TECHNICAL SUBMITTAL

Project:	The Castings	**T.S No:**	CAS-ABE-BU1-XX-TS-E-63-0002
A&B Contract No:	8845	**Date:**	26.05.2022
Engineer:	M. Borlase	**Rev:** C01	

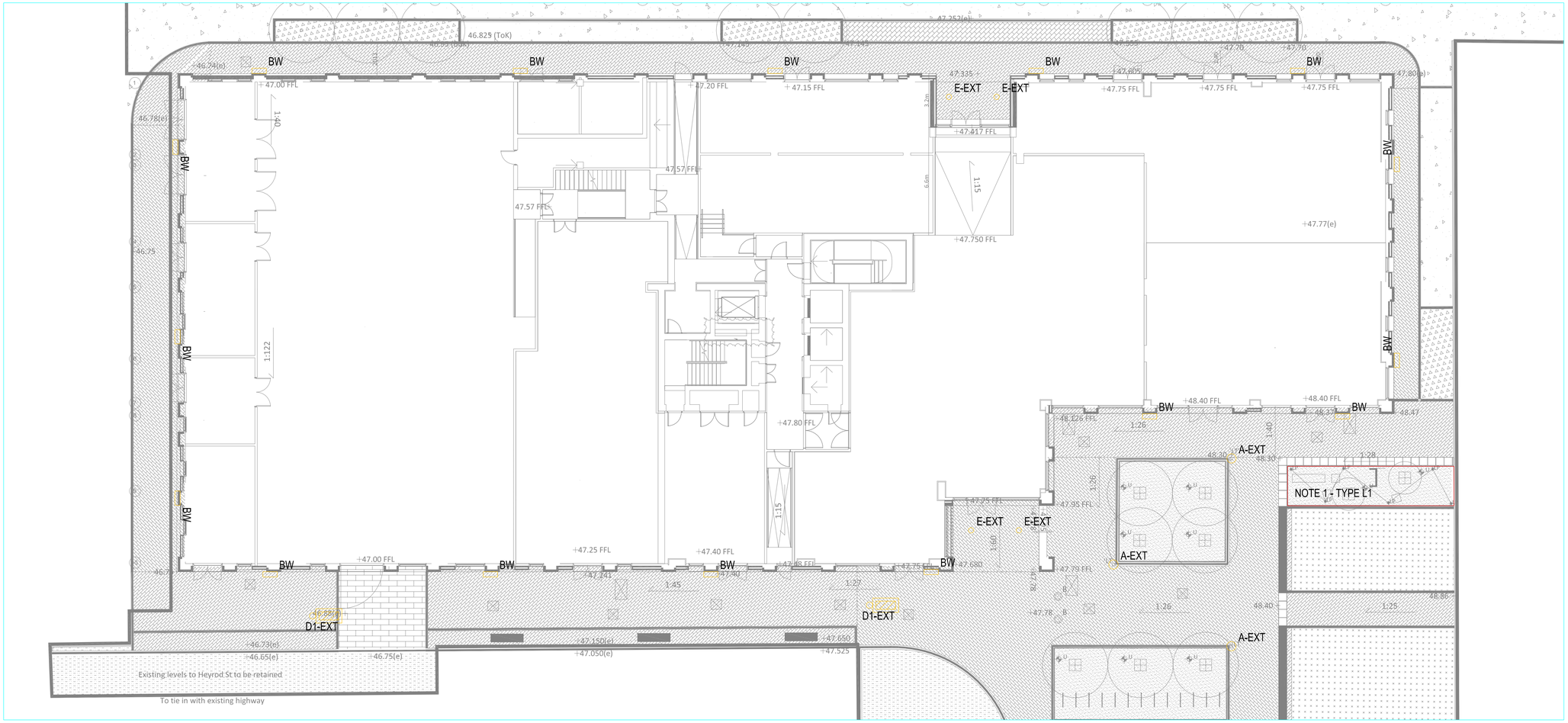
F.T.A.O.	Design Team / Midgard / CWC
Copies To:	4P – Design Team

Plant Item:	External Lighting
Specified Manufacturer:	Not Applicable
Proposed Manufacturer:	Whitecroft Aurora
Model Type:	As per the attached technical proposal
Attachments:	• Manufacturers supporting technical documentation • Refer to CAS-ABE-XX-EX-DR-E-01-6300 External Lighting

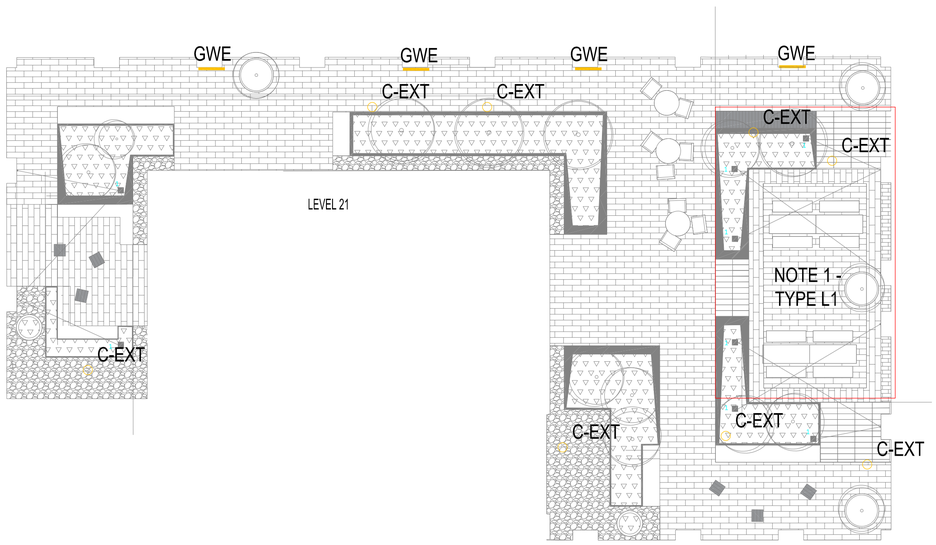
Approval Required By:	26.05.2022

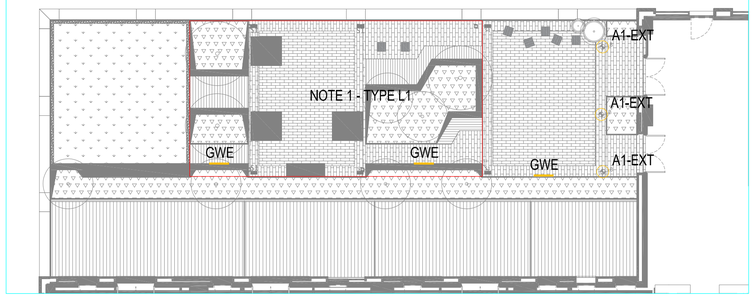
Response:

Date: **Signed:**



LEVEL 00





LEVEL 01

LEGEND OF EXTERNAL LIGHTING SYMBOLS	
SYMBOL	DESCRIPTION
A-EXT	LED LIGHTING STACK 4000K - 45W- 3.6M AS SPECIFICATION - HOLOPHANE - ANTHRACITE
A1-EXT	LED BOLLARD 1000mm BLACK - WHITECROFT KOLO BOALLRD - 4000K 709Lm
BW	WALL MOUNTED @ 3.5m 4000K 18W LED - 1280Lm - BLACK - EN-WL18BLK/40
C-EXT	RECESSED IN GROUND UPLIGHTER 4000K - ENRGL1
D1-EXT	SIROCCO MIDI LED POST TOP 4000K LUMINAIRE COLUMN MOUNTED @ 6m
E-EXT	LED (21W - 4000K) MEDIUM 220-240V UNDER CANOPY RECESSED @ 5M
GW	LED 18W- 4000K SURFACE MOUNBTED LOW LEVEL ON WALL @ 0.6M - E Denotes Emergency

NOTE 1 - TYPE L: TOKISTAR CATENARY FESTOON LIGHTING
2400k 150Lm 2W - LED - AS PER REFORM SPECIFICATION & DESIGN

BUILDING SERVICES ENGINEERS
LIVERPOOL

ALL RIGHTS RESERVED © COPYRIGHT A&B ENGINEERING (MLS) LTD
& A&B ENGINEERING (ILS2LD) LTD.

REVISION	ITEM REVISED	DATE
P01	PRELIMINARY ISSUE	03.11.21
C01	CONSTRUCTION ISSUE	25.05.22
C02	CONSTRUCTION ISSUE • EMERGENCY LIGHTING ADDED TO TERRACE AREAS	22.09.22
C03	CONSTRUCTION ISSUE • EMERGENCY LIGHTING ADDED TO TERRACE AREAS	08.11.22
C04	CONSTRUCTION ISSUE • EMERGENCY LIGHTING ADDED TO TERRACE AREAS	01.08.23
C05	CONSTRUCTION ISSUE • AMENDED AS COMMENTS RECEIVED 27.09.23	28.09.23
C06	CONSTRUCTION ISSUE • LEGEND UPDATED	10.11.23

NOTES

1. DO NOT SCALE FROM THIS DRAWING. USE FIGURED DIMENSIONS ONLY UNLESS OTHERWISE STATED. ALL DIMENSIONS ARE GIVEN IN MILLIMETRES OR METRES. ALL DIMENSIONS TO BE CHECK ON SITE BY INSTALLERS PRIOR TO COMMENCEMENT OF WORKS.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS / DOCUMENTS / SCOPE OF WORKS AND SPECIFICATIONS. THIS DRAWING SHOULD ONLY BE USED FOR ITS INTENDED PURPOSE.
3. BEFORE COMMENCEMENT OF WORK ASSOCIATED WITH THIS DRAWING REFER TO THE APPROPRIATE METHOD STATEMENTS AND RISK ASSESSMENTS.

ALL EXTERNAL LIGHTING CONTROLLED VIA PHOTOCELL AND TIMECLOCK

CONSTRUCTION

CLIENT: JRL MIDGARD

ARCHITECT: AXIS ARCHITECTS

CONTRACT: THE CASTINGS

TITLE: ELECTRICAL SERVICES
EXTERNAL LIGHTING LEVEL 00, 01 & 21

DRAWN	CHECKED	SCALE
DM	PW	NTS@A0

DATE	DRAWING No.	REV
12.10.21	CAS-ABE-XX-EX-DR-E-01-6300	C06

abengineering
Holly Terrace • 9-17 Derby Lane
Old Swan • Liverpool • L13 6QA
tel: 0151 228 4661 • fax: 0151 220 4206
email: info@abeng.co.uk • website:
www.abeng.co.uk

T4 collection





urban lighting



details

T4 collection

ARCHITECTURAL OUTDOOR LIGHTING

T4 is a small architectural lighting structure: at power-on, this ephemeral structure disappears from sight, transforming into four beams of geometrical light which creates a suggestive alternation of light and shadow on the floor.

collection

I	lighting post	IP65 IK 10 4 mm PMMA diffuser ⌀ 140 mm h. 1200 mm h. 2200 mm
T	urban lighting	IP65 IK 10 4 mm PMMA diffuser ⌀ 140 mm h. 3000 mm h. 3600 mm

details

Extruded aluminium alloy body and bars. Die-cast head made of aluminium alloy with very low copper content and aluminium alloy floor fixing flange. A4 Stainless steel screws. The product is subjected to galvanic anodizing treatment divided into distinct phases: mechanical satin finishing, surface degreasing, anodic oxidation and finally fixing. Subsequently the product is painted by performing a double pass in-line process, which allows you to generate a single thick protective layer which then generates barrier against atmospheric agents and UV rays. This allows to achieve corrosion resistance performance in salt spray. PMMA diffuser. Pre-treatment with atmospheric pressure plasma is carried out on the surface before gluing of the diffuser on Platek products.

standard finishes

.06 grey

on request finishes

.01 black

.02 white

.07 corten

.08 anthracite

.09 bronze

lighting post

I

⌀ 140 mm

h. 1200 mm
h. 2200 mm

	→ h. 1200 mm	→ h. 2200 mm
WHITE COB LED		
3000K CRI>80 220-240V 50/60 Hz	21W | 2070 lm (*) 360° emission	26W | 2880 lm (*) 360° emission
2200K / 2700K / 4000K available on request	380 cd/klm	380 cd/klm

urban lighting

T

⌀ 140 mm

h. 3000 mm
h. 3600 mm

	→ h. 3000 mm	→ h. 3600 mm
WHITE COB LED		
3000K CRI>80 220-240V 50/60 Hz	39W | 3820 lm (*) 360° emission	39W | 3820 lm (*) 360° emission
2200K / 2700K / 4000K available on request	380 cd/klm	380 cd/klm

(*) Real Data

Kolo Bollard

Type A1-EXT

Robust and weatherproof versatile LED bollard





Kolo Bollard Asymmetric Black



Kolo Bollard 1000mm Black



Kolo Bollard Root Mount



Kolo Bollard 1000mm Silver

Optics

- Light output options, symmetric 4000K versions:
  - 404 lumens (648mm high versions)
  - 404, 709 or 1500 lumens (998mm high version)
- Emergency output:
  - 332 lumens - symmetrical optic
- 3000K options
- 360 degree distribution (symmetric) or 180 degree distribution (asymmetric)

Body

- Die cast aluminium lid and extruded aluminium body
- IP66 IK10 rated protection
- Finished in Black RAL 9005 or Silver RAL 9006
- High grade paint finish, suitable for inland and coastal applications
- Moulded polycarbonate diffuser
- Spun internal reflector
- Anti-condensation ventilation valve
- DALI driver as standard
- Planted root and flange mounted versions
- Integral 3 hour and DALI addressable emergency options on 998mm high body
- Emergency variants supplied with a NiCd battery
- Integral Air Control module available for use with Air Control Outdoor wireless presence/daylight detector
- IP65 versions require TORX6-KEY for connecting plug terminals

---

Order codes

Root Mounted, symmetric, black, 4000K

			B50		
Version	Order Code	3hr Emergency	LL/CW	L80	L90
648mm high, 404 lumen, 4.2W	BLY114KSRB	N/A	96	54k	49k
998mm high, 404 lumen, 4.2W	BLY214KSRB	BLY214KSRBEM	96	54k	49k
998mm high, 709 lumen, 6.6W	BLY224KSRB	BLY224KSRBEM	107	54k	49k
998mm high, 1500 lumen, 13.8W	BLY234KSRB	BLY234KSRBEM	108	54k	49k

Root mounted, asymmetric, black, 4000K

			B50		
Version	Order Code	3hr Emergency	LL/CW	L80	L90
648mm high, 410 lumen, 5.2W	BLY114KARB	N/A	79	54k	49k
998mm high, 410 lumen, 5.2W	BLY214KARB	BLY214KARBEM	79	54k	49k
998mm high, 703 lumen, 9.1W	BLY224KARB	BLY224KARBEM	77	54k	49k

Options

Description	How to change	For example
3000K LED	Change '4K' to '3K'	i.e. BLY113KSRB
Air Control Module	Add 'AC' before 'Y'	i.e. BLACY114KSRB
Silver finish	Change 'B' to 'S'	i.e. BLY114KSRS
Flange mounted body	Change 'R' to 'F'	i.e. BLY114KSFB
COMEPS addressable emergency (998mm high only)	Change 'EM' to 'EP'	i.e. BLY224KSRBEP

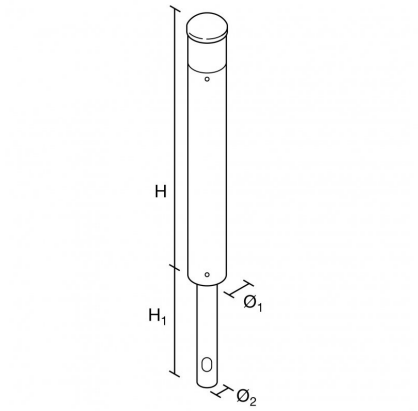
Accessories

Description	Order Code
Tool for IP65 connections	TORX6-KEY

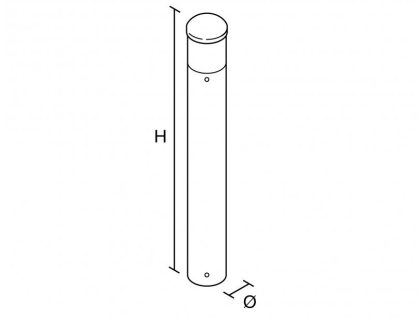
LED Performance

Colour Temp	RA (CRI)	Colour consistency
3000/4000K	>80	MacAdam 3 SDCM

Dimensions

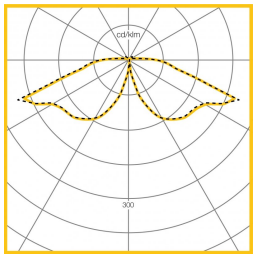


VERSION	H	H1	KG	KG(EM)	Ø1	Ø2
Root Mounted, tall	998	400	9.3	10.6	152	76
Root Mounted, short	648	400	7.5	8.8	152	76

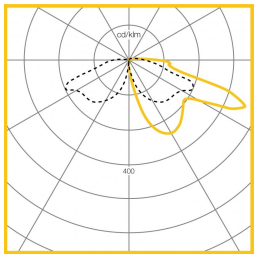


VERSION	H	KG	KG(EM)	Ø
Flange Mounted, tall	998	7.3	8.6	152
Flange Mounted, short	648	5.5	6.8	152

Photometric Performance



Symmetric
LOR = 100%



Asymmetric
LOR = 100%

To Specify

Robust and weatherproof illuminated bollard with aluminium body and clear polycarbonate diffuser. IK10, IP66 rated for maximum protection. Root or flange mounted with fitted lead and plug for easy installation - as Whitecroft KOLO BOLLARD

Type BW -
Building Perimeter Mounted
White or Black Option

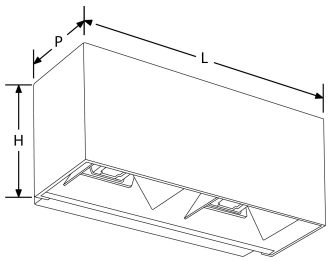


Product Description: Klay™ 18W Multi-Directional IP65 Wall Light

Klay™ is a decorative wall light that offers multiple beam angles and options for light distribution for indoor or outdoor application. On the top or bottom of the product, there is adjustable covers which can be adjusted which then adjusts the beam angle between15° to 60° per light source providing multiple options for illumination.

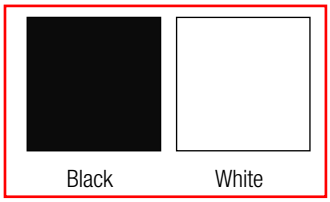
SKU Code	Wattage	Colour	Lumens	Lumens/Watt	Beam Angle	Finish Colour
EN-WL18BLK/40	18	4000	1280	72	120	Black
EN-WL18W/40	18	4000	1710	95	120	White

Line Drawing



Polar Curve

Colour



Product Features:

- Adjustable reflectors allow for a range of symmetric and asymmetric beam angles completely customisable
- IP65 rated for use in damp environments
- IK06 Rated
- Supplied with integral non-dimmable LED driver
- Black or White finish options
- 3 Year Warranty

Product Specs:

Input Voltage	200~240V AC	Power Factor	0.9
IP Rating	IP65	Lifetime L70 (hrs)	50000
IK Rating	IK06	Length (mm)	242
Weight (Kg)	1.100	Projection (mm)	98
Height (mm)	100	Product Type	Wall Lights
Operating Temp. (Min) °C	-20°C	Operating Temp. (Max) °C	45°C

Compliance & Approvals:





Warranty:

This product has a warranty period of 3 Years. Warranties may be available on certain products as indicated in the product description. Warranties are valid from the date of purchase.The warranty is invalid in the case of improper use, installation, tampering, removal of the Q.C. date label or installation in an improper working environment or installation. Should this product fail during the warranty period it will be replaced free of charge, subject to the correct installation of the original product and subsequent return of the faulty unit. Aurora does not accept responsibility for any installation costs associated with the replacement of this product and Aurora reserves the right to alter specifications without prior notice.

AURORA®
VALUE BEYOND ILLUMINATION™

Type C -
Recessed Inground
Uplighter

G-Lite™



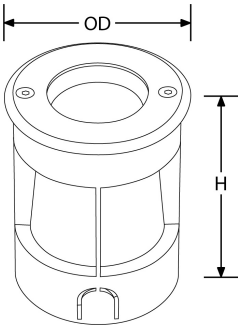
make smart with one control | requires .hub | works with .light | works with .control

Product Description: G-Lite™ GU10 IP67 Stainless Steel Recessed Ground Light

G-Lite™ is the range of 304 stainless steel ground walkover/driveover lights. Designed to be discreetly recessed, these ground lights can be used for pathways and patios making them perfect for domestic and commercial applications.

SKU Code	Finish Colour
EN-RGL1	Stainless Steel

Line Drawing



Polar Curve

Colour

Stainless Steel

Product Features:

- IP67 Mains voltage 304 stainless steel LED ground light
- Supplied with plastic mounting sleeve
- Pre-wired with 1 metre of rubber cable
- For use with GU10 lamps – lamps not included (Max 35W)
- Cut-out 85mm without mounting sleeve
- Cut-out 95mm with mounting sleeve
- Max. weight 2,000kg
- 3 year warranty

Product Specs:

Input Voltage	100~240V AC
IK Rating	IK10
Overall Diameter (mm)	100
Height (mm)	130
Cutout Diameter (mm)	95-95
Operating Temp. (Max) °C	45°C

IP Rating	IP67
Lamp Base	GU10
Weight (Kg)	0.619
Product Type	Walkover Ground,Ground Lights
Operating Temp. (Min) °C	-25°C

Compliance & Approvals:



Warranty:

This product has a warranty period of 3 Years. Warranties may be available on certain products as indicated in the product description. Warranties are valid from the date of purchase.The warranty is invalid in the case of improper use, installation, tampering, removal of the Q.C. date label or installation in an improper working environment or installation. Should this product fail during the warranty period it will be replaced free of charge, subject to the correct installation of the original product and subsequent return of the faulty unit. Aurora does not accept responsibility for any installation costs associated with the replacement of this product and Aurora reserves the right to alter specifications without prior notice.

Sirocco Midi

Type D1 -
6M Lighting Column

High performance LED post top luminaire for road, pathway and area lighting

140+ LL/CW | IK09 | IP66

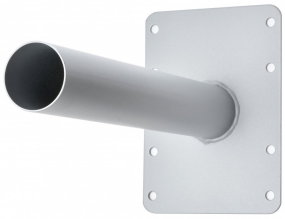




Sirocco Heavy Duty Wall Bracket



Sirocco Midi Post Top



Sirocco Simple Wall Bracket



Sirocco Midi Side Entry

Optics

- Light output options:
  - 2200-15246 lumens (16-102W)
- Efficacy up to 150 LL/CW
- Road, Pathway and Area lighting distribution options
- Zero light pollution when mounted horizontally
- Adjustable tilt between 0° and +20° at 5 degree intervals for post top mounting
- Adjustable tilt between -20° and +10° at 5 degree intervals for side entry mounting
- 4mm thick, thermal shock resistant, tempered clear flat glass
- 4000K and 3000K colour temperature options

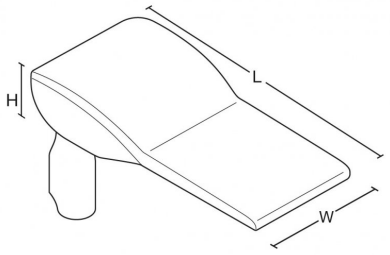
Body

- Die cast aluminium housing
- Primed and powder coated for corrosion and saline environment resistance
- For outdoor applications within 3km of the coast, an enhanced paint finish can be offered on request
- IP66 IK09 rated protection
- 46 to 76mm post top or side entry spigot
- Finished in Graphite Grey RAL 7024
- Electrical Class II
- Supplied with IP67 rated 2 pole plug and socket
- Mains isolated when top cover open, tooled access
- Automatic temperature regulation
- Voltage surge protection to 6kV
- Suitable for ambient temperatures between -30°C to +40°C
- Fixed output or DALI driver options
- Photocell option on request. Pre-set on/off at 20 lux with NEMA socket (fixed output only - requires separate photocell PC/NEMA20 to be fitted by installer)
- Air Control enabled node option on request, for wireless system communication (DALI dimming only - requires separate node ACON-ZHAGA18 to be fitted by installer. Air Control system components and App based programming also required - please contact Whitecroft Technical)
- Optional wall mounting brackets available:
  - Heavy duty bracket maximum weight 13kg, finished in anthracite grey
  - Simple wall bracket maximum weight 8.2kg, finished in silver/grey RAL 9007 or black RAL 9005
- Wide range of lighting columns and accessories available. See 'columns' pages for details.

LED Performance

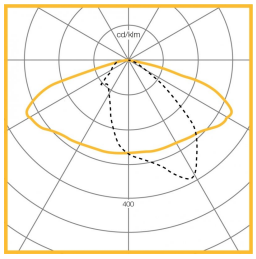
Colour Temp	RA (CRI)	Life expectancy	Colour consistency
3000/4000K	Ra70	100,000hrs L90B50	MacAdam 3 SDCM

Dimensions

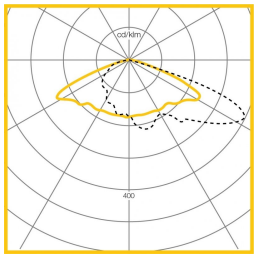


VERSION	L	W	H	KG	Windage (m2)
All versions	558	293	115	6.7	0.04

Photometric Performance



Road Optic, 5099 lumen, 34W
LOR = 100%



Area Optic, 4571 lumen, 33W
LOR = 100%

To Specify

IP66 LED post top luminaire with lightweight die cast aluminium body. High efficacy performance with a choice of road and area lighting distribution patterns and zero upward light when mounted horizontally. Electronic control gear with voltage surge protection and isolating safety switch – as Whitecroft Lighting SIROCCO MIDI.

Mirage LED IP65

Type E-EXT - Recessed Canopy Downlighter

Ceiling recessed LED luminaire for outdoor applications

100+ LL/CW | IK10 | IP65



Optics

- Light output options:
  - 2500 lumens, 21W - 4000K
  - 2325 lumens, 21W - 3000K
- Wide beam symmetrical distribution
- 3000 and 4000K colour temperature options

Body

- Die-cast aluminium body and bezel
- IP65, IK10 rated protection
- Finished in Anthracite Grey
- Clear flat acrylic diffuser in bezel
- Matt anodised aluminium reflector
- Supplied complete with driver contained within main body
- To suit ceiling thickness 5 – 50mm
- Dali dimming driver as standard

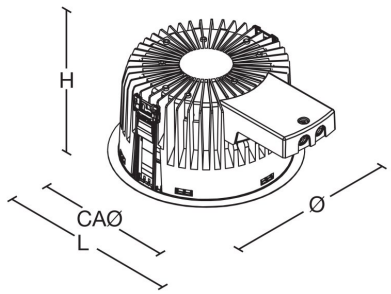
Order codes

Description	Code	LL/CW	L80	L90
LED 4000K, 2500 lumen,21W	M6Y14K	119	>100k	>100k
LED 3000K, 2325 lumen, 21W	M6Y13K	110	>100k	>100k

LED Performance

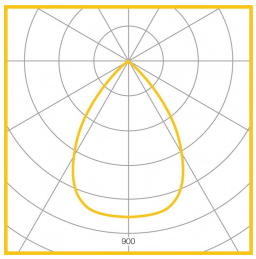
Colour Temp	RA (CRI)	Colour consistency
4000K	>80	MacAdam 3 SDCM

Dimensions



L	H	KG	Ø	Cut Aperture
270	147	2.3	220	210

Photometric Performance



21W 2500 Lumen
LOR = 100.0%

To Specify

IP65/IK10 Recessed LED downlighter with aluminium body, clear diffuser and DALI driver. With wide beam distribution – as Whitecroft Lighting MIRAGE LED IP65.

Type GWE -
Wall Lighter in Emergency



@ansell_lighting
anselllighting
Ansell Lighting
ansell_lighting

Wolf

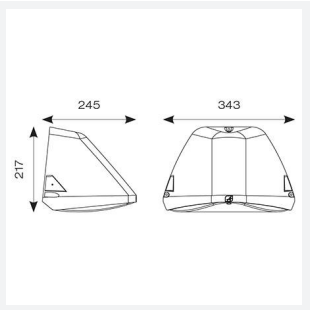
Wolf CCT Multi Wattage Wallpack Emergency

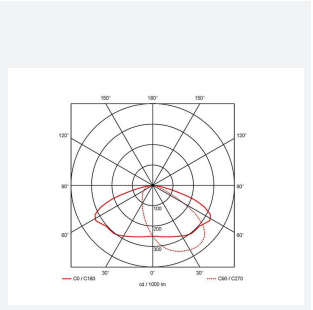
Code: AWOLF/BLK/M3

Category	Bulkheads
Application	Ancillary, Commercial, Healthcare, Hospitality, Industrial, Outdoor, Retail
Specification	Performance









PRODUCT FEATURES

- Modern, robust die-cast aluminium low glare wall pack suitable for commercial and industrial applications
- Reduced light pollution with 0% upward light distribution, helps with compliance with Dark Skies recommendations, helps with compliance with Dark Skies recommendations
- High efficiency up to 120 Lm/W
- Multiple conduit entry and BESA fixing points
- Advanced lens technology offers wide distribution for optimum spacing and uniformity; whilst ensuring minimal uplight and light pollution
- Power selectable; offering a choice of 3 outputs, in one luminaire
- Electrostatic paint finish for enhanced corrosion resistance
- 20mm East and West side entry for surface conduit and through-wire

GENERAL INFORMATION	
Wattage	18W - 30W
Lumens Delivered	2200lm - 3600lm (4000K)
Lm/W	120lm/W (4000K)
Beam Angle	70/140
CRI	82
CCT	3000/4000K
Input	220/240V
Operating Temp	-20°C - 40°C
SDCM	6

TECHNICAL INFORMATION	
Light Source	LED
Colour / Finish	Black
IP Rating	IP65
Class Protection	1
Internal / External	External
Surface / Recessed / Suspended	Surface
Lumen Depreciation	L80 72,000h
Warranty (Years)	5
CE Mark	Yes
Height	217 mm

TYPE L1
LED CATENARY FESTOON LIGHTING - AS PER REFORM DESIGN & SPEC

LIGHTING EQUIPMENT SPECIFICATION

LDC REF: Q

PROJECT NAME:	xxxxxx	**REVISION:**	D
PROJECT NUMBER:	P411	**REVISION DATE:**	17/04/2020
DOCUMENT NAME:	P411_SP04_AREA C	**REVISION BY:**	RA
STATUS:	FOR INFORMATION	**CHECKED BY:**	KK

DESCRIPTION:
Festoon Lighting - Exterior rated festoon LED lighting. Frosted globes diffusers, each globe includes two O-rings for a secure and weatherproof seal to the socket. To be ordered with all specified accesorries quantified by contractor to site conditions prior to order. Festoon lamps to be ordered with 300 mm spacing, contractor to refer to max run lengths below.

IMAGES / DRAWINGS:





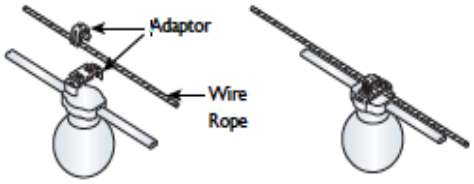
All plastic components comply with UL746C in respect to Ultraviolet Light and Water Absorption testing.

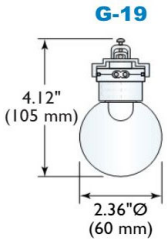
Wet Location Listed

- **Light Sources** include LED and Xenon lamps
- **Polycarbonate Globe** with flammability rating UL 94V-2
- **Flexible Conductors** #12 AWG stranded and plated wire
- **Two O-Rings** on each globe for weatherproof seal
- **Sockets** permanently fastened to cable with sealant
- **Insulation** is flexible PVC with flammability rating UL 94 HB



Festoon to be mounted onto H1 poles.





Festoon mounting- Other mounting options available, contractor to review prior to order.

MANUFACTURER:	Tokistar
REP / CONTACT:	Hayley Pollard
EMAIL:	hp@lightprojects.co.uk
TELEPHONE:	+44 (0)20 7231 8282

ORDER CODE:	xxxxxx
DRIVER REF:	By manufacturer
ACCESSORIES:	Festoon Mounting - EX-MDA-BK (Black)

DIMENSIONS:	As in image

EQUIPMENT TYPE:	LEDL - LED LINEAR
INGRESS PROTECTION:	IP 66
CONNECTED LOAD:	2 WATTS
LUMEN OUTPUT:	150 lm
BEAM / DISTRIBUTION:	Diffuse
MAINTENANCE LIFE:	40,000 HOURS
COLOUR TEMPERATURE:	2400 K
COLOUR RENDERING:	>80
CONTROL PROTOCOL:	SWITCHED
No. OF DATA CHANNELS [1]:	1
QUANTITY AREA C:	xxxxx