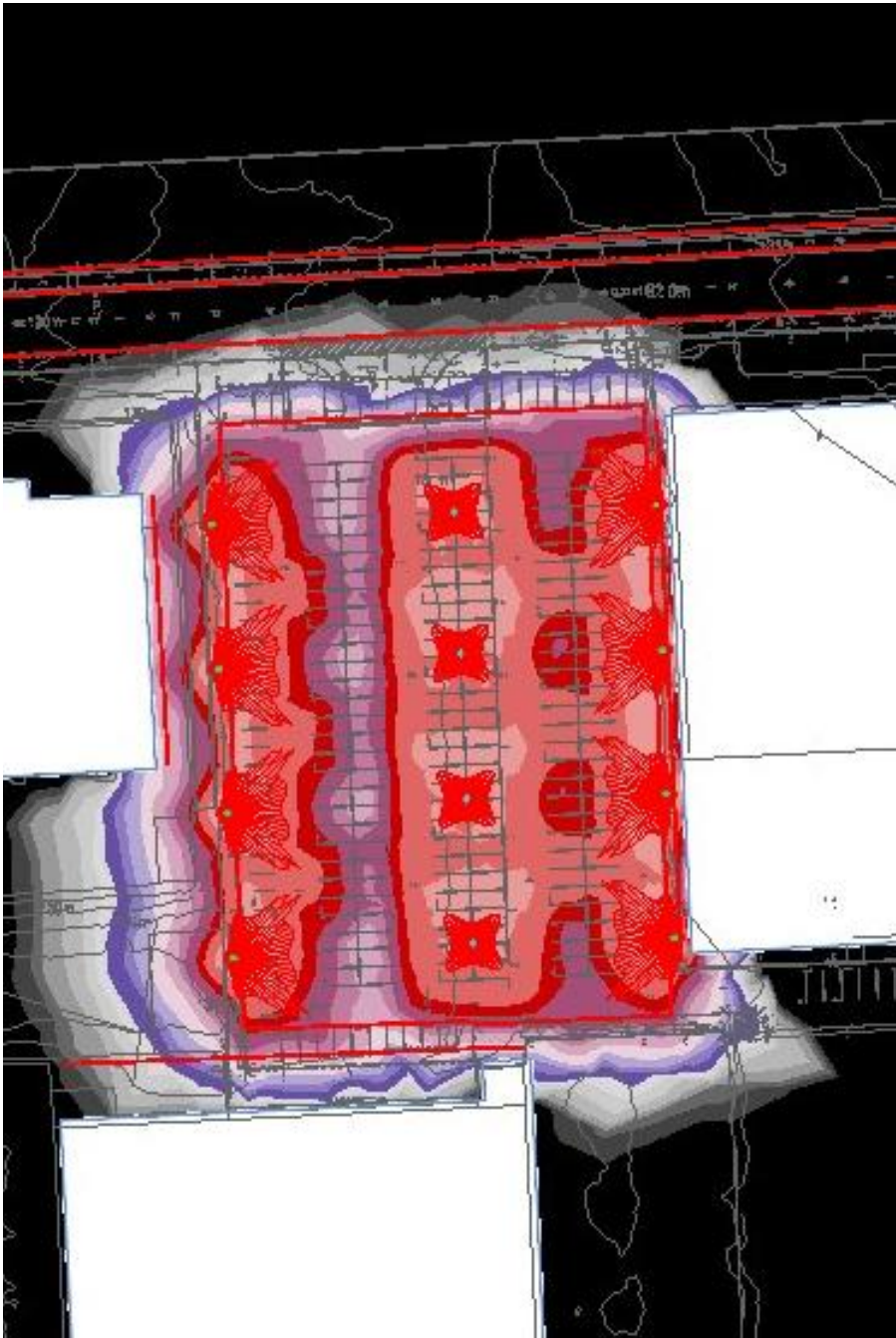




External Lighting Strategy Report

Stakehill Industrial Estate Vehicle Storage, Middleton

12909-CBG-XX-XX-RP-Y-00001

Revision P01 : 22nd September 2025

CONTENTS

1. Introduction and Brief
2. Background Information
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1. Introduction and Brief

INTRODUCTION AND BRIEF

Rentruck has appointed CBG Consultants to produce an external lighting design for the operation of the vehicle storage at the land between Bentley Avenue and Finlan Road, Stakehill Industrial Estate (Middleton), that meets the requirements set by Rochdale Borough Council and the National Planning Policy Framework to minimise negative impact on residential areas, the character of the area, biodiversity and the night sky.

The present report outlines the available information of the site, as well as the proposed external lighting scheme and the assessment of the intended lighting scheme impact on its surroundings.

2. Background Information

BACKGROUND INFORMATION

The Site

The land is located on Bentley Avenue in the Stakehill Industrial Estate in Middleton (Manchester).

It is used for storage of Rentruck's fleet of vans. Its operational hours are:

- Monday to Friday 07:00-19:00
- Saturday and Sunday 09:00-18:00
- Bank Holidays: no operation



Figure 1. Site location on Google Maps.

Its Surroundings

The land borders to the west with a single storey industrial building with tall trees in between and outdoor storage at the sound end, to the south with a double storey industrial building and an outdoor storage, and to the east with another double storey industrial building. Immediately to the north of the land is Bentley Avenue. On the other side of the road there are some residential properties to the northwest and a large field bordered by the road A627.

The buildings facades in the industrial estate are generally equipped with large floodlights with no optics. Similar floodlights are mounted on poles in the open areas used for storage.

Bentley Avenue has street column lighting on both sides of the road across its whole length.



Figure 2. Google Street View of the land from Bentley Avenue in south-west direction, showing the residential properties on the right-hand side of the image.

BACKGROUND INFORMATION

Planning Conditions

Rochdale Borough Council has granted planning permission for the change of use of the land from car park to open storage, subject to conditions.

- Condition 3 asks that the land operates within the hours of 07:00-19:00 Monday to Friday and 09:00-18:00 on Saturday and Sunday and not on Bank Holidays.
- Condition 4 asks that a detailed lighting design is submitted and approved by the local planning authority prior to installation. The scheme shall include the position and height on the building, luminance, angle of installation, hours of luminance and any hoods to be fixed to the lights.

These shall be met in the interests of visual and neighbour amenity P3, G9 and DM1 of the Core Strategy, and the National Planning Policy Framework.

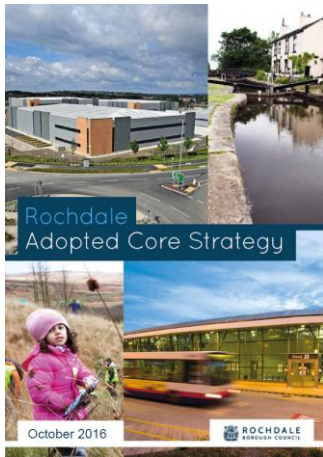


Figure 3. Rochdale Adopted Core Strategy front page.

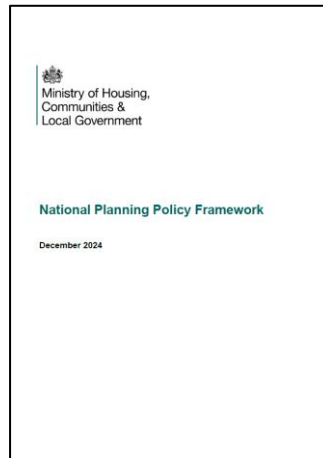


Figure 4. National Planning Policy Framework front page.

Rochdale Adopted Core Strategy (Rochdale Borough Council – October 2016)

Policy P3 on the improvement of the design of new developments asks designs to improve the image and attractiveness of the borough. Design measures, including lighting, shall ensure that spaces are safe to use and access.

Policy G9 for the reduction of the impact of pollution, contamination and land instability includes paragraph 10.65 that states that lighting schemes for new developments shall have “full regard to minimising negative impact on residential areas, the character of the area, biodiversity and the night sky”.

DM1 establishes a series of requirements for development proposals. Requirement “d” asks that impacts due to pollutants, such as light, are mitigated

National Planning Policy Framework

Note 198 under “Ground conditions and pollution” refers to the need to “limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation”.

BACKGROUND INFORMATION

Design Guidance

The Society of Light and Lighting (SLL) Lighting Guide 1 for the Industrial Environment, Lighting Guide 6 for The Exterior Environment and the SLL Code for Lighting reference BS EN 12464-2:2024 for the recommended lighting levels in an outdoor space with vehicle traffic.

BS EN 12464-2:2024 on the lighting of outdoor work places establishes the recommended values of maintained illuminance (E_m), minimum illuminance uniformity (U_o), Glare Rating limits (R_{GL}) and minimum colour rendering indices (R_a) for the lighting of outdoor work places, as shown in the table below.

Ref. no.	Type of area, task or activity	E_m lx		U_o	R_{GL}	R_a	Specific requirements
		required ^a	modified ^b				
7.1	Walkways exclusively for pedestrians	5	—	0,20	50	70	
7.2	Traffic areas for slowly moving vehicles (max. 10 km/h), e.g. bicycles, trucks and excavators	10	—	0,40	50	70	
7.3	Regular vehicle traffic (max. 40 km/h)	20	—	0,20	45	70	At shipyards and in docks, R_{GL} may be 50.
7.4	Mixed traffic areas, vehicle turning, stationary loading and unloading points	50	—	0,40	50	70	When the area is non-occupied E_m required may be reduced to 5 lx. Pay attention to the illuminance levels of the surrounding and adjacent areas.
7.5	Cleaning and servicing	50	—	0,25	50	70	At all relevant surfaces
7.6	Recycling centers - areas with rubbish bins and sorting of waste	30	—	0,25	50	70	
^a Required: minimum value.							
^b Modified: considers common context modifiers in 5.3.3.							

Figure 5. Table 7 in BS EN 12464-2:2024, including the lighting requirements for traffic zones at outdoor work places.

This standard also states the maximum limits of obtrusive light in outdoor installations, as referenced in Guidance Note 01/21 The Reduction of Obtrusive Light by ILP. The land we are studying is deemed to be classified as being in an environmental zone E3 (medium district brightness areas, such as industrial or residential suburbs).

Environmental zone	Light on properties		Luminous intensity		Upward light ratio	Luminance	
	E_v lx		I cd			R_{UL} %	L_b cd·m ⁻²
	Pre-curfew ^a	Post-curfew	Pre-curfew	Post-curfew		Building facade	Signs
E0	0	0	0	0	0	0,1	0,1
E1	2	0 ^b	2 500	0	0	0,1	50
E2	5	1	7 500	500	2,5	5	400
E3	10	2	10 000	1 000	5	10	800
E4	25	5	25 000	2 500	15	25	1 000
where							
E0 represents intrinsically dark areas, such as IDA dark sky parks or major optical observatories;							
E1 represents intrinsically dark areas, such as national parks or protected sites;							
E2 represents low district brightness areas, such as industrial or residential rural areas;							
E3 represents medium district brightness areas, such as industrial or residential suburbs;							
E4 represents high district brightness areas, such as town centres and commercial areas;							
E_v is the maximum value of vertical illuminance on properties in lx;							
I is the luminous intensity of each source in the potentially obtrusive direction in cd;							
R_{UL} is the proportion of the flux of the luminaire(s) that is emitted above the horizontal, when the luminaire(s) is (are) mounted in its (their) installed position and attitude, and given in %;							
L_b is the maximum average luminance of the facade of a building in cd·m ⁻² ;							
L_s is the maximum average luminance of work related information signs (internally or externally illuminated) in cd·m ⁻² . This does not apply to billboards and traffic signs.							
^a In case no curfew regulations are available, the higher values shall not be exceeded and the lower values should be taken as preferable limits.							

Figure 6. Table 4 in BS EN 12464-2:2024, including the maximum levels of obtrusive light for external lighting

3. Proposed Lighting Scheme

PROPOSED LIGHTING SCHEME

In order to meet the planning conditions and design guidelines, the following lighting scheme will be installed on the existing 6-metre-high poles.

Luminaire Specification

Pole mounted floodlights facing down will provide lighting to the parking spaces, without exceeding the maximum 5% ULR. The 3000K colour temperature will also ensure that white light emissions are limited whilst providing good visibility.

A symmetrical light optic will be installed on the central columns.

An asymmetrical light distribution will be installed on the columns near the boundaries of the property. Rear shields and an additional column rear shields are proposed to limit the backward light spill even further.

Refer to Luminaire Schedule reference 12909-CBG-XX-EX-SH-Y-20001 and to Proposed Lighting Layout reference 12909-CBG-XX-EX-DR-Y-20001 for the full specification and layout.



Figure 7. Proposed DW Windsor Kirium Pro 2 poletop luminaire, with rear shield detail.



Figure 8. Proposed DW Windsor additional column rear shield to limit back spill.

Lighting Controls

The luminaires will be controlled by a photocell and a timeclock to ensure that these are only turned on at dusk during operating hours and that they are turned off after 7pm Monday to Friday and after 6pm Saturdays and Sundays, as per the operating hours established by Rochdale Borough Council.

An override presence detector linked to the security system will turn them on during nighttime for 10 minutes after the presence is detected.

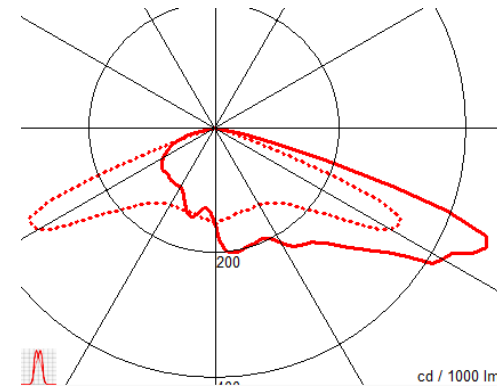


Figure 9. Polar curve of luminaire with asymmetrical light distribution (LP1).

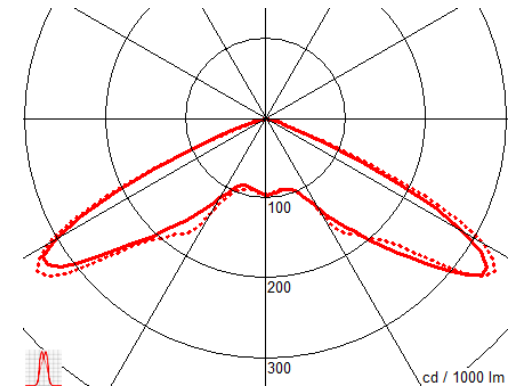


Figure 10. Polar curve of luminaire with symmetrical light distribution (LP2).

4. External Lighting Impact Assessment

EXTERNAL LIGHTING IMPACT ASSESSMENT

The proposed scheme has been modelled on the software Relux with the manufacturer's data to ensure that illuminance limits established by the ILP Guidance Note are not exceeded, whilst satisfying the recommended values for an exterior space of this nature.

Horizontal illuminance

The following values are achieved at ground level using the proposed lighting scheme:

- Average illuminance: 22.6 lux
- Uniformity: 0.16

Illuminance levels are achieved comfortably just over the 20lm target.

Uniformity is slightly lower than the 0.2 target due to the use of existing pole locations. The second row of vehicle storage spaces does not have any poles and will be slightly darker in comparison to the other rows.

There is limited light spill horizontally beyond the land's boundary, as shown on the isoline drawing in the following page.

Vertical illuminance on surrounding properties

Maximum vertical values have been calculated at the residential properties that are situated to the north-west of the land achieving a maximum of 0.07 lux, which is below pre (10 lux) and post curfew (2 lux) maximum values established in ILP's Guidance Note 01/21.

EXTERNAL LIGHTING IMPACT ASSESSMENT

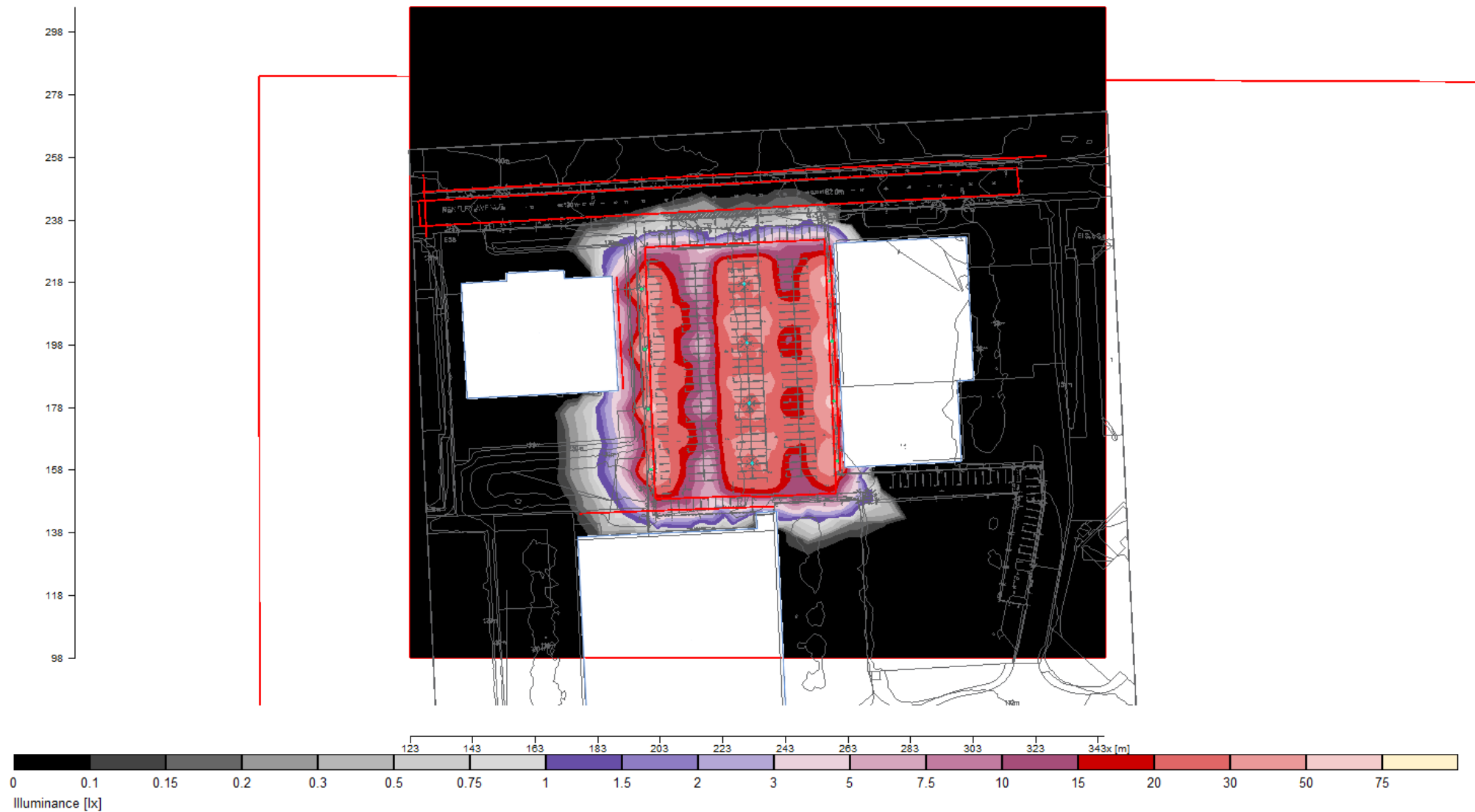


Figure 11. Isoline layout showing the horizontal illuminance caused by the proposed external lighting installation at ground level.

EXTERNAL LIGHTING IMPACT ASSESSMENT

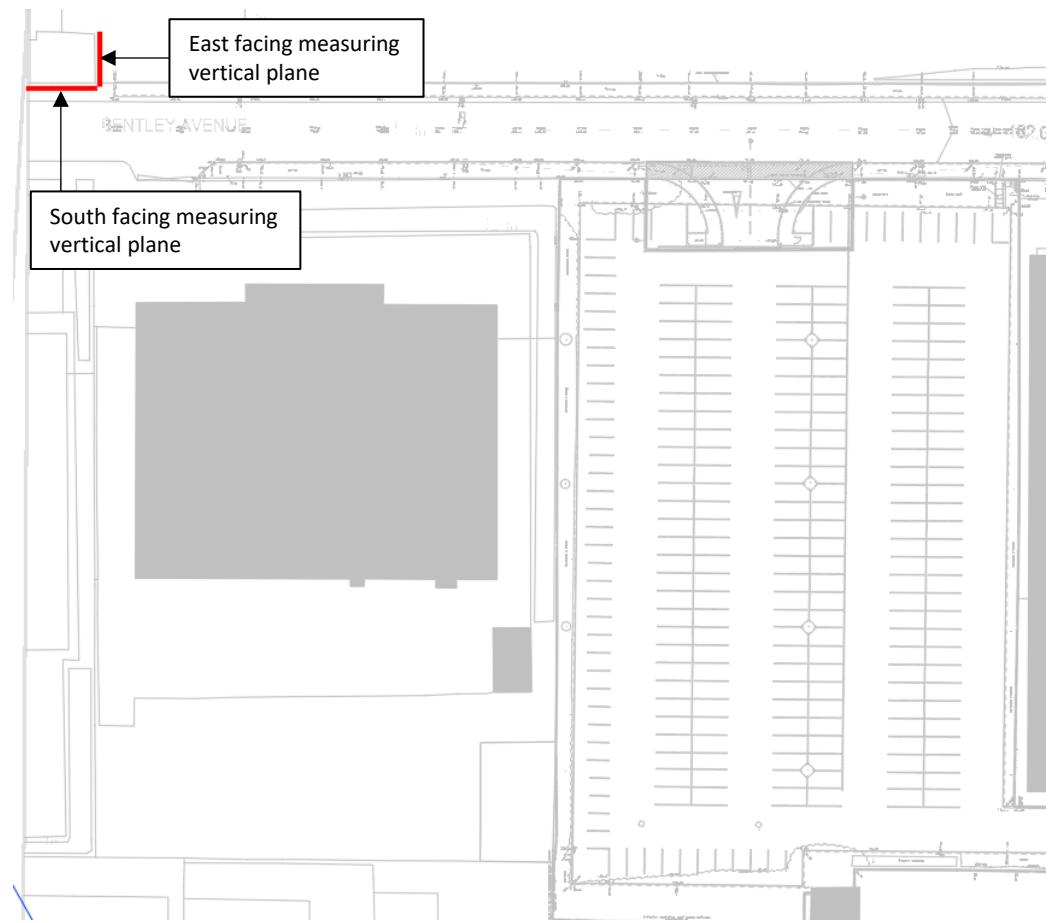


Figure 12. Location of measuring vertical planes at the residential properties.

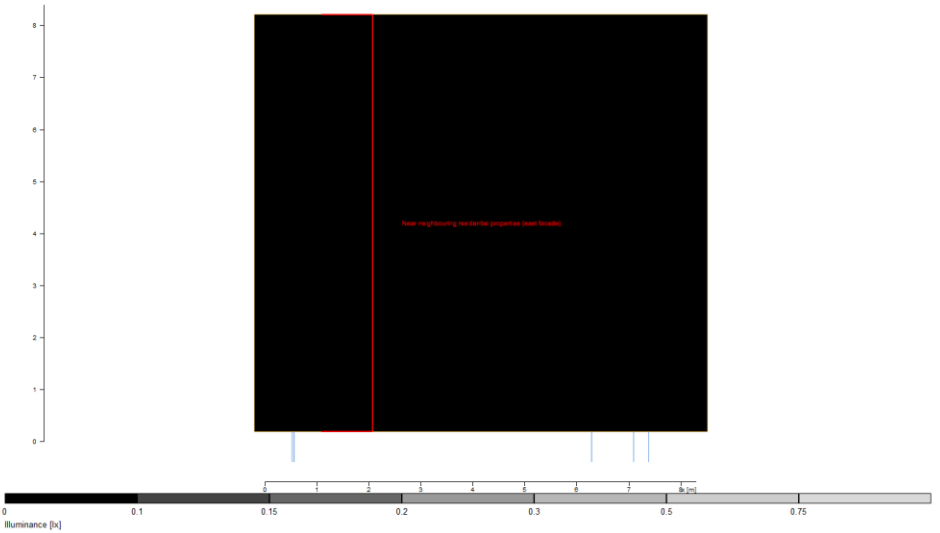


Figure 13. Isoline layout showing the vertical illuminance caused by the proposed external lighting installation on the east facing plane at the nearest residential property (0.07 lux maximum)..

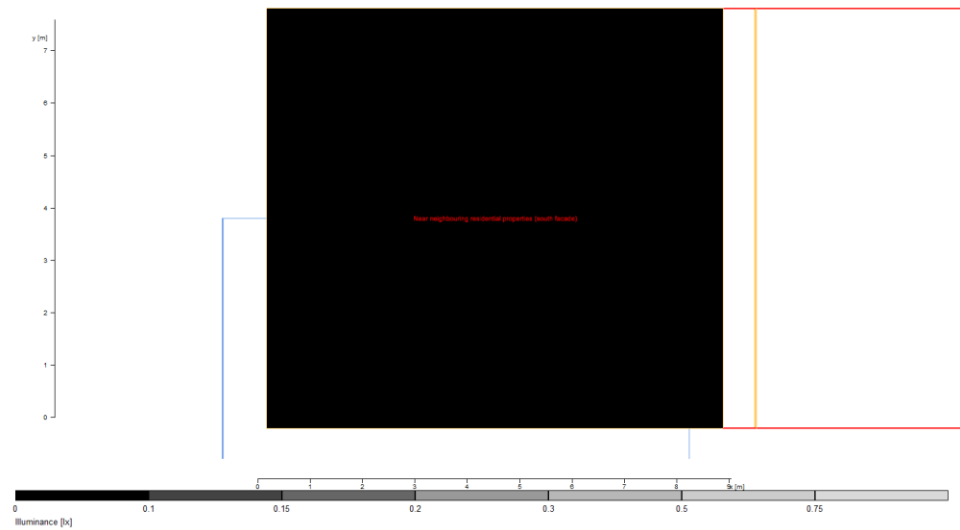


Figure 14. Isoline layout showing the vertical illuminance caused by the proposed external lighting installation on the south facing plane at the nearest residential property (0.02 lux maximum).

5. Conclusion

CONCLUSION

A desktop study of the site has been carried out to provide a suitable and sympathetic external lighting design.

The column lighting installation proposed at the land between Bentley Avenue and Finlan Road, Stakehill Industrial Estate (Middleton) has been carefully designed to limit the light spill upwards and outwards with timed controls, providing lighting where and when is needed. The luminaires are of warm colour temperature. This means that the resulting scheme minimises the impact on the night sky, neighbours and the ecology as much as possible.

The scheme has been modelled accordingly on the software Relux to demonstrate the lighting levels achieved.

6. Appendices

GLOSSARY

Illuminance or E

Luminous flux incident on a surface, measured in lux.

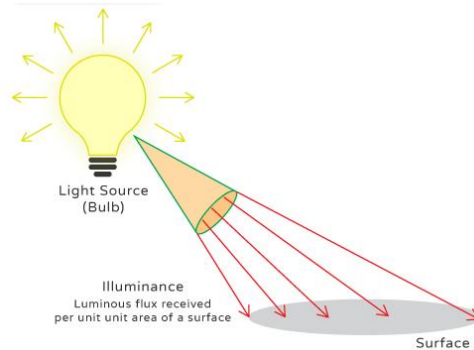


Figure 15. Graphical representation of the concept of illuminance.

Illuminance Uniformity or U_o

Ratio of minimum illuminance to average illuminance on a surface.

Correlated Colour Temperature or CCT

Temperature of a Planckian radiator whose radiation has the same chromaticity as that of a given stimulus 1, measured in Kelvin (K). Typical values for commercial luminaires are 2700K, 3000K or 4000K. The lower the colour temperature, the warmer the light source looks.



Figure 16. Image representing the CCT scale.

Upward Light Ratio or ULR/R_{UL}

Proportion of the total luminaire flux that is emitted above the horizontal by all luminaires to the total luminaire flux from all luminaires in an installation, when the luminaires are mounted in their installed attitudes 1. Typically measured in percentage (%). Upward Light Output Ratio or ULOR/RULO particularly refers to a single luminaire.

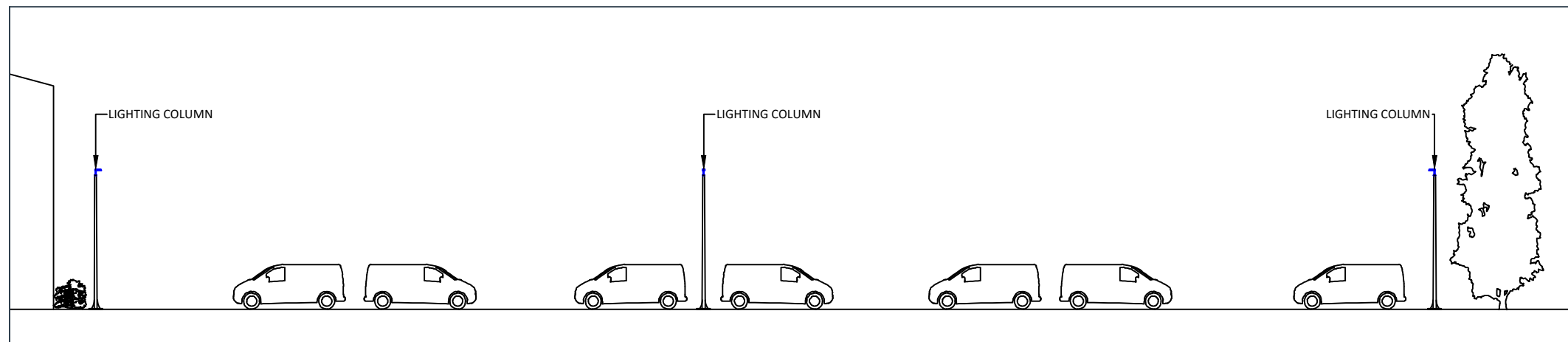


Figure 17. Image representing the concepts of ULR, glare and light spill.

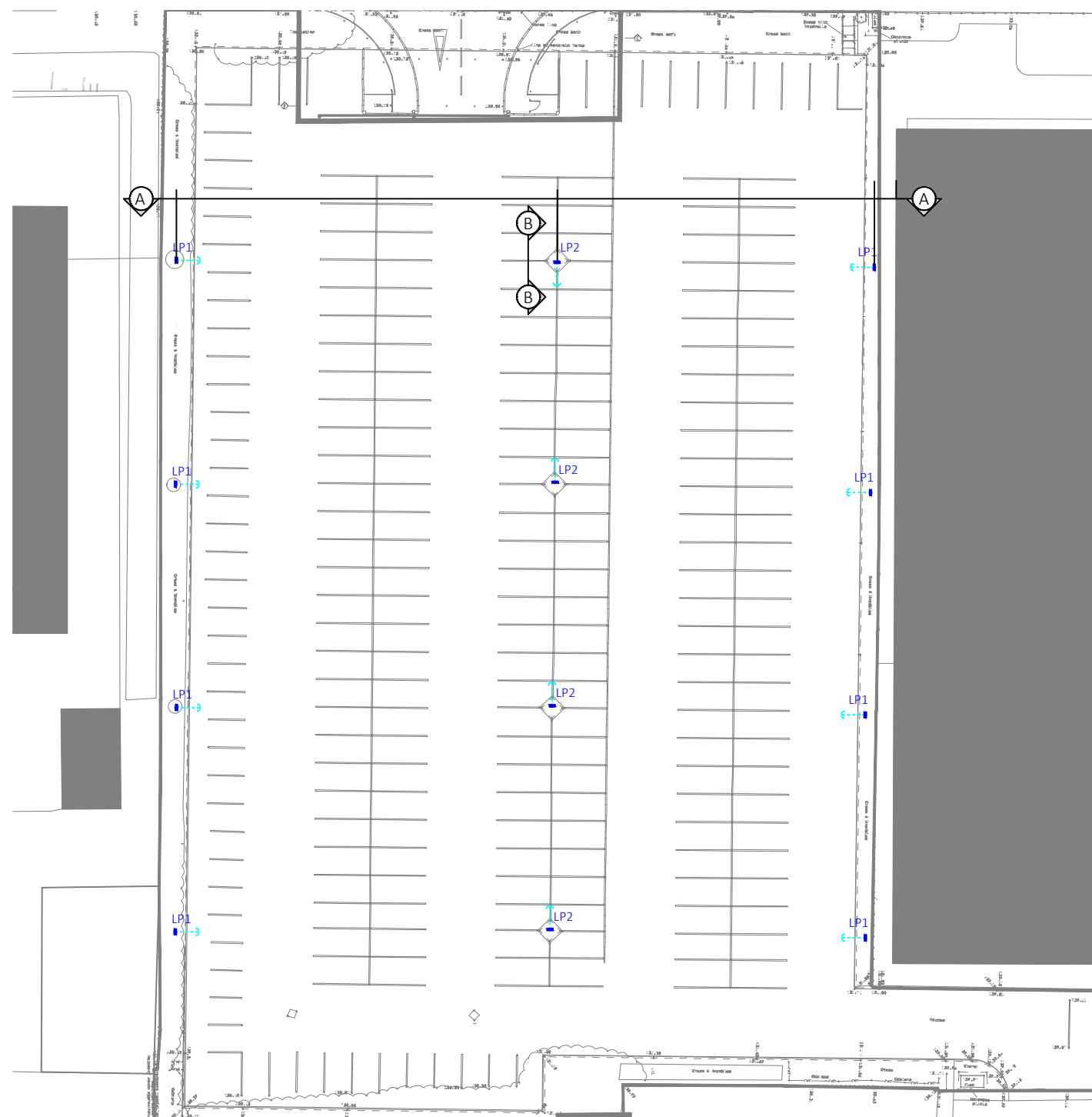
	Initials	Date	Schedule Status			
Prepared by:	JBP	22/09/2025	Revision P01	First Issue appended to report	File Reference:	12909-CBG-XX-XX-SH-Y-20001
Checked by:	MH	22/09/2025			Project Number:	12909
Approved by:	SLH	22/09/2025			Project Name:	Stakehill Industrial Estate Vehicle Storage, Middleton

Reference	Description	Luminaire Image	Luminaire Size	Mounting	Manufacturer	Technical Specification	Control	Unit Budget	Quantity	Total Budget Cost
LP1	Poletop Luminaire		Length: 720mm Width: 350mm Height: 140mm 	Pole mounted on existing 6m high pole (diameter TBC on site prior to ordering to ensure compatibility)	Manufacturer: DW Windsor Product Name: Kirium Pro 2 (64LED) Contact: deanjohnston@dw Windsor.com	Lamp Type: LED Colour Temperature: 3000K CRI: 80 Delivered Lumens: 13948lm Wattage: 90W Lamp Type: C2 Optic (asymmetrical) Finish: Light Grey (TBC by client) IP Rating: IP66 IK Rating: IK10 Accessories: Rear shield and additional column rear shield	Via photocell and timeclock with an override presence detector	£416.33	8 No.	£3,330.64
LP2	Poletop Luminaire		Length: 720mm Width: 350mm Height: 140mm 	Pole mounted on existing 6m high pole (diameter TBC on site prior to ordering to ensure compatibility)	Manufacturer: DW Windsor Product Name: Kirium Pro 2 (64LED) Contact: deanjohnston@dw Windsor.com	Lamp Type: LED Colour Temperature: 3000K CRI: 80 Delivered Lumens: 14536lm Wattage: 90W Lamp Type: C1 Optic (symmetrical) Finish: Light Grey (TBC by client) IP Rating: IP66 IK Rating: IK10 Accessories: None	Via photocell and timeclock with an override presence detector	£316.33	4 No.	£1,265.32

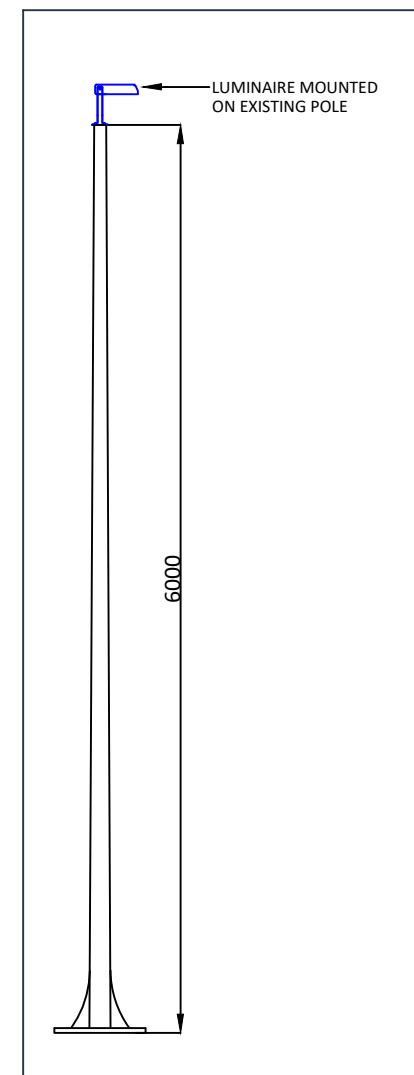
TOTAL BUDGET COST:	£4,595.96
	Excluding VAT



SECTION A-A. COLUMNS DISTRIBUTION WITHIN THE SITE AND IN RELATION TO THE NEIGHBOURING ELEMENTS, WHOSE DIMENSIONS ARE ESTIMATED (SCALE 1:250)



SECTION B-B. LIGHTING POLE DETAIL
(SCALE 1:50)



These details are confidential to illustrate the engineering services only for the purpose intended. Arrange to suit current architectural and structural details which may vary to some degree from these details. This drawing must be viewed and printed using Adobe Acrobat Version 9.0 or above when using as a PDF format.

Do not scale from this drawing in either paper or digital format. To check the drawing has been printed at the intended scale this bar should be 25mm long at A3, 50mm long at A1 and 75mm long at A0.

Notes

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTATION.
2. CONTRACTORS WILL BE REQUIRED TO VERIFY ALL SETTING OUT AND OTHER MEASUREMENTS ON SITE.
3. THE SETTING OUT OF ALL LIGHT FITTINGS, CONTROLS AND ACCESSORIES IS TO BE SUPERVISED BY THE LIGHTING CONSULTANT.
4. FINAL LENGTHS OF ALL LINEAR SYSTEMS ARE TO BE VERIFIED ON SITE BY CONTRACTORS AND CHECKED WITH THE LIGHTING CONSULTANT PRIOR TO ORDERING.

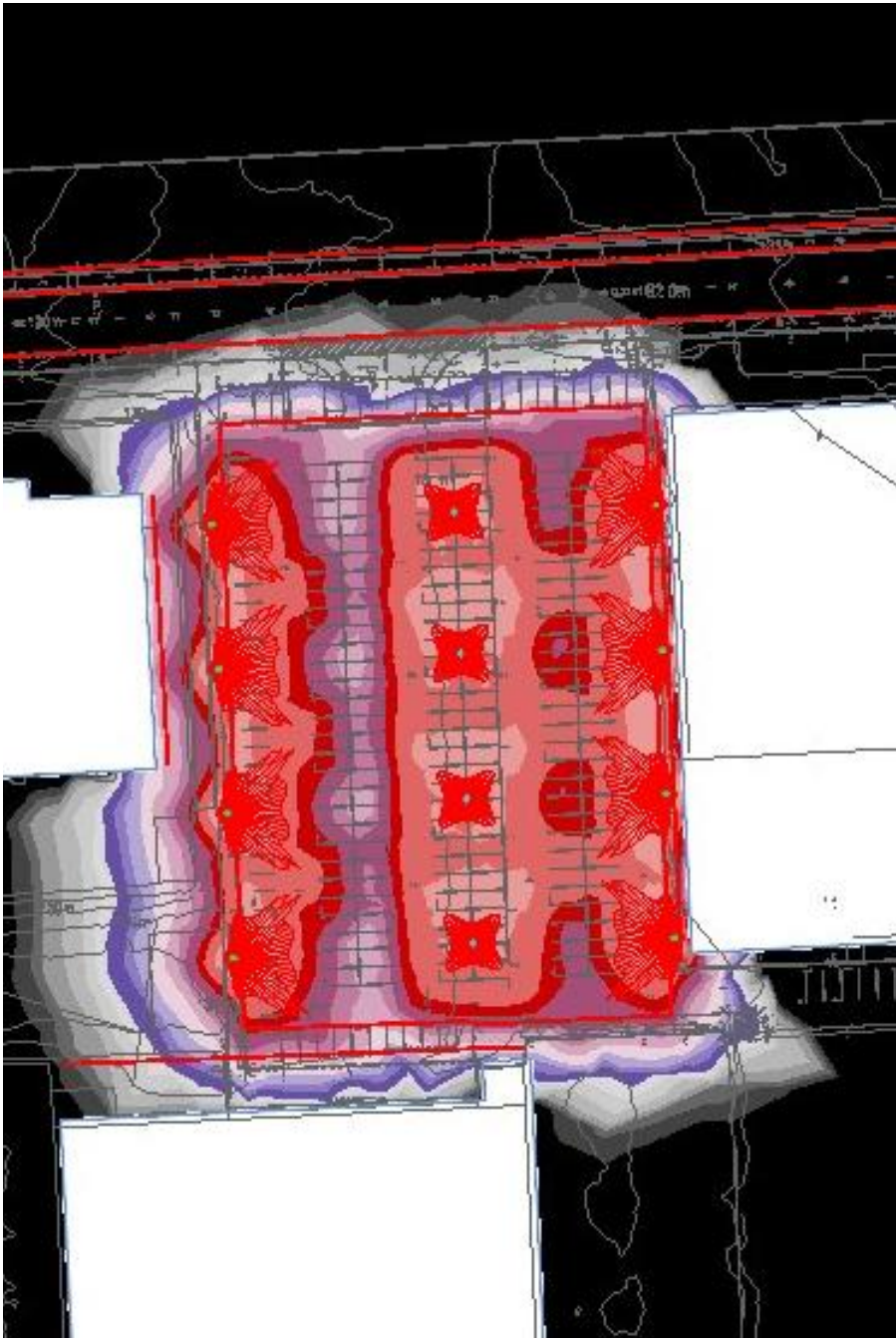
KEY LEGEND



EXTERIOR FLOODLIGHT MOUNTED ON POLE



P01	FIRST ISSUE APPENDED TO REPORT		JBP	MM	SLH	22/09/2022
REV		AMENDMENTS	DRAWN	CHECKED	APPROVED	DATE
CLIENT RENTRUCK						
ARCHITECT DAVID GEORGE ARCHITECT						
PROJECT STAKEHILL INDUSTRIAL ESTATE VEHICLE STORAGE, MIDDLETON						
TITLE PROPOSED LIGHTING LAYOUT						
DRAWING NUMBER 12909-CBG-XX-EX-DR-Y-20001		SCALE 1:500@A3				
STATUS PRELIMINARY		REVISION P01				
		DO NOT SCALE				
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External Lighting Strategy Report

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Revision P01 : 22nd September 2025

CBG LIGHT
PERCEPTIONS