

External Lighting Impact Assessment

LFC Academy External Lighting Impact Assessment And Strategy

1 December 2025

XX-HML-XX-XX-
RP-E-170001

Issue P01



Project Name: LFC Academy

Report Name: External Lighting Impact Assessment

Issue Status: For Comments

Reference: XX-HML-XX-XX-RP-E-170001

Date of Issue: 1 December 2025

Issue: P01

Author: M Waghorn

Checker: A Stallwood

Approver: B Turpin

HM Project No: 37294

HM Office: Neo
9 Charlotte Street
Manchester
M1 4ET

T: +44 (0)161 876 2700

hilsonmoran.com

 hilsonmoran.com

 [@HilsonMoran](https://twitter.com/HilsonMoran)

 [hilson_moran](https://www.instagram.com/hilson_moran)

 [Hilson Moran](https://www.linkedin.com/company/hilson-moran)

Document History:

Issue	Date	Details
P01	1/12/2025	ISSUED FOR COMMENT

Copyright © Hilson Moran 2025. All rights reserved. This report is confidential to the party to whom it is addressed and their professional advisers for the specific purpose to which it refers. No responsibility is accepted to third parties, and neither the whole nor any part of this report nor reference thereto may be published or disclosed without the written consent of Hilson Moran.

Contents

1.

Executive Summary

1

2.

Introduction

2

2.1.

Background

2

2.2.

Purpose & Aims

4

3.

Legislation, Policy and Guidance.....

5

3.2.

Local Policy

6

3.3.

Guidance for General External Lighting.....

7

3.4.

Design Standards/Codes for General External Lighting.....

9

3.5.

Design Standards/Codes for Outdoor Sports Lighting.....

9

4.

Desktop Study & Requirements.....

10

4.1.

Lighting Design Guidance

10

5.

Impact On Key Local Boundary Receptors.....

28

5.1.

UEFA Level D – Lower Tier Broadcast Matches – 800 Lux.....

28

5.2.

Academy Matches – 500 Lux

35

5.3.

Non-Broadcast/Training - 350 Lux.....

44

Appendix A – Lighting Strategy for General Lighting.....

52

1. Executive Summary

Hilson Moran has prepared this External Lighting Impact Assessment and Strategy for the redevelopment of Liverpool Football Club's Academy Training Ground. The project involves the construction of a new indoor pitch, upgrades to the existing outdoor pitch including a 499-seat stand, and installation of new sports floodlighting designed to meet UEFA broadcasting standards. Additional functional external lighting will be introduced to complement revised landscaping and ensure safe movement across access roads, car parks, pedestrian pathways, and building perimeters.

The assessment identifies relevant national and local planning policies, environmental legislation, and best-practice guidance, including ILP, CIBSE, and UEFA standards. The proposed lighting strategy prioritises:

- **Compliance with statutory requirements** under the Clean Neighbourhoods and Environment Act and local planning policies.
- **Minimisation of light spill and glare** to protect nearby residential properties on Simonswood Lane.
- **Energy efficiency and sustainability**, incorporating LED technology and smart controls.
- **Operational flexibility**, with three lighting modes for training, academy matches, and lower-tier broadcast events.

Detailed design calculations for 8no. 21m columns and associated layouts have been developed to ensure uniformity, visual comfort, and environmental protection. The strategy demonstrates that the proposed lighting will meet safety, security, and performance requirements while mitigating potential impacts on surrounding receptors.

2. Introduction

2.1. Background

Hilson Moran have been commissioned by Liverpool Football Club (the 'Client') to provide an External Lighting Strategy for their Academy Training ground.

The Academy is located at the southern end of the complex and was established in 1998 as a dedicated training facility for the club's youth teams. The current site features a main building (The Academy) with an associated indoor pitch adjacent, with two external pitches, one full-size grass pitch and one full size artificial pitch, both of which currently include existing floodlighting. The site is located within an urban setting characterised by a medium level of background illuminance. The training campus shares one boundary with residential properties, while the remaining three boundaries are adjacent to commercial premises, separated by roads and pavements.

The Academy area of the site is proposed for redevelopment, which includes the construction of a new indoor pitch, on the site of the existing show pitch (with the removal of the existing external pitch lighting), with redevelopment to the landscape of the site. This new facility will be connected to the existing Academy building via a newly designed link structure. Additionally, the current outdoor pitch is being upgraded with the installation of a 499-seat stand and new external pitch which is to be enhanced by sports floodlighting to meet UEFA broadcasting standards. A new 'service yard' has been introduced to the scheme, with the new lighting for the scheme being included as part of the external lighting impact assessment.

New functional external lighting will be introduced to complement the revised landscaping layout. This will include upgraded floodlighting for the external pitch, designed to provide three adjustable lux levels to accommodate varying pitch usage requirements.

New function external lighting will be introduced for the new 'Services' yard, which will include new floodlighting design to provide functional lighting to this area.

The main purpose of this report and lighting strategy is to demonstrates adherence to planning requirements and environmental impact assessments, in relation to existing housing that is located on the perimeter of the site, on Simonswood Lane. The area is considered a E3 area, with suburban areas surrounding the site.

Table 2: Environmental zones

Zone	Surrounding	Lighting environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness (SQM ~15 to 20)	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity

The existing site, showing housing on Simonswood lane & red line boundary for the proposed site are shown in **Figure 1-1 & Figure 1-2** below.



Figure 2-1 Aerial view of the existing site, showing housing locations on Simonswood Lane



Figure 2-2 Red Link Boundary showing proposed development

2.2. Purpose & Aims

The purpose & aims for the external Lighting Strategy & associated report are to:

- Identify national and local planning policy, guidance and standards as relevant to external lighting on the Site and the Proposed Development;
- To develop the future design of the project
- Establish the minimum lighting required to construct and operate the Proposed Development safely and securely; and,
- With the aid of a sport lighting specialist, assess the potential effects of the new flood lighting in relation to existing housing while achieving operation requirements and accreditation

3. Legislation, Policy and Guidance

3.1.1. Clean Neighbourhoods and Environment Act

The Clean Neighbourhoods and Environment Act 2005 (CNEA) amended Section 79 of the Environmental Protection Act 1990 by extending the statutory nuisance regime to include light nuisance, by stating the following:

“(fb)...artificial light emitted from premises so as to be prejudicial to health or a nuisance...” “Subsection (1)(fb) does not apply to artificial light emitted from - (a) an airport; (b) harbour premises;

Therefore, since 6th April 2006, artificial light can be considered to be a statutory nuisance unless it is from exempt premises.

Guidance produced by the Department of Environment, Food and Rural Affairs (DEFRA) in April 2006, on Section 101 to 103 of the CNEA, extends the duty on local authorities to ensure their areas are checked periodically for existing sources of statutory nuisances.

If a light nuisance is considered by a local authority to exist, the local authority must serve a notice on the person responsible requiring the abatement of the nuisance, and/or restricting or prohibiting its recurrence.

Section 103 extends the defence of ‘best practical means’ to those statutory nuisances where light is emitted from industrial, trade or business premises and also from relevant outdoor sports facilities.

3.2. Local Policy

The Site is located within the jurisdiction of Knowsley Metropolitan Borough Council. Documentation identified that are relevant to the lighting strategy for the Proposed Development are as follows:

3.2.1. Knowsley Local Plan Core Strategy (adopted January 2016)

The Core Strategy sets out Knowsley's vision for sustainable growth and development up to 2028. It focuses on delivering economic regeneration, providing 8,100 new homes, revitalising town centres, and improving transport connectivity. Key priorities include protecting the Green Belt, enhancing design quality, promoting energy efficiency, and safeguarding biodiversity. The plan underpins all planning decisions, ensuring developments contribute to safe, accessible, and well-designed environments while supporting climate resilience and inclusive growth. Lighting design is expected to complement these principles by improving safety and public realm quality, minimising light pollution, and using energy-efficient solutions that respect ecological and residential sensitivities. In line with the Design Quality SPD, external lighting should avoid glare and overspill, integrate with architectural and landscape design, and incorporate controls such as timers, photocells, and PIR (motion) sensors to reduce energy consumption and environmental impact.

3.2.2. Design Quality in New Development SPD (Knowsley Council)

This SPD (Supplementary planning document) provides detailed guidance to ensure high-quality, sustainable design across all new developments. It emphasises creating safe, attractive, and accessible environments that integrate well with local character and public realm. For external lighting, the SPD requires designs that enhance safety without causing glare or light overspill, use energy-efficient luminaires, and complement architectural and landscape features. It also encourages the use of smart controls such as timers, photocells, and PIR sensors to minimize energy consumption and light pollution, supporting both environmental and community objectives.

3.3. Guidance for General External Lighting

3.3.1. ILP Publications

3.3.1.1. ILP Professional Lighting Guide 01: Guidance Notes for the Reduction of Obtrusive Light (2020)

The Institute of Lighting Professionals (ILP) has published guidance for lighting designers and planning authorities aimed at reducing the environmental impact of lighting installations. The document, Guidance Notes 01/21: The Reduction of Obtrusive Light, introduces a classification system dividing environments into five zones. These zones are defined by factors such as urban context, existing background illuminance, and the level of protection required to preserve the current environmental character.

Table 2: Environmental zones

Zone	Surrounding	Lighting environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness (SQM ~15 to 20)	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity

Figure 2.3-1 Environmental Zones Table

Table 3 (CIE 150 table 2): Maximum values of vertical illuminance on premises

Light technical parameter	Application conditions	Environmental zone				
		E0	E1	E2	E3	E4
Illuminance in the vertical plane (E_v)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	<0.1 lx*	1 lx	2 lx	5 lx

Figure 2.3-2 Maximum values of vertical illuminance on premises

Table 4 (CIE 150 table 3): Limits for the luminous intensity of bright luminaires⁴

Light technical parameter	Application conditions	Luminaire group (projected area A_p in m^2)					
		$0 < A_p \leq 0.002$	$0.002 < A_p \leq 0.01$	$0.01 < A_p \leq 0.03$	$0.03 < A_p \leq 0.13$	$0.13 < A_p \leq 0.50$	$A_p > 0.5$
Maximum luminous intensity emitted by luminaire (I in cd) ⁵	E0 Pre-curfew Post-curfew	0 0	0 0	0 0	0 0	0 0	0 0
	E1 Pre-curfew Post-curfew	0.29 d 0	0.63 d 0	1.3 d 0	2.5 d 0	5.1 d 0	2,500 0
	E2 Pre-curfew Post-curfew	0.57 d 0.29 d	1.3 d 0.63 d	2.5 d 1.3 d	5.0 d 2.5 d	10 d 5.1 d	7,500 500
	E3 Pre-curfew Post-curfew	0.86 d 0.29 d	1.9 d 0.63 d	3.8 d 1.3 d	7.5 d 2.5 d	15 d 5.1 d	10,000 1,000
	E4 Pre-curfew Post-curfew	1.4 d 0.29 d	3.1 d 0.63 d	6.3 d 1.3 d	13 d 2.5 d	26 d 5.1 d	25,000 2,500

Note 1 d is the distance between the observer and the glare source in metres;

Note 2 A luminous intensity of 0 cd can only be realised by a luminaire with a complete cut-off in the designated directions;

Note 3 A_p is the apparent surface of the light source seen from the observer position

Note 4 For further information refer to Annex C of CIE 150

Note 5 Upper limits for each zone shall be taken as those with column $A_p > 0.5$

Figure 2.3-3 Limits for the luminous intensity of bright luminaires table

3.3.2. CIBSE Publications

3.3.2.1. Guide to limiting obtrusive light (2012)

This guide outlines the causes and consequences of obtrusive light, and what can be done to minimise obtrusive light generally and in some commonly occurring applications such as security, sign, sports and façade lighting. The guide covers limits and methods of control through both technology and design.

3.3.2.2. CIBSE Lighting Guide 06: The Outdoor Environment (2016)

The Chartered Institute of Building Services Engineers (CIBSE) Lighting Guide 06 (2016) provides general and specific lighting design criteria for the outdoor environment. The guide covers many technical aspects which are likely to be of interest to

designers. It presents lighting solutions to basic visual problems and individual characteristics of outdoor lighting applications.

3.4. Design Standards/Codes for General External Lighting

3.4.1. BS EN 12464-2:2014 Light and lighting - Lighting of work places Part 2: Outdoor work:

Defines lighting requirements for outdoor work places, which meet the needs for visual comfort and performance.

3.4.2. BS EN 5489-1:2020 Design of road lighting. Lighting of roads and public amenity areas:

BS 5489-1 is a revision of the British Standard for road lighting design. It provides guidance and recommendations that are intended to support the BS EN 13201 series. This document provides recommendations on the general principles of road lighting including aesthetic and technical aspects, operation and maintenance, means of minimising energy consumption and limiting the impact on the environment.

3.5. Design Standards/Codes for Outdoor Sports Lighting

3.5.1. UEFA Stadium Lighting Guide 2023

The guide sets out technical standards for stadium floodlighting to provide the best conditions for players, officials, spectators, and broadcasters. It specifies lighting levels for different competition categories (Elite Levels A to D) and applies to both new and existing stadiums. Key requirements include uniformity, glare control, and colour quality to support UHD and HDR broadcasting. The guide introduces flexible lighting modes for matches, training, and maintenance to improve energy efficiency. It also covers flicker testing, colour temperature, and player visibility for television coverage. Additional guidance includes luminaire positioning, environmental considerations, and compliance testing. Updates focus on LED technology, advanced controls, and integration with entertainment lighting while meeting health and safety standards.

- **Lighting Levels:** Defines horizontal and vertical illuminance for competition categories (Elite Levels A–D), ensuring visibility for players and broadcast quality.
- **Uniformity & Glare Control:** Specifies minimum uniformity ratios and glare limits to maintain visual comfort and safety.

- **Colour Quality:** Requires high colour rendering ($CRI \geq 80$) and consistent colour temperature ($\geq 4000K$) for UHD/HDR broadcasting.
- **Flicker-Free Performance:** Mandates flicker factor $\leq 1\%$ for HDTV and slow-motion replays.
- **Pitch Illuminance Switch Modes (PISM):** Introduces flexible modes for match, training, continuity, and maintenance to optimise energy use.
- **Player Face Modelling:** Ensures adequate vertical illuminance for clear facial visibility on TV.
- **Environmental & Sustainability:** Encourages LED technology, smart controls, and reduced light spill to minimise ecological impact.
- **Compliance & Testing:** Provides procedures for measuring illuminance, uniformity, and flicker, plus diagrams for luminaire positioning.

4. **Desktop Study & Requirements**

A desktop review of the site has been completed to determine the lighting requirements for the proposed development. Strategy layouts and design drawings have been prepared to illustrate the required lux levels. The strategy documentation also includes description of lighting fittings that have been utilised

4.1. **Lighting Design Guidance**

All external lighting will be designed in accordance with the following lighting standards and guidance, as a minimum:

- BS EN 12464-2:2014; Light and lighting – Lighting of work places Part 2: Outdoor work
- BS EN 12665:2018
- BS EN 13201; Road Lighting
- BS EN 5489-1:2020 Design of road lighting
- CIBSE (2016) Lighting Guide LG6 – The Outdoor Environment.
- UEFA Stadium Lighting Guide 2023

4.1.1. **External Lighting Requirements**

The external lighting strategy for sports/training facilities must ensure safe movement, security, and visual comfort across all general areas. This includes access roads, car parks, pedestrian pathways, and building entrances.

Lighting should provide adequate horizontal and vertical illuminance to support visibility for vehicles and pedestrians, minimize glare, and enhance facial recognition for security purposes. Uniformity is essential to avoid dark spots that could compromise safety, while energy efficiency and compliance with environmental standards should be considered to reduce light pollution. The below tables list minimum lux & uniformity requirements for general areas and types of lighting proposed.

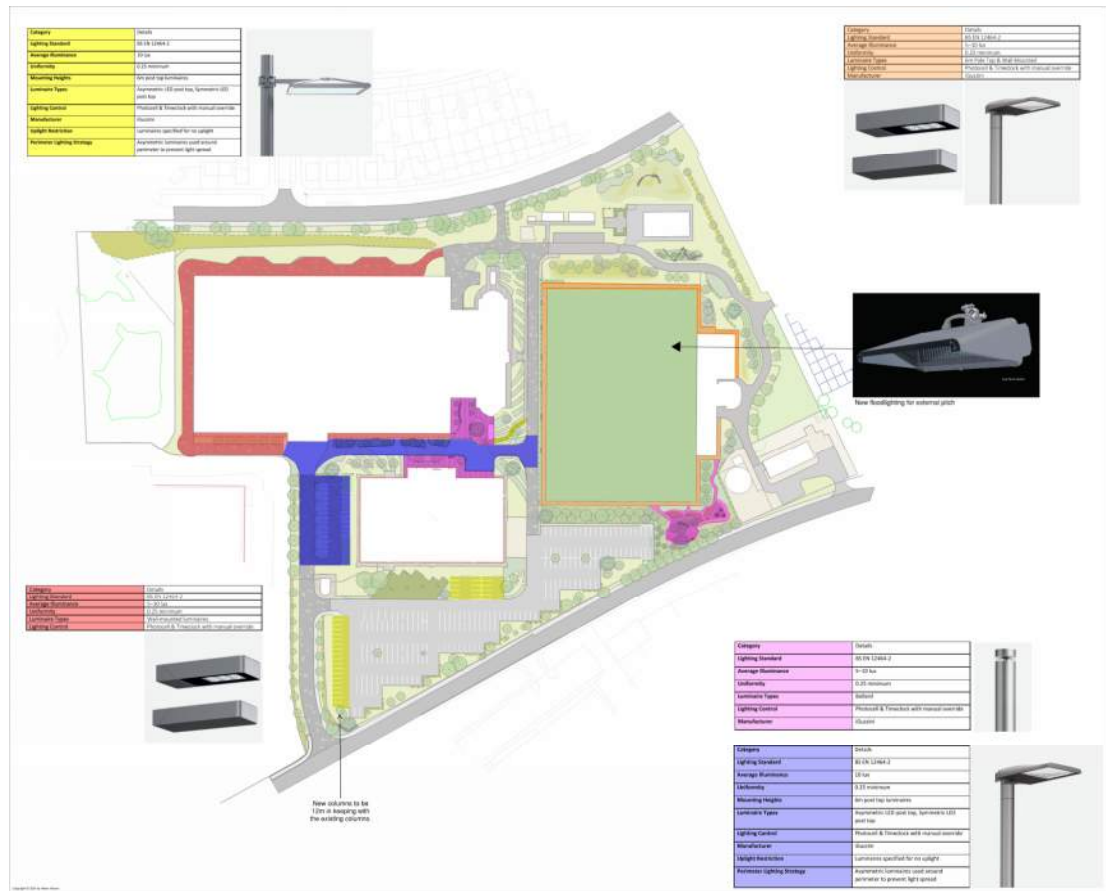


Figure 4.1.1-1 Lighting Strategy (see Appendix A also)

4.1.2. General External Lighting

Below are the overall requirements for each area of the proposed scheme. It is recommended that this section is read in conjunction with the lighting strategy drawing ref: **38158-HML-XX-XX-SK-E-171001**.

4.1.2.1. Pedestrian Walkways

Building Pathways

Category	Details
Lighting Standard	BS EN 12464-2
Average Illuminance	5–10 lux
Uniformity	0.25 minimum
Luminaire Types	Bollard
Lighting Control	Photocell & Timeclock with manual override
Manufacturer	iGuzzini

Example luminaire:



Walkway around New External Pitch

<u>Category</u>	<u>Details</u>
Lighting Standard	BS EN 12464-2
Average Illuminance	5–10 lux
Uniformity	0.25 minimum
Luminaire Types	6m Pole Top & Wall Mounted
Lighting Control	Photocell & Timeclock with manual override
Manufacturer	iGuzzini

Example luminaires:





4.1.2.2. Roadway/Parking Spaces

<u>Category</u>	<u>Details</u>
Lighting Standard	BS EN 12464-2
Average Illuminance	10 lux
Uniformity	0.25 minimum
Mounting Heights	Combination of 6m & 12m post top luminaires
Luminaire Types	Asymmetric LED post top, Symmetric LED post top
Lighting Control	Photocell & Timeclock with manual override
Manufacturer	iGuzzini
Uplight Restriction	Luminaires specified for no uplight
Perimeter Lighting Strategy	Asymmetric luminaires used around perimeter to prevent light spread

Example luminaire:



4.1.2.3. Building Perimeters

Category	Details
Lighting Standard	BS EN 12464-2
Average Illuminance	5–10 lux
Uniformity	0.25 minimum
Luminaire Types	Wall-mounted luminaires
Lighting Control	Photocell & Timeclock with manual override
Manufacturer	iGuzzini

Example luminaire



4.1.3. Sport Floodlighting

4.1.3.1. UEFA Standards 2023

The following table summarises the UEFA Stadium Lighting Guide 2023 requirements for different competition levels, including horizontal and vertical illuminance and uniformity ratios. These standards ensure optimal conditions for players, spectators, and broadcasters.

UEFA Level	Typical Competition	Horizontal Illuminance (E _h avg)	Vertical Illuminance (E _v avg)	Uniformity (E _{min} /E _{avg})
Elite Level A	UEFA Champions League Final, EURO Final	2000 lux	1800 lux	≥ 0.70
Level B	Group Stage, Semi-Finals	1400 lux	1200 lux	≥ 0.65
Level C	Qualifying Rounds	1000 lux	800 lux	≥ 0.60
Level D	Lower-tier Broadcast Matches	800 lux	Average of 350 lux No Point less than 200 lux	≥ 0.60
Training Mode	Non-Broadcast / Training	350 lux	N/A	≥ 0.40

The proposed design for the new pitch will incorporate three distinct lighting levels to provide flexibility for different operational needs. These functions will include a Lower-tier broadcast delivering the illuminance for Level D broadcast-quality events, to achieve the clubs aspirations, alongside non broadcast matches and general training requirements that operate lower requirements. These will be achieved by optimising energy efficient LED technology and easily configurable and 'scenerio' dimmed switching functions while optimising energy efficiency throughout.

Non-Broadcast/Training

This level is designed for training sessions, warm-ups, and non-broadcast activities where full match lighting is not required. It prioritises player safety and comfort while reducing energy consumption. It is envisaged that this will form the majority of the scenarios utilised by the club.

For non-broadcast or training sessions, the UEFA Stadium Lighting Guide recommends a horizontal illuminance of approximately **350 lux** across the pitch to ensure safe and comfortable playing conditions. Vertical illuminance is not specified for broadcast purposes at this level but should still provide clear visibility of players and the ball. A minimum uniformity ratio of $E_{min}/E_{avg} \geq 0.60$ is required to avoid dark spots and

maintain consistent lighting, while glare control remains important for player comfort. Colour quality should achieve a **Colour Rendering Index (CRI) of at least 70 and a colour temperature of 4000K or higher for a natural** appearance. Although flicker performance is less critical than for broadcast standards, modern LED systems should maintain a low flicker factor to support video analysis and ensure visual comfort.

Academy Matches – 500 lux

Academy matches will be played at a illumination level of **500 lux**. A minimum uniformity ratio of $E_{min}/E_{avg} \geq 0.60$ is required to maintain consistent lighting across the pitch, while glare control remains essential for player comfort. Colour quality should achieve a CRI of at least 70 and a colour temperature of 4000K or higher for accurate colour reproduction. This level of illuminance is consistent with existing floodlit pitches at LFC Academy and main training ground currently installed.

Level D – Lower-tier Broadcast Matches

For matches that are broadcast at a lower production level, the UEFA Stadium Lighting Guide specifies a horizontal illuminance of approximately **800 lux** and a vertical illuminance of around 350 lux (with no point less than 200lux) to ensure clear visibility of players and the ball for standard television coverage. A minimum uniformity ratio of $E_{min}/E_{avg} \geq 0.60$ is required to maintain consistent lighting across the pitch, while glare control remains essential for player comfort and camera performance. Colour quality should achieve a CRI of at least 70 and a colour temperature of 4000K or higher for accurate colour reproduction. Flicker performance must meet a flicker factor of 1% or less to support smooth slow-motion replays and avoid visual artefacts. It is anticipated that approximately **6-8 matches per year** will require this standard, making it an important but less frequent operational mode.

4.1.4. External Pitch Lighting Controls

A new 'Smart' IP/app based lighting control system will be provide for the new external pitch floodlighting. This system allows for remote scheduling of lights and provides and ability to incorporate no-lighting curfew hours. The system will facilitate the dimming of the floodlights to pre-determined lux levels associated with the scheduled event or use on the pitch.

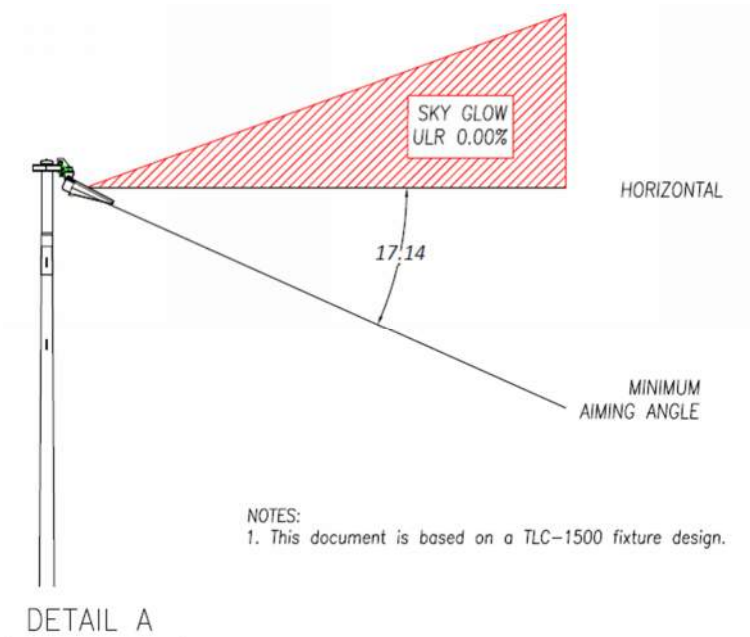
4.1.5. External Pitch & Skills pitch Lighting Lux Plots

The design consists of lighting 1 football pitch and 1 skills training area by means of 8 x 21.34m lighting columns and 1 x 15.24m lighting columns (Within the skills pitch) utilising a combination of TLC-LED-1500, TLC-LED- 1200, TLC-LED- 900 and TLC-LED- 550 luminaires. The drawings in the appendices supplied by Musco detail and segment this information.

It is important that spill light lux and glare is considered as there are neighbouring residential and commercial properties to the West, with road infrastructure in between. These are considered in the design, irrespective of any vegetal barriers in the area such as a high tree line. Column height has been intentionally designed to reduce glare impact to players whilst reducing obtrusive light for surrounding neighbours.

The floodlights use LED technology with individual LED lights sources mounted in clusters on boards on the front of the floodlight. The floodlights will be fitted with external visors designed to reduce upward spill light and shield residential properties from excessive glare and spill light.

As shown in the floodlighting layout drawings, spill light and glare reduction insures minimal disruption to nearby properties. External visors and internal optics included on each luminaire ensures 0% upward Light Ratio as demonstrated in the diagram below.



Musco Lighting has produced comprehensive design calculations on the pitch as well as across the surrounding area. Mast locations, floodlight orientation, pitch illuminance levels and vertical spill values on the facades of residential properties along with contours showing the effective cut offlight.

Equipment List For Areas Shown								
Structure				Fixtures				
QTY	STRUCTURE ID	SIZE	GRADE ELEVATION	ABOVE FIELD LEVEL	FIXTURE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
2	M1-M2		7.50m	7.50m	TLC-LED-550	2	2	0
2	S01 S04	21.34m	-	21.34m	TLC-LED-1500	7	7	0
2	S02-S03	21.34m	-	21.34m	TLC-LED-1500	5	5	0
2	S05 S08	21.34m	-	21.34m	TLC-LED-1500	9	9	0
2	S06-S07	21.34m	-	21.34m	TLC-LED-1500	6	6	0
10	Totals					58	58	0

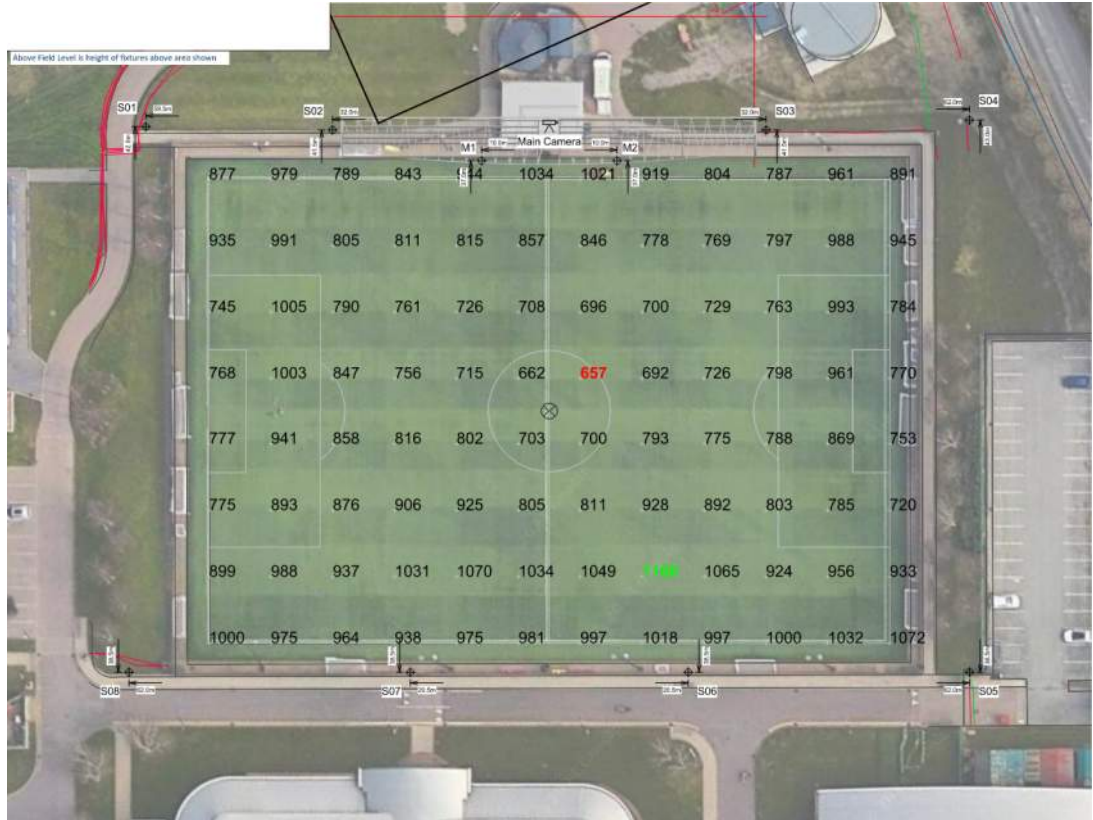
4.1.5.1. Level D – Lower Tier Broadcast Matches – 800 Lux

Maintained Horizontal Lux:

The table below outlines the average requirements for horizontal illuminance (lux) and uniformity levels. The target average illuminance is 800 lux, with an achieved level of 870 lux. Similarly, the target uniformity ratio is 0.6, with an achieved value of 0.75.

Grid Summary	
Name:	Football Eh
Size:	100.5m x 68.5m
Spacing:	9.1m x 9.8m
Height:	1.0m above grade

Illumination Summary	
	MAINTAINED HORIZONTAL LUX
Entire Grid	
Guaranteed Average:	800
Scan Average:	870.6
Maximum:	1107.9
Minimum:	657.1
Guaranteed Min/Avg:	0.6
Min/Avg:	0.75
Min/Max:	0.59
UG (adjacent pts):	1.35
CU:	0.80
No. of Points:	96
FIXTURE INFORMATION	
Applied Circuits:	A
No. of Fixtures:	58
Total Load:	78.30 kW



Maintained Lux FIFA: 0°:

Maintained Lux FIFA at 0° refers to the horizontal illuminance level required by UEFA standards, measured at a 0° viewing angle—meaning directly downward onto the playing surface. For this project, the minimum maintained illuminance requirement was 350 lux, with an achieved level of 598 lux. Similarly, the minimum uniformity target was 0.18, and the achieved uniformity was 0.37, exceeding the specified standards.

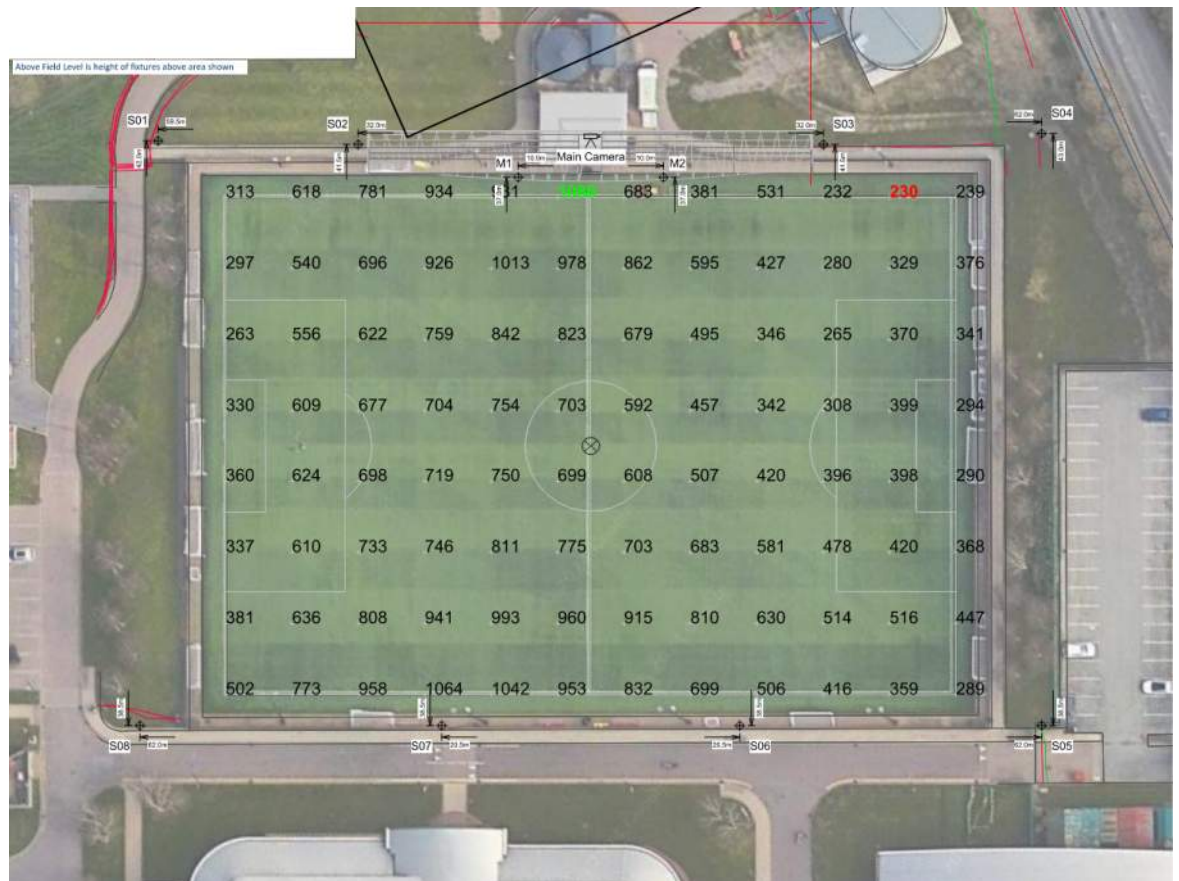
Illumination Summary	
	MAINTAINED LUX FIFA: Ev 0°
	Entire Grid
Guaranteed Average:	350
Scan Average:	598.1
Maximum:	1193.9
Minimum:	218.8
Min/Avg:	0.37
Min/Max:	0.18
UG (adjacent pts):	2.40
CU:	0.80
No. of Points:	96
FIXTURE INFORMATION	
Applied Circuits:	A
No. of Fixtures:	58
Total Load:	78.30 kW



Maintained Lux FIFA: 180°

Maintained Lux FIFA at 180° refers to the horizontal illuminance level required by UEFA standards, measured at a 180° viewing angle. For this project, the minimum maintained illuminance requirement was 350 lux, with an achieved level of 598 lux. Similarly, the minimum uniformity target was 0.21, and the achieved uniformity was 0.38, exceeding the specified standards.

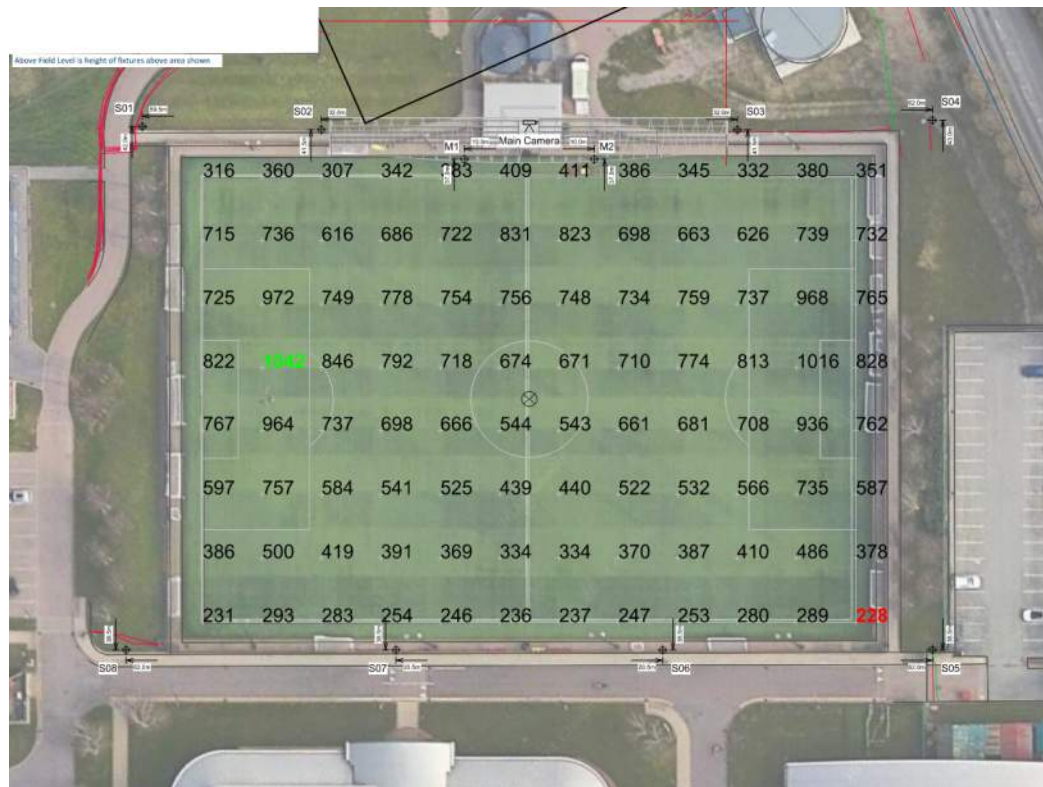
Illumination Summary	
	MAINTAINED LUX FIFA: Ev 180°
	Entire Grid
Guaranteed Average:	350
Scan Average:	598.5
Maximum:	1080.1
Minimum:	230.4
Min/Avg:	0.38
Min/Max:	0.21
UG (adjacent pts):	2.28
CU:	0.80
No. of Points:	96
FIXTURE INFORMATION	
Applied Circuits:	A
No. of Fixtures:	58
Total Load:	78.30 kW



Maintained Lux FIFA: 270°

Maintained Lux FIFA at 270° refers to the horizontal illuminance level required by UEFA standards, measured at a 270° viewing angle. For this project, the minimum maintained illuminance requirement was 350 lux, with an achieved level of 577 lux. Similarly, the minimum uniformity target was 0.22, and the achieved uniformity was 0.39, exceeding the specified standards.

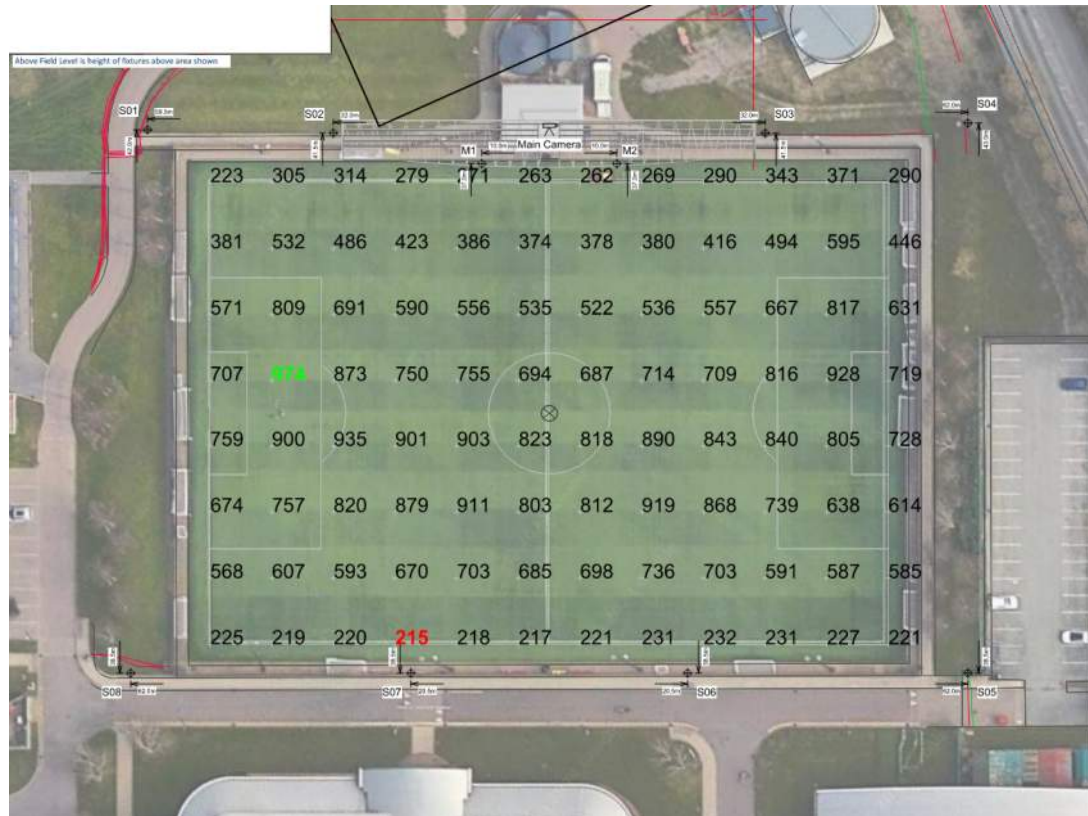
Illumination Summary	
	MAINTAINED LUX FIFA: Ev 270°
	Entire Grid
Guaranteed Average:	350
Scan Average:	577.0
Maximum:	1041.8
Minimum:	227.5
Min/Avg:	0.39
Min/Max:	0.22
UG (adjacent pts):	2.26
CU:	0.80
No. of Points:	96
FIXTURE INFORMATION	
Applied Circuits:	A
No. of Fixtures:	58
Total Load:	78.30 kW



Maintained Lux FIFA: 90°:

Maintained Lux FIFA at 90° refers to the horizontal illuminance level required by UEFA standards, measured at a 90° viewing angle. For this project, the minimum maintained illuminance requirement was 350 lux, with an achieved level of 578 lux. Similarly, the minimum uniformity target was 0.22, and the achieved uniformity was 0.37, exceeding the specified standards.

Illumination Summary	
	MAINTAINED LUX FIFA: Ev 90°
	Entire Grid
Guaranteed Average:	350
Scan Average:	578.7
Maximum:	974.2
Minimum:	214.6
Min/Avg:	0.37
Min/Max:	0.22
UG (adjacent pts):	3.22
CU:	0.80
No. of Points:	96
FIXTURE INFORMATION	
Applied Circuits:	A
No. of Fixtures:	58
Total Load:	78.30 kW



Maintained Glare Reading: Max Reading

Maintained glare reading refers to the glare level of a lighting installation. UEFA Level D requires a guaranteed minimum of 50, with a maximum of 46.8 achieved

Illumination Summary	
	MAINTAINED GLARE RATING: Max Reading
	Entire Grid
Scan Average:	41.2
Maximum:	46.8
Guaranteed Minimum:	50
Minimum:	32.4
No. of Points:	96
FIXTURE INFORMATION	
Applied Circuits:	A
No. of Fixtures:	58
Total Load:	78.30 kW

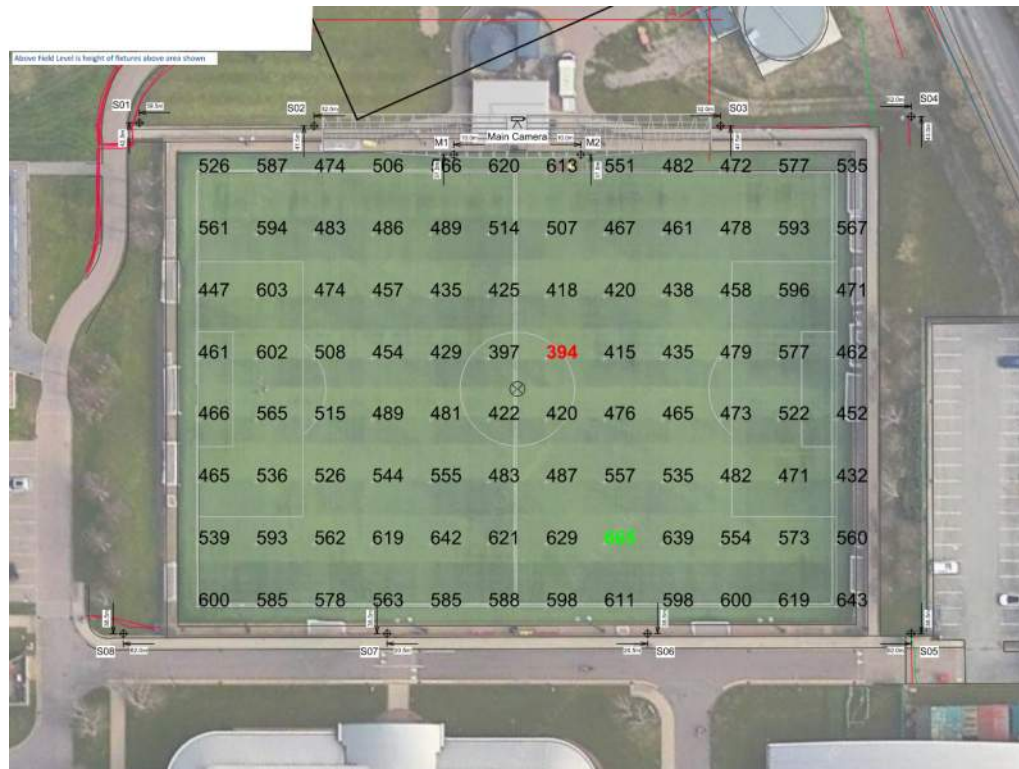


4.1.5.2. Academy Matches – 500 Lux

Maintained Horizontal Lux:

The table below outlines the average requirements for horizontal illuminance (lux) and uniformity levels. The target average illuminance is 500 lux, with an achieved level of 522 lux. Similarly, the target uniformity ratio is 0.6, with an achieved value of 0.75.

Illumination Summary	
	MAINTAINED HORIZONTAL LUX
	Entire Grid
Guaranteed Average:	500
Scan Average:	522.4
Maximum:	664.8
Minimum:	394.3
Guaranteed Min/Avg:	0.6
Min/Avg:	0.75
Min/Max:	0.59
UG (adjacent pts):	1.35
CU:	0.48
No. of Points:	96
FIXTURE INFORMATION	
Applied Circuits:	A
No. of Fixtures:	58
Total Load:	78.30 kW

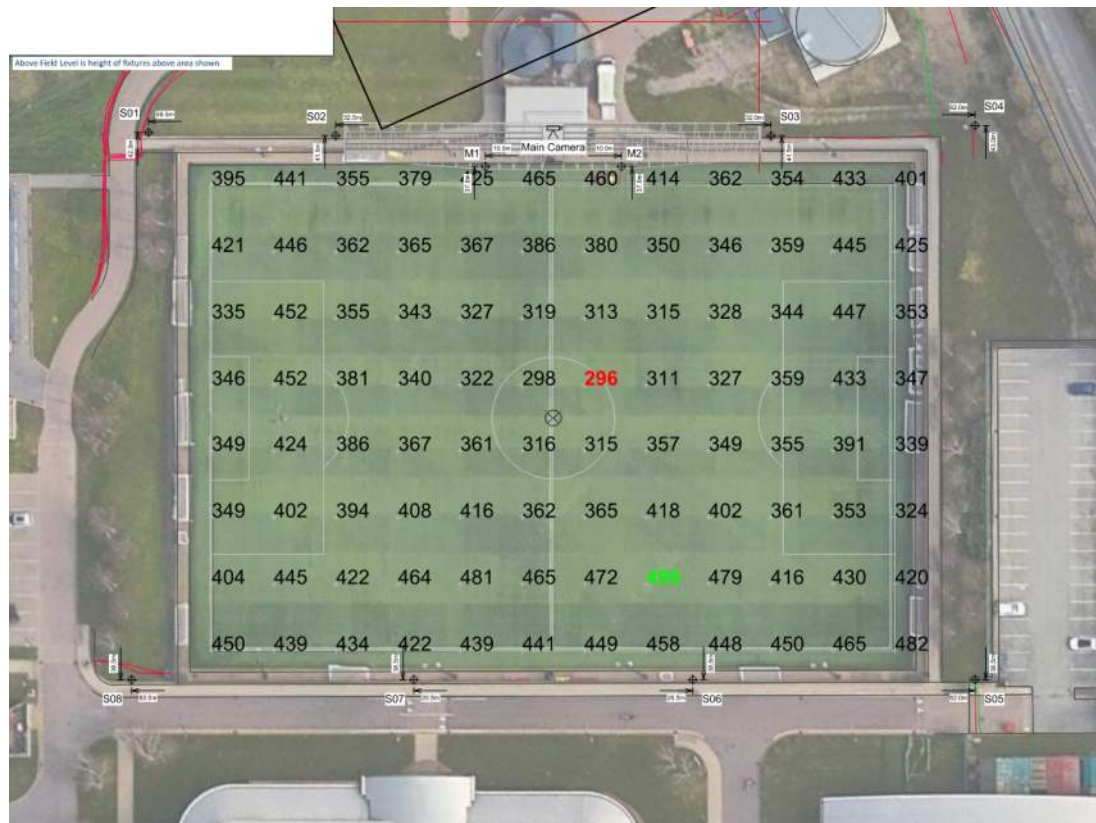


4.1.5.3. Non-Broadcast/Training - 350 Lux

Maintained Horizontal Lux:

The table below outlines the average requirements for horizontal illuminance (lux) and uniformity levels. The target average illuminance is 350 lux, with an achieved level of 391 lux. Similarly, the target uniformity ratio is 0.6, with an achieved value of 0.75.

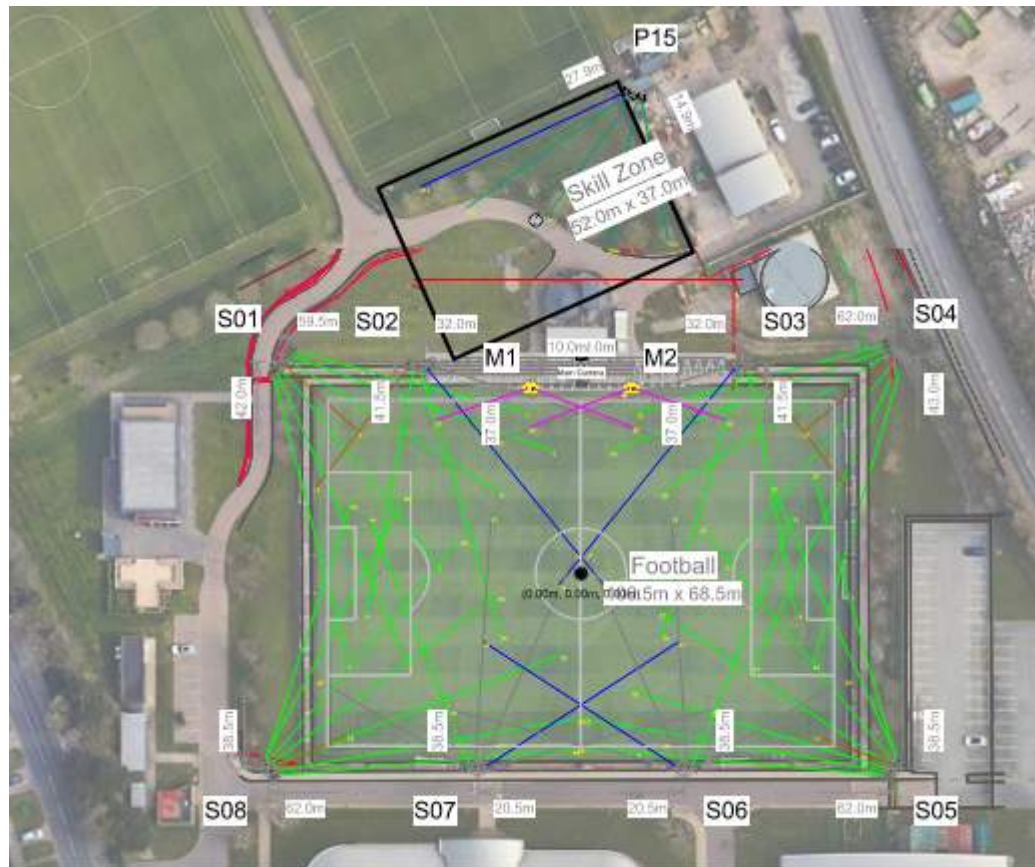
Illumination Summary	
	MAINTAINED HORIZONTAL LUX
	Entire Grid
Guaranteed Average:	350
Scan Average:	391.8
Maximum:	498.6
Minimum:	295.7
Guaranteed Min/Avg:	0.6
Min/Avg:	0.75
Min/Max:	0.59
UG (adjacent pts):	1.35
CU:	0.36
No. of Points:	96
FIXTURE INFORMATION	
Applied Circuits:	A
No. of Fixtures:	58
Total Load:	78.30 kW



4.1.5.4. Equipment Layout (inc Skills area)

Equipment List For Areas Shown						
Structure				Fixtures		
QTY	STRUCTURE ID	SIZE	GLOBAL ELEVATION	ABOVE GLOBAL LEVEL	FIXTURE TYPE	QTY/POLE
2	M1-M2		7.50m	7.50m	TLC-LED-550	2
1	P15	15.24m	-	15.24m	TLC-LED-1200 TLC-LED-900	1 4
2	S01 S04	21.34m	-	21.34m	TLC-LED-1500	7
2	S02-S03	21.34m	-	21.34m	TLC-LED-1500	5
2	S05 S08	21.34m	-	21.34m	TLC-LED-1500	9
2	S06-S07	21.34m	-	21.34m	TLC-LED-1500	6
11	Totals					63

Single Fixture Amperage Draw Chart						
Driver Specifications (.90 min power factor)		Line Amperage Per Fixture (max draw)				
Single Phase Voltage		220 (50)	230 (50)	240 (50)	380 (50)	400 (50)
TLC-LED-1500		7.9	7.6	7.3	4.6	4.4
TLC-LED-1200		6.5	6.3	6.0	3.8	3.6
TLC-LED-900		4.9	4.7	4.5	2.9	2.7
TLC-LED-550		3.0	2.9	2.8	1.8	1.7



5. Impact On Key Local Boundary Receptors

5.1. UEFA Level D – Lower Tier Broadcast Matches – 800 Lux

Maintained Max Vertical Lux at 1.5m

The below demonstrates that at full power output, the calculated maximum vertical illuminance of 0.2lux on the nearest residential receptor is within the permitted E3 zone requirement of 2lux, as indicated in figure 2.3-2.

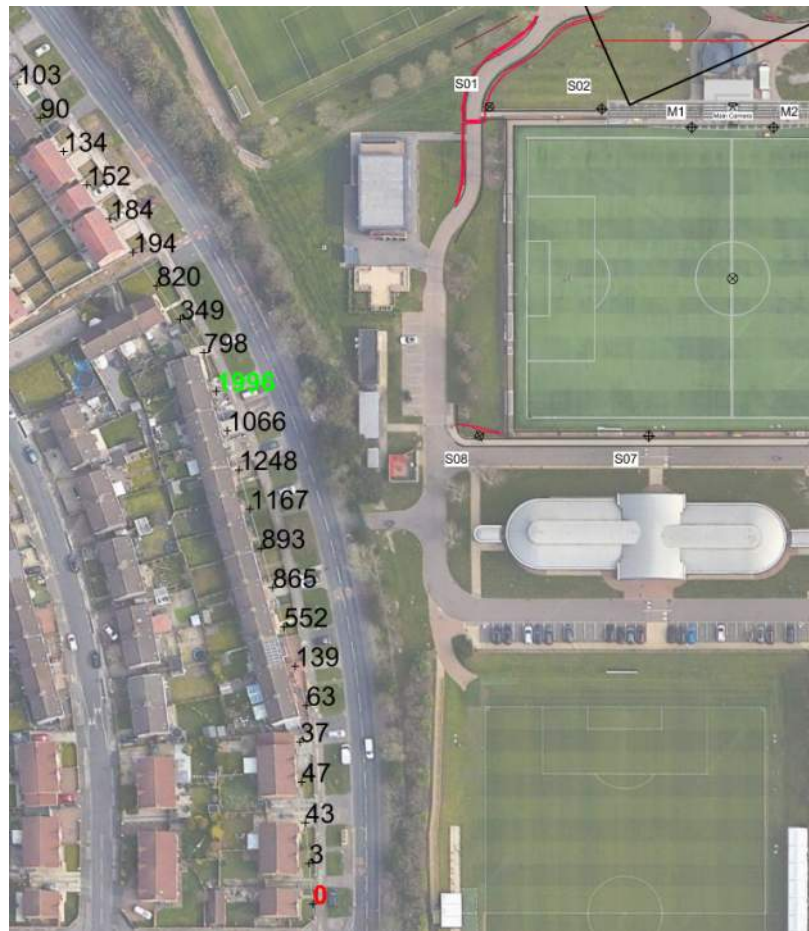
Illumination Summary	
	MAINTAINED MAX VERTICAL LUX
	Entire Grid
Scan Average:	0.1
Maximum:	0.2
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Max Candela (Per Lightbank) at 1.5m:

The below table demonstrates the maintained max glare rating in Candela when all lighting at full output. The maximum simulated being 1995, lower than the 10,000 indicated in fig 2.3-3

Illumination Summary	
	MAINTAINED MAX CANDELA (PER LIGHTBANK)
Entire Grid	
Scan Average:	475.9
Maximum:	1995.9
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,8
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Horizontal Lux at 1.5m

The table below outlines the horizontal illuminance (lux) and uniformity levels at 1.5m on full lighting output. This achieved 0.0 in relation to the closest neighbouring residential property.

Illumination Summary	
	MAINTAINED HORIZONTAL LUX
	Entire Grid
Scan Average:	0.0
Maximum:	0.0
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Horizontal Lux at 3m

The table below outlines the horizontal illuminance (lux) and uniformity levels at full output at 3m. This achieved 0.0 in relation to the closest neighbouring residential property

Illumination Summary	
	MAINTAINED HORIZONTAL LUX
	Entire Grid
Scan Average:	0.0
Maximum:	0.0
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Vertical Lux at 3m

The table below outlines the vertical illuminance (lux) and uniformity levels at full output at 3m. This achieved 0.1 in relation to the closest neighbouring residential property

Illumination Summary	
	MAINTAINED MAX VERTICAL LUX
Entire Grid	
Scan Average:	0.0
Maximum:	0.1
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,8
No. of Fixtures:	63
Total Load:	82.99 kW



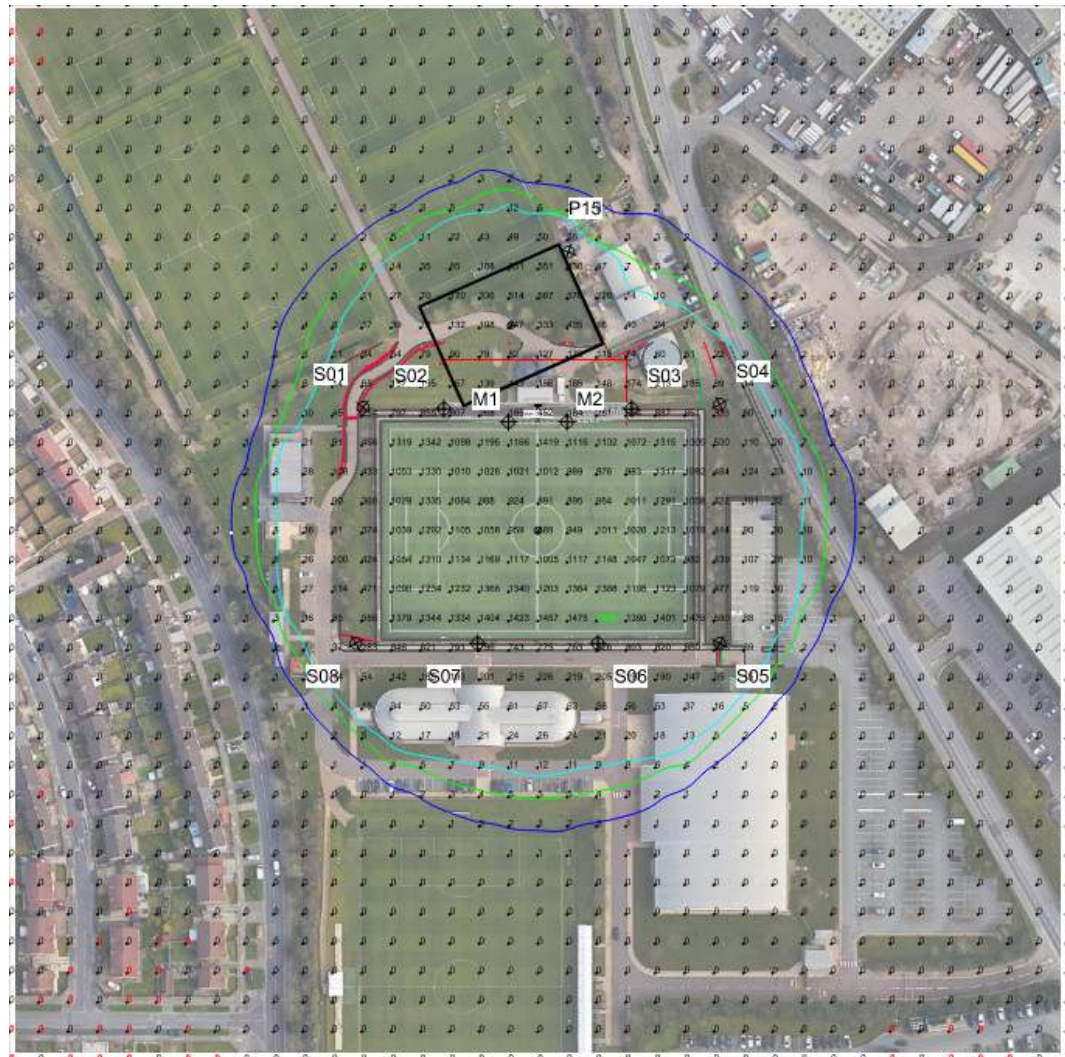
Maintained Max Candela (Per Lightbank) at 3m

The below table demonstrates the maintained max glare rating in Candela when all lighting at full output. The maximum simulated being 523, lower than the 10,000 indicated in fig 2.3-3

Illumination Summary	
	MAINTAINED MAX CANDELA (PER LIGHTBANK)
Entire Grid	
Scan Average:	138.3
Maximum:	522.7
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,8
No. of Fixtures:	63
Total Load:	82.99 kW



Full light horizontal spill isolines (full power output)



Full light vertical spill isolines (full power output)



5.2. Academy Matches – 500 Lux

Maintained Max Vertical Lux at 1.5m

The below demonstrates that at full power output, the calculated maximum vertical illuminance of 0.1lux on the nearest residential receptor is within the permitted E3 zone requirement of 2lux, as indicated in figure 2.3-2.

Illumination Summary	
	MAINTAINED MAX VERTICAL LUX
	Entire Grid
Scan Average:	0.0
Maximum:	0.1
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Max Candela (Per Lightbank) at 1.5m:

The below table demonstrates the maintained max glare rating in Candela when all lighting at full output. The maximum simulated being 1198, lower than the 10,000 indicated in fig 2.3-3

Illumination Summary	
	MAINTAINED MAX CANDELA (PER LIGHTBANK)
	Entire Grid
Scan Average:	285.6
Maximum:	1197.6
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Horizontal Lux at 1.5m

The table below outlines the horizontal illuminance (lux) and uniformity levels at 1.5m on full lighting output. This achieved 0.0 in relation to the closest neighbouring residential property.

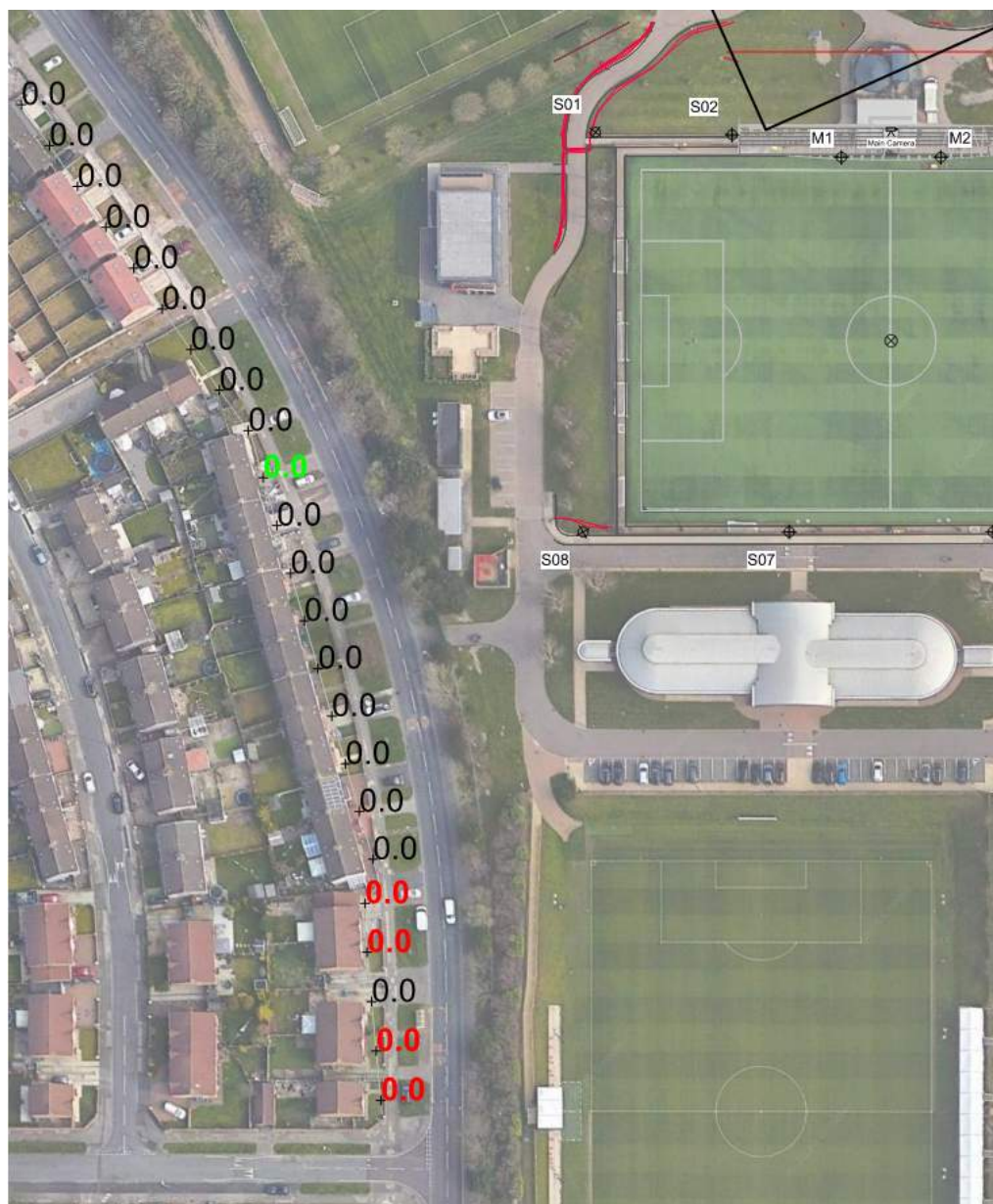
Illumination Summary	
	MAINTAINED HORIZONTAL LUX
	Entire Grid
Scan Average:	0.0
Maximum:	0.0
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Horizontal Lux at 3m

The table below outlines the horizontal illuminance (lux) and uniformity levels at full output at 3m. This achieved 0.0 in relation to the closest neighbouring residential property

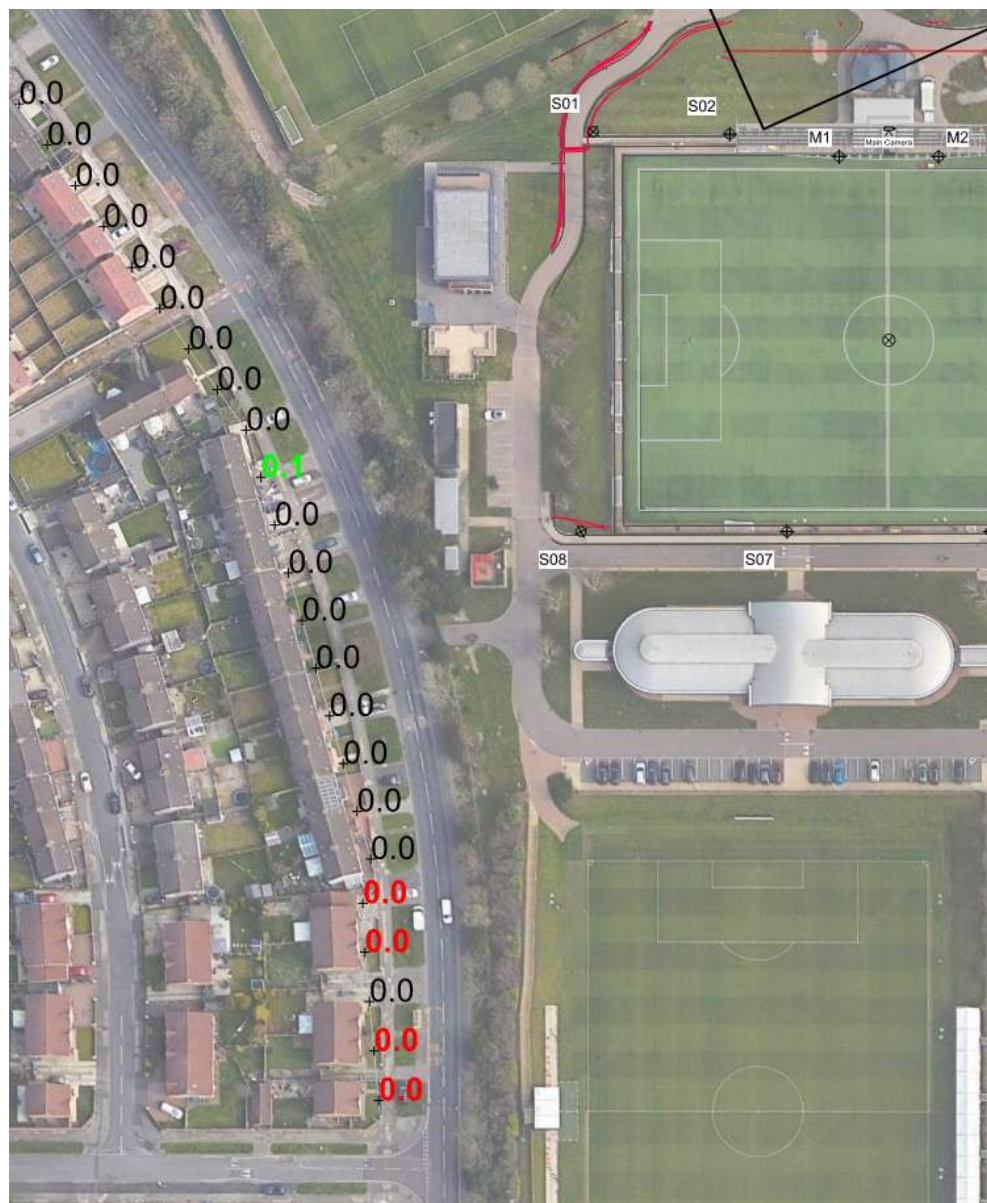
Illumination Summary	
	MAINTAINED HORIZONTAL LUX
Entire Grid	
Scan Average:	0.0
Maximum:	0.0
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Vertical Lux at 3m

The table below outlines the vertical illuminance (lux) and uniformity levels at full output at 3m. This achieved 0.0 in relation to the closest neighbouring residential property

Illumination Summary	
	MAINTAINED MAX VERTICAL LUX
Entire Grid	
Scan Average:	0.0
Maximum:	0.1
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,8
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Max Candela (Per Lightbank) at 3m

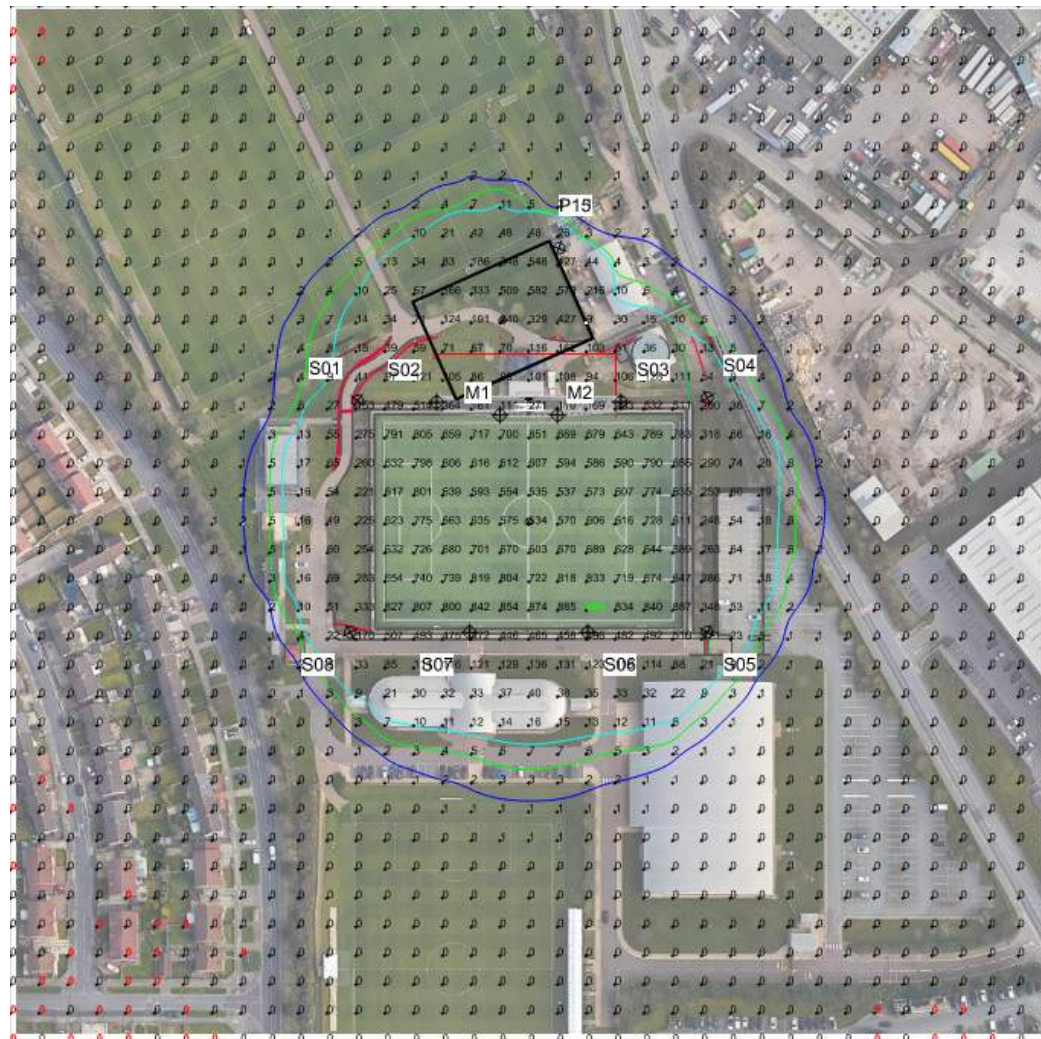
The below table demonstrates the maintained max glare rating in Candela when all lighting at full output. The maximum simulated being 314, lower than the 10,000 indicated in fig 2.3-3

Illumination Summary	
MAINTAINED MAX CANDELA (PER LIGHTBANK)	
Entire Grid	
Scan Average:	83.0
Maximum:	313.6
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,8
No. of Fixtures:	63
Total Load:	82.99 kW



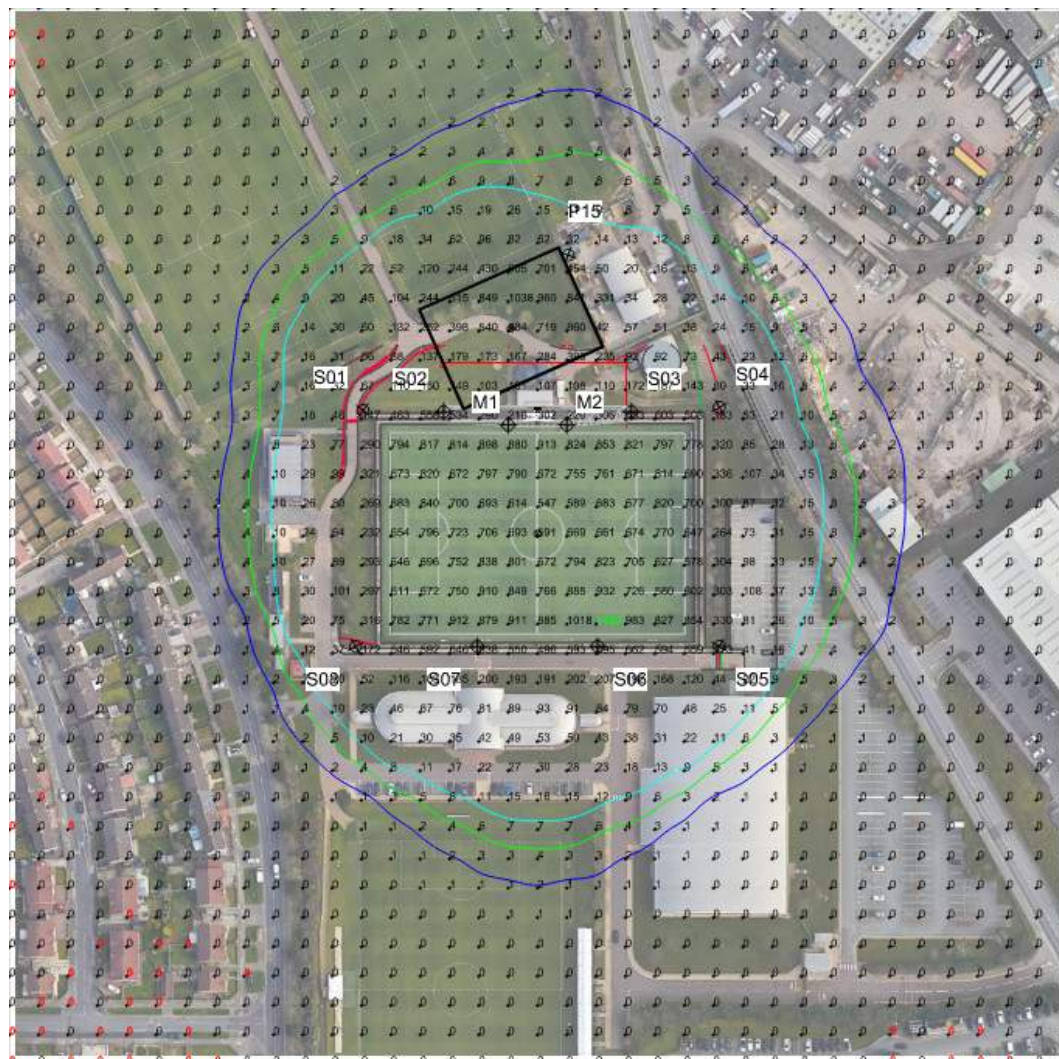
Full light horizontal spill isolines (dimmed to 500lux)

Illumination Summary	
	Entire Grid
Scan Average:	57.4
Maximum:	892.8
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	77.36
CU:	0.60
No. of Points:	1369
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Full light vertical spill isolines (full power output)

Illumination Summary	
	MAINTAINED MAX VERTICAL LUX
Entire Grid	
Scan Average:	71.0
Maximum:	1102.2
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	72.88
CU:	0.60
No. of Points:	1369
FIXTURE INFORMATION	
Applied Circuits:	A, B
No. of Fixtures:	63
Total Load:	82.99 kW



5.3. Non-Broadcast/Training - 350 Lux

Maintained Max Vertical Lux at 1.5m

The below demonstrates that at full power output, the calculated maximum vertical illuminance of 0.0lux on the nearest residential receptor is within the permitted E3 zone requirement of 2lux, as indicated in figure 2.3-2.

Illumination Summary	
	MAINTAINED MAX VERTICAL LUX
	Entire Grid
Scan Average:	0.0
Maximum:	0.1
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Max Candela (Per Lightbank) at 1.5m:

The below table demonstrates the maintained max glare rating in Candela when all lighting at full output. The maximum simulated being 898, lower than the 10,000 indicated in fig 2.3-3

Illumination Summary	
	MAINTAINED MAX CANDELA (PER LIGHTBANK)
Entire Grid	
Scan Average:	214.2
Maximum:	898.2
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Horizontal Lux at 1.5m

The table below outlines the horizontal illuminance (lux) and uniformity levels at 1.5m on full lighting output. This achieved 0.0 in relation to the closest neighbouring residential property.

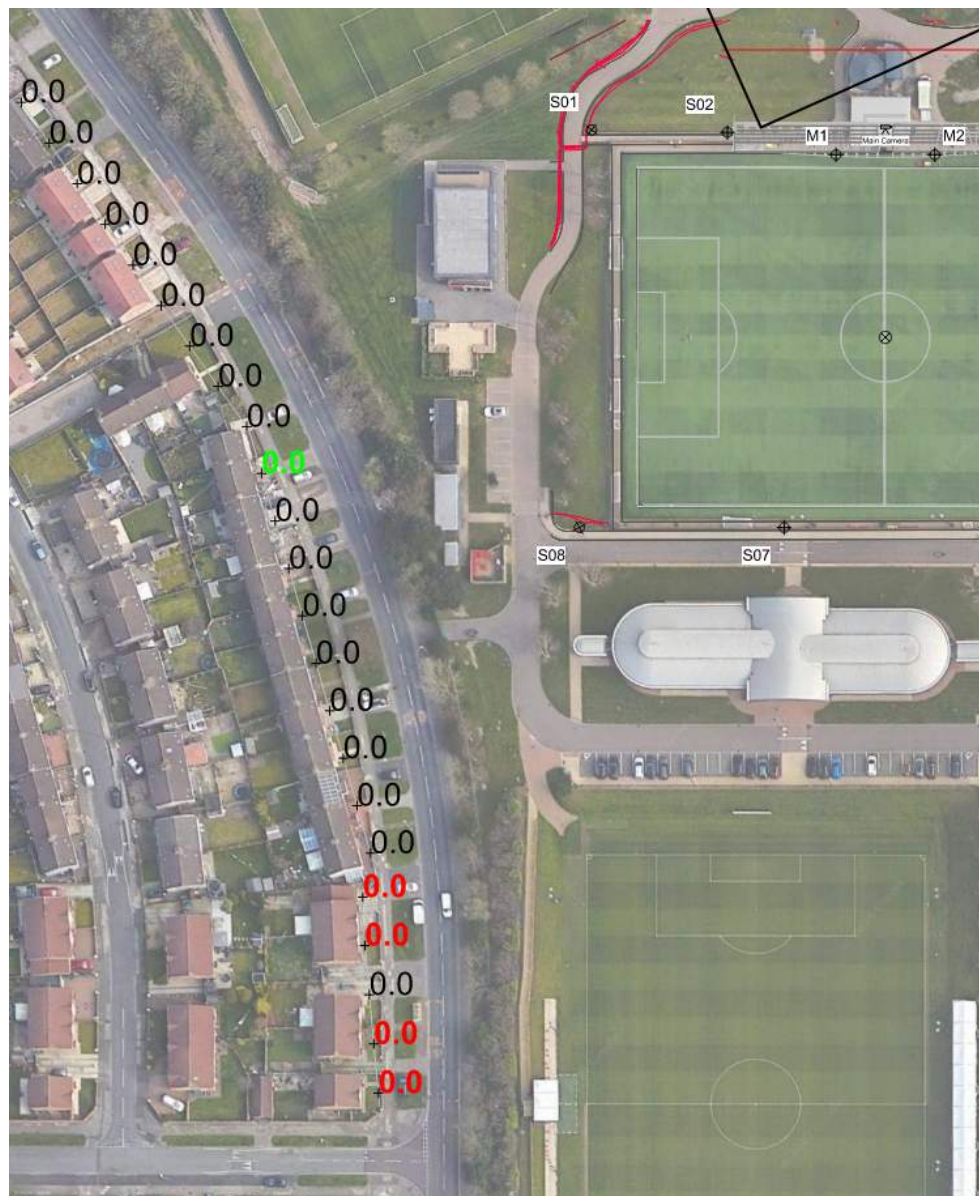
Illumination Summary	
	MAINTAINED HORIZONTAL LUX
	Entire Grid
Scan Average:	0.0
Maximum:	0.0
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Horizontal Lux at 3m

The table below outlines the horizontal illuminance (lux) and uniformity levels at full output at 3m. This achieved 0.0 in relation to the closest neighbouring residential property

Illumination Summary	
	MAINTAINED HORIZONTAL LUX
	Entire Grid
Scan Average:	0.0
Maximum:	0.0
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Maintained Horizontal Lux at 3m

The table below outlines the horizontal illuminance (lux) and uniformity levels at full output at 3m. This achieved 0.0 in relation to the closest neighbouring residential property

Illumination Summary	
	MAINTAINED MAX VERTICAL LUX
	Entire Grid
Scan Average:	0.0
Maximum:	0.0
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,8
No. of Fixtures:	63
Total Load:	82.99 kW



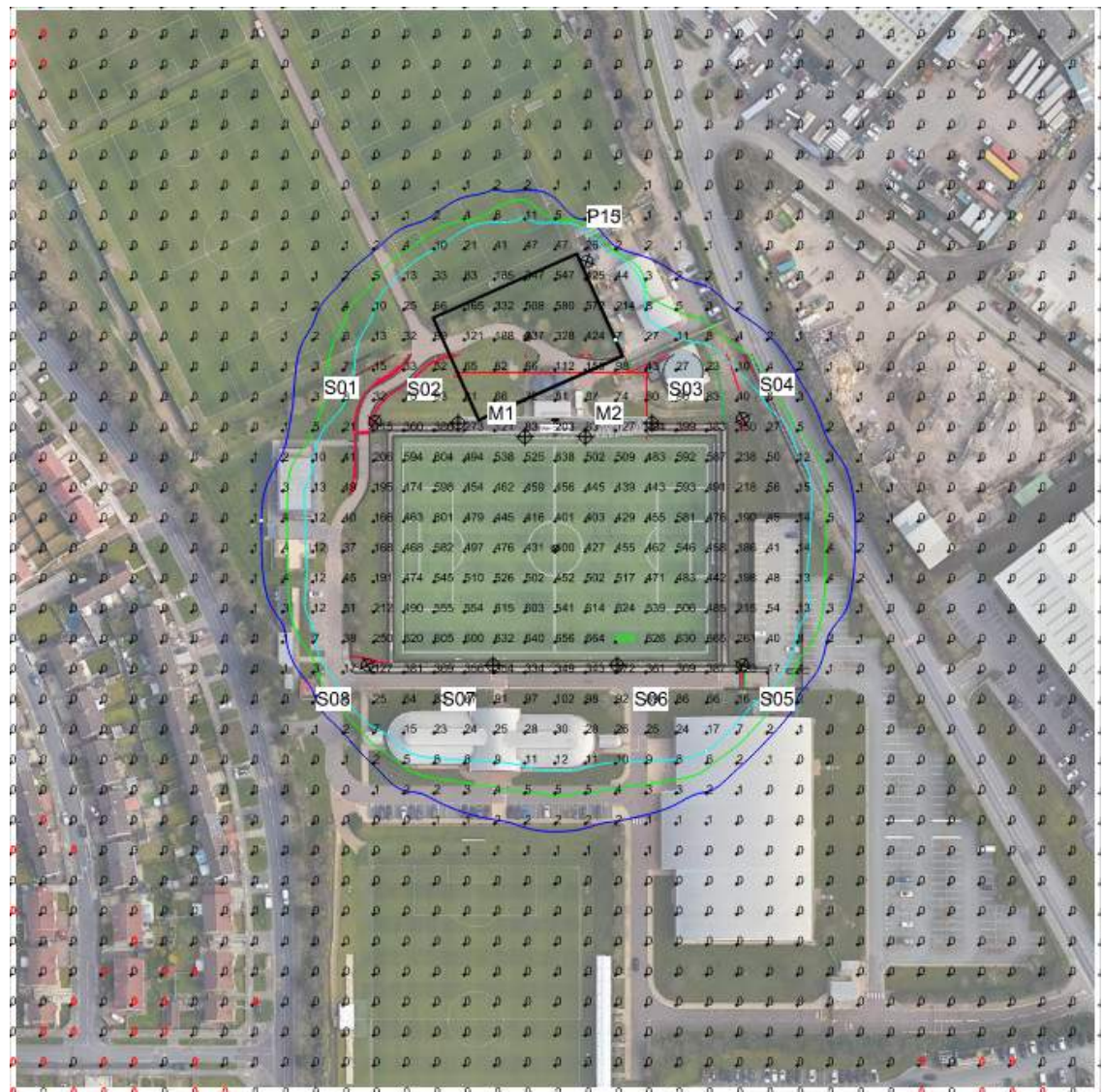
Maintained Max Candela (Per Lightbank) at 3m

The below table demonstrates the maintained max glare rating in Candela when all lighting at full output. The maximum simulated being 314, lower than the 10,000 indicated in fig 2.3-3

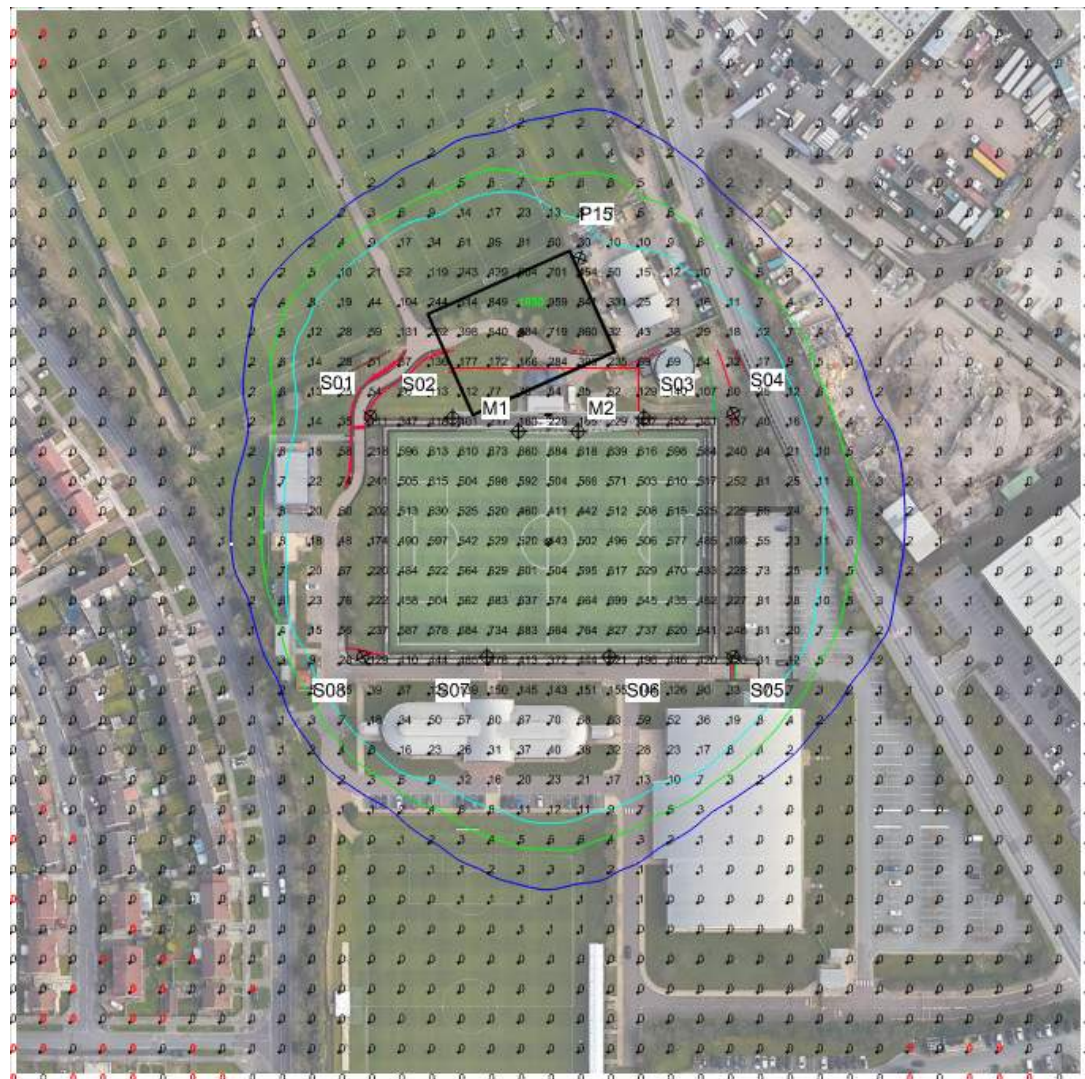
Illumination Summary	
	MAINTAINED MAX CANDELA (PER LIGHTBANK)
	Entire Grid
Scan Average:	62.3
Maximum:	235.2
Minimum:	0.0
Min/Avg:	0.00
Min/Max:	0.00
UG (adjacent pts):	0.00
CU:	0.00
No. of Points:	23
FIXTURE INFORMATION	
Applied Circuits:	A,B
No. of Fixtures:	63
Total Load:	82.99 kW



Full light horizontal spill isolines (dimmed to 350lux)



Full light horizontal spill isolines (dimmed to 350lux)



Category	Details
Lighting Standard	BS EN 12464-2
Average Illuminance	10 lux
Uniformity	0.25 minimum
Mounting Heights	6m post top luminaires
Luminaire Types	Asymmetric LED post top, Symmetric LED post top
Lighting Control	Photocell & Timeclock with manual override
Manufacturer	iGuzzini
Uplight Restriction	Luminaires specified for no uplight
Perimeter Lighting Strategy	Asymmetric luminaires used around perimeter to prevent light spread



Category	Details
Lighting Standard	BS EN 12464-2
Average Illuminance	5–10 lux
Uniformity	0.25 minimum
Luminaire Types	6m Pole Top & Wall Mounted
Lighting Control	Photocell & Timeclock with manual override
Manufacturer	iGuzzini



New floodlighting for external pitch

Category	Details
Lighting Standard	BS EN 12464-2
Average Illuminance	5–10 lux
Uniformity	0.25 minimum
Luminaire Types	Wall-mounted luminaires
Lighting Control	Photocell & Timeclock with manual override



Category	Details
Lighting Standard	BS EN 12464-2
Average Illuminance	5–10 lux
Uniformity	0.25 minimum
Luminaire Types	Bollard
Lighting Control	Photocell & Timeclock with manual override
Manufacturer	iGuzzini



Category	Details
Lighting Standard	BS EN 12464-2
Average Illuminance	10 lux
Uniformity	0.25 minimum
Mounting Heights	6m post top luminaires
Luminaire Types	Asymmetric LED post top, Symmetric LED post top
Lighting Control	Photocell & Timeclock with manual override
Manufacturer	iGuzzini
Uplight Restriction	Luminaires specified for no uplight
Perimeter Lighting Strategy	Asymmetric luminaires used around perimeter to prevent light spread



New columns to be 12m in keeping with the existing columns.

Do not scale from this drawing.
Verify dimensions by site measurement.
Read this drawing in conjunction with the latest architectural and structural drawings.

This drawing is based on the following information:-

- Notes:
- This drawing shall be read in conjunction with all Engineering Services drawings for this contract.
 - All works indicated on this drawing shall be carried out in accordance with the relevant Engineering Services specification.

P01	01/12/2025	For information for planning	AS	BT
Rev	Date	Description	Checked	Approved

H M Hilson Moran

hilsonmoran.com info@hilsonmoran.com
Client
Liverpool FC

Project
LFC Academy,
The Liverpool Way,
Liverpool,
L33 7ED

Drawing Title
Electrical Services
External Services
Road & Pathways
External Lighting Strategy

Scale	Sheet Size	Designed	Checked
NTS	A1	MW	BT
Project Status	Suitability	HM Project No.	
FOR INFORMATION	S2	XXXXX	
Drawing No.	Rev		
38158-HML-XX-XX-SK-E-171001	P01		

Software: Bluebeam Revu



People. Places. Planet.