Environmental Lighting Impact Assessment Report

Rookery Sports Club, Southport

Project number: SHD1036

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R0	Planning	Steve Higham	Steve Higham	20/08/2023

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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 Richard Every Architect Ltd to develop a sensitive lighting strategy to illuminate the periphery of a proposed clubhouse accessed off Roe Lane, Southport (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 Richard Every Architect Ltd.

1.1.3 This lighting assessment report shall be read in conjunction with *'Design and Access Statement'* June 2023, produced by Richard Every Architects Ltd

1.1.4 The report assesses the potential effects of obtrusive light that could arise from outdoor artificial lighting at the Proposed Development.

1.1.5 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.

1.1.6 SHD Lighting Consultancy specialises in designing outdoor lighting and conducting studies on lighting effects. Our design team has the knowledge, experience, professional qualifications, and are 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 is to identify the effects associated with obtrusive light on various sensitive receptors and propose suitable mitigation measures

1.1.9 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.

1.1.10 The lighting impact assessment considers the maximum adverse scenario about the proposed artificial lighting, to assess the significance of the potential effects on identified receptors.

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 in February 2019, and recently revised in July 2021.

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 Standards

2.3.1 The applicable standards 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 organization 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 Sky glow 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 organization 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 provide guidance 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.

3. ASSESSMENT METHODOLOGY

3.1 Environmental Zone Classification

3.1.1 All standards consulted are nationally recognised documents, (some internationally also) which deal with all design issues associated with external lighting.

3.1.2 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.

3.1.3 Using Table 3.1, the assessment site would be classified as **E3 Medium district brightness**

3.2 Obtrusive Light Limitation for Outdoor Lighting Installations

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

3.2.2 The table below (from GN01/21) provides design 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**

3.2.3 The Proposed Development is within an **E3 Environmental Zone**, with Table 3.2 providing the maximum permissible values of lux for light intrusions into windows.

3.2.4 Pre-curfew is considered before 23:00, with a maximum value of 10.00 lux, and post-curfew after 23:00, a maximum value of 2.00 lux must not be exceeded at the centre point of any window.

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.

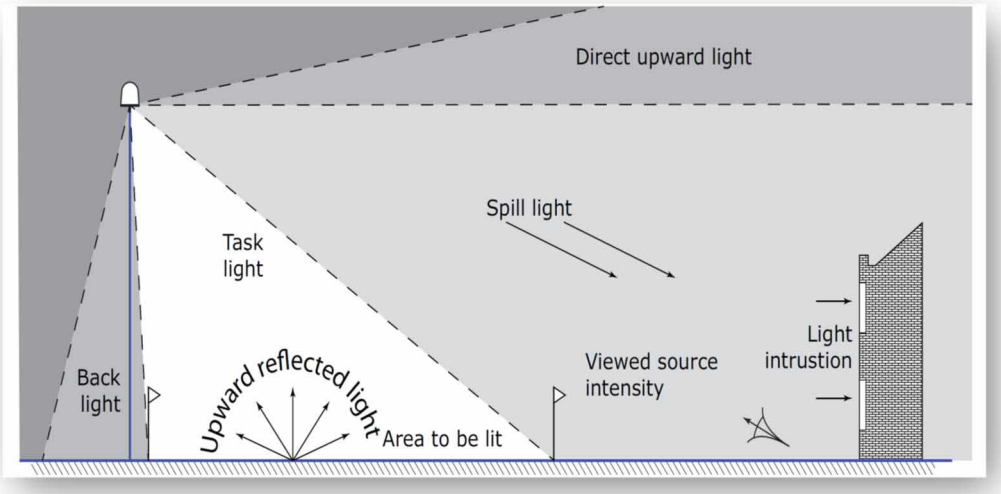

Figure 3.1: Obtrusive light diagram

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. Such design work must be undertaken by a qualified and capable professional.

3.4.2 Poorly designed lighting often involves a sparse arrangement of luminaires attempting to illuminate a wide area. Consequently, these luminaires are often tilted excessively to spread light over intended and unintended surfaces, leading to unintended consequences.

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

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

3.4.5 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.

3.4.6 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.

3.4.7 Preliminary assessments of the proposed lighting installation indicate that the overall light pollution levels in the vicinity, concerning sensitive areas, will not experience significant changes due to the proposed lighting.

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 Roe Lane, Southport which is a residential area, populated with housing and the existing road network illuminated with lighting columns owned and maintained by the Local Authority.

4.1.2 Information in this report will assess the impact of the introduction of artificial lighting which consists of twelve wall-mounted bulkhead luminaires with neutral white LED light sources to illuminate the areas around the clubhouse.

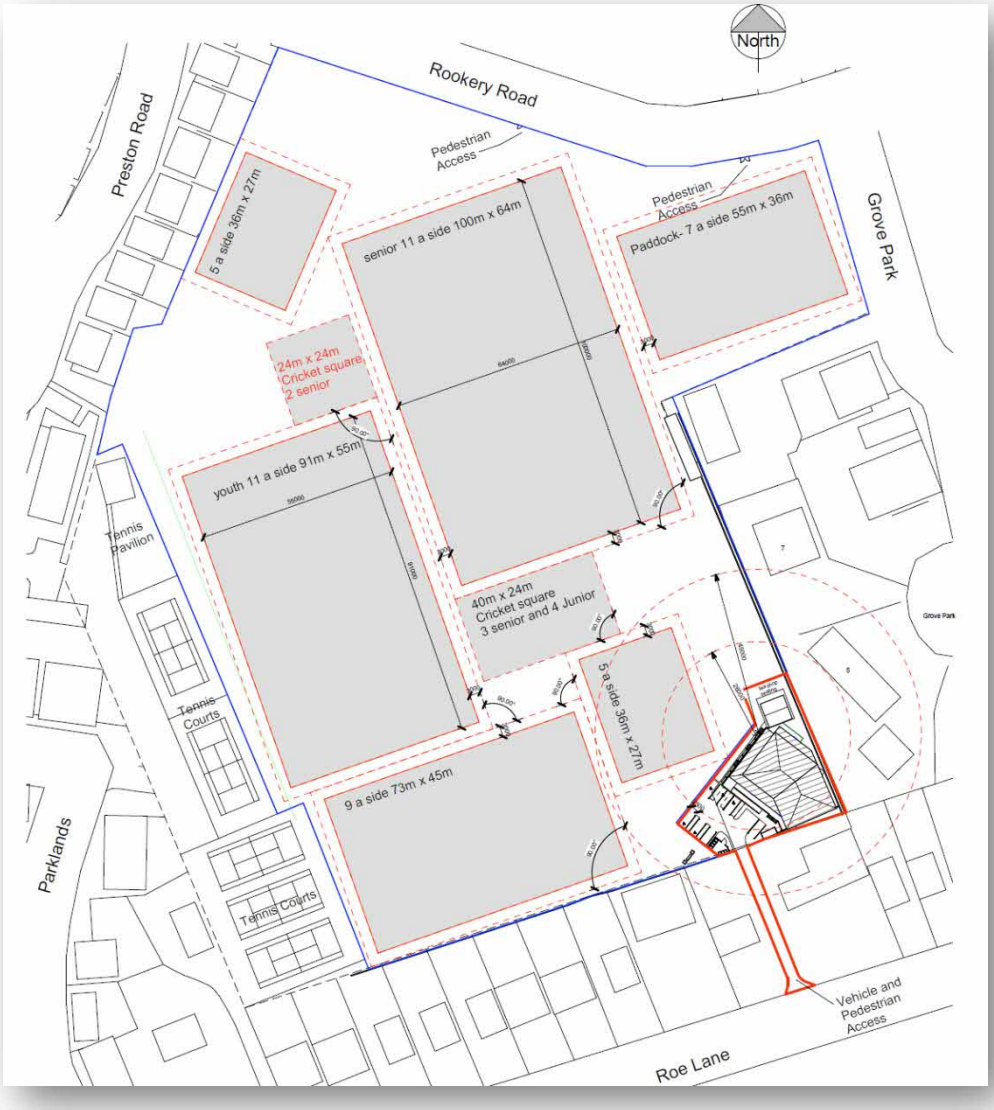

Figure 4.1: Proposed Development boundary outline (edged in red)

5. LIGHTING STRATEGY

5.1 Lighting Brief

5.1.1 The objective of the lighting strategy is to guarantee that the lighting fulfills its intended function and adheres to industry guidance on obtrusive lighting.

5.1.2 This ensures the safety and comfort of on-site activities during nighttime hours, all while actively reducing the risk of disruptive light.

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

- SHD1036-SHD-HLG-ROOK-DR-EO-Lighting Layout-R0
- SHD1036-SHD-HLG-ROOK-CA-EO-Lighting Calculation-R0

5.2 Key Areas Requiring Lighting

5.2.1 Lighting is required within the following areas:

- Periphery of the clubhouse

5.3 Lighting Criteria

5.3.1 Outdoor artificial lighting is to be provided for the following areas:

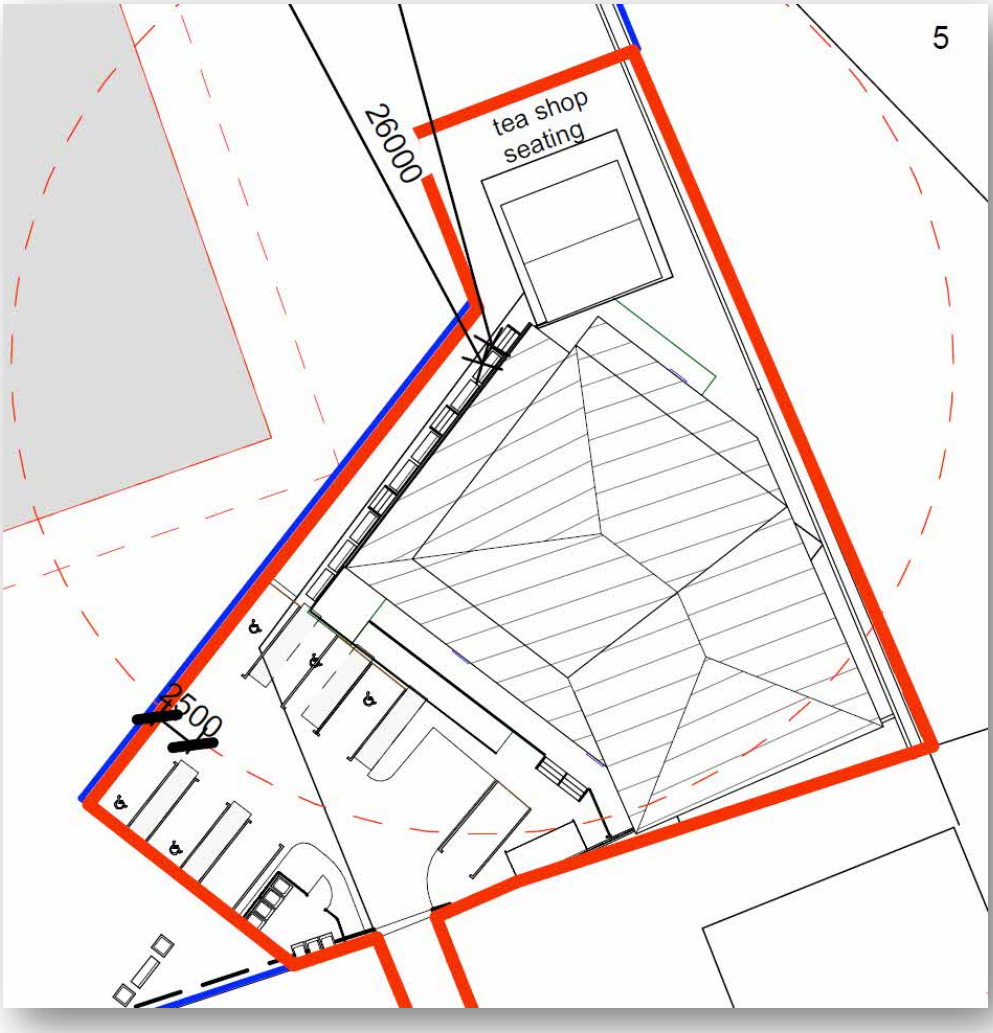

Figure 5.1: Clubhouse area to be illuminated

5.3.2 Figure 5.1 shows the proposed clubhouse, which will have twelve wall mounted bulkhead LED luminaires to illuminate the areas immediately outside to ensure people using the facility during the hours of darkness can navigate safely around the facility.

5.4 Lighting Calculations and Modelling

5.4.1 An external lighting design has been prepared by SHD Lighting Consultancy Ltd for the Proposed Development off Roe Lane, Southport.

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

5.4.3 The site was modeled, replicating the design provided by others, using industry-standard software Dialux.

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

5.4.5 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.

5.4.6 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.

5.4.7 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.

5.4.8 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.

5.5 Maintenance Factors

5.5.1 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.

5.5.2 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.

5.5.3 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.

5.5.4 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.

5.5.5 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. OUTDOOR LIGHTING REQUIREMENTS

6.1 Proposed Lighting Requirements

6.1.1 When carrying out the lighting design, no defined lighting levels have been used however through careful selection of the proposed LED luminaires and a considered approach to where the LED luminaires have been proposed, ensuring there will be minimal light spill onto the surrounding environment.

6.1.2 Additionally, lighting has been designed in accordance with obtrusive light guidance, to ensure that obtrusive light potential is minimised in accordance with E3 Environmental Zone criteria.

6.1.3 It is proposed that the external lighting shall consist of twelve wall-mounted Led bulkhead luminaires, each using neutral white LED light sources, mounted between 1700mm and 2000mm from the finished floor level.

6.2 Lighting Methodology

6.2.1 The proposed lighting arrangement around the clubhouse, consists of twelve wall-mounted LED bulkhead luminaires, mounted between 1700mm to 2000mm from finished floor level.

6.2.2 The circular luminaires are constructed from die-cast aluminium which provides good vandal resistant properties, with a polycarbonate lens.

6.2.3 To minimise sky glow, each bulkhead luminaire has an upper hood, which prevents upward light spill.

6.2.4 The outdoor lighting shall be group switched and will operate using an externally mounted photocell, to ensure lights cannot be left on during hours of daylight.

6.2.5 It is proposed that all the outdoor lighting will have a manual override switch facility so the lighting can be turned off entirely when not required or for maintenance purposes.

Figure 6.1: Gemma Lighting Porchester Hood LED luminaire

6.2.6 Lighting performance parameters for the proposed lighting are outlined in Table 6.1 below

LUMINAIRE SPECIFICATION	
Location:	Externally mounted around the clubhouse
Luminaire Manufacturer:	Gemma Lighting
Luminaire model ref:	Porchester 15w circular eyelid LED
Luminaire style:	Bulkhead
Mounting height:	1700mm to 2000mm
Mounting type:	Wall-mounted
Light source:	4000k neutral white LED
Luminaire control:	Group switched via photocell with manual override function.

Table 6.1: Clubhouse lighting performance parameters

Figure 6.2: Clubhouse lighting -northwest elevation

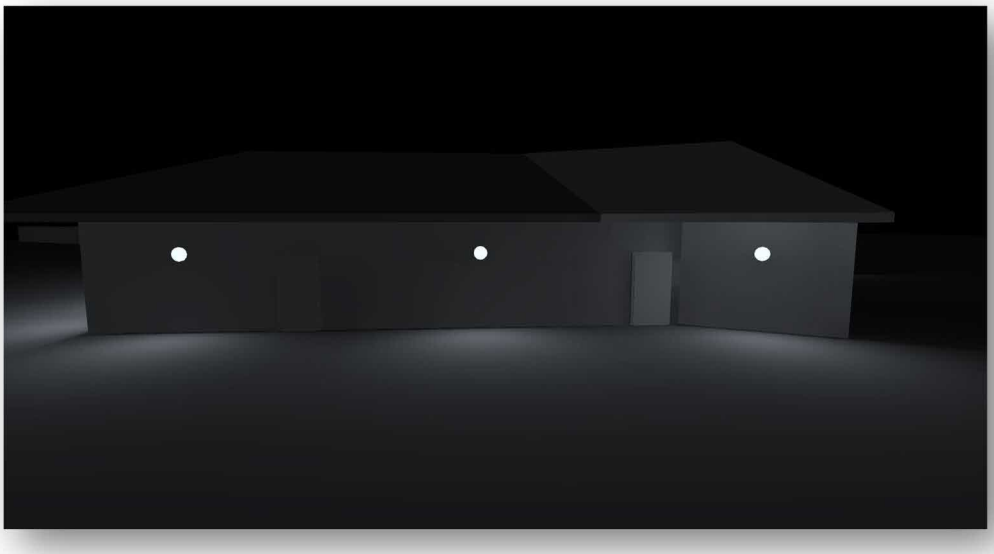

Figure 6.3: Clubhouse lighting - southwest elevation

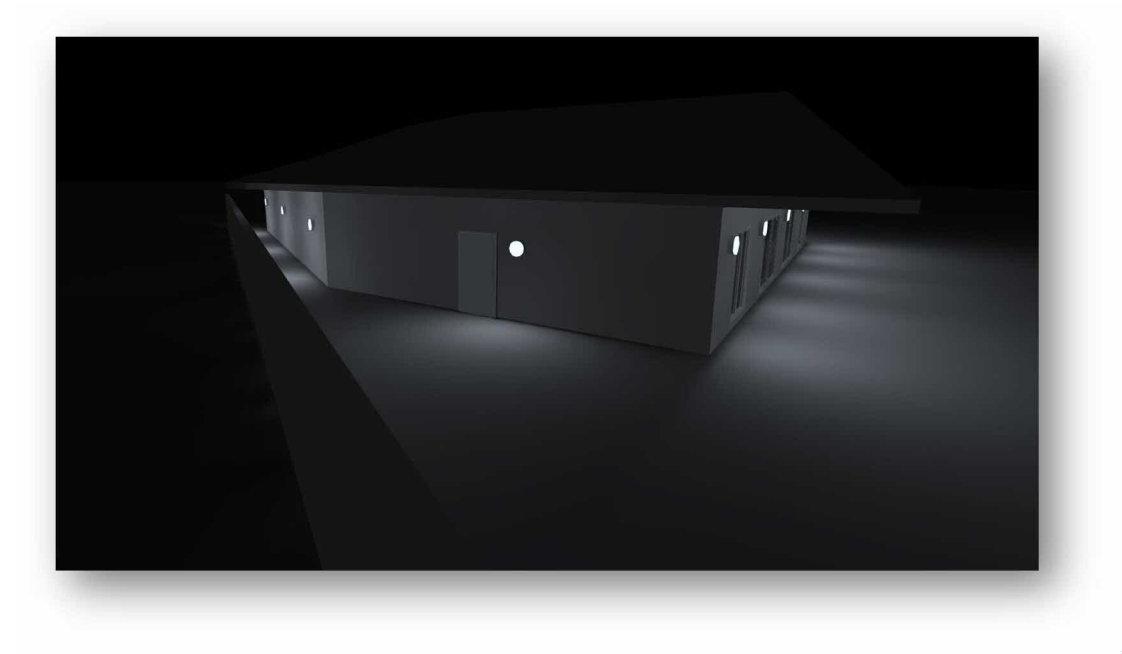

Figure 6.4: Clubhouse lighting – northeast elevation

6.2.7 It is to be noted that the luminaire models shown in the light renders in Figure 6.2 to 6.4, show a circular luminaire, whereas the manufacturer's photometric files are for a luminaire with an integral eyelid hood, as can be seen in the polar diagram in figure 7.0 of this assessment report.

6.1 Sensitive Receptors

6.1.1 The Proposed Development is to replace an existing clubhouse, which is to be replaced with a new sports pavilion with four changing rooms, spectator facilities, and lounge facilities.

6.1.2 SHD Lighting Consultancy identified the house plots which are in the closest proximity and it is these sensitive receptors that have been included in the lighting calculation report.

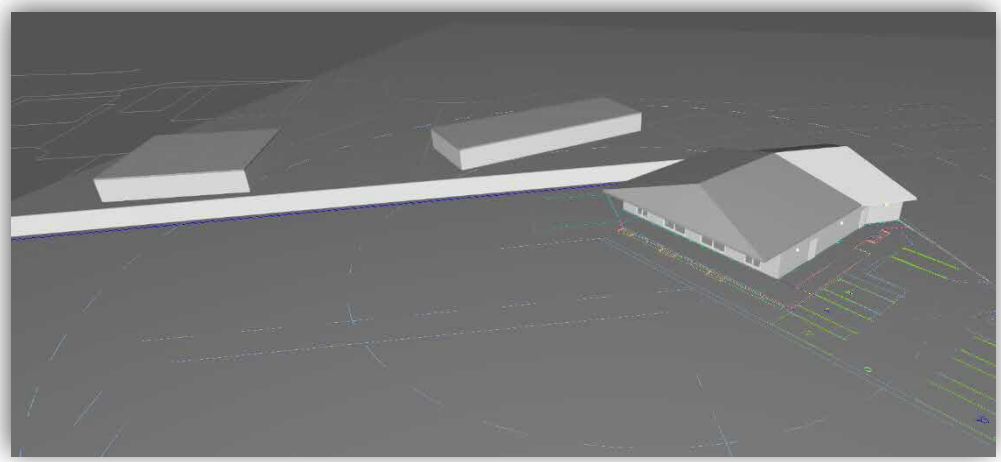

Figure 6.5: Lighting calculation image

6.1.3 The nearest residential dwelling to the Proposed Development are house 5 Grove Park which is 26 metres away and house 7 Grove Park which is 45m away from the clubhouse building.

6.1.4 There is a wall between the clubhouse and the gardens of houses 5 & 7. No information was provided for the height of the wall, so it has been assumed the overall height will be 2000mm from ground level.

6.1.5 Lighting calculation grids were drawn across each house façade that faces the Proposed Development, which would provide light levels measures in lux.

6.1.6 For an E3 Environmental Zone, two values of lux are defined as post-curfew and pre-curfew. post-curfew is considered to be after 23:00 until dawn, with pre-curfew being before 23:00 from dusk.

6.1.7 Light intrusion into windows for an E3 Environmental Zone pre-curfew has a maximum permissible level of 10.00 lux and post-curfew limits of 2.00 lux.

6.1.8 No information was available on the precise location of each of the housing plot window placements, so general full façade calculation grids were carried out.

6.2 Vertical Lighting Calculations: House 7 facing clubhouse

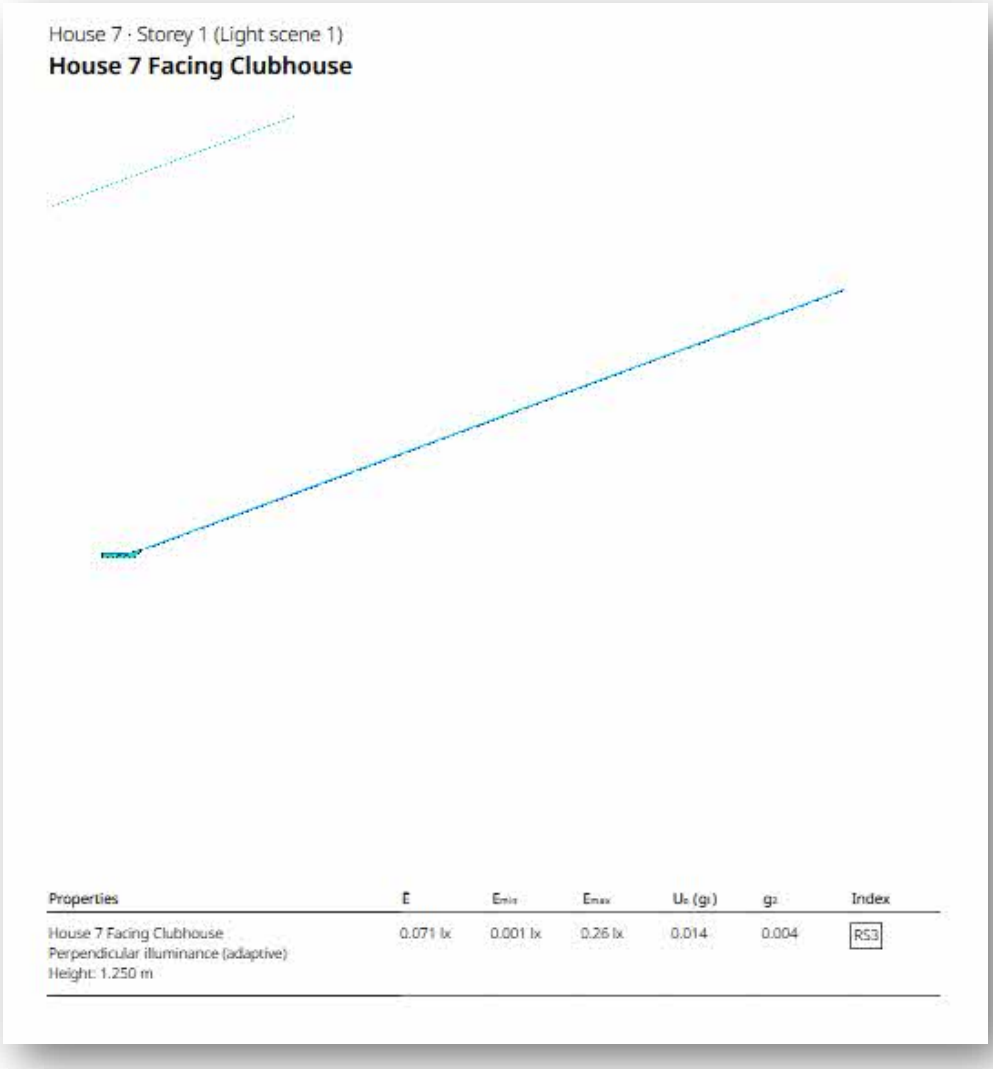

Figure 6.6: House 7 - vertical calculation grid

6.2.1 The house façade that faces the clubhouse, had a vertical lighting calculation grid measuring 2500mm from ground level across the full façade, as no information was provided for any window placement.

6.2.2 The maximum level of lux was measured at 0.071lux, which is below the 2.0lux maximum level, post curfew for an E3 Environmental Zone.

6.3 Vertical Lighting Calculations: House 7 facing pitch

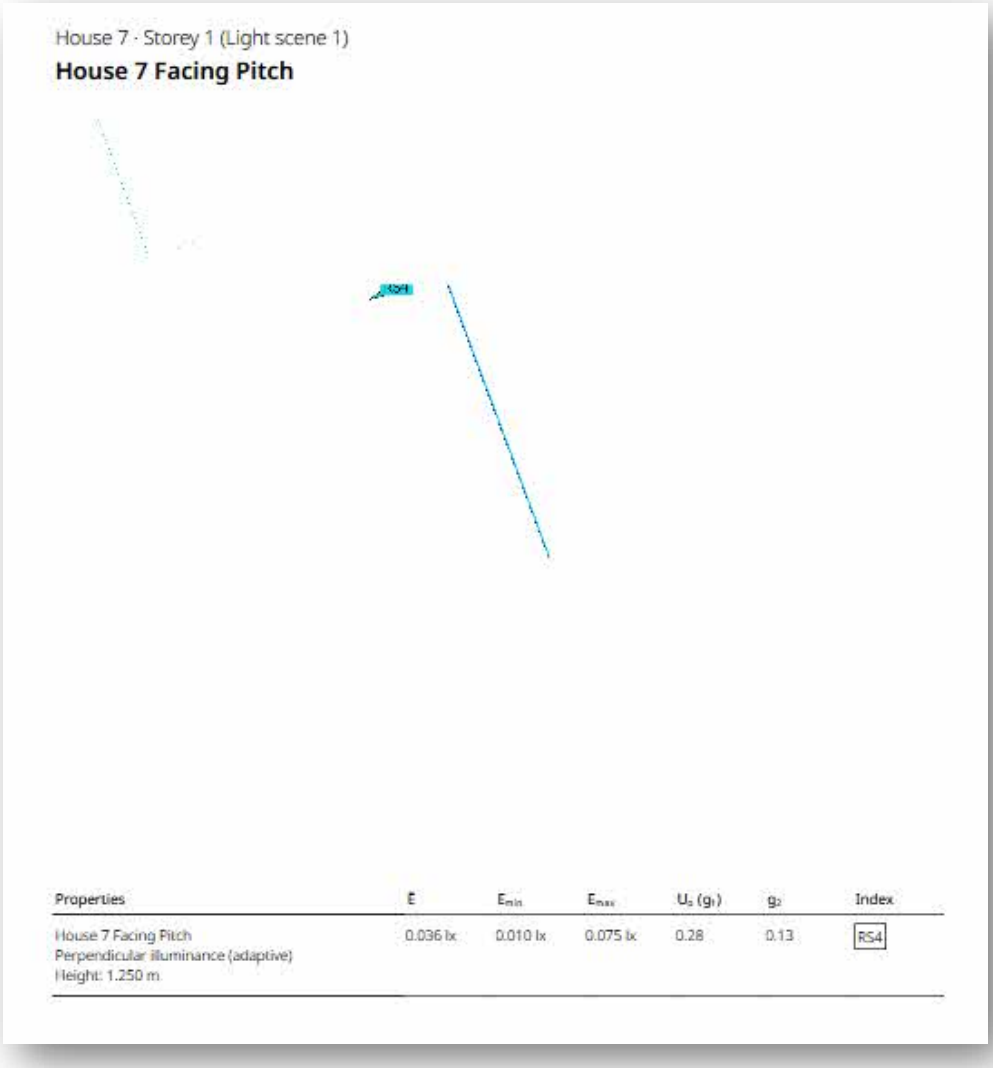

Figure 6.7: House 7 - vertical calculation grid

6.3.1 The house façade that faces the pitches, had a vertical lighting calculation grid measuring 2500mm from ground level across the full façade, as no information was provided for any window placement.

6.3.2 The maximum level of lux was measured at 0.036lux, which is below the 2.0lux maximum level, post curfew for an E3 Environmental Zone.

6.4 Vertical Lighting Calculations: House 5 facing clubhouse

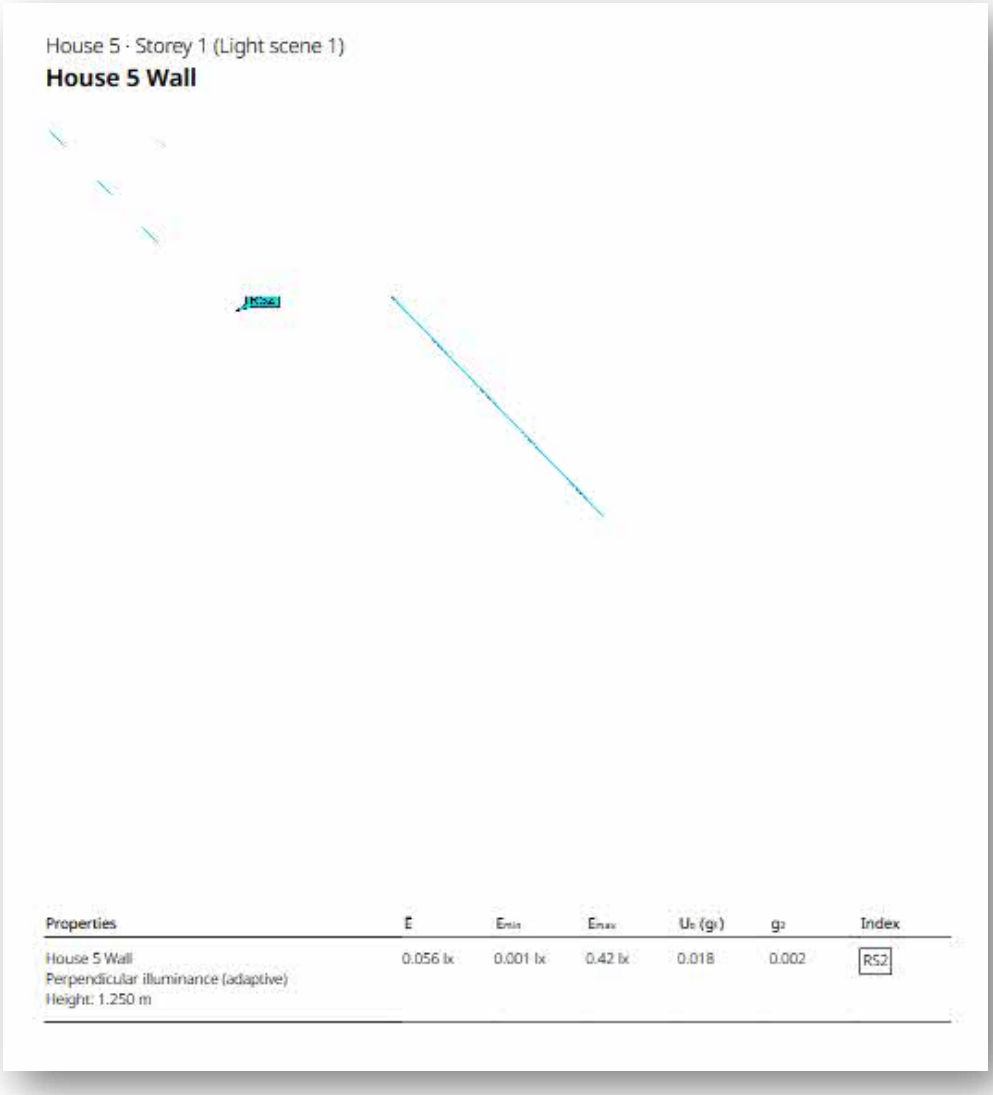

Figure 6.8: House 5 - vertical calculation grid

6.4.1 The house façade that faces the pitches, had a vertical lighting calculation grid measuring 2500mm from ground level across the full façade, as no information was provided for any window placement.

6.4.2 The maximum level of lux was measured at 0.056lux, which is below the 2.0lux maximum level, post curfew for an E3 Environmental Zone.

7. CONCLUSION

7.1 Design Commentary

7.1.1 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.

7.1.2 The outdoor lighting detailed in the lighting strategy will align with the specifications designated for an E3 Environmental Zone, as indicated in Tables 3.1 and 3.2.

7.1.3 Compliance with this lighting strategy guarantees a level of light conducive to safe and considerate pedestrian and driver movement during nighttime. Simultaneously, it mitigates the risk of intrusive light, confining it to an insignificant extent, all in accordance with the guidelines provided by ILP GN01:2021.

7.2 Indicative Light Spill

7.2.1 The indicative light spill drawing included in **Appendix A** demonstrates the ability to provide lighting for the Proposed Development and to ensure that a sensitive lighting solution is installed.

7.2.2 The light spill diagrams closely demonstrate the tight restrictions in light spill that are essential for protecting the immediate surroundings and receptors of the Proposed Development.

7.2.3 The proposed lighting uses luminaires that focus the light down onto the ground, reducing the likelihood of upward light and light spill, as the installation will achieve a 0% Upward Light Ratio.

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

7.3 Upward Light and Glare

7.3.1 Luminaires will integral physical upper eyelid hoods as standard.

7.3.2 As such, they are all compliant with a minimum luminous intensity class of G2. Thus, ensuring that the Upward Light Ratio for the installation is lower than the maximum permitted value of 5% for E3 Environmental Zones.

7.3.3 Through the use of professional-grade luminaires that comply with minimum luminous intensity limitations, glare will be suitably controlled and mitigated.

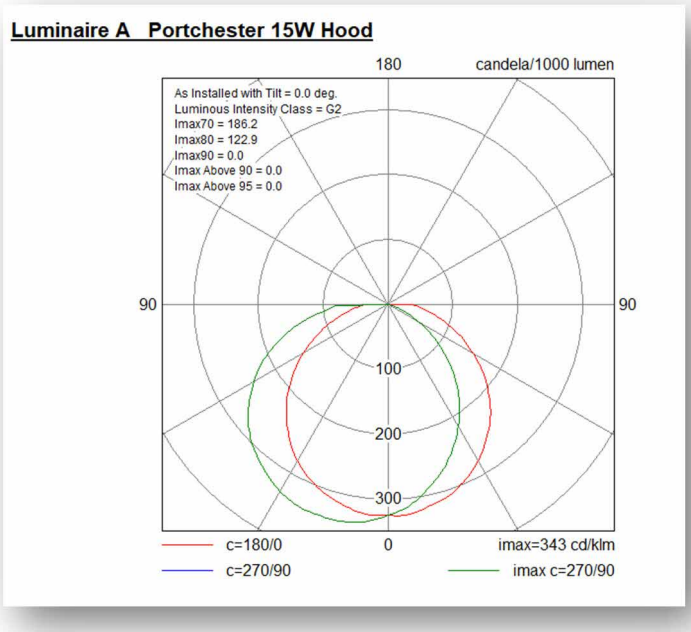

Figure 7.0: Gemma Lighting Porchester Hood polar diagram

7.3.4 The level of flux above the horizontal (Imax90) is 0.0, meaning there the upward light ratio is 0%

7.4 Mitigation

7.4.1 Following the guidelines outlined in ILP GN01/21, during the desktop site assessment, the designer must ensure that luminaires are directed downward in the location shown in **Appendix B.**

7.4.2 This arrangement is designed to mitigate the potential for glare from each LED luminaire. Any deviation from the specified luminaire model or locations shown in **Appendix B** will result in inaccuracies in the provided lighting calculations and Isolux line drawings.

7.4.3 In summary, our expert assessment indicates that the proposed lighting installation is not anticipated to yield significant 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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Proposed wall mounted luminaire

Qty 12

Luminaire:	Gemma Lighting Porchester Hood
Mounting Type:	Wall mounted See drawing notes for mounting height
Manufacturer Ref:	P15 A3N 00B
Lumen Output:	1.78klm
Charge Code:	42 0015 0000 100
Luminaire Wattage:	15w
Colour Temperature:	Neutral White (4000k)
Luminous Intensity:	G2
Control Gear:	Xitanium LED driver
Control Type:	Group switched using external photocell with manual override
Supply:	To be confirmed by others

UNIT IDENTIFICATION KEY:

WM** Proposed lighting column identification number

ISOLUX CONTOUR KEY:

Isolux contour line

LIGHT READING KEY:

0.06 Measurement of light (in lux) at ground level

REV	DESCRIPTION	DATE	BY
R0	INITIAL DESIGN FOR REVIEW AND COMMENT	20/08/2022	SRH

SHD
7 info@shdlighting.co.uk (07834 490 192 : www.shdlighting.co.uk

SCHEME:	ROOKERY SPORTS CLUB, SOUTHPORT
DRAWING:	LIGHT SPILL DRAWING
CLIENT:	RICHARD EVERY ARCHITECTS LTD
DRAWING NUMBER:	SHD1036-SHD-HLG-ROOK-DR-EO-Lighting Layout-R0
SHEET 1 OF 1	
CONTRACT NUMBER:	SHD1036

DRAWN:	SRH
CHECKED:	SRH
APPROVED:	
DATE:	20/08/2023
SCALE @ A1	1:250
REVISION:	R0

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

20/08/2023 16:13:00, SHD Plotstamp

9. APPENDIX B

9.1 Lighting Calculation Reports

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Date 20/08/2023

SHD1036-SHD-HLG-ROOK-CA-EO-Lighting Calculation-R0

Rookery Sports Club, Southport

Object
The Rookery Sports & Social Club
65 Roe Lane
Southport
PR9 7HR

Table of Contents

Product data sheets

Site 1

Site 1 -House 5

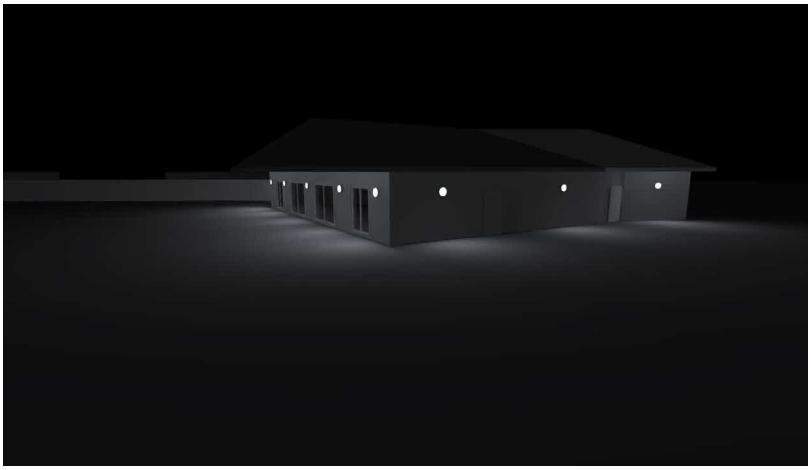
Storey 1

Site 1 -House 7

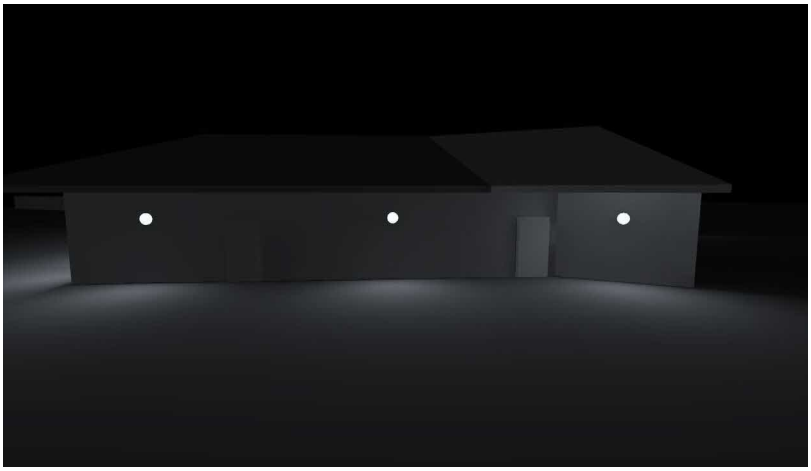
Storey 1

Images

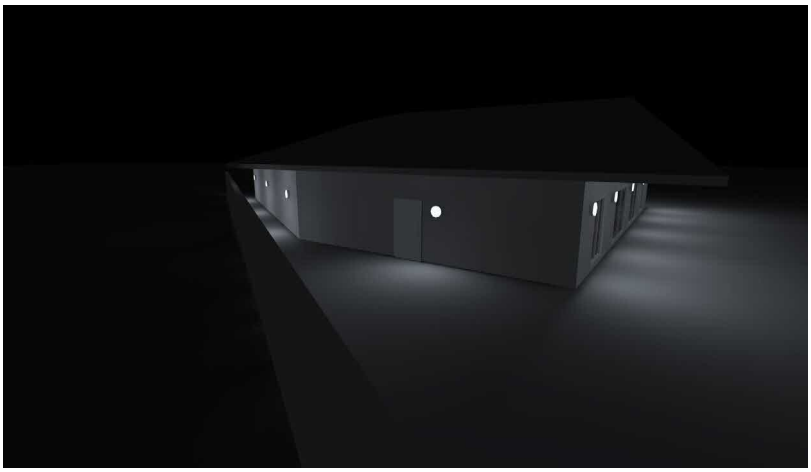
Northwest Elevation



Southwest Elevation



Northeast Elevation



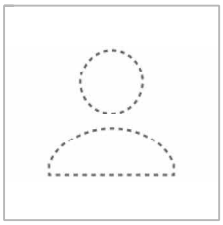
Luminaire list

Φ_{total}	P_{total}	Luminous efficacy
15540 lm	180.0 W	86.3 lm/W

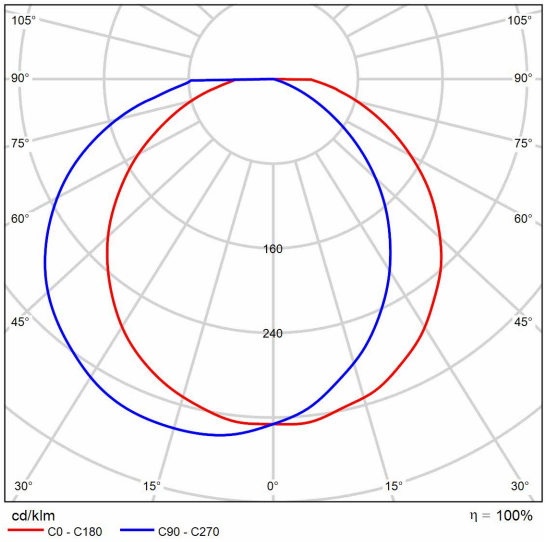
pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
12	Not yet a DIALux member	N/a	Portchester 15W Hood	15.0 W	1295 lm	86.4 lm/W

Product data sheet

Not yet a DIALux member -Portchester 15W Hood



Article No.	N/a
P	15.0 W
Φ_{Lamp}	1301 lm
$\Phi_{Luminaire}$	1295 lm
η	99.58 %
Luminous efficacy	86.4 lm/W
CCT	4000 K
CRI	100



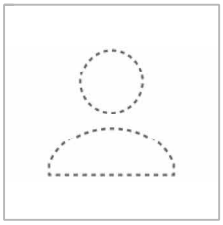
Polar LDC

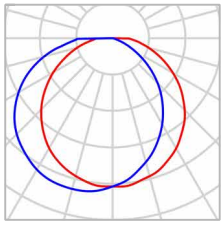
Site 1

Luminaire layout plan

Site 1

Luminaire layout plan





Manufacturer	Not yet a DIALux member
Article No.	N/a
Article name	Portchester 15W Hood
Fitting	1x PH15-A3N-00B

P	15.0 W
$\Phi_{Luminaire}$	1295 lm

Individual luminaires

X	Y	Mounting height	Luminaire
207.329 m	104.807 m	2.000 m	1
205.067 m	101.849 m	2.000 m	2
202.090 m	97.962 m	2.000 m	3
199.109 m	94.060 m	2.000 m	4
196.853 m	91.110 m	2.000 m	5
198.195 m	88.918 m	2.000 m	6
204.161 m	84.351 m	2.000 m	7
209.260 m	79.268 m	2.000 m	8
222.613 m	84.872 m	1.700 m	9
219.890 m	91.128 m	1.700 m	10
217.168 m	97.368 m	1.700 m	11
211.222 m	102.988 m	1.700 m	12

Site 1

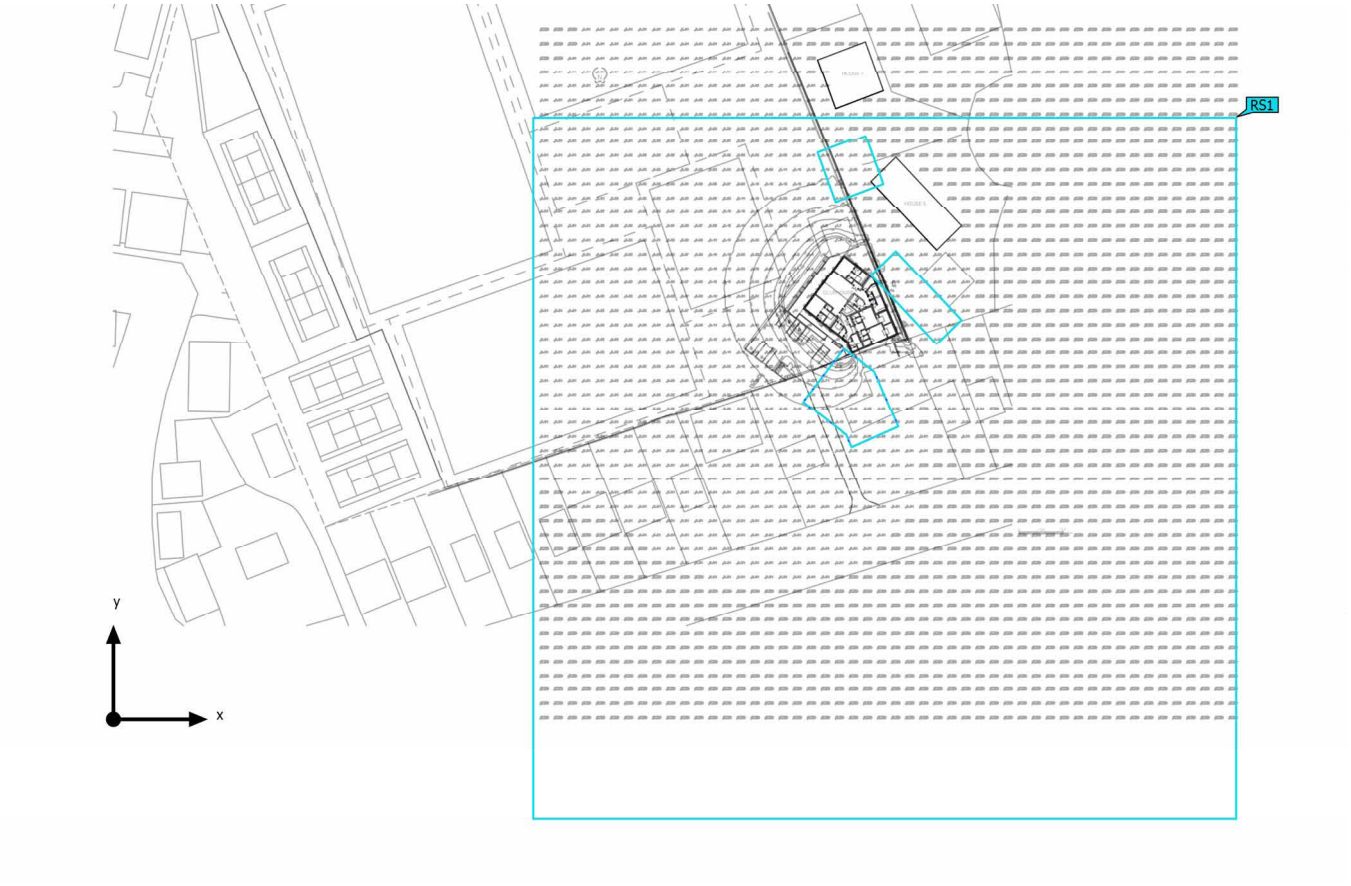
Luminaire list

Φ_{total}	P_{total}	Luminous efficacy
15540 lm	180.0 W	86.3 lm/W

pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
12	Not yet a DIALux member	N/a	Portchester 15W Hood	15.0 W	1295 lm	86.4 lm/W

Site 1 (Light scene 1)

Calculation objects



Site 1 (Light scene 1)

Calculation objects

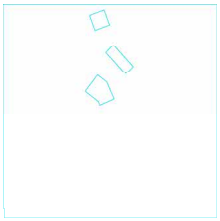
Surface result objects

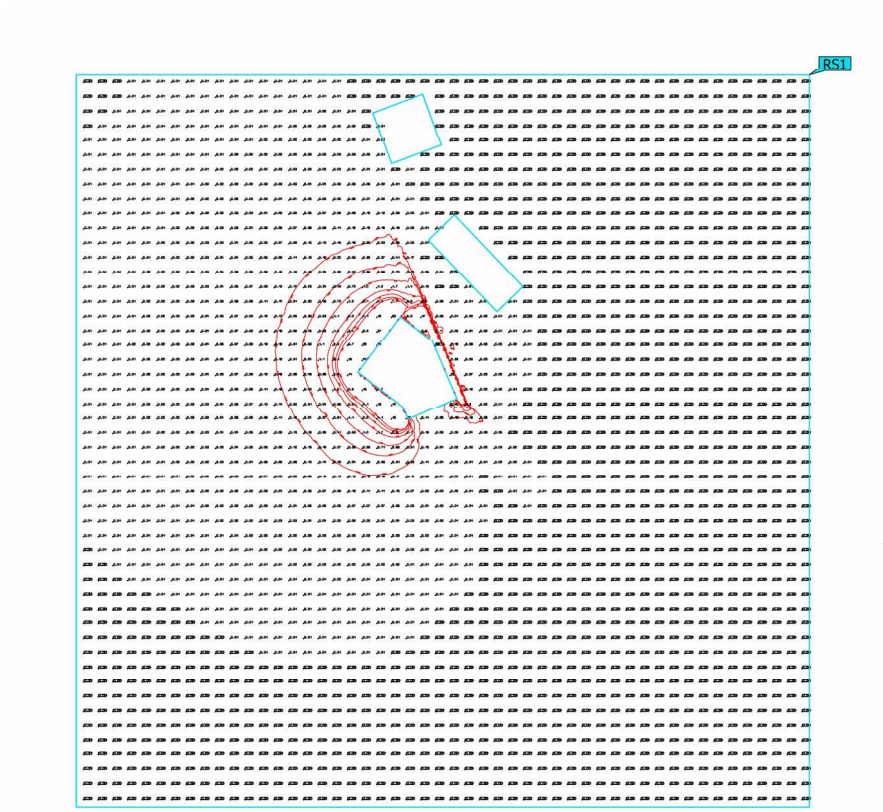
Properties	∅	min	max	U_o (g_1)	g_2	Index
Surface result object 2 Perpendicular illuminance (adaptive) Height: 0.000 m	0.24 lx	0.00 lx	94.6 lx	0.00	0.00	RS1
Surface result object 2 Luminance Height: 0.000 m	0.015 cd/m²	0.00 cd/m²	6.02 cd/m²	0.00	0.00	RS1

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

Site 1 (Light scene 1)

Surface result object 2



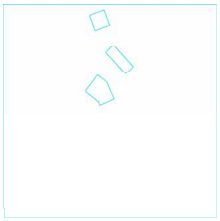


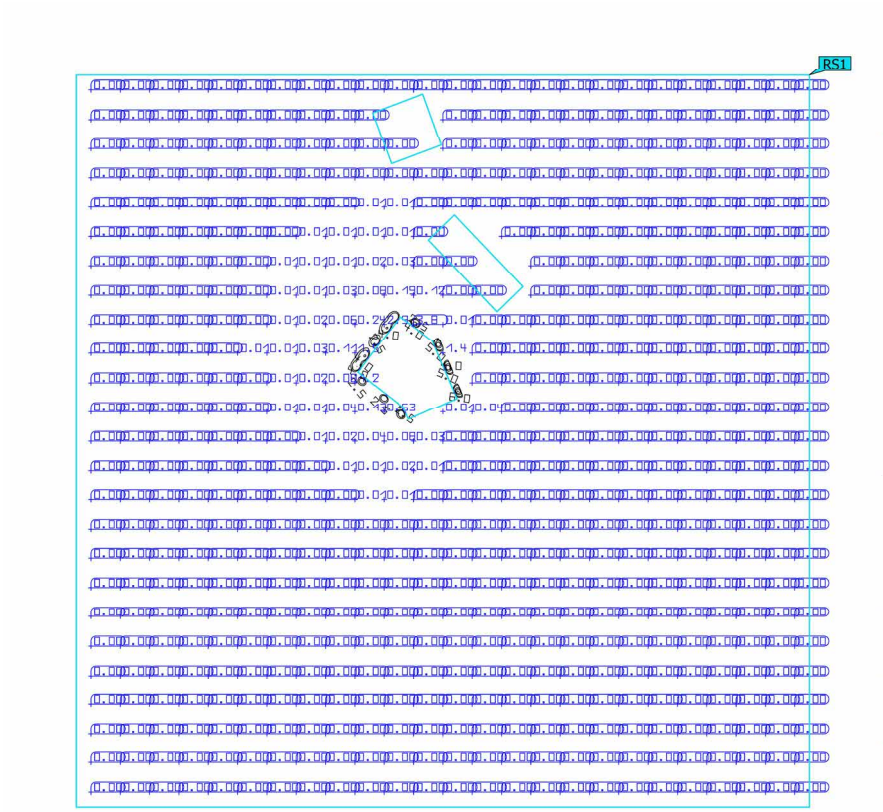
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
Surface result object 2 Perpendicular illuminance (adaptive) Height: 0.000 m	0.24 lx	0.00 lx	94.6 lx	0.00	0.00	RS1

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

Site 1 (Light scene 1)

Surface result object 2





Properties	⌀	min	max	U_o (g_1)	g_2	Index
Surface result object 2 Luminance Height: 0.000 m	0.015 cd/m²	0.00 cd/m²	6.02 cd/m²	0.00	0.00	RS1

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

House 5 · Storey 1 (Light scene 1)

Calculation objects

House 5 · Storey 1 (Light scene 1)

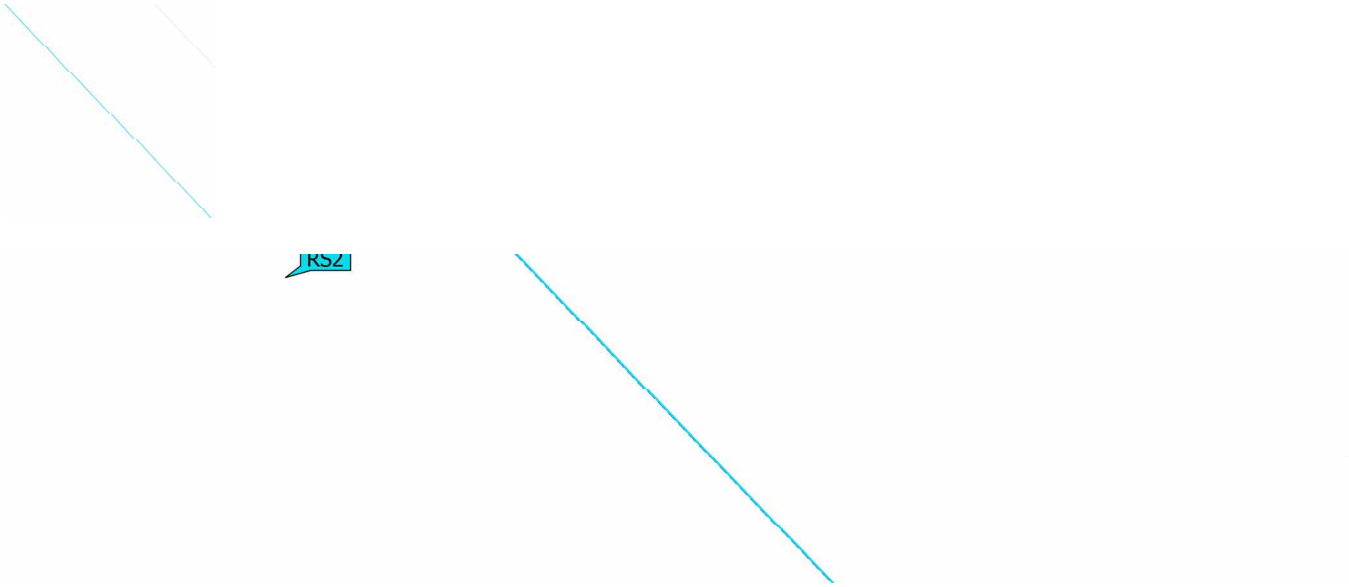
Calculation objects

Surface result objects

Properties	⌀	min	max	U_o (g_1)	g_2	Index
House 5 Wall Perpendicular illuminance (adaptive) Height: 1.250 m	0.056 lx	0.001 lx	0.42 lx	0.018	0.002	RS2
House 5 Wall Luminance Height: 1.250 m	0.009 cd/m²	0.000 cd/m²	0.067 cd/m²	-	0.00	RS2

House 5 · Storey 1 (Light scene 1)

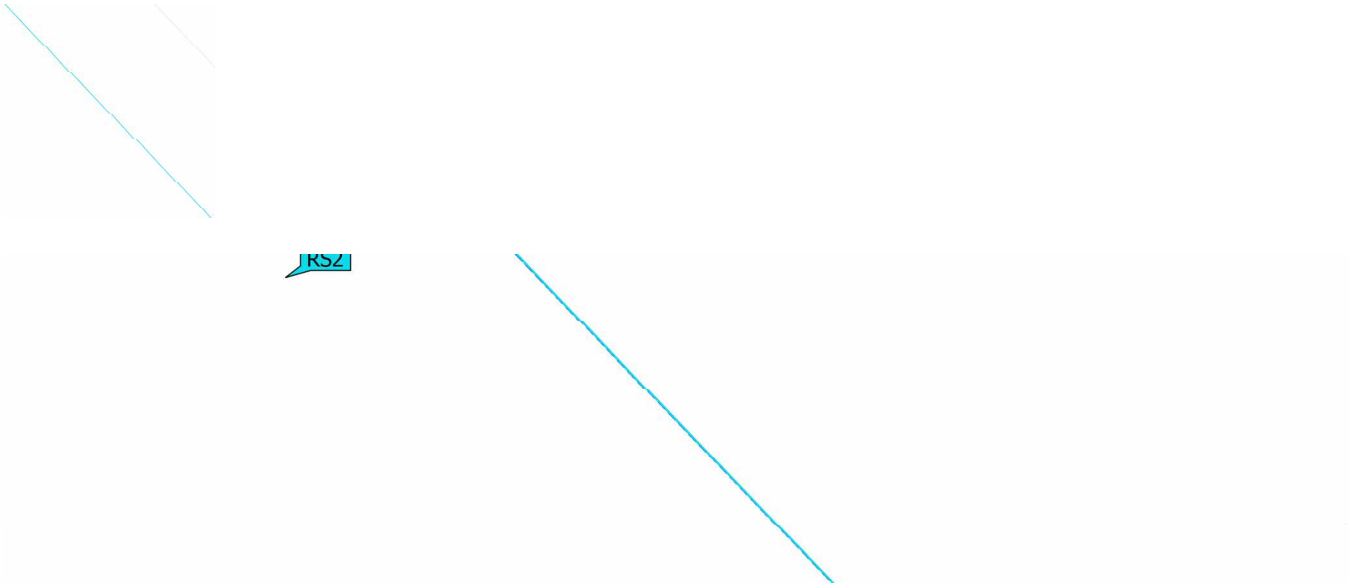
House 5 Wall



Properties	Ē	E_{min}	E_{max}	U_0 (g_1)	g_2	Index
House 5 Wall Perpendicular illuminance (adaptive) Height: 1.250 m	0.056 lx	0.001 lx	0.42 lx	0.018	0.002	RS2

House 5 · Storey 1 (Light scene 1)

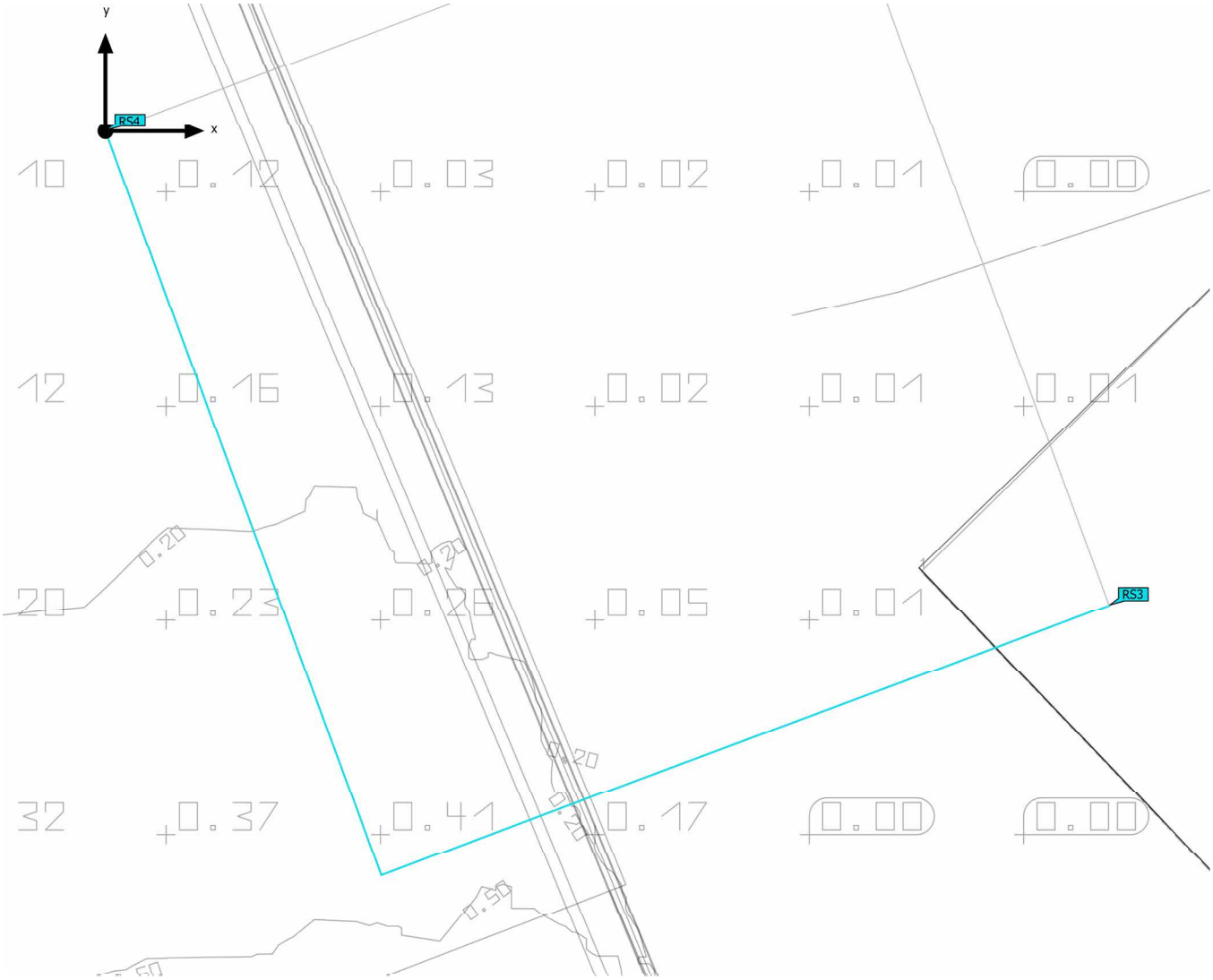
House 5 Wall



Properties	⌀	min	max	U_o (g_1)	g_2	Index
House 5 Wall Luminance Height: 1.250 m	0.009 cd/m²	0.000 cd/m²	0.067 cd/m²	-	0.00	RS2

House 7 · Storey 1 (Light scene 1)

Calculation objects



House 7 · Storey 1 (Light scene 1)

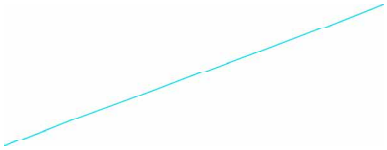
Calculation objects

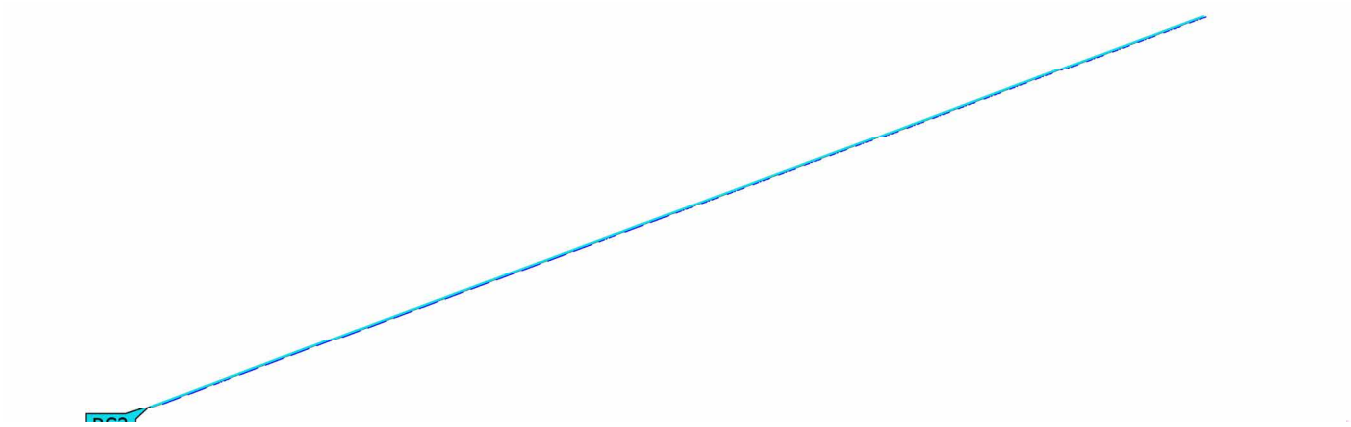
Surface result objects

Properties	⌀	min	max	U_o (g_1)	g_2	Index
House 7 Facing Clubhouse Perpendicular illuminance (adaptive) Height: 1.250 m	0.071 lx	0.001 lx	0.26 lx	0.014	0.004	RS3
House 7 Facing Clubhouse Luminance Height: 1.250 m	0.011 cd/m²	0.000 cd/m²	0.041 cd/m²	0.00	0.00	RS3
House 7 Facing Pitch Perpendicular illuminance (adaptive) Height: 1.250 m	0.036 lx	0.010 lx	0.075 lx	0.28	0.13	RS4
House 7 Facing Pitch Luminance Height: 1.250 m	0.006 cd/m²	0.002 cd/m²	0.012 cd/m²	-	0.17	RS4

House 7 · Storey 1 (Light scene 1)

House 7 Facing Clubhouse

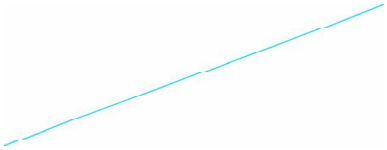


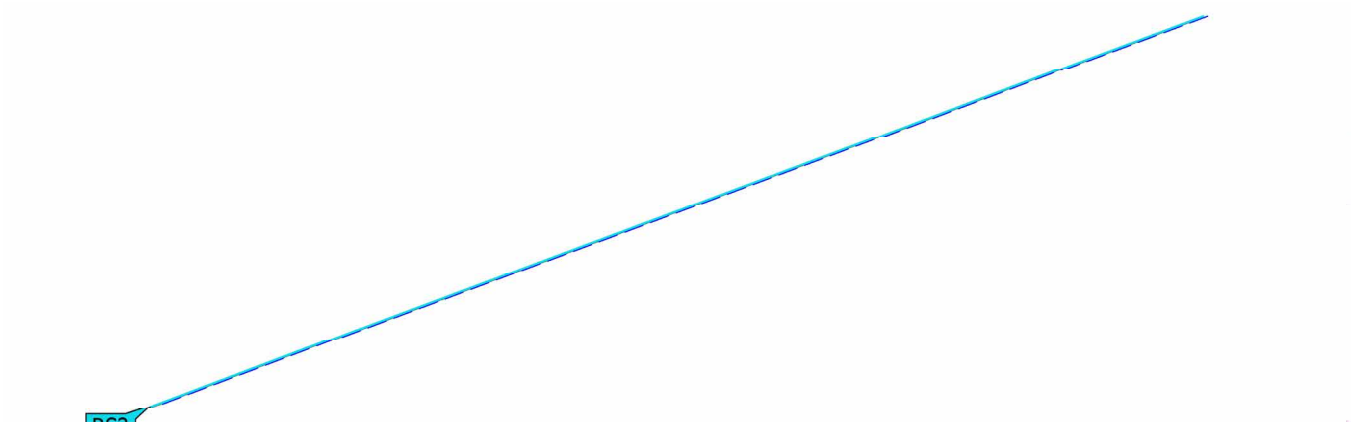


Properties	Ē	E_{min}	E_{max}	U_0 (g_1)	g_2	Index
House 7 Facing Clubhouse Perpendicular illuminance (adaptive) Height: 1.250 m	0.071 lx	0.001 lx	0.26 lx	0.014	0.004	RS3

Site 1 · House 7 · Storey 1 (Light scene 1)

House 7 Facing Clubhouse

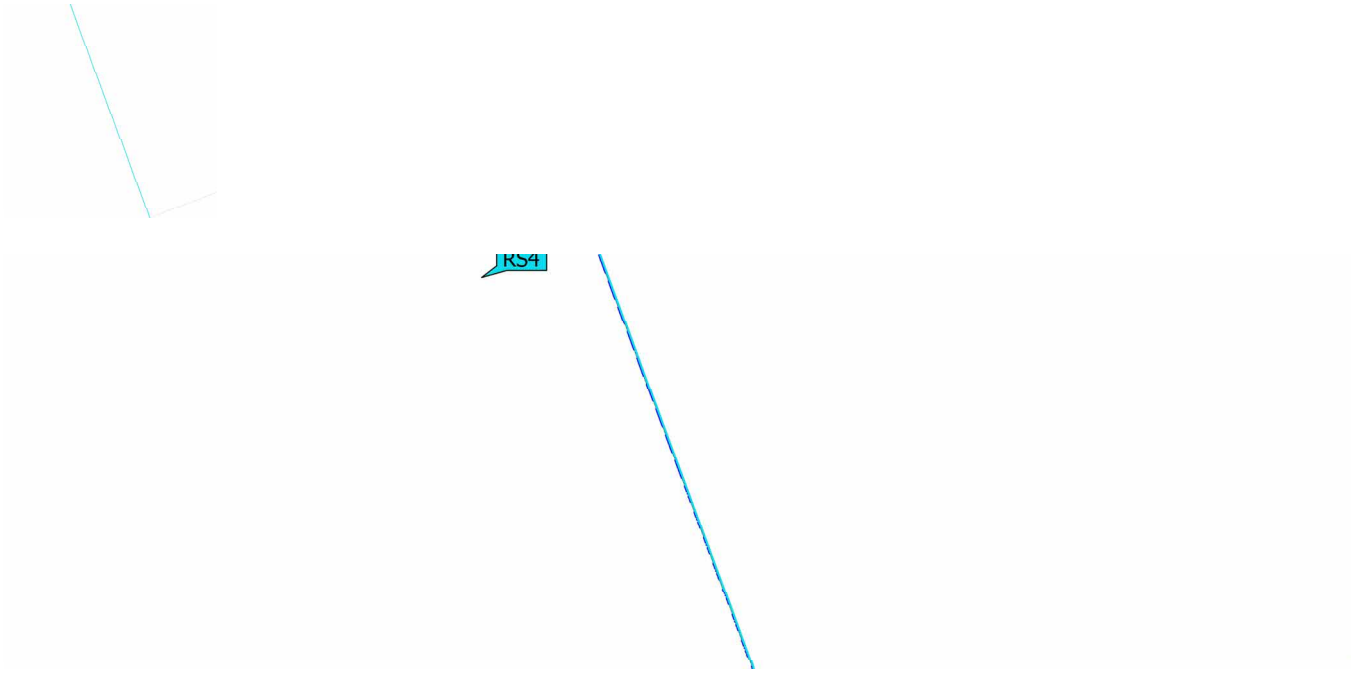




Properties	⌀	min	max	U_o (g_1)	g_2	Index
House 7 Facing Clubhouse Luminance Height: 1.250 m	0.011 cd/m²	0.000 cd/m²	0.041 cd/m²	0.00	0.00	RS3

House 7 · Storey 1 (Light scene 1)

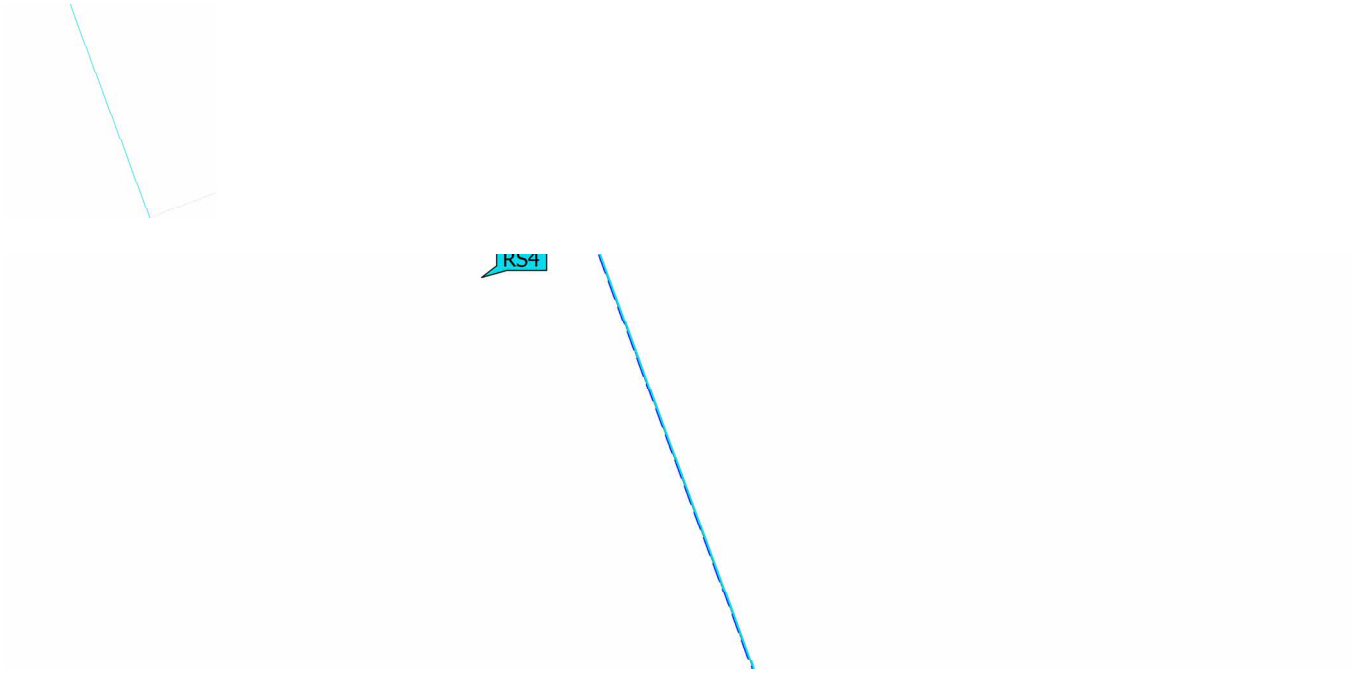
House 7 Facing Pitch



Properties	Ē	E_{min}	E_{max}	U_0 (g_1)	g_2	Index
House 7 Facing Pitch Perpendicular illuminance (adaptive) Height: 1.250 m	0.036 lx	0.010 lx	0.075 lx	0.28	0.13	RS4

House 7 · Storey 1 (Light scene 1)

House 7 Facing Pitch



Properties	⌀	min	max	U_o (g_1)	g_2	Index
House 7 Facing Pitch Luminance Height: 1.250 m	0.006 cd/m²	0.002 cd/m²	0.012 cd/m²	-	0.17	RS4

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).
Controlgroup	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/m² = 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/(m² * a)

Glossary

LLMF	(Engl. lamp lumen maintenance factor)/acc. to CIE97: 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 CIE97: 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 CIE97: 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 CIE97: 2005 by the formula RMFx LMFx LLMFx 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 CIE117. 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 EN12464-1. It is at the same height as the area of the visual task.

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 (Aerial view)

SENSITIVE RECEPTORS	
DESCRIPTION	COLOUR
Proposed Development (Clubhouse)	
House 7	
House 5	

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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The Portchester-Hood 15W is a classic and stylish IP65 rated vandal resistant circular LED bulkhead.

Manufactured from die-cast aluminium and fitted with a strong UV stabilised polycarbonate lens, the Portchester remains robust whilst offering a subtle diffused light.

Options include Dali, Microwave Sensor and Emergency.

Portchester Hood 15 W - LED Bulkhead

Bulkhead Lighting

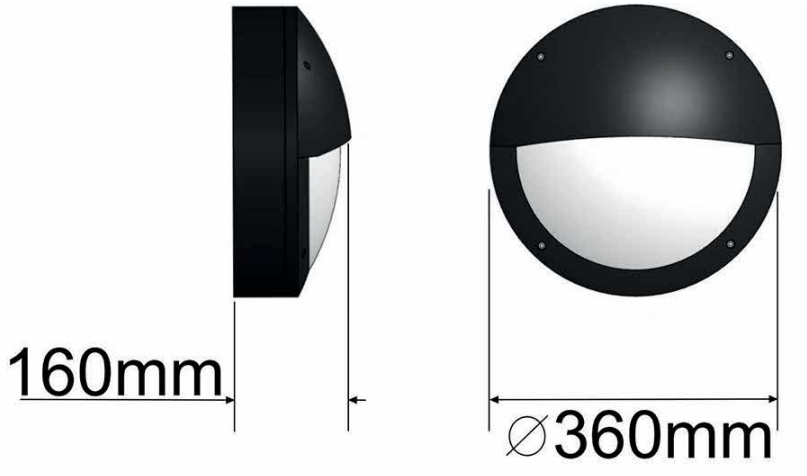
Features

- LED rating 1,782lm (4000K & 6000K).
- LED rating 1,508lm (3000K).
- Luminaire flux 1,301lm (4000K & 6000K).
- Luminaire flux 1,101lm (3000K).
- 3000K (WW), 4000K (NW) and 6000K (CW) colour temperature options.
- -20 to +40°C operating temperature (Emergency 0 to +40°C).
- Long life span > 65,000hrs.
- Osram LED and Osram Driver.
- Hood eyelid cover allows additional impact resistance and reduces upwards light.
- Standard weight: 3.7Kg
- Tamper proof fixings for increased vandal resistance.
- Die-cast aluminium body and strong UV stabilised polycarbonate lens.

Applications

- Hospitals
- Car Parks
- Schools
- Hotels
- Walkways
- Stairwells

www.gemmalighting.com
0800 999 5201



Specifications

Portchester Hood 15W

Item Number	Description	Light Source	LED Rating (lm)	Total Wattage (W)	Colour Name	CCT(K)	CRI	Voltage	Driver Current (mA)	Luminaire Flux (lm)	Luminaire Efficacy (lm/W)	Kg	Unit Colour	Face
Standard - Black														
PH15-A3C-00B	Portchester-Hood-15W-LED-AC-6K-Std-Black	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	3.7	Black	Hood
PH15-A3N-00B	Portchester-Hood-15W-LED-AC-4K-Std-Black	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	3.7	Black	Hood
PH15-A3W-00B	Portchester-Hood-15W-LED-AC-3K-Std-Black	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	3.7	Black	Hood
Standard- Grey														
PH15-A3C-00G	Portchester-Hood-15W-LED-AC-6K-Std-Grey	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	3.7	Grey	Hood
PH15-A3N-00G	Portchester-Hood-15W-LED-AC-4K-Std-Grey	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	3.7	Grey	Hood
PH15-A3W-00G	Portchester-Hood-15W-LED-AC-3K-Std-Grey	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	3.7	Grey	Hood
Standard- Black - Emergency														
PH15-A3C-01B	Portchester-Hood-15W-LED-AC-6K-Std-E3-Black	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	4.2	Black	Hood
PH15-A3N-01B	Portchester-Hood-15W-LED-AC-4K-Std-E3-Black	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	4.2	Black	Hood
PH15-A3W-01B	Portchester-Hood-15W-LED-AC-3K-Std-E3-Black	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	4.2	Black	Hood
Standard- Grey - Emergency														
PH15-A3C-01G	Portchester-Hood-15W-LED-AC-6K-Std-E3-Grey	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	4.2	Grey	Hood
PH15-A3N-01G	Portchester-Hood-15W-LED-AC-4K-Std-E3-Grey	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	4.2	Grey	Hood
PH15-A3W-01G	Portchester-Hood-15W-LED-AC-3K-Std-E3-Grey	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	4.2	Grey	Hood
Standard- Black - Microwave														
PH15-A3C-02B	Portchester-Hood-15W-LED-AC-6K-Std-MW-Black	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	3.9	Black	Hood
PH15-A3N-02B	Portchester-Hood-15W-LED-AC-4K-Std-MW-Black	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	3.9	Black	Hood
PH15-A3W-02B	Portchester-Hood-15W-LED-AC-3K-Std-MW-Black	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	3.9	Black	Hood

Specifications

Portchester Hood 15W

Item Number	Description	Light Source	LED Rating (lm)	Total Wattage (W)	Colour Name	CCT(K)	CRI	Voltage	Driver Current (mA)	Luminaire Flux (lm)	Luminaire Efficacy (lm/W)	Kg	Unit Colour	Face
Standard- Grey- Microwave														
PH15-A3C-02G	Portchester-Hood-15W-LED-AC-6K-Std-MW-Grey	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	3.9	Grey	Hood
PH15-A3N-02G	Portchester-Hood-15W-LED-AC-4K-Std-MW-Grey	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	3.9	Grey	Hood
PH15-A3W-02G	Portchester-Hood-15W-LED-AC-3K-Std-MW-Grey	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	3.9	Grey	Hood
Standard - Black- Microwave- Emergency														
PH15-A3C-03B	Portchester-Hood-15W-LED-AC-6K-Std-MW-E3-Black	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	4.4	Black	Hood
PH15-A3N-03B	Portchester-Hood-15W-LED-AC-4K-Std-MW-E3-Black	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	4.4	Black	Hood
PH15-A3W-03B	Portchester-Hood-15W-LED-AC-3K-Std-MW-E3-Black	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	4.4	Black	Hood
Standard - Grey - Microwave - Emergency														
PH15-A3C-03G	Portchester-Hood-15W-LED-AC-6K-Std-MW-E3-Grey	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	4.4	Grey	Hood
PH15-A3N-03G	Portchester-Hood-15W-LED-AC-4K-Std-MW-E3-Grey	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	4.4	Grey	Hood
PH15-A3W-03G	Portchester-Hood-15W-LED-AC-3K-Std-MW-E3-Grey	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	4.4	Grey	Hood
Dali - Black														
PH15-A3C-20B	Portchester-Hood-15W-LED-AC-6K-Dali-Black	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	3.7	Black	Hood
PH15-A3N-20B	Portchester-Hood-15W-LED-AC-4K-Dali-Black	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	3.7	Black	Hood
PH15-A3W-20B	Portchester-Hood-15W-LED-AC-3K-Dali-Black	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	3.7	Black	Hood
Dali - Grey														
PH15-A3C-20G	Portchester-Hood-15W-LED-AC-6K-Dali-Grey	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	3.7	Grey	Hood
PH15-A3N-20G	Portchester-Hood-15W-LED-AC-4K-Dali-Grey	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	3.7	Grey	Hood
PH15-A3W-20G	Portchester-Hood-15W-LED-AC-3K-Dali-Grey	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	3.7	Grey	Hood
Dali - Black - Emergency														
PH15-A3C-21B	Portchester-Hood-15W-LED-AC-6K-Dali-E3-Black	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	4.2	Black	Hood
PH15-A3N-21B	Portchester-Hood-15W-LED-AC-4K-Dali-E3-Black	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	4.2	Black	Hood
PH15-A3W-21B	Portchester-Hood-15W-LED-AC-3K-Dali-E3-Black	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	4.2	Black	Hood
Dali - Grey- Emergency														
PH15-A3C-21G	Portchester-Hood-15W-LED-AC-6K-Dali-E3-Grey	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	4.2	Grey	Hood
PH15-A3N-21G	Portchester-Hood-15W-LED-AC-4K-Dali-E3-Grey	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	4.2	Grey	Hood
PH15-A3W-21G	Portchester-Hood-15W-LED-AC-3K-Dali-E3-Grey	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	4.2	Grey	Hood
Dali - Black - Microwave														
PH15-A3C-22B	Portchester-Hood-15W-LED-AC-6K-Dali-MW-Black	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	3.9	Black	Hood
PH15-A3N-22B	Portchester-Hood-15W-LED-AC-4K-Dali-MW-Black	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	3.9	Black	Hood
PH15-A3W-22B	Portchester-Hood-15W-LED-AC-3K-Dali-MW-Black	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	3.9	Black	Hood
Dali - Grey - Microwave														
PH15-A3C-22G	Portchester-Hood-15W-LED-AC-6K-Dali-MW-Grey	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	3.9	Grey	Hood
PH15-A3N-22G	Portchester-Hood-15W-LED-AC-4K-Dali-MW-Grey	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	3.9	Grey	Hood
PH15-A3W-22G	Portchester-Hood-15W-LED-AC-3K-Dali-MW-Grey	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	3.9	Grey	Hood

Specifications

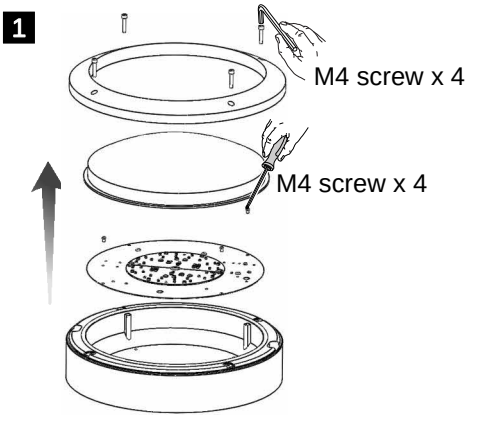
Portchester Hood 15W

Item Number	Description	Light Source	LED Rating (lm)	Total Wattage (W)	Colour Name	CCT(K)	CRI	Voltage	Driver Current (mA)	Luminaire Flux (lm)	Luminaire Efficacy (lm/W)	Kg	Unit Colour	Face
Dali - Black - Microwave - Emergency														
PH15-A3C-23B	Portchester-Hood-15W-LED-AC-6K-Dali-MW-E3-Black	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	4.4	Black	Hood
PH15-A3N-23B	Portchester-Hood-15W-LED-AC-4K-Dali-MW-E3-Black	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	4.4	Black	Hood
PH15-A3W-23B	Portchester-Hood-15W-LED-AC-3K-Dali-MW-E3-Black	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	4.4	Black	Hood
Dali - Grey- Microwave - Emergency														
PH15-A3C-23G	Portchester-Hood-15W-LED-AC-6K-Dali-MW-E3-Grey	LED	1,782	15	CW	6K	Ra>70	220-240	350	1,301	87	4.4	Grey	Hood
PH15-A3N-23G	Portchester-Hood-15W-LED-AC-4K-Dali-MW-E3-Grey	LED	1,782	15	NW	4K	Ra>70	220-240	350	1,301	87	4.4	Grey	Hood
PH15-A3W-23G	Portchester-Hood-15W-LED-AC-3K-Dali-MW-E3-Grey	LED	1,508	15	WW	3K	Ra>80	220-240	350	1,101	73	4.4	Grey	Hood

Legend: **Std** = Standard. **3K** = Warm White (3000K). **4K** = Neutral White (4000K). **6K** = Cool White (6000K). **WW** = Warm White. **NW** = Neutral White. **CW** = Cool White.

	Power	Standard Kg	Kg	MW/PIR Kg	MW/PIR + Kg
	15W	3.4	3.9	3.6	4.1
	15W	3.7	4.2	3.9	4.4
	15W	3.7	4.2	3.9	4.4

1



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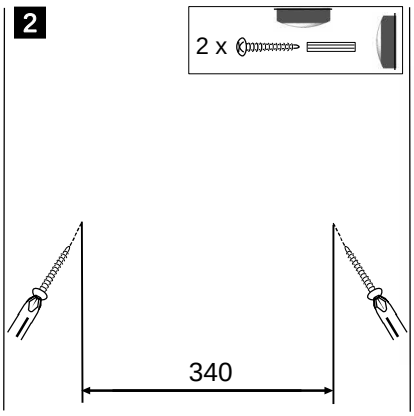

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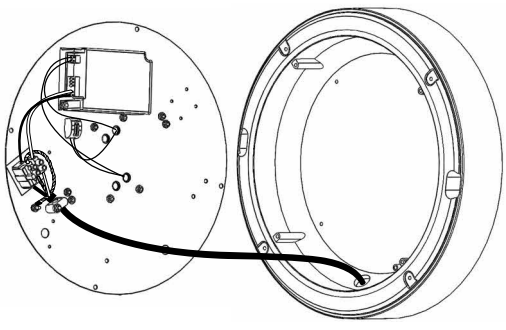

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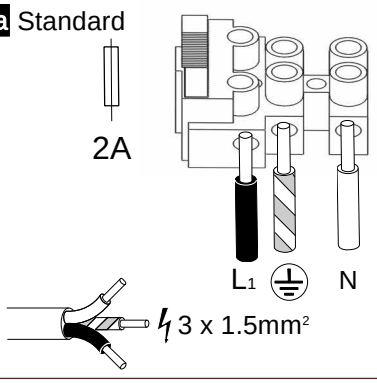
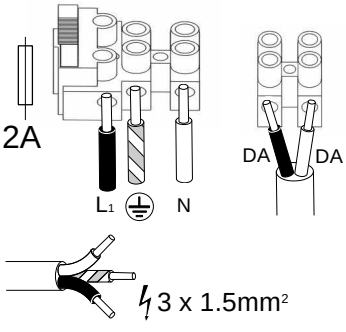
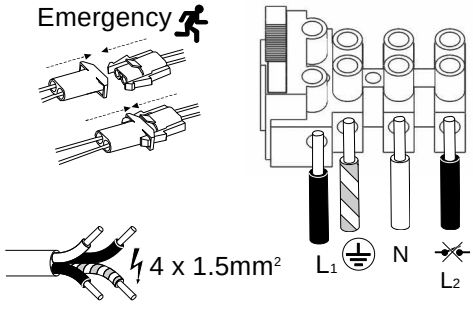


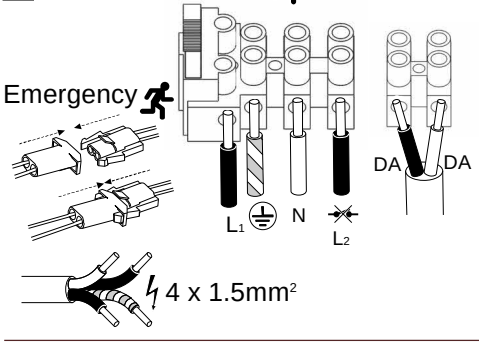
3b Standard + DALI



3c Standard + Emergency



3d DALI + Emergency



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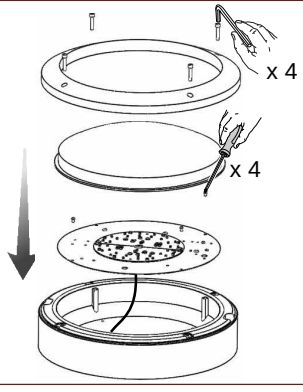

Operation & Maintenance

Failed light source should be replaced promptly or the circuit switched off to avoid possible damage to control gear.

Important - Safety

Before carrying out any servicing on these luminaires, ensure that the mains supply is fully isolated.

Disconnect the luminaire before insulation testing of the installation.

Circuit Breaker Type	C10	C16	B10	B16
Standard Luminaire	29	54	17	28
Dimmable Luminaire	76	136	45	80

i Microwave detection / PIR

MW / PIR Instructions

The light source contained in this luminaire shall only be replaced by the manufacturer or his service agent or a similar qualified person.

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