



**Proposed Floodlighting at Synthetic Pitches  
Belgard Community Centre  
Old Belgard Rd,  
Tallaght,  
Dublin,  
D24 YK38**

**Sports Lighting Proposal  
Compiled by Neil McSherry BEng MIET**

20<sup>th</sup> October 2021

**Lorraine Byrne**  
**South Dublin County Council,**  
**County Hall, Belgard Square North,**  
**Tallaght,**  
**Co. Dublin**

**RE: Floodlighting at Belgard Community Centre**

Dear Mr Dickinson,

As instructed, Musco Lighting Europe has undertaken the sports lighting design for the 75m x 40m pitch. Our design is prepared in compliance with:

- ***Chartered Institute of Building Services Engineers Lighting Guide 4: Sports Lighting (CIBSE LG4)***
- ***Institute of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light GN 01/21***

**Terminology**

For clarity some typical floodlighting terms have been defined/explained to assist in the comprehension of this report and the design documents:

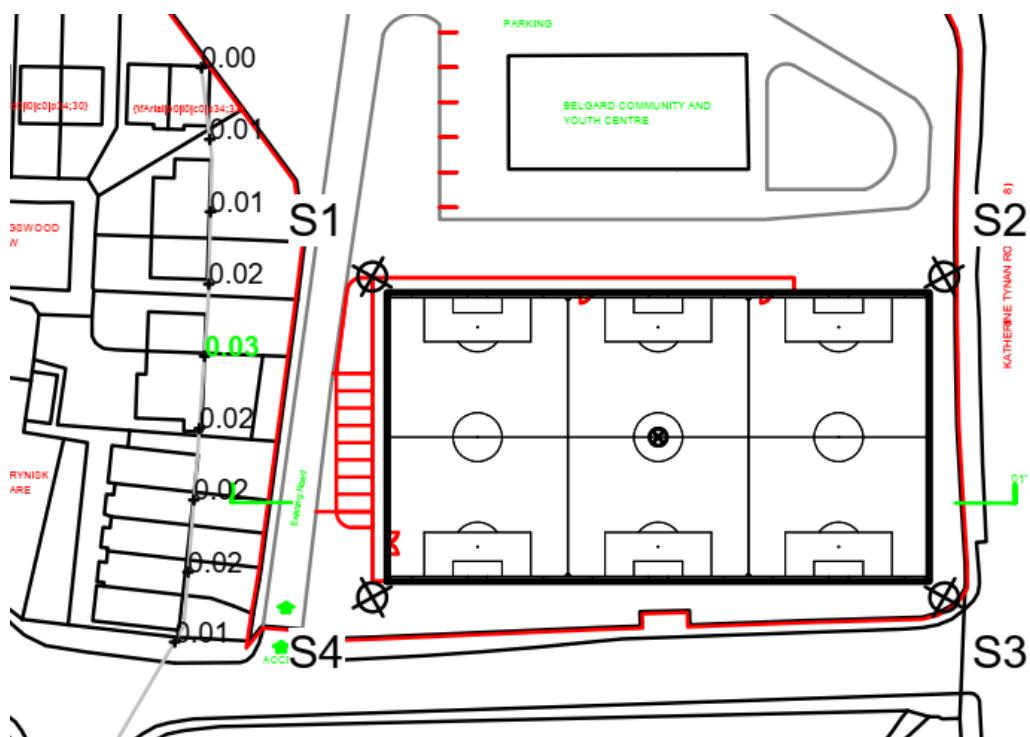
- **Horizontal Illuminance ( $E_h$ )** - the level of light at a given point measured on a horizontal plane, such as the sports pitch, footpath, or a desk. Often used in sports applications as a visual and playability evaluation of light. Measured by holding a light meter horizontal to the ground, facing toward the sky.
- **Vertical Illuminance ( $E_v$ )** - the level of light at a given point measured on a vertical plane, such as a wall, the side of a building, or window. Measured by holding a light meter vertically towards the light source.
- **Lux** - unit of measure for illumination.
  - Sunny Day = 50,000 - 150,000 lux
  - Overcast Day = 5,000 - 10,000 lux
  - Major sports stadium = 2,000 - 3,000 lux
  - Office lighting = 300 - 500 lux
  - Roadway lighting = 15 - 30 lux
  - Sunset = 10 lux
- **Luminaire** - Light fitting/floodlight
- **Uniformity ( $E_{min}/E_{av}$ )** - Evaluation of how evenly light is distributed across a given area. Expressed as a ratio of the minimum point divided by the average of all points.
- **Metal Halide (HID)** - Traditional lamp technology used in sports lighting. Combines specific gases and electricity to produce light.
- **LED - (Light Emitting Diode)** - Light is produced electronically using a semiconductor

The objective of the design was to produce a system compliant with CIBSE LG4 as follows:

**75m x 40m Pitch - 250 lux horizontal average, 0.6 Emin/Eav**

In accordance with the **Institute of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light GN 01/21** the local area can be classified as a suburban environment and therefore Environmental Zone 'E3' applies. E3 areas are defined for lighting purposes as 'Medium District Brightness Areas' (Table 2).

In accordance with *Table 3: Maximum values of vertical illuminance on premises* is limited to 10 lux in the vertical plane ( $E_v$ ). The Musco design is compliant with this requirement with a maximum Light Intrusion into Windows of 0.03 lux vertical ( $E_v$ ) as demonstrated at a height of 1.5m above ground level on page 7: LTW at 1.5m in lighting design document 215518A.

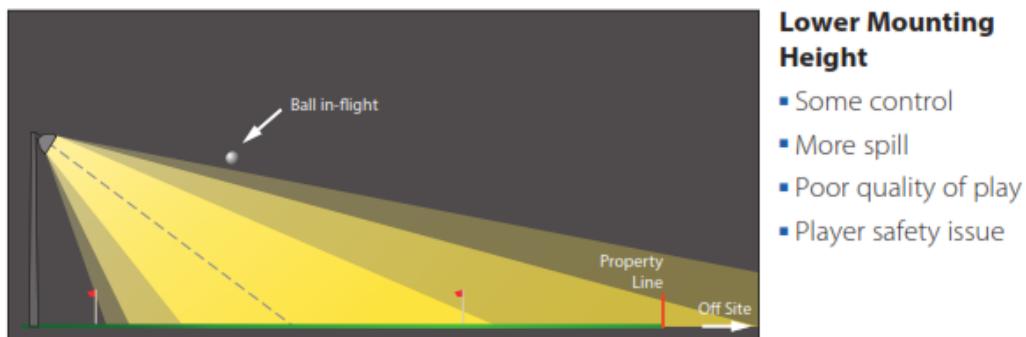
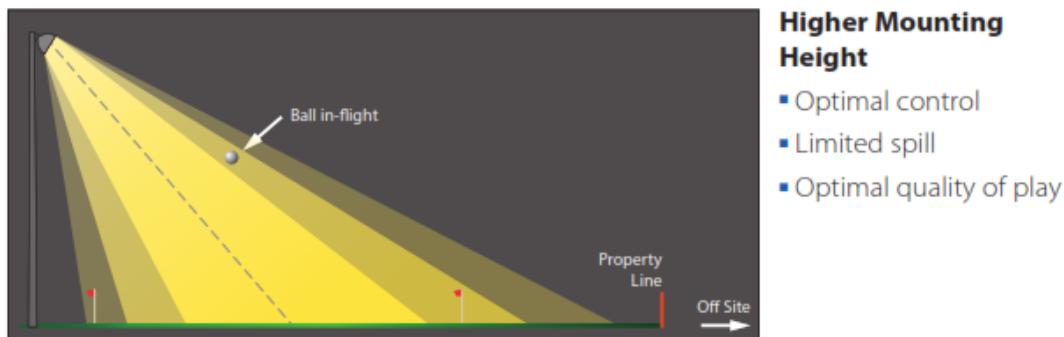


In addition, horizontal and vertical light spill blankets including coloured contour lines are shown on pages 3 & 4 including spill onto the adjacent roadways. Page 7 shows the aiming points for each of the luminaires.

The developed design is optimised for compliance with **ILP Guidance Notes for the Reduction of Obtrusive Light GN 01/21** by minimising obtrusive light; Spill, sky glow and glare. This is achieved in the following ways:

## 1. Column height, number of columns and aiming angles

Choosing appropriate number of columns and column heights is key to the overall quality of the lighting design. Based on the size of the pitch, the sport being played, the competition level, and the application of the floodlighting system (televised or non-televised); column numbers and height requirements must be accurately assessed to ensure the aiming angle of the floodlight onto the pitch is at an appropriate degree to maintain good playability, control glare, and reduce spill light on adjoining properties and roadway. See the diagram below:



To achieve the lighting standard required, a 15m column solution is proposed. These column heights achieve optimal aiming angles; minimising glare and spill light while facilitating even light distribution as set out by CIBSE LG4.

## 2. Class Leading Light Control

The proposal uses Musco's Light Structure Green TLC for LED™ - Total Light Control system. The Musco LED system luminaire is available in a multitude of beam patterns, wattages and cut off visors or cowls ensuring class leading light control and minimal light spill and glare. The visor system ensures visibility of the primary light source is restricted thus reducing any impact on road users.



Musco is a leading international sports lighting company with thousands of installations worldwide. We are leaders in the development of LED technology for sports lighting applications. Some high-profile installations include:

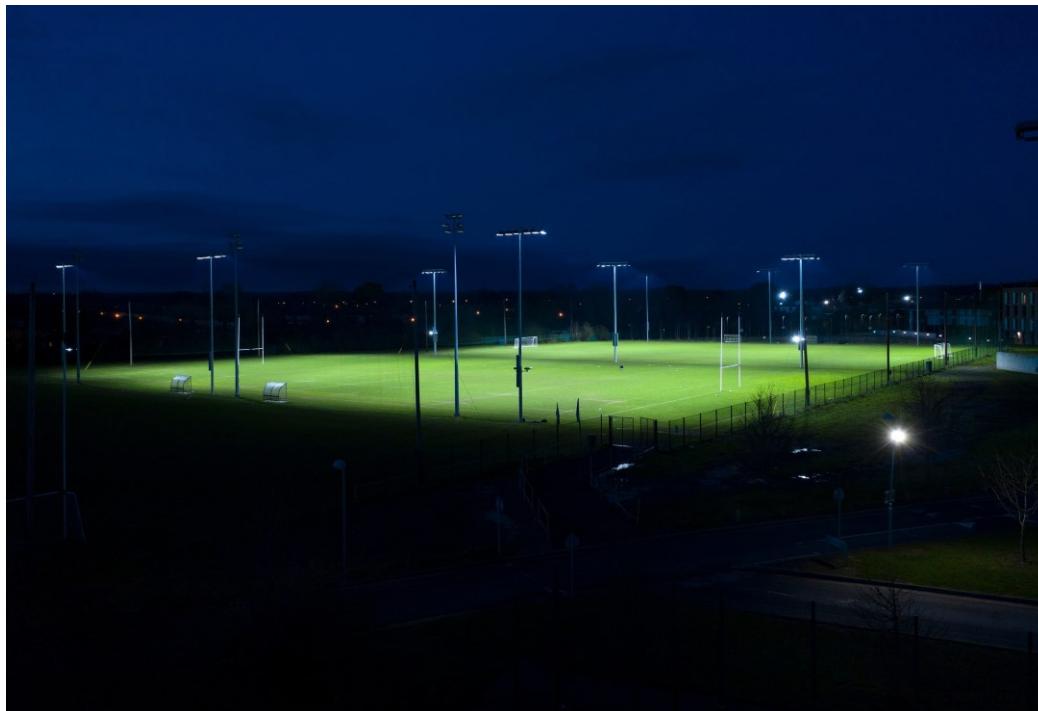
- Aviva Stadium
- Kingspan Stadium
- Twickenham Stadium
- Emirates Stadium
- Wimbledon Centre Court
- Tottenham Hotspur – New Stadium Development

To following images of completed projects illustrate the enhanced spill control of the TLC for LED™ system over traditional metal halide technologies.



IMAGES OF THE MUSCO TLC for LED™ SYSTEM IN PRACTICE

**Maynooth University Sports**



**IT Carlow Sports**



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**IRFU High Performance Centre**



**Hockey Ireland, NSC**





### **3. Patented Technological Advancements**

The Musco LED system is designed to perform for more than ten times as long as traditional metal halide system (L90 120,000 hours). This means less maintenance required, thus less disturbance on the surrounding area. Musco offers a fully inclusive 10-year warranty with the entire system, so it will never fall into disrepair.

The environmental impact relating to energy consumption and CO2 emissions is significantly reduced with the proposed LED system. Analysis of both technologies shows the LED system will reduce energy and CO2 emissions by around 66% over 2kW metal halide systems.

### **Attachments**

1. 215518A Lighting Design
2. TLC-LED-900 System Data Sheets