

Highlights Floodlighting Ltd

Specialist Floodlighting Installation Contractors

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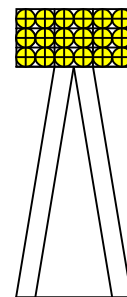


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Spillage Impact Report - Hayling Island Bowls Club LED Floodlighting.

Highlights Floodlighting have been invited to design a suitable LED Floodlighting scheme for an existing outdoor Bowls Club located at the Community Centre of Station road, South Hayling, in Hayling Island, Hampshire. Club members wish to improve facilities at the site, including offering floodlit games to competition standard. Proving compliance to the governing bodies lighting guidelines, ensures safe competitive play to the end user. The guidelines are as follows: 200 Lux average, with a minimum to average uniformity ratio of 0.70. Such lighting criteria is found within the British standard: *Light and Lighting- Sports Lighting: BS EN 12193:2007*.

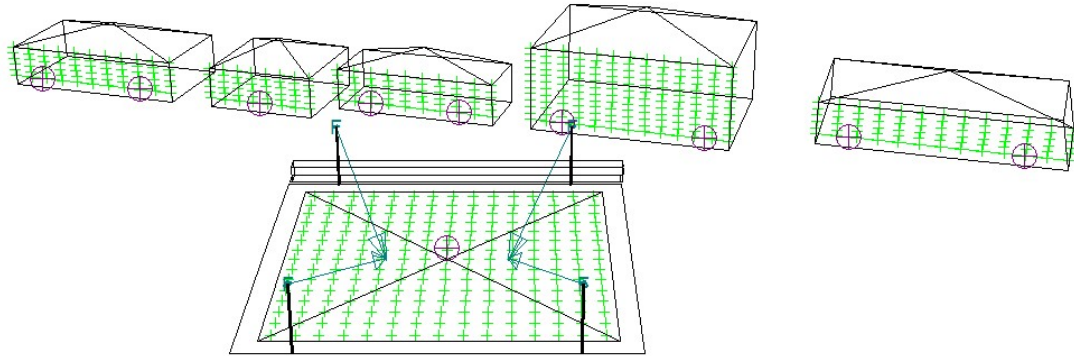
Please find on the following pages a report to analyse the data included within the Calculux Spillage Charts document, relating to the proposed Floodlighting installation. The purpose of the Calculux Spillage Charts document is to encompass horizontal and vertical lighting calculations to examine, recognise and identify potential glare /spill light implications produced from the lighting scheme, and mitigate accordingly, whilst confirming compliance with guidance notes from the Institute of Lighting Professionals (ILP) for an Environmental E2 Zone.

The Bowls Club green is located towards the northern boundary of the overall Community Centre footprint. The entrance to the Bowls is at one end of the Centres carpark, adjacent to the residential properties.



The nearest property elevation is 17 metres away from the proposed floodlit area. The building is relatively new, and is shown on the above diagram as the pink coloured building known as "Bowls Court." For the purposes of the lighting calculations, Bowls Court is listed as "Property Grid 5." Similar lighting calculations have been carried out on a further four properties in close proximity to the sports club.

The “green walls” applied to the houses pictured below, represent the boundaries of the residential properties to which the vertical lighting calculations are based on. The vertical calculation grid points start at 1.4 metres above ground level. This is to simulate the height of the centre of ground floor windows of the properties. The calculation grid points occur every three metres horizontally and every metre vertically, up to twelve metres high. It is the described high frequency of grid points, that ensures correct examination to the adjoining properties for light spill. Please note; large natural barriers such as trees etc have not been considered whilst carrying out the lighting calculations, although the Beach Hedge at the most northern part of the Bowls club has been included. This is because the hedge forms a large natural screen, to the proposed lighting, and unlike some of the surrounding trees; keeps its foliage all year round.



Every effort has been taken in to consideration when designing the proposed lighting installation, to minimise glare and spill light. This includes implementing state of the art Philips LED Luminaires. The floodlights perform with internal integral louvres to each of the LED diode light sources. This new advanced measure of control, mitigates unnecessary spill and glare to the adjacent properties. Correct use of column height and location, ensures luminaires are aimed away from residential properties. The correctly selected column height is 8 metres high in this application. The Basketball floodlighting on the same site utilises lighting columns of the same height. Please see below the superb lighting cut off available via the LED luminaire on a similar project in Northamptonshire.



Due to the internal LED Louvre optics; the floodlights will appear very subtle from the residential properties, without the typical “dazzle” associated with older traditional Metal Halide and alternative LED floodlighting solutions. Please see below:



Some additional information below on the Luminaire:

The Philips OptiVision LED gen3 floodlighting system provides a complete lighting solution for the simplest through to the most complex area and recreational sports lighting applications. The high-efficiency floodlight comes with a single piece die cast housing, hosting 2 and 3 LED engines respectively, which also function with an external driver box – separate for use at a distance from the floodlight (BV), or prefixed onto the mounting bracket of the floodlight (HGB) for ease of installation and lower initial cost. It meets the highest performance standards, provides outstanding light, quality, uniformity and ensures safety and visual comfort. OptiVision LED offers new possibilities to reduce energy consumption and increase flexibility (instant start, programmable lighting levels) when used in conjunction with Interact Sports lighting management system, dedicatedly designed for recreational and training facilities.



The lighting design has been created in accordance with guidance notes recommended by the ILP (Institute of Lighting Professionals) for the reduction of obtrusive light, which advises that within an Environmental E2 Zone (Rural, low district brightness) you should achieve the following:

- 1) Source intensity (Glare) should not be above 7500cd.
- 2) Vertical Illuminance should not be above 5 Lux on windows
- 3) Upward Light Ratio should not be above 2.5%

Within the lighting design, "Observer points" have been put in to demonstrate the luminaire intensity (Glare) to the nearest neighbouring properties to the Bowls Club as stated above. The calculations are on page 6 of the Calculux Spillage Charts document and are as follows:

Property Observer 1 Result = 931 cd
 Property Observer 2 Result = 1417 cd
 Property Observer 3 Result = 1572 cd
 Property Observer 4 Result = 2354 cd
 Property Observer 5 Result = 1864 cd
 Property Observer 6 Result = 1273 cd
 Property Observer 7 Result = 1203 cd
 Property Observer 8 Result = 3127 cd
 Property Observer 9 Result = 4574 cd

The results are below the guidance notes recommendations of 7500cd.

Within the lighting design, Vertical calculations have been inserted to demonstrate the vertical illuminance (Light Intrusion) on to the surrounding residential properties adjacent to the Bowls Club. The maximum predicted readings are on page 6 of the Calculux Spillage charts document, and are as follows:

Property Grid 1 Result = 0.34 Lux
 Property Grid 2 Result = 0.70 Lux
 Property Grid 3 Result = 0.96 Lux
 Property Grid 4 Result = 0.50 Lux
 Property Grid 5 Result = 1.96 Lux

The results are below the guidance notes recommendations of 5 Lux.

The Upward Light Ratio (ULR) is 0.00 – Page 6 Spillage Chart Calculations.

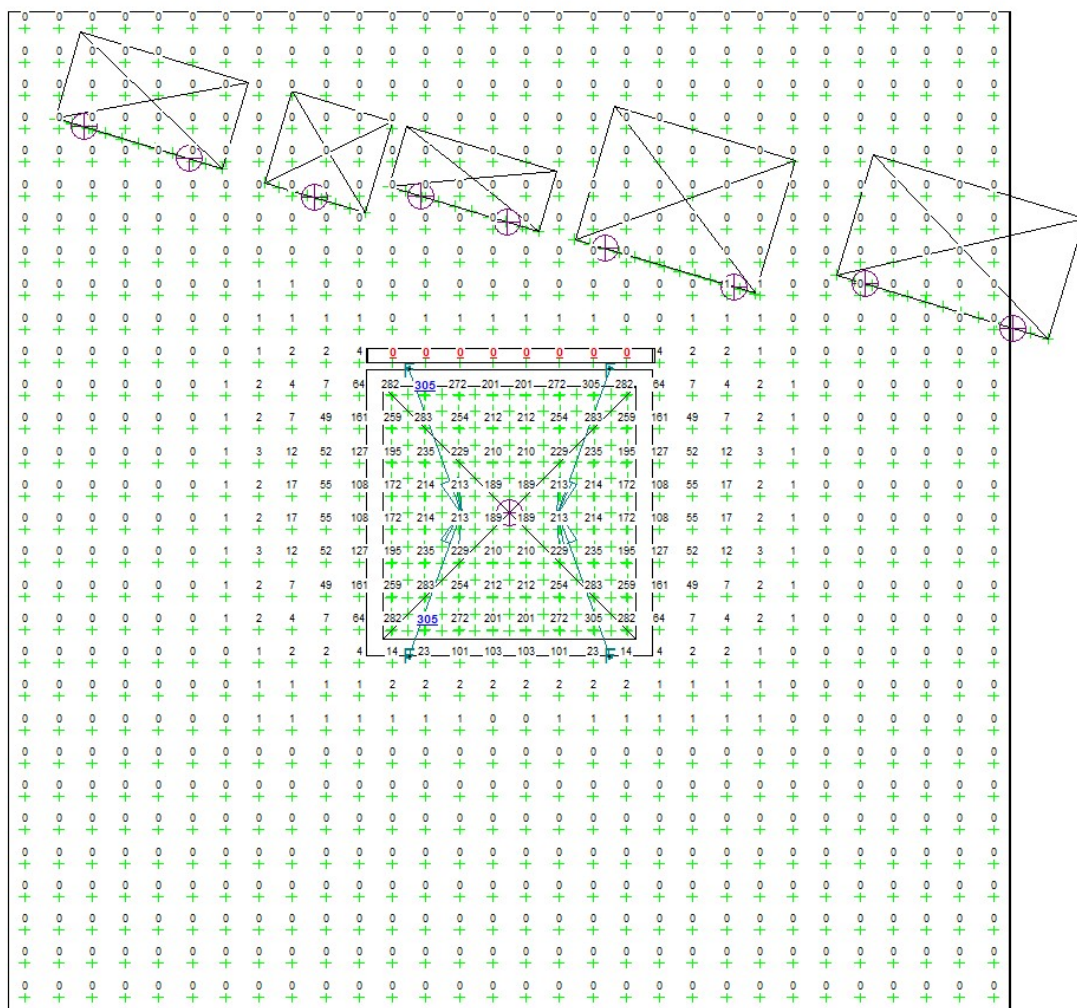
This complies with the guidance notes recommendation of 2.5%.

All results have been calculated at a Maintenance Factor of 1, this means that no allowance has been made for LED depreciation. The results have been calculated with the LED's at their greatest illuminance. The floodlighting solution provided by Highlights Floodlighting conforms in all aspects to Environmental E2 Zone highlighted in yellow below.

Table 2 – Obtrusive Light Limitations for Exterior Lighting Installations – General Observers						
Environmental Zone	Sky Glow ULR [Max %]⁽¹⁾	Light Intrusion (into Windows) E_v [lux]⁽²⁾		Luminaire Intensity I [candelas]⁽³⁾		Building Luminance Pre-curfew⁽⁴⁾
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average, L [cd/m²]
E0	0	0	0	0	0	0
E1	0	2	0 (1*)	2,500	0	0
E2	2.5	5	1	7,500	500	5
E3	5.0	10	2	10,000	1,000	10
E4	15	25	5	25,000	2,500	25

The predicted horizontal lux at ground level is shown below. The spill light can be seen to be tailing off the further it gets away from the Bowls Club. To reduce spill light to an absolute minimum, the least number of luminaires possible have been used to ensure compliance to the relevant governing bodies, as detailed at the start of this report. The LED's provide a crisp subtle light controlled via the internal LED louvre unlike any other product on the market, without bespoke cowls as seen on older metal halide technology. From a residential point of view, the houses will virtually be in darkness. The maximum predicted vertical reading is 1.96 lux. This value could be compared to little more than moon light, far less than street lighting which is typically at values between 5 – 10 Lux. It should be noted that existing street lighting and walk way lighting run along the length of the pathway between the Bowls club, and the residential properties under examination.

To conclude; the above report confirms the proposed floodlighting by Highlights Floodlighting is in total compliance with the ILP guidance notes conditions for an Environmental E2 Zone. It is of our opinion with the above evidence considered, the subsequential effect to the nearby residential properties from the proposed floodlighting will be negligible.



Membership Number: 18502

