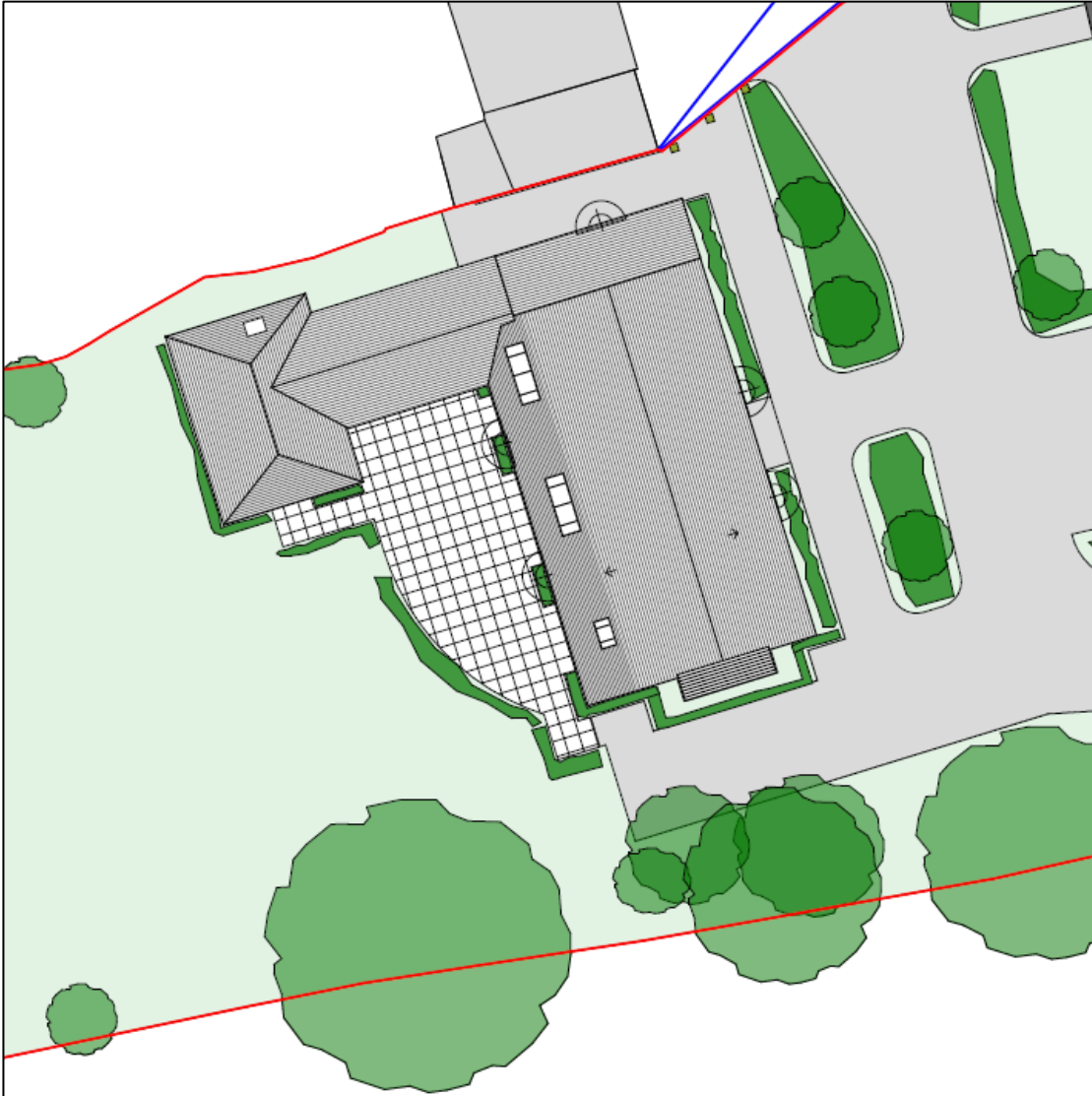


Land Adjacent to Horseshoe Farm, London Road, Barley, SG8 8JE



Lighting Assessment

1st May 2025
784-B071780

PRESENTED TO

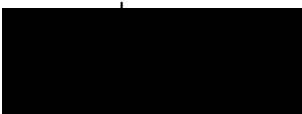
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DOCUMENT CONTROL

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Prepared by:  Faith Doran Senior Environmental Consultant	Checked by:  Pablo Mendez Pelegrina Senior Environmental Consultant	Approved By:  Matthew Smith Associate Environmental Consultant	

EXECUTIVE SUMMARY

Tetra Tech were commissioned by G C & J C Wilkerson Ltd to prepare a Lighting Assessment to discharge a planning condition for the conversion of a barn to one 4-bed dwelling including external alterations, single-storey bay to south gable end and single storey rear extension at Land Adjacent to Horseshoe Farm, SG8 8JE.

An indicative lighting plan has been created by Tetra Tech and used to produce a model of the proposed development within DIALux software in accordance with the appropriate criteria.

The assessment has concluded that the risk of the proposed scheme resulting in exceedances of either the Institution of Lighting Professionals (ILP) pre-curfew or post-curfew obtrusive light limitations at local residential receptors will be low.

Following the installation of an appropriate lighting scheme as detailed in this report, the risk of the proposed development resulting in exceedances of 1 lux along potential bat foraging/commuting routes and dark corridors is low at all ecological receptor locations.

The assessment demonstrates that there is a low risk of significant adverse impacts on local sensitive residential and ecological receptors, and that the proposed development does not conflict with any national or local planning policies regarding lighting.

The dark skies assessment illustrates that the Upward Light Ratio (ULR) for the proposed development is 0%. This is below the 5.00% ULR criteria for the Environmental Zone E3. As such, the indicative lighting scheme is not considered to result in detrimental impacts on the dark sky landscape.

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
CIBSE	Chartered Institute of Building Services Engineers
CIE	Commission on Illumination
ILP	Institution of Lighting Professionals
LDF	Local Development Framework
LP	Local Plan
CS	Core Strategy
DPD	Adopted Development Plan Documents
SPD	Adopted Supplementary Planning Documents
SG	Endorsed Supplementary Guidance Documents
NGR	National Grid Reference
PPS	Planning Policy Statement
NPPF	National Planning Policy Framework
Lx	Lux
ULR	Upward Lighting Ratio

1.0 INTRODUCTION

Tetra Tech were commissioned by G C & J C Wilkerson Ltd to prepare a Lighting Assessment to discharge a planning condition for the conversion of a barn to one 4-bed dwelling including external alterations, single-storey bay to south gable end and single storey rear extension at Land Adjacent to Horseshoe Farm, SG8 8JE.

Planning condition 4 of the application (reference number 23/02707/FP) states the following:

“Details of any external lighting to be installed on the site, including the design of the lighting unit, any supporting structure, and the extent of the area to be illuminated, shall be submitted to and approved in writing by the Local Planning Authority prior to the development commencing. Only the details thereby approved shall be implemented.

Reason: To protect the amenities of the occupiers of adjoining properties”

1.1 SITE LOCATION AND CONTEXT

The development site currently comprises of an existing barn. There not currently existing lighting within the site boundary. The approximate national grid reference of the site is 539745 , 238240. G C & J C Wilkerson Ltd is seeking planning permission for conversion of a barn to one 4-bed dwelling at Land Adjacent to Horseshoe Farm, SG8 8JE.

The proposed development is bounded by:

- Residential properties along London Road to the north. There is some existing lighting present at this location.
- Smiths Lane to the east. There is some existing lighting present at this location.
- Open grassland to the south. There is no existing lighting present at this location.
- Wooded area and open grassland to the west. There is no existing lighting present at this location.

Reference should be made to **Figure 1-1** for a location map of the site and the proposed layout.

1.2 LIGHTING DESIGN AND ASSESSMENT - OVERVIEW

The proposed development will require the installation of a number of luminaires that have the potential to increase existing light levels at sensitive locations within the vicinity of the site. The following stages have therefore been undertaken in order to produce a suitable lighting layout and assess potential impacts:

- Quantitative assessment of potential lighting impacts at existing light sensitive receptors bordering the proposed development site, based on the proposed external lighting design;
- Formulation of appropriate mitigation measures, where necessary, in order to minimise the potentially detrimental impacts of the proposed lighting scheme.

Figure 1-1 – Site Location and Layout



2.0 POLICY, LEGISLATION AND RELEVANT AGENCIES

2.1 DOCUMENTS CONSULTED

The following documents were consulted during the undertaking of this assessment:

- Guidance Notes for the Reduction of Obtrusive Light, The Institution of Lighting Professionals, 2021.
- National Planning Policy Framework Ministry of Housing, Communities & Local Government, December 2024.
- Planning Practice Guidance on Light Pollution, Ministry of Housing, Communities & Local Government, 1st November 2019.
- The Conservation of Habitats and Species Regulations, as amended, 2017.
- Environmental Protection Act, 1990.
- Statutory Nuisance from Insects and Artificial Light, Guidance on Sections 101 to 103 of the Clean Neighbourhoods and Environment Act 2005, DEFRA 2006.
- Artificial Lighting and Wildlife Interim Guidance: Recommendations to Help Minimise the Impact of Artificial Lighting, Bat Conservation Trust, 2014.
- BS EN 13201-4: Road Lighting – Methods of Measuring Lighting Performance, 2003.
- BS 5489-1: Code of Practice for the Design of Outdoor Lighting - Lighting of Roads and Public Amenity Areas, British Standards Institute, 2013.
- PLG 04- Guidance on Undertaking Environmental Lighting Impact Assessments, ILP, 2013.
- Bats and artificial lighting in the UK, Institution of lighting professionals, Bat Conservation Trust, 2023.
- Herefordshire Local Plan Core Strategy 2011-2031.

2.2 LEGISLATIVE FRAMEWORK

Light pollution was introduced within the Clean Neighbourhoods and Environment Act (2005) as a form of statutory nuisance under the Environmental Protection Act (1990), which was amended to include the following definition:

“(fb) artificial light emitted from premises so as to be prejudicial to health or nuisance.”

Although light was described as a statutory nuisance, no prescriptive limits or rules have been set for assessment. Guidance within the National Planning Practice Guidance with regards to Light pollution has been referred to while producing this assessment as well as documents produced by the International Commission on Illumination (CIE), Institution of Lighting Professionals (ILP) and the Chartered Institute of Building Services Engineers (CIBSE).

2.3 DESIGN STANDARDS

2.3.1 National Standards

The appropriate lighting design criteria for the scheme are contained within the following documents:

- BS EN 12464-2: Lighting of Work Places - Outdoor Work Places, 2014.
- BS 5489-1: Code of Practice for the Design of Outdoor Lighting - Lighting of Roads and Public Amenity Areas, 2020.
- BS EN 13201-2: Road Lighting - Performance Requirements, 2020.

Good lighting design also includes luminaires that have been selected to minimise light intrusion and glare to pedestrians and drivers, as discussed within the ILP document 'Guidance Notes for the Reduction of Obtrusive Light'.

2.3.2 Best Practice Design

As well as meeting the statutory design standards outlined in section 2.3.1, the external lighting design has sought to meet a number of criteria to ensure that the environmental effects of artificial lighting are managed to a high standard. These criteria are as follows:

- All external lighting schemes must not have an upward lighting ratio (ULR) of more than 2.5%.
- All new column mounted luminaires shall be fitted with flat glass where appropriate to minimise upward light discharge to below 2.5%.
- Where appropriate, luminaires on the site boundary will be fitted with light baffles to prevent light spill.
- Where possible, external lighting will be controlled via daylight sensors and timers to ensure lights only come on between 7am to sunrise and turn off between sunset to 9pm.

2.4 PLANNING POLICY AND GUIDANCE

2.4.1 National Policy

The National Planning Policy Framework (NPPF), December 2024 principally brings together and summarises the suite of Planning Policy Statements (PPS) and Planning Practice Guidance (PPG) which previously guided planning policymaking. The NPPF broadly retains the principles of PPS 23: Planning and Pollution Control and with regard to light pollution, paragraph 198 states that:

“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:

[...] c. limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.”

The National Planning Practice Guidance web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6 March 2014 and updated for lighting on 1st November 2019 to support the National Planning Policy Framework and make it more accessible. It states that *“for maximum benefit, the best use of artificial light is about getting the right light, in the right place and providing light at the right time”*. The assessment has considered the following implications of the proposed lighting design, as detailed within National Planning Practice Guidance:

“What factors can be considered when assessing whether a development proposal might have implications for light pollution?”

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? For example, this might be because:*
 - *the artificial light has a significant effect on the locality.*
 - *users of the proposed development (e.g. a hospital) may be particularly sensitive to light intrusion from the existing light source.*
- *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).*

If the answer to any of the above questions is ‘yes’, consideration should be made for:

- *where the light shines;*

- *when the light shines;*
- *how much light shines; and*
- *possible ecological impact.”*

2.4.2 Local Policy

Following a review of the Herefordshire Local Plan Core Strategy 2011-2031, Adopted October 2015, the following policy was identified as being relevant to potential light impacts associated with the proposed scheme:

“Policy SS6 – Environmental Quality and Local Distinctiveness

Development proposals should conserve and enhance those environmental assets that contribute towards the county’s distinctiveness, in particular its settlement pattern, landscape, biodiversity and heritage assets and especially those with specific environmental designations. In addition, proposals should maintain and improve the effectiveness of those ecosystems essential to the health and wellbeing of the county’s residents and its economy. Development proposals should be shaped through an integrated approach to planning the following environmental components from the outset, and based upon sufficient information to determine the effect upon each where they are relevant:

- *landscape, townscape and local distinctiveness, especially in Areas of Outstanding Natural Beauty; • biodiversity and geodiversity especially Special Areas of Conservation and Sites of Special Scientific Interest;*
- *historic environment and heritage assets, especially Scheduled Monuments and Listed Buildings;*
- *the network of green infrastructure;*
- *local amenity, including light pollution, air quality and tranquillity;*
- *agricultural and food productivity;*
- *physical resources, including minerals, soils, management of waste, the water environment, renewable energy and energy conservation.”*

3.0 METHODOLOGY

The Lighting Assessment includes the establishment of baseline ambient light conditions and an evaluation of impacts associated with the lighting design. This includes an assessment of change in light obtrusion at existing receptor locations.

Light modelling was undertaken using DIALux, an independent lighting modelling software which is capable of calculating daylight and artificial lighting scenes in interior and exterior scenarios. The model incorporates ILP, CIE 112 and BS EN 12464-2 calculation methodologies which are commonly used for lighting impact assessment.

3.1 LIGHTING DESIGN

An indicative lighting scheme for the development has been designed in accordance with the previously outlined standards and guidance. The design of the lighting has been undertaken in a manner such as to address two potentially conflicting needs; namely, on the one hand, to provide a safe environment for the movement of employees when the natural lighting levels fall and, on the other hand, to meet the light obtrusion limitations stated within the relevant standards and guidance in order to avoid any detriment to local amenity and wildlife. The design also aims to minimise light spillage to the dark corridors surrounding the site.

Modelling for the assessment includes luminaires considered appropriate for the proposed development. following the use of lights that are consistent with those used at nearby approved developments and discussions within the lighting design team, as shown below:

- Austin Ligman AU-30601 4454-5121 lumen 37W Wide at 2.5m

3.2 QUANTITATIVE LIGHTING ASSESSMENT

3.2.1 Obtrusive Light

Baseline light conditions were determined through a desk-based analysis of the existing site and the surrounding area. A lighting model was subsequently developed to represent the proposed external lighting scheme and to enable the obtrusive light from the proposed development to be calculated at local receptors.

The ILP has developed an Environmental Zone classification system for the categorisation of sensitive receptor locations based on typical levels of baseline obtrusive light. This is summarised in **Table 3-1**.

Table 3-1 – Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 t 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones 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 of suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

For each Environmental Zone, recommended obtrusive light limits for exterior lighting installations have also been determined. These are summarised in **Table 3-2** to **Table 3-4**.

Table 3-2 shows the maximum allowable illuminance in the vertical plane for each Environmental Zone for pre-curfew scenarios (after 07:00 hours) and post-curfew scenarios (after 23:00).

Table 3-3 shows the maximum allowable luminous intensity emitted by the luminaires relative to the position of each luminous intensity receptor location depending on what the Environmental Zone is.

Table 3-4 shows the maximum allowable Upward Light Ratio (ULR) for each Environmental Zone. If the modelled maximum values of vertical illuminance, the modelled maximum luminous intensity and the ULR are below the criteria in the tables below, they pass the assessment.

Table 3-2 – Maximum Values of Vertical Illuminance on Properties

Light technical parameter	Application conditions	Environmental Zone				
		E0	E1	E2	E3	E4
Illuminance in the vertical plane (Ev)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	<0.1 lx*	1 lx	2 lx	5 lx

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

Table 3-3 – Limits for the Luminous Intensity of Bright Luminaires

Light technical parameter	Application conditions		Luminaire group (projected area Ap in m²)					
			0<Ap ≤0.002	0.002<Ap ≤0.01	0.01<Ap ≤0.03	0.03<Ap ≤0.13	0.13<Ap ≤0.50	Ap>0.5
Maximum luminous intensity emitted by luminaire (I in cd)	E3	Pre-curfew	0.86 d	1.9 d	3.8 d	7.5 d	15 d	10,000
		Post-curfew	0.29 d	0.63 d	1.3 d	2.5 d	5.1 d	1,000
Aid to gauging Ap			2 to 5cm	5 to 10cm	10 to 20cm	20 to 40cm	40 to 80cm	>80cm
Geometric mean of diameter (cm)			3.2	7.1	14.1	26.3	56.6	>80
Corresponding AP representative area (m2)			0.0008	0.004	0.016	0.063	0.251	>0.5

NOTE:

1. D is the distance between the observer and the glare source in meters;
2. A luminous intensity of 0 cd can only be realised by a luminaire with a complete cut off in the designated directions;
3. A_p is the apparent surface of the light source seen from the observer position;
4. For further information refer to Annex C of CIE 150
5. Upper limits for each zone shall be taken as those with column $A_p > 0.5$

Table 3-4 – Maximum Values of Upward Light Ratio (ULR) of Luminaires

Light technical parameter	Environmental Zone				
	E0	E1	E2	E3	E4
Upward light ratio (ULR)/%	0	0	2.5	5	15

The assessment determined the lighting levels and Environmental Zone classification in the vicinity of the proposed development. Modelling of the lighting scheme was undertaken and predicted obtrusive light values compared with the relevant guidelines, as detailed within **Table 3-2** to **Table 3-4**.

The potential environmental effects of the proposed development are identified, as far as current knowledge of the site and development allows. The significance of potential environmental effects is assessed according to their scale (magnitude) and the sensitivity of the receptors.

For the purposes of this assessment, the effects of the development are considered to be 'significant' if:

- Sensitive ecological receptors exceed 1 lux;
- The development is predicted to exceed the maximum sky glow ULR at any surrounding receptor; or,
- The development is predicted to cause either an exceedance of the ILP obtrusive light trespass limitation at a receptor or if the development is predicted to cause an increase of more than 10% at an existing receptor where the ILP obtrusive light trespass limitation is already being exceeded.

4.0 BASELINE

4.1 RECEPTORS

The term 'receptors' includes any persons, locations or systems that may be susceptible to changes in environmental factors as a consequence of the development.

4.1.1 Residential Receptors

Through a desk-based analysis, key residential properties were identified which have the potential to be affected by obtrusive light from the proposed development, as shown in **Table 4-1**. Reference should be made to **Figure 4-2** for an illustration of the residential receptors used for the purposes of this assessment. All the identified residential receptors are considered to be within ILP Environmental Zone E2. Each receptor was input into the model at a height of 4.0m (bungalows and single-storey building at height of 1.5m) at a distance of 10 cm from the building façade to represent illuminance at first-floor window level, representing a typical bedroom, which is deemed to be the most sensitive receptor room.

Table 4-1 – Residential Receptors

ID	Description	ILP Environmental Zone
R1	Homestall Cottage, London Road, SG8 8JF	E2
R2	1 Horseshoe Close, London Road, SG8 8JF	E2
R3	1 Westfield, London Road, SG8 8JE	E2
R4	4 Westfield, London Road, SG8 8JE	E2
R5	Horseshoe Farm, London Road, SG8 8JE	E2
R6	The Quakers Smith's End Lane, SG8 8LL	E2
R7	Lantern Lodge Smith's End Lane, SG8 8LL	E2
R8	Robin Hill Smith's End Lane, SG8 8LL	E2

Figure 4-1 – Modelled Residential Receptors



4.1.2 Ecological Receptors

Lighting associated with the operational phase of the proposed development has the potential to impact on receptors of ecological sensitivity within the vicinity of the site. The Conservation of Habitats and Species Regulations (2017) and subsequent amendments require competent authorities to review planning applications and consents that have the potential to impact on National Site Network (NSN) designated sites (e.g. Special Areas of Conservation). In order to represent a worst-case scenario, the assessment has assumed that potential bat species on site will be highly sensitive to artificial light.

For the purposes of the assessment, ecological receptor locations have been included at 8 points along the length of hedgerows and trees around and within the boundary of the site, at a height of 2.5m. The ecological receptors include locations where treelines and vegetation with bat roosting and foraging potential are to be kept. **Table 4-2** below, provides a reference for these locations whilst a full spatial illustration of modelled ecological receptors is included in **Figure 4-3**.

Table 4-2 – Ecological Receptors

ID	Description
E1 – E4	Treeline to the northwest of site
E5 – E8	Treeline to the south of site

Figure 4-2 – Modelled Ecological Receptors



5.0 LIGHTING ASSESSMENT

Potential impacts associated with the proposed lighting design at locations in the vicinity of the site were assessed as described in the following sections.

5.1 OBTRUSIVE LIGHT MODELLING

The indicative lighting plan is displayed in **Figure 5-1**. The proposed development and lighting design has been modelled within DIALux software in accordance with appropriate criteria. Reference should be made to **Figure 5-2** and **Figure 5-3** for a 3D representation of the proposed model. Buildings surrounding the development site were also included in the model at heights of 8m (2-storey building) and 4m (1-storey building).

The assessment has considered the possible types of lighting used for the proposed residential areas and has been considered worst-case, as shown below.

- Ligman AU-30601 4454-5121 lumen 37W Wide at 2.5m

The model is only able to accurately represent the effects of solid structures such as buildings and walls on light obstruction. Non-solid barriers such as trees and hedges cannot be accurately modelled and therefore the effects of these are dealt with qualitatively outside the model calculations.

The assessment considers the effect of the proposed development in the pre-curfew and post-curfew periods. The assessment consists of a comparison between assumed baseline illuminance levels at each of the receptor locations against the predicted light obstruction from the proposed development determined in lighting model. The assumed baseline illuminance levels are ILP Environmental Zone E2.

Where it was not practicable to measure existing illuminance at the receptor location, monitoring results from the nearest equivalent representative monitoring location are used.

The ULR of the proposed development has been calculated and referenced to the maximum permitted limitations for the relevant Environmental Zones of the receptor locations, as detailed in **Table 3-2** to **Table 3-4**.

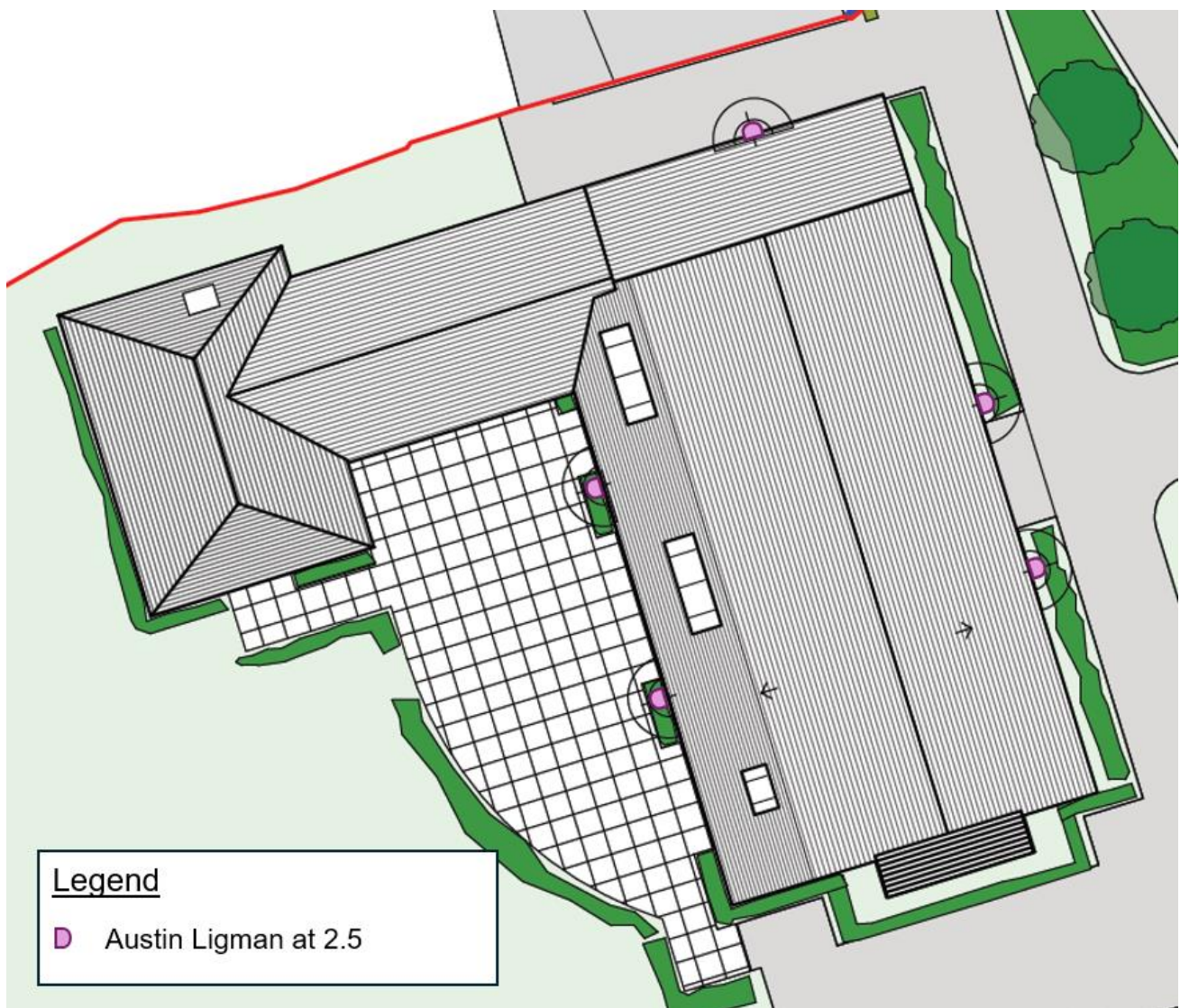
Figure 5-1 – External Lighting Layout

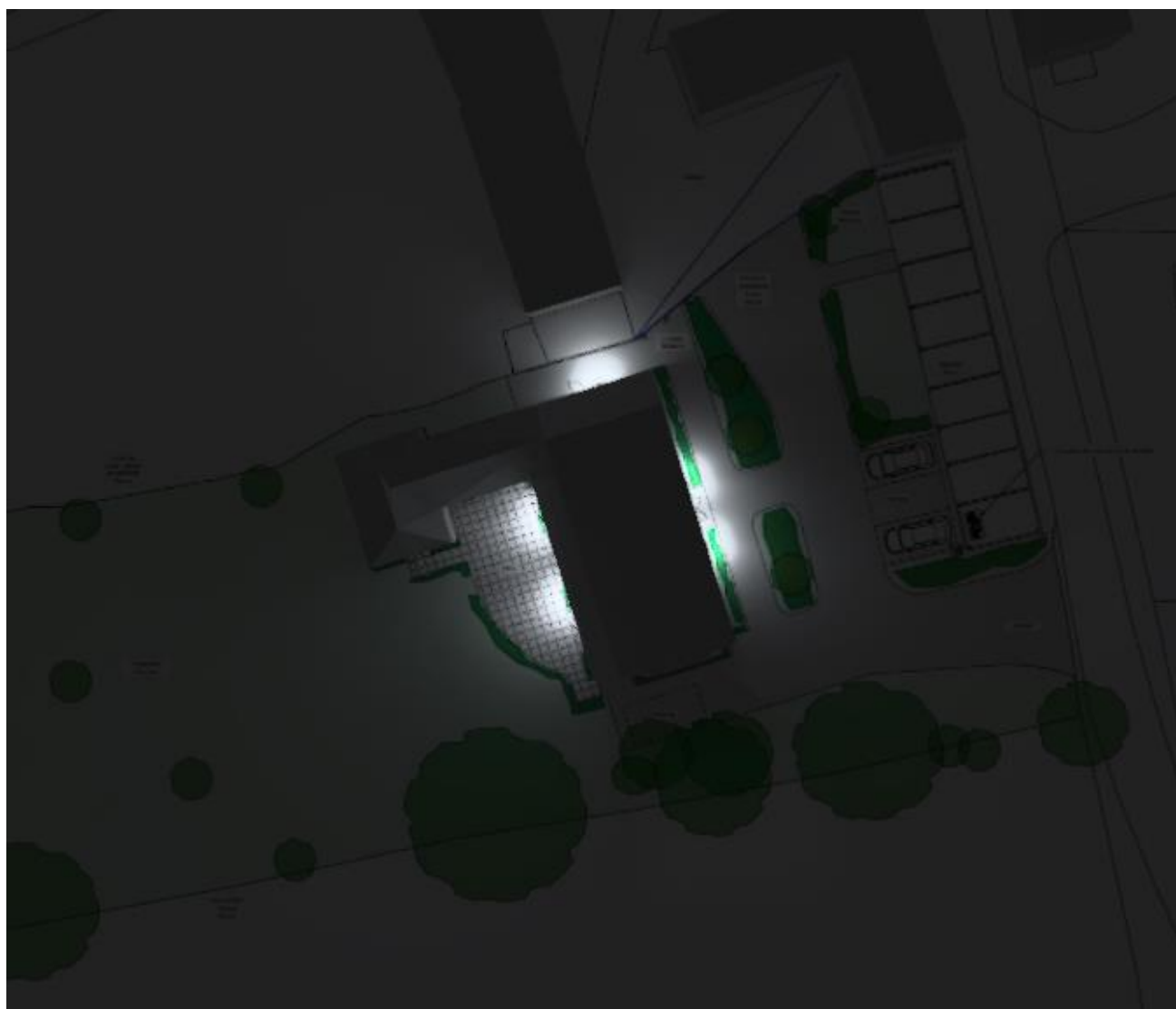
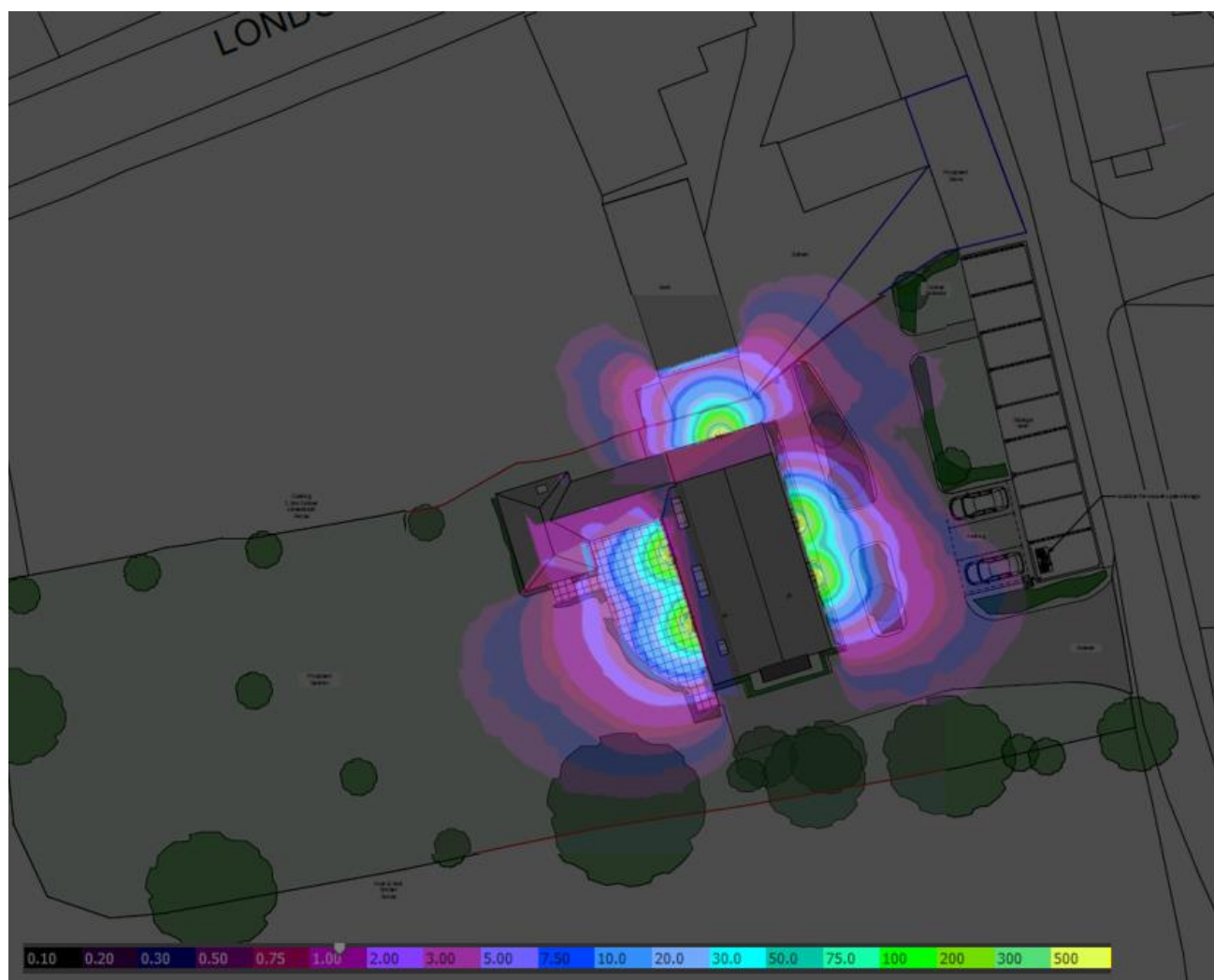
Figure 5-2 – Visual Representation of Proposed External Lighting Model

Figure 5-3 – Visual Representation of Lux Contours

5.1.1 Model Results

5.1.1.1 Residential Receptors

Table 5-1 below compares the modelled lighting arrangements to the ILP pre-curfew and post-curfew criteria limits for ILP Environmental Zone E2, in accordance with the classifications detailed in **Table 3-2** to **Table 3-4**.

Table 5-1 – Residential Receptor Assessment Results

ID	ILP Pre-curfew Criteria (Lx)	ILP Post-curfew Criteria (Lx)	Predicted Model Illuminance (lx)
R1	5.0	1.0	<0.01
R2	5.0	1.0	<0.01
R3	5.0	1.0	<0.01
R4	5.0	1.0	<0.01
R5	5.0	1.0	0.03
R6	5.0	1.0	0.05
R7	5.0	1.0	0.18
R8	5.0	1.0	<0.01

The assessment shows that the ILP pre-curfew and post-curfew Zone E2 criteria will not be exceeded at any residential receptor locations as a result of lighting from the proposed development, with a maximum predicted model illuminance of 0.18 lux at R7. Therefore, the proposed development is not predicted to result in any significant adverse impacts with respect to local sensitive residential receptors.

5.1.1.2 Ecological Receptors

It is believed that most bat emergence requires light levels below 1 lux for late emerging species, up to 14 lux for those that emerge earlier (Noctule and Pipistrelle). These lighting levels of 1 lux are required to ensure that bat commuting, and foraging routes are not impacted and that dark corridors beyond the limits of the site are retained. While some bat species, such as Pipistrelle are more tolerant with light levels above this criterion, it reflects worst-case assumptions concerning the sensitivity of those species present to background illuminance levels. As such, the assessment criteria represent a worst-case scenario in terms of impacts on emergence, commuting and foraging (Bat Conservation Trust, 2018).

When determining the likely impacts of lighting associated with the proposed development on sensitive ecological receptors, the assessment has considered the effect of lighting without mitigation. Impacts are considered potentially significant where predicted illuminance exceeds 1 lux at ecological receptors. If this is the case, further consideration should be given to mitigation measures. **Table 5-2** shows the modelled lighting arrangements for the ecological receptors surrounding the site vicinity and within the site.

Table 5-2 – Ecological Receptor Assessment Results

ID	Predicted Model Illuminance
E1	0.89
E2	0.18
E3	0.10
E4	0.28
E5	0.31
E6	0.71
E7	0.02
E8	0.35

As illustrated by **Table 5-2**, light trespass associated with the proposed development does not exceed 1 lux at any of the 8 modelled ecological receptor locations adjacent to the site boundary and within the proposed site, with the maximum predicted model illuminance of 0.89 lux at E1. As such, lighting from the proposed development is not predicted to result in any significant adverse impacts with respect to local sensitive ecological receptors.

5.1.2 Dark Sky Assessment

The model has been used to calculate the predicted Upward Lighting Ratio (ULR) of the proposed external lighting scheme. Model outputs predict a sky glow figure (ULR) of 0%. As illustrated in **Table 3-2** to **Table 3-4**, the ILP sky glow limitation for an area classified as Environmental Zone E2 is 2.50% ULR. As such, the indicative lighting scheme meets the ILP sky glow limitations and is therefore not considered to result in detrimental impacts on the dark sky landscape.

6.0 CONCLUSIONS

The assessment has concluded that the risk of the proposed scheme resulting in exceedances of either the ILP pre-curfew or post-curfew obtrusive light limitations at local residential receptors will be low.

Following the installation of an appropriate lighting scheme as detailed in this report, the risk of the proposed development resulting in exceedances of 1 lux along potential bat foraging/commuting routes and dark corridors is low at all ecological receptor locations.

The assessment demonstrates that there is a low risk of significant adverse impacts on local sensitive residential and ecological receptors, and that the proposed development does not conflict with any national or local planning policies regarding lighting.

The dark skies assessment illustrates that the Upward Light Ratio (ULR) for the proposed development is 0%. This is below the 2.50% ULR criteria for the Environmental Zone E2. As such, the indicative lighting scheme is not considered to result in detrimental impacts on the dark sky landscape.

APPENDIX A – REPORT CONDITIONS

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The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary, and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The “shelf life” of the Report will be determined by a number of factors including; its original purpose, the Client’s instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.