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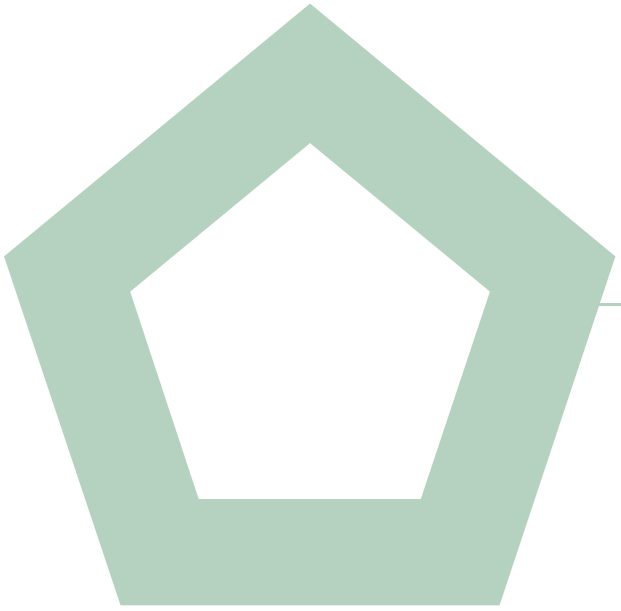
Oxford Institute of Digital Health.
Oxford.
NBBJ.

MEP ENGINEERING
STAGE 3 EXTERNAL LIGHTING REPORT

REVISION P02 – 04 APRIL 2024



STAGE 3

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
P01	21/02/2024	Stage 3 Issue	SS	JK	TK
P02	04/04/2024	Updated Stage 3 Issue	SS	JK	TK

Project number: 31/04081
Document reference: 598-HLE-XX-XX-RP-E-708002-External lighting RevP01

Contents.

1. Introduction

1.1 Scope of Report

This report has been prepared to demonstrate that the external lighting scheme at the new Oxford Institute of Digital health (OIDH) development will comply with Local and National Guidelines in terms of light pollution and minimum levels of illumination required addressing security and amenity.

1.2 Site Location and Description

Oxford Institute of Digital Health (OIDH) is situated near the Radcliffe Observatory Quarter (ROQ), Central North Oxford. The current scheme comprises of two existing buildings, Gibson and Harkness buildings which have a common courtyard, with 2no. associated accessible car parking spaces, bicycle facilities, and walkways.

The new OIDH will be positioned on the site of the existing Gibson and Harkness buildings, which are to be retained and reused. The courtyard between the two buildings will be used to create a new atrium that connects and serves as a hub for the building.

Figure 1 below shows the site location, and Figure 2 shows the proposed site plan.

Figure 1: Site Location

2. Objectives and Design Criteria

2.1 Objectives

Specific objectives of the proposed lighting scheme when fully designed include:

- Provide adequate illuminance to the roadways, pathways and entrance areas of this development
- Provide adequate illuminance to walkways and entrances to improve the security of the users
- Mitigate light pollution and light trespass so far as is practicable
- Minimise energy consumption through efficient luminaires and suitable lighting control strategy

Figure 2: Proposed Site plan

2.2 Relevant Standards & Guidance

Light and people's perception of it, are a complex interaction and vary from person to person. There are therefore recognised standards that are based on current good practice.

The proposed developments external lighting shall be designed in accordance with the following regulations, standards and guidance:

- SLL Code of Lighting
- Society of Light & Lighting Handbook
- CIE Technical Report, CIE 150 – Guide to the Limitation of the Effects of Obtrusive Light from Outdoor Installations

- CIBSE Lighting Guide 6 – The Outdoor Environment
- BS 5489-1:2020 Design of Road Lighting. Part 1: Lighting of Roads and Public Amenity Areas - Code of Practice
- BS EN 13201-2:2015 Road Lighting. Part 2: Performance Requirements
- BS EN 12464-2 Lighting of work places. Part 2: Outdoor work places

Additional guidance on light pollution and limiting impacts on ecology:

- Guidance Notes for the Reduction of Obtrusive Light – ILP

The above publications refer to five environmental zones E0-E4 which are based on background brightness, for which a number of limiting technical parameters are given. The Oxford Institute of Digital Health will fall within Environmental Zone 3: Medium District Brightness.

The legal requirements for good lighting are limited to those aspects relevant to safety and are encompassed in the following UK sets of Regulations:

- Health & Safety at Work etc. Act
- Health & Safety Commission, Approved Code of Practice Regulation 8 Lighting

2.3 Performance Criteria

2.3.1 Quality of Light

Lamps and Luminaires
Lamp types will be selected for their efficacy, colour rendition and longevity to provide an efficient lighting solution with a predictable maintenance regime. Where possible luminaires will be sourced from readily available standard product ranges. Luminaires will be selected for their construction, design, fabrication and ingress protection and will be sited in accessible locations. Particular attention will be paid to selecting luminaires with good optical control to help ensure that light pollution is kept to a minimum.

Colour Temperature
The colour temperature of a light source is conventionally stated in the unit of absolute temperature, Kelvin, having the unit symbol K. Temperatures above 4000K are cool in colour, with bluish white light, while colour temperatures around 4000K are more neutral white in tone, providing a modern feel. Colour temperatures in the 2400K-3000K range have a warmer effect, creating a traditional atmosphere.

Figure 3: Colour Temperature Comparison

2.3.2 Obtrusive Light

Light pollution, or obtrusive light, has the potential to cause physiological and ecological issues. It takes various forms:

- Sky glow: the brightening of the night sky above our towns and cities,
- Glare: the uncomfortable brightness of a light source in contrast to the background
- Light Trespass: the spilling of light beyond the boundary of the property on which the light source is located
- Light Ingress: the passage of light into buildings from an external source(s)

Obtrusive light is a nuisance to both humans and wildlife, it is a waste of energy and contributes to greenhouse gas emissions. The problems of unnecessary, obtrusive light can and should be reduced or eliminated at the design stage. When specifying luminaires, careful consideration is given to minimising upward light and the use of optical units with precise light intensity distribution: thus, ensuring that spill and glare are minimised.

Luminaires selected for this development will have no upward light component and will all be LED with optics designed for precise projection of light.

During the design phase of a lighting installation the following measures should be considered to reduce the occurrence of obtrusive light:

Over-lighting: This is avoided by conducting thorough calculations and carefully selecting the most appropriate lighting equipment and lamp types.

Lighting Control: To ensure luminaires are only switched on when necessary, a lighting control performance specification is produced.

Follow Guidance: For the purpose of this study, it is considered that the development is an area of 'Medium district brightness' (Zone E3). Therefore, the relevant maximum values highlighted from the tables below should be applied.

Zone	Lighting Environment	Examples
E0	Intrinsically dark	UNESCO Starlight Reserves, IDA Dark Sky Parks, Major optical observatories
E1	Dark	Relatively uninhabited rural areas
E2	Low district brightness	Sparsely inhabited rural areas
E3	Medium district brightness	Well inhabited rural and urban settlements
E4	High district brightness	Town and city centres and other commercial areas

Figure 4: LG 6 - Environmental Zones

Source: CIE 150: 2017

Light Technical Parameter	Application Conditions	Environmental Zones				
		E0	E1	E2	E3	E4
Illuminance in 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

Figure 5: CIE 150 - Maximum Values of Vertical Illuminance on Properties

Road Illuminance

Traffic flow	Lighting class		
	Dual carriageway		Single carriageway
	Junction density: high	Junction density: low	
High to very high[A)]	M3	M4	M3
Low to moderate[B)]	M4	M5	M4
Very low[C)]	M5	M6	M5

Figure 6: BS 5489-1:2020 - Lighting classes for traffic routes (v < 40mph)

OIDH will have a very low traffic density as the roadways on the site will be for the building users and for deliveries to the site, therefore the roadways will target lighting class M5.

Class	Luminance of the road surface of the carriageway for the dry and wet road surface condition				Disability glare	Lighting of surroundings
	Dry conditions			Wet	Dry conditions	Dry conditions
	$\overline{L}$ [minimum maintained] cd·m²	U_o [minimum]	U_l [a] [minimum]	U_{ow} [b] [minimum]	f_{TI} [c] [maximum] %	R_{EI} [d] [minimum]
M1	2,00	0,40	0,70	0,15	10	0,35
M2	1,50	0,40	0,70	0,15	10	0,35
M3	1,00	0,40	0,60	0,15	15	0,30
M4	0,75	0,40	0,60	0,15	15	0,30
M5	0,50	0,35	0,40	0,15	15	0,30
M6	0,30	0,35	0,40	0,15	20	0,30

Figure 7: BS EN 13201-2:2015 - M Lighting Classes

Car Park Illuminance

Values in lux

Type of area and usage	$\bar{E}$	U_o
Light traffic, e.g. parking areas of shops, terraced and apartment houses; cycle parks	5	0.25
Medium traffic, e.g. parking areas of department stores, office buildings, plants, sports and multipurpose building complexes	10	0.25
Heavy traffic, e.g. parking areas of major shopping centres, major sports and multipurpose sports and building complexes	20	0.25

Figure 8: BS 5489-1:2020 - Maintained Lighting Levels for Outdoor Car Parks

As the 2no. accessible car parking spaces will be for the sole use of the building users with accessibility requirements, it is anticipated that there will be very little traffic.

Walkway Illuminance

Traffic flow	Lighting class		
	E1 to E4[A)]	E1 to E2[A)]	E3 to E4[A)]
	Pedestrian and cyclists only	Speed limit $v \leq 30$ mph	Speed limit $v \leq 30$ mph
Busy [B)]	P5	P4	P3
Normal [C)]	P5	P5	P4
Quiet [D)]	P6	P5	P4

Figure 9: BS 5489-1:2020 - Lighting Classes for Subsidiary Roads

Class	Horizontal illuminance		Additional requirement if facial recognition is necessary	
	$\bar{E}$ [a] [minimum maintained] lx	E_{min} [maintained] lx	$E_{v,min}$ [maintained] lx	$E_{sc,min}$ [maintained] lx
P1	15,0	3,00	5,0	5,0
P2	10,0	2,00	3,0	2,0
P3	7,50	1,50	2,5	1,5
P4	5,00	1,00	1,5	1,0
P5	3,00	0,60	1,0	0,6
P6	2,00	0,40	0,6	0,2
P7	performance not determined	performance not determined		

[a] To provide for uniformity, the actual value of the maintained average illuminance shall not exceed 1,5 times the minimum $\bar{E}$ value indicated for the class.

Figure 10: BS EN 13201-2:2015 - P Lighting Classes

Pole mounted luminaries with street optic will be utilised to illuminate the main pedestrian walkways through the site, these will allow even illumination of the walkways to improve the safety and security of the users of the site. In order to minimise impact to ecology these will have a colour temperature of 3000K and will be mounted at 2000mm. The minimum maintained illuminance will be as shown in Figure 10.

Access pathways and secondary pathways within the landscaping will be illuminated with pole and ground mounted luminaires.

2.3.3 Ecological Lighting Recommendation

The ecological impact assessment makes a number of recommendations to mitigate the impact of external lighting on the ecology local to the site. The external lighting design addresses these recommendations in the following ways:

The following standard measures are taken to reduce the nighttime lighting effect at the site, these include:

- All luminaires will be LED which do not contain UV elements.
- All luminaires will have optical control and DALI dimming to ensure light is directed to the areas it is required and at the intensity required.
- All luminaires will have a colour temperature of 3000K with peak spectral wavelength of above 600nm.
- Pole mounted luminaires will have a maximum overall height of 2500mm and have optical control to limit light spill.
- All of the fixed lighting specified has 0% upward light and will be mounted in the horizontal.
- Adjustable lighting elements within the terrace areas will have optical controls to ensure sharp cut offs.
- The lighting system will be controlled through photocell and astronomical time clocks to ensure lighting other than that required for security is switched off during night hours, security lighting will be controlled through motion sensors.

3. Calculation Results

3.1 Model

A lighting model was prepared in Relux in order to check the compliance of the design with the aforementioned criteria, ensuring adequate illumination of the roads, car park, paths and entrances to the building, as well as examining the obtrusive light to minimise the ecological impact of the design.

The model was based on the landscape designers and architect's layouts. Relux was used to give a realistic indication of the development when constructed. The parameters considered in the model are as follows:

- All column mounted luminaires will be mounted at 2000mm.

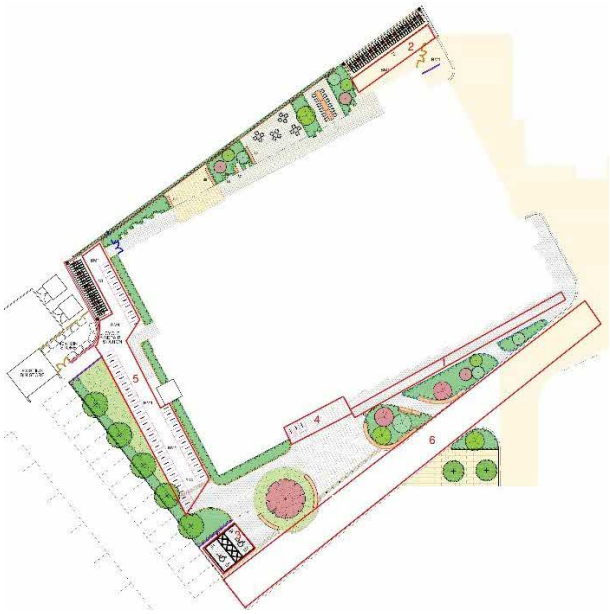


Figure 11: Calculation Surfaces

3.2 Results Overview

	Pedestrian Pathways (1)	Patio (2)	Car Park (3)	Building Entrance (4)	Cycle Area (5)	Roadways (6)
Average Illuminance (lx)	24.4	17.5	49.8	55.3	16.4	25.8
Minimum Illuminance (lx)	5.9	9.4	21.1	26	3.9	9.8
Maximum illuminance (lx)	47	29.3	91.6	79.9	50.9	49.8
Uniformity (Uo)	0.24	0.54	0.42	0.47	0.24	0.38
Minimum Luminance (cd/m²)	-	-	-	-	-	0.04
Average Luminance (cd/m²)	-	-	-	-	-	1.35

3.3 Obtrusive Light

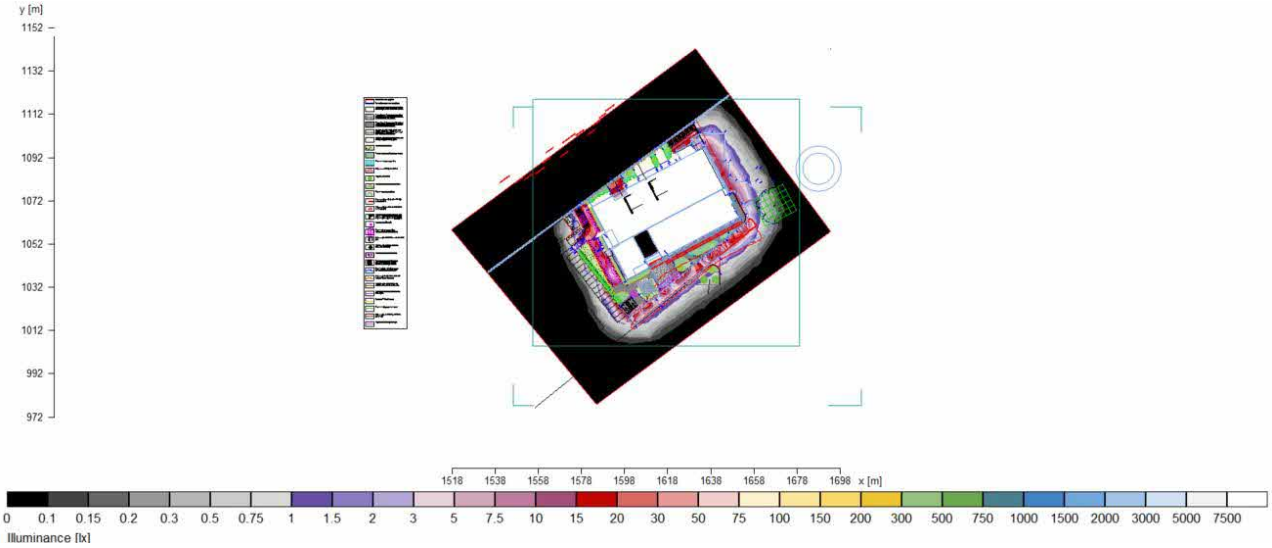


Figure 12: Site Illuminance False Colour Rendering

See associated drawing 598-HLEA-ZZ-XX-DR-E-70804 for detailed isoline layout showing extents of light spill.

3.4 Luminaire Schedule

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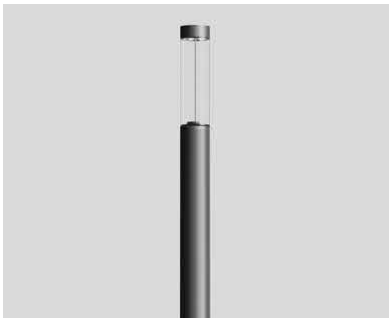
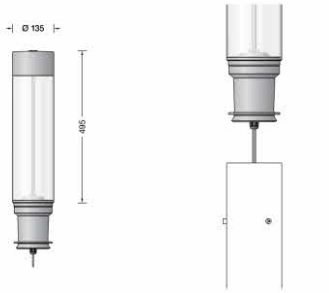
EX1





Manufacturer	Bega			
Product name	84748K3		**Dimensions – Diameter**	135 mm
Product description	Pole top path luminaire		**Dimensions – Height**	495 mm
Mounting type	Pole mounted			
Lamp type	LED, 3000K, CRI80		**Emergency**	N/A
Optic	Asymmetric flat beam		**Accessory –**	Bega 2000mm pole
Connected Load	22.5	W	**Located in:** Perimeter road and cycle parking	
Delivered Lumens	2294	Lm		
Efficiency	102	LLm/W	**Notes:** 2500mm pole mounted luminaire	
Embodied Carbon Stages A, C & D*	TBC	KG/CO2e		
CEAM - TM66 Score	TBC	0 – 4		
Finish	RAL 7016			
Control gear	DALI 2			
IP/IK rating	IP65, IK08			

Note: Prices quoted are manufacturers trade price (£Sterling) excluding V.A.T. Product codes, quantities and prices are for reference only and should be confirmed prior to order placement. Dimensions and technical details are for information only. Installation data should be obtained direct from manufacturer. *Embodied Carbon (GHG) Emissions measured in KGCO2e based on EPD, TM65 or Similar. Stage D if available.

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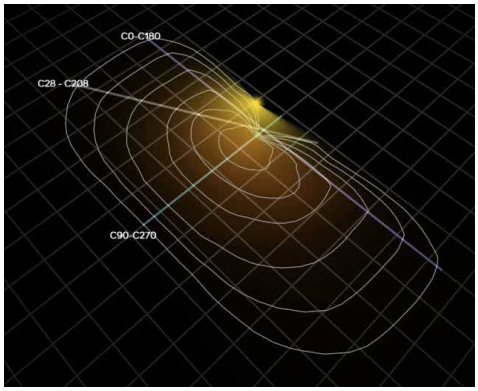
LUMINAIRE DATASHEETS

OIDH
EX2/E



Manufacturer	EWO	
Product name	FA08	
Product description	2m bollard luminaire	
Mounting type	Ground mounted	
Lamp type	LED, 3000K, CRI80	
Optic	AP06	
Connected Load	10	W
Delivered Lumens	792	Lm
Efficiency	80	LLm/W
Embodied Carbon Stages A, C & D*	TBC	KG/CO2e
CEAM - TM66 Score	TBC	0 – 4
Finish	RAL 7016	
Control gear	DALI 2	
IP/IK rating	IP66, IK08	

Dimensions – Length	260 mm
Dimensions – Height	1000 mm
Dimensions – Width	180 mm
Emergency	N/A
Accessory –	

Located in:
Building front pedestrian path

Notes: To be combined with 2m pole

Note: Prices quoted are manufacturers trade price (£Sterling) excluding V.A.T. Product codes, quantities and prices are for reference only and should be confirmed prior to order placement. Dimensions and technical details are for information only. Installation data should be obtained direct from manufacturer. *Embodied Carbon (GHG) Emissions measured in KGCO2e based on EPD, TM65 or Similar. Stage D if available.

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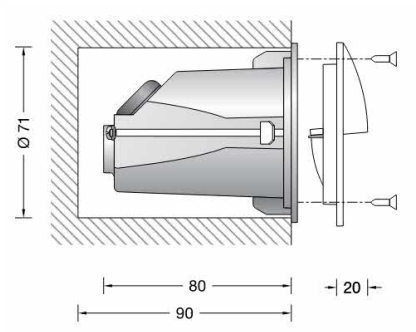
LUMINAIRE DATASHEETS

OIDH

EX3



Manufacturer	Bega			
Product name	22369		**Dimensions – Diameter**	71 mm
Product description	Circular shielded path light		**Dimensions – Length**	100 mm
Mounting type	Wall recessed		**Dimensions – Cut out depth**	90 mm
Lamp type	LED, 3000K, CRI80		**Emergency**	N/A
Optic	Rectangular 'side throw' (R65)		**Accessory –**	
Connected Load	2.7	W	**Located in:** Landscaping	
Delivered Lumens	97	Lm		
Efficiency	35.9	LLm/W	**Notes:**	
Embodied Carbon Stages A, C & D*	TBC	KG/CO2e		
CEAM - TM66 Score	TBC	0 – 4		
Finish	RAL 7016			
Control gear	DALI 2			
IP/IK rating	IP66, IK08			

Note: Prices quoted are manufacturers trade price (£Sterling) excluding V.A.T. Product codes, quantities and prices are for reference only and should be confirmed prior to order placement. Dimensions and technical details are for information only. Installation data should be obtained direct from manufacturer. *Embodied Carbon (GHG) Emissions measured in KGCO2e based on EPD, TM65 or Similar. Stage D if available.

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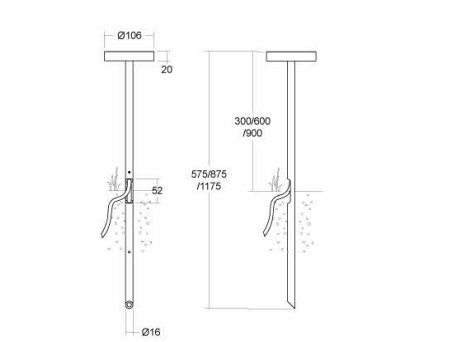
LUMINAIRE DATASHEETS

OIDH
EX4a



Manufacturer	LightGraphix	
Product name	LD53	
Product description	Circular spike top diffuse decorative planter luminaire	
Mounting type	Ground spike mounted	
Lamp type	LED, 3000K, CRI93.5	
Optic	Rectangular 'side throw' (R65)	
Connected Load	5.4	W
Delivered Lumens	310	Lm
Efficiency	44	LLm/W
Embodied Carbon Stages A, C & D*	TBC	KG/CO2e
CEAM - TM66 Score	2.5	0 – 4
Finish	RAL 9005	
Control gear	DALI 2	
IP/IK rating	IP65	

Dimensions – Diameter	106 mm
Dimensions – Height above ground	600 mm
Dimensions – Total length	875 mm
Emergency	N/A
Accessory –	

Located in:
First floor terrace

Notes:
Ground spike mounted within terrace planters

Note: Prices quoted are manufacturers trade price (£Sterling) excluding V.A.T. Product codes, quantities and prices are for reference only and should be confirmed prior to order placement. Dimensions and technical details are for information only. Installation data should be obtained direct from manufacturer. *Embodied Carbon (GHG) Emissions measured in KGCO2e based on EPD, TM65 or Similar. Stage D if available.

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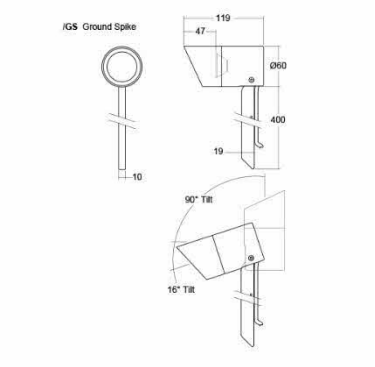
LUMINAIRE DATASHEETS

OIDH
EX4b



Manufacturer	LightGraphix	
Product name	LD10238	
Product description	Miniature ground spike mounted adjustable LED spotlight	
Mounting type	Ground spike mounted	
Lamp type	LED, 3000K, CRI85	
Optic	Wall wash	
Connected Load	4.2	W
Delivered Lumens	379	Lm
Efficiency	76	LLm/W
Embodied Carbon Stages A, C & D*	TBC	KG/CO2e
CEAM - TM66 Score	2.5	0 – 4
Finish	RAL 7016	
Control gear	DALI 2	
IP/IK rating	IP67	

Dimensions – Diameter	60 mm
Dimensions – Height above ground	695 mm (max)
Dimensions – Length	119 mm
Emergency	N/A
Accessory –	

Located in:
Rear garden

Notes:
Ground spike mounted within planters.
Wall wash to existing wall

Remote DALI drivers to be concealed in a dry ventilated space, contractor to coordinate with manufacturers literature for maximum distances between luminaire and driver.

Note: Prices quoted are manufacturers trade price (£Sterling) excluding V.A.T. Product codes, quantities and prices are for reference only and should be confirmed prior to order placement. Dimensions and technical details are for information only. Installation data should be obtained direct from manufacturer. *Embodied Carbon (GHG) Emissions measured in KGCO2e based on EPD, TM65 or Similar. Stage D if available.

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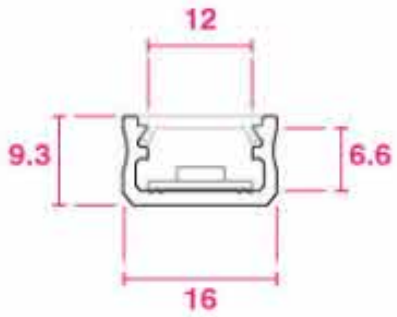
LUMINAIRE DATASHEETS

OIDH
L5



Manufacturer	Optelma Jamie Arnold info@optelma.co.uk	
Product name	Firo	
Product description	LED strip profile	
Mounting type	Surface mounted	
Lamp type	LED, 3000K, CRI90	
Optic	Rectangular 'side throw' (R65)	
Connected Load	4.8	W/m
Delivered Lumens	338	Lm/m
Efficiency	70	LLm/W
Embodied Carbon Stages A, C & D*	TBC	KG/CO2e
CEAM - TM66 Score	TBC	0 – 4
Finish	Silver	
Control gear	DALI 2	
IP/IK rating	IP65	

Dimensions – Width	16 mm
Dimensions – Height	6.6 mm
Dimensions – Length	TBC mm
Emergency	N/A
Accessory –	

Located in:
First floor terrace

Notes:
Concealed on underside of terrace perimeter ledge.

Integration detail and final length to be developed at the next stage of design.

Note: Prices quoted are manufacturers trade price (£Sterling) excluding V.A.T. Product codes, quantities and prices are for reference only and should be confirmed prior to order placement. Dimensions and technical details are for information only. Installation data should be obtained direct from manufacturer. *Embodied Carbon (GHG) Emissions measured in KGCO2e based on EPD, TM65 or Similar. Stage D if available.

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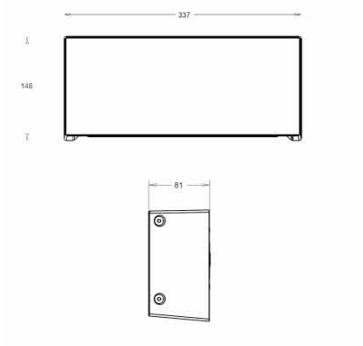
LUMINAIRE DATASHEETS

OIDH
EX6/E



Manufacturer	Kingfisher	
Product name	Semita Urban	
Product description	Wall street and final exit light	
Mounting type	Wall mounted	
Lamp type	LED, 3000K, CRI>70	
Optic	Comfort Path Optic	
Connected Load	11	W
Delivered Lumens	1393	Lm
Efficiency	127	LLm/W
Embodied Carbon Stages A, C & D*	TBC	KG/CO2e
CEAM - TM66 Score	>2.5	0 – 4
Finish	RAL 7016	
Control gear	DALI 2	
IP/IK rating	IP66/ IK10	

Dimensions – Width	337 mm
Dimensions – Height	148 mm
Dimensions – Depth	81 mm
Emergency	3hr
Accessory –	

Located in:
Building perimeter and final exits

Notes:
Integral 3hr emergency

Note: Prices quoted are manufacturers trade price (£Sterling) excluding V.A.T. Product codes, quantities and prices are for reference only and should be confirmed prior to order placement. Dimensions and technical details are for information only. Installation data should be obtained direct from manufacturer. *Embodied Carbon (GHG) Emissions measured in KGCO2e based on EPD, TM65 or Similar. Stage D if available.

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L7

Manufacturer	Kingfisher Lighting Dave Hughes dhughes@kingfisherlighting.com			
Product name	Tocca 2.0		**Dimensions – Width**	340 mm
Product description	Handrail recessed luminaire		**Dimensions – Height**	20 mm
Mounting type	Recessed		**Dimensions – Depth**	16 mm
Lamp type	LED, 3000K, CRI82		**Emergency**	N/A
Optic	Diffuse		**Accessory –**	
Connected Load	4.2	W	**Located in:** **Final Exit**	
Delivered Lumens	195	Lm		
Efficiency	46.5	LLm/W	**Notes:** **To be integrated into handrails within landscape, coordinate with architect for handrail specification and integration details.**	
Embodied Carbon Stages A, C & D*	TBC	KG/CO2e		
CEAM - TM66 Score	TBC	0 – 4	**To be combined with remote driver, concealed in a dry ventilated space. Refer to manufacturer's literature for maximum distance between driver and luminaire.**	
Finish				
Control gear	DALI 2			
IP/IK rating	IP66/ IK10			

Note: Prices quoted are manufacturers trade price (£Sterling) excluding V.A.T. Product codes, quantities and prices are for reference only and should be confirmed prior to order placement. Dimensions and technical details are for information only. Installation data should be obtained direct from manufacturer. *Embodied Carbon (GHG) Emissions measured in KGCO2e based on EPD, TM65 or Similar. Stage D if available.

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LUMINAIRE DATASHEETS

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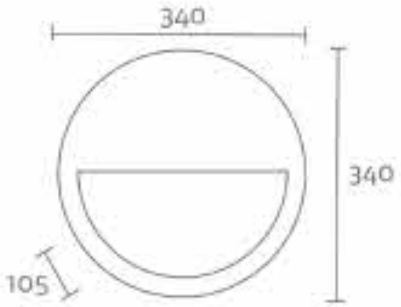
EX8



Manufacturer	Kingfisher Lighting Dave Hughes dhughes@kingfisherlighting.com			
Product name	Alfresco Urban		**Dimensions – Diameter**	340 mm
Product description	Bulkhead luminaire		**Dimensions – Height**	105 mm
Mounting type	Ceiling surface			
Lamp type	LED, 3000K, CRI80		**Emergency**	N/A
Optic	Diffuse		**Accessory –**	
Connected Load	20	W	**Located in:** **Cycle stores**	
Delivered Lumens	2147	Lm		
Efficiency	107	LLm/W	**Notes: To be mounted to underside of cycle store cover**	
Embodied Carbon Stages A, C & D*	TBC	KG/CO2e		
CEAM - TM66 Score	TBC	0 – 4		
Finish				
Control gear	DALI 2			
IP/IK rating	IP66/ IK10			

Note: Prices quoted are manufacturers trade price (£Sterling) excluding V.A.T. Product codes, quantities and prices are for reference only and should be confirmed prior to order placement. Dimensions and technical details are for information only. Installation data should be obtained direct from manufacturer. *Embodied Carbon (GHG) Emissions measured in KGCO2e based on EPD, TM65 or Similar. Stage D if available.

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OIDH
EX9

Manufacturer	iGuzzini			
Product name			**Dimensions – Width**	340 mm
Product description			**Dimensions – Height**	20 mm
Mounting type	Recessed		**Dimensions – Depth**	16 mm
Lamp type	LED, 3000K, CRI82		**Emergency**	N/A
Optic	Diffuse		**Accessory –**	
Connected Load	4.2	W	**Located in:**	
Delivered Lumens	195	Lm	**Notes:**	
Efficiency	46.5	LLm/W		
Embodied Carbon Stages A, C & D*	TBC	KG/CO2e		
CEAM - TM66 Score	TBC	0 – 4		
Finish				
Control gear	DALI 2			
IP/IK rating	IP66/ IK10			

Note: Prices quoted are manufacturers trade price (£Sterling) excluding V.A.T. Product codes, quantities and prices are for reference only and should be confirmed prior to order placement. Dimensions and technical details are for information only. Installation data should be obtained direct from manufacturer. *Embodied Carbon (GHG) Emissions measured in KGCO2e based on EPD, TM65 or Similar. Stage D if available.

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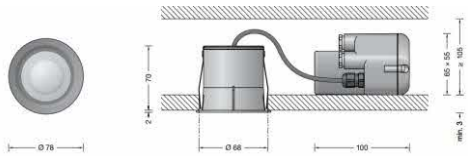
LUMINAIRE DATASHEETS

OIDH
EX10



Manufacturer	Bega			
Product name	24 790		**Dimensions – Diameter**	68 mm
Product description	Recessed downlight		**Dimensions – Height**	72 mm
Mounting type	Ceiling recessed			
Lamp type	LED, 3000K, CRI80		**Emergency**	N/A
Optic	Diffuse		**Accessory –**	
Connected Load	6.3	W	**Located in: Entrance**	
Delivered Lumens	650	Lm	**Notes:**	
Efficiency	103.2	LLm/W		
Embodied Carbon Stages A, C & D*	TBC	KG/CO2e		
CEAM - TM66 Score	TBC	0 – 4		
Finish				
Control gear	DALI 2			
IP/IK rating	IP66/ IK10			

Note: Prices quoted are manufacturers trade price (£Sterling) excluding V.A.T. Product codes, quantities and prices are for reference only and should be confirmed prior to order placement. Dimensions and technical details are for information only. Installation data should be obtained direct from manufacturer. *Embodied Carbon (GHG) Emissions measured in KGCO2e based on EPD, TM65 or Similar. Stage D if available.

3.5 Controls

The external lighting installation will be automatic with user intervention where required. Lighting will be controlled via centralised photocell and programmable time clock lighting control system, located adjacent to external lighting distribution boards. Override / isolation switches will be provided alongside the boards to allow for routine maintenance and testing.

The lighting installation will be zoned to allow different areas to be controlled independently.

- Control Zone 1 : Pedestrian Pathways
- Control Zone 2 : Patio
- Control Zone 3 : Building Entrances
- Control Zone 4 : Cycle Area
- Control Zone 5 : Roadways

The external lighting will be switched on at dusk via the centralised photocell and switch off as detailed below. Please note that these times could be changed within the external lighting system to meet the Client's requirements.

- Control Zone 1 : Pedestrian Pathways - Dusk to Midnight, 6.00am to daylight
- Control Zone 2 : Patio - Dusk to Midnight
- Control Zone 3 : Building Entrances - Dimmed Midnight to 6.00am, 6.00am to Dawn
- Control Zone 4 : Cycle Area - Dusk to Dawn
- Control Zone 5 : Roadways - Dusk to Dawn

The external lighting control system shall be managed by a central control system that shall allow the on/off times to be modified as the requirements of the buildings users and Oxford Institute of Digital Health develops over time.

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