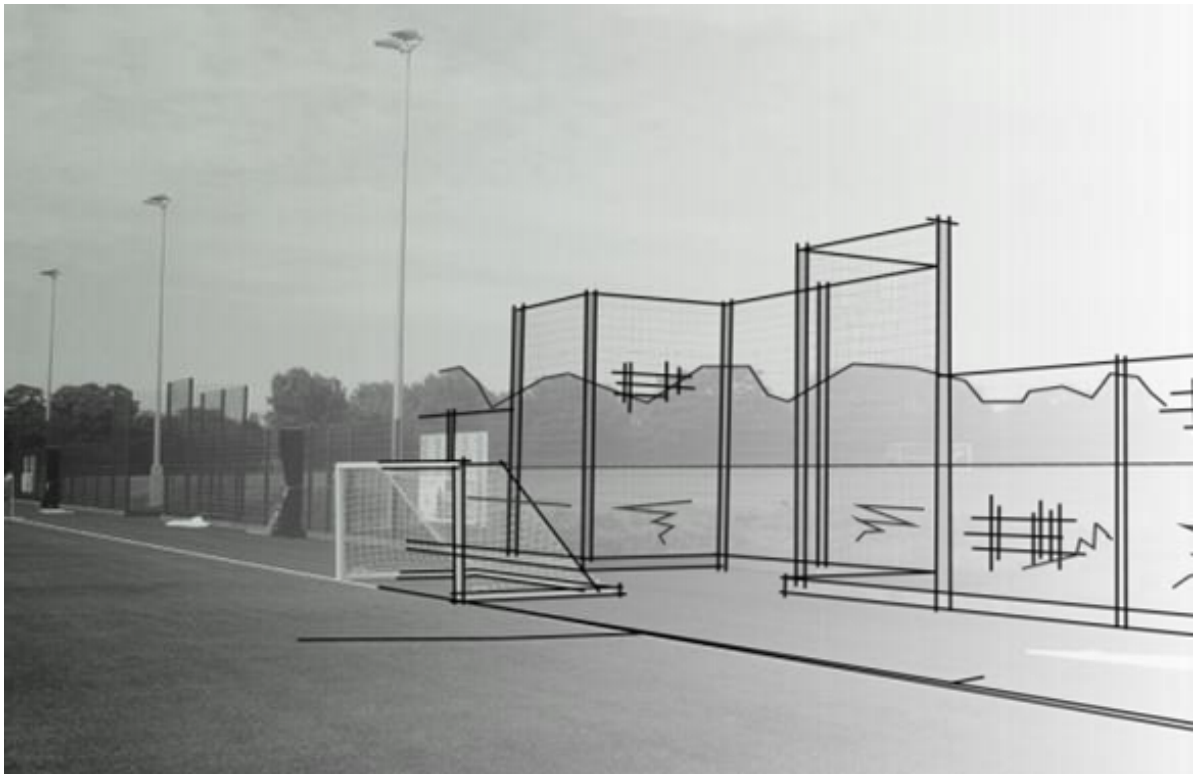
Abraham Moss Community School

Refurbishment of a 3G Artificial Grass Pitch (AGP) with replacement perimeter fencing, hardstanding areas, storage container, replacement floodlights

Sports Lighting Statement



Site	Abraham Moss Community School Crescent Road Crumpsall Manchester M8 5UF		
Project	Refurbishment of a 3G Artificial Grass Pitch (AGP) with replacement perimeter fencing, hardstanding areas, storage container, replacement floodlights		
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Introduction and Lighting Design Overview

Purpose of the Report

This Sports Lighting Statement has been prepared to support the planning application for the development of a new 3G Artificial Grass Pitch (AGP) at Abraham Moss Community School. The purpose of this document is to assess the proposed floodlighting scheme in terms of its technical design, environmental performance, and compliance with planning policy and guidance. The report summarises the lighting design approach, outlines performance data and mitigation measures, and demonstrates how potential impacts have been minimised through best practice.

This statement draws on the technical evidence contained in the following supporting documents:

- G-234439 07 – Floodlighting Scheme
- G-206665 08 – Floodlight Spillage Comparison
- Appendix A - Floodlighting Performance Report
- Appendix B – ILP Guidance Notes

The lighting scheme has been designed in accordance with the standards set out within:

- The Football Association (FA) lighting requirements
- FIFA Class II for non-televised events
- The Institution of Lighting Professionals (ILP)
- BS EN 12193:2007
- The National Planning Policy Framework (2024)

Design Overview

- The existing lighting system comprises of 6Nr. 15m high columns with associated luminaires which are proposed to be removed.
- The replacement floodlighting system includes 6Nr. 13m high columns with associated LED luminaires designed to illuminate a 3G pitch.
- The scheme will deliver a maintained average illuminance of 200 lux, meeting the requirements of BS EN 12193, FIFA Class II for non-televised events and The FA lighting requirements.
- Lighting design complies with ILP GN01/21 for Environmental Zone E3, with:
    - An Upward Light Ratio (ULR) of 0%
    - Controlled beam angles to minimise light spillage.
    - Pre-set curfew controls to extinguish lighting automatically following the final session.
- Designed to limit impact on residential amenity, ecological features, and the wider environment.
- Enables safe, extended use of the facility for community and club-based football.
- Further sections of this report provide full details of the technical specifications, modelling outputs, planning compliance, and mitigation strategy.

Lux, Lumens and Candela

Lumens is a measure of how much light is emitted from a source. Lumens are set out within guidance as the lumens will vary from light source to light source. The more lumens a floodlight emits the brighter the floodlight.

Lux is a unit of measurement for the intensity of light falling on a surface when considering the area over which the light is spread. For example, if a light source delivers 2,500 lumens concentrated onto 1m2, it produces an illuminance of 2,500 lux. However, with the lumens spread across 10m2, the illuminance decreases to just 250 lux. As the light spreads further from the point source, the intensity per square metre reduces.

Candela is a measure of how bright a light source appears in a particular direction to an observer.

Figure 1 - Lumen, Lux and Candella Diagram

Design Standards and Environmental Classification

Environmental Status

The Institution of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light (GN01:2023) sets out the below environmental zones to classify a sites illumination level.

The site has been classified as **Environmental Zone E3** due to the site's location within the developed and built up location of Crumpsall in Manchester, which has been highlighted within the ILP table below. This classification reflects a "well-inhabited rural and urban settlement" setting and prescribes specific limits on obtrusive light during both pre-curfew and post-curfew hours.

Table 1 - 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

Relevant Lighting Standards

The proposed sports lighting system has been designed in accordance with recognised national and international standards to ensure performance, safety, and sustainability. It has been tailored to meet the needs of the club, community users, and the surrounding environment through appropriate illuminance levels, glare control, and LED energy-efficient technology.

A new lighting system should meet the lighting standards set out in FIFA Class II for non-televised events and The Football Association (FA) lighting requirements as shown in the table below.

Table 2 - FIFA Class II Lighting Requirements

Property	Maintained average illuminance
Maintained average illuminance	> 200 Lux
Uniformity (Min / Ave)	> 0.65
Glare rating	≤ 50
Lamp colour temperature	Tk > 4000
Lamp colour rendering	≥ 65

To minimise running costs the lighting system should allow part illumination of the pitch (for cross pitch small-sided football) and a lower level of lighting for training, as given in the table below.

Table 3 - Lighting Illuminance Requirements

Class of Play	Maintained average illuminance	Uniformity (Min / Ave)
Competition	>200 Lux	>0.65
Cross Play	>120 Lux	>0.65
Training	>120 Lux	No Requirement

The floodlight system has been designed in such a way to allow each half of the AGP to be individually programmed to facilitate economical management and prevent over lighting to areas of the pitch when not in use.

In addition, the lighting system design seeks to comply with complimentary recommendations published within BS EN 12193:2007 Light and lighting. Sports lighting.

BS EN 12193 is the European standard that deals with sports lighting to ensure good visual conditions for players, athletes, referees, spectators and CTV transmission. Its objective is to provide recommendations and specify requirements for good quality sports lighting by:

- Optimising the perception of visual information used during sports events
- Maintaining the level of visual performance
- Providing acceptable visual comfort
- Restricting obtrusive light

BS EN 12193 specifies lighting for indoor and outdoor sports events most practiced in Europe. It provides lighting values for the design and control of sports lighting installations in terms of illuminances, uniformity, glare restriction and colour properties of the light sources.

All the requirements are meant to be as minimum requirements. It also gives methods by which these values are measured. For the limitation of glare, it also points out restrictions on the location of the luminaires for specific sporting activities.

Selection criteria of chosen design:

- Adequate illuminance levels (as per above requirements)
- Good uniformity (as per above requirements)
- Low light pollution (displayed within design)
- Good aesthetic appearance
- Regular maintenance
- Vandal resistant equipment and materials

Level of Competition

The facility is intended to support FA-affiliated youth and adult football, including league fixtures, training sessions, and community-based participation. As such, the system has been designed to deliver illumination levels in line with FIFA Class II requirements for non-televised match play, as well as reduced settings for cross-pitch training and small-sided formats.

Hours of Use

The proposed Artificial Grass Pitch (AGP) requires a sports lighting system to satisfy the necessary and planned usage. The lighting system is vital to ensure that clubs and local community can make use of the facility during the darker winter months, to ensure that training sessions and matches can be safely accommodated.

The proposed Artificial Grass Pitch (AGP) requires floodlighting to support scheduled use, particularly during darker winter months, ensuring safe evening training and matches. After the final session, a short illuminated period allows players, coaches, and spectators to vacate safely and for staff to store equipment and secure the facility. To minimise impact, lights will be dimmed to 10% during this time, signalling session end and facilitating a safe, efficient shutdown.

The existing hours of use are outlined in Table 4 below.

Table 4 – Proposed Hours of Use

Day	First Activity	Final Activity
Monday-Friday	08:00	22:00
Saturday	08:00	20:00
Sunday (inc bank holidays)	08:00	20:00

Column Details and Mounting Height

The lighting system comprises:

- 6No. 13m high floodlighting columns
- The lighting columns are tapered with a 346mm diameter shaft at the base reducing to 102mm at the top of the column
- Lighting columns will a self-coloured galvanised steel (Z275) finish

The column height has been calculated using the method detailed in the CIBSE guide LG4 “Sports Lighting”. Using angles from the centre of the pitch and the touchlines to produce a head frame location zone. When applied to sports lighting the optimum column height ranged from 12m to 18m.

A 13m mounting height was chosen as the most efficient solution for the new Artificial Grass Pitch (AGP), as this will allow the optimal downward light angle whilst minimising spillage to the surrounding area and maintaining a low visual profile during daylight hours.

By contrast, higher columns would require more intensive lighting needed to provide adequate results at ground level and lower column heights would result in a higher aiming angle for every luminaire, resulting in increased overspill and glare as demonstrated in the below from the ILP guidance.

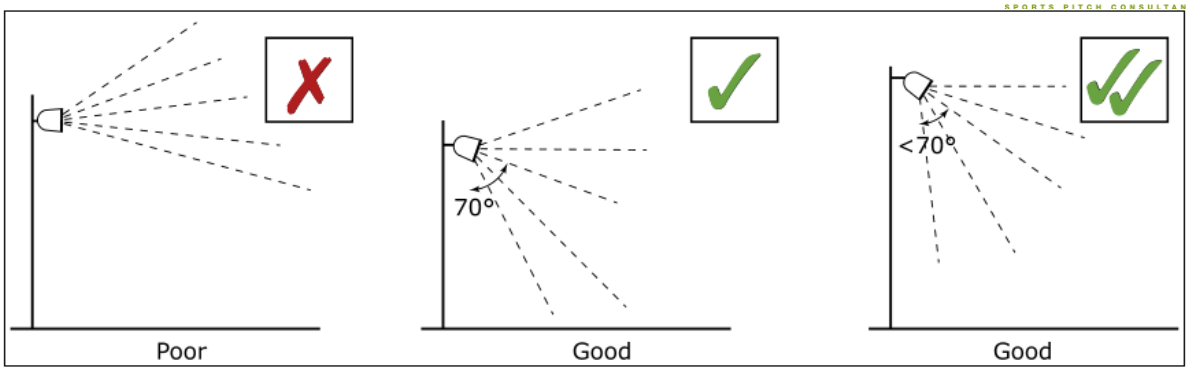

Figure 2 - Luminaire Aiming Angles

Figure 3 - Example of 15m High Slimline Floodlighting Column With LEDs (Proposal is for 13m)

Aiming Angles and Glare Control

To minimise glare, the luminaires are installed at a tilt angle of no more than 15 degrees above the horizontal plane. This ensures the artificial lighting:

- Is directed fully downwards towards the playing surface
- Avoids sky glow
- Achieves full cut-off as recommended by The British Astronomical Association's Campaign for Dark Skies.

The internal luminaires within the floodlight are directed 55° downwards. Therefore, when achieving a rotation of 70° the floodlight will be tilted 15° above the horizontal.

The use of asymmetric optics within the Philips Optivision luminaires provides precise directional control, reducing upward and lateral light spill and ensuring compliance with ILP GN01/21 guidance for Environmental Zone E3.

Floodlight Specification

Modern sports area lighting using LED technology is very different to old-fashioned sports floodlights (using sodium and / or HID), with much advanced light control to ensure it is directed

fully downwards towards the playing pitch surface, with all luminaires achieving an Upward Light Output Ratio (ULOR) of 0% to eliminate sky glow.

Philips Optivision Gen3.5 LED luminaires have been selected as they provide a complete sports lighting system as they offer:

- High efficiency luminaire with low energy consumption
- Precision optical control and asymmetric beam angles
- High performance output with outstanding uniformity
- Zero upward light ratio (ULR 0%)
- Slimline body to minimise daytime visual impact.
- Dimmable control settings to allow a lower lighting level for training purposes.

Figure 4 - Example LEDs

Colour Temperature

Colour Temperature is measured in Kelvins (K) and it describes the hue of a light source. Lower values (2700K) emit warm, yellowish light, while higher values (6500K) emit cool, bluish light.

As an industry standard, LED sports lighting typically uses a colour temperature of 5,700K to replicate daylight and support a safe and comfortable visual environment. The proposed design utilises 4,000K LEDs, the lowest colour temperature recommended for FA match play, to reduce the coolness of the light while still delivering an appropriate and effective colour temperature for outdoor sporting use, as per Table 2.

Figure 5 - Colour Temperature Illustration

Lighting Performance and Impact Assessment

The following technical assessments has been undertaken to evaluate the lighting scheme's performance and its potential impacts on surrounding receptors. The results confirm that the design meets or exceeds all relevant standards for luminance, obtrusive light, and amenity protection, even under conservative (worst-case) modelling assumptions.

Floodlighting Performance

The lighting proposal is detailed within Appendix A - Proposed Floodlighting Scheme, which shows column locations, floodlight orientations, luminance levels on the pitch and projected overspill values.

The design for the Artificial Grass Pitch (AGP) achieves values which meets the requirements of BS EN 12193 as shown in the table below.

Table 5 - Floodlighting Performance

Calculation	Switching Mode	Average (Lux)	Uniformity (Min/Ave)
Football 200 Lux	1	202	0.65
Football 120 Lux	2	112	0.65

All design calculations have been undertaken using an open, unobstructed site, thereby creating a worst-case scenario. Design values of overspill will be further reduced by existing mature trees, adjacent buildings, or natural screening.

The maintained luminance values for the 200 lux lighting (highest lux level) has been calculated using a maintenance factor of 0.95 to account for environmental conditions and depreciation of light output between cyclical maintenance, including bulk lamp change.

The football pitch can be switched to a lower level of lighting (120 lux) for community use and training.

Energy Efficiency and Intelligent Controls

The system utilises dimmable LED luminaires with integrated control features that allow variable light settings based on pitch use and pre-set schedules. These features include:

- Programmable lighting levels for training, match play or half pitch play
- Seasonal scheduling aligned to BST/GMT
- Curfew enforcement with automatic switch-off
- 10% dimming phase post-activity for safe egress with automatic switch off at post-curfew

Lighting Intrusion

The ILP GN01/21 guidance defines maximum limits for vertical illuminance at surrounding premises for each environmental zone. The design ensures all light spill remains within the prescribed limits for Zone E3, including pre- and post-curfew values.

Table 5 - Maximum Values of 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 6 below shows the existing spillage from the existing 6x 15m high lighting system.

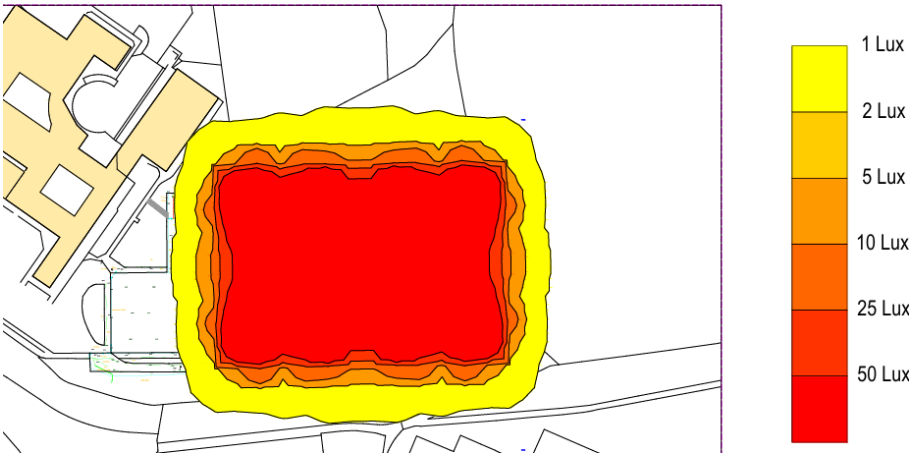

Figure 6 - Existing Lighting Spillage

Figure 7 below is taken from the Proposed Floodlighting Scheme which shows the projected spillage from the proposed 6 column 13m high lighting system.

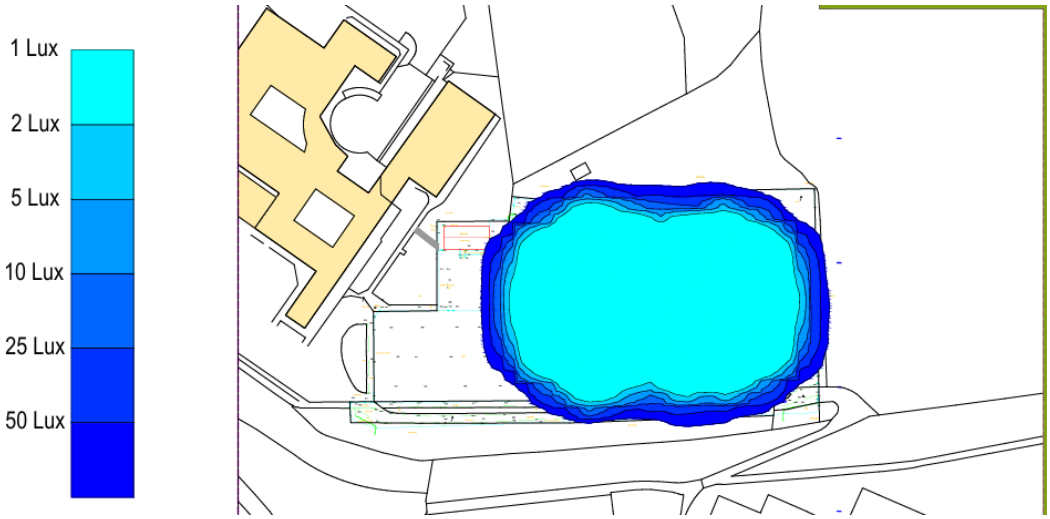

Figure 7 – Proposed Lighting Spillage

- Light intrusion at the nearest property is less than 1 lux at ground level, meeting the 10 lux pre-curfew limit for Environmental Zone E3.
- The comparison above shows that the proposed lighting scheme will be an improvement on the existing system by way of reduced spill.

- All floodlights will be extinguished after the curfew and therefore lighting intrusion will be 0 lux, meeting the 2 lux post-curfew limit for Environmental Zone E3.

Below is an example of both the slimline floodlighting columns and how sports lighting uses contemporary LED technology with minimal spill light and back light around the football pitch perimeter.

Figure 8 - Example AGP at Daytime

Figure 9 - Example AGP at Nighttime with Good LED Spill Control

Management of Lighting Impacts

To prevent nuisance and environmental harm, lighting operation will be actively managed through:

- Time-clock automation tied to agreed curfew times
- Seasonal programming for BST/GMT adjustments
- Pre-programmed usage slots to match bookings
- Zero output post-curfew, aligning with E3 zone requirements

The intelligent lighting system is programmed to extinguish all lights by 22:15 Monday–Saturday and 20:15 on Sundays and Bank Holidays. This strict control ensures no illumination continues into late-night hours, preserving residential amenity.

Post Installation Monitoring

To verify that the floodlighting system performs as expected post-installation, the following monitoring steps are proposed:

- Commissioning tests: Upon installation, the lighting system will be tested for lux levels, alignment, and compliance with the approved lighting plan.
- Periodic re-testing: As part of site maintenance, lighting levels and alignment will be checked at regular intervals to confirm continued compliance with ILP and BS EN standards.
- User feedback: Reports of nuisance or light intrusion (if any) will be reviewed through the club's management structure and, if substantiated, may trigger re-alignment or dimming of affected luminaires.
- Curfew enforcement records: The intelligent control system will log usage to confirm compliance with operational limits and ensure no inadvertent after-hours illumination occurs.

This monitoring strategy ensures that both ecological and residential protections remain robust over the operational lifespan of the facility.

Ecological Sensitivity

The proposed floodlighting scheme has been developed in line with the Institution of Lighting Professionals GN08/23: Bats and Artificial Lighting at Night. While the system uses 4000K LEDs to meet Football Foundation standards for affiliated football use, the design incorporates multiple mitigation measures to reduce ecological impact and safeguard nocturnal wildlife.

Key features aligned with GN08/23 include:

- Colour Temperature: The scheme uses 4000K LEDs, which reduce blue-rich light compared to standard 5700K fittings. While not below 3000K, 4000K represents the lowest permitted colour temperature for FA-affiliated match play and offers a balanced compromise between visibility and biodiversity sensitivity.
- Colour Rendering: Provides stable optics performance; providing sharp cut-off, lower intensity, excellent colour rendition and dimming capabilities.

- Ultra Violet (UV Light): Modern LEDs do not produce UV light like traditional metal halide (HID) floodlights.
- Upward Light Ratio (ULR): All luminaires are full cut-off with 0% upward light, ensuring no sky glow and limiting lighting to only where needed.
- Directional Control: Asymmetric optics and low tilt angles ensure all lighting is tightly focused onto the pitch area. Boundary habitats and vegetated corridors remain unlit.
- Lighting Curfew and Zoning: Automatic shut-off times are enforced via pre-programmed curfews. A 10% dimmed safety setting operates briefly after final use to allow safe egress while minimising unnecessary light output.
- Sensitive Layout: Lighting columns are positioned to avoid direct spill onto tree lines or hedgerows, reducing habitat fragmentation and disruption to potential bat commuting routes.
- Low Spill Levels at Site Boundaries: Modelling confirms lighting levels at the site's perimeter are typically <2 lux, with actual values expected to be lower due to existing vegetation.
- Ecological Appraisal: A supporting ecological survey identified no significant roosting features or priority habitats within or adjacent to the site. However, design measures still follow GN08/23's mitigation hierarchy: avoid > minimise > mitigate.

This approach ensures the lighting strategy supports safe sporting use while actively limiting impacts on local wildlife in accordance with current best practice.

Planning Policy and Conclusion

Planning Policy

The proposed floodlighting scheme has been designed to reflect current best practice in the design and control of external lighting, particularly where artificial illumination may affect nearby residents, ecological features, or the wider environment.

Central Government guidance on lighting and planning is set out in the National Planning Policy Framework (NPPF, Dec 2024). The NPPF identifies sustainable development as the core principle of planning, comprising economic, social, and environmental objectives. The environmental objective includes protecting and enhancing the natural, built, and historic environment—while helping to minimise pollution.

Paragraph 198 of the NPPF states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

(c) "limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

The proposed lighting scheme has been carefully designed to minimise impacts. It uses full cut-off LED luminaires with no upward light output, controlled beam angles to limit spillage, and automated curfews to prevent illumination during sensitive hours.

By employing low-spill technology and intelligent controls, the scheme reduces its environmental footprint while enabling safe, extended community access to sport. Light is directed only where needed, avoiding disruption to neighbouring properties and ecological features, and aligning with the NPPF's objectives for well-managed lighting.

Under the Clean Neighbourhoods and Environment Act 2005, some forms of exterior lighting may constitute a statutory nuisance where they significantly harm nearby occupiers, this includes inappropriate domestic or commercial floodlighting.

It is acknowledged that many lighting installations which may cause obtrusive light do not require planning permission or do not fall under the Act as a statutory nuisance. However, the lighting scheme has been proactively designed to eliminate nuisance through technical specification and operational management.

All lights will be:

- Automatically extinguished after use
- Dimmed post-session to reduce intensity during vacating periods
- Directed to the playing surface
- Programmed not to operate outside agreed planning hours

The design further aligns with ILP GN01/21 and GN08/23, which recommend full cut-off fittings, reduced blue light emission (≤4000K), and extinguishing illumination beyond curfew to prevent unnecessary ecological and residential disturbance.

Conclusion

The proposed floodlighting system for the new refurbished Artificial Grass Pitch (AGP) at Abraham Moss Community School has been carefully designed to meet modern standards for performance, amenity protection, and environmental sustainability, replacing the older existing lighting system. It will provide a vital enhancement to local sports infrastructure, enabling extended and inclusive access to football training and match play during darker months.

Key conclusions of this lighting assessment are as follows:

- Technical Performance: The lighting system delivers a maintained average illuminance of 200 lux with high uniformity, meeting FA and FIFA Class II requirements. Zoned control allows reduced lighting for training and partial-pitch formats.
- Environmental Compliance: The scheme fully complies with ILP GN01/21 for Environmental Zone E3, with all obtrusive light and vertical illuminance values falling below prescribed thresholds. Calculations demonstrate no measurable impact post-curfew.
- Amenity Protection: Directional luminaires, low tilt angles, and strict operational controls eliminate adverse lighting effects on neighbouring properties. No unacceptable glare or overspill is predicted.
- Ecological Safeguards: The scheme avoids light trespass to ecologically sensitive boundaries. The lighting design is fully aligned with current best practice in ecological lighting mitigation and poses negligible risk to protected species.
- Operational Control: All lighting will be automatically extinguished by 22:15 on weekdays, and by 20:15 on Saturdays and Sundays and bank holidays. A short 10% dimming period supports safe egress before full switch-off.
- Planning Alignment: The proposal accords with national and local planning policy, including the NPPF (2024), which requires that developments minimise light pollution and protect residential amenity and biodiversity.

In summary, the floodlighting scheme is proportionate, well-contained, and technically robust. It represents a significant improvement over legacy lighting technologies and has been developed with a strong emphasis on environmental protection and user safety. The system will enable high-quality, year-round sports use of the facility while ensuring lighting impacts are carefully controlled and appropriately mitigated.