St Phillip Howard Academy
Pitch Floodlighting Lighting Impact Study/Overspill Readings

Project Ref : 02735

Report By – JS

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Introduction

This report has been commissioned by Halliday Lighting to examine the proposed floodlighting installation at St Phillip Howard Academy. The proposed floodlighting consists of four number Osram Siteco 2kw Metal Halide floodlights to light the artificial areas for recreational play and general games to allow safe playing conditions in the winter months.

The report has been produced by Halliday Lighting, a specialist Sports Lighting Contractor with over 50 years of experience in Sports Lighting Engineering.

Site Location

The sports pitch is located in Glossop and is indicated on the aerial view below.

The surrounding land consists mainly of residential housing. The nearest surrounding residential properties are located to the North, East, South and West of the MUGA pitch.

Summary

The floodlighting proposals have been assessed using the design guidance outlined in the *Sport England Artificial Sports Lighting Guidelines 2012* installation for a football pitch. This recommends a maintained average lighting level of 120 Lux, with uniformity (min/ave) of 0.50. Details of how to calculate the optimum mast height are also shown and this should be 10m for a football pitch of this size.

In order to ensure compliance with recommended light containment limitations the *ILP 'Guidance notes for the reduction of obtrusive light'* have been consulted. This document categorises the environment into five zones according to the degree of urbanisation and background illumination. The environmental zones categories are shown in Table 1 along with the allowances for spill light and glare in Table 2.

Table 1 – Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

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/m^2]
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 site at St Phillip Howard Academy is in a Suburban area with Medium district brightness, the recommendations for an environmental zone E3 have therefore been applied.

Proposed Lighting System

The proposed floodlighting system has been designed using floodlights manufactured by Siteco Lighting. The floodlights proposed are the High output, floodlights which features Nano optic's designed to reduce upward waste light and overspill.

The lighting design details are shown on Halliday report Ref HLS01616 REV1. The drawing shows the proposed mast locations, floodlight orientation, pitch lighting levels and overspill predictions.

The proposals have been designed are using an independent lighting software package Calculux and confirmed as producing 99.999% correlation to the SI Standard Calculation.

The proposed masts are 10m high in line with the calculated optimum resulting in floodlight beam elevations of between 5° and 10° which complies with the ILP recommended maximum of 70°.

Conclusion

The proposed lighting system has been designed to meet the specific lighting requirements for recreational play of large ball sports, whilst ensuring that nationally recognised environmental lighting standards are adhered to. Sufficient measures are put in place and are adhered to.

The proposed system will therefore allow participants to play in safety whilst maintaining the amenity of neighboring properties.

For and on behalf of

Halliday Lighting

Standards and Guidance

The following lighting guides and documents have been used for reference.

ILP ‘Guidance notes for the Reduction of Obtrusive Light’ 2011

The Society of Light and Lighting(CIBSE), Lighting Guide 4 “Sports Lighting” 2006

BS EN 12193 ‘Sports Lighting’.

Clean Neighbourhoods and Environment Act 2005

Railway Group Standards

Glossary

Lumen

The standard unit of light (luminous flux) used in describing light emitted by a source or received by a surface.

Illuminance and Maintained Illuminance(lumens/m2 or lux)

Illuminance is the term used to describe the level of light on a surface in lumens/square metre or lux. Maintained illuminance is the term used to describe the average illuminance on a reference surface e.g. desktop, at the time maintenance has to be carried out.

Horizontal Illuminance

The level of light falling on to a horizontal plane(ie The Ground).

Vertical Illuminance

The level of light falling on to a vertical plane(ie The walls of a house).

Light Output Ratio (LOR)

This is the ratio of the total light output of a luminaire, relative to the total light output of the lamp/s under reference conditions. Total LOR can be divided into downward(DLOR) and upward(ULOR) light output ratios if appropriate.

Light Intrusion (Light trespass, Overspill, Light into windows).

The flow of light spilling outside the location boundary. With inadequate control Intrusive light may be sufficiently great as to provide a serious nuisance and disturbance to adjacent areas.

Glare.

Glare may be divided into 2 types known as disability and discomfort glare. In a Sports Lighting context it relates primarily to direct viewing of the floodlights. Only in severe situations would disability glare be experienced. In most instances it is discomfort glare that may result, causing annoyance to the viewer if inadequate screening of floodlights is not provided.

Sky Glow

The general term for the Halo-effect caused by upwardly directed light, forming a glow in the night sky. It can cause diminished contrast of stars against their dark background making astronomical observations difficult and often impossible. The upwardly directed light can be caused by direct waste light from floodlights or indirect redirected light from the sports surface.

ILP

The Institution of Lighting Professionals.

ILP 'Guidance notes for the reduction of light pollution'

A booklet produced by the ILP providing advice on reducing the impact of exterior lighting installations on the environment. The degree of permissible overspill & ULOR varies depending on the environmental zone as categorized in the guidance notes. Due to the higher ambient lighting levels in built up areas the restrictions are not as stringent in city centres, were as dark landscapes & rural areas require tighter control