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Portsmouth City Council

Unit 500 – 502 Dunsbury Park

210380

External Lighting Report

Document Revision History			Ref	DP-CPW-ZZ-XX-RP-E-2201-D	
Rev	Author	Verification By	Date	Suitability	Comments / Status
A	K.Morley	V.Sadler	22/09/2021	S3	Preliminary
B	C.Pimm	S.Tuohey	07/10/2022	S3	Ecologist comments incorporated
C	C.Pimm	S.Tuohey	21/01/2022	S3	Site layout updated
D	C.Pimm	S.Tuohey	09/02/2022	S3	Site layout updated

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External Lighting Report



1.0 Introduction

This report details the proposed external lighting design and associated products for units 500, 501 and 502 at Dunsbury Park, Portsmouth. The plot consists of the three new industrial units, each with car parking and service yards including loading areas. There is also a new access road stemming from an existing roundabout which will serve all three units.

The proposed luminaires will utilise various forms to provide functional, amenity and security lighting to service yard, 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 3000°K will be used to minimise disturbance of local ecology. Luminaires will have tight optical control and emit light in the downwards direction only to meet the requirements of Environmental Zone E3. Backwards light shields have also been used wherever reasonable to minimise the light spill on nearby woodland habitat.

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 *DP-CPW-ZZ-XX-DR-E-2201-G – Unit 500, 501, 502 Proposed External Lighting Layout*.

2.0 Lighting Design Brief

The site is bordered by an area of woodland, 'Beech Woods', to the west and open grassland to the north. To the east are other existing and proposed industrial units, with an access road and further industrial units along the south boundary. This existing access road will form part of the main access route to units 500, 501 and 502.

Beyond the woodland and the A3(M) main road to the west, there are residential areas to the north west with the closest property to the site boundary being around 200m.

Due to the site's location, it has been assessed against an environmental zone of E3, described as a Medium District Brightness, well inhabited rural and urban settlements, small town centres of 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;
- ILP Guidance notes on Bats and Artificial Lighting in the UK, Guidance Note 08/18;
- Client briefing documents and specification

Calculations have been made to assess the horizontal and vertical illuminance produced by the lighting design, as well as light pollution intensities on various grid planes around the site 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 the client specification, CIBSE Lighting Guide 6 and the British Standards on a horizontal calculation grid.

The access road lighting shall be in strict accordance with the Hampshire County Council street lighting requirements to enable future adoption.

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-EX5

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 headed 22000lm forward throw distribution LED modules are to be housed within IP65 enclosures and are to be column and building mounted.

Reference EX2 - Single headed 16000lm forward distribution LED modules are to be housed within IP65 enclosures and are to be building mounted.

Reference EX3 - Single headed 11000lm forward throw LED modules are to be housed within an IP65 enclosure and are to be building mounted.

Reference EX4 - Single headed 6500lm forward throw LED modules are to be housed within an IP65 enclosure and are to be column and building mounted.

Reference EX5 - Single headed 5000lm forward throw LED modules are to be housed within an IP65 enclosure and are to be column mounted.

Type EX6-EX7

The AXIA luminaire is part of the Urbis Schreder range. The luminaire is designed for streetlight providing excellent distribution and reduced back spill. The luminaires are in accordance with the Hampshire County Council street lighting requirements and specification.

Reference EX6 - Single headed 9857lm LED modules are to be housed within an IP65 enclosure and are to be column.

Reference EX7 - Single headed 10945lm LED modules are to be housed within an IP65 enclosure and are to be column.

Type EX8

The Denver ID Wall 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 provide a high performance, high efficiency LED luminaire that allows wide spacing for most applications.

Reference EX8 - 1000 lumen package LED, long and narrow optic, building mounted.

Type EX9

The Denver ID Bollard is part of the Holophane range. It is a modern aesthetic design to coordinate with the matching wall mounted luminaire. The luminaire consists of an extruded aluminium body, housing high performance, high efficiency, LED technology.

Reference EX9 - 1000lm package LED, symmetric single lens 1m bollard.

Backwards Light Shields (BLS)

Backwards light shields have been added to luminaires wherever possible near the site boundary to reduce the light spill onto areas of woodland and hedgerow and reduce impact on the local ecology.

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4.0 Illumination Levels

In accordance with the clients briefing and specification, CIBSE Lighting Guide 6 (LG6) and BS EN 12464-2:2014, the following illumination levels are to be achieved:

Area	Maintained Illuminance (Lux)	Uniformity
Building Perimeter	5	0.25
Pedestrian Only Walkways	10	0.25
Parking Areas	15	0.25
Service Yard	30	0.40
Loading Bays	50	0.40
Building Entrances	50	0.40
Pedestrian Ramp	20 (5lux minimum)	-
Access Road (C4 Class)	10	0.40
Access Road Pedestrian Crossing	50	0.40

Average illumination levels achieved on CPW drawing DP-CPW-ZZ-XX-DR-E-2201-G – Unit 500, 501, 502 Proposed External Lighting Layout:

Unit 500	Average Level Achieved (Lux)	Uniformity
Building Perimeter	17.16	0.35
Car Park	18.53	0.32
Loading	53.33	0.75
Office Entrance	58.00	0.64
Service Yard	45.93	0.50
Pedestrian Path 1	26.88	0.47
Pedestrian Path 2	17.14	0.50
Pedestrian Path 3	20.61	0.28
Pedestrian Ramp	24.18 (min 20)	0.83
Unit 501	Average Level Achieved (Lux)	Uniformity
Building Perimeter	16.68	0.36
Car Park	24.02	0.37
Loading	58.11	0.53
Office Entrance	72.33	0.51
Service Yard	36.27	0.44

Pedestrian Path 1	20.12	0.40
Pedestrian Path 2	24.71	0.55
Unit 502	Average Level Achieved (Lux)	Uniformity
Building Perimeter	17.59	0.51
Car Park	19.37	0.46
Loading	52.72	0.76
Office Entrance	77.15	0.70
Service Yard	37.54	0.45
Pedestrian	24.26	0.33
Access Road	Average Level Achieved (Lux)	Uniformity
Access Road	17.86	0.45
Pedestrian Path 1	18.76	0.43
Pedestrian Path 2	36.63	0.41
Pedestrian Path 3	47.17	0.70
Pedestrian Crossing 1	54.50	0.92
Pedestrian Crossing 2	54.83	0.97

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5.0 ILP Guidance Notes for the Reduction of Obtrusive Light, 2020

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 E3.

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 E3 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	2500	0	<0.1
E2:	2.5	5	1	7500	500	5
E3:	5	10	2	10000	1000	10
E4:	15	25	5	25000	2500	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.

6.0 Comparison to ILP Guidance Notes for the Reduction of Obtrusive Light, 2020

Lighting calculations have been undertaken as demonstrated on the CPW External Lighting drawing (*DP-CPW-ZZ-XX-DR-E-2201-G – Unit 500, 501, 502 Proposed External Lighting Layout.*) and the following values have been obtained which demonstrate compliance to the ILP guidance table.

	E3 Maximum	NW 1	NW2
Sky Glow ULR Max %	5%	0%	0%
Light intrusion (into windows) Ev Lux			
Pre-curfew	10	0.0	0.0
Post-curfew	2	0.0	0.0
Luminaire Intensity I (candelas)			
Pre-curfew	10000	170	169
Post-curfew	1000	170	169

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7.0 Observer Reference Points

The blue lines indicate observer reference points which are located at the nearest properties to the development. The calculation is a worst-case calculation as it does not account for any trees or fencing. The red line indicates the plot's location.



8.0 Lighting Levels

The minimum recommended levels targeted are 5 lux average for the building perimeter, 10 lux average for pedestrian walkways and 15lx in car park areas. Increased illuminance levels of 50 lux to the loading bays are required to ensure maximum visibility for checking any paperwork or labels and where more detailed tasks are required.

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

The lighting scheme produced and indicated on CPW drawing DP-CPW-ZZ-XX-DR-E-2201-G – Unit 500, 501, 502 Proposed External Lighting Layout 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).

9.0 Summary

The scheme has been developed to reduce the impact that the external lighting would have on the surrounding areas including residential zones to the north west and woodland to the west. The scheme produced shows that the illuminance spillage towards the nearest residential properties to the development are within the parameters of environmental zone E3.

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, carbon footprint minimised and impact on the local ecology reduced.

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. The access road lighting must remain in strict accordance with the Hampshire County Council streetlighting specification to enable future adoption.



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LEGEND

- [illegible]



- ```

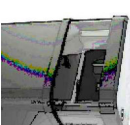
E36 SCHREIBER AXI 3.2,
 COLOUR: COLOUR,
 COLOUR TEMPERATURE: 3000K
 INITIAL LUMENS PER LAMP
 MAINTENANCE FACTOR = 1
 WANTS PER LUMINAIRE = 69
 TILT ANGLE = 0
 TILT ANGLE = 0 AS DERAILED
 TILT ANGLE = 0
 B15 INITIAL COLOUR LUMINAIRE IS
 FITTED WITH A BACKWARDS LIGHT SHIELD

E37 SCHREIBER AXI 3.2,
 COLOUR: COLOUR,
 COLOUR TEMPERATURE: 3000K
 INITIAL LUMENS PER LAMP
 MAINTENANCE FACTOR = 1
 WANTS PER LUMINAIRE = 78
 TILT ANGLE = 0
 TILT ANGLE = 0 AS DERAILED
 TILT ANGLE = 0
 B15 INITIAL COLOUR LUMINAIRE IS
 FITTED WITH A BACKWARDS LIGHT SHIELD

```



- EX8**  
HOLOPHANE DENVER ID WALL,  
BUILDING MOUNTED,  
NARROW OPTIC,  
1000 INITIAL LUMENS PER LAMP  
COLOUR TEMPERATURE: 3000K  
MAINTENANCE FACTOR = 1  
WATTS PER LUMINAIRE = 12  
MOUNTING HEIGHT = AS DETAILED



- HOLOPHANE DENVER ELITE BOLLARD  
BOLLARD MOUNTED,  
SYMMETRIC SINGLE LENS,  
1000 INITIAL LUMENS PER LAMP  
COLOUR TEMPERATURE: 3000K  
MAINTENANCE FACTOR = 1  
WATTS PER LUMINAIRE = 12  
MOUNTING HEIGHT = AS DETAILED
- 1 LUX CONTOUR  
0.5 LUX CONTOUR

THE RESULTS FOR EACH UNIT AND THE ACCESS ROAD PRESENTED WITHIN THE REPORT HAVE BEEN CALCULATED SEPARATELY TO ELIMINATE RELIANCE ON SPILL LIGHTING AND ENSURE REQUIRED LEVELS ARE ACHIEVED. EVEN WHEN NEIGHBOURING UNITS ARE UNOCCUPIED, SPILL AND UMWL HAVE BEEN CALCULATED WITH ALL LUMINAIRES ON TO SHOW THE WORST CASE SCENARIO A SHOWN IN THIS DRAWING.

| Q  | 69-B-0002 | UPDATED SITE LAYOUT                                 | CP |
|----|-----------|-----------------------------------------------------|----|
| F  | 69-B-0008 | UPDATED SITE LAYOUT AND/OR RENO. LIGHTING FOR MAINS | CP |
| E  | 07-B-0006 | UPDATED FOR MAINS                                   | CP |
| D  | 69-B-0001 | UPDATED FOR MAINS                                   | CP |
| C  | 22-B-0001 | UPDATED FOR MAINS                                   | MS |
| B  | 20-B-0001 | UPDATED FOR MAINS                                   | MS |
| A  | 100-0001  | PRELIMINARY TO A-0001 THROUGH LIGHTING              | MS |
| MS | MS        | PRELIMINARY                                         | MS |
|    |           | MS                                                  | MS |



### STAGE 3



ALL DRAWINGS TO BE READ IN CONJUNCTION WITH THE CPW EXTERNAL LIGHTING REPORT

ACCESS ROAD PEDESTRIAN CROSSING COLLIANS (REF EX7) TO BE INSTALLED WITH BELSIA BEACONS IN ACCORDANCE WITH HAMPSHIRE COUNTY COUNCIL REQUIREMENTS.

CPW  
Portsmouth  
CITY COUNCIL

Project  
DUNSTON PARK  
PORTSMOUTH

1. ELECTRICAL CONTRACTOR TO VERIFY LIGHTING CONCEPT, ALLOCATION AS THIS IS ONLY A CONCEPTUAL DESIGN.
2. ELECTRICAL CONTRACTOR TO READ THIS DRAWING IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS.
3. ELECTRICAL CONTRACTOR TO ENSURE CABLES AND LIGHTING COLUMNS ARE LOCATED SUCH THAT THEY WILL NOT BE AFFECTED BY THE FUTURE GROWTH OF THE TREES, PLANT, ETC.
4. ALL EXTERNAL LIGHTING IS TO BE CONTROLLED WITH A PHOTO CELL (LOCATION IS TO BE CONFIRMED) SUCH THAT LIGHTING WILL BE ON AT DUSK AND OFF AT DAWN, LIGHTING WILL REMAIN OPERATIONAL DURING TH HOURS OF DARKNESS.
5. THE LIGHTING DESIGN TO COMPLY WITH THE CODE OF PRACTICE FOR DESIGN OF ROAD LIGHTING AND ALL LATEST ADDITIONS.
6. NO SHIMMERY/CALCULAE HAS BEEN ALLOWED WITHIN THE LIGHTING CALCULATION TO ALLOW FOR WORST CASE ON THE LIGHTING OVERSHILL.
7. ACCESS ROAD LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH HANDBOOK TO CIVIL ENGINEERING TECHNICAL GUIDANCE NOTE 10.3 - STREET LIGHTING.
8. STREET LIGHTING HAS ALSO BEEN CALCULATED WITH ALL LUMINAIRE TO SHOW THE WORST CASE RESULTS.
9. ALL LUMINAIRE TO HAVE A COLOUR TEMPERATURE OF 4000K.

10. ROAD LIGHTING DESIGNED TO COMPLY WITH BS5489-1:2013 CODE OF PRACTICE FOR DESIGN OF ROAD LIGHTING.
11. ALL LIGHTING COLUMNS AND LAMPFRIMS TO BE IN SAME COLOUR AND FINISH TO BE AGREED WITH CLIENT PRIOR TO TENDER. ALL ACCESS ROAD FITTINGS TO BE IN SAME COLOUR AND FINISH TO BE AGREED WITH CLIENT PRIOR TO TENDER. ALL BUILDING MOUNTED LUMINAIRES TO MATCH CLADDING COLOURS AS FAR AS POSSIBLE USING STANDARD RAL COLOURS.
12. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH CPV EXTERNAL LIGHTING REPORT.
13. ACCESS ROAD PREDISTAL PROSSING COLUMN LAMP EX7) TO BE INSTALLED WITH BELUSHI BEACONS ACCORDANCE WITH HAMPSHIRE COUNTY COUNCIL REQUIREMENTS.

10 No. cycle parking spaces.

## EXISTING STREET LIGHTING COLUMN RELOCATION

