

## Etwall Bowls Club – Light Impact Assessment

### Site Location

Portland St, Etwall, Derby DE65 6JF



### Introduction

Abacus Lighting Ltd and Etwall Bowls Club are proposing the installation of purpose-built floodlighting system to their existing bowls green.

### 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. To ascertain the illuminance level required we referred to the CIBSE LG4 guidelines requirements for bowls. This requires a maintained illuminance level of 100 Lux over the playing area, with a uniformity ratio of 0.5.
2. For the relevant environmental zone reference was made 'Guidance Note 01/20 Guidance notes for the reduction of obtrusive light'. This document categorises the environment into four zones ranging from National Parks to City Centres. This site would fall into Zone E3 for an urban 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. When applied to this project the optimum mast height ranged from 8m to 10m for the Pitch. A 8m mounting height was chosen as it would allow the floodlights to be mounted horizontally. This will result in low vertical overspill & good uniformity on the playing surface, without compromising cost. The 8m mast will offer a slim line profile which will minimise daytime impact. If the mounting height was reduced to any lower than 10m the floodlights would be elevated above the horizontal consequently increasing overspill and glare.
4. In order to meet the requirements of the 'Guidance Note 01/20 Guidance notes for the reduction of obtrusive light', the Abacus AL6100 Challenger 1 Series LED floodlight was chosen as being suitable. Details of the main features of this product are highlighted below.

## Abacus AL6100 Challenger 1 Series LED

### Specifications and Features:

#### Housing:

Die-cast/profiled aluminium and steel are used to produce an elegant and unobtrusive low profile design 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

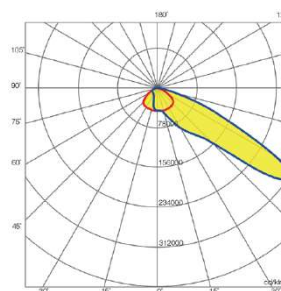
400W - 1200W data available on request

Integral or remote options available

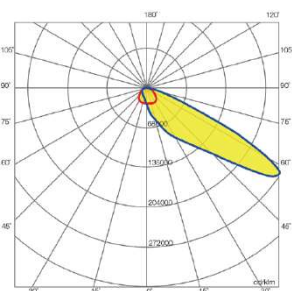


### Photometric Output

#### AL6101 Distribution:



#### AL6102 Distribution:



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



### Abacus Lighting Design

Our proposals can be seen on lighting scheme UKS18126 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.

The design achieves an illuminance value of 144 lux on the playing area (figure 2), 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. As you can see from figure 1, the maximum vertical

*Figure 1*

Obtrusive Light - Compliance Report  
CIE 150:2017, E3-Medium District Brightness, Pre-Curfew  
Filename: AGI18126  
07/12/2021 08:04:45

Illuminance  
Maximum Allowable Value: 10 Lux

Calculations Tested (14):

| Calculation Label         | Test Results | Max. Illum. |
|---------------------------|--------------|-------------|
| PORTLAND ROAD 15_III_Seg1 | PASS         | 0           |
| PORTLAND ROAD 17_III_Seg1 | PASS         | 0           |
| PORTLAND ROAD 18_III_Seg1 | PASS         | 1           |
| PORTLAND ROAD 19_III_Seg1 | PASS         | 4           |
| OAKLANDS ROAD 16_III_Seg1 | PASS         | 1           |
| OAKLANDS ROAD 2a_III_Seg1 | PASS         | 1           |
| OAKLANDS ROAD 2_III_Seg1  | PASS         | 1           |
| OAKLANDS ROAD 4_III_Seg1  | PASS         | 1           |
| OAKLANDS ROAD 6_III_Seg1  | PASS         | 1           |
| BELFIELD ROAD 77_III_Seg1 | PASS         | 1           |
| BELFIELD ROAD 75_III_Seg1 | PASS         | 1           |
| BELFIELD ROAD 73_III_Seg1 | PASS         | 0           |

illuminance on the nearby houses is 4 lux (figure 1), which is under the threshold of 10 lux for an E3 location. 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 5% will be projected into the atmosphere.

All design calculations have been undertaken using an open, unobstructed site, the values of overspill will be further reduced any existing 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 & light grey floodlights which do not stand out against the skyline.

Once installed the Challenger LED series 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 on 01623 511111 or visit [www.abacuslighting.com](http://www.abacuslighting.com).

For and on behalf of Abacus Lighting Ltd

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### *Figure 2*

ILLUMINANCE LEVELS:  
SPECIFIED LEVELS  
MAINTAINED  
E.m.ave = 100 LUX

UNIFORMITY  
Emin/Eave = 0.5

CALCULATED LEVELS  
MAINTAINED  
E.m.ave = 144 LUX

UNIFORMITY  
Emin/Eave = 0.55

Max Glare Rating = 50