



· LIGHTING DESIGN · ELECTRICAL · SMART CITIES ·
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SOUTH VIEW

LIGHTING TECHNICAL REPORT

DFL-UK

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EXECUTIVE SUMMARY

The Application Site is at South View on Top Road, Sharpthorne. The Proposed Development is for the creation of a 5-bedroom detached house.

The Application Site has been assessed as being located within an E2 Environmental Zone (see **Section 5** for details).

The Local Planning Authority for the Application Site is Mid Sussex District Council with policies relating to the proposed lighting detailed in the District Plan 2014 – 2031, Adopted March 2018. Guidance has also been considered from the District Plan 2021 – 2039 Submission Draft December 2023.

Lighting for Proposed Development has been applied sensitively to the Application Site due to its location within a residential area surrounded by a rural setting, including being located with the High Weald National Landscape.

The proposed lighting is compliant with the 0.4 Lux limitation from GN08:2023 on trees and the boundaries of the Application Site as is requested with the preliminary ecological assessment for the Proposed Development. Therefore, the Potentially Sensitive Ecology Receptors (PSER) **will not experience unacceptable levels of obtrusive light** from the implementation of the proposed lighting.

The proposed lighting is compliant with the post-curfew limitations from GN01:2021 on the Potential Human Amenity Receptors (PHAR) adjacent to the east of the Application Site and to the north along Top Road. The vertical illuminance calculations demonstrate that light levels on these receptors do not exceed the post curfew limits for an E1 environment zone. Therefore, **adjacent residential dwellings will not experience unacceptable levels of obtrusive light** from the implementation of the proposed lighting.

This Lighting Technical Report concludes that the proposed lighting achieves compliance with all relevant legislation, national and local policies and industry guidance including from the Institute of Lighting Professionals (ILP).

1. INTRODUCTION

1.1. General

- 1.1.1. This Lighting Technical Report 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 within this report is intended to set out a minimally obtrusive approach to the lighting, whilst ensuring it is necessary and considers the sensitivity of nearby human, environmental and ecological receptors.
- 1.1.3. Lighting associated with the Proposed Development will comply with relevant British Standards and Institution of Lighting Professionals (ILP) guidance 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 Technical Report ensures the lighting installation at the Proposed Development will be in accordance with British Standards, 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 ³light 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. Mid Sussex District Council, District Plan 2014 – 2031, Adopted March 2018.

- 3.1.1. The relevant Local Planning Authority (LPA) for the Proposed Development is the Mid Sussex District Council with policies detailed within the District Plan 2014 – 2031 applying to the lighting associated with the Proposed Development.

The applicable policies are:

“DP29: Noise, Air and Light Pollution

Strategic Objectives: 3) To protect valued landscapes for their visual, historical and biodiversity qualities; and

12) To support sustainable communities which are safe, healthy and inclusive. Evidence Base: Data held by Environmental Health, Air Quality Action Plan – Stonepound Crossroads, Hassocks.

The environment, including nationally designated environmental sites, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people’s life will be protected from unacceptable levels of noise, light and air pollution by only permitting development where:

Light pollution: The impact on local amenity, intrinsically dark landscapes and nature conservation areas of artificial lighting proposals (including floodlighting) is minimised, in terms of intensity and number of fittings;

The applicant can demonstrate good design including fittings to restrict emissions from proposed lighting schemes;

The degree of the impact of noise and light pollution from new development or change of use is likely to be greater in rural locations, especially where it is in or close to specially designated areas and sites.”

3.2. Mid Sussex District Council, District Plan 2021 – 2039 Submission Draft December 2023.

- 3.2.1. Policies are also detailed within the District Plan 2021 – 2039 which is a Submission Draft. However, despite this being a draft, this Lighting Technical Report has still considered the Policies applicable to the lighting associated with the Proposed Development.

The applicable policies are:

“DPN6: Pollution

Development must not cause or be adversely affected by pollution or hazards, including air, noise, vibration, light, water, soil, odour, dust or other pollutants, which significantly adversely impact on people, including health and quality of life, and the natural environment, including nature conservation sites. Mitigation measures may need to be implemented for development that is likely to increase levels of pollution or hazards, taking into account any cumulative impacts.”

“DPN8: Light Impacts and Dark Skies

People’s health and quality of life and the natural environment will be protected from unacceptable levels of light pollution.

Development proposals must demonstrate that all opportunities to reduce light pollution (including sky glow, glare and light spillage) have been taken including minimising impacts on local amenity, intrinsically dark landscapes including protected landscapes, the South Downs International Dark Sky Reserve (Moore’s Reserve) and areas important for nature conservation and nature recovery.

Artificial lighting proposals (including outdoor lighting, floodlighting and new street lighting) should be minimised in terms of intensity and number of fittings. The applicant must demonstrate all of the following:

- 1. The minimum amount of lighting necessary to achieve its purpose is specified or otherwise justified on safety or security grounds.*
- 2. The design and specification of the lighting would minimise sky glow, glare and light spillage in relation to the visibility of the night sky, local amenity and local character.*
- 3. The means of lighting would be unobtrusively sited.*
- 4. Low energy lighting is used.*
- 5. There would not be an adverse impact on wildlife such as through consideration of the appropriate siting, fitting, design, colour and temperature of lighting.*

Development proposals must carefully consider the design and layout of parking arrangements to avoid headlight nuisance.

Development proposals will need to take into account the Institute of Lighting Professionals guidance and other relevant guidance.”

4. GUIDANCE

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

- 4.1.1. This Lighting Technical Report 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 ⁶ (Max %)	Light Trespass (Into Windows) E _v (lux)		Building Luminance Average, Pre-curfew
		Pre- Curfew	Post-Curfew ⁷	Average L (cd/m ²)
E0	0	0	0	0
E1	0	2	0.1 (1 ⁸)	0
E2	2.5	5	1	5
E3	5	10	2	10
E4	15	25	5	25

Table 2: Obtrusive Light Criteria

⁶ ULR (Upward Light Ratio) is the maximum permitted percentage of luminaire flux that goes directly into the sky.

⁷ 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

⁸ 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 lux⁹
- Vertical light levels are not achieved greater than 0.4 lux⁹ between 1.5mtrs and 6.5 mtrs above ground level ¹⁰
- Correlated Colour Temperature (CCT) will be equal to or less than 2700K¹¹

4.2.3. Where standardised mitigation is to be used, the Bat Conservation Trust Guidance (BCT), Landscape and urban design for bats and biodiversity ¹²is consulted using the following methods in conjunction with ILP guidance (GN08).

- Minimum light for safety is to be used (as per British Standards or 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.

⁹ GN08:2023 Paragraph 4.54 page38

¹⁰ GN08:2023 paragraph 4.56 page 39 for 1.5m height, 6.5m height based on the underside of an established tree canopy.

¹¹ GN08:2023 paragraph 4.29 page 29, BCT Bats and Lighting, Overview of current evidence and Mitigation paragraph 3.1.1 page 22.

¹² 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 at South View on Top Road, Sharpthorne which is a residential area in a rural setting. The boundary of the Application Site can be seen in **Figure 1**.



Figure 1: The Application Site Location and Boundary

5.1.3. The Proposed Development is for a 5-bedroom detached house. The dwelling elevations and floor plans are shown in **Figure 2**.



Figure 2: Proposed Development Site Layout Plan

5.2. Designated Sensitive Site

5.2.1. The area is within 2 km¹³ proximity of a designated Sites of Special Scientific Interest Site (SSSI) and National Landscape (Formerly AONBs) these are shown in **Figure 3** and referend to as.

- The Application Site is within the High Weald National Landscape
- West Hoathly (SSSI) 206m northeast of the Application Site
- West Hoathly (Conservation Area) 907m west of the Application Site
- Philpot's and Hook Quarries (SSSI) 1745m west of the Application Site
- Weirwood Reservoir (SSSI) 1890m north of the Application Site

5.2.2. There is not a designated Special Area of Conservation (SAC) within a radius of approximately 2 km of the Application Site.

¹³ 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)

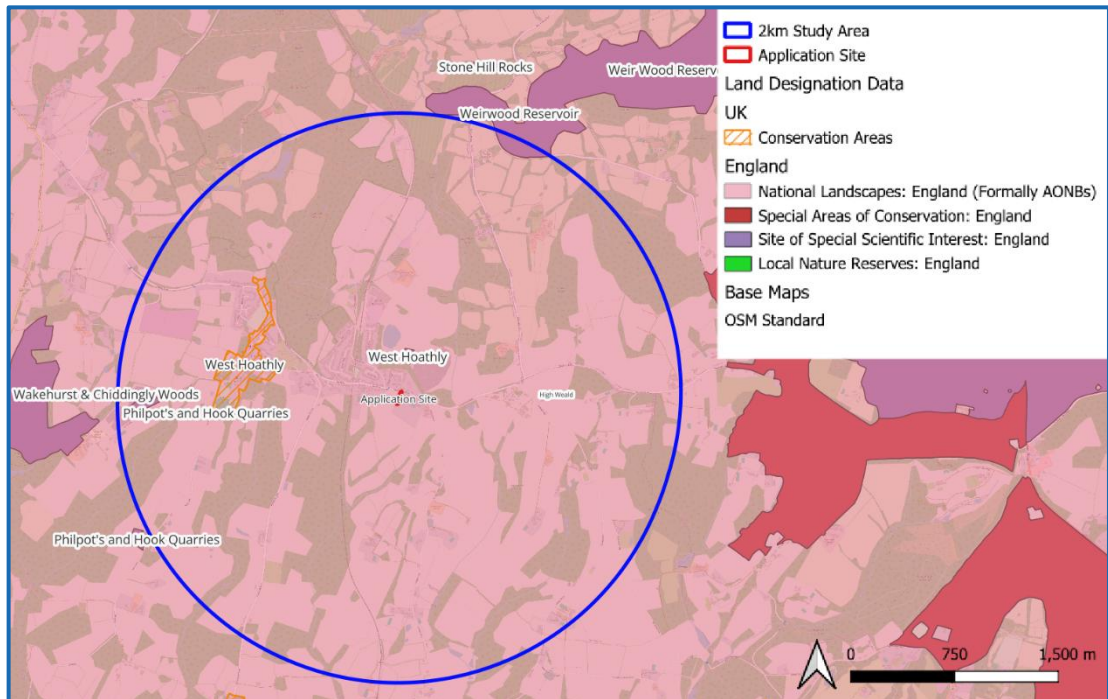


Figure 3: Site Designation

5.3. Existing lighting

- 5.3.1. Top Road runs from east to west adjacent to the Application Site and is an unlit road with a 30mph speed limit that adjoins to a section of road with a national speed limit. **Figure 4** shows the section of Top Road adjacent to the Application Site.



Figure 4: View of Top Road to the North of the Application Site

5.4. Environmental Zone Classification

- 5.4.1. Based on the evidence of the existing lighting (seen in **Section 5.3**), the description of the surrounding environment (seen in **Section 5.1**) and the Application Sites location within the High Weald National Landscape the relevant environmental zone is assessed as E1.
- 5.4.2. The Environmental Zone criteria detailed within **Table 1** and **Table 2** informs the basis of the Lighting Strategy.

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. The Preliminary Ecological Assessment from ASW Ecology Report Number ASW/LEL/146/29/2026 has identified both trees where bat boxes may be installed, and the boundaries of the Application Site as potentially sensitive to the effects of lighting due to the likely presence of bats.
- 6.1.2. A description of the potential ecology receptors can be seen in **Table 4**.

Receptor Type	Receptor No. (Appendix 3)	Description
Ecology	PSER 001	Both trees where bat boxes may be installed and the boundaries of the Application Site.

Table 4: Potentially Sensitive Ecology Receptors (PSER)

- 6.1.3. It should be noted that the Preliminary Ecological Assessment from ASW Ecology states that bat boxes should be installed at heights of 5-6 metres up tree trunks. This in of itself will ensure they are protected from any external light spill, due to the typical mounting heights of private residential lighting. However, this will be confirmed within the technical assessment (**Section 8**).
- 6.1.4. These locations have not been shown within **Appendix 3 – Sensitive Receptors**. However, the locations of the calculation grids for the ecology receptors can be seen within **Appendix 2 – Vertical Light Spill Diagram**.

6.2. Human Amenity

- 6.2.1. To the north and east of the Application Site, Potential Human Amenity Receptors (PHAR) have been identified as shown in **Appendix 3 – Sensitive Receptors**.
- 6.2.2. A description of the potential human receptors can be seen in **Table 5**.

Receptor Type	Receptor No. (Appendix 3)	Description
Human Amenity	PHAR 001	Residential dwellings adjacent to the east of the Application Site including Cookhams Cottage, Coach House, South View, Middle House and Little Cookhams.
Human Amenity	PHAR 002	Residential dwellings of 1 – 6 Glenham Place to the north of the Application Site.

Table 5: Potential Human Amenity Receptors (PHAR)

7. EXTERNAL LIGHTING STRATEGY

7.1. Summary

- 7.1.1. The Proposed Development will require lighting for amenity and wayfinding at limited times during the hours of darkness. Lighting will be fit for purpose and sensitive to nearby receptors.
- 7.1.2. The following criteria seeks to ensure that the lighting is not outside of the obtrusive light limits for the Environmental Zone in which the Application Site is located and is sensitive to the area. 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 to reduce the potential for adverse effects onto potentially sensitive receptors.
- 7.1.6. Lighting will be required in the following application areas:
 - > Dwelling access and egress points
 - > Access driveway

7.2. Dwelling Access & Egress Points

7.2.1. The dwelling access and egress points will be illuminated for amenity purposes only.

Equipment Specification	
Application Area	Dwelling Access & Egress Points
Correlated Colour Temperature (Kelvin)	≤2700K
Lumen Output (lm)	≤1010lm
Height (m)	≤2m
Mounting Arrangement	Wall mounted
Luminaire Tilt (°)	0°
Upward Light Output Ratio (%) E2 < 2.5%	0%
Luminaire Manufacturer	Ligman (Or Similar Approved)
Luminaire family	Jet (Or Similar Approved)
Example Luminaire Image	
Light Spill Diagram reference	Luminaire B
Controls ¹⁴	Presence detectors (PIR sensors) off 1 minute after movement no longer detected.

Table 6: Luminaire Performance Requirements for Access and Egress Points

¹⁴ 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. Access Driveway

7.3.1. The access driveway will be illuminated for amenity and wayfinding purposes.

Equipment Specification	
Application Area	Access Driveway
Correlated Colour Temperature (Kelvin)	≤2700K
Lumen Output (lm)	≤750lm
Height (m)	≤1m
Mounting Arrangement	Bollard (Ground Mounted)
Luminaire Tilt (°)	0°
Upward Light Output Ratio (%) E2 < 2.5%	0%
Luminaire Manufacturer	DW Windsor (Or Similar Approved)
Luminaire family	Pharola (Or Similar Approved)
Example Luminaire Image	
Light Spill Diagram reference	Luminaire A
Controls	Switching on/off for dusk and dawn (timeclock)

Table 7: Luminaire Performance Requirements for Driveway

7.4. Mitigation

- 7.4.1. Careful design ensures the lighting has been minimised onto sensitive receptors in accordance with standards and guidance.
- 7.4.2. 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 safety purposes only.
- 7.4.3. The detailed design is to be completed by a competent person or persons in accordance with the details within this Lighting Strategy.
- 7.4.4. Mitigation methods are detailed in **Table 8**.

Mitigation	Method
Restricting the Upward Light Output Ratio	All luminaires will have an Upward Light Output Ratio of 0%.
Restricting Luminaire Tilt	All luminaires will be installed with 0° of tilt as standard.
Restricting Correlated Colour Temperature (CCT) to 2700K	Restricting the colour temperature of luminaires to ≤2700K for a warm white colour appearance of the luminaire.
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 and mitigated.

Table 8: Mitigation Methods

8. TECHNICAL ASSESSMENT

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 and GN08:2023, 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 $MF = 1.0^{15}$. This demonstrates the light levels at their highest (initial light levels at the start of luminaire life).

8.2. External Lighting

- 8.2.1. Where 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 results of the modelling are summaries within **Table 9**.

Receptor No	GN01:2021 Requirements		Maximum vertical Illuminance (Lux)
	Pre-curfew	Post-curfew	
PHAR 001	2 Lux	0.1 (1) Lux	0.00 Lux
	2 Lux	0.1 (1) Lux	0.00 Lux
	2 Lux	0.1 (1) Lux	0.01 Lux
PHAR 002	2 Lux	0.1 (1) Lux	0.03 Lux
PSER 001	≤0.4 Lux		0.37 Lux
	≤0.4 Lux		0.25 Lux
	≤0.4 Lux		0.03 Lux
	≤0.4 Lux		0.00 Lux
	≤0.4 Lux		0.23 Lux

Table 9: PHAR Results Table, Maximum Illuminance

- 8.2.2. The result of the external lighting modelling shows that the external lighting is compliant with both the requirements of ILP GN01:2021 and ILP GN08:2023.

¹⁵ <https://www.dfl-uk.com/knowledge-hub/faqs/>

8.3. Internal Lighting Embedded Mitigation

- 8.3.1. The Proposed Development itself includes embedded features that will reduce the effects of light spill from internal lighting. These include:
- No glazing is proposed on the side elevations of the proposed dwelling. These are the closest elevations to any areas identified by ASW Ecology as potentially sensitive for ecological purposes.
 - The positioning of the proposed dwelling within the Application Site ensures that the front elevation is approximately 10m from the nearest tree which may have bat boxes installed within it.
 - The positioning of the proposed dwelling within the Application Site ensures that the rear elevation is approximately 14m from the nearest tree which may have bat boxes installed within it.
- 8.3.2. This will assist in ensuring that any effects of internal light spill are reduced or mitigated.

8.4. Indicative Modelling Methodology

- 8.4.1. To assess the potential light spill egress from the proposed development a standard internal light spill model has been used as follows:
- 8.4.2. This model is to show that light egress can be limited and is an *example model only*, it does not directly represent the developments proposed within the Application Site.



Figure 5: Visualisation of the indicative standard model

- 8.4.3. The Internal lighting to the property is based on a widely available LED downlight (Collingwood H2 Pro¹⁶, 550 lumen, 2700K downlight) with a medium beam angle, installed using maximum Space to Height Ratio (SHR_{max}) of 1.1, meaning that the maximum spacing would be 2.2 mtrs from each point based on a ceiling height of 2.8 m.
- 8.4.4. The buildings use the following reflectance factors:

¹⁶ [Availability of luminaires](#)

- > Exterior walls 17% (based on red brick)
- > Interior walls 50%, painted

8.4.5. The lighting transmission value (LTV) or transmission rate, is the amount of light that can transmit through the window, this can change between 90% to 60%. The LTV required is based on the distance to the target light level (≤ 0.4 Lux).

8.4.6. Typical glazing types are as outlined below:

- > High efficiency glazing 90% LTV
- > Standard double glazing 80% LTV
- > Triple glazing between 70% and 65% LTV
- > Specialist low LTV glazing $< 65\%$

8.4.7. This indicative modelling is undertaken with all lighting on, with no curtains or blinds in use, and with a maintenance factor of 1 use. Therefore, it represents a worst-case scenario for light spill out of private dwellings.

8.5. Indicative Modelling Methodology Results

8.5.1. Where glazing faces a boundary of the Application Site, to ensure that a dark corridor is unaffected by internal and external spill light, the mitigation measures outlined in **Table 10** should be applied to ensure that, based on a "standard installation" (as defined in the **Section 8.4**) the vertical light spill from the proposed dwelling will not affect the areas identified by ASW Ecology.

Egress Mitigation Chart				
Distance from Red Line Boundary	≥ 14 Metres	14 – 11 Metres	8 Metres	< 8 Metres
Maximum window transmission	$\leq 90\%$	$\leq 80\%$	$\leq 70\%$	No Installation
Predicted Maximum Light Spill	< 0.3 Lux	< 0.4 Lux	< 0.5 Lux	N/A

Table 10: Egress mitigation requirements (windows)

8.5.2. Based on this model, when following the mitigation detailed within **Table 10** the front and rear elevation of the proposed dwelling will not result in lighting spill from the glazing at the areas identified as sensitive by ASW Ecology. This is primarily due to the distance of these elevation from these locations as detailed within **Paragraph 8.3.1**, and that glazing is not proposed on the side elevations.

8.6. Technical Summary

- 8.6.1. The modelling results of the external lighting show that the External Lighting Strategy (**Section 7**) complies with the requirements of ILP GN01:2021 for an E1 environmental zone and with the requirements of ILP GN08:2023 for the protection of ecological sensitive areas.
- 8.6.2. Due to the positioning of the proposed dwelling within the Application Site as detailed within **Paragraph 8.3.1**, it is unlikely to give rise to significant effects of internal light spill when the mitigation detailed within **Table 10** is followed.

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 potentially sensitive receptors including any light spill through the windows of nearby residential dwellings is also unlikely to cause adverse effects.
- 9.1.3. Through the application of the External 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**. The calculations show compliance with both ILP GN01:2021 guidance for an E1 environmental zone and ILP GN08:2023 for the protection of ecology receptors.
- 9.1.4. The External Lighting Strategy ensures the minimisation of both light spill and light pollution, including upward light not exceeding 0% inline with E1 environmental zone limitations. This mitigates against possible skyglow from upward light to protect the night sky of the High Weald National Landscape as well as comply with Policy DPN8.
- 9.1.5. The proposed lighting has been applied sensitively to the Application Site and complies with Policy DP29 and DPN6 as light pollution will not have an excessive impact on human amenity, intrinsically dark landscapes or sensitive sites surrounding the Proposed Development.
- 9.1.6. Through careful design and mitigation, this External Lighting Strategy ensures the lighting installation at the proposed development will be in accordance with Guidance and Local Policy (Mid Sussex District Council's District Plan 2014 – 2031 & 2021 - 2039).
- 9.1.7. In addition to this, due to the positioning of the proposed dwelling within the Application Site and when following the mitigation detailed within **Table 10**, the internal lighting will not have a significant effect on the identified receptors.

APPENDIX 1 – LIGHT SPILL DIAGRAM

See accompanying document 4566-DFL-ELG-XX-LD-EO-13001

APPENDIX 2 – VERTICAL LIGHT SPILL DIAGRAM

See accompanying document 4566-DFL-ELG-XX-CA-EO-13001

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: $cd \cdot m^{-2} = lm \cdot m^{-2} \cdot sr^{-1}$) [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: $lx = lm \cdot m^{-2}$) 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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