Technical Note

Project:	**Plasyfelin Primary School**	Job No:	60741299
Subject:	**External Lighting Strategy**	Rev:	**P01**
Prepared By:	**Ayanfe Olorunfemi**	Date:	**06/12/2024**
Checked By:	**Siân Lewis**	Date:	**06/12/2024**
Approved By:	**David Buick**	Date:	**06/12/2024**

Scope

External lighting will be provided to all entrance areas, car parks, paths and courtyards to suit the architectural requirements of the development. The external lighting design will provide a secure environment for both road and pedestrian traffic, whilst endeavouring to see that any nuisance effects on adjacent areas is minimised in accordance with current best practice standards and guidance. The scheme will, as far as reasonably practicable, be designed to complement the architectural design philosophy. The luminaires will be selected to meet the architectural requirements of the building and to respect the sensitivities of the surrounding environment.

Design Criteria

The external lighting will be designed in accordance with the Society for Light and Lighting (SLL) Lighting Guide 6 (LG6) for the exterior environment, and will fulfil the categories of amenity, safety and security. The lighting will be provided to enhance the security of the building with minimised impact on the surrounding environment and, wherever possible, the design will satisfy the lighting level requirements indicated in Table 1.

Table 1. Design Criteria Summary Table

Area	Average Illuminance Level E_m (lx)	Uniformity U_0	Standard and Guidance Reference
Pedestrian Walkways	5	0.25	BSEN 12464-2:2014, Ref 5.1.1
Loading and Unloading Areas	50	0.40	BSEN 12464-2:2014, Ref 5.1.4
Car Park	20	0.25	BSEN 12464-2:2014, Ref 5.9.3
Pedestrian Crossing	50	0.40	BSEN 12464-2:2014, Ref 5.1.4
Junction	50	0.40	BSEN 12464-2:2014, Ref 5.1.4
Tree Zone	5	0.25	BSEN 12464-2:2014, Ref 5.1.1

ILP Guidance Notes for the Reduction of Obtrusive Light (2021) [1] has been considered and subject to the Caerphilly County Borough Council confirming the environmental zone classification for the exterior lighting, it is considered that category E3 is applicable, i.e. middle district brightness areas such as suburban residential locations. The lighting design requirements will therefore have regard to the obtrusive light limitations for light trespass (into windows), source intensity (glare) and sky glow upward light ratio for an E3 Environmental Zone, in order to safeguard the sensitivities of the surrounding natural and built environment. This is to minimise the effect of installed lighting on ecological receptors and on the night-time setting and landscape.

Recommended illuminance levels will be achieved by selection of particular luminaire, lamp source and optical control.

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Design Considerations

Car Park Areas & Access Roads (on site)

The external lighting to the proposed car park and on-site access road will provide both road and pedestrian traffic with a secure environment, allowing the areas to be safely used during the hours of darkness. The lighting will be provided using LED lamps in decorative post top luminaires designed to minimise upward light pollution.

Columns will be 3.5m to 5m height and where deemed necessary luminaires will be fitted with accessories such as hoods, cowls, louvres, or shields to direct light to intended areas only'.[2]

Street lighting to adopted roads will be designed to meet Caerphilly County Borough Council highway authority requirements and appropriate British Standard guidance including BS 5489-1:2013 and BS EN 13201:2015 Road Lighting.

Lighting will be directed to the areas intended to be illuminated during the night-time period and light spillage towards the site boundaries will be minimised. This will be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields, as noted above, to direct the light to the intended area only. Such directional lighting must work to minimise lighting of the boundary of the site and any additional areas of ecological significance. In addition, key landscape features or additional planting could be used as a barrier. Alternatively, manmade features that are required within the build can be positioned to act as a screening feature.

Pedestrian Walkways & Footways

Where required, pedestrian walkways and footways will be illuminated by wall mounted lanterns providing good vertical illumination. Low level columns, bollards, approximately 1m high' will be used where risk of vandalism is low. Either wall mounted or low-level bollard lighting will be designed to provide good directional illumination, achieving an average illuminance level of 5 lx at ground level.

All external wall mounted luminaires will be positioned to avoid stray light entering the building, adjacent properties and unlit areas of the application site. Consideration will also be given to locating luminaires away from trees to avoid disturbing flickering and the impact on any ecological receptors, particularly roosting and foraging bat species.

Wall mounted luminaires local to final exits will be fitted with emergency lighting facilities.

Main Entrance

Enhanced accent lighting will be provided at the main entrance area to the school, as the detailed design of the entrance canopy is developed accordingly to enhance the features.

Wall and canopy mounted decorative luminaires are to be used to emphasise the building entrance features. These luminaires will be LED providing good colour rendering. If construction permits, recessed style luminaires could be considered.

External Stores

Cycle stores and external bin stores shall also be provided with lighting in accordance with BREEAM. Where possible, the lighting to the cycle stores shall be provided by adjacent columns to minimise the additional lighting requirements. If the correct lighting level is not achievable by these means, LED bulkheads shall be provided to ensure safe access and the security of the stored bicycles.

Lighting Control

Controls for the external lighting shall include:

- A Photo-cell to ensure the lights cannot be switched on in daylight
- A time clock to automatically switch off the lights at set time

The multi-channel time-clock shall be of the 7-day, multi-programmable, digital type allowing a minimum of two ‘On’ and two ‘Off’ positions. It will also be provided with automated British summertime and daylight saving adjustment. The time-clock will be set to limit “hours of use” in accordance with BREEAM requirements.

The control systems will also be provided with dedicated override switches and Building Management System (BMS) control links.

The final requirements of integrated operational control will be defined with the authority during the detailed design stage.

Signage

Suitable directional luminaires fitted with appropriate accessories to avoid light spillage will be used to highlight the building mounted signs.

Where possible, road lighting will be planned to light any signage as well as the road. Localised lighting will only be used when the road lighting is deemed inadequate for the purpose.

Secure By Design

External lighting is an important element in the secure by design strategy which is being developed in parallel and will inform the extent of the security lighting.

A fully operational CCTV system will be provided to serve the site. The CCTV system shall operate under the recommendations of the Secure By Design strategy, the Local Building Control Officer, the Data Protection Act and the specific requirements of the Client.

All external cameras will either be either be fixed directly to the building fabric or mounted on suitable columns with vandal resistant covers. The positioning of the CCTV cameras will be determined during the detailed design stage of the project.

Movement sensors will be aimed carefully to reduce the amount of time a light is on each night. This will be achieved in a system where the light unit and the movement sensor are able to be separately aimed. Any security lighting should be aimed to illuminate only the immediate area required by using as sharp a downward angle as possible. This will assist in avoiding any unnecessary light spill onto adjacent unlit areas and habitat utilised by foraging and bat species

Design Development

At this preliminary stage of the project the above outline proposals are considered suitable. However, an element of flexibility is essential to suit general design development. Hence, it is anticipated that revised proposals will evolve, and this document may need to be revised accordingly.

References

[1] Institution of Lighting Professionals (ILE) Guidance Notes for the Reduction of Obtrusive Light (2021)

[2] Bats & Lighting in The UK; Bats and the Built Environment