



Winners Chapel

External Lighting Assessment

October 2024

Document Revision Control

Revisions	Date	Reason for Issue	By	Approved
P01	28.10.2024	Preliminary Issue	LR	IC
P02	12.11.2024	Updated To Suit New Site Boundary	LR	IC

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1.0 Introduction

This is an external lighting assessment to support a full planning application, submitted by Winners Chapel International, which proposes the construction of Winners Chapel, Blackley, M9 6GN.

There will be a new two-storey development, which is a place of worship, including offices, functional rooms and car parking spaces following demolition of existing buildings.

The site boundary is identified by the red line in Figure 1 below:



Figure 1 - Site Boundary

The external lighting scheme covers all external areas of the site; however, some areas are currently in abeyance, requiring input from the landscape architect. Figure 2 below highlights the areas that have been designed for currently, and the areas that require additional design. Also shown in this figure is the location of the LV switch room, where the external lighting shall be fed from.



Figure 2 – Breakdown of External Areas

The Lighting Assessment describes the approach to the external lighting and how it will be designed to provide security and amenity whilst limiting nuisance and impact on nature. The report outlines the design criteria and strategies to achieve this, giving consideration towards mitigating the negative impacts of external lighting, in particular towards glare and light spill, light pollution and impacts on the natural environment.

2.0 Lighting Requirements & Strategy

To coincide with the above policies, the external lighting at Winners Chapel will be provided to satisfy the following documents:

- BS EN 12464-2:2014 - Light and Lighting – Lighting of work places: Outdoor work places (2014)
- BS EN 5489-1:2020: Code of Practice – Lighting of roads and public amenity areas (2020)
- CIBSE Lighting Guide 06: The Outdoor Environment (2016)
- GN01/21: Guidance Notes for the Reduction of Obtrusive Light (2021) Institute of Lighting Professionals (ILP)
- CIE 150: Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations: 2017

GN01/21 identifies issues that can arise from artificial lighting if not properly controlled. Consideration must be given to the three components of obtrusive light:

- 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. This is mostly 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 which is to be lit. This is also known as ‘spill’ or ‘trespass’ and may cause nuisance or disturbance to sensitive receptors.

The types of obtrusive light are identified in Figure 3 below.

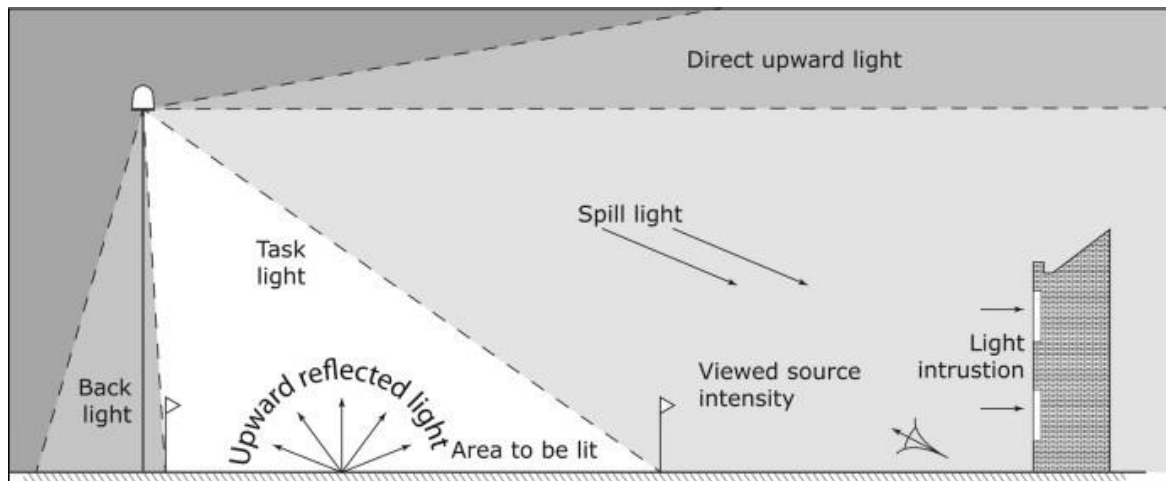


Figure 3 - Types of Obtrusive Light

The choice of luminaire with the correct optical distribution at the correct mounting height is critical to minimising light spill and obtrusive light effects, while providing the right lighting performance on the task area.

The following tables are taken from the ILP document, and offer guidance on the reasonable constraints for external lighting installations in a range of different environmental zones. **Due to the site being located over 0.5 miles from Blackley's main street, it would appear to fit in category E2.**

Table 1 - Environmental Lighting 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

Table 2 - Maximum Values of Vertical Illuminance on Premises

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

Table 3 - Maximum Values of Upward Light Ratio (ULR) of Luminaires

Light technical parameter	Environmental zones				
	E0	E1	E2	E3	E4
Upward light ratio (ULR) / %	0	0	2.5	5	15

Proposed Lighting Strategy

The Lighting Strategy has been prepared to meet the following standards and guidance documents and to ensure the criteria outlined in The Institution of Lighting Professionals: Guidance Notes for the Reduction of Obtrusive Light, 2011 are achieved.

- BS EN 5489-1:2020 Code of Practice for the design of road lighting – Part 1: Lighting of roads and public amenity areas
- BS EN 12464-2:2014 - Light and Lighting – Lighting of work places: Outdoor work places (2014)

Operational lighting is required for the proposed scheme to allow safe use of the development once it is occupied. The Lighting Strategy has been developed specifically to illuminate pedestrian and vehicle access routes, and public amenity spaces while avoiding obtrusive light to other areas of the site. All external lighting will be provided with timer and photocell lighting control in order to energy saving and mitigate the negative impacts on the natural environment.

Luminaires to be used throughout the site will be a mixture of building mounted luminaires and column-mounted floodlights.

When selecting the external luminaires, care should be taken to select appropriate IP rated LED fittings, with limited upwards light output, to reduce the impact on the surrounding areas. The fittings chosen should also reflect the wattages and lumen output of the fittings used in the lighting calculations to maintain safe lux levels and uniformity, in line with the relevant guidance.

3.0 Design Criteria/Guidance

The Lighting Strategy provides a location plan for the luminaires throughout the site and a summary of the lux levels across the site.

Figure 4 indicates the desired lux levels in each external area of the site.



Figure 4 – Minimum Lux Levels in External Spaces

Figures for the above hatched areas are taken from the building standards referenced on the previous page. It should be noted that the red hatching at the main entrance to the building is yet to be confirmed in terms of its lux level. This is an architectural decision, which will result in levels higher than the minimum requirements.

Table 4 provides a breakdown of the fittings used in each area, and the target / actual values achieved. It is expected that equal or approved fittings shall be selected based on the type, wattage, lumen output, IP rating, and optical distribution of the fittings used for calculations.

Table 4: Fittings & Calculation Breakdown

Area	Fitting Name	Fitting Output (Watts/Lumens)	Fitting Type	Average Lx (Target/Actual)	Uniformity U ₀ (Target/Actual)
Access Road	Schreder Axia 3.1 Olson Square Giant	31W/4976 lumens	Floodlight	7.5/7.75	0.25/0.26
Main Car Parking	Schreder Axia 3.2 Olson Square Giant	44W/7760 lumens	Floodlight	10/10.38	0.25/0.23
Overflow Car Parking	Schreder Axia 3.2 Olson Square Giant	44W/7760 lumens	Floodlight	10/10.1	0.25/0.38
Residential Parking	Schreder Axia 3.2 Olson Square Giant	44W/7760 lumens	Floodlight	10/12.6	0.25/0.57
Building Exterior Path	Schreder Indu Wall Pack	15W/2198 lumens	Wall Light	5/7.8	0.25/0.29
Main Entrance	Under developing, which shall comply with the requirements specified in this report			10	0.4
Garden Footpath				5	0.25

Almost all areas are shown to surpass the target levels with the fittings used in the lighting calculation, with exception of the car parking areas, which drop slightly in terms of uniformity. This discrepancy can be seen as negligible as the measuring area used to obtain this figure is incredibly large, and a 0.02 difference will not have an impact on safety in that area.

Vertical illuminance has been calculated incident on the existing care home, north of the proposed site area, which returned an average of 0.2 lux, well below the post-curfew limit of 1 lux, shown in Table 2.

It should also be noted that the fittings suggested to light the roads and car parks are at a 0° tilt angle, and DarkSky approved, meaning that glare, light spill and general upwards light pollution are very strictly controlled.

Appendix A

Full Site – Proposed Lighting Layout

For the site-wide lighting drawing, see drawing number:

312730-HAH-XX-00-D-E-09610