Wates Developments

Foxhole Farm, Bolney

Lighting Impact Assessment

3040714R01

16TH APRIL 2025

nature positive
an RSK company

GENERAL NOTES

Project No.: 3040714R01

Title: Foxhole Farm, Bolney - Lighting Impact Assessment Report

Client: Wates Developments

Date: 16th April 2025

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CONTENTS

1 INTRODUCTION

1.1 Background

Nature Positive has been appointed by Wates Developments to prepare this Lighting Impact Assessment in support of the Outline planning application for residential development of up to 200 dwellings, new community building and public open space on land at Foxhole Farm, Bolney.

1.2 Aim of the Report

This report presents the findings of an assessment of existing / baseline artificial lighting levels in the area of the development and the predicted effects of new artificial lighting installed as part of the proposed scheme on the existing potentially sensitive receptors (e.g residential properties and wildlife) present in the locality.

2 PLANNING POLICY CONTEXT

2.1 National Planning Policy Framework

In December 2024 The National Planning Policy Framework (NPPF) was revised, superseding the bulk of previous Planning Policy Statements with immediate effect. The National Planning Policy Framework was intended to simplify the planning system and includes a presumption in favour of sustainable development.

Section 15 of the NPPF deals with Conserving and Enhancing the Natural Environment, and states that the intention is that the planning system should prevent new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans. The document also states that 'new development [should be] appropriate for its location' and 'the effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account'.

2.2 Mid Sussex District Plan 2014 – 2031 Adopted March 2018

DP29: Noise, Air and Light Pollution

Strategic Objectives: 3) To protect valued landscapes for their visual, historical and biodiversity qualities; and 12) To support sustainable communities which are safe, healthy and inclusive.

Evidence Base: Data held by Environmental Health, Air Quality Action Plan – Stonepound Crossroads, Hassocks.

The environment, including nationally designated environmental sites, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people's life will be protected from unacceptable levels of noise, light and air pollution by only permitting development where:

Light pollution:

• The impact on local amenity, intrinsically dark landscapes and nature conservation areas of artificial lighting proposals (including floodlighting) is minimised, in terms of intensity and number of fittings;

• The applicant can demonstrate good design including fittings to restrict emissions from proposed lighting schemes;

2.3 Mid Sussex District Plan 2021 – 2039 Submission Draft (Regulation 19)

DPN6: Pollution

Development must not cause or be adversely affected by pollution or hazards, including air, noise, vibration, light, water, soil, odour, dust or other pollutants, which significantly adversely impact on people, including health and quality of life, and the natural environment, including nature conservation sites. Mitigation measures may need to be implemented for development that is likely to increase levels of pollution or hazards, taking into account any cumulative impacts.

DPN8: Light Impacts and Dark Skies

People's health and quality of life and the natural environment will be protected from unacceptable levels of light pollution.

Development proposals must demonstrate that all opportunities to reduce light pollution (including sky glow, glare and light spillage) have been taken including minimising impacts on local amenity, intrinsically dark landscapes including protected landscapes, the South Downs International Dark Sky Reserve (Moore's Reserve) and areas important for nature conservation and nature recovery.

Artificial lighting proposals (including outdoor lighting, floodlighting and new street lighting) should be minimised in terms of intensity and number of fittings. The applicant must demonstrate all of the following:

1. The minimum amount of lighting necessary to achieve its purpose is specified or otherwise justified on safety or security grounds.

2. The design and specification of the lighting would minimise sky glow, glare and light spillage in relation to the visibility of the night sky, local amenity and local character.

3. The means of lighting would be unobtrusively sited.

4. Low energy lighting is used.

5. There would not be an adverse impact on wildlife such as through consideration of the appropriate siting, fitting, design, colour and temperature of lighting.

Development proposals must carefully consider the design and layout of parking arrangements to avoid headlight nuisance.

Where lighting of a landmark or heritage feature is proposed, the level and type of illumination used would need to enhance the feature itself as well as meeting the above requirements.

2.4 Bolney Neighbourhood Plan 2015 – 2031

Policy BOLD1 - Design of New Development and Conservation

Planning permission for new development will ordinarily be permitted subject to the following criteria:

It is designed to a high quality which reflects Bolney's rural nature and responds to the heritage and distinctive character by way of;

height, scale, spacing, layout, orientation, design and materials of buildings, and

the scale, design and materials of the public realm (highways, footways, open space and landscape); and

It does not have an unacceptable impact on the setting of any heritage asset; and

It respects the natural contours of a site and protects and sensitively incorporates well-established natural features of the landscape including trees, species-rich hedgerows and ponds within the site; and

It creates a safe, accessible and well-connected environment that meets the needs of its users; and

It will not result in unacceptable levels of light, noise, air or water pollution, and

Where possible, it provides lock-up facilities for storage of bicycles, children's pushchairs and mobility vehicles to encourage walking and cycling and to assist accessibility.

3 SITE LOCATION

3.1 Introduction

The proposed development site is located on land to the East of Foxhole Lane. The site is bordered by residential properties to the East and South, and fields to the North and West. No external lighting was in use at the time of the site visit. The development has hedgerows and trees around the site, giving a natural barrier to artificial light that may spill beyond the site boundary.

A location plan of the current site can be seen in Appendix A, with the proposed Development plan in Appendix B.

4 ASSESSMENT SCOPE AND METHODOLOGY

4.1 Approach

In order to assess the baseline artificial lighting levels in the area, a site visit was conducted by Nature Positive on Wednesday 11th December 2024. Measurements were taken at a height of 1.5m above ground level under an overcast sky between 20:30 and 22:30 hours using an Isotech ILM 01 Digital Light Meter at the position of each measurement location identified (see section 5.0 baseline conditions). The measurement locations where the baseline measurements were taken are shown in Appendix C.

A computer model has been constructed of the proposed development using Relux Pro lighting software version 2023.1.8.0 using an assumed lighting scheme to assess the potential effect of the development on the existing area.

4.2 Lighting Assessment Guidance

The Clean Neighbourhoods and Environment Act 2005 made light pollution a statutory nuisance under the Environmental Protection Act 1990, which came into force on 6th April 2006. Section 79 of the Environmental Protection Act 1990 has been amended to include artificial light emitted from premises that potentially could be prejudicial to health or a nuisance.

No prescriptive limits or rules are set for such assessments, but the following guidance documents have been referred to while compiling this assessment:

- The SLL Lighting Handbook – The Society of Light and Lighting (SLL), this provides guidance on maximum recommended vertical illuminance levels measured at the sensitive receptors windows.
- Lighting Guide 6 The Outdoor Environment – The Society of Light and Lighting (SLL), this gives minimum safe lighting levels for the footpaths.
- ILP Guidance Notes for the Reduction of Obtrusive Light (2011) provides measurable design guidance limits and recommendations to ascertain acceptability of obtrusive light levels at night.
- CPRE _ Night Blight: Mapping England's light pollution and dark skies, provides maps of Great Britain's light pollution and dark skies.

Table 1 from the SLL Handbook shows the five qualitative environmental zones identified by the International Commission on Illumination (CIE) which reflect differing levels of light pollution which can affect an area. The limits recommended by the SLL for limiting light trespass are given in Table 2.

Table 1 - The Environmental Zoning system of the CIE

Environmental Zones	Zone description and examples of sub-zones
E0	Areas with dark landscapes: UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Areas with intrinsically dark landscapes: National Parks, areas of outstanding natural beauty (where roads are usually unlit)
E2	Areas of 'low district brightness': outer urban and rural residential areas (where roads are lit to residential road standard)
E3	Areas of 'middle district brightness': generally urban residential areas (where roads are lit to traffic route standard)
E4	Areas of 'high district brightness': generally, urban areas having mixed recreational and commercial land use with high night-time activity

Table 2 - Maximum vertical illuminance on windows, maximum luminous intensity for obtrusive luminaires and maximum building luminance produced by floodlighting, for five environmental zones

Environmental Zones	Maximum vertical illuminance on windows (Lux)		Maximum luminous intensity (cd)		Maximum building luminance (cd/m^2)
	Before curfew	After Curfew	Before curfew	After curfew	
E0	0	0	0	0	0
E1	2	1	2500	0	0
E2	5	1	7500	500	5
E3	10	2	10000	1000	10
E4	25	5	25000	2500	25

4.3 Measurement Locations

Measurement Locations are initially physical measuring positions in and around the development site. These locations are chosen to give a general idea of lighting levels across the site, but also at potentially sensitive receptors (residential properties, wildlife, etc) in and outside of the development boundary. All measurement locations are then uploaded into the software model as virtual surfaces that are used to calculate illuminance of the development post construction.

Measurements were taken around the whole perimeter of the site, with particular interest at sensitive locations close to the site boundary.

Please refer to Table 3 for a full list of measurement locations and identified potentially sensitive receptors. A plan view of the site showing the measuring element locations is shown in Appendix C.

5 BASELINE CONDITIONS

5.1 Within the Site

The site is currently unlit with no existing sources of artificial light present, and no light spill into the site was observed from street lighting associated with Cowfold Road or The Street.

5.2 Surrounding Area

Fifty Three measurement locations were identified around the site boundary and surrounding area. The minimum recorded level across the whole site was 0.10 Lux. Table 1 above, indicates that the area would be classified as E2, Areas of low district brightness and in line with the SLL guidelines, the vertical illuminance on windows of identified receptors must be less than 5 Lux before and 1 Lux after curfew as indicated in Table 2. The locations of the measuring points are presented in Appendix C.

Table 3 –Baseline Lighting Levels

Measurement Location	Measuring Element	Measured Illuminance (Lux)
1	MP1	0.11
2	MP2	0.12
3	MP3	0.10
4	MP4	0.10
5	MP5	0.10
6	MP6	0.12
7	MP7	0.11
8	MP8	0.10
9	MP9	0.10
10	MP10	0.11
11	MP11	0.12
12	MP12	0.11
13	MP13	0.11
14	MP14	0.10
15	MP15	0.12
16	MP16	0.11
17	MP17	0.12
18	MP18	0.10
19	MP19	0.10
20	MP20	0.10
21	MP21	0.11
22	MP22	0.10
23	MP23	0.10
24	MP24	0.11
25	MP25	0.11
26	MP26	0.10

Measurement Location	Measuring Element	Measured Illuminance (Lux)
27	MP27	0.10
28	MP28	0.10
29	MP29	0.12
30	MP30	0.11
31	MP31	0.10
32	MP32	0.10
33	MP33	0.12
34	MP34	0.13
35	MP35	0.11
36	MP36	0.11
37	MP37	0.10
38	MP38	0.12
39	MP39	0.11
40	MP40	0.12
41	MP41	0.10
42	MP42	0.10
43	MP43	0.10
44	MP44	0.12
45	MP45	0.11
46	MP46	0.10
47	MP47	0.10
48	MP48	0.12
49	MP49	0.11
50	MP50	0.10
51	MP51	0.10
52	MP52	0.12
53	MP53	0.13

The results in table 3 above show that the development site itself is unlit, and there is minimal light spill into the site from the neighbouring properties or roads surrounding the site.

The locations of the measuring points are presented in Appendix C. When considering direct Sky Glow, as a result of direct upwards light, there is the possibility of a site wide effect being visible from darker environments, however, direct Sky Glow cannot be measured. The baseline is assessed relative to visual baseline survey conditions and published Campaign to Protect Rural England (CPRE) – Night Blight data. Taken on a local scale, existing saturated Sky Glow was noticeable from the north towards Crawley at the time of the site visit.

6 DEVELOPMENT LIGHTING

6.1 Indicative Lighting Design

In the absence of a detailed lighting design for the development, broad assumptions on the likely lighting design and locations of luminaires for the purposes of the assessment have been made. The indicative design uses lighting with 0% upward light to minimise Sky Glow and promote a Dark Skies policy. A column height of 5m has been used for the development street lighting. General recommendations for the detailed lighting scheme will be provided and these include:

- Wherever possible, ensuring the use of controlled light distribution, optimised optics, and considered luminaire positioning.
- Modern LED luminaires should be employed to minimise the obtrusive light spill and be as energy efficient as possible.
- Lighting throughout the site will be designed to minimise horizontal spill of light to hedgerows.
- Dimmed and reactive lighting will be used where appropriate.
- Lighting will be directed away from the site boundaries.
- Lighting will be designed in accordance with ILP Guidance Notes for Reduction of Obtrusive Light and CIE 126 (1997) Guidelines for Minimising Sky Glow.

The indicative lighting design is in accordance with the above recommendations. The indicative lighting design includes column mounted luminaries selected to have no upward light as well as sharp cut off characteristics. Lighting has been selected to provide adequate illumination of footpaths and roads without polluting the site boundary and also reducing upward light to minimise Sky Glow. Smart controls will be used including time clocks and photocells but for the purpose of this report, all lighting was assumed to be on to show the worst-case effect. Appendix B shows the proposed development.

7 ASSESSMENT OF IMPACTS

7.1 Surrounding Area

Table 4 shows the results of the calculations and the predicted light levels at all measurement locations. This has been presented as an after-curfew scenario, where light levels are recommended not to exceed 1 Lux at the windows of nearby residential properties. For the purpose of this report, the calculations have been performed with all development lighting switched on across the site to show the potential worst-case effect. The increase in illuminance column represents the increase on the baseline results as a result of the development. The maximum illuminance column represents the maximum lighting levels at that specific measurement location. The measurement locations are presented in Appendix C.

Table 4 – Results For Proposed Scheme

Measurement Location	Increase in Illuminance (Lux)	Maximum Illuminance (Lux)	Maximum Recommended Illuminance (Lux)
1	0.00	0.11	1
2	0.00	0.12	1
3	0.00	0.10	1
4	0.00	0.10	1
5	0.00	0.10	1
6	0.00	0.12	1
7	0.01	0.12	1
8	0.02	0.12	1
9	0.01	0.11	1
10	0.01	0.12	1
11	0.01	0.13	1
12	0.01	0.12	1
13	0.01	0.12	1
14	0.01	0.11	1
15	0.00	0.12	1
16	0.00	0.11	1
17	0.00	0.12	1
18	0.00	0.10	1
19	0.00	0.10	1
20	0.00	0.10	1
21	0.00	0.11	1
22	0.00	0.10	1
23	0.00	0.10	1
24	0.00	0.11	1
25	0.01	0.12	1
26	0.01	0.11	1
27	0.02	0.12	1

Measurement Location	Increase in Illuminance (Lux)	Maximum Illuminance (Lux)	Maximum Recommended Illuminance (Lux)
28	0.03	0.13	1
29	0.01	0.13	1
30	0.00	0.11	1
31	0.00	0.10	1
32	0.00	0.10	1
33	0.00	0.12	1
34	0.03	0.16	1
35	0.59	0.70	1
36	0.78	0.89	1
37	0.32	0.42	1
38	0.56	0.68	1
39	0.63	0.74	1
40	0.43	0.55	1
41	0.27	0.37	1
42	0.03	0.13	1
43	0.14	0.24	1
44	0.35	0.47	1
45	0.26	0.37	1
46	0.00	0.10	1
47	0.00	0.10	1
48	0.00	0.12	1
49	0.00	0.11	1
50	0.00	0.10	1
51	0.00	0.10	1
52	0.01	0.13	1
53	0.03	0.16	1

The results presented in Table 4 indicate there is only a relatively small increase predicted across the site with a maximum increase of 0.78 Lux at measuring position 36.

Measuring positions 35 - 45 are adjacent to the proposed road that connects the north and south areas of the site. The road runs down the eastern border of the site. The results show the scheme will not cause significant light spillage beyond the developed area with all receptor locations recording predicted levels below 1 lux. Predicted light spill is shown in Appendix D.

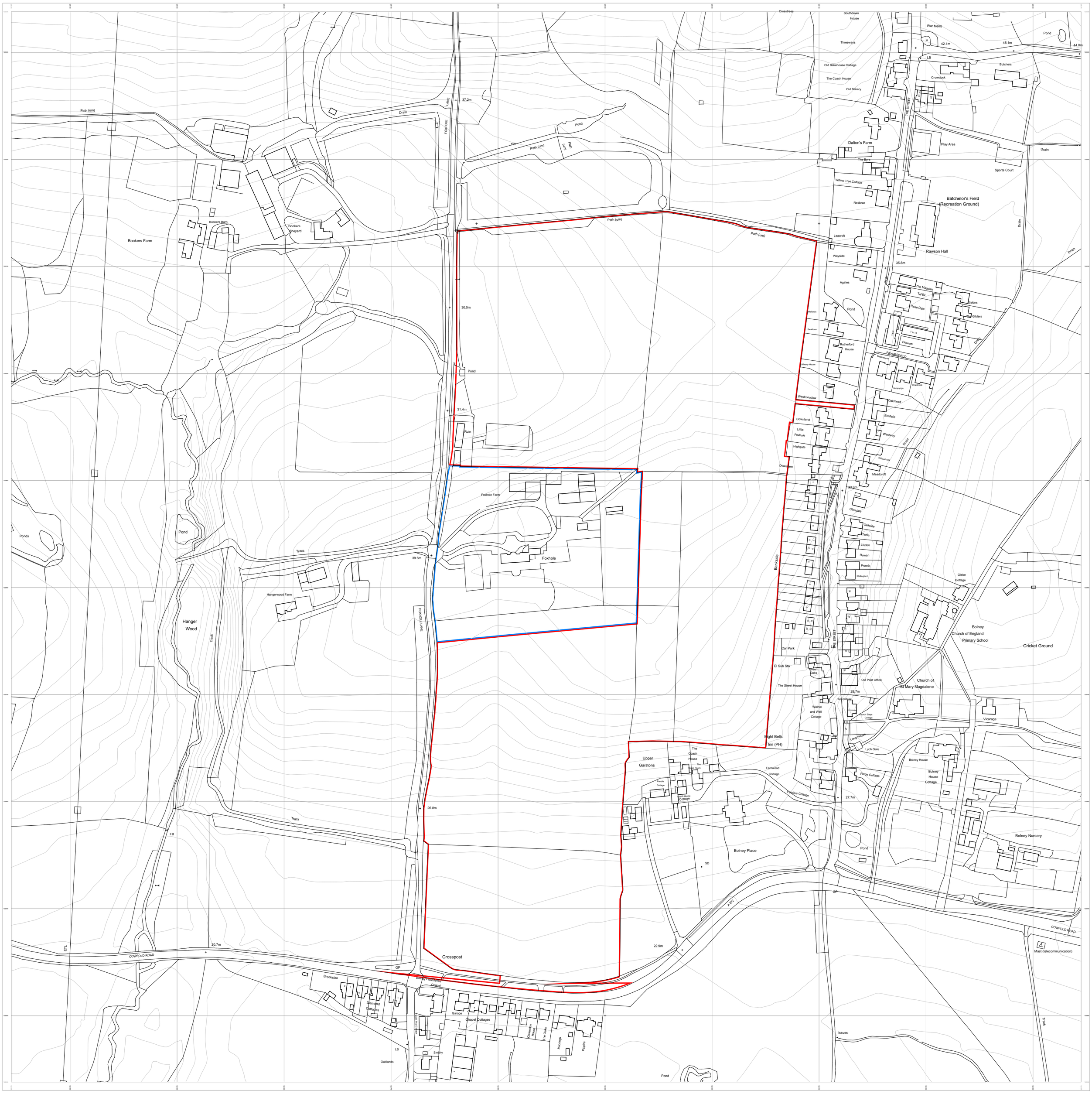
8 CONCLUSION

The proposed development will have a negligible impact on the area surrounding the site. Although light spill from the site will increase in some locations the impact of the new development will be negligible in these locations.

The assumed luminaires to be installed on the site have minimal light spill due to housings that direct the light down and minimise unwanted sideways illumination. This results in a development that will have little or negligible impact on the surrounding area in line with the SLL recommendations.

In summary it has been shown that the proposed development will have an insignificant effect on the immediate environment with respect to lighting pollution. Although light spill has increased illuminance levels at some locations, the potential increase in illuminance is considered negligible.

APPENDIX A: SITE LOCATION PLAN



Serial number: 235345

Site Area:
168,860.45 m²
(16.89 ha)

rev.	date	changes description	status	issued by
P07	13/12/2024	Site boundary updated	S2	DM
P06	21/11/2024	Site boundary updated	S2	DM
P05	01/11/2024	Visibility splay incorporated into red line boundary	S2	DM

N

0 25 50 100 125m

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revision **P07**