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THE PADDOCKS

LIGHTING STRATEGY

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ILP INSTITUTION OF LIGHTING PROFESSIONALS

nqa ISO 9001 QUALITY MANAGEMENT UKAS MANAGEMENT SYSTEMS 0015

HEA Highway Electrical Association

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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.



Quality Knowledgeable Dependable Clear Advice

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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 outlines an assessment for the existing lighting, and considers the sensitivity of nearby human, environmental and ecological receptors.

1.1.3. Lighting associated with the Existing Development will comply with relevant 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 Existing Development;
- Relevant National and Local Policies;
- Why the Proposed Development requires artificial lighting; and
- Details as to how lighting will be implemented for the Existing Development.

1.1.5. It has been determined that the Application Site is considered to be in an E1 Environmental Zone.

1.1.6. This Lighting Strategy is to assess the current lighting which has been installed to Equestrian buildings and the Outdoor Sand School.

1.1.7. This Lighting Strategy is to discharge the Planning condition 6 related to planning application PL/2022/04256 which states the following:

'Within three months of the date of this permission, a lighting plan shall be submitted to and approved in writing by the Local Planning Authority. The plan will:

• Identify those areas/features on site that are particularly important for protected and priority species and which may be adversely affected by new lighting.

• Illustrate where external lighting has been or will be installed and predicted light spill through the provision of lighting contour plans/Lux plot so that it is clearly demonstrated that the boundary features and habitats used by protected and priority. species will not be adversely affected.

• Specify luminaires, heights and positions of fittings, as well as any other features e.g. cowls, louvres or baffles.

• Specify any intended restriction over the timings for implementation of external lighting.

The development shall then be undertaken in strict accordance with the recommendations of any approved lighting plan and no other lighting shall be installed within the site without prior consent from the Local Planning Authority.

REASON: To minimise light spillage into areas of habitat for protected and priority species and to maintain dark wildlife corridors, particularly for foraging and commuting bats, as many

species that are active at night e.g., bats and badgers, are sensitive to light pollution'

1.1.8. 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 Wiltshire County Council, with policies detailed within the Wiltshire Council Core Strategy Adopted 2015 applying to the lighting associated with the Proposed Development.

The applicable policies are:

Core Policy 57: Ensuring high quality design and place shaping.

'….the sensitive design of advertisements and signage, which are appropriate and sympathetic to their local setting by means of scale, design, lighting and materials'

3. BRITISH STANDARDS AND GUIDANCE

3.1. British Standards

3.1.1. The Lighting will not comply to any British Standards due to the Application site being on private land, lighting is for Wayfinding only to ensure security and amenity.

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 Paddocks, Barsmore Farm, Tytherton Lucas, Chippenham SN15 3RL. The Application Site comprises approximately 3ha of former agricultural land situated in the northeast side of the road leading to Tytherton Lucas. An indicative boundary of the site layout can be seen in **Figure 1**.

4.1.2. The Existing Development comprises of the change in use of land to equestrian, formation of vehicular access, erection of equestrian buildings, horse walker and arena (retrospective). 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 is located within two impact risk zones of influence for Bancroft Hill Meadows SSSI (1.0km Southeast) and Kellaway and West Tytherton River Avon SSSI (1.2km Northwest).

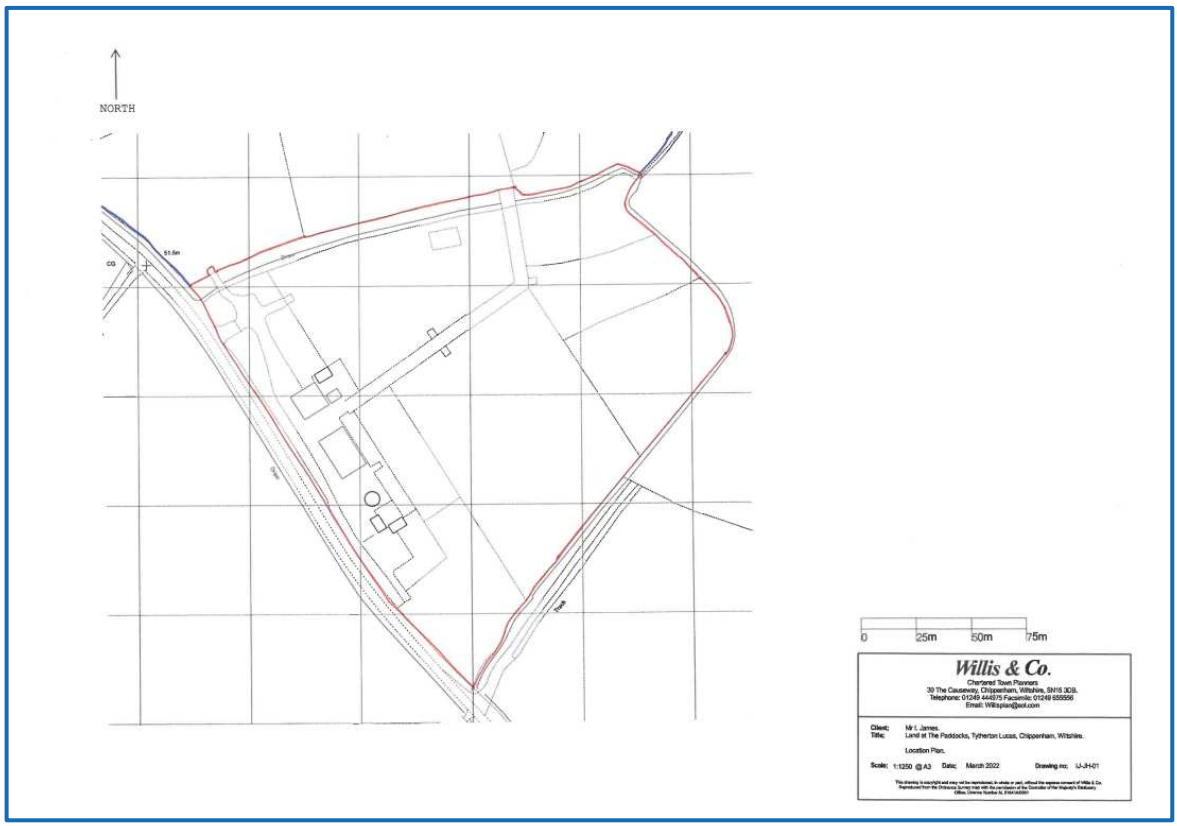

Figure 1: The Application Site location and boundary

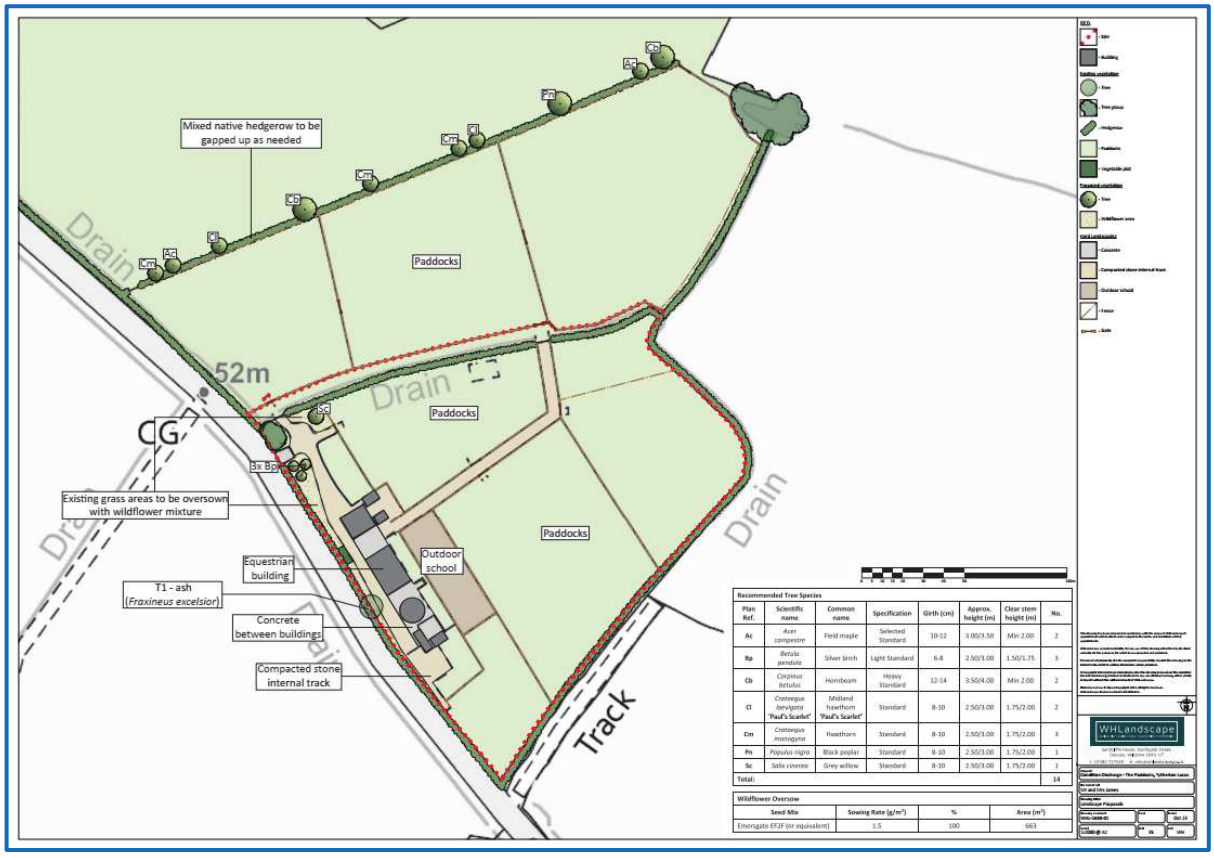

Figure 2: Proposed Development Site layout plan

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 0.5 - 1 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 E1 zone.

4.2.2. The adjacent road is currently unlit and there is limited example of amenity lighting within the surrounding area.

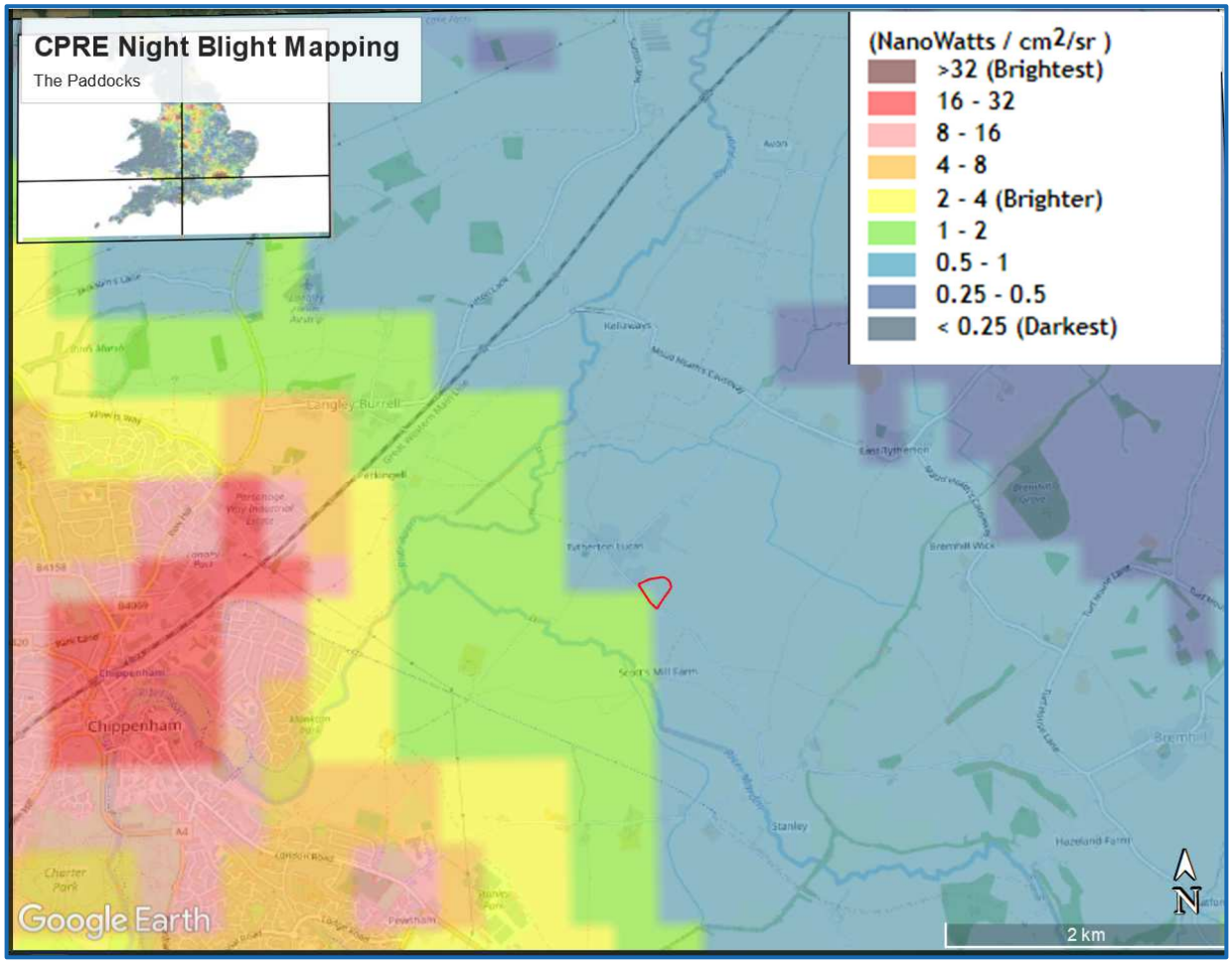

Figure 3: Surrounding areas/roads

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 E1 Environmental Zone, because there are limited examples of lighting within the area, and it can be classified as Sparsely inhabited rural areas.

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	Sparsely inhabited rural areas,

		(SQM ~ 15 to 20)	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

- 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 from Icon Ecology has identified sensitive areas within the Application Site. Icon Ecology has confirmed that the lighting is not adversely affecting the wider environment. Current lighting, which is at a colour temperature of 5000K, indicates extremely low levels of lighting reaching the sensitive receptors. Further mitigation is discussed in **Section 7**.

4.3.2. Guidance for artificial lighting and bats was updated in Autumn 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**)."*

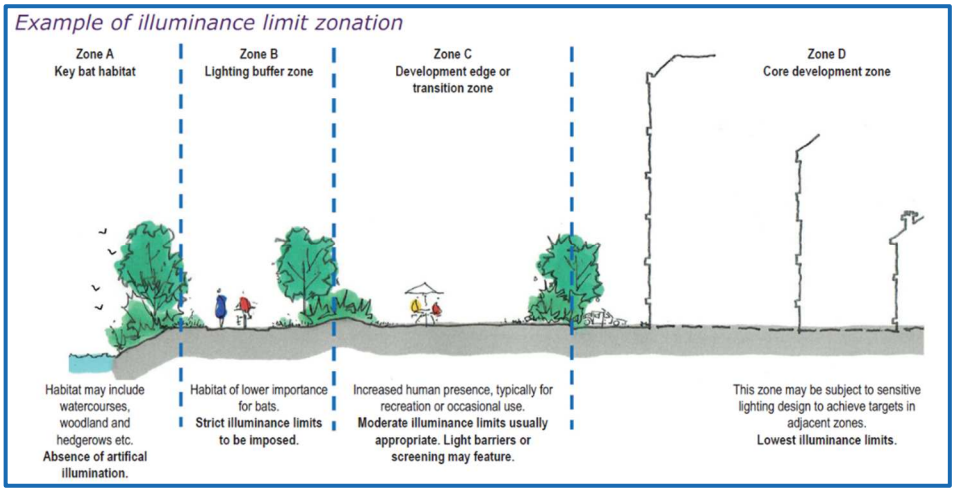

Figure 4: Example of lighting zonation near sensitive boundaries and known ecological habitat

5. IDENTIFIED RECEPTORS.

5.1. Ecological

5.1.1. The Northern boundary(s) of the Application Site have been identified in ecology report from Icon Ecology October 2023 as areas with potential for ecological receptors as shown in **Appendix 3**.

5.1.2. Furthermore, lighting has been modelled to ensure that we are demonstrating that light spills are directed away from the sensitive boundaries. Lighting modelled indicates that on the identified sensitive receptor there is 0.01 Lux which is well within the limits from the guidance.

5.2. Human Amenity / Safety

5.2.1. To the Northeast and South 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 is located within an Impact risk Zone of influence for the Bencroft Hill meadows SSSI and the Kellaway West Tytherton River Avon SSSI.

Receptor Type	Receptor No. (Appendix 3&4)	Description	Sensitivity
Human Amenity/Safety	001	Residential properties (Tytherton Lucas-Northwest of Boundary)	Low
Human Amenity/Safety	002	Residential properties (Adjacent Road, west of Boundary)	Low
Human Amenity/Safety	003	Stanley Farm (Southeast of Boundary)	Low
Ecology	004	Northern Hedgerow	High

Table 3: Potentially Sensitive Receptors

6. LIGHTING STRATEGY

6.1. Summary

6.1.1. The Existing Development requires lighting for safety and amenity at limited times during the hours of darkness. Lighting is installed to be fit for purpose and sensitive to nearby human and ecological receptors.

6.1.2. Amenity lighting for the Proposed Development has been applied sensitively to account for the receptors identified bounding the Application Site and within the Proposed Development.

6.1.3. Luminaires have been installed using 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.

6.1.4. 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 requiring illumination.

6.1.5. All lighting has been predetermined due to the luminaire that has already been installed on site, unless otherwise stated is to emit a colour temperature light (5000 Kelvin or less) to reduce the potential for adverse effects onto potentially sensitive receptors.

6.1.6. Lighting for tasks areas has been installed in the following application areas:

- Equestrian Building
- Outdoor Riding School

6.2. Equestrian Buildings

6.2.1. The Equestrian Buildings have been illuminated for wayfinding purposes only to ensure safety, security, and amenity.

6.3. Outdoor Riding School

6.3.1. The Outdoor Riding School have been illuminated for wayfinding purposes only to ensure safety, security, and amenity.

6.4. Equipment Specification

6.4.1. Performance requirements for the Existing Lighting are outlined in **Table 4**

Equipment Specification		
Application Area	Equestrian Buildings	Outdoor Riding School
Correlated Colour Temperature (Kelvin)	5000K	5000K
Luminaire Manufacturer	Ansell	Ansell
Luminaire Model	Aztec	Aztec
Light Source	LED	LED
Height	3m (Maximum)	4m (Maximum)
Mounting Arrangement	Wall Mounted	Post top
Luminaire Tilt	0%	0%
Upward Light Output Ratio **E2 < 2.5%**	0%	0%
Example Luminaire Image		

Controls	PIR Sensor: ON upon detection of movement, OFF after 1 minute	Internal Switching: To only be used during hours of operation. Switched off at 6:30pm

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 existing development would comply with the obtrusive light guidance set out in ILP GN01, at sensitive receptors.

7.2. Summary of Results

7.2.1. Where ecological receptors are potentially sensitive to vertical light spill, a vertical illumination grid has been modelled, as shown in **Appendix 2**. The light levels based on the modelling do not exceed 0.4 Lux, keeping the light levels within the guidance given within GN08:2023.

7.2.2. Where human receptors are potentially sensitive to vertical light spill, a vertical illumination grid has been modelled, as shown in **Appendix 2**. The light levels based on the modelling do not exceed 0 Lux, keeping the light levels within the guidance given within GN01:2021 for an area identified as an E1 environment.

7.3. Mitigation

7.3.1. Lighting within the Application Site has already been installed. The site works with a strict curfew of no later than 18:30pm. This will ensure there is limited lighting during the hours of darkness.

7.3.2. 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 Existing Development has been installed 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 1.**

8.1.4. 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.

APPENDIX 1 – LIGHT SPILL DIAGRAM

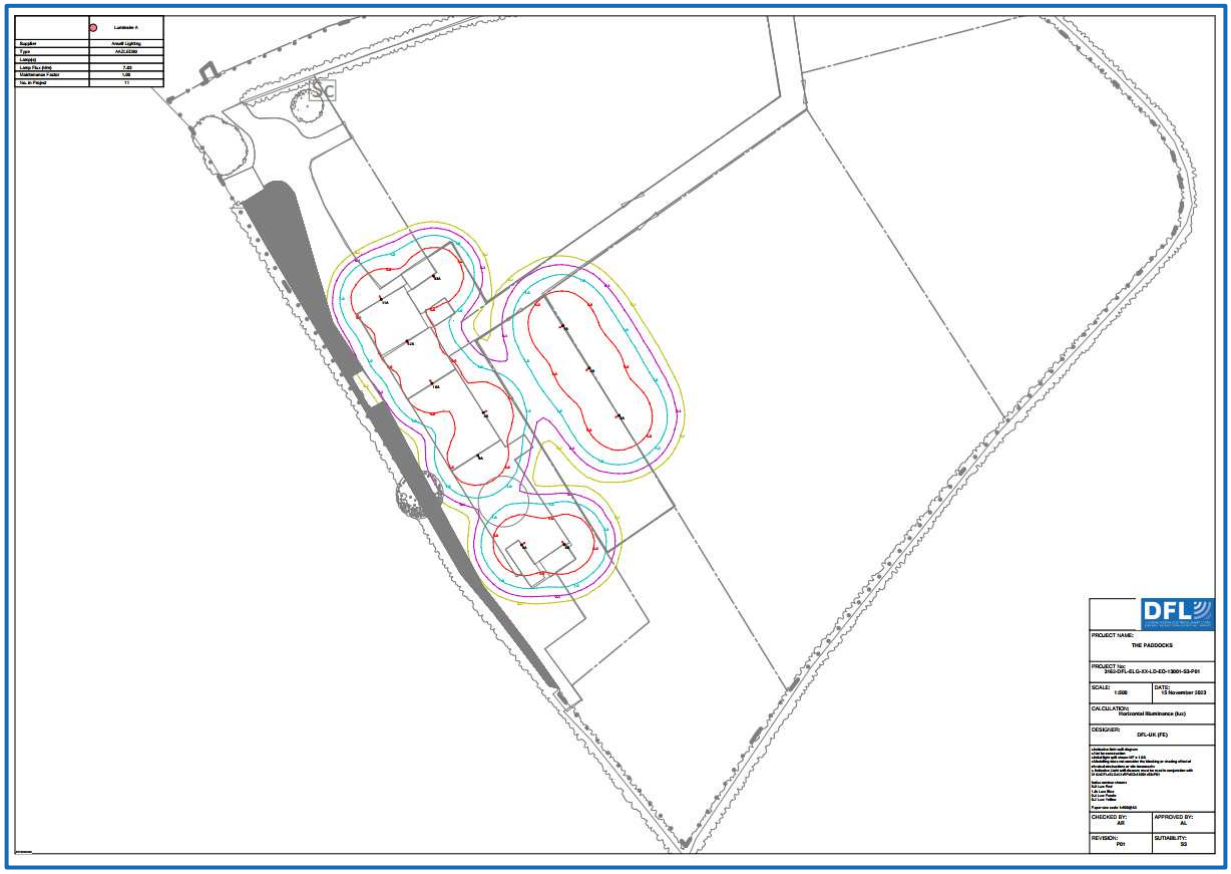

Figure 5: Lighting Spill Diagram

APPENDIX 2 – VERTICAL LIGHT SPILL DIAGRAM

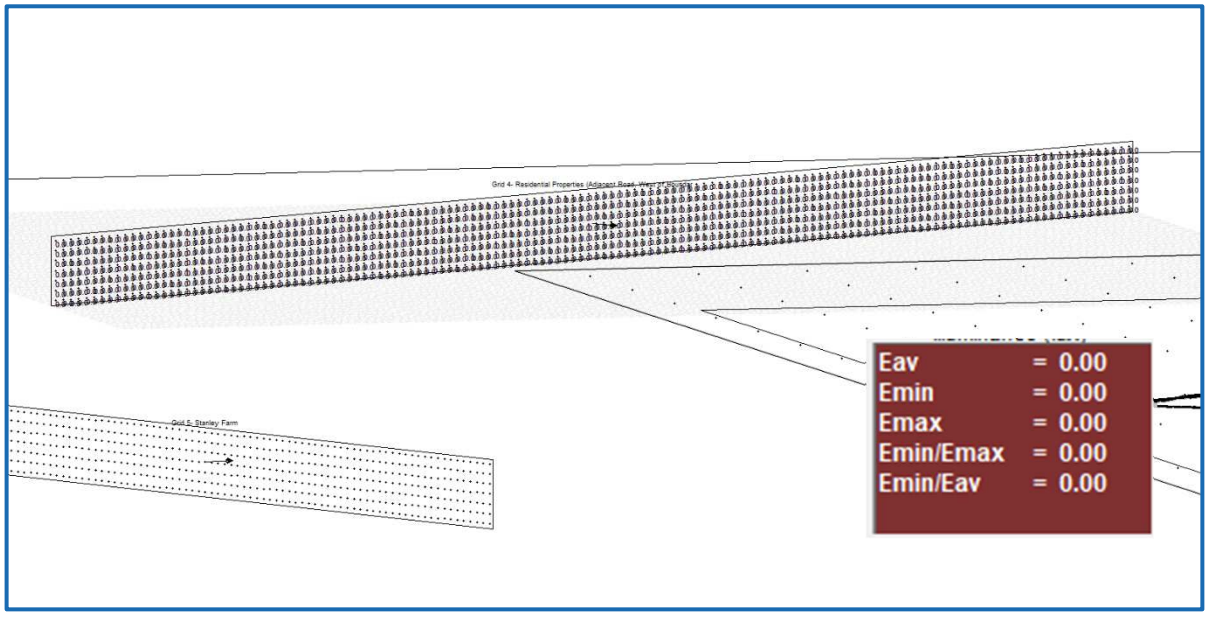

Figure 6: Vertical spill light diagram- Receptor 001. 0.00 Lux

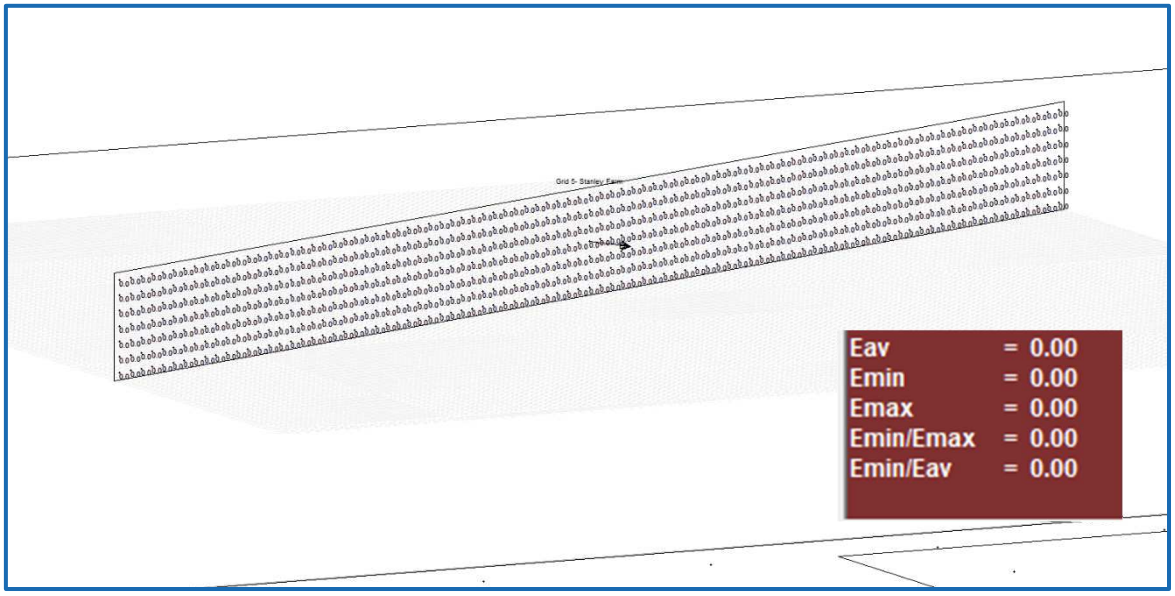

Figure 7: Vertical light spill diagram- Receptor 002. 0.00 Lux

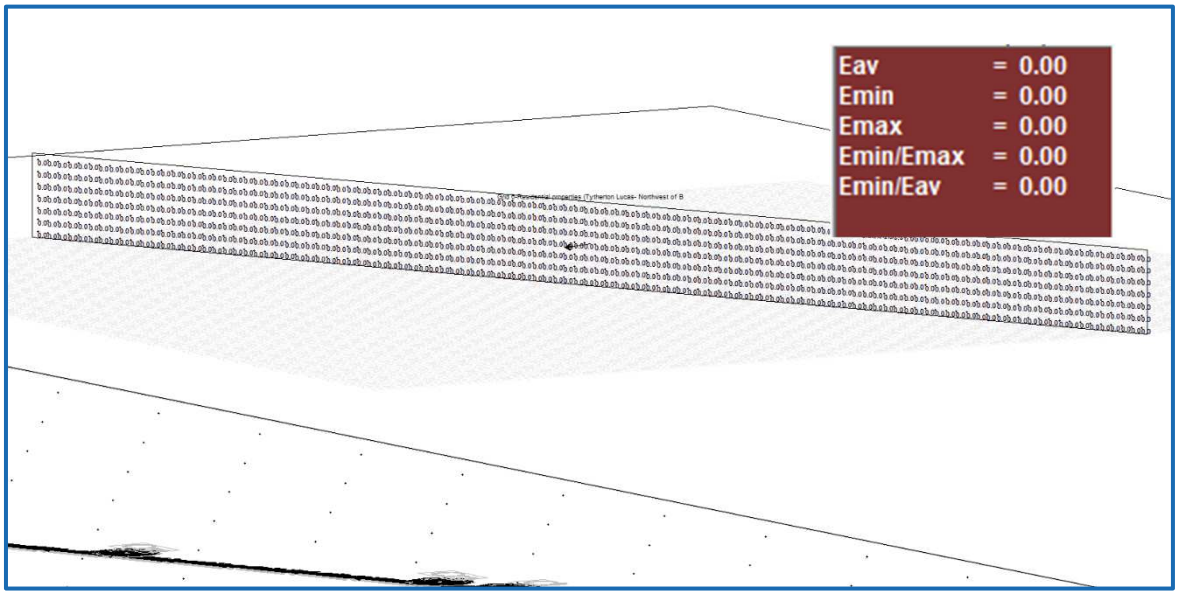

Figure 8: Vertical light spill diagram. Receptor 003. 0.00 Lux

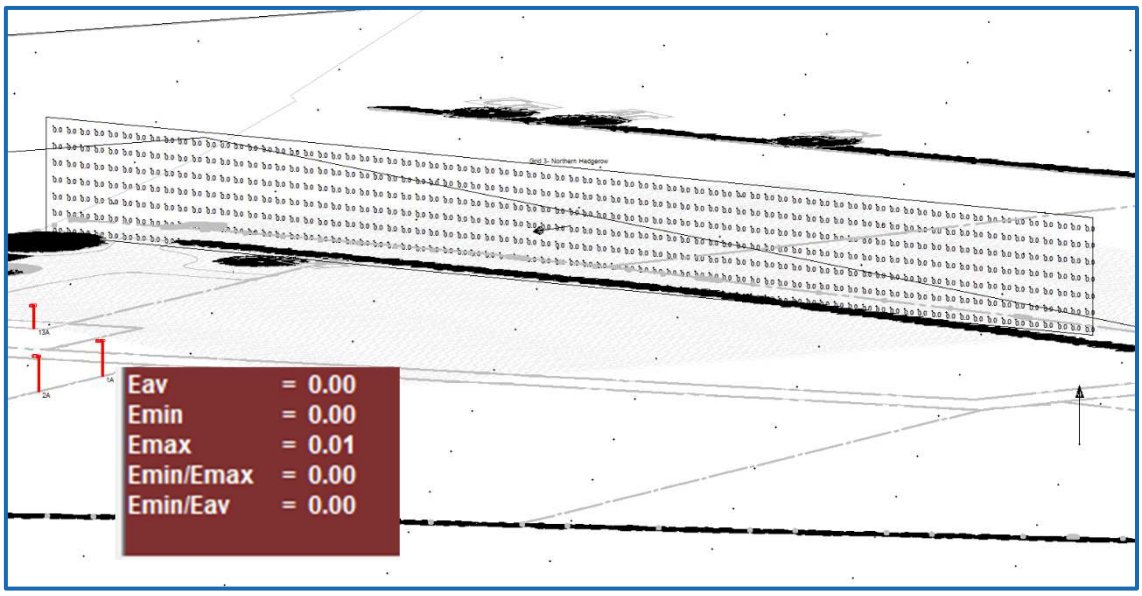

Figure 9: Vertical light spill diagram. Receptor 004. 0.01 Lux

APPENDIX 3 – SENSITIVE RECEPTORS

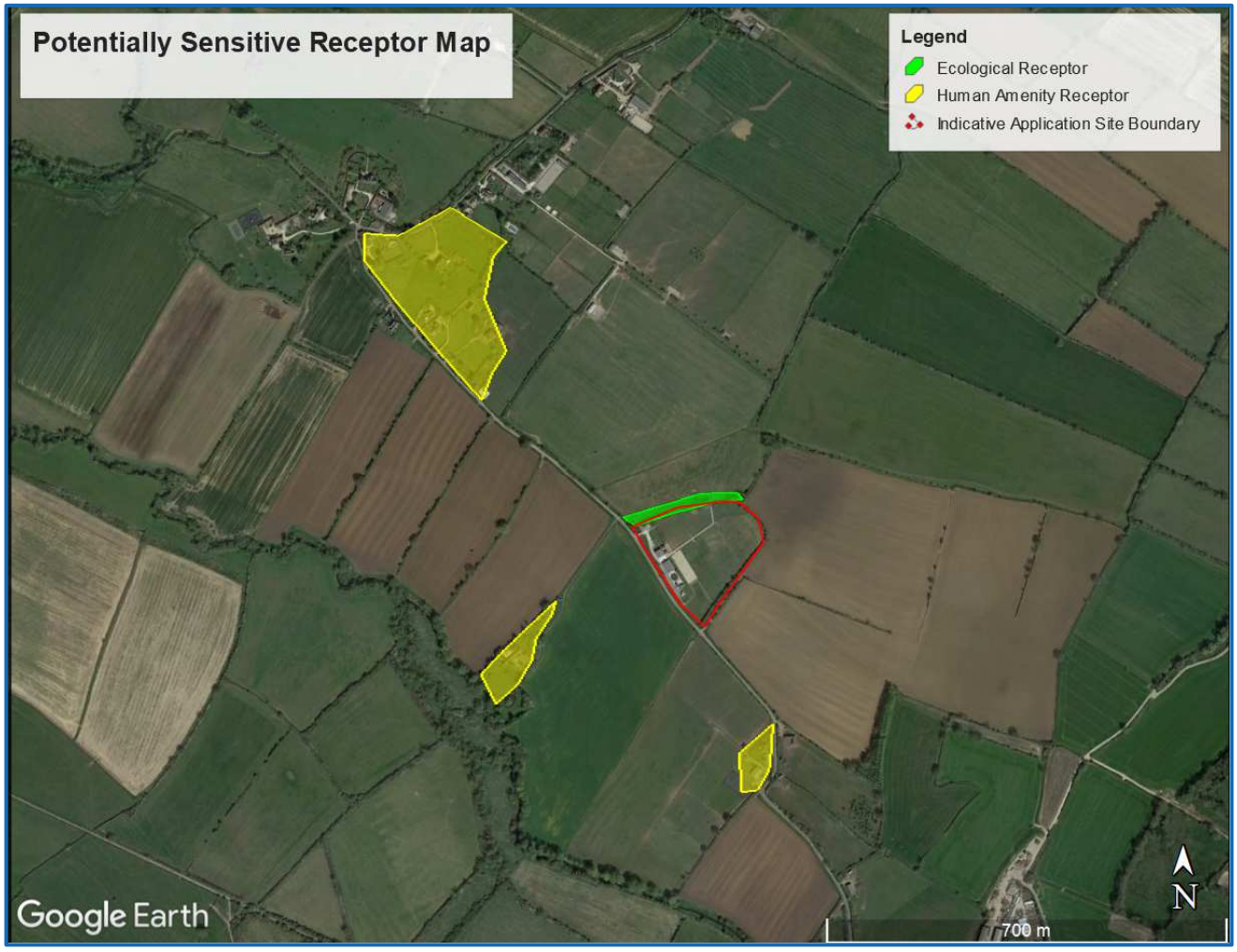

Figure 10: Sensitive receptors

This isn't the end...

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!

THE POWER TO MAKE LIGHT WORK



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