

FOR:
TETRON POINT, TETRON PARK,
WILLIAM NADIN WAY,
SWADLINCOTE DE11 0BB

A PROJECT FOR:
MULBERRY LOGISTICS PARK
DONCASTER LIMITED

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STATUS:
FOR PLANNING

DOCUMENT MANAGEMENT

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1.0 INTRODUCTION

1. This assessment provides a detailed overview of the proposed new external lighting installation for the site Tetron Park, Swadlincote, DE11 0BB.
2. The lighting scheme covers all external areas surrounding the building including external areas to the access roads, , walkways, car parking & service yards.
3. The scheme is based on the use of LED luminaires fixed to the building façades, on lighting columns and low level lighting bollards as detailed on the accompanying drawing, 21-199 EX – 001 Rev P3.

2.0 LIGHTING SOLUTION

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 -The Outdoor Environment and BREEAM 'Excellent' requirements.
2. Care has been taken when selecting the luminaires that ensures the appropriate products will greatly reduce spill light and glare to and around site boundaries and 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 guide lines have been followed in order 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 proposed Thorlux Starbeam, Juno B, Juno D, Realta Bulkhead and Passway Bollard luminaires have a ULR of 2% or less which drastically reduce the upward spread of light near to and above the horizontal. All luminaires are installed at a tilt of 0% to achieve this.
6. The most sensitive/critical zones for minimising sky glow are those between 85 - 100° as shown in Table 1.

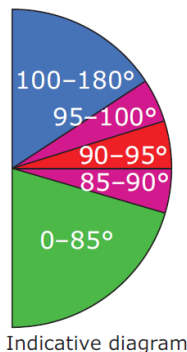


Table 1: The effect on the ability to view the night sky at various angles

Angle of light emitted (degrees)	Sky glow effect	Glare effect
100 – 180	Local	Little
95 – 100	Significant	Some
90 – 95	High	High
85 – 90	Significant	High
0 – 85	Minimal	Some

Table 1: Critical Luminaire Angles for Minimising Sky Glow - [1]

7. With the proposed luminaires being strategically placed and having zero or minimal upward light ratio (ULR), the proposed design solution meets the criteria of environmental zone E4, Lighting Environment classification of High District Brightness and Maximum Upward Light Ratio of Luminaires as indicated respectively in Tables 2 & 3.

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 district brightness (SQM ~15 to 20)	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	Town/city centres with high levels of night-time activity

Table 2: Environmental Zones - [1]

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

Table 3: Maximum Values of Upward Light Ratio (ULR) of Luminaires - [1]

8. 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.

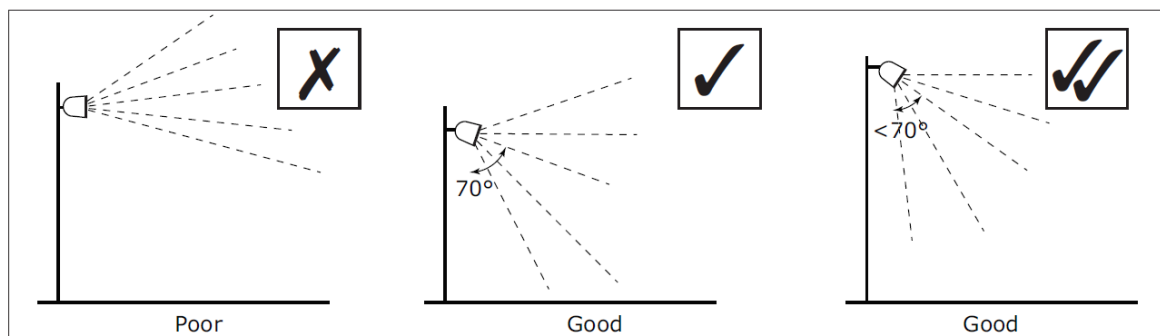


Figure 1: Luminaire Aiming Angles - [1]

In addition, 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.

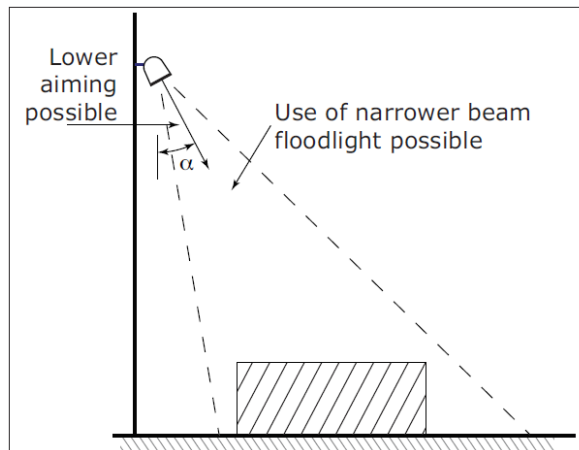


Figure 2: Higher Mounting Height – Less Spill and Glare - [1]

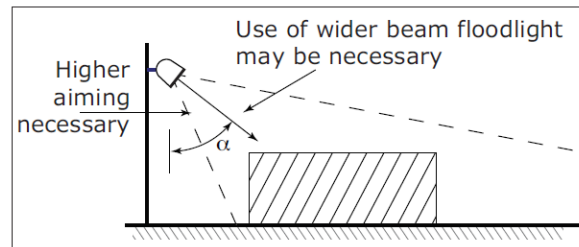


Figure 3: Lower Mounting Height – More Spill and Glare - [1]

9. Lighting pollution on adjacent properties has been kept to a minimum and in accordance with the respective environmental zone category indicated Table 4.

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 4: Maximum Values of Vertical Illumination on Properties – [1]

3.0 DESIGN STATISTICS

1. The following table details the design statistics achieved within the various areas of the development and should be read in conjunction with the external lighting drawings provided.

Description	Average (Lux)	Minimum (Lux)	Uniformity Min / Avg
Building Entrance	80	79	0.99
Car Park	16	6	0.38
Cycle Store	27	20	0.74
Gatehouse	57	24	0.42
Loading Bays	50	20	0.40
Overflow Car Park	34	17	0.50
Service Yard / Circulation	30	12	0.40

Table 5: Designed Lux Levels

2. The results obtained fall in line with the respective guidelines, Environmental Zones E2 inclusive as detailed elsewhere in this report.
3. As further detailed on the drawing any potential light spill over the boundaries into adjoining areas including adjacent areas has been kept to the minimum.

4.0 LUMINAIRE DETAILS

4.1 Thorlux Starbeam and Starbeam Eco Column Led Luminaire

1. The Starbeam Streetlight luminaire is a precision engineered LED floodlight manufactured from die-cast aluminium polyester powder coated RAL9006 silver and UV stabilised polycarbonate cover with area or roadway optical distribution options.
2. LED modules are IP66 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 (IP66).
5. With 0% upward light ratio this luminaire complies with Environmental Zones E0 to and including E4.
6. The luminaire has been chosen for access road to the site, car parks and service yard.



Figure 1: Starbeam and Starbeam Eco

4.2 Thorlux Juno B Led Luminaire

1. The Juno B LED luminaire is a LED pole top amenity luminaire manufactured from die-cast aluminium polyester powder coated RAL9006 silver with high impact UV stabilised polycarbonate cover providing symmetric and asymmetric distribution options
2. The control gear and LED circuit boards are completely replaceable for future maintenance
3. The luminaire consists of two-piece die-cast aluminium housing with integral heat sink fins to optimise thermal management through conductive cooling.
4. The housing is completely sealed against moisture and environmental contaminants (IP66).
5. With 0% upward light ratio this luminaire complies with Environmental Zones E0 to and including E4.
6. The luminaire has been chosen for the cycle store.



Figure 2: Juno B

4.3 Thorlux Juno D Led Luminaire

1. The Juno D LED luminaire is a LED pole top amenity luminaire manufactured from die-cast aluminium polyester powder coated RAL9006 silver with high impact UV stabilised polycarbonate cover providing symmetric and asymmetric distribution options
2. The luminaire equally benefits from a smooth wipe clean surfaces with no dust traps
3. The luminaire is utilised generally for higher mounting heights
4. The luminaire consists of two-piece die-cast aluminium housing with integral heat sink fins to optimise thermal management through conductive cooling.
5. The housing is completely sealed against moisture and environmental contaminants (IP66).
6. With 0% upward light ratio this luminaire complies with Environmental Zones E0 to and including E4.
7. The luminaire has been chosen for car parking and service yard.



Figure 3: Juno D

4.4 Thorlux Realta Bulkhead

1. The Realta luminaire is a wall mounted luminaire with a high pressure die-cast aluminum body.
2. The luminaire is completely sealed against moisture and environmental contaminants (IP66).
3. The luminaire has less than 2% upward light output due to its fixed construction and therefore complies with Environmental Zones E0 to and including E4.
4. The luminaire has been chosen for the loading bay.



Figure 4: Realta

4.5 Thorlux Passway Bollard

1. High performance LED bollard manufactured from extruded aluminium with die-cast head unit and full polyester powder graphite finish.
2. The luminaire is completely sealed against moisture and environmental contaminants (IP66).
3. With 2% upward light ratio this luminaire complies with Environmental Zones E0 to and including E4.
4. The luminaire will be located on the pathways



Figure 5: Thorlux Passway Bollard

5.0 CONCLUSION

1. All external lighting shall be controlled by photocell and time clock.
2. The total lighting solution has been carefully generated to ensure the immediate environment has been protected.
3. The illumination that would normally be free flowing from site boundaries has been restricted and has been further designed to mitigate any potential impact to properties adjacent to the proposed site.
4. Careful consideration has also been taken to ensure no loss of amenity due to glare through shielding of the lamps, choice of luminaires and efficient mounting heights.

6.0 REFERENCES

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

CDM DESIGNER RISK INFORMATION
IN ADDITION TO THE HAZARDS/RISKS NORMALLY
ASSOCIATED WITH THE TYPES OF WORK DETAILED
ON THIS DRAWING
NOTE THE FOLLOWING:-

CONSTRUCTION

MAINTENANCE/CLEANING

DECOMMISSIONING/DEMOLITION

FURTHER INFORMATION CAN BE FOUND ON
DESIGNER RISK ASSESSMENT NUMBER:
IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED
OUT BY A CONTRACTOR COMPETENT UNDER CDM
2015 WORKING TO AN APPROVED METHOD
STATEMENT

B2



C2, C3, C4, D4, D4.W



F2



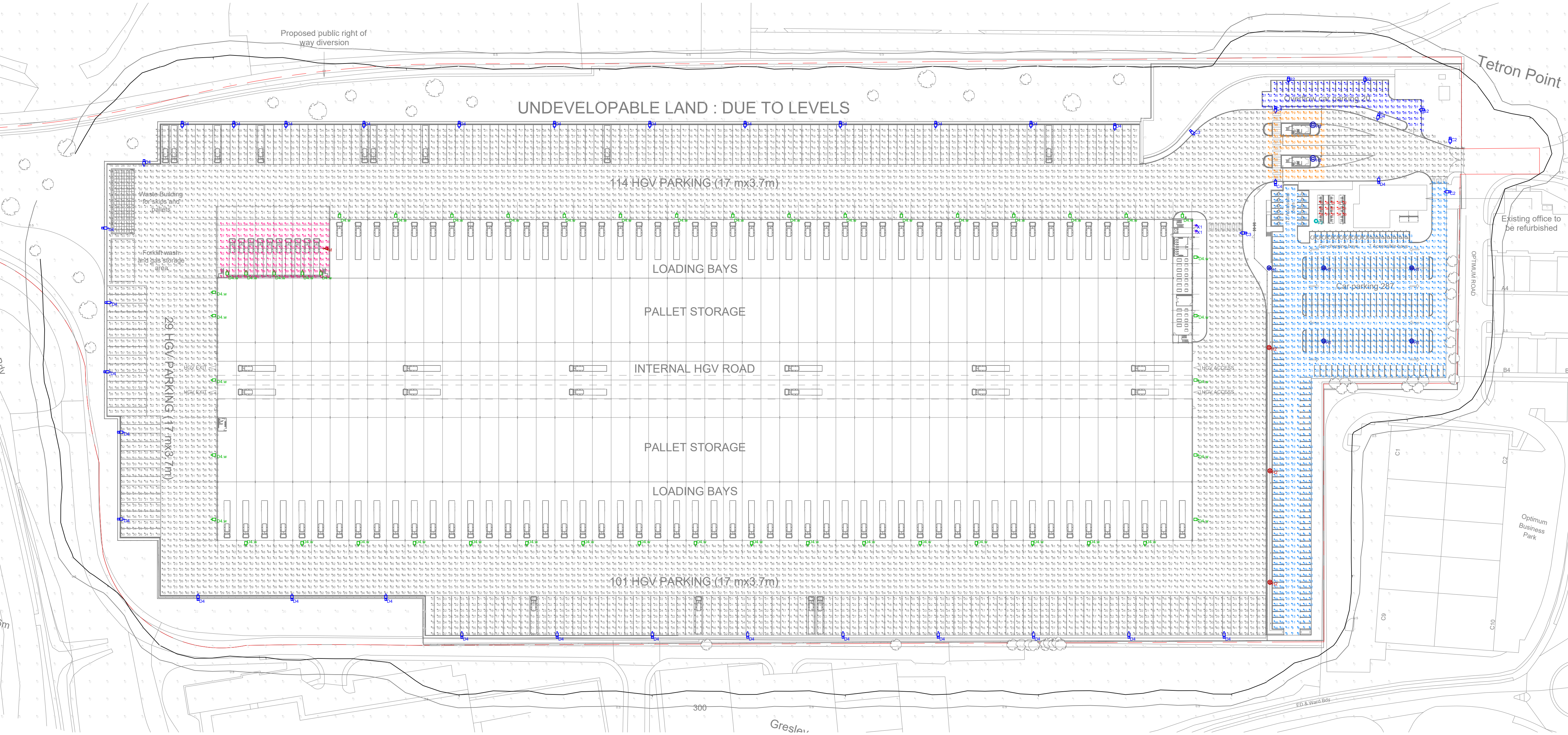
H1, H2, H3



M



X1



LUMINAIRE SCHEDULE						
Symbol	Label	Qty	Catalog Number	Description	Lamp	Watts
	B2	3	THORLUX Starbeam Eco GA2 Area Optic SB19678	Column Mounted @ 6m 0° Tilt	1 x 6,745 Lumens 4,000K Colour Temp CRI70+	51
	C2	2	THORLUX Starbeam GR5 Road Optic SB123R5	Column Mounted @ 10m 0° Tilt	1 x 19,035 Lumens 4,000K Colour Temp CRI70+	132
	C3	2	THORLUX Starbeam GR5 Road Optic SB161R5	Column Mounted @ 8m 0° Tilt	1 x 23,865 Lumens 4,000K Colour Temp CRI70+	171
	C4	2	THORLUX Starbeam GR5 Road Optic SB197R5	Column Mounted @ 10m 0° Tilt	1 x 29,995 Lumens 4,000K Colour Temp CRI70+	209
	D4	32	THORLUX Starbeam GA2 Area Optic SB197A2	Column Mounted @ 10m 0° Tilt	1 x 27,470 Lumens 4,000K Colour Temp CRI70+	209
	F2	1	THORLUX Juno B, Sy - PLY [JUN19201]	Column Mounted @ 6m 0° Tilt	1 x 9,630 Lumens 4,000K Colour Temp CRI80 116 Lm/W	83
	H1	5	THORLUX Juno D, Sy - PLY [JUN18631]	Column Mounted @ 10m 0° Tilt	1 x 24,020 Lumens 4,000K Colour Temp CRI80 121 Lm/W	197
	H2	3	THORLUX Juno D, Sy - PLY [JUN18632]	Column Mounted @ 10m 0° Tilt	1 x 31,920 Lumens 4,000K Colour Temp CRI80 120 Lm/W	265
	H3	2	THORLUX Juno D, Sy - PLY [JUN18633]	Column Mounted @ 10m 0° Tilt	1 x 39,940 Lumens 4,000K Colour Temp CRI80 114 Lm/W	350
	D4.w	48	THORLUX Starbeam GA2 Area Optic SB197A2	Wall Mounted @ 10m 0° Tilt	1 x 27,470 Lumens 4,000K Colour Temp CRI70+	209
	M	1	THORLUX Realta Bulkhead	Wall Mounted @ 6m 0° Bracket Tilt	1 x 2,700 lumens 4,000K Colour Temp CRI80	32
	X1	2	THORLUX Passway Bollard Area Optic PW19913+PW19919	1m Bollard	1 x 1,450 Lumens 4,000K Colour Temp CRI80	21

P3	28.10.21	PLANNING ISSUE	MW
P2	22.10.21	PLANNING ISSUE	MW
P1	08.10.21	PRELIMINARY ISSUE	MW
REV:	DATE:	AMENDMENTS:	APPRD:

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MULBERRY LOGISTICS PARK
DONCASTER LIMITED

TETRON POINT
TETRON PARK
SWADLINCOTE
INDICATIVE EXTERNAL LIGHTING
LAYOUT

DRAWING NUMBER: 21-199-EX-001

REV: P3	STATUS: PRELIMINARY	DESIGNED BY: MW
SCALE: 1:1000@A1	DATE: OCT 2021	DRAWN BY: JEG

STATISTICS				
Description	Symbol	Avg	Min	Min/Avg
Building Entrance [50/0.40]	+	80 lux	79 lux	0.99
Car Park [15/0.33]	+	16 lux	6 lux	0.38
Cycle Store [15/0.33]	+	27 lux	20 lux	0.74
Gatehouse [50/0.40]	+	57 lux	24 lux	0.42
Loading Bays [50/0.40]	+	51 lux	21 lux	0.41
Overflow Car Park [15/0.33]	+	34 lux	17 lux	0.50
Service Yard/Circulation [30/0.40]	+	30 lux	12 lux	0.40

POWER DENSITY STATISTICS		
Name	# Luminaires	Total Watts
External Electrical Loading	103	20534.0 W