



The Abbey

The independent school for girls aged 3-18.

THE ABBEY JUNIOR SCHOOL EXTENSION

EXTERNAL LIGHTING REPORT

**Houghton Greenlees
& Associates Ltd.**

Consulting Building Services Engineers

Established 1963



HGA/6313/ES/PW/EXTLR

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The Abbey, Junior School Extension
External Lighting Report

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1 Introduction

This report has been produced to accompany the design drawings and design software output document for the proposed external lighting design in the carpark & rear extension at The Abbey Junior School, 30 Christchurch Road, Reading, Berkshire, RG2 7AR.

Please note, modelling output results are as shown on the accompanying drawings 6313/ES/400 & 6313/ES/401 and the design software output document.

2 Site Details

The proposed site is located in an urban location surrounded by domestic dwellings and a hotel. The site has two adjacent to two storey dwellings.

The site will comprise of an extension to the front of the school building including a new car park arrangement and a new rear extension for a studio.

The client has requested an external lighting scheme to the car park and rear extension for safe guarding reasons.

3 Proposed Photometric Requirements

The car park lighting design has been completed with to provide illuminance requirements as set out in the Society for Light & Lighting Code for Lighting and BS EN 12464-2. The table below sets out the requirements for each area.

Area	Illuminance (at ground level)	Uniformity	GR	Ra
Pedestrian path	5	0.25	50	20
Vehicle road & car parking	10	0.40	50	20

Due to the nature of the local area with regard to adjacent properties and environmental area, 4000K (white) luminaries have been specified. Back light shields will be employed for luminaries to reduce spillage and reflectance from building surfaces where necessary.

4 Proposed installation

The proposed installation comprises of the below listed luminaire types.

- Column mounted LED luminaires mounted a 4m above ground level in the car park area
- Recessed LED luminaires to underside of front entrance canopy
- Building mounted LED luminaires mounted at 3m above ground level on the rear extension studio room
- Surface mounted LED luminaire to underside of studio entrance canopy

Please see accompanying drawings for further details of the luminaires.

4.1 Lighting Control

Control of the external lighting will be by dusk till dawn photo cell and time clock. The lighting will be operated as described below. Lights will operate only on week days.

Period	Lights On	Lights Off
End of day	Dusk	1930
Start of day	0700	Dawn

The external lighting may intermittently be operated at outside of these times for maintenance, security and evening event purposes.

5 Obtrusive light

The proposal is to provide limits on obtrusive lighting in line with guidance provided by the Institution of Lighting Professionals (ILP) for an environmental zone E3, this is due to the nature of the site surroundings. The ILP guidance provides limits as detailed in the following table.

An E3 zone is defined by the ILP as a zone of medium district brightness and is described as small town centre or urban location.

It is assumed that the external lighting will only operate before curfew and as such the pre-curfew values are applied. Post-curfew values are included for reference.

Zone	Sky glow ULR [Max %]	Light trespass (into windows) Ev [Lux]		Source Intensity I [kcd]		Building Luminance Pre-Curfew, Average L [cd/m²]
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	
E1	0	2	0	2.5	0	0
E2	2.5	5	1	7.5	0.5	5
E3	5.0	10	2	10	1.0	10
E4	15.0	25	5	25	2.5	25

Sky glow ULR is the metric used to describe upward light output from the luminaires as a percentage of the total output of the luminaire. The selected luminaires do not have any upward light output (ULR) and will be directed to illuminate the ground only. The value of upward light output is available on the design software output.

The ILP suggest that the maximum light trespass into windows Ev, which is the maximum vertical illuminance on the window measured in Lux, should be no greater than 10 Lux. For this assessment Ev has been be modelled at 1.5m above ground level for ground floor windows. The maximum values are confirmed on the accompanying drawings and at both heights the levels are well within the ILP requirements, the maximum result being 0.71 Lux.

The ILP suggest that a maximum visible luminaire source intensity i.e. glare, should be less than 10 kcd. The maximum modelled luminaire source intensity is 0.081 kcd.

The ILP suggest that the maximum average luminance of the building surface should not exceed 10 cd/m². The maximum value modelled is 1.19cd/m² suggesting the proposals are acceptable.

The LED luminaires provide a Correlated Colour Temperature of 4000K and is defined as white. The lamps provide a Colour Render Index of Ra of 70 or better.

6 Summary

The proposed external lighting has been modelled to comply with the Institution of Lighting Professionals guidance for the limits of obtrusive light.

Modelling data and results are detailed on the accompanying drawing no.'s 6313/ES/400 & 6313/ES/401 and the design software output demonstrate obtrusive light levels to be within the ILP requirements for an E3 zone.

Although the local area suggests the scheme must comply with the E3 zone requirements. The scheme pre-curfew actually complies with E1 zone requirements.