

Highgate School - Mallinson Sports Centre

External Lighting



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Executive Summary

This report for External Lighting support the planning application for constructing a new sports hall and refurbishing the existing Mallinson Sports Centre facilities at the Bishopswood Road campus (Lower School) of Highgate School.

Planning Requirements - Highgate School Supplementary Planning Document March 2021 section 6.6 requires, “..... Any proposal for lighting will be subject to assessment of impacts and should accord with London Plan policy S5 and Local Plan Policy DM23.”

Local Plan Policy DM23: Light Pollution: Development proposals that include external lighting must mitigate potential adverse impacts from such lighting. Where appropriate, proposals will be required to submit details demonstrating that external lighting is:

- a) Appropriate for its purpose in its setting;
- b) Designed to minimise and provide protection from glare and light spillage, particularly to sensitive receptors such as residential properties and natural habitats, including watercourses; and
- c) Energy efficient

This report demonstrate the compliance with the above requirements using the methodology set by the Institution of Lighting Professionals (ILP) in Guidance Note 01/21.

A computational software is used to simulate the external lighting as coordinated with the Architect and Landscape Designer. The following pages shows the methodology, lighting strategy and compliance with the GN 01/21 and CIBSE SLL LG 21 in line with the Local Plan Policy.

The report from the external lighting simulation included in appendices of this report which indicates that all factors associated with the light “Pollution” / “Obtrusive” light have been mitigated within the design. By selecting the right light fittings, locating in the right locations and easy maintained lighting control system, an efficient, practical and external lighting for security and safe access have been designed with minimal adverse effect on the surrounding premises, environment, flora and fauna.

The report covers the method and results from mitigating the effects of upward light (Sky glow), light intrusion through windows on residents, viewed source intensity on residents, disability glare on read users, environment and high energy consumption.

Due to the effective screening of the surrounding land features, the type, number, colour temperature and positioning of the luminaires used and the limited duration of use, the assessment demonstrates little or no impact from the use of lighting in the surrounding areas, neighbours, and potential sensitive receptors.

Based on this assessment and subject to the incorporation of the recommendations in this report, it is considered that obtrusive lighting from the proposed Lighting Strategy does not constrain the proposed Development.



Figure 1 Aerial View of the site in Red

1.0. Introduction

Highgate School has commissioned Peter Deer and Associates to provide a BREEAM Pre-assessment, advice, and guidance concerning the proposed redevelopments of the Mallinson Sports Centre, Bishopswood Road, Highgate, London.

The purpose of this document is to outline the proposed external lighting design

The proposed Development is predicted to achieve a minimum BREEAM 'Excellent' rating, in line with London Borough strategic policy SP4: Working towards a Low Carbon Haringey and the Highgate School Supplementary Planning document (March 2021).

This document should be read in conjunction with:

- Design and Access Statement
- Energy Statement
- Ecology assessment

A lighting assessment has been undertaken to identify the baseline conditions of the current application site, including details of screening, topography, vegetation, buildings/structures and potential sources of existing artificial lighting; to identify potential sensitive receptors that may be affected by obtrusive light, and to assess the potential effects on those receptors from the new artificial lighting proposed for the Development as set out in the detailed Lighting Strategy submitted with the planning application.

1.1. Site and Location

The Mallinson Sports Centre (MSC) is located on the Bishopswood Road campus of the school estate near other principal school buildings such as the Mills Centre, the Dining Hall, the Pre-preparatory School, and the Junior School.

Site address is Mallinson Sport Centre, Bishopswood Road, London N6 4PH.

The main building comprises of the Pool Hall and associated changing rooms, which was the first building on the site in 1969, followed by the main sports hall with associated ancillary accommodation, gym, entrance hall, central offices and other sports spaces completed in 1989.

The overriding aim of the design seeks to transform this building and create enhanced building aesthetics within the Conservation Area whilst providing all the sports and ancillary-related facilities that the school will need soon.

The intention is to retain the essential elements of the existing building that have significant long-term value and condition, providing spaces of the required technical standard, and integrating them with alterations and extensions into a unified whole, a single sports centre.

The new sports hall is the principal component of the proposed Development of the school's indoor sports facilities. As part of the work, the school intends to demolish the existing Fives Court and Squash Courts building to open a large area within the site that can be more efficiently and architecturally developed. These works are also designed to incorporate a new sports centre building comprising an indoor sports hall, teaching classrooms and staff offices.

The hall's design is to accommodate a National Standard Netball Court within the hall, one that will allow Premier League games to be played. There is an aspiration nationally for netball courts of this standard, for a sport that is increasing in popularity. Many other sports courts will fit within this same interior footprint.

1.2. The Vision

The proposed Development is auxiliary to several other applications in various parts of the school. The vision behind all the proposed developments at the school is set out in the planning statement accompanying the applications, an extract of which is reproduced as follows:

*"Being both a Charity and a School, sustaining and further improving what Highgate does for the benefit of its pupils and pupils of partner schools elsewhere within the borough is never finished business."
"The school has, over the last 15 years or so, been undertaking an extensive programme of modernising and renewing its extensive and mixed stock of buildings and facilities to meet the educational and other demands of a 21st Century establishment. Significant funds have been invested over that period, and the programme will continue over the next decade."
"This programme combines the continuing need to maintain, both in terms of safety and appearance, the buildings on several sites and in varying degrees of condition, with the need to provide essential, flexible, good quality and long-lasting educational facilities for its varied educational and charitable objectives, as well as catering for its diverse pupil-body, which meets the different educational and supporting requirements for each of the three Schools to satisfy Department of Education (DfE) and other statutory requirements."*

1.3. Community Uses

The MSC sports centre is currently available to the community as a private sports club with membership. There are public uses for the outdoor pitches and the indoor sports centre, including other schools and sports clubs. In the holidays there are also holiday camps and other activities. The options for public use are noted as follows on the Camden Cindex website:

Private school facilities are available to the public. Term-time sports activities for children aged 5-14. School holiday courses include multi-activity, football, cricket, tennis, and dance. Facilities for adults include squash, fitness suite and tennis (courts available), 25m x 12.5m swimming pool. Children's parties for 5-15-year-olds (maximum 25 children) are available at weekends, including a variety of sports options and games and swimming sessions. Bouncy castle party available for children aged 5-7 years. Swimming club.

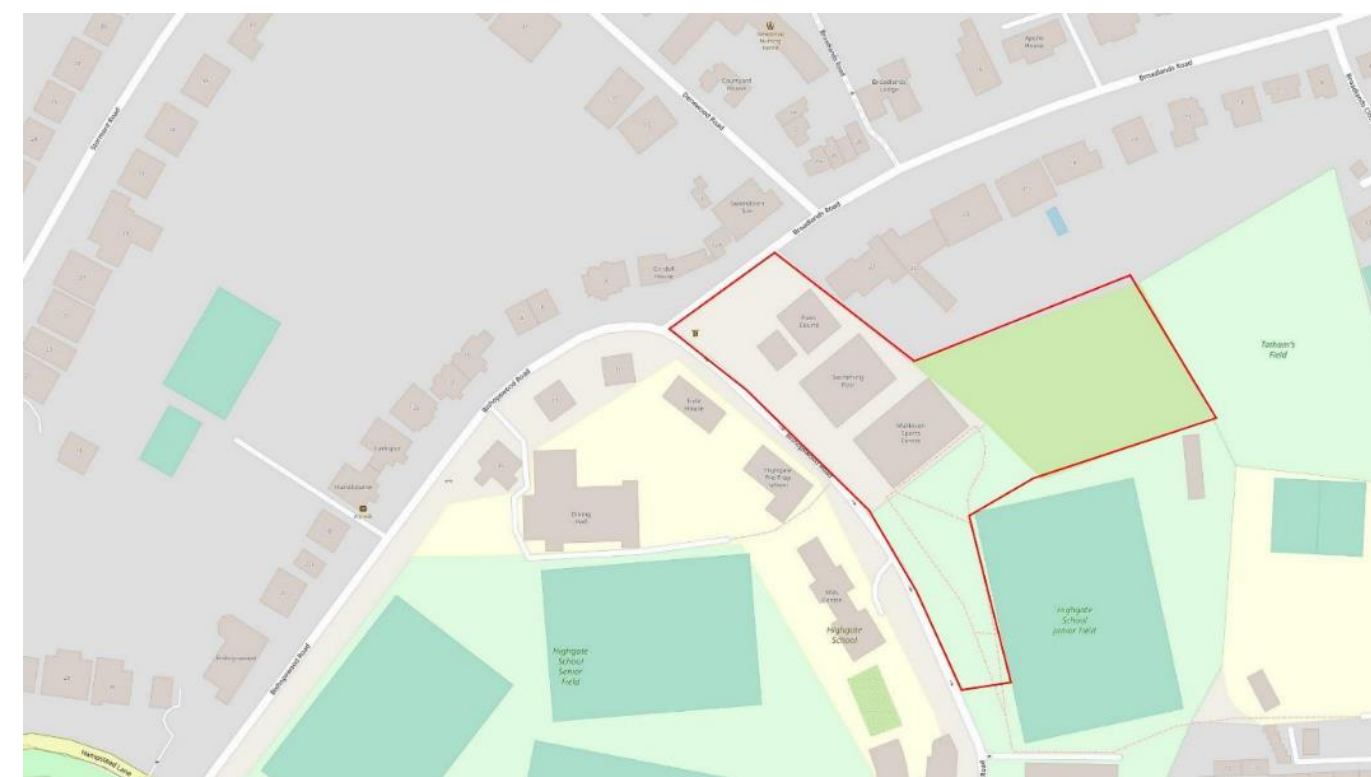


Figure 2 Site Location in Context (Open Street Map)

1.4. Proposed works

The new extensions will create a larger building with various sports facilities, including a second sports hall, which will also be used for other School events, parent evenings, examinations, and assemblies.

The principle of a single secure point of access at the south end is to be maintained, with a larger and more open entrance and foyer fronting the all-weather pitches. Once inside the foyer via a draught lobby, the main Sports Centre reception desk immediately controls the area, which will always be staffed during regular operational hours. The desk will be open within the space to create a friendly and welcoming impression for pupils and visitors and improve visibility. It is anticipated that turnstiles will be used to control and monitor access within the building – these are also provided at the west entrance next to the second hall. Turnstiles and entry doors would all be linked to the building fire alarm and detection system and default to open in the event of a fire for emergency egress.

As a result of the proposed extensions, new lifts will allow complete accessibility for disabled users to all areas of the building which is not currently wheelchair accessible.

Generally, during the school Day, the main doors will be openable, the entry doors being on automatic electric opening systems for disabled and Part M access. After School hours, it is anticipated that the main doors at both entrances will have access security control, operated by coded entry devices with magnetic closing locks. An option being investigated is to have the entry systems operated by pupil and staff cards, which will also serve several other functions in the school.

The proposed works in this submission include:

- Demolition of existing Fives Court and Squash Courts building at the north end of the site and remove the external games court area and high chain-link fencing.
- New north-west extension for a second indoor sports hall with associated new circulation corridor, viewing gallery, access stairs and lift, ancillary spaces for storage and plant, and a teaching block extension for 'Combined Cadet Force' and 'Outdoor Education' classrooms, offices, and associated storage.
- A new south extension to the existing sports hall for eight (8) no. New external covered Fives Courts with run-off area.
- New south-west extension and alterations to the existing building to create an enhanced entrance with foyer, reception, and café, with improved unique access stairs down to the current changing rooms.
- Alterations to the existing sports hall to enhance natural lighting by new roof lights, with interior changes to associated spaces.
- The New east extension in the existing open courtyard provides additional studio/gym spaces and forms connections back to the changing rooms, with ancillary external storage for sports.
- New hard and soft landscaping around the site's perimeter, including removing three Trees, replacing new semi-mature trees, and forming an entrance courtyard area at the new south main entrance.

The works are intended to be constructed as a phased development. They are related to the current project on-site for the refurbishment of the existing Pool Hall, which is being retained at the heart of the proposed scheme. This was granted planning permission on 31 May 2018, reference: HGY/2018/1223, and referred to this further project in the Design and Access Statement as a master-planning intention.

The proposed works will modernise this important indoor sports facility with alterations and extensions and significantly extend the life of the retained elements of the existing building while also providing significant

improvements to accessibility, energy efficiency and reduction of the carbon footprint of the whole Development.

1.5. Landscaping & External Works

The design strategy for the new sports centre is to:

- Create new landscape areas which maximise the amount of planting so that the new building becomes a recognisable and embedded part of the school's landscape and estate;
- Introduce new tree planting;
- Provide low-level, safe, and efficient lighting for students and visitors;
- Surface the paths with permeable paving as part of a sustainable drainage system;
- Utilise a no-dig construction methodology to prevent damage to tree roots where necessary.

The design strategy for the Orchard site is to:

- Create a new outdoor sports area with a unique and elegant oval-shaped amphitheatre that will not only provide seating around the pitch but also acts as a barrier and flood water storage device to prevent future flooding events;
- Introduce new tree planting;
- Provide accessible and safe access to the sports pitches for students and visitors, and connect with other areas of the school;
- Utilise a no-dig construction methodology to prevent damage to tree roots where possible;
- Minimise any impacts on the most valuable, existing trees around the site.
- There are mature trees around the site perimeter, between the MSC and the Orchard site, and all-round and to the east of the Orchard site, where there is a small natural wood.

2.0. Assessment Methodology and Criteria for External Lighting

2.1. Methodology

The methodology employed for this assessment was appropriate to the location of the application site. The baseline conditions were assessed by a desktop study. The methodology for this assessment is mainly established in ILP Guide 01: Guidance Notes for the Reduction of Obtrusive Light (2021), which is also required by the local planning policy.

The desktop study involved research into relevant local and national legislation, policy and guidance relating to obtrusive light. It also involved consultation with relevant parties and studying of ordnance survey maps, plans and aerial photography views to identify likely receptor locations.

2.2. GN01/21 The Reduction of Obtrusive Light

The above guidance published by "Institution of Lighting Professionals" which is in line with the international guidance for obstructive light CIE 150:2017 *Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations*, is being used to determine the effects of proposed artificial lighting for the development. The aim is to provide "The right light, at the right time, in the right place, controlled by the right system".

3.0. Planning Policies

3.1. Clean Neighbourhoods and Environment Act (CNEA) 2005

The Clean Neighbourhoods and Environment Act (CNEA) 2005 gives Local Authorities and the Environment Agency additional powers to deal with a wide range of issues by classifying artificial light emitted from defined premises as a statutory nuisance.

The CNEA 2005 amended section 79(1) of the Environmental Protection Act 1990 to extend the statutory nuisance regime to include light nuisance stating the following:

'(Fb) artificial light emitted from premises to be prejudicial to health or a nuisance.'

Guidance produced in Sections 101 to 103 of the CNEA 2005 by DEFRA (DEFRA, April 2006) extends the duty on local authorities to ensure their areas are checked periodically for existing and potential sources of statutory nuisances, including nuisances arising from artificial lighting. Local authorities must take reasonable steps to investigate complaints of such nuisances from artificial light. Once satisfied that a statutory nuisance exists or may occur or recur, local authorities must issue an abatement notice (following section 80(2) of the Environmental Protection Act 1990), requiring that the nuisance cease or be abated within a set timescale.

3.2. National Planning Policy Framework (NPPF)

The NPPF was introduced as a more concise and useable planning document to aid developers and designers in developing developments within the UK.

The National Planning Policy Framework 2021 makes little reference to lighting regarding the control of obtrusive light. The only reference states:

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

Many Local Planning Authorities (LPAs) have already produced, or are producing, policies within the planning system which will become part of their local development framework. For new developments, there is an opportunity for LPAs to impose planning conditions related to external lighting, including curfew¹¹ hours.

3.3. National Planning Policy

The national online planning guidance resource looks at when lighting pollution concerns should be considered; the guidance provides a high-level overview for planners with links to a few appropriate documents to give planners an overview of the subject through seven discussion points as follows:

- When is light pollution relevant to planning
- What factors should be considered when assessing whether a development proposal might have implications for light pollution
- What factors are relevant when considering where the light shines
- What factors are relevant when considering when light shines
- What factors are relevant when considering how much the light shines
- What factors are relevant when considering possible ecological impact

¹¹ Curfew: The time after which stricter requirements (for the control of obtrusive light) will apply; often a condition of use of lighting applied the local planning department. Depending upon application curfew times often commence between 21:00 to 23:00 and may run until 07:00. However, exact curfew hours should be carefully applied to ensure the reduction of obtrusive light is prioritised within the immediate environment and towards sensitive human as well as fauna and flora receptors.

- What other information is available that could inform approaches to lighting and help reduce light pollution

Artificial light requires consideration at the planning stage. To ensure that any proposed lighting installation conforms to the requirements of an area and its intended task, planners should consult with a competent lighting professional. The appropriate planning conditions for the project can then be established, the application reviewed, and the final performance of the installation confirmed.

4.0. Potential Effects from Artificial Light

There are a limited number of potential effects that arise from artificial lighting. These are as follows:

4.1. Effects from upward light (or sky glow)

Light emitted above the horizontal, either directly from luminaires or indirectly as reflected light from surfaces such as the landscape or buildings, has the potential to cause a sky glow. The ILP "Guidance Notes for the Reduction of Obtrusive Light" places limits on the percentage of direct upward light emitted from the luminaires in their installed attitude, which is dependent upon the environmental zone in which the site lies.

Indirect upward light is subject to material reflectance properties. It is not easily quantifiable but is unlikely to be as significant as direct upward light and is not an assessment criterion used in the ILP guidance notes.

4.2. Effects from light intrusion through windows on residents

Light Intrusion (or light spill) is the spilling of light beyond the boundary of the area being lit. The ILP Guidance Notes limit the amount of vertical Illuminance which falls upon the centre of a dwelling window. The suggested maxima values quoted are relative to the amount of light measured as a baseline without the presence of the obtrusive light source.

4.3. Effects from viewed source intensity on residents and sightseers

Table 1 below advises various lighting levels in different environmental zones and limits on luminaire intensity or viewed source intensity from luminaires to an observer. The most significant problems are usually from poorly aimed floodlights, security lighting, or lighting located too close to properties.

4.4. Effects from disability glare on road users

The proposed lighting strategy includes requirements for lighting to be installed such that Glare is minimised following the ILP guidance notes.

4.5. Effects of obtrusive light on the environment

Artificial light at night often has unexpected impacts on the environment. The light spill has the potential to affect both flora and fauna. Light spills can disrupt feeding patterns and force ecological receptors to leave their habitat. It has been noted that there are bat and hedgehog records within the vicinity of the site. The lighting strategy will seek to mitigate light spills with potential ecological receptors that could be adversely affected—reducing spill light using guidance provided by the ILP to reduce obtrusive light.

4.6. Effects of high energy consumption

Lighting installations have the potential to consume high quantities of energy, and competent lighting professionals should carefully design them. A good practice for energy-efficient lighting would be implementing an LED-based lighting solution with a suitable lighting control system that applies to the application.

5.0. Obtrusive Light Limitations

To safeguard and enhance the night-time environment, it is necessary to control obtrusive light (also known as light pollution), which can present ecological and physiological problems to both natural and manufactured environments for people in most aspects of daily life, from residents, sightseers, transport users to environmentalists and astronomers. Figure 3 below is taken from the ILP guidance notes GN01:2021, shows the various forms of obtrusive light.

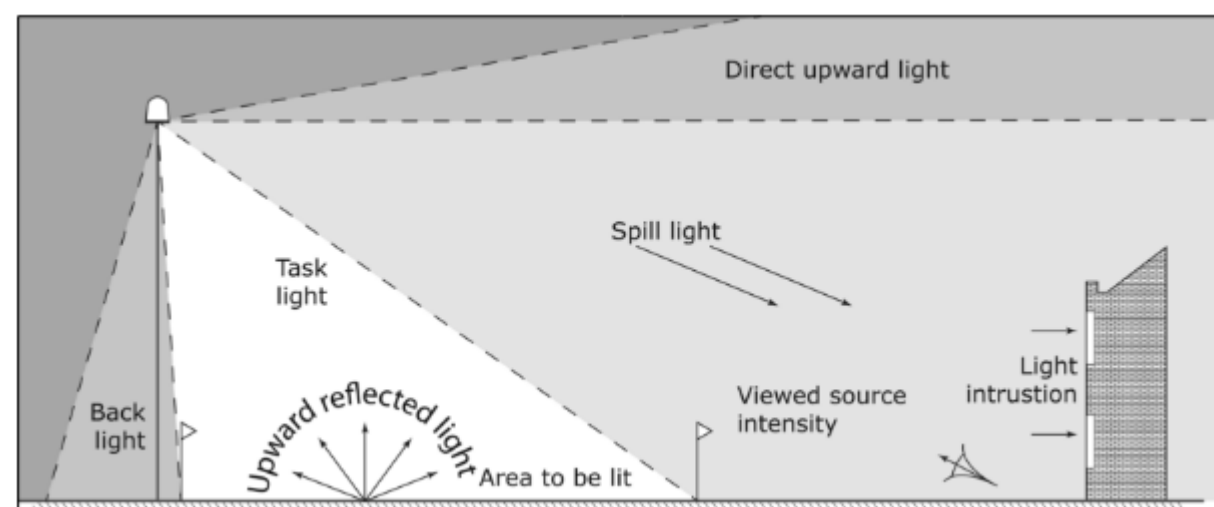


Figure 3 - Types of Obtrusive light

6.0. Environmental Zones

The ILP has established Environmental Zones for exterior lighting based on the area's existing external ambient lighting levels (see Table 1).

The ILP Environmental Zone classification for the site has been determined based on professional judgement.

The following Environmental Zones is extracted from ILP guidance note 01/21.

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

Table 1 (ILP Table 2): Environmental Zones

In the context of the existing lighting conditions, it has been established that the site and its surroundings can be categorised within ILP Environmental Zone E3 (Suburban), due to the medium level of district brightness identified.

7.0. Recommended Maximum Values of Light Parameters for the Control of Obtrusive Light

The following sections are extracts from the ILP Guidance Notes 01/21 which quantify the maximum values of illuminance or luminous intensity as identified within the International guidance CIE 150.

7.1. Limitation of illumination on surrounding premises

Table below indicates the maximum values of vertical illuminance on surrounding premises. It can also be considered for managing spill lights; however, the task performance requirements of any adjacent lit areas must be considered and ensure that any spill light does not adversely affect these performance parameters as this could affect their safe use. It may be necessary to minimise spill and intrusive lighting values to less than expected for the environmental zone within which the installation lies.

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

* If the installation is for public (road) lighting, this may be up to 1 lx.

Table 2 (CIE 150 table 2): Maximum Values of Vertical Illuminance on-premises

7.2. Limitation of bright luminaires in the field of view

The limits for the luminous intensity of bright luminaires are dependent on the viewing distance and the projected area of the bright part of the luminaire in the direction of the observer. The following table shows the maximum values for the luminous intensity of luminaires in designated directions where views of bright surfaces of luminaires are likely to be a nuisance to occupants of premises.

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
	Aid to gauging A_p Luminaire diameter	2 to 5 cm	5 to 10 cm	10 to 20 cm	30 to 40 cm	40 to 80 cm	>80 cm
	Geometric mean of diameter (cm)	3.2	7.1	14.1	26.3	56.6	>80
	Corresponding A_p representative area (m^2)	0.0008	0.004	0.016	0.063	0.251	>0.5

Table 3 (CIE 150 table 3): Limits for the luminous intensity of bright luminaires from a given source.

The above information is applicable for the consideration of a single luminaire, but where two or more luminaires are located close to each other that to the observer they appear as a single light source, then the assessment shall be undertaken based upon the combined bright surfaces of luminaires (A_p) in the direction of the observer or, from positions where such views are likely to be maintained.

Definitions and Notes (as GN 01/21 Table 4)

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

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

A_p - is the apparent surface of the light source seen from the observer's position

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

Note 7 - A luminous intensity of 0 cd can only be realised by a luminaire with a complete cut-off in the designated directions

Note 9 - For further information, refer to Annex C of CIE 150

To aid this assessment, values of A_p corresponding to the geometric mean diameter of each circular luminaire group have been extracted from CIE150 Annex C and included in Table 3. These areas can be considered for assessing likely A_p in the observer direction to calculate a maximum luminous intensity value.

7.3. Limitation of Sky glow

The following values can be used for different environmental zones in order to limit the upward light.

Light Technical Parameter	Environmental Zones				
	E0	E1	E2	E3	E4
Upward Light Ratio (ULR) / %	0	0	2.5	5	15
Road	n/a	2	5	12	35
Amenity	n/a	n/a	6	12	35
Sports	n/a	n/a	2	6	15

Table 4 (CIE 150 table 5&6): Maximum values of upward light ratio (ULR) of luminaires

Note 1 - This is the primary approach to limit sky glow and is suitable to compare different single luminaires and mitigate the contribution of each luminaire within an installation.

Note 2 - This does not consider the effect of light reflected upwards from the ground that contributes to sky glow.

Note 3 - Some lighting schemes will require the deliberate and careful use of upward light, e.g., ground recessed luminaires, ground mounted floodlights and festive lighting, to which these limits cannot apply. However, care should always be taken to minimise upward waste light by correctly applying suitably directional luminaires and light-controlling attachments.

7.4. Limitation of the effect of over-lit building facades and signs

Table below provides recommendations regarding luminance values that provide visibility in order that a balanced urban lighting master plan can be considered.

Light technical parameter	Application conditions	Environmental zones				
		E0	E1	E2	E3	E4
Building façade luminance (L_b)	Taken as the product of the design average illuminance and reflectance divided by n	< 0.1 cd/m ²	< 0.1 cd/m ²	5 cd/m ²	10 cd/m ²	25 cd/m ²

Table 5 (CIE 150 table 7): Maximum permitted values of average surface luminance.

Note: The values apply to both pre-and post-curfew, except that in Zones 0 and 1, the values shall be zero post-curfew. The values for signs do not apply to signs for traffic control purposes.

8.0. BREEAM

The aim is to reduce the building's energy consumption through the specification of energy-efficient lighting including external lighting.

External light fittings within the Construction Zone are being specified with:

- The average initial luminous efficacy of not less than 70 luminaire lumens per circuit Watt
- Automatic control to prevent operation during daylight hours and post curfew (except for security lighting)
- Presence detection in areas of intermittent pedestrian traffic

Average Initial Luminous Efficacy of the external light fittings

The individual luminous fluxes of all luminaires within the construction zone are summed (in lumens) and then divided by the total circuit Watts for all the luminaires.

For lamps other than LED lamps, the luminous flux of a luminaire can be determined by multiplying the sum of the luminous fluxes produced by all the lamps in the luminaire by the light output ratio of the luminaire (as confirmed by the luminaire manufacturer).

LED lamps are typically integral to the luminaire (LED luminaires). As such, the manufacturer's literature will encompass the lamp and luminaire.

Suppose the assessed building is part of a larger development containing common areas and other buildings or is a new extension to an existing building. In that case, the external lighting criteria apply only to external new and existing lighting within the construction zone of the assessed building.

8.1. Temporary lighting, decorative lighting, and floodlighting

Temporary lighting such as theatrical, stage or local display installations can be excluded from the assessment of this issue. Decorative lighting and floodlighting must, however, be assessed for this issue.

8.2. Emergency lighting

Emergency light fittings, including security lighting used for normal operation, are assessed for this issue. Non-maintained lighting which only activates in an emergency can be excluded from the assessment of this issue.

8.3. Areas of intermittent pedestrian traffic

An area can have intermittent traffic where a pedestrian is approaching the space less than two-thirds of the time when the lighting, without presence detection, would be switched on.

8.4. Automatic control

An automatic external lighting control system prevents operation during daylight hours through either a time switch or a daylight sensor (a manually switched lighting circuit with a daylight sensor or time switch override is also acceptable). In addition to the above, the system should provide presence detection in areas of intermittent traffic. For external lighting not fitted with presence detectors, time switches must provide an automatic switch off from lighting after a specified curfew hour, except in cases where there is a specific requirement for lighting to be left on all night.

8.5. Construction zone

To this issue, the construction zone is defined as the site being developed for the BREEAM-assessed building and its external site areas, i.e., the scope of the new works.

8.6. Daylight sensor

A type of sensor that detects daylight and switches lighting on at dusk and off at dawn.

Luminous efficacy in luminaire lumens per circuit Watt

The ratio between the luminous flux produced by an entire luminaire (light fitting) (in lumens) and the total power consumed by the lamps and the control gear contained within the luminaire (Watts).

8.7. Presence detector

A sensor can turn lighting on when a presence is detected in the scanned area and off after a pre-set time when no presence is detected. Presence detectors must be compatible with the lamp type used as frequent switching can reduce the life of some lamp types.

In certain circumstances, other forms of presence-related control could be used if they switch off the lighting when nobody is in the space. Examples could include absence detection, where people switch on the lighting using a push button or similar control but switching off is done automatically; and key control in secure areas, where people use a swipe card or type a code on entering a space, and the lighting then comes on and remains on until they leave. Presence-related controls need careful design and commissioning to ensure that people cannot be left in the dark while still in the outdoor space.

8.8. Time switch

A switch with an inbuilt clock will allow lighting to be switched on and off at programmed times.

9.0. Assessment

A qualitative assessment has been completed to establish the possible effects of obtrusive light that may arise from the proposed development. The assessment includes the consideration of potential adverse effects of the following three components of obtrusive light (as expressed in Figure 3):

Sky glow – the brightening of the night sky above areas with large amounts of artificial light, which may be reflected from illuminated surfaces or come from direct upward lighting installations

Glare – the brightness of a light source which is uncomfortable when viewed against a dark background. Glare is mainly experienced when light sources are not covered by a shield or directed by a suitable lens/reflector set-up.

Light Intrusion – when light affects areas beyond the boundary of the area to be lit. Light Intrusion is also known as 'spill' or 'trespass' and may cause nuisance or disturbance to sensitive receptors.

Lighting Designers have developed a Lighting Strategy to provide quantitative analysis and proper calculations to determine the light levels from the proposed design for sky glow, Glare, and light Intrusion. The Lighting Strategy has been developed iteratively to meet the specified limitations of the relevant ILP Environmental Zone.

10.0. Operational Lighting

10.1. Lighting Requirements

Operational lighting is required for the proposed scheme to allow safe use of the development once it is occupied.

General principles considered to prevent obtrusive light and protect the sensitive receptors surrounding the site have been provided in this assessment. The lighting design for each space has been carried out as follows;

- Street elevation along Bishopswood Road,
- Street elevation along Broadlands Road,

Lighting in each area has been designed to meet the statutory requirements and guidelines governing the space that lighting is intended for or being used.

11.0. Lighting Strategy

11.1. Design Objectives

In addition to the requirements in Haringey Local Plan: Sustainable Design & Construction (March 2013) Section 7.3 Light Pollution, the key design objective for the Lighting Strategy has been for luminaires, and the design specified to seek to achieve the limitations set for obtrusive lighting for ILP Environmental Zone E3.

11.2. Employer's Requirements

The client brief was to provide an external lighting design in compliance with the statutory requirements in order to;

- Provide adequate lighting on the ramps, steps and the building façade with minimum clutter.
- Lighting around the building and along paths to provide safety and security for all routes around the new building.
- The paths to be lit with a combination of low-level bollard lights and wall lights on the building facades.
- Recessed light fittings on walls may be used to light the ramps and steps that connect the terraces around.
- No additional external lighting at entrances or signage.
- Light fittings of high efficacy of not less than 70 luminaire lumens per circuit Watt
- Automatic control to prevent operation during daylight hours.
- Presence detection in areas of intermittent pedestrian traffic.

11.3. Proposed Lighting Strategy

Lighting Strategies have been proposed for three areas as below;

The Lighting Strategy has been designed following the minimum lighting levels required in the following standards and guidance documents:

- - BS EN 5489-1:2013 Code of Practice for the design of road lighting – Part 1: Lighting of roads and public amenity areas
- - CIBSE (2016) Lighting Guide 06: The Outdoor Environment

The Lighting Strategy (Appendix A) provides a location plan for the columns, bollards and wall lights in the building perimeter and walkways with a summary of the lux levels across the site. A 3D luminance image has also been provided, indicating what the proposed Development's ambient light conditions can be expected to look like. The design has been tested using computational modelling to understand whether it meets the lighting specifications for ILP Environmental Zone E3.

Element	Requirement	Reference Table
Location	Suburban	ILP Table 2
Zone	E3	ILP Table 2
Lighting Environment	Medium district brightness	ILP Table 2
Illuminance in the vertical plane (Ev)	Pre-Curfew 10 lx	ILP Table 3 /CIE 150 T2
	Post-Curfew 2 lx	ILP Table 3 /CIE 150 T2
Maximum luminous intensity emitted by luminaire (I in cd)	Pre-Curfew 0.86d	ILP Table 4 /CIE 150 T3
	Post-Curfew 0.29d	ILP Table 4 /CIE 150 T3
Upward Light Ratio	Site 5%	ILP Table 6 /CIE 150 T5

Table 6: Site Lighting Standards.

12.0. Mitigation Measures and Conclusion

12.1. Mitigation Measures

The general design principles that have been incorporated into the Lighting Strategy to mitigate adverse effects of obtrusive light include:

- Orientation – lighting units will be angled so that no light is released above the horizontal. To achieve wide beam, involves using a suitable luminaire positioned at a great height to allow light to be directed downwards. Lighting will be directed, so it does not intrude (or spill) outside the immediate working area.
- Placement – lighting will be located away from sensitive receptors wherever possible.
- Reflectance – any high-intensity lighting will be installed onto buildings or columns and directed to the area where the light is required, rather than facing a building façade which may be reflective and result in a sky glow.
- Quantity - Preference has been given to several lower lighting units rather than tall, wide beam lighting units to illuminate large areas as it will limit light intrusion, glare and sky glow.
- Operating Hours - Lighting will be reduced or switched off when not required for safety purposes. The working hours of the school sport centre will be mainly from 0700 to 2200.
- Security – Security Lighting will be kept at the minimum level needed for visual and security protection, and infrared floodlighting and CCTV systems will be used to reduce the need for visible lighting outside working hours.

Limitation of illumination on surrounding premises – In accordance to section 7.1 above the requirement for zone E3 for illuminance in the vertical plane is 10 Lux at Pre-Curfew hours and 2 Lux Post Curfew hours. Using the simulation software the vertical light levels at four different locations (neighbouring properties) are shown below;

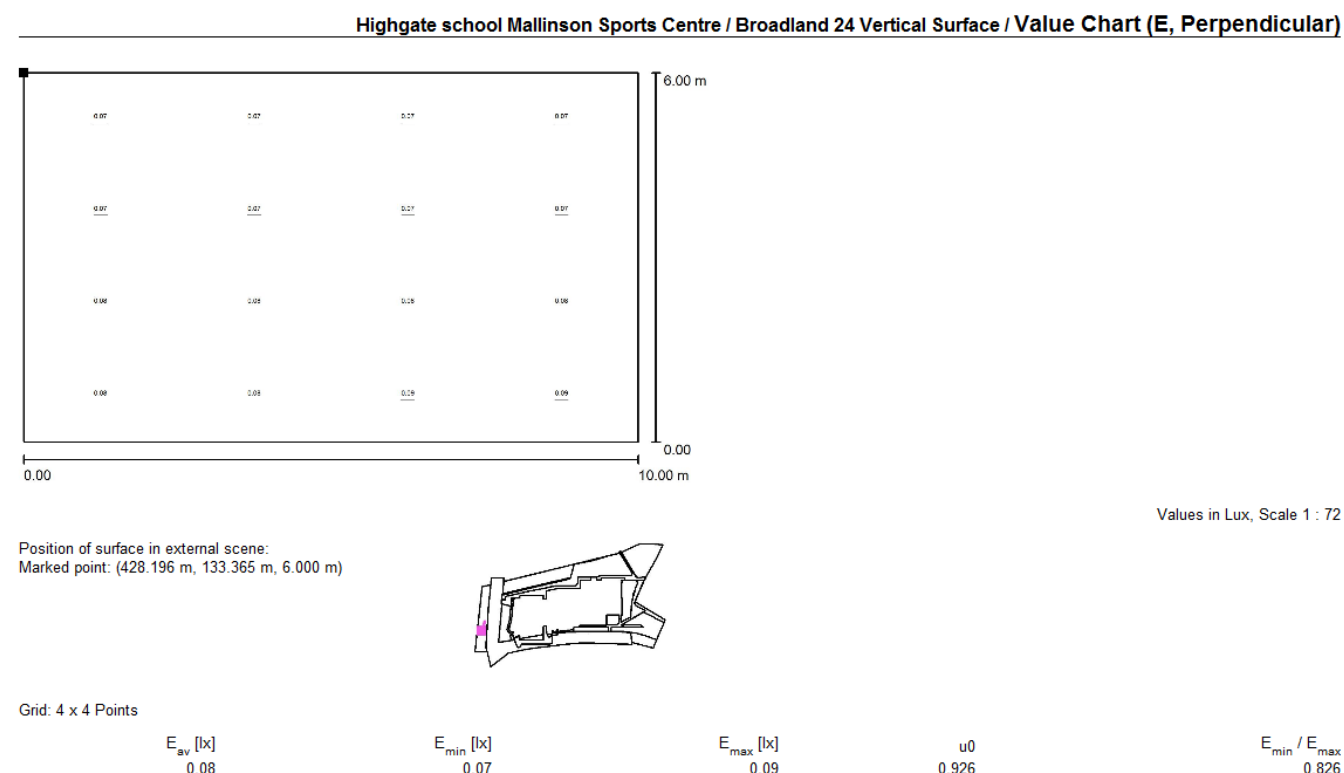


Figure 4: Values of vertical illuminance on neighbours (24 Broadland)

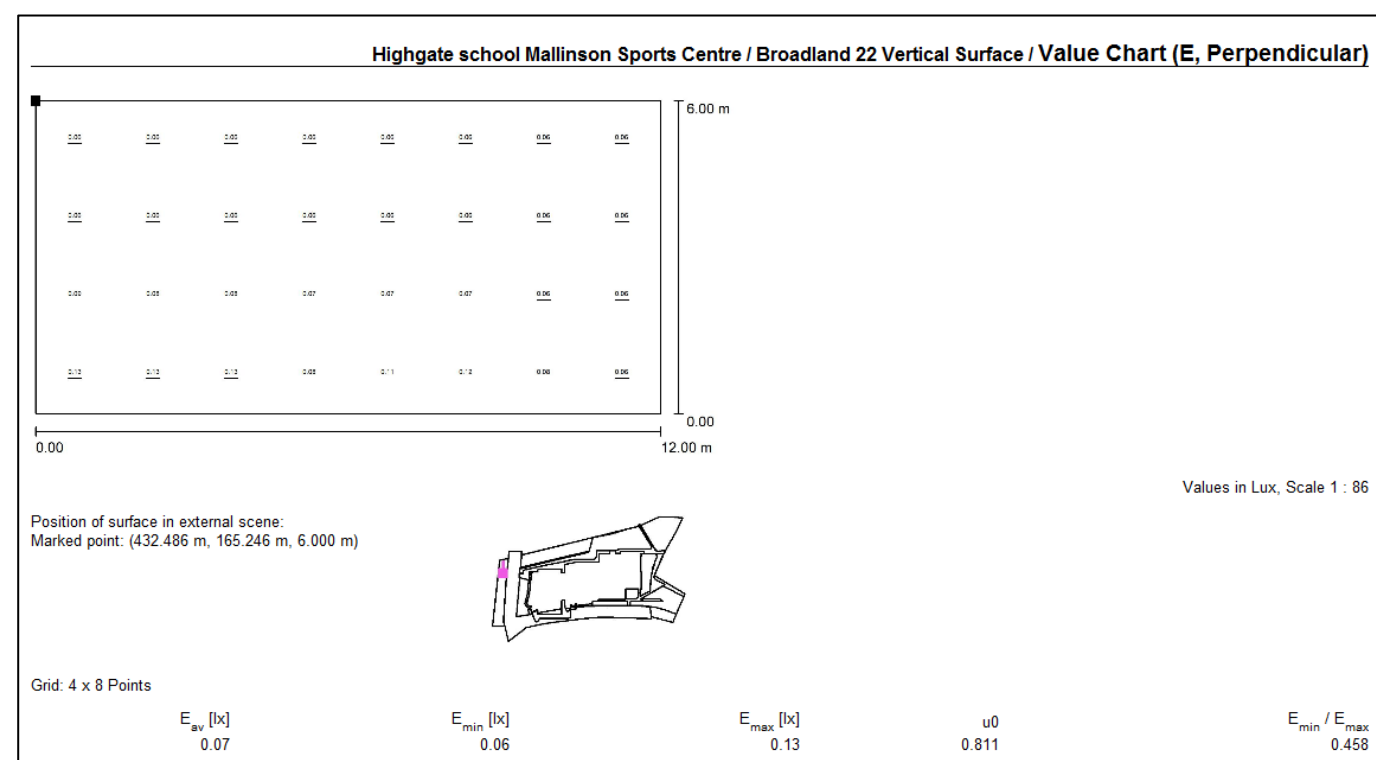


Figure 5: Values of vertical illuminance on neighbours (22 Broadland)

External lighting Simulation Result for Vertical Calculation Points at the neighbouring residential premises indicate maximum 0.13 Lux.

This value is less than the requirement for zone E3 and E2 & E1. The external lighting will be switched off during post-curfew hours.

Limitation of bright luminaires in the field of view – For mitigation in accordance with section 7.2 above, light fittings being specified are with a complete cut-off in the designated directions. All light fittings are recessed within the body of the light fitting and direct to the ground with minimal spread of light. The spill light is shown in the result from the simulation software in appendix B. It is to be noted that the nearest premises are about 20m or more from the construction zone with a road and mature trees in the between.



Figure 6: Sample External Wall mounted Light Fittings

As set out, the Lighting Strategy meets the required pre-curfew limitations of ILP Environmental Zone E3. No instances have been identified where the lighting levels exceed the required pre /post-curfew limitations of ILP Environmental Zone E3. Achieving levels within the acceptable limits for ILP Environmental Zone E2 /E1 will maintain the 'low district brightness' for the Application Site, thus minimising the possible effects of obtrusive light.

Limitation of Sky glow – External lighting simulation for the entire development indicates Upward Light Ratio (ULR):1.5%.

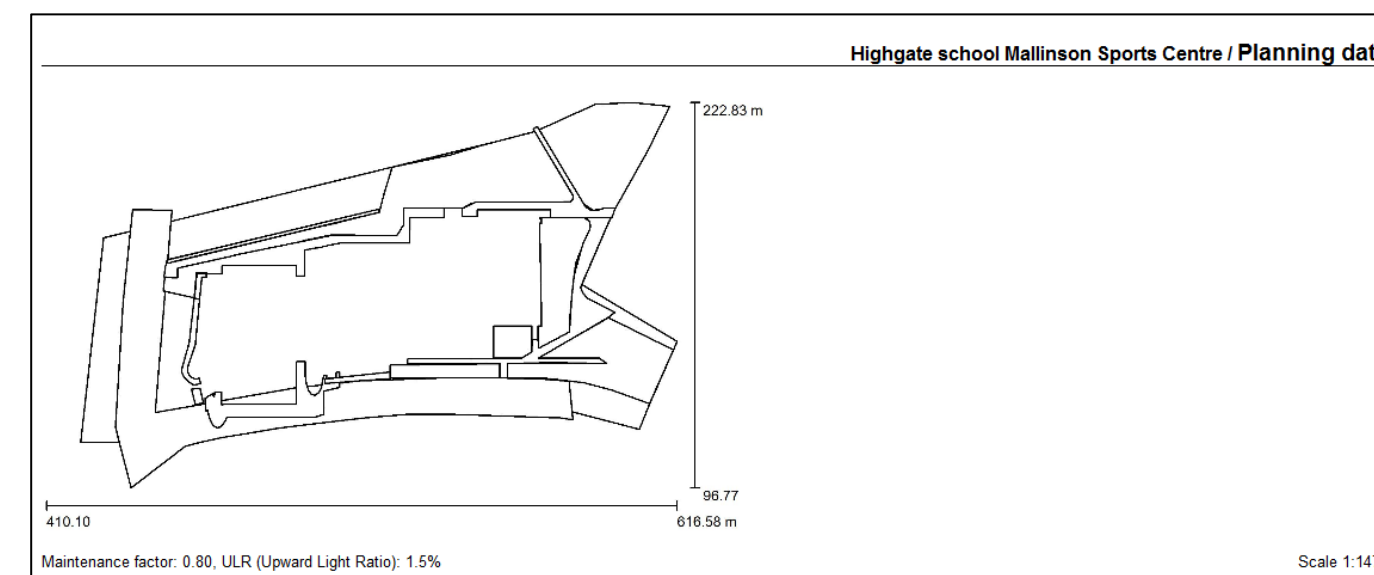


Figure 7 - External Lighting Simulation ULR Result

In accordance with section 8.3 above, the ULR for zone E3 is 5% and for zone E2 is 2.5%. The ULR for the development is better than the requirements for zone E2 (Rural).

Limitation of the effect of over-lit building facades – For limiting the light levels on the building façade, the illuminance levels on the building facade by the Bishopswood Road has been calculated and the result from the external lighting simulation indicates the maximum of 0.31cd/m² on one elevation. This result is better than requirement for zone E2 Rural areas.

12.2.Conclusions

Due to the effective screening of the surrounding area, the type, number and positioning of the luminaires used and the limited duration of use, the assessment demonstrates little impact from the use of artificial lighting at the surrounding areas, neighbours and potential sensitive receptors.

The Lighting Strategy for the site has been sought to minimise levels of lighting through designing to the relevant British Standard; minimise the effects of obtrusive light on existing and future sensitive receptors; and meet the obtrusive light limitation for exterior lighting specified for ILP Environmental Zone E3.

Based on this assessment and subject to the incorporation of the recommendations set out in this report, it is considered that obtrusive lighting from the proposed Lighting Scheme does not pose a constraint to the proposed development.

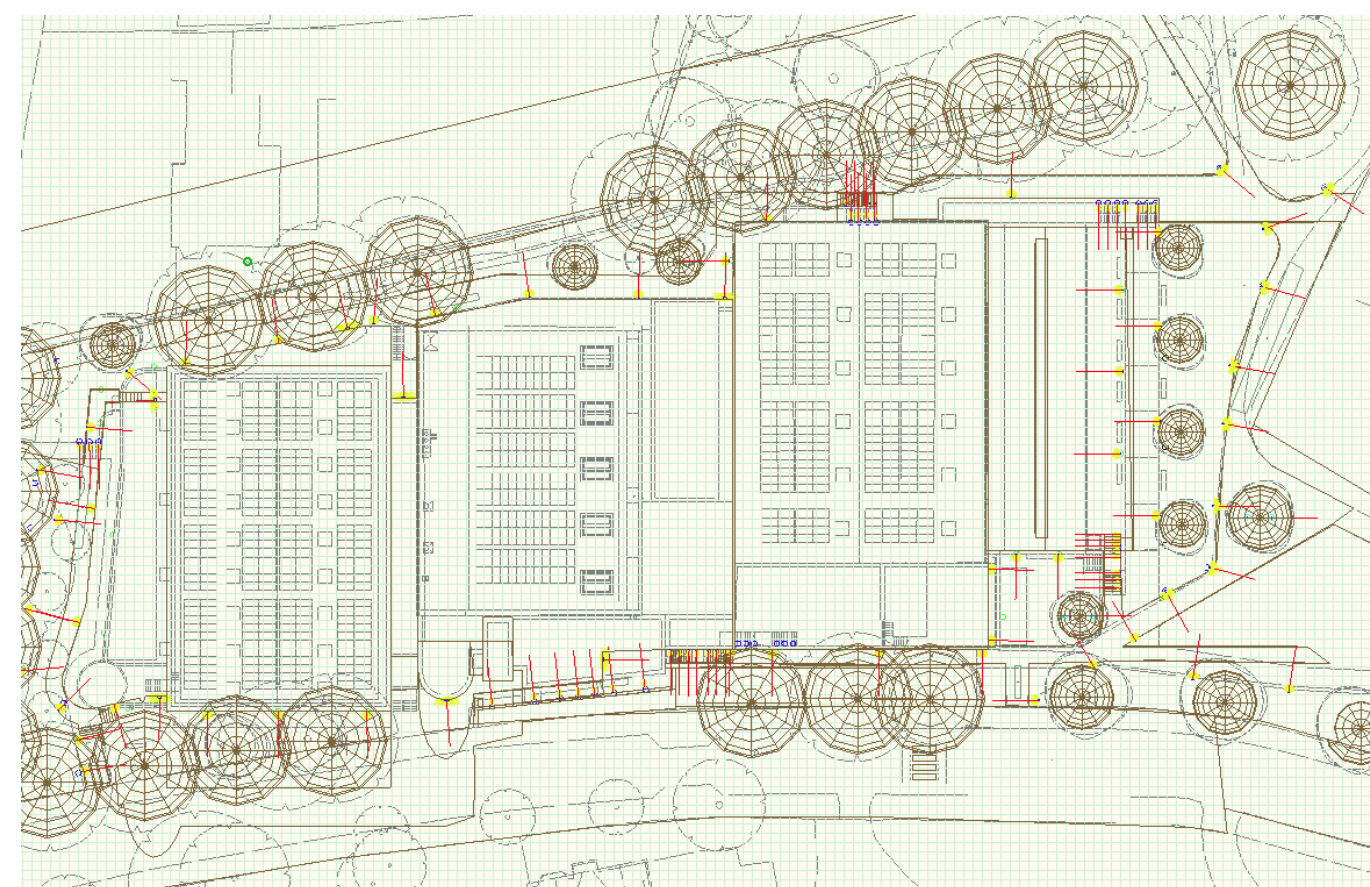
The site lighting is designed with safe light levels to the paths without obtrusive level of reflected light onto the surrounding properties. The wall-mounted luminaires are located on the walls within the perimeters of the building in location which are not over looked by windows.

To reduce the risks of obtrusive lighting through the windows and surrounding the light fittings have been selected with zero or minimum upward light ratio except where being used as floor markers.

The lighting design has an overall predicted upward reflected ratio (UPR) light level of 1.5%. These are considerably lower than Institute of Lighting Professionals recommended maximum allowable level of 5% for suburban areas.

Overall the lighting design to provide safe access during dark hours through the site without creating obtrusive levels of reflected light through the windows. The external lighting was designed, ensuring a balance between aesthetic, sustainable scheme and creating safe spaces whilst minimising the chances for crime to be committed and reducing opportunities for anti-social behaviour.

The external lighting scheme for the site, with the illuminance levels shown throughout the site and at the boundaries. The calculation model was prepared using industry standard software, DIALux. It shows that adequate levels of lighting have been achieved on the site with minimal effect on the surrounding area.



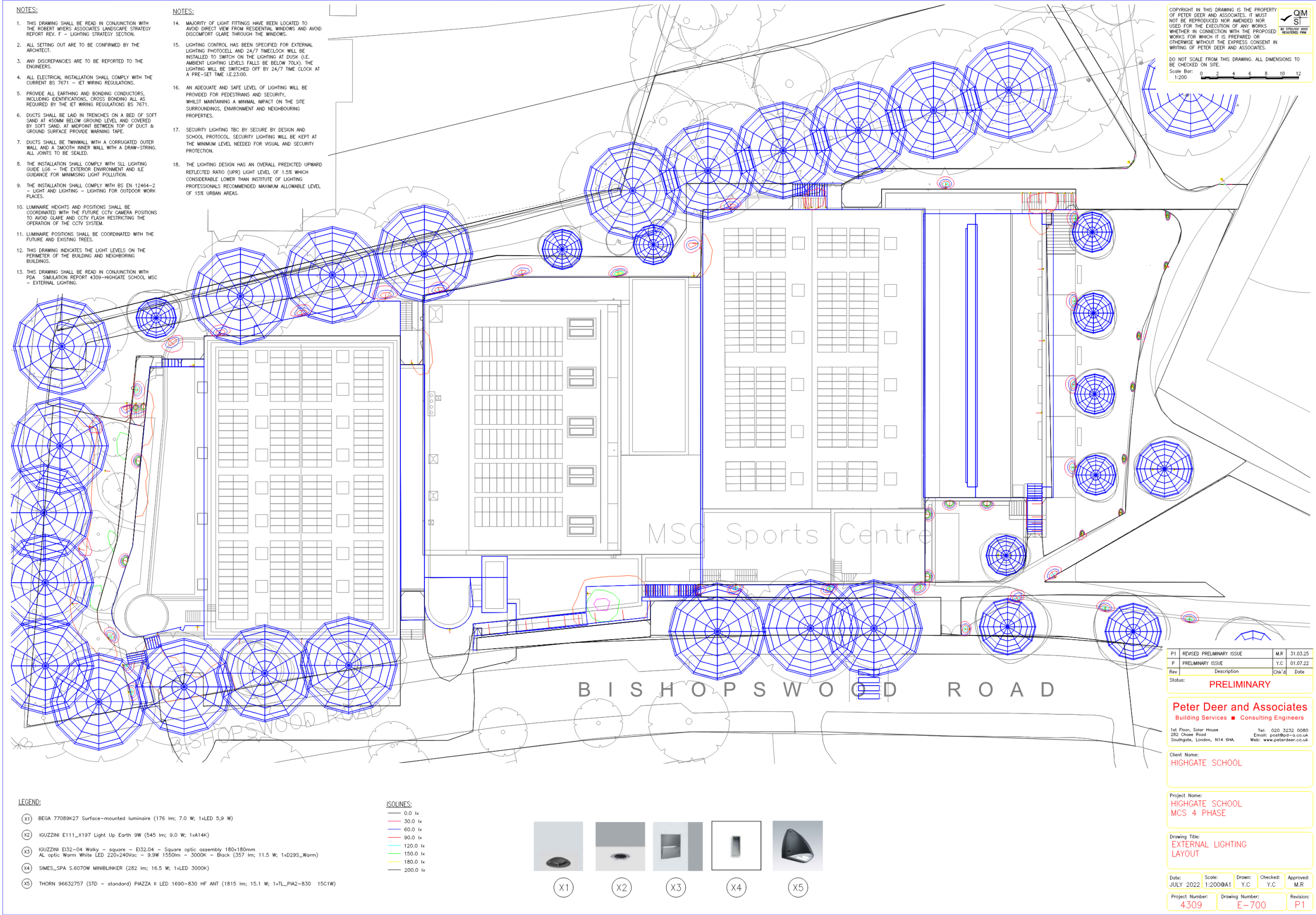
13.0. Appendices

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Appendix A External Lighting Design – Isolines & Beam Directions



Appendix B External Lighting Simulation Report

4309-Highgate school Mallinson Sports Centre

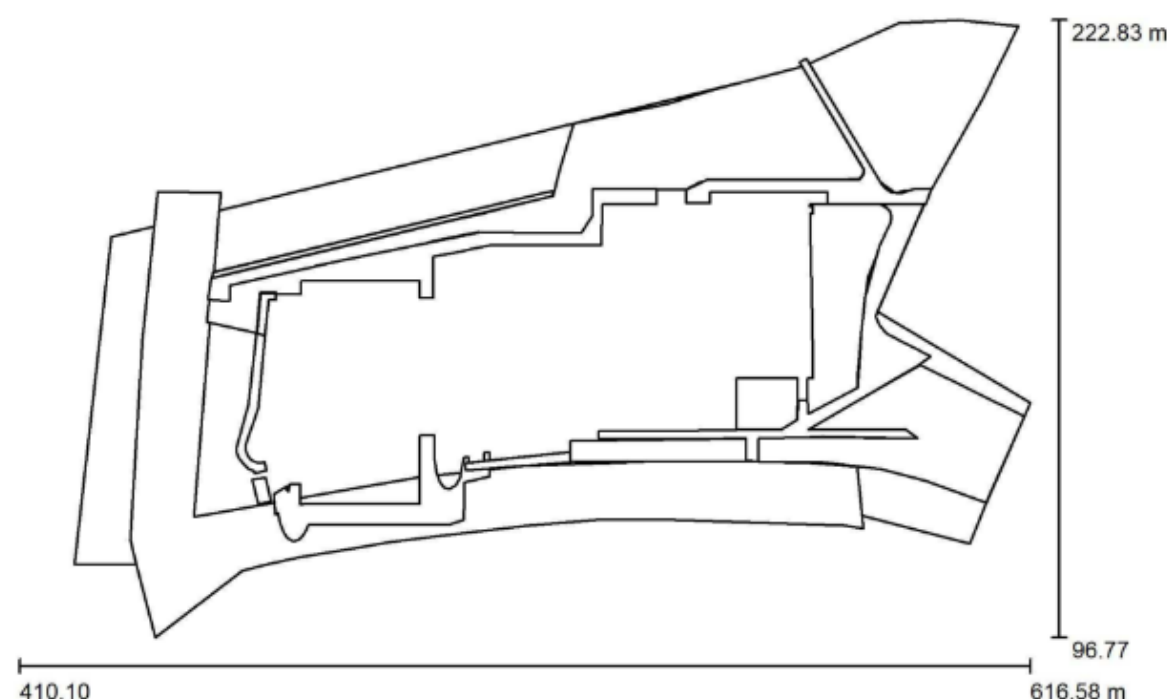
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Highgate school Mallinson Sports Centre / Planning data



Maintenance factor: 0.80, ULR (Upward Light Ratio): 1.5%

Scale 1:1477

Luminaire Parts List

No.	Pieces	Designation (Correction Factor)	Φ (Luminaire) [lm]	Φ (Lamps) [lm]	P [W]
1	9	BEGA 77089K27 Surface-mounted luminaire (1.000)	176	176	7.0
2	4	IGUZZINI E111_X197 Light Up Earth 9W (1.000)	545	730	9.0
3	44	IGUZZINI EI32-04 Walky - square - EI32.04 - Square optic assembly 180x180mm - AL optic - Warm White LED - 220+240Vac - 9.9W 1550lm - 3000K - Black (1.000)	357	1550	11.5
4	40	SIMES_SPA S.6070W MINIBLINKER (1.000)	282	282	16.5
5	7	THORN 96632757 (STD - standard) PIAZZA II LED 1690-830 HF ANT (1.000)	1815	1815	15.1
Total:			43418	96674	1370.7

4309-Highgate school Mallinson Sports Centre

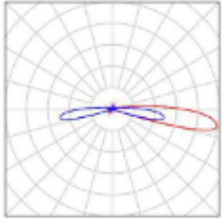
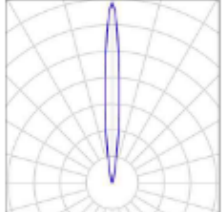
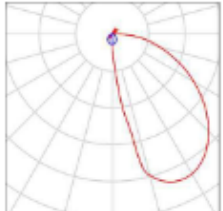
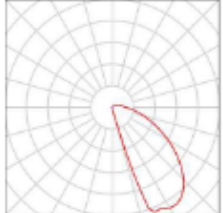
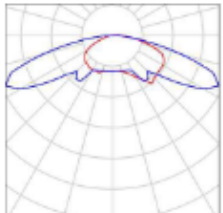
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Highgate school Mallinson Sports Centre / Luminaire parts list

9 Pieces	BEGA 77089K27 Surface-mounted luminaire Article No.: 77089K27 Luminous flux (Luminaire): 176 lm Luminous flux (Lamps): 176 lm Luminaire Wattage: 7.0 W Luminaire classification according to CIE: 74 CIE flux code: 01 02 23 74 100 Fitting: 1 x LED 5,9 W (Correction Factor 1.000).		
4 Pieces	IGUZZINI E111_X197 Light Up Earth 9W Article No.: E111_X197 Luminous flux (Luminaire): 545 lm Luminous flux (Lamps): 730 lm Luminaire Wattage: 9.0 W Luminaire classification according to CIE: 0 CIE flux code: 00 00 12 00 75 Fitting: 1 x A14K (Correction Factor 1.000).		
44 Pieces	IGUZZINI EI32-04 Walky - square - EI32.04 - Square optic assembly 180x180mm - AL optic - Warm White LED - 220+240Vac - 9.9W 1550lm - 3000K - Black Article No.: EI32-04 Luminous flux (Luminaire): 357 lm Luminous flux (Lamps): 1550 lm Luminaire Wattage: 11.5 W Luminaire classification according to CIE: 99 CIE flux code: 40 74 93 99 23 Fitting: 1 x D29S_Warm (Correction Factor 1.000).		
40 Pieces	SIMES_SPA S.6070W MINIBLINKER Article No.: S.6070W Luminous flux (Luminaire): 282 lm Luminous flux (Lamps): 282 lm Luminaire Wattage: 16.5 W Luminaire classification according to CIE: 90 CIE flux code: 37 71 90 90 100 Fitting: 1 x LED 3000K (Correction Factor 1.000).		
7 Pieces	THORN 96632757 (STD - standard) PIAZZA II LED 1690-830 HF ANT Article No.: 96632757 (STD - standard) Luminous flux (Luminaire): 1815 lm Luminous flux (Lamps): 1815 lm Luminaire Wattage: 15.1 W Luminaire classification according to CIE: 98 CIE flux code: 22 53 86 98 100 Fitting: 1 x TL_PIA2-830 15C1W (Correction Factor 1.000).	See our luminaire catalog for an image of the luminaire.	
			

4309-Highgate school Mallinson Sports Centre

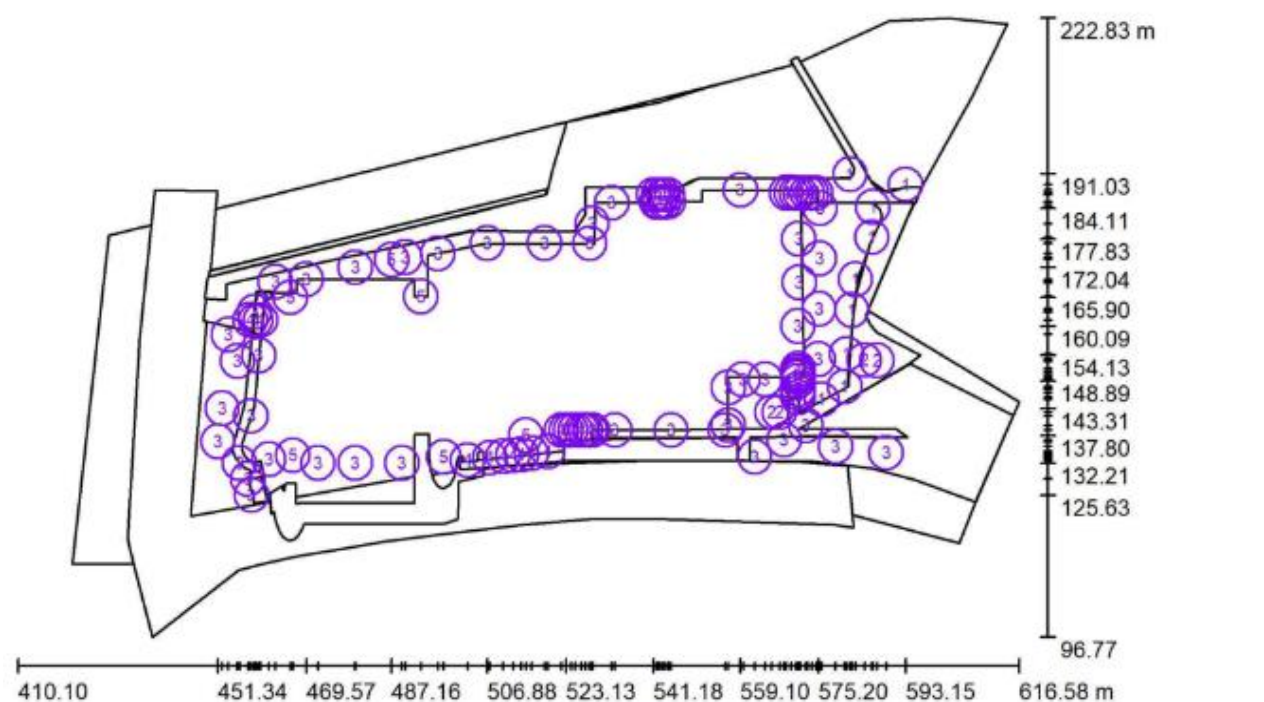
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Highgate school Mallinson Sports Centre / Luminaires (layout plan)



Scale 1 : 1477

Luminaire Parts List

No.	Pieces	Designation
1	9	BEGA 77089K27 Surface-mounted luminaire
2	4	IGUZZINI E111_X197 Light Up Earth 9W
3	44	IGUZZINI EI32-04 Walky - square - EI32.04 - Square optic assembly 180x180mm - AL optic - Warm White LED - 220+240Vac - 9.9W 1550lm - 3000K - Black
4	40	SIMES_SPA S.6070W MINIBLINKER
5	7	THORN 96632757 (STD - standard) PIAZZA II LED 1690-830 HF ANT

4309-Highgate school Mallinson Sports Centre

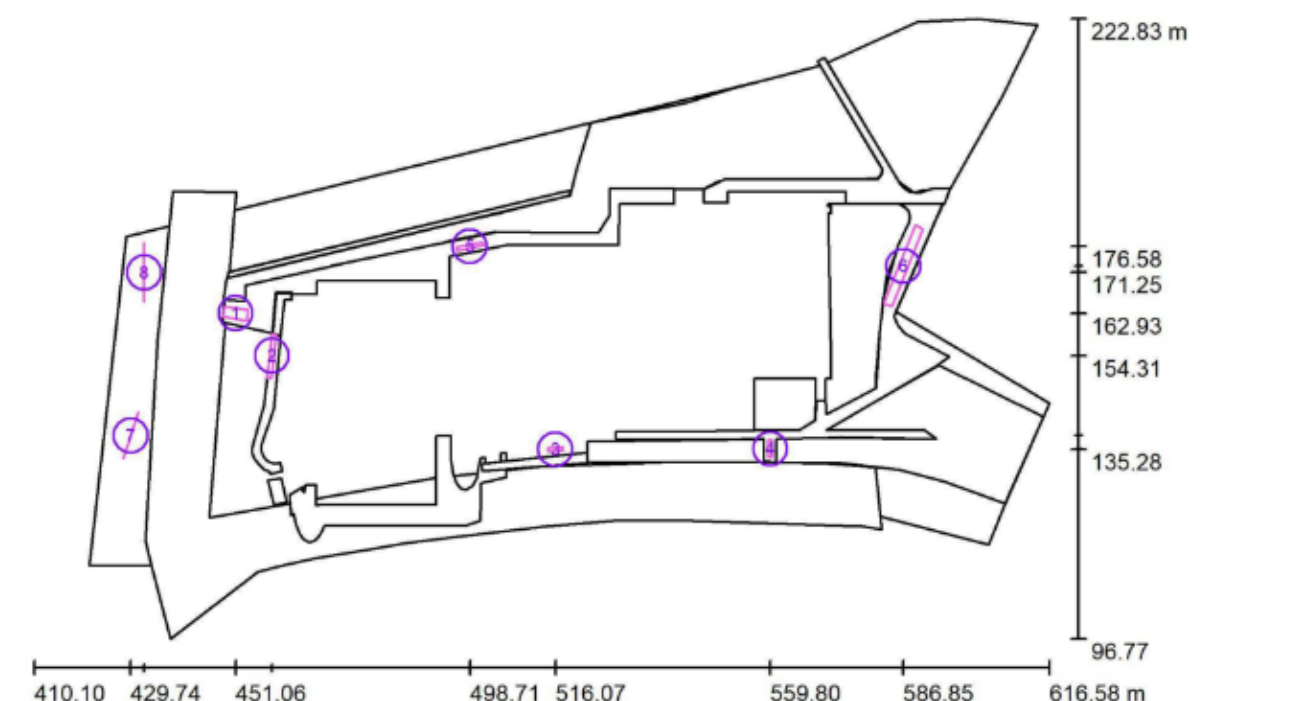
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Highgate school Mallinson Sports Centre / Calculation surfaces (results overview)



Scale 1 : 1477

Calculation Surface List

No.	Designation	Type	Grid	E _{av} [lx]	E _{min} [lx]	E _{max} [lx]	u0	E _{min} / E _{max}
1	New delivery gate and entry point to site	perpendicular	4 x 2	0.09	0.09	0.10	0.936	0.830
2	Walkaway	perpendicular	128 x 128	4.13	1.01	28	0.246	0.037
3	North 2nd Entrance	perpendicular	128 x 128	42	11	203	0.250	0.052
4	Final exit	perpendicular	4 x 16	2.13	0.60	7.14	0.282	0.084
5	Walkway East facade	perpendicular	128 x 32	7.66	0.39	73	0.051	0.005
6	Back walkaway	perpendicular	128 x 64	0.06	0.04	0.13	0.676	0.287
7	Broadland 24 Vertical Surface	perpendicular	4 x 4	0.08	0.07	0.09	0.926	0.826
8	Broadland 22 Vertical Surface	perpendicular	4 x 8	0.07	0.06	0.13	0.811	0.458

Summary of Results

Type	Quantity	Average [lx]	Min [lx]	Max [lx]	u0	E _{min} / E _{max}
perpendicular	8	0.91	0.04	203	0.04	0.00

4309-Highgate school Mallinson Sports Centre

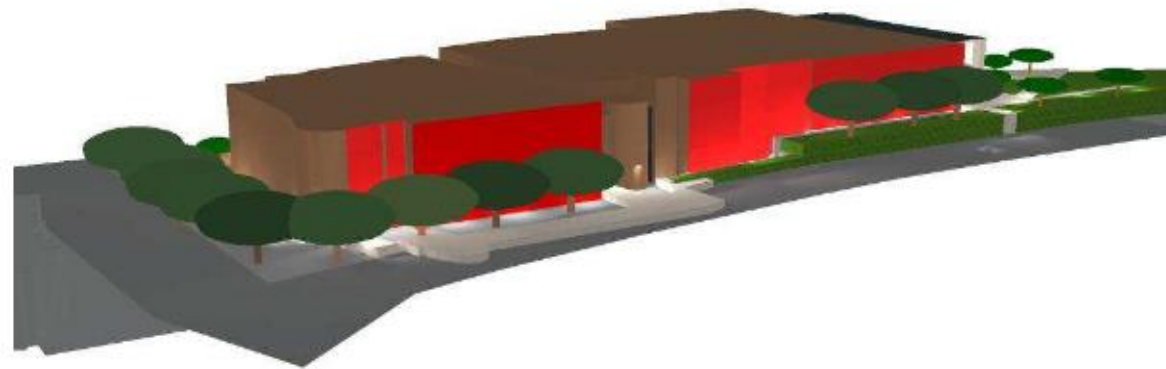
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Highgate school Mallinson Sports Centre / 3D Rendering



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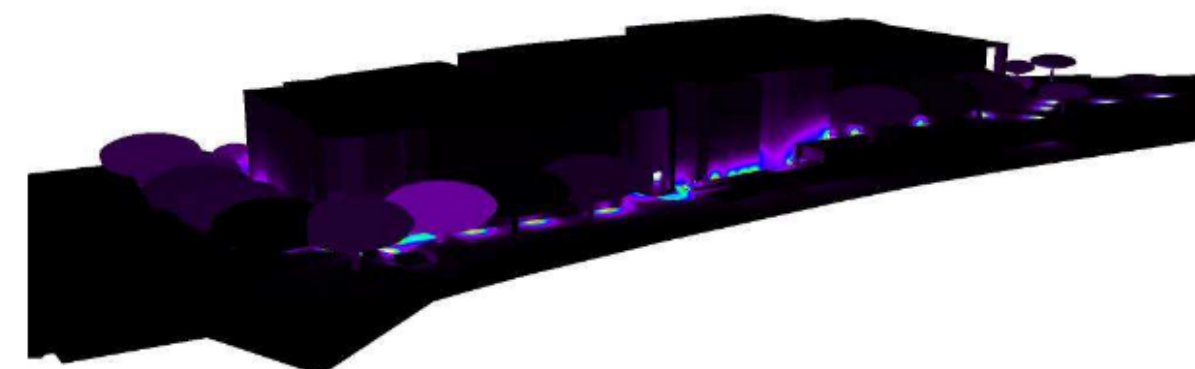
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Highgate school Mallinson Sports Centre / False Colour Rendering



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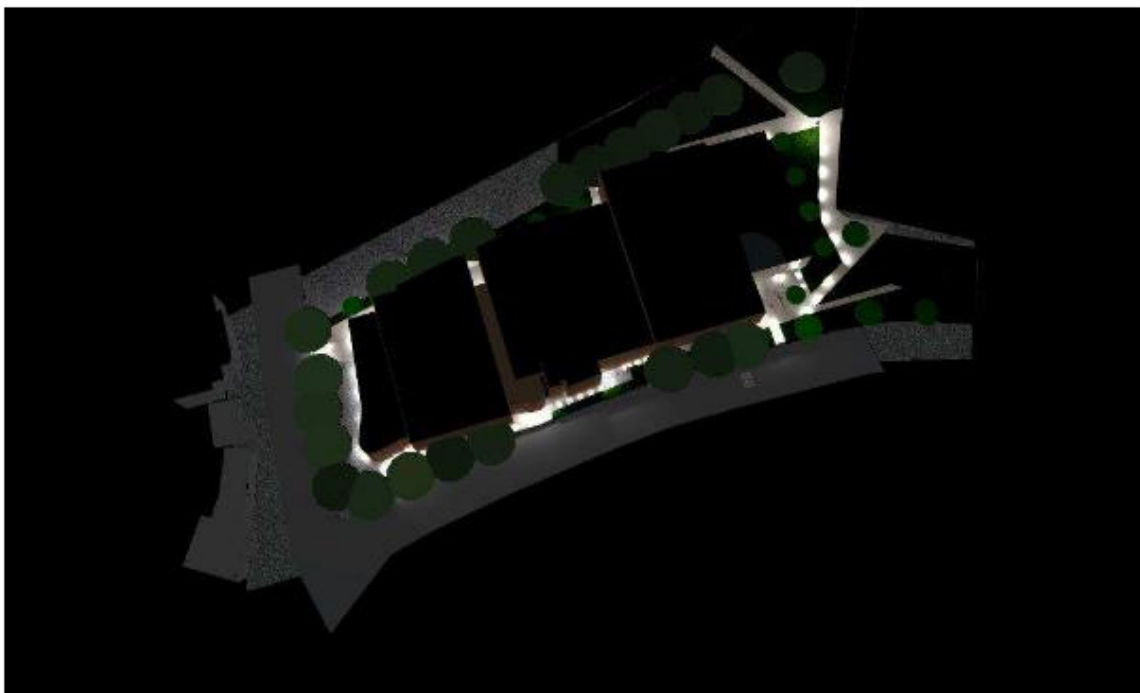
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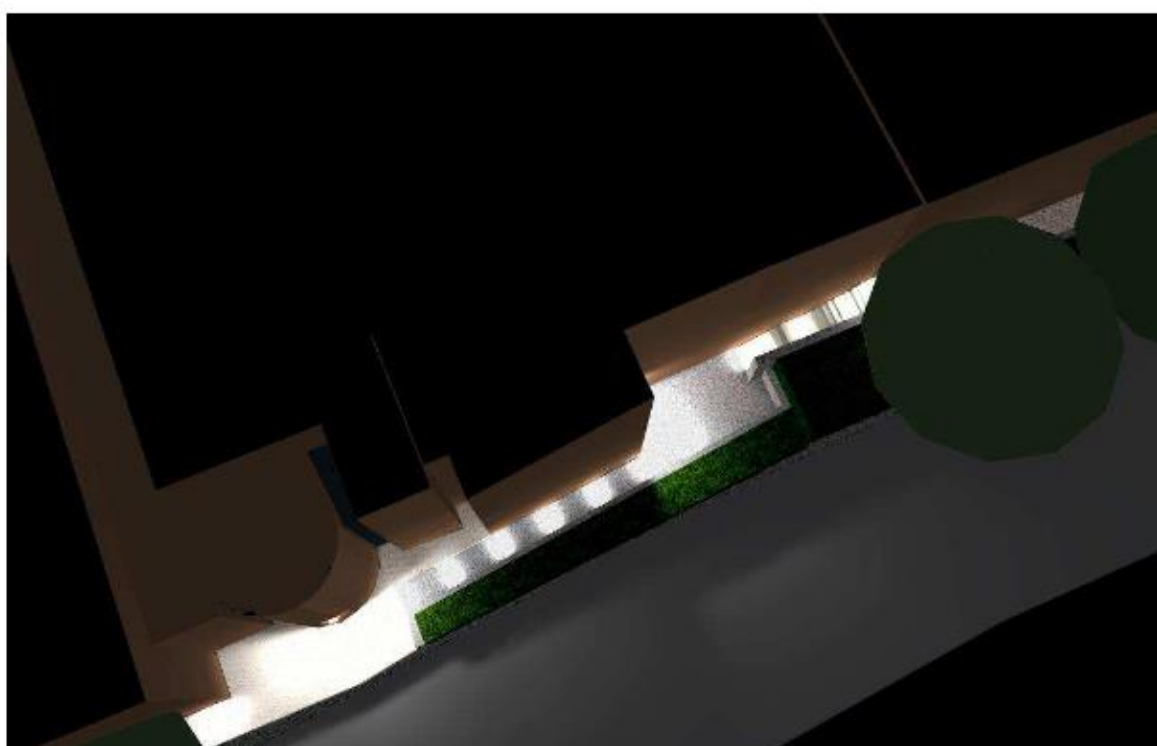
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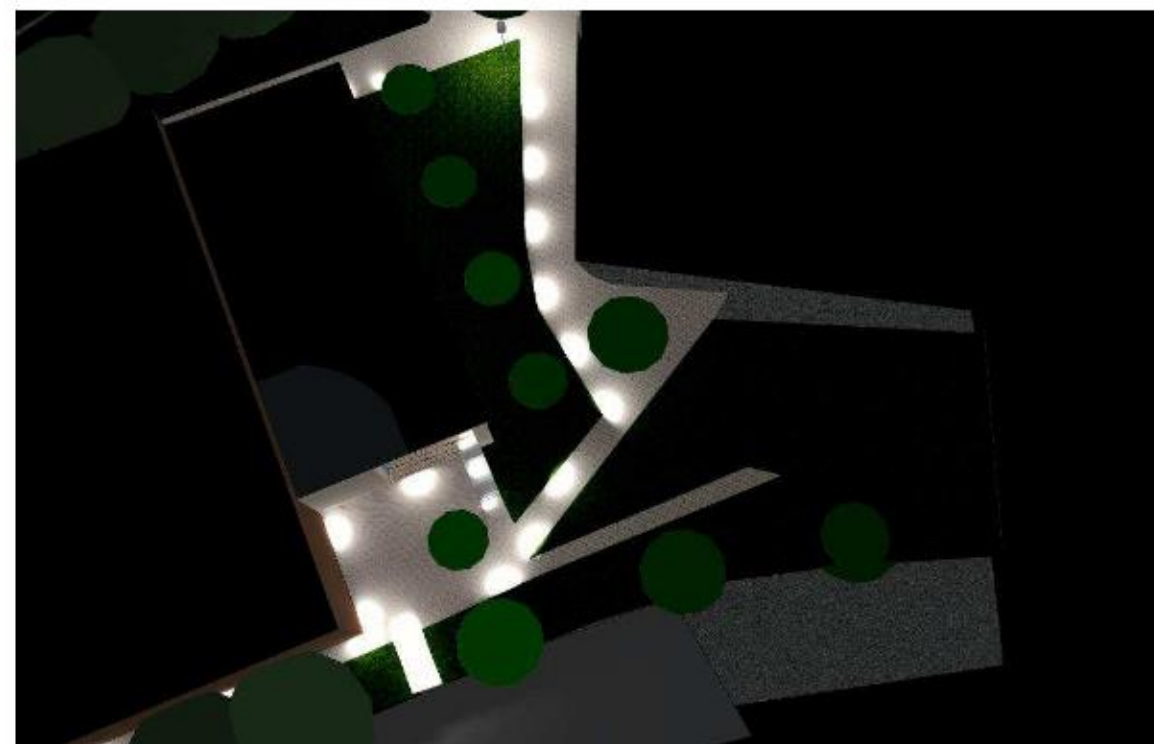
Highgate school Mallinson Sports Centre / Bird view



Highgate school Mallinson Sports Centre / West ramp and stairs



Highgate school Mallinson Sports Centre / South-West view



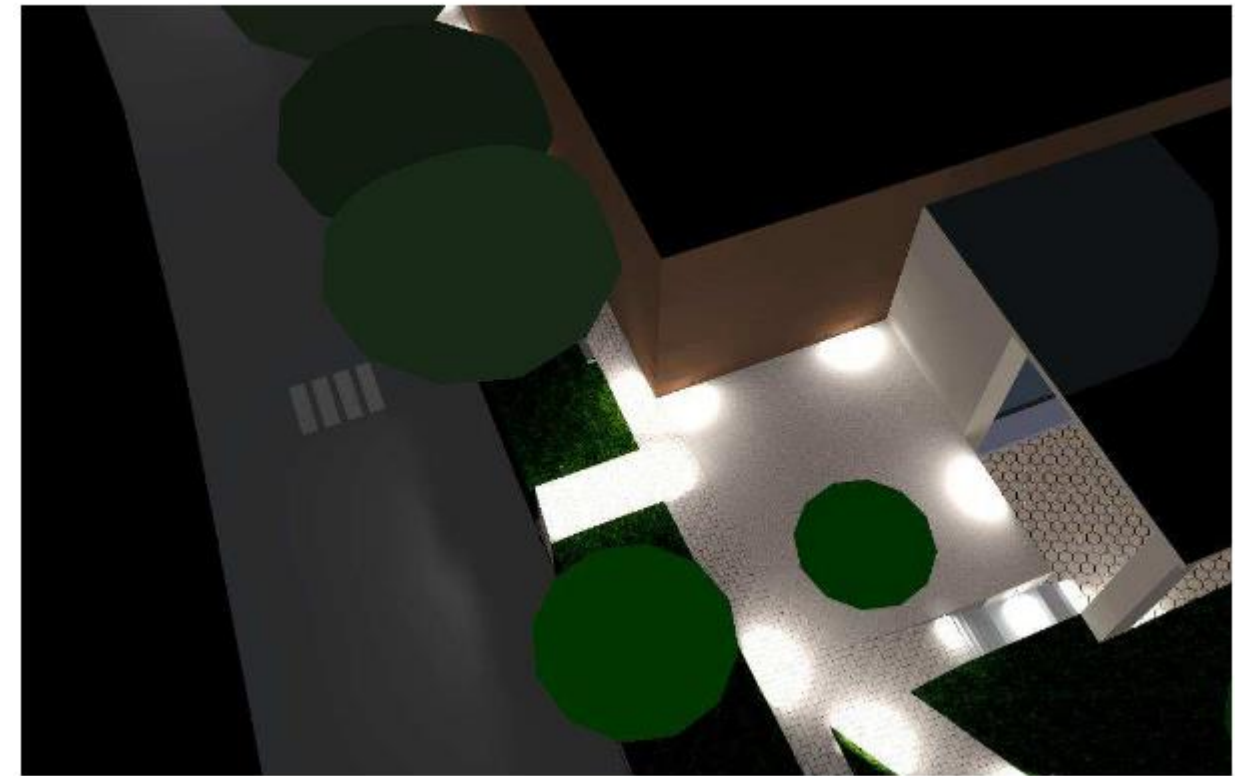
Highgate school Mallinson Sports Centre / North-West view



Highgate school Mallinson Sports Centre / South - East view



Highgate school Mallinson Sports Centre / Puplic entrance



Highgate school Mallinson Sports Centre / South view



4309-Highgate school Mallinson Sports Centre

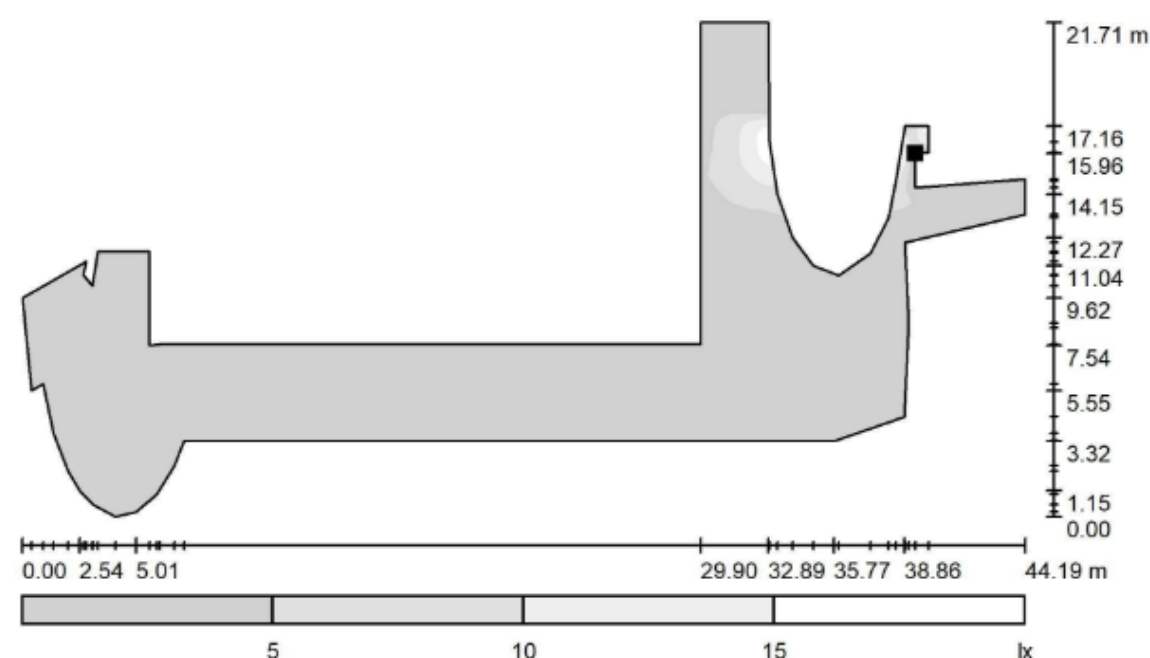
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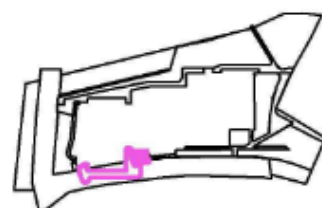
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Highgate school Mallinson Sports Centre / Walkway around the building 2 / Surface 1 / Greyscale (E)



Position of surface in external scene:
Marked point:
(501.274 m, 132.344 m, 0.900 m)



Scale 1 : 316

Grid: 128 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$	E_{min} / E_{max}
0.99	0.07	21	0.068	0.003

4309-Highgate school Mallinson Sports Centre

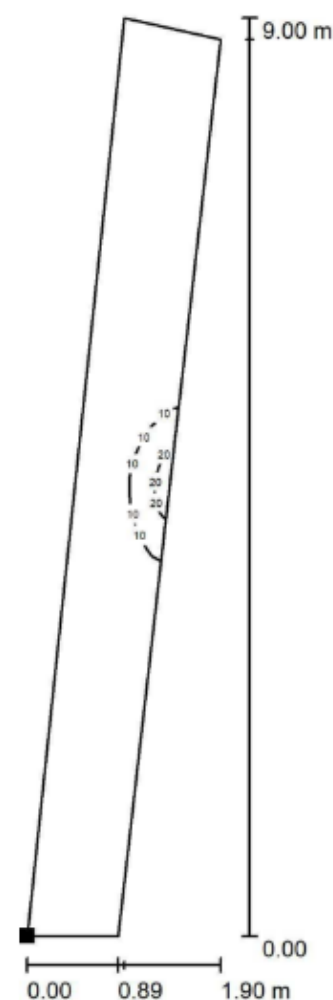
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Highgate school Mallinson Sports Centre / Walkaway / Isolines (E, Perpendicular)



4309-Highgate school Mallinson Sports Centre

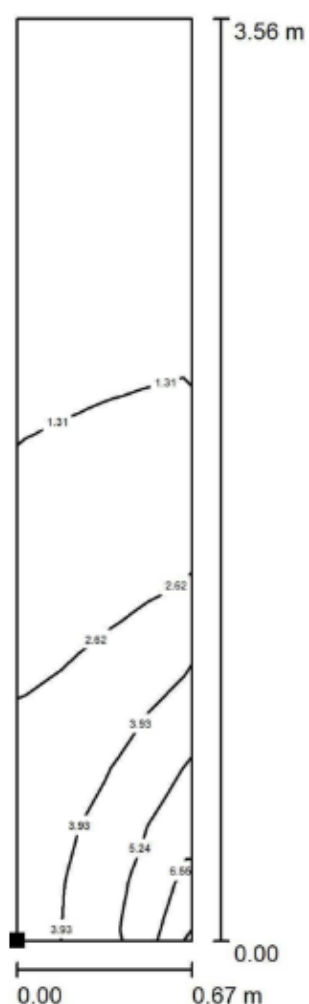
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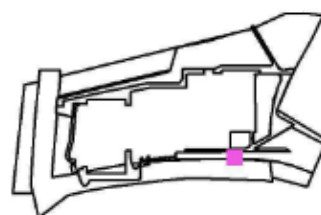
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Highgate school Mallinson Sports Centre / Final exit / Isolines (E, Perpendicular)



Position of surface in external scene:
Marked point:
(559.464 m, 133.622 m, 2.900 m)



Values in Lux, Scale 1 : 28

Grid: 4 x 16 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$	E_{min} / E_{max}
2.13	0.60	7.14	0.282	0.084

4309-Highgate school Mallinson Sports Centre

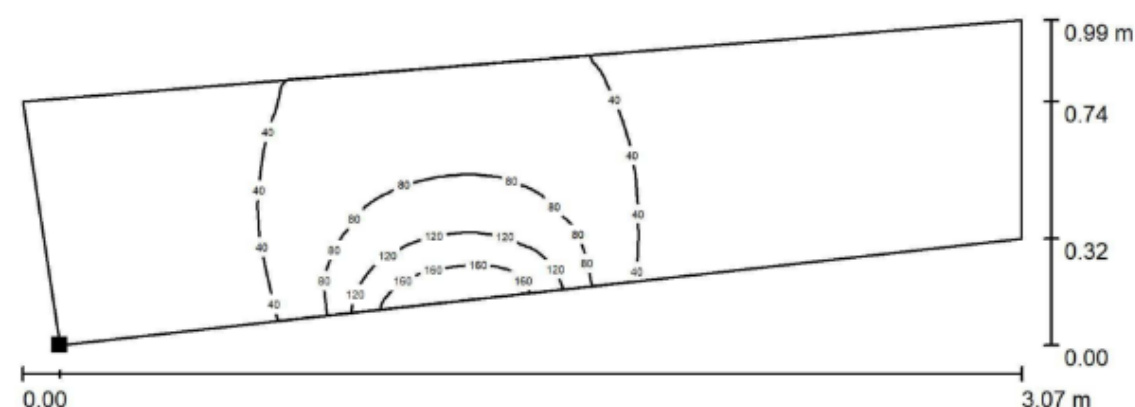
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Peter Deer & Associates

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London, N3 1QG

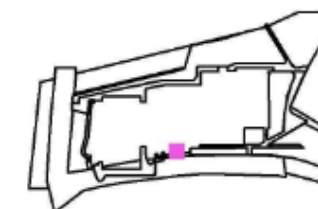
Operator M. Rezvan
Telephone 0203 232 00800
Fax
e-Mail mohammad.r@pd-a.co.uk

Highgate school Mallinson Sports Centre / North 2nd Entrance / Isolines (E, Perpendicular)



Values in Lux, Scale 1 : 22

Position of surface in external scene:
Marked point:
(514.651 m, 134.764 m, 0.300 m)



Grid: 128 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$	E_{min} / E_{max}
42	11	203	0.250	0.052

4309-Highgate school Mallinson Sports Centre

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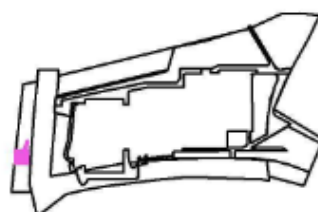
Operator M. Rezvan
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Highgate school Mallinson Sports Centre / Broadland 24 Vertical Surface / Isolines (E, Perpendicular)



Values in Lux, Scale 1 : 72

Position of surface in external scene:
Marked point:
(428.196 m, 133.365 m, 6.000 m)



Grid: 4 x 4 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$	E_{min} / E_{max}
0.08	0.07	0.09	0.926	0.826

4309-Highgate school Mallinson Sports Centre

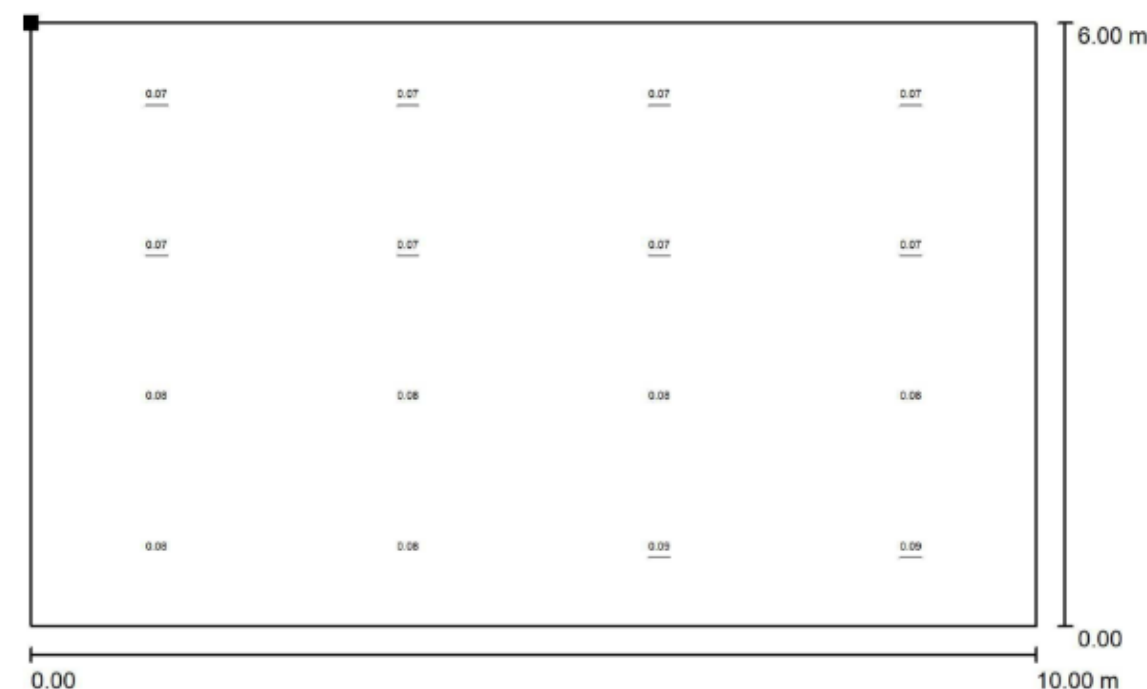
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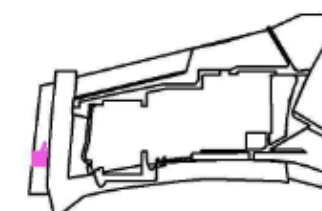
Operator M. Rezvan
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Highgate school Mallinson Sports Centre / Broadland 24 Vertical Surface / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 72

Position of surface in external scene:
Marked point:
(428.196 m, 133.365 m, 6.000 m)



Grid: 4 x 4 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$	E_{min} / E_{max}
0.08	0.07	0.09	0.926	0.826

4309-Highgate school Mallinson Sports Centre

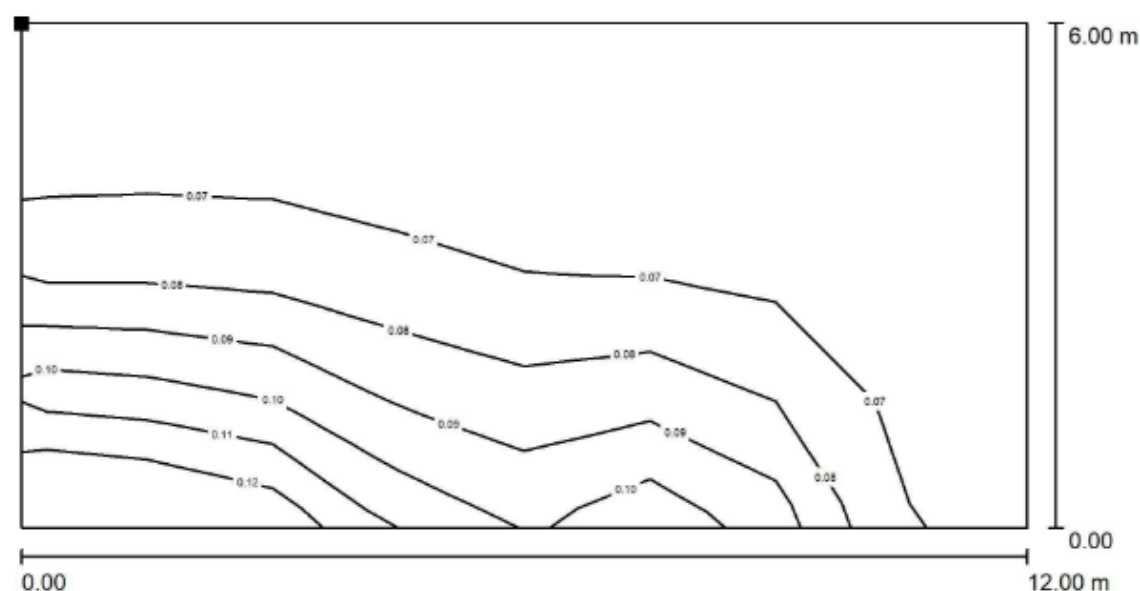
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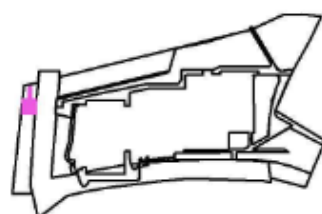
Operator M. Rezvan
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Highgate school Mallinson Sports Centre / Broadland 22 Vertical Surface / Isolines (E, Perpendicular)



Values in Lux, Scale 1 : 86

Position of surface in external scene:
Marked point:
(432.486 m, 165.246 m, 6.000 m)



Grid: 4 x 8 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$	E_{min} / E_{max}
0.07	0.06	0.13	0.811	0.458

4309-Highgate school Mallinson Sports Centre

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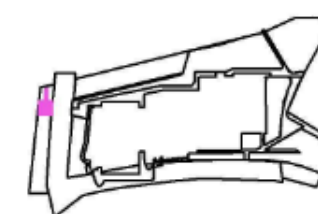
Operator M. Rezvan
Telephone 0203 232 00800
Fax
e-Mail mohammad.r@pd-a.co.uk

Highgate school Mallinson Sports Centre / Broadland 22 Vertical Surface / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 86

Position of surface in external scene:
Marked point:
(432.486 m, 165.246 m, 6.000 m)



Grid: 4 x 8 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$	E_{min} / E_{max}
0.07	0.06	0.13	0.811	0.458

4309-Highgate school Mallinson Sports Centre

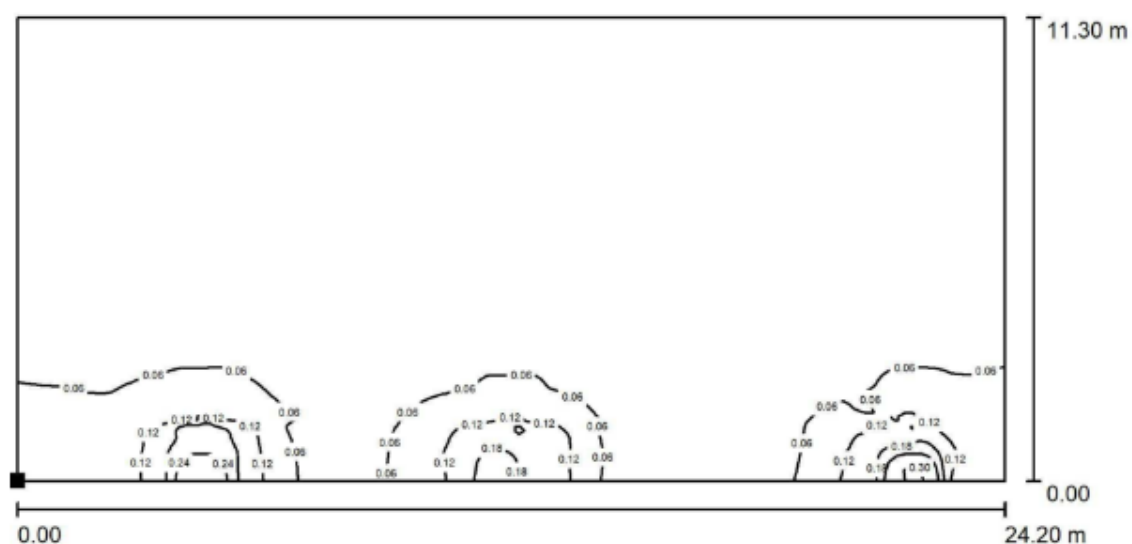
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Highgate school Mallinson Sports Centre / Proposed sport hall / Bishopwood Elevation / Isolines (L)



Values in Candela/m², Scale 1 : 174

Position of surface in external scene:
Marked point:
(467.623 m, 132.205 m, 0.000 m)



Grid: 128 x 128 Points

L_{av} [cd/m²]
0.03

L_{min} [cd/m²]
0.00

L_{max} [cd/m²]
0.31

4309-Highgate school Mallinson Sports Centre

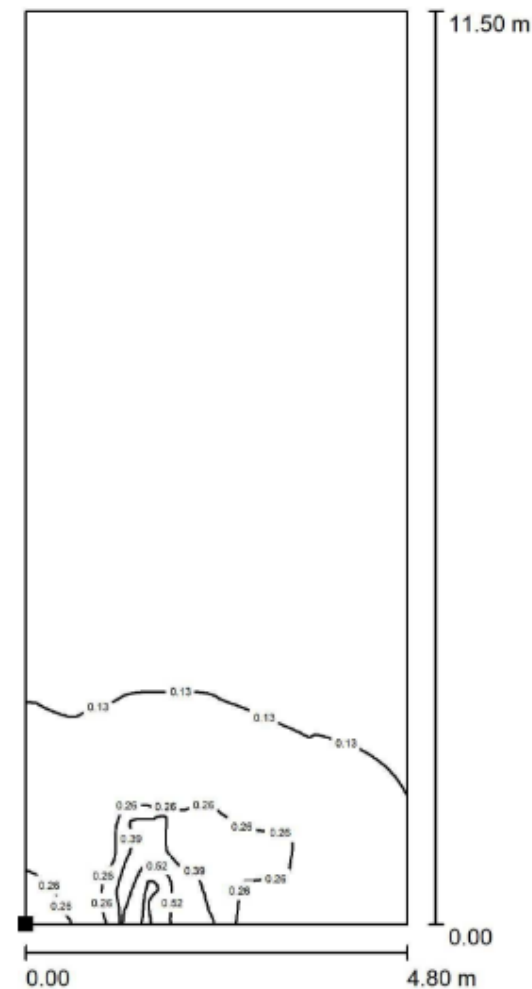
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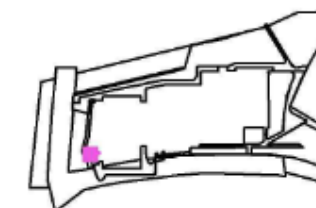
Operator M. Rezvan
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e-Mail mohammad.r@pd-a.co.uk

Highgate school Mallinson Sports Centre / Proposed classrooms, offices, stores / Bishopwood Elevation / Isolines (L)



Values in Candela/m², Scale 1 : 90

Position of surface in external scene:
Marked point:
(460.103 m, 132.577 m, 0.000 m)



Grid: 128 x 128 Points

L_{av} [cd/m²]
0.09

L_{min} [cd/m²]
0.03

L_{max} [cd/m²]
0.67

4309-Highgate school Mallinson Sports Centre

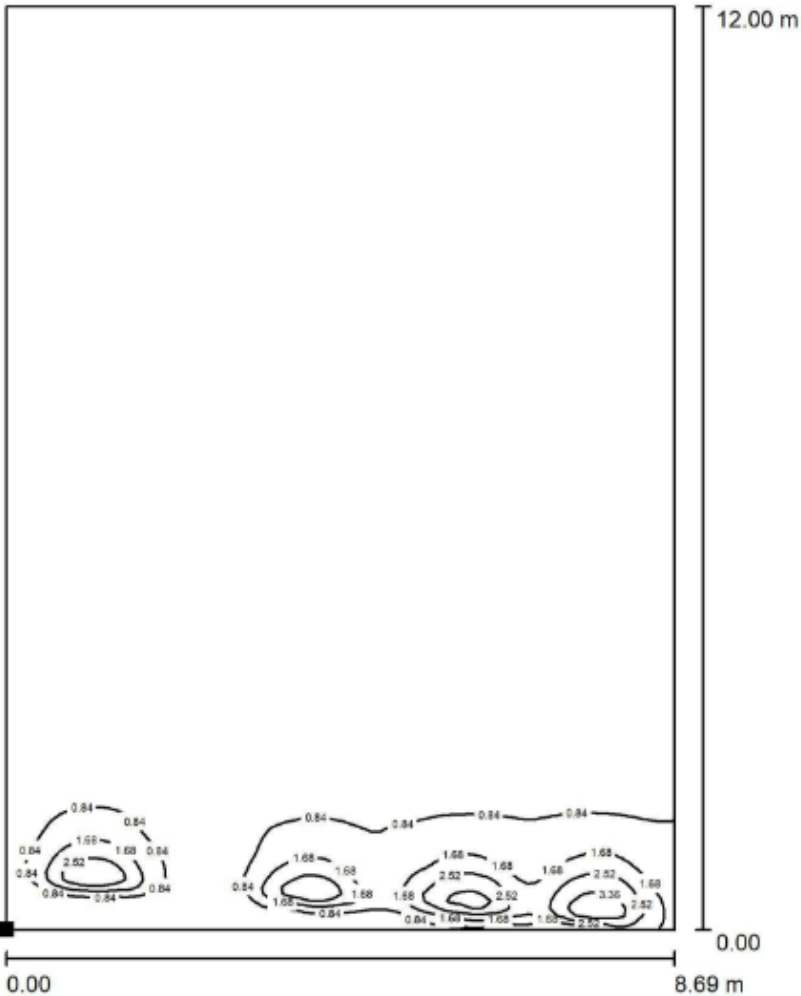
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Peter Deer & Associates

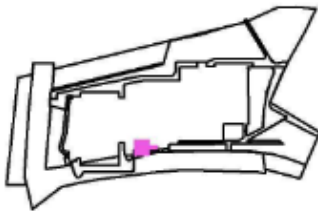
405 Nether Street
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e-Mail mohammad.r@pd-a.co.uk

Highgate school Mallinson Sports Centre / Proposed secondary entrance, studio /
Bishopwood Elevation / Isolines (L)



Position of surface in external scene:
Marked point:
(506.116 m, 134.582 m, 0.000 m)



Values in Candela/m², Scale 1 : 94

Grid: 128 x 128 Points

L_{av} [cd/m²]
0.24

L_{min} [cd/m²]
0.02

L_{max} [cd/m²]
4.20

Light Up

Design IGuzzini IGuzzini

Last information update: March 2025

Product configuration: E111+X197.04

E111: Recessed floor luminaire Earth D=144 mm - Warm White - Spot Optic
X197.04: Plastic casing for installation on floors + end cap - Black



Product code

E111: Recessed floor luminaire Earth D=144 mm - Warm White - Spot Optic

Technical description

Recessed luminaire applicable to the floor or ground, designed for fitting monochrome white LED sources, for illumination, fixed optic, with incorporated electronic control gear. The round frame has a diameter D=144 mm; the body and frame are made of AISI 304 stainless steel with sodium-calcium extra clear glass, thickness 12mm. Stainless steel body coated with black paint. The luminaire is fixed to the outer casing by means of two TORX-type screws that ensure proper anchoring. Inclusive of LED circuit, methacrylate lens and black plastic cover. The product is wired using an A2 stainless steel cable gland, with type-H07RNF 2x1 mm² outgoing power cable (L=1200 mm). The cable is equipped with an anti-transpiration device (IP68) consisting of a silicone seal placed on the power cable and housed inside the product. The outer casing for installation can be ordered separately from the plastic optical assembly. The assembly made up of the frame, optical assembly and outer casing guarantees 5000 kg resistance to static loads. Maximum glass surface temperature is lower than 40°C.

Installation

The product is secured to the outer casing by means of two TORX-type screws. The luminaire can be installed recessed, floor-standing, using an outer casing or on the ground.

Colour

Steel (13)

Weight (Kg)

1.63

Mounting

Floor recessed|ground recessed

Wiring

Product inclusive of 220-240 VAC electronic control gear

Notes

IP68 protection rating for both the product and the power cable using IP68 connectors * The product is not deemed suitable for installation in pools and fountains. Overvoltage protection: 2KV Common mode, 1KV differenzial mode

Complies with EN60598-1 and pertinent regulations



withstand a static load of up to 50000 N and to resist drive-over stress by vehicles with tires. The fixtures cannot be used in lanes subjected to horizontal stresses due to acceleration, braking and / or changes of direction.

Accessory code

X197.04: Plastic casing for installation on floors + end cap - Black

Technical description

Made of plastic (polypropylene). Inclusive of front cap with system for extracting the cables and double cable entry.

Installation

Floor-standing (concrete)

Colour

Black (04)

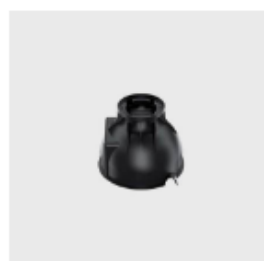
Weight (Kg)

0.88

Mounting

ground surface|Floor recessed|ground recessed

Complies with EN60598-1 and pertinent regulations



BEGA

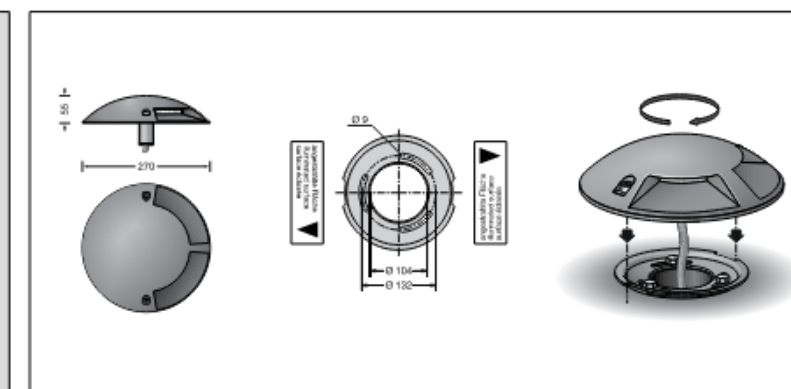
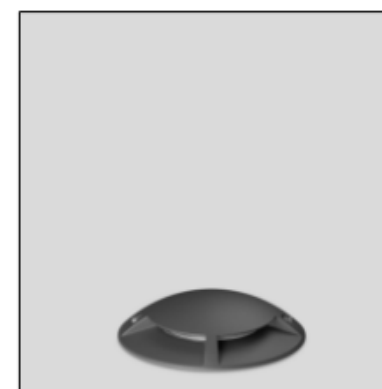
77 089

On-ground luminaire

10 IP 67

Project - Reference number

Date



Product data sheet

Product description

Luminaire made of aluminium alloy and stainless steel
BEGA Tricoat® coating technology
Borosilicate glass
Silicone gasket
Luminaire with mounting plate for bolting onto a foundation or onto a connecting housing
Mounting plate made of stainless steel
Steel grade number 1.4301
3 fixing holes ø 9 mm
Angle 120° · Pitch circle ø 132 mm
1,8 m water-resistant connecting cable
07RN8-F 3 G 1[□] with implemented water stopper and 1.2 m PVC cable conduit
BEGA Ultimate Driver®
LED power supply unit
220-240 V ~ 0/50-60 Hz
DC 176-264 V
Safety class I
Protection class IP 67
Dust-tight and protection against temporary immersion
Pressure load 1,000 kg (~10 kN)
Impact strength IK10
Protection against mechanical impacts < 20 joule
Maximum surface temperature 25 °C (measured according to EN 60598 of ta 15 °C)
CE – Safety mark
CE – Conformity mark
Weight: 2.9 kg
This product contains light sources of energy efficiency class(es) G

Application

On-ground luminaire with half-sided light sector.
Drive-over luminaire for vehicles with pneumatic tyres.
For the various requirements at the installation site, we offer a connection housing as a accessory.
The luminaires can thus be installed on unpaved surfaces.
Please note:
Luminaire must not be used for installation in road lanes, where the fixture is exposed to a horizontal strain due to braking, acceleration and change of direction.

Lamp

Module connected wattage 5.9 W
Luminaire connected wattage 7 W
Rated temperature ta = 25 °C
Ambient temperature ta_max = 50 °C

77 089 K27

Module designation LED-0258/827
Colour temperature 2700 K
Colour rendering index CRI > 80
Module luminous flux 870 lm
Luminaire luminous flux 176 lm
Luminaire luminous efficiency 25,1 lm/W

77 089 K3

Module designation LED-0258/830
Colour temperature 3000 K
Colour rendering index CRI > 80
Module luminous flux 875 lm
Luminaire luminous flux 177 lm
Luminaire luminous efficiency 25,3 lm/W

77 089 K4

Module designation LED-0258/840
Colour temperature 4000 K
Colour rendering index CRI > 80
Module luminous flux 930 lm
Luminaire luminous flux 188 lm
Luminaire luminous efficiency 26,9 lm/W

Light distribution



Service life · Ambient temperature

Rated temperature ta = 25 °C
LED psu: > 50,000 h
LED module: > 200,000 h (L.80 B.50)
100,000 h (L.90 B.50)
Ambient temperature max. ta = 50 °C (100 %)
LED psu: 50,000 h
LED module: > 200,000 h (L.80 B.50)
100,000 h (L.90 B.50)

Inrush current

Inrush current: 11.3 A / 112 µs
Maximum number of luminaires of this type per miniature circuit breaker:

B 10 A: 34 luminaires
B 16 A: 55 luminaires
C 10 A: 57 luminaires
C 16 A: 92 luminaires

Lighting technology

Luminaire data for the DIALux lighting design program for outdoor lighting, street lighting and indoor lighting, as well as luminaire data in EULUMDAT and IES format are available on the BEGA website at www.bega.com.

BEGA Tricoat®

BEGA Tricoat® is a protected trademark for a technology that we use in order to achieve optimal corrosion resistance. These carefully coordinated inorganic and organic coating processes applied to extremely resistant alloys ensure the best possible surface protection and outstanding corrosion resistance.

Accessories

71 246 Connection housing made of galvanised steel
Total length 225 mm
70 730 Distribution box with 7 cable entries
Connection terminals 5 x 4[□]

For the accessories a separate instructions for use can be provided upon request.

Article No. 77 089

LED colour temperature optionally 2700 K, 3000 K or 4000 K
2700 K – Article number + **K27**
3000 K – Article number + **K3**
4000 K – Article number + **K4**

