



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

HENTHORN ROAD, CLITHEROE

LIGHTING STRATEGY

DFL-UK

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



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Executive Summary

The Lighting Strategy proposes good practice and outlines a suitable approach for the proposed lighting at Henthorn Road, Clitheroe for the purpose of safety, security, wayfinding and amenity.

It has been identified that the Application Site is set within a sparsely inhabited rural area (E2).

The proposed Lighting Strategy offers an approach, at outline planning stage, to lighting the Application Site sensitively and appropriately using the relevant lighting classes (outlined in BS 5489-1:2020). The approach will be designed as such to allow the Application Site to comply with relevant industry standard guidance (GN01:2021 and GN08:2023) and address Local Policies EN4, DMG1 and DME3 of the Core Strategy 2008 – 2028 A Local Plan for Ribble Valley. This is achieved by directing light down, allowing no upward light and limiting mounting heights to minimise light spill onto sensitive perimeters.

1. INTRODUCTION

1.1. General

- 1.1.1. This Lighting Strategy has been written by DFL (Designs for Lighting Ltd¹), a lighting design consultancy specialising in Lighting Impact Assessments, obtrusive light mitigation, and detailed lighting design.
- 1.1.2. The Lighting Strategy is intended to set out a minimally obtrusive approach to the lighting, whilst ensuring it is necessary and considers the sensitivity of nearby 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 Strategy 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 (Published 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. Ribble Valley Borough Council, Core Strategy 2008 – 2028 A Local Plan for Ribble Valley Adopted Version.

3.1.1. The relevant Local Planning Authority (LPA) for the Proposed Development is Ribble Valley Borough Council, with policies detailed within the Core Strategy 2008 – 2028 A Local Plan for Ribble Valley adopted December 2014 applying to the lighting associated with the Proposed Development.

The applicable policies are:

EN4 – Biodiversity and Geodiversity

“The Council will seek wherever possible to conserve and enhance the area’s biodiversity and geodiversity and to avoid the fragmentation and isolation of natural habitats and help develop green corridors. Where appropriate, cross-Local Authority boundary working will continue to take place to achieve this.

Negative impacts on biodiversity through development proposals should be avoided. Development proposals that adversely affect a site of recognised environmental or ecological importance will only be permitted where a developer can demonstrate that the negative effects of a proposed development can be mitigated, or as a last resort, compensated for. It will be the developer’s responsibility to identify and agree an acceptable scheme, accompanied by appropriate survey information, before an application is determined. There should, as a principle be a net enhancement of biodiversity.

These sites are as follows:

- *Sites of Special Scientific Interest (SSSIs)*
- *Local Nature Reserves (LNRs)*
- *Local Biological Heritage sites (CBHs)*
- *Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)*
- *Local Geodiversity Heritage Sites*
- *Ancient Woodlands*
- *Lancashire Biodiversity Action Plan priority habitats and species*
- *European Directive on Protected Species and Habitats - Annexe 1 Habitats and Annexe II Species*
- *Habitats and Species of Principal Importance in England*

With respect to sites designated through European legislation the Authority will be bound by the provisions of the relevant Habitats Directives and Regulations.

For those sites that are not statutorily designated and compensation could be managed through a mechanism such as biodiversity off-setting via conservation credits"

DMG1 – General Considerations

"IN DETERMINING PLANNING APPLICATIONS, ALL DEVELOPMENT MUST:

(...) AMENITY

1. NOT ADVERSELY AFFECT THE AMENITIES OF THE SURROUNDING AREA.

(...) ENVIRONMENT

1. CONSIDER THE ENVIRONMENTAL IMPLICATIONS SUCH AS SSSIS, COUNTY HERITAGE SITES, LOCAL NATURE RESERVES, BIODIVERSITY ACTION PLAN (BAP) HABITATS AND SPECIES, SPECIAL AREAS OF CONSERVATION AND SPECIAL PROTECTED AREAS, PROTECTED SPECIES, GREEN CORRIDORS AND OTHER SITES OF NATURE CONSERVATION.

2. WITH REGARDS TO POSSIBLE EFFECTS UPON THE NATURAL ENVIRONMENT, THE COUNCIL PROPOSE THAT THE PRINCIPLES OF THE MITIGATION HIERARCHY BE FOLLOWED. THIS GIVES SEQUENTIAL PREFERENCE TO THE FOLLOWING: 1) ENHANCE THE ENVIRONMENT 2) AVOID THE IMPACT 3) MINIMISE THE IMPACT 4) RESTORE THE DAMAGE 5) COMPENSATE FOR THE DAMAGE 6) OFFSET THE DAMAGE."

DME3 – Sites and Species Protection and Conservation

"DEVELOPMENT PROPOSALS THAT ARE LIKELY TO ADVERSELY AFFECT THE FOLLOWING WILL NOT BE GRANTED PLANNING PERMISSION. EXCEPTIONS WILL ONLY BE MADE WHERE IT CAN CLEARLY BE DEMONSTRATED THAT THE BENEFITS OF A DEVELOPMENT AT A SITE OUTWEIGH BOTH THE LOCAL AND THE WIDER IMPACTS. PLANNING CONDITIONS OR AGREEMENTS WILL BE USED TO SECURE PROTECTION OR, IN THE CASE OF ANY EXCEPTIONAL DEVELOPMENT AS DEFINED ABOVE, TO MITIGATE ANY HARM, UNLESS ARRANGEMENTS CAN BE MADE THROUGH PLANNING CONDITIONS OR AGREEMENTS TO SECURE THEIR PROTECTION:

1. WILDLIFE SPECIES PROTECTED BY LAW

2. SSSI'S

3. PRIORITY HABITATS OR SPECIES IDENTIFIED IN THE LANCASHIRE BIODIVERSITY ACTION PLAN

4. LOCAL NATURE RESERVES

5. COUNTY BIOLOGICAL HERITAGE SITES Core Strategy Adoption version 96

6. SPECIAL AREAS OF CONSERVATION (SACS)

7. SPECIAL PROTECTED AREAS (SPAS)

8. ANY ACKNOWLEDGED NATURE CONSERVATION VALUE OF SITES OR SPECIES.

DEVELOPERS ARE ENCOURAGED TO CONSIDER INCORPORATING MEASURES TO ENHANCE BIODIVERSITY WHERE APPROPRIATE THAT WILL COMPLEMENT PRIORITY HABITATS AND SPECIES IDENTIFIED IN THE LANCASHIRE BAP."

3.2. Adoption Policy

3.2.1. Adoptable Lighting associated with the Proposed Development will be designed and installed in accordance with Lancashire County Council's adoptable specification for street lighting. At this stage, the specification of the equipment is unknown, therefore, the Lighting Strategy sets out best practice and aligns with the relevant British Standards, that would typically inform an adoptable specification.

3.3. Unadopted Roads

3.3.1. Whilst the roads and paths within the Application Site will be privately maintained, they will be designed to an adoptable class and compliant with the relevant British Standards.

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, 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.

5. GUIDANCE

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

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

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

Table 1: Environmental Zone Descriptions

Environmental Zones	Sky Glow ULR 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

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

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, which states the following.

“It is acknowledged that, especially for vertical calculation planes, very low levels of light (<0.5 lux) may occur even at considerable distances from the source if there is little intervening attenuation. It is therefore very difficult to demonstrate ‘complete darkness’ or a ‘complete absence of illumination’ on vertical planes where some form of lighting is proposed on site despite efforts to reduce them as far as possible and where horizontal plane illuminance levels are zero. Consequently, where ‘complete darkness’ on a feature or buffer is required, it may be appropriate to consider this to be where illuminance is below 0.2 lux on the horizontal plane and below 0.4 lux on the vertical plane. These figures are still lower than what may be expected on a moonlit night and are in line with research findings for the illuminance found at hedgerows used by lesser horseshoe bats, a species well known for its light adverse behaviour (Stone, 2012).”

“A warm white light source (2700Kelvin or lower) should be adopted to reduce blue light component.”

*“A buffer zone subdivided into smaller zones of increasing illuminance limit further away from the Supporting Habitat would ensure light levels (illuminance - measured in lux) do not exceed certain defined limits. This has the effect of a gradual decrease in lighting from the developed zone, rather than a distinct cut-off, which may provide useable area for the project which also limits lighting impacts on less sensitive species, or less well-used habitat.” (see **Figure 1**).”*

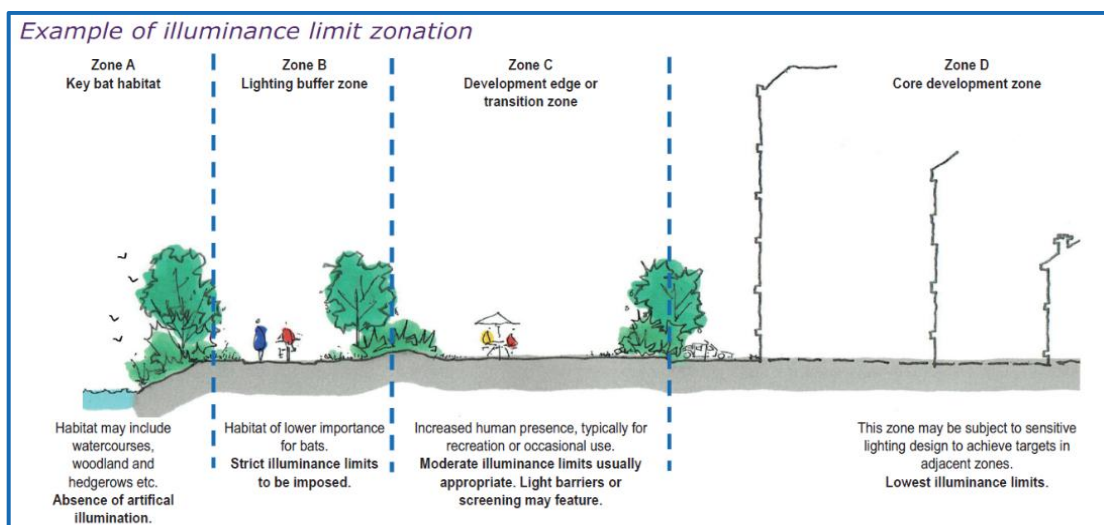


Figure 1: Example of Lighting Zonation Near Sensitive Boundaries and Known Ecological Habitat

5.3. PLG23/2020 Lighting for Cycling Infrastructure.

- 5.3.1. This ILP guidance describes an approach to assessing the need for and the provision to several different cycling infrastructure facilities such as, Cycle routes, Cycle lanes, Cycle gaps, Cycle tracks, Cycleways, shared surfaces for cyclists and pedestrians, Cycle storage facilities.
- 5.3.2. The Law required bicycles ridden at night (between sunrise and sunset) to have, amongst other things, front and rear lights and reflectors.
- 5.3.3. The purpose of lighting on cycle tracks is to enable users to orientate themselves, identify other users, detect potential hazards, discourage crime and engender a feeling of safety and security.
- 5.3.4. The following table extract from PLG23:2020 should be taken into consideration when looking to apply lighting to cycling infrastructure.

	Strategic	Major	Local	Rural
Route type	Core routes linking main settlements and areas of high employment or education	Core leisure routes and routes linking the strategic network to secondary destinations	Feeder routes within urban areas	Rural feeder routes
Common characteristics	Largely segregated network of cycle routes with separation from pedestrian where width allows	Predominantly off-road routes, although some linking sections might be on road	Mix on road routes often with cycle lanes / symbols and off-road shared use links	Predominantly quite on road routes without cycle lanes, with some off road paths.
Surface	Sealed surface	Sealed surface	Generally surfaced routes	Generally, surfaces, but some routes may be unsurfaced
Lighting	Lit within urban areas	Lit within urban areas	On road routes usually lit	Not generally lit.

Table 3: Typical Cycle Route Hierarchy (Table 2: PLG23/2020)

- 5.3.5. As per section 3 of PLG23/2020 where lighting may not be appropriate alternatives to traditional lighting should be considered.

6. DESKTOP STUDY

6.1. Site Description and Context

- 6.1.1. A desktop assessment was completed to understand its position within the current lit environment.
- 6.1.2. The Application Site is currently occupied by two pastoral fields bordered by hedgerow and treeline. The field to the west of Henthorn Road to be accessed via Ingleton Crescent is the smaller of the two and is a modified grassland field used for grazing livestock. The field to the east of Henthorn Road is larger but used for the same purpose. The Application Site has a watercourse running through it from the northwestern corner until it exits and flows into Pendleton Brook to the south. Pendleton Brook forms the southern boundary of this parcel of the Application Site. A public right of way runs the full width of the Application Site from Henthorn Road on the western boundary to Pendleton Meadows to the northeast of the Application Site. An indicative boundary of the site and proposed layout can be seen in **Figure 2**.



Figure 2: The Application Site Location and Boundary

6.1.3. The Proposed Development is for outline planning of up to 115 residential dwellings with associated parking and infrastructure. The Site Layout Plan is shown in **Figure 3**.



Figure 3: Proposed Development Site Layout Plan

6.2. Designated Sensitive Site

6.2.1. The area is within 5 km⁹ proximity of designated Sites of Special Scientific Interest Site (SSSI) and National Landscape (Formerly AONBs) these are shown in **Figure 4** and referenced as.

- Salthill and Bellmanpark Quarries SSSI – within 2.6 km to northeast
- Coplow Quarry SSSI - within 3 km to northeast
- Clitheroe Knoll Reefs SSSI – within 4.2 km to northeast
- Forest of Bowland National Landscape – within 1.8 km to west

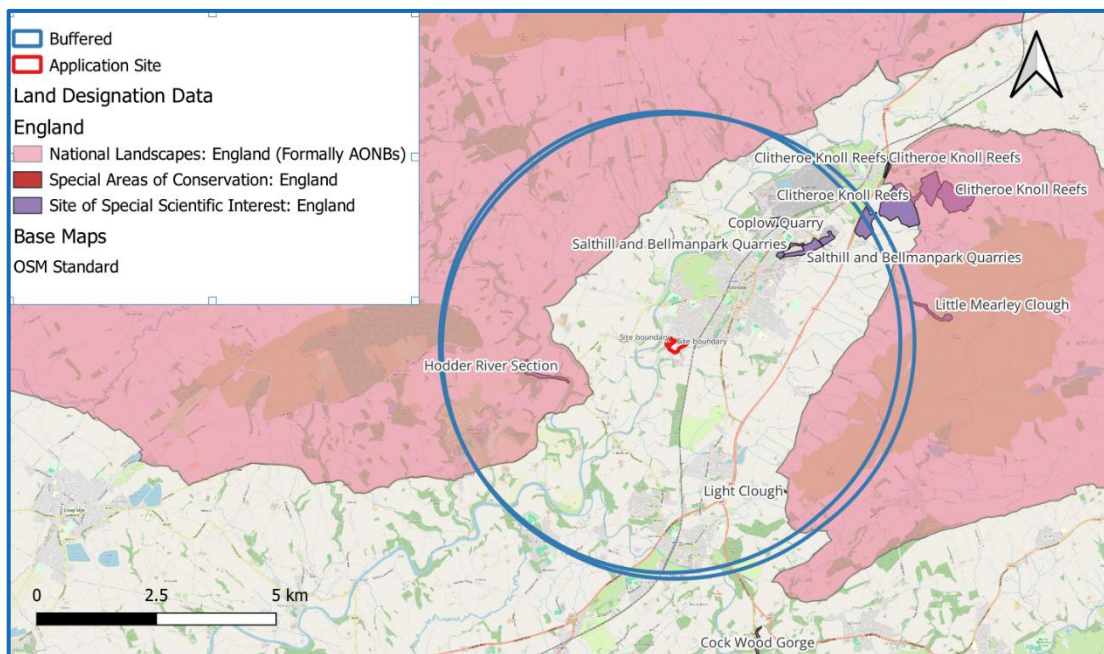


Figure 4: Site Designation

⁹ 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)

6.3. Existing lighting

- 6.3.1. The Application Site abuts the southwestern extent of the town of Clitheroe, a town of more than 16,000 inhabitants located in the Ribble Valley. The areas to the east, south and west of the Application Site are intrinsically dark, being predominantly a patchwork of agricultural fields and woodland with sporadic residential dwellings and farmsteads. There are other industrial and commercial uses such as a household waste recycling facility, solar farm and sewerage works, but there is little evidence of artificial lighting.
- 6.3.2. In contrast, the area to the north is suburban in nature. The immediate neighbourhood is residential in character with a high proportion of recent developments. This area and the rest of the town is well-lit with most roads having street lighting. **Figure 5** provides a visual representation of the typical lighting arrangement in the surrounding environment. As you move further north towards the town centre, development becomes more commercial and industrial in nature with associated car parking and area lighting and higher-level street lighting.



Figure 5: View of the Lighting in the Surrounding Environment

6.4. Environmental Zone Classification

- 6.4.1. Review of the existing lighting (**Section 6.3**) and the local environmental character (**Section 6.1**) indicates that the area exhibits conditions representative of an E2 environmental zone.
- 6.4.2. The Lighting Strategy is based on the Environmental Zone criteria in **Table 1** and **Table 2**, with the Application Site identified as falling within Zone E2.

Zone	Surrounding	Examples	Limitations		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 4: Limitations of Identified Environmental Zone.

7. IDENTIFIED RECEPTORS

7.1. Ecological

7.1.1. The north, east, south and west boundaries of both development parcels have been identified in ecology report Bat Activity Survey Report by FPCR Environment and Design as areas where potentially sensitive ecological receptors maybe present, as shown in **Appendix 2 – Sensitive Receptors**. Therefore, this Lighting Strategy has been written in accordance with GN08:2023.

7.1.2. A description of the potential ecological receptors can be seen in **Table 5**.

Receptor Type	Receptor No. (Appendix 3)	Description
Ecology	PSER 001	Area adjacent to Pendleton Brook in southern section
Ecology	PSER 002	Area adjacent to western boundary of larger parcel
Ecology	PSER 003	Hedgerow adjacent to northern boundary of larger parcel
Ecology	PSER 004	Hedgerow adjacent to eastern boundary of larger parcel
Ecology	PSER 005	Area adjacent to southern boundary of smaller parcel
Ecology	PSER 006	Hedgerow adjacent to western boundary of smaller parcel
Ecology	PSER 007	Hedgerow adjacent to northern boundary of smaller parcel
Ecology	PSER 008	Hedgerow adjacent to eastern boundary of smaller parcel

Table 5: Potentially Sensitive Ecological Receptors (PSER)

7.2. Human Amenity

- 7.2.1. To the north, east and southwest of the larger parcel of land and to the west and north of the smaller parcel of land of the Application Site, Potential Human Amenity Receptors (PHAR) have been identified as shown in **Appendix 2 – Sensitive Receptors**. Therefore, this Lighting Strategy has been written in accordance with GN01:2021 (Table 2 - Obtrusive Light Criteria).
- 7.2.2. A description of the potential human receptors can be seen in **Table 6**.

Receptor Type	Receptor No. (Appendix 3)	Description
Human Amenity	PHAR 001	Residential dwellings to the north of the larger parcel
Human Amenity	PHAR 002	Residential dwellings to the east of the larger parcel located on Ludlow Road
Human Amenity	PHAR 003	Residential dwellings to the southwest of the larger parcel located on Henthorn Road
Human Amenity	PHAR 004	Residential dwelling to the west of the smaller parcel
Human Amenity	PHAR 005	Residential dwellings to the north of the smaller parcel

Table 6: Potential Human Amenity Receptors (PHAR)

8. LIGHTING STRATEGY

8.1. Summary

- 8.1.1. The Proposed Development will require lighting for safety and amenity at limited times during the hours of darkness. Lighting will be fit for purpose and sensitive to nearby human and ecological receptors.
- 8.1.2. Lighting will be of an appropriate specification and designed in accordance with British Standards.
- 8.1.3. 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.
- 8.1.4. 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.
- 8.1.5. 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, is sensitive to the area, and provides a recognised standard level of lighting for all adoptable areas requiring illumination. Luminaires will distribute light downwards only to reduce the potential for light spill onto the boundaries surrounding the buildings and upwards towards the sky.
- 8.1.6. All lighting unless otherwise stated is to emit a warm white colour temperature light (2700 Kelvin or less) to reduce the potential for adverse effects onto potentially sensitive receptors.
- 8.1.7. Lighting in adopted areas will be required in the following application areas:
- > Roadways
 - > Shared Pedestrian/ Cycle Link
- 8.1.8. Lighting in unadopted areas will be required in the following task areas:
- > Property Frontages and Rears

8.2. Roadways

- 8.2.1. The Roadways within the Application Site will be illuminated in accordance with BS 5489-1:2020 and BS EN 13201-2:2015 for amenity and safety purposes. The lowest possible lighting levels are proposed within this Lighting Strategy.
- 8.2.2. Performance requirements for the Roadways are outlined and highlighted in **Figure 6**.
- 8.2.3. The equipment specification can be seen in **Table 7**.

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

Figure 6: Performance Requirements – BS5489-1:2020

Equipment Specification	
Application Area	Roadways
Correlated Colour Temperature (Kelvin)	≤ 2700 K
Height (m)	≤ 6 m
Mounting Arrangement	Root mounted
Luminaire Tilt (°)	0%
Upward Light Output Ratio (%) E2 < 2.5%	0%
Luminaire Manufacturer	Lancashire approved adoptable specification
Controls	Local adoptable specification

Table 7: Luminaire Performance Requirements - roadways

8.3. Shared Pedestrian / Cycle links

- 8.3.1. The shared pedestrian/ cycle links within the Application Site will be illuminated in accordance with BS 5489-1:2020 and BS EN 13201-2:2015 for amenity and safety purposes. The lowest possible lighting levels are proposed within this Lighting Strategy.
- 8.3.2. The ILP PLG23/2020 should also be consulted at detailed design stage to determine the need to light, as well as the most appropriate application of lighting.
- 8.3.3. Performance requirements for the pedestrian/cycle links are outlined and highlighted in **Figure 6**.
- 8.3.4. If a risk assessment supports reducing the lighting class from P5 to P6, this reduction should be implemented to minimise potential light spill.
- 8.3.5. The equipment specification can be seen in **Table 8**.
- 8.3.6. Should the potential to leave the shared pedestrian / cycle link unlit arise, non-illuminated/reflective bollards similar to those in **Table 9** should be applied where a change in direction or ground level occur.

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

Figure 7: Performance Requirements – BS5489-1:2020

Equipment Specification	
Application Area	Shared pedestrian / cycle link
Correlated Colour Temperature (Kelvin)	≤ 2700 K
Height (m)	≤ 6 m
Mounting Arrangement	Root mounted
Luminaire Tilt (°)	0%
Upward Light Output Ratio (%) E2 < 2.5%	0%
Luminaire Manufacturer	Lancashire approved adoptable specification
Controls	Local adoptable specification

Table 8: Luminaire Performance Requirements – shared pedestrian / cycle links


Equipment Specification	
Application Area	Joint Cycle & Pedestrian Pathway
Reflective Bollards	
Height	≤ 1 metre
Mounting Arrangement	Root mounted
Example Luminaire Image	

Table 9: Non illuminated bollards / reflective bollards

8.4. Property Frontages and Rears

- 8.4.1. The property frontages and rears are to be lit for amenity, safety and security purposes. No specific British Standard is to be applied to the residential properties; however output, types and mounting limitations are to be imposed to limit the opportunity for light pollution to occur.
- 8.4.2. The equipment specification and limitations can be seen in **Table 10**.



Equipment Specification		
Application Area	Property Frontages	Property Rears
Correlated Colour Temperature (Kelvin)	≤2700 K	
Height (m)	≤ 2m	≤ 2.4m
Mounting Arrangement	Wall mounted	
Luminaire Tilt (°)	0%	
Upward Light Output Ratio (%) E2 < 2.5%	0%	
Output limits	≤ 550 lumens	≤ 2000 lumens
Luminaire Manufacturer	Ligman, Jet, downlight only (Or similar approved)	Ligman, Leeds, downlight only (Or similar approved)
Optic	Narrow beam	Asymmetrical
Visual representation of luminaire type		
Controls	Motion sensor on for no longer than 2 minutes	Motion sensor on for 2 minutes when motion is detected + manual override

Table 10: Luminaire Performance Requirements – Property Frontages and Rears

9. SUMMARY OF LIMITATIONS

9.1. Overview

- 9.1.1. Whilst this documentation looks to provide evidence that the Proposed Development can be constructed without negative impacts to the surrounding environment, during the detailed design stage, additional mitigation may be developed outside of the limitations within this document in order to comply to the standards and policies relevant to the Application Site.
- 9.1.2. To ensure the worst-case scenario has been modelled, the highest potential light levels are to be modelled / presented in a light spill diagram, with the project maintenance factors set at $MF = 1.0^{10}$. This will demonstrate the light levels at their highest (initial light levels at the start of luminaire life).
- 9.1.3. The Axia 3.1 has been utilised as an indicative luminaire for modelling purposes only. This is to provide an indication of expected horizontal light spill from the spine road at potentially sensitive receptor locations. The luminaire is the standard unshielded variety. Light Spill will need to be revisited at the detailed design stage when the site layout is fixed, equipment specification is confirmed and any further mitigation measures can be considered. The program used for the modelling was an industry standard modelling program (Relux Desktop).
- 9.1.4. As the application is for outline planning, during the detailed design stage where a sensitive receptor is identified, building frontages should be designed to face any sensitive location to limit the opportunity for high output lighting to be installed at a later stage and limit the light spill to road lighting, property frontage lighting and light egress from the Proposed Development.
- 9.1.5. Lighting Egress is to be addressed through the limitation of window glazing in relation to identified ecological receptors.

¹⁰ <https://www.dfl-uk.com/knowledge-hub/faqs/>

9.2. General

9.2.1. 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 11** should be applied to ensure that, based on a “standard installation” (as defined in **Appendix 3**), the vertical light spill from the Proposed Development does not impact the dark corridor.

Egress Mitigation Chart				
Distance from ecological receptors	≥14 metres	14 - 11 Metres	8 Metres	<8 metres
Maximum window transmission	≤90%	≤80%	≤60%	No installation
Predicted maximum light spill¹¹	<0.3 Lux	<0.4 Lux	<0.5 Lux	N/A

Table 11: Glazing restrictions

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

9.2.3. The summarised requirements with a relevant maintenance factor applied, for guidance compliance can be seen in **Tables 12, 13, and 14** below.

Area	Class	BS5489-1 Requirements	
		Eav Lux	Min ¹²
Access Roads, Roads within the Application Site	P5	3-4.5	0.6
Pedestrian pathways, Joint Cycle and Pedestrian pathways	P5	3-4.5	0.6

Table 12: BS5489-1 compliance P Class.

9.2.4. Where ecological receptors are potentially sensitive to vertical light spill, a vertical illumination grid is to be modelled. The light levels based on the modelling do not exceed the requirements based on the buffer zones within the parameter plans, keeping the light levels within the guidance given within GN08/2023.

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

¹¹ Predicted vertical light spill from the lighting egress, and a single exterior light highlight the entrance to the door. Modelling as defined in Appendix 5

¹² Minimum required lux level

9.2.6. Where lighting is required for essential infrastructure and there is potential for ecological impact, the lowest feasible light level should be used. If compliance with GN08/2023 cannot be achieved, additional mitigation should be developed in consultation with a qualified ecologist.

9.2.7. GN08/2023 compliance requirements for vertical illuminance are outlined in **Table 13**.

Receptor No	GN08/2023 requirements	MF used to calculate
PSER 001	0.4	1.0
PSER 002	0.4	1.0
PSER 003	0.4	1.0
PSER 004	0.4	1.0
PSER 005	0.4	1.0
PSER 006	0.4	1.0
PSER 007	0.4	1.0
PSER 008	0.4	1.0

Table 13: PSER results table, maximum vertical illuminance.

9.2.8. Where a Potentially Sensitive Ecological receptor is identified, a horizontal illuminance no greater than 0.2 lux should be evidenced, should a light level exceed this the team ecologist should be consulted as to the sensitivity of the location and, if required, additional mitigation should be applied.

9.2.9. Where human receptors are potentially sensitive to vertical light spill, during a detailed design stage, a vertical illumination grid is to be modelled. The location of these areas is shown in **Appendix 2**. The light levels based on the modelling are not to exceed 1 Lux, keeping the light levels within the guidance given within GN01/2021, post-curfew, for an area identified as an E2 environment.

Receptor No	GN01/2021 requirements		MF used to calculate
	Pre-curfew	Post-curfew	
PHAR 001	5 Lux	1 Lux	1.0
PHAR 002	5 Lux	1 Lux	1.0
PHAR 003	5 Lux	1 Lux	1.0
PHAR 004	5 Lux	1 Lux	1.0
PHAR 005	5 Lux	1 Lux	1.0

Table 14: PHAR Results Table, Maximum Illuminance

9.2.10. The roads and joint Pedestrian/Cycleways are to be lit and levels of illumination are outlined in the Lighting Parameters Plan in **Appendix 1 – Light Spill Diagram and Parameters Plan**.

9.3. Summary of Evidence

- 9.3.1. To ensure the outline proposal can be implemented in a format that protects the surrounding environment, a light spill diagram within **Appendix 1** has been completed.
- 9.3.2. Building light spill egress has been accounted for through the strategy proposal outlined in **Table 11**.
- 9.3.3. Based on the evidence to be submitted during the detailed design stage, light spill can be limited to ensure that ecological and human receptors can be protected from any negative effects associated with the application of artificial light.
- 9.3.4. As seen in **Appendix 1** the horizontal illuminance nearing sensitive receptors can be kept to less than 0.2 lux in accordance with the limitations outlined within GN08/2023.

9.4. Mitigation and Enhancements

- 9.4.1. Through the use of the control methods detailed in **Section 8**, 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.
- 9.4.2. The detailed design is to be completed by a competent person or persons in accordance with the details within this Lighting strategy.
- 9.4.3. Additional mitigation and enhancement are detailed in **Table 15**.

Mitigation/Enhancement	Method	note
Street lanterns	Internally built in spill shields to be proposed during detailed design stage	Where a lantern may have the potential to cause spill light an internally built in spill shield should be applied.
	Spill shields where relevant	Only to be proposed where a built in spill shield is not enough.
	Where possible the lowest practicable light level is to be applied	
Fencing/brick walls	Where horizontal light spill cannot be mitigated by any other means closed board fencing or a brick wall should be proposed	These should be applied as additional mitigation once all other methods have been exhausted.
Hop overs	Where essential infrastructure creates a break in foraging paths, lighting should be minimised, and the use of hop-overs ¹³ should be considered.	Opportunities to reduce illumination along roads or pathways should be explored to support ecological connectivity.
Connective planting	Where foraging paths may be interrupted, planting should be used to help wildlife move smoothly between areas and maintain access to important habitat	

Table 15: Mitigation and Enhancements

¹³ A 'hop-over' typically consists of tall vegetation planted on either side of a road/railway with overhanging branches that create a continuous canopy over the gap. Source, conservationevidence.com [last visited 09/04/25]

10. CONCLUSION

10.1. General

- 10.1.1. Lighting associated with the Proposed Development shall be designed in accordance with the Lighting Strategy for the Application Site outlined in **Section 8**.
- 10.1.2. This Lighting Strategy has been written in accordance with the relevant British Standards, industry guidance and local policies to ensure it is unlikely to give rise to obtrusive light with the potential to affect human, environmental and ecological receptors.
- 10.1.3. The roads and joint Pedestrian/Cycleways to be lit and levels of illumination are outlined in the Lighting Parameters Plan in **Appendix 1 – Light Spill Diagram and Parameters Plan**.
- 10.1.4. Through the application of this Lighting Strategy sensitive receptors will not be adversely affected by obtrusive light, as shown in **Appendix 1 – Light Spill Diagram and Parameters Plan**.
- 10.1.5. Through careful design and mitigation, including directing light down, allowing no upward light and limiting mounting heights to minimise light spill onto sensitive perimeters, this Lighting Strategy ensures the lighting installation at the proposed development will be in accordance with British Standards, Industry Guidance and Local Policy (EN4, DMG1 and DME3 of the Core Strategy 2008 – 2028 A Local Plan for Ribble Valley).

APPENDIX 1 – LIGHT SPILL DIAGRAM AND PARAMETERS PLAN

See accompanying document 4248-DFL-ELG-XX-LD-EO-13001-S3

APPENDIX 2 – SENSITIVE RECEPTORS



Figure 8: Sensitive Receptors

APPENDIX 3 – MODELING METHODOLOGY

General

To assess the potential light spill egress from a standard development the methodology below was employed.

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.

Four property frontages are modelled with a single wayfinding light to the front access, each property has three windows, one living room window and two bedroom windows.

The Internal lighting to each property is based on a widely available LED downlight (Collingwood H2 Pro¹⁴, 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 ceiling height 2.8 m

The buildings use the following reflectance factors

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

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).

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%

¹⁴ [Availability of luminaires](#)



Figure 1.1: Visual of properties modelled

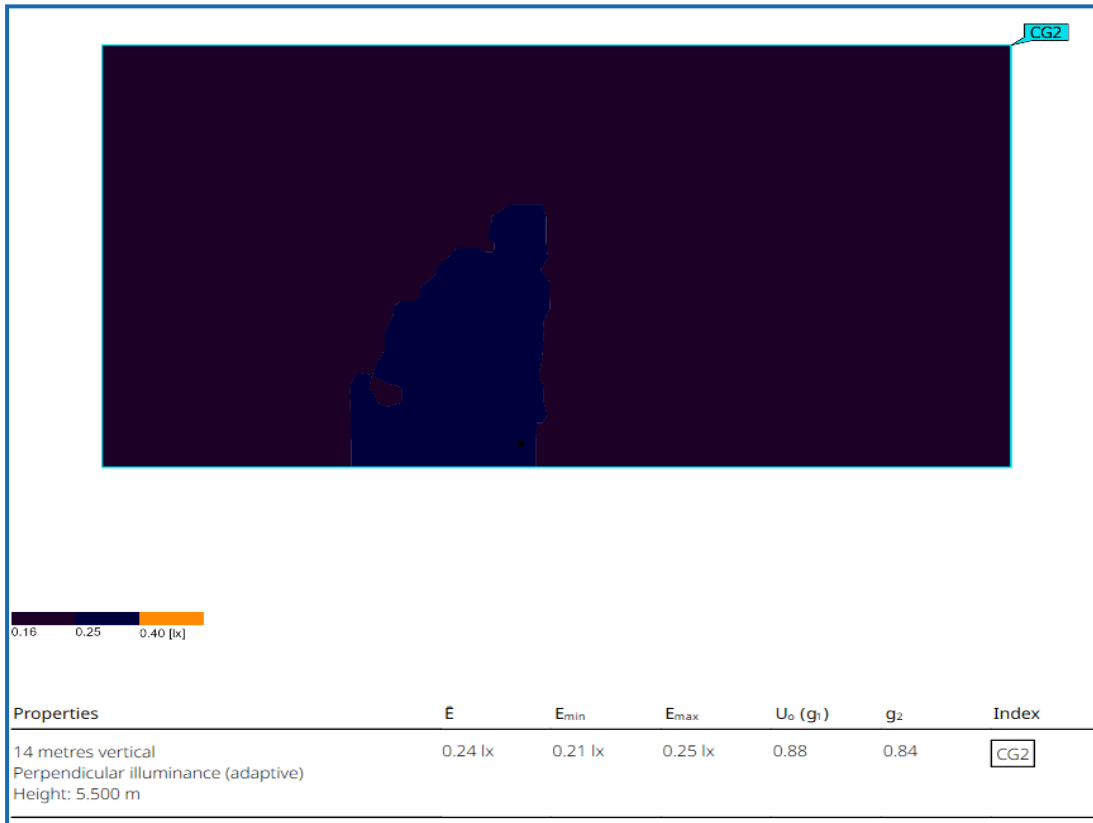


Figure 1.2: 90% Transmissible glazing results, 14mtrs from buildings

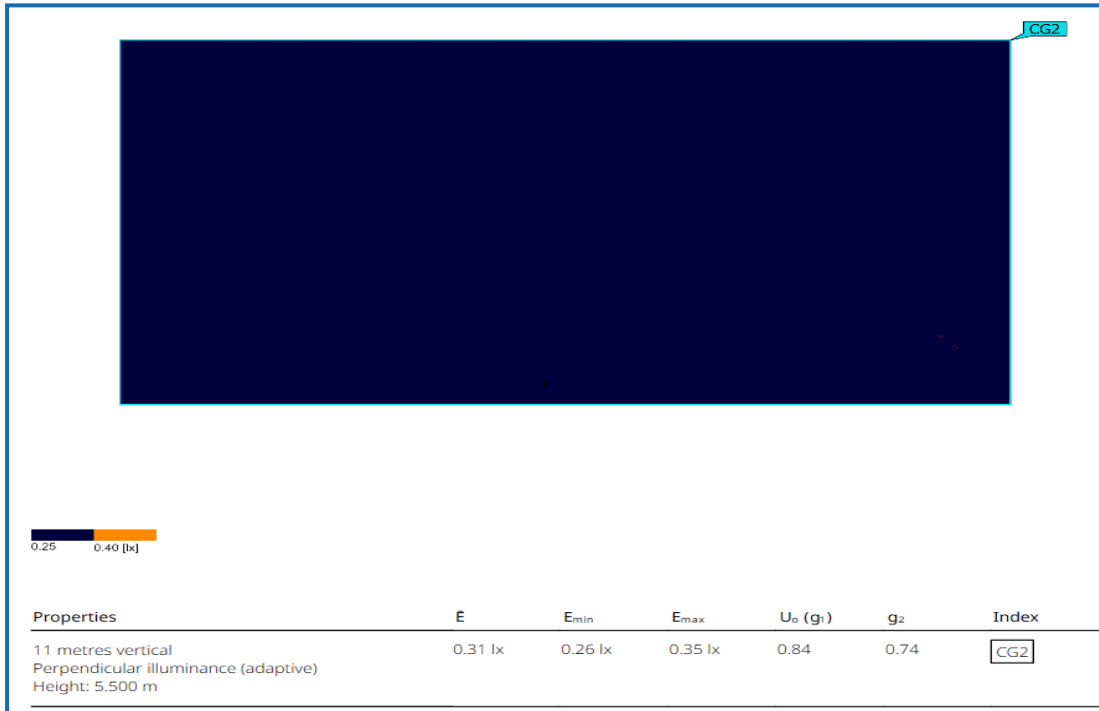


Figure 1.3: 80% Transmissible glazing results, 11mtrs from buildings

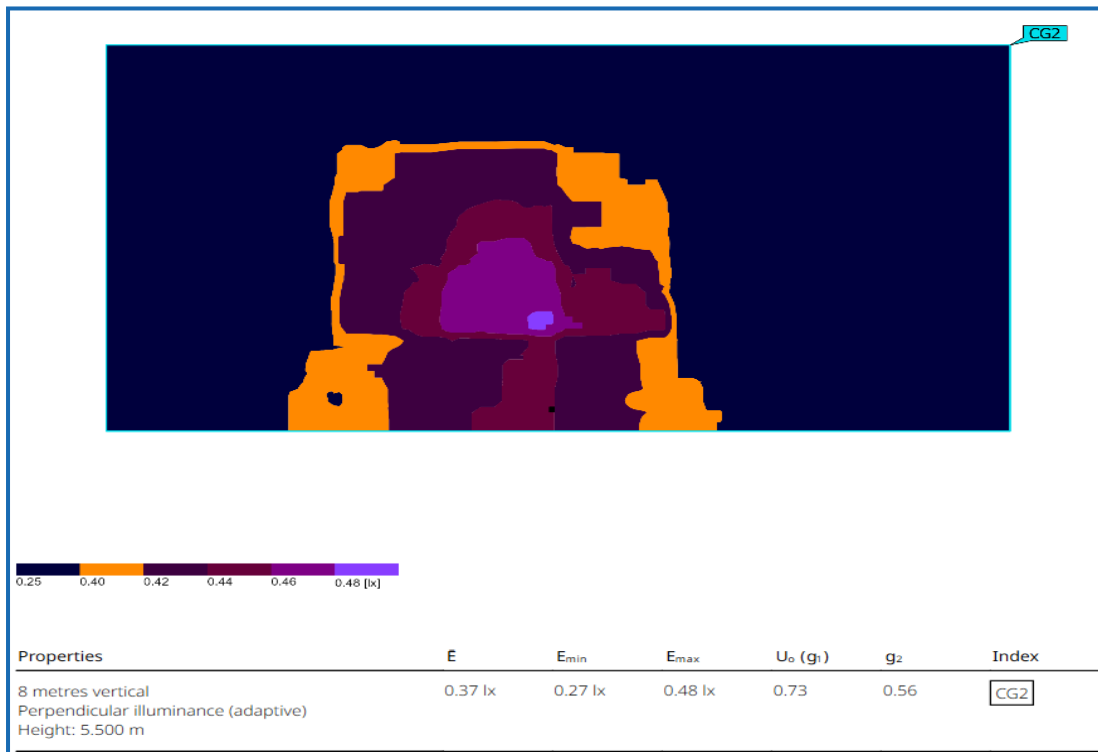


Figure 1.4: 60% Transmissible glazing results, 8mtrs from buildings

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. (T_{cp})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 (U_o): 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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