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Client: FESP

Project: JOHNSTOWN ESTATE – HOTEL EXTENSION

Title: SITE LIGHTING REPORT

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1 INTRODUCTION

PMEP Consulting were commissioned by FESP, to assist with the planning submission for the hotel extension at the Johnstown Estate, Enfield, Co Meath.

This site lighting report has been prepared to accompany an application for the proposed development at the Johnstown Estate, Enfield, Co Meath.

- Construction of 3 storey extension to the rear of the existing hotel comprising 90 no. guest bedrooms with an area of plant at roof level of the extension;
- Creation of ope in rear façade of the existing hotel at ground floor level with the omission of one existing guest bedroom to allow for a new single-storey connection to the extension;
- The development also includes all other associated engineering works, landscaping, and ancillary works necessary to facilitate the development.

No works are proposed to the protected structure.

DESIGN CONSIDERATIONS

1.1 Usage

When designing the proposed lighting scheme for the development the following traffic classifications have only been considered and have been taken into account:

- Pedestrian Traffic

1.2 Landscaping

Co-ordination of the site lighting with the landscape design to ensure an unobtrusive addition to the local environment and to ensure the following:

- Luminaire and tree positions (where applicable) do not overlap.
- Luminaires located outside the branch width of any trees to avoid damage to the light fitting from falling branches and to avoid the need for regular trimming.
- Avoidance of obstruction to lighting by reducing the height of lighting columns.
- Lighting enhances the visual appearance of the landscape and views from hanger areas.

1.3 Lighting Design Parameters

The lighting layout was designed with the following considerations:

- Provide safe circulation & exit to and from the development.
- Ensure visibility is good for all road users and ensuring there are no dark areas.
- Co-ordination with the landscape developers to ensure light positions do not clash with tree positions, limiting light obstruction and associated future maintenance costs.
- Reduction in the height of lighting columns and tilt angles of luminaires where possible to reduce sky glow.
- Reduction in the height of lighting columns and utilising hinged columns in areas difficult to reach to assist with future maintenance.
- Using flat glass diffusers in the light fitting to reduce light spill.

- Low energy lighting - luminaires identified as Energy Efficient (as listed by Sustainable Energy Authority of Ireland).
- High colour rendering index to assist occupants and visitors with their ability to render colours and assist with signage identification.
- A sufficiently high S/P ratio in the luminaires used to assist both traffic and pedestrians with Photopic and Scotopic vision for security and safety and to assist with the identification of both moving and static objects at night.
- Maintaining adequate lighting on the pedestrian path to ensure pedestrian safety.
- Ensuring minimal upward light pollution from the site through design and suitable equipment use.
- Using LED lamp sources

2 SITE LIGHTING

2.1 Introduction

Consideration will be given to the impact and potential effect of site lighting to the overall development, in addition to its impact on the immediate surrounding environment.



Figure 1: Aerial view of the Application Site (Source. www.google.maps.ie)

2.2 Environmental Zone

The site is located in an area/environmental zone definable as E3 from table 1. below and as shown in Fig.1.

E3 environmental zones are defined as, being located in a Suburban area of medium district brightness. For the development to fit into the area from the perspective of site illumination, consideration will be given to the impact of site lighting and lighting types and the impact the choice of lighting will have on how well the development fits into its surrounding environment and environmental zone.

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty (AONB)
E2	Rural	Low district brightness	Village or relatively dark outer suburban
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night time activity

Table 1. Environmental Zone
(CIBSE Lighting Guide 6 Reduction of Obtrusive Light)

2.3 Dark Sky Parks

As per CIBSE Lighting Guide 06, in areas of outstanding natural beauty and nocturnal habitats, all light pollution is to be limited and the associated impact of streetlighting contribution to the effects of skyglow to be mitigated. This will be done on this site through passive design techniques relating to siting of streetlights and tilt angles of installed streetlighting to reduce sky glow and light trespass.

2.4 Sky Glow & Light Trespass

Environmental Zone	Sky Glow ULR [Max %]	Light Intrusion (into house windows) E_v		Luminaire Intensity I [candelas]		Building Luminance Pre-curfew
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average L [cd/m ²]
E0	0	0	0	0	0	0
E1	0	2	0	2,500	0	0
E2	2.5	5	1	7,500	500	5
E3	5	10	2	10,000	1,000	10
E4	15	25	5	25,000	2,500	25

Table 2 Sky Glow and Light Intrusion
(CIBSE Lighting Guide 6 Reduction of Obtrusive Light)

Due to the location of the developments and its environmental zone being an E3 environmental zone, the concern of sky glow and its associated adverse effects on the ability to view the night sky will be largely mitigated through the correct choice of lighting, as follows:

- The use of uplighters will be limited to task area illumination or completely avoided.
- Streetlights to have zero degree cut off, and an upward light ratio appropriate for its environmental zone (as per Table 2) to limit the potential for upward light into the surrounding atmosphere.
- Correlated colour temperatures of LED lights will be carefully chosen to facilitate both safe & secure lighting within the development and taking into consideration for the bat wildlife.

2.5 Public Lighting Classification & Design

The lighting design is based on current CIBSE lighting guide 6 2016, IS EN 12464-2:2014 "Lighting of Outdoor Workplaces". British Standards BS 5489 2013 and EN 13201 1&2 2003.

Prior to lux level calculations being performed, we use the relevant design guidelines to determine the class of lighting required within the development. Based on the guidelines set out in the above documents, the parameters applicable to the site are set out in table 3 and table 4 below.

Table 3. indicates the lighting levels required to meet the Local County Council Public Lighting requirements in line with EN13201: 1 & 2.

Table 4. sets out the lighting levels required within the development to provide a safe working environment for staff and employees in line with IS EN 12464-2:2014 Lighting of Workplaces Outdoor Workplaces, CIBSE and Society of Light and Lighting guidelines.

Location	Lighting Class	Maintained (Eave) Lux Level	Maintained (Emin) Lux Level
Site Entrance/T-Junction	Conflict Area	20 Lux	8 Lux
Main Roads-Traffic areas for slow moving vehicles	P2	10 Lux	2 Lux
Subsidiary Roads-Traffic areas for slow moving vehicles	P4	5 Lux	1 Lux
Pedestrian & Cyclist areas	P5	3 Lux	0.6 lux

Table 3 IS EN 13201:2015. Road Lighting Performance

Location	Maintained (Eave) Lux Level	Uniformity
Walkways exclusively for pedestrians	5 lux	0.25
Parking Areas – Light traffic	5 lux	0.25
Traffic areas & roads for slow moving vehicles	10 lux	0.4
Regular vehicular traffic (max 40mph)	20 lux	0.4
Loading & Unloading areas	50 lux	0.4

Table 4 IS EN 12464-2:2014 Lighting of Workplaces. Outdoor Workplaces.

2.6 Colour Rendering

The technical performance of the LED streetlights used in the design will facilitate the ability of road users to render colours accurately by eye. This will aid the ability of drivers to correctly identify different colours and assist in ensuring potential for accidents where stop lights/stop signs cannot be rendered by colour-blind drivers, elderly drivers and visually impaired drivers are mitigated as much as this can assist with.

2.7 Lighting Classification

The existing main roads and pathways within the facility are not considered as the public lighting installation is existing.

Areas under consideration is the two pedestrian pathways as indicated on the drawings and are designed in accordance with the requirements of IS EN 12464-2:2014 for lighting class levels as outlined in Table 4.

2.8 Luminaire Selection

The main proposed lighting scheme throughout the roads and walkways within the development consists of LED bollard type. Refer to drawing F014-PMEP-00-00-DR-E-01 for Site Lighting layout.

In keeping with the Environmental Zone, impact to bat conversation and including the site location, a correlated colour temperature (CCT) will match the existing external lighting CCT to ensure compatibility of the ambient light levels achieved in the industrial development and the local lighting environment in the immediate surroundings.

All pole mounted streetlights within the industrial development have been designed with zero-degree tilt and will have zero light uplift in line with CIBSE Lighting Guide 06 and Guidance Note GN001 to limit the potential for skyglow.

The proposed luminaires for the development are as follows:

- Footpath (Bollard)

LED Bollard light – Nobile Italia Slim Bollard at a height of 900mm – 10.5W, LED (as shown on F014-PMEP-00-00-DR-E-01), 4000K Correlated Colour Temperature, with a CRI of greater than 70.



Figure 2.:TBC - LED Bollard streetlight

The proposed bollard luminaire is selected for the following reasons;

- Provides low level lighting;
- Minimises upward light spill;
- Use of low voltage LED lamps;
- Consistent aesthetics to existing bollard luminaires installed within the grounds.

2.9 Obstruction Aviation lighting

Not required.

3 LIGHTING LAYOUT

Each light fitting will be controlled via an Photoelectric Control Unit (PECU) to facilitate automatic switch on/off during dusk/dawn hours.

Fig. 3 indicates the proposed lighting layout (refer to dwg F014-PMEP-00-00-DR-E-01).



4 CONCLUSION

The proposed lighting installation for the development meets the following requirements:

- Luminaire selection eliminates upward light spill.
- Potential light trespass onto adjoining properties negligible and within best practice levels.
- Lighting scheme achieves the recommended lux levels in accordance with current regulations and standards.
- Lighting scheme achieves the recommended minimum lux levels in accordance with recommended and lighting guides for bat conservation purposes.
- Good light uniformity in accordance with current regulations and standards throughout the development to ensure good visibility at night.

- Co-ordination with the landscaping will ensure light positions do not clash with tree positions (where applicable), limiting light obstruction and future associated maintenance costs.
- Utilisation of existing colour correlated temperature LED luminaires in the road and circulation routes to enhance security and visibility for both disability and general vehicular drivers.

5 REFERENCE INFORMATION

Codes and Standards;

Calculations performed and results produced in this document are in accordance with the following relevant codes, guidelines and standards;

- Meath County Council Public Lighting Guidance Document
- I.S. EN 12464-2:2014
- EN IS 13201-1: 2015; Guidelines on Selection of Lighting Classes.
- EN IS 13201-2:2015 "Road lighting Performance Requirements".
- EN IS 13201-3:2015 "Road Lighting: Calculation of Performance".
- BS 5489 – 1 2003 A1 2008
- BS 5489 – 1 2003 A2 2008
- BS 5489 – 1 2013
- CIBSE Lighting Guide 6 2016 – The Exterior Environment
- GN001 – Guidance Note on Avoidance of Light Pollution.
- Bats & Lighting - Guidance Notes for: Planners, engineers, architects and Developers, December 2010