

THE GOAT,
14 LOWER KILMACUD ROAD,
GOATSTOWN,
DUBLIN 14.

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1919	Site Lighting Report	07	C.H	09/02/2021	S.O.B

1.0 INTRODUCTION

This report documents the approach taken by Homan O' Brien to develop an external lighting design for the proposed mixed use development at the existing Goat Bar & Grill, 14 Lower Kilmacud Road, Goatstown, Dublin 14. Homan O' Brien carried out the lighting calculations with the Dialux (4.13) lighting simulation software platform. The calculation results are then compared to figures detailed in industry design standards. Appended to the report is the proposed lighting layout drawing and proposed luminaires.



Figure 1: Goat Bar & Grill - Site Location.

The proposed Strategic Housing Development will consist of: the demolition of an existing commercial block on the site known as The Goat Centre and the removal of a number of extensions that have been added to the existing Goat Public House (total demolition c. 1,214 sq m); and the construction of a mixed use scheme comprising: 299 No. apartments (89 No. one-bedroom apartments; 202 No. two-bedroom apartments; and 8 No. three-bedroom apartments) arranged in 4 No. five to eight-storey blocks (identified as Buildings 1-4 on the architects' drawings) with a residential gross floor area of c. 29,035 sq m (including residential amenity space of c. 251 sq m) over a basement and undercroft area (c. 13,569 sq m); a 22 No. bedroom hotel (c. 1,124 sq m); 6 No. retail units (c. 680 sq m); the change of use of the 2 No. existing cottages at Nos. 240 and 242 Lower Kilmacud Road (c. 105 sq m) to a childcare facility and construction of an extension to the rear (c. 277 sq m); and the construction of an extension of c. 610 sq m to the existing public house (c. 574 sq m), on an overall site of c. 1.87 ha.

2.0 PROPOSED APPROACH

There were five key lighting design elements reviewed in advance of carrying out lighting calculations. The lighting design should conform to all standards listed below.

Design Criteria

1. Lighting Lux Levels, and uniformity on walkways
2. Light pollution on surrounding properties
3. Luminaire intensity
4. Up Light Ratio (ULR)
5. Lighting Controls

Standards

- EN 12464-2 2014 - Light and lighting. Lighting of work places. Outdoor work places
- SLL Code of Lighting 2012
- SLL Lighting Handbook 2018
- SLL Lighting Guide 6 – Exterior environment
- SLL Lighting Guide 9 – Lighting for communal residential buildings
- I.S 3217:2013
- Building Regulations Part M

2.1 DESIGN CRITERIA

The Goat Bar & Grill is classified as an 'E4' environment in accordance with IS EN 12464-2:2014. This represents high district brightness areas, such as town centres and commercial areas. The following lighting criteria must be adhered to when designing a lighting installation for an E4 environment.

Light Pollution on Surrounding Properties

- 25 lux pre-curfew (maximum value of vertical illuminance on properties)
- 5 lux post-curfew (maximum value of vertical illuminance on properties)

Luminaire Intensity (cd - candela)

- 25000 pre-curfew
- 2500 post-curfew

Upward Light (ULR %)

- 25%

General Task Lighting allows occupants navigate through the site and around building pedestrian pathways. General lighting is required during the normal operation of the building while emergency lighting is required in the case were the normal lighting operation fails due to power loss. The CIBSE lighting guides and IS EN 12464-2: 2014 recommend lighting values for external roadways & path ways.

General Lighting Values

- Walkways exclusively for pedestrians – 5 lux (Illuminance)
- Regular Vehicle traffic – 20 lux (Illuminance)
- GRI – 50 (Glare Rating)
- Ra – 20 Ra (Colour Rendering)

Lighting Controls

Lighting controls are essential for all exterior lights. A photo-electric cell (PEC) is proposed for automatic switch-on at dusk and off with time control. Presence detection may also be incorporated for safety purposes, e.g. when nobody is outside, after a set interval time, lighting reduces to a pre-determined level, e.g. 50%, but as soon as human or vehicular movement is detected, full illumination is restored.

Bat Protection

For Bat protection, the following mitigation measures have been imposed.

- All pole top luminaires to the western tree line boundary have been designed to 4 meter high, as Bats typically fly somewhere between 3 to 5m high.
- Pole top luminaires within the site are designed with hoods to minimise uplight spillage.
- Bollards lighting has been used as the primary way finding light source around blocks to offer mitigation to Bats flying somewhere between 3 to 5m high.

3.0 PROPOSED LIGHTING

Pole top lighting, bollards, handrail lighting and architectural lighting are the primary lighting types proposed throughout. The proposed luminaires are utilized to meet all the aforementioned design criteria (minimum lux levels, glare, colour rendering etc.). Lighting specification sheet can be seen in Appendix 1.



Figure 2: Bollard Luminaire Example



Figure 3: Pole Top Luminaire No1 Example



Figure 4: Pole Top Luminaire No2 Example



Figure 5: Handrail Luminaire Example

3.1 PROPOSED LIGHTING CALCULATION: RESULTS

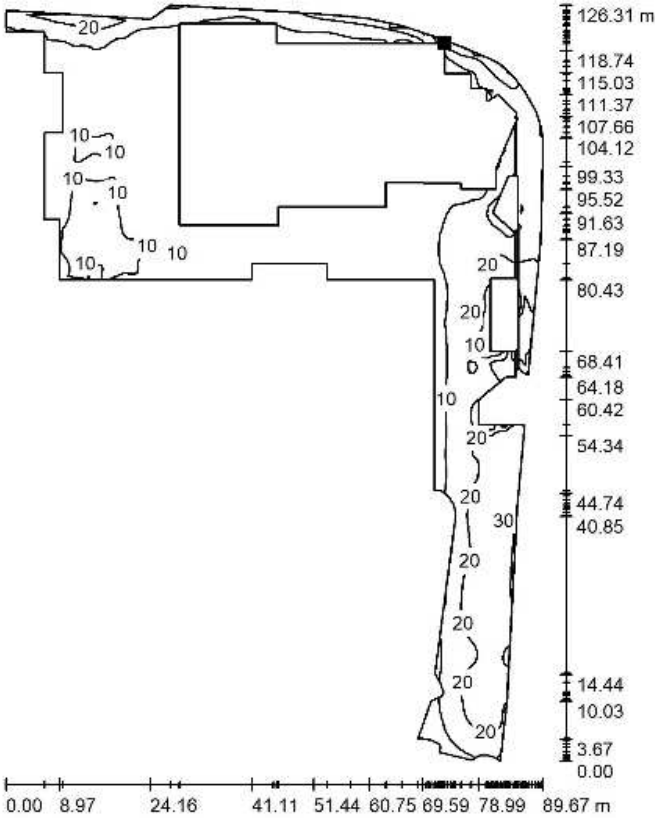
Figure 6 & 7 below details the light calculation result generated by Dialux.

- Pedestrian walkways for the hotel development - average lux level : 12 Lux
- Pedestrian walkways for the residential development - average lux level : 10 Lux

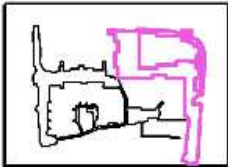
On review of the lighting results, light levels achieved are in line with standards and little or no light pollution on adjacent properties exist.

The ULR (Upward light ratio) has been estimated at 1.0% which is less than the design criteria maximum of 25% for an E4 environment.

Figure 6 -Dialux Calculation Output– Pedestrian walkways for the hotel development:



Position of surface in external scene:
Marked point: (-84.374 m, 78.609 m, 0.000 m)

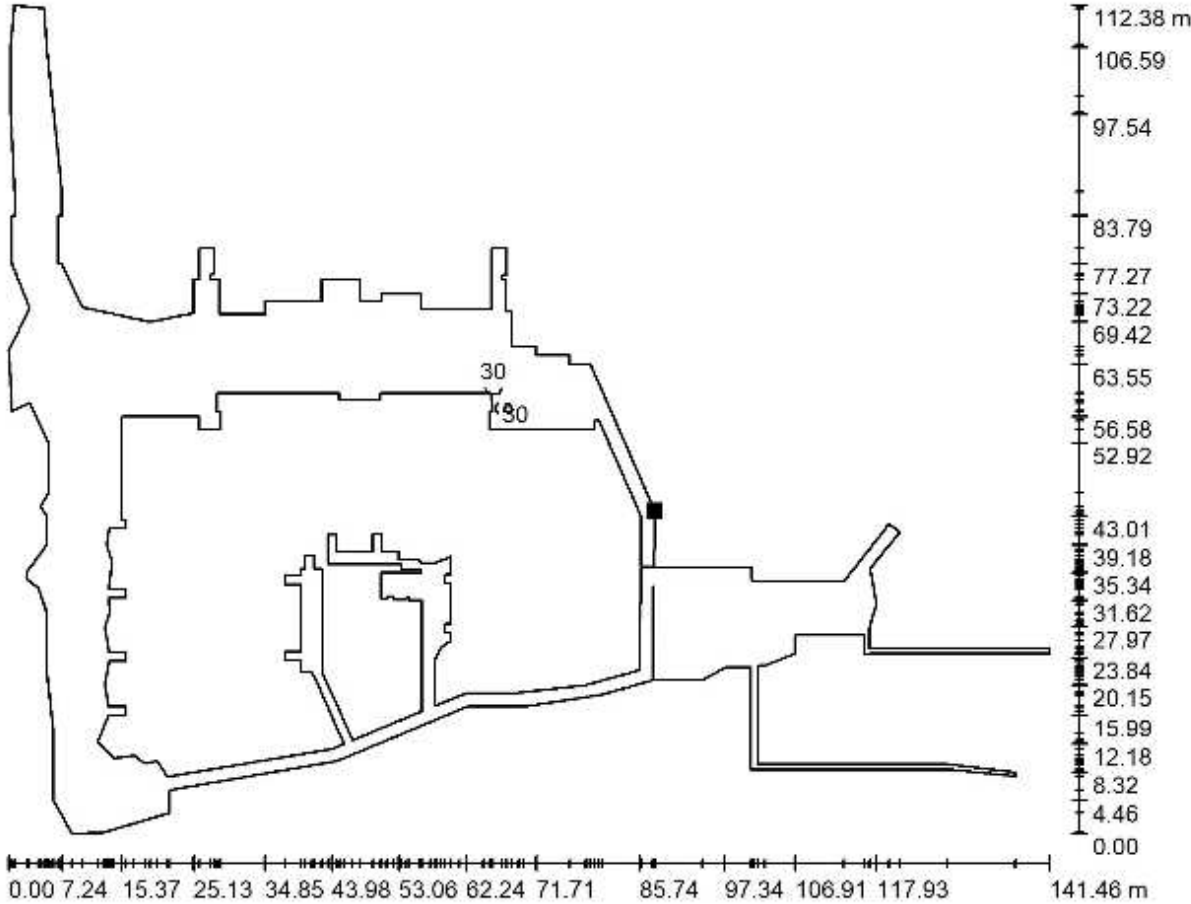


Grid: 128 x 128 Points

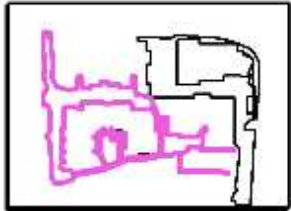
$$E_{av} [lx]$$

12

Figure 7 -Dialux Calculation Output – Pedestrian walkways for the residential development:



Position of surface in external scene:
Marked point: (-139.853 m, 19.134 m, 0.000 m)



Grid: 128 x 128 Points

$$E_{av} [lx]$$

10

Figure 8 Dialux Model 3D Visual (Taney Road View):

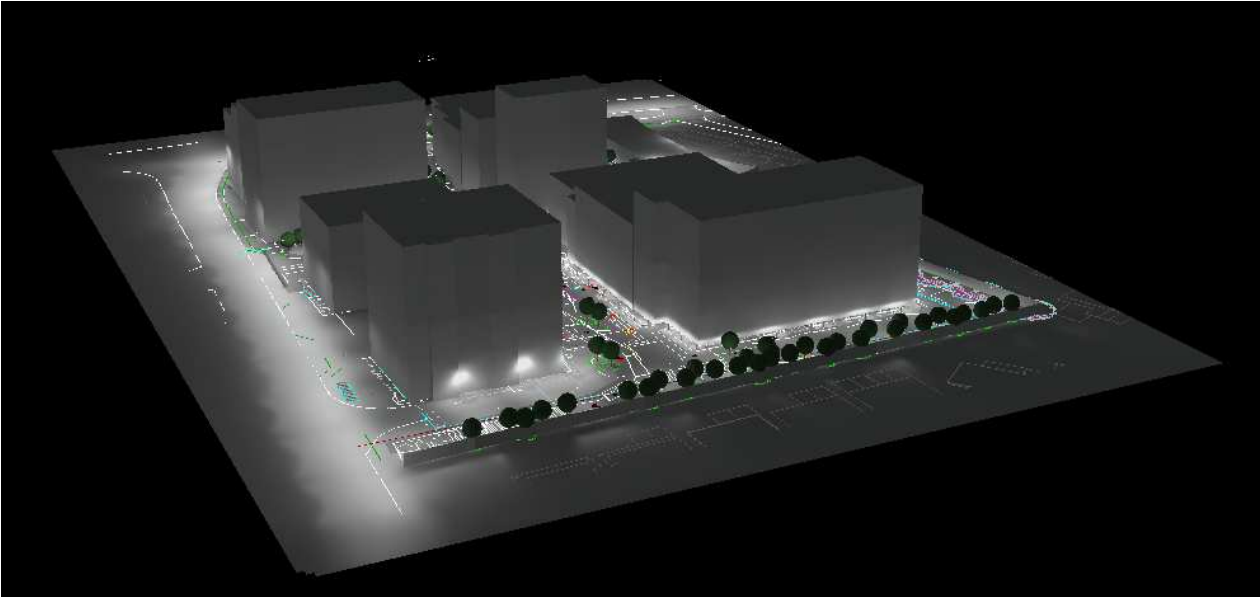


Figure 9 Dialux Lighting Output Visual (Taney Road View):

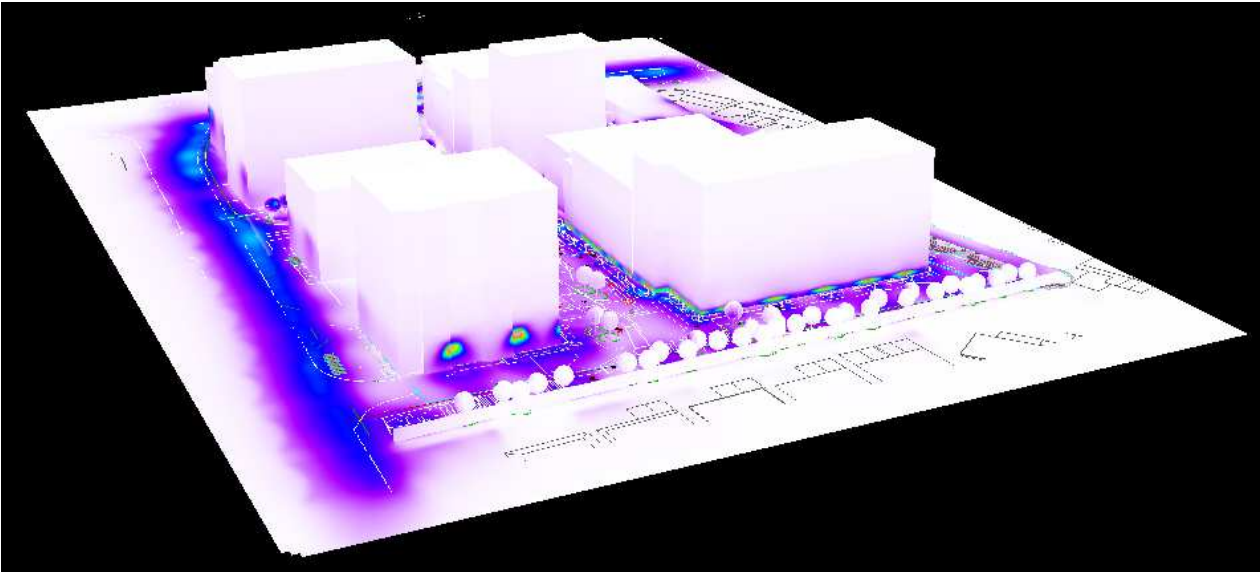


Figure 10 Dialux Model 3D Visual (Drummartin Road View):



Figure 11 Dialux Lighting Output Visual (Drummartin Road View):

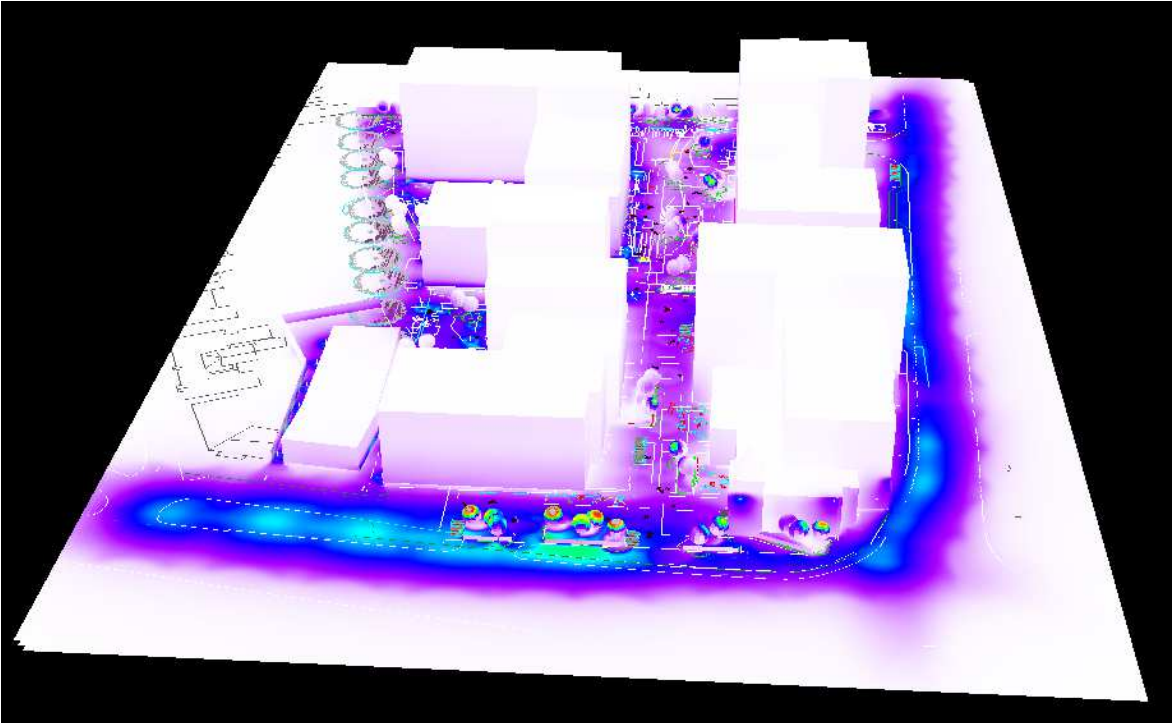


Figure 12 Dialux Model 3D Visual (Birds Eye View):



Figure 13 Dialux Lighting Output Visual Visual (Birds Eye View):



4.0 CONCLUSION

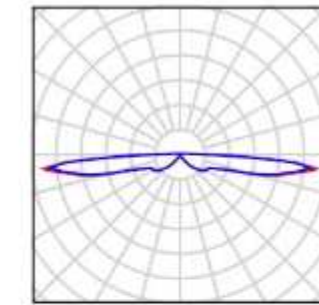
Dialux calculations indicate that there will be negligible light pollution on surrounding areas. The upward light is estimated at 1.0% which is below the 25% maximum for an E4 environment.

The design has taken into account the presence of bats along the tree line and mitigation measures have been allowed for to minimise impact.

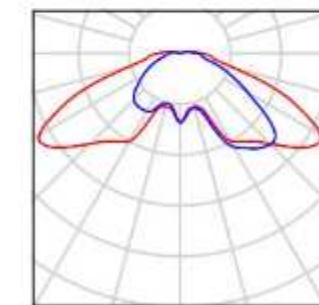
The proposed layout offers a design aesthetically pleasing for occupants and for the site as a whole. Homan O' Brien believe the proposed layout will blend seamlessly into the surrounding environment.

APPENDIX 1 - LUMINAIRE SCHEDULE & SPECIFICATION

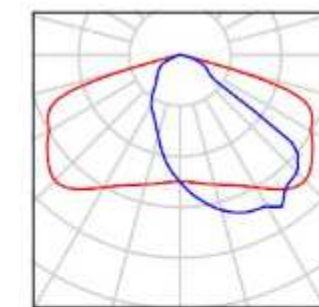
61 Pieces
IGUZZINI BW84 iWay square 24.5W
Article No.: BW84
Luminous flux (Luminaire): 905 lm
Luminous flux (Lamps): 2010 lm
Luminaire Wattage: 24.5 W
Luminaire classification according to CIE: 94
CIE flux code: 03 15 43 94 45
Fitting: 1 x LB79 (Correction Factor 1.000).



35 Pieces
IGUZZINI E002 Twilight 20.2W
Article No.: E002
Luminous flux (Luminaire): 2080 lm
Luminous flux (Lamps): 2080 lm
Luminaire Wattage: 20.2 W
Luminaire classification according to CIE: 95
CIE flux code: 28 67 91 95 100
Fitting: 1 x C11R (Correction Factor 1.000).



27 Pieces
IGUZZINI EH69 Street 35.8W
Article No.: EH69
Luminous flux (Luminaire): 4250 lm
Luminous flux (Lamps): 4250 lm
Luminaire Wattage: 35.8 W
Luminaire classification according to CIE: 100
CIE flux code: 41 76 97 100 100
Fitting: 1 x B25I (Correction Factor 1.000).



KLIKSYSTEMS LPOD40 LPOD40-Dir-PCLens-AsymRefW-LPOD-500mA-4000K-0.025m-451795-A
Article No.: LPOD40
Luminous flux (Luminaire): 158 lm
Luminous flux (Lamps): 234 lm
Luminaire Wattage: 2.0 W
Luminaire classification according to CIE: 100
CIE flux code: 58 95 100 100 68
Fitting: 1 x LPOD-500mA-4000K (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.

