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MTP DEV LIMITED



Mira Technology Park

Plot 44

240236

External Lighting Report

Document Revision History

Rev	Author	Verification By	Date	Suitability	Comments / Status
P01	D. Woolgar	S.Tuohey	18/09/2024	S3	PLANNING ISSUE

Birmingham | Nottingham | Huntingdon | Leeds | Bristol | Leicester | London | Manchester | Derby | Poland | India

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External Lighting Report



1.0 Introduction

This report details the proposed external lighting design and associated products in support of a planning application for the erection of an industrial building with ancillary office space alongside associated access, parking, landscaping and drainage at Plot 44 Mira Technology Park.

The proposed luminaires mounted the building & on steel columns will utilise various forms to provide functional, amenity and security lighting to the service 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 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.

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 GN01/21*, BS EN 12464-2 and other institutional guides for exterior lighting.

This report should be read in conjunction with the included CPW drawing **240236-CPW-XX-XX-DR-E-307001 – Proposed External Lighting Layout**

2.0 Lighting Design Brief

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

- BS EN 12464-2:2014 Light and Lighting – Lighting of workplaces: Part 2 Outdoor Workplaces.
- 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 GN01/21;
- Lighting Guide 6 - The Outdoor Environment
- Client briefing documents and specification.

Due to the site's location, it has been assessed against an environmental zone of E3, described as Well inhabited rural and urban settlements, small town centres of suburban locations.

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 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-EX2 Holophane D-Series

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. Sealed to IP65.



Reference EX1 - Single headed 10,000lm LED modules, column mounted and building mounted.

Reference EX2 - Single headed 6,000lm LED modules, column and building mounted.

Type EX3

The Citymax is part of the Holophane range. It is ideal for large car parks with its Symmetric light distribution. Precisely controlled light distribution offers maximum efficiency keeping light pollution along with spill and glare to a minimum.



Reference EX3 - 7,000lm package LED, building mounted.

Type EX4 Holophane ID Wall

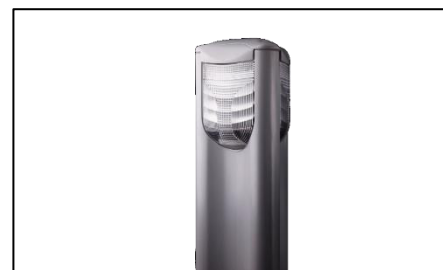
Holophane Denver iD: Wall consists of a 2-part body and a removable LED module manufactured from LM6 marine grade die-cast aluminium with integrated thermal management properties. Both luminaire body and LED module are sealed to IP65 and rated IK10. Drivers and LED are mounted separately from each other to promote low operating temperatures and long system life.



Reference EX4 - 1,500lm package LED, building mounted

Type EX5 Holophane Elite Bollard

The luminaire shall consist of an extruded aluminium body, housing integral control gear for LED technology. The optical arrangement shall consist of a prismatic lens or prismatic lens with louvre. The top tri-lobe gasket enabling the bollard to achieve EN60598-1 (patent pending) is secured between the top cap and body via three stainless steel nuts. Root mounted option available. The luminaire complies to EN60598 with a range of options and accessories.



Reference EX5 - 1,000lm package LED, mounted on ground.

Type EX6 Holophane Metrolux

The luminaire shall consist of a prismatic glass refractor, gasket sealed within an aluminium door frame assembly. The luminaire housing shall consist of a two-part die-cast aluminium assembly with a concealed hinge for easy lamp access, and suitable integral control gear for a choice of compact fluorescent lamps and an LED option. The luminaire shall comply with EN60598 with an IP rating of 65.



Reference EX6 - Bulkhead, 1,000lm LED modules with asymmetrical narrow optic to be mounted within bin stores.

Type EX7 - EX8 DW Windsor Kirium Pro 2

Kirium Pro 2 street luminaire with 64 LED light engine. Constant light output enabled fully programmable DALI driver operating up to 1050mA. 3,000K colour temperature using Diamond+ A1 optic technology. LM6 high pressure die-cast aluminium body in RAL 7046 mid grey with a polyester powder coat finish and flat toughened glass glazing. With lift-off head, automatic electrical disconnection block and toolless entry for easy maintenance. Cool Zone™ thermal technology for improved performance. IP66 and IK10 protection. 100,000-hour (L90 B10) lifetime.



Reference EX7 - Single headed 11,700lm LED modules, to be mounted on 'Gina - Side entry' column.

Reference EX8 - Single headed 8,648lm LED modules, to be mounted on 'Gina - Side entry' column.

'NR' long and narrow distribution.

'FW' Denotes forward throw distribution.

'BLC' Denotes long & distribution with extreme backlight cut-off.

'AS3' Denotes asymmetric optic.

'ST1' Denotes symmetric long optic.

'TR' Denotes triple symmetric optic.

'BLS' Denotes backwards light shield.

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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	1Lux (min)
Parking Areas	10	0.25
HGV Parking Areas	30	0.40
Service Yard	30	0.40
Dock Doors	50	0.40
Building Entrances	50	0.40
Road Lighting (C4)	10	0.40

Plot 44
Average illumination levels achieved on CPW drawing drawings **240236-CPW-XX-XX-DR-E-307001 - Proposed External Lighting Layout:**

Infrastructure	Average Level Achieved (Lux)	Uniformity
Road Lighting	16.39	0.43
Car Park	18.37	0.27
Unit 44a Building Perimeter	25.15	6Lux (min)
Unit 44a Service Yard	33.96	0.50
Unit 44a Dock Doors	55.30	0.85
Unit 44a Building Entrance	72.00	0.82
Unit 44b Building Perimeter	22.19	6Lux (min)
Unit 44b Service Yard	31.34	0.41
Unit 44b Dock Doors	55.55	0.86
Unit 44b Building Entrance	60.00	0.82

5.0 ILP Guidance Notes for the Reduction of Obtrusive Light, 2021

In accordance with the Institute of Lighting Professionals (ILP) 'Guidance Notes for the Reduction of Obtrusive Light, 2021'. 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.

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6.0 Comparison to ILP Guidance Notes for the Reduction of Obtrusive Light, 2021

Lighting calculations have been undertaken as demonstrated on the CPW External Lighting drawings ‘240236-CPW-XX-XX-DR-E-307001 – Proposed External Lighting Layout’ and the following values have been obtained which demonstrate compliance to the ILP guidance table for environmental zone E3 and the sensitive receptors residential receptions (ref 1) identified by the blue lines in Section 7, as follows:

Unit	E3 Maximum	Ref 1	Ref 3
Sky Glow ULR Max %	5%	0.002%	0.002%
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	33	23
Post-curfew	1000	33	23

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.



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8.0 The CPRE Sky Glow Map

The CPRE Sky Glow Map identifies that the existing light pollution levels surrounding the Site (outlined in red below) fall under a high brightness designation, which is confirmed by the orange colouration (4 – 8 NanoWatts / cm² / sr) in the extract provided below. The main area of high brightness surrounding the Application Site are nearby industrial developments & residential areas further to the south.



The Application Site is located in an area containing several industrial, commercial, and residential developments. Accordingly, an environmental zone of E3 has been selected to inform the lighting strategy of the Proposed Development due to the spare rural areas adjacent to the site. An E3 environmental zones comprises one described as a Well inhabited rural and urban settlements, small town centres of suburban locations.

9.0 Lighting Levels

The minimum recommended levels targeted are 5 lux average for the building perimeter with 10 lux in car park and road areas. Increased illuminance levels of 30 lux for service yards & 50 lux to the dock doors are required to ensure safe manoeuvring and handling of goods.

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 drawings '**240236-CPW-XX-XX-DR-E-307001 - Proposed External Lighting Layout**' is within the parameters specified within the ILP guidance notes for the reduction of obtrusive light, 2021. 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. Perimeter walkway track & bin store lighting to be controlled via PIR detection. (Final settings to be determined by Client).

10.0 Summary

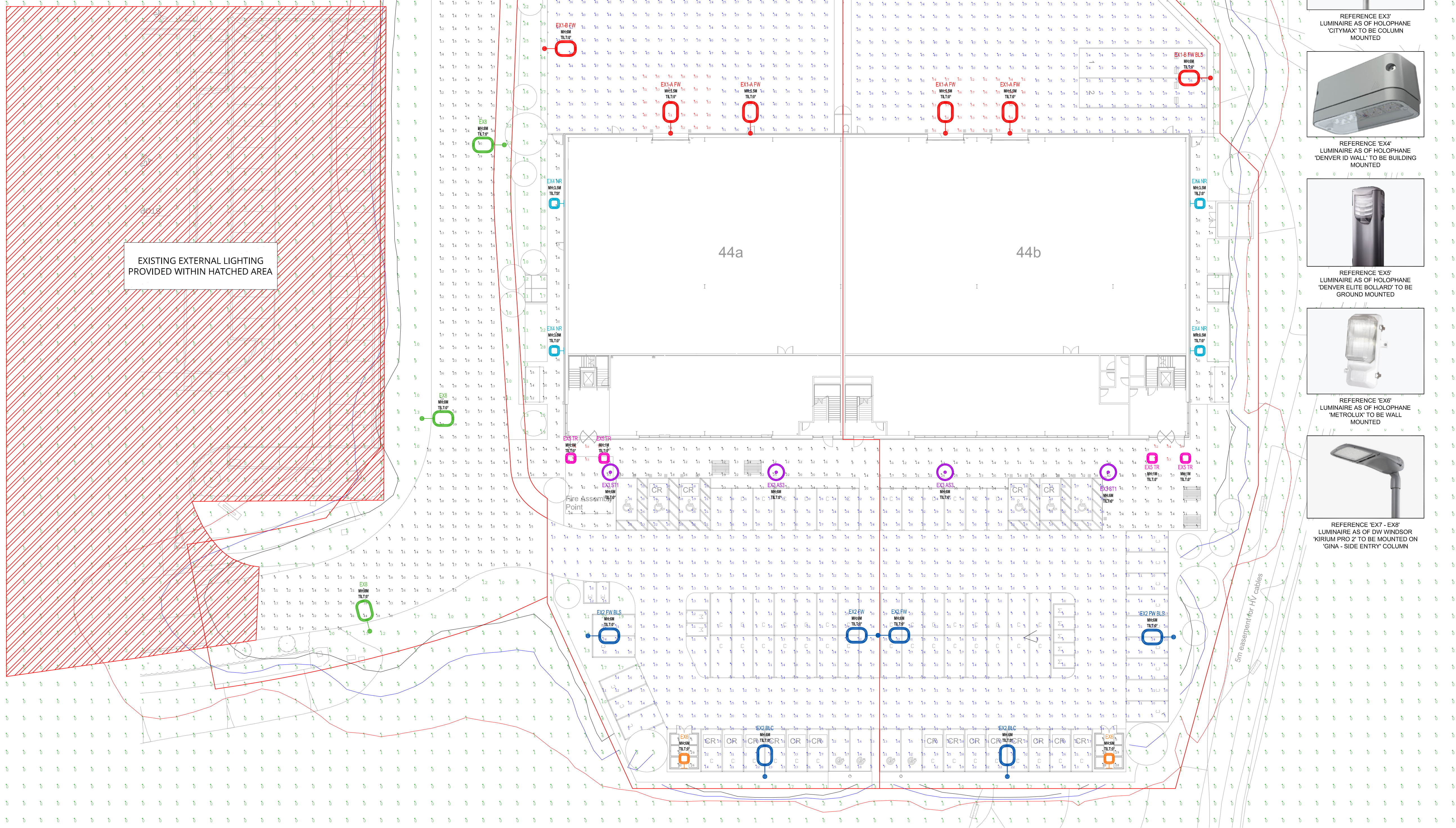
The scheme has been developed to reduce the impact that the external lighting would have on the surrounding areas. The scheme produced shows that the illuminance spillage towards the nearest residential properties to the development are within the parameters of environmental zone E3.

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.

NOTES

- ELECTRICAL CONTRACTOR TO VERIFY LIGHTING DESIGN PRIOR TO INSTALLATION. THIS IS ONLY A CONCEPTUAL DESIGN.
- ELECTRICAL CONTRACTOR TO READ THIS DRAWING IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS.
- ELECTRICAL CONTRACTOR TO ENSURE CABLES AND LIGHTING COLUMNS ARE LOCATED SUCH THAT THEY WILL NOT BE AFFECTED BY THE FUTURE GROWTH OF THE TREE ROOT.
- FOR PLANNING PURPOSES ASSUME ALL EXTERNAL LIGHTING WILL COME ON AT DUSK AND REMAIN ON UNTIL DAWN, EXACT HOURS TO BE CONFIRMED BY THE OCCUPYER.
- THE LIGHTING DESIGN TO COMPLY WITH THE CIBSE GUIDE LG06 THE OUTDOOR ENVIRONMENT, AND THE ILP GUIDANCE NOTES FOR REDUCTION OF OBTRUSIVE LIGHT, 2021 AND ALL LATEST ADDITIONS.
- LUMINAIRE COLOURS TO MATCH COLUMN/CLADDING COLOURS.
- ALL LUMINAIRES TO HAVE 0° TILT TO MINIMISE UPWARD LIGHT SPILL AND OBTRUSIVE LIGHT.
- EX6 & EX7 TO BE MOUNTED ON 'GINA - SIDE ENTRY' COLUMNS, AND COLOURS TO BE MATCHED TO EXISTING FOR CONTINUITY ON THE ROAD THROUGHOUT THE SITE.
- 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. PERIMETER WALKWAY TRACK & BIN STORE LIGHTING TO BE CONTROLLED VIA PIR DETECTION. (FINAL SETTINGS TO BE DETERMINED BY CLIENT).



LEGEND

- EX1-A** BUILDING MOUNTED D-SERIES, 4000K, 10,000 INITIAL LUMENS PER LAMP, MAINTENANCE FACTOR = 1, WATTS PER LUMINAIRE = 81, MOUNTING HEIGHT = AS DETAILED
- EX1-B** COLUMN MOUNTED D-SERIES, 4000K, 10,000 INITIAL LUMENS PER LAMP, MAINTENANCE FACTOR = 1, WATTS PER LUMINAIRE = 81, MOUNTING HEIGHT = AS DETAILED
- EX2** COLUMN MOUNTED D-SERIES, 4000K, 6,000 INITIAL LUMENS PER LAMP, MAINTENANCE FACTOR = 1, WATTS PER LUMINAIRE = 45, MOUNTING HEIGHT = AS DETAILED
- EX3** COLUMN MOUNTED CITYMAX, 4000K, 7,000 INITIAL LUMENS PER LAMP, MAINTENANCE FACTOR = 1, WATTS PER LUMINAIRE = 56, MOUNTING HEIGHT = AS DETAILED
- EX4** BUILDING MOUNTED ID WALL, 4000K, 1,500 INITIAL LUMENS PER LAMP, MAINTENANCE FACTOR = 1, WATTS PER LUMINAIRE = 12, MOUNTING HEIGHT = AS DETAILED
- EX5** GROUND MOUNTED DENVER ELITE BOLLARD, 4000K, 1,000 INITIAL LUMENS PER LAMP, MAINTENANCE FACTOR = 1, WATTS PER LUMINAIRE = 12
- EX6** WALL MOUNTED METROLUX, 4000K, 1,000 INITIAL LUMENS PER LAMP, MAINTENANCE FACTOR = 1, WATTS PER LUMINAIRE = 14, MOUNTING HEIGHT = AS DETAILED
- EX7** COLUMN MOUNTED KIRIUM PRO 2, 4000K, 11,700 INITIAL LUMENS PER LAMP, MAINTENANCE FACTOR = 1, WATTS PER LUMINAIRE = 64, MOUNTING HEIGHT = AS DETAILED
- EX8** COLUMN MOUNTED KIRIUM PRO 2, 4000K, 8,648 INITIAL LUMENS PER LAMP, MAINTENANCE FACTOR = 1, WATTS PER LUMINAIRE = 48, MOUNTING HEIGHT = AS DETAILED

- 'FW' DENOTES FORWARD THROW
- 'AS3' DENOTES ASYMMETRIC OPTIC
- 'BLC' DENOTES LONG & NARROW DISTRIBUTION WITH EXTREME BACKLIGHT CUT-OFF
- 'BLS' DENOTES FITTED WITH BACKWARDS LIGHT SHIELD
- 'ST1' DENOTES SYMMETRIC LONG OPTIC
- 'NR' DENOTES LONG AND NARROW OPTIC
- 'TR' DENOTES TRIPLE SYMMETRIC OPTIC

- 5 LUX CONTOUR LINE
- 3 LUX CONTOUR LINE
- 1 LUX CONTOUR LINE



REFERENCE 'EX1-A' LUMINAIRE AS OF HOLOPHANE 'D-SERIES' TO BE BUILDING MOUNTED



REFERENCE 'EX1-B - EX2' LUMINAIRE AS OF HOLOPHANE 'D-SERIES' TO BE COLUMN MOUNTED



REFERENCE EX3' LUMINAIRE AS OF HOLOPHANE 'CITYMAX' TO BE COLUMN MOUNTED



REFERENCE 'EX4' LUMINAIRE AS OF HOLOPHANE 'DENVER ID WALL' TO BE BUILDING MOUNTED



REFERENCE 'EX5' LUMINAIRE AS OF HOLOPHANE 'DENVER ELITE BOLLARD' TO BE GROUND MOUNTED



REFERENCE 'EX6' LUMINAIRE AS OF HOLOPHANE 'METROLUX' TO BE WALL MOUNTED



REFERENCE 'EX7 - EX8' LUMINAIRE AS OF DW WINDSOR 'KIRIUM PRO 2' TO BE MOUNTED ON 'GINA - SIDE ENTRY' COLUMN

REV	DATE	DESCRIPTION	BY	ST
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RIBA Stage

STAGE 2

Status

PLANNING

Client

MTP DEV LIMITED

Project

MIRA TECHNOLOGY PARK PLOT 44

Drawing Title

PROPOSED EXTERNAL LIGHTING LAYOUT

Scale (A1)

1:250

Date

09/09/2024

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CPW Project No.

240236

Linked Files

21-092-03-SGP-ZZ-ZZ-DR-A-131011-P06-Site Plan - CAT B

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11.0 Appendix A: Lighting Plans



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