



Satellite Business Park
External Lighting Assessment
For Mileway

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CONTENTS

1.	PROJECT DESCRIPTION.....	1
1.1	Proposed Development	1
2.	INTRODUCTION.....	1
3.	EXTERNAL LIGHTING AREAS AND ZONES	1
4.	DESIGN STANDARDS	1
5.	REDUCTION OF OBTRUSIVE LIGHT	1
6.	LIGHTING LEVELS	2
7.	LUMINAIRE TYPES	3
8.	ENERGY EFFICIENCY	3
9.	LIGHTING CONTROLS	3

1. PROJECT DESCRIPTION

1.1 Proposed Development

Hydrock have been appointed to provide planning stage advisory services in relation to the demolition, design and construction of the proposed development at Satellite Business Park.

This document forms part of the detailed planning application for the site and will inform the City of Wolverhampton Council Planning Department of the proposed external lighting strategy in order for the development to meet the necessary compliance requirements.

The site is currently comprised of existing industrial buildings and is located within the administrative boundary of the City of Wolverhampton Council. The redevelopment will consist of the demolition of existing buildings and the construction of a building for use as a builders merchant. The proposed site plan is shown below in Figure 1.

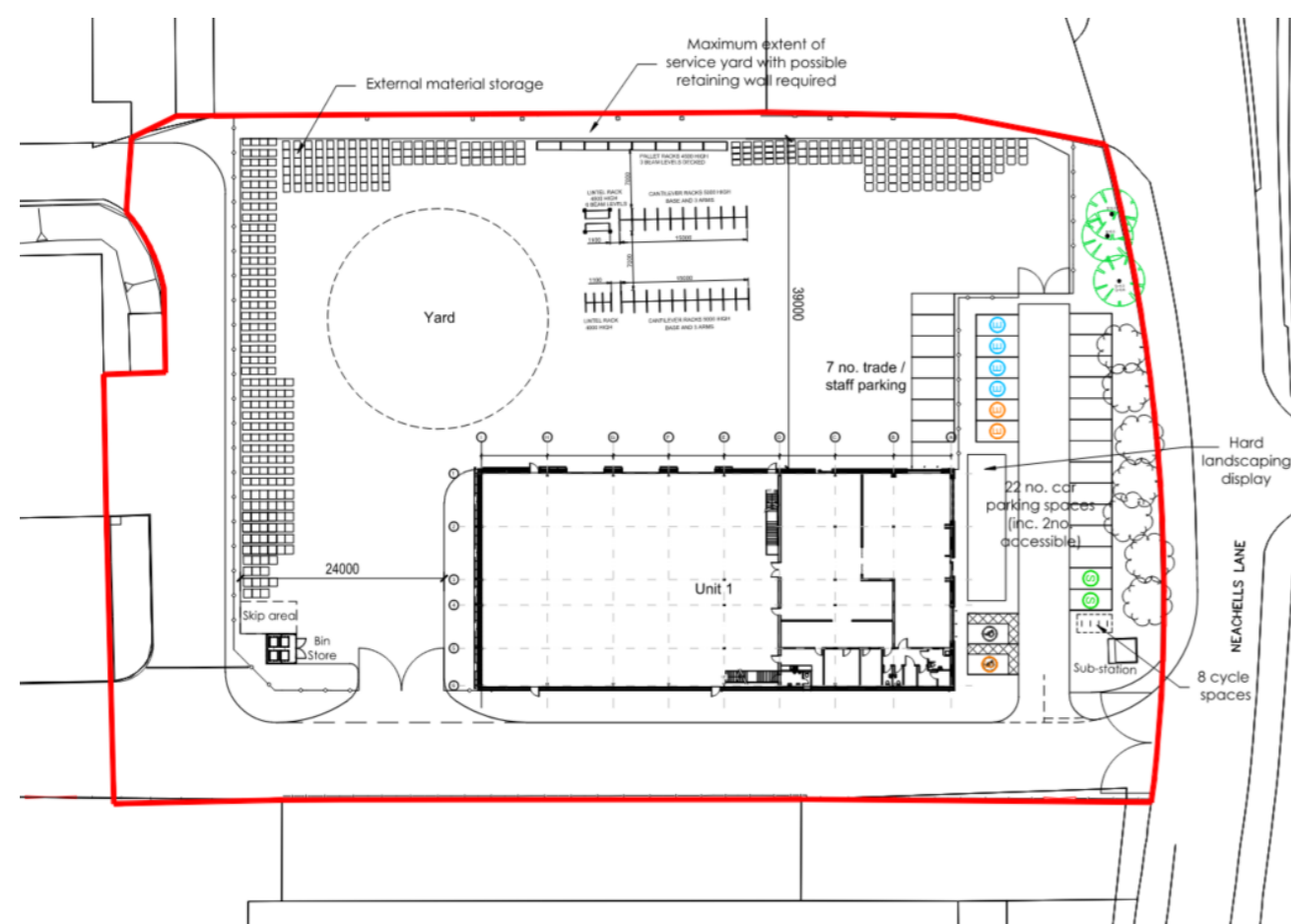


Figure 1 - Proposed Site Plan

2. INTRODUCTION

This assessment has been produced for planning purposes to describe the proposals for the new artificial external lighting for the development.

The lighting strategy shall aim to deliver the following objectives:

- Create a safe, secure and accessible environment for all users of the proposed facility.
- Minimise the impact on the existing surroundings using good design principles.
- Ensure compliance with the relevant guidelines and standards.
- Adopt a sustainable approach to selection and specification of the lighting.
- Adopt a controls approach that will allow lighting levels to be modified to suit specific use and unused zones to be switched off.

3. EXTERNAL LIGHTING AREAS AND ZONES

The following areas and zones shall be provided with new artificial external lighting.

- General walkways.
- Building perimeter walkways.
- Building frontages (Level Access Doors)
- Logistics yard areas.
- Skip/Bin Store area
- Trade/Staff/Accessible car parking
- Sub-station area

4. DESIGN STANDARDS

The proposed external lighting shall meet the recommended design criteria guidance detailed within the following documents:

- ILE "Guidance Notes for the Reduction of Obtrusive Light".
- BS5489-1 "Code of Practice for the Design of Road Lighting".
- BS EN 12464-2 "Light and Lighting – Lighting of Workspaces – Part 2: Outdoor Work Places".
- BREEAM Credit Ene 03 "Energy Efficient External Lighting".
- BREEAM Credit Pol 04 "Reduction of Night Time Light Pollution".

5. REDUCTION OF OBTRUSIVE LIGHT

Using the following table contained within the ILE guide (Figure 2), we would assess this site as a Category E3 Environmental Zone, which is defined as 'Small town centres or suburban locations'.

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

Figure 2 - Table 1 taken from ILE "Guidance Notes for the Reduction of Obtrusive Light".

The following table contained within BS EN 12464 Part 2 (Figure 3) expands on the definition of the E3 Environmental Zone as 'Represents medium district brightness areas, such as industrial or residential suburbs.'

Table 2 — Maximum obtrusive light permitted for exterior lighting installations

Environmental zone	Light on properties		Luminaire 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
E1	2	0	2 500	0	0	0	50
E2	5	1	7 500	500	5	5	400
E3	10	2	10 000	1 000	15	10	800
E4	25	5	25 000	2 500	25	25	1 000

where

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 light 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 signs in cd·m⁻².

^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 3 - Table 2 taken from BS EN 12464 Part 2.

This site would come under the definitions provided for a category E3 Environmental Zone.

The external lighting shall be designed to ensure that the maximum permitted obtrusive light or light pollution is not exceeded to help minimize difficulties for people, flora and fauna.

The luminaires shall be carefully selected to achieve compliance with table 2 (Figure 3) of BS EN 12464 Part 2, which states that the "Sky Glow" upward light ratio (ULR) shall be no more than 15%.

The lighting shall be provided by a combination of column/building mounted luminaires and bollard luminaires. To minimise light pollution and light trespass the columns and bollard heights will be kept relatively low.

6. LIGHTING LEVELS

Using the following tables contained within BS EN 12464 Part 2 (Figures 4 & 5), we would propose the following:

- Walkways (Ref. no. 5.1.1) and car parking areas (Ref.no. 5.9.1) are illuminated to an average of 5 lux with a uniformity of 0.25
- The yard area (Ref.no. 5.1.4) is illuminated to an average of 50 lux with a uniformity of 0.40.

To help create a safe, secure and accessible environment for all users of the buildings, we would propose that the building entrances and perimeters are illuminated to an average of 20 lux with a uniformity of 0.25.

Table 5.1 — General requirements for areas and for cleaning at outdoor work places

Ref. no.	Type of area, task or activity	\bar{E}_m lx	U_o -	R_{GL} -	R_a -	Specific requirements
5.1.1	Walkways exclusively for pedestrians	5	0,25	50	20	
5.1.2	Traffic areas for slowly moving vehicles (max. 10 km/h), e.g. bicycles, trucks and excavators	10	0,40	50	20	
5.1.3	Regular vehicle traffic (max. 40 km/h)	20	0,40	45	20	At shipyards and in docks, R_{GL} may be 50
5.1.4	Pedestrian passages, vehicle turning, loading and unloading points	50	0,40	50	20	
5.1.5	Cleaning and servicing	50	0,25	50	20	All relevant surfaces

Figure 4 - Table 5.1 taken from BS EN 12464 Part 2.

Table 5.9 — Parking areas

Ref. no.	Type of area, task or activity	\bar{E}_m lx	U_o -	R_{GL} -	R_a -	Specific requirements
5.9.1	Light traffic, e.g. parking areas of shops, terraced and apartment houses; cycle parks	5	0,25	55	20	
5.9.2	Medium traffic, e.g. parking areas of department stores, office buildings, plants, sports and multipurpose building complexes	10	0,25	50	20	
5.9.3	Heavy traffic, e.g. parking areas of major shopping centres, major sports and multipurpose building complexes	20	0,25	50	20	

Figure 5 - Table 5.9 taken from BS EN 12464 Part 2.

7. LUMINAIRE TYPES

The luminaires to be used shall generally be as follows (or similar) for each area:

- Walkways and footpath access routes will utilise a column mounted luminaires and low-level bollard lighting.
- Building entrances and perimeters will utilise wall mounted luminaires.
- The Logistics Yard will utilise column mounted luminaires.

Ref	Area	Image	Specification
X1	Walkways and car parking areas		Light source – LED Colour Temperature - 3000K
X2	Walkways and footpaths		Light source – LED Colour temperature - 3000K
X3	Building entrances and perimeter walkways		Light source – LED Colour temperature - 3000K
X4	Logistics Yard		Light source - LED Colour Temperature - 3000K

Table 1 - Luminaire Schedule

8. ENERGY EFFICIENCY

All luminaires will be provided with efficiency in mind and as such energy efficient LED lamp sources will be used.

The overall scheme shall have an average initial luminous efficiency of no less than 70 luminaire lumens per circuit watt, which will achieve compliance with the BREEM credit Ene 03.

9. LIGHTING CONTROLS

The control of the lighting will be sympathetic to the environmental impact by providing controls to turn some of the lighting off during normally less busy times (23:00-07:00 hours). Several fittings shall stay illuminated after 23:00 to provide security for pedestrians on the site during these hours, however a manual override facility shall also be provided to override any automatic controls to give the end user more flexibility and control.