Practice (2001)

- 2.3 The Office of the Deputy Prime Minister (ODPM – now Department for Communities and Local Government) in conjunction with the Countryside Commission published 'Lighting in the Countryside: Towards Good Practice' in July 1997, and a revised issue in 2001. The guidance was developed to 'provide practical advice on the prevention and control of lighting effects through appropriate action by all those involved with lighting in the countryside'. Its objective is 'to identify good practice in the planning and design of lighting in rural areas; and advise on how it can be achieved, using case study examples'. The guide aims to provide an overview and common understanding of all aspects of good lighting practice stating that close co-operation and participation is required for all those involved in planning, designing and installing lighting schemes. The guidance provides valuable information on lighting best practice and the standard methodology outlined in this guidance document has been followed as part of this assessment. Whilst the guidance relates to 'lighting in the countryside', it is considered best practice to adopt many of the principles contained within the guidance to sites of a more urban nature.

Institute of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light (2021)

- 2.4 The ILP has proposed lighting guidance and criteria for local authorities with a recommendation that they are incorporated at the local plan level. The guidance defines various forms of light pollution and describes a series of environmental zones (similar to the CIE 150 environmental zones). The ILP guidance provides suitable criteria against which the effects of artificial lighting can be assessed and is used in this assessment.
- 2.5 The ILP Guidance Notes recommends that the immediate environment is classified systematically as shown in **Table 1**. ILP Guidance Notes then make recommendations for limiting obtrusive light according to the environmental zone in which the lighting would be situated. The stringency depends on the capacity to absorb lighting effects, with Zone E0 requiring the strictest level of control and E4 the lowest.

Table 1. Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night- time activity

- 2.6 For each Environmental Zone, recommended obtrusive light limits for exterior lighting installations have also been determined. These are summarised in **Table 2**.

Table 2. Obtrusive Light Limitations for Exterior Lighting Installations

Light Technical Parameter	Application Conditions	Environmental Zones				
		E0	E1	E2	E3	E4
Illuminance in the vertical plane (E _v)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	<0.1 lx	1 lx	2 lx	5 lx
Upward light ratio (ULR) %		0	0	2.5	5	15

Institute of Lighting Professionals (ILP) Guidance Note 08 for Bats and artificial lighting in the UK (2023)

- 2.7 This document is aimed at lighting professionals, lighting designers, planning officers, developers, bat workers/ecologists and anyone specifying lighting. It is intended to raise

awareness of the impacts of artificial lighting on bats, and mitigation is suggested for various scenarios.

British Standards

BS 5489: Code of Practice for the Design of Road Lighting – Part 1: Lighting of Roads and Public Amenity Areas (2021)

- 2.8 BS 5489-1 provides recommendations on the general principles, aesthetic and technical aspects of road lighting and advises on statutory provisions, operation and maintenance of lighting. The standard provides recommendations for the design of lighting for all types of highways and public thoroughfares, including those specifically for pedestrians and cyclists, and for pedestrian subways and bridges.
- 2.9 **Table 3** is taken from BS 5489-1 which helps to define the lighting class for subsidiary roads (Class P – subsidiary roads including residential roads). The required lighting performance criteria for each class is defined in BS EN 13201 Part 2: Road Lighting Performance Requirements (2015).

Table 3. Lighting classes for subsidiary roads

Traffic flow	Lighting class		
	E1 to E4 ^{A)}	E1 to E2 ^{A)}	E3 to E4 ^{A)}
	Pedestrian and cyclists	Speed limit <30mph	Speed limit <30mph
Busy ^{B)}	P5	P4	P3
Normal ^{C)}	P5	P5	P4
Quiet ^{D)}	P6	P5	P4

^{A)} Environmental zone, as given in ILP Guidance Notes (refer to **Table 1**).

^{B)} Busy traffic flow refers to areas where the traffic usage is high and can be associated with local amenities such as clubs, shopping facilities, public houses, etc.

^{C)} Normal traffic flow refers to areas where the traffic usage is of a level equivalent to a housing estate access road.

^{D)} Quiet traffic flow refers to areas where the traffic usage is of a level equivalent to a residential road, and is mainly associated with the adjacent properties or properties on other equivalent roads accessed from this road.

BS EN 13201 Part 2: Road Lighting Performance Requirements (2015)

- 2.10 This standard defines lighting classes for road lighting according to photometric requirements and aiming at the visual needs of road users. It also considers environmental aspects of road lighting.
- 2.11 **Table 4** is taken from BS EN 13201-2 which defines the lighting performance requirements for Class P roads.

Table 4. P Lighting class performance requirements

Class	Horizontal illuminance	
	Maintained average (Lux)	Minimum (Lux)
P1	15.0	3.0
P2	10.0	2.0
P3	7.5	1.5
P4	5.0	1.0
P5	3.0	0.6
P6	2.0	0.4

Kirklees Local Plan Strategy and Policies (Adopted 27 February 2019)

2.12 This document is the Kirklees Local Plan. The Local Plan is the statutory development plan and its purpose is to set out the policies necessary to achieve the strategy and how much new development there should be in the district and where it will go. The Local Plan covers the administrative area of Kirklees Council except for that part within the Peak District National Park. The Plan covers the period 2013 – 2031.

Policy LP30 Biodiversity & Geodiversity

“The council will seek to protect and enhance the biodiversity and geodiversity of Kirklees, including the range of international, national and locally designated wildlife and geological sites, Habitats and Species of Principal Importance and the Kirklees Wildlife Habitat Network.”

“Development proposals will be required to:-

- i. result in no significant loss or harm to biodiversity in Kirklees through avoidance, adequate mitigation or, as a last resort, compensatory measures secured through the establishment of a legally binding agreement;*
- ii. minimise impact on biodiversity and provide net biodiversity gains through good design by incorporating biodiversity enhancements and habitat creation where opportunities exist;*
- iii. safeguard and enhance the function and connectivity of the Kirklees Wildlife Habitat Network at a local and wider landscape-scale unless the loss of the site and its functional role within the network can be fully maintained or compensated for in the long term;*
- iv. establish additional ecological links to the Kirklees Wildlife Habitat Network where opportunities exist; and*
- v. incorporate biodiversity enhancement measures to reflect the priority habitats and species identified for the relevant Kirklees Biodiversity Opportunity Zone.”*

Policy LP52 Protection and improvement of environmental quality

“Proposals which have the potential to increase pollution from noise, vibration, light, dust, odour, shadow flicker, chemicals and other forms of pollution or to increase pollution to soil or where environmentally sensitive development would be subject to significant levels of pollution, must be accompanied by evidence to show that the impacts have been evaluated and measures have been incorporated to prevent or reduce the pollution, so as to ensure it does not reduce the quality of life and well-being of people to an unacceptable level or have unacceptable impacts on the environment.

Such developments which cannot incorporate suitable and sustainable mitigation measures which reduce pollution levels to an acceptable level to protect the quality of life and well-being of people or protect the environment will not be permitted.

Where possible, all new development should improve the existing environment.”

“Artificial lighting is used for a number of reasons, including work, recreation, security, safety, advertising, display, and to create a pleasant atmosphere where people gather socially. It is important to ensure that it does not become a nuisance to others. Obtrusive light (light pollution) can present serious physiological and ecological problems. Light 'spilling over' onto other property can cause annoyance, distraction and discomfort and may cause driving problems by glaring into drivers' eyes or competing with signs and other traffic signals.”

Ecologist Guidance

- 2.13 The appointed Ecologist has been consulted as part of this assessment. Identification of receptors and mitigation measures are discussed later in this report.

Ecological Impact Assessment (EclA) (October 2022)

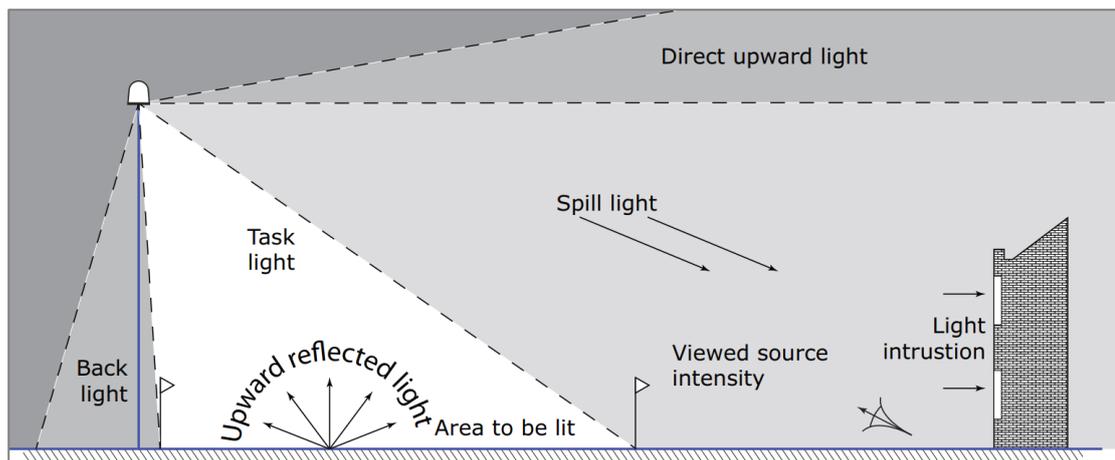
- 2.14 The purpose of this report is to:

- Describe the baseline data collection and assessment methodologies used;
- Present the results of the Extended Phase 1 Habitat Survey, desk study and Phase 2 protected species surveys (including for the wider survey area, in addition to the application site area itself);
- Identify important ecological receptors, and describe potentially significant ecological effects upon these receptors, if relevant;
- Set out any mitigation measures and sensitive working practices to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects; and
- identify opportunities for ecological enhancement, including via a Metric 3.1 Biodiversity Net Gain assessment, describing how a 10% net gain shall be achieved.

3. LIGHT POLLUTION

- 3.1 Light pollution is a generic term for all the adverse impacts that artificial lighting can have after dark. The main types of light pollution are shown diagrammatically in **Figure 1**.

Figure 1. Types of Light Pollution



- 3.2 Contributing to these direct effects are three design aspects that should be considered alongside the purpose for a new lighting installation and the type of sensitive receptors found in the local area. These are described later in this report.

Types of Light Pollution

Light Spill (Light intrusion, back light)

- 3.3 Light spill is 'the spilling of light beyond the boundary of the site on which a light source is located', such that it causes a noticeably adverse effect. More simply, light spill is often termed as the intrusion of light into homes. It can also have a negative effect on wildlife and ecological systems local to an installation.

- 3.4 As set out in the ILP Guidance Notes, the limits for light spill vary according to the environmental zone of the existing location and have been set to encourage appropriate lighting design. Through careful design, it can readily be ensured that this impact is prevented and that the illumination falling within any residential property can be reduced to zero. This is incorporated into the Lighting Strategy contained within this report.

Sky Glow (Direct upward light)

- 3.5 Sky glow is the 'the brightening of the night sky' above illuminated areas. The brightness created is constantly varying as a function of many parameters such as direct upward-lighting, ground surface reflectance, overhead cloud cover, and the degree of water droplets in the atmosphere - rain, fog/mist, and snow, for example, exacerbate the effect.

- 3.6 Mitigation is achieved by complying with the recommended limits in the ILP Guidance Notes for upward light emission. The limits vary according to the environmental zone of

the existing location and have been set to encourage appropriate lighting design. The Lighting Strategy will ensure that these limits can be met for the Proposed Development.

- 3.7 To mitigate sky glow as much as possible, lighting must be accurately targeted and kept to a minimum, and this design principle is incorporated into the Lighting Strategy.
- 3.8 The magnitude of the impact is a matter of judgement, taking into account the existing night-time view. The magnitude is lessened for those views where an observer is subject to direct illumination from, say, a nearby streetlight, or where light spill from a nearby light source illuminates the foreground, because the observer's vision is not fully dark adapted.

Glare (Viewed source intensity)

- 3.9 Glare occurs when an individual experiences visual discomfort or disability stemming from direct views of lamp sources, or high contrast of a lighting installation against a dark background. The placement of luminaires, their photometric characteristics, and the viewing context contribute to glare, which has been noted to result from uncontrolled private lighting installations, security lighting, street lighting mounted at high level near residences or habitat.

Design Aspects

Building Luminance

- 3.10 This considers the appropriateness and scale of brightness for the lighting / highlighting of built structures. Design criteria is included within ILP guidance notes as more of a main effect. While this is addressed independently, building luminance can also be considered as an indirect contributor to light spill, sky glow and glare.

Light Levels

- 3.11 Light levels, both as designed and installed, have the potential to create areas which have a noticeable difference in brightness. A new lighting installation in an area that has not been lit or is significantly brighter than the surrounding area may affect both adjacent receptors in the form of light spill or glare, and those over a larger area by contributing to sky glow through over-lighting.

Light Colour

- 3.12 Light colour has the potential to alter an individual's perception of their environment with respect to colour and clarity, as the human eye responds best to whiter light with higher quantities of ultraviolet wavelengths. Various wildlife species may respond differently to spectral composition depending on how reliant they are on darkness; many nocturnal animals continue their social habits and feeding behaviours with increased activity in the area while others may decrease their activity and possibly desert their habitat. This type of impact could affect pedestrians, vehicle operators and wildlife, and is likely to occur where new lighting is placed.

Example Lux Levels

3.13 To give context to the lux levels mentioned to within this report, **Table 5** provides examples of typical lux levels in various scenarios and applications.

Table 5. Example lux levels

Lighting Condition	Lux level
British summer sunshine	50,000
Overcast sky	5,000
Well-lit office	500
Minimum for easy reading	300
Passageway / outside working area	25
Main road lighting	5-20
Sunset	10
Typical side road lighting	5
Minimum security lighting	2
Twilight	1
Clear full moon	0.25 to <1
Typical moonlight / cloudy sky	0.1
Typical starlight	0.001
Poor starlight	0.0001

Source: IPCCTV specialists use-IP Ltd

4. BASELINE

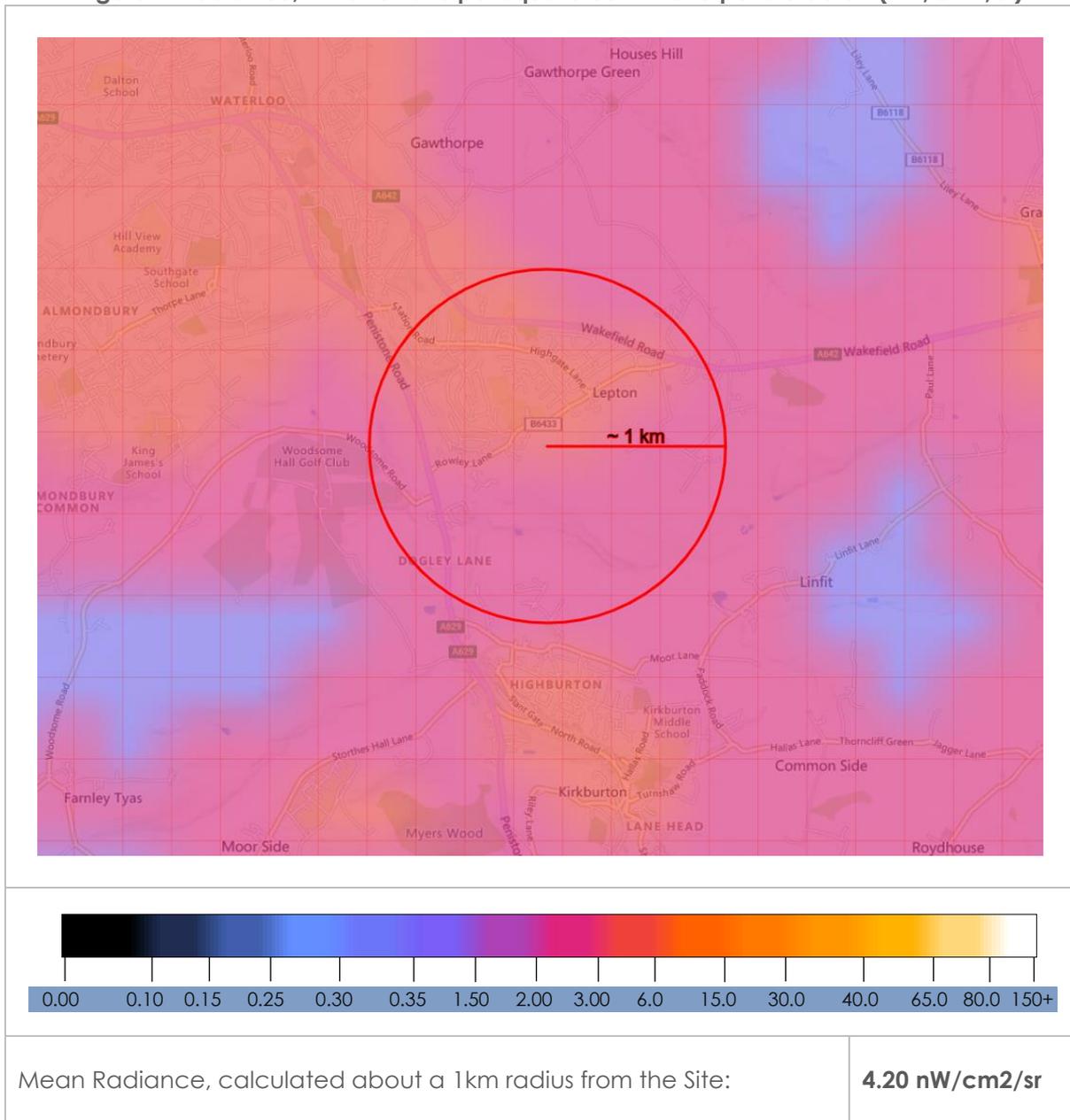
Introduction

- 4.1 The study area includes the application site, the surrounding areas and any sensitive receptors which may have a direct view towards external lighting proposals and/or which may be affected during the construction and operation of the proposed development. Assessment of designation, use, habitat and external lighting condition dictates the classification of Environmental Zone across the proposed site location and surrounding areas.
- 4.2 The Site lies on the southern edge of Lepton, circa 4.5km to the south-east of the centre of Huddersfield. It consists predominantly of three large fields and a series of smaller fields or part fields.
- 4.3 The Site is bound to the north-west and north by existing residential properties within Hermitage Park and along Rowley Lane. Hermitage Park is provided with an assumed 5m high column mounted street lighting installation. Rowley Lane is provided with an assumed 6m high street lighting installation.
- 4.4 The Site is bound to the east and south-east by Lepton Great Wood, and to the south and southwest by further cattle-grazed fields of grassland, both of which are not provided with an external lighting installation.
- 4.5 The following categories have been determined as potential sensitive receptors which could be impacted by any external lighting proposals at the Site:
 - Ecology;
 - Residential properties;
 - Natural – direct sky glow; and
 - Transport – highway and railway.

Local Radiance

- 4.6 The Visible Infrared Imaging Radiometer Suite (VIIRS) is a satellite instrument which orbits earth to collect and record radiance data (light emissions). The latest data was recorded in 2023 and is available in visual format. An extract at the Site location is included in **Figure 2**.
- 4.7 It is important to state that recognised organisations, such as the ILP or CIE, have not calibrated VIIRS radiance data with the Environmental Zones established in **Table 1**. It is also important to note the data should not accurately be relied upon and should be viewed conservatively. The data should be used as one tool to help understand the context of existing light emissions local to the Site.

Figure 2. Radiance, in nanowatts per square centimetre per steradian (nW/cm²/sr)



Environmental Zone

4.8 With reference to **Table 1** and with consideration of the site context and nature of identified potentially sensitive receptors it is deemed that the Site falls within **Environmental Zone E2**, defined as a Village or relatively dark outer suburban locations.

Ecology Receptors

- 4.9 The appointed Ecologist has been consulted as part of the Lighting Strategy in order to establish all potentially light-sensitive ecology receptors in proximity to the Site.
- 4.10 Although the Site itself does not contain any non-statutory sites, four Local Wildlife Sites (LWS), occur within the 2km radius of the centre of the Site. Carr Wood, Almondbrury Common, and Gawthorpe Lower Wood are considered to lie a sufficient distance from the Site (all over 1km away) such that any lighting proposals will not affect them, and as such they will not be considered as part of this assessment.
- 4.11 The potentially sensitive ecology receptors surrounding the site have been identified as illustrated in **Figure 3**. Mitigation measures are discussed later in this report.

Figure 3. Ecology receptors

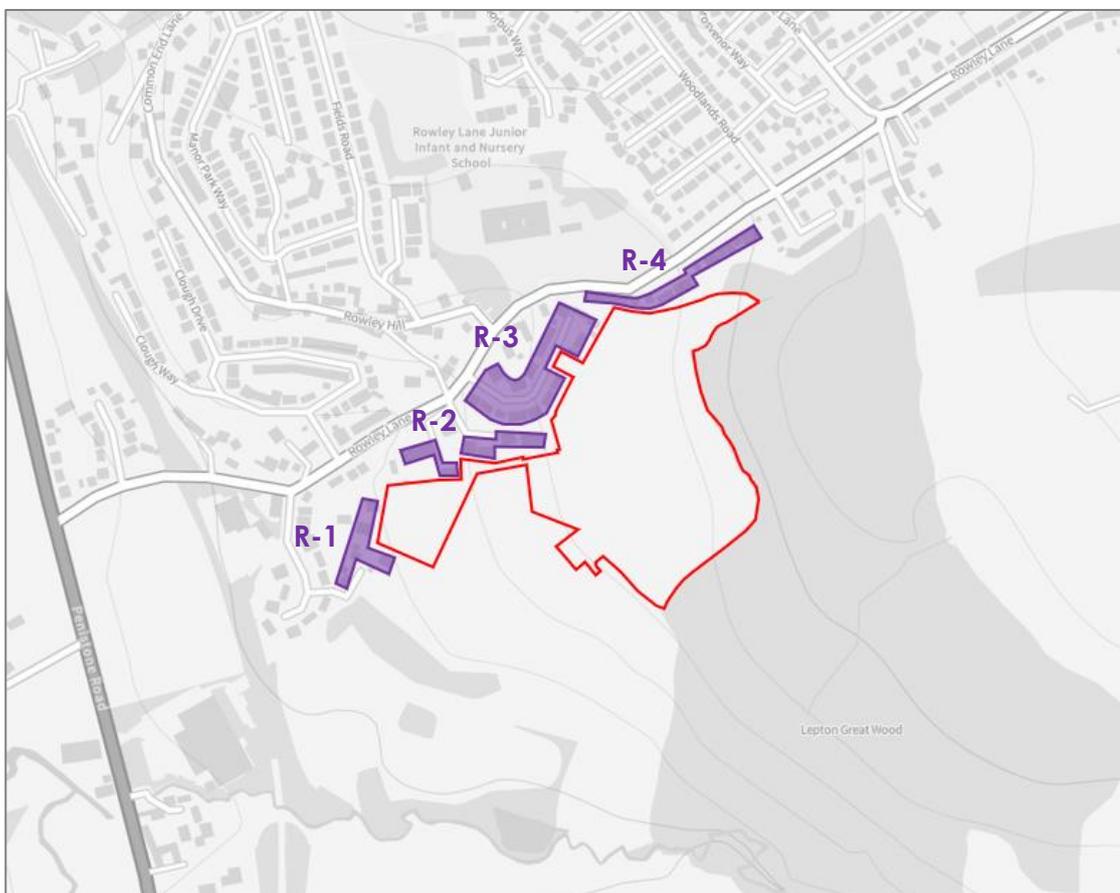


- **E-1** North-east boundary feature. Identified as moderate sensitivity, to be kept as dark as practicable.
- **E-2** Central public open space. Identified as moderate sensitivity, to be kept as dark as practicable.
- **E-3** South-east boundary feature. Identified as moderate sensitivity, to be kept as dark as practicable.
- **E-4** Lepton Great Wood Local Wildlife Site. The woodland forms part of the Kirklees Wildlife Habitat Network. Identified as high sensitivity, to be kept dark.

Residential Receptors

- 4.12 The residential receptors surrounding the site have been identified based on a desktop study using MAGIC mapping data in conjunction with Google Earth satellite and street view imagery.
- 4.13 Residential properties within 200m of the Site with a direct view of the Site are considered potentially sensitive.
- 4.14 Potentially sensitive residential receptors surrounding the site have been identified as illustrated in **Figure 4**. Mitigation measures are discussed later in this report.

Figure 4. Residential receptors



- **R-1** Residential properties off Beldon Brook Green
- **R-2** Residential properties off Rowley Lane (west)
- **R-3** Residential properties off Hermitage Park
- **R-4** Residential properties off Rowley Lane (east)

- 4.15 The limits for light intrusion (Illuminance in the vertical plane, in this case intrusion through windows) for Environmental Zone E2 are provided in **Table 6**.

Table 6. Maximum values of vertical illuminance on residential properties

Light Technical Parameter	Application Conditions	Environmental Zones				
		E0	E1	E2	E3	E4
Illuminance in the vertical plane (E _v)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	<0.1 lx	1 lx	2 lx	5 lx

4.16 Curfew is defined as the time after which stricter requirements (for the control of obtrusive light) will apply; often a condition of use of lighting applied by the local authority. Unless otherwise stated this 23:00 – 07:00 is suggested.

Natural – Sky Glow Receptors

4.17 The ILP GN01/21 guidance provides limitations for maximum allowable sky glow percentage for each Environmental Zone as shown in **Table 7**.

4.18 Sky glow is measured as ULR (Upward Light Ratio), the percentage of luminaire flux of a luminaire or a lighting installation that is emitted above the horizontal. Sky glow limitations depend on the Environmental Zone of the lighting installation as set out in the ILP guidance notes. The Environmental Zone categories are previously defined in this report in **Table 1**.

Table 7. Maximum values of upward light ratio (ULR) of luminaires

Light Technical Parameter	Environmental Zones				
	E0	E1	E2	E3	E4
Upward light ratio (ULR) %	0	0	2.5	5	15

Transport Receptors

- 4.19 The transport receptors surrounding the site have been determined based on a desktop study using MAGIC mapping data in conjunction with Google Earth satellite and street view imagery.
- 4.20 Highways or railway lines within 200m of the site with a direct view of the Site are considered potentially sensitive.
- 4.21 Potentially sensitive transport receptors surrounding the site have been identified as illustrated in **Figure 5**. Mitigation measures are discussed later in this report.

Figure 5. Transport receptors



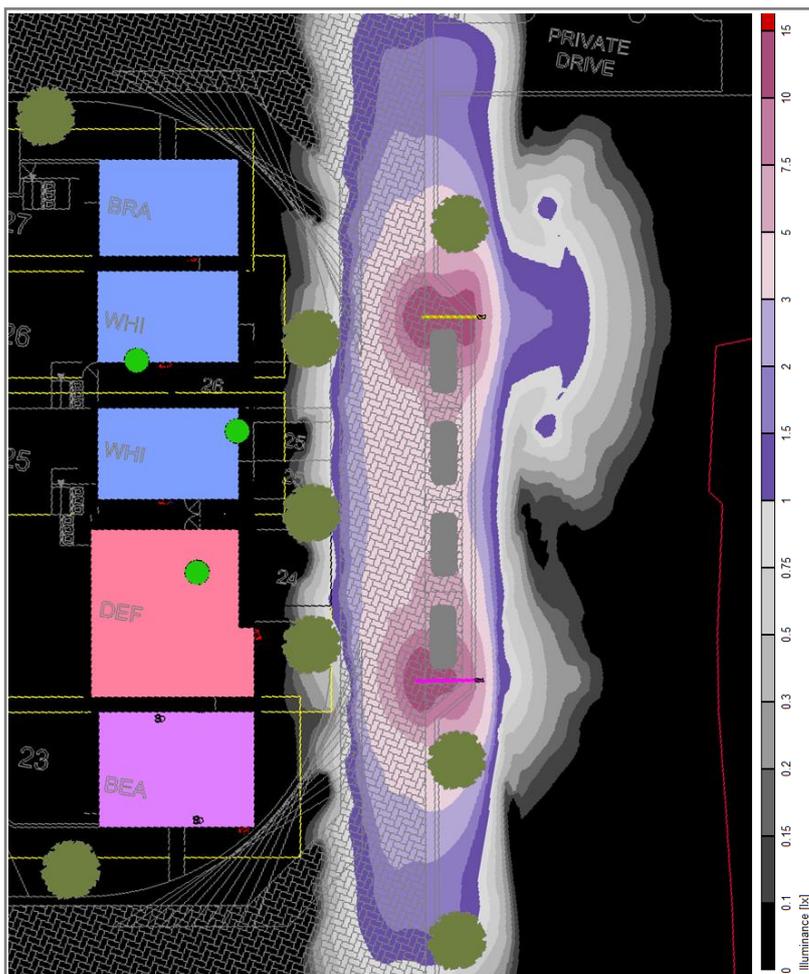
- **T-1** Hermitage Park

5. PROPOSED SITE LIGHTING

Design Parameters

- 5.1 A street lighting design has been commissioned and undertaken utilising approved Kirklees products, designed to achieve Lighting Class P5, in accordance with **Table 2** and **3**.
- 5.2 All external lighting has been proposed in accordance with the Kirklees Local Plan Strategy and Policies (Adopted 27 February 2019).
- 5.3 The proposed luminaires are LED light source to provide optimum energy efficiency and accurate targeting of light output to minimise obtrusive light.
- 5.4 All luminaires are proposed to be equipped with integrated spill shields, designed to minimise off-site light spill while reducing visibility of light sources. For context a sample pseudo colour plot is included in **Figure 6**, illustrating the improvements in light spill provided by integrated spill shields.

Figure 6. Unshielded vs shielded luminaires



- 5.5 Column heights have been carefully considered and restricted to 6m in order to minimise obtrusive light. Columns are as low as practicable, at maximum spacing, designed to achieve the performance requirements of the task area while not introducing any tilt angle to the heads. Columns have been positioned to minimise impact on ecology features as far as practicable.
- 5.6 The final detailed design may deviate from the indicative external lighting design presented but must meet all parameters and criteria as set out in this report and demonstrate equal to or less than the quantity of obtrusive light achieved. An adequate and safe level of lighting must be provided for site tasks, amenity, and security, whilst maintaining acceptable impact on the site surroundings, ecology, and neighbouring properties.
- 5.7 All luminaires are proposed at 2700K colour temperature in accordance with the recommendations of the appointed ecologist and ILP GN08/23.

Figure 7. Selected colour temperature



- 5.8 The lighting layout is included in **Appendix 2**. The lux plot layout is included in **Appendix 3**. Literature from the manufacturers of the proposed luminaires type is included in **Appendix 4**.

Performance Requirements

- 5.9 Illumination shall be provided to meet the minimum recommendations of Lighting Class P5 for a normal traffic residential road in an E2 environmental zone as defined in **Table 4** and **5**.

Table 8. Proposed external lighting design levels

Area	Target	
	Maintained Illuminance Em (Lux)	Minimum Illuminance Em (Lux)
Roads	3.0	0.6

Luminaire Selection

- 5.10 The luminaires selected for use at the Site must be capable of achieving the design parameters set out in this report.
- 5.11 All proposed luminaires should be submitted to the Kirklees for review and approval.

Table 9. Street Lighting Luminaire

Specification	Description
Location	Street lighting
Correlated Colour Temperate (CCT)	2700K
Mounting Height	6m
Light source	LED
Example Luminaire	Urbis Axia 3.1
Controls	Astronomical time clock
Notes	All luminaires shall be equipped with integrated rear louvres Refer to Appendix 2, 3, and 4 for further details.
Example Luminaire Image	

Table 10. Example luminaire – Dwelling Lighting

Specification	Description
Location	Dwelling lighting
Correlated Colour Temperate (CCT)	2700K
Mounting Height	1.8m-2.2m
Light source	LED
Example Luminaire	Litecraft Fibo Wall Light
Controls	Manual
Notes	Downward directional In accordance with the Condition, under no circumstances should any external dwelling lighting be installed on dwellings facing either Lepton Great Wood or areas of Public Open Space without prior consent from the local planning authority.
Example Luminaire Image	

Obtrusive Light Assessment

5.12 The lux plot layout, included in **Appendix 3**, has been produced in industry standard lighting calculation software. The lux plot assumes a level, clear site. In practice, the effect of changes in elevation and obstructions such as trees and hedges will contain the light spill further than is shown in the plot.

Light spill (light intrusion)

5.13 As can be seen in **Appendix 4**, light spill will attenuate down to <1 lux before reaching any existing dwelling. Vertical calculations have also been undertaken at property boundaries which demonstrate <1 lux. this level will attenuate further as distance increases toward each dwelling elevation. As illustrated in **Table 2**, the ILP obtrusive light limitation for an area classified as Environmental Zone E2 is 5 lux pre-curfew and 1 lux post-curfew. As such the proposed lighting scheme meets the ILP obtrusive light limitations and is therefore not considered to result in unacceptable light spill impacts on residential properties.

Upward light ratio (ULR)

5.14 The indicative lighting design has been used to calculate the predicted ULR of the proposed external lighting scheme. The model outputs predict a ULR of 0.00%. As illustrated in **Table 2**, the ILP sky glow limitation for an area classified as Environmental

Zone E2 is 2.5% ULR. As such the proposed lighting scheme meets the ILP sky glow limitations and is therefore not considered to result in unacceptable impacts on the dark sky landscape.

Ecology measures

- 5.15 The proposed external lighting design has been prepared in accordance with the recommendations of the appointed Ecologist. All reasonable steps have been taken to avoid illuminating sensitive receptors as far as practicable while providing the Site with sufficient lighting.
- 5.16 All luminaires are proposed at 2700K colour temperature in accordance with the recommendations of the appointed ecologist and ILP GN08/23.
- 5.17 The lighting design has been produced in collaboration with the appointed ecologist. The Ecologist has reviewed and subsequently approved the lighting design presented.
- 5.18 Any proposed bat boxes should be installed at locations which will not be directly illuminated by the proposed lighting installation.

Climate Change

- 5.19 The external lighting installation must incorporate highly efficient LED light sources to minimise the required energy while providing the required lighting levels. Typically LED light sources use between 25%-80% less energy than traditional incandescent light sources, reducing the cumulative kilowatt-hours and carbon footprint of the installation. LED technology can last between 3-15 times longer than traditional light sources which also reduces the required manufacture, distribution and installation works needed to routinely replace and dispose of failed luminaires.
- 5.20 The external lighting installation must utilise luminaires with flat glass components, emitting directional light in order to minimise light pollution and therefore minimise energy lost due to "waste" light.
- 5.21 An external lighting controls system shall be employed as described above to ensure lighting is energised only when required.

Construction Phase Lighting

- 5.22 While construction phase lighting is expected to be short term and reversible it is important to define the parameters to minimise light pollution.
- 5.23 To reduce the effects of lighting during the construction phase on sensitive receptors, a Construction Environmental Management Plan (CEMP) shall be produced which will contain best practice recommendations given by CIE, ILP, CIRIA and Health and Safety Executive (HSE). These should include, but not be limited to, the following:
 - Lighting will operate in all external areas used by construction workers after dark in order to provide a safe and secure working environment without over lighting. High quality LED light sources with high colour rendering index (CRI) shall be utilised to maximise visibility with efficient light output.

- Lighting shall be provided to meet the target lux level as set out in BS 12464-2 Lighting of Outdoor Workplaces without over lighting. Luminaires shall be mounted at the lowest practical mounting height, providing lighting only where lighting is required.
- The Contractor shall specify working hours, uses of lighting, location of temporary floodlights and construction compound and agreeing these with the local council to reduce duration of impact.
- Lighting controls should be employed to dim or switch off any lighting that is not needed.
- Lighting that needs to be sited close to the perimeter or ecologically sensitive areas should be fitted with shielding or be switched off or dimmed when not in use.
- Lighting should be controlled in such a way to illuminate high activity, hazardous or high security areas while reducing lighting levels at less pertinent areas.
- The Contractor should act responsibly to adjust any temporary lighting reported as causing nuisance.

6. CONCLUSION

- 6.1 As part of the lighting strategy a review has been undertaken of the potential impact created by new lighting in relation to the proposed development.
- 6.2 Legislation, British standards, and good practice guidance recommends the development requires new exterior lighting for purposes of vehicular and pedestrian safety.
- 6.3 The proposed external lighting installation complies with the recommendations of national and local policy, specifically the following policies which are contained within the Kirklees Local Plan Strategy and Policies (Adopted 27 February 2019):
- Policy LP30 Biodiversity & Geodiversity
 - Policy LP52 Protection and improvement of environmental quality
- 6.4 The proposed external lighting installation has been produced in compliance with, and to satisfy the requirements of, Planning Conditions which is outlined under **Paragraph 1.5** of this report.
- 6.5 Potentially significant effects from the proposed lighting on sensitive receptors can be managed to create a negligible night-time impact.
- 6.6 The lighting design strategy presented indicates the potential significant effects from new lighting for the proposed development can be adequately managed and all tested parameters are expected to meet recommended guidance benchmarks.
- 6.7 The lighting design strategy presented indicates the proposed lighting installation can achieve the required minimum lighting levels and distribution to meet the requirements of the ILP Guidance notes while causing negligible light trespass to the adjoining land and negligible increase in local sky glow.
- 6.8 The final design may deviate from the indicative external lighting design presented but must meet all parameters and criteria as set out in this report and demonstrate equal to or less than the quantity of light spill achieved. An adequate and safe level of lighting must be provided for site tasks, amenity, and security, whilst maintaining acceptable impact on the site surroundings, ecology, and neighbouring properties.
- 6.9 The lighting design has been produced in collaboration with the appointed ecologist. Lighting impact to all identified potentially sensitive receptors has been removed or reduced to an acceptable level. The Ecologist has reviewed and subsequently approved the indicative lighting design presented.
- 6.10 The most noticeable effect due to the proposed street lighting installation expected to remain is a negligible increase in sky glow.

APPENDICES

Appendix 1: Proposed Development Masterplan



225611 - Hermitage Park, Lepton

AFFORDABLE							
Ref	Housetype	Type	Parking	Storey	Bed	Sq Ft	Total Sq Ft
BAY	Baymont	Semi	PS	2	2	850	3400
		End	PS	2	2	850	3400
		Mid	PS	2	2	850	1700
LOC	Lockton	Semi	PS	2	3	1001	6006
						SUB TOTAL	16 14506

OPEN MARKET							
WHI	Whitton	Det	PS	2	2	947	6629
BRA	Braxton	Det	PS	2	2	996	7968
POR	Portstone	Det	SG	2	3	1212	2424
DEN	Denstone	Det	INT	2	3	1368	12312
CHE	Cherrystone	Det	INT	2	3	1296	7776
BEA	Beauwood	Det	SG	2	4	1379	8274
SAN	Sandalwood	Det	SG	2	4	1422	2844
HOM	Homesford	Det	DDG	2	5	1568	7840
DEF	Denford	Det	INT	2	5	1640	19680
GRA	Grayford	Det	SG	2	5	1780	10680
		Det	DDG	2	5	1780	1780
						SUB TOTAL	64 88207

TOTAL	80	102713
--------------	-----------	---------------

Areas	m2	Acres	Hectares
Gross Area	61275.00	15.14	6.13
Nett Area	24883.00	6.15	2.49
POS	29272.00	7.23	2.93

Sq Ft Per Acre	16705
-----------------------	--------------



BOUNDARY TREATMENTS KEY

- 1800mm PIER AND PANEL WALL
- 1800mm TIMBER FENCE
- 1100mm METAL ESTATE RAILING
- 600MM KNEE HIGH RAIL
- 2000mm ACOUSTIC FENCE



CLIENT: MILLER HOMES
 PROJECT: HERMITAGE PARK, LEPTON
 DRAWING: DRAFT FEASIBILITY LAYOUT

DRAWING NUMBER: 22-5611-SK08
 SCALE @ A0: 1:500

DRAWN: JP
 CHECKED: VS
 DATE: SEP 24
 DATE: SEP 24

JRP Associates
 14 Manor Court
 Calder Park, Wakefield, WF4 3PL

T 01924 383322
 E info@jrp.co.uk
 W jrp.co.uk

Do not scale off this drawing - Only figured dimensions to be taken from this drawing. Drawings based on Ordnance Survey and/or existing record drawings - Design and Drawing content subject to Site Survey, Structural Survey, Site Investigations, Planning and Statutory Requirements and Approvals. Authorised reproduction from Ordnance Survey Map with permission of the Controller of Her Majesty's Stationery Office. Crown Copyright reserved.

Appendix 2: Proposed External Lighting Layout



Notes

1. Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

Legend

- A Urtis Axia 3.1 5266 Optic BLEED 2700K 14W 500mA
Equipped with integrated rear louvres Column mounted at 6m
- B Urtis Axia 3.1 5267 Optic BLEED 2700K 21W 750mA
Equipped with integrated rear louvres Column mounted at 6m

3 LUX - P5 - ROADS AND FOOTPATHS
 Results - Horizontal Illuminance (lux)
 Eavg= 3.32
 Emin= 0.66
 Emax= 12.88
 Emin/Emax= 0.05
 Emin/Eavg= 0.20
 Emax/Eavg= 3.88



P1	27.11.24	Preliminary Issue	GCL	DA
Rev	Date	Details of issue / revision	Dw	Rev

Issues & Revisions

BWB
 A GMP GROUP COMPANY
 www.bwbconsulting.com

- Birmingham | 0121 233 3322
- Leeds | 0113 233 8000
- London | 020 7407 3679
- Manchester | 0161 233 4280
- Nottingham | 0115 924 1100

Client
 Miller Homes (Yorkshire) Ltd

Project Title
 Hermitage Park Lepton

Drawing Title
 Electrical Services
 Proposed External Lighting
 Layout
 Proposed Site Plan

Drawn:	G. C. Leeming	Reviewed:	D. Alazfar
BWB Ref:	244698	Date:	27.11.24
Scale:	AO	Scale:	1:500

Drawing Status
 PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
HPL-BWB-00-XX-DR-E-2300	S2	P1

Appendix 3: Proposed External Lux Plot Layout



Notes

1. Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

Legend

- A Urtis Axia 3.1 5266 Optic BLEED 2700K 14W 500mA
Equipped with integrated rear louvres Column mounted at 6m
 - B Urtis Axia 3.1 5267 Optic BLEED 2700K 21W 750mA
Equipped with integrated rear louvres Column mounted at 6m
 - 3.0 lux
 - 0.6 lux
- 3 LUX - P5 - ROADS AND FOOTPATHS**
 Results - Horizontal Illuminance (lux)
 E_{ave} = 3.32
 E_{min} = 0.66
 E_{max} = 12.98
 E_{min}/E_{ave} = 0.05
 E_{min}/E_{max} = 0.20
 E_{max}/E_{ave} = 3.98



P1	27.11.24	Preliminary Issue	GCL	DA
Rev	Date	Details of issue / revision	Dw	Rev

Issues & Revisions

<input type="checkbox"/> Birmingham 0121 233 3322	<input type="checkbox"/> Leeds 0113 233 8000
<input type="checkbox"/> London 020 7407 3679	<input type="checkbox"/> Manchester 0161 233 4280
<input type="checkbox"/> Nottingham 0115 924 1100	<input type="checkbox"/> www.bwbconsulting.com

Client
 Miller Homes (Yorkshire) Ltd

Project Title
 Hermitage Park Lepton

Drawing Title
 Electrical Services
 Proposed External Lighting
 Lux Plot Layout
 Proposed Site Plan

Drawn:	G. C. Leeming	Reviewed:	D. Alazfar
BWB Ref:	244698	Date:	27.11.24
Scale:	AO	Scale:	1:500

Drawing Status
 PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
HPL-BWB-00-XX-DR-E-2301	S2	P1

Appendix 4: Proposed Luminaire Type

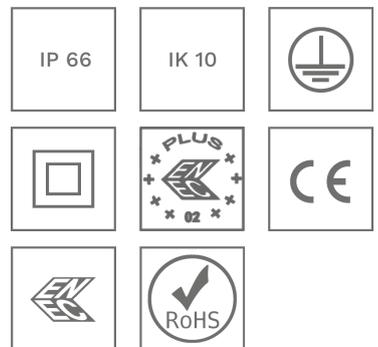
Axia 3



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, cost-effectiveness 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.



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 ProFlex™ 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
- BRIDGES
- 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 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.



ProFlex™

The ProFlex™ 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™ 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™ 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.

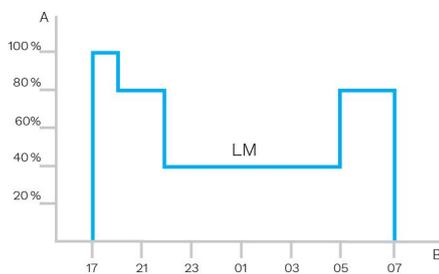




Custom dimming profile

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.

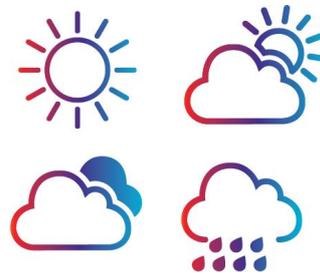


A. Dimming level | B. Time



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

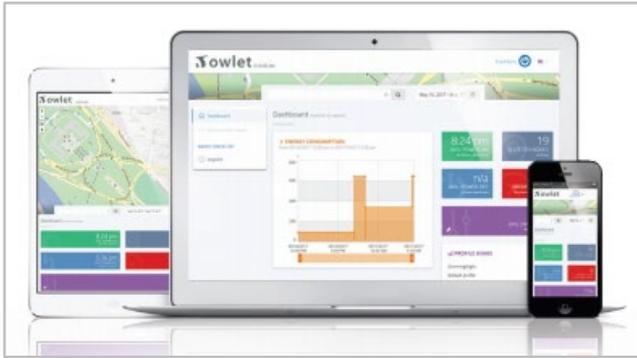
In places with little nocturnal activity, lighting can be dimmed to a minimum most of the time. By using passive infrared (PIR) sensors, the level of light can be raised as soon as a pedestrian or a slow vehicle is detected in the area.

Each luminaire level can be configured individually with several parameters 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.



Owlet IoT

Owlet IoT remotely controls luminaires in a lighting network, creating opportunities for improved efficiency, accurate real-time data and energy savings of up to 85%.



ALL-IN-ONE

The LUCO P7 CM controller includes the most advanced features for optimised asset management. It also provides an integrated photocell and operates with an astronomical clock for seasonal dimming profile adaptations.

EASY TO DEPLOY

Thanks to wireless communication, no cabling is needed. The network is not subject to physical constraints or limitations. From a single control unit to an unlimited network, you can expand your lighting scheme at any time.

With real-time geolocation and automatic detection of luminaire features, commissioning is quick and easy.

USER-FRIENDLY

Once a controller is installed on a luminaire, the luminaire automatically appears with its GPS coordinates on a web-based map.

An easy-to-use dashboard enables each user to organise and customise screens, statistics and reports. Users can gain relevant, real-time insights.

The Owlet IoT web application can be accessed at all times from anywhere in the world with a device connected to the Internet. The application adapts to the device to offer an intuitive and user-friendly experience.

Real-time notifications can be pre-programmed to monitor the most important elements of the lighting scheme.

SECURE

The Owlet IoT system uses a local wireless mesh communication networks to control the on-site luminaires combined with a remote control system utilising the cloud to ensure smooth data transfers to and from the central management system.

The system uses encrypted IP V6 communication to protect data transmission in both directions. Using a secure APN, Owlet IoT ensures a high level of protection.

In the exceptional case of a communication failure, the built-in astronomical clock and photocell will take over to switch the luminaires on and off, thus avoiding a complete blackout at night.

EFFICIENT

Thanks to sensors and/or pre-programmed settings, lighting scenarios can be easily adapted to cope with live events, providing the right lighting levels at the right time and in the right place.

The integrated utility grade meter offers the highest accuracy available on the market today, enabling decisions based on real figures.

Accurate real-time feedback and clear reporting ensures that the network operates efficiently and maintenance is optimised.

When LED luminaires are switched on, the inrush current can create problems for the electricity grid. Owlet IoT incorporates an algorithm to preserve the grid at all times.

OPEN

The LUCO P7 CM controller can be plugged onto the standard 7 pin NEMA socket and operates through either a DALI or 1-10V interface to control the luminaire.

Owlet IoT is based on the IPv6 protocol. This method for addressing devices can generate an almost unlimited number of unique combinations to connect non-traditional components to the Internet or computer network.

Through open APIs, Owlet IoT can be integrated into existing or future global management systems.

The Schröder Bluetooth solution consists of 3 main components:

- A Bluetooth dongle plugged into the modular driver of the luminaire (BLE transceiver)
- A Bluetooth antenna fitted on the luminaire
- A smartphone application called Sirius BLE



Easy to use

The Schröder Bluetooth solution is ideal for the on-site configuration of individual outdoor luminaires using Bluetooth. From the ground, the user is able to switch the luminaire on or off, adapt the dimming curve, read diagnostic data and much more. A user-friendly application called Sirius BLE provides an easy and secure access to the control and configuration functions.

Whether you are managing a lighting network in an urban or a residential area, this solution will make it easy to control your outdoor luminaires while simply standing by the pole.

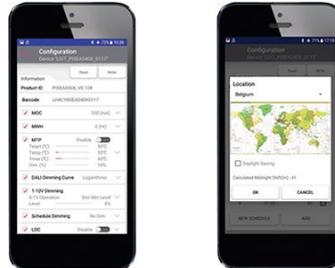
Quick and easy pairing

Get the Sirius App from Schröder. Go to the menu. Press the “SCAN DEVICE (START)” button, to search for the surrounding BLE modules. They will be displayed with a bar graphic (signal intensity) to indicate the closest and the most distant one you can reach. Click on the device you want to connect to and enter your personal access key to control the luminaire.



Defining the settings

Once you are connected to a luminaire, you can set various parameters such as the maximum output current, minimum dimming level and custom dimming profile.



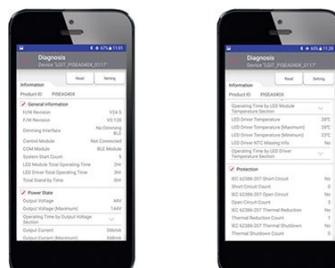
Manual dimming control

The App enables you to do a manual override to adapt the dimming levels instantly. Simply tap on the “Dimming” button in the main menu and adjust the dimming using the wheel and button. Predefined dimming levels can be applied immediately. The corresponding value is displayed on the wheel. This enables you to test the ON / OFF and dimming features of the luminaire paired to the smartphone.



On-site diagnostic

When a luminaire is paired, you can access various diagnostic information: total number of power up events, operation time of LED module and driver, total energy consumption of LED driver... etc. You can also track operating events (short circuits, thermal shutdowns...). The diagnostic values may be the current state or values accumulated to date.



GENERAL INFORMATION

Recommended installation height	4m to 12m 13' to 39'
Driver included	Yes
CE Mark	Yes
ENEC certified	Yes
ENEC+ certified	Yes
ROHS compliant	Yes
Testing standard	LM 79-08 (all measurements in ISO17025 accredited laboratory)

HOUSING AND FINISH

Housing	Aluminium Composite materials
Optic	Polycarbonate
Protector	Polycarbonate (with integrated lenses)
Housing finish	Polyester powder coating
Standard colour(s)	RAL 7040 window grey RAL 9005 Jet black
Tightness level	IP 66
Impact resistance	IK 10
Vibration test	Compliant with modified IEC 68-2-6 (0.5G)

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 I EU, Class II EU
Nominal voltage	220-240V – 50-60Hz
Power factor (at full load)	0.9
Surge protection options (kV)	10
Electromagnetic compatibility (EMC)	EN 55015 / EN 61000-3-2 / EN 61000-4-5 / EN 61547
Control protocol(s)	Bluetooth, DALI
Control options	Bi-power, Custom dimming profile, Photocell, Remote management
Socket	NEMA 3-pin (optional) NEMA 6-pin (optional) NEMA 7-pin (optional) Low voltage socket (optional)
Associated control system(s)	Sirius BLE Owlet IoT
Sensor	PIR (optional)

OPTICAL INFORMATION

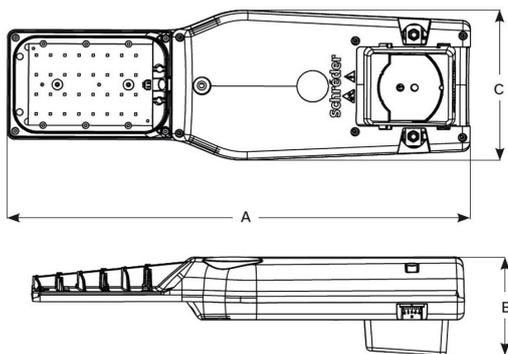
LED colour temperature	3000K (Warm White 730) 4000K (Neutral White 740)
Colour rendering index (CRI)	>70 (Warm White 730) >70 (Neutral White 740)
Upward Light Output Ratio (ULOR)	0%

LIFETIME OF THE LEDS @ TQ 25°C

All configurations	100,000h - L90
--------------------	----------------

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 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





Luminaire	Number of LEDs	Current (mA)	Luminaire output flux (lm) Warm White 730		Luminaire output flux (lm) Neutral White 740		Power consumption (W)		Luminaire efficacy (lm/W)	Photometry
			Min	Max	Min	Max	Min	Max		
AXIA 3.1	8	300	1000	1000	1100	1100	8.3	8.3	133	
	8	400	1300	1300	1400	1400	10.9	10.9	128	
	8	600	1900	1900	2000	2100	16.3	16.3	129	
	8	700	2100	2200	2300	2400	18.8	18.8	128	
	8	850	2500	2600	2700	2800	22.8	22.8	123	
	16	200	1400	1400	1500	1500	11.1	11.1	135	
	16	300	2000	2100	2200	2300	15.9	15.9	145	
	16	480	3100	3200	3300	3500	25.1	25.1	139	
	16	500	3200	3300	3400	3600	25.8	25.8	140	
	16	600	3800	3900	4000	4200	31	31	135	
	16	700	4300	4500	4600	4800	35.6	35.6	135	
	16	870	5100	5300	5400	5700	44	44	130	

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



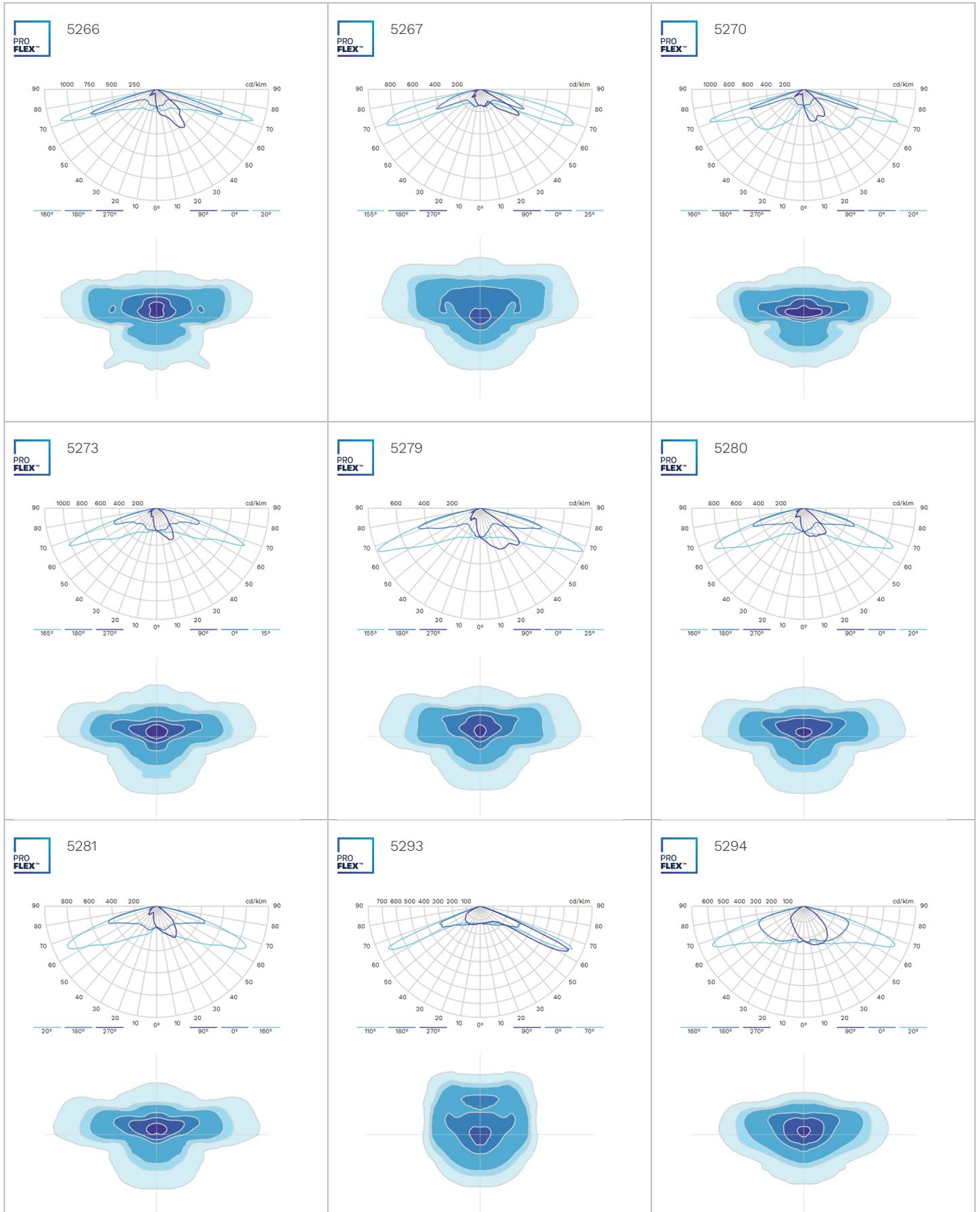
Luminaire	Number of LEDs	Current (mA)	Luminaire output flux (lm) Warm White 730		Luminaire output flux (lm) Neutral White 740		Power consumption (W)		Luminaire efficacy (lm/W)	
			Min	Max	Min	Max	Min	Max	Up to	Photometry
AXIA 3.2	24	200	2100	2200	2200	2300	15.3	15.3	150	
	24	300	3100	3200	3300	3400	22.4	22.4	152	
	24	400	4000	4100	4300	4400	29.7	29.7	148	
	24	500	4800	5000	5200	5400	37.2	37.2	145	
	24	590	5600	5800	6000	6200	44	44	141	
	24	700	6400	6600	6900	7100	52.5	52.5	135	
	24	800	7100	7400	7600	7900	60.5	60.5	131	
	24	900	7800	8000	8300	8600	68.5	68.5	126	
	24	1000	8400	8600	9000	9300	76	76	122	
	32	200	2800	2900	3000	3100	19.8	19.8	157	
	32	300	4100	4200	4400	4500	29.5	29.5	153	
	32	450	5900	6100	6300	6500	45.5	45.5	143	
	32	500	6500	6700	6900	7200	48.5	48.5	148	
	32	600	7500	7800	8100	8400	59	59	142	
	32	700	8600	8900	9200	9500	69	69	138	
	32	800	9500	9800	10200	10500	78	78	135	

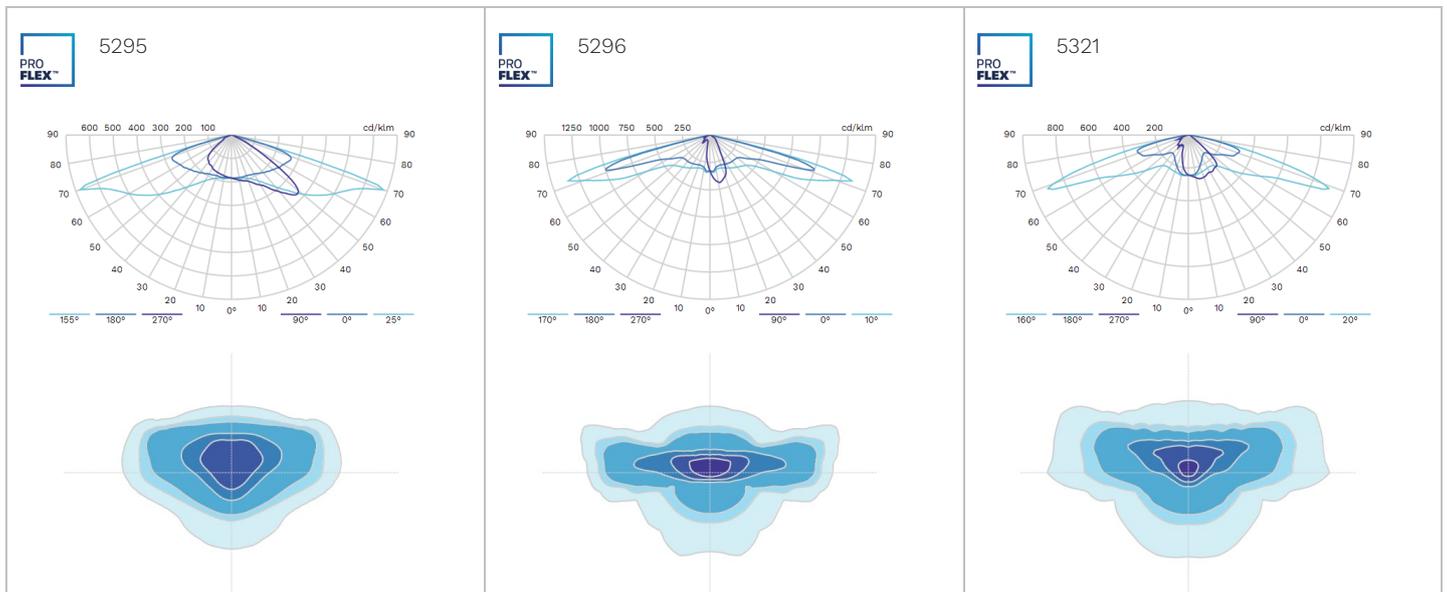
Tolerance on LED flux is $\pm 7\%$ and on total luminaire power $\pm 5\%$



Luminaire	Number of LEDs	Current (mA)	Luminaire output flux (lm) Warm White 730		Luminaire output flux (lm) Neutral White 740		Power consumption (W)		Luminaire efficacy (lm/W)	
			Min	Max	Min	Max	Min	Max	Up to	Photometry
AXIA 3.3	48	200	4200	4300	4500	4600	27.9	27.9	165	
	48	300	6100	6400	6600	6800	42	42	162	
	48	400	8000	8300	8500	8900	56	56	159	
	48	550	10400	10900	11200	11600	78	78	149	
	48	600	11200	11700	12000	12500	86	86	145	
	48	700	12600	13200	13500	14100	100	100	141	
	48	800	13900	14500	14900	15500	115	115	135	
	48	880	14900	15500	15900	16600	129	129	129	
	64	200	5600	5800	6000	6200	37.7	37.7	164	
	64	300	8200	8500	8800	9100	56.5	56.5	161	
	64	420	11100	11500	11900	12400	79	79	157	
	64	500	12900	13400	13800	14400	94	94	153	
	64	600	15000	15600	16000	16700	113	113	148	
	64	700	16900	17600	18100	18800	137	137	137	
	64	880	19800	20600	21200	22100	172	172	128	

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







A **CAF** GROUP COMPANY

