

# Donaldson Veterinary Hospital Honley, Huddersfield

## External Lighting Light Pollution Assessment

September 2024

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**Low  
Carbon Energy  
Assessor**

| REV | DESCRIPTION     | DATE           | BY |
|-----|-----------------|----------------|----|
| A   | For Information | September 2024 | KH |
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## 1.0 Introduction

The purpose of this report is to provide supporting evidence associated with the Donaldson Veterinary Hospital external lighting design to satisfy the planning conditions of Kirklees Council.

The aims and objectives of this report are to provide an assessment of the impact of the lighting on the adjoining local areas generally together with any proposed mitigation measures to remove or reduce any adverse impacts identified.

### 1.1 Site Details

The development shall be located at Riverside Works, Woodhead Road, Honley, Huddersfield, HD9 9PW

The development shall consist of a new 2 storey Veterinary Hospital and associated carpark.

The external lighting elements of the development cover the provision external lighting columns to the external carpark and building mounted lighting to the buildings perimeter.

### 1.2 Requirements to Provide External Illumination

External lighting is required for this development due to its nature and proposed use. The building perimeter walkways and external carpark lighting are to be designed to BS EN 12464-2:2014 Light and Lighting. Lighting of Workplaces. Outdoor Workplaces.

|                      |              |
|----------------------|--------------|
| Building Perimeter   | 5 lux (ave)  |
| Medium Usage Carpark | 10 lux (ave) |

## 2.0 Assessment of Light Impact

The surrounding area of the site has been assessed ahead of producing the external lighting scheme and strategy and the following has been noted:

- To the North of the site are a row of residential terrace houses with no windows facing onto the site.
- To the South of the site is general woodland
- To the West of the site is general woodland
- To the East of the site is general woodland





Taking into account the above, it can be concluded that the immediate surrounding areas are primarily of a rural nature.

Particular consideration is given to the light impact on the residential properties to the north and woodland areas.

The proposed lighting scheme will provide minor impact to residential areas, light spill outside the site perimeter is very low and well within acceptable tolerances.

An ecology study at the site has been carried out and determined that the development does have there are several common bat species in the wider general area, and bat roosts within 500m

The external carpark lighting is to be designed to the latest ILP Guidance and Eurobats guidance to mitigate the impact on bats as much as is reasonably practicable.

## 3.0 External Lighting Design Proposals

### 3.1 Design Considerations

The recommendations of the following British Standards and industry guidance have been considered when preparing the external scheme proposals:

- ILP Guidance note 1 - The reduction of obtrusive light
- ILP Guidance note 8 - Bats and Artificial lighting at night.
- Eurobats Guidance
- SLL Code for Lighting
- BS EN 12464-2:2014 Light and Lighting

In addition to the recommendations of the above standards and guidance, the proposals shall take into consideration the site constraints and the nature of the

surrounding areas.

### 3.2 Design Parameters

The Institution of Lighting Professionals (ILP) Guidance Notes apply a common environmental zoning system as shown below.

| 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   | Town/city centres with high levels of night-time activity |

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

The site is situated within a medium brightness sub-urban area and as such the environmental class has been taken to be E2.

There are also other factors which influence the design of the lighting scheme based on the environmental class. These factors are explained in further detail below:

#### Sky Glow

Sky glow is reduced by restricting the amount of upward light ratio of all the external luminaires.

Table 2 above shows data from ILP Guidance Notes and gives recommended limitations on upward light ratio for each environmental zone.

In the case of the proposed development this will be taken as 2.5% for environmental class E2.



Proposed luminaires are angled at a maximum of 5 degrees from the horizontal and therefore have an upward light output ratio (ULOR) of 0%, therefore in compliance with environmental zone E2.

#### Illuminance at Windows in Neighbouring Properties

Light overspill illuminance at neighbouring properties on the vertical plane of the windows must be limited.

Table 2 above gives recommended pre-curfew and post-curfew limitations for each environmental zone.

In the case of the proposed development this will be taken as 5 lux pre-curfew and 1 lux post-curfew for environmental zone E2.

Calculations show pre-curfew illumination levels of 0.6 lux at the window of the first terrace house to the north which is the nearest neighbouring property the development. Which is in compliance with both pre-curfew and post-curfew lighting level requirements.

#### Luminaire Intensity

The intensity of all the external luminaires must be controlled so that no light sources are visible at neighbouring properties exceeding the values in table 2 above.

Table 2 above gives recommended pre-curfew and post-curfew limitations for each environmental zone.

In the case of the proposed development this will be taken as 7,500 cd pre-curfew and 500 cd post-curfew for environmental zone E2.

Calculations show a maximum value below 400 cd pre-curfew and will be 0 cd post-curfew.

### 3.3 Glare and Stray Light Control Measures

The following measures have been taken in the preparation of the external lighting scheme to limit the potential for glare and stray light:

1. 6m lighting columns and LED post top luminaires are to be provided with control optics that are designed to provide an asymmetric light distribution to minimise light overspill from the site.
2. Luminaires to comply with Dark Sky Association Guidance which stipulates that no luminaires with outwards or sideways light distribution shall be used to aid reduction of luminaire intensity. i.e 0% upward light ratio.
3. Dark buffer zones.
4. Screening in the form of vegetation, fences and structures.
5. Appropriately designated darkened areas.
6. Peak luminaire wavelength at a minimum of 550nm.

#### Additional measures taken to reduce the impact on bats

The guidance of ILP Guidance Notes 1 and 8 and Eurobats are to be followed to reduce the impact of the lighting installation on bats. These are as follows:

1. Dark buffer zones.
2. Screening in the form of vegetation, fences and structures.
3. Appropriately designated darkened areas.
4. Luminaries reduced of UV elements. A warm white spectrum (<2700-3000K) to reduce blue light.
5. Peak luminaire wavelength at a minimum of 550nm.



## 4.0 Lighting Control and Operation

The building perimeter and carpark lighting will be controlled via a photocell and timeclock arrangement with manual override.

Time clock will be set to switch automatically switch off the external lighting between the hours of 23:00 and 07:00 daily.





## 5.0 Proposed Luminaire Selection



**Kingfisher  
Lighting**

Part of the **LUCCECO** group of companies

# Datasheet

## ITALO



### Specification Text

The ITALO shall be manufactured from high-pressure diecast aluminium with a semi-gloss satin grey marine grade finish. It shall have Zhaga D4i Certification, with a power output ranging between 11.9W – 132.0W, with an efficacy from 132.8 – 163.8 lm/W. It shall produce 1,560 - 19,410 luminaire lumens. The ITALO 1 shall utilise reflector-based optics to create a comfortable low glare illumination with distributions to suit pathways, roadways, carparks and asymmetric flood lighting optics to suit industrial applications. It shall have a fully programmable DALI driver. The luminaire shall come in 2700K, 3000K and 4000K and be IK09 and IP66 rated. It shall come with post top and side entry options.

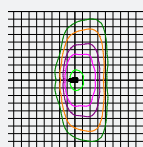
### Specification

|               |                                           |
|---------------|-------------------------------------------|
| Weight:       | 7.0 kg                                    |
| Windage:      | 0.06 m <sup>2</sup> - 0.18 m <sup>2</sup> |
| Material:     | Die-cast Aluminium                        |
| Paint Finish: | Semi-Gloss Satin Grey                     |

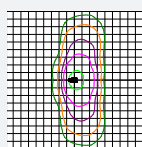
### Optics



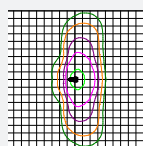
Street Optic (STE-M)



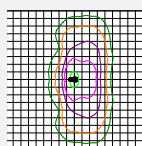
Street Optic (STU-M)



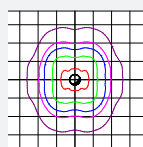
Street Optic (STU-S)



Street Optic (STA)



Street Optic (SV)



### Product Description

One product, three sizes. The ITALO series offers high performance functionality, versatility and a wide variety of optics. A versatile solution suitable for any street application.

### Key Features

- 11.9W - 132.0W
- 1,560 – 19,410 Luminaire Lumens
- Efficacy up to 166 lm/W
- 2700K, 3000K, 4000K, CRI>70
- IP66, IK09
- Lifetime 100,000, L94
- Toolless Entry
- Marine Grade as Standard
- Wireless Dimming





# Piazza II LED

THORN

96632758 PIAZZA II LED 1690-830 HF P ANT

|                     |     |      |      |  |    |  |  |  |  |  |               |
|---------------------|-----|------|------|--|----|--|--|--|--|--|---------------|
| LED 15W TL_PIA2-830 | ida | IP65 | IK10 |  | CE |  |  |  |  |  | Ta -20<br>+40 |
|---------------------|-----|------|------|--|----|--|--|--|--|--|---------------|

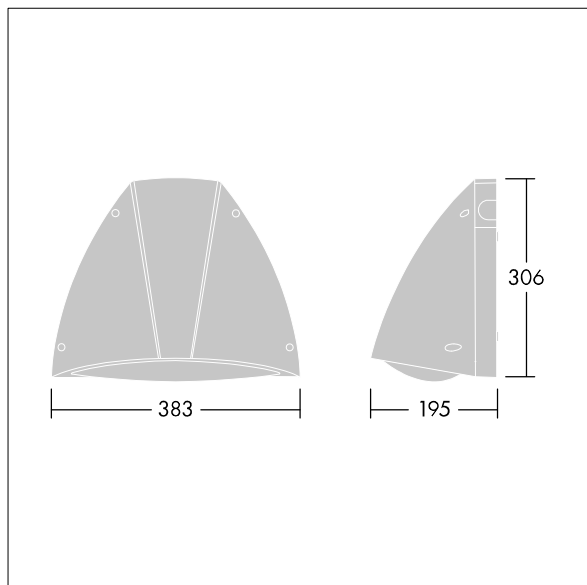
## Piazza II LED

A robust Wall mounted luminaire. Electronic, fixed output control gear. Back plate: die-cast aluminium, painted anthracite. Body: anthracite polycarbonate. Ø20mm cable entry via rear or side conduit entries, BESA compatible. IP65, IK10. Complete with 3000K LED. Equipped with Mini Photocell.

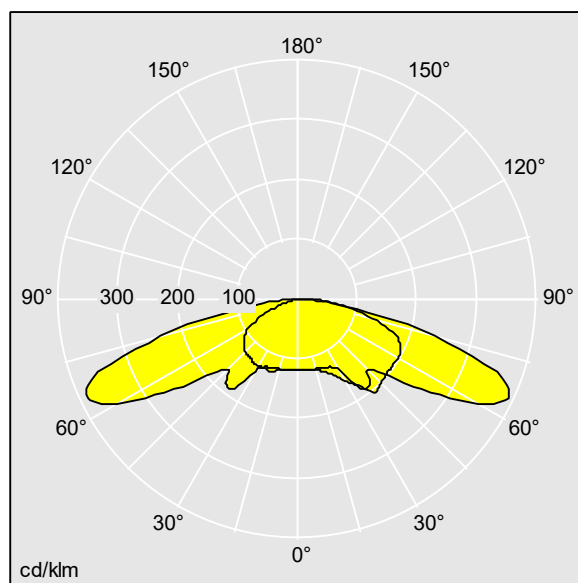
Dimensions: 381 x 196 x 305 mm  
Luminaire input power: 15.1 W  
Luminaire luminous flux: 1815 lm  
Luminaire efficacy: 120 lm/W  
Weight: 2.8 kg



TLG\_PIA2\_F\_PDB.jpg



TLG\_PIA2\_M\_LD1.wmf



D43175AA.ltd

Lamp position: STD - standard  
Light Source: LED  
Luminaire luminous flux\*: 1815 lm  
Luminaire efficacy\*: 120 lm/W  
Colour Rendering Index min.: 80  
Correlated colour temperature\*: 3000 Kelvin

Chromaticity tolerance (initial MacAdam): 5  
Rated median useful life\*:  
L70 60000 h at 25 °C  
Ballast: 1x HF\_  
Luminaire input power\*: 15.1 W  
Dimming: FO  
LOR: 1,00 ULOR: 0,02 DLOR: 0,98

This product contains a light source of energy efficiency class E.

All values marked with an \* are rated values. Thorn uses tried and tested components from leading suppliers, however there may be isolated instances of technology-related failures of individual LEDs during the rated product lifetime. International standards set the tolerance in initial flux and connected load at  $\pm 10\%$ . Unless stated otherwise, the values apply to an ambient temperature of 25°C.

Thorn Lighting is constantly developing and improving its products. The right is reserved to change specifications without prior notification or public announcement.  
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## 6.0 Calculation Results



NOTES:

- EXTERNAL LIGHTING DESIGN ACHIEVES 0% UPWARD LIGHT POLLUTION IN ACCORDANCE WITH INSTITUTION OF LIGHTING PROFESSIONALS (ILP) GUIDANCE NOTE 8.
- EXTERNAL LIGHTING DESIGN ACHIEVES FULL COMPLIANCE WITH INSTITUTION OF LIGHTING PROFESSIONALS (ILP) GUIDANCE NOTE 1.
- EXTERNAL LIGHTING DESIGN IS IN FULL COMPLIANCE WITH BS EN 12464-2:2014, LIGHT AND LIGHTING. LIGHTING OF WORK PLACES. OUTDOOR WORK PLACES.

| LUMINAIRE SCHEDULE |                                                                                                                                                                                                     |                                                                                     |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| REF                | DESCRIPTION                                                                                                                                                                                         | IMAGE                                                                               |
| A                  | KINGFISHER ITALO 1 POST TOP/SIDE ENTRY SINGLE HEAD LANTERN COMPLETE WITH 34.8W, 4,500 LUMEN, 2700K, IP66, LED MODULE.<br>MOUNTED ON 6m TUBULAR STEEL ROOTED COLUMN WITH BLACK POWDER COATED FINISH. |  |
| B                  | KINGFISHER ITALO 1 POST TOP/SIDE ENTRY DUAL HEAD LANTERN COMPLETE WITH 34.8W, 4,500 LUMEN, 2700K, IP66, LED MODULE.<br>MOUNTED ON 6m TUBULAR STEEL ROOTED COLUMN WITH BLACK POWDER COATED FINISH.   |  |
| C                  | SURFACE MOUNTED THORN PIAZZA II 15W, 1844 LUMEN, 3000K LED IN BLACK                                                                                                                                 |  |

|                    | PEAK LIGHTING LEVEL (LUX) | AVERAGE LIGHTING LEVEL (LUX) | MINIMUM LIGHTING LEVEL (LUX) | UNIFORMITY |
|--------------------|---------------------------|------------------------------|------------------------------|------------|
| BUILDING PERIMETER | 31.7                      | 15.5                         | 4.3                          | 0.28       |
| CAR PARK           | 56.5                      | 19.1                         | 4.8                          | 0.25       |





## 7.0 Conclusion

The proposed developments external lighting will not increase light pollution in the area and is fully compliant with industry standard guidelines.

### Key points:

#### Sky Glow

- Proposed luminaires are angled at a maximum of 5 degrees from the horizontal and therefore have an upward light output ratio (ULOR) of 0%. Therefore, in compliance with ILP Guidance for zone E2, < 2.5%.

#### Illuminance at Windows in Neighbouring Properties

- Calculations show illumination levels at the nearest neighbouring property are 0.6 lux. Therefore, in compliance with ILP Guidance for zone E2, 5 lux pre-curfew and 1 lux post-curfew.

#### Luminaire Intensity

- Calculations show a maximum value below 400 cd pre-curfew and will be 0 cd post-curfew. Therefore, in compliance with ILP Guidance for zone E2, 7,500 cd pre-curfew and 500 cd post-curfew.

#### Effect on Bats

- The external carpark lighting has been designed in full compliance with the latest ILP Guidance and Eurobats guidance to mitigate the impact on bats as much as is reasonably practicable.