

Land at Bankside (Phase 2)
Banbury

Lighting Appraisal



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1 Introduction

- 1.1 Brookbanks Consulting Ltd is appointed by Hallam Land Management Ltd to assess the noise environment in support of a residential development on Land at Bankside (Phase 2), Banbury.
- 1.2 The Report considers the methodology and results following the completion of investigations assessing:
- Existing Site baseline lighting conditions
 - Proposed Development lighting arrangement

2 Background Information

Location & Details

- 2.1 The proposed development lies to the south of the urban extent of Banbury and to the east of Bodicote village. The site is bound to the west by College Park House, Bodicote Park (Rugby Grounds) and to the south-west by the A4260 Oxford Road. The remaining boundaries of the site are bound by agricultural fields that extend to the surrounding areas. A number of farm properties are shown within proximity of the site.
- 2.2 The land is currently undeveloped and is not thought to have been historically subject to any significant built development. The site location and boundary is shown indicatively on Figure 2a, below:

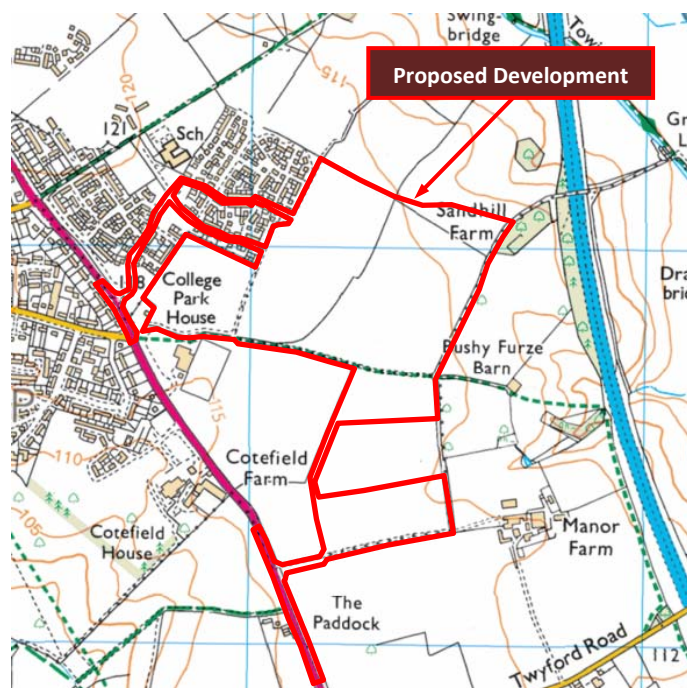


Figure 2a: Site Location

Description of Development

- 2.3 It is proposed to develop up to 850 residential units and an area designated for allotments and green space.

Legislative Framework

- 2.4 Light pollution was introduced within the Clean Neighbourhoods and Environment Act (2005) as a form of statutory nuisance under the Environmental Protection Act (1990). Lighting nuisance is given by the following definition:

"Artificial light emitted from premises so as to be prejudicial to health or nuisance;"

- 2.5 More recently, the National Planning Policy Framework (NPPF) sets out the Government’s core policies and principles with respect to planning. With regard to lighting, this includes the following relevant to the assessment:

"By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

- 2.6 The implications of the NPPF have been considered throughout this assessment

Institute of Lighting Engineers Guidance

- 2.7 Luminaires associated with any proposed development have the potential to cause light trespass into residential properties in the vicinity of the Site. The Institute of Lighting Engineers (ILE) has developed an Environmental Zone classification system for the categorisation of assessment locations. Figure 2b below provides an overview of this information.

Environmental Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically Dark	National Parks Areas of Outstanding National 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 2b: ILE Environmental Zone Classifications

- 2.8 For each environmental zone, the guidance has identified pre and post curfew luminance levels for external lighting installations. These values are shown in Figure 2c below:

Environmental Zone	Sky Glow URL (Max %)	Light Intrusion (into windows) E _v [lux]		Luminaire Intensity I [candelas]		Building Luminance Pre-curfew
		Pre Curfew	Post Curfew	Pre Curfew	Post Curfew	Average L [candelas]
E0	0	0	0	0	0	0
E1	0	2	0 (1*)	2,500	0	0
E2	2.5	5	1	7,500	500	5
E3	5.0	10	2	10,000	1,000	10
E4	15	25	5	25,000	2,500	25

Figure 2c: ILE Obtrusive Light Limitations for Exterior Installations

- URL** - Upward Light Ratio of the Installation
- E_v** - Vertical luminance in lux
- I** - Light Intensity in Candelas (cd)
- L** - Luminance in Candelas per square metre (cd/m²)
- Curfew** - the time after which stricter requirements for the control of obtrusive light will apply (usually 2300hrs)
- *** - Permitted only from public road lighting installations

3 Existing Site Conditions

- 3.1 The proposed development land is currently undeveloped and in agricultural use, resulting in areas where there is limited light spillage. There are some existing light sources, these are outlined below:

- Headlights from vehicles following the A4260 to the south west of the site and the M40 in the north west.
- General domestic and security lighting from residential/farm properties to areas surrounding the site.

3.2 For the purposes of this assessment, the baseline lighting condition is therefore considered to be a standard non-artificially illuminated situation. The following lighting levels are generally considered representative:

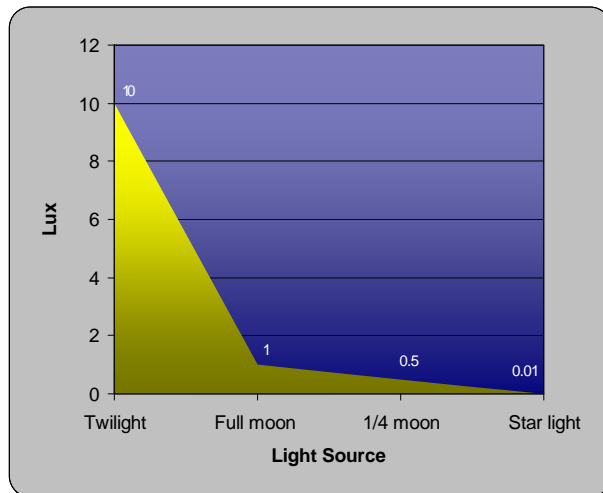


Figure 3a: Standard Non-Artificial Lighting Levels

Receptors

- 3.3 Street lighting will be required within the proposed development and this coupled with the effects of residential lighting has to be considered in the context of potential lighting sensitive receptors.
- 3.4 The potential receptors considered within this report are:

- Fauna and flora within and adjacent to the site, with particular regard to the Greater Horseshoe bat, as requested.

Fauna & Flora

- 3.5 Certain fauna and flora are sensitive to the effects of lighting, the introduction of which can have an adverse effect on the population. So, for example, whilst certain species of bats, such as the Noctule and Serotine are happy to fly around illuminated street lighting, capitalising on the increased supply of insects that are attracted to the light source. Horseshoe bats will avoid street lighting and therefore inappropriate locations such as at entrances to roosts, commuting corridor or foraging location, should be avoided where possible.
- 3.6 The Master Plan has in turn indicated that there will be public open space as well as planting in these parts of the proposed development. While not essential for satisfactory operation of the development, this will help to minimise glare at night-time onto private gardens and houses from the flood lighting.

4 Proposed Development

Construction Lighting Impacts

- 4.1 It is anticipated that the main construction works will be associated with site clearance and preparation works, the installation of temporary and permanent access roads and footpaths, and the construction of the buildings and other structure.
- 4.2 The following temporary lighting requirements are expected during the construction phase:

- Lighting within temporary car parking and compound areas, for security and health and safety purposes.
- Security and health and safety lighting for use within ongoing working areas.
- Internal and external lighting for temporary office units and compound facilities.

4.3 To avoid undue light spill, glare and/or sky glow, such lighting can be controlled to ensure that it is sensitively installed, correctly angles with baffles if necessary. Such construction lighting will be temporary.

4.4 There is potential for disturbance from lighting generated from plant and construction vehicles. But this is considered infrequent and minimal due to the standard working hours requirements. Construction works would not occur during late evening or night-time hours.

Mitigation of Construction Lighting Impacts

4.5 A Draft Construction Environmental Management Plan (CEMP) has been prepared and submitted to the clients. This draft submitted CEMP will be provided as part of the outline planning application and will be agreed in advance of commencement of the construction activities. The CEMP can identify the location of the material storage areas, construction compound, temporary parking bays, highway works and temporary security/health and safety lighting. In considering the CEMP, impacts of the temporary lights on sensitive receptors can be reduced to a minimum.

4.6 The following best practice measures are identified as recommended by the ILE, CIRIA and Health and Safety Executive (HSE):

- A named individual for the public to contact should there be any complaints related to temporary lighting installations;
- Specified working hours and the location of construction compounds should be agreed in advance. The location of the compound and storage areas should take into consideration the location of sensitive receptors.
- Lighting should to be switched off when not required unless specifically needed for construction activities, security and/or health and safety requirements;
- Glare caused by poorly directed lights can be minimised by ensuring that light fittings are horizontally mounted and directed away from the boundaries of the Site. Lighting should be confined to the defined area intending to be illuminated;
- The use of appropriate hoarding (if deemed necessary) can contain surface level illumination on the boundaries of the construction areas; and
- Light spill can be minimised by avoiding poorly sited lights on the boundary of the Site. Lighting will be located and directed so that it does not cause unnecessary intrusion to adjacent residential properties.

4.7 In terms of Health and Safety requirements during the construction phases, the following measures will be implemented:

- Any temporary detours of vehicles or pedestrians (e.g. any temporary footpath diversions) around then construction site should be clearly visible at all times;
- Construction area fences located near existing roadways or walkways should be appropriately lit to assist in defining the limits of the construction area for motorists and pedestrians;
- Temporary walkways, roads and parking areas should be illuminated to the same intensity in accordance with current guidance stipulated in the ILE Guidance Notes of the Reduction of Obtrusive Light (2005); and
- Should hoarding be required during the construction phases, care should be taken to avoid these casting shadows on surrounding and adjacent footpaths and roads which may otherwise compromise safety.

Construction Summary

- 4.8 Any temporary impact from construction lights can be minimised and mitigated by application of the measures outlined above. Some existing vegetation will be retained at the boundaries of the Site which will help screen areas of construction and lighting from view.
- 4.9 Any mitigation measures can be delivered through the adoption and management of the CEMP by the on-site contractor.

Operational Lighting Impacts

- 4.10 The following lighting is anticipated for the Proposed Development:
- Street lighting (c. 6m columns) within the built development areas;
 - Security lighting at individual properties and key entrances;
 - Street lighting (c. 8 or 10m columns) may be provided in the future at the location of the proposed access junction into the site.
- 4.11 Such lighting will result in an increase in artificial lighting instalments on the Site. But any limit will not be materially different to other residential areas in the vicinity.
- 4.12 Future detailed lighting design for the Proposed Development will be prepared at the detailed design stage. However, for the purposes of this outline assessment, it is anticipated that impacts from artificial lighting could arise as a result of the following:
- Type and specification of the lighting equipment used;
 - The location of the lighting columns; and
 - The intensity of the light source.

Mitigation of Operational Lighting Impacts

- 4.13 With suitable mitigation measures, any impact of new lighting to nearby existing residential and ecological receptors can be minimised. The new lighting strategy will consider the advice in the Bats and Lighting in the UK document, to comply with the requirements of the Bats Conservation Trust.
- 4.14 If lighting is necessary, then there are a number of ways to minimise the effect of lighting on bats, to allow dark corridors to persist in line with paragraph 125, Chapter 11 of the NPPF. The following mitigation strategies have been taken from Bat Conservation Trust Landscape and Urban design for Bats and Biodiversity (Gunnell et al., 2012) and other referenced sources:
- Limiting the height of lighting columns to eight meters and increasing the spacing of lighting columns can reduce spill of light into unwanted areas such as the aforementioned habitats.
 - Other ways to reduce light spill include the use of directional luminaires, shields, baffles and/or louvres. Flat, cut-off lanterns are best.
 - Lighting that is required for security or access should use a lamp that is PIR sensor activated, to ensure that the lights are only on when required and turned off when not in use.
- 4.15 At detailed design, if applicable the presence of bats on the Site (particularly around the edges) should be taken into account when designing a lighting scheme. Lighting levels should be kept to a minimum as far as possible, in particular around the peripheries of the Site and in areas designated as public open space.
- 4.16 The lighting scheme will be designed to minimise light pollution, particularly as seen in views from the wider countryside of the AONB to the west and south-west. Any lighting within the proposed development should follow Kent County

Council's Guidance and where necessary it should also include measures such as the use of directional lighting, limiting the use of lighting to specified operating hours and implementation of lights that reduce glare and spill.

- 4.17 Where residential streets and areas of open space adjoin the countryside to the east of the site, opportunities for street lighting within this area to use low level bollard lighting and other measures to limit light pollution.
- 4.18 Where development fronts the landscape buffer and green corridor along the southern and north-western edge of the site, lighting will be minimised and designed to limit light spill into adjacent unlit / low-lit areas.

Operational Summary

- 4.19 The majority of potential impacts from the Proposed Development can be minimised by the careful selection of lighting equipment and installation.
- 4.20 In general, it is recommended that site lighting is kept to a minimum during both the construction and operational phases, especially in areas of foraging/commuting corridors such as woodland edges, as well as along retained greenspace habitat in the north of the development.

5 Summary

- 5.1 Any temporary impact from construction lights can be minimised and mitigated by application of best practice measures. Some existing vegetation can be retained at the boundaries of the Site, which will help screen of the construction and lighting from view. Any mitigation measures can be delivered through the adoption and management of the CEMP by the on-site contractor.
- 5.2 The majority of potential impacts from the operation of the Proposed Development can be minimised by the careful selection of lighting equipment and installation. The full lighting strategy will be addressed at the future Reserved Matters stage, which will also comply with the requirements of the Bats Conservation Trust concerning Bats and Lighting in the UK.

6 Limitations

- 6.1 The conclusions and recommendations contained herein are limited to those given the general availability of background information and the planned usage of the site.
- 6.2 Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.
- 6.3 The benefits of this report are provided solely to Hallam Land Management Ltd for the Proposed Development on Land at Bankside, Banbury.
- 6.4 Brookbanks Consulting Ltd excludes third party rights for the information contained in the report.

