LIGHTING STRATEGY

PROJECT: CHALKDOWNS, HOLDEN LANE, BEAUWORTH

PREPARED FOR: MR. B. HEYMAN

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1 Introduction

1.1 General

1.1.1 This lighting strategy has been written by Designs for Lighting Ltd, a lighting design consultancy with experience and knowledge 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 to apply to the installation of the proposed lighting. The aim of the strategy is to outline a minimally obtrusive approach to lighting, which is necessary to ensure safety and sensitivity to both the environmental and nearby ecological receptors.

1.1.3 This strategy is provided to discharge Condition 5 against Application No. SDNP/21/00857/HOUS. Condition 5 states:

"Details of any external lighting of the site shall be submitted to, and approved in writing by the Local Planning Authority prior to the commencement of the development. The lighting scheme should be in accordance with Guidance Note 08/18 produced by the Bat Conservation Trust and Institute of Lighting Professionals. This information shall include a layout plan with beam orientation and a schedule of equipment in the design (luminaire type, mounting height, aiming angles and luminaire profiles). The lighting shall be installed, maintained and operated in accordance with the approved details unless the Local Planning Authority gives its written consent to the variation."

1.1.4 Due to the location of the Application Site within the South Downs National Park Authority (SDNPA) boundaries, the lighting strategy has been informed by the relevant SDNP Dark Skies policy.

1.1.5 The Approved Development requires artificial lighting for safety, security, and amenity, which can be applied sensitively to ensure that the potential for obtrusive light is suitably minimised to comply with the predetermined obtrusive light limits for the Environmental Zone in which the Application Site is located. This can be achieved through the implementation of a carefully planned and implemented lighting design strategy. This outlines the lighting design approach, as well as imposing limits on the technical specification of the luminaires.

1.1.6 The lighting strategy proposes good practice and offers a suitable approach to apply to the installation of the proposed lighting. The aim of the strategy is to outline a minimally obtrusive approach to lighting, which is functional as well as ensuring sensitivity to the environment.

1.1.7 The Application Site is located within Beauworth, Hampshire, and is approximately 9.6 km south east of Winchester city centre. The Application Site is located within the SDNP, and lighting for the site should consider the potential effects on skyglow within the wider area.

1.1.8 Lighting associated with the Approved Development will comply with Guidance Notes for the Reduction of Obtrusive Light outlined by the Institution of Lighting Professionals (ILP), as well as Guidance for sensitive ecology receptors.

1.1.9 This report outlines the following:

- Relevant obtrusive light policies in direct relation to the Approved Development;
- Relevant national and local policies;
- Why the Approved Development requires artificial lighting; and
- Necessary mitigation measures to reduce the potential for spill light to adversely affect the surrounding landscape.

2 Legislative Frameworks and Local Policies

2.1 Relevant 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:

"… the following matters constitute "statutory nuisances" for the purposes of this Part, that is to say … (fb) artificial light emitted from premises so as to be prejudicial to health or a nuisance … and it shall be the duty of every local authority to cause its area to be inspected from time to time to detect any statutory nuisances which ought to be dealt with under section 80 … and, where a complaint of a statutory nuisance is made to it by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint."

National Planning Policy Framework 2021

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 July 2021 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:

a) 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;

b) 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

c) 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 following local policies are relevant to the Approved Development:

South Downs Local Plan 2014-2033 (Adopted July 2019)

2.2.2 The Application Site is within the boundaries of the South Downs National Park Authority, and the lighting strategy is informed by the dark – skies policy within the South Downs Local Plan (2014-2033) accordingly. The most relevant policy of the above-named Local Plan is Strategic Policy **SD8:** *Dark Night Skies*.

2.2.3 Strategic Policy **SD8:** *Dark Night Skies* applies to any proposal which involves the installation of external lighting, and where the design of developments may result in light spill from internal lighting, which could adversely affect the Dark Night Sky.

Policy **SD8** states the following:

(1) Development proposals will be permitted where they conserve and enhance the intrinsic quality of dark night skies and the integrity of the Dark Sky Core as shown on the Policies Map.

(2) Development proposals must demonstrate that all opportunities to reduce light pollution have been taken, and must ensure that the measured and observed

sky quality in the surrounding area is not negatively affected, having due regard to the following hierarchy:

(a) The installation of lighting is avoided;

(b) If lighting cannot be avoided, it is demonstrated to be necessary and appropriate, for its intended purpose or use:

(i) any adverse impacts are avoided; or

(ii) if that is not achievable, then adverse impacts are mitigated to the greatest reasonable extent.'

2.2.4 Paragraph **5.59** goes on to state the following:

'The Authority will encourage further reductions, for example towards the limits of an E0 dark sky zone, or by removing below or near horizontal light paths from fixtures. Often this can be achieved with little further disruption. Examples of how this can be done include:

- *Lighting should be subject to control measures to reduce unnecessary light pollution. Examples include:*
  - *'Curfews' or automatic timers;*
  - *Proximity 'PIR' sensors, timers or any additional shielding or coving, including angling the front surface of lights to the horizontal;*
  - *Different surface types to reduce the amount of reflectivity;*
  - *Appropriate use of glazing to reduce light transmittance; and*
  - *Screening or shielding to reduce the impact of reflectivity.*

Location	Requirements for level of protection				
Dark Sky Zone description	ILP guidance[35]	Landscape impact	Maximum Lux level (suggested 10 Lux)	Preferred lights-off curfew	Astronomical darkness curfew
E0 Dark Sky Core and areas outside this zone with a SQM[36] of 20.5+	✓	✓	✓		✓
E1(a) 2km Buffer Zone and areas outside this and the above zone which are of intrinsic rural darkness with a SQM range of 20 to 20.5	✓	✓	✓	✓	
E1(b) Transition Zone and areas outside this and the above zones with a SQM range of ~15 to 20	✓	✓	✓		
E3/4 Urban zone with an SQM of <15	✓	✓			
4. Outdoor lighting proposals are required to provide a statement to justify why the proposed lighting is required.					

Table 1 Policy SD8

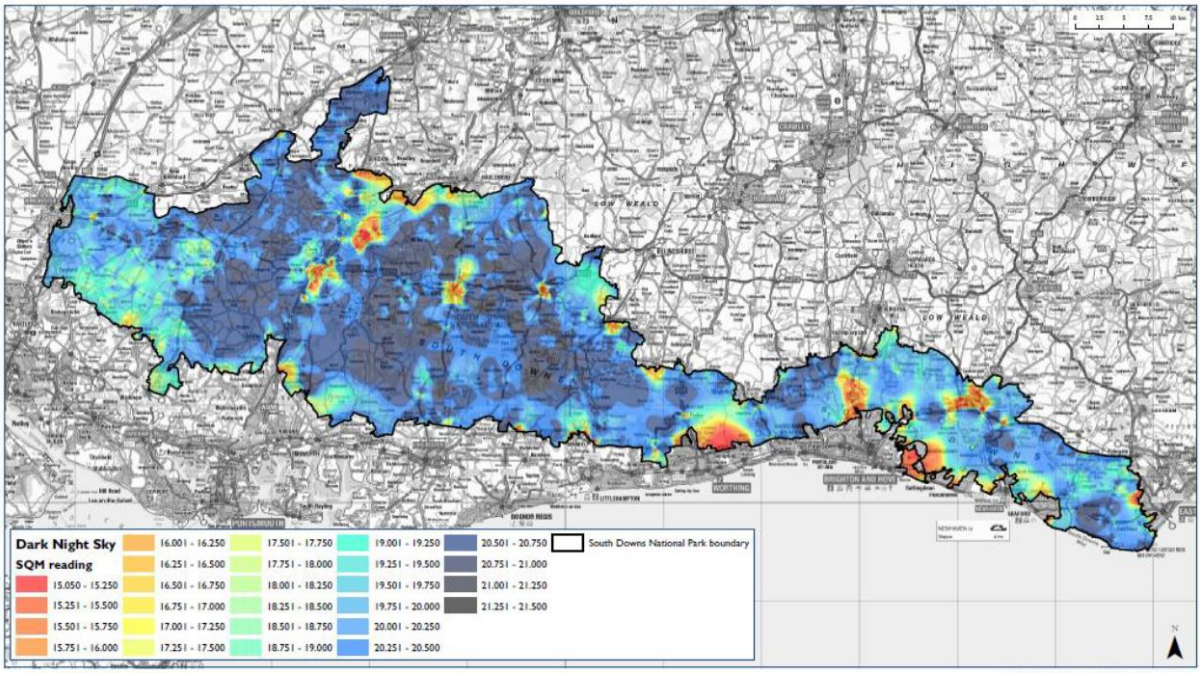

Figure 1 SDNP International Dark-Skies Reserve Sky Quality Map

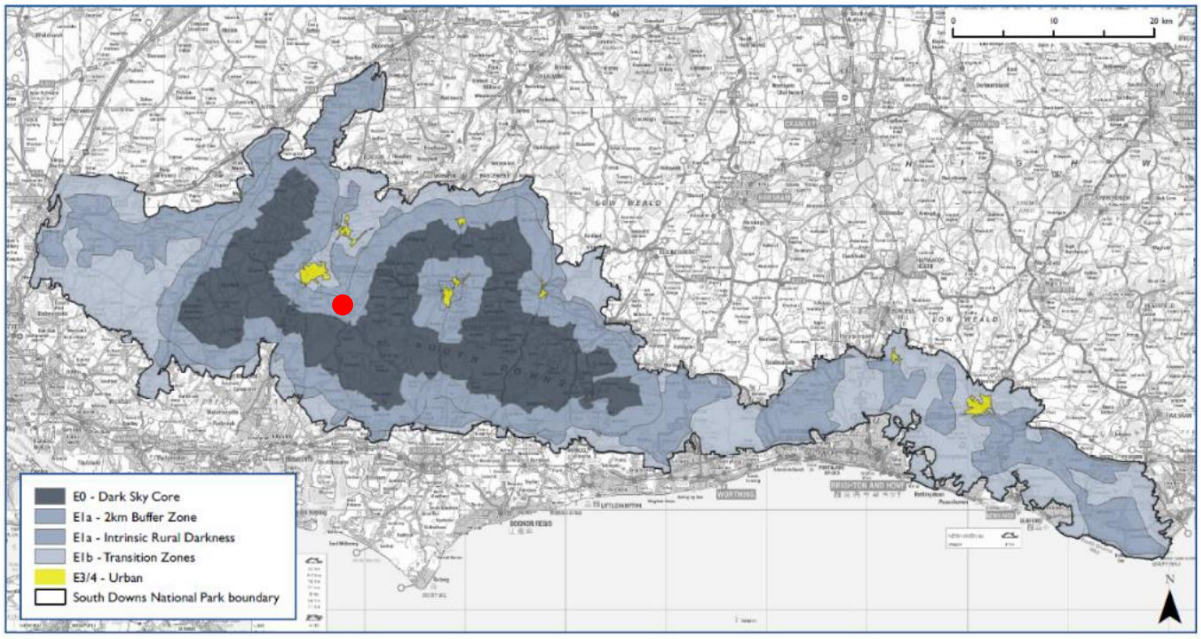

Figure 2 SDNP Dark Sky Core (Policy / Environmental Zone Map) (Approximate site location shown in red)

2.2.5 The SDNPA further outline suitable practice for lighting proposals within the SDNP in the separate document *SDNP Dark Skies Technical Advice Note April 2018*. This document outlines suitable lighting practice, with further detail on suitable luminaire types, outputs and positions, and guidance for interior lighting.

3 Standards and Guidance

3.1 Guidance Notes for the Reduction of Obtrusive Light (GN01:2021)

3.1.1 The lighting strategy shall be informed by industry guidance notes which aim to reduce the potential for obtrusive light to occur, 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. Notably, the updated guidance has been specifically aimed at systems of flood lighting, as such some sections relating to luminaire source intensity are not applicable to this lighting strategy.

3.1.2 The Environmental Zone criteria detailed within **Table 2** and **Table 3** will form the basis for the lighting strategy.

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 2 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/m²)
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 3 Obtrusive light criteria relating to each Environmental Zone

Notes to table:
- ***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.***

3.2 GN08/18 Bats and Artificial Lighting in the UK – Bat Conservation Trust and Institution of Lighting Professionals.

3.2.1 Although there are no previously identified areas of significant environmental sensitivity in the immediate vicinity of the Application Site, opportunities should be taken in design proposals to protect and enhance biodiversity; particularly in the relatively rural environment in which the Application Site is located. As such, the lighting design is brought forward with sensitivity to all possible situations, and guidance has been taken from all documentation which may prevent any detrimental effects to the environment.

3.2.2 Guidance for artificial lighting and bats was updated in Autumn 2018, 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 averse behaviour (Stone, 2012)."

4 Lighting Approach

4.1 Artificial Lighting

4.1.1 The Approved development is for the construction of a single residential property with associated external lighting.

4.1.2 The requirement for artificial lighting to support the Approved Development means that (without mitigation) there could be some potential effects caused by some parts of the required lighting including; direct source luminance or glare (onto receptor views) and sky glow or upward light without suitable mitigation measures.

4.1.3 Lighting for the Approved Development will be designed to reduce the potential effects of the artificial lighting, such as excessive light spill outside of the site boundaries and glare towards potentially sensitive receptors. The lighting strategy will also seek to minimise the effects of lighting on dark skies in the immediate locality of the Application Site, and protect the International Dark-Skies Reserve, as the Application Site is located within the SDNP.

5 Potentially Sensitive Receptors

5.1 Overview

5.1.1 The Application Site currently contains a single residential property, with a garden and driveway separating the property and the adjacent Holden Lane. There are limited examples of lighting in proximity to the Application Site, with lighting provided to residential properties within a 500 metre radius of the site.

5.1.2 There is no street lighting in the vicinity of the Application Site.

5.1.3 The Application Site location is shown in **Figure 3**.

Figure 3 Application Site (Current)

5.1.4 Ecological surveys undertaken for the Application Site were completed by LC Ecological Services, with a phase 1 bat survey completed on the 6th of August 2015. A phase 2 bat survey was completed on the 27th of May 2020; with these surveys concluding that Chalkdown was home to numerous bat species.

5.1.5 The evidence gathered during the bat surveys concluded that the existing residential property may hold a non-breeding day roost used by low numbers of common and soprano pipistrelle bats, a transitional roost for a single barbastelle bat, and a non-breeding day roost and hibernation roost for low numbers of long-eared bats.

5.1.6 The surveys further concluded that the exterior lighting should be designed and implemented so as to limit the potential impact upon roosting bats, through the following measures:

- Selection and design of the lighting systems and by using accessories such as cowls or hoods to minimise light spill and direct light only where it is needed.
- Using light sources that emit minimal ultra-violet light, peak higher than 550nm and be of a warm/neutral colour <2,700 kelvin.
- LED luminaires should be used where possible.
- All security lighting will be on a timer and only triggered at waist height.

5.1.7 Through the information gathered during bat surveys and the policies established in the SDNP local plan, combined with a desktop assessment of the Application Site, potentially sensitive receptors to the Approved Development have been determined. The potentially sensitive receptors are shown in **Appendix 2** and summarised below:

- Receptor 1 – Human (Safety) – Drivers on Holden Lane to the north east. Separated from the Application Site by gardens and hedging only. Limited screening from existing foliage.
- Receptor 2 – Ecological – Bat roosting sites within the Application Site. To be supported by the introduction of 4 x bat boxes.
- Receptor 3 – Human (Amenity) / Ecological – SDNP Dark Skies Reserve.

5.1.8 The lighting strategy will seek to minimise the significance of lighting on the potentially sensitive receptors, such that the potential effects of lighting associated with the Approved Development will be of negligible significance.

6 Exterior Lighting Strategy

6.1 Brief

6.1.1 This section outlines the requirements for the lighting design, ensuring that it is fit for purpose and sensitive to the surrounding environment. This will be achieved by limiting the lighting specification to ensure compliance with the relevant SDNP Environmental Zone's obtrusive light criteria. Additionally, lighting levels on site will be designed in accordance with key lighting guidance and standards, to ensure areas requiring lighting are not illuminated to excess levels. Lighting levels previously used on the site are not considered or used as a basis for this lighting strategy, which is focussed on the potential environmental sensitivities of the surrounds.

6.1.2 Lighting of areas requiring activity is vital for providing a safe and hospitable living environment. Lighting will be limited to enable wayfinding, and to effectively illuminate the property frontage and rear.

6.1.3 Lighting will be provided through the provision of wall mounted downlights mounted at heights no greater than 2.0m. Lighting will be designed with all luminaires to distribute light downwards only, with a peak beam occurring at less than 70°, and will be designed by a competent and suitably qualified lighting designer, to ensure there are no potential effects on the rural surrounds and the International Dark-Skies Reserve.

6.1.4 Residential amenity lighting will be subject to a curfew and be switched off automatically at 11pm.

6.1.5 No road or area lighting is proposed as part of the Approved Development.

6.1.6 The colour temperature of the luminaires used will not exceed 2700K, to ensure lighting is sensitively applied in accordance with ILP GN08 / 18.

6.1.7 Luminaires will be used with integral LED's and 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 and upward light are unlikely to affect the integrity of the rural surrounds and the international dark-sky reserve.

6.2 Lighting Specification

6.2.1 Wall mounted downlights to be fitted to the property frontage and rear at a maximum of 2.00m height. Luminaire choice to emit no upwards light, and to appropriately illuminate doorways to enable wayfinding and enhance visual appeal.

6.2.2 PIR Sensors for the proposed lighting are to be mounted at heights not exceeding 1.00 m; to ensure that

Lighting Type	Property frontage and rear
Correlated Colour Temperature (K)	Warm White 2700 K (max)
Luminaire Manufacturer	UNILAMP (or equivalent approved)
Luminaire Model	MIRA Square wall mounted lamp (Or equivalent approved)
Example Luminaire Image	
Luminaire Style	Wall Mounted Downlight
Light Source	LED
Height	2.00m (max)
Tilt	0°
Mounting Type	Wall Mounted
Controls	Timer & PIR controlled. Dusk – Dawn: ON - upon detection of movement, dimming to OFF after 5 minutes.

Table 4 Lighting performance and Installation requirements

7 Indicative Light Spill

7.1 Modelling

7.1.1 The indicative light spill model included in **Appendix 1 - Indicative Light Spill** demonstrates the ability to provide lighting for the Approved Development and to ensure that a sensitive lighting solution is installed.

7.1.2 The light spill diagrams closely demonstrate the tight restrictions in light spill that are essential for protecting the immediate surrounds and receptors of the Application Site. As the models do not consider obstructions such as the buildings, the proposed fencing and landscaping features or the topography, the Isolux contours presented in **Appendix 1** represent the adverse scenario. Blocking effects of the site features would further reduce the potential for light spill to affect the boundaries of the Application Site.

7.1.3 The proposed lighting uses luminaires that focus the light down onto the ground, reducing the likelihood of upward light and light spill, as the installation will achieve 0% Upward Light Ratio. The Isolux contours demonstrate the initial light output ultimately demonstrating the absolute adverse scenario.

7.2 Likely impacts

7.2.1 Whilst the lighting level within the Approved Development will increase, the use of well controlled LED luminaires will limit the potential for significant levels of obtrusive light to leave the site.

7.2.2 The use of luminaires with a 0% ULOR, in accordance with GN01:2021, GN08:2018, and South Downs Local Plan Policy SD8, will significantly limit the potential for the Approved Development to contribute to levels of sky glow, or to affect nearby potentially sensitive receptors.

7.2.3 Lighting is to be applied only where needed and controlled via PIR motion sensors, mitigating the impact of the proposed lighting on the ecology found on the site and the receptors in the surrounding area.

7.2.4 On balance, the impacts associated with the lighting for the Proposed Development are likely to be of negligible significance. The lighting levels outside the Application Site are highly unlikely to noticeable increase.

7.2.5 Isolux contours for the exterior lighting showing the low levels of light spill are presented in Appendix 1. Contours are presented for horizontal illuminance at lux levels of 5.0, 1.0 and 0.2.

8 Conclusion

8.1.1 This report is provided to support the proposed lighting of the site on Holden Lane, Beauworth, Hampshire.

8.1.2 This report is provided to discharge Condition 5 against Application No. SDNP/21/00857/HOUS, through the provision of a layout plan showing beam orientation, and a schedule of equipment included therein.

8.1.3 Lighting associated with the Approved Development is designed to ensure it is sympathetic to local residents and ecology and does not create obtrusive light.

8.1.4 An exterior lighting strategy has been prepared, ensuring that luminaires are sensitive to local residential amenity and ecology, and do not have a significant impact upon the wider Dark Skies Reserve. This has been achieved through ensuring the relevant British Standards and industry Guidance have informed the proposed approach to lighting.

8.1.5 Due to the limited lighting required within the Application Site, and the implementation of the lighting strategies outlined, the proposed lighting is unlikely to contribute to detrimental levels of light spill falling outside the confines of the Application Site onto potentially sensitive ecological receptors or to contribute to an increase in sky glow.

8.1.6 The site further benefits from of established foliage and trees at the Application Site boundaries, further limiting the potential for obtrusive light to occur; as the remaining stray light will be partially blocked by topographical features and foliage.

8.1.7 Horizontal light spill is contained within the Application Site, as can be seen in the drawing presented in **Appendix 1**. To provide the absolute adverse scenario, the screening has not been modelled, thus the Isolux contours presented are typical of the worst-case on-site scenario at start of life.

8.1.8 Luminaires have a 0% ULOR, emitting no light above the horizontal. Accordingly, the Approved Development is not anticipated to contribute to the effect of skyglow and is compliant with the South Downs Local Plan (Adopted 2014) Strategic Policy **SD8:** *Dark Night Skies*.

Appendix 1 – Layout Plan

See separate file: 2132-DFL-ELG-XX-CA-EO-13001

Appendix 2 – Potentially Sensitive Receptor Positions

Receptor Location	Description	Type	Key
Application Site	Application Site position (indicative)	N/A	
1	Drivers on Holden Lane	Human (Safety)	
2	Bat roosting sites within the Application Site	Ecological	N/A – Boxes within site
3	SDNP Dark Skies Reserve	Human (Amenity) / Ecological	N/A – District Level