

EXTERNAL LIGHTING ASSESSMENT



SOLENT ROAD,
HAVANT

Prepared For:

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External Lighting Assessment

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External Lighting Assessment

1 Introduction

This report has been provided on behalf of Chancerygate (Erdington) Limited, to review the proposed external lighting scheme at Solent Road, Havant

In support of the development Planning Application, the intent of this report is to provide an External Lighting Assessment of the potential obtrusive light impact to surrounding building's and the environment within the vicinity.

Where applicable, this document will outline the requirements of mitigation measures to be implemented at design and operational stages to reduce or remove any potential impact.

The potential impact of obtrusive lighting is categorised below:

- **Light Spill:** The spilling of light beyond the boundary of a property which may cause nuisance to others
- **Glare:** The uncomfortable brightness of the light source against a dark background which results in dazzling the observer, which may cause residents and a hazard to road users.
- **Sky Glow:** The upwards spill of light into the sky which can cause a glowing effect and is often seen above cities when viewed from a dark area.

The existing site is illuminated by halogen type building & column mounted luminaires. The existing luminaires shall be removed to make way for a new lighting layout which is in keeping with the proposed development and current British, European, and BREEAM standards.

The luminaires selected will be a combination of column and wall mounted LED fittings, which are to comply with BREEAM requirements; Pol 04 (Reduction of night time light pollution), ENE 03 (External lighting) & Part L2A of the building regulations.

The site has been classified as an E3 Environmental zone according to BS EN 12464-2:2014, Lighting of Work Places, Part 2. The table below is taken from BS 12464-2:2014, Table 2 and summarises the classifications of Environmental Zones.

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Table 2 — Maximum obtrusive light permitted for exterior lighting installations

Environmental zone	Light on properties		Luminaire intensity		Upward light ratio	Luminance	
	E_v lx		I cd		R_{UL} %	L_b cd·m ⁻²	L_s cd·m ⁻²
	Pre-curfew ^a	Post-curfew	Pre-curfew	Post-curfew		Building facade	Signs
E1	2	0	2 500	0	0	0	50
E2	5	1	7 500	500	5	5	400
E3	10	2	10 000	1 000	15	10	800
E4	25	5	25 000	2 500	25	25	1 000
where E1 represents intrinsically dark areas, such as national parks or protected sites; E2 represents low district brightness areas, such as industrial or residential rural areas; E3 represents medium district brightness areas, such as industrial or residential suburbs; E4 represents high district brightness areas, such as town centres and commercial areas; E_v is the maximum value of vertical illuminance on properties in lx; I is the light intensity of each source in the potentially obtrusive direction in cd; R_{UL} is the proportion of the flux of the luminaire(s) that is emitted above the horizontal, when the luminaire(s) is (are) mounted in its (their) installed position and attitude, and given in %; L_b is the maximum average luminance of the facade of a building in cd·m⁻²; L_s is the maximum average luminance of signs in cd·m⁻². ^a In case no curfew regulations are available, the higher values shall not be exceeded and the lower values should be taken as preferable limits.							

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2 Relevant Policy and Guidance

Legislations

Clean Neighbourhoods and Environment Act (CNEA) 2005

The Clean Neighbourhoods and Environment Act (CNEA) 2005 gives Local Authorities additional powers to deal with artificial lighting by classifying artificial light emitted from defined premises as a statutory nuisance (from April 2006). Guidance produced on Sections 101 to 103 of the CNEA extends the duty on local authorities to ensure their areas are checked periodically for existing and potential sources of statutory nuisances including nuisances arising from artificial lighting. Local authorities must take reasonable steps to investigate complaints of such nuisances from artificial light.

Empowerment to Light Roads - The Highways Act 1980

Section 97 empowers a Highway Authority to provide lighting for any highway or proposed highway for which they are or will be the Highway Authority. District Councils and many Parish or Town Councils also have the power to provide lighting as local lighting authorities.

National Planning Policy

The National Planning Policy Framework 2012 and 2019

The National Planning Policy Framework (NPPF) encourages good design with planning policies and decisions limiting the effect of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

Artificial lighting needs to be considered when a development may increase levels of lighting or would be sensitive to prevailing levels of artificial lighting. Artificial light provides a valuable benefits to society, including opportunities for sport and recreation grounds, and can be essential to a new development. However, for maximum benefit, it is important to get the right light, in the right place and for it to be used at the right time.

Artificial light is not always necessary. It has the potential to produce 'light pollution' or 'obtrusive light', and not all modern lighting is suitable in all locations. It can be a source of annoyance to people, harmful to wildlife and undermine enjoyment of the countryside or the night sky, especially in areas with intrinsically dark landscapes. Intrinsically dark landscapes are those entirely, or largely, uninterrupted by artificial light. National parks and nature reserves can serve as good examples, particularly where they support habitats for native nocturnal animals. The following National Planning Practice Guidance (NPPG) further details the factors relevant to the control of obtrusive light.

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Light pollution – (<https://www.gov.uk/guidance/light-pollution>)

The National Planning Guidance (NPPG) advise on how to consider light within the planning systems, focusing mainly on the following:

- When light pollution is relevant to planning
- What factors should be considered when assessing whether a development proposal might have implication for light pollution
- What factor are relevant when considering where, when and how much light shines
- What factors are relevant when considering possible ecological effects.

Obtrusive Light and Design Guidance

Institute of Lighting Professionals – Guidance Notes for the Reduction of Obtrusive Light GN01:2020

This guidance provides measurable design guidance limits and recommendations to ascertain acceptability of obtrusive light levels at night time.

CIE – 150:2017 – Guidance on the Limitation of the effects of Obtrusive Light from Outdoor Lighting Installations

The purpose of this guide is to help formulate guidelines for assessing the environmental effects of outdoor lighting. This guid will also recommend limits for relevant lighting parameters to contain the obtrusive effects of outdoor lighting within tolerable levels. 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 potential adverse effects of outdoor lighting on both natural and man-made environments for people in most aspects of daily life, from residence, sightseers, transport users to environmentalists and astronomers.

BS5489-1: 2020 – Code of practice for the design of road lighting – Part 1: Lighting of roads and public amenity area

This part of BS 5489 gives recommendations on the general principles of road lighting, and its aesthetic and technical aspects, and advises on operation and maintenance.

BS EN 13201-2: 2015 – Road lighting – Part 2: Performance requirements

This part of this European Standard defines, according to photometric requirements, lighting classes for road lighting aiming at the visual needs of road users, and it considers environmental aspects of road lighting.

BS EN 12464-2: 2014 – Lighting of Work Places – Part 2: Outdoor Work Places

This European standard specifies lighting requirements for outdoor work places, which meet the needs for visual comfort and performance. All usual visual tasks are considered.

External Lighting Assessment

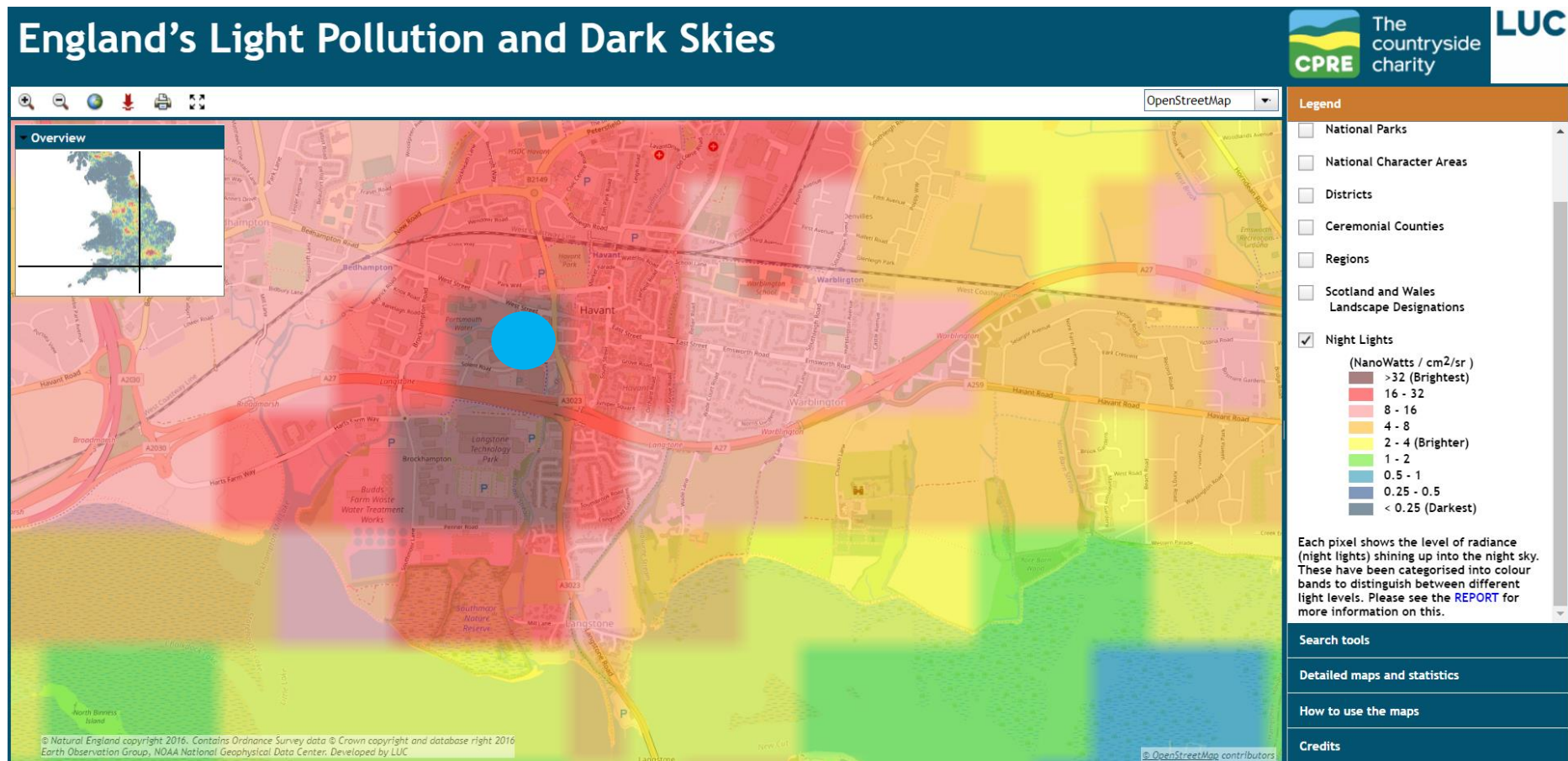
Campaign to Protect Rural England (CPRE) – Night Blight 2017

CPRE – Night Blight data (2017) gives a broad-brush indication of upwards light (sky glow) experienced within the UK. The interactive mapping tool allows specific areas and locations to be assessed with regards to a baseline condition.

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3 Dark Sky

The image below shows the satellite Sky Glow overview of Havant (<http://www.nightblight.cpre.org.uk/maps/>). The blue circle on the image below is the approximate location of the existing site. As shown below the brown shading around the blue circle indicates the illuminance of the Sky Glow surrounding the proposed site at Solent Road, Havant.



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4 Luminaire Selection and type

The following luminaires have been selected:

Qty	Range	Mounting Height (m)	Mounting Type	Lamp	Lm/W	LOR %	RA	L2A Compliant	BREEAM Compliant
3	Italo	8m	Column	93w	111.61	100%	70	Yes	Yes
4	Italo	8m	Column	93w	111.62	100%	70	Yes	Yes
4	Italo	8m	Wall	93w	111.61	100%	70	Yes	Yes
14	Alfresco	1.8m	Wall	21w	29.34	54%	60	No*	Yes
4	Guardian pro	6m	Wall	50w	104.00	100%	60	Yes	Yes
6	Italo	8m	Column	76w	123.95	100%	70	Yes	Yes
3	Italo	8m	Column	76w	123.95	100%	70	Yes	Yes
8	Quarto	3.5m	Wall	13.5w	110.00	100%	70	Yes	Yes

* Average taken to achieve BREEAM compliance

5 Luminaire Control Philosophy

A combination of photocells & timeclocks shall be installed to control all external lighting. The time clocks will act as a master control and be set to switch off at times when the development is not in operation. Outside of these hours photocells will control the site external lighting according to day light levels. This will prevent night time lighting pollution and to comply with POL 04/L2A.

6 Assessment Summary Matrix

Effect/Description	Mitigation	Calculation Results
Light Intrusion: Light intrusion from the site to surrounding residential areas.	All luminaires will be fitted with suitable optics to limit excessive emissions on the horizontal plane.	The Light Trespass at the site has been calculated.* This is below the maximum permitted level of Light Intrusion for an Environmental Zone deemed to be E3.
Sky Glow: Brightening of the night sky	All Luminaires will be fitted with horizontal cut off optics to minimise upward light spill.	The sky glow achieved at the site is 1.44%. This is below the maximum permitted level of sky glow for an Environmental Zone deemed to be E3.
Luminaire Intensity: Glare, the uncomfortable brightness of light against a dark back ground	Lighting design will comply with the relevant limits on lighting intensity.	Luminaire Intensity (Pre and Post curfew) at the site has been calculated as 111 Cd. This is below the maximum permitted level of luminaire intensity for an Environmental Zone deemed to be E3.

*Luminaire intensity and light intrusion have been taken into consideration, but not calculated. This is based on the assumption that no luminaire fittings will be left on, post curfew.

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7 Conclusion

To conclude, this site is classified as an E3 Environment Zone. External lighting calculations have been carried out to achieve the correct lux levels for this site, taking into consideration, light pollution, surrounding premises and other aspects.

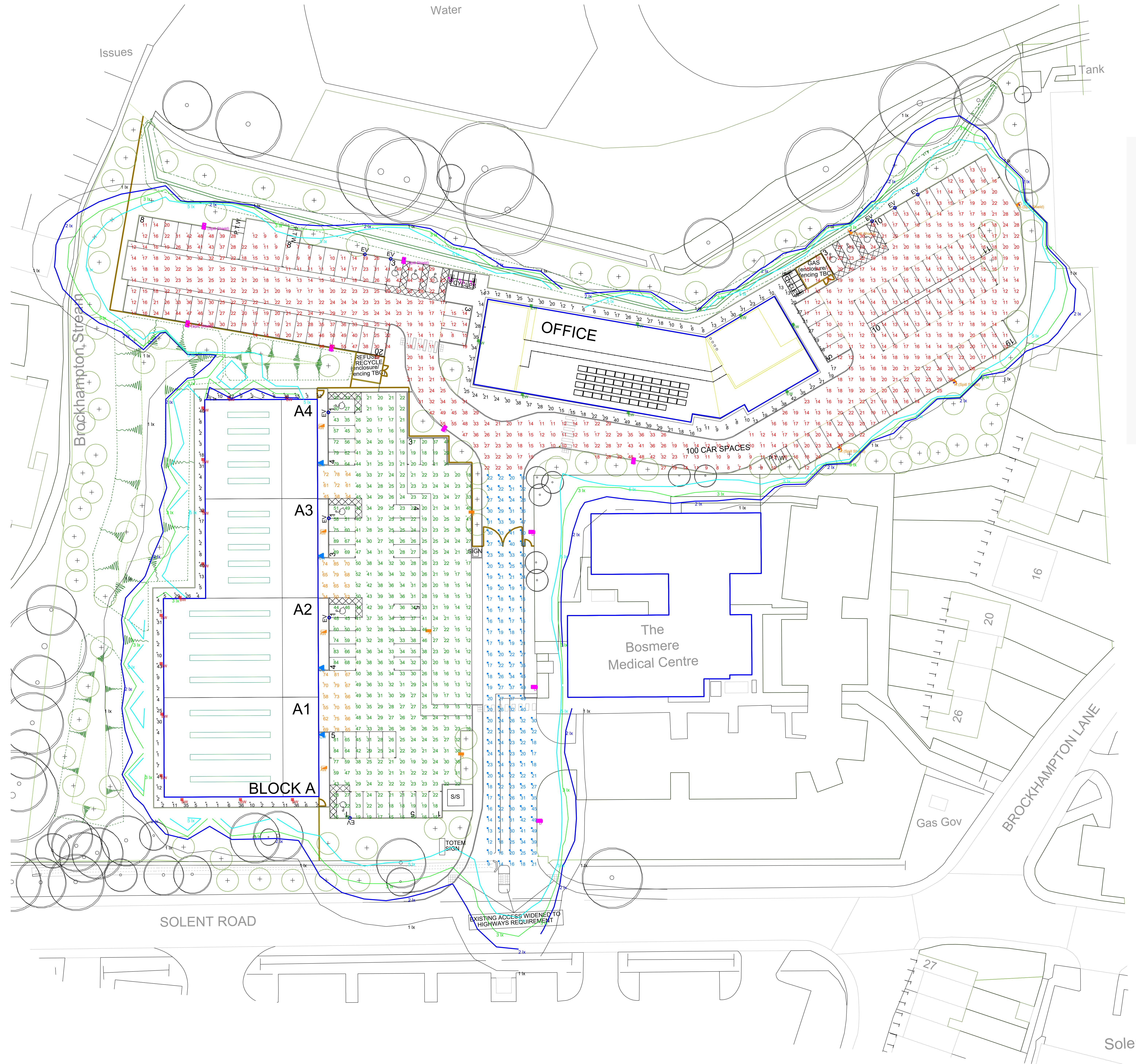
The proposed luminaires used to carry out external lighting calculations are LED. Utilising LED luminaires helps reduce light pollution and can reduce the overall power consumption by 40-60%.

External Lighting Assessment

8 Appendices

8.1 Lighting Design

Inserted PDF



BREEAM New Construction 2018 (UK)

Part of the Luceco PLC group of companies **LUCECO**

D41166b - Chancerygate Havant, Solent Road

Qty	Range	Light Source	Lamp Lumens	Circuit Watts	lm/W	LOE	Luminaire Lumens	LOER	Upward Lux	RA	20' Ht. Foot Candles	CO ₂ Tonnage per Year
11	Panel 1	5000K LED Module	1080	39	111.4	58.0%	114580	0.0	0	70	12	0.00
15	Jefferson 2.0 (Wood)	21W (2000lm)	2181	21	26.94	100.0%	4050	40.7%	968	0.0	12	0.30
4	Recreation Box	5W LED	500	50	10.00	200.0%	20000	0.0%	0	60	12	0.00
3	Panel 1	5000K LED Module	1080	39	111.4	58.0%	114580	0.0	0	70	12	0.00
8	Panel 1	5000K LED Module	1080	39	111.4	58.0%	114580	0.0	0	70	12	0.00
8	Panel 1	5000K LED Module	1080	39	111.4	58.0%	114580	0.0	0	70	12	0.00
4	Recreation Box	5W LED	500	50	10.00	200.0%	20000	0.0%	0	60	12	0.00
4	Recreation Box	5W LED	500	50	10.00	200.0%	20000	0.0%	0	60	12	0.00
4	Recreation Box	5W LED	500	50	10.00	200.0%	20000	0.0%	0	60	12	0.00
4	Recreation Box	5W LED	500	50	10.00	200.0%	20000	0.0%	0	60	12	0.00

Total Installation Currents	203265.86	Total ULK	<u>1.66%</u>
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Table 1 compliance

Environmental zone	E3
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Sky Glow	Target	Achieved	Status
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Source intensity (candelas)

Post curfew	1,000	111	Pass
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Pre curfew	10	0	Pass
Post curfew	2	0	Pass

Building Luminance (cd/m ²)	10		
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Compliance Status:		
Pol 04	Reduction of night time light pollution	Pass
Env 03	Energy efficient external lighting	Pass
Env 03	Internal and external lighting levels	Pass

Note - HSA21 in this report only applies to outdoor light.

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Part of the Luceco plc group of companies **LUCEC**

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Symbol	Qty	Label	Arrangement	LLF	Description
	3	A	SINGLE	0.900	63w (4 module) 650MA latio 1 with S05 Optic column mounted at 8m
	1	A (Split Shield)	SINGLE	0.900	63w (4 module) 650MA latio 1 with S05 Optic column mounted at 8m
	4	AW	SINGLE	0.900	63w (4 module) 650MA latio 1 with S05 Optic wall mounted at 8m
	14	BW	SINGLE	0.900	21w LED Galleria 2 emergency bulkhead with hood wall mounted at 1.8m
	4	CW	SINGLE	0.900	50w LED 400K Reflex Pro Asymmetrical floodlight wall mounted at 5m
	6	D	SINGLE	0.900	76w (3 module) 700MA latio 1 with STE-M Optic column mounted at 5m
	3	D (Split Shield)	SINGLE	0.900	76w (3 module) 700MA latio 1 with STE-M Optic column mounted at 5m
	8	EW	SINGLE	0.900	13.5w LED Quatro 2.0 bulkhead with cycle optic wall mounted at 1.5m

Calculation Summary						
Label	Units	Avg	Max	Min	Max	MaxDiff
Observational Light 1	ObsType - Cg	185.29	822	9	0.05	0.01
Observational Light 1_Cg_Seg1	ObsType - Cg	0.00	0.0	0.0	N.A.	N.A.
Observational Light 1_Cg_Seg2	ObsType - Cg	28.28	9	0	0.1	0.1
Observational Light 2_Cg_Seg1	ObsType - II	0.00	0.0	0.0	N.A.	N.A.
Observational Light 2_Cg_Seg2	ObsType - II	90.56	11	0	0.77	0.77
Observational Light 3_Cg_Seg1	ObsType - II	0.00	0.0	0.0	N.A.	N.A.
Observational Light 3_Cg_Seg2	ObsType - II	19.51	6	0	0.36	0.36
Observer Cycle Sums	Observer	13.67	17	11	0.80	0.65
Observer Parameter	Illuminance	22.44	43	6	0.08	0.12
Observer Light	Illuminance	25.18	39	0.36	0.18	0.36
Unit A Parameter	Illuminance	12.94	43	4	0.08	0.02
Unit A1 Axi Loading Bars	Illuminance	64.69	59	0.68	0.12	0.68
Unit AT A2 Axi Front View	Illuminance	30.03	89	12	0.40	0.13
Unit A3 Loading Bars	Illuminance	62.75	88	34	0.54	0.40
Unit A4 Axi Loading Bars	Illuminance	62.78	88	34	0.12	0.68



Ref EW



Ref CW



Ref BW



Ref A, AW & I

REV	DESCRIPTION	INI	INI	INI	01-01-1
Revision	Description	Drawn By	Engineer	Approved	Date



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INFORMATION

Client

CHANCERYGATE

**SOLENT ROAD
HAVANT**

EXTERNAL LIGHTING DESIGN LAYOUT

Scale	Size	Drawn By	Engineer	Approved	Date
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Drawing Reference					Revision
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External Lighting Assessment

8.2 Luminaire Type 1 – Italo



**Kingfisher
Lighting**

Datasheet

Italo Street

One product, three sizes. The Italo series offers high performance functionality, versatility and a wide variety of optics. A versatile solution suitable for any street application.



Key Features

- 525mA & 700mA
- Efficacy 138 luminaire lm/W
- 4000K, CRI >70
- Lifetime >100,000hr L80
- Post Top 76mm, side entry 76mm
- Driver included

60mm post-top and side-entry spigots available.
76mm recommended. Call for further details.

Applications

- Street lighting
- Highways
- Area lighting
- Car parks
- Parks & plazas



Italo also available in urban and flood options.
See separate datasheets for details.



Fitting		Luminaire Lumens	LED Lumens	Power	Optics
S05	Italo 1	1,520 - 8,210	1,841 - 9,820	15.5W - 76W	S05 asymmetrical suburban street optic 
	Italo 2	8,310 - 16,240	9,697 - 19,640	74W - 152W	
	Italo 3	15,280 - 31,000	17,455 - 36,825	131W - 286W	
STU-S	Italo 1	1,520 - 8,210	1,841 - 9,820	15.5W - 76W	STU-S asymmetrical suburban street optic 
	Italo 2	8,310 - 16,240	9,697 - 19,640	74W - 152W	
	Italo 3	15,280 - 31,000	17,455 - 36,825	131W - 286W	

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KF ITALO STREET VERSION 1

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External Lighting Assessment

Fitting	Luminaire Lumens	LED Lumens	Power	Optics
STU-M	Italo 1	1,520 - 8,210	1,841 - 9,820	15.5W - 76W
	Italo 2	8,310 - 16,240	9,697 - 19,640	74W - 152W
	Italo 3	15,280 - 31,000	17,455 - 36,825	131W - 286W
SV	Italo 1	1,520 - 8,210	1,841 - 9,820	15.5W - 76W
	Italo 2	8,310 - 16,240	9,697 - 19,640	74W - 152W
	Italo 3	15,280 - 31,000	17,455 - 36,825	131W - 286W
STE-S	Italo 1	2,010 - 11,270	2,475 - 13,200	20W - 102W
	Italo 2	11,450 - 19,030	13,035 - 23,100	98W - 183W
	Italo 3	19,550 - 32,510	23,463 - 39,600	173W - 303W
STE-M	Italo 1	2,010 - 11,270	2,475 - 13,200	20W - 102W
	Italo 2	11,450 - 16,630	13,035 - 19,800	98W - 148W
	Italo 3	17,670 - 32,510	20,856 - 39,600	150W - 303W
STW	Italo 1	2,010 - 11,270	2,475 - 13,200	20W - 102W
	Italo 2	11,450 - 16,630	13,035 - 19,800	98W - 148W
	Italo 3	17,670 - 32,510	20,856 - 39,600	150W - 303W

Specifications

Weight	6.8-19 kg
Windage	Italo 1: 0.05-0.18m ² Italo 2: 0.08-0.3m ² Italo 3: 0.1-0.4m ²
Material	Die-cast aluminium
Paint Finish	Graphite grey

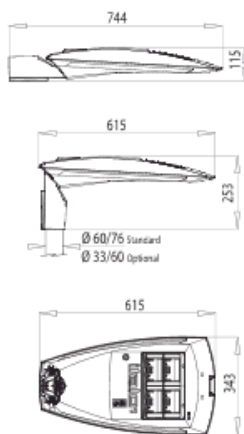
Specification Text

The luminaire shall be manufactured from high pressure die-cast aluminium. It shall have an LED efficacy of up to 151 luminaire lm/W and will be capable of producing up to 32,510 luminaire lumens at 4000K with a CRI >70. A number of optics will be available and the luminaire will be rated at IP66 and IK09. The optical design will be a reflector-based optic with glass screen.

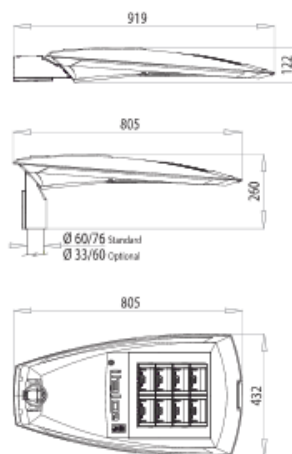


Dimensions

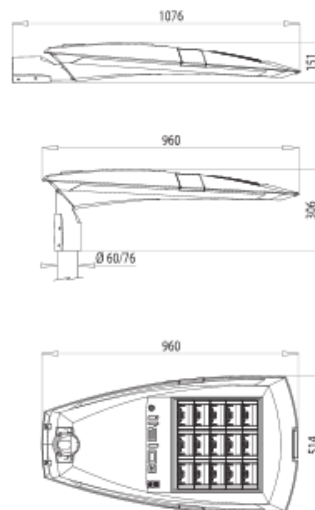
Italo 1



Italo 2



Italo 3



All units of measurement in mm.

External Lighting Assessment

8.3 Luminaire Type 2 – Alfresco



Specification Text

The luminaire shall be manufactured from high pressure die-cast aluminium. It shall have an LED efficacy of up to 100 luminaire lm/W and will be capable of producing up to 2100 luminaire lumens at 4000K with a CRI >70. It shall be IP65 and IK08 rated.

Specification

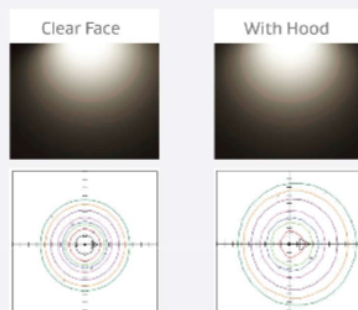
Weight: 2.3 - 2.6 kg
Material: Die-cast Aluminium
Paint Finish: Anthracite Grey

Key Features

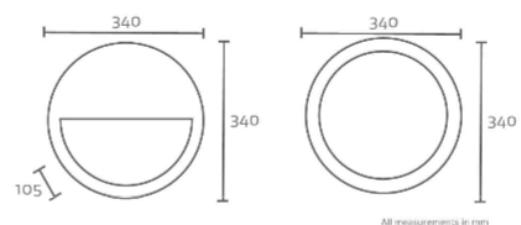
- 21W
- 1,050 - 2,100 Luminaire Lumens
- Efficacy up to 100 lm/W
- 4000K, CRI >70
- Lifetime >50,000hr
- Asymmetrical
- Options hood/ clear face



Optics



Dimensions



External Lighting Assessment

Code	Power	Light Source	Luminaire Lumens	Optic	CCT(K)	IP	IK	Weight (kg)	Paint Finish
ALFH21F	21W	LED	1050	Asymmetrical	4000	IP65	IK08	2.5	Anthracite Grey
ALFH21FPEC	21W	LED	1050	180 x 90° Illumination	4000	IP65	IK08	2.6	Anthracite Grey
ALFCL21F	21W	LED	2100	Asymmetrical	4000	IP65	IK08	2.3	Anthracite Grey
ALFCL21FPEC	21W	LED	2100	180 x 180° Illumination	4000	IP65	IK08	2.4	Anthracite Grey



Accessories / Options

- Emergency options
- Photocell options

Mounting Options

- Wall Mounted



External Lighting Assessment

8.4 Luminaire Type 3 - Guardian Pro



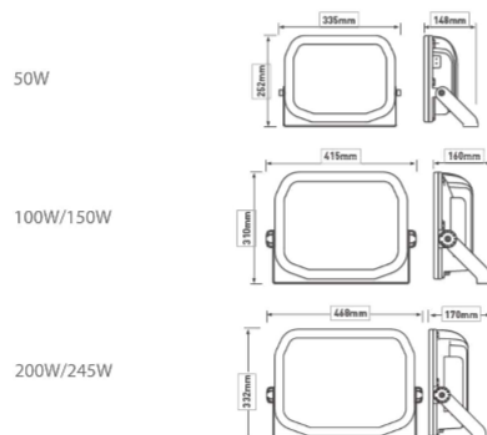
Specification Text

The luminaire shall be manufactured from high pressure die-cast aluminium. It shall have an LED efficacy of up to 136 luminaire lm/W and will be capable of producing up to 30,000 luminaire lumens at 4000K with a CRI >70. It shall have an asymmetric forward throw optic and is rated at IP65 and IK08.

Specification

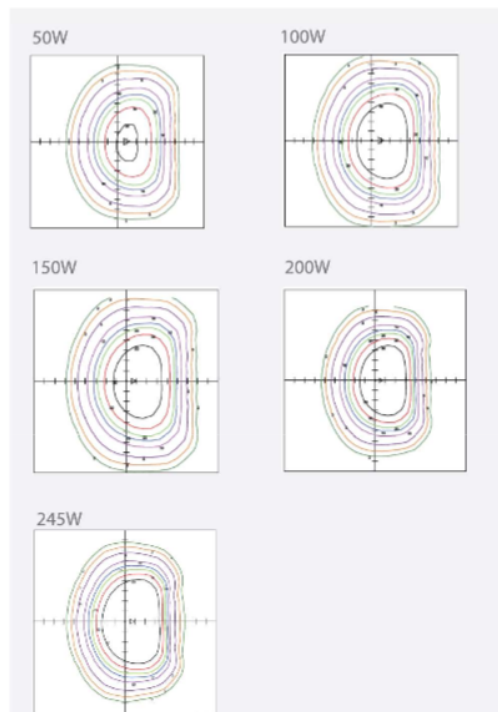
Weight:	4.7 kg - 50W 7.0 kg - 100W 7.4 kg - 150W 9.3 kg - 200W/ 245W
Windage:	0.08m² Max.
Material:	Die-cast Aluminium
Paint Finish:	Anthracite Grey

Dimensions



Key Features

- 50W - 245W
- 6,800 - 30,000 Luminaire Lumens
- Efficacy up to 136 lm/W
- 4000K, CRI >70
- Lifetime >70,000hr
- Driver included



External Lighting Assessment



Code	Power	Light Source	Luminaire Lumens	Optic	CCT(K)	IP	IK	Weight (kg)	Paint Finish
LFP50B140F	50W	LED	6800	Asymmetrical Flood Optic	4000	IP65	IK08	4.7	Antracite Grey
LFP100B140F	100W	LED	12500		4000	IP65	IK08	7.0	Antracite Grey
LFP150B140F	150W	LED	19200		4000	IP65	IK08	7.4	Antracite Grey
LFP200B140F	200W	LED	26000		4000	IP65	IK08	9.3	Antracite Grey
LFP245B140F	245W	LED	30000		4000	IP65	IK08	9.3	Antracite Grey



Accessories / Options

- Control options available
- Integrated photocell option

Mounting Options

- Stirrup Mounted

External Lighting Assessment

8.5 Luminaire Type 4 - Quarto



**Kingfisher
Lighting**

Datasheet

Quarto



Specification Text

The luminaire shall be manufactured from high pressure die-cast aluminium. It shall have an LED efficacy of up to 114.2 luminaire lm/W and will be capable of producing up to 1,542 luminaire lumens at 4000K with a CRI >70. It shall have an asymmetric forward throw optic and is rated at IP65 and IK10.

Specification

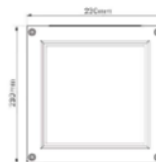
Weight: 4.26kg Max.
Windage: 0.05m² Max.
Material: Die-cast Aluminium
Paint Finish: Anthracite Grey

Key Features

- 7.5W & 14.2W
- 857 - 1542 Luminaire Lumens
- Efficacy up to 114.2 lm/W
- 2700K, 3000K & 4000K
- Lifetime >100,000hr L80
- Asymmetrical
- Dali Dimmable options

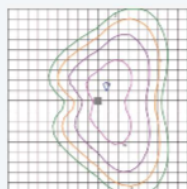
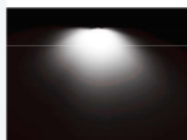


Dimensions

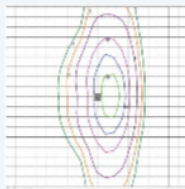
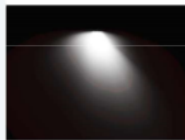


Optics

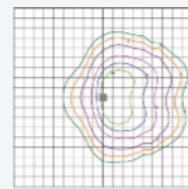
STREET



CYCLE



FLOOD





**Kingfisher
Lighting**

Datasheet

Quarto



Specification Text

The luminaire shall be manufactured from high pressure die-cast aluminium. It shall have an LED efficacy of up to 114.2 luminaire lm/W and will be capable of producing up to 1,542 luminaire lumens at 4000K with a CRI >70. It shall have an asymmetric forward throw optic and is rated at IP65 and IK10.

Specification

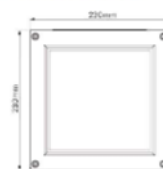
Weight: 4.26kg Max.
Windage: 0.05m² Max.
Material: Die-cast Aluminium
Paint Finish: Anthracite Grey

Key Features

- 7.5W & 14.2W
- 857 - 1542 Luminaire Lumens
- Efficacy up to 114.2 lm/W
- 2700K, 3000K & 4000K
- Lifetime >100,000hr L80
- Asymmetrical
- Dali Dimmable options



Dimensions



Optics

