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- KEY - INDICATIVE LIGHTING EQUIPMENT:
- (A) 6m STREET LIGHTING COLUMN AND 3000K LED LUMINAIRE TO WEST SUSSEX COUNCIL SPECIFICATION
QUANTITY: 8
 - (B) 5m STREET LIGHTING COLUMN AND 3000K LED LUMINAIRE TO WEST SUSSEX COUNCIL SPECIFICATION
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 - (C) 5m STREET LIGHTING COLUMN AND 3000K LED LUMINAIRE TO WEST SUSSEX COUNCIL SPECIFICATION AND REAR LIGHT SHIELD
QUANTITY: 17
 - (D) 5m PRIVATE STREET LIGHTING COLUMN AND 3000K LED LUMINAIRE WITH REAR LIGHT SHIELD
QUANTITY: 3

- KEY - INDICATIVE AREA TYPES:
- ADOPTABLE ROADS
WCS SPECIFICATION LIGHTING
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COLUMN MOUNTED LIGHTING
 - EMERGENCY ACCESS
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- 0.4 0.4 LUX CONTOUR
 - 0.6 0.6 LUX CONTOUR
 - 1.0 1.0 LUX CONTOUR

P02 BASE AND LIGHTING LAYOUT UPDATE 27/10/2021
P01 FIRST ISSUE 05/08/2021

FOR REVIEW



Client
PYE HOMES

Project Name
**LAND EAST OF WOODGATE RD,
WOODGATE**

Drawing Title
OUTLINE LIGHTING STRATEGY

Original Drawing Size : A1	Drawn: JJ	Rev P02
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Lighting Report

Land at Woodgate Centre Oak Tree Lane, Woodgate

Document Control

Issue Date	Revision	Comment	Author
11/10/2021	A	First Issue	Julian Joseph
27/10/2021	B	Reformatted. Response to planning comments included.	Julian Joseph

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Lighting Assessment
Woodgate Road, Woodgate
Revision B, October 2021

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1. Introduction

- 1.1. This lighting assessment has been produced in support of a planning application LPA ref: AL/107/21/PL for the SD5 Barnham, Eastergate and Westergate (BEW) Development Site.

2. Policy, Statements and Consultation

Planning Supporting Statement

- 2.1. The Planning Support statement dated August 2021 states:

2.2. Policy EH10 seeks to ensure development proposals do not detract from the unlit nature of the Parish. The applicant is willing to accept a condition to supply all the details relating to the lighting of the scheme, as the scheme forms part of the strategic allocation there in a later development plan there has been an acceptance that the unlit nature of the allocation will change, so whilst the development will seek to minimise light pollution the character of the site will change.

Designing Out Crime

- 2.3. The Local Policing Support Team in consultation letter ref: LM/ARU/21/A9A has indicated the following:
- 2.4. Lighting throughout the development will be an important consideration and where it is implemented it should conform to recommendations within BS5489-1:2013. Secured by Design (SBD) considers that bollard lighting is not appropriate as it does not project sufficient light at the right height making it difficult to recognise facial features and as a result causes an increase in the fear of crime.

Ecology Assessment

- 2.5. The ECOSA interim ecological assessment report dated 6th August 2021 states:
- 2.6. *The site has been assessed as having moderate suitability for supporting foraging and commuting bats (Para. 2, Page 12)*
- 2.7. *Implementation of a sensitive lighting scheme will ensure that dark corridors (**less than one lux**) are maintained across key areas of foraging and commuting habitat within and bordering the site such as the Lidsey Rife. (Para. 6, Page 75)*
- 2.8. *New external lighting will comprise hooded luminaires directed away from vegetation, particularly mature oak trees where possible. Ideally the bulbs will be LED and at the warmer end of the spectrum (e.g., avoiding blue or white light). LED lights emit much lower levels of UV and therefore have a lower impact on wildlife.*

The lighting on the outside of new buildings will be motion-activated and task related, associated with specific entrance/exit points. The lux level will be as low as possible to allow the task to be carried out safely and effectively. Guidance on task related lighting levels published by the Chartered Institution of Building Services Engineers (CIBSE) (CIBSE, 2002) will be followed. None of the areas in the vicinity of bat mitigation infrastructure will be directly illuminated. The majority of the Lidsey Rife will not be illuminated and will continue to be a commuting and foraging feature available to bats in the local area. Where lighting is necessary, this will be sensitively lit to reduce impacts on bats as much as possible. (Para. 7, Page 75).

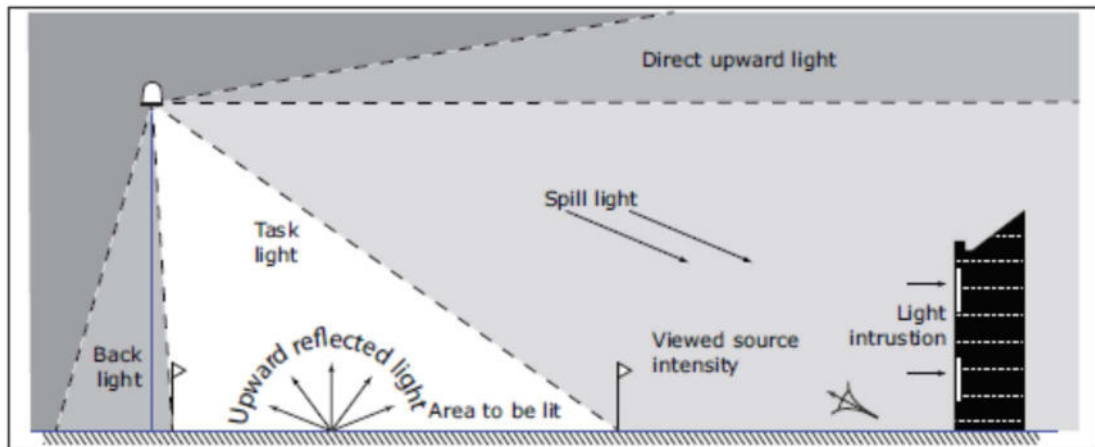
3. Lighting Strategy

- 3.1. In response to the planning policies, this section of the report sets out the considerations for delivering a lighting scheme for the site which is predominantly focussed on street lighting.

Light pollution

- 3.2. Light pollution relates to artificial lighting that creates excessive glare, skyglow and light trespass.
- 3.3. **Glare** – The uncomfortable brightness of a light source when viewed against a dark background.
- 3.4. Glare can be restricted through careful placing of lighting units out of the view from windows. For road users, street lighting luminaires should be selected with a luminous intensity class of G3 where possible.
- 3.5. **Skyglow** – The brightening of the night sky which limits our ability to view the sky at night.
- 3.6. All lighting units whether on or off the highway should have no direct upward light output. All street lighting units will use LED luminaire set with a zero-degree tilt.
- 3.7. **Light trespass** – Light spill beyond a boundary of the area being lit.
- 3.8. As with glare, the light sources or lamp posts should be carefully placed away from windows i.e., not to be placed directly outside property frontages where possible.
- 3.9. The types of pollution and obtrusive light are depicted in diagram 1 below taken from the ILP Guidance Note 01/20 – Guidance Notes for the Reduction of Obtrusive Light.

Diagram 1



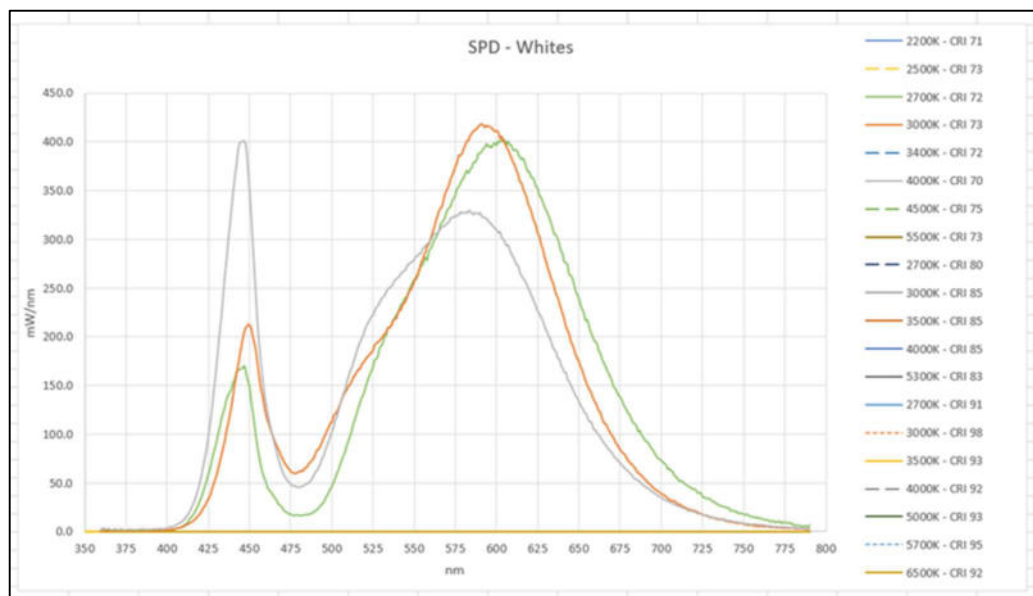
Environmental Considerations – Bats

- 3.10. The application site is over 12km southeast of the Singleton and Cocking Tunnels which is a site of special scientific interest.
- 3.11. The ecological report has assessed the Woodgate application site as being of moderate suitability for foraging and commuting bats which indicates that some adjustment to standard lighting levels and light sources will be required.
- 3.12. The report has also highlighted a preference for a 'warmer' LED light source. The local authority standard for street lighting is a colour temperature of around 4000K which is often referred to as neutral white. LEDs described as warmer are defined as being below 4000K and are often sold incrementally as 3000K, 2700K, 2200K etc.
- 3.13. The 'ILP Guidance Note 08 – Bats and Artificial Lighting in the UK' makes the following reference in relation to colour temperature and UV content:

'Warm white' (more yellow/orange colour) at around 3000°K and as low as 2700°K can now be used with little reduction in lumen output. LED typically features no UV component and research indicates that while lower UV components attract fewer invertebrates, warmer colour temperatures with peak wavelengths greater than 550nm (~3000°K) cause less impacts on bats (Stone, 2012, 2015a, 2015b).'

- 3.14. The peak wavelengths for 3000K as described in paragraph 3.9 are greater than 550nm in line with guidance to reduce impact on bats and as shown in Diagram 2.
- 3.15. The spectra diagram below compares 2700K, 3000K & 4000K data.

Diagram 2



- 3.16. The 3000K colour temperature (orange) has a much-reduced blue light component which peaks at around 425-450nm.
- 3.17. It is therefore recommended that lighting units under control of the Developer and Local Authority utilise LEDs with a colour temperature of no more than 3000K.

Public Street Lighting

- 3.18. All adoptable roads will be lit using a specification and/or design brief issued by West Sussex Council (WSC). The recommended lighting levels for these roads are set out in chapter 4 and are aligned with the BS5489 standard for road lighting.
- 3.19. The Developer has no control over the exact model of street lighting on the highway but the Lighting Authority will specify LED luminaires.
- 3.20. The LED luminaires will have 0% direct upward light (skyglow control) and are commonly required to have a minimum luminous intensity class of G3 (glare control).
- 3.21. The Designer will seek to use this equipment in an arrangement to reduce light trespass i.e., avoid placing columns in front of first floor windows where possible.

Private Street Lighting

- 3.22. In areas where the lighting is not to be adopted such as private driveways and courtyards, the Developer can provide additional 'private' lighting to these areas for security. These can take the form of street lighting columns, bollards and wall mounted 'bulkhead' units in confined apartment block courtyards.
- 3.23. Although there is more freedom in specifying equipment types, the lighting should still adopt the same lighting principles as the adoptable lighting and minimise light pollution.
- 3.24. An additional requirement for improved facial recognition as recommended in the Police consultation letter (namely Secured by Design) is normally achieved by confirming the vertical illuminance. However, in practice this is difficult to achieve or at least confirm in all areas due to the difficulty in defining the appropriate observer position. Further consultation may be required to identify specific areas of security concern across the site during detailed design.
- 3.25. Lighting should be highly controlled in these often peripheral and confined locations around the development to avoid overspill on to the neighbouring properties and green infrastructure.

4. Lighting Specification

4.1. Table 1 lists the recommended lighting equipment type lighting levels for each highway area.

Table 1

Location	Mounting	Luminaire	Recommended Lighting Levels*	Switching	Dimming
Adoptable access roads	6 metre column	West Sussex LED road lighting unit – 3000K or lower	3.00 to 4.50 lux average	Dusk til dawn – Photocell or wireless CMS control.	West Sussex Council specification
Adoptable shared surface	5 metre column	West Sussex LED road lighting unit – 3000K or lower	2.00 to 3.00 lux average	Dusk til dawn – Photocell or wireless CMS control.	West Sussex Council specification
Private drives and parking areas	5 metre column	Area lighting unit - 3000K or lower	2.00 to 3.00 lux average (uniformity of 25% in parking areas)	Dusk until dawn photocell.	None.
Emergency Access Road	5 or 6 metre column	West Sussex LED road lighting unit – 3000K or lower	2.00 to 3.00 lux average	Dusk til dawn – Photocell or wireless CMS control.	West Sussex Council specification
*Lighting levels refer to horizontal illuminance only. Vertical illuminance for facial recognition to be used in defined areas following further Police and Local Authority consultation at detailed design stage.					

5. Outline Lighting Scheme

- 5.1. Please refer to drawing 100255-JLD-ASMT-DR-0001-P02 at Appendix A for an illustration of the recommended strategy in practice.

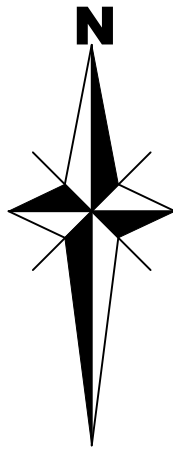
6. Summary

- 6.1. All adoptable lighting column mounted units to use directional LEDs with a colour temperature of 3000K or less subject to confirmation by the Lighting Authority.
- 6.2. All private lighting units to use directional LEDs with no direct upward light with a colour temperature of 3000K or less.
- 6.3. Lighting units installed along the boundary of the site or to property frontages are to have column mounted light shields attached.
- 6.4. Recommended lighting levels from Table 1 of this document to be applied during detailed design.
- 6.5. Any unavoidable light spill beyond the site boundary to be under one lux in the horizontal plane.
- 6.6. Lighting across defined dark corridors to be restricted to one lux where safe to do so.
- 6.7. Direct or indirect lighting of proposed bat box habitat features shall be zero.
- 6.8. Locations of proposed bat boxes and other sensitive habitat features to be overlaid on detailed lighting drawing for Lighting Authority review purposes.
- 6.9. Across the development, specifiers and occupants should collectively seek to reduce the amount of exterior light used in domestic situations. This can be achieved by some simple measures:
 - Use only the necessary amount of light for the task
 - Do not use fixture with permanent upward light output
 - Switch off unnecessary lighting late at night
- 6.10. If in doubt, further guidance can be sought in the ILP Publication - Guidance Note 9 Domestic exterior lighting: getting it right.

7. References

- BS5489-1:2020 Code of practice for the design of road lighting
- BS EN 13201-2:2015 Guidelines on the selection of lighting classes
- ILP Guidance Note 01/20 –Reduction of Obtrusive Light
- ILP Guidance Note 08/18 – Bats and Artificial Lighting in the UK
- ILP Guidance Note 09/19 - Domestic exterior lighting

8. Appendix A



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