



Lighting Design Considerations & Environmental Report

1334 Horsted Keynes

DESIGN CONSIDERATIONS & ENVIRONMENTAL REPORT

Document Issue Sheet

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This Design Considerations & Environmental Report has been prepared for our client as stated within our appointment only and expressly for the purposes set out in an appointment and we owe no duty of care to any third parties in respect of its content. Therefore, unless expressly agreed by us in signed writing, we hereby exclude all liability to third parties, including liability for negligence, save only for liabilities that cannot be so excluded by operation of applicable law. This report has been based solely on the specific design assumptions and criteria stated herein.

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1. Introduction

1.1 This Design Considerations & Environmental Report has been prepared by Williams Lighting Consultants Ltd. for and on behalf of the Client. The report assesses the requirements for safety fences (lighting protection), design considerations, Health and Safety requirements, environmental impacts and future maintenance schedules associated with the proposed lighting equipment.

1.2 Site Location:



2. Safety Fences –Bollards

- 2.1 All bollards are to be positioned at least 0.8m from the kerb edge or at the rear of the footpath. Refer to drawings WLC1493-1300-001 for further details.
- 2.2 The British Standard recommends a 0.8m setback as a minimum. With the above proposals, it is considered that safety barriers will not be a requirement for any lighting bollard within the proposed design.

3. Maintenance Activities

3.1 Electrical Test and Inspection

- 3.1.1 Upon installation, all lighting bollards shall have an electrical installation certificate as per the latest BS7671 Requirements for Electrical Installations - IET Wiring Regulations. This certificate is to be passed to the developer upon completion.
- 3.1.2 Each lighting bollard shall require a periodic condition report every 6 years dated from the initial test certificate.

3.2 Lamp Changes

- 3.2.1 The proposed lanterns utilize an LED light source, lamp changes will not be required. It is however recommended that the LED lens be cleaned every 6 years and driver replacements should be considered.

3.3 Structural Test and Inspections

- 3.3.1 It is recommended that all lighting bollards are visually inspected for damage every three years for the first six years and then every 2 years.
- 3.3.2 Bollards to be structurally tested and inspected following with industry best practice ILP Guidance Note 22/19 Asset-Management Toolkit: Minor Structures.

4. Health and Safety

4.1 All works are to be carried out considering current Health and Safety regulations, legislation and Construction Design Management 2015 regulations. The below list is not exhaustive:

- Highways Act, 1980
- The Management of Health and Safety at Work Regulations, 1999 and 2003
- Electricity at Work Regulations, 1989
- CDM Regulations 2015
- BS7671 Wiring Regulations
- New Roads and Street Works Act (NRSWA), 1991
- BS5489 (British Standards for Lighting)
- G39/1 Working in Vicinity of DNO Equipment

4.2 Under CDM a project is notifiable if the construction work is to exceed 30 working days and has more than 20 workers working simultaneously at any point or exceeds 500 person-days. If any of these are applicable an F10 form must be submitted. This form can be found by visiting the HSE website.

4.3 CDM regulations will still apply if the project does not meet the above requirements. If any of this is in doubt the company should seek professional advice.

4.4 It is recommended that all street lighting works are carried out by a HERS Registered contractor.

4.5 All electrical works must comply with the latest BS7671 Requirements for Electrical Installations - IET Wiring Regulations.

5. Design Considerations

5.1 Existing Lighting

5.1.1 The site is a new development – no lighting is present.

5.2 Maintenance Factors

5.2.1 Proposed luminaire maintenance factors have been set to 1.00 to represent day 1 lighting levels.

5.3 Overhead Cables

5.3.1 None present.

5.4 Lighting Levels

5.4.1 The proposals have been designed for wayfinding and security purposes only.

5.5 Ecology Concerns

5.5.1 The site lies within the High Weald Area of Outstanding Natural Beauty. Ecological constraints, the requirements of condition 24 of planning permission DM/20/4692, and the lighting design response are addressed at section 6.4.

6. Environmental Considerations

6.1 Proposed Lighting

- 6.1.1 The proposed design ensures existing receptors do not have any light spill onto their properties.
- 6.1.2 The potential lighting impact has been significantly reduced using a competent design practice and careful considerations towards heights of bollards and equipment specification.

6.2 Obtrusive Light Limitations for Exterior Lighting

- 6.2.1 The below table has been reproduced from the ILP GN01/20 and provides maximum limits on vertical illuminance values on properties.

Table 1 (Table 3 GN01/20): Maximum values of vertical illuminance on properties.						
Light technical parameter	Application conditions	Environmental zone				
		E0	E1	E2	E3	E4
Illuminance on the vertical plane (E _v)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	<0.1 lx	1 lx	2 lx	5 lx

- 6.2.2 In accordance with condition 24 of planning permission DM/20/4692, the site is assessed under Environmental Zone E1 (intrinsically dark landscape), reflecting its position within the High Weald Area of Outstanding Natural Beauty and the requirement to protect the dark skies of the AONB. The obtrusive light limits for zone E1 have been adopted as the design criteria.
- 6.2.3 The below table has been reproduced from the ILP GN01/20 and provides maximum limits on upward light values. All proposed light fixtures have a 0% upward light ratio.

Table 2 (Table 6 GN01/20) Maximum values of upward light ratio (ULR) of luminaires.					
Light technical parameter	Environmental zone				
	E0	E1	E2	E3	E4
Upward Light Ratio (ULR %)	0	0	2.5	5	15

6.3 Proposed Luminaire

Table 3: Luminaire Specification				
Luminaire	Proposed Locations	Characteristics		Image
Solareye Solar Bollard	Highway lighting	Upward Light:	0%	
		Colour temperature:	2700K (Warm White)	
Orlight 3010-S Downlight	Amenity lighting	Upward Light:	0%	
		Colour temperature:	3000K (Warm White)	
				

6.4 Ecology

- 6.4.1 The site lies within the High Weald Area of Outstanding Natural Beauty. Condition 24 of planning permission DM/20/4692 requires a lighting design scheme for biodiversity and the protection of the dark skies of the AONB, adopting the Institute of Lighting Professionals recommended light control zone E1. The lighting design has been developed to meet this requirement, and the scheme is assessed under zone E1 at section 6.2.
- 6.4.2 The ecological baseline is set out in the Ecological Assessment (Ecology Solutions, December 2020) and the associated briefing notes referenced in the planning permission. Features sensitive to artificial light, such as the retained boundary hedgerows, trees and woodland edge that may be used by foraging and commuting bats, are to be kept dark.
- 6.4.3 The design limits impact on these features through low level solar bollard lighting (PIR controlled), luminaires with a 0% upward light ratio, a warm 2700/3000K colour temperature to reduce short wavelength content, and optical control that directs light onto the carriageway and footways. Light units have been positioned to maintain an unlit buffer to the site boundaries and retained vegetation, so that light does not spill onto features used by bats.
- 6.4.4 Lighting contour plans and the luminaire technical specifications at section 6.3 demonstrate that illuminance at the sensitive boundaries is kept to a minimum and that the areas to be lit will not disturb or prevent bats using their territory. The design has regard to the Institute of Lighting Professionals and Bat Conservation Trust Guidance Note GN08/23: Bats and Artificial Lighting in the UK.

7. Environmental Residual Effects

7.1 The proposed lighting will have a residual effect on the environment, and these will occur at different phases during the project. The residual effects have been assessed below and consider the permanent and temporary effects.

7.2 Operational - Landscape and Visual (permanent impact)

7.2.1 There is a permanent impact on the visual scene. With the use of a design practice, the impact can be minimized through good design – reducing the number of bollards required. With the use of modern lanterns light is well controlled.

7.2.2 Recommendation: Design prepared by competent designer following BS 5489 and ILP Guidance on the Reduction of Obtrusive Light.

7.3 Operational - Community (permanent impact)

7.3.1 A well-designed lighting installation will have a positive impact on the local community, providing:

- A reduction in the fear of crime
- Encourage the use of more sustainable modes of transport, such as walking, cycling.

7.3.2 Recommendation: None

7.4 Construction and Demolition - Noise (temporary impact)

7.4.1 Noise during construction

7.4.2 Recommendation: Employment of competent contractor with the use of appropriate tools to minimize noise.

7.5 Construction and Demolition - Dust (temporary impact)

7.5.1 Dust during construction

7.5.2 Recommendation: Employment of competent contractor with the use of appropriate tools to minimize dust.

7.6 Construction and Demolition – Ground Contamination (temporary impact)

7.6.1 None anticipated

7.6.2 Recommendation: None

7.7 Construction and Demolition – Storage of Materials (temporary impact)

7.7.1 Storage of materials is anticipated

7.7.2 Recommendation: Hazardous materials to be handled, stored, and transported following COSHH regulations and manufacturer guidelines.

7.8 Construction and Demolition – Waste

7.8.1 Waste is anticipated

7.8.2 Recommendation: Lamps and lanterns to be disposed of following WEEE regulations. Bollards to be recycled where possible.