

BUILDINGS AND BUILT ENVIRONMENT

Richborough
Spencers Wood
Wokingham
Lighting Strategy

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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
11 Portland Street
Manchester, M1 3HU
T: 0161 233 4260

Market Harborough
Harborough Innovation Centre, Wellington Way, Airfield Business Park, Leicester Road
Market Harborough, Leicestershire, LE16 7WB
T: 01858 455020

Nottingham
5th Floor, Waterfront House, Station Street
Nottingham, NG2 3DQ
T: 0115 924 1100

February 2025

DOCUMENT ISSUE RECORD

BWB Document Number	SWW-BWB-ZZ-XX-RP-E-0001
BWB Reference	233424

Revision	Date of Issue	Status	Author:	Checked:	Approved:
P01	16.10.24	Information	D. Alasfar	P. Leonard	P. Leonard
P02	13.11.24	Information	D. Alasfar	P. Leonard	P. Leonard
P03	14.02.25	Information	D. Alasfar	P. Leonard	P. Leonard
P03	28.02.25	Information	D. Alasfar	P. Leonard	D. Alasfar

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1. INTRODUCTION

Instruction

- 1.1 BWB Consulting (BWB) was instructed by Richborough (the Client) to carry out a Lighting Strategy at a proposed development described as:

"Outline planning permission is sought with all matters reserved for future determination, save for the means of access via Basingstoke Road, for: up to 420 dwellings (Use Class C3), an 80 bed care home (Use Class C2), 1ha of employment land (Use Class E(g), primary school (Use Class F1), local centre (Use Classes E(a), (b), (c), (f)), GP Surgery (Use Class E(e)), sports pitch and changing facility, public open space, SANG provision and associated infrastructure."

- 1.2 The Site is located within the administrative area of Wokingham Council (WC).

Scope of Works

- 1.3 This report details the relevant lighting policy and guidance that should be complied with during the future production of a detailed lighting design.
- 1.4 This report describes the main forms of light pollution. It sets out the maximum acceptable light pollution limits at the Site and explains how they can be mitigated against as much as possible.
- 1.5 This report defines the design parameters and criteria that shall be followed during the production of a future detailed lighting design. This includes details of luminaires, mounting heights, light direction and example luminaires. Performance criteria for average lux level and uniformity are defined for each type of area, task or activity throughout the Site.
- 1.6 The future proposed external lighting design must not exceed the recommended levels for obtrusive light. An adequate and safe level of lighting will be provided for site tasks, amenity, and security, whilst maintaining a minimal impact on local light-sensitive receptors.
- 1.7 The Development Framework Plan is included in **Appendix 1**.

2. RELEVANT POLICY AND GUIDANCE

- 2.1 The relevant international, national, and local policy documents plus relevant guidance are summarised in this section and have been considered in the production of this Lighting Strategy.

International Guidance

Commission Internationale De L'Eclairage (CIE 150)

- 2.2 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.

Guidelines for Minimising Sky Glow (CIE 126)

- 2.3 These guidelines prepared by Commission Internationale De L'Eclairage provide general guidance for lighting designers and policy makers on the reduction of sky glow. The report gives recommendations about maximum permissible values for lighting installations. These values must be regarded as limiting values. Lighting designers should seek to meet the lowest specifications for the design. Other uses of the open air areas at night will usually result in less stringent sky-glow requirements. Practical implementation of the general guidance is left to National Regulations.

National Guidance

Lighting in the Countryside: Towards Good Practice

- 2.4 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.

National Planning Policy Framework

- 2.5 The 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 198 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.

National Planning Practice Guidance

- 2.6 Light Pollution Planning Practice Guidance (<http://planningguidance.planningportal.gov.uk/blog/light-pollution>) advises on how to consider light within the planning system. It recognises that artificial light provides valuable benefits to society, including extending opportunities for sport, recreation, and commerce, and can be essential to a new development. Equally, inappropriate artificial light has the potential to be obtrusive and to cause light pollution. It can be a source of annoyance, harm wildlife, and undermine enjoyment of the countryside and views of the night sky.

ILP Guidance Notes for the Reduction of Obtrusive Light (GN01/21)

- 2.7 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.
- 2.8 This Guidance Note recommends that the immediate environment is classified into an environmental zone based on ambient lighting levels in the surrounding area. The environmental zones are detailed in **Table 1**. Zone E0 requires the strictest level of control and E4 the lowest.

Table 1. Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations

Zone	Surrounding	Lighting Environment	Examples
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

- 2.9 For each Environmental Zone, recommended obtrusive light limits for exterior lighting installations have also been determined. Limits apply for light spill (**Table 2**), sky glow (direct upward light) (**Table 3**) and glare (viewed source intensity) (**Table 4**).

Table 2. Light spill limits

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

Table 3. Sky glow limits

Light technical parameter	Application conditions	Environmental zones				
		E0	E1	E2	E3	E4
Upward light ratio (ULR) %	Pre/post-curfew	0	0	2.5	5	15

Table 4. Glare (source intensity) limits

Light technical parameter	Application conditions	Luminaire group (projected area A _p in m ²)					
		0<A _p ≤0.002	0.002<A _p ≤0.01	0.01<A _p ≤0.03	0.03<A _p ≤0.13	0.13<A _p ≤0.50	A _p >0.5
Maximum luminous intensity emitted by luminaire (I in cd)	E0						
	Pre-curfew	0	0	0	0	0	0
	Post-curfew	0	0	0	0	0	0
	E1						
	Pre-curfew	0.29 d	0.3 d	1.3 d	2.5 d	5.1 d	2,500
	Post-curfew	0	0	0	0	0	0
	E2						
	Pre-curfew	0.57 d	1.3 d	2.5 d	5.0 d	10 d	7,500
	Post-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	500
	E3						
	Pre-curfew	0.86 d	1.9 d	3.8 d	7.5 d	15 d	10,000
	Post-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	1,000
	E4						
	Pre-curfew	1.4 d	3.1 d	6.3 d	13 d	26 d	25,000
	Post-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	2,500

ILP Guidance Note 08 for Bats and artificial lighting in the UK (GN08/23)

- 2.10 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 EN 12464-2: Lighting of Workplaces, Outdoor Workplaces (2014)

- 2.11 This standard specifies requirements for lighting of tasks in most outdoor work places and their associated area in terms of quantity and quality of illumination. In addition, recommendations are given for good lighting practice. This standard includes important recommendations on how obtrusive light can be limited to keep night skies free of light pollution.

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

- 2.12 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.
- 2.13 **Table 5** 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 5. 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)

- 2.14 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.
- 2.15 **Table 6** is taken from BS EN 13201-2 which defines the lighting performance requirements for Class P roads.

Table 6. 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

BS EN 12193: Sports Lighting (2018)

- 2.16 This Standard deals with sports lighting to ensure good visual conditions for players, athletes, referees, spectators and CTV transmission. The objective of this document is to provide recommendations and specify requirements for good quality sports lighting by:
- Optimizing the perception of visual information used during sports events;
 - Maintaining the level of visual performance;
 - Providing acceptable visual comfort; and
 - Restricting obtrusive light.
- 2.17 This standard provides target lighting criteria for indoor and outdoor sporting applications based on the intended level of competition:
- **Lighting Class I:** Top level competition such as international and national competition which will generally involve large spectator capacities with long potential viewing distances. Top level training can also be included in this class. For some sports the requirements of the governing body might take precedence over the values in this standard.
 - **Lighting Class II:** Mid-level competition such as regional or local club competition which generally involve medium size spectator capacities with medium viewing distances. High level training can also be included in this class.

- **Lighting Class III:** Low level competition such as local or small club competition which generally do not involve spectators. General training, physical education (school sports) and recreational activities will also come into this category.

2.18 **Table 7** is taken from BS EN 12193 (2018) which helps to establish suitable lighting class for varying levels of competition.

Table 7. Selection of lighting class

Level of competition	Lighting Class		
	I	II	III
International and National	X		
Regional	X	X	
Local	X	X	X
Training		X	X
Recreation/School sports			X

Local Guidance

Wokingham Borough Council Local Plan Update (2023-2040)

2.19 This Draft Policy has been considered during the production of this Lighting Strategy. It aims sets out a clear strategy to deliver a vision of thriving, green, and inclusive communities.

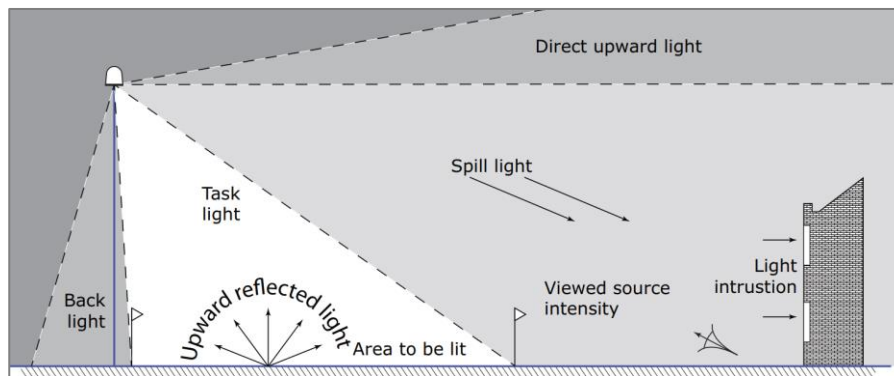
2.20 Policy **HC7: Light pollution** states:

- "Development proposals that include outdoor lighting should be sensitively designed and appropriately located to avoid obtrusive light, such as excessive glare and intrusive live spillage, and protect the amenity of immediate and wider neighbouring residential properties (both existing and proposed).
- Development proposals that include outdoor lighting should submit a Lighting Appraisal in accordance with current guidance from the Institute of Lighting Professionals (ILP) (or similar body), national guidance and British Standards. Lighting schemes should adopt the minimum level of luminance to adequately serve the needs of end users.
- All reasonable steps should be taken to avoid obtrusive light, including sky glow, on sensitive receptors such as wildlife corridors, Local Wildlife Sites and protected species. Where avoidance is not possible, adverse impacts must be identified and mitigated."

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



Source: ILP GN01/21

- 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 8** provides examples of typical lux levels in various scenarios and applications.

Table 8. 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 CONDITIONS

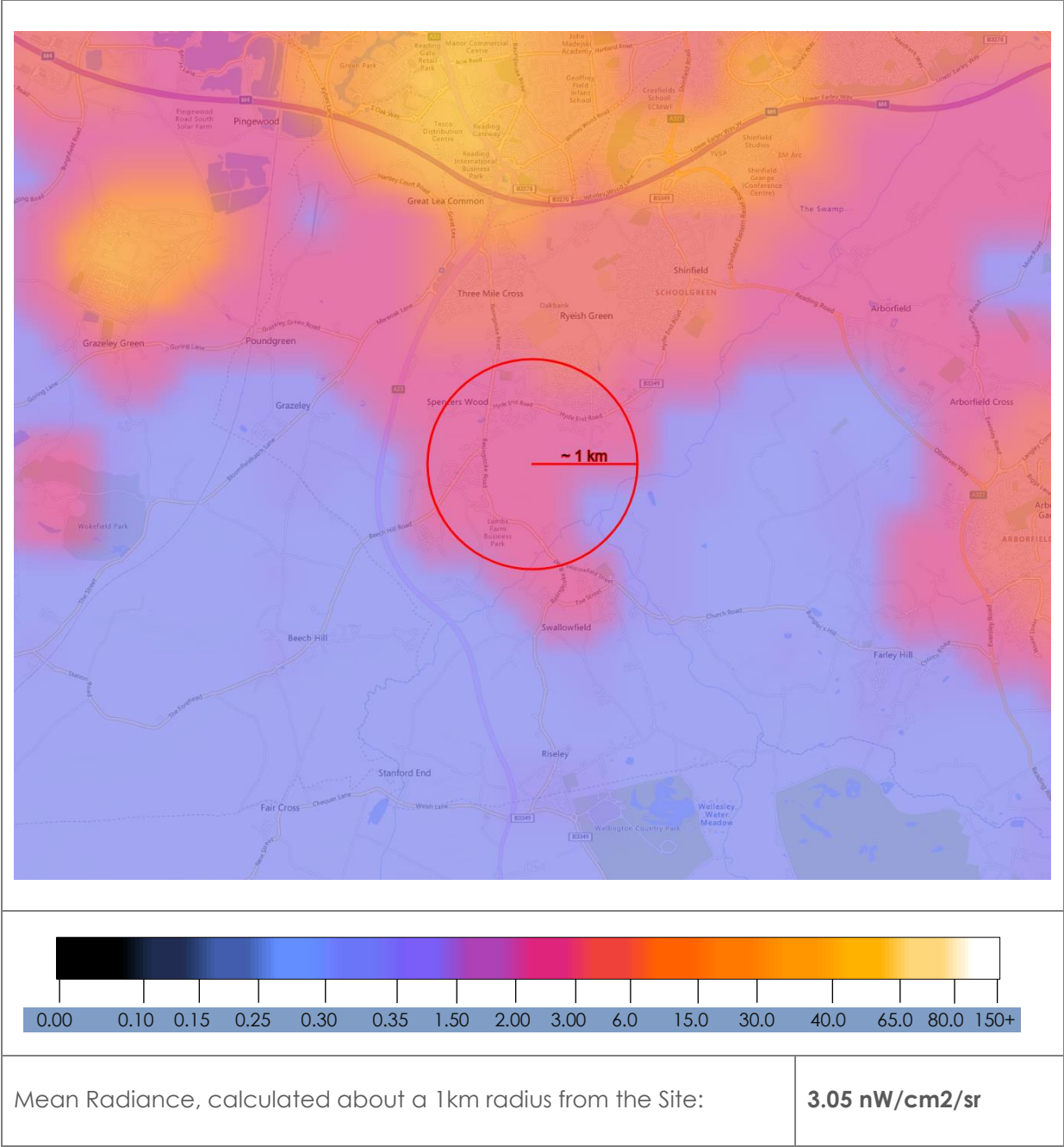
Introduction

- 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 is located to the east of Basingstoke Road (B3349), within the administrative area of (WBC) and currently comprises of arable / agricultural land with hedgerows, trees and shrub vegetation. The Site is located in a semi-rural area, bound to the north and north-east by residential dwellings, with Hyde End Road (B3349) located beyond to the north. To the east of the Site lies arable land, with a solar farm and the River Loddon located beyond. To the south and west of the Site lies Basingstoke Road (B3349) with existing commercial premises situated beyond to the south and existing dwellings to the west.
- 4.3 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

- 4.4 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**.
- 4.5 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. Local radiance (nW/cm2/sr)



Source: Visible Infrared Imaging Radiometer Suite (VIIRS) Imagery (2023)

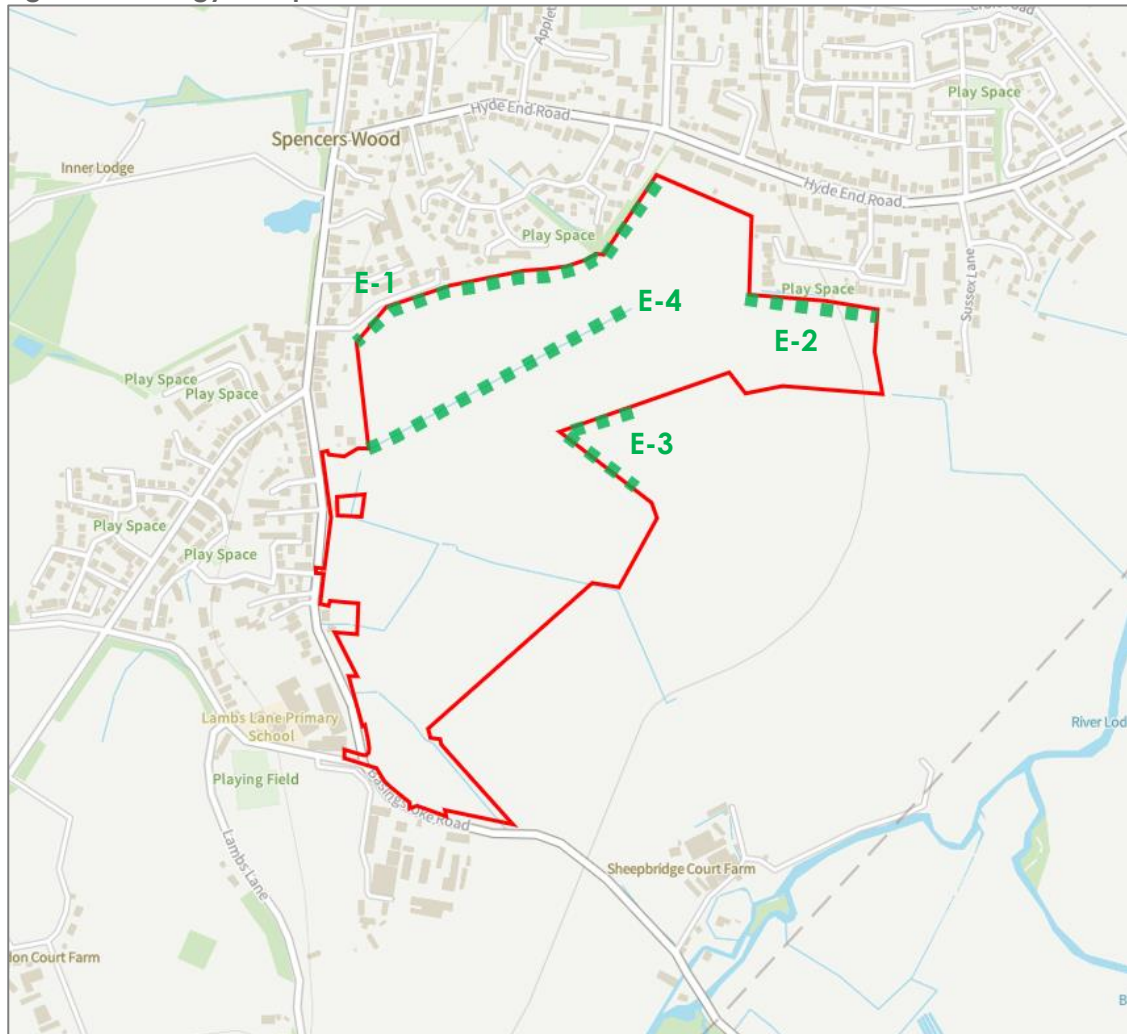
Environmental Zone

4.6 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 into **Environmental Zone E2**, defined as rural, low district brightness e.g. village or relatively dark outer suburban locations.

Ecology Receptors

- 4.7 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.
- 4.8 Potentially sensitive ecology receptors surrounding the site have been identified as illustrated in **Figure 3**. Mitigation measures are discussed later in the lighting strategy.

Figure 3. Ecology receptors

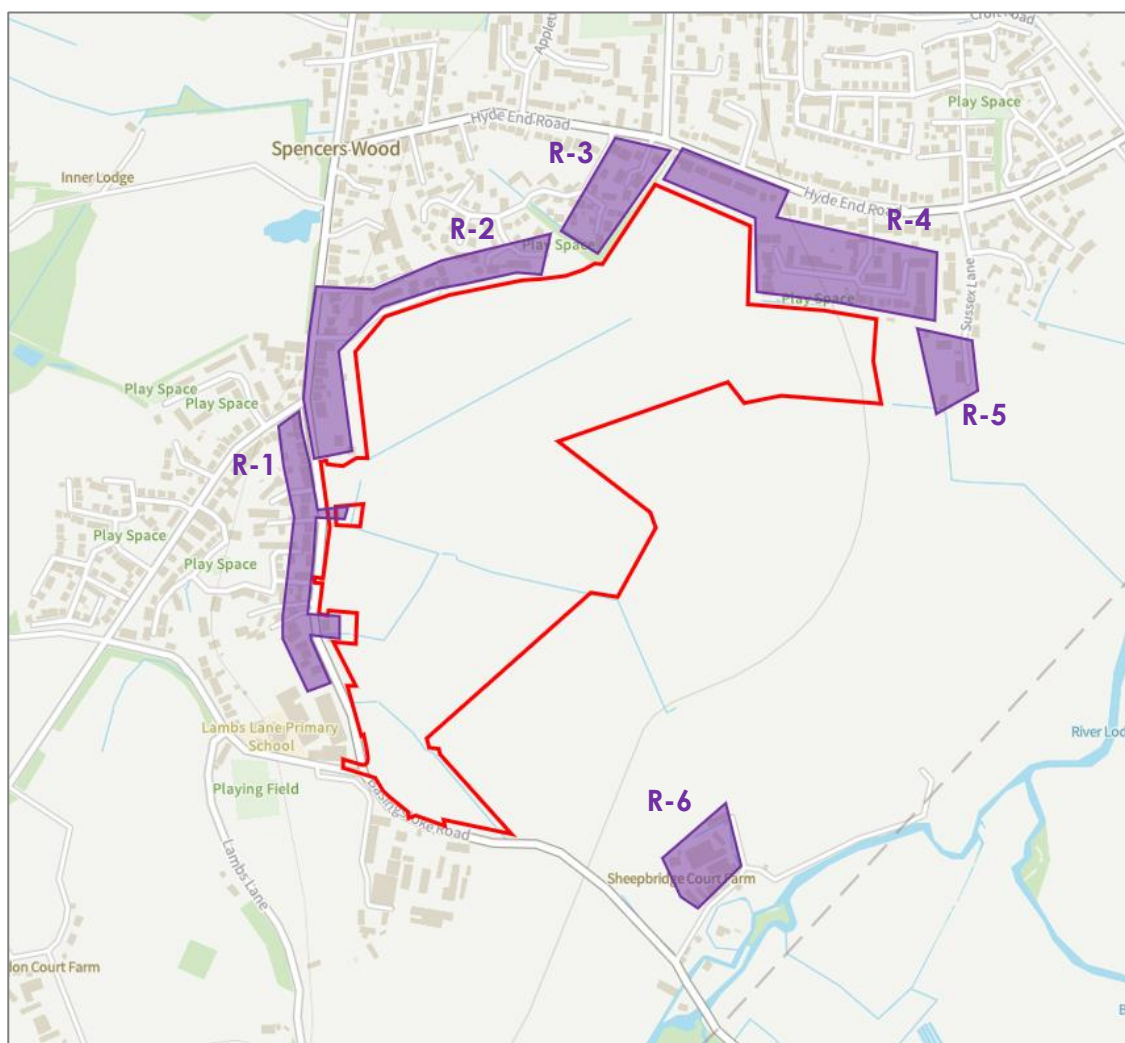


- **E-1** This northwest boundary feature is potentially valuable to local ecology and should be maintained as dark as practicable, identified as medium sensitivity.
- **E-2** This northeast boundary feature is potentially valuable to local ecology and should be maintained as dark as practicable, identified as medium sensitivity.
- **E-3** This eastern boundary feature is potentially valuable to local ecology and should be maintained as dark as practicable, identified as medium sensitivity.
- **E-4** this linear feature is proposed to be retained as a key ecology feature and should be maintained as dark as practicable, identified as high sensitivity.

Residential Receptors

- 4.9 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.
- 4.10 Residential properties with a direct view of the Site are considered potentially sensitive.
- 4.11 Potentially sensitive residential receptors surrounding the site have been identified as illustrated in **Figure 4**. Mitigation measures are discussed later in the lighting strategy.

Figure 4. Residential receptors



- **R-1** Dwellings situated to the west, off Basingstoke Road. These dwellings have largely unobstructed views of the Site. High sensitivity.
- **R-2** Dwellings situated to the north-west, off Basingstoke Road, Hunters Way and Blackwater Close. These dwellings have largely unobstructed views of the Site. High sensitivity.

- **R-3** Dwellings situated to the north, off Magill Close and Beckingham Place. These dwellings are partially screened from the site via mature trees however will have views of the Site. High sensitivity.
- **R-4** Dwellings situated to the northeast, off Century Drive and Hyde End Road. These dwellings have largely unobstructed views of the Site. High sensitivity.
- **R-5** Dwellings situated to the northeast, off Sussex Lane. These dwellings have largely unobstructed views of the Site. High sensitivity.
- **R-6** Sheepbridge Court Farm. This property is likely to experience views of the site. Medium sensitivity.

4.12 The limits for light intrusion (Illuminance in the vertical plane, in this case intrusion through windows) for Environmental Zone E1 are provided in **Table 9**.

Table 9. 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

4.13 The limits for source intensity (as viewed from nearby residential properties) for Environmental Zone E1 are provided in **Table 10**.

Table 10. Glare (source intensity) limits as viewed from residential properties

Light technical parameter	Application conditions	Luminaire group (projected area A _p in m ²)					
		0<A _p ≤0.002	0.002<A _p ≤0.01	0.01<A _p ≤0.03	0.03<A _p ≤0.13	0.13<A _p ≤0.50	A _p >0.5
Maximum luminous intensity emitted by luminaire (I in cd)	E0						
	Pre-curfew	0	0	0	0	0	0
	Post-curfew	0	0	0	0	0	0
	E1						
	Pre-curfew	0.29 d	0.3 d	1.3 d	2.5 d	5.1 d	2,500
	Post-curfew	0	0	0	0	0	0
	E2						
	Pre-curfew	0.57 d	1.3 d	2.5 d	5.0 d	10 d	7,500
	Post-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	500
	E3						
	Pre-curfew	0.86 d	1.9 d	3.8 d	7.5 d	15 d	10,000
	Post-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	1,000
	E4						
	Pre-curfew	1.4 d	3.1 d	6.3 d	13 d	26 d	25,000
	Post-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	2,500

- 4.14 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

- 4.15 The ILP GN01/21 guidance provides limitations for maximum allowable sky glow percentage for each Environmental Zone as shown in **Table 11**.
- 4.16 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**.

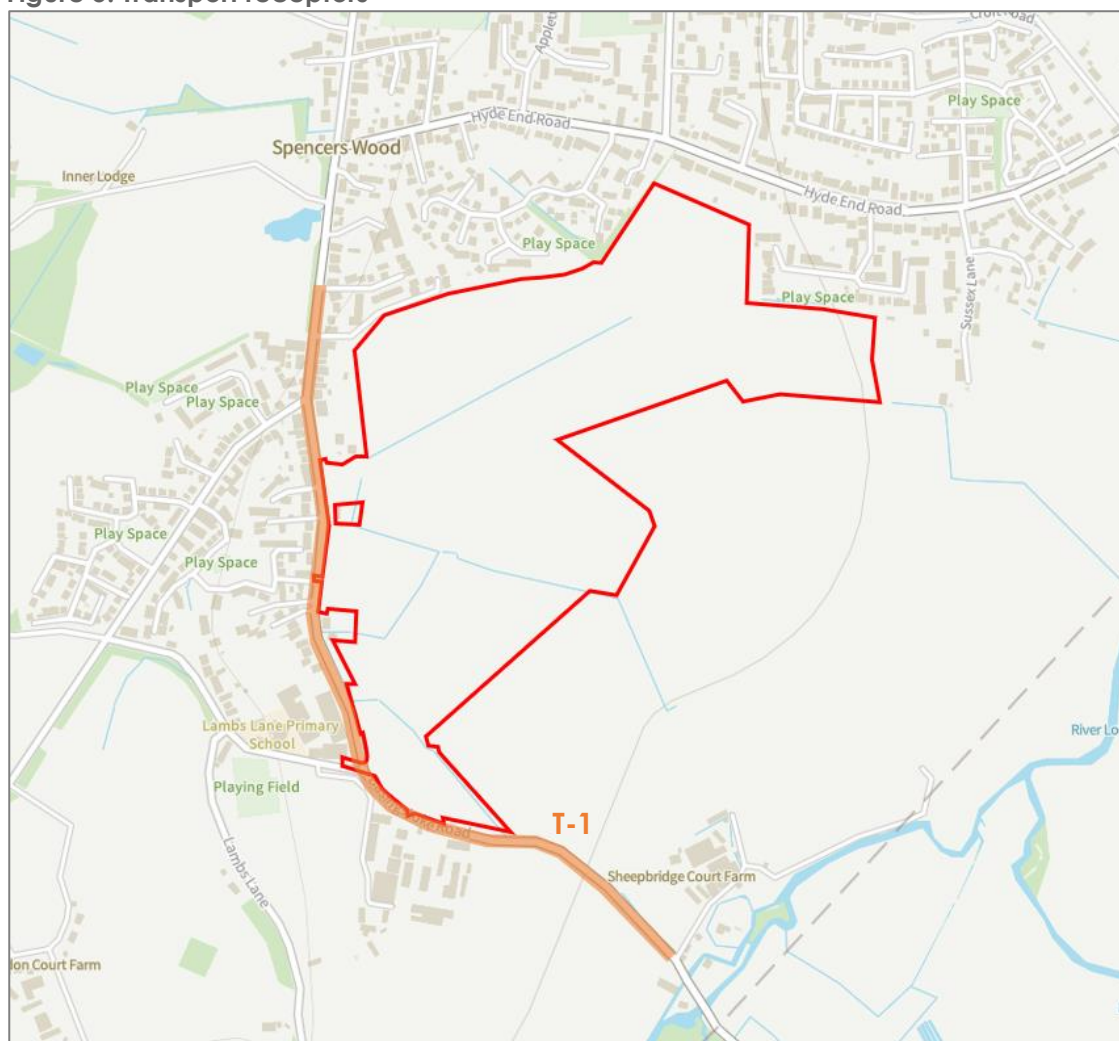
Table 11. Maximum values of upward light ratio (ULR) of luminaires

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

Transport Receptors

- 4.17 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.
- 4.18 Highways or railway lines within 500m of the site or with a direct view of the Site are considered potentially sensitive.
- 4.19 Potentially sensitive transport receptors surrounding the site have been identified as illustrated in **Figure 5**. Mitigation measures are discussed later in the lighting strategy.

Figure 5. Transport receptors



- **T-1** Basingstoke Road (Highway). High sensitivity.

Highway

- 4.20 The ILP GN01/21 guidance provides limitations for the maximum threshold increment (TI) and veiling luminance (LV) for each road classification type, as shown in **Table 12**.

Table 12. Obtrusive light limitations for exterior lighting installations – road users

Road Classification	Threshold Increment (Ti)	Veiling Luminance (Lv)
No road lighting	15% based on adaptation luminance of 0.1cd/m ²	0.04
ME6 / ME5	15% based on adaptation luminance of 1cd/m ²	0.25
ME4 / ME3	15% based on adaptation luminance of 2cd/m ²	0.40
ME2 / ME1	15% based on adaptation luminance of 5cd/m ²	0.84

Where Threshold Increment (TI) is a measure of the loss of visibility caused by the disability glare from the obtrusive light installation and Veiling Luminance (LV) is a measure of the adaptation luminance caused by the disability glare from the obtrusive light installation.

- Road Classifications – as given in BS EN 13201-2:2015 Road lighting performance requirements. Limits apply where users of transport systems are subject to a reduction in the ability to see essential information. Values given are for relevant positions and for viewing directions in the path of travel.

5. LIGHTING STRATEGY

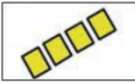
Introduction

- 5.1 This section sets out the design principles and overall outline strategy external lighting for the Site. The measures set out must be reflected in the final lighting design which shall be produced at the detailed design stage. The Lighting Strategy supports relevant policy and guidance.
- 5.2 A modern external lighting installation is vitally important to the Proposed Development for many reasons including, but not limited to, the following:
- To provide safety for pedestrians from moving vehicles;
 - To provide ease of wayfinding and navigation for staff and visitors;
 - To provide security and deter antisocial behaviour;
 - To set the architectural scene and urban landscape;
 - To enable sports and other activities to be undertaken safely during hours of darkness;
 - To control directional signage and their relationship with other illuminated material;
 - To protect installations from accidental or deliberate damage; and
 - To allow safe access and maintenance.
- 5.3 It is important that the lighting applications provide both an aesthetic quality and also the appropriate levels of illumination required for the space they inhabit.
- 5.4 This section focuses primarily on the operational phase lighting strategy. A sub-section specific to construction phase lighting strategy is included at the end of this section.
- 5.5 All external lighting shall be provided in accordance the relevant policies and guidance. It will be designed to minimise obtrusive light and optimise energy use. Lighting will comply with recommendations for Environmental Zone E2 given in the ILP GN01/21 guidance.

Figure 6. Extract from P23-2449_DE_001-2V Development Framework Plan



Primary Movement Routes



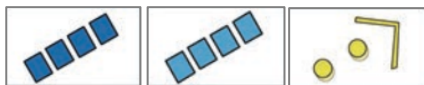
- 5.6 A modern LED type street lighting installation is required to promote safe navigation and to reduce fear of crime while minimising obtrusive light.
- 5.7 Street lighting shall be provided in accordance with BS EN 5489-1 and BS EN 13201-2, designed to achieve the performance requirements for a Class P Road as defined in **Table 5** and **6**. Based on a busy traffic flow in Environmental Zone E2 this is anticipated to be Lighting Class P4 generally, with elevated levels at junctions and conflict areas. Any lighting class is subject to a risk assessment and consultation with relevant stakeholders including Wokingham Borough Council.

Lighting Class P4: 5.0 lux average and 1.0 lux minimum

- 5.8 While the extent of proposed adoptable highway has not yet been established, it is recommended that street lighting equipment is provided by a manufacturer and product which is approved by Wokingham Borough Council for adoption. An example product is the Signify Luma gen2.

Specification	Description
Location	Street lighting
Correlated Colour Temperate (CCT)	2700K – 3000K
Mounting Height	6m - 8m
Light source	LED
Example Luminaire	Signify Luma gen2 (or equal and approved by Wokingham Borough Council)
Notes	Internal spill shield should be installed on luminaires adjacent the site boundary or ecology features
Example Luminaire Image	

Secondary Movement Routes, Tertiary Streets and Primary Cycle Routes



- 5.9 A modern LED type street lighting installation is required to promote safe navigation and to reduce fear of crime while minimising obtrusive light.
- 5.10 Street lighting shall be provided in accordance with BS EN 5489-1 and BS EN 13201-2, designed to achieve the performance requirements for a Class P Road as defined in **Table 5** and **6**.

Secondary Movement Routes and Tertiary Streets

- 5.11 Based on a quiet traffic flow in Environmental Zone E2 this is anticipated to be Lighting Class P5 generally, with elevated levels at junctions and conflict areas. Any lighting class is subject to a risk assessment and consultation with relevant stakeholders including Wokingham Borough Council.

Lighting Class P5: 3.0 lux average and 0.6 lux minimum

Primary Cycle Roads

- 5.12 Based on a medium traffic flow cycle route in Environmental Zone E2 this is anticipated to be Lighting Class P5. Any lighting class is subject to a risk assessment and consultation with relevant stakeholders including Wokingham Borough Council.

Lighting Class P5: 3.0 lux average and 0.6 lux minimum

- 5.13 While the extent of proposed adoptable highway has not yet been established, it is recommended that lighting equipment is provided by a manufacturer and product which is approved by Wokingham Borough Council for adoption. An example product is the Signify Luma gen2.

Specification	Description
Location	Street lighting, cycle route lighting
Correlated Colour Temperate (CCT)	2700K – 3000K
Mounting Height	3m - 6m
Light source	LED
Example Luminaire	Signify Luma gen2 (or equal and approved by Wokingham Borough Council)
Notes	Internal spill shield should be installed on luminaires adjacent the site boundary or ecology features

Specification	Description
Example Luminaire Image	

Sports Pitch



- 5.14 A sports pitch complete with a flood lighting installation is proposed as part of the proposed development.
- 5.15 The pitch is intended for predominantly community level football training and competition. The intention is not for televised lighting or Competition Class I as defined in **Table 7**.
- 5.16 A floodlighting installation is required to extend the hours of use especially during winter months during which when daylight is reduced to as little as 7 hours per day.
- 5.17 Sports lighting shall be provided in accordance with BS EN 12193 Table A.21 (outdoor football), designed to achieve the performance requirements of Competition Class III for training and the capability to achieve up to Class II for competitive match play. Competition Class II is consistent with guidance from the Football Association (FA) for competition up to Ground Grade B (Step 2).
- 5.18 A high-quality LED flood lighting installation shall be provided with strict optical control, designed to ensure light is restricted to the playing area as much as practicable, preventing excessive light spill and glare.
- 5.19 Shielding shall be employed to control spill and tilt angles shall not be applied to ensure there is no significant contribution to upward light or sky glow.



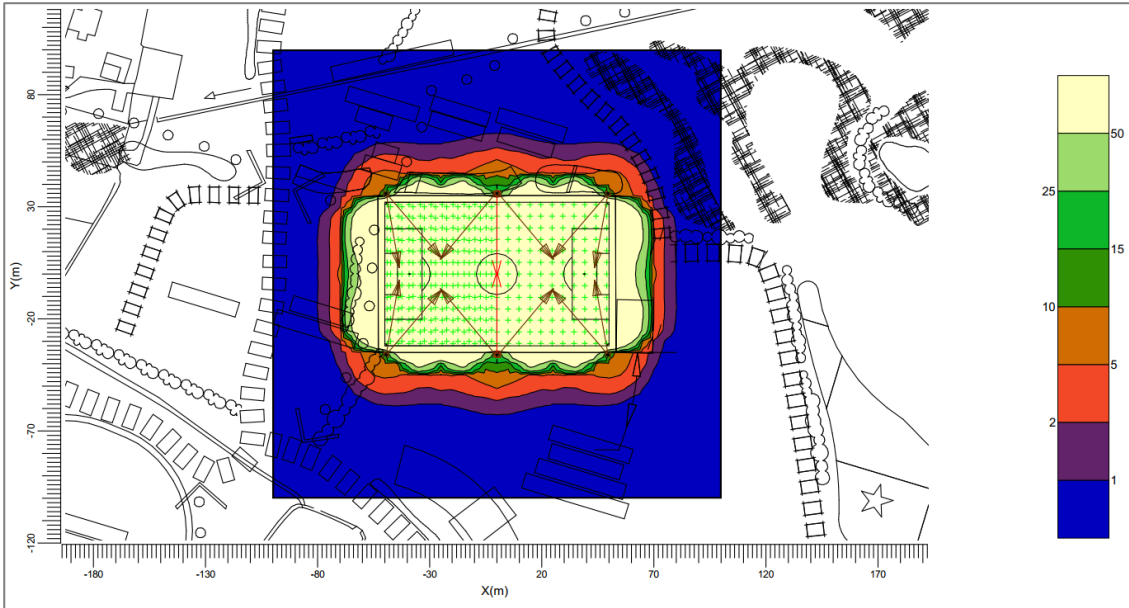
Low quality flood lighting



High quality flood lighting

- 5.20 An indicative flood lighting design has been prepared to illustrate how light will attenuate from 200 lux (average) at the main playing area down to <1 lux at the surroundings areas. This represents the maximum anticipated lighting output which is Competition Class II.
- 5.21 The proposed lighting equipment is from a high-quality manufacturer which offers class-leading optical control, low glare and high overall efficiency.
- 5.22 Column heights shall be 15m, designed to minimise impact on the daytime setting.
- 5.23 This designed has been prepared in collaboration with the appointed Ecologist. The ecologist has reviewed and subsequently approved the design. The indicative lux plot is included in **Figure 7**.

Figure 7. Indicative flood lighting lux plot



Lighting Controls

5.24 It is recommended that a lighting controls installation is employed to ensure the flood lighting is in operation only when needed, and lighting provided to achieve an appropriate level depending on the application.

Competitive match play mode

Table A.21 Football (Class II): 200 lux average and 0.60 uniformity

FA Guide to Floodlighting (Grade B): 180 lux average and 0.25 diversity

Training mode

Table A.21 Football (Class III): 75 lux average and 0.50 uniformity

Amenity mode

The flood light installation shall include an amenity mode which shall be used during set up / pack down. The amenity lighting mode shall be automatically applied at the curfew time, dimming the lighting to signal the end of play and allowing safe egress from the area.

Amenity mode: 20 lux average

Specification	Description
Location	Sports pitch
Correlated Colour Temperate (CCT)	3000K
Mounting Height	15m
Light source	LED
Example Luminaire	Signify Optivision Gen 3.5 LED
Notes	Flood lights to be equipped with integrated LO (maximum cut off) louvres
Example Luminaire Image	

Commercial Land, Local Centre, GP surgery, School



- 5.25 Site access, car parks, building perimeters and service yards shall be provided with a modern LED type lighting installation to promote safe navigation and to reduce fear of crime while minimising obtrusive light.
- 5.26 Lighting shall be provided in accordance with BS EN 12464-2 designed to achieve the performance requirements set out below.

Pedestrian walkways Table 5.1.1: 5 lux average and 0.25 uniformity

Traffic areas (max. 10km/h) Table 5.1.2: 10 lux average and 0.40 uniformity

Traffic areas (max. 40km/h) Table 5.1.3: 20 lux average and 0.40 uniformity

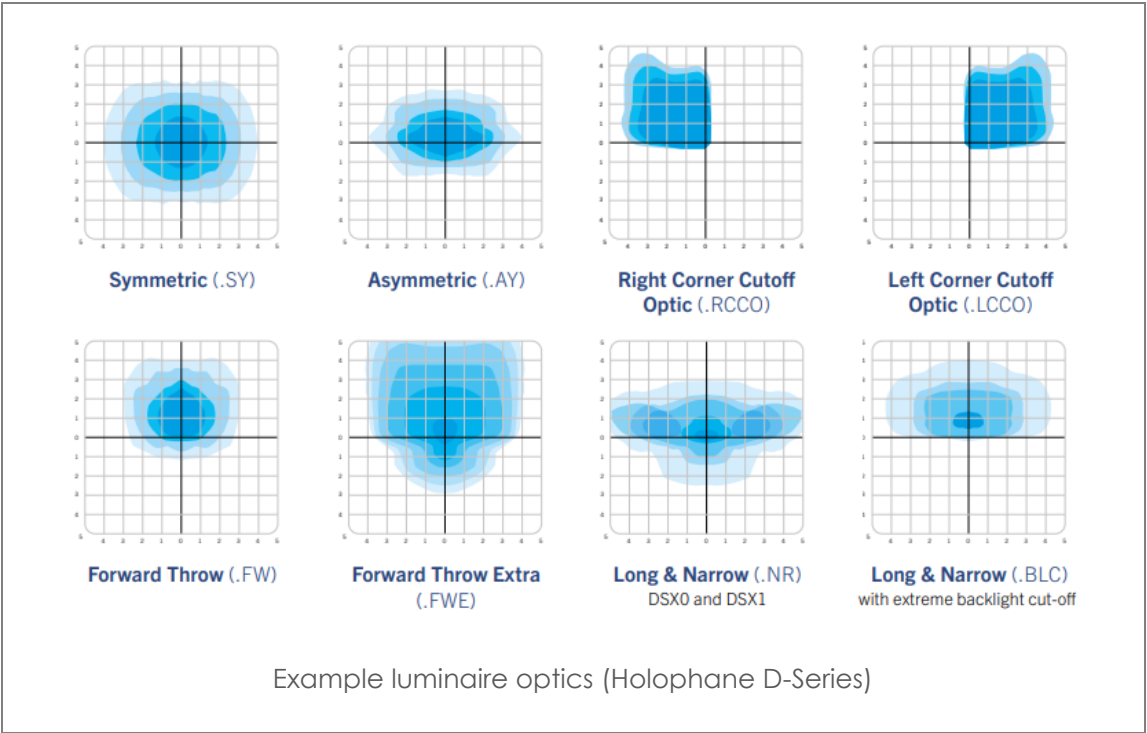
Vehicle turning, loading and unloading Table 5.1.4: 50 lux average and 0.40 uniformity

Car parks (light traffic) Table 5.9.1: 5 lux average and 0.25 uniformity

Car parks (medium traffic) Table 5.9.2: 10 lux average and 0.25 uniformity

Car parks (heavy traffic) Table 5.9.3: 20 lux average and 0.25 uniformity

- 5.27 Lighting shall be provided from a high-quality manufacturer which offers a wide range of optics to provide light where needed while minimising off site light spill.



- 5.28 Area lighting shall be provided to areas such as car parks and service yards shall be illuminated via column mounted installations with mounting heights anticipated to range 5m – 8m depending on area size. The minimum practicable column height shall be selected at maximum spacing, ensuring all luminaires are installed with zero tilt angle applied.
- 5.29 Shielding shall be introduced to any luminaires proposed adjacent a site boundary or any areas identified by the Ecologist as sensitive.



Luminaires without back shield

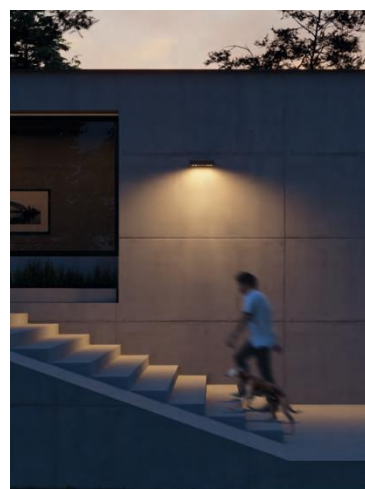


Luminaires with internal back shield

- 5.30 Building perimeters shall be illuminated via low glare directional wall lighting mounted at circa 2m – 4m to suit the architecture of the building.



Poor high glare wall light



Well-designed directional wall light

Specification	Description
Location	Area lighting
Correlated Colour Temperate (CCT)	3000K
Mounting Height	5m – 8m
Light source	LED
Example Luminaire	Holophane D-Series
Notes	Internal spill shield should be installed on luminaires adjacent the site boundary or ecology features
Example Luminaire Image	

Specification	Description
Location	Building perimeters
Correlated Colour Temperate (CCT)	3000K
Mounting Height	2m – 4m
Light source	LED
Example Luminaire	Kingfisher Semita Urban
Notes	Appropriate optics / beam angles shall be adopted depending on the required light coverage
Example Luminaire Image	

Lighting Controls

- 5.31 Lighting controls systems help to reduce energy consumption and ensure efficient operation of the lighting installation.

Astronomical Timeclock

- 5.32 The astronomical timeclock or switch is an automatic time-switch control that controls lighting based on the time of day and astronomical events such as sunset and sunrise, accounting for geographic location and calendar date.
- 5.33 Timers with both astronomic and Daylight-Saving Time (DST) functionality automatically adjust to the seasonal day-to-night-time changes throughout the year. An electronic timer with astronomic functionality determines each day's sunrise and sunset times based on geographic location, while the automatic DST functionality resets the clock by one hour in the spring and fall.
- 5.34 It is recommended that all external lighting at the Site is controlled via an astronomical time clock as a minimum standard.

Dimming

- 5.35 Subject to a risk assessment and consultation between all relevant stakeholders, dimming should be considered as a means to reduce energy consumption and overall lighting impact.

Part night dimming

- 5.36 In some areas on the Site it may be appropriate to apply a part-night dimming profile. This would involve reducing the luminaire output at set times to achieve reduced average illuminance across the intended area. For example, a car park may see reduced levels of traffic during post-curfew hours and could therefore be reclassified according to BS EN 12464-2 Lighting of outdoor work places.

Car parks (light traffic) Table 5.9.1: 5 lux average

Car parks (medium traffic) Table 5.9.2: 10 lux average

Car parks (heavy traffic) Table 5.9.3: 20 lux average

Dynamic dimming

- 5.37 In some areas on the site, it may be appropriate to apply dynamic dimming during post-curfew hours. This would involve reduced (or no) illuminance at an area of the site, until motion is detected, at which point illuminance rises to the design levels for a set duration before returning to its dormant state.

Manual Controls

- 5.38 The sports pitch should be provided with a manual controls system as described above, capable of providing a range of illuminance levels depending on the requirements at any given time.

Proposed Mitigation

- 5.39 **Optimising column heights:** Column heights shall be carefully considered at the time of design. The minimum practicable column height shall be selected at maximum spacing, ensuring all luminaires are installed with zero tilt angle applied. Lower column heights shall be used where practicable. With the exception of the sports pitch, high mast lighting shall be avoided.
- 5.40 **Avoiding over lighting:** All illumination levels will be set as low as practicable while complying with safety and security recommendations. Lighting designs shall be produced to a tight tolerance of the minimum requirements as set out above for each particular task or area.
- 5.41 **Spill control:** At the outer edges of the Site luminaires shall, as far as practicable, be positioned so that they are out of view of sensitive receptors. Luminaires at the outer edges of the Site shall be complete with back light shields, internal shields or optics with sharp cut-off to minimise impact on sensitive receptors.
- 5.42 **Latest generation optics:** Luminaires must utilise optimum optical distribution to direct exactly where needed while allowing maximum spacing between luminaries and minimise the required number of columns.
- 5.43 **No direct upward light:** Luminaires shall be of the directional type that emit all their light below the horizontal plane. Direct upward light shall be removed by ensure all luminaires are installed at zero tilt.
- 5.44 **Lighting controls:** A lighting controls strategy shall be implemented to ensure light is only provided when required.
- 5.45 **Colour temperature:** Colour temperature shall be considered in collaboration with a qualified Ecologist especially in areas close to biodiversity sensitive areas.

Climate Change

- 5.46 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.

- 5.47 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.
- 5.48 A lighting controls strategy shall be implemented to ensure light is only provided when required.

Construction Phase Lighting

- 5.49 While construction phase lighting is expected to be short term and reversible it is important to define the parameters to minimise light pollution.
- 5.50 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 permitter 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 A modern external lighting installation is vitally important to the Proposed Development for many reasons including, but not limited to, the following:
- To provide safety for pedestrians from moving vehicles;
 - To provide ease of wayfinding and navigation for staff and visitors;
 - To provide security and deter antisocial behaviour;
 - To set the architectural scene and urban landscape;
 - To enable sports and other activities to be undertaken safely during hours of darkness;
 - To control directional signage and their relationship with other illuminated material;
 - To protect installations from accidental or deliberate damage; and
 - To allow safe access and maintenance.
- 6.2 The Lighting Strategy supports relevant policy and guidance including from the Wokingham Borough Council Local Plan Update (2023-2040).
- 6.3 Through careful practise detailed lighting designs could be produced that minimises light pollution and complies all relevant policy and guidance as identified in this report while meeting the defined performance requirements.
- 6.4 The following key principles shall be carried forward into the next design stages:
- Ensuring that all areas within the development are lit adequately to the relevant policy and guidance, depending on the purpose, intended usage and to ensure safety;
 - Aspire to meet relevant standards and local authority requirements, and where possible to emphasise the developments key spaces and views;
 - Minimise crime and promote safety throughout the development; and
 - Minimise adverse lighting impact on local ecology, residents, transport systems, and the nighttime sky.
 - Consideration of lighting controls to further reduce energy consumption and overall lighting impact.
 - Consider views from the surrounding countryside and avoid a line of lights, defining the edge of the settlement.
- 6.5 This report should be reviewed by all relevant parties prior to the production of a detailed lighting design. The designer should use the final version of this report to form the basis of their lighting design.
- 6.6 The lighting designer should work in collaboration with all relevant parties, including the local authority and a qualified Ecologist, to produce a lighting design that satisfies all requirements.

6.7 The detailed lighting design shall be produced using industry standard lighting calculation software. The design shall include:

- A lux plot that indicates light spill outside of the site boundary;
- Calculations to demonstrate compliance with Environmental Zone E2;
- Horizontal and vertical calculations at local ecology receptors;
- A calculation of average maintained illuminance and illuminance uniformity at each type of area, task or activity across the site;
- Specific details of the position and type of lighting units including tilt angle, if any; and,
- A lighting control strategy.

APPENDICES

APPENDIX 1: Development Framework Plan



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KEY

	SITE BOUNDARY		PRIMARY AVENUE		KEY FOOTPATHS		AREAS OF PLAY
	RESIDENTIAL DEVELOPMENT		INDUSTRIAL ROAD		SANG WALKING ROUTE		SUSTAINABLE DRAINAGE
	SCHOOL SITE		SECONDARY STREETS		EXISTING VEGETATION		PARKING
	LOCAL CENTRE		TERTIARY STREETS		PROPOSED PLANTING		POTENTIAL HIGHWAYS UPGRADES
	EMPLOYMENT USES		PRIVATE LANES		NEW TREE PLANTING		MEETING POINTS
	SANG BOUNDARY		SHARED SURFACE STREET/MEWS		COMMUNITY ORCHARD		POTENTIAL CONNECTIONS TO EXISTING MOVEMENT ROUTES
	GP SURGERY		PROPOSED EMERGENCY		PUBLIC OPEN SPACE		
	CARE HOME FACILITY		EXISTING PUBLIC RIGHTS OF WAY		MULTI-FUNCTIONAL OPEN SPACE AND PAVILION		
	ACCESS VIA BASINGSTOKE ROAD		ACTIVE TRAVEL ROUTES		EXOLLUM PIPELINE		

KEY PRINCIPLES

1. PRIMARY ACCESS VIA BASINGSTOKE ROAD;
2. PRIMARY AVENUE THROUGH DEVELOPMENT;
3. SECONDARY STREETS;
4. TERTIARY STREETS;
5. FULLY CIRCULATORY CYCLE/ PEDESTRIAN ROUTES PROVIDING ACCESS TO ALL AREAS OF PUBLIC OPEN SPACE AND SURROUNDING INFRASTRUCTURE;
6. NEWLY CREATED SANG (GROVELAND COUNTRY PARK) PROVIDING A 2.3KM FULLY CIRCULATORY PEDESTRIAN ROUTE;
7. LANDSCAPED COMMONS AND GREENS PROVIDING RECREATIONAL SPACE FOR ALL AGES;
8. COMMUNITY SPACES IN THE FORM OF MULTI-FUNCTIONAL OPEN SPACES AND A COMMUNITY ORCHARD;
9. LANDSCAPED GREENWAYS PROVIDING PUNCTUATION THROUGH DEVELOPMENT AND AREAS FOR ADDITIONAL PLANTING;
10. MAXIMUM RETENTION OF EXISTING VEGETATION;
11. POTENTIAL CYCLE/ PEDESTRIAN CONNECTIONS TO EXISTING MOVEMENT ROUTES;
12. POTENTIAL HIGHWAYS IMPROVEMENT TO EXISTING HIGHWAYS TO FACILITATE CYCLE AND PEDESTRIAN MOVEMENT;
13. SITE LOW POINTS UTILISED FOR SUSTAINABLE DRAINAGE;
14. NATURALISED WILDLIFE PONDS (FALLING WITHIN SANG BOUNDARY);
15. MAXIMUM OUTWARD FACING DEVELOPMENT FOR NATURAL SURVEILLANCE;
16. VIEWING CORRIDORS PROVIDING OPPORTUNITY TO ENJOY FAR-REACHING VIEWS OVER RIVER LODDON AND LOCAL COUNTRYSIDE;

APPENDIX 2: Indicative Sports Pitch Design

Spencers Wood, Swallowfield

Sports Pitch

Date: 05-11-2024

Designer: Andy Poplett

Description:

The nominal values shown in this report are the result of precision calculations, based upon precisely positioned luminaires in a fixed relationship to each other and to the area under examination. In practice the values may vary due to tolerances on luminaires, luminaire positioning, reflection properties and electrical supply.

Signify

Unit 3

Guildford Business Park

Guildford

Surrey

GU2 8XG

Mobile Phone: 0044 7810 832266

E-Mail: andrew.poplett@signify.com

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1. Project Description

1.1 Description

Maintenance Factor - 0.90

Pitch 100m x 64m (Fenced Area 106m x 70m)

The design has been completed using the Philips Asymmetric OptiVision LED GEN 3.5 3000k Floodlights. A total of 14 no have been used to achieve an average of 200lux.

Floodlights are mounted on 6 x 15 metre columns

All Floodlights fitted with integral LO (maximum cut off) louvres to reduce spill and glare.

1.2 3-D Project Overview



1.3 Top Project Overview



Scale
1:1500

2. Summary

2.1 Obstacle Information

Obstacle	Transparency (%)	Position		
		X (m)	Y (m)	Z (m)
End Cols	0	-49.50	-36.00	0.00
		49.50	-36.00	0.00
		-49.50	36.00	0.00
		49.50	36.00	0.00
End Cols1	0	0.00	-36.00	0.00
		0.00	36.00	0.00

2.2 Project Luminaires

Code	Qty	Luminaire Type	Lamp Type	Power (W)	Flux (lm)
N	12	BVP528 OUT T35 A55-NB LO	1 * LED2470-4S/730	1498.6	1 * 247000
O	2	BVP528 OUT T35 A55-NMB LO	1 * LED2470-4S/730	1498.6	1 * 247000

The total installed power: 20.98 (kWatt)

Number of Luminaires Per Switching Mode:

Switching Mode	Luminaire Code		Power (kWatt)
	N	O	
Main Pitch	12	2	20.98
All ON	12	2	20.98

Number of Luminaires Per Arrangement:

Arrangement	Luminaire Code		Power (kWatt)
	N	O	
Centre 1	4	0	5.99
Centre 6	0	2	3.00
Corner 1	8	0	11.99

2.3 Calculation Results

Switching Modes:

Code	Switching Mode	Maintenance factor
1	Main Pitch	0.90
2	ALL ON	1.00

(Il)luminance Calculations:

Calculation	Switching Mode	Type	Unit	Ave Min/AveMin/Max		
Football	1	Surface Illuminance	lux	208	0.68	0.35
Spillage	2	Surface Illuminance	lux	46.3	0.00	0.00

Obtrusive Light Calculations:

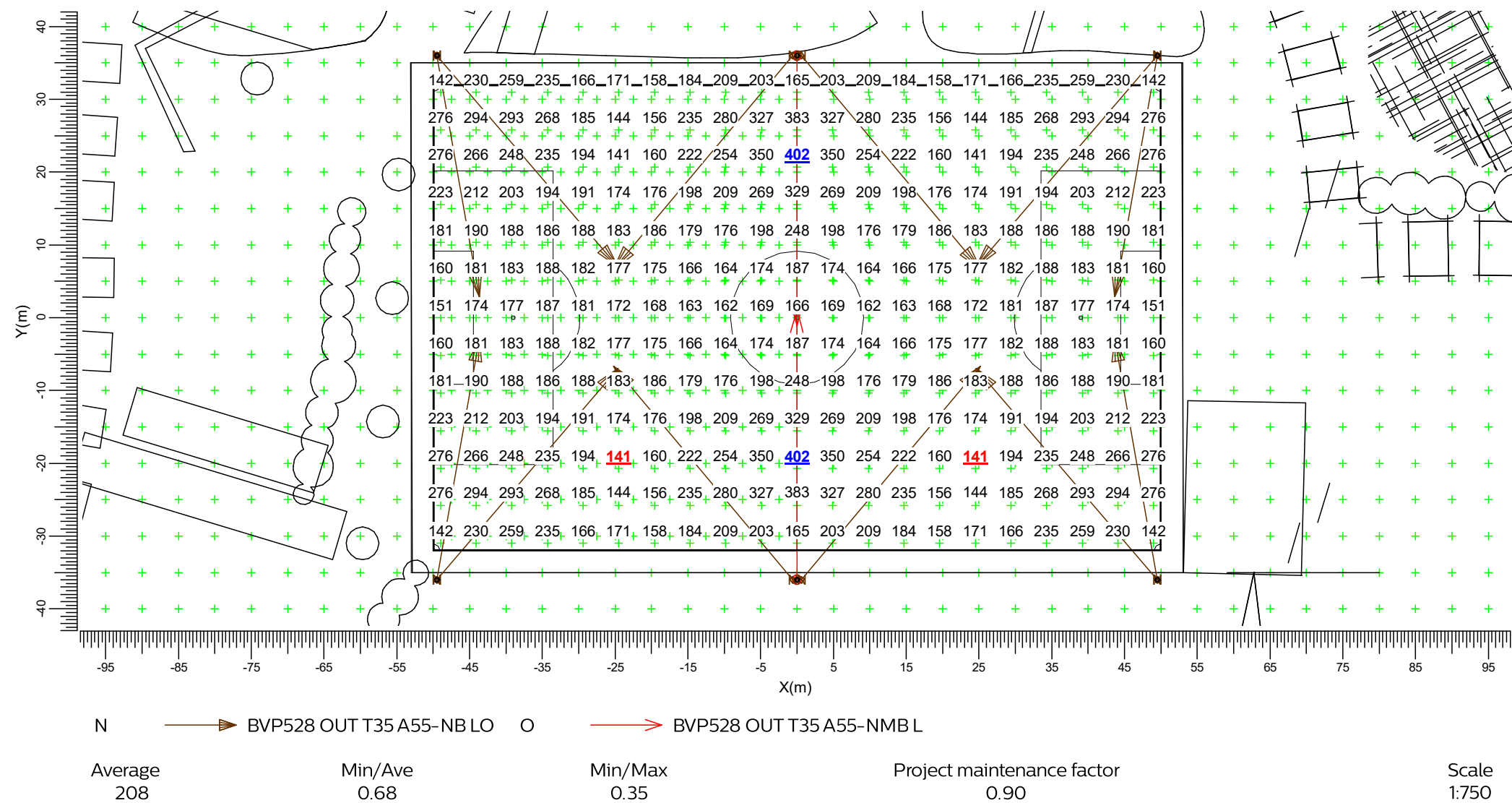
Switching Mode	ULR
1	0.00
2	0.00

3. Calculation Results

3.1 Football: Graphical Table

Main Pitch

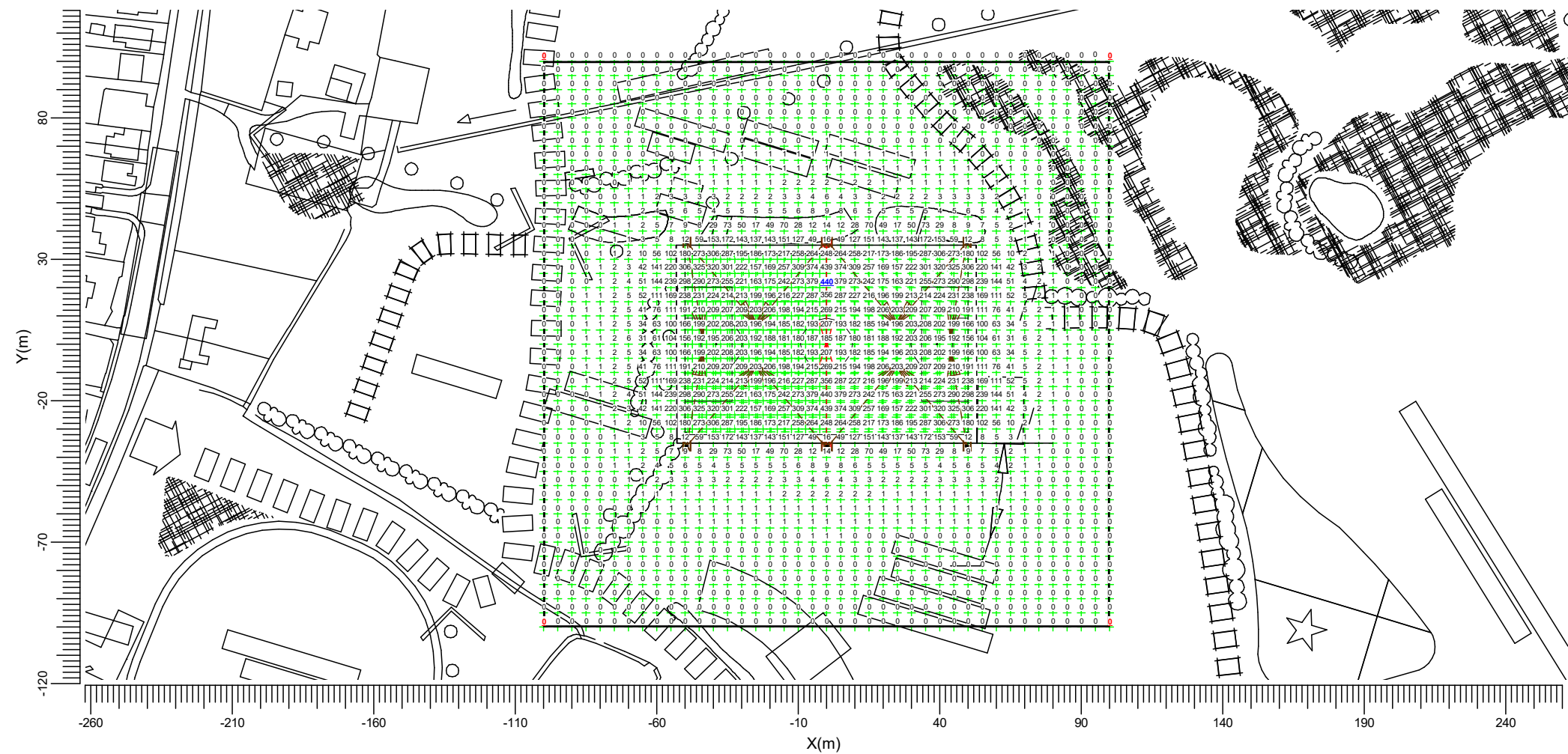
Grid : Football at Z = -0.00 m
Calculation : Surface Illuminance (lux)



3.2 Spillage: Graphical Table

All ON

Grid : Spillage at Z = -0.00 m
Calculation : Surface Illuminance (lux)



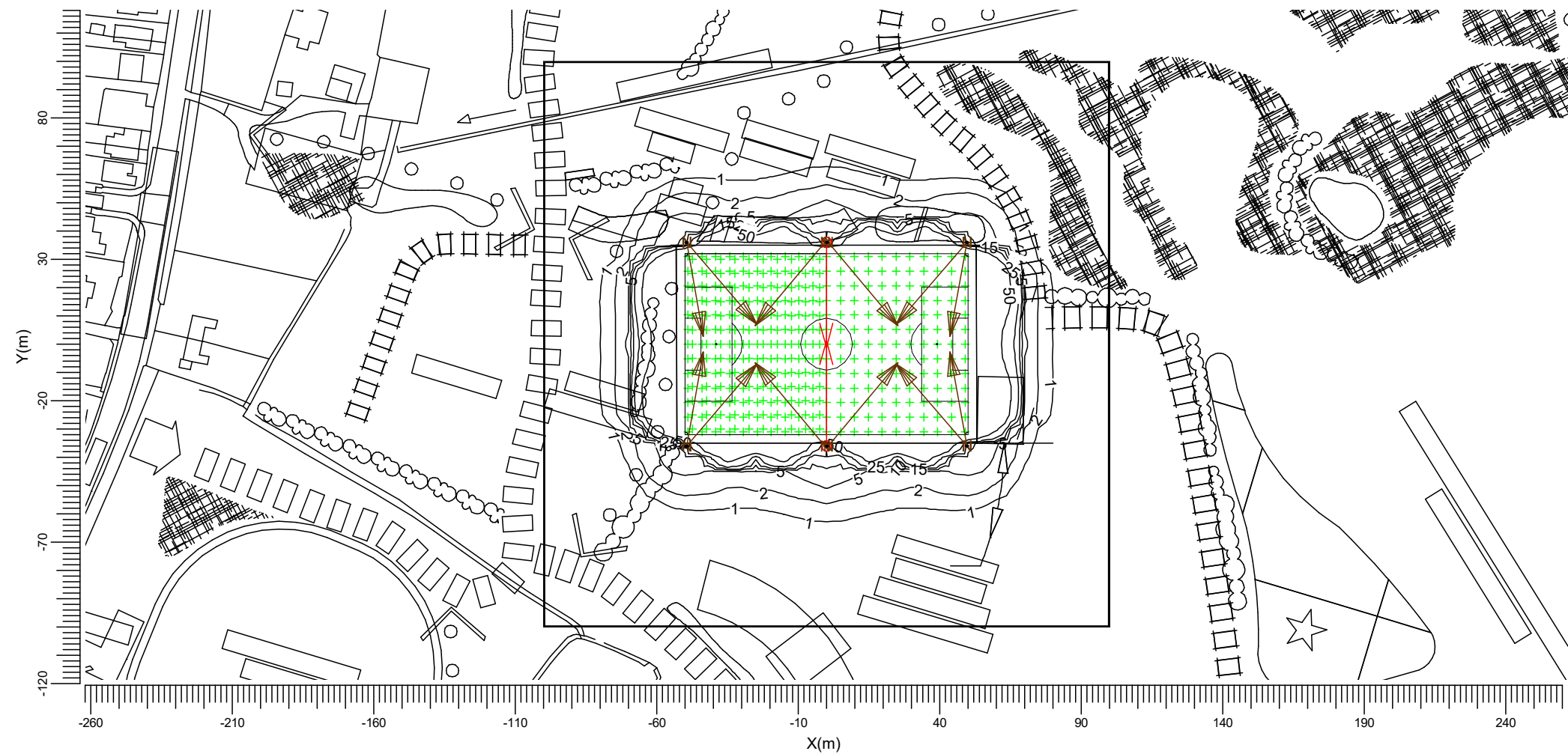
N BVP528 OUT T35 A55-NB LO O BVP528 OUT T35 A55-NMB L

Average 46.3 Min/Ave 0.00 Min/Max 0.00 Project maintenance factor 1.00 Scale 1:2000

3.3 Spillage: Iso Contour

ALL ON

Grid : Spillage at Z = -0.00 m
Calculation : Surface Illuminance (lux)



N BVP528 OUT T35 A55-NB LO BVP528 OUT T35 A55-NMB L

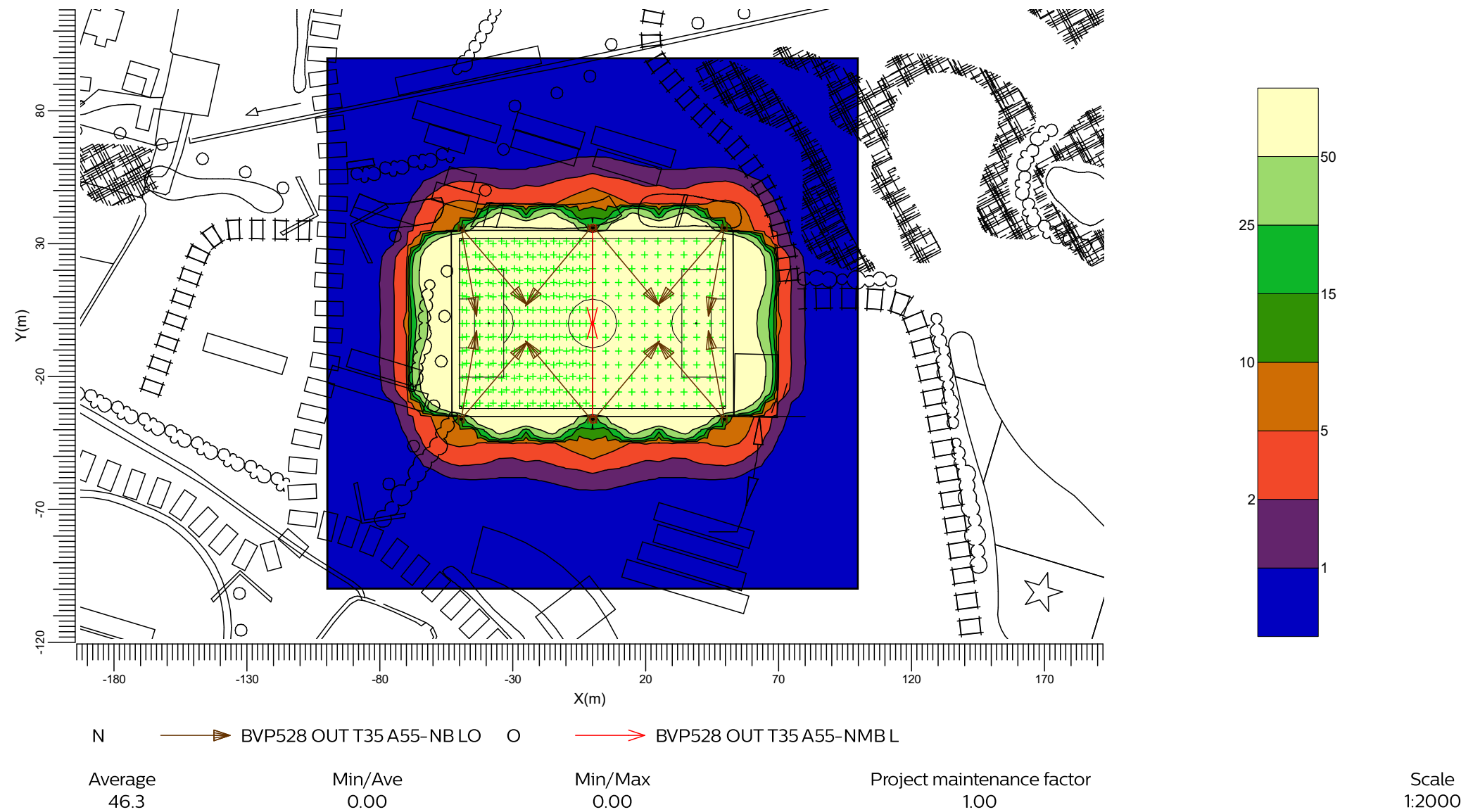
Average 46.3	Min/Ave 0.00	Min/Max 0.00	Project maintenance factor 1.00	Scale 1:2000
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3.4 Spillage: Filled Iso Contour

All ON

Grid : Spillage at Z = -0.00 m

Calculation : Surface Illuminance (lux)



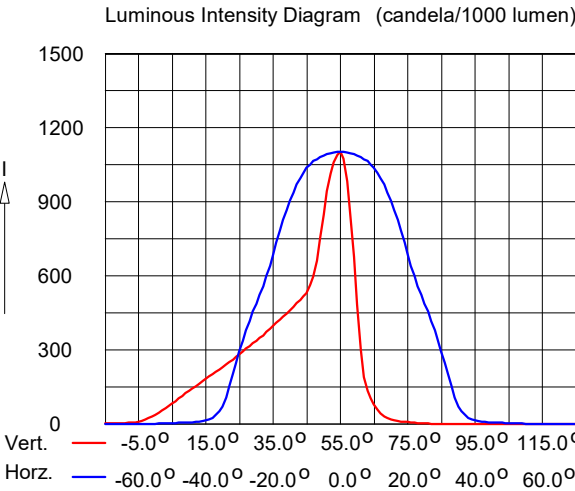
4. Luminaire Details

4.1 Project Luminaires

OptiVision LED gen3.5 2022
BVP528 OUT T35 1xLED2470-4S/730/730 E3/D4I A55-NB LO

Light output ratios	
DLOR	: 0.56
ULOR	: 0.00
TLOR	: 0.56
Ballast	: E3/D4I
Lamp flux	: 247000 lm
Luminaire wattage	: 1498.6 W
Measurement code	: LVM20482U1

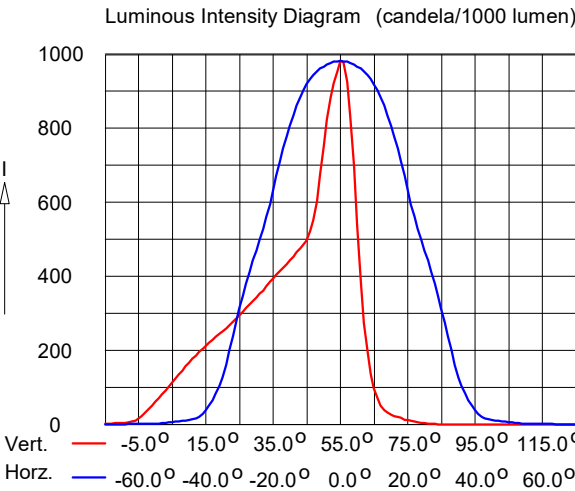
Note: Luminaire data not from database.



OptiVision LED gen3.5 2022
BVP528 OUT T35 1xLED2470-4S/730/730 E3/D4I A55-NMB LO

Light output ratios	
DLOR	: 0.56
ULOR	: 0.00
TLOR	: 0.56
Ballast	: E3/D4I
Lamp flux	: 247000 lm
Luminaire wattage	: 1498.6 W
Measurement code	: LVM2I482U1

Note: Luminaire data not from database.



APPENDIX 3: Manufacturer's Literature



Luma gen2 – The standard in road lighting, redefined

Luma gen2

Luma gen2 is the next generation of the Luma LED luminaire family, fully optimised to become your long-term lighting and innovation partner. While keeping the distinctive design characteristics of the first generation, Luma gen2 gives you the benefits of the latest technologies thanks to its future-proof System Ready architecture, use of optimised Ledgine LED and optical platform ensuring best-in-class lighting performance in a broad range of applications. It also offers improved serviceability. Installation has also become easier and faster, and thanks to the Service tag, you have access to all relevant documentations onsite. Also, the cable feed-through has been redesigned and access to the gear components is easy thanks to top down tool-less access. Luma gen2 also offers all connectivity and dimming options available today and thanks to being System Ready, it can also be paired with lighting management systems such as Interact City or existing and upcoming sensor innovations. The Luma gen2 has been developed to optimise and simplify spare part repair and maintenance work using a new plug-and-play GearFlex module containing all electrical components in an easy to handle and accessible box inside the housing. As a company conscious about the impact of light on the environment and biodiversity, we also equipped the Luma gen2 with dedicated light recipes that help with maintaining the optimal ecosystems for bats or preserve a dark night sky.

Benefits

- Ease of maintenance and spare part repair enabled through the dedicated GearFlex module
- Best-in-class efficiency and light performance in a broad range of applications
- Future-ready thanks to the SR (System Ready) socket
- The luminaire is also equipped with dedicated light recipes that help with: 1) maintaining the optimal ecosystems for bats 2) preserve a dark night sky and reduce light pollution
- Equipped with a service tag, a QR-based identification system that makes each luminaire uniquely identifiable and provides maintenance, installation and spare part information

Features

- Dedicated GearFlex module enabling faster, safer and tool-less maintenance
- New cable feed-through for easy installation
- Ready to be connected to the Interact City lighting management software
- Ready to be paired with third-party lighting management systems and sensors
- Tilt now with 2-5-degree precision
- Efficacy up to 155 lm/W
- Choice of 40+ different beams and the option of different internal louvres
- Further optimisation on performance flux level enabled by the Philips L-Tune
- Surge protection up to 10 kV
- Wide range of lumen packages, ranging from 1,000 to 55,000 lm

Application

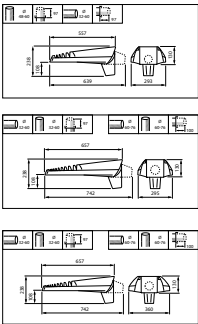
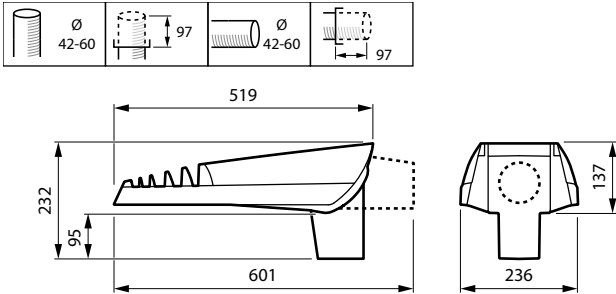
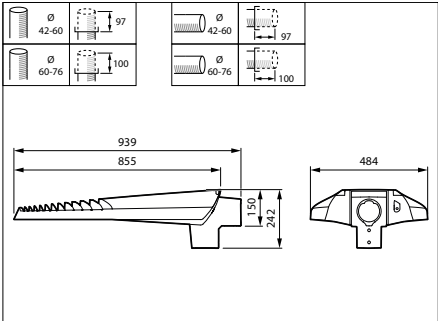
- Motorways, inter-urban main roads, boulevards and avenues, roundabouts, pedestrian crossings
- Residential streets, side streets, squares, parks, cycle and pedestrian paths, playgrounds
- Parking areas, industrial areas, petrol stations, rail yards, airports, harbours, waterways

Versions



BGP705 Luma gen2 Large back

Dimensional drawing



Product details

BGP701 Luma gen2 Nano FG DPP



BGP701 Luma gen2 Nano Open2 DPP



BGP705 Luma gen2 Large FG DPP



BGP705 Luma gen2 Large Open1 DPP



General Information	
CE mark	Yes
Driver included	Yes
Flammability mark	-
Light source replaceable	Yes
Number of gear units	Unit
Light Technical	
Optical cover type	Glass
Standard tilt angle side entry	-
Standard tilt angle post-top	0°
Upwards light output ratio	0
Mechanical and Housing	
Housing Colour	Grey
Approval and Application	
Ingress protection code	IP66
Surge Protection (Common/ Differential)	Luminaire surge protection level up to 6 kV differential mode and 8 kV common mode
Application Conditions	
Maximum dim level	Not applicable

General Information

Order Code	Full Product Name	Lamp family code	Product family code
10583600	BGP701 LED8-4S/740 DM11 FG GR 42/60P	LED8	BGP701
10584300	BGP701 LED40-4S/740 DM10 GF SRT SRB 42/6	LED40	BGP701
10585000	BGP701 LW10 LED50-4S/830 DM11 GF CTGO-DG	LED50	BGP701
05966500	BGP702 LED60-4S/740 DM11 GF SRT SRB 60/7	LED60	BGP702
05967200	BGP702 LED40-4S/740 DM10 GF SRT SRB 60/7	LED40	BGP702
05968900	BGP702 LW10 LED50-4S/830 DM11 GF CTGO	LED50	BGP702
05974000	BGP704 LED140-4S/740 DM50 GF SRT SRB 60	LED140	BGP704
05976400	BGP704 LW10 LED120-4S/830 DM11 GF CTGO	LED120	BGP704
10403700	BGP705 LED150-4S/740 DM11 GF SRT SRB 60/	LED150	BGP705

Light Technical (1/2)

Order Code	Full Product Name	Luminaire light beam spread	Light source colour	Correlated Colour Temperature	Colour rendering index (CRI)
10583600	BGP701 LED8-4S/740 DM11 FG GR 42/60P	70° x 37°	740 neutral white	4000 K	>70
10584300	BGP701 LED40-4S/740 DM10 GF SRT SRB 42/6	73° x 44°	740 neutral white	4000 K	>70
10585000	BGP701 LW10 LED50-4S/830 DM11 GF CTGO-DG	70° x 37°	830 warm white	3000 K	>80
05966500	BGP702 LED60-4S/740 DM11 GF SRT SRB 60/7	70° x 37°	740 neutral white	4000 K	>70
05967200	BGP702 LED40-4S/740 DM10 GF SRT SRB 60/7	73° x 44°	740 neutral white	4000 K	>70

Order Code	Full Product Name	Luminaire light beam spread	Light source colour	Correlated Colour Temperature	Colour rendering index (CRI)
05968900	BGP702 LW10 LED50-4S/830 DM11 GF CTGO	70° x 37°	830 warm white	3000 K	>80
05974000	BGP704 LED140-4S/740 DM50 GF SRT SRB 60	154° - 31° x 54°	740 neutral white	4000 K	>70
05976400	BGP704 LW10 LED120-4S/830 DM11 GF CTGO	70° x 37°	830 warm white	3000 K	>80
10403700	BGP705 LED150-4S/740 DM11 GF SRT SRB 60/	70° x 37°	740 neutral white	4000 K	>70

Light Technical (2/2)

Order Code	Full Product Name	Luminous Flux	Optic type outdoor
10583600	BGP701 LED8-4S/740 DM11 FG GR 42/60P	728 lm	Distribution medium 11
10584300	BGP701 LED40-4S/740 DM10 GF SRT SRB 42/6	3,600 lm	Distribution medium 10
10585000	BGP701 LW10 LED50-4S/830 DM11 GF CTGO-DG	4,500 lm	Distribution medium 11
05966500	BGP702 LED60-4S/740 DM11 GF SRT SRB 60/7	5,400 lm	Distribution medium 11
05967200	BGP702 LED40-4S/740 DM10 GF SRT SRB 60/7	3,600 lm	Distribution medium 10

Order Code	Full Product Name	Luminous Flux	Optic type outdoor
05968900	BGP702 LW10 LED50-4S/830 DM11 GF CTGO	4,500 lm	Distribution medium 11
05974000	BGP704 LED140-4S/740 DM50 GF SRT SRB 60	12,740 lm	Distribution medium 50
05976400	BGP704 LW10 LED120-4S/830 DM11 GF CTGO	10,920 lm	Distribution medium 11
10403700	BGP705 LED150-4S/740 DM11 GF SRT SRB 60/	13,500 lm	Distribution medium 11

Operating and Electrical

Order Code	Full Product Name	Power Consumption
10583600	BGP701 LED8-4S/740 DM11 FG GR 42/60P	6.1 W
10584300	BGP701 LED40-4S/740 DM10 GF SRT SRB 42/6	25 W
10585000	BGP701 LW10 LED50-4S/830 DM11 GF CTGO-DG	40.5 W
05966500	BGP702 LED60-4S/740 DM11 GF SRT SRB 60/7	38 W
05967200	BGP702 LED40-4S/740 DM10 GF SRT SRB 60/7	25 W

Order Code	Full Product Name	Power Consumption
05968900	BGP702 LW10 LED50-4S/830 DM11 GF CTGO	40.5 W
05974000	BGP704 LED140-4S/740 DM50 GF SRT SRB 60	83 W
05976400	BGP704 LW10 LED120-4S/830 DM11 GF CTGO	91 W
10403700	BGP705 LED150-4S/740 DM11 GF SRT SRB 60/	87 W

Controls and Dimming

Order Code	Full Product Name	Dimmable
10583600	BGP701 LED8-4S/740 DM11 FG GR 42/60P	No
10584300	BGP701 LED40-4S/740 DM10 GF SRT SRB 42/6	No
10585000	BGP701 LW10 LED50-4S/830 DM11 GF CTGO-DG	Yes
05966500	BGP702 LED60-4S/740 DM11 GF SRT SRB 60/7	No
05967200	BGP702 LED40-4S/740 DM10 GF SRT SRB 60/7	No

Order Code	Full Product Name	Dimmable
05968900	BGP702 LW10 LED50-4S/830 DM11 GF CTGO	Yes
05974000	BGP704 LED140-4S/740 DM50 GF SRT SRB 60	No
05976400	BGP704 LW10 LED120-4S/830 DM11 GF CTGO	Yes
10403700	BGP705 LED150-4S/740 DM11 GF SRT SRB 60/	No

Approval and Application

Order Code	Full Product Name	Mech. impact protection code
10583600	BGP701 LED8-4S/740 DM11 FG GR 42/60P	IK10
10584300	BGP701 LED40-4S/740 DM10 GF SRT SRB 42/6	IK09
10585000	BGP701 LW10 LED50-4S/830 DM11 GF CTGO-DG	IK09
05966500	BGP702 LED60-4S/740 DM11 GF SRT SRB 60/7	IK09
05967200	BGP702 LED40-4S/740 DM10 GF SRT SRB 60/7	IK09

Order Code	Full Product Name	Mech. impact protection code
05968900	BGP702 LW10 LED50-4S/830 DM11 GF CTGO	IK09
05974000	BGP704 LED140-4S/740 DM50 GF SRT SRB 60	IK09
05976400	BGP704 LW10 LED120-4S/830 DM11 GF CTGO	IK09
10403700	BGP705 LED150-4S/740 DM11 GF SRT SRB 60/	IK09

Over Time Performance (IEC Compliant)

Order Code	Full Product Name	Driver failure rate at 5,000 hours
10583600	BGP701 LED8-4S/740 DM11 FG GR 42/60P	-
10584300	BGP701 LED40-4S/740 DM10 GF SRT SRB 42/6	-
10585000	BGP701 LW10 LED50-4S/830 DM11 GF CTGO-DG	-
05966500	BGP702 LED60-4S/740 DM11 GF SRT SRB 60/7	0.005 %
05967200	BGP702 LED40-4S/740 DM10 GF SRT SRB 60/7	0.005 %

Order Code	Full Product Name	Driver failure rate at 5,000 hours
05968900	BGP702 LW10 LED50-4S/830 DM11 GF CTGO	0.005 %
05974000	BGP704 LED140-4S/740 DM50 GF SRT SRB 60	0.005 %
05976400	BGP704 LW10 LED120-4S/830 DM11 GF CTGO	0.005 %
10403700	BGP705 LED150-4S/740 DM11 GF SRT SRB 60/	0.005 %

Polar Wide Diagrams

Polar Normal (separate) - BGP704I -
910925866542

Polar Normal (separate) - BGP702I -
910925866535

Polar Normal (separate) - BGP702I -
910925866536

Polar Normal (separate) - BGP702I -
910925866534

Polar Normal (separate) - BGP704I -
910925866544

Polar Normal (separate) - BGP705I -
910925867142

Polar Normal (separate) - BGP701I -
910925867326

Polar Normal (separate) - BGP701I -
910925867324

Polar Normal (separate) - BGP701I -
910925867325



D-SERIES



D-SERIES




HOLOPHANE[®]
An Acuity Brands Company



OptiVision LED gen3.5

BVP528 2200/757 HGB A35-WB D9 T25 50K

OPTIVISION LED GEN3.5 LARGE, LED module 220000 lm, LED, 1500 W, Power supply unit with DALI interface, Asymmetrical axis angle 32° wide beam, Polycarbonate bowl/cover clear, 5° - 13° x 120°, DALI, Mounting bracket adjustable

The Philips OptiVision LED gen3.5 floodlighting system provides a complete lighting solution for the simplest through to the most complex area and recreational sports lighting applications. The high-efficiency floodlight comes with a single piece die cast housing, hosting 2 and 3 LED engines respectively, which also function with an external driver box – separate for use at a distance from the floodlight (BV), or pre-fixed onto the mounting bracket of the floodlight (HGB) for ease of installation and lower initial cost. It meets the highest performance standards, provides outstanding light, quality, uniformity and ensures safety and visual comfort.

Product data

General Information		Light Technical	
Lamp family code	LED2200 [LED module 220000 lm]	Flammability mark	For mounting on normally flammable surfaces
Light source replaceable	Yes	ENEC mark	ENEC mark
Number of gear units	1 unit	EU RoHS compliant	Yes
Driver included	Yes		
Light source engine type	LED	Upward light output ratio	0
Service tag	Yes	Luminous Flux	194,714 lm
Product family code	BVP528 [OPTIVISION LED GEN3.5 LARGE]	Standard tilt angle posttop	0°
Lighting Technology	LED	Standard tilt angle side entry	-
Value ladder	Specification	Correlated Color Temperature (Nom)	5700 K
CE mark	CE mark	Luminous Efficacy (rated) (Nom)	130 lm/W
Warranty period	3 years	Color rendering index (CRI)	>70

OptiVision LED gen3.5

Light source color	757 cool white
Optical cover type	Polycarbonate bowl/cover clear
Luminaire light beam spread	5° - 13° x 120°
Optic type outdoor	Asymmetrical axis angle 32° wide beam

Operating and Electrical

Input Voltage	220-400 V
Line Frequency	50 to 60 Hz
Inrush current	20 A
Inrush time	0.160 ms
Power Consumption	1,500 W
Power Factor (Fraction)	0.9
Connection	Connection unit 5-pole
Cable	-
Number of products on MCB of 16 A type B	-

Temperature

Ambient temperature range	-40 to +55 °C
---------------------------	---------------

Controls and Dimming

Dimmable	Yes
Driver/power unit/transformer	Power supply unit with DALI interface
Control interface	DALI
Constant light output	No

Mechanical and Housing

Housing Material	Aluminum
Reflector material	-
Optic material	Polycarbonate
Optical cover material	Polycarbonate
Fixation material	Aluminum
Housing Color	Aluminum
Mounting device	Mounting bracket adjustable
Optical cover shape	Flat
Optical cover finish	Clear
Overall length	612 mm
Overall width	695 mm
Overall height	737 mm
Effective projected area	0.512 m²
Dimensions (Height x Width x Depth)	737 x 695 x 612 mm

Approval and Application

Ingress protection code	IP66 [Dust penetration-protected, jet-proof]
Mech. impact protection code	IK08 [5 J vandal-protected]
Surge Protection (Common/Differential)	Surge protection level until 10 kV differential mode
Sustainability rating	-
Protection class IEC	Safety class I

Initial Performance (IEC Compliant)

Luminous flux tolerance	+/-7%
Initial chromaticity	(0.329, 0.342) SDCM <5
Power consumption tolerance	+/-10%
Init. Color Rendering Index Tolerance	+/-2

Over Time Performance (IEC Compliant)

Control gear failure rate at median useful life 50000 h	0.005 %
Lumen maintenance at median useful life* 50000 h	L80

Application Conditions

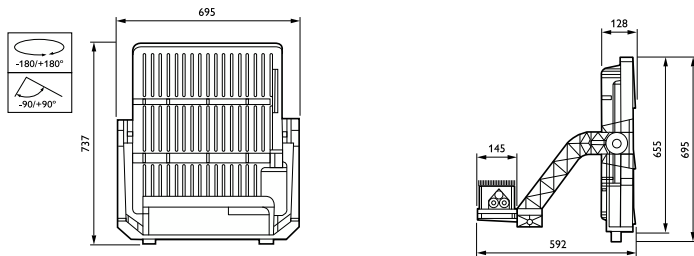
Performance ambient temperature Tq	25 °C
Maximum dim level	10%

Product Data

Order product name	BVP528 2200/757 HGB A35-WB D9 T25 50K
Full product name	BVP528 2200/757 HGB A35-WB D9 T25 50K
Full product code	871951420089000
Order code	912300024647
Material Nr. (12NC)	912300024647
Numerator - Quantity Per Pack	1
EAN/UPC - Product/Case	8719514200890
Numerator - Packs per outer box	1
EAN/UPC - Case	8719514200890

OptiVision LED gen3.5

Dimensional drawing



D-SERIES

The modern styling of the **D-Series** is striking yet unobtrusive - making a bold, progressive statement as it blends seamlessly with its environment. **D-Series** takes all the benefits of LED technology and moulds it into a high performance, high efficacy and long life area lighting luminaire.

With its exceptional 'finned' thermal management system, **D-Series** is capable of delivering over 100,000 hours LED module life. Offering a wide range of lumen packages and optical distributions, **D-Series** delivers optimised lighting application designs.

With the integrated ZD4i compatibility **D-Series** delivers a controllable luminaire that helps you realise energy consumption goals and demonstrate environmental responsibility. With its unique optics placed below each LED it ensures light is delivered where it needs to be, providing a uniform Nighttime Friendly environment with minimal light pollution.

Applications

- Amenity Areas
- Car Parks
- Retail Parks
- Truck Yards
- Warehousing
- Exterior Areas

Optics / Light Source

- Lumen packages ranging from 2,000 - 50,000 in 3 different luminaire variants
- Fully soak tested light engines ensuring LED reliability and eliminating early failures.
- 2700K/3000K/4000K colour temperature.
- RA 70.

TM66 CEAM-Make Rating

Rating: 2.6 Excellent Circularity.



TM66 Assured Score

Approvals

Complies with EN60598



IP IP65 luminaire and LED optic

Ta -40°C to +40°C

DSX1



For further information please visit the Holophane website www.holophane.co.uk

AN ENVIABLE REPUTATION THROUGHOUT THE WORLD



When Holophane was founded in 1896 in London, headed by Pelham Trotter, it marked the start of an incredible history that has now seen Holophane become a global business revered throughout the world for its expertise, quality, innovation and excellence in lighting.

Holophane’s first product was the famous patented globe in ‘white’ or ‘rose crystal’ that sold for around 2 shilling (10p). Today, Holophane continues this proud tradition with our values deeply rooted in the dedication to creating luminaires, with exceptional lighting performance, innovative patented technologies, and delivering added customer value beyond illumination.

What does it mean for our customers?

A Trusted & Reliable UK Manufacturer

From Royalty all the way to small residential projects, Holophane has been a trusted manufacturer over the decades for all manner of projects. You can be sure you are in good hands and can rely on the collective knowledge and expertise we have gathered since our inception in 1896.

Development of Innovative Products

As part of our design philosophy, Holophane are always trying to push boundaries in the development of unique product innovations. As such many of our luminaires hold UK and International design patents.



Products That Deliver Added Value

In today’s world, sustainability and added value are becoming increasingly important. As such our products and solutions go further than just lighting. Many of our innovations include integrated smart connected solutions to help customers achieve further energy savings and can also enable remote monitoring.

Delivering excellent customer service

Over our 125-year history we have always been committed to delivering the best service to our customers and supporting in a myriad of ways to ensure the best possible outcomes. This goes as far as offering a free lighting design service to one-off products/ solutions to meet customers unique needs.

THE D-SERIES RANGE 3 LUMINAIRES, ONE COMPLETE PROJECT SOLUTION

The **D-Series** range has been designed not only for super optical quality and performance but also to have a cohesive family aesthetic.

Available in 3 luminaire sizes, the D-Series range offers a full outdoor lighting solution for any environment.



DSX2

30,000 - 50,000 lumens
8m mounting heights and above

DSX1

22,000 - 36,000 lumens
between 6m and 10m mounting heights

DSX0

2,000 to 22,000 lumens
up to 6m mounting heights

PRODUCT FEATURES

Enhanced Performance

The **D-Series** range features the very latest LED technologies. In conjunction with silicone optics this delivers the best lighting performance coupled with low-energy consumption and high efficacy. This also means D-Series meets BREEAM compliance.

Class leading optics

The **D-Series** range has the flexibility of 4 optimised optical distributions. Through using individual bubble optics per LED D-Series controls the light exactly where it's needed. This results in a luminaire that provides best in class spacings and uniformity.

Easy maintenance

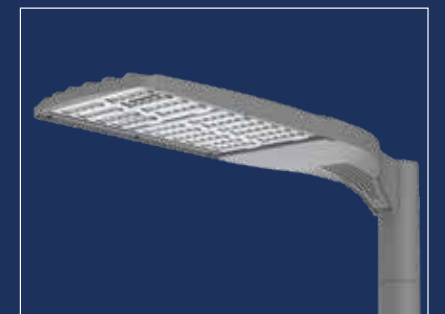
The **D-Series** range has an easily accessible gear compartment ensuring fast and simple component changes if required.



D-SERIES



DSX1



DSX2

Connected

The **D-Series** range is ZD4i compatible when specified with the 4-pin Zhaga socket options (TZ01 or TZ02) enabling a future proof luminaire that can be used in conjunction with Controlux Air or a expanding ecosystem of third party devices and sensors.

Note: Post Top Bracket for The D-Series range is sold separately. Please enquire with your Holophane representative for the full range of mounting options.



DSX0



THERMAL MANAGEMENT

The reliability and performance of an LED luminaire is dependent on a combination of factors. Keeping the temperature of the drivers, LEDs and electronic components as low as possible is critical to maintaining the luminaire's efficiency.

One of Holophane's key luminaire design principles ensures that the **D-Series** family utilises all three heat transfer principles of conduction, convection and radiation.



Conduction

Taking heat away from electronic components, LEDs and drivers.

The **D-Series** range has drivers and LEDs that are mounted directly to thermally efficient, LM6 Aluminium to promote efficient transfer of heat from these critical components.



Convection

From luminaire heat sink chassis and LED module to ambient air.

The **D-Series** range is designed to have drivers and LEDs that are mounted separately to avoid compound heating of components. This ensures critical components are kept as cool as possible to ensure long system life.



Radiation

Surface finish and form designed to maximise heat radiation.

The **D-Series** range incorporates a large finned casting design which increases the total surface area of the luminaire and in turn helps to promote cooling through radiation.

THERMAL MANAGEMENT

DSX1

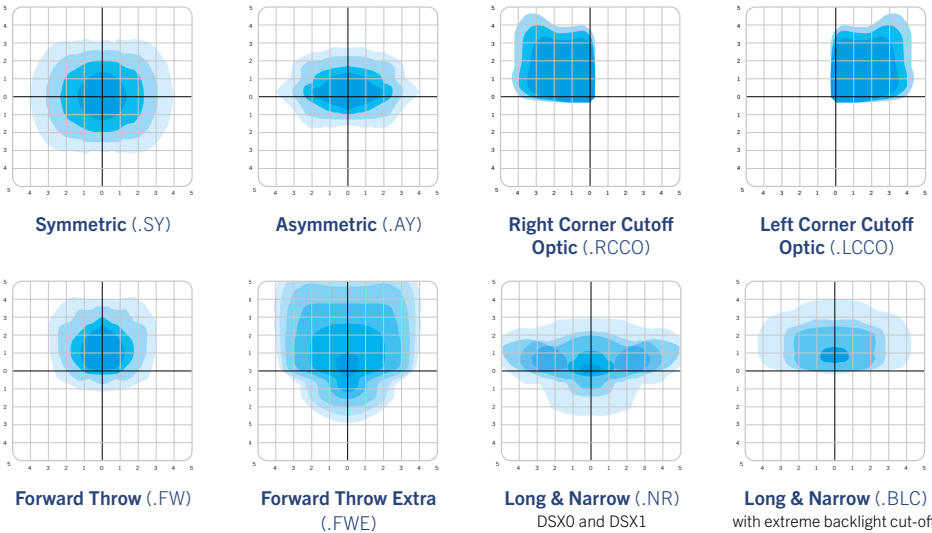


SPECIFICATION

Specification

Single-piece die-cast aluminium housing, that conforms to EN1706 AC-46500, with integral heat sink fins to optimise thermal management through conductive cooling. LED modules are IP65 with individual lenses, and high grade aluminium housing to transfer heat away from the LEDs and dissipate through the finned housing for cooling. The LED driver is mounted in direct contact with the finned housing for cooling to promote low operating temperature and long system life. Housing is completely sealed against moisture and environmental contaminants (IP65). Installation is via the integrated mounting block and integral arm that facilitate a quick and easy installation. 3000K or warmer must be selected for IDA dark sky certification.

Light Distributions



SPECIFICATION

Features and benefits

System Longevity

- The D-Series's diecast aluminium housing acts as its primary heat sink. Its longitudinal fins employ conductive cooling techniques to dissipate heat away from the key LED components and driver that extends the life of the luminaire.
- Light engine(s) consist of either 20 or 30 high efficacy LEDs (subject to chosen configuration) mounted to a metal-core circuit board to maximize heat dissipation and promote long life.

Exceptional Performance

- Offering six lumen packages ranging from 2000 lm to 50,000 lm with efficiencies of up to 143 lpw (Lumens Per Watts).

- Four optimised distributions (Symmetric, asymmetric, forward throw and long and narrow) delivered by quality LEDs and bespoke UV stabilised optics.
- LED light engines with 0% ULOR ensuring night time friendly.

Complete Light Package

- Available with ZD4i compatibility for use with range of 3rd-party sensors and devices.
- Fully integrated into Holophane standard column range.

DIMENSIONS & PERFORMANCE

Typical luminaire performance

Configuration	Delivered Lumens	Circuit Power (W)	Driver output current (mA)	Luminaire total number of LEDs	Luminaire efficacy (lm/W)
DSX0.1.LA02X	2,000	15	450	20	133
DSX0.1.LA03X	3,000	21	650	20	143
DSX0.1.LA04X	4,000	29	450	20	138
DSX0.1.LA05X	5,000	37	570	20	135
DSX0.1.LA06X	6,000	45	700	20	133
DSX0.1.LA08X	8,000	64	990	20	125
DSX0.1.LA10X	10,000	81	1250	20	123
DSX0.1.LA11X	11,000	88	700	40	133
DSX0.1.LA13X	13,000	107	850	40	127
DSX0.1.LA15X	15,000	133	1050	40	120
DSX0.4.LA16X	16,000	114	932	40	140
DSX0.4.LA18X	18,000	130	1050	40	138
DSX0.4.LA22X	22,000	169	1385	40	130
DSX1.2.LA30X	30,000	286	1400	60	105
DSX1.4.LA36X	36,000	256	1400	60	128
DSX2.2.LA30X	30,000	282	1050	80	115
DSX2.2.LA36X	36,000	328	1000	100	121
DSX2.4.LA40X	40,000	268	883	100	136
DSX2.4.LA45X	45,000	339	1016	100	133
DSX2.4.LA50X	50,000	386	1157	100	130

Weight (with control gear)

DSX 0	8.0 kg
DSX 1	12.2 kg
DSX 2	15.0 kg

Windage (effective projected area)

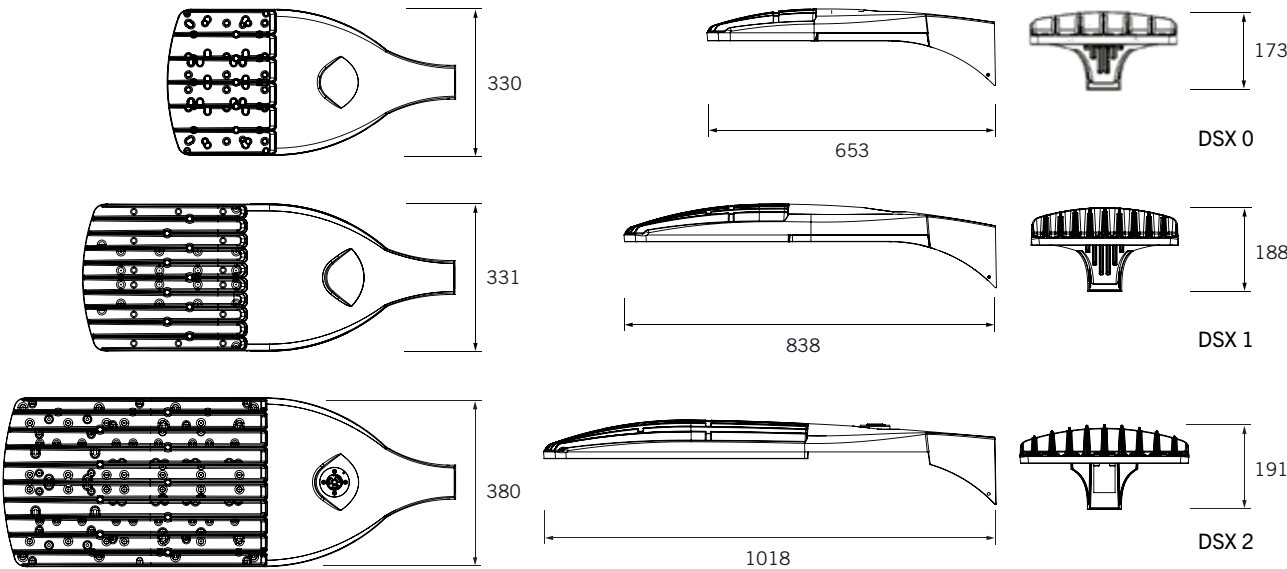
DSX 0	0.09 m²
DSX 1	0.09 m²
DSX 2	0.10 m²

TA

-40°C to 40°C

X - Denotes colour temperature (replace X with 2 for 2700K, 3 for 3000K and 4 for 4000K)

Note: Data is correct at time of print.
* For other life metric data in line with IEC PAS62722-2-1 and 62717 contact your Holophane Representative for details.



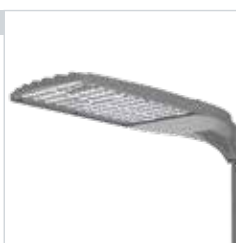
DSX2



Code	Luminaire (required)									
DSX0	D-Series 1 Luminaire									
	Code	Lamp Type (required)								
	.LA02X	LED light engine producing c.2,000 lm								
	.LA03X	LED light engine producing c.3,000 lm								
	.LA04X	LED light engine producing c.4,000 lm								
	.LA05X	LED light engine producing c.5,000 lm								
	.LA06X	LED light engine producing c.6,000 lm								
	.LA08X	LED light engine producing c.8,000 lm								
	.LA10X ¹	LED light engine producing c.10,000 lm								
	.LA11X	LED light engine producing c.11,000 lm								
	.LA13X	LED light engine producing c.13,000 lm								
	.LA15X	LED light engine producing c.15,000 lm								
	.LA16X	LED light engine producing c.16,000 lm								
	.LA18X	LED light engine producing c.18,000 lm								
	.LA22X ¹	LED light engine producing c.22,000 lm								
	Code	Distribution (required)								
	.SY	Symmetric light distribution								
	.AY	Asymmetric light distribution								
	.FW	Forward Throw distribution								
	.NR	Long and Narrow distribution								
	.BLC	Long and Narrow distribution with extreme backlight cut-off								
	.RCCO	Right Corner Cutoff								
	.LCCO	Left Corner Cutoff								
	.FWE	Forward Throw Extra								
	Code	Colour (required)								
	.C1	Smooth White (RAL9016)								
	.C4	Graphite (RAL 7011)								
	.C6	Smooth Grey (RAL7035)								
	.C7	Black (RAL9005)								
	.C9	Metallic Silver (RAL9006)								
	.RAL****	RAL Colour (Customer choice)								
	Code	Voltage Electrical Class (option)								
	.CII	Class II								
		Code	Photocell (option)							
		.TSZ	Complete with miniature 70 lux factory fitted photocell. (Zodion SS12)							
		.T1	Complete with NEMA socket. (To accept standard NEMA Photocell, available from Holophane).							
		.T5	Complete with 5-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) without locking top							
		.T7	Complete with 7-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) without locking top							
		.T5T	Complete with 5-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top							
		.T7T	Complete with 7-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top							
		.TZ01	Complete with 4-Pin Zhaga Socket - 'Top' (suitable photocell/node supplied by others) with weather proof locking cap							
		.TZ02	Complete with 4-Pin Zhaga Socket - 'Bottom' (suitable photocell/node supplied by others) with weather proof locking cap							
		.TZ03	Complete with 4-Pin Zhaga Socket - 'Top & bottom' (suitable photocell/node supplied by others) with weather proof locking cap							
		Code	Controls (option)							
		.PH1	PIR on a Zhaga socket, suitable up to 12m. Dims to 30% after 10 minutes of inactivity - switches off after further 10 minutes. Remotely re-programmable with accessory HEL.PRG (purchased separately). Requires option TZ02 or TZ03.							
		.PH2	Groupable PIR on a Zhaga socket, suitable up to 12m. Dims to 30% after 10 minutes of inactivity - switches off after further 10 minutes. Remotely re-programmable with accessory HEL.PRG.G (purchased separately). Requires option TZ02 or TZ03.							
		.CA	Wireless lighting node (top socket) for use with Holophane Controlux Air System. Requires option TZ01 or TZ03. (Includes subscription package for two years)							
		.CAP	Wireless lighting node (top socket) & PIR (bottom socket) for use with Holophane Controlux Air System. Requires option TTZ03. (Includes subscription package for two years). Suitable up to 12m.							
		Code	Control Gear (option)							
		.CL7	Programmed to deliver 70% of the initial lumens over the life of the luminaire							
		.CL8	Programmed to deliver 80% of the initial lumens over the life of the luminaire							
		.CL9	Programmed to deliver 90% of the initial lumens over the life of the luminaire							
		.CL****	Customer specified programming							
		Code	Dimming outputs (option)							
		.LRD	DALI							
		.LRT56	pre-set to dim to 50% between 12am to 6am							
		.LRT66	pre-set to dim to 60% between 12am to 6am							
		.LRT76	pre-set to dim to 70% between 12am to 6am							
		.LRT*****	Customer specified pre-set dimming							
		Code	Paint finish (option)							
		.C	Enhanced Paint Finish							
DSX0	.LA02X	.AY	.C7	.CII	.TSZ	.CL7	.LRD	.C		
Example										

Note: The specifications of the Holophane luminaire, all descriptions, illustrations, drawings and specifications in the Holophane catalogue and website represent only general particulars of the goods to which they apply and shall not form part of any contract. The company reserves the right to change specifications at its discretion without prior notification or public announcement.

Code	Luminaire (required)									
DSX1	D-Series 1 Luminaire									
DSX2	D-Series 2 Luminaire									
Lamp Type (required)										
.LA22X*	LED light engine producing c 22,000 lumens									
.LA30X+	LED light engine producing c 30,000 lumens									
.LA36X**	LED light engine producing c 36,000 lumens									
.LA40X+	LED light engine producing c 36,000 lumens									
.LA45X**	LED light engine producing c 45,000 lumens									
.LA50X**	LED light engine producing c 50,000 lumens									
Code	Distribution (required)									
.AY	Asymmetric									
.SY	Symmetric									
.FW	Forward throw									
.BLC	Long and Narrow distribution with extreme backlight cut-off									
.NR	Long and Narrow distribution									
.RCCO	Right Corner Cutoff									
.LCCO	Left Corner Cutoff									
.FWE	Forward Throw Extra									
Code	Colour (required)									
.C1	Smooth White (RAL9016)									
.C4	Graphite (RAL 7011)									
.C6	Smooth Grey (RAL7035)									
.C7	Black (RAL9005)									
.C9	Metallic Silver (RAL9006)									
.RAL****	RAL Colour (Customer choice)									
Code	Photocell (option)									
.T	Mini Photocell									
.T1	Complete with NEMA socket (To accept standard NEMA Photocell, available from Holophane)									
.T5	Complete with 5-pin dimming NEMA ANSI C136.41 socket (suitable photocell/node supplied by others) without locking top									
.T7	Complete with 7-pin dimming NEMA ANSI C136.41 socket (suitable photocell/node supplied by others) without locking top									
.T5T	Complete with 5-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top									
.T7T	Complete with 7-pin dimming NEMA ANSI C136.41 socket (photocell/node supplied by others) with weather proof locking top									
.TZ01	Complete with 4-Pin Zhaga Socket - Top (suitable photocell/node supplied by others) with weather proof locking top [†]									
.TZ02	Complete with 4-Pin Zhaga Socket - Bottom (suitable node/presence detector supplied by others) with weather proof locking top [†]									
.TZ03	Complete with 4-Pin Zhaga Socket - 'Top & bottom' (suitable photocell/node supplied by others) with weather proof locking cap.									
Code	Control Gear (option)									
.CL7	Programmed to deliver 70% of the initial lumens over the life of the luminaire									
.CL8	Programmed to deliver 80% of the initial lumens over the life of the luminaire									
.CL9	Programmed to deliver 90% of the initial lumens over the life of the luminaire									
.CL****	Customer specified programming									
Code	Controls (option)									
.PH1	PIR on a Zhaga socket, suitable up to 12m. Dims to 30% after 10 minutes of inactivity - switches off after further 10 minutes. Remotely re-programmable with accessory HEL.PRG (purchased separately). (Requires option TZ02 or TZ03).									
.PH2	Groupable PIR on a Zhaga socket, suitable up to 12m. Dims to 30% after 10 minutes of inactivity - switches off after further 10 minutes. Remotely re-programmable with accessory HEL.PRG.G (purchased separately). (Requires option TZ02 or TZ03).									
.CA	Wireless lighting node (top socket) for use with Holophane Controlux Air System (Includes subscription package for two years). (Requires option TZ01 or TZ03).									
.CAP	Wireless lighting node (top socket) & PIR (bottom socket) for use with Holophane Controlux Air System. (Includes subscription package for two years). Suitable up to 12m. (Requires option TZ03).									
Code	Dimming outputs (option)									
.LRD	DALI									
.LRT56	Pre-set to dim to 50% between 12am to 6am									
.LRT66	Pre-set to dim to 60% between 12am to 6am									
.LRT76	Pre-set to dim to 70% between 12am to 6am									
Code	Paint finish (option)									
.C	Enhanced Paint Finish									



DSX1	.LA30X	.AY	.C7	.T1	.CL7	.PH1	.LRT56	.C
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SUSTAINABILITY ENVIRONMENTAL



AN ECO DESIGN THAT IS SUSTAINABLE WITHIN.

Our products are just one part of our sustainability efforts, with the 4 pillars of our eco-design which constantly push us to create the most sustainable products that reduce our own environmental impact.

Pillar One Sustainable we make more with less

How are we doing it?

- To make use of recycled materials where we can
- Reducing unnecessary materials, weight and component count
- Only using components that can be used in other luminaires
- Reduce labour time and energy usage during the manufacturing process

Pillar Three Serviceable we ensure product longevity

All of our products are:

- Upgradable
- Simple in design
- Ensure easy access to internal components
- Spares are easily available to enable customer servicing and repair

Pillar Two Scalable we tailor the product for application

We offer:

- Products that are scalable to accommodate new features
- Form-factor sizing for each application to help reduce material waste
- Flexible mounting options

Pillar Four Separable we are committed to global sustainability

Our products are:

- Environmentally friendly
- Recyclable
- Easy to disassemble, making materials used easy to separate



For information on our EarthLIGHT initiative please scan the QR code



CIRCULAR ECONOMY TM66

Holophane's ambitious sustainability efforts have set us on the path to obtaining several accreditations with the LIA and CIBSE's TM66 which allows us to rate our products and follow a method that designs out waste.

The traditional resource consumption model is linear, where raw material is collected to make products, then often thrown away once they have served their purpose.

CIBSE's TM66 allows us to rate our products and follow a method to design out waste, maximise value and improve maintenance so that our luminaires can be repaired, recycled and re-used.



TM66
Assured Score

2.5 to 4.0	Excellent circularity
1.5 to 2.5	Definite/substantial progress to circularity
0.5 to 1.5	Some circular economy functionality
0 to 0.5	Very poor circular economy performance

CONTROLS

COMPATIBLE WITH CONTROLUX AIR

Controlux Air helps users transform their existing infrastructure into a wireless platform. With Controlux Air, you have full remote configuration or your site with an intuitive user interface which is map based and delivers accurate/update reporting.

Wireless Controller

Wireless communication, lighting control and external sensor interface.

External antenna allowing communication with 'Motion Sensor' and 'Wireless Gateway'.

Creates a wireless mesh type network when used with the 'Wireless Gateway'.

Available with option codes .CA or .CAP



Motion Sensor

Motion sensor and wireless communication triggering 1 to 10 luminaires (with Integral Wireless Controller) upon detection (user configurable).

Wireless communication with 'Gateway'.

Detects pedestrians, cyclists and cars range (range: 2.5 -75 mph)

Range: up to 15m on each side, 9m front and 3m behind at a mounting height of 5m (max).



Gateway

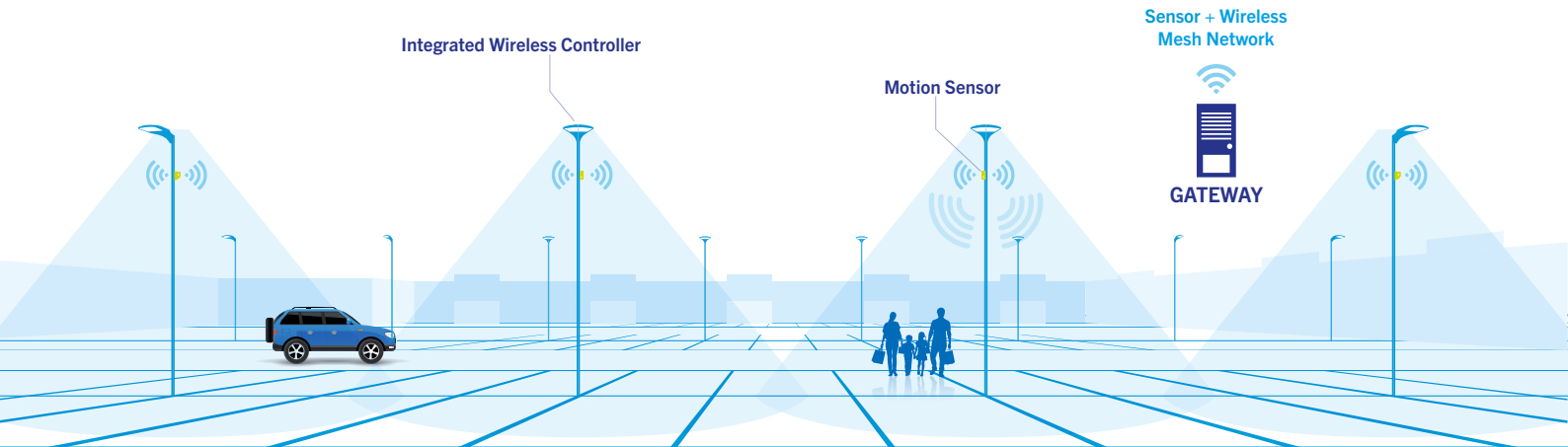
Wireless network and server communication (via SIM Card).

Suitable for pole, wall or inside cabinet mounting.

One Gateway required for up to 200 devices (Motion Sensors or Integrated Light Controllers)

with a range of up to 1km open field range.

Links all devices to web-based Customer Interface for remote management of luminaires and devices.



Intuitive user interface

Gain in-depth insights into every single aspect of your lighting system. Smart analytics and simple charts will help you make the right decision about your lighting infrastructure.



Automatic failure reports

Lighting-related system faults are identified, and automatic failure reports are sent in real-time. This results in optimized maintenance, better planning, reduced costs and extended luminaire life.



Power metering

Dedicated hardware provides precise energy metering, which is converted into detailed energy usage and savings reports.



Accurate real-time data

Generation of analytics per an individual light point or their groups. Available data includes: notifications about lighting-related faults, number of triggers per light point, generated energy savings, heatmaps, and more.



Map-based visualizations

Outdoor lighting points are represented in a graphic interface on Google Maps, coordinated with GPS technology, which enables you to locate, monitor and control individual light points with ease.



Continuous support

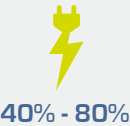
CityManager receives periodic security and feature upgrades. We do this to ensure optimum functionality and system performance.



Financial Benefits

By installing Controlux Air controls systems, you benefit financially, thanks to energy savings and reduced energy costs.

Energy savings of up to 80%



- By using dynamic lighting, it is possible to generate energy savings of 40-80%, depending on the usage environment
- In dense urban environments, the Controlux Air solution has the potential to generate energy savings of 40-50% (in this case, actual savings depend on the traffic intensity)

Maintenance costs savings up to 50%



- Automatic failure reporting
- No need for expensive visual inspections
- Extended luminaire lifetime
- Excellent preventive maintenance



For more information about ControluxAir scan the QR code or visit www.holophane.co.uk/controlux-air

D-SERIES

D-SERIES



Holophane Europe Limited
Bond Avenue, Bletchley, Milton Keynes MK1 1JG United Kingdom
Telephone: +44 (0)1908 649292
E-mail: info@holophane.co.uk
www.holophane.co.uk





**Kingfisher
Lighting**

Part of the **LUCCECO** group of companies

Datasheet

SEMITA Urban



Specification Text

The SEMITA Urban shall be manufactured from high pressure die-cast aluminium and powder coated with a RAL 7016 Anthracite Grey marine grade finish. It shall have a power output ranging between 6 - 11W, with an efficacy of 127 - 146 lm/W. The luminaire shall deliver 744 - 1,611 luminaire lumens. The SEMITA Urban has a range of different optics to suit narrow, medium and wide paths, with a fully programmable DALI driver. Available in 2700K and 4000K, the luminaire shall be IK10 and IP66 rated with 3 hour integral emergency back-up and self-test options available.

For DarkSky Specifications, the luminaire shall produce a CCT of 2700K.



Specification

Weight: 2.4 kg
Material: Die-cast Aluminium
Paint Finish: RAL7016 Anthracite Grey
Embodied Carbon: 44 kg CO₂e

Product Description

Designed and engineered in the UK, SEMITA Urban is a slimline wallpack, available with street, path or flood optics in addition to comfort options.



**Kingfisher
Lighting**

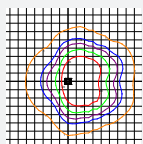
Part of the **LUCCECO** group of companies

Key Features

- 6.0W - 11.0W
- 744 - 1,611 Luminaire Lumens
- Efficacy up to 146.0 lm/W
- 2700K, 4000K, CRI>70
- IP66, IK10
- Lifetime > 100,000hr, L80
- 3 Hour Integral Emergency
- DarkSky Approved

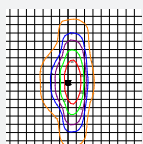
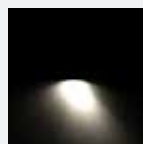
Available with integral 3 hour emergency using a 3.0W pack. Output range from 372 - 438 lm dependant on optic, CCT & accessories.

Optics



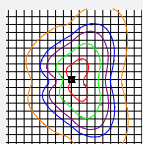
Flood Optic FL

Designed with excellent wide distribution for areas needing greater illumination such as car parks, children's areas and many more areas



Path Optic OC

Perfect for a variety of pedestrian areas in close proximity to buildings. E.g retail parks, façade lighting and offices



Street Optic ST

Ideal for illuminating areas such as building perimeters and access areas. It would be best placed in areas such with high security needs.



Circular Economy Score

0 to 0.05	Very poor circular economy performance
0.5 to 1.5	Some circular economy functionality
1.5 to 2.5	Definite/substantial progress to circularity
2.5 to 4.0	Excellent circularity

Other Options Available

Contact for further details

- 3 Hour Integral Emergency
- Colour Temperature Opportunities

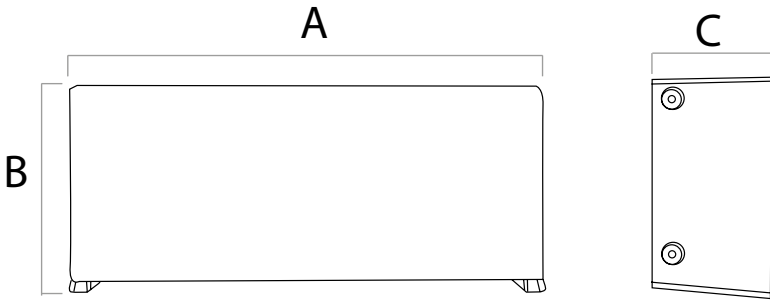
Mounting Options

- Wall Mount

Dimensions

Body Type	A	B	C
Standard	337	148	82

All measurements in mm



Code	Power (W)	Luminaire Lumens (lm)	Drive Current (mA)	Inrush Current (A pk)	Optic	CCT (K)	IP	IK	Weight (kg)	Driver Included	Driver Type
SEMUFL08D	6.0	812	205	5.0	Asymmetrical Flood Optic FL	4000	IP66	IK10	2.4	Yes	Basic DALI
SEMUFL08D27K	6.0	771	205	5.0		2700	IP66	IK10	2.4	Yes	Basic DALI
SEMUFL15D	11.0	1,611	410	5.0		4000	IP66	IK10	2.4	Yes	Basic DALI
SEMUFL15D27K	11.0	1,530	410	5.0		2700	IP66	IK10	2.4	Yes	Basic DALI
SEMUOC15D	11.0	1,570	410	5.0	Asymmetrical Path Optic OC	4000	IP66	IK10	2.4	Yes	Basic DALI
SEMUOC15D27K	11.0	1,505	410	5.0		2700	IP66	IK10	2.4	Yes	Basic DALI
SEMUOC08D	6.0	802	205	5.0		4000	IP66	IK10	2.4	Yes	Basic DALI
SEMUOC08D27K	6.0	762	205	5.0		2700	IP66	IK10	2.4	Yes	Basic DALI
SEMUST08D	6.0	783	205	5.0	Asymmetrical Street Optic ST	4000	IP66	IK10	2.4	Yes	Basic DALI
SEMUST08D27K	6.0	744	205	5.0		2700	IP66	IK10	2.4	Yes	Basic DALI
SEMUST15D	11.0	1,496	410	5.0		4000	IP66	IK10	2.4	Yes	Basic DALI
SEMUST15D27K	11.0	1,425	410	5.0		2700	IP66	IK10	2.4	Yes	Basic DALI



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