

Hermes Plot 1,
Hoyland Common, Barnsley

191308

External Lighting Report

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1.0 Introduction

This report proposes external lighting products for various areas of the Hermes Plot 1 proposal located within Hoyland Common, Barnsley.

The proposed luminaires will utilise various forms to provide functional, amenity and security lighting to lorry yards, car parks and all other associated areas as detailed later in this report.

In general, only high colour rendering lamps are proposed to aid the visual tasks required such as parking. LED luminaires which exhibit a white light colour of 4000°K will be used. Luminaires will have tight optical control and emit light in the downwards direction only. Upward light is therefore limited.

The lighting design will be sensitive and compliant with the principles set out within the ILP (Institute of Lighting Professionals) *'Guidance Notes for the Reduction of Obtrusive Light, Guidance Note 01/20*, BS EN 12464-2 and other institutional guides for exterior lighting.

This report should be read in conjunction with the included CPW external lighting drawing 191308-E-EXT-00-01-P3.

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2.0 Lighting Design Brief

The site is predominantly surrounded by residential areas, agricultural land and the M1 motorway running adjacent to the site on the West. Due to the sites location it has been assessed against an environmental zone of E2, described as a Low District Brightness, sparsely inhabited rural areas, village or relatively dark outer suburban locations.

The plot is intended to be in use throughout the year with a 24-hour operational working day.

The external lighting concept design has been developed with reference to:

- BS EN 12464-2:2014 Light and Lighting – Lighting of work places: Part 2 Outdoor Work Places.
- BS 5489-1:2013 Code of practice for the design of road lighting — Part 1: Lighting of roads and public amenity areas;
- BS EN 13201-1:2015 Road Lighting, Part 1 Guidelines on selection of lighting classes;
- BS EN 13201-2:2015 Road Lighting, Part 2 Performance Requirements;
- ILP Guidance Notes on the Reduction of Obtrusive Light, Guidance Note 01/20;

Calculations have been made to assess the horizontal & vertical illuminance produced by the lighting design, as well as light pollution intensities on various grid planes around the site in order to apprise the light trespass toward nearby stakeholders.

The following sections of this report detail the proposed external lighting installation and the calculation results produced.

The external lighting within the site has been designed to meet illumination levels set out within CIBSE Lighting Guide 6 and the British Standards on a horizontal calculation grid.

The following pages detail the external lighting proposal and calculations against the required performance criteria. The required lighting levels are baseline targets which can be increased upon in areas as dictated by the landscaping and client's requirements.

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3.0 Product Types

Type EX1-EX4

The D-Series luminaire is part of the Holophane Range. It is ideal for open spaced areas with its Asymmetric, Symmetric and Forward Throw light distribution options. Precisely controlled light distribution offers maximum efficiency keeping light pollution along with spillage and glare to a minimum.

Reference EX1 - Single head 36,000lm forward throw distribution LED modules are to be housed within an IP65 enclosure column and building mounted.

Reference EX2 - Single headed 22,000lm forward throw distribution LED modules are to be housed within IP65 enclosures and are to be building mounted.

Reference EX3 - Single headed 11,000lm forward throw distribution LED modules are to be housed within IP65 enclosures and are to be column mounted.

Reference EX4 - Single headed 11,000lm asymmetrical distribution LED modules are to be housed within IP65 enclosures and are to be column mounted.

Reference EX5 - Single headed 11,000lm symmetrical distribution LED modules are to be housed within IP65 enclosures and are to be column mounted.

Type EX6, EX7

The Denver Wall Elite is part of the Holophane range. It is a modern aesthetic design that incorporates LEDs in addition to standard white light sources. Its stylish design and clear glass optic for LED, proves a high performance distribution, with wide spacing for high efficiency.

Reference EX6 - 3000 lumen package LED building mounted on security buildings.

Reference EX7 - 2000 lumen package with narrow distribution LED building mounted on main building.

Type EX8, EX9

The Parking Garage luminaire is part of the same D-Series Holophane range. A dedicated LED luminaire that delivers a variety of efficient lumen per watt packages with excellent optical performance. LED light engines with 0% ULOR ensuring nighttime friendly. 7000lm LED modules are to be housed within an IP65 enclosure and are to be surface mounted under canopies.

Reference EX8 – 7000 lumen package, Square wide optic, used along the loading bays

Reference EX9 – 7000 lumen package, Square narrow optic, used along the level access doors

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4.0 Illumination Levels

In accordance with the Chartered Institute of Building Services Engineers (CIBSE) Lighting Guide 6 (LG6) and BS EN 12464-2:2014, the following illumination levels are to be achieved:

Area	Maintained Illuminance (Lux)	Uniformity
Car Parking	10	0.25
Access Road	10	0.20
Lorry Parking	30	0.40
Service Yard	30	0.40
Loading Bays	50	0.40
Gatehouse	50	0.40

Average illumination levels achieved on CPW drawing 191308-E-EXT-00-01-P3

Area	Average Level Achieved (Lux)	Uniformity
Amenity Area	23	0.44
Access Road (Directly off road)	13	0.38
Building Entrance	47	0.60
Car Park	13	0.30
Entrance Gatehouses	62	0.40
Entry Road	12	0.59
Exit Gatehouses	60	0.45
Exit Road	13	0.67
Footpath along Car Park	19	0.21
Level Access	75	0.66
Loading Bays East	70	0.47
Loading Bays West	71	0.84
Lorry Parking East	30	0.40
Lorry Parking South	33	0.69
Lorry Parking South (Central)	38	0.58
Lorry Parking West	30	0.55
Motorcycle and Cycle Parking	24	0.57
Recycling Area	34	0.39
Service Yard	36	0.40
Tractor Parking	36	0.55
Wash and Fuel Zone	26	0.38

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5.0 ILP Guidance Notes for the Reduction of Obtrusive Light, 2011

In accordance with the Institute of Lighting Professionals (ILP) 'Guidance Notes for the Reduction of Obtrusive Light, 2020'. The development has been classed with having an environmental zone of E2.

Zone	Surrounding	Examples
E0:	Protected – Dark	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1:	Natural - Dark	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc
E2:	Rural – Low district brightness	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3:	Suburban – Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4:	Urban - High district brightness areas	Town/city centres with high levels of night-time activity

Having an environmental zone of E2 indicated that the design shall need to comply with the table below:

Environmental Zone	Sky Glow ULR (Max %)	Light Trespass (into windows) Ev (Lux)		Source Intensity I (cd)		Building Luminance Pre-curfew
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average, L
E0	0	n/a	n/a	0	0	<0.1
E1	0	2	<0.1	2,500	0	<0.1
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

- ULR** Upward light ratio of the installation is the maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky.
- EV** Vertical illuminance in lux and is measured flat on the glazing at the centre of the window.
- I** Light intensity in Cd.
- L** Luminance in Cd/m².
- Curfew** Time after which stricter requirements (for the control of obtrusive light) will apply; often a condition of lighting applied by the local authority. If not stated—23:00h is suggested.

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6.0 Comparison to ILP Guidance Notes for the Reduction of Obtrusive Light, 2011

Lighting calculations have been undertaken as demonstrated on the CPW External Lighting drawing (191308-E-EXT-00-01-P3) and the following values have been calculated. The four observer reference points are shown on the above drawing and are the four closest residential areas to the site. The calculations do not include for any potential landscaping which could provide a further barrier between the site and observer positions, meaning that the calculated figures below may well be lower than those calculated.

As shown within the table both the pre and post curfew values fall below the maximum allowance.

	E2 Maximum	1	2	3	4
Sky Glow URL Max %	2.5%	0.001	0.001	0.001	0.001
Light intrusion (into windows) Ev Lux					
Pre-curfew	5	0.8	0.4	0.4	0.3
Post-curfew	1	0.8	0.4	0.4	0.3
Luminaire Intensity I (candelas)					
Pre-curfew	7,500	486	491	164	221
Post-curfew	500	486	491	164	221

7.0 Lighting Levels

The minimum recommended levels are 30 lux average for the lorry parking and service yard, 10 lux average for car parking. Increased illuminance levels of 50 lux average to the loading canopies and level access docks where more arduous activities will be performed.

These lighting levels are baseline targets which meet the minimum levels within current British Standards (BS EN 12464-2:2014) and Lighting Guide LG6.

The lighting scheme produced and indicated on CPW drawing 191308-E-EXT-00-01-P3 is within the parameters specified within the ILP guidance notes for the reduction of obtrusive light, 2020. The luminaires have been carefully selected to minimise upward light spill, glare and backwards light spillage.

All external lighting is to be controlled with a photocell and time clock such that the lighting will be energised at low ambient lighting and will switch off during daylight hours. (Final settings to be determined by Client).

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8.0 Summary

The scheme has been developed to reduce the impact that the external lighting would have on the surrounding areas. The lighting scheme is based around a low pollution, low energy and low maintenance strategy. Considerations were also given to low energy products which have excellent light control optics such that their efficiencies are maximised, and carbon footprint minimised.

Alternative luminaires may develop and be introduced into the market during the detailed design stage, however the philosophy of downward light only should always be retained and implemented into the finalised design.