



Blackburn Rovers Academy
(Brockhall Village)
Proposed Floodlighting
Lighting Impact Study

Project Reference: PRQ0001833
Report by: CG
Date: 21/05/2026



Introduction

This report has been commissioned by Hi-Volt Ireland Limited to examine the proposed floodlighting installation at Blackburn Rovers Academy (Brockhall Village). We are proposing to floodlight one football pitch to improve playing conditions during winter months and periods of low ambient light.

The report has been produced by Hi-Volt Ireland Limited, with over 27 years of experience, Hi-Volt offers premium LED sports lighting solutions that are energy-efficient, durable, and designed to provide superior performance.

Site Location

The proposed floodlighting location is indicated on the aerial view below. The pitch is located within the Blackburn Rovers Academy grounds at Brockhall Village. The surrounding land comprises existing academy pitches and training facilities to the east and south-east, mature tree belts/woodland and open land around parts of the site, and wider rural/academy land to the north, south and west.



Summary

The floodlighting proposal has been assessed using the design guidance outlined in *Professional Development Phase Games Programme: Alternative Venue Criteria - Appendix One*. This recommends a maintained average lighting level no lower than 250 lux. The proposed design achieves an average maintained illuminance of 325.92 lux and uniformity of 0.7 (Min/Avg).

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 Blackburn Rovers Academy is within an established sports academy setting with low-to-medium district brightness, including surrounding sports pitches, open land and mature landscaping. The recommendations for an environmental zone E2/E3 assessment approach have therefore been considered, subject to confirmation by the planning authority.



Proposed Lighting System

The proposed floodlighting system has been designed using floodlights manufactured for Hi-Volt Ireland Limited. The floodlights proposed are the HFL21-1200W LED sports floodlight, using a combination of 30-degree and 60-degree beam distributions. The luminaire schedule comprises 20 No. HFL21-1200W fittings in total: 8 No. 60-degree luminaires and 12 No. 30-degree luminaires, with an approximate total connected load of 24.13 kW.

The lighting design details are shown on Hi-Volt Ireland Limited lighting design output: 2026-05-19 Blackburn Rovers Academy - 325lx. The drawing shows the proposed mast locations, floodlight orientation, pitch lighting levels and overspill predictions.

The proposals have been designed using AGi32 lighting calculation software and confirmed as producing 99.999% correlation to the SI Standard Calculation.

The proposed masts on the football pitch are 16m high in line with the calculated optimum mounting height, with luminaire aiming angles carefully optimised to achieve the required playing performance while minimising spill light and glare.

Light containment has been carefully considered within the design. The AGi32 calculation output records an average horizontal spill illuminance of 6.84 lux across the wider spillage assessment area, with the 10-lux contour localised around the pitch perimeter and adjacent academy areas. The proposed installation has therefore been designed to control light spill and visual impact while achieving the required pitch lighting performance for FA standards.

Lighting Spill & Obtrusive Light Mitigation Statement

The proposed LED sports lighting design for Blackburn Rovers Academy has been engineered to provide the required playing performance levels while minimising light spill and visual impact on the surrounding academy grounds, open land, mature vegetation and wider environment.

Several mitigation measures and specialist lighting design techniques have been incorporated into the design process to support compliance with relevant obtrusive light recommendations and planning requirements.

Impact on surroundings

The natural shielding provided by trees, mature planting and landscape features around the site has not been relied upon within the lighting calculation. This provides a robust assessment of expected overspill levels; actual observed spill may be reduced where existing vegetation screens views of the luminaires and pitch surface.

The trees and hedges should not be affected by cabling excavation. Cable positions will be located to reduce the risk of damage to existing tree roots and adjacent vegetation.

The lighting system will be controlled by a time clock or suitable control system so that agreed operational hours and any planning curfew can be adhered to. The proposed floodlighting is intended primarily for use during winter months and periods of low ambient light.

The supplied AGi32 design output provides pitch illuminance, glare rating and horizontal spill illuminance calculations; this report therefore focuses on the modelled spill, glare and optical-control information provided by the lighting design and the HFL21 luminaire data sheet.

Key Mitigation Measures Implemented

- Use of specialist-controlled beam optics to direct light precisely onto the playing surface while reducing unnecessary outward spill light.
- Use of two beam distributions in the design: 8 No. HFL21-1200W 60-degree luminaires and 12

No. HFL21-1200W 30-degree luminaires.

- Careful calculation of individual luminaire aiming points to ensure light is focused only where required on the pitch area.
- Use of 16m mounting heights selected to balance pitch lighting performance, aiming geometry, glare control and containment of spill light.
- Precision photometric modelling undertaken in AGi32 to optimise mast locations, mounting heights, luminaire tilt/orientation and beam distribution.
- Selection of modular HFL21 LED sports luminaires with multiple beam angle options and adjustable aiming for accurate sports-lighting control.
- Use of high-output, high-efficiency LED luminaires to achieve the required maintained average illuminance with an efficient quantity of fittings.
- Operational control by time clock or suitable control system to ensure use is limited to the required hours and any planning curfew.

Surrounding Spill Light Performance

The complete lighting design demonstrates that spill light levels reduce rapidly outside the pitch area. The AGi32 spillage calculation records an average horizontal spill illuminance of 6.84 lux across the wider spillage calculation area, with a maximum calculated value of 73 lux at localised points close to the pitch lighting zone.

The aerial/Isolux output indicates that the 10-lux contour is localised around the pitch perimeter and adjacent academy land, while lower spill levels extend further into surrounding open areas. This demonstrates that the proposed installation has been designed to balance sports performance requirements, player visibility, safety standards and environmental protection.

Luminaire Technology

The proposed Hi-Volt HFL21-1200W LED sports luminaires incorporate a number of features suited to sports lighting applications and precise light control, including:

- Optically independent modular floodlight construction.
- Multiple beam angle options, including the 30-degree and 60-degree distributions used in this design.
- High luminous efficacy, with the HFL21 range rated up to 170 lm/W depending on beam and wattage configuration.
- 5700K LED configuration and CRI ≥ 70
- IP66 wet-location protection and IK08 impact rating.
- 10kV surge protection and Class I electrical protection.
- Adjustable U-bracket and individual module adjustment to support accurate aiming.
- 0-10V, DMX and DALI control compatibility.
- 100,000-hour L70B50 lifetime rating at 25 degrees C and 7-year warranty.

The HFL21 luminaire system is therefore appropriate for professional sports lighting applications where high maintained illuminance, reliable operation and controlled beam distribution are required.



Conclusion

The lighting proposal for Blackburn Rovers Academy has been designed using best-practice sports lighting principles to meet the specific lighting requirements for use on a Grade 1 Academy Football Pitch, while taking into account nationally recognised environmental lighting guidance and the amenity of the surrounding area.

The AGi32 design output demonstrates that the proposed installation achieves the required pitch lighting performance, with an average maintained illuminance of 325.92 lux and uniformity values of 0.70 Min/Avg and 0.42 Min/Max. The use of 20 No. HFL21-1200W LED sports luminaires mounted at 16m provides the required level of performance while using controlled beam distributions to manage spill light.

Through the use of precision optics, controlled beam angles, carefully calculated aiming positions, appropriate mounting heights and operational controls, the proposed installation maintains low levels of obtrusive light beyond the pitch area relative to the requirements of sports use.

The proposed system will allow participants to train and play safely during winter and low-light periods while maintaining appropriate consideration for surrounding academy land, landscape features and neighbouring amenities.

In summary, based on the supplied lighting design output and luminaire data, the proposed lighting scheme is considered compliant with the stated sports lighting design objective and has incorporated appropriate mitigation to reduce light spill and visual impact.

For and on behalf of
Hi-Volt Ireland Limited

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" BS EN 12193:2018 'Light and lighting - Sports lighting'
- Professional Development Phase Games Programme: Alternative Venue Criteria – Appendix One
- Clean Neighbourhoods and Environment Act 2005
- Hi-Volt HFL21 LED Sports Light data sheet
- Hi-Volt Ireland Limited AGi32 lighting design output: 2026-05-19 Blackburn Rovers Academy - 325lx



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 or lx)

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 onto a horizontal plane (e.g. the ground).

Vertical Illuminance

The level of light falling onto a vertical plane (e.g. walls of a housing).

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, where as dark landscapes & rural areas require tighter control.