Lightable

BRUNNINGHAMS FARM

FINCHAMPSTEAD

LIGHTING STRATEGY

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EXECUTIVE SUMMARY

This Lighting Strategy has been prepared by Dan Alasfar, an Incorporated Engineer and Registered Member of the Institute of Lighting Professionals ("ILP") with 10+ years' experience of technical input for environmental lighting.

A modern external lighting installation is vitally important to the Site for many reasons including, but not limited to, the following:

- To provide safety for pedestrians and cyclists from moving vehicles;
- To provide ease of wayfinding and navigation;
- To provide security and deter antisocial behaviour;
- To set the architectural scene and urban landscape;
- To protect installations from accidental or deliberate damage; and
- To allow safe access and maintenance.

The Lighting Strategy has been prepared to ensure that site lighting is sensitive, safeguards the character of the area and protects potentially sensitive receptors. All lighting shall be necessary and proportionate, carefully directed and controlled, and specified to eliminate unnecessary spill, glare, and sky glow.

The Lighting Strategy establishes obtrusive light limits, provides mitigation measures, and recommends appropriate types of lighting which should be carried forward to the production of a future lighting design.

Key Recommendations:

- Adopt a site-wide warm white colour temperature (< 3000K).
- Utilise low intensity luminaires (< 800 lumens).
- Utilise high quality luminaires which are either directional or diffused, with no exposed bare bulbs.
- Avoid column mounted streetlights and low-quality domestic type floodlights.
- Consult with a qualified ecologist prior to commencing any lighting design.

1.0 POLICY AND GUIDANCE

Finchampstead Neighbourhood Development Plan (2022-2038)

Policy IRS5 - Ecologically important areas and Biodiversity:

"As appropriate to their scale, nature and location development proposals should demonstrate that:

- *[...] They conserve the environment for nocturnal species, through the avoidance of lighting and mitigating the impact of external lighting likely to increase night-time human presence. [...]"*

Policy PU/DH2 - Safeguarding Amenity:

"Development proposals should not cause by themselves, or cumulatively with other existing or proposed development, a detrimental impact on the amenity of existing properties or unacceptable living conditions for new occupiers in terms of:

- *[...] e. Artificial lighting.*

Environmental Protection Act 1990 / Clean Neighbourhoods and Environment Act (2005)

The CNEA 2005 amended section 79(1) of the Environmental Protection Act 1990, extending the statutory nuisance regime to include light nuisance stating the following:

"(fb) artificial light emitted from premises so as to be prejudicial to health or a nuisance."

National Planning Policy Framework (2024)

The Revised National Planning Policy Framework (NPPF) provides guidance relating to planning and pollution control for new development in England. The purpose of the planning system is to contribute to achievement of sustainable development. In relation to lighting, Paragraph 198 states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

Institute of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light (GN01/21)

The ILP has proposed lighting guidance and criteria for local authorities with a recommendation that they are incorporated at the local plan level. ILP GN01/21 recommends that the immediate environment is classified into an environmental zone based on ambient lighting levels in the surrounding area. The environmental zones are detailed in **Table 1**. Zone E0 requires the strictest level of control and E4 the lowest.

Table 1. Environmental Zones

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

ILP Guidance Note 08 for Bats and artificial lighting in the UK (GN08/23)

This document is aimed at lighting professionals, lighting designers, planning officers, developers, bat workers/ecologists and anyone specifying lighting. It is intended to raise awareness of the impacts of artificial lighting on bats, and mitigation is suggested for various scenarios.

BS 5489-1:2020 Design of Road Lighting (2021)

BS 5489-1 provides recommendations on the general principles, aesthetic and technical aspects of road lighting and advises on statutory provisions, operation and maintenance of lighting. The standard provides recommendations for the design of lighting for all types of highways and public thoroughfares.

Table 2 is taken from BS 5489-1 which helps to define the lighting class for subsidiary roads (Class P – subsidiary roads including residential roads). The required lighting performance criteria for each class is defined in BS EN 13201 Part 2: Road Lighting Performance Requirements (2015).

Table 2. Lighting Classes

Traffic flow	Lighting Class		
	E1 to E4 [A)]	E1 to E2 [A)]	E3 to E4 [A)]
	Pedestrians and cyclists only	Speed limit <30mph	Speed limit >30mph
Busy [B)]	P5	P4	P3
Normal [C)]	P5	P5	P4
Quiet [D)]	P6	P5	P4

[A)] Environmental zone, as given in ILP Guidance Notes (see Table 1 of this report)

[B)] Busy traffic flow refers to areas where the traffic usage is high and can be associated with local amenities such as clubs, shopping facilities, public houses, etc.

[C)] Normal traffic flow refers to areas where the traffic usage is of a level equivalent to a housing estate access road.

[D)] Quiet traffic flow refers to areas where the traffic usage is of a level equivalent to a residential road, and is mainly associated with the adjacent properties or properties on other equivalent roads accessed from this road.

BS EN 13201 Part 2: Road Lighting Performance Requirements (2015)

This standard defines lighting classes for road lighting according to photometric requirements and aiming at the visual needs of road users. It also considers environmental aspects of road lighting.

Table 3 is taken from BS EN 13201-2 which defines the lighting performance requirements for Class P roads.

Table 3. Lighting Classes

Class	Lighting Class	
	Maintained average (lux)	Minimum (lux)
P1	15.0	3.0
P2	10.0	2.0
P3	7.5	1.5
P4	5.0	1.0
P5	3.0	0.6
P6	2.0	0.4

National Planning Practice Guidance

Light Pollution Planning Practice Guidance (http://planningguidance.planningportal. Gov.uk/blog/ light-pollution) advises on how to consider light within the planning system. It recognises that artificial light provides valuable benefits to society, including extending opportunities for sport, recreation, and commerce, and can be essential to a new development. Equally, inappropriate artificial light has the potential to be obtrusive and to cause light pollution. It can be a source of annoyance, harm wildlife, and undermine enjoyment of the countryside and views of the night sky.

Lighting in the Countryside: Towards Good Practice

The Office of the Deputy Prime Minister (ODPM – now Department for Communities and Local Government) in conjunction with the Countryside Commission published 'Lighting in the Countryside: Towards Good Practice' in July 1997, and a revised issue in 2001. The guidance was developed to 'provide practical advice on the prevention and control of lighting effects through appropriate action by all those involved with lighting in the countryside'. Its objective is *"to identify good practice in the planning and design of lighting in rural areas; and advise on how it can be achieved, using case study examples"*. The guide aims to provide an overview and common understanding of all aspects of good lighting practice stating that close co-operation and participation is required for all those involved in planning, designing, and installing lighting schemes.

2.0 BASELINE

The study area includes the Site, the surrounding areas and any sensitive receptors which may have a direct view towards external lighting proposals and/or which may be affected during the construction and operation of the Site.

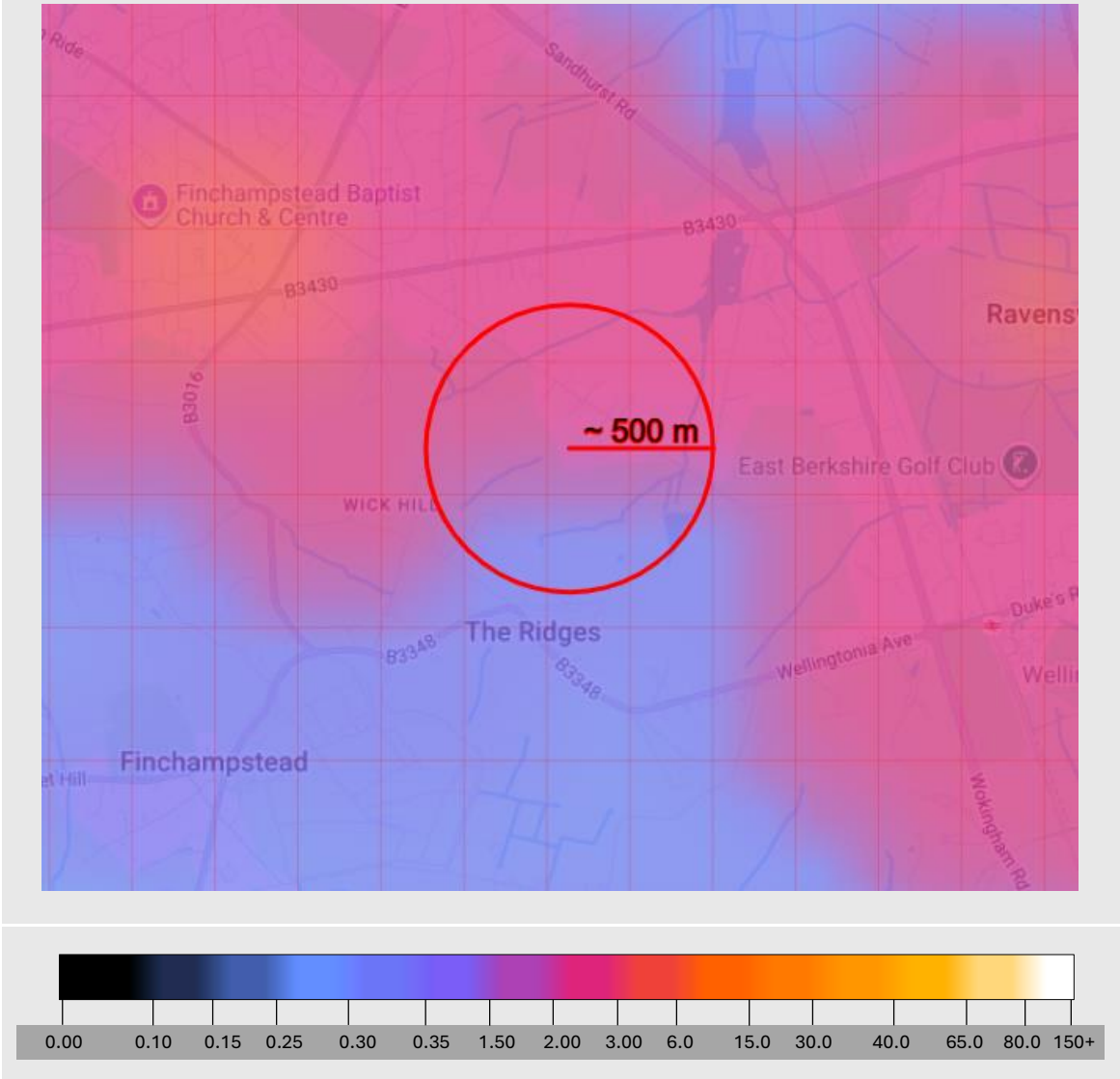
Assessment of designation, use, habitat, and external lighting condition dictates the classification of Environmental Zone across the proposed Site location and surrounding areas.

Local Radiance

The Visible Infrared Imaging Radiometer Suite (VIIRS) is a satellite instrument which orbits earth to collect and record radiance data (light emissions). The latest data was recorded in 2024 and is available in visual format. An extract at the Site location is included in **Figure 1**.

It is important to state that recognised organisations, such as the ILP, have not calibrated VIIRS radiance data with the Environmental Zones as defined by the ILP. It is also important to note the data should not accurately be relied upon and should be viewed conservatively. The data should be used as one tool to help understand the context of existing light emissions local to the Site.

Figure 1. Local radiance



Mean Radiance, calculated about a 500m radius from the Site:	2.03nW/ cm^2sr

Residential Receptors

Residential receptors surrounding the Site have been identified based on a desktop study using mapping data in conjunction with Google Earth satellite and street view imagery.

Residential properties within 100m and with a direct or partial view of the Site are considered potentially sensitive.

Figure 2. Residential receptors

Ecology

The ecological baseline has been established through a Preliminary Ecological Appraisal (PEA) undertaken by Arbtech, the appointed project ecologist.

The following light-sensitive species were discussed in the PEA:

- Bats

Foraging and commuting habitat

"Habitats recorded on site are assessed to provide foraging and commuting opportunities for bats in the form of wet woodland, other neutral grassland, bramble scrub, bracken, and scattered trees. These habitats are likely to provide micro-climatic conditions that support a large population of invertebrates that will in turn provide ample foraging opportunities for a large bat population. Most notably, the woodland on site extends beyond the site adding to the continuity of vegetated features present in the wider landscape. While there are no prominent linear features present onsite, the site is surrounded by high-value habitats for bats such as priority deciduous woodland, ponds, lowland heathland, wood pasture and parkland, and ancient woodland in all directions. It is likely that bats will regularly commute through the site to reach further suitable habitats present in the wider landscape."

Roosting habitat

"Buildings to be impacted by the proposed development are assessed for their suitability to support roosting bats below. There are a total of 4 buildings on site: the main barn (B1), and three outbuildings (B2–B4). All buildings were surveyed as all will be impacted by the proposed development. Trees to be impacted by the development will be assessed in a

Recommendations

"A low impact lighting strategy will be adopted for the site during post-development which outlines the areas of the site that will be retained as dark corridors. Parameters can be found on the Bat Conservation Trust website: https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/"

Proposed Dark Corridor

Figure 3 illustrates a zone which is currently recommended as a dark corridor. This designation may be subject to change pending the outcomes of future ecological surveys, but it should be used as a guide for future reference.

Figure 3. Proposed dark corridor

Environmental Zone

Based on the findings of this baseline study, the Site is deemed to fall in Environmental Zone E2.

Table 4. Environmental Zones

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
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3.0 DESIGN PARAMETERS

This Section sets out the parameters for Site lighting, both lighting performance requirements and obtrusive light limits which must be complied with in order to reduce adverse impacts to negligible levels.

Lighting Performance

The access road lighting performance requirements have been established using the methodology in **Table 2** and **3** for quiet traffic flow street in an Environmental Zone E2 location.

Table 5. Lighting Performance criteria

Traffic flow	Environmental Zone	Lighting Class		
		Class	Maintained average (lux)	Minimum (lux)
Quiet	E2	P5	3.0 – 4.5	0.6

Dwelling lighting shall not be designed to any specific performance standard. It shall provide illumination necessary for security and wayfinding after dark.

Obtrusive Light

The following criteria shall be assessed at the identified receptor locations.

Residential Receptors

Light intrusion, as defined in ILP GN01/21, specifically limits the amount of artificial light that can spill into residential properties from neighbouring lighting installations. The guidance ensures that light trespass is minimised to acceptable levels.

Table 6. Obtrusive light limit – Light intrusion

Parameter	Conditions	Environmental Zone E2 Limits
Illuminance in the vertical plane (lux)	Pre-curfew	5 lux
	Post-curfew	1 lux

Sky Glow (Upward light ratio)

The upward light ratio in ILP GN01/21 sets a maximum percentage of total luminous flux from a lighting installation that is allowed to be emitted above the horizontal plane. This limit is designed to reduce sky glow by minimising the amount of light that escapes directly upwards into the night sky.

Table 7. Obtrusive light limit – Sky glow

Parameter	Conditions	Environmental Zone E2 Limits
Upward light ratio (%)	n/a	2.5%

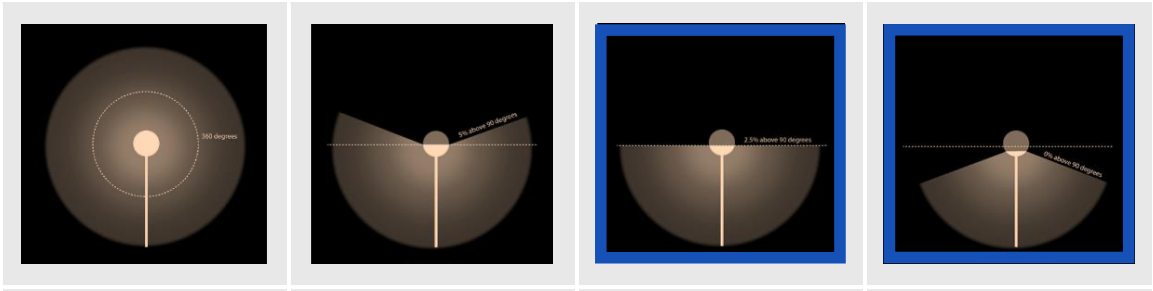
4.0 MITIGATION

Poorly thought-out lighting has the potential to cause unacceptable impacts on sensitive receptors. The following key mitigation steps have been applied in an effort to reduce adverse impacts to negligible levels.

Small scale: External lighting shall be restricted to provide the minimum requirements for access and wayfinding after dark. The access road shall be provided with directional bollard lights to provide the minimum requirements for safe access and wayfinding after dark. Dwelling lighting shall be in keeping with the recommended light types provided later in this strategy.

Directional light: All luminaires shall be directional, emitting light below the horizontal plane. This effectively creates a dark corridor above. This is in accordance with the recommendations of BCT/ILP GN08/23.

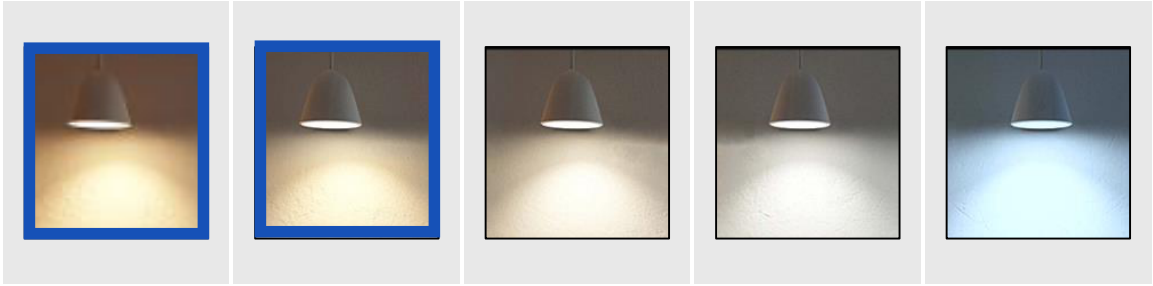
Figure 4. Full cut-off lighting



Non cut-off	Semi cut-off	Cut-off	Full cut-off

Warm colour temperature: Luminaires are proposed at 2700K warm white colour temperature with a peak wavelength higher than 550nm. Warm white is less prone to disrupt natural sleep-wake cycle and melatonin production and causes less light "scatter" which contributes to sky glow. This is in accordance with the recommendations of BCT/ILP GN08/23.

Figure 5. Selected colour temperature



2700K	3000K	4000K	5000K	6000K
Warm white		Neutral White	Cool white	

Low intensity

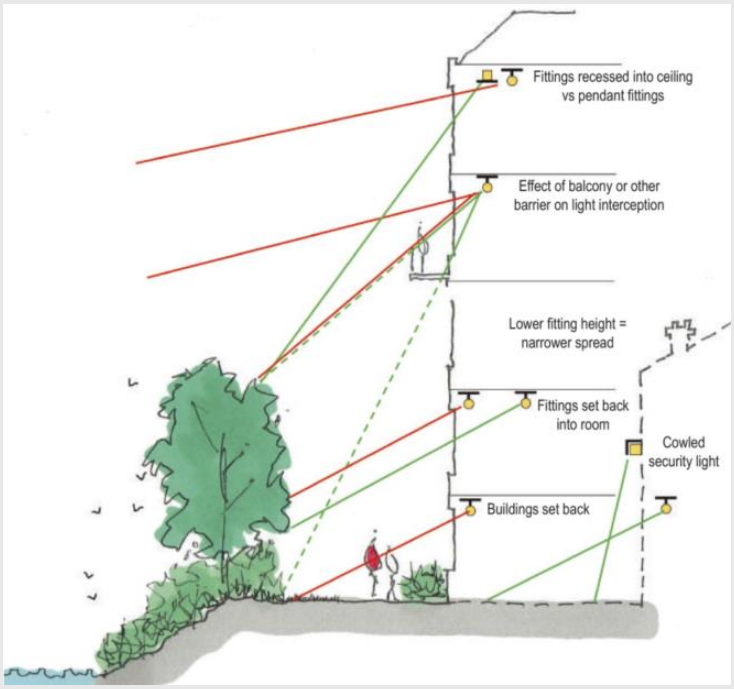
All lighting shall be low intensity and designed to complement the character of the site. Individual external lights shall not exceed 800 lumens.

Internal Lighting Mitigation

Internal lights shall be set back into rooms and not aimed towards windows. Pendant lighting or "bare bulbs" shall not be positioned in close proximity to windows. This is in accordance with the recommendations of *ILP GN08/23*.

Internal lights should be maximum 3000K colour temperature. Internal lighting mitigation measures are illustrated in **Figure 6**.

Figure 6. Internal lighting mitigation (source: ILP GN08/23)



5.0 LUMINAIRE SELECTION

The example luminaires shown on the following pages illustrate the recommended (and not recommended) types and styles for different areas of the site. These examples are intended as guidance to promote appropriate styles that ensure compliance with the overall lighting strategy. The example luminaires provided is non-exhaustive.

The final selection of specific products shall align with the examples provided and must fully comply with the lighting strategy. If in doubt, advice should be sought from a competent lighting professional.

Figure 7 illustrates the nature of light types which are recommended (and not recommended) for this Site.

Figure 7. Recommended (and not recommended) luminaire types

Access road lighting

Shall be provided via directional bollards emitting all light below the horizontal plane. This effectively creates a dark corridor above, retaining opportunities for foraging. Upward light shall be kept to a minimum.

	Recommended *Directional bollard* - Max output 800 lumens - Max 3000K CCT - Upward light shall be kept to a minimum *Example product TRT Lighting VIA bollard
	Recommended *Directional bollard* - Max output 800 lumens - Max 3000K CCT - Upward light shall be kept to a minimum
	Not recommended *Unshielded bollard* - Exposed light source
	Not recommended *Unshielded bollard* - Exposed light source

Dwelling Lighting

Shall be either directional or diffused, with no exposed bare bulbs. An upward light component shall be permitted only when installed beneath canopies or overhangs.

Recommended
Shielded down light
- Dwelling entrances, perimeter paths
- Max output 800 lumens
- Max 3000K CCT

*Example product Knightsbridge Eamon

Recommended
Surface linear downlight
- Garages, areas where increased light levels are required
- Max output 800 lumens
- Max 3000K CCT

Recommended
Rectangular slot light
- Driveways
- Terraces
- Max output 300 lumens
- Max 3000K CCT

Not recommended
Open bulb light
- Exposed light source

Not recommended
Domestic flood light
- High output uncontrolled light

6.0 CONSTRUCTION PHASE LIGHTING

While construction phase lighting is expected to be short term and reversible it is important to minimise disruption as far as practicable. To reduce the effects of lighting during the construction phase the following measures should be put in place:

- Lighting will operate in all external areas used by construction workers after dark in order to provide a safe and secure working environment without over lighting. High quality LED light sources with high colour rendering index (CRI) shall be utilised to maximise visibility with efficient light output;
- Lighting shall be provided to meet the target lux level as set out in BS EN 12464-2 *Lighting of outdoor workplaces* without over lighting. Luminaires shall be mounted at the lowest practical mounting height, providing lighting only where lighting is required;
- The Contractor shall specify working hours, uses of lighting, location of temporary floodlights and construction compound and agreeing these with the local council to reduce duration of impact;
- Lighting controls should be employed to dim or switch off any lighting that is not needed;
- Lighting that needs to be sited close to the perimeter or ecologically sensitive areas should be directed into the Site, fitted with shielding, or be switched off or dimmed when not in use;
- Lighting should be controlled in such a way to illuminate high activity, hazardous or high security areas while reducing lighting levels at less pertinent areas; and
- The Contractor should act responsibly to adjust any temporary lighting reported as causing nuisance.