



· LIGHTING DESIGN · ELECTRICAL · SMART CITIES ·
ENERGY REDUCTION · LIGHTING IMPACT

HAWKE RIDGE BUSINESS PARK, WESTBURY

LIGHTING IMPACT ASSESSMENT

DFL-UK

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EXECUTIVE SUMMARY

The Lighting Impact Assessment has been prepared in accordance with relevant industry guidance and local planning policy, with the aim of preventing obtrusive light and minimising potential impacts on both human and ecological receptors.

The Application Site (Hawke Ridge Business Park, Westbury BA13 4LD) is considered to fall within an E2 environmental zone due to its location outside the settlement of Westbury.

The Proposed Development is for

"Erection of: (i) 1 No. retail convenience store (Class E), 3 No. flexible retail units (Class E), and roadside drive through unit (sui generis); (ii) a 64-bed care home (Class C2); and (iii) 249 No. residential dwellings (Class C3) with associated access, green and blue infrastructure works."

The development of the Lighting Strategy has taken into consideration the needs of the site user whilst still accounting for the surrounding relevant sensitivities and ensuring the Trowbridge and Westbury Bat Mitigation Strategy is appropriately considered.

The proposed lighting design has been developed to meet the applicable industry guidance, as well as local planning policy requirements. Compliance is achieved through the use of luminaires directing light downwards, with no upward light emitted from the fittings, and by limiting mounting heights to reduce light spill.

The ecological receptors within and surrounding the Application Site have been identified by a qualified ecologist, and these locations have been assessed within the Lighting Impact Assessment.

The proposed Lighting Strategy (**Appendix 1**) has been specifically developed to minimise potential disturbance to sensitive habitats and protected species through the use of warm colour temperatures, the proposing of back light shielding where appropriate, and the careful and selective lighting of the Proposed Development. Collectively, these measures are intended to limit unnecessary light spill and maintain dark areas where required, whilst continuing to achieve the necessary operational functionality and safety requirements of the development.

For human receptors, the worst likely outcome is a **Neutral or Slight** residual effect on all receptors. **Neutral or Slight** as defined by **Table 7** is *"No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error."* And *"Effects at this level are not material in the decision-making process."*

For ecological receptors, the worst likely outcome is a **Slight** residual effect on receptors. **Table 7** defines **Slight** as *"Effects at this level are not material in the decision-making process."*

1. INTRODUCTION

1.1. Overview

- 1.1.1. This Lighting Impact Assessment has been prepared by DFL (Designs for Lighting Ltd), a leading lighting design consultancy renowned for delivering expert Lighting Impact Assessments, innovative obtrusive light mitigation strategies, and precision-engineered lighting designs.
- 1.1.2. The Lighting Impact Assessment assessed the proposed lighting for development Hawke Ridge Business Park, Westbury BA13 4LD (referred to as Application Site hereafter).
- 1.1.3. The Proposed Development is:
- "Erection of: (i) 1 No. retail convenience store (Class E), 3 No. flexible retail units (Class E), and roadside drive through unit (sui generis); (ii) a 64-bed care home (Class C2); and (iii) 249 No. residential dwellings (Class C3) with associated access, green and blue infrastructure works."*
- 1.1.4. Lighting associated with the Proposed Development will follow relevant British Standards and Institution of Lighting Professionals (ILP) guidance to ensure obtrusive light is minimised in accordance with best practice.
- 1.1.5. A Lighting Strategy (**Appendix 1**) has been developed for the Proposed Development. This Lighting Impact Assessment assesses the potential effects of the lighting proposed within this strategy on receptors that have been identified surrounding the Application Site.
- 1.1.6. This report outlines the following:
- Relevant obtrusive light policies in direct relation to the Proposed Development,
 - Relevant National and Local Policies,
 - Relevant Guidance Documents,
 - Why the Proposed Development requires artificial lighting,
 - Details as to how lighting will be implemented for the Proposed Development,
 - The existing lighting conditions within and surrounding the Application Site,
 - Those locations that are sensitive to lighting, and;
 - The potential effects of the proposed lighting on those areas that have been identified as sensitive to lighting.

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:

“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 considered:

“198. 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.”*

2.3. 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:

"The following questions indicate matters that may need to be considered in relation to managing the effects of light pollution:

- *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.)"*

Paragraph 002 Ref ID: 31-002-20191101 revision 01 11 2019

3. LOCAL POLICIES

3.1. Introduction

3.1.1. The relevant Local Planning Authority (LPA) for the Proposed Development is Wiltshire Council. Wiltshire Council have published several documents that contain policies relevant to the Application Site, these are:

➤ Wiltshire Core Strategy adopted January 2015

3.1.2. The relevant Local Highway Authority (LHA) for the Application Site is Wiltshire Council. Wiltshire Council have published an adoptable specification for lighting systems as detailed in the documents:

- Residential Lighting Specification (LED and CMS) Generic Revision R Draft
- Non-Residential Lighting Specification (LED and CMS) Generic Revision L Draft

3.2. Wiltshire Core Strategy, Adopted January 2015

3.2.1. The applicable policies are:

"CP50 – Biodiversity and geodiversity

Protection

All development proposals shall incorporate appropriate measures to avoid and reduce disturbance of sensitive wildlife species and habitats throughout the lifetime of the development.

Local sites

Sustainable development will avoid direct and indirect impacts upon local sites through sensitive site location and layout, and by maintaining sufficient buffers and ecological connectivity with the wider environment. Damage or disturbance to local sites will generally be unacceptable, other than in exceptional circumstances where it has been demonstrated that such impacts:

- i. cannot reasonably be avoided*
- ii. are reduced as far as possible*
- iii. are outweighed by other planning considerations in the public interest*
- iv. where appropriate compensation measures can be secured through planning obligations or agreements.*

Development proposals affecting local sites must make a reasonable contribution to their favourable management in the long-term."

“CP51 – Landscape

Development should protect, conserve and where possible enhance landscape character and must not have a harmful impact upon landscape character, while any negative impacts must be mitigated as far as possible through sensitive design and landscape measures. Proposals should be informed by and sympathetic to the distinctive character areas identified in the relevant Landscape Character Assessment(s) and any other relevant assessments and studies. In particular, proposals will need to demonstrate that the following aspects of landscape character have been conserved and where possible enhanced through sensitive design, landscape mitigation and enhancement measures:

vi. Important views and visual amenity.

vii. Tranquillity and the need to protect against intrusion from light pollution, noise, and motion.”

“CP57 – Ensuring high quality design and place shaping

A high standard of design is required in all new developments, including extensions, alterations, and changes of use of existing buildings. Development is expected to create a strong sense of place through drawing on the local context and being complementary to the locality. Applications for new development must be accompanied by appropriate information to demonstrate how the proposal will make a positive contribution to the character of Wiltshire through:

(...) vii. having regard to the compatibility of adjoining buildings and uses, the impact on the amenities of existing occupants, and ensuring that appropriate levels of amenity are achievable within the development itself, including the consideration of privacy, overshadowing, vibration, and pollution (e.g. light intrusion, noise, smoke, fumes, effluent, waste or litter)”

4. BRITISH STANDARDS

4.1. **BS 5489-1:2020 - Lighting of Roads and Public Amenity Areas - Code of practice**

- 4.1.1. This standard gives recommendations on the general principles of road lighting, its aesthetics and technical aspects and provides guidance on operational maintenance. It also provides guidance on means of minimizing energy consumption and limiting the impacts on the environment and adjacent properties.

4.2. **BS EN 13201-2:2015 - Road lighting. Performance requirements**

- 4.2.1. This British and European standard defines the performance requirements specified as lighting classes for road lighting aiming at the visual needs of the road users, as well as the consideration of the environmental aspects of the road lighting to be applied.

4.3. **BS EN 12464-2:2024 - Light and Lighting – Lighting of workplaces**

- 4.3.1. This British and European standard specifies lighting requirements for outdoor workplaces which meet the needs for visual and task performance. All visual tasks are considered with the exclusion of emergency lighting.

5. GUIDANCE

5.1. Institution of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light GN01:2021

5.1.1. The Lighting Strategy within this Lighting Impact Assessment is informed by industry guidance note GN01:2021 which aims to reduce the potential for obtrusive light to occur, which is typically caused by poorly designed and installed exterior artificial lighting.

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	Astronomical Observable dark skies, UNESCO starlight reserves, IDA Dark Sky Parks.
E1	Natural	Intrinsically dark	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, etc.
E2	Rural	Low district brightness	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

Zones	Sky Glow ULR ¹ (Max %)	Light Trespass (Into Windows) E _v (lux)		Building Luminance Average, Pre-curfew
		Pre-Curfew	Post-Curfew ²	Average L (cd/m ²)
E0	0	0	0	0
E1	0	2	0.1(1*) ³	0
E2	2.5	5	1	5
E3	5	10	2	10
E4	15	25	5	25

Table 2: Obtrusive Light Criteria

¹ ULR (Upward Light Ratio) is the maximum permitted percentage of luminaire flux that goes directly into the sky.

² 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.

³ If the installation is for public (road) lighting, then this may be up to 1 lx

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

5.2.1. 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.

5.2.2. Based on the information provided the following limitations are recommended

- Horizontal light levels are not exceeding 0.2 lux⁴
- Vertical light levels are not achieved greater than 0.4 lux⁹ between 1.5mtrs and 6.5 mtrs above ground level ⁵
- Correlated Colour Temperature (CCT) will be equal to or less than 2700K⁶

5.2.3. Where standardised mitigation is to be used, the Bat Conservation Trust Guidance (BCT), Landscape and urban design for bats and biodiversity ⁷is 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, walls and viaduct bridges.

5.2.4. 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.

⁴ GN08:2023 Paragraph 4.54 page38

⁵ GN08:2023 paragraph 4.56 page 39 for 1.5m height, 6.5m height based on the underside of an established tree canopy.

⁶ GN08:2023 paragraph 4.29 page 29, BCT Bats and Lighting, Overview of current evidence and Mitigation paragraph 3.1.1 page 22.

⁷ BCT Landscape and Urban design for bats and biodiversity page 28 and page 29

5.3. Trowbridge and Westbury Bat Mitigation Strategy Summary

- 5.3.1. This document is aimed at lighting professionals, lighting designers, planning officers, developers, bat workers/ecologists and anyone specifying lighting within the consultation zones of the Bath and Bradford on Avon Bats Special Area of Conservation (SAC) in the Trowbridge and Westbury area. It is intended to raise awareness of the impacts of artificial lighting on bats, and mitigation is suggested for various scenarios within each zone of influence. The key text from this guidance document relevant to the Lighting Impact Assessment is:

"8.3.1 Illuminance Zones

173. Development sites should include a discrete buffer zone oriented parallel to each retained bat habitat feature. The zones shown on Figure 6 and described below must be used to determine the boundaries for the control of light spill to be imposed at the outset of scheme design.

174. It is critical that the bat habitat zone (Zone A) is maintained in 'completely dark' conditions, defined as < 0.2 lux on the horizontal plane and less than 0.4 lux on the vertical plane (measured at 1.5m and 4m) (Bat Conservation Trust and Institution of Lighting Professionals, 2018). There must be no glare impact from the development within this zone. Where baseline levels are above the lux levels stated here, the development design should ensure there is no increase above existing background light levels and ideally, where possible, reduce these towards completely dark conditions.

175. The buffer zone (Zone B) is the area where the urban environment gives way to softer landscaping and natural features. It is expected that habitat sympathetic to the bat habitat zone will be created in the buffer zone. However, the buffer zone can also be multi-functional in that it can be used as public open space, access for pedestrians and cyclists, soft landscaping with native species, or fencing. It is critical that the buffer zone is unlit, with strict illuminance targets to be met (within the range of <1 lux on the horizontal plane measured at the development edge of the buffer zone reducing to <0.2 lux on the horizontal plane at the boundary with the bat habitat zone).

176. The development zone (Zone C) is characterised by a dominance of hardstanding and built structures. While lighting is required in this zone, sensitive lighting design will be required in order to achieve illuminance targets within the buffer zone and the bat habitat zone and to avoid upward spread of light and thereby minimise environmental impacts more generally."

5.4. PLG04:2013 Guidance on Undertaking Environmental Lighting Impact Assessment

- 5.4.1. This document is aimed at lighting professionals and provides a methodology for undertaking Lighting Impact Assessments.
- 5.4.2. This includes guidance on conducting:
- Desktop Assessments, including the assessment of Environmental Zones
 - Lighting Baseline Surveys
 - How to conduct obtrusive light calculations for a Proposed Development, and where these are appropriate⁸.
- 5.4.3. This has informed the methodological approach to the Lighting Impact Assessment, but not the process of assessing the significance of an effect.

5.5. Design Manual for Roads and Bridges – LA 104 Environmental Assessment and Monitoring Revision 1

- 5.5.1. This document outlines the process for assessing the significance criteria of an effect. While it is primarily intended as guidance for the environmental assessment of roads, and the application site may not directly align with the specific purpose of this guidance, it is considered one of the most robust frameworks for addressing environmental impact and is therefore consulted during the preparation of this documentation.
- 5.5.2. This process is a widely adopted across the UK and provides a recognised approach for the assessment of significant residual effects. This process has also been widely applied to lighting within the UK.
- 5.5.3. This has directly informed **Table 3 - Table 7**.

5.6. CAST Aerodrome Safeguarding Advice Note 2 – Lighting Near Aerodromes April 2024

- 5.6.1. This advice note, published by the Civil Aviation Authority (CAA), considers the location, height, brightness, type, and pattern of lights around the aerodrome, with an overall caveat that no light should be directed or pointed towards any aircraft.
- 5.6.2. It further states that:

“Various types of lighting have the potential to cause issues for example:

- *Temporary lighting, e.g. construction lighting, light shows, temporary installations*
- *Advertisements*
- *Lighting of buildings and other structures*

⁸ All obtrusive light calculations will be compared to guidance from ILP GN01:2021 and ILP BCT GN08:2023

- *Street and car park lighting*
- *Flood lighting at sporting venues or similar including special events in temporary locations*

No lighting should be displayed which could distract pilots or confuse them by being mistaken for aeronautical ground lights."

- 5.6.3. The advice also references use of Road Lighting Standards BS 5489-1:2020 and BS EN 13201-2:2015, which inform this Lighting Strategy.
- 5.6.4. This guidance has been followed while creating the Lighting Strategy.

6. METHOD OF ASSESSMENT AND SIGNIFICANCE CRITERIA

6.1. Methodology

- 6.1.1. The assessment has been carried out in accordance with the published guidance documents from the ILP and Highways standards. These quantify impacts to surroundings, the levels of direct upward light, light intrusion, viewed source intensity and glare regarded as acceptable for varying environmental zones.
- 6.1.2. The methodology employed for this Lighting Impact Assessment is appropriate to the location of the Application Site. It comprises:
 - A review of the legislative, policy and guidance context,
 - A desktop study and site survey in which the baseline conditions were established (Environmental Zone),
 - The conducting of obtrusive light calculation based on the Lighting Strategy (**Appendix 1**)
- 6.1.3. The methodology takes guidance from the Institution of Lighting Professionals PLG 04 document “Guidance on Undertaking Environmental Lighting Impact Assessments” with the significance criteria coming from the Highways standard DMRB V11 (LA104) model of assessing impact.

6.2. Significance Criteria

- 6.2.1. Sensitivity of the receptor is classified as Very High, High, Medium, Low, or Negligible, as outlined in **Table 3**.
- 6.2.2. Magnitude of change is evaluated as Major, Moderate, Minor, Negligible, No Change, Adverse, or Beneficial, with detailed descriptions provided in **Table 4**.
- 6.2.3. The significance of an effect from artificial lighting is assessed by first determining the sensitivity of the receptor and the magnitude of change at that receptor under the revised conditions.
- 6.2.4. The significance category is determined using the matrix within **Table 6** and the significance of an effects is defined in **Table 7**.
- 6.2.5. The duration of the effect is established in accordance with **Table 5**, and this informs the magnitude of change assessment.
- 6.2.6. Residual effects are the effects (as defined in **Table 7**) that remain after all feasible mitigation measures have been applied to a Proposed Development — for example, a Moderate effect may be reduced to Slight or Neutral with effective mitigation.

Sensitivity	Description of Criteria
Very High	Very high importance and rarity, international scale and very limited potential for substitution. The environment is fragile, and an impact is likely to leave it in an altered state from which recovery would likely be impossible.
High	High importance and rarity, national scale, and limited potential for substitution. The environment is fragile, and an impact is likely to leave it in an altered state from which recovery would be difficult or impossible.
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution. The environment has a degree of adaptability and resilience and is likely to accommodate the changes caused by an impact, although there may still be some residual modification as a result.
Low	Low or medium importance and rarity, local scale. The environment is adaptable and is resilient to change. Nearly all impacts can be absorbed within it without modifying the baseline conditions.
Negligible	Very low importance and rarity, local scale. Receptor has little or no night-time activity.

Table 3: Criteria for Receptor Sensitivity

Magnitude of Change		Definition of Change
Major	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements. Example: A large increase in light levels at the receptor, exceeding guidance limits (including breaches of higher category limits).
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality. Example: A large reduction in light levels at the receptor, bringing them from well above the guidance limit to within or below it.
Moderate	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements. For example: Increase in light levels reaching the receptor that are breaching the guidance threshold, but not significantly above the limit.
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality. Example: A decrease in light levels at the receptor, bringing them within or just below the guidance limit.
Minor	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Example: An increase in light levels at the receptor up to, but not exceeding, the guidance limit.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring. Example: A decrease in light levels at the receptor to below the existing likely baseline
Negligible	Adverse	Very minor loss or detrimental alteration to one or more characteristics, features or elements. Example: Increase in light levels reaching the receptor that are below the guidance threshold but above natural variation.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements. Example: Decrease in light levels reaching the receptor, but where the existing lighting was not resulting in a breach in guidance thresholds.
No Change		No Change from baseline condition (light levels reaching receptor are within the limits of natural variation), this will be deemed "negligible" when assessed as a magnitude of change.

Table 4: Criteria for Magnitude of Change (+/- = Baseline – Proposed Design)

Duration	Definition
Short Term	A period of months up to one year
Medium Term	A period of one year, up to five years
Long Term	A period of greater than five years

Table 5: Definitions of Duration of Effect

Significance of Effect Matrix		Magnitude of Change				
		No Change	Negligible	Minor	Moderate	Major
Sensitivity	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Table 6: Significance of Effect Matrix

Significance Category / Residual Effect	Typical Description
Very Large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors.
Slight	Effects at this level are not material in the decision-making process.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Table 7: Definitions of significance Categories / Residual Effect

- 6.2.7. The approach to assigning significance of effect relies on reasoned argument, the professional judgement of competent experts and using effective consultation to ensure the advice and views of relevant stakeholders are taken into account.
- 6.2.8. Significant effects typically comprise residual effects that are within the Moderate, Large or Very Large categories.

6.3. Study Area

6.3.1. The purpose of the study area is to provide a reasonable area to conduct the Lighting Impact Assessment within. It will include:

- Sufficient area to provide a robust understanding of the lighting baseline surrounding and within the Application Site.
- Include all receptors that can reasonably be expected to experience effects of lighting.

6.3.2. The study area for the assessment of the effects of lighting is based on several factors. These are:

- The size of the Application Site:
 - The larger the Application Site the larger the study area.
- The lighting being proposed:
 - The brighter the lighting the larger the study area,
 - The larger the volume of proposed lighting the larger the study area.
- The number of identified receptors and distance of these receptors from the Application Site:
 - The greater the number of receptors and the larger the distance of any identified receptors are from the Application Site, the larger the study area will be.

6.4. Classification of Environmental Zone

6.4.1. To understand the restrictions needed to keep the implementation of lighting to a minimum, we use what is classified as an environmental zone, this is rated from E0 to E4. An environmental zone is given its designation based on the context of the surrounding environment as defined by the ILP in GN01:2021 (see **Section 5**).

6.5. Potential Effects from Artificial Light

6.5.1. The potential effects on human receptors and the surrounding environment are evaluated based on their adherence to the limitations outlined in the relevant ILP guidance. This guidance, GN01:2021, outlines restrictions on such things as light intrusion, luminous source intensity and upward light ratio (or sky glow). The tables outlining the restrictions are in the **Section 5**.

6.5.2. As the needs of ecology differ from those of a human amenity or human safety receptor a separate set of guidance (GN08:2023), is used to evaluate the effects of lighting on the most light sensitive ecology receptors (Bats). An explanation of the implementation and restrictions to protect light sensitive ecology, such as bats, is outlined in **Section 5**.

6.5.3. The following parameters of obtrusive light will be assessed upon the relevant receptors:

- Light Spill
- Light Intrusion
- Sky Glow (Upward Light Ratio)

6.5.4. The effects assessment for the Proposed Development is based on the Lighting Strategy (**Appendix 1**), lighting calculations and the Baseline Survey (**Appendix 2**).

7. SITE ASSESSMENT

7.1. Site Description and Context

- 7.1.1. A desktop assessment and site survey were completed to understand the Application Site and its position within the current lit environment.
- 7.1.2. The Application Site is Hawke Ridge Business Park, Westbury BA13 4LD which is located approximately 5km south of Trowbridge. The Application Site is comprised of two arable agricultural fields bordered by hedgerows and treelines with an area of woodland adjacent to the eastern boundary. Mill Lane provides access to the Application Site and runs through the centre, separating the two parcels of land within the Application Site. The Application Site has two access roads within it to the western boundary, where the site is accessed from a roundabout on Hawkeridge Road (B3097).
- 7.1.3. The Application Site is bordered to the east by an active railway line, to the west by Hawkeridge Road B3097 and the north and south by further agricultural farmland. The divide between the two parcels of land also contains a field, as well as the Grade 2 listed Hawkeridge Farmhouse building, along with various outbuildings and commercial premises to the south of the Farmstead.

The boundary of the Application Site and the site layout plan is shown in **Figure 1**.

- 7.1.4. The Proposed Development is a:

"Erection of: (i) 1 No. retail convenience store (Class E), 3 No. flexible retail units (Class E), and roadside drive through unit (sui generis); (ii) a 64-bed care home (Class C2); and (iii) 249 No. residential dwellings (Class C3) with associated access, green and blue infrastructure works."



Figure 1: Proposed Development Site layout plan

7.2. Site Designations

- 7.2.1. The study area (blue line) of lighting effects extends 2 km from the centre of the Application Site (red line), as shown in **Figure 2**. The study area is used because it captures all receptors that could be impacted by the effects of lighting within the Proposed Development, and it also provides a reasonable area for the lighting baseline to be assessed.
- 7.2.2. The Application Site is within 2 km proximity of a designated Site of Special Scientific Interest (SSSI) this is shown in **Figure 2** and referenced as
- Picket and Clanger Wood SSSI - within 720 m to northeast.

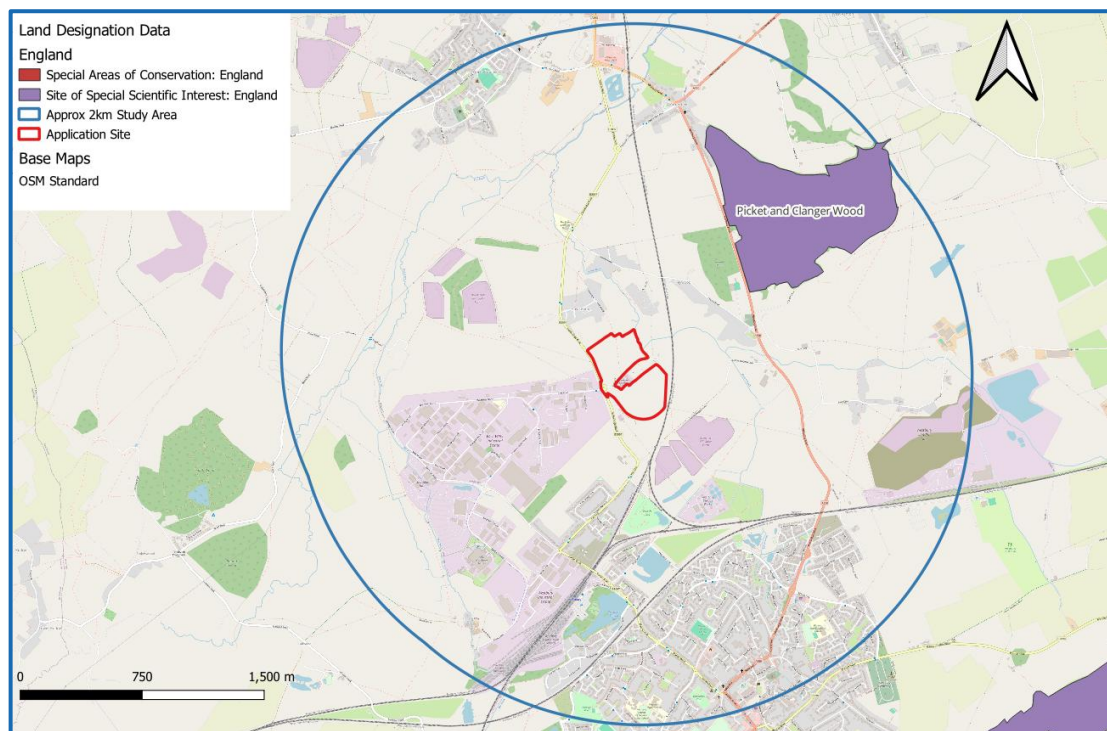


Figure 2: Site designations

7.3. Local Character

- 7.3.1. The Application Site is located 1.5 km north of the market town of Westbury and around 5 km south of the town of Trowbridge. The Proposed Development is situated to the south of the small village of Hawkeridge, in the parish of Heywood, which lies to the east. The Application Site itself is rural in nature, currently in use as arable farmland. The areas to the immediate north, east and south are similar in character being dominated by agriculture and fields bound by hedgerows and treeline and patches of woodland. A live railway line runs north to south adjacent to the eastern boundary.
- 7.3.2. The strip of land that divides the two parcels of the Application Site has Mill Lane running through the centre and contains several commercial businesses with an IT Consultancy and Auto Repair Garage at the southern end and a boarding kennels and farmyard to the north. It also features the Grade 2 Listed Hawkeridge Farmhouse.
- 7.3.3. The area to the west of the Application Site is industrial in nature, being dominated by the West Wiltshire Trading Estate. This is a major industrial and commercial hub with numerous businesses operating 24 hours a day. Further to the south lies the residential fringes of Westbury. This area is dominated by a variety of residential development along The Ham, the main traffic route into Westbury.

7.4. Existing Lighting

- 7.4.1. The areas to the north, east and south of the Application Site are predominantly dark, in keeping with their rural character. This is shown best within the Baseline Survey Report as demonstrated within the results and photography shown in **Appendix 2** and summarised in **Section 9**.
- 7.4.2. The Application Site itself has existing street lighting within it at the southern end of Mill Lane at the access from the roundabout and on the two side roads built to enable access to future development, as shown on **Figure 3**. Hawkeridge Road (B3097) runs adjacent to the western boundary from north to south and transects the roundabout where it intersects with Mill Lane to the east and Link Road to the west. The roundabout and approaches are lit as a conflict area with 8 – 10 m column mounted LED lighting. This existing street lighting impacts the Application Site on the western boundary as is demonstrated in the Baseline Survey results shown in **Appendix 2** and summarised in **Section 9**.



Figure 3: View of existing on-site street lighting from roundabout on Hawkeridge Road (B3097)

- 7.4.3. The area to the west of the Application Site is dominated by West Wiltshire Trading Estate. This estate is extensively and well-lit with 6 – 8m column mounted street lighting throughout and a variety of security and car park floodlighting (**Figure 5**). This is shown throughout **Figure 3 - Figure 7**.



Figure 4: View of existing lighting from Link Road facing Commercial Close



Figure 5: View of existing lighting from Broadway N road



Figure 6: View of existing lighting from Headquarters Road



Figure 7: View of existing lighting at the roundabout on Storridge Rd linking to Quartermaster Rd

- 7.4.4. The settlements of Hawkeridge to the north and Westbury to the south both exhibit street lighting on spine roads and subsidiary residential roads, in line with that of a suburban environment. This is shown in **Figure 8 & Figure 9**.



Figure 8: View of existing street lighting on Hawkeridge Park to the south



Figure 9: View of the existing street lighting from The Ham

7.5. Environmental Zone Classification

- 7.5.1. The environmental zone criteria detailed within **Table 1** and **Table 2** informs the basis of the Lighting Impact Assessment.
- 7.5.2. The Application Site is assessed as being located within an E2 environmental zone. This is because of the Application Sites location within a relatively sparsely inhabited rural area situated on the edge of an outer suburban location.
- 7.5.3. The lighting classes used within the Proposed Development, and the limitation placed on the lighting in terms of its environmental effect are informed by the requirements for an E2 environmental zone (**Appendix 1** and **Table 8**).

E Zone	Surrounding	Examples	Limitations E _v (lux)		Sky Glow ULR (Max)
			Pre-curfew	Post-curfew	
E2	Rural	Sparsely inhabited rural areas, Village or relatively dark outer suburban locations	5	1	2.5%

Table 8: Limitations of the Environmental Zone

8. IDENTIFIED RECEPTORS

8.1. General

8.1.1. The locations of the Identified Potential Sensitive Receptor in relation to the Application Site can be seen in **Appendix 3**.

8.2. Ecological

8.2.1. Ethos Environmental (the project ecologist) have been liaised with regarding the identification of sensitive areas within and surrounding the Application Site. The ecology receptors with sensitivity to lighting are detailed in **Table 9**.

Receptor Type	Receptor No.	Description	Sensitivity
Ecology	PSER 001	Zone A buffer along southern boundary of Parcel A 001	High
Ecology	PSER 002	Zone A buffer along southern boundary of Parcel A 002	High
Ecology	PSER 003	Zone A buffer along southern boundary of Parcel A 003	High
Ecology	PSER 004	Zone A buffer along southern boundary of Parcel B 001	High
Ecology	PSER 005	Zone A buffer along southern boundary of Parcel B 002	High
Ecology	PSER 006	Zone A buffer along southern boundary of Parcel B 003	High
Ecology	PSER 007	Zone A buffer along southern boundary of Parcel B 004	High

Table 9: Sensitive Ecological Receptors (PSER)⁹

⁹ The Ecology Buffer zones as required by the Trowbridge Bat Strategy have been split into several receptors for the purposes of this report. This is to enable more detailed analysis of the light levels reaching these locations, and to make the result of the lighting calculation clearer.

8.3. Human Amenity

8.3.1. Human amenity receptors have been identified surrounding the Application Site. The human amenity receptors to lighting are detailed in **Table 10**.

Receptor Type	Receptor No.	Description	Sensitivity
Human Amenity	PHAR 001	Residential dwelling (Hawkeridge Farmhouse) located on Mill Lane between Parcel A & Parcel B	Medium
Human Amenity	PHAR 002	Residential dwellings located off Haweridge to the north	Low
Human Amenity	PHAR 003	Residential dwellings located off Norleaze to the northeast	Low
Human Amenity	PHAR 004	Residential dwellings located at the eastern end of Mill Lane	Low
Human Amenity	PHAR 005	Residential dwellings located off Haweridge Road (B3097) to the south	Low

Table 10: Human Amenity Receptors (PHAR)

8.4. Human Safety Receptors

8.4.1. Human safety receptors have been identified surrounding the Application Site. These are listed in **Table 11**.

Receptor Type	Receptor No.	Description	Sensitivity
Human Safety	PSR 001	Railway line adjacent to southern boundary	Medium
Human Safety	PSR 002	RAF Keevil / USAAF Station 471 to the Northeast of the Application Site	Medium

Table 11: Human Safety Receptors (PSR)

9. LIGHTING BASELINE SURVEY

9.1. Lighting Baseline Conclusion

- 9.1.1. The baseline lighting survey confirms that the Application Site is predominantly dark for the most part, with little evidence of artificial lighting in the majority of the Application Site. This is evidenced by the consistently low horizontal and vertical illuminance readings recorded across most measurement locations, concentrated in the range of 0.00 – 0.40 lux, which would comply with GN08:2023 guidance levels for light sensitive species. These results are characteristic of a rural site with limited artificial lighting influence and align with the visual observations and nighttime photography captured during the survey.
- 9.1.2. The western boundary by contrast is a well-lit suburban environment with street lighting installed within the Application Site boundary on Mill Lane to provide access to both parcels of the Proposed Development. Light levels on the western boundary are supplemented by street lighting at Hawkeridge Road roundabout and on its approaches. This area is lit to a high level as it is a conflict area, with primary access to both West Wiltshire Trading Estate and Hawke Ridge Business Park. The night-time photography seen in **Figures 1 – 11 (Appendix 2)** and the illuminance measurement results provided within **Appendix 2** illustrate the night-time appearance of this area and the high levels of illuminance. The illuminance results recorded at illuminance measurement locations 013 – 017 and 033 and 034 are nearly all in excess of GN08:2023 guidance levels in all measured directions. The highest level horizontally being 19.58 lux at location 13 and 12.88 vertically at location 14, well in excess of GN08:2023 guidance of 0.2 lux horizontally and 0.4 lux vertically.
- 9.1.3. Overall, the baseline lighting environment of the Application Site can be characterised as predominantly dark, with measured illuminance levels confirming a very minimal influence from artificial lighting. The site retains a rural night-time character with very low ambient light levels for most of the site, capable of sustaining Zone A and Zone B dark corridors in line with Trowbridge and Westbury Bat Mitigation Strategy (TWBMS) guidance. In contrast, the western boundary is well-lit and extensively illuminated and would not support dark corridors without substantial mitigation to the existing lighting.
- 9.1.4. This baseline assessment establishes a clear and robust reference condition against which the potential effects of the proposed development and associated lighting can be assessed within the accompanying Lighting Impact Assessment.
- 9.1.5. For further details refer to **Appendix 2**.

10. ASSESSMENT OF EFFECTS

10.1. Overview

10.1.1. This assessment is based on the Desktop Study, Baseline Survey, Lighting Calculations and Lighting Strategy (**Appendix 1**).

10.2. Mitigation by Design

10.2.1. This assessment is carried out with all the mitigation detailed in the Lighting Strategy (**Appendix 1**) included. This mitigation by design is also detailed within (**Table 12**).

Mitigation Name	Description of Mitigation	Installation Location
Restricting the Upward Light Output Ratio	All luminaires will have an Upward Light Output Ratio of 0% and will be certified by Darksky.org.	Whole Proposed Development
Restricting Luminaire Tilt	All luminaires will be installed with a 0° as standard. An allowance to tilt luminaires to 5° may be made, where it is demonstrated that: 1. This is required to achieve a standard lighting level on the task or area, 2. This will not result in any significant effects on the surrounding receptors, This does not result in an increase in the Upward Light Ratio of the lighting design above 0%.	Whole Proposed Development
Installation of Back Light Shielding	Manufacturers often provide “back light optics” where back light mitigation is integrated on the lenses of the luminaires. This is the preferred option as it provides the greatest degree of control. Where this is not available, traditional back light shields can be used.	Whole Proposed Development: Where luminaires are installed on the boundary of an area facing into the site. Especially if adjacent to areas of ecological interest.
Using the lowest applicable lighting levels for tasks and areas	All areas and tasks will be lit using the lowest applicable lighting levels as defined in the relevant British Standard. This will ensure a standard and recognised levels of light are provided for all areas of the Proposed Development, while ensuring no area is overlit. During the detailed lighting design, a risk assessment must be undertaken to help defined the specific lighting class for any area.	Whole Proposed Development

Mitigation Name	Description of Mitigation	Installation Location
	If any guidance encourages the increase in the lighting level compared to the British Standard, the British Standard level must take precedence.	
Using the minimum practical mounting height	All luminaires will be mounted at the minimum practical mounting height for the area or task. This will reduce the visibility of the luminaires in the landscape, by allowing surrounding trees and buildings to act as blocking features to direct views of luminaires. It must be noted that mounting luminaires lower than the minimum practice mounting height will increase the need to tilt luminaires to achieve British Standard lighting levels. Doing this will increase light spill and upward light.	Whole Proposed Development
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. This will help reduce light spill out of area and either over lighting or under lighting area. This will also prevent the need to tilt luminaires and will reduce light spill and upward light.	Whole Proposed Development
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.	Whole Proposed Development

Table 12: Mitigation by Design

10.3. Obtrusive Light Calculations

10.3.1. Human receptors have been identified within the vicinity of the Application Site. As these receptors are located beyond, or in a similar position relative to, the identified ecological receptor locations, no separate assessment grid has been proposed specifically for human receptors. Instead, the results obtained from the ecological assessment grids will be used to inform the assessment of effects on human receptors. This approach is considered appropriate as the lighting criteria set out within the relevant ecological guidance are more stringent than the corresponding criteria within GN01 for human receptors, thereby providing a conservative basis for the assessment on these receptors.

Receptor Number	Requirements of GN01:2021 for the Environmental Zone (E2)		Calculated Maximum Result
	[lux]		
	Pre-Curfew	Post-Curfew	
PHAR 001	5	1	≤0.08
PHAR 002	5	1	0.00
PHAR 003	5	1	0.00
PHAR 004	5	1	0.00
PHAR 005	5	1	≤0.01

Table 13: Light Intrusion Calculations

10.3.2. Safety receptors have also been identified within the vicinity of the Application Site. As these receptors are located beyond, or in a similar position relative to, the identified ecological receptor locations, no separate assessment grid has been proposed specifically for safety receptors. Instead, the results obtained from the ecological assessment grids will be used.

Receptor Number	Requirements from GN08:2023 and Trowbridge Bat Mitigation Strategy [lux]	Calculated Maximum Result
PSER 001 - Parcel A 001	<0.5	0.00
PSER 001 - Grid 2 - Parcel A 001	<0.5	0.00
PSER 002 - Parcel A 002	<0.5	0.00
PSER 003 - Parcel A 003	<0.5	0.00
PSER 003 - Grid 2 - Parcel A 003	<0.5	0.00
PSER 003- Grid 3 - Parcel A 003	<0.5	0.01
PSER 004 - Parcel B 001	<0.5	0.08
PSER 005 - Parcel B 002	<0.5	0.00
PSER 005 - Grid 2 - Parcel B 002	<0.5	0.00
PSER 006 - Parcel B 003	<0.5	0.00
PSER 006- Grid 2 - Parcel B 003	<0.5	0.00
PSER 006- Grid 3 - Parcel B 003	<0.5	0.02
PSER 006- Grid 4 - Parcel B 003	<0.5	0.01
PSER 006- Grid 5 - Parcel B 003	<0.5	0.01
PSER 006- Grid 6 - Parcel B 003	<0.5	0.01
PSER 006- Grid 7 - Parcel B 003	<0.5	0.00
PSER 007 - Parcel B 004	<0.5	0.00
PSER 007 - Grid 2 - Parcel B 004	<0.5	0.00

Table 14: Light Spill Calculations

Receptor Number	Requirements of GN01:2021 for the Environmental Zone (E2) [%]	Upward Light Ratio for Manufacturer Specification
PHAR 001	2.5%	0%
PHAR 002	2.5%	0%
PHAR 003	2.5%	0%
PHAR 004	2.5%	0%
PHAR 005	2.5%	0%

Table 15: Upward Light Ratio

10.4. Magnitude of Change

10.4.1. By comparing the modelled illuminance levels at the sensitive receptors with the recommendations made in GN01:2021 and GN08:2023 the magnitude of change is assessed.

Receptor	Magnitude of Change Assessment	Magnitude of Change	Duration
PSER 001 - Parcel A 001	The light spill from the Application Site will not result in any change in the ambient light levels for this area. In Table 15 it is shown that light levels are within guidance limits (GN08:2023) and will not result in a change at the receptor.	No Change	Long Term
PSER 002 - Parcel A 002	Light spill from the Application Site will result in a Negligible change to the surrounding area. However, as shown in Table 15 it the light levels onto the receptor are within guidance limits (GN08:2023)	Negligible	Long Term
PSER 003 - Parcel A 003		Negligible	Long Term
PSER 004 - Parcel B 001		Negligible	Long Term
PSER 005 - Parcel B 002	The light spill from the Application Site will not result in any change in the ambient light levels for this area. In Table 15 it is shown that light levels are within guidance limits (GN08:2023) and will not result in a change at the receptor.	No Change	Long Term

PSER 006 - Parcel B 003	Light spill from the Application Site will result in a Negligible change to the surrounding area. However, as shown in Table 15 it the light levels onto the receptor are within guidance limits (GN08:2023)	Negligible	Long Term
PSER 007 - Parcel B 004	The light spill from the Application Site will not result in any change in the ambient light levels for this area. In Table 15 it is shown that light levels are within guidance limits (GN08:2023) and will not result in a change at the receptor.	No Change	Long Term
PHAR 001	Light spill from the Application Site will result in a Negligible change to the surrounding area. However, as shown in Table 14 it the light levels onto the receptor are within guidance limits (GN01:2021)	Negligible	Long Term
PHAR 002		No Change	Long Term
PHAR 003		No Change	Long Term
PHAR 004		No Change	Long Term
PHAR 005		Negligible	Long Term
PSR 001	The light spill from the Application Site will not result in any change in the ambient light levels for this area. In Table 15 it is shown that light levels are within guidance limits (GN08:2023) and will not result in a change at the receptor.	No Change	Long Term
PSR 002	The light spill from the Application Site will not result in any change in the ambient light levels for this area. Lighting for the Application Site will be in accordance with CAST Aerodrome Safeguarding Advice Note 2 – Lighting Near Aerodromes April 2024 and will not result in a change at the receptor. No lighting within the Application Site will be installed in such a way as it could be confused with an Aerodrome (both in terms of column arrangement and colour of light). Additionally, the proposed lighting is not bright enough or close enough to the Aerodrome that it could cause distraction to pilots taking off, landing, or moving along their flightpaths.	No Change	Long Term

Table 16: Magnitude of Change Assessment

10.5. Significance of Effect

10.5.1. Based on the sensitivity of the receptor (**Table 9**, **Table 10** and **Table 11**) and the magnitude of change (**Table 16**) the significance of effect is predicted by using significance of the effect matrix (**Table 6**).

Receptor	Sensitivity	Magnitude of Change	Significance of Effect
PSER 001	High	No Change	Neutral

PSER 002	High	Negligible	Slight
PSER 003	High	Negligible	Slight
PSER 004	High	Negligible	Slight
PSER 005	High	No Change	Neutral
PSER 006	High	Negligible	Slight
PSER 007	High	No Change	Neutral
PHAR 001	Low	Negligible	Neutral or Slight
PHAR 002	Low	No Change	Neutral
PHAR 003	Low	No Change	Neutral
PHAR 004	Low	No Change	Neutral
PHAR 005	Low	Negligible	Neutral or Slight
PSR 001	Medium	No Change	Neutral
PSR 002	Medium	No Change	Neutral

Table 17: Assessment of Significance of Effect

10.5.2. The residual effect on all human amenity receptors is assessed as being **Neutral** or **Slight**.

10.5.3. The residual effect of the ecology receptors is considered to be **Slight** and **Neutral**.

10.5.4. The residual effect of the safety receptors is considered to be **Neutral**.

11. ASSUMPTIONS AND LIMITATIONS

11.1.1. Several assumptions have been made in the completion of the Lighting Strategy and this Lighting Impact Assessment.

11.1.2. It is assumed that the speed limit of all roads within the Proposed Development will be ≤30 mph, and that carparking will not be allowed on any roadways except in allocated spaces.

11.1.3. The traffic flow through the Proposed Development will be quiet¹⁰ and of residential use. Quiet traffic flow is defined within BS 5489-1:2020 as:

"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."

11.1.4. It is assumed that the lighting installation will be installed by a suitable qualified and competent contractor and the principles detailed within the Lighting Strategy (**Appendix 1**) will be followed.

¹⁰ [Road Traffic UK](#)

12. CONCLUSION

- 12.1.1. This Lighting Impact Assessment for, provides a comprehensive overview of the proposed lighting conditions and establishes a reliable baseline for future assessment. The report evaluates the lighting environment in relation to its surrounding context.
- 12.1.2. The Proposed Development of residential dwellings, commercial developments and associated infrastructure at the Application Site, if implemented as per the proposed strategy (**Appendix 1**), is likely to result in an overall lighting impact assessment outcome no greater than **Slight**, as defined in **Section 6**. This will mean that some sensitive receptors are likely to experience a change in the existing lighting environment; however, this change will be within the limits imposed by relevant industry standard guidance on obtrusive light levels.
- 12.1.3. Based on the desktop study conducted in **Section 6**, the Application Site is likely to be located within an E2 environmental zone.
- 12.1.4. The assessment confirms that the proposed lighting strategy has been carefully designed to respond sensitively and appropriately to the site's environmental setting. Developed in accordance with the requirements of GN08:2023 and GN01:2021, the scheme incorporates recognised industry best practice to minimise light spill, and unnecessary sky glow.
- 12.1.5. The proposed lighting (see **Appendix 1**) within the Application Site is anticipated to give rise to residual effects ranging from **Neutral or Slight** to **Slight** for identified sensitive receptors within the surrounding area. In the majority of cases, effects are expected to be limited to Slight significance due to the use of carefully selected low-level luminaires, directional lighting design, controlled mounting heights, and the application of appropriate shielding and lighting controls. The proposed lighting strategy therefore represents an appropriate balance between operational, safety, and environmental considerations, while ensuring that impacts on the surrounding environment are effectively minimised.

13. SUMMARY OF EFFECTS

13.1.1. The summary of the effects from lighting can be seen in **Table 18**.

Receptor	Sensitivity	Magnitude of Change (Adverse or Beneficial)	Duration	Significance of Effect	Addition Mitigation (if required)	Magnitude of Change After Addition Mitigation (Adverse or Beneficial)	Final Residual Effect (Adverse or Beneficial)
PSER 001	High	No Change	Long term	Neutral	N/A	N/A	Neutral
PSER 002	High	Negligible	Long term	Slight	N/A	N/A	Slight
PSER 003	High	Negligible	Long term	Slight	N/A	N/A	Slight
PSER 004	High	Negligible	Long term	Slight	N/A	N/A	Slight
PSER 005	High	No Change	Long term	Neutral	N/A	N/A	Neutral
PSER 006	High	Negligible	Long term	Slight	N/A	N/A	Slight
PSER 007	High	No Change	Long term	Neutral	N/A	N/A	Neutral
PHAR 001	Medium	Negligible	Long term	Neutral or Slight	N/A	N/A	Neutral or Slight
PHAR 002	Low	No Change	Long term	Neutral	N/A	N/A	Neutral
PHAR 003	Low	No Change	Long term	Neutral	N/A	N/A	Neutral
PHAR 004	Low	No Change	Long term	Neutral	N/A	N/A	Neutral

PHAR 005	Low	Negligible	Long term	Neutral or Slight	N/A	N/A	Neutral or Slight
PSR 001	Medium	No Change	Long term	Neutral	N/A	N/A	Neutral
PSR 002	Medium	No Change	Long term	Neutral	N/A	N/A	Neutral

Table 18: Summary of Lighting Effects

APPENDIX 1

Lighting Strategy

14. LIGHTING STRATEGY

14.1. Introduction

- 14.1.1. The Proposed Development will require lighting for safety and amenity during the hours of darkness. Lighting will be fit for purpose and sensitive to nearby human and ecological receptors.
- 14.1.2. Lighting will be of an appropriate specification and designed in accordance with British Standards.
- 14.1.3. The following criteria seeks to ensure that the lighting is not outside of the obtrusive light limits for the environmental zone in which the Proposed Development is located, is sensitive to the area, and provides a recognised standard level of lighting for all adoptable areas requiring illumination.

14.2. The Proposed Development

- 14.2.1. The follow areas will require task lighting to facilitate the safe undertaking of operational tasks:
- 14.2.2. Lighting to an adoptable specification will be required in the following areas:
- > Primary Roads
- 14.2.3. Lighting to a private specification will be required in the following task areas:
- > Car Parks
 - > The Perimeter of the Commercial Units and Offices (where applicable)
 - > Property Fronts and Rears
 - > Care Home
- 14.2.4. Areas to remain unlit are:
- > Secondary Roads (also the perimeter residential roads)

14.3. Operational Lighting

14.4. Primary Roads

14.4.1. The Primary Roads will be illuminated in accordance with BS 5489-1:2020 & BS EN 13201-2:2015.

14.4.2. The illuminance performance requirements for the Primary Roads are outlined in **Figure 10**.

14.4.3. Following a risk assessment, the lighting class will remain as recommended in BS 5489-1:2020 & BS EN 13201-2:2015.

Table A.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 only	Speed limit $v \leq 30$ mph	Speed limit $v \leq 30$ mph
Busy ^{B)}	P5	P4	P3
Normal ^{C)}	P5	P5	P4
Quiet ^{D)}	P6	P5	P4

NOTE 1 Table A.5 assumes no parked vehicles; see risk assessment in [4.3.3.2](#).

NOTE 2 An EV lighting class using vertical illuminance, from BS EN 13201-2:2015, Table 6, can be specified in addition to the general lighting class when there are particular concerns about crime and personal safety. EV is calculated at the typical height of a human face (1.5 m) and in relevant viewing orientations.

NOTE 3 To ensure adequate uniformity, the actual value of the maintained average illuminance is not to exceed 1.5 times the value indicated for the class.

NOTE 4 The actual overall uniformity of illuminance, U_o , needs to be as high as reasonably practicable (see [7.2.6](#)).

NOTE 5 The ambient luminance descriptions E1 to E4 refer to the environmental zone as defined in ILP GN01 [N2].

NOTE 6 The illuminance classes are suggested minimum levels. A risk assessment needs to be carried out to ensure that the light levels are adequate, particularly for pedestrians and cyclists.

Figure 10: Extract from British Standard Showing How the Light Levels is Decided Upon

Area	Class	BS 5489-1:2020 Requirements		MF used (for design)
		Eav [lux]	Min ¹¹ [lux]	
Primary Roads	P4	5.00 – 7.50	1.00	0.82

Table 19: Design Parameters for Primary Roads from BS 5489-1:2020

¹¹ Minimum required lux level

14.5. Car Parks

14.5.1. Car Parks will be illuminated in accordance with BS EN 12464-2:2024.

14.5.2. The illuminance performance requirements for the Car Parks are outlined in **Figure 11**.

14.5.3. Following a risk assessment, the lighting class will remain as recommended in BS EN 12464-2:2024.

Table 8 — Parking areas							
Ref. no.	Type of area, task or activity	E_m lx		U_0	R_{GL}	R_a	Specific requirements
		required ^a	modified ^b				
8.1	Light traffic, e.g. parking areas of shops, terraced and apartment houses; cycle parks	5	—	0,25	55	70	
8.2	Medium traffic, e.g. parking areas of department stores, office buildings, plants, sports and multipurpose building complexes	10	—	0,25	50	70	
8.3	Car charging station points in lit areas	20	—	0,25	50	70	At the relevant area approx. up to 3 m from charging point. If the display is not self illuminated, a vertical illuminance of $E_m = 50$ lx at the charging poles should be provided for the time of reading. Vertical illuminance on the car should be considered.
8.4	Car charging station points in unlit areas	10	—	0,25	50	70	If the display is not self illuminated, a vertical illuminance of $E_m = 50$ lx at the charging poles should be provided for the time of reading.
8.5	Heavy traffic, e.g. parking areas of major shopping centres, major sports and multipurpose building complexes	20	—	0,25	50	70	
^a Required: minimum value.							
^b Modified: considers common context modifiers in 5.3.3.							

Figure 11: Extract from British Standard Showing How the Light Levels is Decided Upon

Area	Class	BS EN 12464-2:2024 Requirements		MF used (for design)
		Eav [Lux]	Uo	
Car Park	8.1	25	0.25	0.82

Table 20: Design Parameters for Car Parks from BS EN 12464-2:2024

14.6. Nursing / Care Home

- 14.6.1. The nursing / care home will be illuminated in accordance with BS EN 12464-2:2024.
- 14.6.2. The illuminance performance requirements for the car park of the care home are outlined in **Figure 11** as directed to by **Figure 12**.
- 14.6.3. Entrances and doorways will be illuminated by wall mounted downlights as shown in **Table 26**.
- 14.6.4. Following a risk assessment, the lighting class will remain as recommended in BS EN 12464-2:2024.

Table 11 — Outdoor areas, nursing homes, somatic and psychiatric hospitals							
Ref. no.	Type of area, task or activity	$\bar{E}_m$ lx		U_o	R_{GL}	R_a	Specific requirements
		required ^a	modified ^b				
11.1	Outdoor area with equipment that requires lighting for safety reasons	30	50	0,25	50	80	
11.2	Emergency and intensive care units' entrances, ambulance unloading areas	200	300	0,40	50	80	
11.3	Balconies for patients and staff	20	—	0,25	—	80	Movement detection control preferred for energy savings.
11.4	Yards or area (ex. for outdoor smoking, meeting etc.) during the hours with no daylight	30	—	0,25	50	80	
11.5	Play areas for ball playing and games to be used during the hours with no daylight	15	20	0,40	50	70	Pay attention to the illuminance levels of the surrounding areas (5.3.4).
11.6	Parking areas						See Table 8
11.7	Distribution						See Table 18
^a Required: minimum value.							
^b Modified: considers common context modifiers in 5.3.3.							

Figure 12: Extract from British Standard Showing How the Light Levels is Decided Upon

Area	Class	BS EN 12464-2:2024 Requirements		MF used (for design)
		Eav [Lux]	Uo	
Care Home Car Park	11.6 (8.1)	25	0.25	0.82

Table 21: Design Parameters for External Area of Care Home from BS EN 12464-2:2024

14.7. Operational Equipment for Roadways, Car Parks and Care Home

Equipment Specification	
Application Area	Primary Road, Secondary Roads, Car Parks & Care Home
Correlated Colour Temperature [Kelvin / K]	2700K
Luminaire Manufacturer	Urbis Schreder
Luminaire Model	Axia 3.1
Light Output (lm)	
Height [m]	≤6m
Mounting Arrangement	Post top
Luminaire Tilt [°]	0°
Upward Light Output Ratio [%] E2 < 2.5%	0%
Example Luminaire Image	
Controls ¹²	As per Wiltshire CC adoptable specification

Table 22: Luminaire performance requirements – Primary Road, Secondary Roads and Car Parks

¹² Dimming: when dimming is applied it is announced as a percentage still in use of the total percentage output (dimmed too, not dimmed by).

14.8. The Perimeter of the Commercial Units and Offices (Where Applicable)

14.8.1. The Perimeters of the Commercial Units and Offices will be illuminated in accordance with BS EN 12464-2:2024.

14.8.2. The illuminance performance requirements for the Perimeter of the Commercial Units and Offices are outlined in **Figure 13**.

14.8.3. Following a risk assessment, the lighting class will remain as recommended in BS EN 12464-2:2024.

Table 7 — General requirements for traffic zones outside buildings and for cleaning at outdoor work places							
Ref. no.	Type of area, task or activity	$\bar{E}_m$ lx		U_o	R_{GL}	R_a	Specific requirements
		required ^a	modified ^b				
7.1	Walkways exclusively for pedestrians	5	—	0,20	50	70	
7.2	Traffic areas for slowly moving vehicles (max. 10 km/h), e.g. bicycles, trucks and excavators	10	—	0,40	50	70	
7.3	Regular vehicle traffic (max. 40 km/h)	20	—	0,20	45	70	At shipyards and in docks, R_{GL} may be 50.
7.4	Mixed traffic areas, vehicle turning, stationary loading and unloading points	50	—	0,40	50	70	When the area is non-occupied $\bar{E}_m$ required may be reduced to 5 lx. Pay attention to the illuminance levels of the surrounding and adjacent areas.
7.5	Cleaning and servicing	50	—	0,25	50	70	At all relevant surfaces
7.6	Recycling centers - areas with rubbish bins and sorting of waste	30	—	0,25	50	70	
^a Required: minimum value.							
^b Modified: considers common context modifiers in 5.3.3.							

Figure 13: Extract from British Standard Showing How the Light Levels is Decided Upon

Area	Class	BS EN 12464-2:2024 Requirements		MF used (for design)
		Eav [Lux]	Uo	
Perimeters of Commercial Units and Offices	7.1	5.00	0.20	

Table 23: Design Parameters for the Perimeter of Commercial Units and Offices from BS EN 12464-2:2024

Equipment Specification	
Application Area	The Perimeter of Commercial Units and Offices
Correlated Colour Temperature [Kelvin / K]	2700K
Luminaire Manufacturer	Collingwood (Or Similar Approved)
Luminaire Model	Arc Pro CSP Down Light (Or Similar Approved)
Light Output (lm)	1400lm
Height [m]	≤3m
Mounting Arrangement	Wall mounted
Luminaire Tilt [°]	0°
Upward Light Output Ratio [%] E2 < 2.5%	0%
Example Luminaire Image	
Controls ¹³	Motion sensor, off unless movement detected, on for one minute when motion is detected.

Table 24: Luminaire performance requirements – Commercial Units & Offices

¹³ Dimming: when dimming is applied it is announced as a percentage still in use of the total percentage output (dimmed too, not dimmed by).

14.9. Property Fronts and Rears

14.9.1. The Property Fronts and Rears will be illuminated for safety and amenity purposes only and not in accordance with any British Standard. Light output has been controlled by restricting the mounting heights and the use of motion sensor controls as detailed in **Table 12: Mitigation by Design**. The lowest possible lighting levels are proposed within this Lighting Strategy.

Equipment Specification	
Application Area	Property Fronts and Rears
Correlated Colour Temperature [Kelvin / K]	2700K
Luminaire Manufacturer	Ligman
Luminaire Model	Jet Down Light
Light Output (lm)	550lm
Height [m]	≤2m
Mounting Arrangement	Wall mounted
Luminaire Tilt [°]	0°
Upward Light Output Ratio [%] E2 < 2.5%	0%
Example Luminaire Image	
Controls ¹⁴	Motion sensor, off unless movement detected, on for one minute when motion is detected.

Table 25: Luminaire performance requirements – Property Fronts & Rears

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).

Equipment Specification	
Application Area	External of Care Home (Entrances / Doorways)
Correlated Colour Temperature [Kelvin / K]	2700K
Luminaire Manufacturer	DW Windsor (Or Similar Approved)
Luminaire Model	Kirium Wall (Or Similar Approved)
Light Output (lm)	2370lm
Height [m]	≤2.5m
Mounting Arrangement	Wall mounted
Luminaire Tilt [°]	0°
Upward Light Output Ratio [%] E2 < 2.5%	0%
Example Luminaire Image	
Controls ¹⁵	Motion sensor, off unless movement detected, on for one minute when motion is detected.

Table 26: Luminaire performance requirements – Care Home Entrances and Doorways

¹⁵ Dimming: when dimming is applied it is announced as a percentage still in use of the total percentage output (dimmed too, not dimmed by).

APPENDIX 2

Lighting Baseline Survey

See accompanying document 4143-DFL-ELG-XX-SU-EO-13001-S3

APPENDIX 3

Identified Receptor Maps

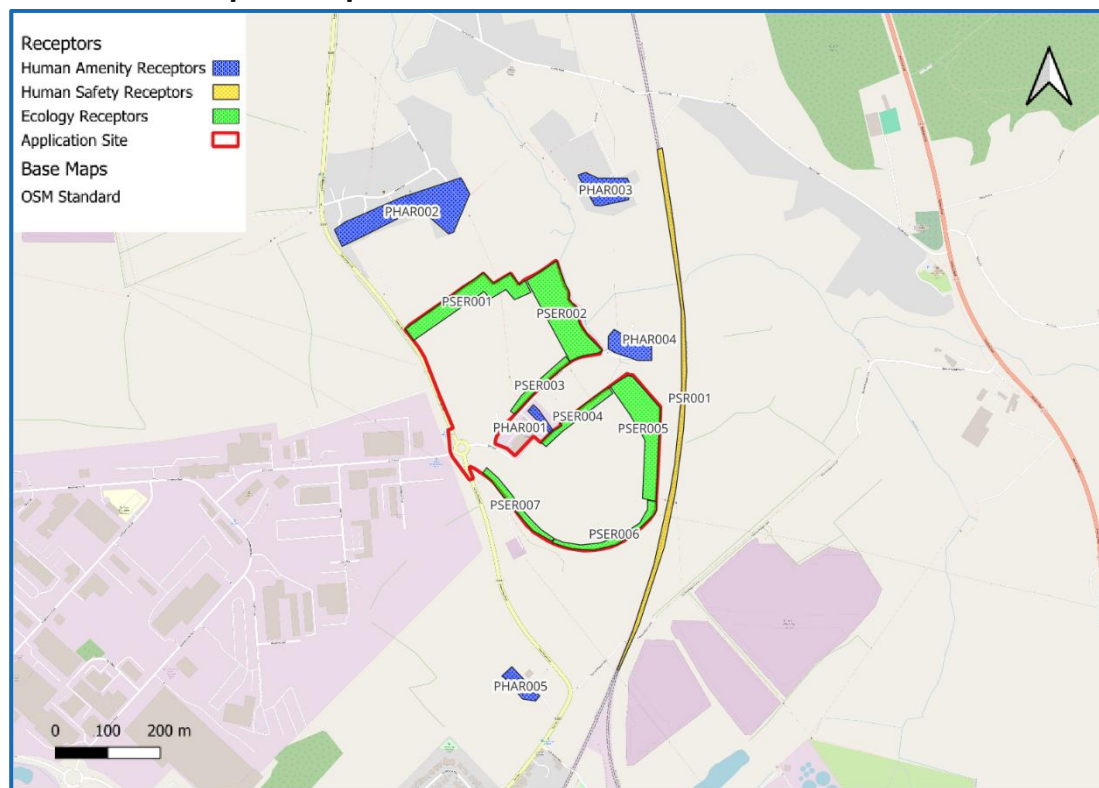


Figure 14: Identified Receptor Maps

APPENDIX 4 – LIGHT SPILL DIAGRAM

See accompanying document 4659-DFL-ELG-XX-CA-EO-13001-S3

APPENDIX 5 – VERTICAL LIGHT SPILL DIAGRAM

See accompanying document 4659-DFL-ELG-XX-CA-EO-13001-S3

TECHNICAL DESCRIPTIONS, DEFINITIONS & 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&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&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&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 in 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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We don't just have the solution for what you need today. We also have the solutions you might need for the future. We have dedicated teams that deliver.

- **Lighting Impact and Planning** team that focus on delivering the most effective and sensitive lighting solutions to support planning.
- **Residential** teams that cover all aspects of new development and redevelopment spanning private, section 38 and section 278 design packages.
- **Public Realm** teams that are experts in enhancing night-time public spaces to create inviting spaces and opportunity for local economies to thrive during the hours of darkness.
- **Electrical** teams – we don't just put a light in the ground; we can help you get power to it as well! Additionally, we also offer design services for EV charging. As this market rapidly expands, make sure you have the experts managing the load, otherwise your EV charging solutions might not live up to expectations.
- **Strategic Infrastructure** teams that offer Lighting and Electrical expertise for complex transport networks and interchanges.
- **Consultancy Services** teams that help when you know what you want but you need someone to help you turn the idea into a project.

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