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JCB Car Park

17293

External Lighting Proposals

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1.0 External Lighting

Couch Perry & Wilkes LLP have written this report to summarise the external lighting calculations for the works associated with the Car Parking and Lorry Park at Harewood Estate.

The design will be undertaken to conform to the guidance on obtrusive light. Obtrusive light is as defined within the Institute of Lighting Professionals environmental light guidance GN01. The site has been assessed against an environmental zone of E2, defined as a Rural area. This means that the values are shown in table 2, shown adjacent, must not be exceeded if the guidance is to be met.

Calculations have been made in the form of horizontal and vertical illuminance on various grid planes around the site in order to inform of light trespass toward those planes.

The design criteria for the site is stated below.

Area	Maintained Illuminance (Lux)	Uniformity
Carpark*	10	0.25
Lorry Circulation & Parking	30	0.25
Security Walk ways	20	0.25

*Car park illuminance has been designed to a maintained illuminance of 10lux as the car park is private.

It has been assumed that no loading or unloading of Lorries will take place on site, therefore a lower Illumination level has been designed to.

The following pages detail a proposal which aims to fulfil the above performance criteria whilst attempting to reduce/minimise light pollution impacts.

LED luminaires are being proposed.

The use of LEDs reduces the need for future maintenance due to their long service lamp lives. The projected life of the LED module based upon the manufactures information used throughout the scheme is 100,000 hours based on L70 @ 20˚C.

A maintenance plan for replacement and cleaning should be carried out by the client to keep the luminaires in full working order and condition.

Table 1 – 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 etc
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

Table 2 – Obtrusive Light Limitations for Exterior Lighting Installations – General Observers

Environmental Zone	Sky Glow ULR [Max %][1]	Light Intrusion (into Windows) E_v [lux] [2]		Luminaire Intensity I [candelas] [3]		Building Luminance Pre-curfew [4]
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average, L [cd/m^2]
E0	0	0	0	0	0	0
E1	0	2	0 (1*)	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

Table taken from Guidance notes for the Reduction of Obtrusive Light GN01:2011 produced by the Institute of Lighting Professionals.

1.1 Proposed Installation

The drawing for the proposed external lighting scheme for the site is provided within the appendix and should be read in conjunction with this report to view the positioning of the luminaires.

The areas required a design that provides sufficient lighting levels for the tasks in hand whilst being sensitive to the environment and the visual aspect of the site.

The proposed external lighting scheme for the site is to adopt a combination of column mounted luminaires to achieve this.

The Car Park areas consist of 6 meter column mounted luminaires and the Lorry Park is illuminated by 8 meter columns mounted luminaires of which allow efficient spacing and reduce overall quantity of luminaires needed.

Additionally the footpaths leading to the car park areas on the site will be illuminated using 1 meter high bollards.

The luminaires chosen have a tight light distribution allowing us to aim the light where it is needed and minimise any light spill. The column mounted luminaires chosen have zero upward light in accordance with the ILP guidance note GN01.

The building has existing bollard luminaires running around the perimeter of the buildings to provide security lighting of which doesn't form part of the new lighting proposal within this report.

1.2 Proposed Luminaires

The luminaires proposed for the project all utilise very tight control optics with LED focused light sources to reduce energy usage and prevent light pollution.

EX1

Product: Holophane D- Series
Lamp: LED
Asymmetric Distribution
Colour Temp: 4000K
Output 4720lm
Mounting: 6m Column

EX2

Product: Holophane D- Series
Lamp: LED
Forward Throw Distribution
Colour Temp: 4000K
Output 4784lm
Mounting: 8m Column

EX3 – Twin Head

Product: Holophane D- Series
Lamp: LED
Forward Throw Distribution
Colour Temp: 4000K
Output 4784lm
6m Column

EX4

Product: Holophane Denver Elite Pole
Lamp: LED
Forward Throw Distribution
Colour Temp: 4000K
Output 11415lm
Mounting: 8m Column

EX5 – Twin Head

Product: Holophane D- Series
Lamp: LED
Forward Throw Distribution
Colour Temp: 4000K
Output 11415lm
8m Column

EX6 – Bollard

Product: Zefiro Mid – Power
Lamp: LED
Colour Temp: 4000K
Output 1937lm
1m Bollard

EX1/EX2/EX4

EX6

1.3 Results

A summary of each area is detailed below;

Staff Car Park 1:

Average Illuminance: 15 lx

Minimum Illuminance: 6.80 lx

Uniformity 0.45 uO

Staff Car Park 2:

Average Illuminance: 15 lx

Minimum Illuminance: 6.53 lx

Uniformity: 0.44 uO

Staff Car Park 3:

Average Illuminance: 13 lx

Minimum Illuminance: 5.53 lx

Uniformity: 0.41 uO

Visitors Car Park:

Average Illuminance: 17 lx

Minimum Illuminance: 8.70 lx

Uniformity: 0.52 uO

Lorry Park:

Average Illuminance: 38 lx

Minimum Illuminance: 12 lx

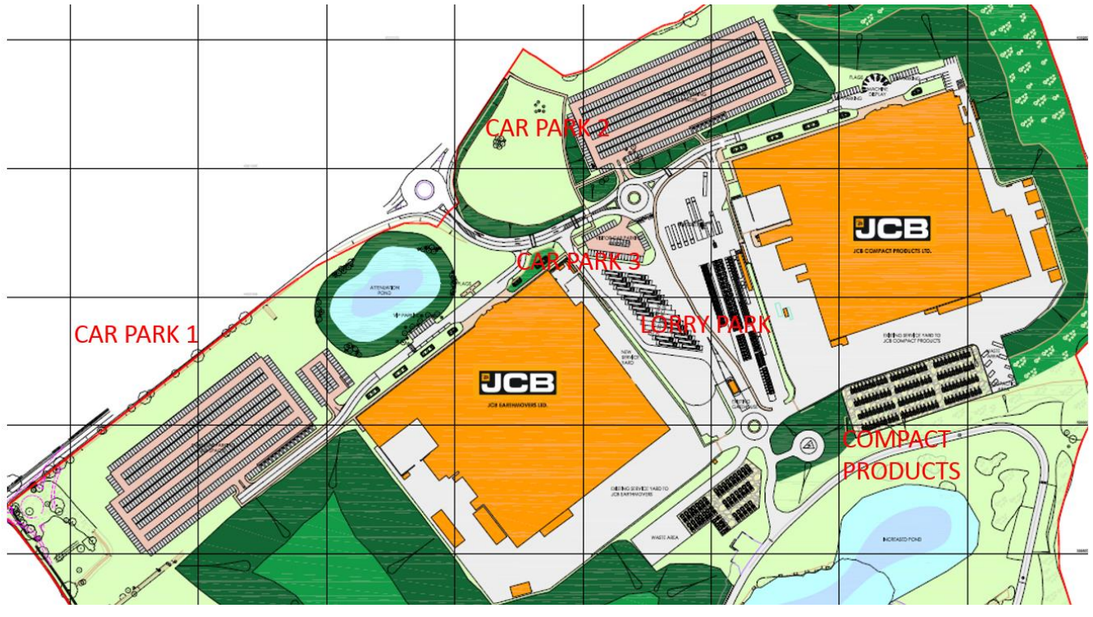
Uniformity: 0.32 uO

Compact Products Yard 1

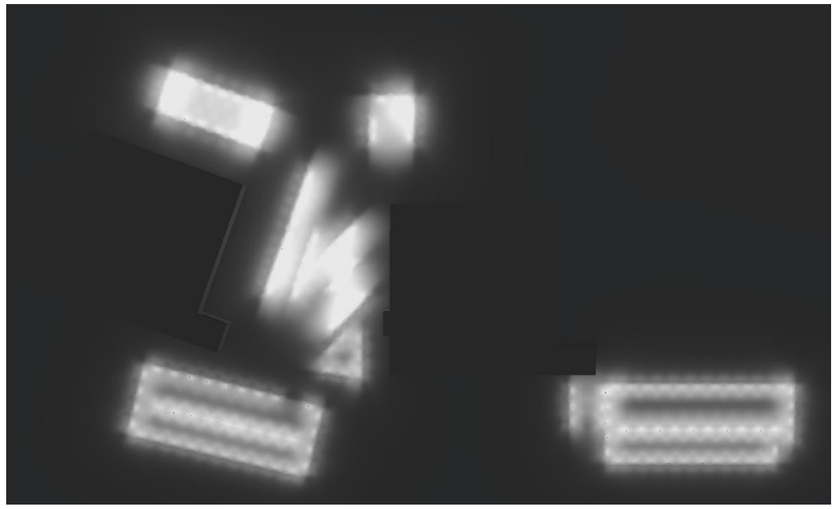
Average Illuminance: 42 lx

Minimum Illuminance: 29 lx

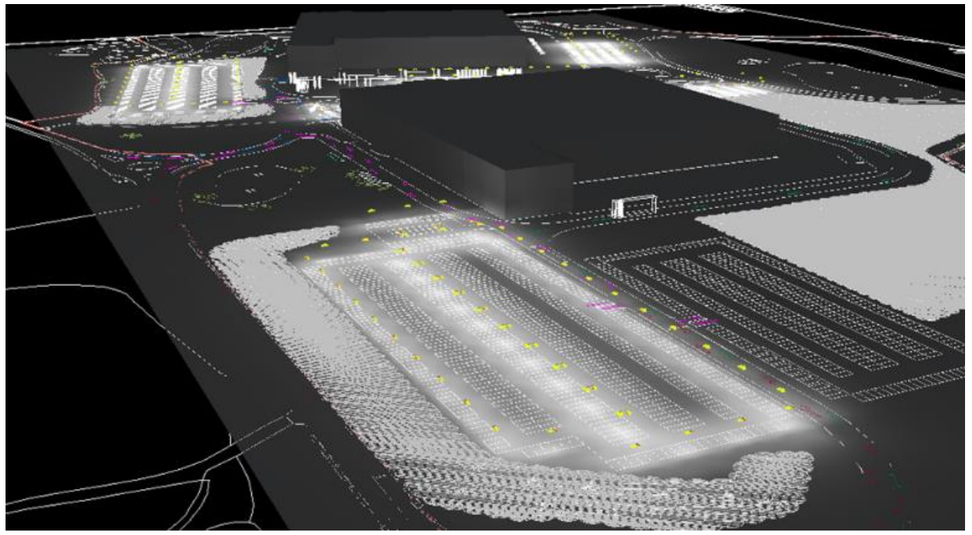
Uniformity: 0.52 uO



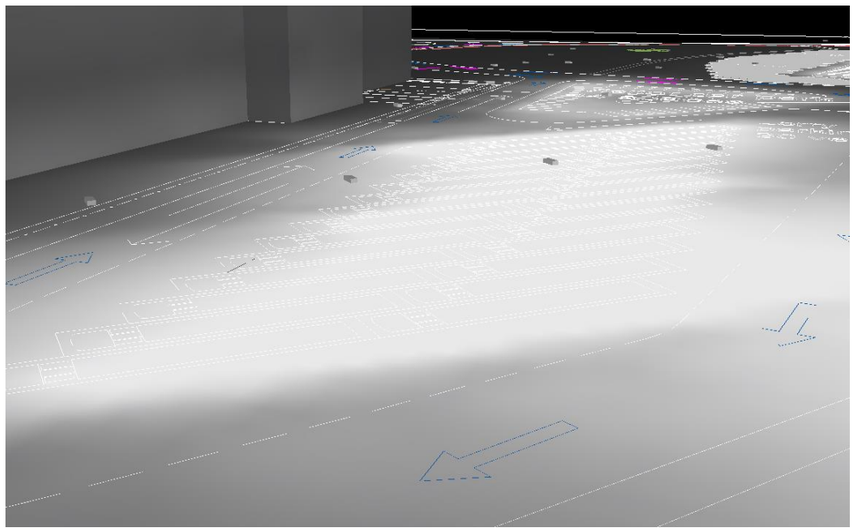
1.4 Images of DIALux Model



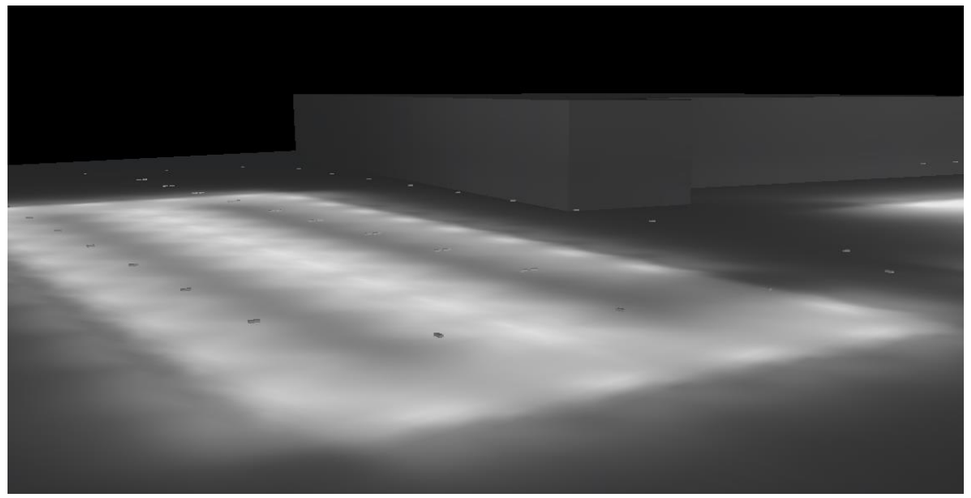
Birds Eye View of Car Park's and Lorry Park Lighting Scheme



Staff Car Park View – Car Park 1 Lighting Scheme



Lorry Park Lighting Scheme



Staff Car Park – Car Park 2 Lighting Scheme

2.0 Summary

The design for the development provides a low energy lighting system with no upward waste light and very tightly controlled downlight.

The design was put together to provide safety lighting to the site whilst keeping the light spill to an absolute minimum. The site has surrounding buildings close to the boundary. The surrounding buildings were considered meaning that the use of different optic distributions to prevent light trespassing into other properties. A Cool White colour appearance of lamps has been chosen, positioning was also carefully considered.

The results shown on page four have been compiled using the computer software, DIALux 4.13. This allows us to use true photometric data from the manufacturer and calculate the results to a high degree of accuracy. The proposed design was formed to comply with the specification as well as adhering to the ILP Guidance on Obtrusive Light.

For the Obtrusive Light calculations an Environmental Zone of E2 has been assumed for the area, which is described as being in a suburban surrounding with medium district brightness. This area needs to be confirmed by the Local Planning Authorities.

The lighting falls well within both the pre curfew and post curfew levels set out however it should be noted that the lighting should switch off when out of hours. We expect this to be no later than the 11pm curfew. Within occupied hours it is possible to control the lighting with PIR sensors allowing them to dim down to 50% if no occupancy is detected within the area.

In summary the lighting design proposed meets all the illuminance levels specified and are well within the limitations set out within the guidance regarding obtrusive light.

External Lighting Proposals – JCB Harewood Estate

Sample area of lighting arrangement for Staff Car Park.