

Designs for Lighting Ltd

Lighting Strategy

Prepared for Arcadis

Eastlands Car Park



Date: February 2016

PROJECT NUMBER: 0410		DOCUMENT REF: 0410-DfL-LS-001_B_EASTLANDS				
B	For Issue	RC	RJ	AS	AS	03/03/16
A	For Approval	RC	RJ	AS	AS	26/02/16
Revision	Purpose Description	Originated	Checked	Reviewed	Authorised	Date



Designs for Lighting Ltd
17 City Business Centre, Hyde Street, Winchester, SO23 7TA

T: +44(0)1962 855080, E: info@designsforlighting.co.uk www.designsforlighting.co.uk

Contents

1	Definitions	3
2	Introduction	4
2.1	Outline	4
3	Legislative and Policy Framework	6
3.1	Introduction.....	6
3.2	Relevant British Standards.....	6
3.3	Guidance	6
4	Lighting Strategy	7
4.1	Introduction.....	7
4.2	Lighting Performance	7
4.3	Equipment & Installation Geometry.....	7
4.4	Usage	7
5	Appendix 1- Applicable Lighting Standards	8

1 Definitions

Proposed Development: Refers to the details of the development.

Application Site: Refers to the land on which the development will occur.

Obtrusive Light: Obtrusive light or light pollution is any light which strays to areas other than where it is intended and can include light intrusion (spill light) into neighbouring properties, upward light (which can create sky glow), visual source intensity and glare. It can also create effects upon the ecological receptors in the area, particularly with respect to bat roosts and foraging corridors.

Illuminance: Is a measure of how much light falls on a surface.

2 Introduction

2.1 Outline

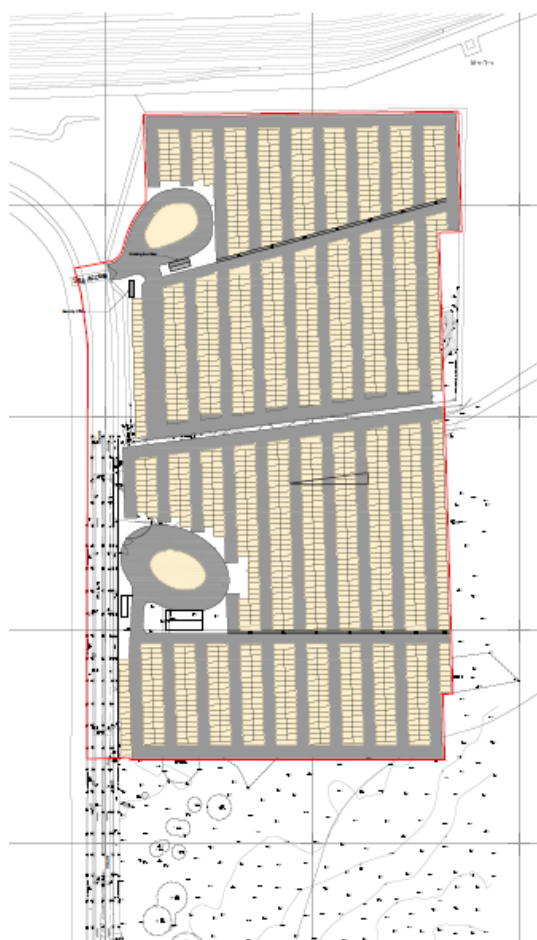
- 2.1.1 Arcadis (UK) Limited has been commissioned by Jaguar Land Rover to provide environmental studies to support works for improving on-site efficiencies, capabilities and resilience at Jaguar Land Rover Halewood.
- 2.1.2 Jaguar Land Rover proposes to create 1589 temporary parking spaces (inclusive of 304 existing temporary spaces) on and around the existing Eastlands car park (see images below). This will free up other areas of the site for future development associated with increased market demands. The proposals will include the replacement of the existing Eastlands car park and surrounding land within the fence-line with hard-standing marked with parking spaces. An indicative plan of the proposals is presented in **Images 1 and 2**.
- 2.1.3 This report has been prepared by Designs for Lighting Ltd; a lighting consultancy which specialises in lighting design, lighting impact assessments and mitigation.
- 2.1.4 The purpose of this report is to propose a suitable artificial lighting strategy which will be required for the safe and secure operation of the **Proposed Development**. Note that this lighting strategy applies solely to the **Application Site** and the **Proposed Development** associated with it.
- 2.1.5 The **Application Site** is situated at the north east side of the Jaguar Land Rover / Getrag site from which an internal park and ride operates.
- 2.1.6 The **Proposed Development** involves the construction of a temporary car park to provide 750 spaces and associated works for three years.
- 2.1.7 The location of the site is within an industrial area, situated approximately 1.5 miles north east of Liverpool John Lennon airport. Access to the site is via East Road which is accessed from the A561 and the A562.
- 2.1.8 Industrial sites are located west of the **Application Site** and span a distance of approximately 2 miles. Located east of the site are areas of grassland and natural screening provided by trees, obscuring the visibility of the **Application Site** from the east. Network Rail's Liverpool to Warrington railway line runs parallel to the Jaguar Land Rover Site at the north boundary.
- 2.1.9 This lighting strategy should be viewed in conjunction with the Lighting Impact Assessment (410-DFL-LIA-001_B_EASTLANDS).

Image 1 Identification of proposed Eastlands car park within Jaguar Land Rover Site

Location of proposed Eastlands car parks



Image 2 Indicative layout of proposed Eastlands car parks



(Not to scale)

3 Legislative and Policy Framework

3.1 Introduction

3.1.1 This strategy has been prepared with consideration towards the relevant legislation and guidance. It ensures that the proposed lighting is suitable for the requirements of the user, without causing detrimental effects to the surrounding environment.

3.1.2 The applicable policies and legislation documents are listed below:

- Environmental Protection Act 1990 / Clean Neighbourhoods and Environment Act 2005
- National Planning Policy Framework: 2012 DCLG
- Knowsley Local Plan Core Strategy (Adopted January 2016)
- Knowsley Unitary Development Plan- Policy ENV3: Light Pollution.

3.1.3 Further details are provided in the Lighting Impact Assessment document: (410-DFL-LIA-001_B_EASTLANDS)

3.2 Relevant British Standards

3.2.1 The most applicable British Standards for lighting that relate to the proposed development are:

- BS EN 12464-2: 2014- *Lighting of Work Places (Outdoor work places)*
- BS 5489-1: 2013 – *Code of practice for the design of road lighting.*

3.3 Guidance

Guidance Notes for the Reduction of Obtrusive Light; 2011 Institution of Lighting Professionals (ILP)

3.3.1 The lighting strategy takes guidance from the Institution of Lighting Professionals to ensure that potential obtrusive light is mitigated as far as is reasonably practicable. Further information can be found in the Lighting Impact Assessment. (410-DFL-LIA-001_B_EASTLANDS)

4 Lighting Strategy

4.1 Introduction

- 4.1.1 Artificial Lighting is required within the **Proposed Development** to support the safe and secure operation of the site. This is particularly focused towards the safety and security of personnel using the car park.

The **Proposed Development** is to be temporary (up to three years) and there are currently no existing power supplies to the **Application Site**.

4.2 Lighting Performance

- 4.2.1 Uncovered parking areas require lighting that is suitable for the safe and secure operation of the facility. As these areas are open, lighting should also be designed so that it is sensitive to the surrounding environment.
- 4.2.2 Guidance for outdoor parking areas within *BS 5489-1:2013 7.4.8.3 table 5* shall be applicable to the **Proposed Development** (see **Appendix 1**) the guideline lighting levels are:

Average Illuminance: 10 lux (minimum)

Uniformity (Uo): 0.25 (minimum)

4.3 Equipment & Installation Geometry

- 4.3.1 Due to the constraints of the **Application Site** and the temporary nature of the **Proposed Development**, it is suggested that static tower mounted metal halide or LED flood lighting is used to illuminate the car park.
- 4.3.2 Luminaires should be focussed into the car park and shall be tilted to an angle $\leq 70^\circ$ as detailed in the ILP Guidance listed in **Section 3.3**.
- 4.3.3 Where the static lighting towers are located near the north boundary, luminaires shall be focussed carefully to ensure they do not affect the adjacent Liverpool to Warrington Railway line.
- 4.3.4 If the **Proposed Development** becomes a permanent development at any time, a permanent lighting installation would be advised. The luminaires and arrangement would be specified during the detailed design stage, but should be designed to ensure that the installation would minimise obtrusive light into the environment. Using luminaires with a tilt angle of 0° would minimise the potential for obtrusive light in the form of Direct Upward light and light intrusion. Columns should be a maximum of 8 metres in height and an LED solution should be applied.

4.4 Usage

- 4.4.1 For a permanent lighting installation lighting controls would commonly be specified; however the controllability of a static tower lighting solution is limited. As such, the static lighting towers should be switched on to allow illumination of the car park zones that are occupied. As the volume of vehicles in the car park decreases, the lighting towers that are illuminating non – occupied zones should be switched off. It would be advisable to use static lighting towers with automatic timers incorporated.
- 4.4.2 If the car park is out of use, the lighting should be switched off.
- 4.4.3 If a permanent lighting installation is installed, a controls system should be specified to ensure that the lighting is adaptive to usage through the use of dimming. Adaptive lighting should use less energy as the lighting is dimmed to a base state when there is no vehicular or pedestrian activity within the car park.

5 Appendix 1- Applicable Lighting Standards

Table 5 Maintained lighting levels for outdoor car parks

Type of area and usage	$\bar{E}$ lx	U_o
Light traffic, e.g. parking areas of shops, terraced and apartment houses; cycle parks	5	0.25
Medium traffic, e.g. parking areas of department stores, office buildings, plants, sports and multipurpose building complexes	10	0.25
Heavy traffic, e.g. parking areas of schools, churches, major sports and multipurpose sports and building complexes	20	0.25

BS 5489-1:2013 – Table 5: Maintained lighting levels for outdoor car parks.

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	L_s 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.							

BS EN 12464-2:2014 – Table 2: Maximum obtrusive light permitted for exterior lighting installations