



• LIGHTING DESIGN • ELECTRICAL • SMART CITIES •
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ROOSTHOLE

LIGHTING STRATEGY

DFL-UK

17/18 City Business Centre, Hyde Street, Winchester, SO23 7TA

+44(0)1962 855080 | info@dfi-uk.com | www.dfi-uk.com



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Designs for Lighting (DFL) is a business built on successfully collaborating with our clients. We have over 20 years proven experience in our industry, listening to the challenges our clients face, developing the best solutions and being innovators in our specialism. Our role is to find the most effective and sustainable outcome to enhance and support your projects. We proudly work with recognised industry bodies to promote and shape the future of the industry and ensure our staff are trained to exceed the required competency levels of our industries. Above all, we ensure each project delivers against our values.



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EXECUTIVE SUMMARY

This Lighting Strategy has been prepared by Designs for Lighting Ltd (DFL) to present and document the proposed external lighting scheme at Roosthole.

The purpose of this report is to present the proposed external lighting scheme and demonstrate compliance with the requirements of the pre-commencement condition relating to biodiversity and bat protection. The report identifies ecological features and habitats that may be sensitive to artificial lighting and assesses the potential effects of the proposed lighting installation on these receptors.

The assessment has been undertaken in accordance with relevant legislation, national and local planning policy, and current best-practice guidance, including the Institution of Lighting Professionals (ILP) Guidance Note GN01:2021 and guidance relating to bats and artificial lighting. The report includes details of the proposed lighting equipment, lighting layout, technical specifications, and lighting contour plans to demonstrate the extent of illumination across the site and its surroundings.

The lighting assessment confirms that predicted light levels at identified Potential Ecologically Sensitive Receptors (PSERs), including habitats and routes likely to be used by bats, remain within the applicable guidance thresholds. The proposed lighting scheme has been designed to minimise light spill beyond operational areas and to maintain dark corridors where required, ensuring that bat activity and movement through the site are not adversely affected.

The findings demonstrate that the proposed lighting scheme can be implemented without causing unacceptable impacts on biodiversity and will safeguard protected and priority species in accordance with the requirements of the planning condition. This report has therefore been prepared to support the discharge of the relevant planning condition, the wording of which is reproduced below.

Condition 4 states: -

"Pre-Commencement (Slab Level) Condition: No development above ground floor slab level shall commence until a lighting design scheme for biodiversity has been submitted to and approved in writing by the Local Planning Authority. The scheme shall identify those features on site that are particularly sensitive for bats and that are likely to cause disturbance along important routes used for foraging; and show how and where external lighting will be installed (through the provision of appropriate lighting contour plans and technical specifications) so that it can be clearly demonstrated that areas to be lit will not disturb or prevent bats using their territory.

All external lighting shall be installed in accordance with the specifications and locations set out in the scheme and maintained thereafter in accordance with the scheme. Under no circumstances should any other external lighting be installed without prior consent from the local planning authority.

Reason: As these matters are fundamental to safeguard the ecology and biodiversity of the area in accordance with Policy 31 of the Horsham District Planning Framework (2015), and to enhance Protected and Priority Species/habitats and allow the LPA to discharge its duties under the s40 of the NERC Act 2006 (Priority habitats & species)"

1. INTRODUCTION

1.1. General

- 1.1.1. This Lighting Strategy has been written by DFL (Designs for Lighting Ltd¹), a lighting design consultancy specialising in Lighting Impact Assessments, obtrusive light mitigation, and detailed lighting design.
- 1.1.2. The Lighting Strategy is intended to set out a minimally obtrusive approach to the lighting, whilst ensuring it is necessary and considers the sensitivity of nearby environmental and ecological receptors.
- 1.1.3. Lighting associated with the Proposed Development will comply with relevant guidance from the Institution of Lighting Professionals (ILP) to ensure obtrusive light is minimised in accordance with best practice.
- 1.1.4. This report outlines the following:
- > Relevant obtrusive light policies in direct relation to the Proposed Development;
 - > Relevant National and Local Policies;
 - > Why the Proposed Development requires artificial lighting; and
 - > Details as to how lighting will be implemented for the Proposed Development.
- 1.1.5. Through careful design and mitigation, this Lighting Strategy ensures the lighting installation at the Proposed Development will be in accordance with Guidance and Local Policy.

¹ <https://www.dfl-uk.com/about/>

2. LEGISLATIVE FRAMEWORKS AND NATIONAL POLICIES

2.1. Environmental Protection Act 1990 / Clean Neighbourhoods and Environment Act 2005

- 2.1.1. Since 2005, artificial light has been incorporated as a potential statutory nuisance. An amendment to section 79 of the Environmental Protection Act 1990, contained within the Clean Neighbourhoods and Environment Act 2005 states: ²

"The following matters constitute "statutory nuisances" for the purposes of this Part, that is to say— [...]

[...] artificial light emitted from premises so as to be prejudicial to health or a nuisance;

[...]and it shall be the duty of every local authority to cause its area to be inspected from time to time to detect any statutory nuisances which ought to be dealt with under section 80 and, where a complaint of a statutory nuisance is made to it by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint".

2.2. National Planning Policy Framework 2024 (Amended 2025)

- 2.2.1. The National Planning Policy Framework (NPPF) sets out the government's planning policies for England and how they are expected to be applied and provides a framework for local plans. With regard to light pollution, the NPPF was updated in February 2025 and states that the following elements are to be considered⁴:

"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:

- *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life,*
- *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- *limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."*

² <https://www.legislation.gov.uk/ukpga/1990/43/part/III/crossheading/statutory-nuisances-england-and-wales> Section 79, paragraph 1,

³ 2005 Section 102 relating to section 79, Indent reference (fb)

⁴ Paragraph 198 NPPF 2024 page 57

2.3. Planning Practice Guidance

2.3.1. Guidance for assessing the effects of proposed artificial lighting is outlined in the planning practice guidance (PPG). The guidance states:⁵

“Does an existing lighting installation make the proposed location for a development unsuitable, or suitable only with appropriate mitigation? For example, this might be because:

- *the artificial light has a significant effect on the locality; and/or*
- *users of the Proposed Development (e.g., a hospital) may be particularly sensitive to light intrusion from the existing light source.*

Where necessary, development proposed in the vicinity of existing activities may need to put suitable mitigation measures in place to avoid those activities having a significant adverse effect on residents or users of the proposed scheme, reflecting the agent of change principle. Additional guidance on applying this principle is set out in the planning practice guidance on noise.

- *Will a new development, or a proposed change to an existing site, be likely to materially alter light levels in the environment around the site and/or have the potential to adversely affect the use or enjoyment of nearby buildings or open spaces?*
- *Will the impact of new lighting conflict with the needs of specialist facilities requiring low levels of surrounding light (such as observatories, airports and general aviation facilities)? Impacts on other activities that rely on low levels of light such as astronomy may also be a consideration but will need to be considered in terms of both their severity and alongside the wider benefits of the development.*
- *Is the development in or near a protected area of dark sky or an intrinsically dark landscape where new lighting would be conspicuously out of keeping with local nocturnal light levels, making it desirable to minimise or avoid new lighting?*
- *Would new lighting have any safety impacts, for example in creating a hazard for road users?*
- *Is a proposal likely to have a significant impact on a protected site or species? This could be a particular concern where forms of artificial light with a potentially high impact on wildlife and ecosystems (e.g. white or ultraviolet light) are being proposed close to protected sites, sensitive wildlife receptors or areas, including where the light is likely to shine on water where bats feed.*
- *Does the Proposed Development include smooth, reflective building materials, including large horizontal expanses of glass, particularly near water bodies? (As it may change natural light, creating polarised light pollution that can affect wildlife behaviour.)”*

⁵ <https://www.gov.uk/guidance/light-pollution>, Paragraph 002 Ref ID: 31-002-20191101 revision 01 11 2019

3. LOCAL POLICIES

3.1. Horsham District Council, Horsham District Planning Framework (Adopted November 2015)

- 3.1.1. The relevant Local Planning Authority (LPA) for the Proposed Development is the Horsham District Council with policies detailed within the Horsham District Planning Framework applying to the lighting associated with the Proposed Development.

The applicable policies are:

"Policy 24 - Strategic Policy: Environmental Protection

The high quality of the district's environment will be protected through the planning process and the provision of local guidance documents. Taking into account any relevant Planning Guidance Documents, developments will be expected to minimise exposure to and the emission of pollutants including noise, odour, air and light pollution..."

"Policy 27 - Strategic Policy: Settlement Coalescence

Landscapes will be protected from development which would result in the coalescence of settlements.

Development between settlements will be resisted unless it can be demonstrated that:

- 2. It does not generate urbanising effects within the settlement gap, including artificial lighting, development along key road corridors, and traffic movements."*

"Policy 30 - Protected Landscapes

- 1. The natural beauty and public enjoyment of the High Weald AONB and the adjoining South Downs National Park will be conserved and enhanced and opportunities for the understanding and enjoyment of their special qualities will be promoted. Development proposals will be supported in or close to protected landscapes where it can be demonstrated that there will be no adverse impacts to the natural beauty and public enjoyment of these landscapes as well as any relevant cross boundary linkages."*

4. GUIDANCE

4.1. Guidance Notes for the Reduction of Obtrusive Light (Institution of Lighting Professionals GN01:2021)

- 4.1.1. This Lighting Strategy has been developed in accordance with industry guidance aimed at minimising the risk of obtrusive light, which often results from poorly designed or installed external lighting. It draws specifically on the most relevant sections of GN01:2021, which provides best practice recommendations for reducing obtrusive light across a wide range of outdoor lighting applications.

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA Dark Sky Parks.
E1	Natural	Intrinsically dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, etc.
E2	Rural	Low district brightness (SQM ~ 15 to 20)	Sparsely inhabited rural areas, Village or relatively dark outer suburban locations.
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres or suburban locations.
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity.

Table 1: Environmental Zone Descriptions

Environmental Zones	Sky Glow ULR ⁷ (Max %)	Light Trespass (Into Windows) E _v (lux)		Building Luminance Average, Pre-curfew
		Pre-Curfew	Post-Curfew ⁸	Average L (cd/m ²)
E0	0	0	0	0
E1	0	2	0.1 (1 ⁹)	0
E2	2.5	5	1	5
E3	5	10	2	10
E4	15	25	5	25

Table 2: Obtrusive Light Criteria

6 Areas of Outstanding Natural Beauty (AONBs) have been redefined as National Landscapes. References within ILP GN01:2021 to AONBs should therefore be interpreted accordingly. This documentation will be updated in line with this change in future ILP guidance revisions as they are published.

7 ULR (Upward Light Ratio) is the maximum permitted percentage of luminaire flux that goes directly into the sky.

8 Curfew refers to a time when the local planning authority has agreed that the lighting installation should be switched off; this typically refers to 23h00 – 07h00

9 If the installation is for public (road) lighting, then this may be up to 1 lx

4.2. GN08:2023 Bats and Artificial Lighting in the UK – Bat Conservation Trust and Institution of Lighting Professionals.

4.2.1. 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. However, it is not meant to replace site-specific ecological and lighting assessments.

4.2.2. Based on the information provided the following limitations are recommended:

- Horizontal light levels are not exceeding 0.2 lux¹⁰
- Vertical light levels are not to achieve greater than 0.4 lux between 1.5mtrs and 6.5 mtrs above ground level¹¹
- Correlated Colour Temperature (CCT) will be equal to or less than 2700K¹²

4.2.3. Where standardised mitigation is to be used, the Bat Conservation Trust Guidance (BCT), Landscape and urban design for bats and biodiversity¹³ is consulted using the following methods in conjunction with ILP guidance (GN08).

- Minimum light for safety is to be used (as per relevant guidance documents)
- Flat cut-off lanterns are to be proposed
- The most appropriate narrow spectrum light will be used avoiding blue wavelengths (less than 2700K)
- Pedestrian lighting in close proximity will be targeted below 3 Lux
- Increased lantern spacing
- Lighting of only high risk stretches of roads allowing headlights to provide necessary illumination at other times
- Limiting the times of use to provide dark periods
- Use of temporary close-boarded fencing until vegetation matures shielding sensitive areas from lighting
- Deployment of hop-over at crown height, hop over vegetation, hop over vegetation and walls and viaduct bridges

4.2.4. Whilst lighting will be designed to comply with the GN08:2023 criteria for creation of a dark corridor (horizontal of 0.2 lux and vertical of 0.4 lux) any break in a foraging route will either be reconnected, diverted or mitigated where possible.

10 GN08:2023 Paragraph 4.54 page38.

11 GN08:2023 paragraph 4.56 page 39 for 1.5m height, 6.5m height based on the underside of an established tree canopy.

12 GN08:2023 paragraph 4.29 page 29, BCT Bats and Lighting, Overview of current evidence and Mitigation paragraph 3.1.1 page 22.

13 BCT Landscape and Urban design for bats and biodiversity page 28 and page 29.

5. DESKTOP STUDY

5.1. Site Description and Context

- 5.1.1. A desktop assessment was completed to understand the Application Site and its position within the current lit environment.
- 5.1.2. The Application Site is Roosthole house along Hammerpond Road, Horsham. The Application Site is located within the rural area to the east of Horsham town centre and south of St Leonard's Forest within the High Weald National Landscape. The boundary of the Application Site and layout is shown in **Figure 1**.



Figure 1: The Application Site Location and Boundary

- 5.1.3. The Proposed Development is for Roosthole and the application is described as

"Variation of Condition 1 of previously approved application reference DC/25/1832 (Demolition of existing garage and erection of single storey side extensions. Erection of a garage with studio above) to update block plan."

5.2. Designated Sensitive Site

5.2.1. The Application Site is within 2 km¹⁴ proximity of a designated Sites of Special Scientific Interest (SSSI) and National Landscape (Formerly AONBs). These are shown in **Figure 2** and referred to as:

- The Application Site is within the High Weald National Landscape
- St. Leonard's Forest (SSSI) 137m to the north and east of the Application Site
- St. Leonard's Park Ponds (SSSI) 1324m to the northwest of the Application Site

5.2.2. There are no designated Special Area of Conservation (SAC) within a radius of approximately 2 km¹⁵ of the Application Site.

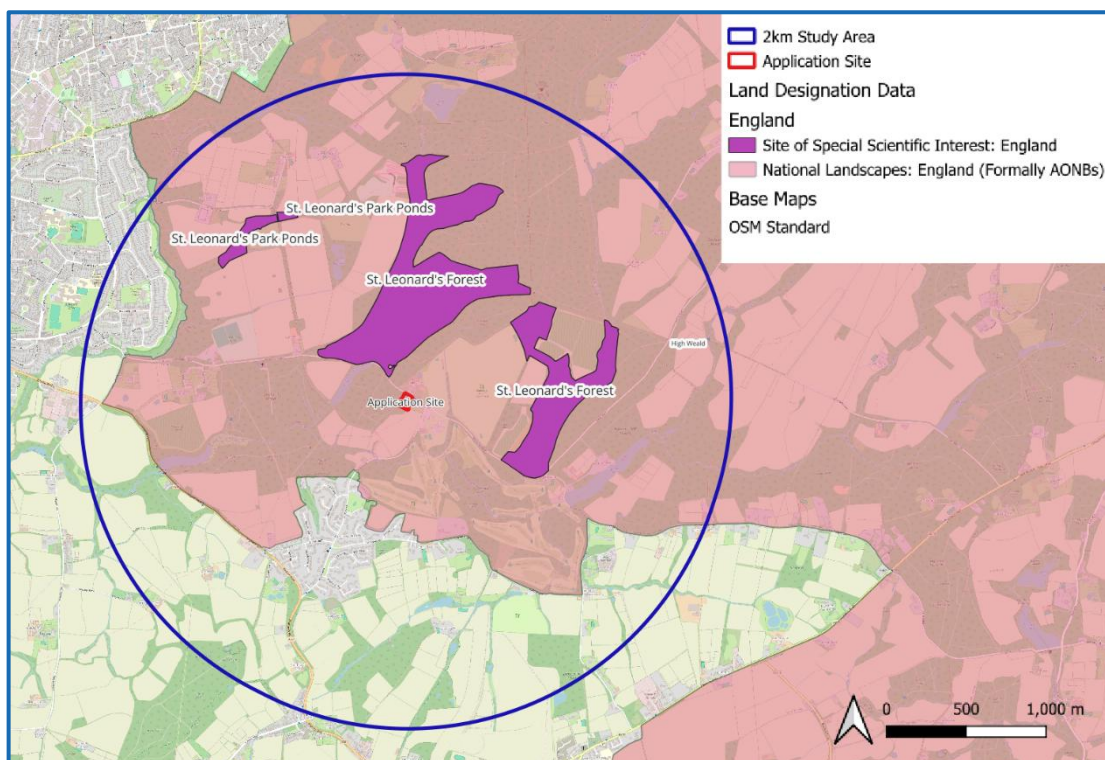


Figure 2: Site Designations

14 Based on empirical thresholds from visual impact studies, tall slender structures in open landscapes are typically prominent up to about 2 km, still relatively prominent between 2 and 5 km, and beyond this distance their prominence declines significantly, based on statements within Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes study (U.S.BLM-sponsored)

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5.3. Existing lighting

- 5.3.1. There is no lighting within the surrounding area of the Application Site. See **Figure 3** for visual representation of the surrounding environment from Hammerpond Road adjacent to the north of the Application Site.



Figure 3: View from Hammerpond Road adjacent to the north of the Application Site

- 5.3.2. There are low level driveway entry luminaires for wayfinding mounted at the entrance to Manning Health Estate which are visible from Hammerpond Road, shown in **Figure 4**.



Figure 4: View from Hammerpond Road of the entrance to Manning Health Estate

- 5.3.3. There is existing lighting within Mannings Health Golf Club which exhibits heritage styles column mounted luminaires and low-level bollard lighting. This is shown in **Figure 5**.



Figure 5: Existing lighting within Mannings Health Golf Club

5.4. Environmental Zone Classification

- 5.4.1. Based on the evidence of the existing lighting (seen in **Section 5.3**) and the description of the surrounding environment (seen in **Section 5.1**) are similar to those expected within an E1 zone.
- 5.4.2. The Environmental Zone criteria detailed within **Table 1** and **Table 2** informs the basis of the Lighting Strategy. The Application Site is assessed as being located within an E1 Environmental Zone due to its location within the High Weald National Landscape.

Zone	Surrounding	Examples	Limitations		Sky Glow ULR (Max)
			Pre-curfew	Post-curfew	
E1	Natural	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, etc.	2	0.1 (1)	0%

Table 3: Limitations of Identified Environmental Zone

6. IDENTIFIED RECEPTORS

6.1. Ecological

- 6.1.1. It has been assumed based on the available topographic view, that the areas to the west and northwest are likely to be ecologically sensitive. The visual location of these areas can be seen in **Appendix 3 – Sensitive Receptors**.
- 6.1.2. A description of the Potentially Sensitive Ecological Receptors can be seen in **Table 4**.

Receptor Type	Receptor No. (Appendix 3 – Sensitive Receptors)	Description
Ecology	PSER 001	Treeline and hedgerow to the West
Ecology	PSER 002	Treeline and hedgerow to the South
Ecology	PSER 003	Treeline and hedgerow to the East
Ecology	PSER 004	Treeline and hedgerow to the North

Table 4: Potentially Sensitive Ecological Receptors (PSER)

7. LIGHTING STRATEGY

7.1. Summary

- 7.1.1. The Proposed Development will require lighting for wayfinding and amenity at limited times during the hours of darkness. Lighting will be fit for purpose and sensitive to nearby ecological receptors.
- 7.1.2. The following criteria seek to ensure that the lighting is not outside of the obtrusive light limits for the Environmental Zone in which the Application Site is located: is sensitive to the area and provides a recognised standard level of lighting for all areas requiring illumination. Luminaires will distribute light downwards only to reduce the potential for light spill onto the boundaries surrounding the buildings and upwards towards the sky.
- 7.1.3. Amenity lighting for the Proposed Development will be applied sensitively to account for the receptors identified bounding the Application Site and within the Proposed Development.
- 7.1.4. Luminaires will be used with integral LEDs and only where the luminaire photometry is available from the manufacturer. This is to ensure the photometric footprint of the luminaires can be modelled to ensure the potential effects of light spill are minimised or mitigated.
- 7.1.5. All lighting, unless otherwise stated, is to emit a warm white colour temperature light (2700 Kelvin or less) to reduce the potential for adverse effects onto potentially sensitive receptors.
- 7.1.6. Lighting will be required in the following task areas:
 - > Residential Dwellings (Fronts & Rears)
 - > Driveway (Bollards)

7.2. Residential Dwelling (Fronts & Rears)

- 7.2.1. The residential dwelling within the Application Site will be illuminated at the front and rear of the property for amenity and wayfinding purposes. As the lighting is not subject to a specific British Standard, to reduce the potential light spill, limitations on the mounting height, output, direction, control and type of luminaire have been proposed.
- 7.2.2. Luminaires on the residential dwelling will be used with PIR sensors that turn on when motion is detected and turn off a few seconds after the motion is no longer detected. This ensures that lighting is only used when needed for the residents.

Equipment Specification	
Application Area	Residential Dwelling (Fronts & Rears)
Correlated Colour Temperature (Kelvin)	≤2700K
Lumen Output (lm)	≤550lm
Height (m)	≤2m
Mounting Arrangement	Wall mounted
Luminaire Tilt (°)	0°
Upward Light Output Ratio (%) E3 < 5%	<0%
Luminaire Manufacturer	Ligman (Or Similar Approved)
Luminaire family	Jet 4 (Or Similar Approved)
Example Luminaire Image	
Light Spill Diagram reference	Luminaire A
Controls¹⁶	PIR Sensors – turn on when motion detect, turn off 30 seconds after motion is no longer detected with override switch where necessary.

Table 5: Luminaire Performance Requirements for Residential Dwelling

¹⁶ Dimming: when dimming is applied it is announced as a percentage still in use of the total percentage output (dimmed too, not dimmed by).

Equipment Specification	
Application Area	Residential Dwelling (Frongs & Rears)
Correlated Colour Temperature (Kelvin)	≤2700K
Lumen Output (lm)	≤1380lm
Height (m)	≤2m
Mounting Arrangement	Wall mounted
Luminaire Tilt (°)	0°
Upward Light Output Ratio (%) E3 < 5%	<0%
Luminaire Manufacturer	Ligman (Or Similar Approved)
Luminaire family	Leeds T4 (Or Similar Approved)
Example Luminaire Image	
Light Spill Diagram reference	Luminaire B
Controls¹⁷	PIR Sensors – turn on when motion detect, turn off 30 seconds after motion is no longer detected with override switch

Table 6: Luminaire Performance Requirements for Residential Dwelling

¹⁷ Dimming: when dimming is applied it is announced as a percentage still in use of the total percentage output (dimmed too, not dimmed by).

7.3. Driveway (Bollards)

- 7.3.1. The driveway within the Application Site will be illuminated for amenity and wayfinding purposes. As the lighting is not subject to a specific British Standard, to reduce the potential light spill, limitations on the mounting height, output, direction, control and type of luminaire have been proposed.

Equipment Specification	
Application Area	Driveway
Correlated Colour Temperature (Kelvin)	≤2700K
Lumen Output (lm)	≤160lm
Height (m)	≤1m
Mounting Arrangement	Bollard
Luminaire Tilt (°)	0°
Upward Light Output Ratio (%)	0%
E3 < 5%	
Luminaire Manufacturer	Collingwood Lighting (Or Similar Approved)
Luminaire family	LED Wooden Bollard (Or Similar Approved)
Example Luminaire Image	
Light Spill Diagram reference	Luminaire C
Controls	Solar Time Clock (Dusk-till-Dawn) with override switch

Table 7: Luminaire Performance Requirements for the Staircase

8. SUMMARY OF RESULTS

8.1. Overview

8.1.1. The Light Spill Diagram shown in **Appendix 1 – Light Spill Diagram** and **Appendix 2 – Vertical Light Spill Diagram**, demonstrates that the Light Spill Levels associated with the proposed lighting would comply with the obtrusive light guidance set out in ILP GN01:2021, at sensitive receptors.

8.1.2. To ensure the worst-case scenario has been modelled, the highest potential light levels have been modelled / presented in the light spill diagram, with the project maintenance factors set at MF = 1.0¹⁸. This demonstrates the light levels at their highest (initial light levels at the start of luminaire life).

8.2. Summary of Results

8.2.1. The proposed lighting within the task area(s) is compliant to the relevant policies, standards and guidance.

8.2.2. Where ecological receptors are potentially sensitive to vertical light spill, a vertical illumination grid has been modelled, as shown in **Appendix 2 – Vertical Light Spill Diagram**. The light levels based on the modelling do not exceed 0.4 Lux, keeping the light levels within the guidance given within GN08:2023.

8.2.3. In line with section 4.56 of GN08:2023, the vertical grids will be mounted at a height of 1.5 metres above the ground level to simulate the likely flight path of a light sensitive bat.

Receptor No	GN08:2023 Requirements	Maximum Vertical Illuminance (Lux)
PSER 001	0.40 Lux	0.04
PSER 002	0.40 Lux	0.01
PSER 003	0.40 Lux	0.00
PSER 004	0.40 Lux	0.01

Table 8: PSER Results Table, Maximum Illuminance

¹⁸ <https://www.dfl-uk.com/knowledge-hub/faqs/>

8.3. Mitigation

- 8.3.1. Careful design ensures the lighting has been minimised onto sensitive receptors in accordance with standards and guidance.
- 8.3.2. Through the use of the control methods detailed in **Section 7**, the amount of light in the affected Application Area is to be restricted to the amount of time required for amenity and wayfinding purposes only.
- 8.3.3. The detailed design is to be completed by a competent person or persons in accordance with the details within this Lighting Strategy.
- 8.3.4. Mitigation is detailed in **Table 9**.

Mitigation	Method
Restricting the Upward Light Output Ratio	All luminaires will have an Upward Light Output Ratio of 0% as per the requirements from GN01:2021 for the identified E1 environment.
Restricting Luminaire Tilt	All luminaires will be installed with a 0° as standard.
Using appropriate optics for the areas being illuminated	The luminaire optic used will be specific to the area being lit. This will ensure the task and area is lit to a standard level of light, while also allowing the Lux contours to be shaped to the specific areas.
Only using Luminaires where Photometry is Available from the Manufacturer	Luminaires will be used with integral LEDs and only where the luminaire photometry is available from the manufacturer. This is to ensure the photometric footprint of the luminaires can be modelled to ensure the potential effects of light spill are minimised or mitigated.
PIR Sensors on Residential Dwellings	PIR Sensors will be installed on luminaires at the front and rear of residential dwellings which ensure lighting is only used when needed by detecting motion.

Table 9: Mitigation Methods

9. CONCLUSION

9.1. General

- 9.1.1. Lighting associated with the Proposed Development shall be designed in accordance with the Lighting Strategy for the Application Site outlined in **Section 7**.
- 9.1.2. This Lighting Strategy has been written in accordance with the relevant industry guidance and local policies to ensure it is unlikely to give rise to obtrusive light with the potential to affect environmental and ecological receptors.
- 9.1.3. Through the application of this Lighting Strategy sensitive receptors will not be adversely affected by obtrusive light, as shown in **Appendix 1 – Light Spill Diagram** and **Appendix 2 – Vertical Light Spill Diagram**.
- 9.1.4. The proposed lighting scheme has been designed to minimise impacts on biodiversity and sensitive ecological receptors. The assessment demonstrates that lighting levels within areas used by bats for commuting and foraging remain within the relevant guidance limits and that dark corridors are maintained where required.
- 9.1.5. It is therefore concluded that the proposed lighting scheme will not adversely affect bats or other sensitive ecological features and complies with the requirements of the planning condition. The information provided is considered sufficient to support the discharge of the condition
- 9.1.6. Through careful design and mitigation, this Lighting Strategy ensures the lighting installation at the proposed development will be in accordance with Guidance and Local Policy (Horsham District Planning Framework).

APPENDIX 1 – LIGHT SPILL DIAGRAM

See accompanying document 4723-DFL-ELG-XX-LD-EO-13001-S3

APPENDIX 2 – VERTICAL LIGHT SPILL DIAGRAM

See accompanying document 4723-DFL-ELG-XX-CA-EO-13001-S3

APPENDIX 3 – SENSITIVE RECEPTORS



Figure 6: Sensitive Receptors

TECHNICAL DESCRIPTIONS, DEFINITIONS AND ABBREVIATIONS

PHAR: is an abbreviation for a potential human amenity receptor, a location where an observer could have the potential to be affected by the proposed lighting to be installed [Abbreviation used by DFL LI and P.](#)

PSER: is an abbreviation for an area identified as or treated as a location that may host a potentially sensitive ecological receptor. This is generally used where light sensitive bats have the potential to live, forage or use as a flight path, other ecologically sensitive receptors such as (but not limited to) the Great Crested Newt may also be identified by this term. [Abbreviation used by DFL LI and P.](#)

PSR: is an abbreviation for an area where an individual maybe susceptible to light brightness (Light intensity) which may have the potential to cause a hazardous situation. [Abbreviation used by DFL LI and P.](#)

Obtrusive Light: refers to excessive or bothersome artificial light that goes where it shouldn't, causing discomfort and disruption. *Spill light which because of quantitative, directional or spectral attributes in a given context gives rise to annoyance, discomfort, distraction or reduction in the ability to see essential information.* [CIBSE LG21 Lighting Guide 21: Protecting the night-time environment.](#)

Sky glow: When lights are directed upwards or light is scattered by particles in the air, like dust or water droplets, it creates a glow that makes it hard to see stars. *The increase in diffuse illuminance of the night sky above that produced by natural sources such as the moon and visible star.* [CIBSE LG21 Lighting Guide 21: Protecting the night-time environment.](#)

Vertical Illuminance: is how much light lands on upright surfaces like walls. It's measured in lux or footcandles and matters for places where the view from a vertical angle is important. *Lighting of vertical surfaces such as walls, windows, statues, sculptures and people's faces.* [CIBSE LG21 Lighting Guide 21: Protecting the night-time environment.](#)

Correlated colour temperature (CCT): the appearance of light emitted by a light source measured in Kelvin (K), Lower CCT values such as 2700K represent warmer, more yellowish light, *similar to the light from older incandescent lamps. (Tcp)The temperature of the Planckian radiator whose perceived colour most closely resembles that of a given stimulus at the same brightness and under specified viewing conditions, measured in absolute temperature on the kelvin (K) scale.* [CIBSE LG21 Lighting Guide 21: Protecting the night-time environment.](#)

Lux: measures the brightness of light as perceived by the human eye at a specific point on a surface. *The SI derived unit of illuminance, measuring luminous flux per unit area (1 lux = 1 lumen/m²).* [CIBSE LG21 Lighting Guide 21: Protecting the night-time environment.](#)

Lumens: measure how bright a light appears to our eyes. The SI derived unit of luminous flux; a measure of the total quantity of visible light emitted by a source or received by a surface (unit: lumen). [CIBSE LG21 Lighting Guide 21: Protecting the night-time environment.](#)

Glare: refers to an excess of bright light that makes you uncomfortable or hinders your vision. It happens when there's a big difference between a bright light and the rest of the surroundings. *Glare: condition of vision in which there is discomfort or a reduction in the ability to see details or objects, caused by an unsuitable distribution or range of luminance, or by extreme contrasts.* [BS EN 12665-2018, Light and lighting - Basic terms and criteria for specifying lighting requirements, Section 3.1.8](#)

Luminous intensity: is light brightness or how intense the light source is. light intensity is how intense a light source is emitted or received in a particular direction, this is measured candelas and is termed as luminous intensity I_v *<of a source, in a given direction> quotient of the luminous flux, $d\Phi_v$, leaving the source and propagated in the element of solid angle $d\Omega$ containing the given direction, by the element of solid angle (unit: $cd = lm \cdot sr^{-1}$.* [BS EN 12665-2018, Light and lighting - Basic terms and criteria for specifying lighting requirements, Section 3.2.2.](#)

Candela: is a measurement for the brightness of a light source, taking into account the direction in which the light is emitted. *Base unit of luminous intensity in the International System of Units (SI); the luminous power per unit solid angle emitted by a point light source in a particular direction.* [CIBSE LG21 Lighting Guide 21: Protecting the night-time environment.](#)

Uniformity (Uo): is an explanation for the even distribution of light across an area or surface. The overall uniformity shall be calculated as the ratio of the lowest luminance, occurring at any grid point in the field of calculation, to the average luminance. [BS EN 13201-3-2015, Calculation of Performance Section 8.3.](#)

Luminance: is how bright a surface appears to our eyes. It considers the light coming from or reflected by an object. L_v <in a given direction, at a given point of a real or imaginary surface> quantity defined by the formula (unit: $\text{cd} \cdot \text{m}^{-2} = \text{lm} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$) [BS EN 12665-2018, Light and lighting - Basic terms and criteria for specifying lighting requirements, Section 3.2.3.](#)

Illuminance is how much light lands on a surface per square meter. It's measured in lux. More lux means a brighter area. E_v (unit: $\text{lx} = \text{lm} \cdot \text{m}^{-2}$) 1. <at a point of a surface> quotient of the luminous flux $d\Phi_v$ incident on an element of the surface containing the point, by the area dA of that element 2. <at a point of a surface> equivalent definition: integral, taken over the hemisphere visible from the given point, of the expression. [BS EN 12665-2018, Light and lighting - Basic terms and criteria for specifying lighting requirements, Section 3.2.10.](#)

Luminaire: a light fixture, this is also sometimes referred to as a lantern or a light fitting, is a product that produces artificial light. *apparatus which distributes, filters or transforms the light transmitted from one or more lamps and which includes, except the lamps themselves, all the parts necessary for fixing and protecting the lamps and, where necessary, circuit auxiliaries together with the means for connecting them to the electric supply* [BS EN 12665-2018, Light and lighting - Basic terms and criteria for specifying lighting requirements, Section 3.3.3](#)

ULOR: upward light output ratio or ULOR refers to the amount of light the light fixture will produce upwards as a percentage of its total light output. *RULO <of a luminaire> ratio of the upward luminous flux of the luminaire, measured under specified practical conditions with its own lamp(s) and equipment, to the sum of the individual luminous fluxes of the same lamp(s) when operated outside the luminaire with the same equipment, under specified conditions* [BS EN 12665-2018, Light and lighting - Basic terms and criteria for specifying lighting requirements, Section 3.3.12.](#)

Maintenance factor (MF): is an allowance for how well the lights keep working overtime. It considers things like dirt on the light fittings and "wear and tear". *DEPRECATED: light loss factor ratio of illuminance produced by the lighting installation after a certain period to the illuminance produced by the installation when new* Note 1 to entry: The term depreciation factor has been formerly used to designate the reciprocal of the above ratio. Note 2 to entry: The maintenance factor takes into account light losses caused by dirt accumulation on luminaires and room surfaces (in interiors) or other relevant surfaces (in exteriors, where appropriate), and the decrease of the luminous flux of lamps. [BS EN 12665-2018, Light and lighting - Basic terms and criteria for specifying lighting requirements, Section 3.5.18.](#)

Tilt: is how much the luminaire is lifted based on the fitting facing flat to the ground.

Outreach: how far away the fitting is from the column/wall its mounted on to the light source.

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17/18 City Business Centre, Hyde
Street, Winchester, Hampshire,
SO23 7TA