

BUILDINGS AND BUILT ENVIRONMENT

Britannia Victoria Ltd
Victoria Park Probation Centre
Manchester
Lighting Impact Assessment

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1. INTRODUCTION

Instruction

- 1.1 BWB Consulting Limited (BWB) was appointed by Britannia Victoria Ltd (the Client) to undertake a lighting impact assessment to support the planning application for 72 residential units through a mix of houses and apartments. The proposed development is to be located on Laindon Road in southeast Manchester.

Proposed Development

- 1.2 The proposed development comprises the demolition of an existing building and the subsequent construction of residential properties with associated landscaping and site infrastructure.
- 1.3 The Proposed Development Masterplan is included within **Appendix 1**.

Objectives

- 1.4 This report has been produced to identify the proposed lighting strategy and subsequent impact of the external lighting installation on the existing site environment and the wider locality.
- 1.5 A lighting installation is required to enable users to operate safely and reduce the fear of crime. Lighting is needed for both pedestrians and vehicle drivers. For pedestrians, lighting for good viewing conditions and avoidance of dark areas is necessary. For vehicle drivers the emphasis is on good lighting for vehicle movement and use of roads.
- 1.6 This report reviews the potential effects of new lighting and reviews methods of lighting the proposed external areas while limiting potentially obtrusive effects to receptors that may have a negative response to a change in their lighting condition. Nearby residential properties and wildlife / habitat which are found on, near or utilising the site are typical receptors considered for analysis.

Scope of Works

- 1.7 The Scope of work includes:
- Identification and assessment of receptors and their sensitivity.
 - Identification of required / anticipated lighting provisions for the proposed development; and
 - Assessment of the potential effects created by a new lighting strategy with respect to the baseline condition.

2. RELEVANT POLICY AND GUIDANCE

International guidance

Commission Internationale De L'Eclairage (CIE 150)

- 2.1 The purpose of this guide is to help formulate guidelines for assessing the environmental effects of outdoor lighting and to give recommended limits for relevant lighting parameters to contain the obtrusive effects of outdoor lighting within tolerable levels. As the obtrusive effects of outdoor lighting are best controlled initially by appropriate design, the guidance given is primarily applicable to new installations; however, some advice is also provided on remedial measures which may be taken for existing installations. This guide refers to the potentially adverse effects of outdoor lighting on both natural and man-made environments for people in most aspects of daily life, from residents, sightseers, transport users to environmentalists and astronomers.

Guidelines for Minimising Sky Glow (CIE 126)

- 2.2 These guidelines prepared by Commission Internationale De L'Eclairage provide general guidance for lighting designers and policy makers on the reduction of sky glow. The report gives recommendations about maximum permissible values for lighting installations. These values must be regarded as limiting values. Lighting designers should seek to meet the lowest specifications for the design. Other uses of the open air areas at night will usually result in less stringent sky-glow requirements. Practical implementation of the general guidance is left to National Regulations.

National guidance

National Planning Policy Framework (2021)

- 2.3 The Revised National Planning Policy Framework (NPPF) provides guidance relating to planning and pollution control for new development in England. The purpose of the planning system is to contribute to achievement of sustainable development. In relation to lighting, Paragraph 185 states: "Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation"

DEFRA's Lighting in the Countryside: Towards Good Practice (2001)

- 2.4 The Office of the Deputy Prime Minister (ODPM – now Department for Communities and Local Government) in conjunction with the Countryside Commission published 'Lighting in the Countryside: Towards Good Practice' in July 1997, and a revised issue in 2001. The guidance was developed to 'provide practical advice on the prevention and control of lighting effects through appropriate action by all those involved with lighting in the countryside'. Its objective is 'to identify good practice in the planning and design of lighting in rural areas; and advise on how it can be achieved, using case study examples'. The guide aims to provide an overview and common understanding of all aspects of good lighting practice stating that close co-operation and participation is

required for all those involved in planning, designing and installing lighting schemes. The guidance provides valuable information on lighting best practice and the standard methodology outlined in this guidance document has been followed as part of this assessment. Whilst the guidance relates to 'lighting in the countryside', it is considered best practice to adopt many of the principles contained within the guidance to sites of a more urban nature.

Institute of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light (2021)

- 2.5 The ILP has proposed lighting guidance and criteria for local authorities with a recommendation that they are incorporated at the local plan level. The guidance defines various forms of light pollution and describes a series of environmental zones (similar to the CIE 150 environmental zones). The ILP guidance provides suitable criteria against which the effects of artificial lighting can be assessed and is used in this assessment.
- 2.6 The ILP Guidance Notes recommends that the immediate environment is classified systematically as shown in **Table 1**. ILP Guidance Notes then make recommendations for limiting obtrusive light according to the environmental zone in which the lighting would be situated. The stringency depends on the capacity to absorb lighting effects, with Zone E0 requiring the strictest level of control and E4 the lowest.

Table 1. Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night- time activity

- 2.7 For each Environmental Zone, recommended obtrusive light limits for exterior lighting installations have also been determined. These are summarised in **Table 2**.

Table 2. Obtrusive Light Limitations for Exterior Lighting Installations

Light Technical Parameter	Application Conditions	Environmental Zones				
		E0	E1	E2	E3	E4
Illuminance in the vertical plane (E _v)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	<0.1 lx	1 lx	2 lx	5 lx
Upward light ratio (ULR) %		0	0	2.5	5	15

Institute of Lighting Professionals (ILP) BCT Guidance Note 08 for Bats and artificial lighting in the UK (2018)

- 2.8 This document is aimed at lighting professionals, lighting designers, planning officers, developers, bat workers/ecologists and anyone specifying lighting. It is intended to raise awareness of the impacts of artificial lighting on bats, and mitigation is suggested for various scenarios.
- 2.9 The Guidance Note provides recommendations for appropriate external lighting specification:
- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used.
 - LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
 - A warm white spectrum (ideally <2700 Kelvin) should be adopted to reduce blue light component.
 - Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
 - Column heights should be carefully considered to minimise light spill.
 - Only luminaires with an upward light ratio of 0% and with good optical control should be used.
 - Luminaires should always be mounted on the horizontal, ie no upward tilt.
 - As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

SLL Lighting Guide 6: The External Environment (2016)

- 2.10 The scope of this Lighting Guide is concerned with lighting for the external environment. This guide highlights the fact that lighting can greatly enhance the outdoor environment by creating a heightened sense of place, contributing to a real and perceived sense of security at night, enhancing the night-time experience for visitors and residents alike.
- 2.11 This Lighting Guide also highlights the issues with inappropriate external lighting and the potential to cause environmental nuisance. It states that artificial light should always be delivered to the point where it is required, and nowhere else. Issues such as brightness, direction and context also need to be considered in the development of the external lighting design to ensure that light pollution and light spill is avoided.
- 2.12 This Lighting Guide refers the reader to BS 5489-1, BS EN 13201-2 and BS EN 12464-2. These standards specify requirements for lighting of roads and tasks in most outdoor workplaces and their associated area in terms of quantity and quality of illumination. In addition, recommendations are given for good lighting practice.
- 2.13 The Lighting Guide states that local restrictions, local authority requirements and relevant guidance (such as ILP Guidance Notes for the Reduction of Obtrusive Light) must be fully consulted prior to design, approval, or construction.

British Standards

BS EN 12464-2: Lighting of Workplaces, Outdoor Workplaces (2014)

- 2.14 This standard specifies requirements for lighting of tasks in most outdoor workplaces and their associated area in terms of quantity and quality of illumination. In addition, recommendations are given for good lighting practice. This standard includes important recommendations on how obtrusive light can be limited to keep night skies free of light pollution.

BS 5489-1: Code of Practice for the Design of Road Lighting – Part 1: Lighting of Roads and Public Amenity Areas (2020)

- 2.15 BS 5489 Part 1 provides recommendations on the general principles, aesthetic and technical aspects of road lighting and advises on statutory provisions, operation and maintenance of lighting. The standard provides recommendations for the design of lighting for all types of highways and public thoroughfares, including those specifically for pedestrians and cyclists, and for pedestrian subways and bridges.
- 2.16 **Table 3** is taken from BS 5489-1 which helps to define the lighting class for subsidiary roads (Class P – subsidiary roads including residential roads). The required lighting performance criteria for each class is defined in BS EN 13201 Part 2: Road Lighting Performance Requirements (2015).

Table 3. Lighting classes for subsidiary roads

Traffic flow	Lighting class		
	E1 to E4 ^{A)}	E1 to E2 ^{A)}	E3 to E4 ^{A)}
	Pedestrian and cyclists	Speed limit <30mph	Speed limit <30mph
Busy ^{B)}	P5	P4	P3
Normal ^{C)}	P5	P5	P4
Quiet ^{D)}	P6	P5	P4

^{A)} Environmental zone, as given in ILP Guidance Notes (refer to **Table 1**).

^{B)} Busy traffic flow refers to areas where the traffic usage is high and can be associated with local amenities such as clubs, shopping facilities, public houses, etc.

^{C)} Normal traffic flow refers to areas where the traffic usage is of a level equivalent to a housing estate access road.

^{D)} Quiet traffic flow refers to areas where the traffic usage is of a level equivalent to a residential road, and is mainly associated with the adjacent properties or properties on other equivalent roads accessed from this road.

BS EN 13201-2: Road Lighting Performance Requirements (2015)

- 2.17 This standard defines lighting classes for road lighting according to photometric requirements and aiming at the visual needs of road users. It also considers environmental aspects of road lighting.
- 2.18 **Table 4** is taken from BS EN 13201-2 which defines the lighting performance requirements for Class P roads.

Table 4. P Lighting class performance requirements

Class	Horizontal illuminance	
	Maintained average (Lux)	Minimum (Lux)
P1	15.0	3.0
P2	10.0	2.0
P3	7.5	1.5
P4	5.0	1.0
P5	3.0	0.6
P6	2.0	0.4

Local guidance

Manchester City Council - Core Strategy Development Plan Document (Adopted 2012)

- 2.19 The Core Strategy was adopted by Manchester City Council on 11th July 2012. It is the key document in Manchester's Local Development Framework and covers a period of 15 years from 2012 to 2027. It describes Manchester today and outlines the Council's vision for Manchester in 2027 along with the planning policies which will be used to deliver that vision.
- 2.20 **Policy DM 1** (Development Management) states that all development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:
- Appropriate siting, layout, scale, form, massing, materials and detail.
 - Impact on the surrounding areas in terms of the design, scale and appearance of the proposed development. Development should have regard to the character of the surrounding area.
 - Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.
 - Accessibility: buildings and neighbourhoods fully accessible to disabled people, access to new development by sustainable transport modes.
 - Community safety and crime prevention.
 - Design for health.
 - Adequacy of internal accommodation and external amenity space.
 - Refuse storage and collection.

Ecology Guidance

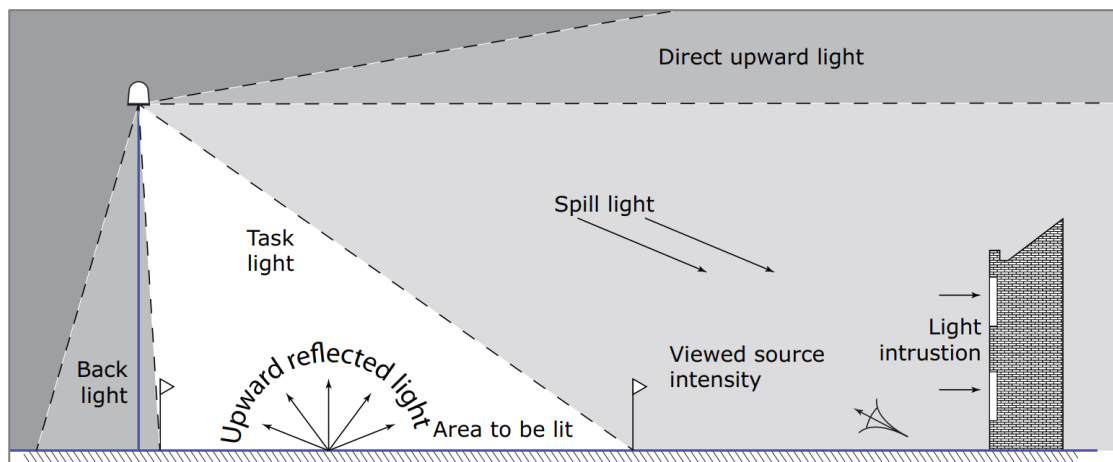
Preliminary Ecological Appraisal (PEA) and Preliminary Roost Assessment (PRA) (2022)

- 2.21 The aim of the PEA was to obtain data on existing ecological conditions, and to conduct a preliminary assessment of the likely significance of ecological impacts on the proposed development.
- 2.22 The aim of the PRA was to determine the presence or evaluate the likelihood of the presence of roosting bats, and to gain an understanding of how bats could use the site for roosting, foraging or commuting.
- 2.23 This report states the following with reference to bats and external lighting:
- A low impact lighting strategy will be adopted for the site during and post-development, which will include the following measures:
 - Use narrow spectrum light sources to lower the range of species affected by lighting.
 - Use light sources that emit minimal ultra-violet light.
 - Avoid white and blue wavelengths of the light spectrum to reduce insect attraction and where white light sources are required in order to manage the blue shortwave length content they should be of a warm / neutral colour temperature <4,200kelvin.
 - Not use bare bulbs and any light pointing upwards. The spread of light will be kept in line with or below the horizontal.
 - Light spill will be reduced via the use of low-level lighting used in conjunction with hoods, cowls, louvers and shields. Lights will also be directional to ensure that light is directed to the intended areas only.
 - External lighting will be on PIR sensors that are sensitive to large objects only (so that they are not triggered by passing bats) and will be set to the shortest time duration to reduce the amount of time the lights are on.
 - Wall lights and security lights will be 'dimmable' and set to the lowest light intensity settings. There are several products on the market that allow the control of the light intensity and the duration that the lights are on. All lighting on the developed site will make use of the most up to date technology available.
 - This report provides the following biodiversity enhancement recommendations:
 - Bat boxes should be positioned 3-5m above ground level facing in a south or south-westerly direction with a clear flight path to and from the entrance, away from artificial light.
 - Alternatively, bat boxes could be incorporated into new buildings on the site e.g. Habitat Bat Box Schwegler 1FR Bat Tubes Bat tubes should be inserted into the fabric of the building during construction, positioned 3-5m above ground level facing in a south or south-westerly direction with a clear flight path to and from the entrance and facing landscapes areas, away from artificial light.
 - This report refers to the following guidance:
 - Institute of Lighting Professionals (ILP) BCT Guidance Note 08 for Bats and artificial lighting in the UK (2018).

3. LIGHT POLLUTION

- 3.1 Light pollution is a generic term for all the adverse impacts that artificial lighting can have after dark. The main types of light pollution are shown diagrammatically in **Figure 1**.

Figure 1. Types of Light Pollution



- 3.2 Contributing to these direct effects are three design aspects that should be considered alongside the purpose for a new lighting installation and the type of sensitive receptors found in the local area. These are described later in this report.

Types of Light Pollution

Light Spill (Light intrusion, back light)

- 3.3 Light spill is 'the spilling of light beyond the boundary of the site on which a light source is located', such that it causes a noticeably adverse effect. More simply, light spill is often termed as the intrusion of light into homes. It can also have a negative effect on wildlife and ecological systems local to an installation.
- 3.4 As set out in the ILP Guidance Notes, the limits for light spill vary according to the environmental zone of the existing location and have been set to encourage appropriate lighting design. Through careful design, it can readily be ensured that this impact is prevented and that the illumination falling within any residential property can be reduced to zero. This is incorporated into the Lighting Strategy contained within this report.

Sky Glow (Direct upward light)

- 3.5 Sky glow is the 'the brightening of the night sky' above illuminated areas. The brightness created is constantly varying as a function of many parameters such as direct upward-lighting, ground surface reflectance, overhead cloud cover, and the degree of water droplets in the atmosphere - rain, fog/mist, and snow, for example, exacerbate the effect.
- 3.6 Mitigation is achieved by complying with the recommended limits in the ILP Guidance Notes for upward light emission. The limits vary according to the environmental zone of

the existing location and have been set to encourage appropriate lighting design. The Lighting Strategy will ensure that these limits can be met for the Proposed Development.

- 3.7 To mitigate sky glow as much as possible, lighting must be accurately targeted and kept to a minimum, and this design principle is incorporated into the Lighting Strategy.
- 3.8 The magnitude of the impact is a matter of judgement, taking into account the existing night-time view. The magnitude is lessened for those views where an observer is subject to direct illumination from, say, a nearby streetlight, or where light spill from a nearby light source illuminates the foreground, because the observer's vision is not fully dark adapted.

Glare (Viewed source intensity)

- 3.9 Glare occurs when an individual experiences visual discomfort or disability stemming from direct views of lamp sources, or high contrast of a lighting installation against a dark background. The placement of luminaires, their photometric characteristics, and the viewing context contribute to glare, which has been noted to result from uncontrolled private lighting installations, security lighting, street lighting mounted at high level near residences or habitat.

Design Aspects

Building Luminance

- 3.10 This considers the appropriateness and scale of brightness for the lighting / highlighting of built structures. Design criteria is included within ILP guidance notes as more of a main effect. While this is addressed independently, building luminance can also be considered as an indirect contributor to light spill, sky glow and glare.

Light Levels

- 3.11 Light levels, both as designed and installed, have the potential to create areas which have a noticeable difference in brightness. A new lighting installation in an area that has not been lit or is significantly brighter than the surrounding area may affect both adjacent receptors in the form of light spill or glare, and those over a larger area by contributing to sky glow through over-lighting.

Light Colour

- 3.12 Light colour has the potential to alter an individual's perception of their environment with respect to colour and clarity, as the human eye responds best to whiter light with higher quantities of ultraviolet wavelengths. Various wildlife species may respond differently to spectral composition depending on how reliant they are on darkness; many nocturnal animals continue their social habits and feeding behaviours with increased activity in the area while others may decrease their activity and possibly desert their habitat. This type of impact could affect pedestrians, vehicle operators and wildlife, and is likely to occur where new lighting is placed.

4. BASELINE

- 4.1 This section provides a review of the existing conditions at the site. The review is based on a desktop study using Google Earth satellite and Street View imagery.
- 4.2 The Site is located off Laindon Road, Manchester.
- 4.3 The Site is bound to the north by Daisy Bank Road which is provided with assumed 6m high LED type street lighting columns with residential properties beyond.
- 4.4 The Site is bound to the west by Laindon Road which is provided with assumed 6m high LED type street lighting columns with residential properties beyond.
- 4.5 The Site is bound to the south by Cypress House which is an apartment building including associated car parking which appears to be illuminated via non-LED type assumed 6m high lighting columns.
- 4.6 Situated to the east of the site are residential properties off Daisy Bank Road, Merwood Grove, and Ayton Grove. Merwood Grove and Ayton Grove are provided with assumed 5m high LED type street lighting columns.
- 4.7 The Site itself currently contains the Victoria Park Probation Centre and associated car parking. The extent of existing on-site external lighting appears to be limited to building mounted security lighting.
- 4.8 **Figure 2** shows an aerial view of the proposed site.

Figure 2. Aerial view of site



Environmental Zone

- 4.9 Following the desktop study, it was concluded that the development is in a suburban location and the proposed development site should be classified as 'Environmental Zone E3 – Medium district brightness area, in accordance with the ILP guidance limits outlined within **Table 1**. Therefore, with reference to **Table 2**, the worst case permitted light trespass limit at an offsite receptor in the pre-curfew period (typically considered to be 07:00-23:00) is 10 Lux and in the post curfew period (typically considered to be 23:00-07:00) is 2 Lux. The maximum upward light ratio (ULR) is 5%.

5. PROPOSED DEVELOPMENT

Proposed Site Lighting

5.1 A lighting design strategy has been prepared that reflects:

- Environmental requirements and the applicable guidance / standards.
- Local Authority requirements.
- Technical requirements and the applicable guidance / standards; and
- Appropriate selection of lighting typologies to suite the above.

Overview

5.2 The proposed lighting design comprises high quality building mounted LED luminaires at 3.5m above ground, 5m high column mounted LED luminaires, and 1m high bollard LED luminaires, all equipped with specific optics to maximum useful light and minimise wasteful light.

5.3 Illumination has been proposed to meet the recommendations of BS 5489-1 and BS EN 13201-2. The design has been produced to provide illumination at Lighting Class P4 (5.0 lux average, 1.0 lux minimum), for a quiet residential road in an E3 environmental zone as defined in **Table 3** and **Table 4**. The proposed external lighting levels are demonstrated in **Table 5**.

Table 5. Proposed external lighting design levels

Area	Target		Design	
	Maintained Illuminance Em (lux)	Minimum Illuminance Em (lux)	Maintained Illuminance Em (lux)	Minimum Illuminance Em (lux)
Apartment block access road	5.0	1.0	5.02	2.0
Housing access road	5.0	1.0	5.33	2.0
Apartment pathway	5.0	1.0	8.43	3.0
Kitchen garden	5.0	1.0	8.47	6.0
Residents garden	5.0	1.0	5.39	2.0

5.4 The lighting design layout is included in **Appendix 2**. The lighting lux plot layout is included in **Appendix 3**. Literature from the manufacturer literature of the proposed luminaire types is included in **Appendix 4**.

Upward light ratio (ULR)

5.5 The proposed building and column mounted luminaires have been designed to achieve the target lighting illuminance and uniformity at full cut-off, at 0° tilt.

5.6 The design has been used to calculate the predicted ULR of the proposed external lighting scheme. Model outputs predict a ULR of 0.15%. As illustrated in **Table 2**, the ILP sky glow limitation for an area classified as Environmental Zone E3 is 5% ULR. As such the

proposed lighting scheme meets the ILP sky glow limitations and is therefore not considered to result in unacceptable impacts on the dark sky landscape.

Table 6. Summary of upward light ratio

Environmental Zone	Measurement reference	Upward light ratio limit	Designed upward light ratio	PASS / FAIL
E3	Site-wide	5%	0.15%	PASS

Light spill

- 5.7 The lux plot layout, included in **Appendix 3**, has been produced in industry standard lighting calculation software. The lux plot assumes a level, clear site. In practice, the effect of changes in elevation and obstructions such as fences, trees and vegetation will contain the light spill further than is shown in the plot, i.e. this Lux plot represents the absolute worst case scenario.
- 5.8 The mounting height for all luminaires has been limited to a maximum of 5m, at 0° tilt, to reduce the quantity of light spill. Limiting column heights also helps to reduce the impact on the daytime setting.
- 5.9 The proposed luminaires are equipped with optics specific to each area which minimises the distribution of light outside of the site boundary.
- 5.10 Vertical calculation surfaces have been included to simulate light intrusion on all existing residential properties adjacent to the site. As demonstrated on the lux plot layout the calculation shows maximum 1 lux vertical illumination. As demonstrated in **Table 2**, the ILP obtrusive light limitation for an area classified as environmental zone E3 is 10 lux pre-curfew and 2 lux post-curfew. The calculation results are summarised in **Table 7**. As such the proposed lighting scheme meets the ILP obtrusive light limitations and is therefore not considered to result in unacceptable impacts on residential properties.

Table 7. Summary of designed light intrusion

Environmental Zone	Measurement reference	Environmental zone Limit Ev (lux)		Designed Vertical Illuminance Ev (Lux)	PASS / FAIL
		pre-curfew	post-curfew		
E3	Residential property 1	10	2	1.0	PASS
E3	Residential property 2	10	2	0.0	PASS
E3	Residential property 3	10	2	0.0	PASS
E3	Residential property 4	10	2	0.0	PASS
E3	Residential property 5	10	2	0.0	PASS

Ecology measures

- 5.11 The design has been produced in accordance with the recommendations of the Preliminary Ecological Appraisal (PEA) and Preliminary Roost Assessment (PRA) (2022):
- Use of narrow spectrum light sources to lower the range of species affected by lighting.
 - Use of light sources that emit minimal ultra-violet light.
 - Avoided white and blue wavelengths of the light spectrum to reduce insect attraction and where white light sources are required in order to manage the blue shortwave length content, a warm temperature has been used (2700kelvin) as recommended by Institute of Lighting Professionals (ILP) BCT Guidance Note 08 for Bats and artificial lighting in the UK (2018).
 - No use of bare bulbs and any light pointing upwards.
 - Light spill has been minimised via the use of low-level lighting used in conjunction careful positioning and use of specific optics. Light is directional to ensure that light is directed to the intended areas only.
 - Wall lights and security lights are set to the lowest light intensity settings.
- 5.12 The agreed final location of integrated bat boxes should be selected with direct reference to the proposed lighting layout to ensure the areas avoid direct illumination from the installation.
- 5.13 The design has been prepared in line with the recommendations of Institute of Lighting Professionals (ILP) BCT Guidance Note 08 for Bats and artificial lighting in the UK (2018).

6. RECOMMENDATIONS

- 6.1 All external lighting, whether for the construction or operation phase, must comply with the recommended limitations given in the ILP Guidance Notes for an Environmental Zone E3 location. The limits, set out in **Table 2**, prohibits excessive emission of upward light and helps to minimise light spill and glare.
- 6.2 Light colour should be addressed as part of the overall approach to the masterplan lighting design. Warmer light colour (2700K) is preferred in accordance with accordance to Institute of Lighting Professionals (ILP) BCT Guidance Note 08 for Bats and artificial lighting in the UK (2018). LED typically features no UV component and research indicates that while lower UV components attract fewer invertebrates, warmer colour temperatures (2700K) cause less impacts on bats.
- 6.3 During the detailed design phase of the project the locations of proposed integrated bat boxes shall be coordinated with the proposed lighting installation.
- 6.4 Spectral composition is somewhat related to light colour, but the effects are not always immediately apparent. It is desirable for light quality, safety and wildlife effect limitation purposes to use LED technology. LEDs present good working efficacy, a smaller light emitting area which is good for light control and spectral compositions which are less disturbing to nocturnal wildlife or their food sources than UV rich traditional light sources.
- 6.5 The use of horizontal cut-off luminaires installed at zero tilt with flat glass lenses and internal optics is recommended to limit views of the lamp, control glare and direct light in a controlled pattern. This will help to minimise potential glare, sky glow and light spill.
- 6.6 New generation LED light sources are recommended for new external lighting.
- 6.7 Wattages shall achieve required light levels without over-lighting.

7. CONCLUSION

- 7.1 As part of the lighting strategy a review has been undertaken of the potential impact created by new lighting in relation to the proposed development.
- 7.2 Legislation, British standards, and good practice guidance recommends the development requires new exterior lighting for purposes of vehicular and pedestrian safety.
- 7.3 Potentially significant effects from the proposed lighting on sensitive receptors can be managed to create a negligible night-time impact.
- 7.4 The lighting design strategy presented indicates the potential significant effects from new lighting for the proposed development can be adequately managed and all tested parameters are expected to meet recommended guidance benchmarks.
- 7.5 During the detailed design phase of the project the locations of proposed integrated bat boxes shall be coordinated with the proposed lighting installation.
- 7.6 The final detailed design may deviate from the indicative external lighting design presented but must meet all parameters and criteria as set out in this report and demonstrate equal to or less than the quantity of light spill achieved. An adequate and safe level of lighting must be provided for site tasks, amenity, and security, whilst maintaining acceptable impact on the site surroundings, ecology, and neighbouring properties.
- 7.7 The indicative lighting design strategy presented indicates the proposed lighting installation can achieve the required minimum lighting levels and distribution to meet the applicable standards while causing negligible light trespass to the adjoining land and negligible increase in local sky glow.
- 7.8 The impact of the proposed development lighting is considered to be negligible with respect to sensitive receptors. The most noticeable effect due to the proposed lighting installation expected to remain is a negligible increase in sky glow.

APPENDICES

Appendix 1: Proposed Development Masterplan



IMPORTANT NOTES:

G	06/10/22	AMENDED HOUSETYPE MIX
F	03/10/22	AMENDED HOUSETYPE MIX
E	20/09/22	AMENDED TO HIGHWAYS AND ARBORICULTURAL COMMENTS
D	07/09/22	AMENDED TO HIGHWAYS COMMENT
C	02/09/22	AMENDED APARTMENT MIX
B	19/08/22	OVERLAID TOPO
REVISION	DATE	DESCRIPTION

CLIENT: BRITANNIA GROUP	
PROJECT: PROPOSED RESIDENTIAL DEVELOPMENT	
ADDRESS: VICORIA PARK PROBATION CENTRE	
DRAWING TITLE: SITE PLAN	
SCALE: 1:200 @ A1	DATE: JULY 2022
DRAWING NO: A662_P_100G	

Appendix 2: Proposed External Lighting Layout

Luminaire Schedule					
Symbol	Qty	Label	Arrangement	LLF	Description
	9	A	SINGLE	0.900	15w LED 2700k Viva City Pro 320mA with Internal Spill Shield AYB70 Optic column mounted at 5m
	3	BW	SINGLE	0.900	6w LED 2700k Semita Urban bulkhead with cycle optic + Comfort Glass wall mounted at 3.5m
	4	C	SINGLE	0.900	9.2w LED 2700k 200mA Valio 1m High Bolland With Symmetric Optic

Calculation Summary								
Label	CalcType	Units	Avg	Max	Min	Min/Avg	Min/Max	
Apartment block access road	Illuminance	Lux	5.02	8	2	0.39	0.25	
Housing access road	Illuminance	Lux	5.33	10	2	0.38	0.20	
Apartment pathway	Illuminance	Lux	8.43	13	3	0.36	0.23	
Kitchen Garden	Illuminance	Lux	8.47	15	6	0.71	0.40	
Residents Garden	Illuminance	Lux	5.39	13	2	0.37	0.15	
ObtrusiveLight_1_III_Seg1	Obtrusive - III	Lux	0.33	1	0	0.00	0.00	
ObtrusiveLight_1_III_Seg2	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.	
ObtrusiveLight_1_III_Seg3	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.	
ObtrusiveLight_2_III_Seg1	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.	
ObtrusiveLight_2_III_Seg2	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.	
ObtrusiveLight_3_III_Seg1	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.	
ObtrusiveLight_4_III_Seg1	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.	
ObtrusiveLight_5_III_Seg1	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.	



GN01 - 2011

Table 1 Compliance	
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Environmental Zone	E3
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Sky Glow	Target	Achieved	Status
	5.00%	0.15%	Pass

Source Intensity (Candelas)			
Pre Curfew	10,000	157	Pass
Post Curfew	1,000	157	Pass

Note - we have not been able to calculate this as no housing is shown on the drawing

Light Trespass into Windows (Lux)			
Pre Curfew	10	0	Pass
Post Curfew	2	0	Pass

Note - we have not been able to calculate this as no housing is shown on the drawing

Building Luminance (cd/m²)			
	10		Pass

CO ₂ Calculation For A Year													
Colour Temperature (K)	Qty	Range	Light Source	Luminaire Lumens (lm)	Watts (W)	Lm/W	LOR	Total Lumens	ULOR	Upward Lumens	CRI	** ART Hour Per Day	CO ₂ (Tonnes)
2700	9	Viva City PRO	15w LED AYB70	1234	15	82.27	100%	11106	0.0%	0	>70	12	0.12
2700	3	Semita Urban	6w LED OC	738	6	123.00	100%	2214	0.0%	0	>70	12	0.02
2700	4	Valio	VAI-SY-7xx-59-D (9.2w)	515	9	55.98	100%	2060	1.1%	23	>70	12	0.03

Total Installation Lumens	15380.00
Total Upward Light	0.15%
Total CO2 Per Year (Tonnes)	0.17
Total Electric Consumption (Kw)	0.19
Total Electric Consumption Per Year (Kwh)	831.32
Average Luminaire Lumens Per Circuit Watt	81.03

Compliance Status		
Pol 04	Reduction Of Night Time Light Pollution	Pass
Enr 03	Energy Efficient External Lighting	Pass
Hea 01	Internal And External Lighting Levels	Pass

Note - HEAD1 in this report only applies to exterior lighting
** ART = (Average Run Time)

Date 04/10/2022



Notes

- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer immediately.

Key Plan

Legend

P1	24.10.22	Preliminary Issue	GCL	DA
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions



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☒ Leeds | 0113 233 8000
☐ London | 020 7407 3879
☐ Manchester | 0161 233 4260
☐ Nottingham | 0115 924 1100
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Client

Brittania Group

Project Title
Victoria Park Probation Centre

Drawing Title
Electrical Services
Proposed External Lighting Layout
Site Plan

Drawn:	G. C. Leeming	Reviewed:	D. Alasfar
BWB Ref:	221460	Date:	20.09.22
Scale@A1:	1:250		
Drawing Status PRELIMINARY			

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
VPPC-BWB-00-XX-DR-E-2300	S2	P1

Appendix 3: Proposed External Lux Plot Layout

Luminaire Schedule					
Symbol	Qty	Label	Arrangement	LLF	Description
	9	A	SINGLE	0.900	15w LED 2700k Viva City Pro 320mA with Internal Spill Shield AYB70 Optic column mounted at 5m
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ObtrusiveLight_1_III_Seg3	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.
ObtrusiveLight_2_III_Seg1	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.
ObtrusiveLight_2_III_Seg2	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.
ObtrusiveLight_3_III_Seg1	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.
ObtrusiveLight_4_III_Seg1	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.
ObtrusiveLight_5_III_Seg1	Obtrusive - III	Lux	0.00	0	0	N.A.	N.A.



GN01 - 2011

Table 1 Compliance	
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Pol 04	Reduction Of Night Time Light Pollution	Pass
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Date 04/10/2022



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P1	24.10.22	Preliminary Issue	GCL	DA
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

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Client

Brittania Group

Project Title

Victoria Park Probation Centre

Drawing Title

**Electrical Services
Proposed External Lighting
Lux Plot Layout
Site Plan**

Drawn:	G. C. Leeming	Reviewed:	D. Alasfar
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BWB Ref:	221460	Date:	20.09.22	Scale@A1:	1:250
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Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
VPPC-BWB-00-XX-DR-E-2301	S2	P1

Appendix 4: Proposed Luminaire Type

Datasheet

Viva-City Pro



Product Description

A modular, slimline, performance street lantern with improved efficacy and output. Viva-City Pro offers a choice of optics with asymmetrical distribution including an area optic.

Specification Text

The luminaire shall be manufactured from high-pressure die-cast aluminium. It shall have an LED efficacy of up to 150.0 lm/W and will be capable of producing up to 24,660 luminaire lumens at 4000K with a CRI >70. It shall have an asymmetric forward throw optic and is rated at IP66 and IK08.

Specify 2700K for IDA compliance.

Specification

Weight: 4.5 - 9.1kg

Windage: 0.04m²

Material: Die-cast Aluminium

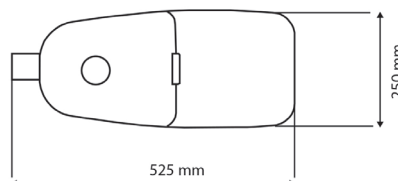
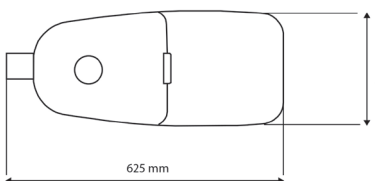
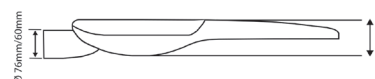
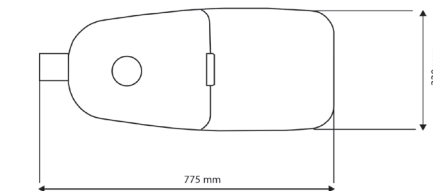
Paint finish: RAL7016 Anthracite Grey Finish

Key Features

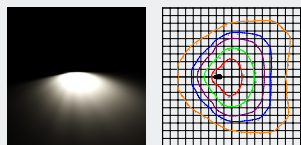
- 15.0 - 180.0W
- 2,250 - 24,660 Luminaire Lumens
- Efficacy up to 150.0 lm/W
- 4000K, CRI >70
- Lifetime >100,000hr, L80



Dimensions



Optics



Asymmetric Forward Throw Optic 70°



Code	Power	Luminaire Lumens	Drive Current	Optic	CCT(K)	IP	IK	Weight kg	Paint Finish	Driver Included	Driver Type
VCYP-FW70-4.3-15D	15.0	2,250	640	Asymmetrical Forward Throw Optic - 70°	4000	IP66	IK08	4.5	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.3-15DPEC	15.0	2,250	640		4000	IP66	IK08	4.6	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-40D	40.0	5,880	805		4000	IP66	IK08	6.0	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-40DPEC	40.0	5,880	805		4000	IP66	IK08	6.1	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.6-60D	60.0	8,760	610		4000	IP66	IK08	6.0	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.6-60DPEC	60.0	8,760	610		4000	IP66	IK08	6.1	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-80D	80.0	11,040	805		4000	IP66	IK08	6.0	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-80DPEC	80.0	11,040	805		4000	IP66	IK08	6.1	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.6-120D	120.0	17,760	620		4000	IP66	IK08	9.0	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.6-120DPEC	120.0	17,760	620		4000	IP66	IK08	9.1	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-180D	180.0	24,660	880		4000	IP66	IK08	9.0	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-180DPEC	180.0	24,660	880		4000	IP66	IK08	9.1	RAL7016 Anthracite Grey Finish	Driver inc	Dali



Accessories & Options

Mounting Options

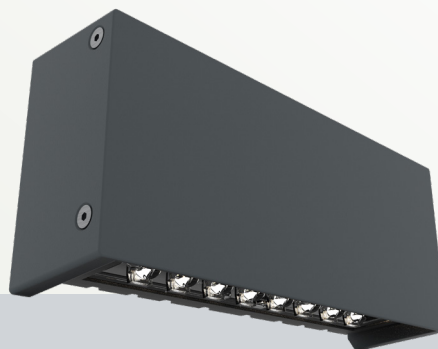
- Post top 60mm
[Contact for details](#)

Other Options

- Part Night Dimming
- Colour Temperature Option
- Photocell Option
- Emergency Option
[Contact for details](#)

Datasheet

Semita Urban



Product Description

Designed and engineered in the UK, Semita Urban is a contemporary, slimline wallpack. The newest addition to our popular wallpack family is available with street, path or flood optics and comes equipped with an optional 'click on' comfort diffuser for a softer output.

Specification Text

The luminaire shall be manufactured from high-pressure die-cast aluminium. It shall have an LED efficacy of up to 146.0 lm/W and will be capable of producing up to 146.0 luminaire lumens at 4000K with a CRI >70. It shall have an asymmetric forward throw optic and is rated at IP66 and IK10.

Specify 2700K for IDA compliance.

Specification

Weight: 2.4kg

Material: Die-cast Aluminium

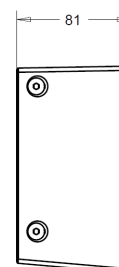
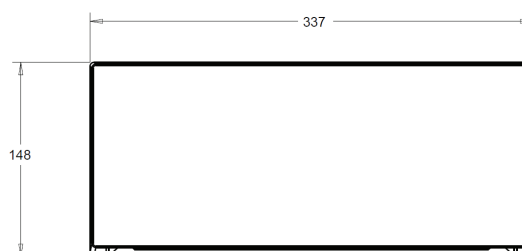
Paint finish: RAL7016 Anthracite Grey Finish

Key Features

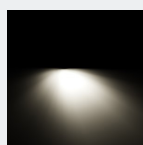
- 6.0 - 11.0W
- 812 - 1,611 Luminaire Lumens
- Efficacy up to 146.0 lm/W
- 4000K, CRI >70
- Lifetime >100,000hr, L80



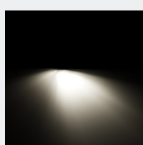
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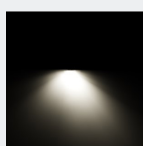
Optics



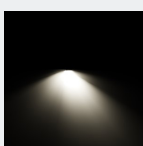
Comfort Flood Light Optic



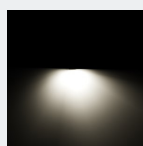
Flood Light Optic



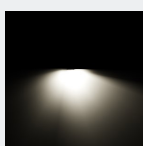
Comfort Path Optic



Path Optic



Comfort Street Optic



Street Optic



Code	Power	Luminaire Lumens	Drive Current	Optic	CCT(K)	IP	IK	Weight kg	Paint Finish	Driver Included
SEMUFL08D	6.0	812	205	Asymmetrical Flood Light Optic FL	4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc
SEMUFL15D	11.0	1,611	410		4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc
SEMUOC08D	6.0	802	205	Asymmetrical Path Optic OC	4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc
SEMUOC15D	11.0	1,570	410		4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc
SEMUST08D	6.0	783	205	Asymmetrical Street Optic ST	4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc
SEMUST15D	11.0	1,496	410		4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc



Accessories & Options

Mounting Options

- Wall Mount
[Contact for details](#)

Other Options

- Colour Temperature Option
- Photocell Option
- Emergency Option
[Contact for details](#)

Datasheet

Ray Series



Product Description

The Ray series is a range stainless steel down lighters available in an array of sizes and beam angles. Perfect for canopy lighting and wall washes.

Specification Text

The luminaire shall be manufactured from high-pressure die-cast aluminium. It shall have an LED efficacy of up to 128 lm/W and will be capable of producing up to 1,150 luminaire lumens at 4000K with a CRI >80. It shall have an asymmetric forward throw optic and is rated at IP68 and IK08.

Specification

Weight: 0.8 - 2.4kg
Material: Extruded Aluminium
Paint finish: Stainless Steel Finish

Key Features

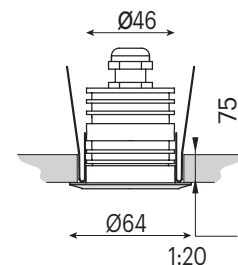


- 4.0 - 12.0W
- 1,450 - 1,150 Luminaire Lumens
- Efficacy up to 128 lm/W
- 4000K, CRI >80
- Lifetime >60000hr, L80

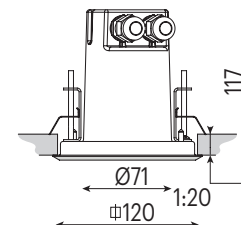


Dimensions

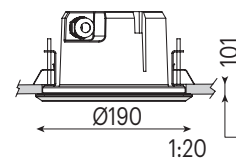
Ray 55



Ray 110



Ray 180

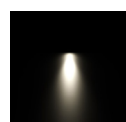
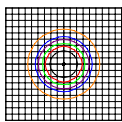


All units of measurement in mm.

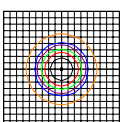
Optics



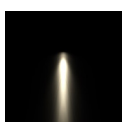
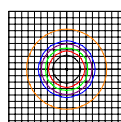
Medium 24°



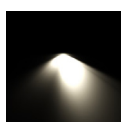
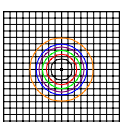
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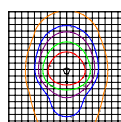
Medium 17°



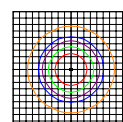
Narrow 10°



Wide 30°



Wide Flood 46°



Wide Flood 47°

Code	Power	Luminaire Lumens	Optic	CCT(K)	IP	IK	Weight kg	Paint Finish	Driver Included
RAY55-SY25-840-4-30	4.0	450	Medium 25°	4000	IP68	IK08	0.8	Stainless Steel Finish	Driver not included
RAY55-SY46-840-4-30	4.0	375	Wide 46°	4000	IP68	IK08	0.8	Stainless Steel Finish	Driver not included
RAY110S-SY10-840-4-30	4.0	520	Narrow 10°	4000	IP67	IK09	0.9	Stainless Steel Finish	Driver not included
RAY110S-SY24-840-4-30	4.0	510	Medium 24°	4000	IP67	IK09	0.9	Stainless Steel Finish	Driver not included
RAY110S-SY47-840-4-30	4.0	460	Wide 47°	4000	IP67	IK09	0.9	Stainless Steel Finish	Driver not included
RAY180S-SY17-840-12-30	12.0	1,150	Medium 17°	4000	IP67	IK07	2.4	Stainless Steel Finish	Driver inc
RAY180S-SY30-840-12-30	12.0	1,100	Wide 30°	4000	IP67	IK07	2.4	Stainless Steel Finish	Driver inc



Accessories & Options

Mounting Options

- Recessed Mount
[Contact for details](#)

Other Options

- Colour Temperature Options
- Paint Finish Options
[Contact for details](#)



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