



Dunsbury Park, Plot 3
External Lighting Assessment

Document Ref: DHF-BMD-Z3-XX-RP-E-48700

23/02/2018

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Report Title: External Lighting Assessment

CLIENT: BAM Construction

PROJECT: Dunsbury Park, Plot 3

Contract no: 0SE 4847

Job no: 4330 Z3

Document Ref: DHF-BMD-Z3-XX-RP-E-48700

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Date: 23/02/2018

Status: S2 - Information

Amendments				
Ref.	Date	Amendment	Amended by	Checked by
P01	23/02/18	Planning Issue	J McNicholas	N Neill

EXTERNAL LIGHTING ASSESSMENT

Design strategy

The external lighting design strategy is intended to achieve the required illumination levels in compliance with the following design guides:-

- BS EN 12464-2:2011 - Lighting of Workplaces – Outdoor Work Places
- Lighting guide LG6 2016 – The exterior environment
- BS 5489-1 2013 – Code of practice for the design of road lighting
- Institution of lighting professionals – Guidance notes for the reduction of obtrusive light

In addition, due to the presence of bats within the vicinity of the site, the lighting design has also been carefully considered to take account of guidance relating to external lighting and its potential impact on bats. This includes the following:-

- BCT Interim Guidance: Artificial lighting and wildlife
- Bats & Lighting – Overview of current evidence and mitigation – Bats & lighting research project – Bristol University
- Bat conservation trust – Artificial lighting and wildlife

The above guidance provides clear recommendations on limiting the effect of external lighting on the local bat population, this has been addressed within the proposed external lighting design and includes adherence to the following key recommendations

- Use of narrow spectrum light sources
- Use of light sources that emit minimal ultraviolet light
- Avoiding white and blue wavelengths of the light spectrum - in order to manage the short wave length content lighting they should be a warm/neutral colour temperature of <4200 Kelvin
- Limit the times that lights are on to provide some dark periods

All external lighting proposed for the development will utilise LED technology – this is a key feature of addressing the criteria given above as LED light utilises narrow spectrum light sources and in conjunction with carefully selected luminaires produces a directional light source limiting light spill. In addition LED lighting does not emit ultraviolet light.

All lighting employed on the development will have a lamp colour of 4000 kelvin.

Overview of Lighting Design

External lighting will be provided to the perimeter of the buildings, the car parks, pedestrian footpaths and the service yard.

The lighting guides referred to above give recommended maintained lighting levels and consideration has been given to the recommendations in these documents.

To comply with artificial lighting and wildlife guides the design aims to avoid installing lighting in ecologically sensitive areas whilst maintaining lighting levels and uniformity.

Street lighting will be provided to the common access road but this element is under a separate contract.

Design

The recommended lighting levels for the areas listed above are achieved using LED luminaires. These have been selected with regard to energy efficiency and colour rendering/temperature for security purposes and being more wildlife friendly. A detailed design has been completed, in conjunction with a lighting manufacturer to provide the external lighting proposals.

Car Parks

The car parking areas will be illuminated by LED luminaires mounted on 6 metre high columns. An average illumination level of 10 lux is proposed throughout these areas.

Service and Staff Car Park

The Service and Staff Car Park Area will be illuminated by LED luminaires mounted on 6 metre high columns and building mounted at 3m. An average illumination level of 20 lux is proposed throughout these areas.

Service Yard and Entrance Road

The Service Yard and Entrance Road will be illuminated by LED luminaires mounted on 6 metre high columns and building mounted at 8m. An average illumination level of 20 lux is proposed throughout these areas.

Building Perimeter Footpath Lighting

The perimeter footpath will be illuminated by building mounted LED luminaires mounted at approximately 3 metres from ground level.

These luminaires will provide lighting for safe egress from the vicinity of the building and emergency luminaires will be provided at all entrances to the building and fire exit routes.

Emergency luminaires will comprise self-contained non-maintained emergency lighting battery/inverters to provide emergency lighting in the event of a power failure for safe egress.

Controls

All external lighting will be controlled via time clocks to limit the period when external lighting can operate and photocells to ensure lighting operates only in hours of darkness. The Time clocks will control the electrical supply and photocells will switch luminaires on and off by sensing ambient natural light.

Time clocks will initially be set to switch off at 22:00 hours and reset at 07:00 hours but will be programmable to provide lighting to meet the tenants requirements. A manual override switch will be provided to override the time clock if required for short periods of out-of-hours use. It is highly likely that the service yard lighting will require longer operating hours than this.

Metering

External lighting will be metered separately for energy monitoring and to meet the requirements of Approved Document Part L2A.

External Lighting Drawings

This report is to be read in conjunction with the following drawing which indicates the proposed external lighting layout and calculated illumination levels;

- PP115-2800-03 – External Lighting (Holophane Lighting)

Proposed Luminaires

Refer to the above external lighting drawings for luminaire reference types.

Calculation Results

Calculation results are shown on the accompanying drawing which indicates that the proposed lighting levels for the areas listed above will be achieved using the luminaires detailed.

The results confirm that the luminaires selected assist in achieving minimal obtrusive light within the parameters issued by the Institution of Lighting Professionals, ie;

- The extent to which the installation illuminates the surrounding area to 1 Lux or above is indicated as an isoline (gradient type line) on the accompanying drawing which doesn't interact with any other buildings. It does interact with trees on the East elevation but this is at ground level so a vertical measurement plane is included to indicate the extent of this light spill, which is below the tree canopy.
- The upward light ratio of the installation is 0.33 which is obviously well within the 5% limit for an E3/ suburban environmental zone.

In terms of energy efficiency the luminaires selected meet the BREEAM requirements as follows;

- LED lanterns mounted on 3 and 5 metre high columns achieve a minimum of 99 luminaire lumens per circuit Watt, exceeding the 60 required.
- Wall mounted LED luminaires achieve 96 luminaire lumens per circuit Watt, also exceeding the 60 required.