

LIGHTING IMPACT ASSESSMENT

PROJECT: ALDERHOLT MEADOWS

PREPARED FOR: DUDSBURY HOMES (SOUTHERN) LTD

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1 Introduction

1.1 General

- 1.1.1 This document is provided by Design for Lighting Ltd, a specialist lighting consultancy with extensive knowledge and experience in Lighting Impact Assessments, mitigation, and lighting design for the protection of amenity and ecology. DFL-UK is currently represented within the Institution of Lighting Professionals (ILP) technical committee and British Standard committees for lighting, providing technical input into industry technical guidance documents.
- 1.1.2 Designs for Lighting Ltd are Corporate Premier Members of the Institution of Lighting Professionals and Members of the Highway Electrical Association. All lighting designs and Lighting Impact Assessments produced by DFL-UK Ltd are authorised by an Incorporated or Chartered Engineer.
- 1.1.3 Designs for Lighting Ltd have been commissioned to develop a sensitive Lighting Strategy and undertake a Lighting Impact Assessment for the development at land at Alderholt, Fordingbridge adjacent to the existing Village of Alderholt (hereafter referred to as the Application Site) (**Figure 1**).
- 1.1.4 The Lighting Strategy proposes good practice and outlines a suitable approach to apply to the lighting design at the detailed design phase. The aim of the strategy is to outline a minimally obtrusive approach to lighting, which is functional, compliant with minimum standards and to ensure sensitivity to both the potentially sensitive local environment and potentially sensitive human receptors.
- 1.1.5 The objective of the Lighting Impact Assessment is to provide an independent report on the suitability of the proposed lighting in accordance with guidance outlined in the institution of Lighting Professionals (ILP) Professional Lighting Guidance (PLG) 04 (2013) 'Guidance on undertaking Environmental Lighting Impact Assessment.
- 1.1.6 The full description of the Proposed Development can be found within the main body of the Environmental Statement. The Indicative Masterplan can be seen in **Figure 2** and is reproduced in **Appendix 2**.
- 1.1.7 Full details regarding the Application Site and Proposed Development description can be found in the relevant chapters of the Environmental Statement.
- 1.1.8 The Proposed Development will require lighting for the purposes of safety, security, and amenity during the hours of darkness. Lighting associated with the Proposed Development can be applied sensitively to ensure that the potential for obtrusive light is suitably minimised in accordance with the predetermined obtrusive light limits for the relevant Environmental Zone. This can be achieved through the implementation of a carefully planned and implemented Lighting Strategy informed by relevant standards and guidance.
- 1.1.9 The Lighting Strategy for the Proposed Development can be found in **Appendix 1**.

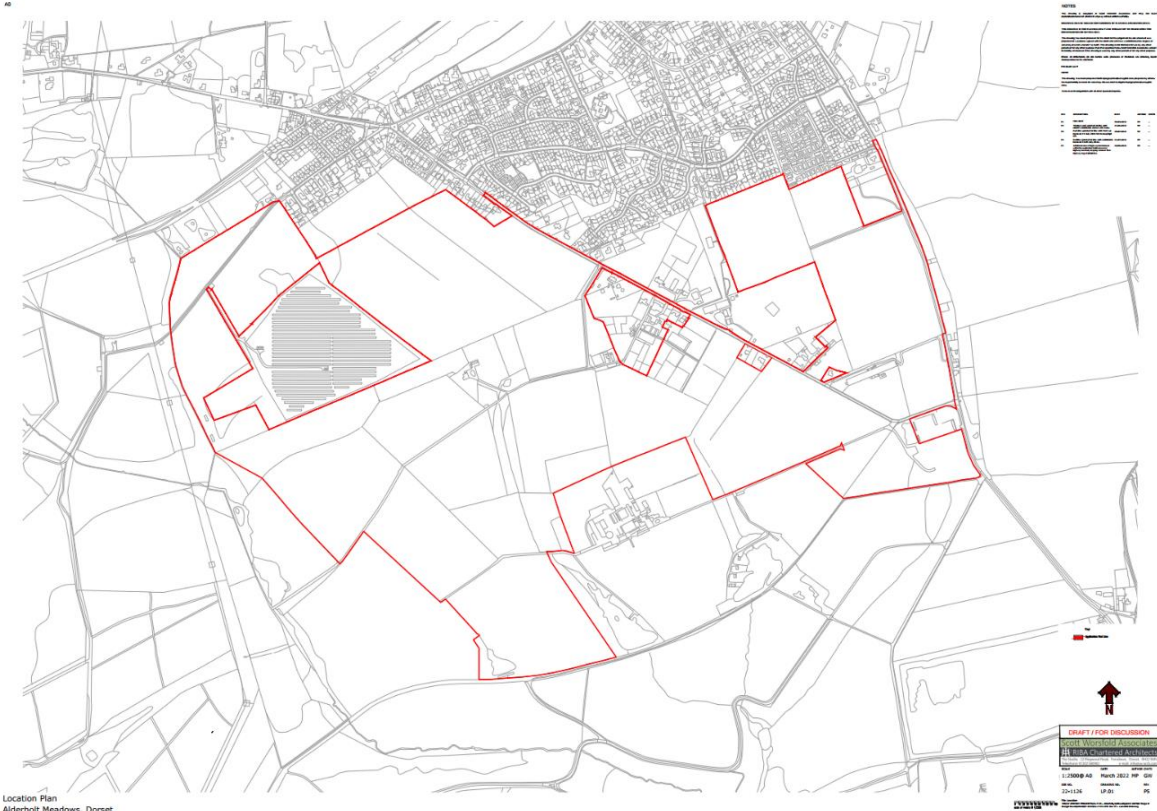


Figure 1: Indicative Site boundary (shown in red)



Figure 2: The Indicative Masterplan (Reproduced in Appendix 2).

2 Legislative and Policy Framework

2.1 National Policy and Legislation

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 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 a new development proposal, or a major change to an existing one, materially alter light levels outside the development and/or have the potential to adversely affect the use or enjoyment of nearby buildings or open spaces?”

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.*

Does a proposal have a significant impact on a protected site or species e.g., located on, or adjacent to, a designated European site or where there are designated European protected species that may be affected?

Is the development in or near a protected area of dark sky or an intrinsically dark landscape where it may be desirable to minimise new light sources?

Are forms of artificial light with a potentially high impact on wildlife (e.g., white or ultraviolet light) being proposed close to sensitive wildlife receptors or areas, including where the light shines on water?

Does the Proposed Development include smooth, reflective building materials, including large horizontal expanses of glass, particularly near water bodies (because it may change natural light, creating polarised light pollution that can affect wildlife behaviour)?”

2.2 Relevant local policies

- 2.2.1 The Application Site sits within the planning control of Dorset Council; whose local plan is under consultation and is not yet adopted. A Regulation 18 Issues and Options consultation was published in January 2021. The emerging policies within this plan are at a very early stage and carry minimal if any weight at all.
- 2.2.2 The most relevant guidance for the Proposed Development that is currently adopted is the Christchurch and East Dorset Local Plan (Adopted April 2014). This will be replaced by the Dorset Council Local Plan once this is adopted (currently expected for early 2026).
- 2.2.3 The Draft Dorset Council Local Plan sets out a plan covering strategic policy for Dorset; detailing the manner in which all development should be undertaken.

Policy ENV11: Amenity that is relevant to lighting states:

“Proposals for external lighting schemes (including illuminated advertisement schemes) should be clearly justified and designed to minimise potential pollution from glare or spillage of light. The intensity of lighting should be the minimum necessary to achieve its purpose, and the benefits of the lighting scheme must be shown to outweigh any adverse effects.”

- 2.2.4 The Christchurch and East Dorset Local Plan (Adopted April 2014) is the most relevant currently adopted planning guidance for the Proposed Development.

Policy ME1 states:

“The Core Strategy aims to protect, maintain and enhance the condition of all types of nature conservation sites, habitats and species within their ecological networks including:

- *Internationally designated sites (SPA, SAC, Ramsar)*
- *Sites of Special Scientific Interest (SSSI)*
- *Sites of Nature Conservation Interest (SNCI)*
- *Local Nature Reserves*
- *Priority species and habitats*
- *Important geological and geomorphological sites*
- *Riverine and coastal habitats*
- *Suitable Alternative Natural Greenspace (SANG)*

Within Strategic Nature Areas identified on Map 13.3, specific action will be taken towards meeting targets for the maintenance, restoration and recreation of priority habitats and species, and linking habitats to create more coherent ecological networks that are resistant to climate change.

Where development is considered likely to impact upon particular sites, habitats or species as set out within the Dorset Biodiversity Protocol, it will need to be demonstrated that the development will not result in adverse impacts. To determine the likelihood of harm occurring, there should be an assessment of effects on any existing habitats, species and/or features of nature conservation importance, and the results of this assessment documented. The method of survey and level of detail will vary according to the size and type of development and whether any priority species and habitats exist on site. The survey should involve consultation and advice from Natural England, the Dorset Wildlife Trust, and Dorset County Council.

In considering the acceptability of proposals, the Council will assess their direct, indirect and cumulative impacts relative to the significance of the features' nature conservation value. National policy will be applied to ensure the level of protection afforded international, national and locally designated sites and species is commensurate with their status.

The following criteria should be addressed when development is proposed:

- *Avoidance of harm to existing priority habitats and species through careful site selection, artificial lighting design, development design and phasing of construction and the use of good practice construction techniques.*
- *Retention of existing habitats and features of interest, and provision of buffer zones around any sensitive areas.*
- *Enhancement of biodiversity through improving the condition of existing habitats and achieving net gains in biodiversity, where possible. Particular attention should be paid to priority habitats and species referred to in Section 41 of the Natural Environment and Rural Communities Act 2006 and the Dorset Biodiversity Strategy, and the Strategic Nature Areas identified on the Dorset Nature Map.*
- *Where harm is identified as likely to result, provision of measures to avoid or adequately mitigate that harm should be set out. Development should be refused if adequate mitigation or, as a last resort, compensation cannot be provided.*
- *Provision of adequate management of the retained and new features.*
- *Monitoring of habitats and species for a suitable period of time after completion of the development to indicate any changes in habitat quality or species numbers and put in place corrective measures to halt or reverse any decline.*

In addition, and in recognition of the function of the New Forest National Park, the Core Strategy will carefully consider any adverse impacts on the New Forest as a result of development.”

- 2.2.5 Additionally, where applicable the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4 will be followed. This will apply to all adoptable roadways within the Proposed Development.

“Environmental Zone 2

Areas of Low District Brightness (Rural locations outside Zone 1), these are areas that have low / medium population densities and some roads already lit.

Villages and settlements within this zone may not currently be lit and if they are, may not be lit to the current or an historic standard. Any new lighting schemes will be provided in accordance with the relevant current minimum standard applicable to the type and use of the highway.

Apart from designated traffic routes all other lights may be operational for just part of the night, when levels of highway use are at their highest. Statutory and safety requirements may require that some lights remain in operation all night.

Roads between villages and settlements in this zone will generally only be provided with lighting where there is a known safety issue during the hours of darkness that cannot be solved by other means.

Luminaries should be well controlled and restrict the upward light ratio to 0% with a CCT which should ideally not exceed 3000K.”

- 2.2.6 Where roadways within the Proposed Development are not to be adopted, they will confirm to the requirements of the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4. This is to provide consistency across the Proposed Development and to help ensure a coherent sense of place for those living within the Proposed Development.

- 2.2.7 Switching regimes will be implemented within the Proposed Development for the proposed street lighting as outlined within the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4:

“Switching regimes

Streetlights - All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off)

Streetlights - Part Night, Switch Regime 762, Dusk to 24:00/5:30 to Dawn GMT (35 lux switch on/18 lux switch off)

Illuminated traffic signs – All night, Switch Regime 808, Dusk to Dawn (35 lux switch on 18 lux switch off)

Illuminated bollards – All night, Switch Regime 100, Dusk to Dawn (InfraRed Photocell)”

- 2.2.8 To ensure lighting is provided consistently across the Proposed Development these switching regimes will apply to both the adoptable and non-adoptable roadways as required.

3 British Standards

3.1.1 The most applicable British Standards for lighting that relate to the Proposed Development are:

- *BS 5489-1: 2020 – Lighting of Roads and Public Amenity Areas - Code of practice* – This standard is applicable to the internal roads and junctions that help to facilitate movement of vehicular and pedestrian traffic about the development including car parking areas.
- *BS EN 13201-2:2015 – Road Lighting – Part 2: Performance Requirements* – This standard is applicable to the internal roads and junctions that help to facilitate movement of vehicular and pedestrian traffic about the development, by providing the standard levels of lighting to be used to facilitate the use of the areas.
- *BS EN 12464-2:2014 – Light and Lighting – Lighting of Workplaces – Part 2 Outdoor Workplaces* - This standard is applicable to the exterior areas where working activities or other activity necessary to facilitate the functioning of commercial activities takes place. This can include but is not limited to parking areas, amenity areas within commercial spaces, fuel filling stations, and tasks necessary to facilitate construction projects.

4 Guidance

4.1 Guidance Notes for the Reduction of Obtrusive Light, 2021

- 4.1.1 Guidance notes produced by the Institution of Lighting Professional (ILP) are among the most commonly referenced guidance notes for good practice within the lighting design industry.
- 4.1.2 Obtrusive light (or sometimes referred to as light pollution) refers to any light emitted in a direction in which it is not required or wanted and as such is detrimental to other users.
- 4.1.3 Consideration is given to light intrusion, direct upward light (sky glow) and glare within the context of varying Environmental Zones.
- 4.1.4 Light intrusion refers to the spilling of light beyond the boundary of the area to be lit. This includes the intrusion of light into bedroom windows.
- 4.1.5 Sky glow refers to the brightening of the sky above towns cause by direct or reflected upward light.
- 4.1.6 Glare refers to the uncomfortable brightness of a light source when viewed against a dark background. **Figure 3** illustrates the different types of obtrusive light.

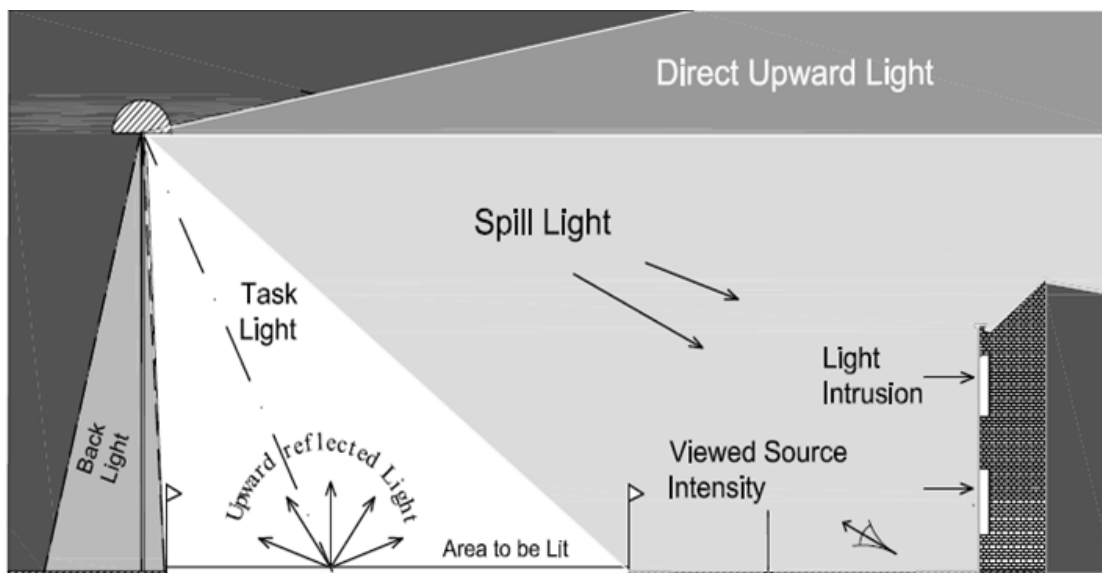


Figure 3: Obtrusive light diagram

4.2 Institution of Lighting Professionals (ILP) PLG 02 – The Application of Conflict Areas on the Highway

- 4.2.1 PLG02 provides lighting design guidance on the application of conflict areas on highways within the UK.

4.3 Institution of Lighting Professionals (ILP) PLG 03 – Lighting for subsidiary roads

- 4.3.1 PLG03 provides lighting design guidance for subsidiary roads within the UK.

4.4 Institution of Lighting Professionals (ILP) PLG 04 “Guidance on Undertaking Environmental Lighting Impact Assessments”, 2013

- 4.4.1 PLG 04 is used to ensure that the Lighting Impact Assessment is correctly carried out:

“...this document is designed to provide an explanation of, and guidance on, the process for producing a Lighting Assessment...to remove or minimise environmental problems”.

4.5 Institution of Lighting Professionals (ILP) and Bat Conservation Trust GN08:18 “Bats and Artificial Lighting in the UK”

4.5.1 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 adverse behaviour (Stone, 2012).”

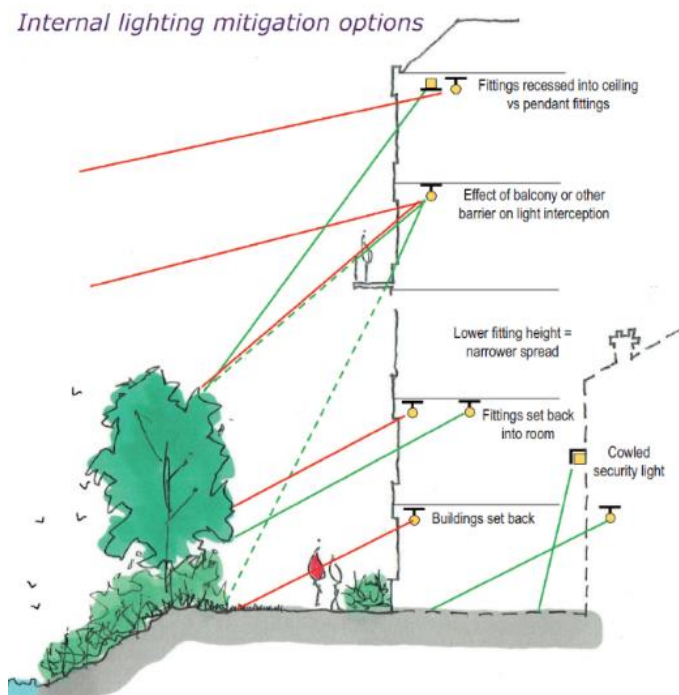


Figure 4: Internal Light Spill Mitigation Extract from GN08/18

Example of illuminance limit zonation

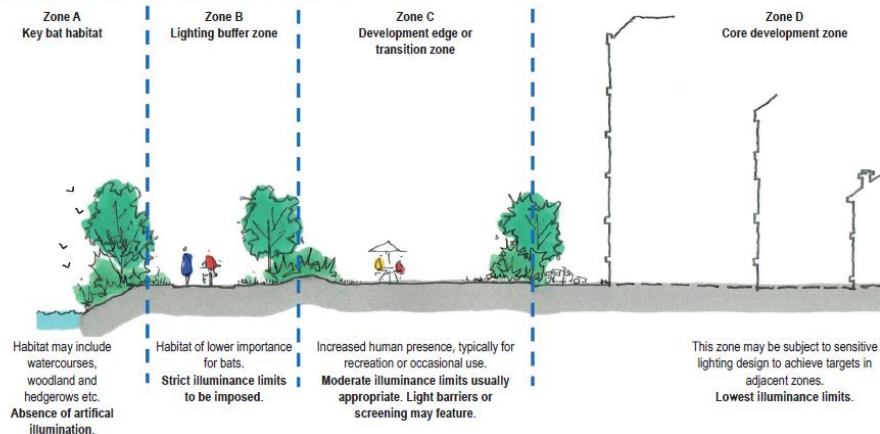


Figure 5: Illuminance Limit Zonation Extract from GN08/18

5 Assessment Methodology and Significance Criteria

5.1 Methodology

- 5.1.1 The assessment has been conducted in accordance with the published guidance documents from the ILP. These quantify the levels of direct upward light, light intrusion, viewed source intensity and glare regarded as acceptable for varying Environmental Zones.
- 5.1.2 The Lighting Impact Assessment is desk-top based. The methodology employed for this assessment is appropriate to the location of the site. It comprises a desk-top study of the legislative, policy and guidance context; consultation with the design team; confirmation of the general expected light levels for the relevant Environmental Zone in which the site is located; evaluation of the likely effects of the proposed lighting using appropriate assessment criteria; indicative layout and associated light spill modelling (where applicable).
- 5.1.3 The methodology takes guidance from the Institution of Lighting Professionals PLG 04 document “Guidance on Undertaking Environmental Lighting Impact Assessments”. This sets out industry best practice for conducting the assessment.
- 5.1.4 The desktop study involved research into relevant legislation, policy and guidance relating to obtrusive light. It also involved studying of Ordnance Survey maps, plans and aerial photography to identify likely receptor locations.

5.2 Study Area

- 5.2.1 The desktop study area was determined by assessing the potential receptors that could be affected by a change in artificial lighting in line with the criteria outlined in **Table 2** and limits set within GN08:18. This included nearby existing residential development, roadways and any identified sensitive ecology.
- 5.2.2 The study area is detailed in **Appendix 3**.

5.3 Potential Effects from Artificial Light

- 5.3.1 The following potential effects can arise from inappropriately designed artificial lighting:
- Effects from light intrusion from exterior lighting on residents (through windows)**
- 5.3.2 Light intrusion (or light spill) is the term for the spilling of light beyond the boundary of the area being lit. The ILP Guidance Notes places a limit on the amount of vertical Illuminance which falls upon the centre of a dwelling window. The suggested maximum values quoted are relative to the amount of light measured as a baseline without the presence of the obtrusive light source.
- Effects from luminous source intensity on residents and sightseers**
- 5.3.3 **Table 4** within ILP GN01/21 advises limits on luminaire intensity or luminous source intensity from luminaires to an observer. The greatest effects are usually encountered from poorly aimed floodlights or security lighting, or from lighting which is located too close to properties.
- Effects from upward light (or sky glow)**
- 5.3.4 Light emitted above the horizontal either directly from luminaires or indirectly as reflected light from surfaces such as the landscape or buildings, has the potential to cause sky glow. The ILP “Guidance Notes for the Reduction of Obtrusive Light” places limits on the percentage of direct upward light emitted from the luminaires in their installed attitude, which is dependent upon the Environmental Zone in which the Application Site lies.
- 5.3.5 Indirect upward light is subject to surface reflectance properties. It is not easily quantifiable but is unlikely to be as significant as direct upward light from luminaires.
- Effects from disability glare on transport users**
- 5.3.6 The lighting is designed to be installed such that glare is minimised in accordance with the ILP guidance notes.

Effects from light on bats roosts and insects

- 5.3.7 Light falling on a roost access point will at least delay some species of bats from emerging and this shortens the amount of time available to them for foraging. As the main peak of nocturnal insect abundance occurs at and soon after dusk, a delay in emergence means this vital time for feeding is missed.
- 5.3.8 Insects and foraging in addition to causing disturbance to bat at the roost, artificial lighting can also affect the feeding behaviour of bats. There are two aspects to this - one is the attraction that light from certain types of lamps has to a range of insects; the other is the presence of lit conditions causing bats to exhibit their light adverse behaviours.

5.4 Classification of Environmental Zone

- 5.4.1 The ILP Guidance Notes guide quantify the levels of Obtrusive light regarded as acceptable for varying Environmental Zones (E0 to E4).
- 5.4.2 The Application Site is described as exhibiting low district brightness and is representative of “*Sparsely inhabited rural areas, Village or relatively dark outer suburban locations*”, therefore is categorised as an **E2** Environmental Zone in accordance with ILP Guidance Notes.

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

Table 1 Environmental Zones

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.

5.5 Obtrusive Light Limitations

- 5.5.1 In the absence of suitable statutory guidance, the ILP “Guidance Notes for the Reduction of Obtrusive Light” GN01:2021 is typically used, in order to provide suitable assessment criteria against which to assess the likely effects of artificial lighting.
- 5.5.2 The relevant criteria of upward light, light intrusion and direct source intensity for the relevant Environmental Zone are detailed in **Table 2**.

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	< 0.1
E1	0	2	< 0.1 (1*)	< 0.1
E2	2.5	5	1	5
E3	5	10	2	10
E4	15	25	5	25

Table 2 Obtrusive light criteria relating to each Environmental Zones

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

5.6 Significance Criteria

- 5.6.1 The significance of an effect from artificial lighting has been based upon the sensitivity of the receptor and the magnitude of change at that receptor due to the revised conditions.
- 5.6.2 The sensitivity of the receptor has been classified as High, Medium, or Low according to the descriptions provided in **Table 3**.
- 5.6.3 The magnitude of impact is determined as being High, Medium, Low or Negligible and descriptions for each are provided in **Table 4**.
- 5.6.4 The scale of effect is derived through a matrix (**Table 5**), matching the sensitivity of the receptor, with the magnitude of the impact.
- 5.6.5 The descriptions that have been adopted for each effect are summarised in **Table 6**, with effects identified as either beneficial or adverse.

Sensitivity	Description of Criteria
High	<p>The environment is fragile, and an impact is likely to leave it in an altered state from which recovery would be difficult or impossible.</p> <p>Human (Amenity) – receptors which are sensitive to a change in lighting such that the quality of life would be affected (i.e., lighting is designated a statutory nuisance)</p> <p>Human (Safety) - receptors where a change in the lighting has the potential to either dramatically improve or reduce safety (for pedestrians, drivers or workers).</p> <p>Ecological – where a change in the lighting affects the habitats, breeding or feeding of fauna (e.g., protected habitats or other special areas) or growth patterns of fauna / crops.</p>
Medium	<p>The environment has a degree of adaptability and resilience and is likely to accommodate the changes caused by an impact, although there may still be some residual modification as a result.</p> <p>Human (Amenity) – receptors which are sensitive to a change in lighting however not such that the quality of life would be affected.</p> <p>Human (Safety) - receptors where a change in the lighting has the potential to either improve or reduce safety (for pedestrians, drivers or workers).</p> <p>Ecological – where a change in the lighting affects the movement or feeding patterns of fauna but the receptor can adapt.</p>
Low	<p>The environment is adaptable and is resilient to change. Nearly all impacts can be absorbed within it without modifying the baseline conditions.</p> <p>Human (Amenity) – receptors which would not noticeably be aware of a change in lighting. (i.e., in areas of medium to high luminance)</p> <p>Human (Safety) - receptors where a change in the lighting has limited potential to affect safety (for pedestrians, drivers or workers).</p>

Sensitivity	Description of Criteria
	Ecological – area with limited wildlife.
Negligible	Receptor has little or no night-time activity

Table 3 Criteria for receptor Sensitivity

Magnitude of Impact	Description of Criteria
High	A large change compared to the natural variations in background levels. A clear breach of limits and standards may occur. For example, levels of obtrusive light in the form of sky glow, light trespass or glare towards a receptor which exceeds the limits set within the ILP guidance for a higher Environmental Zone might classify as a high magnitude of change.
Medium	Change which is noticeable and may be a breach of limits and standards. In terms of the limits set in the ILP guidance this might equate to exceeding the limit but within the limits set for the next Environmental Zone.
Low	Change which, when compared to background levels, is only just noticeable.
Negligible	Change is not noticeable.

Table 4 Criteria for Magnitude of Impact

Magnitude of Impact	Sensitivity of Receptor			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Negligible
Medium	Major	Moderate	Minor to Moderate	Negligible
Low	Moderate	Minor to Moderate	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Table 5 Scale of Effect Matrix

Likely Effect	Description
Major beneficial	Substantial reduction in obtrusive light at sensitive receptors and/or users of the site such that large scale improvements to visual amenity, human safety or health is delivered. Significantly improves ecological habitats
Moderate beneficial	Moderate reduction in obtrusive light at sensitive receptors and/or users of the site such that noticeable improvements to visual amenity, human safety or health are delivered. Improves ecological habitats
Minor beneficial	Minor reduction in obtrusive light at sensitive receptors and/or users of the site such that perceptible improvements to visual amenity, human safety or health is delivered; perceptible improvement to ecological habitats.
Neutral/Not significant	No appreciable effect on sensitive receptors. Effects are reversible.
Minor adverse	Minor increase in obtrusive light at sensitive receptors and / or users of the site such as an increase in Glare, Light Trespass to properties, increase in Sky Glow or effects on flora and fauna. Effects are reversible or temporary.
Moderate adverse	Moderate increase in obtrusive light at sensitive receptors and / or users of the site such as an increase in Glare, Light Trespass to properties, increase in Sky Glow or effects on flora and fauna. Requires monitoring and local remedial work. For example, lighting which is visible and causes nuisance to a sensitive receptor outside the site.
Major adverse	Major increase in obtrusive light at sensitive receptors and / or users of the site such as an increase in Glare, Light Trespass to properties, increase in Sky Glow or effects on flora and fauna. Requires extensive remedial works. For example, a floodlighting installation which directs light into the eyes of oncoming motorists causing disability glare and potential reduction in visual performance leading to an increased risk of collision.

Table 6 Likely Effects Description

5.7 Assumptions and Limitations

- 5.7.1 This assessment assumes that the design and installation of artificial lighting associated with the Proposed Development will be undertaken by suitably qualified and experienced designers and contractors who are capable of conducting such works, in line with the Lighting Strategy provided in **Appendix 1**.
- 5.7.2 Light spill modelling has been conducted for the Ringwood Road Junctions and Hillbury Road Roundabout and approach. As the light levels requirements for these areas are higher than the areas that have not been modelled, it is assumed their impact will be reduced compared to the modelled areas as light spill will not extended as far from the illuminated areas.

6 Baseline Conditions

6.1 Site Description and Context

- 6.1.1 The Application Site is located to the south of the town of Alderholt, Dorset, south of Fordingbridge.
- 6.1.2 The Application Site is currently active farmland and the conditions on site are typical of this environment.
- 6.1.3 Existing residential development that makes up Alderholt is located north of the boundary of the Application Site. Further afield, the Application Site sits within typically rural and agricultural surroundings.
- 6.1.4 The Application Site is consistent with the conditions for an **E2** Environmental Zone, as defined within ILP GN01:2021.

6.2 Baseline Conditions

- 6.2.1 The Application Site located at the southern edge of the Town of Alderholt, in Dorset.
- 6.2.2 The Application Site is consistent with the conditions for an **E2** Environmental Zone as defined within ILP GN01:2021.
- 6.2.3 The highest density of existing lighting seen on the CPRE is centred on the existing areas of Alderholt, Fordingbridge, and Verwood. The CPRE night blight map can be seen in **Figure 6** below.
- 6.2.4 Considering that the Application Site and the surrounding area contains “low district brightness” and is typical of “Sparsely inhabited rural areas, Village or relatively dark outer suburban locations” a **E2** Environmental Zone has been chosen to inform the Lighting Impact Assessment and Lighting Strategy (**Table 1 and 2**).

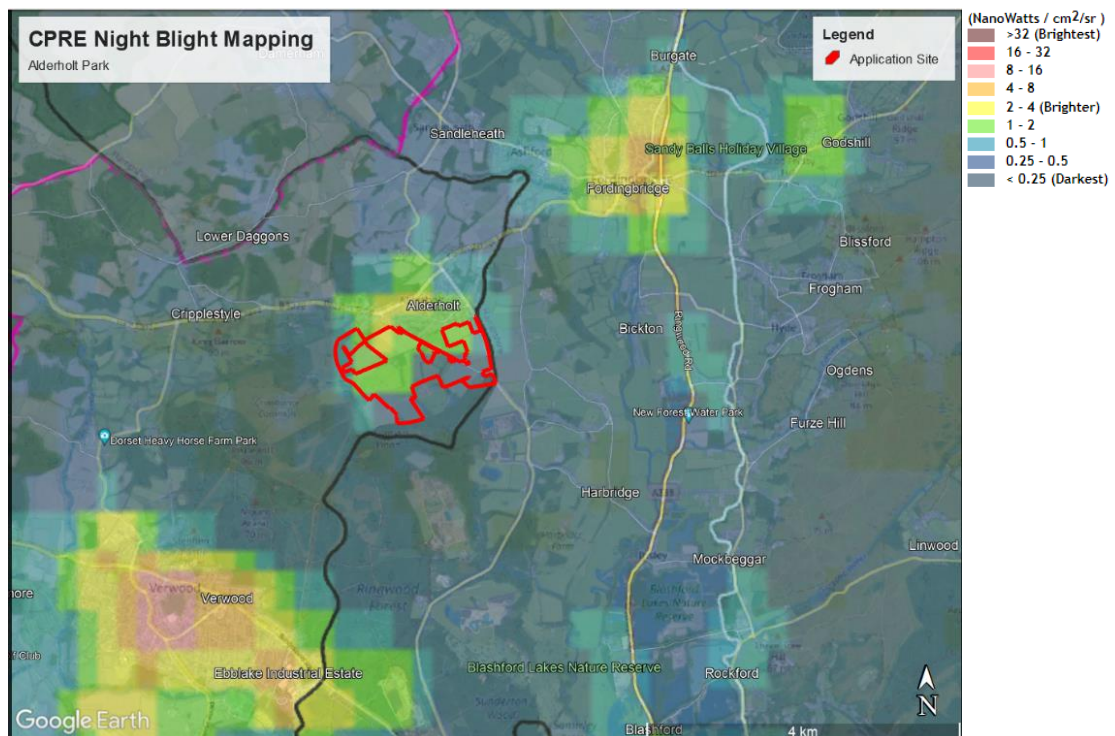


Figure 6: CPRE Night Blight Mapping (Application Site shown in Red)

- 6.2.5 As can be seen in **Figure 6** the Application Site and the surrounding area contains existing levels of skyward radiance ranging between 0.25-32 NanoWatts/cm²/sr, indicating areas of low and medium-high levels of existing external artificial lighting. The two main areas containing high levels of existing external artificial lighting are Verwood and Fordingbridge. The existing built form of Alderholt shows lower levels of skyward radiance compared to Verwood and Fordingbridge.
- 6.2.6 The Desktop Assessment has shown there is no evidence of artificial lighting within the Application Site.
- 6.2.7 The distribution of skyward radiance shown in **Figure 6** is supported by the images available on Google Street View of the surrounding roads. **Figures 7 – 8** show the existing lighting for the residential areas surrounding of the Application Site and its surrounding roads.



Figure 7: Taken from Google Maps showing Broomfield Drive



Figure 8: Taken from Google Maps showing Blackwater Close

- 6.2.8 **Figures 7 – 8** show that the residential roads of Alderholt are lit to either historic or current standards and that a range of lighting technology is used. Lighting in these areas is being updated to modern technology, which is visible on Google Street view as other roads in the area are lit using modern luminaires (Philips Luma Gen 2). This lighting will be contributing to the existing levels of skyward radiance present in and surrounding the built form of Alderholt to the north and west of the Application Site.
- 6.2.9 The external and internal artificial lighting installed in residential areas north of the Application Site is also contributing to these existing levels of skyward radiance.



Figure 9: Taken from Google Maps showing Hillbury Road



Figure 10: Taken from Google Maps showing Ringwood Road



Figure 11: Taken from Google maps showing B3078

6.2.10 **Figures 9 - 11** show that the country roads and traffic routes surrounding Alderholt are currently unlit, these include Ringwood Road, Hillbury Road and the B3078. The unlit nature of the roads has informed the selection of lighting classes for the proposed junctions and the Proposed Development as a whole.

6.2.11 The above figures (**Figure 9,10 and 11**) demonstrate that the roads surrounding the Application Site are unlit. This combined with the current use of the Application Site has led to the conclusion that the Application Site is dark, as there is not any significant existing artificial lighting within or close enough to the Application Site to be having a significant effect.

6.3 Application Site Ecology

6.3.1 Several surveys have been conducted to obtain a baseline of the existing sensitive species within the Application Site. The surveys are as follows:

1. Lindsay Carrington Ecological Services (2019) and;
2. ABR Ecology Ltd (2022).

6.3.2 The surveys identified that the Application Site holds high potential for foraging and commuting bats, with a least 10 species of bats being recording using the site. These include:

1. Greater Horseshoe Bats,
2. Barbastelle,
3. Myotis sp,
4. Long-eared Bat sp,
5. Soprano and Nathusius' Pipistrelle and Serotine, and;
6. Noctule and Leisler's Bat.

6.3.3 Additionally, The following bat roosts are present on the Application Site and/or within the ZOI:

1. A maternity roost/hibernation roost for Brown Long-eared Bats in building 'B2',
2. A day roost for Greater Horseshoe Bat in 'B2',
3. Day roosts for Brown Long-eared Bat and Common Pipistrelle in 'B5', and;

4. A day roost for Soprano and Common Pipistrelles in 'B14'.

6.3.4 This shows the Application Site supports an excellent assemblage of bat species, including at least two rare Annex II bat species, Greater Horseshoe Bat and Barbastelle, with key habitats considered to be the areas of woodland, treelines and hedgerows around the boundaries.

6.3.5 This will require the effects of lighting on key habit features to be mitigated to support the use of these habits by these species during the operation of the Proposed Development.

6.4 Sensitive Receptors

6.4.1 This assessment considers the potential effects of lighting associated with the Proposed Development on sensitive receptors such as adjacent residents and ecology receptors.

6.4.2 Where multiple receptors are sited in the same direction relative to sources of lighting, the closest of the two receptors will be considered; as the magnitude of change at receptor positions will diminish as the distance from the Application Site increases.

6.4.3 Human receptors will be assessed for potential effects in accordance with the requirements set out in ILP GN01:2021 for an **E2** Environmental Zone.

6.4.4 Potentially sensitive human amenity receptors to the Proposed Development will consist of residential properties, with this assessment considering 1st floor bedroom windows facing in the direction of the Application Site as the primary source of sensitivity. These windows typically start at heights of approximately 3.8 metres and will be considered to have a **Medium** sensitivity to changes in lighting.

6.4.5 Potentially sensitive human safety receptors to the Proposed Development will consist of mostly residential roads, with assessment considering drivers on the roads. These typically will be considered to a **Medium** sensitivity to changes in light.

6.4.6 Ecology receptors will be assessed for potential effects in accordance with the requirements set out in ILP GN08:2018.

6.4.7 Potentially sensitive ecological receptors are also present within the Application Site. These primarily consists of bats that use woodland, treelines and hedgerows around the boundaries of the Application Site. As such, ecological mitigation is being provided for the Proposed Development to minimise impact on these species. Areas providing suitable habitat for these species within the Proposed Development have been highlighted as sensitive to lighting, and therefore are included as ecology receptors for the purposes of this assessment.

6.4.8 Further areas external to the Application Site have also been identified as potentially sensitive ecological receptors through a desktop assessment.

6.4.9 These wooded/planted areas have been identified as sensitive receptors and are considered to have **High** sensitivity to changes in lighting

6.4.10 Potentially sensitive receptors are shown in **Appendix 3** and are summarised in **Table 7**.

Receptor Type	Receptor No. (Appendix 3&4)	Description	Sensitivity
Human Amenity	001	Dwellings on Ringwood Road	Medium
Human Amenity	002	Dwellings on Broomfield Drive	Medium
Human Amenity	003	Dwellings on Blackwater Grove	Medium
Human Amenity	004	Warren Park Farm	Medium

Receptor Type	Receptor No. (Appendix 3&4)	Description	Sensitivity
Human Amenity	005	Foxhill Farm	Medium
Human Amenity	006	Dwellings on Attwood Close	Medium
Human Amenity	007	Dwellings on Pine Road	Medium
Human Amenity	008	Dwellings on Blackwater Close	Medium
Human Amenity	009	Sleepbrook Campsite	Medium
Human Amenity	010	Alderholt Riding and Livery	Medium
Human Amenity	011	Dwellings Hazel Close	Medium
Human Amenity	012	Dwellings Saxon Close	Medium
Human Amenity	013	Dwellings on Unknown Road	Medium
Human Amenity	014	Dwellings on Wren Gardens	Medium
Human Amenity	015	Dwellings on Fern Close	Medium
Human Amenity	016	Hillbury Road Dwelling	Medium
Human Amenity	017	Ringwood Road Dwelling	Medium
Human Safety	018	Drivers on Ringwood Road	Medium
Human Safety	019	Drivers on Hillbury Road	Medium
Ecological	020	Dorset Heathland (0.2km) – Ramsar, SPA, SSSI, SAC	High
Ecological	021	Cranbourne Chase- SSSI, AONB and Dark Skies reserve	High
Ecological	022	New Forest- Ramsar, SPA	High
Ecological	023	Barn Owls Roost	High
Ecological	024	Horseshoe Bat maternal Roosts	High

Receptor Type	Receptor No. (Appendix 3&4)	Description	Sensitivity
Ecological	025	Internal Green Spaces	High
Ecological	026	River Avon	High
Night Sky	027	Night Sky within and surrounding the Application Site	High

Table 7 Potentially Sensitive Receptor

7 Lighting Requirements

7.1 Lighting Strategy

7.1.1 This Lighting Impact Assessment is informed by a Lighting Strategy, which defines the types, mounting heights, orientation, and specification of lighting units to be used as part of the Proposed Development.

7.1.2 The Lighting Strategy is presented in **Appendix 1**.

7.2 Construction Lighting

7.2.1 Due to the scale of the Proposed Development, lighting will be required to enable use of the construction site during the hours of darkness.

7.2.2 Where construction lighting is required, it will be temporary in nature, as it will be removed once the Proposed Development is completed.

7.2.3 If construction lighting is required, lighting levels will be defined on a task-by-task basis, in accordance with the relevant guidance and lighting levels set out in BS EN 12464-2:2014.

7.2.4 Construction lighting will be implemented in line with the Lighting Strategy (**Appendix 1**) and the Construction Environment Management Plan (CEMP) accompanying the application.

7.3 Operational Lighting

7.3.1 British Standard compliant lighting is to be provided to the areas of the Proposed Development as required for the safe function of the development. These areas have been identified as follows:

1. Spine Road,
2. Hillbury Road Roundabout and Approach,
3. Ringwood Road Junction,
4. Residential Roads,
5. Dwelling Fronts and Rears, and;
6. Employment Zone.

7.3.2 Lighting for roadways within the Proposed Development will use a maximum Correlated Colour Temperature (CCT) of 3000K, being installed post-top with 0° of tilt, on varying heights of columns dependent on the road width and the design requirements.

7.3.3 Where permanent lighting is proposed for residential roads and/or near areas identified as ecologically sensitive within the Proposed Development, they will use a CCT of 2700K, in accordance with recommendations set out in ILP GN08:2018 – Bats and Artificial Lighting in the UK and will be installed with back light shields.

7.3.4 The luminaire performance requirements for each area identified above are detailed within the Lighting Strategy (**Appendix 1**).

8 Potential Effects

8.1 Potential Effects from Construction Phase Artificial Lighting (without mitigation)

- 8.1.1 Glare from inappropriately oriented floodlighting associated with the construction phase has limited potential to affect nearby potentially sensitive receptors during winter months, when flood lighting of construction operations has the potential to be required for short durations after sunset.
- 8.1.2 It is likely that isolated instances of skyglow over the construction site would occur for short periods of time where tasks require specific lighting levels for safety. This would mainly occur between sunset and the end of the construction day.
- 8.1.3 Lighting associated with the construction phase of the project has minimal potential to impact residential and ecological receptors through obtrusive light, as the majority of site preparation and construction tasks are unlikely to take place during the hours of darkness. Where preparation and construction tasks take place in the late afternoon of winter months, lighting for limited periods may be necessary for safety purposes, depending upon the tasks being undertaken.
- 8.1.4 Poorly designed construction phase lighting can contribute the following obtrusive light components:
- Light intrusion onto windows: this is typical of wall mounted luminaires with high tilt angles,
 - Upward light causing sky glow: this is typical of up-lighting,
 - Glare: due to high light source intensity from floodlights, or luminaires used for highway lighting; and
 - Light Spill: light falling beyond the boundaries of the area being lit, with the potential to affect ecology: this can be caused by excessive height and tilt.
- 8.1.5 The potential effects from construction phase lighting without mitigation are likely to be temporary in nature and of **Moderate Adverse** significance, based on the above components of obtrusive light, all of which could occur unless mitigation measures outlined in **Section 9 and Appendix 1** are implemented.

8.2 Potential Effects from Operational Artificial Lighting (without mitigation)

- 8.2.1 As a result of the exterior lighting detailed above (i.e., without mitigation), there is a potential for obtrusive light to occur if it is not installed in accordance with the detailed lighting design.
- 8.2.2 Obtrusive light can arise from poorly designed lighting, that generally consists of the installation of a limited number of luminaires that are being used to light a wide area. Due to this, the lighting is normally installed with tilt angles that are too great, or that provide an inappropriate lighting distribution, because there is a need to spread the light as far as possible, lighting the intended area, as well as surfaces where the lighting was not intended. This also has the effect of producing high levels of vertical illuminance.
- 8.2.3 Poorly designed lighting can contribute the following obtrusive light components:
- Light Intrusion onto windows: this is typical of poorly controlled and installed luminaires with potentially high tilt angles,
 - Upward light causing sky glow: this is typical of up-lighting,
 - Glare: due to high light source intensity from floodlights, or luminaires used for highway lighting; and
 - Light Spill: light falling beyond the boundaries of the area being lit, with the potential to affect ecology: this can be caused by excessive height and tilt.

- 8.2.4 The potential effects without mitigation are likely to be temporary or permanent in nature and of **Moderate Adverse** significance, based on the above components of obtrusive light, all of which could occur unless mitigation measures outlined in **Section 9 and Appendix 1** are implemented.

9 Scope of Mitigation

9.1 Mitigation by Design – Construction

- 9.1.1 Construction lighting will be provided in compliance with the guidance within BS EN 12464-2: 2014; which defines appropriate lighting levels for outdoor work tasks. The levels required will vary depending upon the task being undertaken and will be assessed on a task-by-task basis. Construction lighting will not significantly exceed the relevant lighting standard for the task being undertaken in order to limit the visibility of construction lighting within the landscape.
- 9.1.2 Construction lighting will be maintained at a low level and focussed into the site, onto the task being undertaken. Where possible, construction lighting is to be provided by handheld sources or headtorches, ensuring the lowest possible amount of light is used for the task at hand.
- 9.1.3 Where this is not possible, construction lighting will be mounted an appropriate distance from the task being performed to ensure the required minimum illuminance levels and uniformity is achieved without the need to tilt the luminaires. Additionally, luminaires will be fitted with baffles or shields where necessary to ensure that lighting is not directed towards potentially sensitive receptors.
- 9.1.4 Construction tasks will predominantly be undertaken during the hours of daylight and as such, there is a limited requirement for construction lighting throughout the construction phase of the Proposed Development. Construction tasks are not anticipated to be undertaken for significant periods during the hours of darkness.
- 9.1.5 To limit the visibility of construction lighting within the landscape, it will be switched off when not in use. Task lighting for construction tasks is to be controlled by timed switches, ensuring that task lighting is only provided when needed and does not operate outside the hours of use.
- 9.1.6 Security lighting to the construction compound will be provided by luminaires fixed to site infrastructure, such as cabins or scaffolding poles, will be oriented downwards only and will be focussed into the site only to reduce the levels of light spill leaving the site.
- 9.1.7 Security lighting will be controlled via photosensor and Passive Infra-red Motion Sensor (PIR), ensuring that lighting is only operational during the hours of darkness and when required.
- 9.1.8 Detailed construction lighting requirements will be provided in the CEMP accompanying the application. Through the implementation of the CEMP, potential impacts associated with construction lighting will be minimised.
- 9.1.9 This information is also detailed within the Lighting Strategy (**Appendix 1**).

9.2 Mitigation by Design – Operation – External Lighting

- 9.2.1 Potentially negative effects of artificial lighting associated with the external lighting for Proposed Development will be effectively mitigated through the implementation of the Lighting Strategy.
- 9.2.2 The Lighting Strategy sets out the types, positions, heights, outputs, and specification of luminaires to be used throughout the Proposed Development.
- 9.2.3 Measures as outlined in ILP GN01:2021 will be implemented to ensure the Proposed Development does not adversely impact nearby potentially sensitive receptors. Where required and possible, lighting will be implemented in accordance with ILP GN08:2018 for the protection of nearby ecological receptors.
- 9.2.4 Lighting will be implemented at a low level, with lighting designed such that it does not significantly exceed the requirements for the lighting standards proposed throughout the Application Site.
- 9.2.5 Mounting heights will be minimised to the lowest practical level, to reduce the potential spread of lighting beyond the areas where it is needed.

- 9.2.6 All fixtures will emit light downwards only, with an Upward Light Output Ratio (ULOR) of 0%. This minimises the level of skyglow created by the Proposed Development and reduces the potential for the Proposed Development to impact potentially sensitive receptors.
- 9.2.7 Fixtures will have good optical control and light spill will be limited by directing light only where it is needed.
- 9.2.8 All luminaires proposed are to have good optical control and the option for the installation of luminaire shields. This is an effective method of shielding the source intensity and reducing both horizontal and vertical light spill.
- 9.2.9 Luminaires in proximity to potentially sensitive receptors will have back light shields installed by default; specifically on columns adjacent to ecological sensitive areas throughout the site and will have CCTs of 2700K if they are not included within the two main junctions or within the 5 second rule leading to these junctions.
- 9.2.10 All street lighting will be controlled as per the specific switching regimes as outlined within the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards – PSL900A Rev 4:
- “Switching regimes*
- Streetlights – All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off)*
- Streetlights – Part Night, Switch Regime 762, Dusk to 24:00/5:30 to Dawn GMT (35 lux switch on/18 lux switch off)*
- Illuminated traffic signs – All night, Switch Regime 808, Dusk to Dawn (35 lux switch on 18 lux switch off)*
- Illuminated bollards – All night, Switch Regime 100, Dusk to Dawn (InfraRed Photocell)”*
- 9.2.11 Dwelling amenity lighting installed on the Proposed Dwellings will be controlled by PIR inclusive of timed switch control and internal switching. This will ensure lighting is provided when the occupants require it and that it is not left on overnight.
- 9.2.12 The Lighting Strategy is presented in **Appendix 1** and contains detailed descriptions of the lighting requirements for each area of the Proposed Development.

9.3 Mitigation by Design – Operation – Internal Lighting

- 9.3.1 Potentially negative effects of artificial lighting associated with the internal lighting for Proposed Development will be effectively mitigated through the design of the dwellings and other structures along with the careful design of internal lighting to avoid excess light spill through glazing.
- 9.3.2 There is currently no legislative policies or industry guidance specifically related to the controlling of internal light spill, however GN08:18 contains some guidance on internal light spill and methods have been adopted by AONBs and other authorities to mitigate the effects of internal lighting.
- 9.3.3 This is primary through the control of the glazed area of buildings and the orientation of glazed elevations in relation to sensitive receptors such as ecology buffers and sensitive landscape views.
- 9.3.4 To ensure the protection of the receptors identified within this report the following glazing parameters will be met by all structures within the Proposed Development:
1. The glazed area of a building will not exceed 25% of the total floor area (all floors), and;
 2. No façade will have more than 50% of its area covered by glazing.
- 9.3.5 These metrics are adopted by International Dark Skies Reserves and will provide mitigation for both the night sky and landscape views.
- 9.3.6 Additionally, care will be taken when designing the dwellings and other buildings within the Proposed Development to ensure the effects on ecology receptors from internal lighting is mitigated. This will be achieved by complying with the above metrics, by the orientation of the buildings, and ensuring sufficient space between the buildings and the sensitive areas.

- 9.3.7 Further mitigation will be imbedded in the designing of the internal lighting within the Proposed Development and guidance on this can be found in GN08:18.
- 9.3.8 To ensure minimal light spill through glazing no omnidirectional light sources will be used in the internal lighting designs, these typically take the form on pendants. Instead, all internal light will be provided by luminaires with either upward or downward light distributions, and these can be mounted on the walls or recessed into ceilings of the internal spaces:
- “Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill. (See figure overleaf.)”* GN08:18 page 18 (**Figure 4**).
- 9.3.9 Care will also be taken to ensure the beam angles of the luminaires used in the internal lighting design does not result in direct light spill through glazing.
- 9.3.10 Once occupied, residents of the Proposed Development may choose to use table or standing lamps in their respective dwellings. These typically have shades or other light limiting features, and modern designs often use directional light sources, meaning the effects of these types of luminaires will not be as significant as luminaires installed in the fabric of rooms.
- 9.3.11 It must also be noted that features of dwellings such as curtains, which are primarily used for privacy purposes at night, are also key mitigating features for internal light spill.
- 9.3.12 Where internal lighting is proposed for commercial spaces such as shops or offices spaces, the internal lighting can be controlled by timed switching systems that ensure the lighting is not left on overnight. These systems often also have the feature of ‘scene setting’ which allows the levels of light to be customised based on the task being completed and the time of day, which can also reduce the effects of internal lighting on sensitive areas at night.

10 Residual Effects Assessment

10.1 Brief

- 10.1.1 The effects associated with the detailed lighting design would be minimised by the application of the mitigation measures outlined above and in the Lighting Strategy (**Appendix 1**).

10.2 Lighting Proposals

- 10.2.1 This Lighting Impact Assessment is informed by the Lighting Strategy (**Appendix 1**), which defines the types, mounting heights, orientation, and specification of lighting units to be used as part of the proposed development.
- 10.2.2 Lighting is to be provided at sensitive CCTs of 3000K and 2700K in accordance with the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4. Luminaires will have ULORs of 0% and are to be directed to where it is needed at the lowest possible safe level.
- 10.2.3 Lighting for the Hillbury Road Roundabout is to be provided as outlined within BS 5489-1:2020, BS EN 13201-2:2015 and the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4.
- 10.2.4 The lighting classes selected for the Hillbury Road Roundabout are as follows:
- C5 – 7,50 Lux Minimum Maintained Average, 0.4 Uniformity: The extent of the conflict area within the roundabout.
 - P4 - 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum: Extending 67m along the approach roads to comply with the 5 second rule.
- 10.2.5 Lighting for the Spine Road is to be provided as outlined within BS 5489-1:2020, BS EN 13201-2:2015 and the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards – PSL900A Rev 4.
- 10.2.6 The lighting class has been selected for the Spine Road is as follows:
- P4 – 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum
- 10.2.7 This is based on the expect normal – high traffic flow through the areas the Spine Road provides access to and the location of the Application Site within an **E2** Environmental Zone.

- 10.2.8 Lighting for the Ringwood Road Junction is to be provided as outlined within BS 5489-1:2020, BS EN 13201-2:2015 and the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4.
- 10.2.9 The lighting class selected for the Ringwood Road Junction is as follows:
- P4 – 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum
- 10.2.10 This is based on the unlit nature of the remaining extent of Ringwood Road, and the location of the Application Site within an **E2** Environmental Zone.
- 10.2.11 Lighting for the Residential Roads throughout the Proposed Development is to be provided as outlined within BS 5489-1:2020, BS EN 13201-2:2015 and the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4.
- 10.2.12 The lighting class selected for the Residential Roads is as follows:
- P5 – 3,00 Lux Minimum Maintained Average, 0,50 Lux Maintained Minimum
- 10.2.13 This is based on the location of the Application Site within an **E2** Environmental Zone and the expected quiet – normal levels of traffic flow on these roads.
- 10.2.14 Lighting of the Employment Zone within the Proposed Development is to be provided as outlined within BS 5489-1:2020, BS EN 13201-2:2015, and BS EN 12464-2:2014.
- 10.2.15 The lighting classes used within the Employment Zone are expected to be:
- BS EN 12464-2:2014 - 5.9.1 – 05,00 Lux Minimum Maintained Average, 0.25 (25%) Uniformity.
 - BS EN 12464-2:2014 - 5.1.1 – 5,00 Lux Minimum Maintained Average, 0.25 (25%) Uniformity.
 - BS EN 13201-2:2015 - P4 – 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum.
- 10.2.16 This is based on the typical tasks required within exterior areas of Employment Zones of this kind.
- 10.2.17 **Figure 2** shows that the built-up areas of the Proposed Development are confined predominantly to the north and east of the Application Site. The south of the Application Site will remain intrinsically dark.
- 10.2.18 Large areas of open green space have been used throughout the Proposed Development as specific mitigation for potentially sensitive receptors in and around the Application Site.
- 10.2.19 Detailed lighting design will be undertaken at the reserved matters stage to limit the potential for light spill to affect nearby potentially sensitive receptors.
- 10.2.20 Levels will be further reduced by switching luminaires off post-curfew (where applicable), ensuring that the areas of the site are unlit for the majority of the hours of darkness, back light shields will also be used where applicable to direct light only where needed and reduce any impact on surrounding sensitive receptors.
- 10.2.21 Lighting design will need to be undertaken by a suitably qualified lighting professional.

10.3 Residual Effects

- 10.3.1 The lighting proposals outlined above and within the Lighting Strategy within **Appendix 1** will result in the following residual effects:
- 10.3.2 Whilst the lighting will produce a visual change within the environment, this change is likely to only significantly effect close views along adjacent roads.
- 10.3.3 The low levels of light being provided, the good optical control of the luminaires specified within the Lighting Strategy, and the dimming regimes being used will reduce the impact on medium and distance views and the impact of the Proposed Development as a whole.
- 10.3.4 The magnitude of change to Human Amenity Receptor Locations 001 – 019 is considered 'Negligible', Lighting has been modelled for the junction surrounding the Application Site, these

have been chosen as these represents the highest levels of lighting that will be implemented. **Appendix 4** contains the light spill diagrams for the two Proposed Junctions. Modelled vertical illuminance produced in these locations is significantly lower than the pre- and post-curfew limits for the Environmental Zone in which the Application Site is located, and the remaining areas of the Application Site will produce lower levels of vertical illuminance by comparison.

- 10.3.5 The magnitude of change to Ecology Receptor Locations 020-026 is considered 'Negligible'. This is due to the lighting class selected for the road being the lowest safe level allowable within BS 5489-1:2020, the use of 2.7K colour temperatures, the requirements for back light shields as set out within the Lighting Strategy (**Appendix 1**), and the requirements for dimming and switching as set out in the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4 and the Lighting Strategy (**Appendix 1**). These will ensure that light spill reaching areas highlighting as ecologically sensitive will be as low a practically possible and that sensitive colour temperatures will be used across the Proposed Development.
- 10.3.6 The Upward Light Output Ratio (ULOR) of the proposed luminaires is 0% (**Appendix 1**) and the installation is therefore compliant with the Upward Light Ratio criteria detailed within **Table 2**. There will be some impact resulting from reflected upward light, however, as the light levels specified within **Appendix 1** are the minimum for the required tasks and ground surface materials are typically low reflectance, the magnitude of change is considered 'Negligible'.
- 10.3.7 In accordance with **Table 5**, the significance of the change from the proposed lighting is summarised in **Table 8**.

Environmental Effect	Receptor Type	Sensitivity of Receptor	Impact Magnitude	Nature of Impact (Permanent / Temporary)	Residual Effects
Sky Glow or Upward Light	Night Sky (027)	High	Negligible	Permanent	Neutral / Not Significant
Light Intrusion	Human Residential Receptors (001 - 017)	Medium	Negligible	Permanent	Neutral / Not Significant
Light Spill	Human Residential Receptors (001 - 017)	Medium	Negligible	Permanent	Neutral / Not Significant
	Human Safety Receptors (018 - 019)	Medium			
	Ecological Receptors (020 - 026)	High			
Glare	Human Residential Receptors (001)	Medium	Negligible	Permanent	Neutral / Not Significant
	Human Safety Receptors (018 - 019)	Medium			
	Ecological Receptors (020 - 026)	High			

Table 8 Significance of Change to Each Receptor Location

- 10.3.8 Further criteria are given in **Table 6** which aim to assess the significance of the effects of the change in lighting. In this case, due to the 'Negligible' significance of change at the potentially sensitive receptors, the effects of the change in lighting on human and ecology receptors would be classified as **Neutral / Not Significant** in all cases.

- 10.3.9 Whilst the implementation of the lighting scheme will represent visual change within the environment and an extension of the illuminated area of Alderholt, the lighting attributed to the site is not considered to give rise to permanent significant adverse effects due to sensitivity of the Lighting Strategy.
- 10.3.10 Additionally, the modelling conducted for the two main junctions show the distribution of light spill from areas requiring the highest light levels. As can be seen in **Appendix 4** light spill from these areas does not have a significant effect on the nearest Human or Ecology Receptors, and therefore the lower levels of lighting and lower CCTs used on the remaining roads will have a reduced impact compared to the lighting for these areas.

11 Conclusions

11.1 Brief

- 11.1.1 This lighting assessment is presented to evaluate the potential effects of lighting associated with the Proposed Development.
- 11.1.2 The objective of the assessment is to provide an independent report on the suitability of the proposed lighting in accordance with guidance outlined in the Institution of Lighting Professionals (ILP) Professional Lighting Guide (PLG) 04 (2013).
- 11.1.3 Permanent lighting is proposed for the following areas;
1. Spine Road,
 2. Hillbury Road Roundabout and Approach,
 3. Ringwood Road Junction,
 4. Residential Roads,
 5. Dwelling Fronts and Rears, and;
 6. Employment Zone.
- 11.1.4 Lighting is to be subject to the Lighting Strategy outlined in **Appendix 1**.

11.2 Baseline Conditions

- 11.2.1 The Application Site is located in an **E2** Environmental Zone, where the typical background luminance within the area would be described as 'Low'. Existing lighting is present in the area surrounding the Application Site, associated with dwellings and roadways; and the Application Site itself is considered dark. This conclusion was informed by the desktop assessment which found no instances of significant external artificial lighting within or near the Application Site.

11.3 Lighting Strategy

- 11.3.1 A comprehensive Lighting Strategy has been prepared for the Proposed Development, which limits the type, mounting height, inclinations, positions, and operating hours of the proposed lighting, to ensure it is minimally obtrusive within the landscape and has a minimal impact on nearby potentially sensitive receptors. This Lighting Strategy is presented in **Appendix 1**.

11.4 Sensitive Receptors

- 11.4.1 Potentially sensitive human amenity and ecological receptors were identified within the assessment, with their sensitivity described as medium or high. The magnitude of change is assessed as being negligible in all cases given the compliant nature of the proposed lighting and the degree to which levels fall below the identified limits. Furthermore, levels are reduced by a specific switching strategy which is outlined within **Appendix 1**, back light shields can be applied where applicable to ensure light is directed only where needed. Increased areas of green space have also been used within the proposed development, and these are protected as outlined within **Appendix 1** to ensure mitigation against any negative effects is achieved.
- 11.4.2 The residual effects assessment indicates that light spill to nearby human safety and amenity receptors will be significantly lower than the pre- and post-curfew limits for the Environmental Zone in which the Application Site is located.

11.5 Assessment Outcome

- 11.5.1 The residual effect assessment shows that through the implementation of the Lighting Strategy shown in **Appendix 1** the Proposed Development will be compliant with the criteria outlined in **Table 2**. Lighting levels are likely to create a magnitude of change that would equate to a 'Negligible' level, as shown in **Table 8**.
- 11.5.2 Levels will be further reduced by switching luminaires off post-curfew (where applicable) as stated in **Appendix 1**, ensuring that the areas of the site are unlit for the majority of the hours of darkness, back light shields will also be used where applicable to direct light only where needed and reduce any impact on surrounding sensitive receptors.

11.5.3 In conclusion, through the implementation of the Lighting Strategy, there are unlikely to be significant effects from lighting associated with the Proposed Development.

Appendix 1- Lighting Strategy

1 Lighting Strategy

1.1 Brief

- 1.1.1 This Lighting Strategy outlines the requirements for the lighting design, ensuring that it is fit for purpose and sensitive to the surrounding environment.
- 1.1.2 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. The minimum applicable lighting class for each area has been selected based on the methods detailed with the British Standards outlined in **Section 3** of the Lighting Impact Assessment and detailed within this Lighting Strategy.
- 1.1.3 During the Operational Phase of the Proposed Development the following areas will require external artificial lighting:
1. Spine Road,
 2. Hillbury Road Roundabout and Approach,
 3. Ringwood Road Junction,
 4. Residential Roads,
 5. Dwelling Fronts and Rears, and;
 6. Employment Zone.
- 1.1.4 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 obtrusive light can be assessed and controlled by appropriate mitigation.
- 1.1.5 Where applicable the Dorset County Council Adoptable Specification for lighting will be followed as outlined within *Specification for Street Lighting and Illuminated Traffic Signs / Bollards – PSL900A Rev 4*.
- 1.1.6 Where lighting is not to be adopted the height of and finishing on lighting columns will comply with the *Specification for Street Lighting and Illuminated Traffic Signs / Bollards – PSL900A Rev 4*. This is to keep a coherent sense of place across the Proposed Development.
- 1.1.7 Whether street lighting is to be adopted or not, the control regimes outlined within the *Specification for Street Lighting and Illuminated Traffic Signs / Bollards – PSL900A Rev 4* will apply as follows:
1. Spine Road: Streetlights - All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off).
 2. Hillbury Road Roundabout and Approach: Streetlights - All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off).
 3. Ringwood Road Junction: Streetlights - All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off).
 4. Residential Roads: Streetlights - Part Night, Switch Regime 762, Dusk to 24:00/5:30 to Dawn GMT (35 lux switch on/18 lux switch off).
- 1.1.8 Full details of the control parameters can be found within **Table 1.10**.
- 1.1.9 The luminaire performance requirements for the areas highlighted in **Paragraph 1.1.3** are presented in **Sections 1.2 – 1.8**.
- 1.1.10 External artificial lighting will also be required during the Construction Phase of the Proposed Development. The parameters for the Construction Phase lighting are outlined in **Section 1.9**.

1.2 Spine Road – Bus Route (Primary Road)

- 1.2.1 Lighting for the Spine Road is to be provided as outlined within BS 5489-1:2020, BS EN 13201-2:2015 and the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards – PSL900A Rev 4.
- 1.2.2 The lighting class has been selected for the Spine Road is as follows:
 - P4 – 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum
- 1.2.3 This is based on the expect normal – high traffic flow through the areas the Spine Road provides access to and the location of the Application Site within an **E2** Environmental Zone.
- 1.2.4 Lighting will be controlled as per the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards – PSL900A Rev 4.
- 1.2.5 The Spine Road pass through the village centre, and areas of this road within the village centre will require lighting of outlined above.
- 1.2.6 The luminaire performance parameters for the Spine Road can be seen in **Table 1.1**.


<u>Equipment Specification</u>	<u>Description</u>
Location	Spine Road - Bus Route (Primary Road)
Correlated Colour Temperature (Kelvin)	2700K (maximum)
Luminaire Manufacturer	DW Windsor (or similar approved)
Luminaire Model	Ely (or similar approved)
Light Source	LED (Light Emitting Diode)
Height	8m (Maximum)
Mounting Arrangement	Wall and Column Mounted on Heritage Brackets
Luminaire Tilt	0 degrees from horizontal
Upward Light Output Ratio (ULOR)	0% (Fully Shielded)
Example Luminaire Image	
<u>Design Guidance</u>	
Lighting Class	BS 5489-1:2020 and BS EN 13201-2:2015: P4
Design Criteria	P4 – 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum
Controls	Photocells – 7 pin NEMA or Zhaga Socket - All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off)
Accessories	Luminaire Light Shields (where luminaires are required to be installed in proximity to ecological sensitive areas)

Table 1.1: Spine Road – Bus Route

1.3 Hillbury Road Roundabout and Approach

- 1.3.1 Lighting for the Hillbury Road Roundabout is to be provided as outlined within BS 5489-1:2020, BS EN 13201-2:2015 and the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4.
- 1.3.2 The lighting classes selected for the Hillbury Road Roundabout are as follows:
- C5 – 7,50 Lux Minimum Maintained Average, 0.4 Uniformity: The extent of the conflict area within the roundabout.
 - P4 - 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum: Extending 67m along the approach roads to comply with the 5 second rule.
- 1.3.3 This is based on the lighting class for the Spine Road of the Proposed Development, the unlit nature of the remaining extents of Hillbury Road, and the location of the Application Site within an **E2** Environmental Zone.
- 1.3.4 Lighting will be controlled as per the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4.
- 1.3.5 The luminaire performance parameters for the Hillbury Road Roundabout can be seen in **Table 1.2 and 1.3**.


<u>Equipment Specification</u>	<u>Description</u>
Location	Hillbury Road Roundabout – Conflict Area
Correlated Colour Temperature (Kelvin)	3000K (maximum)
Luminaire Manufacturer	DW Windsor (or similar approved)
Luminaire Model	Ely (or similar approved)
Light Source	LED (Light Emitting Diode)
Height	8m (Maximum)
Mounting Arrangement	Column Mounted on Heritage Brackets
Luminaire Tilt	0 degrees from horizontal
Upward Light Output Ratio (ULOR)	0% (Fully Shielded)
Example Luminaire Image	
<u>Design Guidance</u>	
Lighting Class	BS 5489-1:2020 and BS EN 13201-2:2015: P4
Design Criteria	C5 – 7,50 Lux Minimum Maintained Average, 0.4 Uniformity
Controls	Photocells – 7 pin NEMA or Zhaga Socket - All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off)
Accessories	Luminaire Back Light Shields (where luminaires are required to be installed in proximity to ecological sensitive areas)

Table 1.2: Hillbury Road Roundabout – Conflict Area


<u>Equipment Specification</u>	<u>Description</u>
Location	Hillbury Road Roundabout – Approach Roads – 5 Second Rule
Correlated Colour Temperature (Kelvin)	3000K (maximum)
Luminaire Manufacturer	DW Windsor (or similar approved)
Luminaire Model	Luma Gen 2 (or similar approved)
Light Source	LED (Light Emitting Diode)
Height	8m (Maximum)
Mounting Arrangement	Column Mounted on Heritage Brackets
Luminaire Tilt	0 degrees from horizontal
Upward Light Output Ratio (ULOR)	0% (Fully Shielded)
Example Luminaire Image	
<u>Design Guidance</u>	
Lighting Class	BS 5489-1:2020 and BS EN 13201-2:2015: P4
Design Criteria	P4 – 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum
Controls	Photocells – 7 pin NEMA or Zhaga Socket - All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off)
Accessories	Luminaire Back Light Shields (where luminaires are required to be installed in proximity to ecological sensitive areas)

Table 1.3: Hillbury Road Roundabout – Approach Roads – 5 Second Rule

1.4 Ringwood Road Junction

- 1.4.1 Lighting for the Ringwood Road Junction is to be provided as outlined within BS 5489-1:2020, BS EN 13201-2:2015 and the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4.
- 1.4.2 The lighting class selected for the Ringwood Road Junction is as follows:
 - P4 – 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum
- 1.4.3 This is based on the lighting class for the Ringwood Road Junction of the Proposed Development, the unlit nature of the remaining extent of Ringwood Road, and the location of the Application Site within an **E2** Environmental Zone.
- 1.4.4 Lighting will be controlled as per the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4.
- 1.4.5 The luminaire performance parameters for Ringwood Road Junction can be seen in **Table 1.4**.


<u>Equipment Specification</u>	<u>Description</u>
Location	Ringwood Road Junction
Correlated Colour Temperature (Kelvin)	3000K (maximum)
Luminaire Manufacturer	3000K (maximum)
Luminaire Model	DW Windsor (or similar approved)
Light Source	LED (Light Emitting Diode)
Height	8m (Maximum)
Mounting Arrangement	Column Mounted on Heritage Brackets
Luminaire Tilt	0 degrees from horizontal
Upward Light Output Ratio (ULOR)	0% (Fully Shielded)
Example Luminaire Image	
<u>Design Guidance</u>	
Lighting Class	BS 5489-1:2020 and BS EN 13201-2:2015: P4
Design Criteria	P4 – 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum
Controls	Photocells – 7 pin NEMA or Zhaga Socket - All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off)
Accessories	Luminaire Back Light Shields (where luminaires are required to be installed in proximity to ecological sensitive areas)

Table 1.4: Ringwood Road Junction

1.5 Residential Roads (Secondary and Tertiary Roads)

- 1.5.1 Lighting for the Residential Roads throughout the Proposed Development is to be provided as outlined within BS 5489-1:2020, BS EN 13201-2:2015 and the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4.
- 1.5.2 The lighting class selected for the Residential Roads is as follows:
 - P5 – 3,00 Lux Minimum Maintained Average, 0,50 Lux Maintained Minimum
- 1.5.3 This is based on the location of the Application Site within an **E2** Environmental Zone and the expected quiet – normal levels of traffic flow on these roads.
- 1.5.4 Lighting will be controlled as per the Dorset County Council Specification for Street Lighting and Illuminated Traffic Signs/Bollards - PSL900A Rev 4.
- 1.5.5 The where residential roads are included within the village centre they will require lighting of outlined above.
- 1.5.6 The luminaire performance parameters for Residential Roads throughout the Proposed Development can be seen in **Table 1.5**.


<u>Equipment Specification</u>	<u>Description</u>
Location	Residential Roads for Adoption (Secondary and Tertiary Roads)
Correlated Colour Temperature (Kelvin)	2700K (maximum)
Luminaire Manufacturer	DW Windsor (or similar approved)
Luminaire Model	Ely (or similar approved)
Light Source	LED (Light Emitting Diode)
Height	5m (Maximum)
Mounting Arrangement	Wall and Column Mounted on Heritage Brackets
Luminaire Tilt	0 degrees from horizontal
Upward Light Output Ratio (ULOR)	0% (Fully Shielded)
Example Luminaire Image	
<u>Design Guidance</u>	
Lighting Class	BS 5489-1:2020 and BS EN 13201-2:2015: P4
Design Criteria	P4 – 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum
Controls	Photocells – 7 pin NEMA or Zhaga Socket - Part Night, Switch Regime 762, Dusk to 24:00/5:30 to Dawn GMT (35 lux switch on/18 lux switch off)
Accessories	Luminaire Light Shields (where luminaires are required to be installed in proximity to ecological sensitive areas)

Table 1.5: Residential Roads for Adoption and not for Adoption

1.6 Dwelling Fronts and Rears

- 1.6.1 Lighting will be provided to the dwelling fronts and rears to enable wayfinding for access to entrances.
- 1.6.2 These luminaires will be wall mounted and will direct light downward only with no upward light component (0% ULOR), they will use a correlated colour temperature of 2700K, will use integral light sources (LED), and will have a maximum beam angle of 20 degrees. This is to ensure the impact of external lighting on the night sky and the identified ecology is mitigated as far as possible.
- 1.6.3 Luminaire performance parameters for the dwelling fronts and rears are outlined in **Table 1.6**.

<u>Equipment Specification</u>	<u>Description</u>
Location	Dwelling Fronts and Rears
Correlated Colour Temperature (Kelvin)	2700 Kelvin (Maximum).
Luminaire Manufacturer	LIGMAN (or similar approved)
Luminaire Model	JET 31 - 30351(or similar approved)
Light Source	LED
Beam angle	20° (Maximum)
Height	2m (Maximum)
Mounting Arrangement	Wall Mounted
Luminaire Tilt	0° (Maximum)
Upward Light Output Ratio (ULOR)	0% (Maximum)
Example Luminaire Image	
<u>Design Guidance</u>	
Lighting Class	N/A
Lighting Design Criteria	N/A
Controls	Passive Infrared Motion Sensor (PIR) inclusive of timed switch control Internal Switching

Table 1.6: Dwelling Fronts and Rears

1.7 Employment Zone

- 1.7.1 Lighting of the Employment Zone within the Proposed Development is to be provided as outlined within BS 5489-1:2020, BS EN 13201-2:2015, and BS EN 12464-2:2014.
- 1.7.2 The lighting classes used within the Employment Zone are expected to be:
- BS EN 12464-2:2014 - 5.9.1 – 05,00 Lux Minimum Maintained Average, 0.25 (25%) Uniformity.
 - BS EN 12464-2:2014 - 5.1.1 – 5,00 Lux Minimum Maintained Average, 0.25 (25%) Uniformity.
 - BS EN 13201-2:2015 - P4 – 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum.
- 1.7.3 This is based on the typical tasks required within exterior areas of Employment Zones of this kind.
- 1.7.4 The luminaire performance parameters for Employment Zone can be seen in **Table 1.7, 1.8 and 1.9.**


<u>Equipment Specification</u>	<u>Description</u>
Location	Employment Zone
Correlated Colour Temperature (Kelvin)	2700 Kelvin (Maximum)
Luminaire Manufacturer	DW Windsor (or similar approved)
Luminaire Model	Kirium Wall (or similar approved)
Light Source	LED (Light Emitting Diode)
Height	3m (Maximum)
Mounting Arrangement	Wall Mounted
Luminaire Tilt	0 degrees from horizontal
Upward Light Output Ratio (ULOR)	0%
Example Luminaire Image	
<u>Design Guidance</u>	
Lighting Class	BS EN 12464-2:2014 – 5.1.1 BS EN 12464-2:2014 – 5.9.1 BS EN 13201-2:2015 – P4
Design Criteria	5.1.1: 5,00 Lux Minimum Maintained Average, 0.25 (25%) Uniformity 5.9.1: 5,00 Lux Minimum Maintained Average, 0.25 (25%) Uniformity P4: 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum
Controls	Photocell controlled (Dusk till Dawn) Switch off after the hours of use of the site – resume at Dawn (35 lux switch on/18 lux switch off)

Table 1.7: Employment Zone – Wall Mounted


<u>Equipment Specification</u>	<u>Description</u>
Location	Employment Zone
Correlated Colour Temperature (Kelvin)	2700 Kelvin (Maximum)
Luminaire Manufacturer	DW Windsor (or similar approved)
Luminaire Model	Milano Classic (or similar approved)
Light Source	LED
Height	6m (Maximum)
Mounting Arrangement	Post Top
Luminaire Tilt	0° (Maximum)
Upward Light Output Ratio (ULOR)	0% (Maximum)
G Class	G3 (Minimum)
Example Luminaire Image	
<u>Design Guidance</u>	
Lighting Class	BS EN 12464-2:2014 – 5.1.1 BS EN 12464-2:2014 – 5.9.1 BS EN 13201-2:2015 – P4
Lighting Design Criteria	5.1.1: 5,00 Lux Minimum Maintained Average, 0.25 (25%) Uniformity 5.9.1: 5,00 Lux Minimum Maintained Average, 0.25 (25%) Uniformity P4: 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum
Controls	Photocell controlled (Dusk till Dawn) Switch off after the hours of use of the site – resume at Dawn (35 lux switch on/18 lux switch off)

Table 1.8: Employment Zone – Column Mounted

<u>Equipment Specification</u>	<u>Description</u>
Location	Employment Zone
Correlated Colour Temperature (Kelvin)	2700 Kelvin (Maximum)
Luminaire Manufacturer	DW Windsor (or similar approved)
Luminaire Model	Kirium Pro (or similar approved)
Light Source	LED
Height	6m (Maximum)
Mounting Arrangement	Post Top
Luminaire Tilt	0° (Maximum)
Upward Light Output Ratio (ULOR)	0% (Maximum)
G Class	G3 (Minimum)
Example Luminaire Image	
<u>Design Guidance</u>	
Lighting Class	BS EN 12464-2:2014 – 5.1.1 BS EN 12464-2:2014 – 5.9.1 BS EN 13201-2:2015 – P4
Lighting Design Criteria	5.1.1: 5,00 Lux Minimum Maintained Average, 0.25 (25%) Uniformity 5.9.1: 5,00 Lux Minimum Maintained Average, 0.25 (25%) Uniformity P4: 5,00 Lux Minimum Maintained Average, 1,00 Lux Maintained Minimum
Controls	Photocell controlled (Dusk till Dawn) Switch off after the hours of use of the site – resume at Dawn (35 lux switch on/18 lux switch off)

Table 1.9: Employment Zone – Column Mounted

1.8 Lighting Controls

- 1.8.1 Different areas of the Proposed Development will require different regimes of control, these are summarized per area in **Table 1.10**.

Lighting Controls Summarised per Area of the Proposed Development		
Area Name	Control System	Control Parameters
Spine Road	Photocell controlled	All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off)
Hillbury Road Roundabout and Approach	Photocell controlled	All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off)
Ringwood Road Junction	Photocell controlled	All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off)
Residential Roads	Photocell controlled	Part Night, Switch Regime 762, Dusk to 24:00/5:30 to Dawn GMT (35 lux switch on/18 lux switch off).
Employment Zone	Photocell controlled	Photocell controlled (Dusk till Dawn) Switch off after the hours of use of the site – resume at Dawn (35 lux switch on/18 lux switch off)
Dwelling Fronts and Rears	Photocell controlled	Passive Infrared Motion Sensor (PIR) inclusive of timed switch control. Internal Switch override of PIR.

Table 1.10: Lighting Control Summary

1.9 Construction Phase Lighting

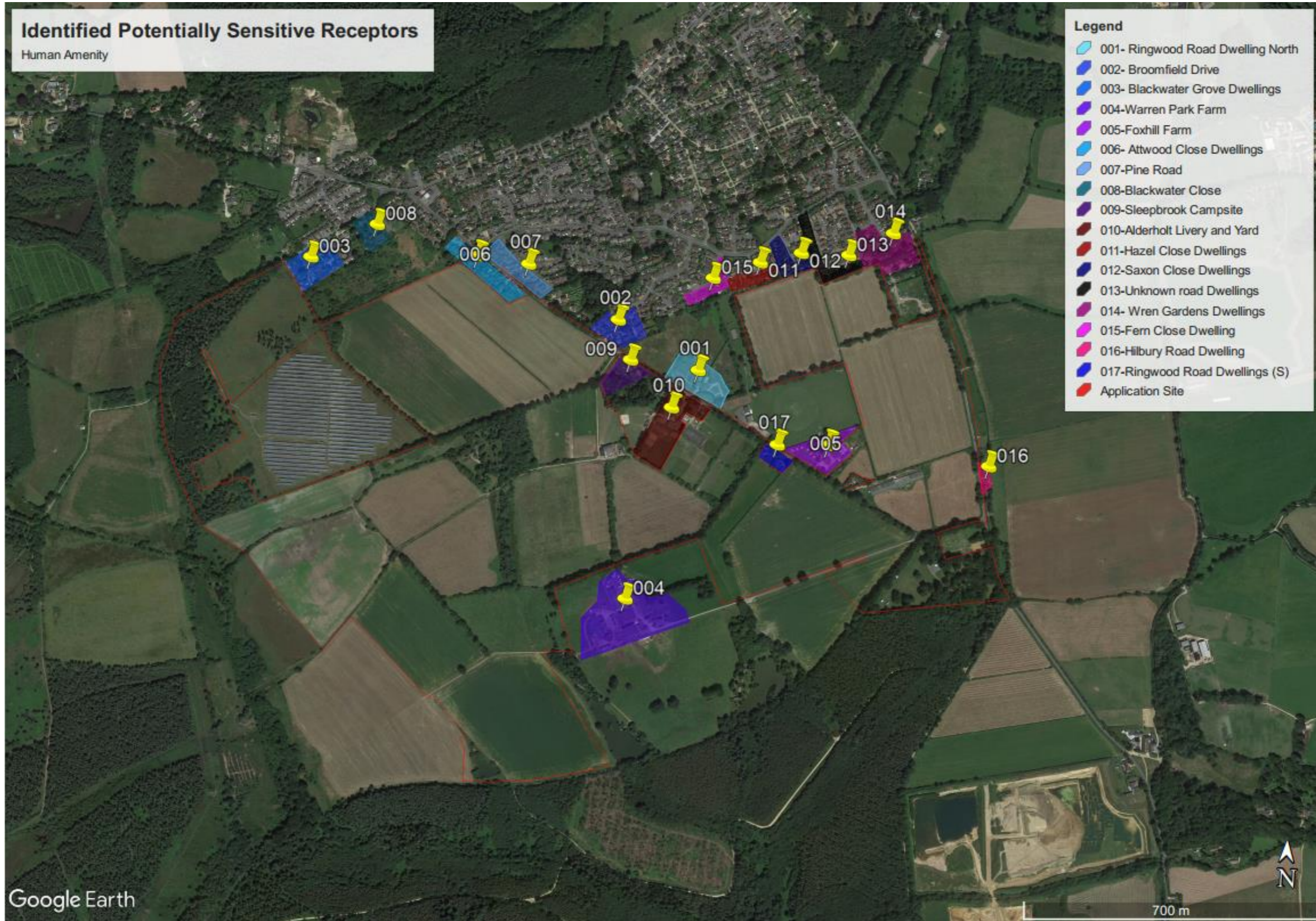
- 1.9.1 The lighting of construction tasks requires higher levels of illuminance than required during the operational stage of the Proposed Development. However, unlike the operational phase lighting, the construction phase light will not become a permanent feature of the landscape and will be removed once the development is complete.
- 1.9.2 Construction lighting will be provided in compliance with the guidance within BS EN 12464-2: 2014; which defines appropriate lighting levels for outdoor work tasks. The levels required will vary depending upon the task being undertaken and will be assessed on a task-by-task basis. Construction lighting will not significantly exceed the relevant lighting standard for the task being undertaken in order to limit the visibility of construction lighting within the landscape.
- 1.9.3 Construction tasks will predominantly be undertaken during the hours of daylight and as such, there is a limited requirement for construction lighting throughout the construction phase of the Proposed Development. Construction tasks are not anticipated to be undertaken for significant periods during the hours of darkness.
- 1.9.4 Construction lighting will be maintained at a lowest level applicable for the task being performed and focussed into the site, onto the task being undertaken. Where possible, construction lighting is to be provided by handheld sources or headtorches, ensuring the lowest possible amount of light is used for the task at hand.
- 1.9.5 Where this is not possible, construction lighting will be mounted an appropriate distance from the task being performed to ensure the required minimum illuminance levels and uniformity is achieved without the need to tilt the luminaires. Additionally, luminaires will be fitted with baffles or shields where necessary to ensure that lighting is not directed towards potentially sensitive receptors.
- 1.9.6 To limit the visibility of construction lighting within the landscape, it will be switched off when not in use. Task lighting for construction tasks is to be controlled by timed switches, ensuring that task lighting is only provided when needed and does not operate outside the hours of use.
- 1.9.7 Security lighting to the construction compound will be provided by luminaires fixed to site infrastructure, such as cabins or scaffolding poles, will be oriented downwards only and will be focussed into the site only to reduce the levels of light spill leaving the site.
- 1.9.8 Security lighting will be controlled via photosensor and Passive Infra-red Motion Sensor (PIR) with the target size set to large. This will ensure that lighting is only operational during the hours of darkness and when required and it is not activated by animals passing through the site or by debris.
- 1.9.9 Detailed construction lighting requirements will be provided in the CEMP accompanying the application. Through the implementation of the CEMP, potentially impacts associated with construction lighting will be minimised.

Appendix 2 – Proposed Development Indicative Masterplan



Appendix 3 – Potentially Sensitive Receptors

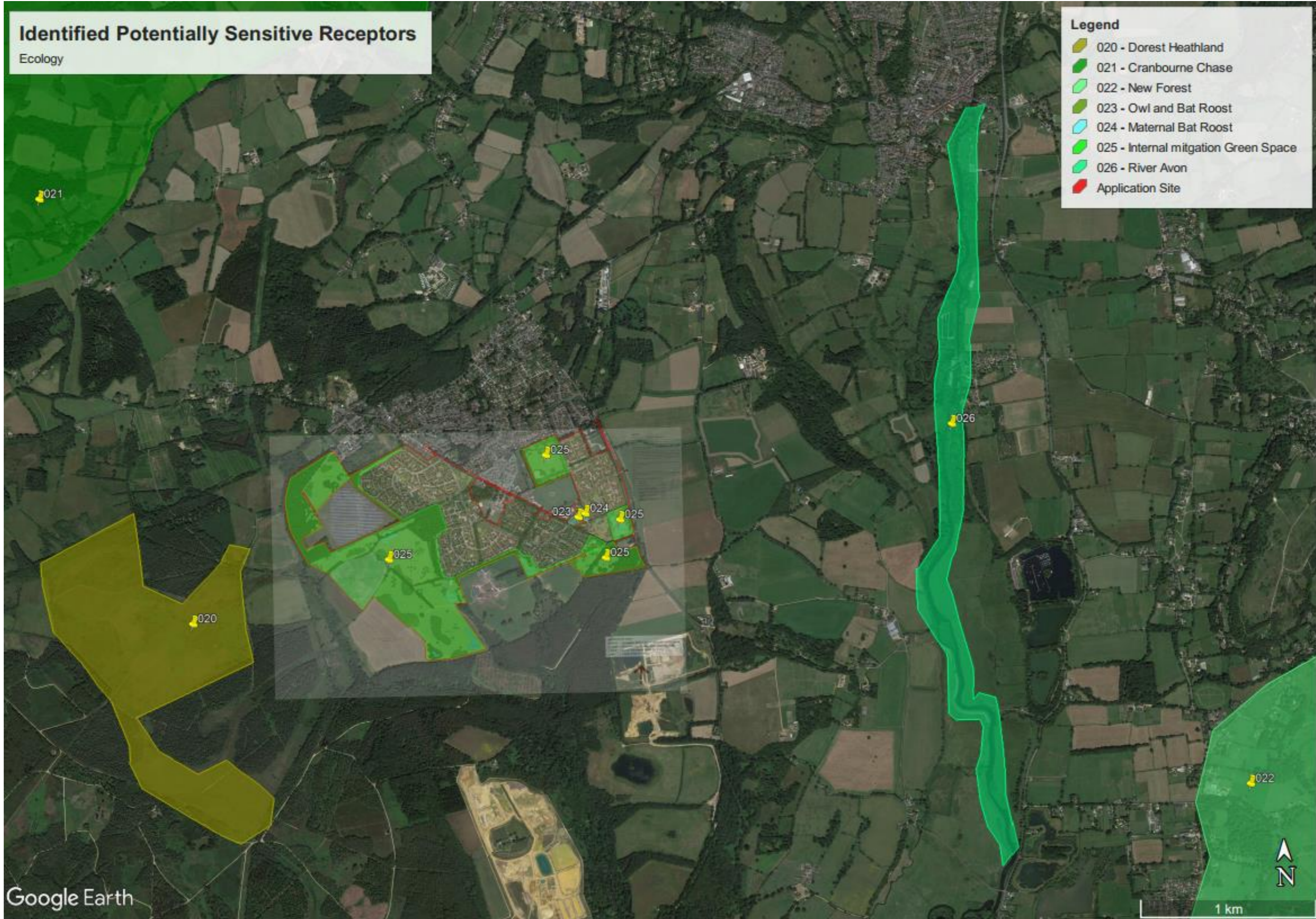
Potentially Sensitive Human Amenity Receptors



Potentially Sensitive Human Safety Receptors



Potentially Sensitive Ecology Receptors



Appendix 4 – Indicative Light Spill Diagrams

See Separate Files:

- 2493-DFL-ELG-XX-LD-EO-13001
- 2493-DFL-ELG-XX-LD-EO-13002