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ELECTRICAL BUILDING SERVICES
STREET/AREA/FLOOD LIGHTING (EXTERNAL)
STATEMENT REPORT
FOR
THE ORACLE, READING – HOUSE OF FRASER
(HOF) RECONFIGURATION

REV S2-P03



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REVISION

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1.0 INTRODUCTION

Rolton Group have been appointed to prepare an external lighting statement report to support the current project planning submission for the proposed House of Fraser (HOF) redevelopment at The Oracle, Reading.

The purpose of external lighting design for the proposed retail development is:

- To provide feature façade lighting to the glazed portals, highlighting entrances to the new retail unit(s) along the Riverside façade.
- To minimise light overspill into adjacent areas.
- Meet the requirements of external lighting standards.
- To minimise impact on biodiversity.

This report shall detail in accordance with Reading Borough Council guidance:

- An appraisal of the need for lighting;
- The proposed hours of use and means of controlling usage times; and
- An assessment of potential impact of proposed lighting on the amenity of nearby properties, upon roads/ highway safety, waterway or any sensitive biodiversity, heritage and character of the area on or close to the site (where relevant), and how any such impacts may be mitigated.
- A layout drawing showing:
 - The location of lighting fixtures,
 - A schedule of the equipment,
 - Isolux level plans (plan of lighting illuminance and distribution levels).

2.0 PLANNING POLICY & DESIGN STANDARDS

2.1 PLANNING POLICY

2.1.1 National Policy

From a national perspective, the National Planning Policy Framework (NPPF) and the Ministry of Housing, Communities & Local Government Planning Practice Guidance embody the requirements which all planning applications must consider. With regards to external artificial lighting the NPPF¹ states:

"Planning policies and decisions should also ensure that the new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as potential sensitivity of the site or the wider area to impact as that could arise from the development. In doing so they should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

Planning Practice Guidance on light pollution² describes four key criteria when completing an artificial external lighting assessment:

- Where the light shines,
- When the light shines,
- How much the light shines,
- What is the possible ecological impact.

In order for the local authority to assess a development against the above criteria, the Planning Practice Guidance points to guidance set out by Defra in the Statutory Nuisance from Insects and Artificial Light - sections 101 to 103 of the Clean Neighbourhoods and Environment Act, 2005.

Defra describes that exterior artificial lighting shall be designed using best practicable means to avoid or limit nuisance to nearby residents and the environment. The guidance states:

"Efficient and high-quality lighting installations that help people to see where they are going and bring security to both themselves and their property can be designed so as to produce minimal impact on the environment. The management and maintenance of such lighting that limits both glare and dark shadows is also essential for people with visual impairment... Lighting systems should be adequate for purpose, and not in excess of that requirement, so that impact is minimal whilst remaining compatible with the use and function of the facilities."

To incorporate the best practicable means, the following design measures are to be met where applicable in accordance with the guidance:

- The minimum level of illumination necessary to light a property should be used.
- Timers adjusted to the minimum to reduce the operation of the lighting, with a curfew time of 23.00 suggested.

¹ National Planning Policy Framework Section 15: Conserving and Enhancing the Natural Environment, paragraph 180, 2018.

² Ministry of Housing, Communities & Local Government Planning Practice Guidance on Light Pollution, 2014.

2.1.2 Local Policy

On a local level, Reading Borough Council Policy is described in the recently adopted Reading Borough Local Plan.

The Reading Borough Local Plan sets out the following requirements in terms of external lighting:

- Development will not cause a significant detrimental impact to the living environment of existing or new residential properties, in terms of artificial lighting.
- In considering illumination levels, the levels of illumination set out by the Institute of Lighting Engineers will be applied as maxima for public safety reasons. Lower levels may be sought on a case-by-case basis to protect visual amenity.
- In some circumstances, particularly where listed buildings and conservation areas are concerned, illumination levels may need to be reduced, although this will be determined on a case-by-case basis. The general preference in most cases is for advertisements to be illuminated externally, e.g. through spotlight, rather than internally.
- Shopfronts, individual features of shopfronts and cash machines will respect the character of the building on which they are located and their surroundings, as well as the wider street, in terms of design, colours, materials, lighting, and location. Features that positively contribute to the character of the building and street will be retained and, where possible, restored. Safety and security will be maintained and enhanced.

2.2 DESIGN STANDARDS

In order to comply with the best practicable means as stated in section 2.1, the following guidance and design standards shall be adhered to:

- CIBSE Lighting Guide 6: The Exterior Environment
- BS 5489 - Part 1 - Lighting of Roads and Public Amenity Areas
- BREEAM Credit Ene 03: External Lighting

2.2.1 CIBSE and British Standards

The applicable CIBSE standard for external lighting requirements are covered in CIBSE Lighting Guide 6.

The applicable British Standard for car park external lighting requirements is BS5489:

The Exterior Environment (2016). The general guidance shall be followed where applicable to the design.

The table below shows general requirements for outdoor areas:

Table 1: Lighting for Working in Outdoor Areas (Excerpt from BS EN 12464-2:2014)

Ref.	Type of area, task or activity	E _m [lux]	U _o	R _{GL}	R _a
5.1.1	Walkways exclusively for pedestrians	5	0.25	50	20
5.1.2	Traffic areas for slowly moving vehicles (max. 10 km/h), e.g. bicycles, trucks and excavators	10	0.40	50	20
5.1.3	Regular vehicle traffic (max. 40 km/h)	20	0.40	45	20
5.1.4	Pedestrian passage, vehicle turning, loading and unloading points	50	0.40	50	20

Note: E_m – Maintained illuminance
U_o – Minimum illuminance uniformity
R_a – Authenticated colour rendering index
R_{GL} – Glare Rating

The proposed feature lighting is not intended for area/amenity lighting. As such, the above requirements do not apply to this scheme.

2.2.2 The Institute of Lighting Professionals

The Guidance Notes for the Reduction of Obtrusive Light GN01:2011 has been published by the Institute of Lighting Professionals to provide best practice guidance regarding external lighting design.

Table 2: Environmental Zones

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
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Towns/city centres with high levels of night time activity

The classification of the site into one of the above zones has been undertaken qualitatively, drawing on a desktop study and an on-site survey of the existing site, based on the descriptions above the environmental zone of the development is deemed to be E4 – Urban.

The Institute of Lighting Professionals establishes the lighting criteria in each zone as follows in Table 3, and can also be found in BS EN 12464-2³, Table 2.

Table 3: Environmental Zones

Zone	Sky Glow Upward Light Ratio [Max%]	Light Intrusion (Windows) Ev [lux]		Luminaire Intensity I [candelas]		Building Luminance
		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	5.0	10	2	10,000	1,000	10
E4	15	25	5	25,000	2,500	25

The external lighting design will therefore need to meet the maximum requirements above for E4.

2.2.3 BREEAM

Although there is currently no target for BREEAM within this project, the following criteria shall be considered.

Table 4: BREEAM Credits for External Lighting.

BREEAM Credit	Ene 03: External Lighting
Requirement	All external lighting to have a minimum efficacy of 70 lm/W and be automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.

³ BS EN 12464-2:2014 Light and lighting. Lighting of work places. Outdoor work places

3.0 BASELINE EXTERNAL LIGHTING

3.1 THE EXISTING SITE

The existing HOF retail unit is located to the South West of The Oracle, Reading.

The retail unit borders Bridge Street and Riverside, following the River Kennet. Existing external lighting is present in these area to provide street and pedestrian walkway lighting in the form of column mounted luminaires and festoon lighting.

The Riverside area of the redevelopment is populated with a number of Food & Beverage (F&B) retail units.

3.2 THE PROPOSED SITE

The HOF retail unit will be subdivided into a number of retail, leisure and F&B units. New portal frame entrances will be constructed.

The existing column and festoon lighting running around the riverside walkway past the unit shall be retained in situ and shall continue to provide the area/amenity lighting to the external of the building.

4.0 EXTERNAL LIGHTING DESIGN PROPOSAL

Based on the design requirements instructed by policy and design standards highlighted in Section 2.0, this section will address the external lighting design of the scheme and assess its performance against the relevant standard(s) where necessary.

4.1 FAÇADE FEATURE LIGHTING

4.1.1 Proposal

Façade feature lighting will comprise LED strip lighting to the internal perimeter of glazed surfaces (portal frame)/entrances.

Façade feature lighting shall be Red, Green, Blue, White (RGBW) colour changing with associated control to enable the client to change the colour of the external appearance of the building season dependant i.e. red on Valentine's Day, green for St. Patricks Day or red at Christmas for example. Controls shall be simplified touch panel control via a DALI or equivalent control protocol.

The standards listed in Section 2.0 do not give any minimum requirements for façade feature lighting. The drivers for this element are a balance between aesthetic appeal and minimising obtrusive light and glare.

An all LED solution has been proposed. This will minimise maintenance costs, energy usage and ultra violet light. The white element of the lighting will have a colour temperature of 4000k to minimise the effect to biodiversity.

At this stage, it is envisaged that the portal frame perimeter lighting will be a flexible water proof RGBW LED tape provided by LED Flex Group. The efficacy of the proposed light fittings is 11.96 lumens per circuit watt; the 4000k white element of which is 42.97 lumens per circuit watt.

Whilst this does not meet the requirement set in BREEAM Credit Ene 03 (see Section 2.2.3); given that the proposed LED tape has an extremely low power usage of just 4.18 W/m this should be considered acceptable.

Lighting shall be controlled via 24/7 365 digital programmer, photocell & override system. Times of operation shall be selected to prevent nuisance lighting during curfew hours and reduce impact on biodiversity, while allowing illuminating the building entrances during operational hours.

Light spill into the surrounding areas has been minimised as far as reasonably practicable.

For more information see the external lighting drawing of the scheme in Appendix A.

4.1.2 Calculations

The proposal as described has been calculated using lighting calculation software.

It should be noted that these calculations represent only the proposed new façade lighting, and not the existing amenity lighting along the riverside.

The resulting light levels can be summarised as follows:

Table 5: Illuminance Levels Pedestrian Precincts

Area	Average (lux)	Minimum (lux)	Maximum (lux)	Uniformity Ratio (min./average)
Pedestrian area in front of retail units	8.00	1.98	130	0.247

Table 6: Illuminance Levels (Light Spill) to Adjacent Properties

Area	Average (lux)	Minimum (lux)	Maximum (lux)	Uniformity Ratio (min./average)
Elevation of shopfronts opposite	2.71	1.95	3.47	0.719

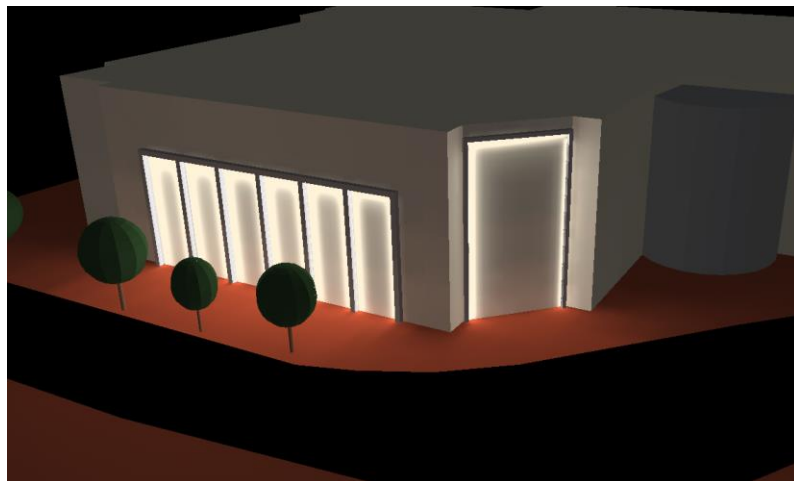


Figure 1: 3D Render

The lighting calculations to date do not allow for any dimming of the proposed luminaires. This may form part of the commissioning exercise.

The site's location within the centre of Reading indicates that this is an area of High District Brightness (E4) and as such the maximum obtrusive light to neighbouring properties is 25 lux pre-curfew and 5 lux post-curfew.

The calculations indicate that the illuminance on the neighbouring building from the proposed façade lighting is 3.47 lux; this is compliant to both the pre and post curfew levels.

4.2 EMERGENCY LIGHTING

Emergency lighting shall be provided by non-maintained fittings with battery back-up function.

Thorlux Lighting Mini 8 fittings shall be located adjacent to each final exit door excluding the customer entrances. These fittings will be emergency versions to assist with safe exit from the building in emergency conditions.

5.0 SUMMARY

This report has outlined the external lighting design for the proposed redevelopment of the HOF retail unit at The Oracle, Reading.

When assessed against the relevant design standards, as well as national and local policies the report found that the external lighting being proposed was in accordance with these standards as far as reasonably practicable.

The scheme is an all LED lamp source lighting design. The light spill outside of the site has been minimised as far as reasonably practicable.

Colour changing luminaires shall be installed to allow the landlord to change the appearance of the building depending on season or event(s) Digital programmer/lighting controls with time and photocell feature shall be utilised to reduce light outside of curfew hours.

APPENDIX A

ELECTRICAL BUILDING SERVICES DRAWING(S)

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