

EXTERNAL LIGHTING STRATEGY REPORT

FOR:

A PROJECT FOR:
WRENBRIDGE (FRELD READING) LLP

AUTHOR:
R HOWELL

STATUS:
PLANNING ISSUE – REV PL2

DOCUMENT MANAGEMENT

DOCUMENT REVISIONS

Rev:	Description:	By:	Date:
PL1	Draft Issued for Comment	RH	03.02.2025
PL2	Planning Issue	RH	10.02.2025

CONTENTS

1.0	INTRODUCTION	3
2.0	SITE CONTEXT	3
3.0	LIGHTING SOLUTION	4
4.0	DESIGN STATISTICS BASED ON THE SITE PROPOSED DESIGN	7
5.0	LUMINAIRE DETAILS BASED ON SITE PROPOSED DESIGN.	9
6.0	CONCLUSION	11
7.0	REFERENCES	11
8.0	APPENDIX	12

1.0 INTRODUCTION

1. This report provides details of the Lighting Strategy for the proposed new development at Shinfield Park, Shinfield Road, Reading, RG2 9XY. The proposed development description is as follows:

“Redevelopment of the site for flexible employment and industrial processes (Use Class E(g) (ii)- (iii) / B2/B8) together with associated servicing areas, parking, landscaping and other associated works”

2. The Lighting Strategy is intended to achieve the following objectives:
 - Provide a safe and secure environment for the operation of the site, and for visitors to it.
 - Prevent harm to the Ancient Woodland and Ecological Sensitive Areas through light pollution.
 - Prevent harm to light-sensitive species.
 - Prevent loss of amenity at nearby domestic homes through spill light.
3. The Strategy achieves this using technology that minimises light spill and sky glow above the horizontal.

2.0 SITE CONTEXT

1. The specific site context has informed the lighting design and calculations for the development, the overriding principle of which has been to minimise operational light spill.
2. This necessitates a specific lighting design to avoid disturbance to light-sensitive species like bats as far as possible and spill of lighting into the ancient woodlands area surrounding the site.
3. There are also some residential properties to the north of the site. The lighting strategy includes ways to minimise any light pollution to these properties.
4. This Lighting Strategy has been designed to comply with the criteria as follows.
 - The detailed lighting scheme has been prepared in line with relevant British Standards and the latest national design guidance.
 - The design minimises unnecessary glare and spillage.
 - There is no significant adverse impact on neighbouring development, nature conservation and biodiversity or the wider landscape.
 - Light levels are the minimum required for safety, operational and security purposes, taking account of the existing location and character of the area; and
5. The International Commission on Illumination (CIE) identifies five types of environmental zones, as set out in tables detailed below. The Shinfield site falls within the E1 and E2 zones as detailed in the tables below.

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies; UNESCO starlight reserves; IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc
E2	Rural	Low distinct brightness (SQM 15 to 20)	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium distinct brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High distinct brightness	Town/city centres with high levels of night-time activity

Environmental Zones Table

Light technical parameter	Environmental zones				
	E0	E1	E2	E3	E4
Upward light ratio (ULR)/%	0	0	2.5	5	15

Maximum Values of Upward Light Ratio (ULR) of Luminaires Table

3.0 LIGHTING SOLUTION

3.1 OVERVIEW

1. The lighting solution has been prepared in accordance with the current Design Standard for Exterior Lighting in conjunction with BS 5489-1:2020, BS EN 12464-2:2014, CIBSE LG6 Technical Advice including the guidance on bats: Institute of Lighting Professionals (ILP) Guidance Note 8: Bats and Artificial Lighting. BREEAM 'Excellent' requirements have also been considered.
2. Care has been taken when selecting the luminaires that ensure the appropriate products will greatly reduce light spill and glare to and around site boundaries. The maximum lux level will not exceed 1 lux and will prevent sky glow.
3. Full cut-off luminaires, horizontal, "flat" floodlights and LED modules that are housed in the luminaires canopy have been generally selected.
4. Best lighting practice design guidelines have been followed to achieve the criteria outlined in The Institution of Lighting Professionals: Guidance Notes for the Reduction of Obtrusive Light 01/20, covering Environmental Zones E0 to E4.
5. The light spill indicated in the lighting solution does not consider any vegetation surrounding the site which will reduce this figure further from the calculated value.
6. Further override and time-controlled switching facilities will be provided, enabling further overall control of the lighting except for necessary health and safety lighting adjacent to the buildings as required. This also

meets the applicable BREAM requirements in terms of limiting nighttime glare between the hours of 11pm and 7am

7. The only lighting that will remain on is the requirements to cover health and safety aspects as noted above.
8. The lighting to the main access roads through the site including the parking area to the north of the site have been designed using column lighting that includes automatic presence detection with automatic dimming controls to operate as follows.
 - If no presence is detected in the area the individual luminaires will automatically dim down to an output level of 20% of the maximum output.
 - If presence is then detected in the area the individual luminaires will automatically ramp up to the maximum output until no further presence is detected where they will then dim back down to 20% output and remain there until further presence is detected.

3.2 PROPOSED LUMINAIRES

1. The proposed Holophane D-Series 0 and 2, Denver ID Wall, Polar 1, Wallpack and Denver iD post top façade and column mounted luminaires have a ULR of 0% and drastically reduce the upward spread of light near to and above the horizontal.
2. The most sensitive/critical zones for minimising sky glow are those between 85 - 100° as shown in Table 1 below and the Environmental Zones Table.

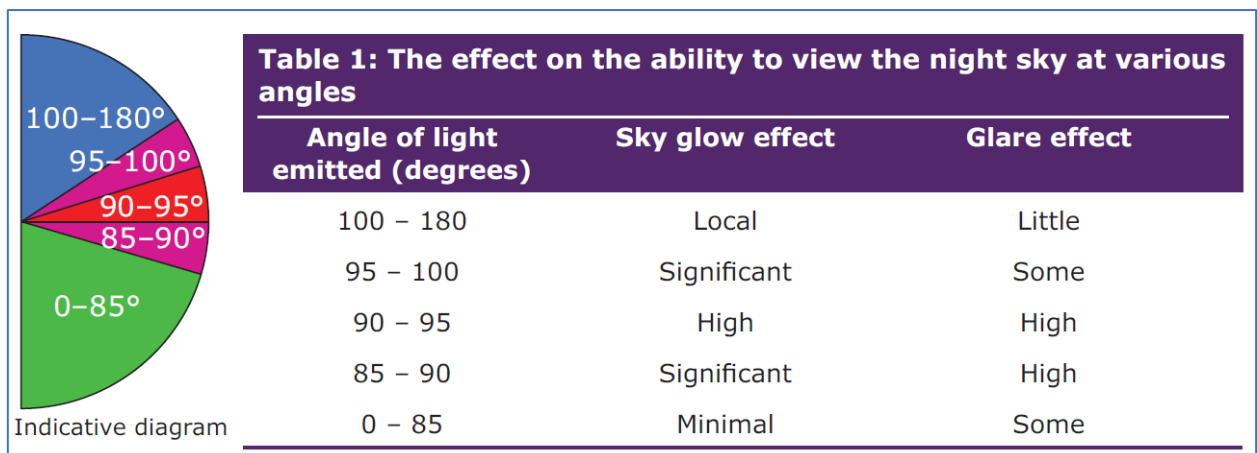


Table 1: Critical Luminaire Angles for Minimising Sky Glow

3. With the proposed luminaires being strategically placed and having zero upward light ratio (ULR), the proposed design solution meets the criteria of environmental zones E1 to E2, Lighting Environment classification as indicated respectively in the Environmental Zones Table.
4. Glare has been kept to a minimum by ensuring that the main beam angle of all the luminaires directed towards any potential observer is not more than 70 degrees as indicated in Figure 1 below.

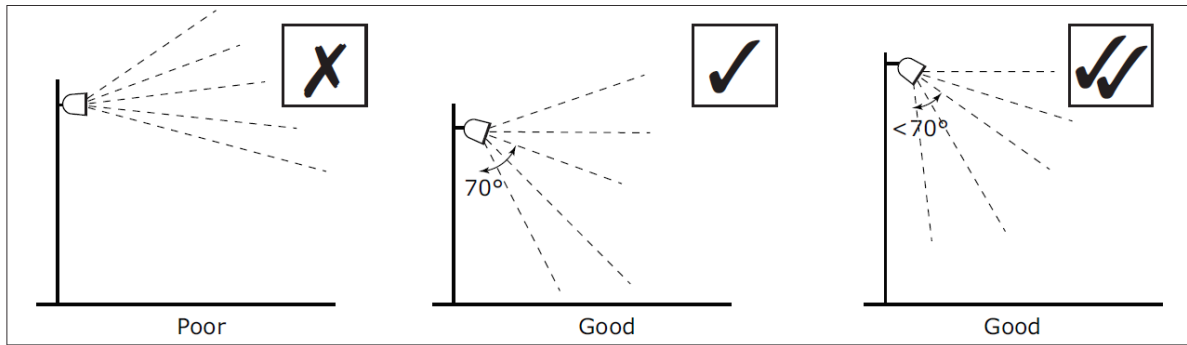


Figure 1: Luminaire aiming angles

5. In addition to this, the designed mounting heights and chosen luminaires ensure that greater spacing between luminaires is achieved thus reducing the number of overall lighting points and also reducing the spill and glare as indicated in Figures 2 and 3 below.

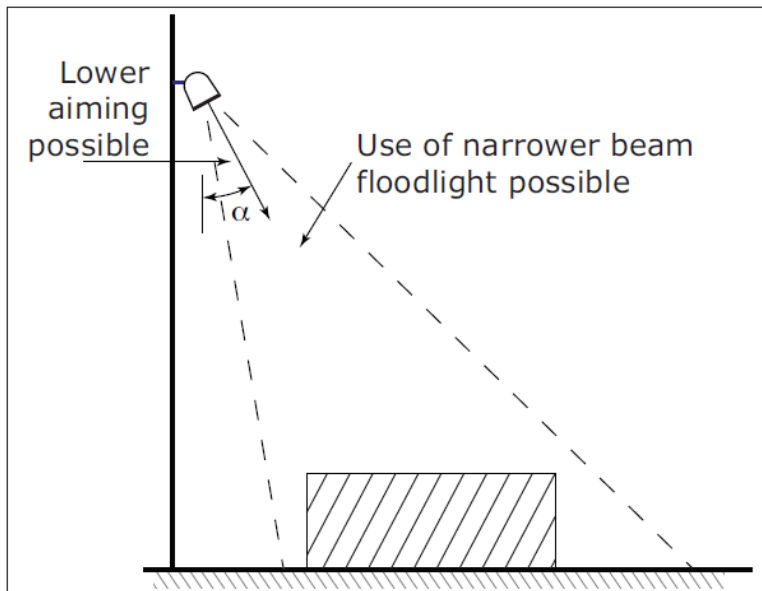


Figure 2: Higher mounting height – less spill and glare

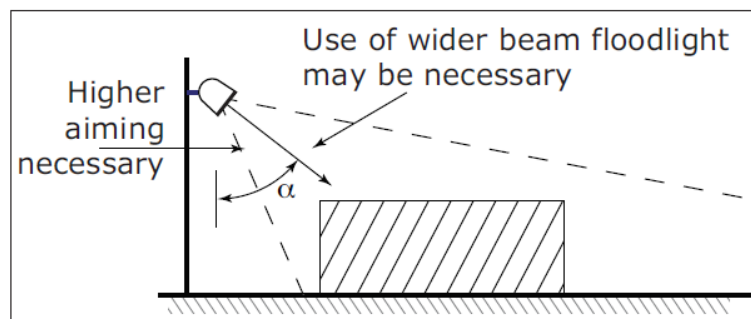


Figure 3: Lower mounting height – more spill and glare

6. Light pollution on adjacent properties has been kept to a minimum and in accordance with the respective environmental zone category indicated in Table 2 below.

Light technical parameter	Application conditions	Environmental zone				
		E0	E1	E2	E3	E4
Illuminance in the vertical plane (E_v)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	<0.1 lx*	1 lx	2 lx	5 lx

Table 2: Maximum values of vertical illumination on properties

- The external lighting design is based on using luminaires that are zero tilt and have zero upward light components. Consideration has been given to the impact of the proposed development to the ancient woodland's areas around the site and light-sensitive species, notably bats. The proposals include mitigation strategies to minimise the degree of impact.
- The lighting strategy includes upward lighting and glow design control and prevents excessive lighting spill near and adjacent to the boundaries of the site through the use of luminaires equipped with back shields and additional optics with zero tilt and glare.
- All proposed lighting fixtures meet the environmental standards of E1/E2 zoning.
- All colour temperatures for the lamps within the bat sensitive areas as noted above are proposed to be 2700K. The output from a 2700k lamp, which is warm white ensures that the overall brightness within the area is limited as opposed to a cool white lamp which is generally brighter in appearance.

4.0 DESIGN STATISTICS BASED ON THE SITE PROPOSED DESIGN

- The following table details the design statistics achieved within the various areas within the development zone.
- The scheme is based on the use of LED luminaires fixed to the building façades and lighting columns as detailed on the accompanying external lighting layout, 24114-MBA-EX-SP-DR-E-0001 Rev PL1.
- The symbols indicated in the table below represent the different types of luminaires utilised on the lighting layout drawing. The table below should be read in conjunction with the lighting layout drawing.
- The northern overflow car park statistics are covered within the access road results detailed in the table below. Additional controls have been included within all the individual luminaires that includes automatic dimming and proximity controls as detailed elsewhere in this report, section 3.1 paragraph 8.

Statistics				
Description	Symbol	Avg	Min	Min/Avg
Access Road (Landlords) - 20/0.40Uo(Copy)	+	21 lux	9 lux	0.43
Unit 1 Car Park - 10/0.25Uo	+	13 lux	6 lux	0.46
Unit 1 Cycles	+	6 lux	3 lux	0.50
Unit 1 Dock Doors - 50/0.40Uo	+	55 lux	26 lux	0.47
Unit 1 Rear Walkway - 10/0.40Uo	+	13 lux	7 lux	0.54
Unit 1 Service Yard - 20/0.40Uo	+	21 lux	10 lux	0.48
Unit 1/5 Car Park - 10/0.25Uo	+	12 lux	3 lux	0.25
Unit 2 Car Park - 10/0.25Uo	+	12 lux	3 lux	0.25
Unit 2 Dock Doors - 50/0.40Uo	+	53 lux	33 lux	0.62
Unit 2 Rear Walkway - 10/0.40Uo	+	12 lux	5 lux	0.42
Unit 2 Service Yard - 20/0.40Uo	+	24 lux	10 lux	0.42
Unit 3 Rear Walkway - 10/0.40Uo	+	11 lux	5 lux	0.45
Unit 3a Car Park - 10/0.25Uo	+	14 lux	6 lux	0.43
Unit 3a Service Yard - 20/0.40Uo	+	21 lux	9 lux	0.43
Unit 3b Car Park - 10/0.25Uo	+	10 lux	4 lux	0.40
Unit 3b Service Yard - 20/0.40Uo	+	21 lux	12 lux	0.57
Unit 4 Car Park - 10/0.25Uo	+	11 lux	4 lux	0.36
Unit 4 Cycles	+	20 lux	15 lux	0.75
Unit 4 Rear Walkway - 10/0.40Uo	+	11 lux	8 lux	0.73
Unit 4 Service Yard - 20/0.40Uo	+	22 lux	10 lux	0.45
Unit 5 Cycles	+	10 lux	7 lux	0.70
Unit 5 Dock Doors - 50/0.40Uo	+	54 lux	31 lux	0.57
Unit 5 Rear Walkway - 10/0.40Uo	✗	10 lux	4 lux	0.40
Unit 5 Service Yard - 20/0.40Uo	+	21 lux	12 lux	0.57

Design Statistics Table – Layout Drawing 24114-MBA-EX-SP-DR-E-0001 Rev PL1.

- The results obtained fall in line with the respective guidelines Environmental Zones E1to E3 inclusive as detailed elsewhere in this report.
- As further detailed on the drawing, any potential light spill over the boundaries into adjoining and protected areas including neighboring properties has been kept to the minimum of 0 lux and 1 lux up to the boundary line which is detailed on the drawing and indicates the expected spill zone and the respective level.

5.0 LUMINAIRE DETAILS BASED ON SITE PROPOSED DESIGN.

5.1 D-SERIES 1 & 2 POST MOUNTED AND WALL MOUNTED LED LUMINAIRE

1. The D-SERIES Streetlight luminaire has a single-piece die-cast aluminium housing that conforms to EN 1706 AC-46500 with integral heat sink fins to optimise thermal management through conductive cooling. Figure 4 indicates an image of the proposed luminaire.
2. LED modules are IP65 with individual lenses, and high-grade aluminium housing to transfer heat away from the LEDs and dissipate through the finned housing for cooling.
3. The LED driver is mounted in direct contact with the finned housing for cooling to promote low operating temperature and long system life.
4. The housing is completely sealed against moisture and environmental contaminants (IP65).
5. With 0% upward light ratio and backward lighting spill this luminaire complies with Environmental Zones E0 to and including E4.
6. The luminaire has been chosen for the access road and the individual unit car parks and service yards.



Figure 4: D-Series 0 & 2 Luminaire

5.2 WALLPACK WALL MOUNTED LED LUMINAIRE

1. The Wallpack Wall mounted luminaire with prismatic glass lens equipped with LED lamp modules. This luminaire has 2 × 10 LED modules that are protected to IP65 rating within individual lenses and comes in four optical distributions. The Forward Throw optics have been used on this project to suit the area being lit. Figure 5 indicates an image of the proposed luminaire.
2. The luminaire consists of two-piece die-cast aluminium housing with integral heat sink fins to optimise thermal management through conductive cooling.
3. The housing is completely sealed against moisture and environmental contaminants (IP65).
4. With 0% upward light ratio and backward lighting spill, this luminaire complies with Environmental Zones E0 to and including E4.
5. The luminaire has been chosen for the overflow car park, individual unit car parks and service yards situated adjacent to sensitive lighting areas.



Figure 5: Wallpack Luminaire

5.3 DENVER iD WALL MOUNTED LED LUMINAIRE

1. The Denver iD Wall luminaire consists of a die cast aluminium body with LED modules which are sealed with a high transparency glass. The luminaire is available in five different output optics; symmetric, asymmetric, long & narrow, forward throw and high beam long and narrow. A long and narrow optic distribution has been used on this project to suit the area being lit. Figure 6 indicates an image of the proposed luminaire.
2. The luminaire is completely sealed against moisture and environmental contaminants (IP65).
3. With 0% upward light ratio this luminaire complies with Environmental Zones E0 to and including E4.
4. The luminaire has been chosen for the foot paths around Unit 1 and 2 and Unit 1 service yard.



Figure 6: Denver iD Wall Luminaire

5.4 POLAR LED LUMINAIRE

1. Indoor and outdoor floodlight. Die cast aluminum body, coated with polyester anticorrosion powder, silver color, 4mm thick tempered transparent glass, silicon gasket, electronic driver 220-240V50/60Hz. Figure 7 indicates an image of the proposed luminaire.
2. Manufactured in accordance with EN / IEC 60598-1:2018.
3. The luminaire has been chosen for the dock door locations for units 1, 2 and 5.



Figure 7: Polar 1 luminaire

6.0 CONCLUSION

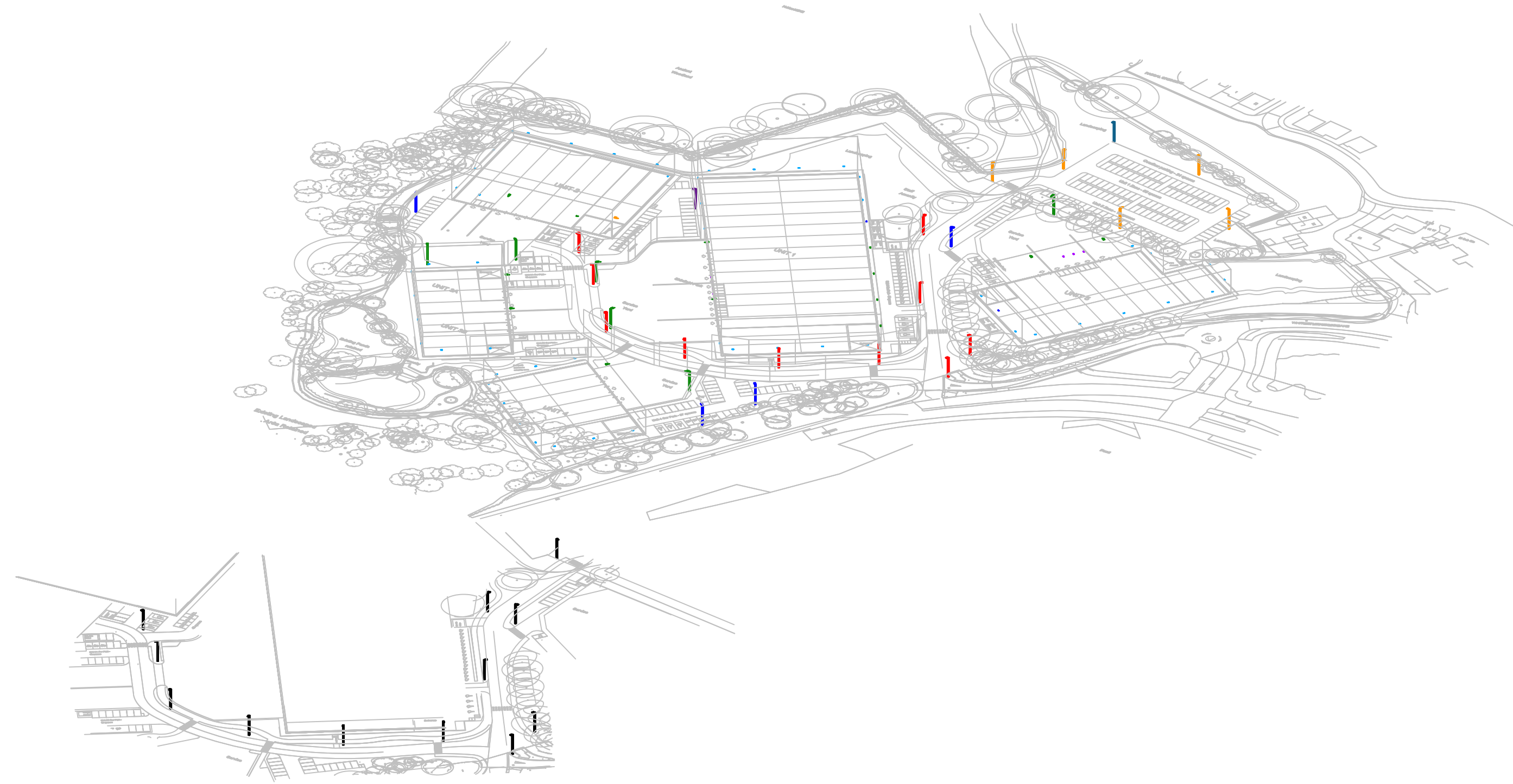
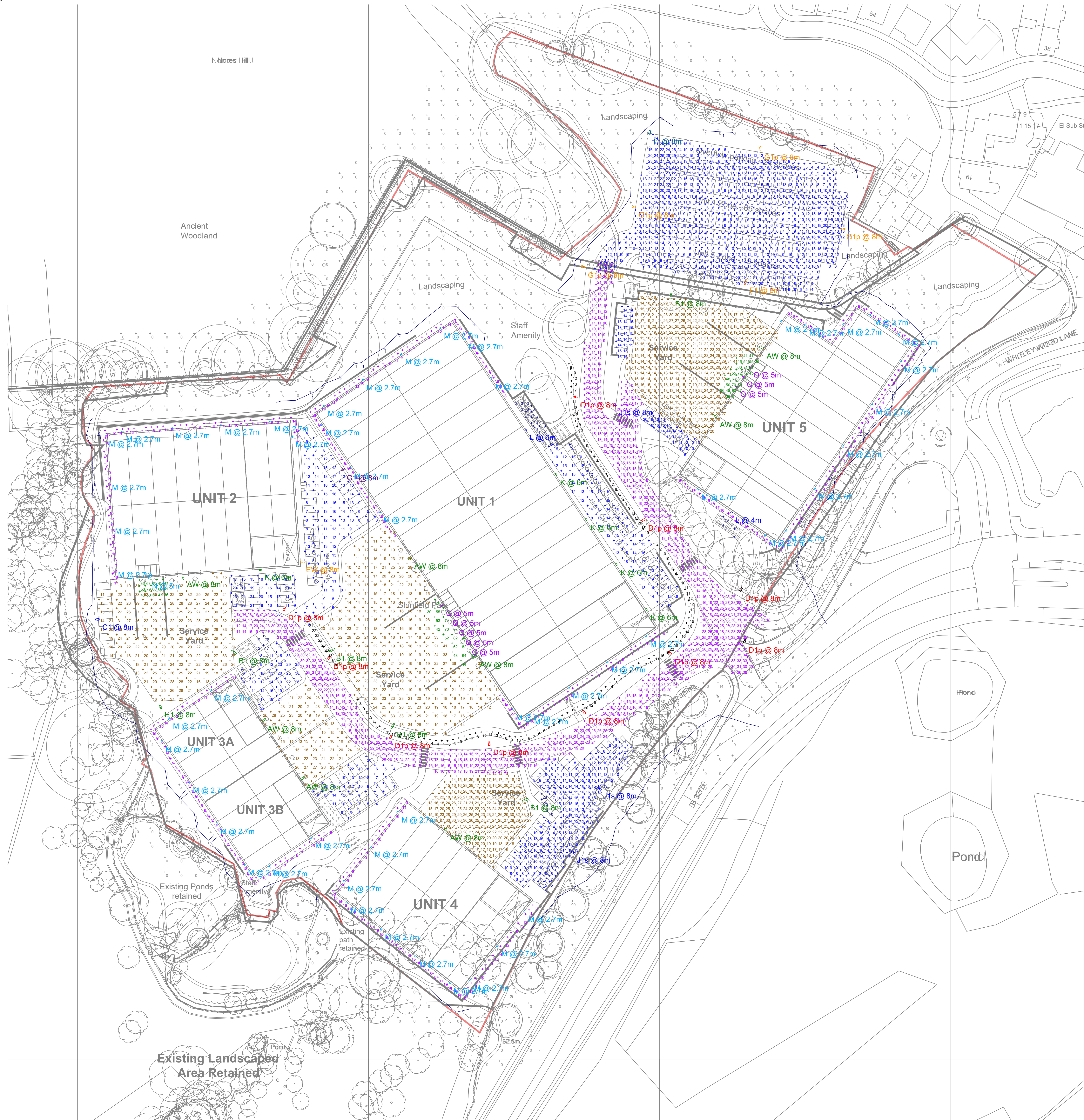
1. This lighting strategy has been developed by MBA Consulting Engineers to ensure the strategy takes full account of the sensitivities of the area, light sensitive species that may be present in surrounding vegetation, and the occupants of the houses to the north of the site.
2. The strategy makes use of a lighting strategy to satisfy the need for operational safety and security without harming any of these sensitivities.
3. The strategy is appropriate for the environmental zone in which the development is proposed and complies with the relevant planning policy.

7.0 REFERENCES

- [1] – 2020/01 - Institute of Lighting Professionals – GN 01/20 Guidance Note for the reduction of obtrusive light.

8.0 APPENDIX

1. External lighitng layout, 24114-MBA-EX-SP-DR-E-0001 Rev PL1



South East View

Schedule							
Symbol	Label	QTY	Manufacturer	Catalog	Description	Lamp	Input Power
	AW	8	HOLOPHANE EUROPE LIMITED	DSX1.4.LA222.FWE (TZ)	D-Series - Area luminaire on Wall Bracket at 8m AFFL	LED C.22000 Lumens - 2700K	145
	B1	5	HOLOPHANE EUROPE LIMITED	DSX1.4.LA222.FWE (TZ)	D-Series 1 - Area luminaire on 8m Column	LED C.22000 Lumens - 2700K	145
	C1	1	HOLOPHANE EUROPE LIMITED	DSX0.4.LA182.BLC (TZ)	D-Series 0 - Area luminaire on 8m Column	LED C.18000 Lumens - 2700K	130
	D1p	10	HOLOPHANE EUROPE LIMITED	DSX1.4.LA222.AY (TZ)	D-Series 1 - Area luminaire on 8m Column. With Integral Groupable PIR, Dimming Regime TBC	LED C.22000 Lumens - 2700K	145
	EW	1	HOLOPHANE EUROPE LIMITED	DSX0.4.LA152.FWE (TZ)	D-Series 0 - Area luminaire on Wall Bracket at 8m AFFL	LED C.15000 Lumens - 2700K	106
	F1	1	HOLOPHANE EUROPE LIMITED	DSX0.4.LA132.FWE (TZ)	D-Series 0 - Area luminaire on 8m Column	LED C.13000 Lumens - 2700K	90
	G1	1	HOLOPHANE EUROPE LIMITED	DSX0.4.LA132.BLC (TZ)	D-Series 0 - Area luminaire on 8m Column. With Extreme Backlight Control Optics.	LED C.13000 Lumens - 2700K	90
	G1p	4	HOLOPHANE EUROPE LIMITED	DSX0.4.LA132.BLC (TZ)	D-Series 0 - Area luminaire on 8m Column. With Extreme Backlight Control Optics. With Integral Groupable PIR, Dimming Regime TBC	LED C.13000 Lumens - 2700K	90
	H1	1	HOLOPHANE EUROPE LIMITED	DSX0.4.LA132.LCCO (TZ)	D-Series 0 - Area luminaire on 8m Column. With Extreme Corner Control Optics	LED C.13000 Lumens - 2700K	98
	I1	1	HOLOPHANE EUROPE LIMITED	DSX0.4.LA132.RCCO (TZ)	D-Series 0 - Area luminaire on 8m Column. With Extreme Corner Control Optics	LED C.13000 Lumens - 2700K	98
	J1s	3	HOLOPHANE EUROPE LIMITED	DSX0.4.LA112.AY.(DSX0.40LED.BLS) (TZ)	D-Series 0 - Area luminaire on 8m Column and Back Light Shield	LED C.11000 Lumens - 2700K	75
	K	5	HOLOPHANE EUROPE LIMITED	WAP.1.LA082.FW	WALLPACK at 6m AFFL	LED C.8000LM-2700K	63
	L	2	HOLOPHANE EUROPE LIMITED	DWL.1.LA032.AY.W018	Denver ID Wall 4m	LED C.3,000 Lumens - 2700K	18
	M	53	HOLOPHANE EUROPE LIMITED	DWL.1.LA022.HN.W011.CL8	Denver ID Wall 2.7m	LED C.2,000 Lumens-2700K	10.3
	N	1	HOLOPHANE EUROPE LIMITED	TBHF.POL.1.7026R.30A04GL at 5m Zero Tilt	7026 - POLAR 1 40W MOD. AR 3000K	LED C.4000LM-3000K	
	O	8	HOLOPHANE EUROPE LIMITED	TBHF.POL.1.7026R.30A03GL at 5m Zero Tilt	7026 - POLAR 1 30W MOD. AR 3000K	LED C.3000LM-3000K	30

Statistics				
Description	Symbol	Avg	Min	Min/Avg
Access Road (Landlords) - 20/0.40Uo(Copy)	+	21 lux	9 lux	0.43
Unit 1 Car Park - 10/0.25Uo	+	13 lux	6 lux	0.46
Unit 1 Cycles	+	6 lux	3 lux	0.50
Unit 1 Dock Doors - 50/0.40Uo	+	55 lux	26 lux	0.47
Unit 1 Rear Walkway - 10/0.40Uo	+	13 lux	7 lux	0.54
Unit 1 Service Yard - 20/0.40Uo	+	21 lux	10 lux	0.48
Unit 1/5 Car Park - 10/0.25Uo	+	12 lux	3 lux	0.25
Unit 2 Car Park - 10/0.25Uo	+	12 lux	3 lux	0.25
Unit 2 Dock Doors - 50/0.40Uo	+	53 lux	33 lux	0.62
Unit 2 Rear Walkway - 10/0.40Uo	+	12 lux	5 lux	0.42
Unit 2 Service Yard - 20/0.40Uo	+	24 lux	10 lux	0.42
Unit 3 Rear Walkway - 10/0.40Uo	+	11 lux	5 lux	0.45
Unit 3a Car Park - 10/0.25Uo	+	14 lux	6 lux	0.43
Unit 3a Service Yard - 20/0.40Uo	+	21 lux	9 lux	0.43
Unit 3b Car Park - 10/0.25Uo	+	10 lux	4 lux	0.40
Unit 3b Service Yard - 20/0.40Uo	+	21 lux	12 lux	0.57
Unit 4 Car Park - 10/0.25Uo	+	11 lux	4 lux	0.36
Unit 4 Cycles	+	20 lux	15 lux	0.75
Unit 4 Rear Walkway - 10/0.40Uo	+	11 lux	8 lux	0.73
Unit 4 Service Yard - 20/0.40Uo	+	22 lux	10 lux	0.45
Unit 5 Cycles	+	10 lux	7 lux	0.70
Unit 5 Dock Doors - 50/0.40Uo	+	54 lux	31 lux	0.57
Unit 5 Rear Walkway - 10/0.40Uo	✗	10 lux	4 lux	0.40
Unit 5 Service Yard - 20/0.40Uo	+	21 lux	12 lux	0.57

PL1	03/02/25	DRAFT ISSUE FOR COMMENT	RH
REV.	DATE:	AMENDMENTS	APPROVED

The logo consists of the letters "mba" in a large, bold, blue sans-serif font. Below it, the words "CONSULTING ENGINEERS" are written in a smaller, all-caps, black sans-serif font.

Maple House, Woodlands Business Park,
Lindford Woods West, Mill Lane WIDEFORD

Tel: +44 (0)1908 320-099
Email: enquiries@mba-consultants.co.uk
Web: www.mba-consultants.co.uk

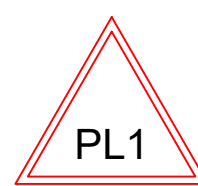
CLIENT: WRENBRIDGE

PROJECT: SHINFIELD PARK, READING

TITLE: INDICATIVE EXTERNAL LIGHTING LAYOUT

DRAWING NUMBER: 24114-MBA-EX-SP-DR-E-000

REV:	STATUS:	FLOOR:
PL1	PLANNING	SITE
SCALE @A0	DATE:	PROJECT No:
1:500	FEB 2025	24-114



INDICATIVE EXTERNAL LIGHTING LAYOUT

Scale 1:500 @ A0