



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

THE STABLES, NORTHWEST OF FELTMAKERS LANE

LIGHTING STRATEGY

DFL-UK

17 City Business Centre, Hyde Street, Winchester, SO23 7TA
+44(0)1962 855080 | info@df-l-uk.com | www.dfl-uk.com



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



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1. INTRODUCTION

1.1. Executive Summary

- 1.1.1. This Lighting Strategy has been written by DFL (Designs for Lighting Ltd), a lighting design consultancy specialising in Lighting Impact Assessments, obtrusive light mitigation, and detailed lighting design.
- 1.1.2. The Lighting Strategy proposes good practice and outlines a suitable approach for the proposed lighting, aiming 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 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. It has been determined that the Application Site is considered to be in an E2 Environmental Zone.
- 1.1.6. Through careful design and mitigation, this Lighting Strategy ensures the lighting installation at the proposed development will be in accordance with Guidance and Local Policy.

2. LEGISLATIVE FRAMEWORKS AND LOCAL POLICIES

2.1. National Policies

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:

“Artificial light emitted from premises so as to be prejudicial to health and nuisance constitutes a ‘Statutory 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”

National Planning Policy Framework 2023

- 2.1.2. 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 September 2023 and states that the following elements are to be considered:

“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.”*

Planning Practice Guidance

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

“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.)”*

2.2. Relevant Local policies

2.2.1. The relevant Local Planning Authority (LPA) for the Proposed Development is the South Gloucestershire District council with policies detailed within the South Gloucestershire Core Strategy (Adopted 2013) applying to the lighting associated with the Proposed Development.

The applicable policies are:

Policy CS1- High Quality Design

'Development will only be permitted where the highest possible standards of design and site planning are achieved. Information submitted with an application should be proportionate to the scale, significance and impact of the proposal....'

Ensure the design, orientation and locations of buildings, roof pitches, windows, habitable rooms. Lighting and soft landscaping help to achieve energy conservation....'

3. BRITISH STANDARDS AND GUIDANCE

3.1. British Standards

- 3.1.1. The Application Site will be lit for wayfinding purposes only. No British Standards will apply to the application site.

3.2. Guidance

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

The Lighting Strategy is informed by industry guidance notes which aim to reduce the potential for obtrusive light to occur, which is typically caused by poorly designed and installed exterior artificial lighting. The Lighting Strategy is informed by the most relevant sections of GN01/21 that has recently been published to reduce the potential for obtrusive light from a wide range of exterior lighting applications.

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

This document is aimed at lighting professionals, lighting designers, planning officers, developers, bat workers/ecologists and anyone specifying lighting. It is intended to raise awareness of the impacts of artificial lighting on bats, and mitigation is suggested for various scenarios. However, it is not meant to replace site-specific ecological and lighting assessments.

4. DESKTOP STUDY

4.1. Site Description and Context

4.1.1. The Application Site is The Stables, Northwest of Feltmakers Lane. The site is currently undeveloped. An indicative boundary of the site and proposed layout can be seen in **Figure 1**.

4.1.2. The Proposed Development comprises of three residential properties with associated landscaping. The Site Layout Plan is shown in **Figure 2**.

4.1.3. A desktop assessment was completed to understand its position within the current lit environment.

4.1.4. The site does not sit within or in close proximity to any statutory designations.



Figure 1: The Application Site location and boundary

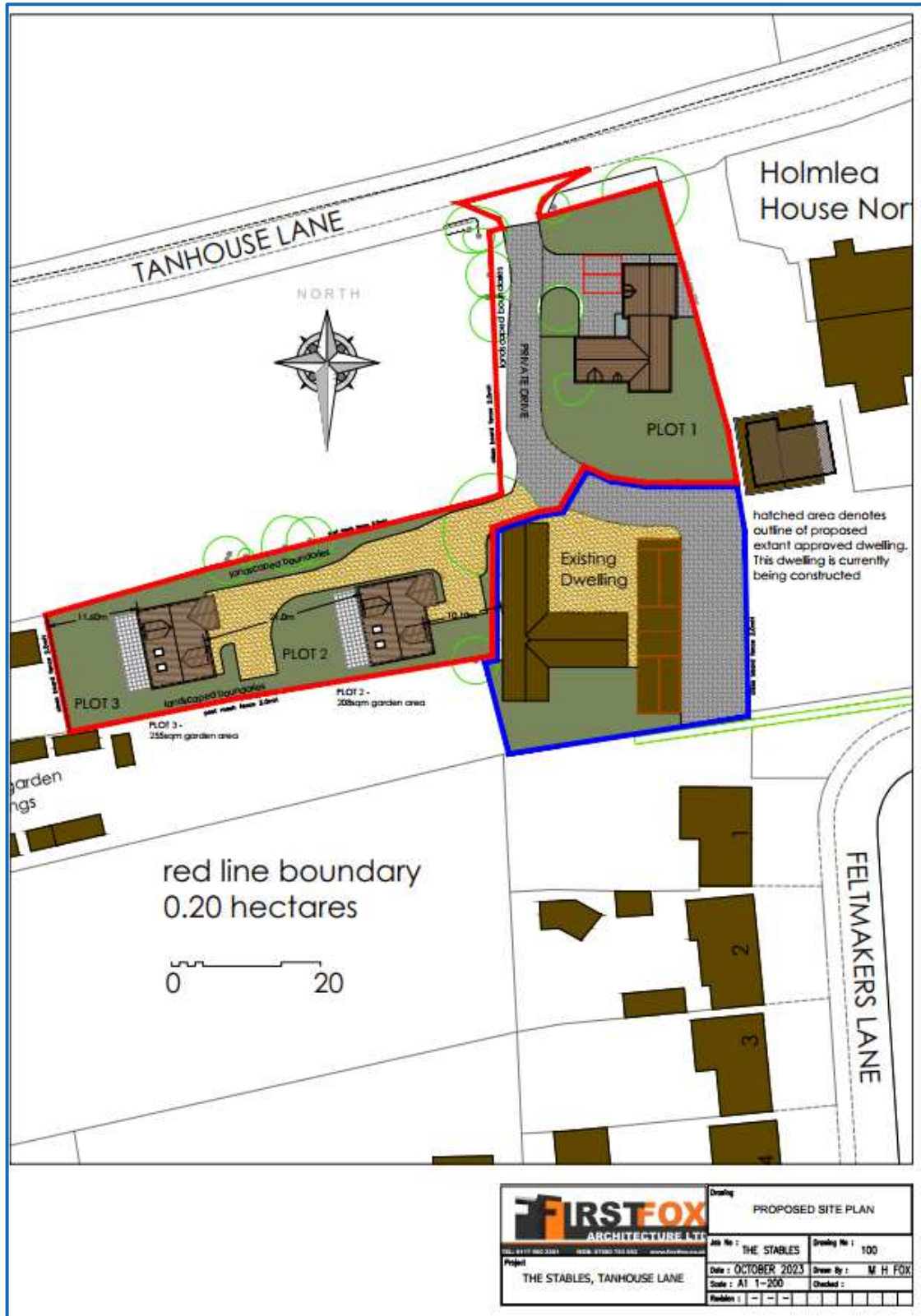


Figure 2: Proposed Development Site layout plan

4.2. CPRE Night Blight Mapping

- 4.2.1. To inform the Environmental Zone classification, the CPRE Night Blight Mapping confirms the skyward radiance within the vicinity of the Application Site is between 1 - 2 Nano Watts/cm²/sr. As shown in **Figure 3**, the likely levels of skyglow within the vicinity of the Application Site are similar to those expected within an E2 zone.
- 4.2.2. The adjacent Tanhouse Road is currently lit. There are limited examples of other amenity lighting in the surrounding areas.

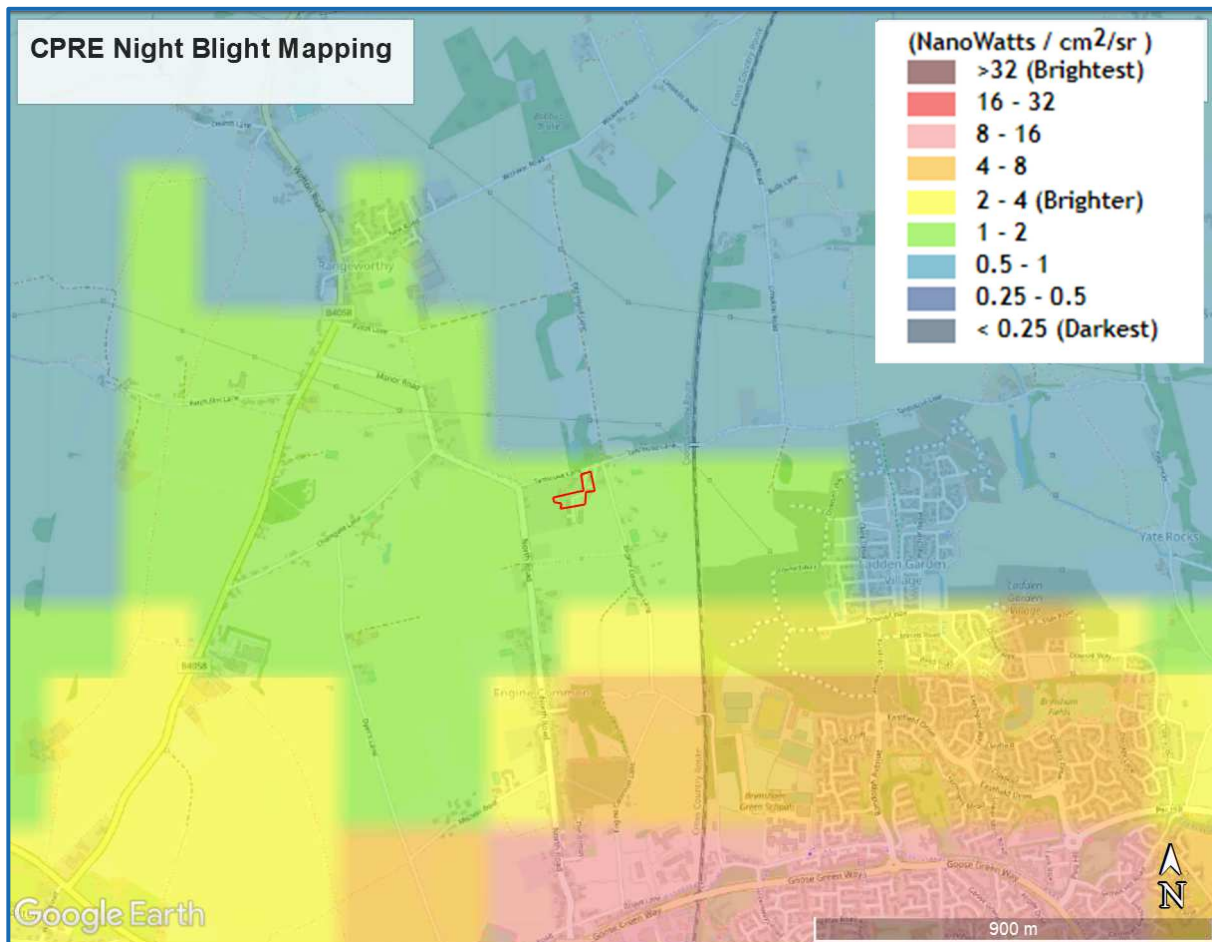


Figure 3: Surrounding areas/roads

- 4.2.3. The Environmental Zone criteria detailed within **Table 1** and **Table 2** informs the basis of the Lighting Strategy. The Application Site is considered to be located within an E2 Environmental Zone, because there are limited examples of amenity lighting within the wider area, the area is also classes as sparsely inhabited rural area.

Zone	Surroundin g	Lighting Environment	Examples
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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

Notes:

1. Where an area to be lit lies on the boundary of two zones the obtrusive light limitation values used should be those applicable to the most rigorous zone.
2. Rural zones under protected designations should use a higher standard of policy.
3. Zone E0 must always be surrounded by an E1 Zone.
4. Zoning should be agreed with the local planning authority and due to local requirements a more stringent zone classification may be applied to protect special/specific areas.
5. SQM (Sky Quality Measurements) referenced by the International Dark-Sky Association (IDA), the criteria for E0 being revised in mid-2019 but not retrospective.
6. Astronomical observable dark skies will offer clearer views of the Milky Way and of other objects such as the Andromeda galaxy and the Orion Nebula.
7. Although values of SQM 20 to 20.5 may not offer clear views of astronomical dark sky objects such as the Milky Way, these skies will have their own relative intrinsic value in the UK.

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

Table 2: Obtrusive Light Criteria



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- > ULR (Upward Light Ratio) is the maximum permitted percentage of luminaire flux that goes directly into the sky.
- > E_v is Vertical Illuminance in Lux.
- > L is Luminance in Candelas per square metre; and
- > 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.
- > (*) Permitted only from public road lighting installations up to a maximum of 1.0 lux.

4.3. Ecology

- 4.3.1. The ecology report created by Ethos Ecology 'Ecology report' has identified sensitive areas within the Application Site.
- 4.3.2. Guidance for artificial lighting and bats was updated in August 2023, the guidance 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 to 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 4**)."*

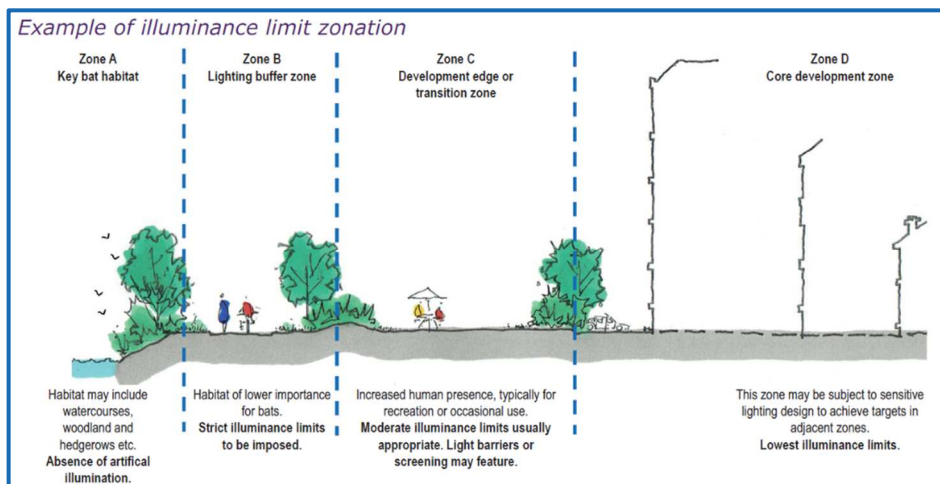


Figure 4: Example of lighting zonation near sensitive boundaries and known ecological habitat.

5. IDENTIFIED RECEPTORS

5.1. Ecological

5.1.1. The north and southern boundary(s) of the Application Site have been identified in ecology report created by Ethos, which identifies the hedgerows - as areas with potential for ecological receptors as shown in **Appendix 3**. Therefore, this lighting strategy has been written in accordance with GN08.

5.2. Human Amenity / Safety

5.2.1. To the east and west of the site, potentially sensitive human receptors have been identified as shown in **Appendix 3**. Therefore, this lighting strategy has been written in accordance with GN01, **Table 2** - Obtrusive Light Criteria.

5.3. Other

5.3.1. The site does not sit within or in close proximity to any statutory designations.

Receptor Type	Receptor No. (App. 3)	Description	Sensitivity
Human Amenity/Safety	001	Adjacent North Road Properties (450)	Medium
Human Amenity/Safety	002	Adjacent North Road Properties (444)	Medium
Human Amenity/Safety	003	Adjacent North Road Properties (442)	Medium
Human Amenity/Safety	004	Adjacent Feltmakers Lane (Holmlea House North)	Medium
Human Amenity/Safety	005	Adjacent Feltmakers Lane Properties (Existing Dwelling)	Medium
Ecology	006	Hedgerow (Northern Boundary)	High
Ecology	007	Hedgerow (Southern Boundary)	High

Table 3: Potentially Sensitive Receptors

6. LIGHTING STRATEGY

6.1. Summary

- 6.1.1. 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.
- 6.1.2. Lighting will be of an appropriate specification and designed in accordance with Guidance and Policy.
- 6.1.3. 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.
- 6.1.4. Luminaires will be used with integral LED's 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.
- 6.1.5. 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 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.
- 6.1.6. 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.
- 6.1.7. Lighting in tasks areas will be required in the following application areas:
 - > Property Frontages and Rears

6.2. Property Frontages and Rears

6.2.1. The Property Frontages and Rears will be illuminated for wayfinding purposes only to ensure amenity and safety.

6.3. Equipment Specification

6.3.1. Performance requirements are outlined in **Table 4**.


Equipment Specification	
Application Area	Property Frontages and Rears
Correlated Colour Temperature (Kelvin)	2700K
Luminaire Manufacturer	Thorn
Luminaire Model	Cesar
Light Source	LED
Height	2m
Mounting Arrangement	Wall Mounted
Luminaire Tilt	0%
Upward Light Output Ratio E2 < 2.5%	0%
Example Luminaire Image	
Controls	PIR Sensor: ON upon detection of movement, OFF after 1 Minute

Table 4: Equipment specification

7. SUMMARY OF RESULTS

7.1. Overview

- 7.1.1. The Light Spill Diagram shown in **Appendix 1** demonstrates that the Light Spill Levels associated with the proposed lighting would comply with the obtrusive light guidance set out in ILP GN01, at sensitive receptors.
- 7.1.2. To ensure the worst-case scenario has been modelled, the highest potential light levels have been modelled / presented in the light spill diagram, with the project maintenance factors set at MF = 1.0. This demonstrates the light levels at their highest (initial light levels at the start of luminaire life).

7.2. Summary of Results

- 7.2.1. The proposed lighting within the task area(s) is compliant to the relevant policies and guidance.
- 7.2.2. Where ecological receptors are potentially sensitive to vertical light spill, a vertical illumination grid has been modelled, as shown in **Appendix 3**. The light levels based on the modelling do not exceed 0.4 Lux, keeping the light levels within the guidance given within GN08:2023.
- 7.2.3. Where human receptors are potentially sensitive to vertical light spill, a vertical illumination grid has been modelled, as shown in **Appendix 3**. The light levels based on the modelling do not exceed 1 Lux, keeping the light levels within the guidance given within GN01:2021 for an area identified as an E2 environment.

7.3. Mitigation

- 7.3.1. Careful design ensures the lighting has been minimised onto sensitive receptors in accordance with standards and guidance.
- 7.3.2. Equipment specified has been chosen to ensure there is no adverse effects on the wider environment. All luminaires have a 0% ULOR. The wall mounted fitting used for the purpose of security and amenity have been selected as they contain IDA Dark skies approved optics. All lighting provided is a task specific to ensure controlled light.
- 7.3.3. Chosen optics have been selected to protect ecology by the operation time only being activated at times of motion detection and then off after 1 minute , thus limiting the time the light is present and reducing any potential for light pollution and limiting upward light.
- 7.3.4. Through the use of the control methods detailed in **Table 4**, it limits the amount of light in the affected Application Area to minimum amount of time for amenity and safety purposes.

8. CONCLUSION

8.1. General

- 8.1.1. Lighting associated with the Proposed Development shall be designed in accordance with the Lighting Strategy for the Application Site outlined in **Section 6**.
- 8.1.2. This lighting strategy has been written in accordance with the relevant industry guidance and local policies to ensure it is unlikely to give rise to obtrusive light with the potential to affect human, environmental and ecological receptors.
- 8.1.3. Through the application of this lighting strategy sensitive receptors will not be adversely affect by obtrusive light, as shown in **Appendix 2**.
- 8.1.4. This lighting strategy has demonstrated the controlled and considerate lighting will not cause an adverse effect on the wider environment. As stated in the Ecology Report lighting has been installed at minimum levels, at a warm colour temperature and with Timers and movement sensors to ensure lights are not on when not in use.
- 8.1.5. 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.

APPENDIX 1 – LIGHT SPILL DIAGRAM

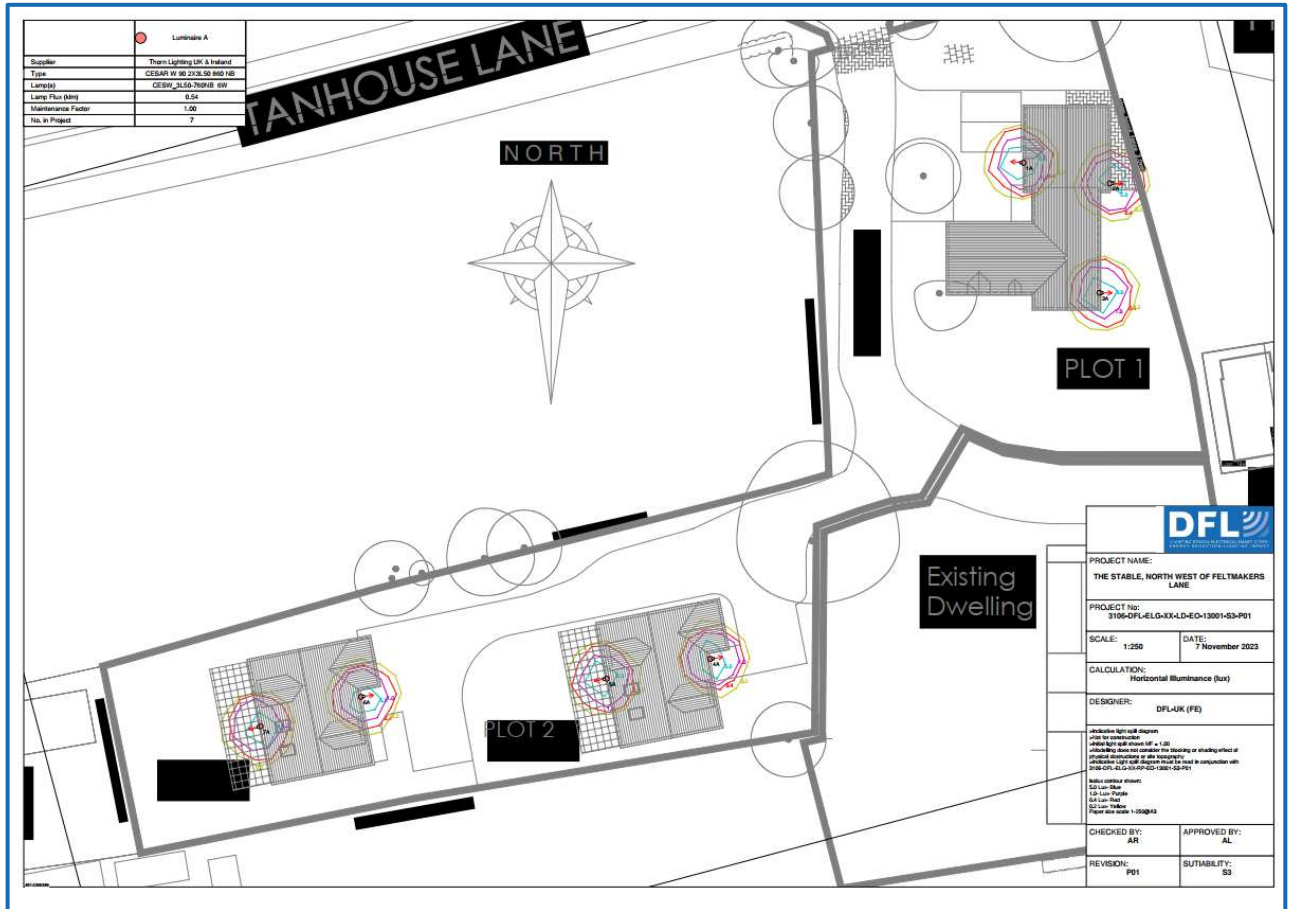


Figure 5: Lighting Spill Diagram

APPENDIX 2 – VERTICAL LIGHT SPILL DIAGRAM

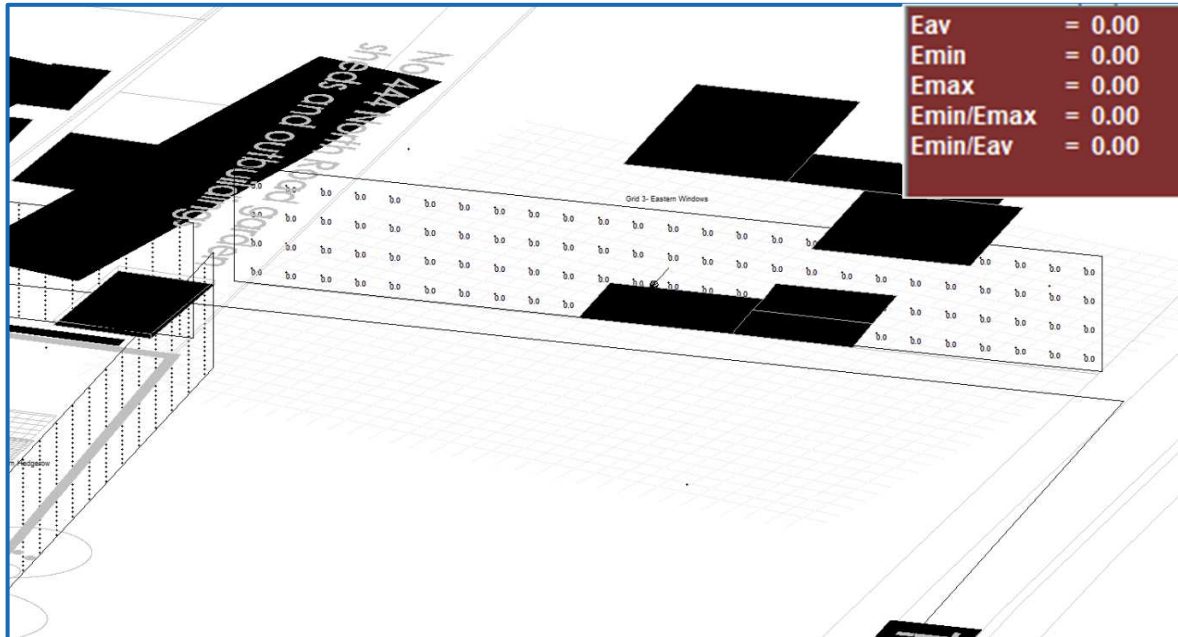


Figure 6: Vertical spill light diagram. Receptor 001. 0.00 Lux

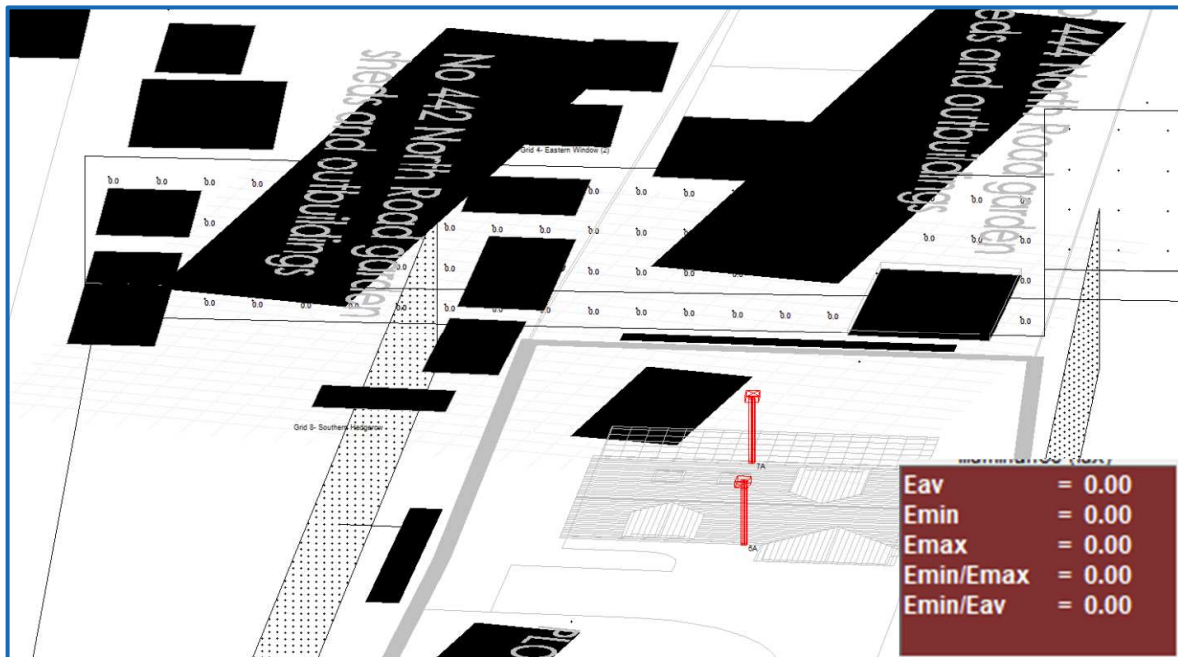


Figure 7: Vertical Spill Light Diagram. Receptor 002. 0.00 Lux

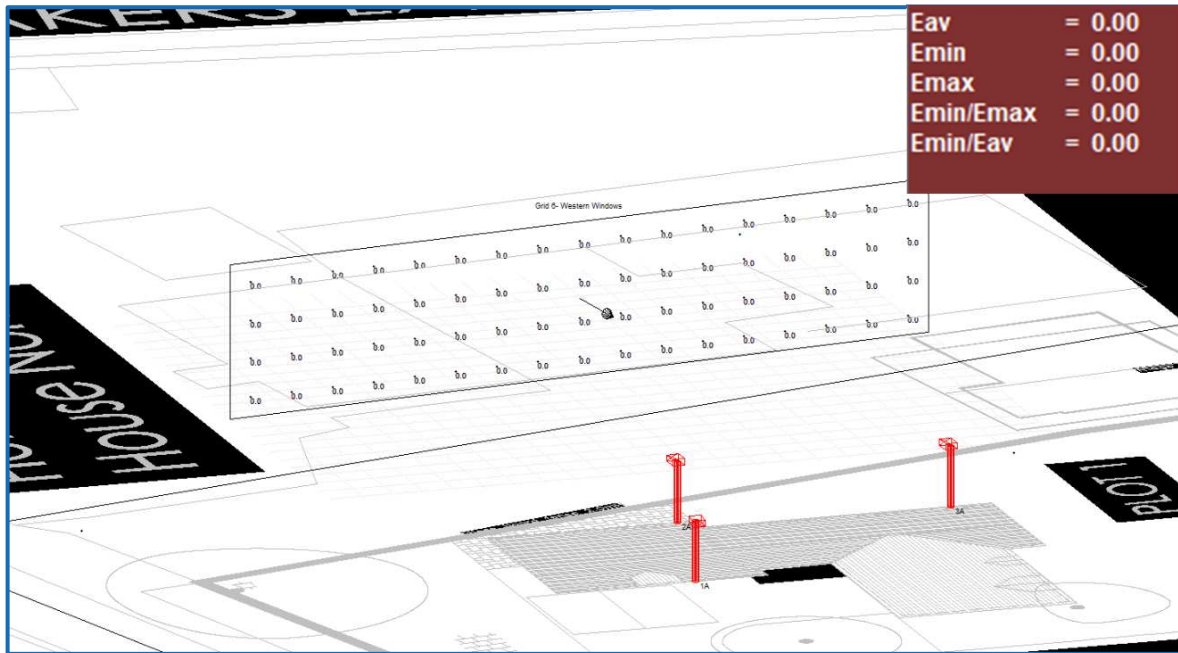


Figure 8: Vertical Spill Light Diagram. Receptor 003. 0.00 Lux

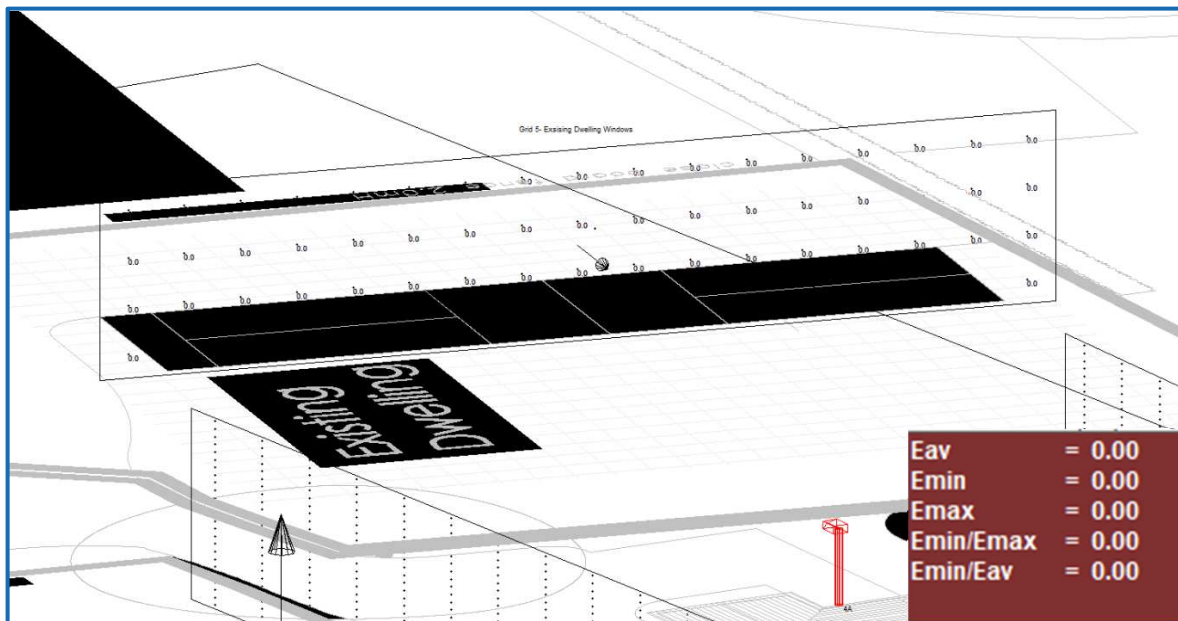


Figure 9- Vertical Spill Light Diagram. Receptor 004. 0.00 Lux

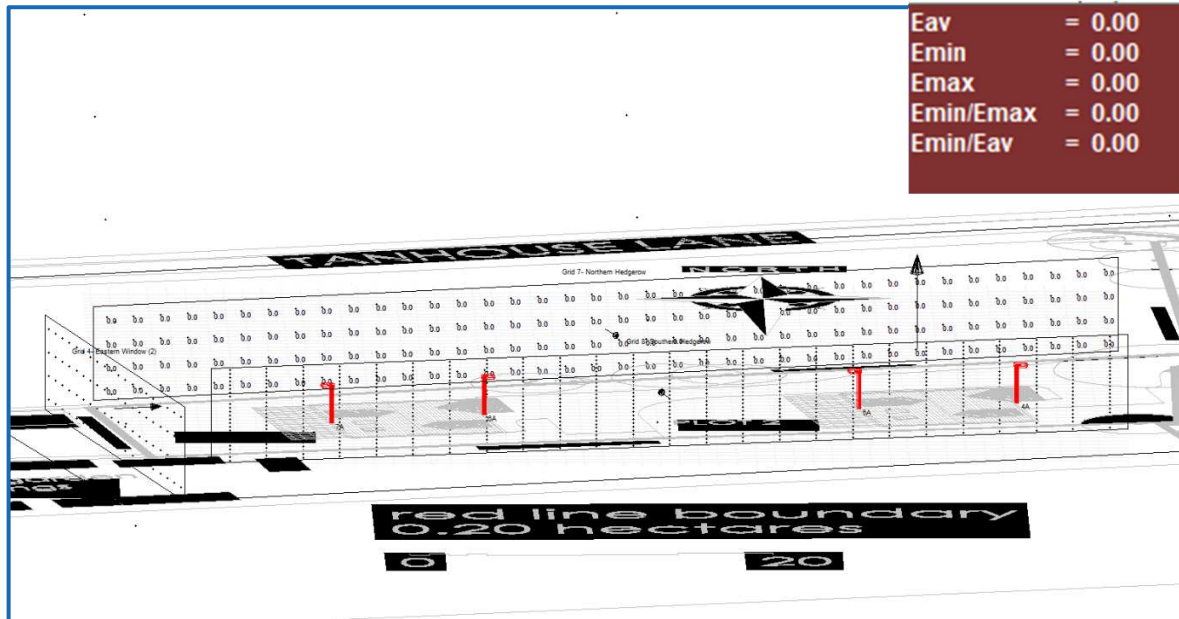


Figure 10- Vertical Spill Light Diagram. Receptor 005. 0.00 Lux

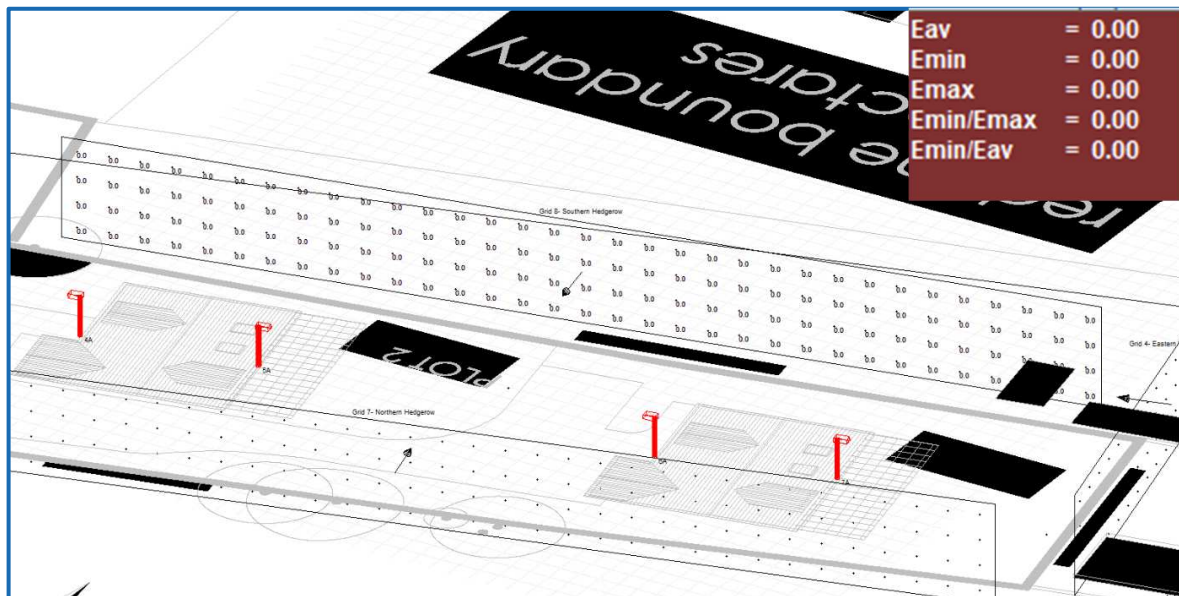


Figure 11- Vertical Spill Light Diagram. Receptor 006. 0.00 Lux

APPENDIX 3 – SENSITIVE RECEPTORS

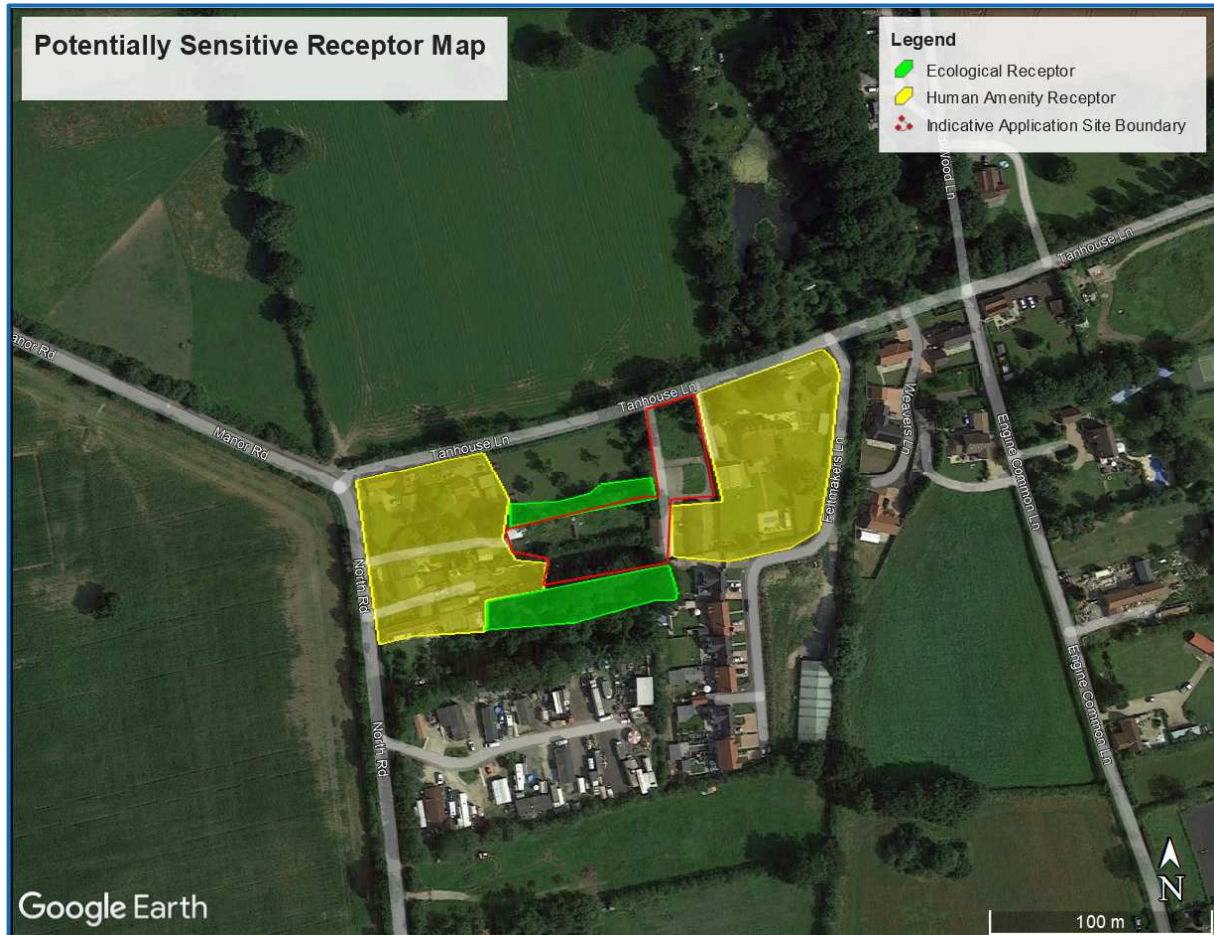


Figure 12: Sensitive receptors

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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** teams 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.

Finally, as innovators, you might be facing something bespoke or niche. Don't worry – we might have the answer you need. Feel free to get in touch!

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Fiona Elsley
Lighting Technician



+44 (0)1962 855080



fiona@dfi-uk.com



www.dfi-uk.com/



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