D51

Environmental Lighting Impact Assessment Report

Woodfold Villa

Project number: SHD1343

Document reference: SHD1343-SHD-HLG-WOOD-RP-EO-Lighting Assessment Report-R0

Revision	Purpose of document	Compiled by	Reviewed by	Review date
R0	Planning	Steve Higham	Steve Higham	19/02/2024
R1	**Planning**	**Steve Higham**	**Steve Higham**	**28/02/2024**

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Contents

1. INTRODUCTION

1.1 General

1.1.1 This report has been prepared by SHD Lighting Consultancy Ltd on behalf of Shaw & Jagger Architects Ltd to provide lighting calculations for the proposed external lighting around the periphery of a new dwellinghouse on land adjacent to Further Lane and Woodfold Park, Mellor, BB2 7QA (hereafter referred to as the *Proposed development*).

1.1.2 The report has been prepared by SHD Lighting Consultancy Ltd to the best of our knowledge using information provided by Shaw & Jagger Architects Ltd.

1.1.3 The report assesses the potential effects of obtrusive light that could arise from outdoor artificial lighting at the proposed development.

1.1.4 This lighting assessment has been conducted by an individual with Level 4 expertise, aligned with the competency standards outlined by the Institution of Lighting Professionals.

1.1.5 SHD Lighting Consultancy specializes in designing outdoor lighting and conducting studies on lighting effects.

1.1.6 Our design team has the knowledge, experience, and professional qualifications, and is well-equipped to perform calculations for lighting design and assessments on environmental lighting impact.

1.1.7 SHD Lighting Consultancy Ltd accepts no responsibility or liability for:

- The consequence of this documentation being used for any purpose or project other than that for which it was commissioned.
- The issue of this document to any third party with whom approval for use has not been agreed.

1.1.8 The principal objective of this lighting assessment report is to identify any effects of proposed outdoor lighting and to propose suitable mitigation measures if required.

2. LEGISLATION, PLANNING, AND POLICY GUIDANCE

2.1 Legislative Background

2.1.1 Light pollution was introduced within the Clean Neighbourhoods and Environment Act (2005) as a form of statutory nuisance under the Environmental Protection Act (the 'EPA', 1990), which was amended in 2006 to include the following nuisance definition:

> "Artificial light emitted from premises to be prejudicial to health or nuisance"

2.1.2 Although light was described as having the potential to cause statutory nuisance, no prescriptive limits or rules were set for impact assessment purposes.

2.1.3 While not specifically requiring external lighting schemes to be submitted for approval, it does suggest planning authorities have the right to request such information as part of the approval process.

2.2 National Planning Policy Framework

2.2.1 The National Planning Policy Framework (NPPF), was first published in March 2012, updated at various stages and recently revised in December 2023.

2.2.2 The National Planning Policy Framework is a key document in the planning system of England that guides local authorities and other stakeholders on planning policies and decision-making. It sets out the government's planning policies for sustainable development, including housing, the environment, and economic growth.

2.2.3 Planning policies and decisions should also ensure that the proposed 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 proposed development.

2.3 Relevant Lighting Guidance

2.3.1 The applicable guidance for outdoor lighting that relate to the proposed development are:

Guidance Notes for the Reduction of Obtrusive Light; GN01/21 (2021) published by The Institution of Lighting Professionals (ILP)

2.3.2 Guidance Notes for the Reduction of Obtrusive Light published by The Institution of Lighting Professionals (ILP) provide practical guidelines to minimize the negative impacts of outdoor lighting installations on the environment and neighboring areas.

2.3.3 These notes offer advice on how to design, install, and manage lighting systems to mitigate issues such as light pollution, glare, and light trespass.

2.3.4 The guidance focuses on ensuring that lighting is effective and efficient while also being considerate of the surrounding community and environment.

2.3.5 This resource is valuable for lighting professionals, planners, and decision-makers seeking to create lighting installations that balance visibility needs with minimizing obtrusive light effects.

CIE 150: Guide on the limitations of the effects of obtrusive light from outdoor lighting installations (2003)

2.3.6 CIE 150: Guide on the limitations of the effects of obtrusive light from outdoor lighting installations (2003) is a technical document created by the Commission Internationale de l'Éclairage (CIE), also known as the International Commission on Illumination.

2.3.7 CIE is an international organisation that sets standards and provides guidelines related to lighting, color, and vision.

2.3.8 The purpose of CIE 150 is to provide guidance and recommendations on how to minimise the negative impacts of outdoor lighting installations, specifically focusing on obtrusive light.

2.3.9 Obtrusive light refers to light that spills or shines where it is not intended, causing visual discomfort, glare, or other adverse effects. This can include light trespass onto neighboring properties, skyglow that affects astronomical observations, and other forms of light pollution.

2.3.10 The guide addresses various aspects related to outdoor lighting, such as fixture design, aiming, and control mechanisms, to mitigate the potential negative consequences of light pollution.

2.3.11 It aims to help lighting designers, planners, and decision-makers in designing and implementing outdoor lighting installations that are not only effective but also environmentally responsible and considerate of the surrounding community.

2.3.12 By following the recommendations outlined in CIE 150, stakeholders can work towards creating lighting designs that minimize light pollution and its impact on the environment, human health, and astronomical observations.

CIE 126: Guidelines for Minimising Sky Glow (1997)

2.3.13 CIE 126: Guidelines for Minimising Sky Glow (1997) is a technical document created by the Commission Internationale de l'Éclairage (CIE), an international organisation that sets standards and provides guidance on lighting, color, and vision.

2.3.14 The purpose of CIE 126 is to provide guidelines specifically focused on reducing the phenomenon known as "sky glow."

2.3.15 Skyglow refers to the brightening of the night sky over populated areas due to the scattering of artificial light by particles and molecules in the atmosphere.

2.3.16 This effect can lead to a loss of visibility of stars and celestial objects, impacting astronomical observations and the overall quality of the night sky.

2.3.17 CIE 126 offers practical recommendations and strategies to minimize sky glow resulting from outdoor lighting installations.

2.3.18 It addresses factors such as the design and positioning of luminaires, the choice of lighting technologies, and proper lighting controls to limit the upward-directed light that contributes to sky glow.

2.3.19 These guidelines are relevant for the UK and other regions concerned with preserving natural nighttime conditions, reducing light pollution, and supporting astronomical observations.

The Exterior Environment: Lighting Guide 6 (2016) as published by The Chartered Institution of Building Services Engineers (CIBSE)

2.3.20 The Exterior Environment: Lighting Guide 6 (2016) is a comprehensive publication by The Chartered Institution of Building Services Engineers (CIBSE), an organisation in the UK that offers guidance and standards for building services and environmental engineering.

2.3.21 This guide focuses on providing in-depth recommendations and best practices for outdoor lighting design and implementation. It covers various aspects of lighting in exterior spaces such as streets, public areas, parks, and building exteriors.

2.3.22 The guide offers guidance on creating effective and sustainable lighting solutions that enhance safety, security, aesthetics, and functionality in outdoor environments while also considering energy efficiency and minimising light pollution.

2.3.23 Lighting Guide 6 is a valuable resource for lighting designers, engineers, architects, and other professionals involved in outdoor lighting projects.

2.3.24 It provides practical insights, technical information, and design considerations to ensure that outdoor lighting installations are well-designed, visually appealing, and environmentally responsible.

Public Lighting Guide 04: Guidance on Undertaking Environmental Lighting Impact Assessments (2013) as published by The Institution of Lighting Professionals (ILP)

2.3.25 Public Lighting Guide 04: Guidance on Undertaking Environmental Lighting Impact Assessments (2013) is a publication by The Institution of Lighting Professionals (ILP), an organisation based in the UK that focuses on promoting excellence in lighting.

2.3.26 This guide serves as a comprehensive resource for professionals involved in the design and implementation of outdoor lighting projects.

2.3.27 Its primary focus is to guide on assessing and mitigating the potential environmental impacts of outdoor lighting installations.

2.3.28 The guide addresses various aspects related to lighting effects on the environment, including issues such as light pollution, sky glow, glare, and other obtrusive light-related concerns.

2.3.29 Key elements covered in the guide include methodologies for conducting environmental lighting impact assessments, techniques for modeling and predicting lighting effects, and recommendations for designing lighting schemes that minimise negative impacts while achieving their intended goals.

2.3.30 The guide takes into account factors like visual comfort, energy efficiency, and the preservation of natural darkness.

2.3.31 Public Lighting Guide 04 is a valuable tool for lighting professionals, local authorities, planners, and other stakeholders who seek to create outdoor lighting installations that are both visually effective and environmentally responsible.

2.3.32 It helps ensure that lighting projects contribute positively to the built environment while considering their impact on the natural surroundings and quality of life.

Bat Conservation Trust Lighting Guidance; GN08/23 (2023) as published by The Institution of Lighting Professionals (ILP)

2.3.33 The Bat Conservation Trust and the ILP produced a paper in 2018 and updated in 2023, "Bats and artificial lighting at night", discussing the appropriate lighting levels, types of lamps, colour temperatures, etc. which are suitable for lighting areas adjacent to bat houses

2.3.34 Guidance for artificial lighting and bats was updated in Autumn 2023, the guidance states the following:

"It is acknowledged that, especially for vertical calculation planes, very low levels of light (<0.5 lux) may occur even at considerable distances from the source if there is little intervening attenuation.

It is therefore very difficult to demonstrate 'complete darkness' or a 'complete absence of illumination' on vertical planes where some form of lighting is proposed on-site despite efforts to reduce them as far as possible and where horizontal plane illuminance levels are zero.

Consequently, where 'complete darkness' on a feature or buffer is required, it may be appropriate to consider this to be where illuminance is below 0.2 lux on the horizontal plane and below 0.4 lux on the vertical plane.

These figures are still lower than what may be expected on a moonlit night and are in line with research findings for the illuminance found at hedgerows used by lesser horseshoe bats, a species well known for its light adverse behaviour (Stone,2012)."

"Dark buffers, illuminance limits, and zonation dark buffer zones can be used as a good way to separate habitats or features from lighting by forming a dark perimeter around them.

Buffer zones rely on ensuring light levels (levels of illuminance measured in lux) within a certain distance of a feature do not exceed certain defined limits. The buffer zone can be further subdivided into zones of increasing illuminance limits radiating away from the feature" (refer to Figure 2.1)

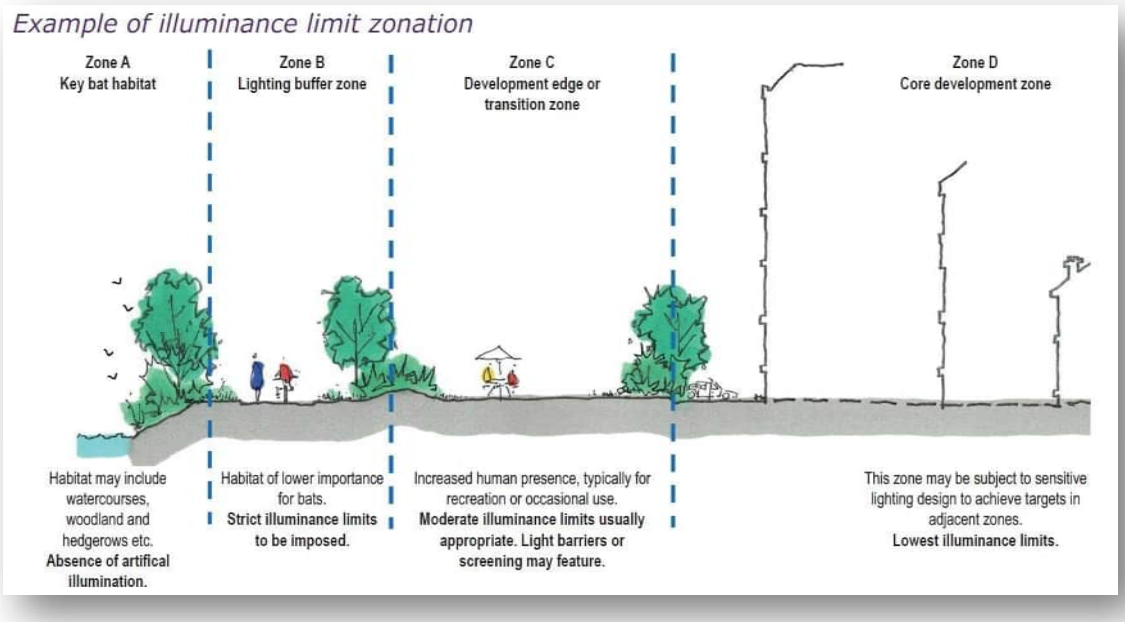


Figure 2.1

Extract from The Institution of Lighting Professionals: Guidance Note 08/18: Guidance notes for bats and artificial lighting in the UK (2023)

3. ASSESSMENT METHODOLOGY

3.1 Environmental Zone Classification

3.1.1 CIE Standards, the CIBSE, and the Society of Light & Lighting guidance documents, all apply a common Environmental Zoning system, which is summarised in Table 3.1 below.

ENVIRONMENTAL ZONE CLASSIFICATION AND PARAMETERS			
Zone	Surrounding	Lighting Environment	Example
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty
E2	Rural	Low district brightness	Village or relatively dark outer suburban location
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town or City centres with high levels of nighttime activity

Table 3.1

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 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 relative intrinsic value in the UK.

3.1.2 Using Table 3.1, the assessment site would be classified as **E2 Medium district brightness**

3.2 Obtrusive Light Limitation for Outdoor Lighting Installations

3.2.1 Obtrusive light or light pollution is any light that strays to areas other than where it is intended and can include light intrusion (spill light) into neighbouring properties, upward light (which can create sky glow), and visual source intensity (glare).

It can also create effects on ecological receptors in the area, particularly concerning bat roosts and foraging corridors.

3.2.2 The ILP Guidance Notes for the Reduction of Obtrusive Light (ILP GN01/21) provide guidelines and threshold values applicable to each Environmental Zone.

3.2.3 The table below (extracted from GN01/21) provides guidance for obtrusive light limitations for exterior lighting installations.

OBTRUSIVE LIGHT LIMITATIONS FOR EXTERIOR LIGHTING INSTALLATIONS						
Zone	Sky Glow ULR % (i)	Light intrusion into windows Ev, measured in Lux (ii)		Luminaire intensity I, measured in kilo candelas (iii)		Building luminance L, (cd/m²) (iv)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Pre-curfew
E0	0	0	0	0	0	0
E1	0	2	0 (1*)	2.5	0	0
E2	2.5	5	1	7.5	0.5	5
E3	5.0	10	2	10	1	10
E4	15	25	5	25	2.5	25

Table 3.2

ULR (Upward Light Ratio) is the maximum permitted percentage of luminaire flux that goes directly into the sky.

Ev is Vertical illuminance in Lux measured flat on the glazing at the centre of the window

I is Light Intensity in Candelas.

L is Luminance in Candelas per square metre.

Curfew = the time after which stricter requirements (for the control of obtrusive light) will apply subject to the conditions of the local planning authority.

*** Permitted only from public road lighting installations only**

3.3 Obtrusive Light

3.3.1 Poorly designed lighting can contribute to the following obtrusive light components:

- Obtrusive light (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.
- Nuisance/intrusion, the spilling of light beyond the area or property being lit. Light nuisance can include intrusion into windows of neighbouring properties, but it can also cause issues to habitats and areas of high biodiversity interest.
- Sky glow, this is the glow that is visible around urban areas resulting from the scattering of artificial light. Sky glow is light from reflected surfaces and badly directed light sources illuminating air molecules and other particles. A major effect of sky glow at night is to reduce contrast in the sky. This is the most pervasive form of light pollution and can affect areas many miles from the original light source.
- Glare, the uncomfortable brightness of a light source when viewed against a contrasting darker background. Glare forms a veil of luminance from poorly controlled and directed lighting that reduces contrast and visibility.

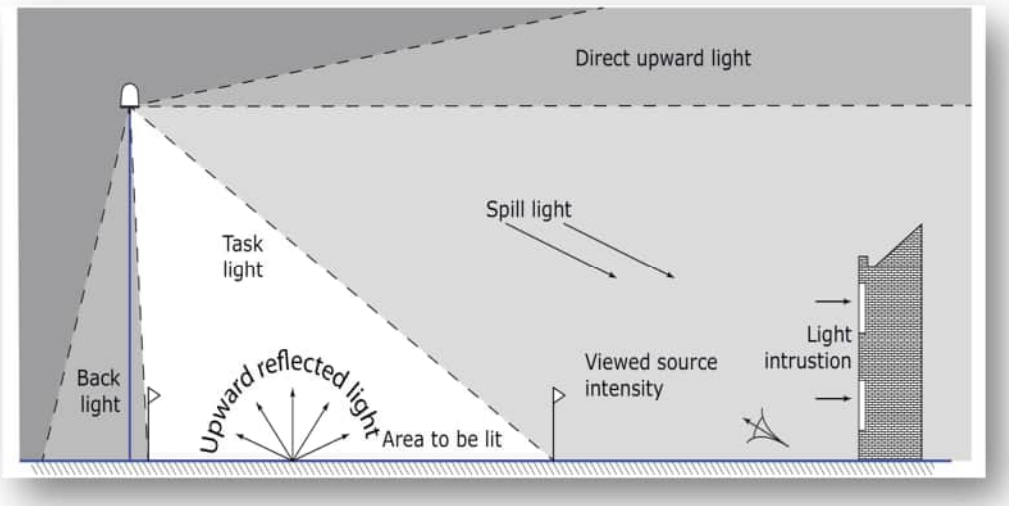


Figure 3.1: Obtrusive light diagram

Extract from The Institution of Lighting Professionals: Guidance Note 01/21: Guidance notes for the reduction of obtrusive light (2021)

3.4 Potential Effects

3.4.1 Many potential effects of artificial lighting can be effectively managed through a well-considered lighting strategy, thoughtful design, and appropriate selection of lighting equipment.

3.4.2 Poorly designed lighting often involves a sparse arrangement of luminaires attempting to illuminate a wide area.

3.4.3 Consequently, these luminaires are often tilted excessively to spread light over intended and unintended surfaces, leading to excess light spill and unwanted sky glow.

3.4.4 Minimising lighting impact is achievable by employing established methods of lighting control, mainly involving limiting light intensity and managing light spill.

3.4.5 Lighting should primarily ensure safety and security while avoiding light pollution beyond site boundaries.

3.4.6 For this lighting scheme, LED light sources are specified due to their low lumen output and high efficiency. All luminaires incorporate electronic drivers and control gear.

3.4.7 Combining electronic drivers with LED light sources creates an energy-efficient lighting system that reduces overall energy consumption and lessens the environmental strain on natural resources.

3.4.8 The proposed lighting design has integrated these established methods to ensure minimal overall impact and to uphold environmental considerations.

4. BASELINE CONDITIONS

4.1 Site Overview

4.1.1 The site for the proposed development is off Further Lane, Mellor which is a rural road, approximately 3 miles west of Blackburn.

4.1.2 The section of Further Lane where the access road for the proposed development is located, is currently unlit with no form of street lighting illuminating the adopted highway.

4.1.3 Information in this report will assess the impact of any introduction of artificial lighting if it were to be installed during the construction of Woodfold Villa.

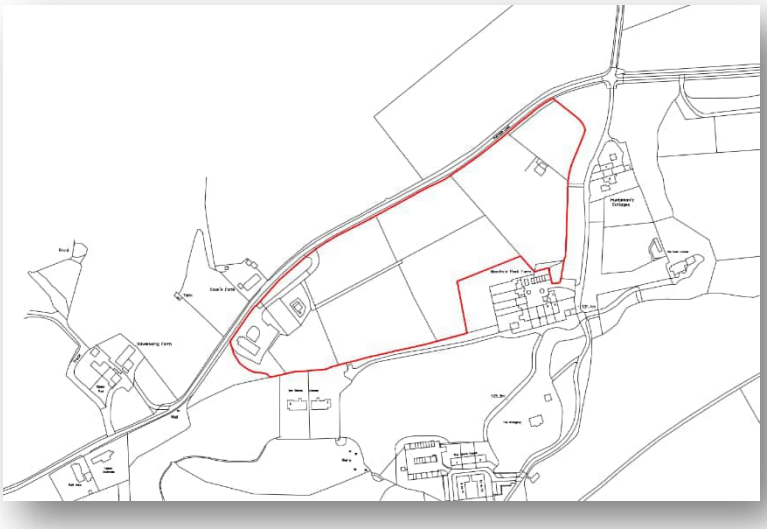


Figure 4.1: Proposed development boundary outline

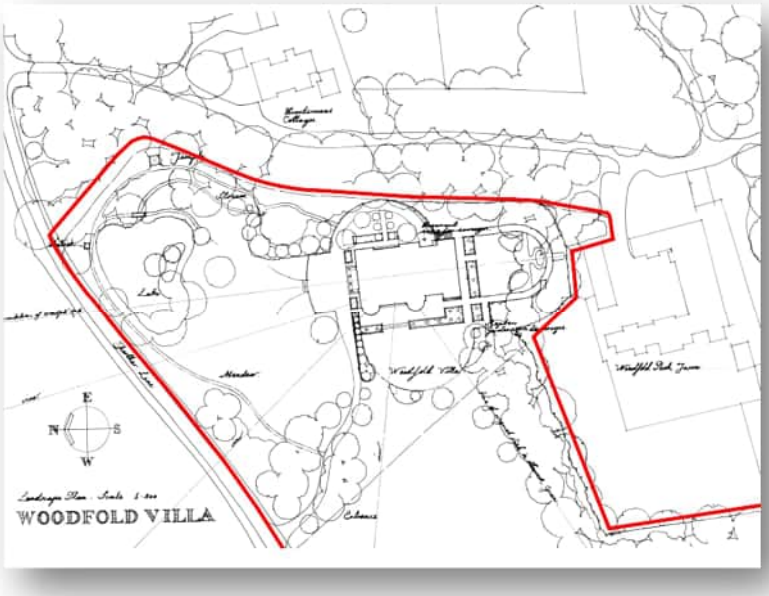


Figure 4.2: Proposed development boundary outline

Existing Lighting

4.1.4 There are two outbuildings within the boundary limits of the proposed development which are to be demolished during the proposed works.

4.1.5 As the buildings are to be removed from the site, no external lighting on each building has been included in this assessment report.

4.1.6 Figure 4.3 below shows each building marked A & B

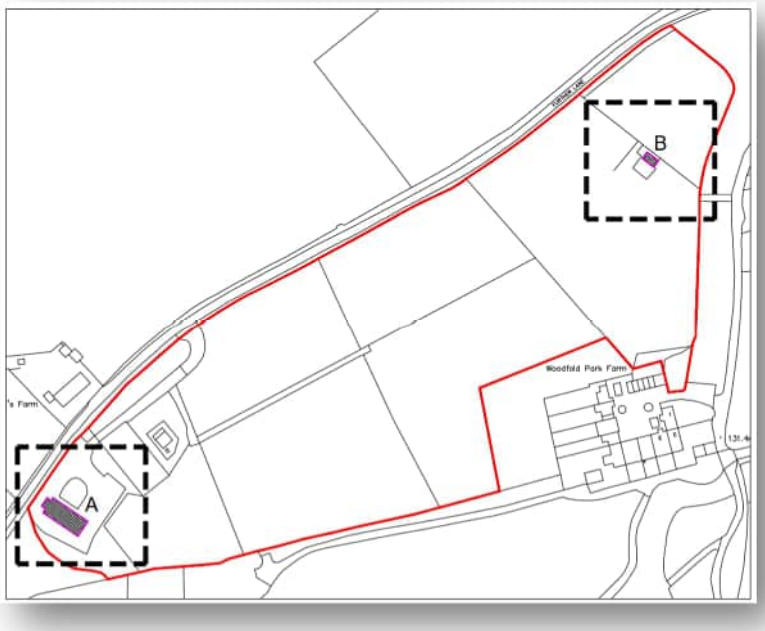


Figure 4.3: Existing buildings to be demolished.

5. LIGHTING STRATEGY

5.1 Lighting Brief

5.1.1 The objective of the lighting strategy is to demonstrate recommendations contained in the report 'Preliminary Ecological Appraisal Report with Recommendations for Planning Version 1,2, as produced by Conservation Contracts Northwest Ltd, dated 21/11/2022.

Bat activity should be assumed along the western, southern, and eastern boundary habitat. As such, lighting (both external and potential light spread from internal fixtures in the proposed dwelling) should not project into a dark buffer of a minimum of 20m from the internal edge of the northern and eastern boundaries.

Additionally, in the dark buffer zone, 20-30m from the internal edge lighting should not be more than 1lux (equivalent of twilight) (BCT/ILM, 2018).

A principle of bollard-lighting only, away from any property should be followed; there should be no vertical or horizontal light-spill from artificial lighting introduced on the site.

Extracted from Preliminary Ecological Appraisal Report With Recommendations for Planning Version 1,2

5.1.2 Lighting performance details outlined in this section of the document are to be considered in conjunction with the following key documents:

- SHD1343-SHD-HLG-WOOD-DR-EO-Lighting Layout-R0
- SHD1343-SHD-HLG-BOOT-CA-EO-Lighting Calculation-R0
- Woodfold Villa Proposed External Lighting.pdf
- PEAR 2022 v2

5.2 Key Areas Where Lighting Might Be Desirable

5.2.1 Lighting is required within the following areas:

- Access Road from Further Lane
- Woodfold Villa wall lights
- Woodfold Villa Access points
- Access Road to basement

Figure 5.1: Woodfold Villa lighting locations

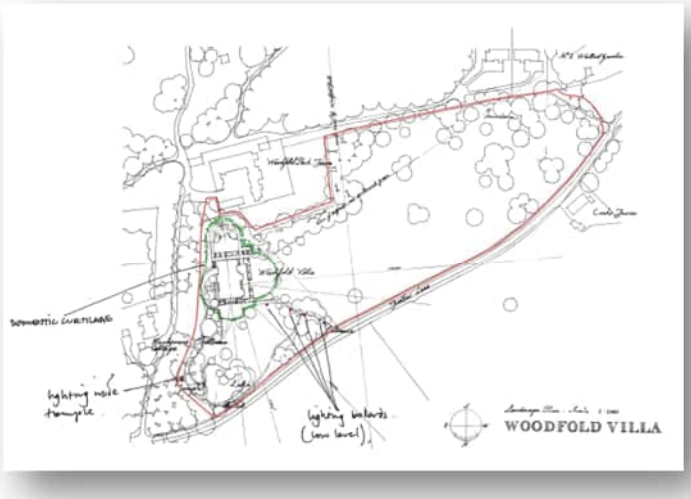


Figure 5.2: Access Road lighting locations

5.3 Lighting Proposals

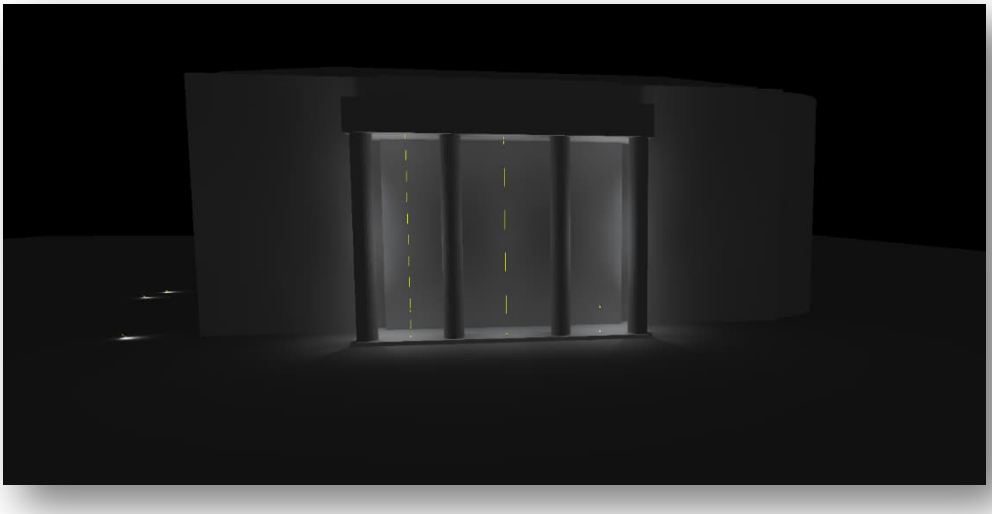


Figure 5.3: Woodfold Villa: West elevation

Figure 5.4: Woodfold Villa: North elevation

Figure 5.5: Woodfold Villa: East elevation

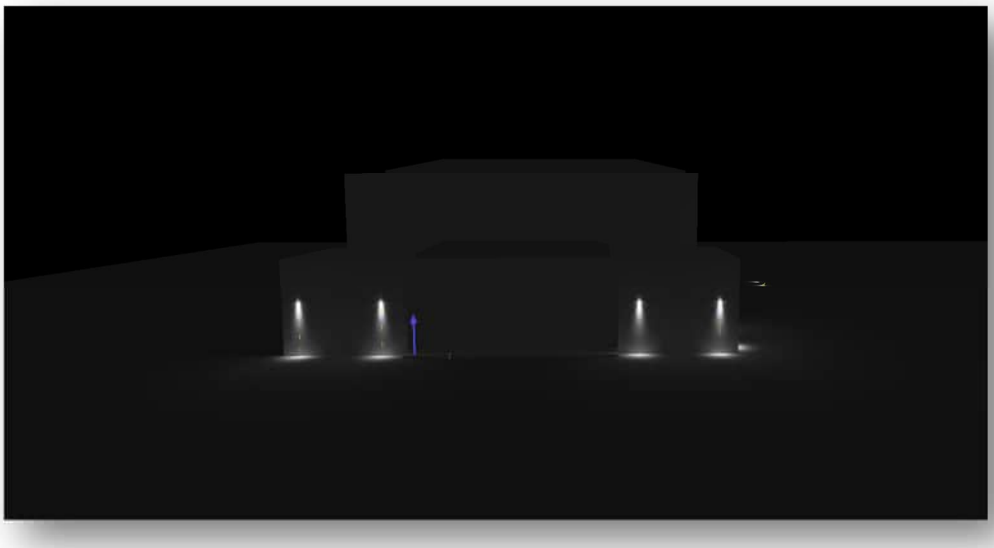


Figure 5.6: Woodfold Villa: South elevation

6. OUTDOOR LIGHTING REQUIREMENTS

6.1 Proposed Lighting Requirements

6.1.1 We were provided with a plan showing the proposed locations of each outdoor lighting unit and additional information about the preferred manufacturer, make, and model of each outdoor lighting unit.

6.2 Lighting Calculations and Modelling

6.2.1 SHD Lighting Consultancy does not assume responsibility for any lighting designs and strategies produced by anyone other than themselves.

6.2.2 The lighting for Woodfold Villa was modeled, using industry-standard software Dialux.

6.2.3 Dialux, a computer software calculation tool, employs photometric data files from manufacturers to replicate the lighting performance of selected light fixtures.

6.2.4 The light spill model does not consider physical obstructions and provides light spill details for the initial light output, therefore disregarding the maintenance factor used for ensuring the lighting design performs as required at the end of its life.

6.2.5 The calculation model (illustrated by illuminance levels and Isolux contour lines on a drawing) does not include any proposed or existing planting/ hedgerows/trees on site, or in the surrounding area.

6.2.6 In light of this, the light spill diagram presents an intensified and most extreme scenario regarding the ground-level light spill, assuming the absence of light-restricting elements.

6.2.7 From these calculations, drawings illustrating the illuminance levels throughout the site and at the boundary have been produced so that the lighting scheme's impact can be assessed.

6.3 Maintenance Factors

6.3.1 In lighting assessments, the concept of a maintenance factor is used to account for the reduction in light output over time due to factors like dirt, dust, and aging of lamps or luminaires. A maintenance factor less than 1.0 indicates a decrease in light output over time.

6.3.2 However, ILP GN04, which is a guidance note published by the Institution of Lighting Professionals (ILP) in the UK, suggests assigning a maintenance factor of 1.0 to luminaires in certain cases.

6.3.3 This is typically done when you want to assess the lighting conditions in a scenario that assumes optimal maintenance. In other words, it assumes that the luminaires are being cleaned, maintained, and replaced as necessary to maintain their initial performance throughout the assessment period.

6.3.4 Assigning a maintenance factor of 1.0 simplifies the assessment process by eliminating the need to calculate and account for maintenance-related losses. It provides a best-case scenario where the luminaires' light output remains constant throughout the assessment period.

6.3.5 This approach is useful for comparing different lighting designs or technologies under the assumption of ideal maintenance practices. However, in real-world applications, maintenance factors less than 1.0 would be used to more accurately reflect the actual degradation of light output over time due to practical maintenance challenges.

6.4 Access Road from Further Lane

6.4.1 The access road leading from Further Lane to Woodfold Villa is proposed to be illuminated using four low-level directional lighting units.

6.4.2 Each light suggested comprises of a 500mm spike with a warm white (2700k) LED light source with medium optic light distribution.

6.4.3 During the calculations, it has been assumed that each LED light will be angled at a 45° tilt towards the ground, as this will minimise any upward light spill.

6.4.4 This approach guarantees appropriate lighting levels for operational needs while effectively addressing environmental concerns in accordance with the provided guidance.

6.4.5 The luminaires will be designed to emit light solely in a downward direction. This design choice is aimed at minimising the possibility of light spilling over onto the proposed development surrounding boundaries and upwards into the sky.

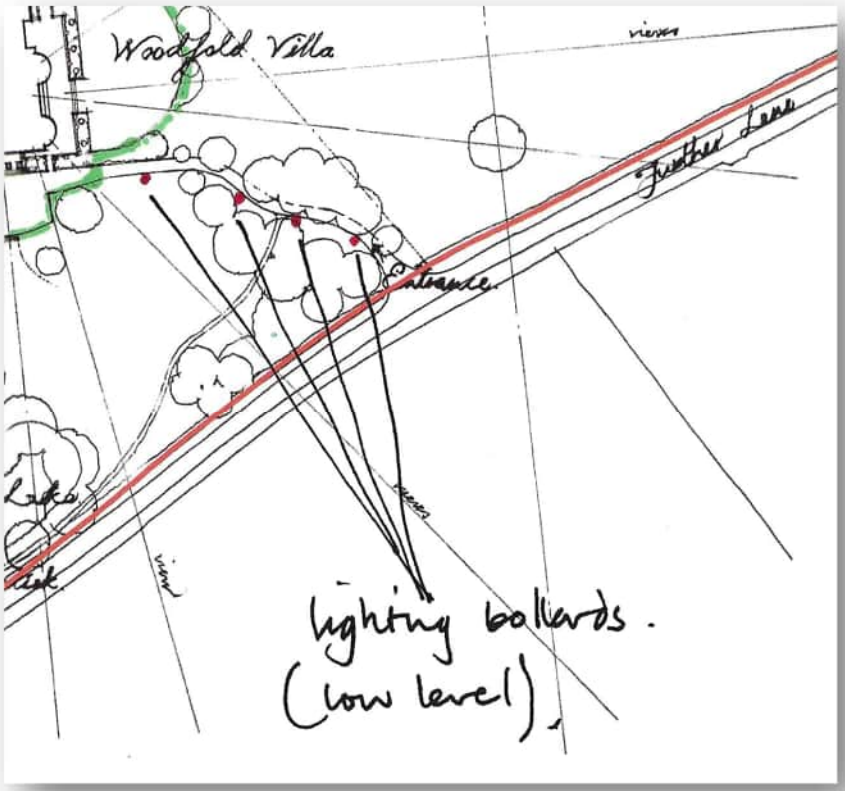


Figure 6.1: Access Road lighting location plan

Figure 6.2: John Cullen Kew 40 spike light (medium beam)

6.4.6 Lighting performance parameters for the proposed access road lighting are outlined in Table 6.1 below

LUMINAIRE SPECIFICATION	
Location:	Access Road
Luminaire Manufacturer:	John Cullen
Luminaire model ref:	Kew 40 Medium
Luminaire style:	Spike Light
Mounting height:	400mm FFL
Mounting type:	Ground Mounted
Luminaire tilt:	45° facing downwards
Light source:	8w 0.562klm warm white (2700k) LED

Table 6.1: Access Road Lighting Performance Parameters

6.5 Woodfold Villa Wall Lights

6.5.1 To the east and south elevations, it is proposed to use six wall-mounted lighting units.

6.5.2 Each light suggested comprises of a 100mm wall-mounted lighting unit with a warm white (2700k) LED light source with medium optic light distribution.

6.5.3 During the calculations, it has been assumed that each LED light will be angled towards the ground, as this will minimise any upward light spill, and are to be mounted at a height of 3000mm from ground level.

6.5.4 This approach guarantees appropriate lighting levels for operational needs while effectively addressing environmental concerns in accordance with the provided guidance.

6.5.5 The luminaires will be designed to emit light solely in a downward direction. This design choice is aimed at minimising the possibility of light spilling over onto the proposed development surrounding boundaries and upwards into the sky.

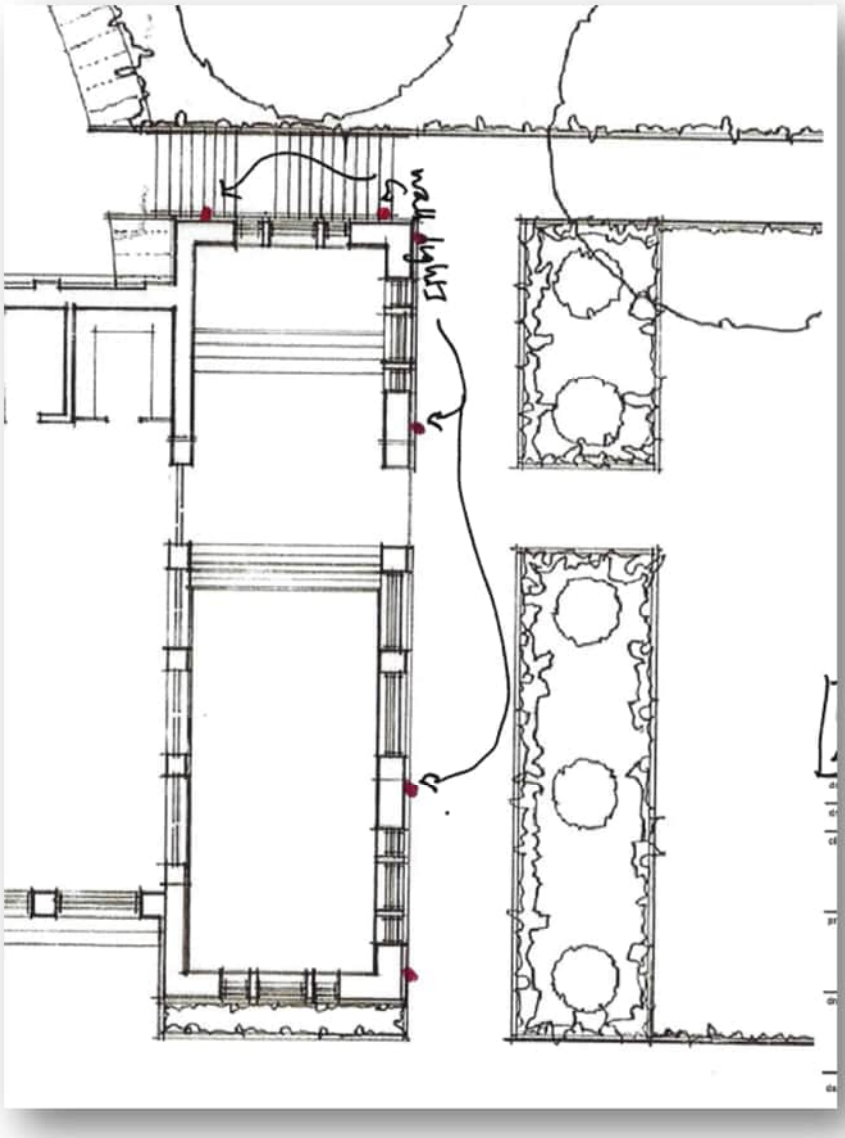


Figure 6.3: Wall light location plan

Figure 6.4: John Cullen Kew 40 surface light (medium beam)

6.5.6 Lighting performance parameters for the proposed access road lighting are outlined in Table 6.2 below

LUMINAIRE SPECIFICATION	
Location:	Access Road
Luminaire Manufacturer:	John Cullen
Luminaire model ref:	Kew 40 Surface
Luminaire style:	Wall light
Mounting height:	3000mm FFL
Mounting type:	Wall Mounted
Luminaire tilt:	0° facing downwards
Light source:	8w 0.562klm warm white (2700k) LED

Table 6.2: Wall lights performance parameters

6.6 Woodfold Villa Up and Down Lights

6.6.1 To the north and west elevations, it is proposed to have eight ground-mounted uplights and eight downlight lighting units.

6.6.2 Each light comprises of a trimless flush fitting lighting unit with a warm white (2700k) LED light source with medium optic light distribution.

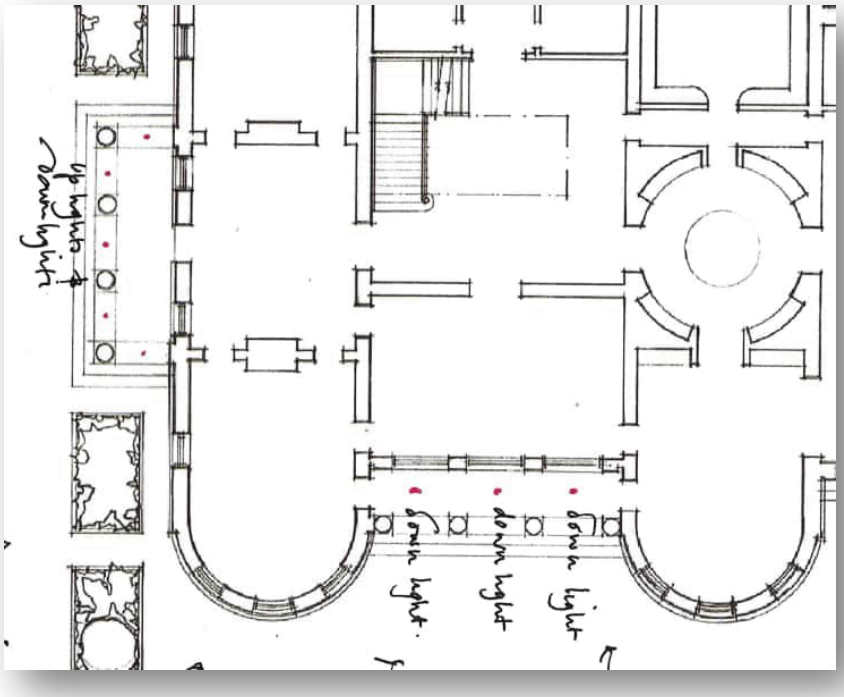


Figure 6.5: Up and Downlighting unit location plan

Figure 6.6: John Cullen Lucca 60 light (medium beam)

6.6.3 Lighting performance parameters for the proposed access road lighting are outlined in Table 6.3 below

LUMINAIRE SPECIFICATION	
Location:	North and West building elevations
Luminaire Manufacturer:	John Cullen
Luminaire model ref:	Lucca 60 Trimless
Luminaire style:	Up or Downlight
Mounting type:	Flush
Luminaire tilt:	0° facing downwards and 0° facing upwards
Light source:	6w 0.230klm warm white (2700k) LED

Table 6.3: Up and Down Lights Performance parameters

6.7 Woodfold Villa Step Lights

6.7.1 At the access points to Woodfold Villa it is proposed there are a series of steps to the north, east, and west elevations.

6.7.2 It is proposed that the steps be illuminated using flush mounted single-facet LED indicator lighting unit.

6.7.3 Each light comprises of a flush-fitting lighting unit with a warm white (2700k) LED light source.

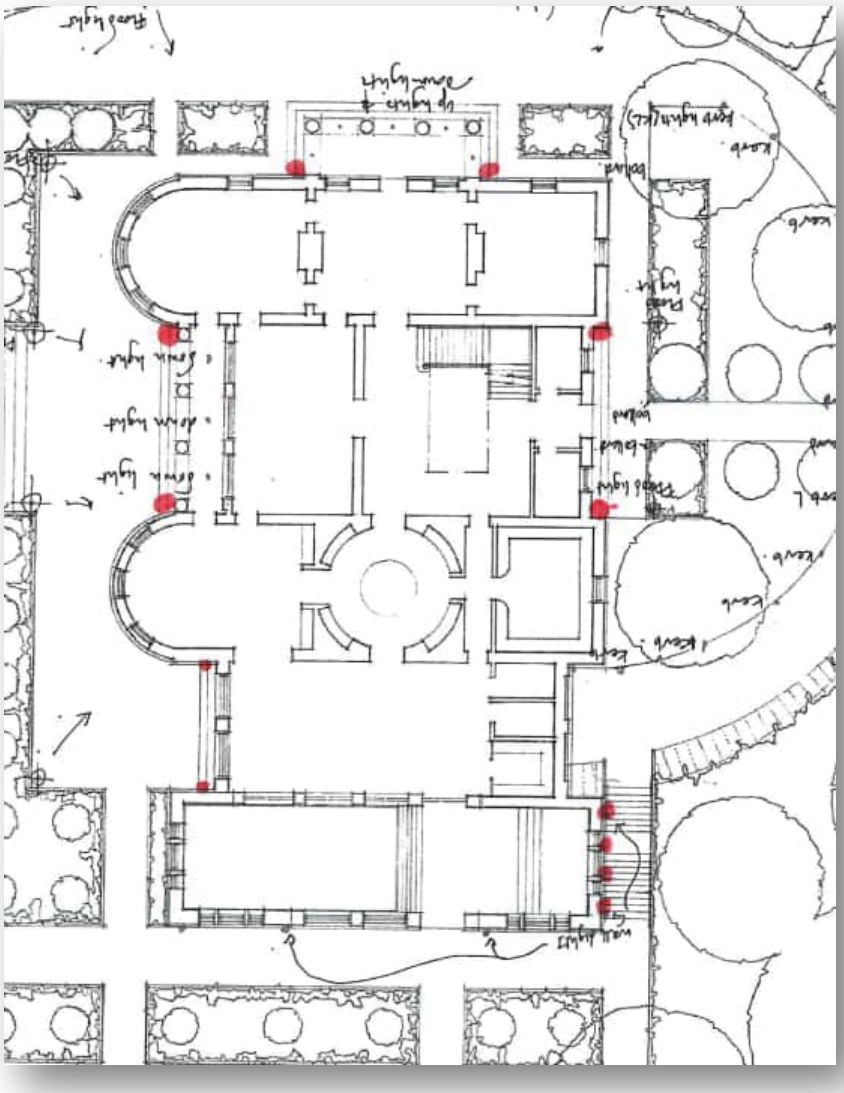


Figure 6.7: Entrance Steps lighting unit location plan

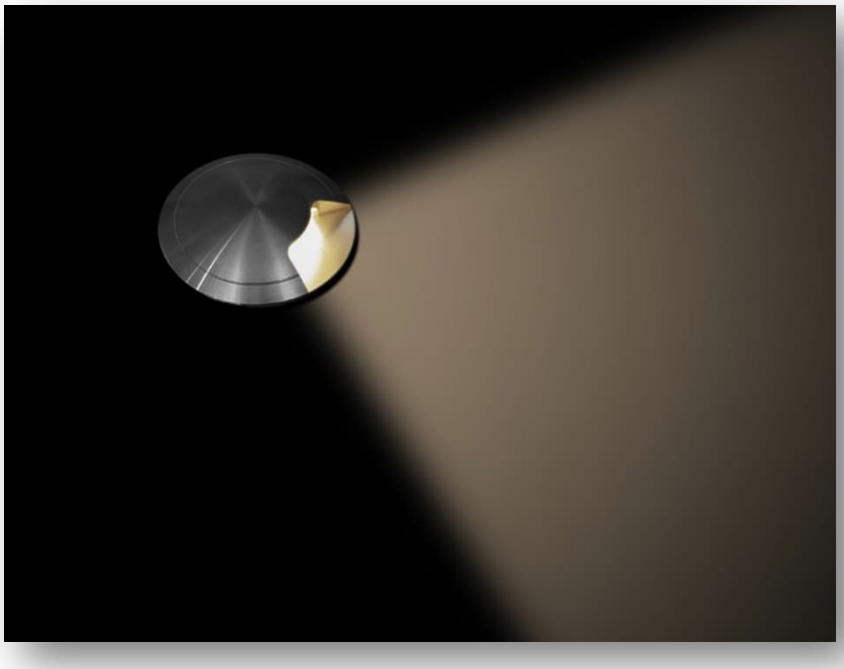


Figure 6.8: John Cullen Guida light

6.7.4 Lighting performance parameters for the proposed access road lighting are outlined in Table 6.4 below

LUMINAIRE SPECIFICATION	
Location:	North, East, and West building entrances
Luminaire Manufacturer:	John Cullen
Luminaire model ref:	Guida Single Facet
Luminaire style:	Floorwash
Mounting type:	Flush
Light source:	1w 0.010klm warm white (2700k) LED

Table 6.4: Step lights performance parameters

6.8 Road to basement

6.8.1 An access road to the north elevation leads to the basement beneath Woodfold villa.

6.8.2 It is proposed that the sloped access road will be illuminated using eleven flush-mounted lighting units.

6.8.3 Each light comprises of a flush-fitting lighting unit with a warm white (2700k) LED light source.

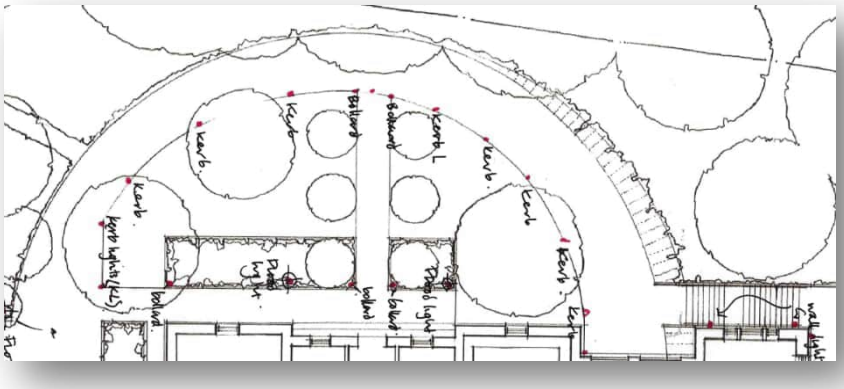


Figure 6.9: Access Road to basement lighting unit location plan

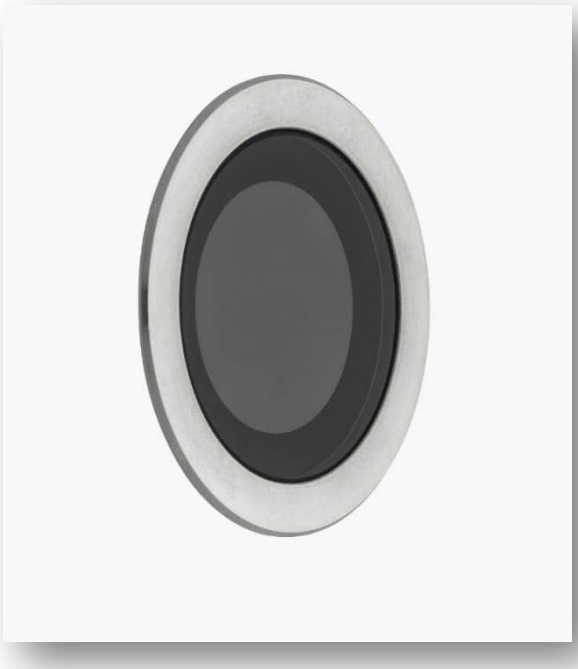


Figure 6.10: John Cullen Lucca 40 step light

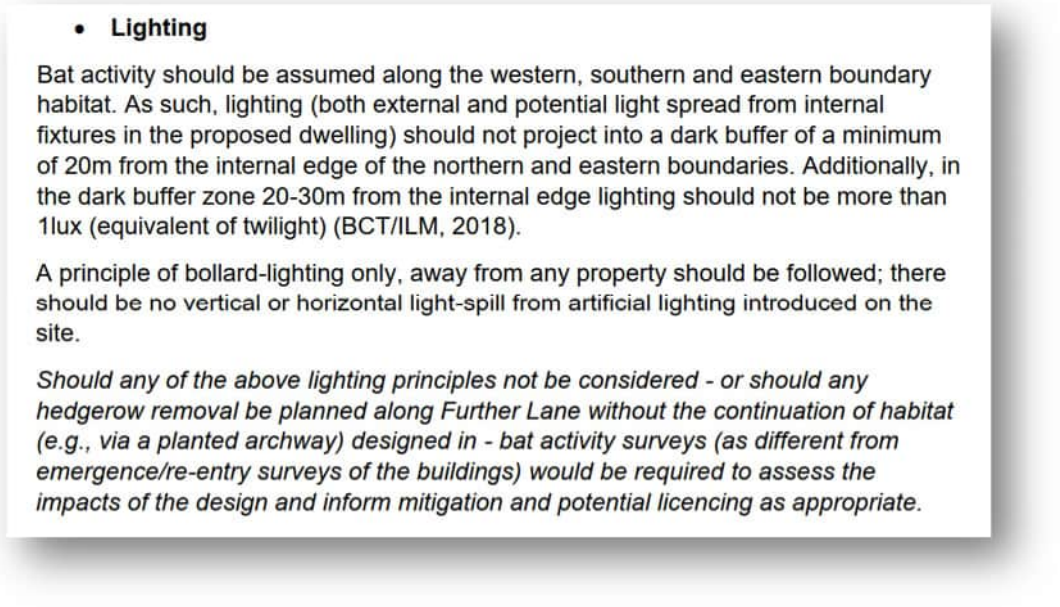
6.8.4 Lighting performance parameters for the proposed access road lighting are outlined in Table 6.5 below

LUMINAIRE SPECIFICATION	
Location:	Access road leading to the basement
Luminaire Manufacturer:	John Cullen
Luminaire model ref:	Lucca 40 step light
Luminaire style:	Floorwash
Mounting type:	Flush
Light source:	Asymmetrical 2700k LED

Table 6.5: Step lights performance parameters

6.9 Sensitive Receptors

6.9.1 Information provided in the Preliminary Ecological Appraisal Report with Recommendations for Planning V 1.2 states the following:



- **Lighting**

Bat activity should be assumed along the western, southern and eastern boundary habitat. As such, lighting (both external and potential light spread from internal fixtures in the proposed dwelling) should not project into a dark buffer of a minimum of 20m from the internal edge of the northern and eastern boundaries. Additionally, in the dark buffer zone 20-30m from the internal edge lighting should not be more than 1lux (equivalent of twilight) (BCT/ILM, 2018).

A principle of bollard-lighting only, away from any property should be followed; there should be no vertical or horizontal light-spill from artificial lighting introduced on the site.

Should any of the above lighting principles not be considered - or should any hedgerow removal be planned along Further Lane without the continuation of habitat (e.g., via a planted archway) designed in - bat activity surveys (as different from emergence/re-entry surveys of the buildings) would be required to assess the impacts of the design and inform mitigation and potential licencing as appropriate.

Figure 6.11: Extract from 'Preliminary Ecological Appraisal Report with Recommendations for Planning V 1.2'

6.9.2 Using Dialux and photometric data files obtained from John Cullen website, SHD Lighting Consultancy modeled each of the outdoor lighting units and produced an isolux contour plan, showing the levels of light at ground level with all lighting units operating at once, all with maintenance factor of 1.0.

6.9.3 During the calculations the access road from Further Lane and the road to the basement were omitted as the access road is further than the 20-30m buffer zone identified above and the basement road lighting units are all to be below ground level so will not produce any light spill onto the boundary habitats.

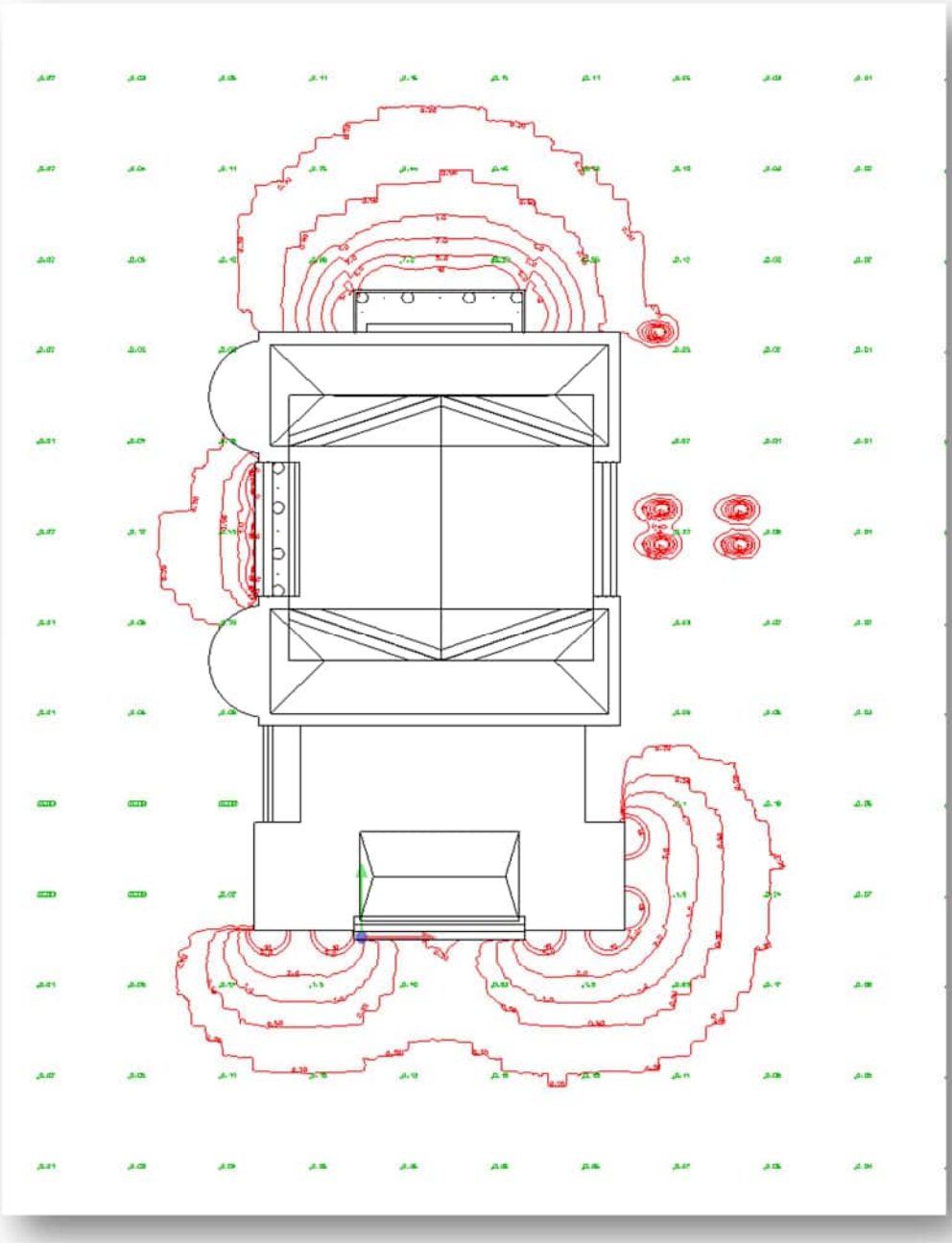


Figure 6.12: Lighting calculation image

6.9.4 In addition to the isolux contour lines at ground level, four vertical calculation grids were created at each elevation.

6.9.5 Each vertical calculation grid measured 10m from ground level and has calculated measurement grid points spaced at 2m intervals across the full façade of each grid.

6.10 Vertical Lighting Calculation Grid

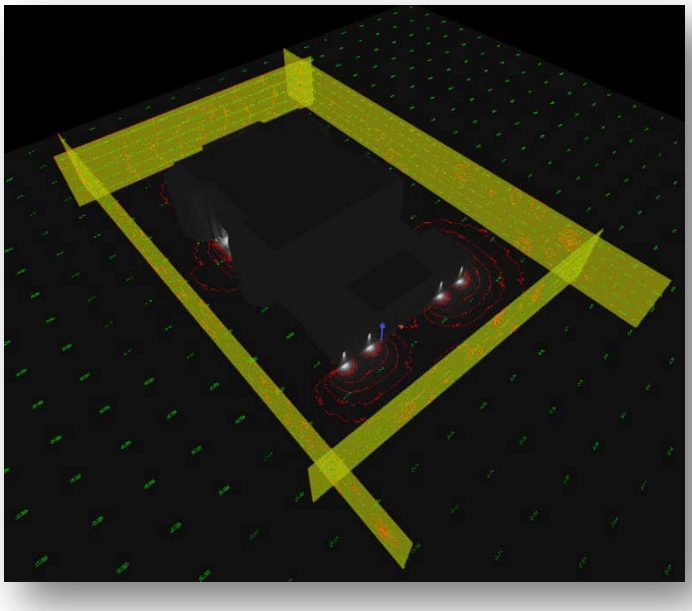


Figure 6.13: Vertical calculation grids

6.10.1 The east and west elevation grids are located approximately 11m from each building façade and north and south vertical grids are approximately 13m from each building façade.

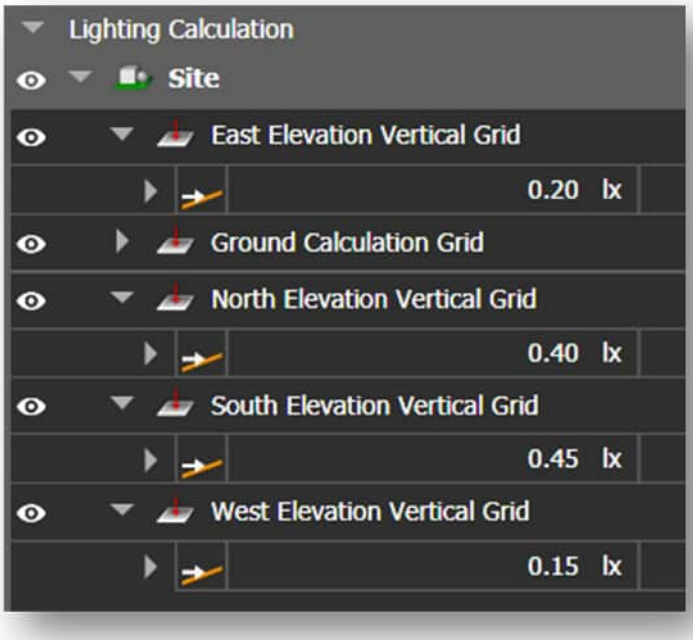


Figure 6.14: Vertical calculation grid result table

6.10.2 The table shown in Figure 6.14 shows a maximum measurement of lux on the South elevation vertical surface as being 0.45 lux which is below the 1.00 lux requirement shown in the information provided in the Preliminary Ecological Appraisal Report with Recommendations for Planning V 1.2.

7. CONCLUSION

7.1 Indicative Light Spill

7.1.1 The indicative light spill models included in **Appendix A** demonstrate the ability to provide lighting for the proposed development and to ensure that a sensitive lighting solution is installed.

7.1.2 The isolux contour lines shown at ground level, demonstrate the tight restrictions in light spill that are essential for protecting the immediate surroundings and receptors of the proposed development.

7.1.3 As the models do not consider obstructions such as the buildings, any proposed fencing, landscaping features, or the topography.

7.1.4 The Isolux contours presented in **Appendix A** represent the adverse scenario. Blocking effects of the site features would further reduce the potential for light spill to affect the boundaries of the proposed development.

7.1.5 The Isolux contours shown at ground level demonstrate the initial light output demonstrating the absolute worst-case scenario.

7.2 Design Commentary

7.2.1 This lighting strategy and assessment outlines the lighting design for the proposed development. The objective is to ensure the lighting serves its purpose effectively while demonstrating sensitivity to the environment. This is achieved by adhering to relevant industry-specific lighting guidance.

7.2.2 In summary, our expert assessment indicates that the proposed lighting installation is not anticipated to yield any material adverse effects on the immediate environment in terms of lighting pollution or energy consumption and that all reasonable measures have been integrated into the design phase of this lighting scheme to minimise its impact on the environment.

8. APPENDIX A

8.1 Light Spill Drawing

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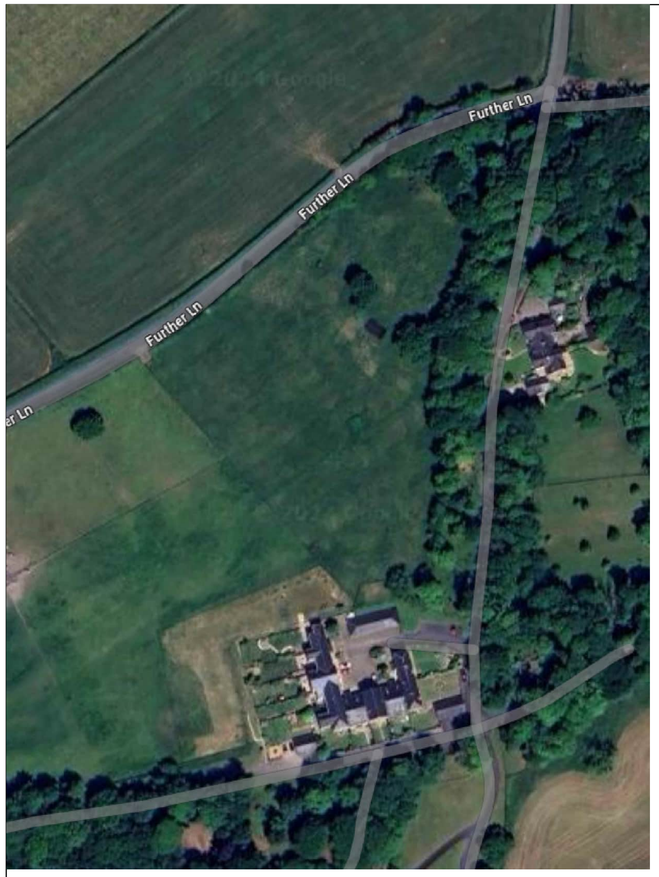

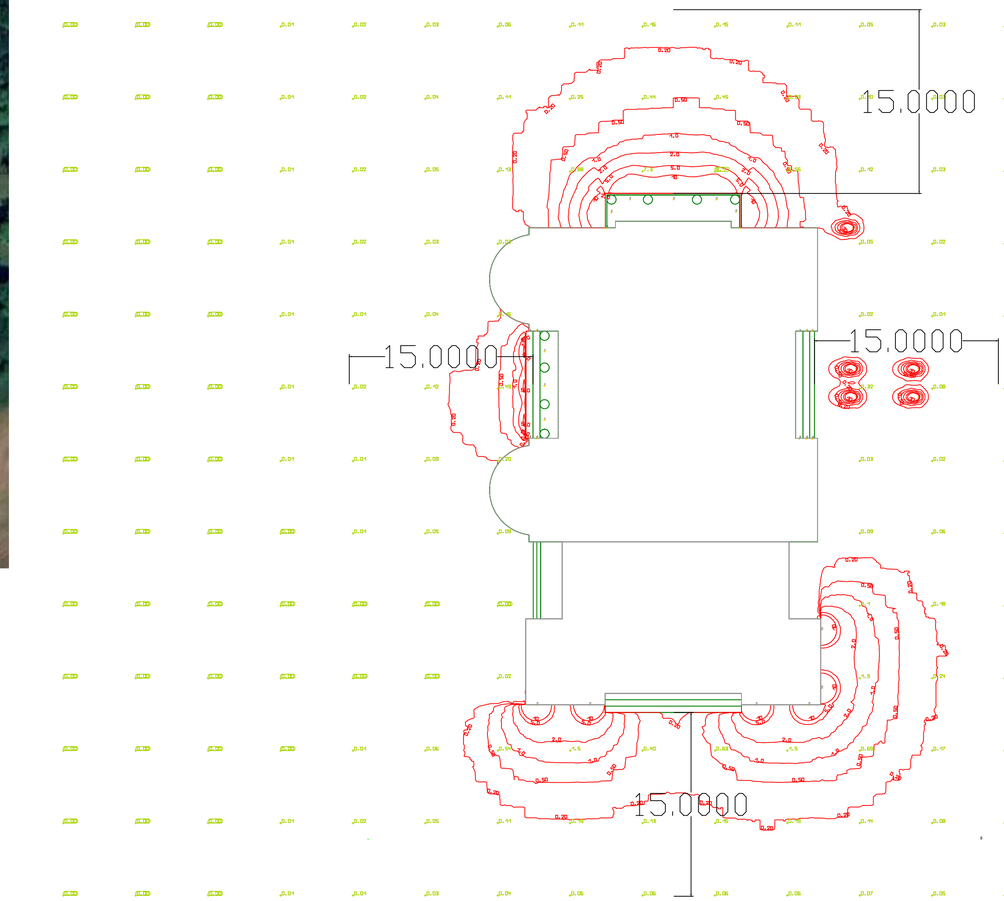

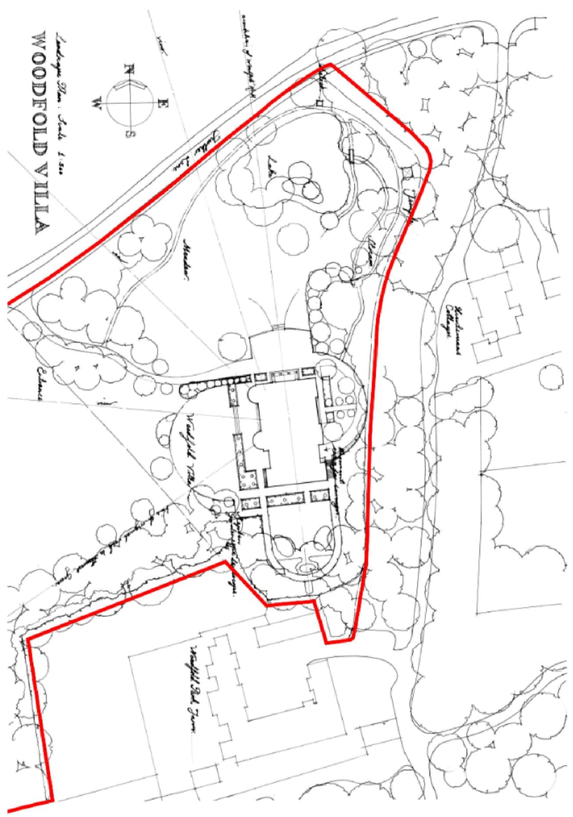

LUX VALUES AT GROUND LEVEL

ISOLUX CONTOUR LINES AT GROUND LEVEL

1.0
2.0
5.0
10

Luminaire list (Site 1)								
Index	Manufacturer	Article name	Item number	Fitting	Luminous flux	Maintenance factor	Connected load	Quantity
1	Not yet a DIALux member	Lucca 60 Medium		1x	351 lm	0.80	6 W	13
2	Not yet a DIALux member	Kew 40 Medium	GLK4XMXX2	1x	562 lm	0.80	8 W	6
3	Not yet a DIALux member	Dark Sky Kew 25 Wide	GLK2DWxx2	1x	106 lm	0.80	2 W	5
4	Not yet a DIALux member	Guida SF		1x	10 lm	0.80	1 W	12

#	Name	Parameter	Min	Max	Average	Min/average	Min/max
1	Ground Calculation Grid	Perpendicular Illuminance (Adaptive)	0.000 lx	1255 lx	0.19 lx	0.00	0.00
		Luminance (Adaptive)	0.000 cd/m²	79.9 cd/m²	0.012 cd/m²	0.00	0.00
2	East Elevation Vertical Grid	Vertical Illuminance	0.016 lx	3.16 lx	0.20 lx	0.080	0.005
3	West Elevation Vertical Grid	Vertical Illuminance	0.009 lx	0.87 lx	0.15 lx	0.060	0.010
4	North Elevation Vertical Grid	Vertical Illuminance	0.063 lx	1.12 lx	0.40 lx	0.16	0.056
5	South Elevation Vertical Grid	Vertical Illuminance	0.021 lx	12.1 lx	0.45 lx	0.047	0.002

0 1:250 12.5 metres

The details provided on this drawing are subject to comments by all the relevant approving authorities or overseeing organisation.
No construction works shall take place until technical approval has been obtained by the approving authority or overseeing organisation.
It is to be understood that these drawings and the information shown are preliminary only and shall not be used for construction. Should the contractor commence work on site prior to obtaining technical approval, then it is entirely at their own risk and no liability shall be accepted by SHD Lighting Consultancy Ltd.

REV	DESCRIPTION	DATE	BY
R0	INITIAL DESIGN FOR REVIEW AND COMMENT	20/02/2024	SRH

SHD
info@shdlighting.co.uk ☎ 07834 490 192 www.shdlighting.co.uk

SCHEME:	WOODFOLD VILLA, MELLOR			
DRAWING:	LIGHT SPILL DRAWING			
CLIENT:	SHAW AND JAGGER			
DRAWING NUMBER:	SHD1343-SHD-HLG-WOOD-CA-EO-Lighting Calculation-R0		DRAWN:	SRH
	SHEET 1 OF 1		CHECKED:	SRH
			APPROVED:	
CONTRACT NUMBER:	SHD1343	DATE: 19/02/2024	SCALE @ A1	1:250
			REVISION:	R0

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

9. APPENDIX B

9.1 Lighting Calculation Reports

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Date 20/02/2024

Woodfold Villa, Mellor

Lighting Impact Strategy

Table of Contents

Product data sheets

Site 1

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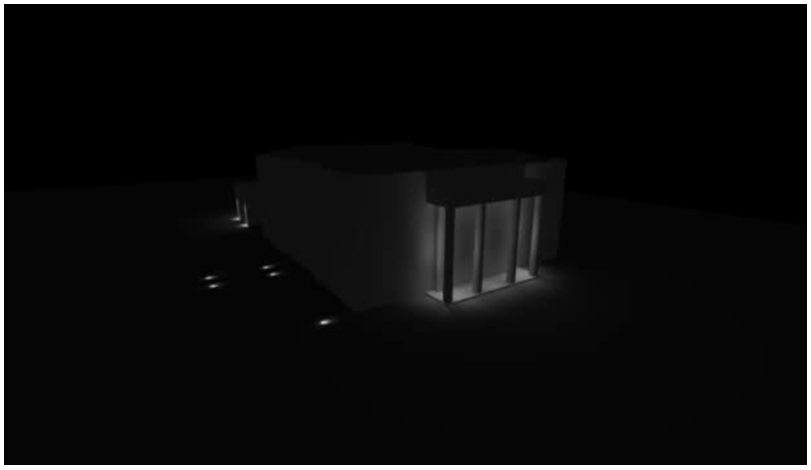
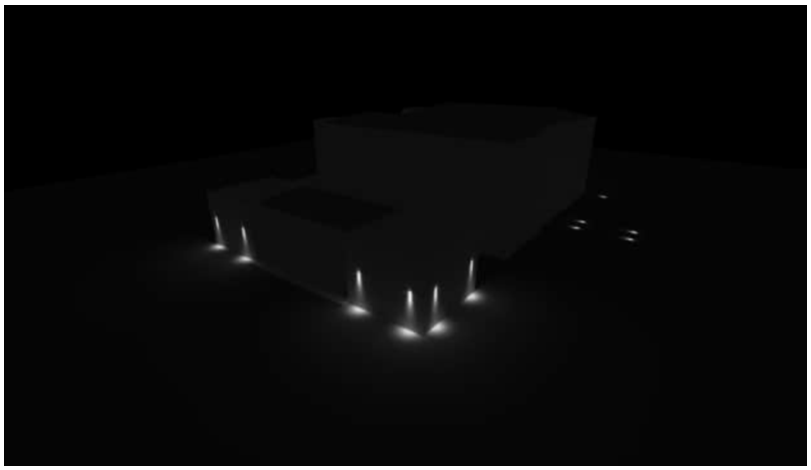
Images

North Elevation



East Elevation



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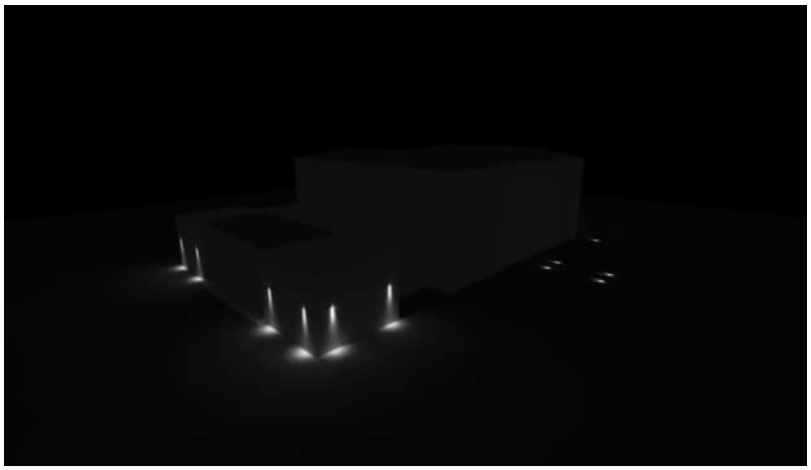
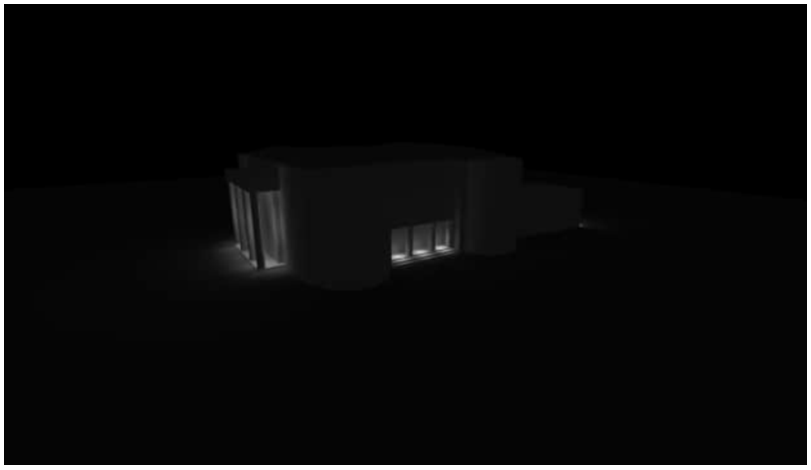


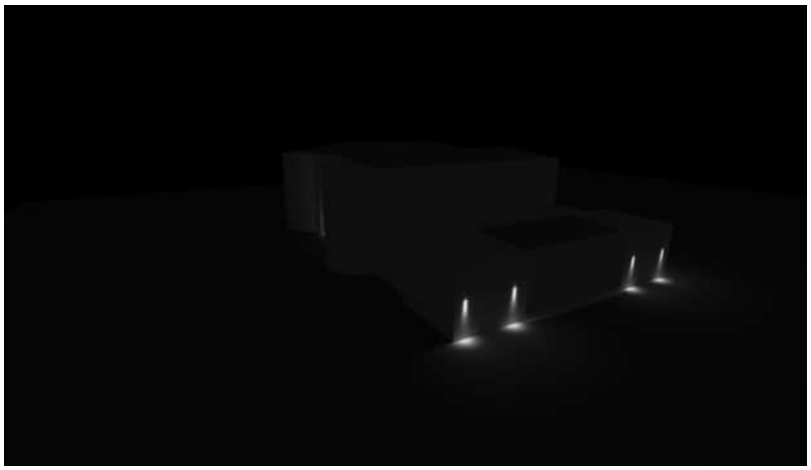
D51

Images

South East Elevation



South Elevation



Entrance

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Luminaire list

Φ_{total}	P_{total}	Luminous efficacy
8546 lm	148.0 W	57.7 lm/W

pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
12	Not yet a DIALux member		Guida SF	1.0 W	10 lm	10.0 lm/W
13	Not yet a DIALux member		Lucca 60 Medium	6.0 W	348 lm	58.0 lm/W
5	Not yet a DIALux member	GLK2DWxx2	Dark Sky Kew 25 Wide	2.0 W	106 lm	53.2 lm/W
6	Not yet a DIALux member	GLK4XMXX2	Kew 40 Medium	8.0 W	562 lm	70.3 lm/W

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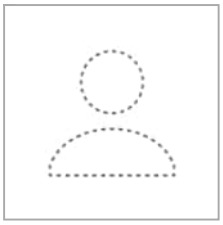
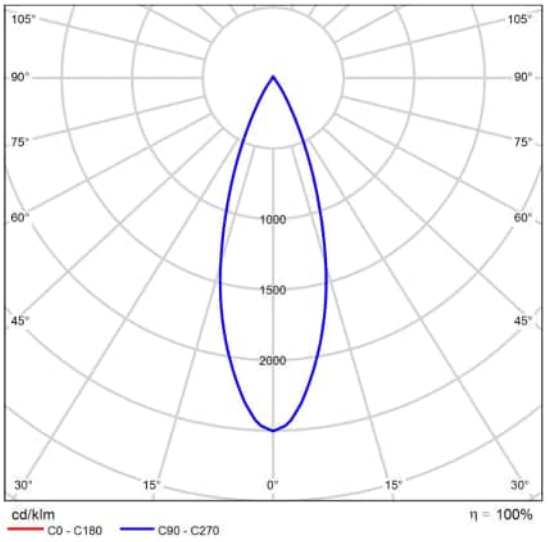
Product data sheet

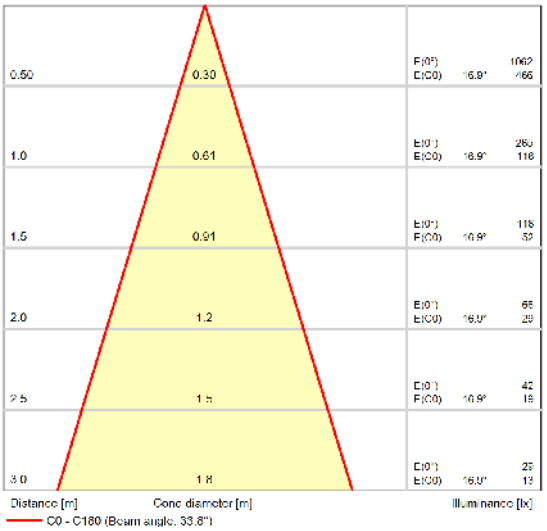
Not yet a DIALux member - Dark Sky Kew 25 Wide



Article No.	GLK2DWxx2
P	2.0 W
Φ_{Lamp}	106 lm
$\Phi_{Luminaire}$	106 lm
η	100.34 %
Luminous efficacy	53.2 lm/W
CCT	3000 K
CRI	100



Polar LDC



Cone diagram

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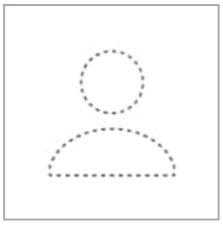
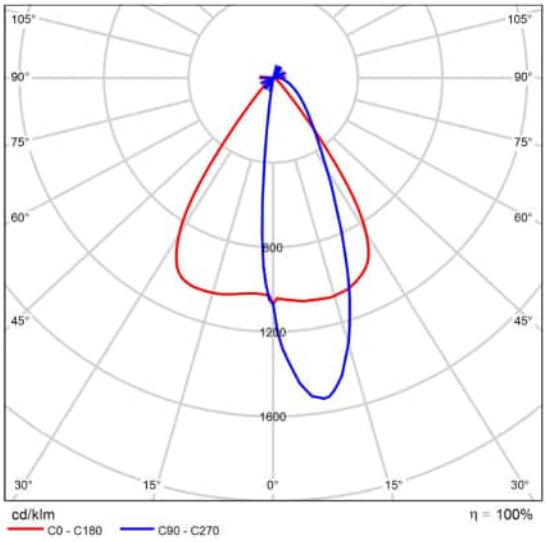
Product data sheet

Not yet a DIALux member - Guida SF



P	1.0 W
Φ_{Lamp}	10 lm
$\Phi_{Luminaire}$	10 lm
η	100.02 %
Luminous efficacy	10.0 lm/W
CCT	3000 K
CRI	100

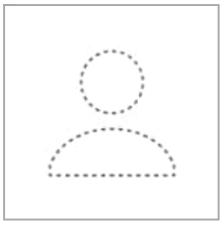


Polar LDC

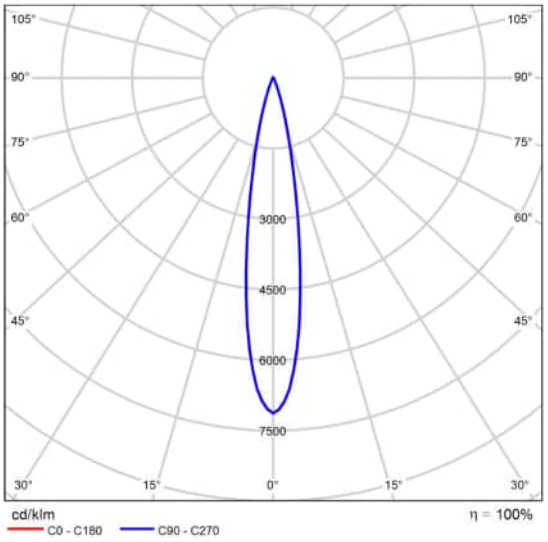
D51

Product data sheet

Not yet a DIALux member - Kew 40 Medium



Article No.	GLK4XMXX2
P	8.0 W
Φ_{Lamp}	562 lm
$\Phi_{Luminaire}$	562 lm
η	100.00 %
Luminous efficacy	70.3 lm/W
CCT	3000 K
CRI	100



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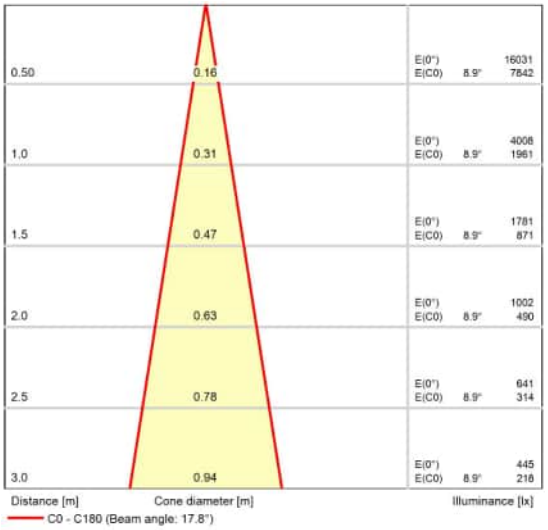
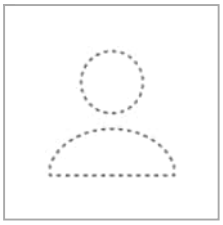


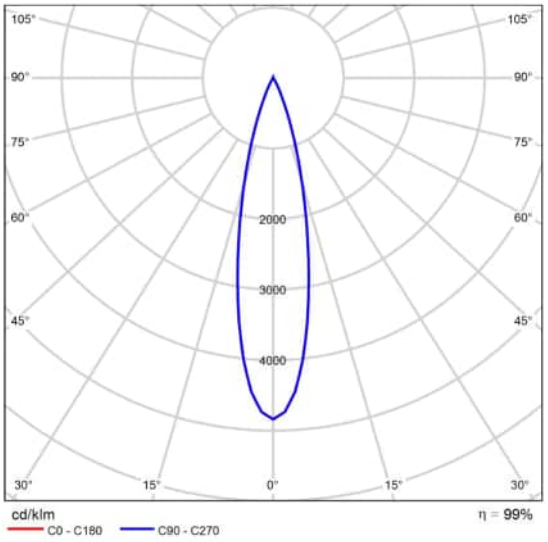
Cone diagram

Product data sheet

Not yet a DIALux member - Lucca 60 Medium



P	6.0 W
Φ_{Lamp}	351 lm
$\Phi_{Luminaire}$	348 lm
η	99.12 %
Luminous efficacy	58.0 lm/W
CCT	3000 K
CRI	100



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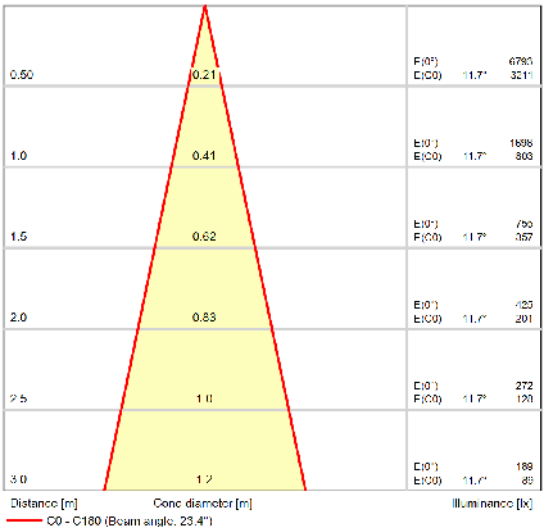

Cone diagram

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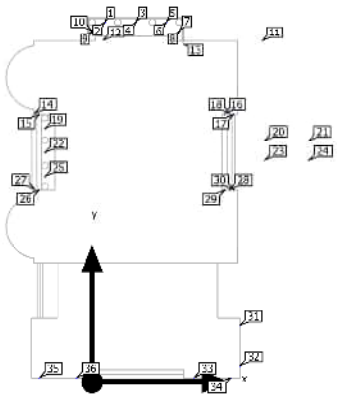
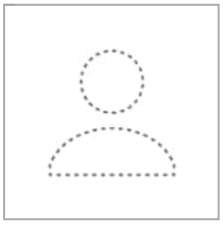
Site 1

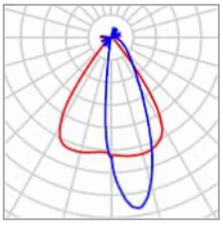
Luminaire layout plan



Site 1

Luminaire layout plan





Manufacturer	Not yet a DIALux member
Article name	Guida SF
Fitting	1x

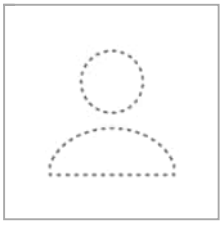
P	1.0 W
$\Phi_{Luminaire}$	10 lm

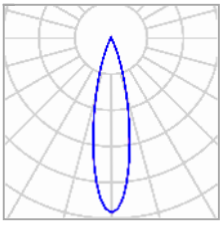
Individual luminaires

X	Y	Mounting height	Luminaire
-0.415 m	39.326 m	0.160 m	12
10.559 m	39.326 m	0.160 m	13
-6.672 m	31.049 m	0.160 m	14
-6.106 m	31.046 m	0.310 m	15
15.356 m	31.035 m	0.460 m	16
16.389 m	31.032 m	0.160 m	17
15.921 m	31.032 m	0.310 m	18
-6.103 m	22.162 m	0.310 m	26
-6.668 m	22.161 m	0.160 m	27
15.921 m	22.135 m	0.310 m	28
15.356 m	22.134 m	0.460 m	29
16.389 m	22.132 m	0.160 m	30

Site 1

Luminaire layout plan





Manufacturer	Not yet a DIALux member
Article name	Lucca 60 Medium
Fitting	1x

P	6.0 W
$\Phi_{Luminaire}$	348 lm

Individual luminaires

X	Y	Mounting height	Luminaire
1.500 m	41.700 m	7.695 m	1
1.500 m	41.700 m	0.100 m	2
5.068 m	41.700 m	7.695 m	3
5.068 m	41.700 m	0.100 m	4
8.567 m	41.700 m	7.695 m	5
8.567 m	41.700 m	0.100 m	6
10.156 m	40.691 m	7.695 m	7
10.156 m	40.691 m	0.100 m	8
-0.004 m	40.649 m	7.695 m	9
-0.004 m	40.649 m	0.100 m	10
-5.470 m	29.284 m	3.695 m	19
-5.470 m	26.484 m	3.695 m	22
-5.470 m	23.684 m	3.695 m	25

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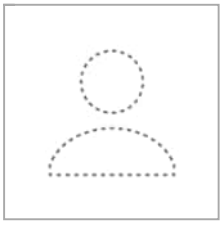
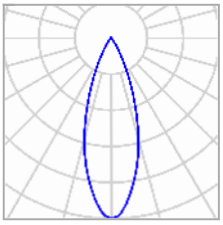
Site 1

Luminaire layout plan





Manufacturer	Not yet a DIALux member
Article No.	GLK2DWxx2
Article name	Dark Sky Kew 25 Wide
Fitting	1x

P	2.0 W
$\Phi_{Luminaire}$	106 lm

Individual luminaires

X	Y	Mounting height	Luminaire
19.736 m	39.400 m	0.300 m	11
20.000 m	27.900 m	0.300 m	20
25.101 m	27.885 m	0.300 m	21
20.000 m	25.600 m	0.300 m	23
25.101 m	25.585 m	0.300 m	24

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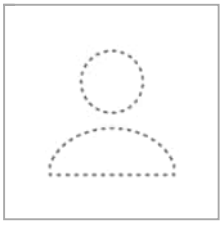
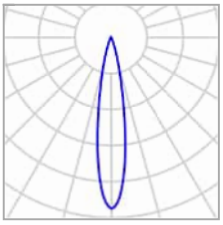
Site 1

Luminaire layout plan





Manufacturer	Not yet a DIALux member
Article No.	GLK4XMXX2
Article name	Kew 40 Medium
Fitting	1x

P	8.0 W
$\Phi_{Luminaire}$	562 lm

Individual luminaires

X	Y	Mounting height	Luminaire
17.133 m	6.574 m	3.000 m	31
17.133 m	1.807 m	3.000 m	32
11.785 m	0.457 m	3.000 m	33
16.085 m	0.457 m	3.000 m	34
-6.100 m	0.457 m	3.000 m	35
-1.800 m	0.457 m	3.000 m	36

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Site 1

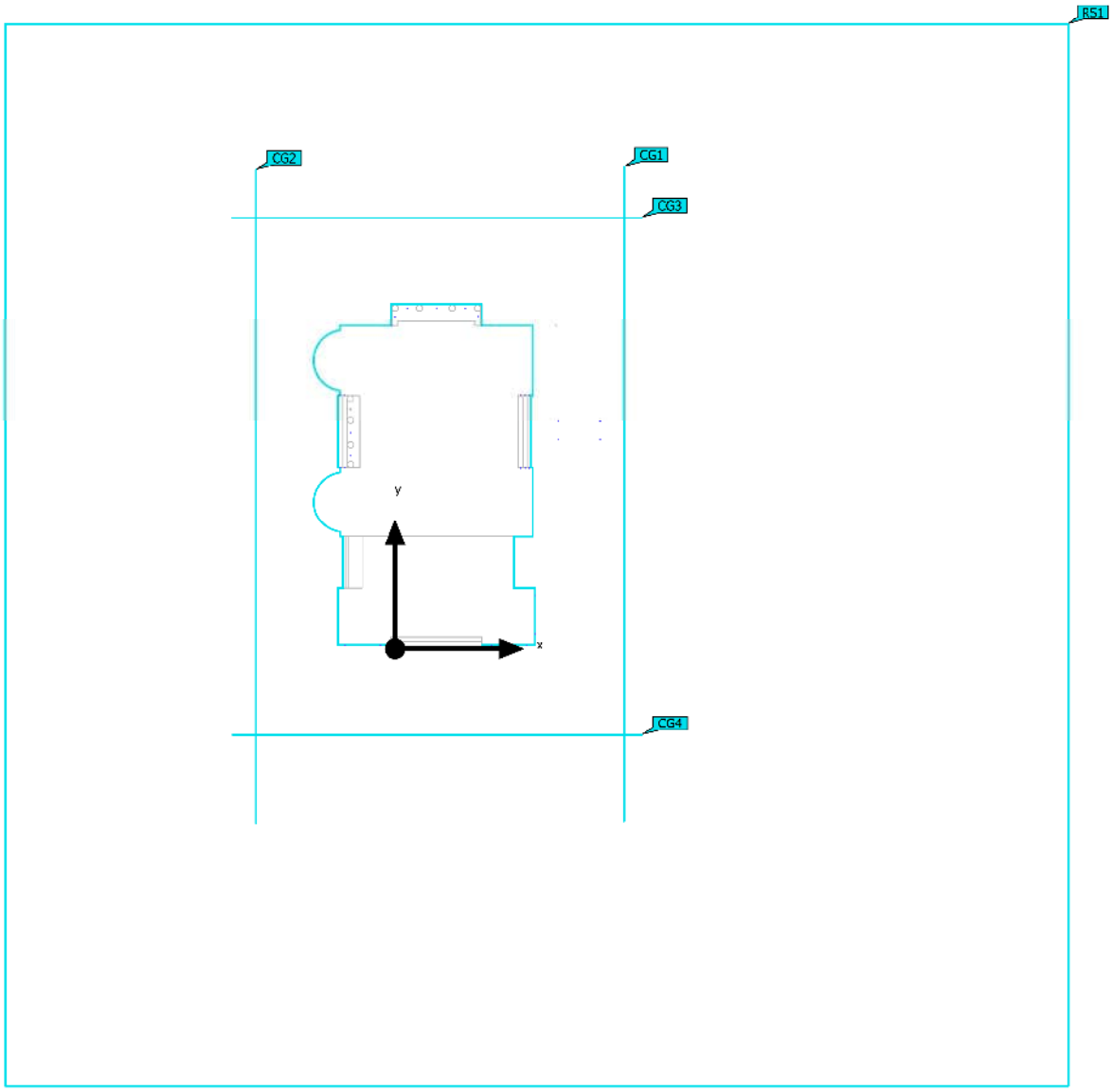
Luminaire list

Φ_{total}	P_{total}	Luminous efficacy
8546 lm	148.0 W	57.7 lm/W

pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
12	Not yet a DIALux member		Guida SF	1.0 W	10 lm	10.0 lm/W
13	Not yet a DIALux member		Lucca 60 Medium	6.0 W	348 lm	58.0 lm/W
5	Not yet a DIALux member	GLK2DWxx2	Dark Sky Kew 25 Wide	2.0 W	106 lm	53.2 lm/W
6	Not yet a DIALux member	GLK4XMXX2	Kew 40 Medium	8.0 W	562 lm	70.3 lm/W

Site 1 (Light scene 1)

Calculation objects



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Site 1 (Light scene 1)

Calculation objects

Surface result objects

Properties	Ø	min	max	U_o (g_1)	g_2	Index
Ground Calculation Grid Perpendicular illuminance (adaptive) Height: 0.000 m	0.19 lx	0.000 lx	1255 lx	0.00	0.00	RS1
Ground Calculation Grid Luminance Height: 0.000 m	0.012 cd/m²	0.000 cd/m²	79.9 cd/m²	0.00	0.00	RS1

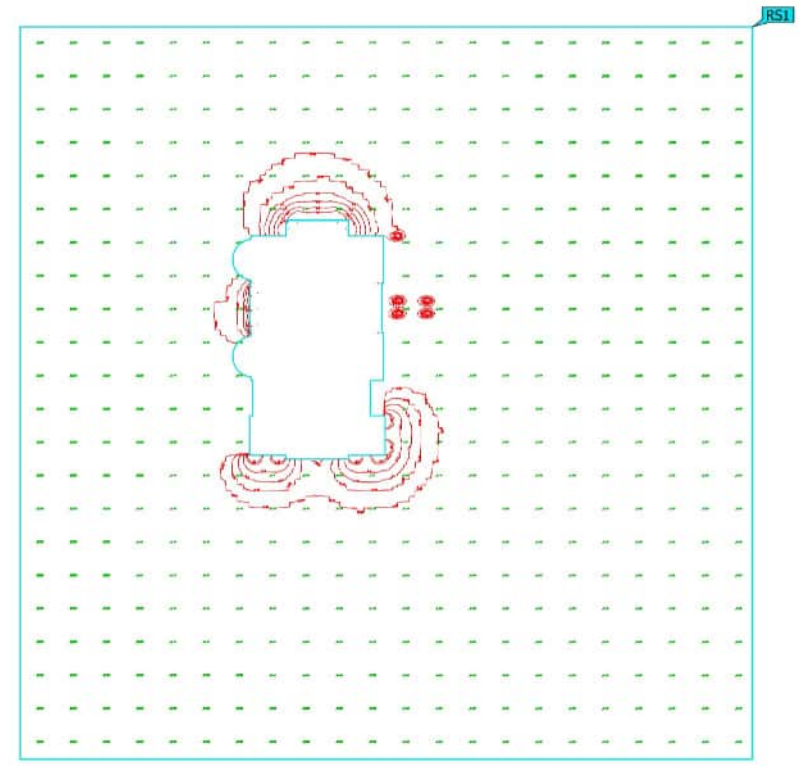
Calculation surfaces

Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
East Elevation Vertical Grid Vertical illuminance Rotation: 180.0°, Height: 4.900 m	0.20 lx	0.016 lx	3.16 lx	0.080	0.005	CG1
West Elevation Vertical Grid Vertical illuminance Rotation: 0.0°, Height: 4.900 m	0.15 lx	0.009 lx	0.87 lx	0.060	0.010	CG2
North Elevation Vertical Grid Vertical illuminance Rotation: 270.0°, Height: 4.900 m	0.40 lx	0.063 lx	1.12 lx	0.16	0.056	CG3
South Elevation Vertical Grid Vertical illuminance Rotation: 90.0°, Height: 4.900 m	0.45 lx	0.021 lx	12.1 lx	0.047	0.002	CG4

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Ground Calculation Grid

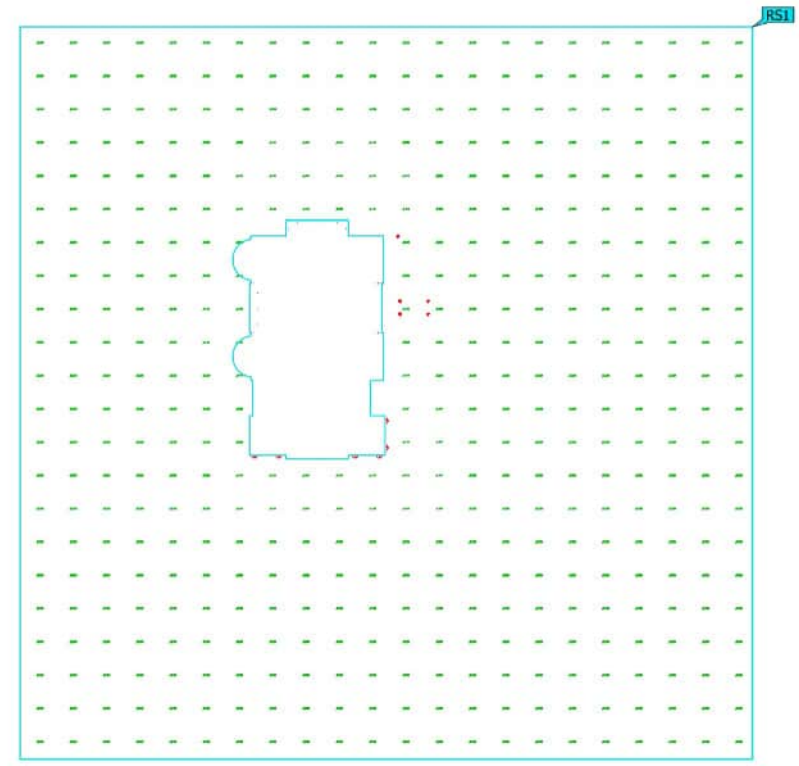


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Ground Calculation Grid Perpendicular illuminance (adaptive) Height: 0.000 m	0.19 lx	0.000 lx	1255 lx	0.00	0.00	RS1

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

Ground Calculation Grid



Properties	Ø	min	max	U_o (g_1)	g_2	Index
Ground Calculation Grid Luminance Height: 0.000 m	0.012 cd/m²	0.000 cd/m²	79.9 cd/m²	0.00	0.00	RS1

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

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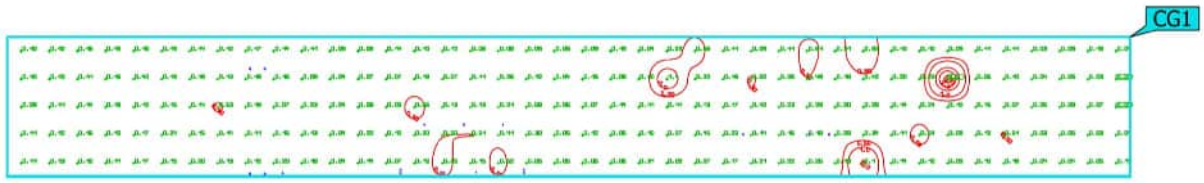
Site 1 (Light scene 1)

East Elevation Vertical Grid

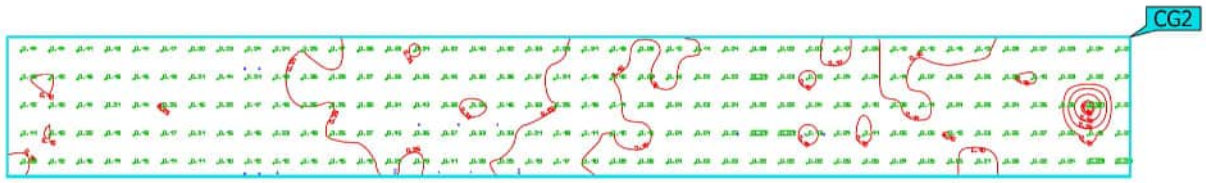


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
East Elevation Vertical Grid Vertical illuminance Rotation: 180.0°, Height: 4.900 m	0.20 lx	0.016 lx	3.16 lx	0.080	0.005	CG1

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

West Elevation Vertical Grid

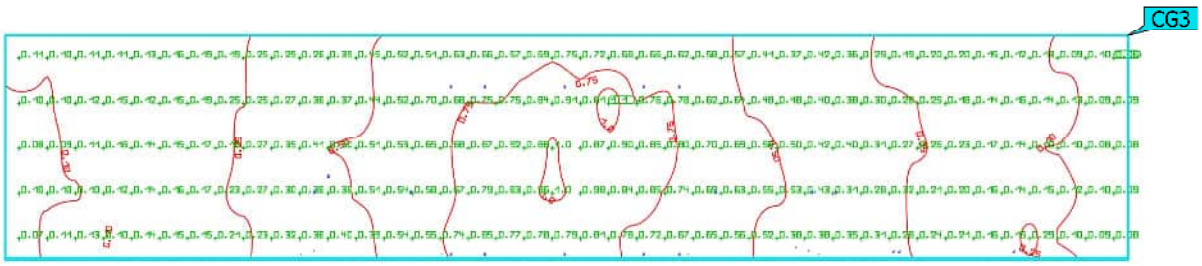


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
West Elevation Vertical Grid Vertical illuminance Rotation: 0.0°, Height: 4.900 m	0.15 lx	0.009 lx	0.87 lx	0.060	0.010	CG2

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

North Elevation Vertical Grid

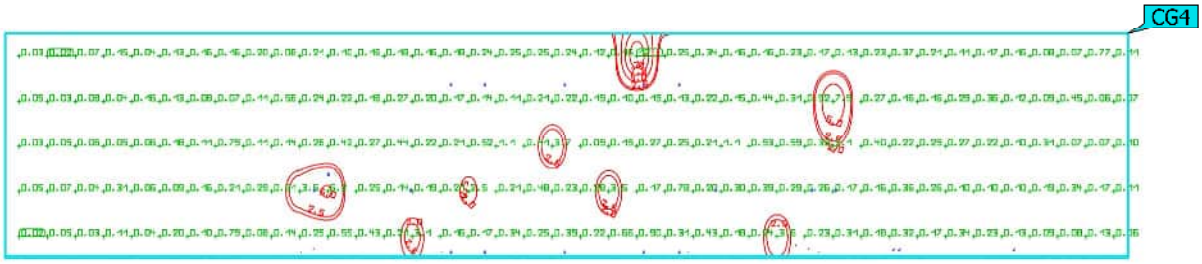


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
North Elevation Vertical Grid Vertical illuminance Rotation: 270.0°, Height: 4.900 m	0.40 lx	0.063 lx	1.12 lx	0.16	0.056	CG3

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)

South Elevation Vertical Grid



Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
South Elevation Vertical Grid Vertical illuminance Rotation: 90.0°, Height: 4.900 m	0.45 lx	0.021 lx	12.1 lx	0.047	0.002	CG4

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Glossary

A

A	Formula symbol for a surface in the geometry

B

Background area	The background area borders the direct ambient area according to DIN EN 12464-1 and reaches up to the borders of the room. In larger rooms, the background area is at least 3 m wide. It is located horizontally at floor level.

C

CCT	(Engl. correlated colour temperature) Body temperature of a thermal radiator which serves to describe its light colour. Unit: Kelvin [K]. The lesser the numerical value the redder; the greater the numerical value the bluer the light colour. The colour temperature of gas-discharge lamps and semi-conductors are termed "correlated colour temperature" in contrast to the colour temperature of thermal radiators. Allocation of the light colours to the colour temperature ranges acc. to EN 12464-1: Light colour - colour temperature [K] warm white (ww) < 3,300 K neutral white (nw) ≥ 3,300 – 5,300 K daylight white (dw) > 5,300 K
Clearance height	The designation for the distance between upper edge of the floor and bottom edge of the ceiling (in the completely furnished status of room).
Control group	A group of luminaires that are dimmed and controlled together. For each lighting scene, a control group provides its own dimming value. All luminaires within a control group share this dimming value. The control groups with their luminaires are automatically determined by DIALux on the basis of the created light scenes and their luminaire groups.
CRI	(Engl. colour rendering index) Designation for the colour rendering index of a luminaire or a lamp acc. to DIN 6169: 1976 or CIE 13.3: 1995. The general colour rendering index Ra (or CRI) is a dimensionless figure that describes the quality of a white light source in regards to its similarity with the remission spectra of defined 8 test colours (see DIN 6169 or CIE 1974) to a reference light source.

Glossary

D

Daylight autonomy	Describes what percentage of the daily working time the required illuminance is met by daylight. The nominal illuminance is used from the room profile, unlike described in EN 17037. The calculation is not done in the centre of the room but at the placed sensor measuring point. A room is considered sufficiently supplied with daylight if it achieves at least 50% daylight autonomy.
Daylight factor	Ratio of the illuminance achieved solely by daylight incidence at a point in the inside to the horizontal illuminance in the outer area under an unobstructed sky. Formula symbol: D (Engl. daylight factor) Unit: %
Daylight quotient effective area	A calculation surface within which the daylight quotient is calculated.

E

Energy evaluation	Based on an hourly calculation procedure for daylight in indoor spaces, considering the project geometry and any existing daylight control systems. Orientation and location of the project are also considered. The calculation uses the specified system power of the luminaires to determine the energy demand. A linear relationship between power and luminous flux in the dimmed state is assumed for daylight-controlled luminaires. Times of use and nominal illuminance are determined from the usage profiles of the spaces. Switched-on luminaires that are explicitly excluded from control also consider the specified times-of-use. The daylight control systems use a simplified control logic that closes them at an outdoor horizontal illuminance of 27,500lx. The calendar year 2022 is used as a reference only. It is not a simulation of this year. The reference year is only used to assign the days of the week to the calculated results. The changeover to summer time is not considered. The reference sky type used is the average sky described in CIE 110 without direct sunlight. The method was developed together with the Fraunhofer Institute for Building Physics and is available for review by the Joint Working Group 1 ISO TC 274 as an extension of the previous annual regression-based method.
Eta (η)	(light output ratio) The light output ratio describes what percentage of the luminous flux of a free radiating lamp (or LED module) is emitted by the luminaire when installed. Unit: %

Glossary

G

g_1	Often also U_o (Engl. overall uniformity) Designates the overall uniformity of the illuminance on a surface. It is the quotient from E_{min} to $\bar{E}$ and is required, for instance, in standards for illumination of workstations.
g_2	Actually it designates the "non-uniformity" of the illuminance on a surface. It is the quotient of E_{min} to E_{max} and is generally only relevant for certifying the emergency lighting acc. to EN 1838.

I

Illuminance	Describes the ratio of the luminous flux that strikes a certain surface to the size of this surface ($lm/m^2 = lx$). The illuminance is not tied to an object surface. It can be determined anywhere in space (inside or outside). The illuminance is not a product feature because it is a recipient value. Luxometers are used for measuring. Unit: Lux Abbreviation: lx Formula symbol: E
Illuminance, adaptive	For the determining of the middle adaptive illuminance on a surface, this is rastered "adaptively". In the area of large illuminance differences within the surface, the raster is subdivided finer; within lesser differences, a rougher classification is made.
Illuminance, horizontal	Illuminance that is calculated or measured on a horizontal (level) surface (this can be for example a table top or the floor). The horizontal illuminance is usually identified by the formula letter E_h.
Illuminance, perpendicular	Illuminance that is calculated or measured plumb-vertical to a surface. This needs to be taken into account for tilted surfaces. If the surface is horizontal or vertical, then there is no difference between the perpendicular and the horizontal or vertical illuminance.
Illuminance, vertical	Illuminance that is calculated or measured on a vertical surface (this can be for example the front of some shelves). The vertical illuminance is usually identified by the formula letter E_v.

L

LENI	(Engl. lighting energy numeric indicator) Lighting energy numeric indicator acc. to EN 15193 Unit: $kWh/(m^2 * a)$

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Glossary

LLMF	(Engl. lamp lumen maintenance factor)/acc. to CIE 97: 2005 Lamp flux maintenance factor that takes the luminous flux reduction into account of a luminaire or an LED module in the course of the operating time. The lamp flux maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no luminous flux reduction existing).
LMF	(Engl. luminaire maintenance factor)/acc. to CIE 97: 2005 Luminaire maintenance factor that takes the soiling into account of the luminaire in the course of the operating time. The luminaire maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no soiling existing).
LSF	(Engl. lamp survival factor)/acc. to CIE 97: 2005 Lamp survival factor that takes the total failure into account of a luminaire in the course of the operating time. The lamp survival factor is specified as a decimal digit and can have a maximum value of 1 (no failures existing within the time concerned or prompt replacement after the failure).
Luminance	Dimension for the "brightness impression" that the human eye has of a surface. The surface itself can emit light thereby or light striking it can be reflected (emitter value). It is the only photometric value that the human eye can perceive. Unit: Candela per square metre Abbreviation: cd/m² Formula symbol: L
Luminous efficacy	Ratio of the emitted luminous flux Φ [lm] to the absorbed electrical power P [W] Unit: lm/W. This ratio can be formed for the lamp or LED module (lamp or module light output), the lamp or module with control gear (system light output) and the complete luminaire (luminaire light output).
Luminous flux	Dimension for the total light output that is emitted from one light source in all directions. It is thus an "emitter value" that specifies the entire emitting output. The luminous flux of a light source can only be determined in a laboratory. A difference is made between the lamp or LED module luminous flux and the luminaire luminous flux. Unit: Lumen Abbreviation: lm Formula symbol: Φ
Luminous intensity	Describes the intensity of the light in a certain direction (emitter value). The luminous intensity is a matter of the luminous flux Φ that is emitted in a certain spherical angle Ω. The radiation characteristics of a light source are presented graphically in a light distribution curve (LDC). The luminous intensity is an SI base unit. Unit: Candela Abbreviation: cd Formula symbol: I

Glossary

M

Maintenance factor	See MF
MF	(Engl. maintenance factor)/acc. to CIE 97: 2005 Maintenance factor as decimal number between 0 and 1 that describes the ratio of the new value of a photometric planning parameter (e.g. of the illuminance) to a maintenance value after a certain time. The maintenance factor takes into account the soiling of luminaires and rooms as well as the luminous flux reduction and the failure of light sources. The maintenance factor is taken into account either overall or determined in detail acc. to CIE 97: 2005 by the formula RMF x LMF x LLMF x LSF.

P

P	(Engl. power) Electric power consumption Unit: watt Abbreviation: W

R

$R_{(UG)}$ max	Measure of the psychological glare in indoor spaces. In addition to the luminance of luminaires, the level of the $R_{(UG)}$ value also depends on the observer position, the viewing direction and the ambient luminance. The calculation is made according to the table method, see CIE 117. Among other things, EN 12464-1:2021 specifies maximum permissible $R_{(UG)}$- values $R_{(UGL)}$ for various indoor workplaces.
Reflection factor	The reflection factor of a surface describes how much of the striking light is reflected back. The reflection factor is defined by the colour of the surface.
RMF	(Engl. room maintenance factor)/acc. to CIE 97: 2005 Room maintenance factor that takes the soiling into account of the space encompassing surfaces in the course of the operating time. The room maintenance factor is specified as a decimal digit and can have a maximum value of 1 (no soiling existing).

S

Surrounding area	The ambient area directly borders the area of the visual task and should be planned with a width of at least 0.5 m according to DIN EN 12464-1. It is at the same height as the area of the visual task.

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Glossary

U

UGR (max)	(unified glare rating) Measure for the psychological glare effect in interiors. In addition to luminaire luminance, the UGR value also depends on the position of the observer, the viewing direction and the ambient luminance. Among other things, EN 12464-1 specifies maximum permissible UGR values for various indoor workplaces.
UGR observer	Calculation point in the room, for the DIALux the UGR value is determined. The location and height of the calculation point should correspond to the typical observer position (position and eye level of the user).

V

Visual task area	The area that is needed for carrying out the visual task in accordance with DIN EN 12464 -1. The height corresponds with the height at which the visual task is executed.

W

Wall zone	Circumferential area between working plane and walls which is not taken into account for the calculation.
Working plane	Virtual measuring or calculation surface at the height of the visual task that generally follows the room geometry. The working plane may also feature a wall zone.

10. APPENDIX C

10.1 Sensitive Receptors

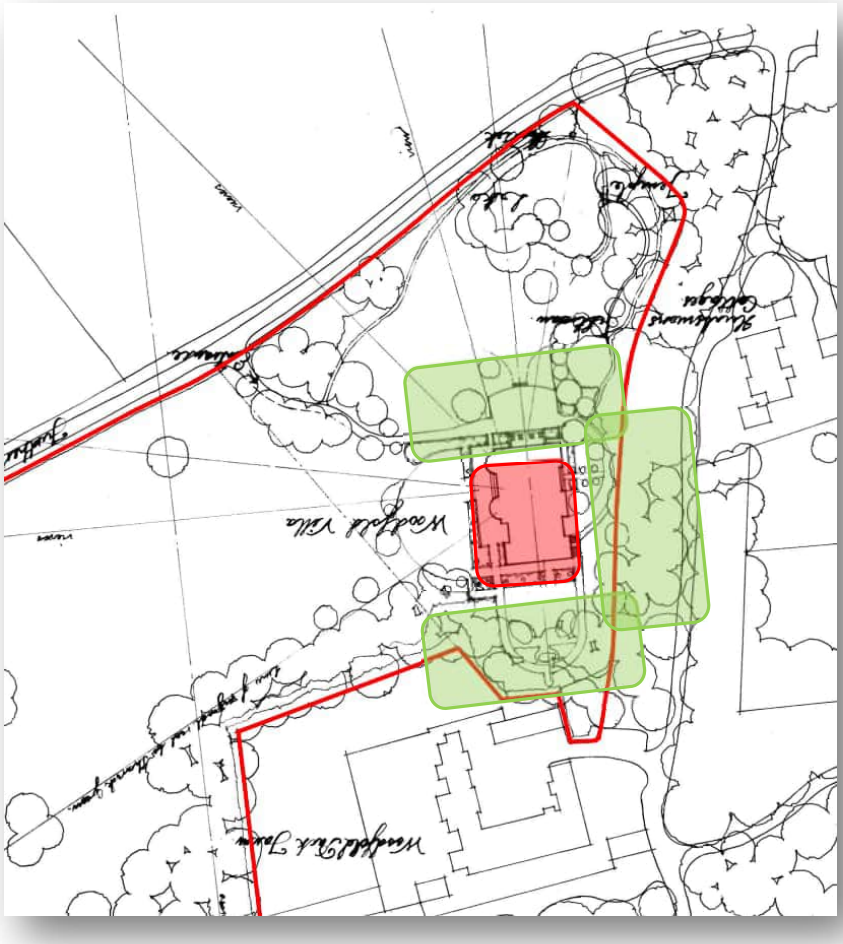

Figure 10.0: Sensitive receptors

SENSITIVE RECEPTORS	
DESCRIPTION	COLOUR
Woodfold Villa	
Woodland	

Table 10.0: Sensitive receptors

11. APPENDIX D

11.1 Regulations and References

The National Planning Policy Framework (NPPF), 2021

Clean Neighbourhoods and Environment Act, 2005

The Environmental Protection Act, 1990

The Exterior Environment - Lighting Guide 6, 2016: Chartered Institution of Building Services Engineers (CIBSE)

Public Lighting Guide 04 Guidance on Undertaking Environmental Lighting Impact Assessments, 2013. Institution of Lighting Professionals (ILP)

CIE 126: Guidelines for Minimising Sky Glow, 1997

CIE 150: Guide on the limitations of the effects of obtrusive light from outdoor lighting installations, 2003

BS 5489-1, 2020 - Code of Practice for the Design of Road Lighting;

Well-lit Highways - Code of Practice for Highway Lighting Management - UK Lighting Board, 2004

The Exterior Environment - Lighting Guide 6, 2016: Chartered Institution of Building Services Engineers (CIBSE)

Well Maintained Roads – Code of Practice for Highway Maintenance Management – Roads Liaison Group, 2005;

Health and Safety at Work Act, 1974

BS 7671, Requirements for Electrical Installations

BS 4533, 1992, Luminaires - Section 102.3, Specification for Luminaires for Road and Street Lighting

BS EN 13201, Parts 2, 3, and 4, Road lighting

BS EN 60529, 1992, Specification for clarification of Degrees of Protection provided by Enclosures

Institution of Lighting Professionals: Competency Requirements for Lighting Design Staff, 2007

Guidance Notes for the Reduction of Obtrusive Light; GN01/21, 2021. Institution of Lighting Professionals (ILP)

Department of the Environment and Countryside Commission document ‘Lighting in the Countryside - Towards good practice’

ILP and CIBSE document ‘Lighting the Environment - A Guide to good urban lighting’

12. APPENDIX E

12.1 Manufacturers datasheets

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D51

GUIDA

LOW PROFILE INDICATOR LIGHT - SINGLE/DOUBLE FACET

LUMINAIRE REF:

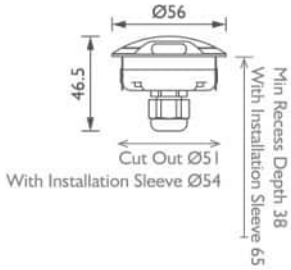
PROJECT REF:

The Guida is an exterior in-ground LED indicator light producing a low glare light across the ground. It is ideal for multiple uses including exterior landscaping and marine applications by lighting the edge of pathways, steps or decking.

This indicator light is available in a single or double facet depending in which direction you want the light to be angled.

NAVAL BRASS

STAINLESS STEEL



FLOOR WASH

DOUBLE FLOORWASH

ACCESSORIES

IP66 ENCLOSURE FOR DRIVER LARGE
ACENIPLRG

IP66 ENCLOSURE FOR DRIVER SMALL
ACENIPSML

IP68 IN-LINE CONNECTION
ACILIP68C

INSTALLATION SLEEVE
ACISGUID1

IP68 Y-JUNCTION CONNECTION
ACYJBIP68

3 YEAR WARRANTY

WWW.JOHNCULLENLIGHTING.COM
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JOHN CULLEN

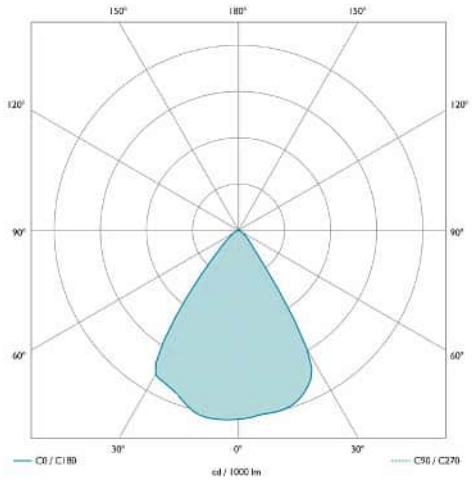
GUIDA

LOW PROFILE INDICATOR LIGHT - SINGLE/DOUBLE FACET

LUMINAIRE REF:

PROJECT REF:

SPECIFICATION	FLOOR WASH	DOUBLE FLOORWASH
BEAM ANGLE (°)	68° x 21°	71° x 47.5°
LED SOURCE LUMENS (LM)	90 lm	90 lm
LUMINAIRE LUMENS (LM)	10 lm	20 lm
INTENSITY RATING (CD)	16	32
POWER CONSUMPTION (W)	1W	1W
LUMINAIRE EFFICACY (LM/W)	10 lm/W	20 lm/W
DRIVE CURRENT (mA)	350mA	350mA
FORWARD VOLTAGE (V DC)	2.7	2.7



INGRESS RATING	IP67
IMPACT RATING	IK20
COMPLIANCE	IEC/EN 60598-1:2015
	IEC/EN 60598-2-2:2012
	IEC/EN 60598-2-13:2006

COLOUR TEMPERATURE	2700K
CIE CRI AVAILABLE AS	98 Ra
IES TM-30 COLOUR FIDELITY (Rf)	94.9
IES TM-30 COLOUR GAMUT (Rg)	98.7
BINNING	2 SDCM
LIFETIME L70/B10 (HOURS)	>50000
AMBIENT TEMPERATURE (Ta)	-20 ... +40 °C

ELECTRICAL	
SOURCE TYPE	LED
PRODUCT CLASS	Class III (SELV low voltage)
DIMMING PROTOCOL	1-10V dimmable
	DALI dimmable
	Switched

OTHER DATA	
Cable Type	2 Core Silicone (180 °C)
Cable Size	6.4mm OD - 2 off 24/0.2 (0.75mm2)
Cable Length	5000mm
Connector Type	N/A
Weight	2200g

3 YEAR WARRANTY

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KEW 40 SPIKE

SPIKE-MOUNTED ADJUSTABLE SPOTLIGHT

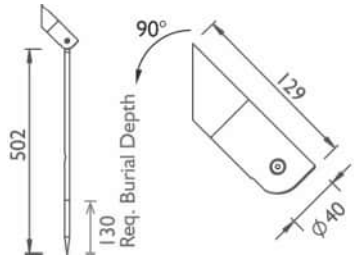
LUMINAIRE REF:

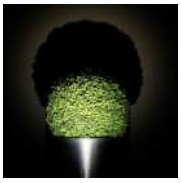
PROJECT REF:

OLIVE GREEN

The Kew 40 Spike is a spiked garden light that will help bring your garden to life and assist with building a dramatic outdoor space for you to enjoy. This medium sized fitting is ideal for highlighting landscape features such a trees, pergolas or statues or foliage with a beam of directed light. Mounted on a spike, it can be repositioned in the earth as the planting grows and changes between seasons. The light is shielded within the fitting to precisely direct the light minimising glare. It comes as standard with a half snoot but other snoots are available as accessories.

The colour and size of the fitting ensures it disappears into planting. The Kew is IP66 Rated - see FAQs for more details on IP Values.





NARROW

MEDIUM

WIDE

ACCESSORIES

KEW 40 CAP SNOOT OLIVE GREEN
ACK4CS251

KEW 40 FULL SNOOT OLIVE GREEN
ACK4FS251

KEW 40 HALF SNOOT OLIVE GREEN
ACK4HS251

KEW 40 SHORT SNOOT OLIVE GREEN
ACK4SS251

3 YEAR WARRANTY

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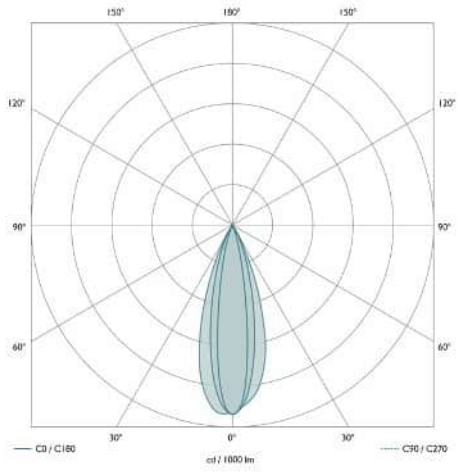
KEW 40 SPIKE

SPIKE-MOUNTED ADJUSTABLE SPOTLIGHT

LUMINAIRE REF:

PROJECT REF:

SPECIFICATION	NARROW	MEDIUM	WIDE
BEAM ANGLE (°)	18°	27°	38°
LED SOURCE LUMENS (LM)	840 lm	840 lm	840 lm
LUMINAIRE LUMENS (LM)	572 lm	562 lm	450 lm
INTENSITY RATING (CD)	4451	1966	1045
POWER CONSUMPTION (W)	8W	8W	8W
LUMINAIRE EFFICACY (LM/W)	71.5 lm/W	70.3 lm/W	52.5 lm/W
DRIVE CURRENT (mA)	700mA	700mA	700mA
FORWARD VOLTAGE (V DC)	12V	12V	12V

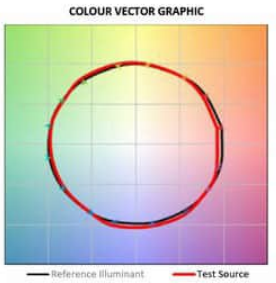


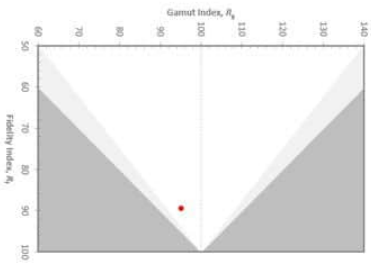
INGRESS RATING	IP66
IMPACT RATING	N/A
COMPLIANCE	BS EN IEC 60598-1:2014
	IEC 60598-2-7:1982/AMD1:1987/AMD2:1994

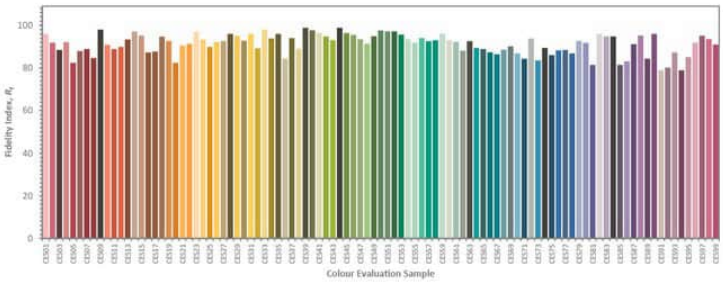
COLOUR TEMPERATURE	2700K
CIE CRI AVAILABLE AS	>94 Ra
IES TM-30 COLOUR FIDELITY (Rf)	>90
IES TM-30 COLOUR GAMUT (Rg)	N/A
BINNING	2 SDCM
LIFETIME L70/B10 (HOURS)	>50000
AMBIENT TEMPERATURE (Ta)	-20 ... +40 °C

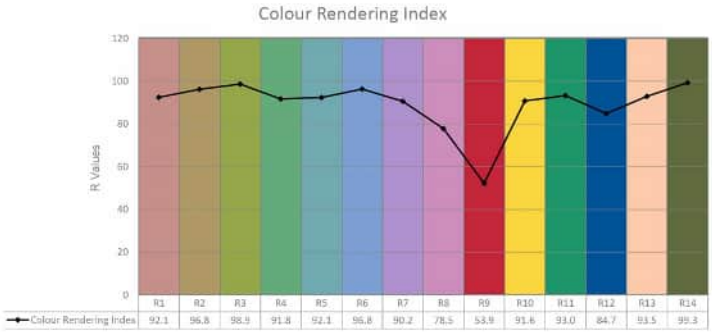
ELECTRICAL	
SOURCE TYPE	LED
PRODUCT CLASS	Class III (SELV low voltage)
DIMMING PROTOCOL	DALI dimmable
	1-10V dimmable
	Mains dimmable (phase cut dimming)
	Switched

OTHER DATA	
Cable Type	2 Core Silicone (180 °C)
Cable Size	6.4mm OD - 2 off 24/0.2 (0.75mm2)
Cable Length	1800mm
Connector Type	N/A
Weight	275g / 285g









3 YEAR WARRANTY

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CE PART L COMPLIANT BRITISH DESIGN UK CA

D51

KEW 40 SURFACE

SURFACE-MOUNTED ADJUSTABLE SPOTLIGHT

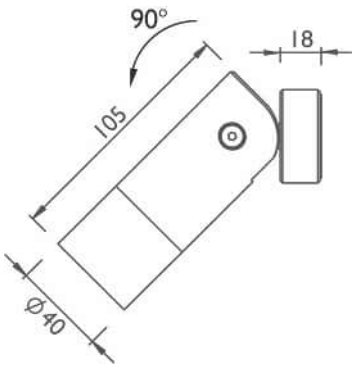
LUMINAIRE REF:

PROJECT REF:

The Kew 40 Surface is a surface mounted IP66 spotlight, ideal for pinpointing landscape ornaments from above or wall grazing for use both inside and out. Our unique, patented wall mounting system allows for quick, tool-free installation on site. The luminaire mounts onto the wall bracket and is self-locking at 15° intervals, preventing the need for further fixing. A discreet, optional tamper proofing feature is available if required for commercial projects. The Kew Surface is IP66 Rated - see FAQs for more details on IP Values.

BLACK RAL 9005

BRONZE



NARROW

MEDIUM

WIDE

ACCESSORIES

KEW/HAMPTON 40 CONDUIT BOX
ACHK4CB1

KEW 40 CAP SNOOT BLACK
ACK4CS021

KEW 40 CAP SNOOT BRONZE
ACK4CS061

KEW 40 FULL SNOOT BLACK
ACK4FS021

KEW 40 FULL SNOOT BRONZE
ACK4FS061

KEW 40 HALF SNOOT BLACK
ACK4HS021

KEW 40 HALF SNOOT BRONZE
ACK4HS061

KEW 40 SHORT SNOOT BLACK
ACK4SS021

KEW 40 SHORT SNOOT BRONZE
ACK4SS061

3 YEAR WARRANTY

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CE PART L COMPLIANT BRITISH DESIGN UK CA DARK SKY

D51

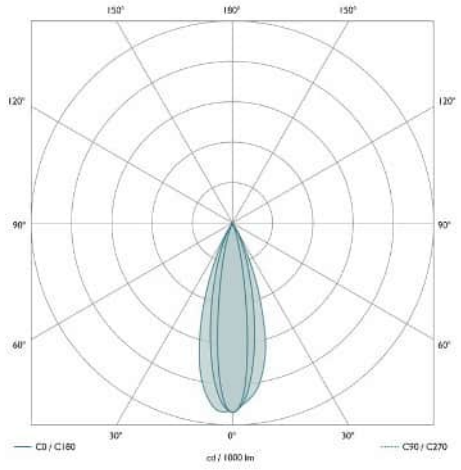
KEW 40 SURFACE

SURFACE-MOUNTED ADJUSTABLE SPOTLIGHT

LUMINAIRE REF:

PROJECT REF:

SPECIFICATION	NARROW	MEDIUM	WIDE
BEAM ANGLE (°)	18°	27°	38°
LED SOURCE LUMENS (LM)	840 lm	840 lm	840 lm
LUMINAIRE LUMENS (LM)	572 lm	562 lm	450 lm
INTENSITY RATING (CD)	4451	1966	1045
POWER CONSUMPTION (W)	8W	8W	8W
LUMINAIRE EFFICACY (LM/W)	71.5 lm/W	70.3 lm/W	52.5 lm/W
DRIVE CURRENT (mA)	700mA	700mA	700mA
FORWARD VOLTAGE (V DC)	12V	12V	12V

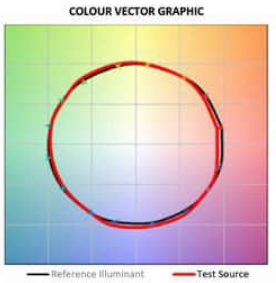


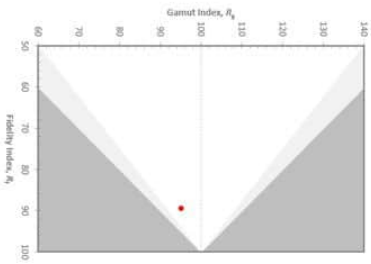
INGRESS RATING	IP66
IMPACT RATING	N/A
COMPLIANCE	BS EN IEC 60598-1:2015
	BS 4533:SECTION 102.1:1990/EN 60598-2-1:1989

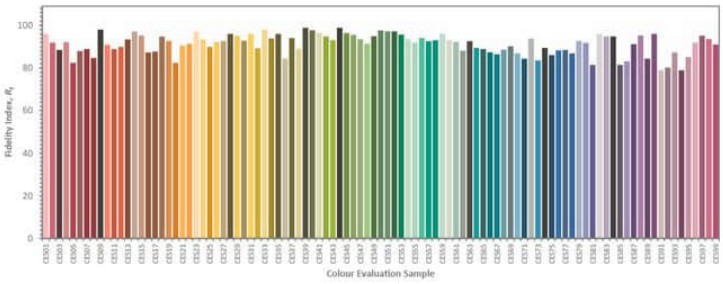
COLOUR TEMPERATURE	2700K
CIE CRI AVAILABLE AS	>94 Ra
IES TM-30 COLOUR FIDELITY (Rf)	>90
IES TM-30 COLOUR GAMUT (Rg)	N/A
BINNING	2 SDCM
LIFETIME L70/B10 (HOURS)	>50000
AMBIENT TEMPERATURE (Ta)	-20 ... +40 °C

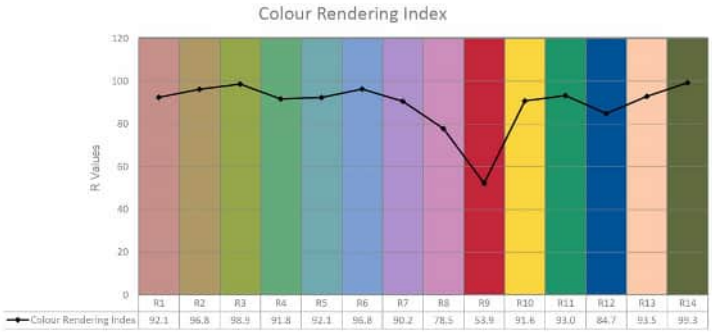
ELECTRICAL	
SOURCE TYPE	LED
PRODUCT CLASS	Class III (SELV low voltage)
DIMMING PROTOCOL	1-10V dimmable
	DALI dimmable
	Mains dimmable (phase cut dimming)
	Switched

OTHER DATA	
Cable Type	2 Core Silicone (180 °C)
Cable Size	6.4mm OD - 2 off 24/0.2 (0.75mm2)
Cable Length	350mm
Connector Type	N/A
Weight	275g / 285g









3 YEAR WARRANTY

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CE PART L COMPLIANT BRITISH DESIGN UK CA DARK SKY

D51

LUCCA 60 TRIMLESS

MIDI UPLIGHT FOR ARCHITECTURAL LIGHTING

LUMINAIRE REF:

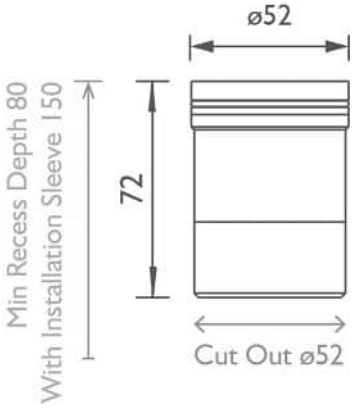
PROJECT REF:

The Lucca 60 is an energy efficient trimless LED midi uplight. It is ideal for creating stunning uplighting effects to columns, arches, window reveals, walls and trees. Available in narrow, medium and wide distributions, with additional elliptical and asymmetric variants for wall grazing and wall washing. Trimless fittings come with a burial tube as standard.

It is IP67 rated so ideal for use both inside and out. If using inside, the warranty increases to 5 years. Fittings come with 1m of cable as standard. Custom cable lengths are available.

BLACK ANODISED

STAINLESS STEEL



ASYMMETRIC

ELLIPTICAL

NARROW

MEDIUM

WIDE

ACCESSORIES

IP66 ENCLOSURE FOR DRIVER LARGE
ACENIPLRG

IP66 ENCLOSURE FOR DRIVER SMALL
ACENIPSML

3 YEAR WARRANTY

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CE PART L COMPLIANT BRITISH DESIGN UK CA

D51

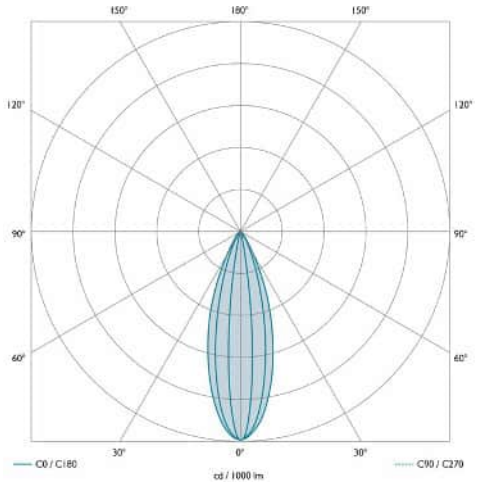
LUCCA 60 TRIMLESS

MIDI UPLIGHT FOR ARCHITECTURAL LIGHTING

LUMINAIRE REF:

PROJECT REF:

SPECIFICATION	ASYMMETRIC	ELLIPTICAL	NARROW	MEDIUM	WIDE
BEAM ANGLE (°)	Asymmetric	Elliptical	13°	27°	36°
LED SOURCE LUMENS (LM)	516 lm	516 lm	516 lm	516 lm	516 lm
LUMINAIRE LUMENS (LM)	N/A	262 lm	345 lm	230 lm	127 lm
INTENSITY RATING (CD)	N/A	1021	5561	858	315
POWER CONSUMPTION (W)	6W	6W	6W	6W	6W
LUMINAIRE EFFICACY (LM/W)	N/A	44 lm/W	57.5 lm/W	38.3 lm/W	21.2 lm/W
DRIVE CURRENT (mA)	500mA	500mA	500mA	500mA	500mA
FORWARD VOLTAGE (V DC)	12V DC	12V DC	12V DC	12V DC	12V DC



INGRESS RATING	IP67
IMPACT RATING	IK10
COMPLIANCE	IEC/EN 60598-1:2015
	IEC/EN 60598-2-2:2012
	IEC/EN 60598-2-13:2006

COLOUR TEMPERATURE	2700K
CIE CRI AVAILABLE AS	>90 Ra
IES TM-30 COLOUR FIDELITY (Rf)	>90
IES TM-30 COLOUR GAMUT (Rg)	>95
BINNING	2 SDCM
LIFETIME L70/B10 (HOURS)	>50000
AMBIENT TEMPERATURE (Ta)	-20 ... +40 °C

ELECTRICAL	
SOURCE TYPE	LED
PRODUCT CLASS	Class III (SELV low voltage)
DIMMING PROTOCOL	1-10V dimmable
	DALI dimmable
	Mains dimmable (phase cut dimming)
	Switched

OTHER DATA	
Cable Type	2 Core Silicone (180 °C)
Cable Size	2 off 7/0.2 (0.22mm2)
Cable Length	1000mm
Connector Type	N/A
Weight	N/A

3 YEAR WARRANTY

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CE PART L COMPLIANT BRITISH DESIGN UK CA

JOHN CULLEN

LUCCA STEPLIGHT INSTALLATION GUIDE

D51

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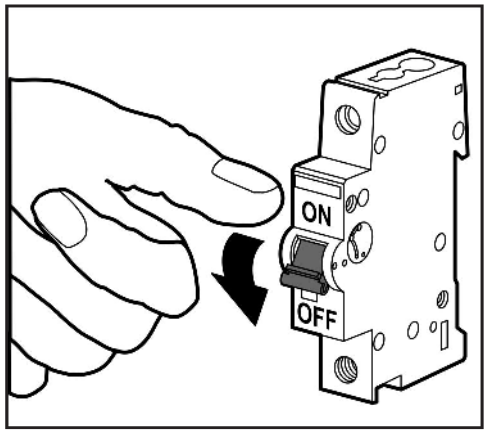

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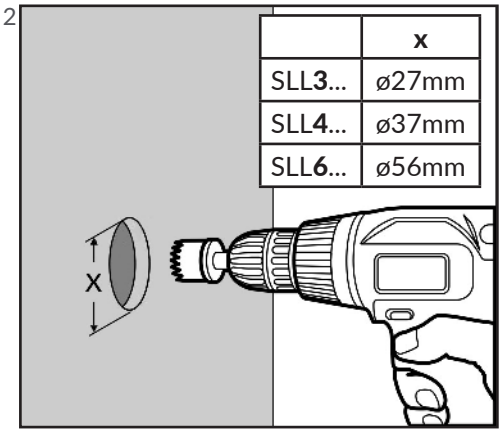
	x
SLL**3**...	ø27mm
SLL**4**...	ø37mm
SLL**6**...	ø56mm



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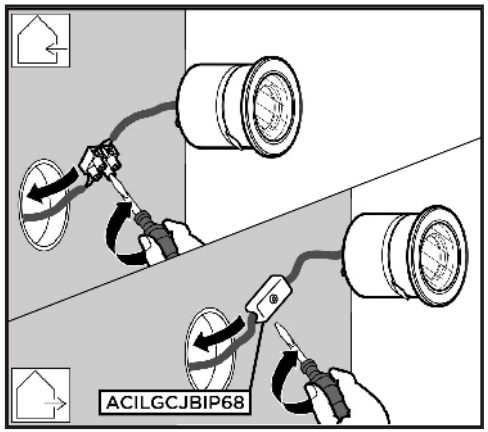

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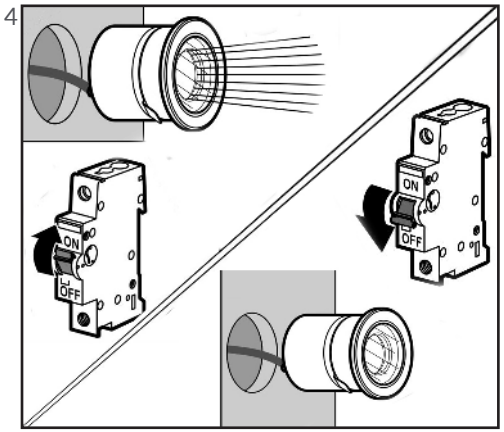

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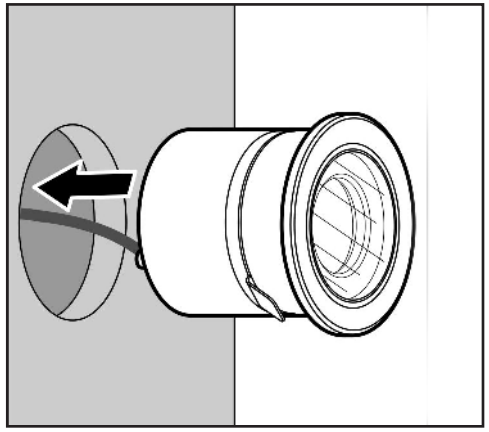

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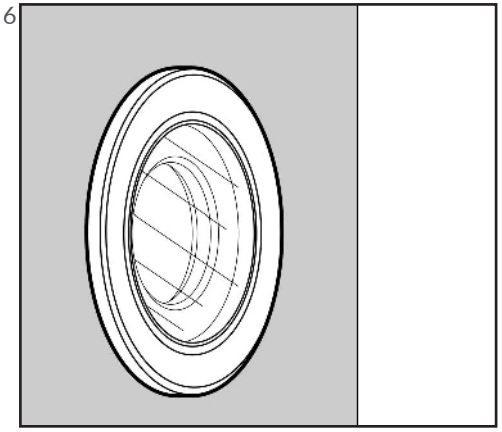

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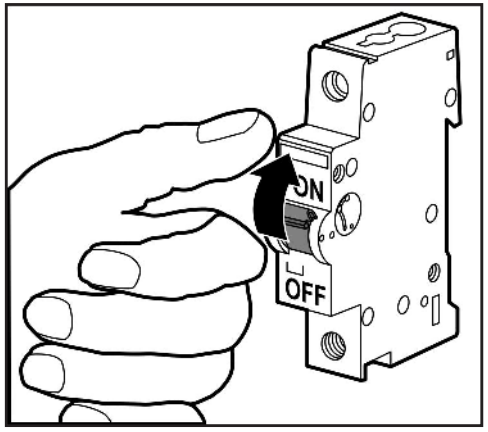

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JOHN CULLEN

LUCCA STEPLIGHT D51
INSTALLATION GUIDE

GB - INSTRUCTIONS OF INSTALLATION AND USE
WARNING
The product cannot be in any case modified or forced, any modifications might jeopardize the safety system making it dangerous. John Cullen Lighting declines any responsibility on modified products.
The product must not be covered with insulating or similar materials.
The light source contained in this luminaire shall only be replaced by the manufacturer or similar qualified person.
Damaged cables must only be replaced by manufacturer.
A SELV LED driver must be used. Max Uout 120V DC ripple free.
Constant current products to be wired in series.
Constant voltage products to be wired in parallel.
Do not wire when driver is energised as a hot connection will destroy the LED.
Luminaire is ready to connect directly into terminal block or driver. If required, any additional wiring should follow the below specification:
CSA: 0.75mm2 - 1.5mm2 | Strip Length: 8.5 - 9.5mm | Cable Type: Rigid
Luminaire shall be connected to control gear with integrated or external screwless terminal block.
Terminal block not included. Installation must be performed by a qualified professional.
John Cullen stipulate the following terminal blocks:
For internal use: Wago Type 221 | For external use: Steab Paguro 5665
Always check third party instructions.
Driver must be connected to internal luminaires with a maximum cable length of 2m, and to external luminaires with a maximum cable length of 5m.
Any extension to external cabling shall be of Type: Rubber insulation
Correct polarity must be observed - Black cable (-) Negative | Red cable (+) Positive
CLEANING INSTRUCTIONS
Use only a soft cloth to clean the appliance, dampened with water and soap or mild cleanser if needed for resistant dirt.
Warning: do not use alcohol or other solvents.

FR - INSTRUCTIONS D'INSTALLATION ET D'UTILISATION
AVERTISSEMENT
Le produit ne peut en aucun cas être modifié ou forcé, toute modification risque de compromettre le système de sécurité et le rendre dangereux. John Cullen Lighting décline toute responsabilité sur les produits modifiés.
Le produit ne peut pas être couvert avec des matériaux isolants ou similaires.
La source lumineuse contenue dans ce luminaire ne peut être remplacée que par le constructeur ou par une personne qualifiée. similaire.
Les câbles ne peuvent être remplacés que par le constructeur.
Utiliser un driver LED TBTS. Max Uout 120V DC sans ondulation.
Relier en série les produits à courant constant.
Relier en parallèle les produits à tension constante.
Ne pas câbler lorsque le driver est sous tension, car une connexion élevée détruirait la LED.
Le luminaire est prêt à être directement raccordé au bornier ou au driver. Tout câblage supplémentaire doit, le cas échéant, respecter les caractéristiques suivantes :
CSA : 0,75 mm2 - 1,5 mm2 | Longueur de bande : 8,5 - 9,5 mm | Type de câble: rigide
Le luminaire doit être raccordé à un appareil de commande avec un bornier sans vis intégré ou externe.
Bornier non inclus. L'installation doit être effectuée par un professionnel qualifié.
John Cullen stipule les borniers suivants :
Pour usage interne : Wago Type 221 | Pour usage externe : Steab Paguro 5665
Toujours vérifier les instructions des tiers.
Le pilote doit être connecté à des luminaires internes avec une longueur de câble maximale de 2 m et à des luminaires externes avec une longueur de câble maximale de 5 m. Toute extension de câblage externe doit être de type : isolation en caoutchouc
Câblage en série : respecter les polarités - Câble noir (-) négatif | Câble rouge (+) positif
INSTRUCTIONS DE NETTOYAGE
Utiliser uniquement un chiffon doux humidifié d'eau et de savon, ou si nécessaire un nettoyant doux en cas de saleté résistante pour nettoyer l'appareil. Avertissement : ne pas utiliser d'alcool ou autres solvants.

ES - INSTRUCCIONES DE INSTALACIÓN Y USO
ADVERTENCIA
Bajo ninguna circunstancia, se puede modificar ni forzar el producto.
Cualquier modificación del mismo puede poner en peligro la integridad del sistema de seguridad y hacerlo peligroso. John Cullen Lighting no asume ninguna responsabilidad por los productos modificados.
El producto no debe cubrirse con materiales aislantes o similares.
La fuente de luz contenida en esta luminaria solo la puede reemplazar el fabricante o una persona competente al efecto.
Solo el fabricante está autorizado a sustituir cables dañados.
Utilice un driver LED MBTS. Max Uout 120 V CC sin ondulación.
Los productos de corriente constante deben cablearse en serie.
Los productos de tensión constante deben cablearse en paralelo.
No efectúe el cableado mientras el driver está energizado, ya que una conexión en caliente destruiría el LED.
La luminaria está preparada para la conexión directa a un bloque de terminales o driver. Si es necesario, todo cableado adicional deberá efectuarse siguiendo la especificación que se indica a continuación:
CSA: 0,75 mm2 – 1,5 mm2 | Longitud de pelado: 8,5 – 9,5 mm | Tipo de cable: rígido
La luminaria se conecta al equipo de control mediante un bloque de terminales integrado o externo sin tornillos.
Bloque de terminales no incluido. La instalación debe ser realizada por un profesional calificado.
John Cullen estipula los siguientes bloques de terminales:
Para uso en interior: Wago 221 | Para uso en exterior: Steab Paguro 5665
Revise siempre las instrucciones de terceros.
El driver debe conectarse a las luminarias de interior con una longitud máxima de cable de 2 m, y a las luminarias de exterior con una longitud máxima de cable de 5 m. Cualquier extensión al cableado externo deberá ser de Tipo: Aislamiento de caucho
Respete la polaridad - Cable negro (-) negativo | Cable rojo (+) positivo
INSTRUCCIONES DE LIMPIEZA
Utilice únicamente un paño suave humedecido con agua y jabón para limpiar el dispositivo, o. si es necesario, un producto de limpieza suave para la suciedad más persistente. Advertencia: no utilice alcohol ni otros disolventes.

DE - INSTALLATIONS- UND GEBRAUCHSANLEITUNG
ACHTUNG
Das Produkt darf in keinem Fall modifiziert werden. Auf das Produkt darf kein Zwang ausgeübt werden. Jegliche Änderungen können die Sicherheit beeinträchtigen und zu Gefahren führen. John Cullen Lighting lehnt jede Verantwortung für modifizierte Produkte ab.
Das Produkt darf nicht mit isolierenden oder ähnlichen Materialien bedeckt werden.
Die in dieser Leuchte enthaltene Lichtquelle darf nur durch den Hersteller oder entsprechendes Fachpersonal ersetzt werden.
Die Kabel dürfen nur vom Hersteller ausgetauscht werden.
Es muss ein SELV LED-Treiber verwendet werden. Max. Uout 120 V DC, wellenfrei.
Produkte mit Konstantstrom, die in Serie verdrahtet werden sollen.
Produkte mit Konstantspannung, die parallel verdrahtet werden sollen.
Nicht verdrahten, wenn der Treiber mit Strom versorgt wird, da eine heiße Verbindung die LED zerstört.
Die Leuchte kann direkt an eine Klemmleiste oder einen Treiber angeschlossen werden. Bei Bedarf erforderliche zusätzliche Verdrahtung entsprechend folgender Spezifikation vornehmen:
CSA: 0,75 mm2 - 1,5 mm2 | Abisolierlänge: 8,5 - 9,5 mm |
Kabeltyp: starr
Der Anschluss der Leuchte an Betriebsgeräte erfolgt über eine integrierte oder externe schraubenlose Klemmleiste.
Klemmleiste nicht im Lieferumfang enthalten. Die Installation muss von einem qualifizierten Fachmann durchgeführt werden.
Gemäß Angaben von John Cullen erforderliche Klemmleisten:
Verwendung im Innenbereich: Wago Typ 221 | Verwendung im Außenbereich: Steab Paguro 5665
Sets Vorschriften und Anweisungen Dritter beachten.
Der Treiber muss an interne Leuchten mit einer maximalen Kabellänge von 2 m und an externe Leuchten mit einer maximalen Kabellänge von 5 m angeschlossen werden. Jede Verlängerung der externen Verkabelung muss vom Typ: Gummiisolierung sein
Die richtige Polarität ist zu beachten - Schwarzes Kabel: Minus (-) | Rotes Kabel: Plus (+)
REINIGUNGSHINWEISE
Verwenden Sie zur Reinigung des Geräts nur ein weiches mit Wasser und Reinigungsmittel befeuchtetes Tuch oder bei Bedarf einen milden Reiniger für hartnäckigen Schmutz.
Achtung: Verwenden Sie keinen Alkohol oder andere Lösungsmittel.

NL - INSTALLATIE-INSTRUCTIES EN GEBRUIKSAANWIJZING
WAARSCHUWING
Het product mag niet worden gemodifceerd of geforceerd; eventuele modificaties kunnen de veiligheid van het product belnvloeden, waardoor gebruik van het product gevaarlijk wordt geacht. John Cullen Lighting wijst iedere verantwoordelijkheid af voor gemodificeerde producten.
Het product mag niet worden bedekt met isolerend materiaal of iets soortgelijk.
De lichtbron in het armatuur mag alleen worden vervangen door de fabrikant of een gekwalificeerd persoon.
De kabels mogen alleen worden vervangen door de fabrikant.
Er moet een SELV LED-driver worden gebruikt. Max Uout 120V DC rimpelvrij.
Producten met constante stroom moeten in serie worden aangesloten.
Producten met constante spanning moeten parallel worden aangesloten.
Werk niet aan de bedrading wanneer de driver onder spanning staat, aangezien een aansluiting onder spanning de LED kan vernietigen.
Het armatuur is gereed om rechtstreeks te worden aangesloten op het aansluitblok of de driver. Indien extra bedrading nodig is, dient deze aan de volgende specificaties te voldoen:
Doorsnede: 0,75 - 1,5 mm2 | Striplengte: 8,5 - 9,5 mm |
Kabeltype: stijf
Het armatuur moet worden aangesloten op voorschakelapparatuur met geïntegreerd of extern aansluitblok zonder schroeven.
Aansluitblok niet inbegrepen. De installatie moet worden uitgevoerd door een gekwalificeerde professional.
John Cullen schrijft het gebruik van de volgende aansluitblokken voor:
Voor intern gebruik: Wago Type 221 | Voor extern gebruik: Steab Paguro 5665
Controleer altijd de instructies van derden.
De driver moet worden aangesloten op interne armaturen met een maximale kabellengte van 2 m en op externe armaturen met een maximale kabellengte van 5 m. Elke uitbreiding naar externe bekabeling moet van het type zijn: rubberen isolatie
Houd rekening met de juiste polariteit - Zwarte kabel (-) negatief | Rode kabel (+) positief
REINIGINGSINSTRUCTIES
Gebruik om het apparaat te reinigen alleen een zachte doek die bevochtigd is met water en zeep of met een zacht schoonmaakmiddel als er sprake is van hardnekkig vuil.
Waarschuwing: gebruik geen alcohol of andere oplosmiddelen.

SE - INSTALLATIONS- OCH BRUKSANVISNING
VARNING
Produkten får aldrig modifieras eller öppnas. Det kan förstöra armaturens säkerhet och göra att den blir farlig att använda. John Cullen Lighting ansvarar inte för modifierade produkter.
Produkten får inte täckas av isolering eller liknande material.
Ljuskällan i denna armatur får endast bytas ut av tillverkaren eller en annan likvärdig och godkänd/certifierad person.
Kablar får endast bytas ut av tillverkaren.
En SELV LED-skruvdragare måste användas. Max Uout 120V DC rippelfri.
Produkter med konstant ström ska kopplas i serie.
Produkter med konstant spänning ska kopplas parallellt.
Anslut inte armaturen när drivdonet är strömförsett, det kommer att förstöra LED:en.
Armaturen är klar att ansluta direkt till en kopplingsplint eller drivenhet.
Om ytterligare kablar krävs, ska de uppfylla specifikationerna nedan:
CSA: 0,75 mm2 – 1,5 mm2 | Bandlängd: 8,5 – 9,5 mm |
Kabeltyp: Styv
Armaturen ska anslutas till ett reglerdon med ett integrerat eller externt skruvlöst terminalblock.
Kopplingsplint medföljer ej. Installationen måste utföras av en kvalificerad fackman.
John Cullen kräver att följande kopplingsplintar används:
För intern användning: Wago Type 221 | För extern användning: Steab Paguro 5665
Läs alltid instruktionerna från tredjepartsleverantörer.
Fraren måste vara ansluten till interna armaturer med en maximal kabellängd på 2 m och till externa armaturer med en maximal kabellängd på 5 m. Eventuell förlängning av extern kabel ska vara av typ: Gummiisolering
Viktigt med korrekt polaritet! - Svart kabel (-) Minus | Röd kabel (+) Plus
INSTRUKTION FÖR RENGÖRING
Använd en mjuk, lätt fuktad trasa med milt rengöringsmedel om det finns behov av att tvätta rent armaturen från smuts.
Använd inte alkohol eller liknande lösningsmedel.

AB - تعليمات التركيب والاستعمال
تحذير
لا يجب في أي حال من الأحوال تعديل المنتج أو محاولة إدخاله بقوة، إذ أن أي تعديلات تجرى عليه يمكن أن تعطل نظام السلامة وبالتالي تجعله خطيرا. إن مؤسسة John Cullen Lighting لن تتحمل أي مسؤولية عن المنتجات التي يجري تعديلها.
يجب عدم تغليف المنتج بمواد عازلة أو ما مماثلها.
كما يجب عدم استبدال مصدر الضوء في جهاز الإنارة هذا إلا بواسطة المؤسسة الصانعة أو شخص يتمتع بمؤهلات مماثلة.
وينبغي عدم استبدال الأسلاك التالفة إلا بواسطة المؤسسة الصانعة.
يجب استخدام خلية توصيل SELV LED. ماكس Uout 120V DC مموج مجانا.
يجب توصيل منتجات التيار المستمر متصلة مع بعضها ضمن سلسلة
يجب توصيل منتجات الجهد الكهربائي المستمر موازاة بعضها البعض
يجب تجنب توصيل الأسلاك بينما تكون خلية التوصيل موصلة بالكهرباء، حيث إن توصيل السلك الحي في هذه الحالة سيؤدي إلى إتلاف مصباح LED.
جهاز الإنارة جاهز للتوصيل مباشرة في موصل الأسلاك أو خلية التوصيل. وإن لزم الأمر استخدام أي توصيلات كهربائية إضافية، فيجب الالتزام بالمواصفات التالية:
مقطع السلك: 0.75 ملم2 – 1.5 ملم2 | مسافة كشف السلك: 8.5 – 9.5 ملم
نوع الكابل: جامد
يوصل جهاز الإنارة بمفتاح تشغيل مرتبط بموصل أسلاك داخلي أو خارجي يثبت بدون براغي.
الكتلة الطرفية غير متضمنة يجب أن يتم التثبيت بواسطة متخصص مؤهل.
باستخدام موصلات الأسلاك التالية John Cullen تنصح مؤسسة:
Steab Paguro 5665 :موصل أسلاك خارجي | Wago 221 :موصل أسلاك داخلي
يرجى الاطلاع دائما على تعليمات المواد التي من طرف ثالث.
يجب وصل خلية التوصيل بأجهزة الإنارة الداخلية بسلك لا يتجاوز طوله 2 متر، وبأجهزة الإنارة الخارجية بسلك لا يتجاوز طوله 5 أمتار.
يجب أن يكون أي امتداد للكابلات الخارجية من النوع: عازل مطاطي.
يجب أن يكون أي امتداد للكابلات الخارجية من النوع:عازل مطاطي،يتم التوصيل على التوالي: يجب الانتباه للقطبية الصحيحة
السلك الأسود (-) سالب | السلك الأحمر (+) موجب
تعليمات التنظيف
من أجل تنظيف الجهاز، يجب أن تُستخدم فقط قطعة قماش طريّة مبللة بالماء والصابون، أو بمنظف خفيف إذا كان لازماً لإزالة أوساخ مستعصية.
تحذير: لا تستعمل مواد كحولية أو مذيبات أخرى.