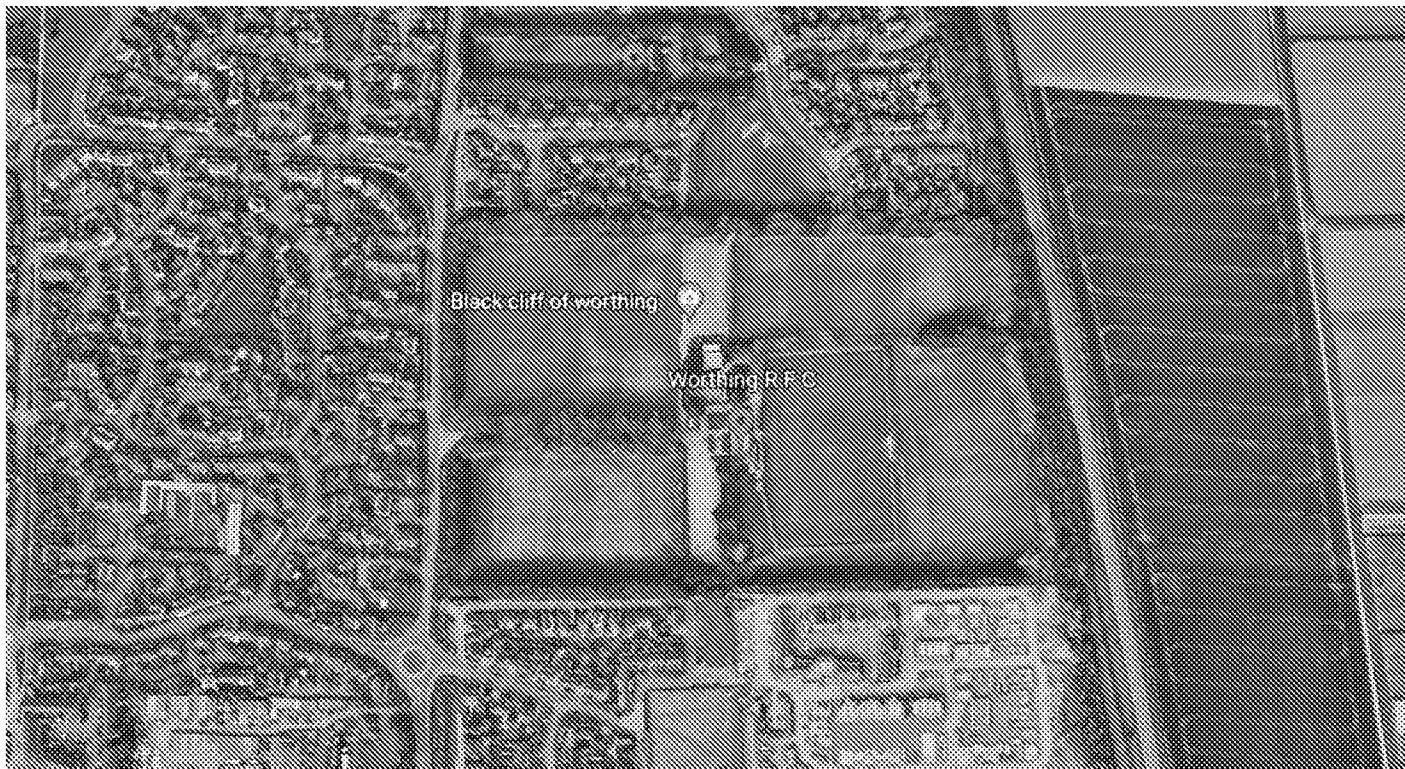


Worthing RFC – Light Impact Assessment

Site Location

Worthing R F C, The Rugby Park, Roundstone Ln, Angmering, Littlehampton BN16 4AX.



Introduction

Replacement of the existing floodlighting system on the training pitch at the club.

Abacus Design Outline

In designing a suitable floodlighting solution key specification issues had to be considered. These included the illuminance level required, the environmental zone category for the site, the minimum mast height & the number type of floodlights. Details of how these issues were resolved are as follows:-

1. The illuminance level was determined and provided by the end user. This requires a maintained average illuminance level of 100 Lux over the playing area, a uniformity ratio of 0.5. The proposed lighting is the minimum required to perform the relevant lighting task (as per the RFU specification for training) and has been specifically designed to minimise the risk of light spillage beyond the development site boundary.
2. For the relevant environmental zone reference was made The Institution of Lighting Professionals GN01: *Guidance Note for The Reduction of Obtrusive Light 2021*. This document categorises the environment into five zones ranging from UNESCO Starlight Reserves to City Centres. This site would fall into Zone E2 location.
3. The mast height was calculated using the method detailed in the CIBSE guide LG4 "Sports Lighting". This uses angles projected from the centre of the pitch & the touch line to produce a head frame location zone. A 15m mast has been used to take into consideration the ground levels to be mounted horizontally. This will result in low vertical overspill & good uniformity on the playing surface, without compromising cost. The masts will offer a slim line profile which will minimise daytime impact. If the mounting height was reduced to any lower than proposed on our design, the floodlights would need be elevated above the horizontal to maintain compliant lighting levels which consequently increases overspill and glare.

4. In order to meet the requirements of The Institution of Lighting Professionals GN01: *Guidance Note for The Reduction of Obtrusive Light 2021*, the Abacus Challenger 1 LED floodlight was chosen as being suitable with the addition of overspill limiting shields. Details of the main features of this product are highlighted below.

Abacus Challenger 1 LED Floodlight.

Specifications and Features:

Housing:

Die-cast/profiled aluminium and steel are used to produce an elegant and unobtrusive low profile design. 29.6kg in weight (6 module) with an IP66 rating.

Ratings:

UKCA, CE, CB, SAA, IP66

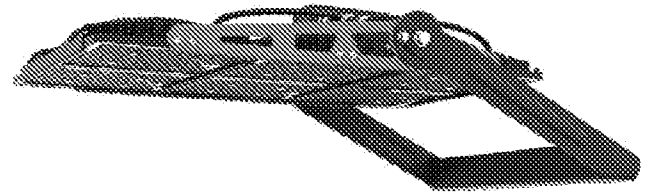
Finish:

Powder coated Black/Red

Driver:

1500W driver is 3ch. DALI2/DMX driver, 5.6kg, IP66
400W - 1200W data available on request
Integral or remote options available

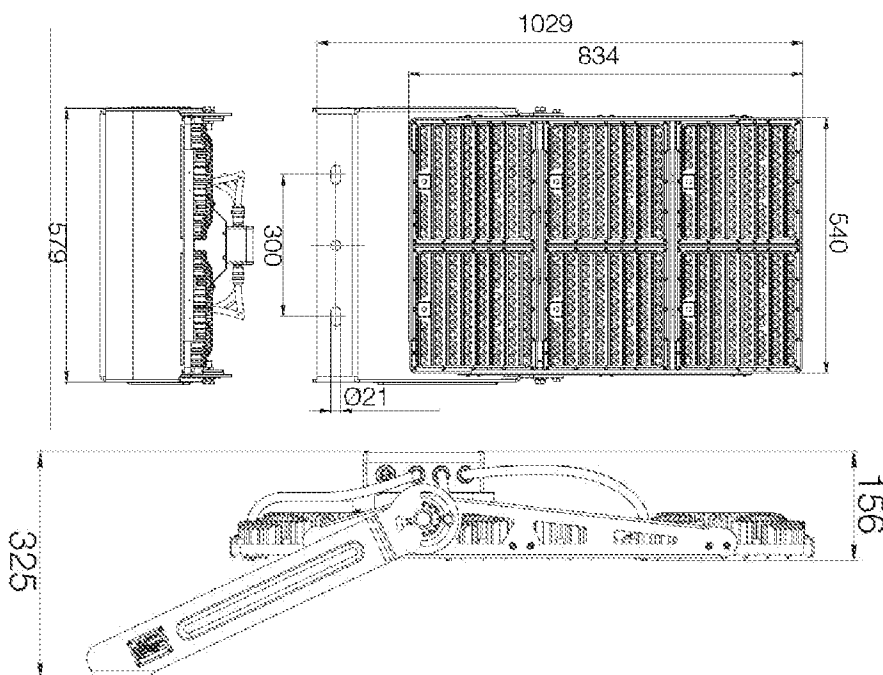
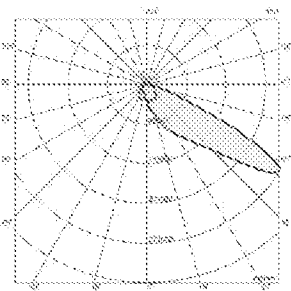
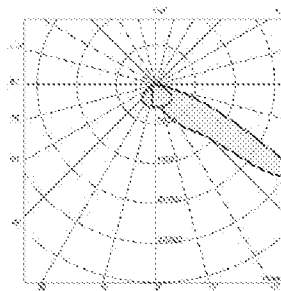
Full dimensions, and an image containing shielding/cowls, is as follows:



Photometric Output

AL6101 Distribution:

AL6102 Distribution:



Please see pictures below of recent installations using the above floodlight.



Abacus Lighting Design

Our proposals can be seen on lighting scheme UKS18242 which is attached.

The Abacus lighting proposals are detailed on the design, these show the mast locations, floodlight orientations, illuminance levels on the pitch & projected overspill values. Also included is the obtrusive light compliance report which shows the results of the vertical overspill calculations taken on the surrounding properties, you can see that results show compliance to the obtrusive light guidelines for the location.

HORIZONTAL ILLUMINANCE LEVELS

Rugby Pitch (specified level)

Average Maintained Horizontal Illuminance (Eh.m): 100 lx
Uniformity Ratio (E.min / E.av): 0.50

Rugby Pitch (calculated level)

Average Initial Horizontal Illuminance (Eh.m): 138 lx
Average Maintained Horizontal Illuminance (Eh.m): 124 lx
Uniformity Ratio (E.min / E.av): 0.50

Glare Rating: GRmax= 45

The design achieves a maintained average of 124 lux with 0.5 uniformity on the playing area, the maintained illuminance values are calculated using a maintenance factor of 0.90. This takes into account light losses due to dirt accumulation on the floodlight front glass & lamp lumen depreciation, ensuring that the minimum requirements for safe play are achieved. The obtrusive light calculations are calculated using a maintenance factor of 1.0, to reflect the lamps condition when brand new.

The use of the floodlight ensures that horizontal & vertical overspill containment is excellent. As less than 10 Lux vertical illuminance will be projected towards any residential property windows the system will exceed the requirements for an environmental zone E3 location. Upward waste light will also be minimised & at the floodlight elevations used less than 2.5% will be projected into the atmosphere. This will meet the recommendations of The Campaign For Dark Skies, an organisation who lobby for low light pollution systems & recommend the use of Abacus systems. We are also proposing to use some front/back cowls on 4no floodlights to ensure our compliance with the obtrusive guidelines.

All design calculations have been undertaken using an open, unobstructed site, the values of overspill will be further reduced any existing buildings, mature trees or natural screening.

Conclusion

The proposed system would be suitable for installing in an environmental zone E3, meeting the most stringent of light control parameters whilst maintaining the specified illuminance levels for the sports pitch.

The impact on residents will be minimised as overspill values into gardens will be no more than moonlight & vertical illuminance into windows before curfew are below the values recommended by the ILP. Daytime visual impact will also be minimised by using slim line masts & grey floodlights which do not stand out against the skyline.

Once installed the light control system will provide the optimum sports lighting solution, ensuring that light reaches the sports surface & not into the sky or polluting the environment. Our scheme will significantly reduce overspill light, decrease glare and fundamentally reduces the impact on the environment and local residents.

Abacus Lighting Limited are world leaders in the design & manufacture of low pollution exterior lighting solutions. For further information regarding Abacus low light pollution products please contact our Head Office [REDACTED]

For and on behalf of Abacus Lighting Ltd

Josh Egginton | Abacus Lighting
Sales Manager – Sports Lighting

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom

Obtrusive Light - Compliance Report

CIE 150:2017, E3-Medium District Brightness, Pre-Curfew
Filename: UKS17870_4 - 4051080 Worthing RFC-Copy-30759
27/04/2022 09:08:16

Illuminance

Maximum Allowable Value: 10 Lux

Calculations Tested (6):

Calculation Label	Test Results	Max. Illum.
Brougham Grove 31_III_Seg1	PASS	4
Brougham Grove 33,35,37_III_Seg1	PASS	8
Brougham Grove 39,41_III_Seg1	PASS	7
Brougham Grove 43_III_Seg1	PASS	3
Baker Way 4,6_III_Seg1	PASS	1
Baker Way 5,7,9,11_III_Seg1	PASS	1