



Metis Homes

**Proposed Residential Development
Lighting Assessment**

**Land Rear of 15-27 Horndean Road,
Emsworth**

June 2019

Executive Park, Avalon Way, Anstey, Leicester, LE7 7GR

Tel: 0116 234 8000

Email: Nathan.allen@wyg.com



Document Control

Project: Land Rear of 15-27 Horndean Road, Emsworth

Client: Metis Homes

Job Number: A113747

File Origin: O:\Acoustics Air Quality and Noise\Active Projects\

Document Checking:

Prepared by:	Ben Myers <i>Environmental Technician</i>	Initialled: BM
Prepared by:	Viral Patel <i>Environmental Consultant</i>	Initialled: VP

Checked by:	Nathan Allen <i>Principal Environmental Consultant</i>	Initialled: NA
-------------	---	----------------

Verified by:	Nigel Mann <i>Director</i>	Initialled: NM
--------------	-------------------------------	----------------

Issue	Date	Status
1	13 th June 2019	First Issue
2		



Contents Page

1.0	Introduction.....	1
2.0	Policy, Legislation and Relevant Agencies	2
3.0	Methodology.....	7
4.0	Baseline.....	10
5.0	Lighting Assessment.....	15
6.0	Conclusions	18

Figures

Figure 1 – Site Boundary

Figure 2 – Light Monitoring Locations

Figure 3 – Existing Residential and Ecological Receptors

Figure 4 – 3D Representation of Model

Figure 5 – Simplified Light Scheme



1.0 Introduction

WYG Environment Planning Transport (WYG) were commissioned by Metis Homes to undertake a Lighting Assessment for a residential development at Land Rear of 15-27 Horndean Road, Emsworth.

1.1 Site Location and Context

The development site currently consists of agricultural outbuildings and grassland, the approximate national grid reference of which is 474503, 106807.

The proposed site is bounded by:

- Residential properties along Horndean Road to the North and East;
- Park and Grassland to the South and South- West, with sports facilities including a bowling and tennis club beyond;
- Grassland and hedgerow to the West

Reference should be made to Figure 1 for a visual representation of the application site and surrounding area.

1.2 Lighting Design and Assessment - Overview

The proposed development will require the installation of a number of luminaires that have the potential to increase existing light levels at sensitive locations within the vicinity of the site. The following stages have therefore been undertaken in order to produce a suitable lighting layout and assess potential impacts:

- Baseline survey;
- Quantitative assessment of potential lighting impacts at existing light sensitive receptors bordering the proposed development site, based on the proposed external lighting design;
- Formulation of appropriate mitigation measures, where necessary, in order to minimise the potentially detrimental impacts of the proposed lighting scheme.

The results of the assessment are detailed in the following section of this report.



2.0 Policy, Legislation and Relevant Agencies

2.1 Documents Consulted

The following documents were consulted during the undertaking of this assessment:

- Guidance Notes for the Reduction of Obtrusive Light, The Institution of Lighting Professionals, 2011;
- National Planning Policy Framework, Ministry of Housing, Communities & Local Government, February 2019;
- National Planning Practice Guidance on Light Pollution, Department for Communities and Local Government, 6th March 2013;
- Environmental Protection Act, 1990;
- Statutory Nuisance from Insects and Artificial Light, Guidance on Sections 101 to 103 of the Clean Neighbourhoods and Environment Act 2005, DEFRA 2006
- BS EN 12464-2: Lighting of Work Places - Outdoor Work Places, British Standards Institute, 2007;
- BS EN 13201-4: Road Lighting – Methods of Measuring Lighting Performance, 2003;
- BS 5489-1: Code of Practice for the Design of Outdoor Lighting - Lighting of Roads and Public Amenity Areas, British Standards Institute, 2013;
- PLG 04- Guidance on Undertaking Environmental Lighting Impact Assessments, ILP, 2013; and,
- Havant Borough Core Strategy: Local Development Framework (Adopted January 2011); and,
- Havant Borough Draft Local Plan 2036.

Legislative Framework

Light pollution was introduced within the Clean Neighbourhoods and Environment Act (2005) as a form of statutory nuisance under the Environmental Protection Act (1990), which was amended to include the following nuisance definition:

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

Although light was described as a statutory nuisance, no prescriptive limits or rules have been set for assessment. Guidance within the National Planning Policy Guidance with regards to Light pollution has been referred to while producing this assessment as well as documents produced by the International Commission on Illumination (CIE), Institute of Lighting Professionals (ILP) and the Chartered Institute of Building Services Engineers (CIBSE).

2.2 Design Standards

2.2.1 National Standards

The appropriate lighting design criteria for the scheme are contained within:

- BS EN 12464-2: Lighting of Work Places - Outdoor Work Places, 2014;
- BS 5489-1: Code of Practice for the Design of Outdoor Lighting - Lighting of Roads and Public Amenity Areas, 2013; and,
- BS EN 13201-2: Road Lighting - Performance Requirements, 2003.

Good lighting design also includes luminaires that have been selected to minimise light intrusion and glare to pedestrians and drivers, as discussed within the ILP document "Guidance Notes for the Reduction of Obtrusive Light".

2.2.2 Best Practice Design

As well as meeting the statutory design standards outlined in section 2.3.1, the external lighting design has sought to meet a number of criteria to ensure that the environmental effects of artificial lighting are managed to a high standard. These criteria are:

- All external lighting schemes must not have an upward lighting ratio (ULR) of more than 0.0%;
- All new column mounted luminaires shall be fitted with flat glass where appropriate to aid 0% upward light discharge

2.3 Planning Policy and Guidance

2.3.1 National Policy

The National Planning Policy Framework (NPPF) principally brings together and summarises the suite of Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) which previously guided planning policy making. The NPPF broadly retains the principles of PPS 23: Planning and Pollution Control and with regard to light pollution, states that:

'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.'

The National Planning Practice Guidance web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6 March 2014 to support the National Planning Policy Framework and make it more accessible. It states that "for maximum benefit, the best use of artificial light is about getting the right light, in the right place and providing light at the right time". In light of this guidance, the assessment has considered the following implications of the proposed lighting design:

- *Does a new development proposal, or a major change to an existing one, materially alter light levels outside the development and/or have the potential to adversely affect the use or enjoyment of nearby buildings or open spaces?*
- *Does an existing lighting installation make the proposed location for a development unsuitable? For example, this might be because:*
 - *the artificial light has a significant effect on the locality;*
 - *users of the proposed development (e.g. a hospital) may be particularly sensitive to light intrusion from the existing light source.*
- *Does a proposal have a significant impact on a protected site or species e.g. located on, or adjacent to, a designated European site or where there are designated European protected species that may be affected?*
- *Is the development in a protected area of dark sky or an intrinsically dark landscape where it may be desirable to minimise new light sources?*

- *Are forms of artificial light with a potentially high impact on wildlife (e.g. white or ultraviolet light) being proposed close to sensitive wildlife receptors or areas, including where the light shines on water?*
- *Does the proposed development include smooth, reflective building materials, including large horizontal expanses of glass, particularly near water bodies (because it may change natural light, creating polarised light pollution that can affect wildlife behaviour)?*

If the answer to any of the above questions is 'yes', consideration should be made for:

- where the light shines;
- when the light shines;
- how much light shines; and
- possible ecological impact.

2.3.2 Local Policy

Following a review of the Havant Borough Draft Local Plan 2036, the following policy were identified as being relevant to potential light impacts associated with the proposed scheme:

Policy E20: Amenity and Pollution

"Development proposals will be permitted where:

- a. Projected levels of air, noise, odour, vibration, **light**, water or other pollution do not - users of the site, nearby occupiers and residents or the wider environment; and*
- b. Where any significant negative effects are identified, applicants will be required to provide appropriate mitigation measures which can be demonstrated to be suitable for the purposes intended, and will ensure that any likely or actual negative effect on receptor(s) identified by criteria a. are limited to an acceptable level."*

Following a review of the Havant Borough Core Strategy: Local Development Framework (Adopted January 2011), the following policy were identified as being relevant to potential light impacts associated with the proposed scheme:

Policy DM10: Pollution

"Development that may cause pollution of water, air or soil or pollution through noise, smell, smoke, fumes, gases, steam, dust, vibration, light, heat, electromagnetic radiation



and other pollutants will only be permitted where all of the following relevant criteria can be met:

- 1. The health and safety of existing and future users of the site, or nearby occupiers and residents is not put at risk.*
- 2. National air quality standards or objectives would not be breached.*
- 3. The water environment would not be detrimentally affected.*
- 4. It would not lead to an unacceptable deterioration in the quality or potential yield of coastal, surface and ground water resources.*
- 5. External lighting is of the minimum level of illumination and duration required for security and operational purposes.*
- 6. External lighting would not interfere with safe navigation in either Chichester or Langstone Harbours and other coastal locations."*

3.0 Methodology

The Lighting Assessment includes the establishment of baseline ambient light conditions and an evaluation of impacts associated with the proposed lighting design. This includes an assessment of change in light obtrusion at existing receptor locations.

Light modelling was undertaken using DIALux software, an independent lighting model which is capable of calculating daylight and artificial lighting scenes in interior and exterior scenarios. The model incorporates ILP, CIE 112 and BS EN 12464-2 calculation methodologies and is commonly used for lighting impact assessment.

3.1 Lighting Design

The proposed lighting scheme for the residential development was designed in accordance with the previously outlined standards and guidance. The design of the lighting has been undertaken in a manner such as to address two potentially conflicting needs; namely, on the one hand, to provide a safe environment for the movement of residents when the natural lighting levels fall and, on the other hand, to meet the light obtrusion limitations stated within the relevant standards and guidance in order to avoid any detriment to local amenity and wildlife.

The street lighting has been designed to subsidiary roads category P4 as specified in BS EN 13201-2:2015- Road lighting- Part 2: Performance requirements.

The proposed lights to be installed at the development site are low level, with directional LEDs that are downward facing resulting in a zero upward light spill. The lights will be regulated and will not be in operation after 1am to ensure minimal light pollution to the night sky.

3.1.1 Obtrusive Light

Baseline light conditions were determined during a site survey of the existing site and surrounding area. A lighting model was subsequently developed to represent the proposed external lighting scheme and to enable the obtrusive light from the proposed development to be calculated at local receptors.

The ILP has developed an Environmental Zone classification system for the categorisation of sensitive receptor locations based on typical levels of baseline obtrusive light. This is summarised in Table 1.

Table 1. Environmental Zone Classification

Category	Description	Examples
E0	Dark landscapes	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Intrinsically dark landscapes	National Parks, Areas of Outstanding National Beauty, etc
E2	Low district brightness areas	Village or relatively dark outer suburban urban locations
E3	Medium district brightness	Small town centres or suburban locations
E4	High district brightness areas	Town/city centres with high levels of night-time activity

For each Environmental Zone, recommended obtrusive light limits for exterior lighting installations have also been determined. These are summarised in Table 2.

Table 2. Obtrusive Light Limitations for Exterior Lighting Installations

Environmental Zone	Max Sky Glow ULR ^(a) (%)	Light Trespass (into Windows) Ev (lx) ^(b)		Source Intensity I (kcd)		Building Luminance Pre-curfew Average L ^(c) (Cd.m ⁻²)
		Pre-curfew ^(d)	Post-curfew ^(e)	Pre-curfew ^(d)	Post-curfew ^(e)	
E0	0	0	0	0	0	0
E1	0	2	1 ^(*)	2.5	0	0
E2	2.5	5	1	7.5	0.5	5
E3	5.0	10	2	10	1.0	10
E4	15.0	25	5	25	2.5	25

NOTE: (a) Upward light ratio of the installation - maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky.
 (b) Vertical Illuminance measured flat at the glazing at the centre of the window.
 (c) Luminance.
 (d) Typically considered to be between 07:00 and 23:00
 (e) Typically considered to be between 23:00 and 07:00
 (*) Permitted only from public road light installations

The assessment determined the lighting levels and Environmental Zone classification in the vicinity of the proposed development through the baseline survey. Modelling of the lighting scheme was undertaken and predicted obtrusive light values compared with the relevant guidelines, as detailed within Table 2.

The potential environmental effects of the proposed development are identified, in so far as current knowledge of the site and development allows. The significance of potential environmental effects is assessed according to their scale (magnitude) and the sensitivity of the receptors.



For the purposes of this assessment the effects of the development are considered to be 'significant' if:

- The development is predicted to exceed the maximum sky glow ULR at any surrounding receptor;
- The development is predicted to cause either an exceedance of the ILP obtrusive light trespass limitation at a receptor, or if the development is predicted to cause an increase of more than 10% at an existing receptor where the ILP obtrusive light trespass limitation is already being exceeded.



4.0 Baseline

This section provides a review of the existing lighting levels at the site in order to provide a benchmark against which to assess potential impacts associated with the development.

4.1 Baseline Survey

4.1.1 Survey Conditions

A baseline lighting survey was undertaken on the 27th May 2019.

The survey was conducted using a Digital Lux Meter which meets CIE photopic spectral response, with a maximum resolution of 0.01 lux. The survey was undertaken with a meter resolution of 0.01 lux.

4.1.2 Existing Light Sources

Existing light sources surrounding the site are residential lighting from windows and on-street lighting including an 'always on' crossing light.

4.1.3 Survey Locations

Light monitoring was undertaken at a number of survey locations to determine variations in baseline light levels within the vicinity of the site. Where possible, monitoring at the boundary of the receptor locations was undertaken to provide the best possible representation of existing light obtrusion. Where this was not possible, monitoring was undertaken at the most appropriate representative location. Reference should be made to Figure 2 for an illustrative site map of the monitoring locations.

The purpose of the survey is fourfold:

- The survey enables quantified light levels at (or as near as possible to) local sensitive receptor locations to be measured;
- The site survey also provides an understanding of any significant landforms and vegetation that can potentially provide a pathway screen between light sources and receptors;
- The survey enables the ILP environmental zone to be determined based on sound, quantified evidence; and,
- The survey enables existing significant sources of artificial light and natural screens to be accounted for outside of the quantified model predictions.

Land Rear of 15 - 27 Horndean Road, Emsworth

Lighting Assessment



The survey therefore provides a robust understanding of the current artificial lighting illuminance levels currently experienced around the development site. The locations of all the light monitoring locations are summarised in Table 3 below and the results from the survey are contained in Table 4.

A series of measurements were taken at key points; a horizontal ground level measurement and four vertical measurements at 1.5m facing north east, south and west in general accordance with the recommended monitoring method in the statutory guidance issued by the ILP. Illuminance levels can vary quite significantly over relatively small distances and even with slight changes in the plane of the lens. Therefore, the range of measurements taken over a monitoring length was recorded, in order to determine minimum and maximum illuminance at receptor façades.

Table 3. Baseline Light Monitoring Locations

Reference	Monitoring Location	Purpose of Survey	Key Local Sources of Light
L1	Adjacent to access road of 27 Horndean Road, East side of pavement	Lighting levels along Horndean Road	On-street Lighting
L2	Junction of Horndean Road and Bellevue Lane	Lighting levels along Horndean Road	On-street Lighting
L3	Outside 21 Horndean Road, East pavement	Lighting levels along Horndean Road	On-street Lighting
L4	Northern streetlight outside St James CofE Primary School	Lighting levels along Horndean Road	On-street Lighting
L5	Southern streetlight outside St James CofE Primary School	Lighting levels along Horndean Road	On-street Lighting
L6	Entrance to Land rear of 15- 27 Horndean Road	Lighting levels along Horndean Road	On-street Lighting.
L7	Northern perimeter of Land rear of 15- 27 Horndean Road	Lighting levels on-site	Minimal
L8	Northern perimeter of Land rear of 15- 27 Horndean Road	Lighting levels on-site	Minimal
L9	Northern perimeter of Land rear of 15- 27 Horndean Road	Lighting levels on-site	Minimal
L10	North- western perimeter of Land rear of 15- 27 Horndean Road	Lighting levels on-site	Minimal
L11	North- western perimeter of Land rear of 15- 27 Horndean Road	Lighting levels on-site	Minimal
L12	North- western perimeter of Land rear of 15- 27 Horndean Road	Lighting levels on-site	Minimal

Land Rear of 15 - 27 Horndean Road, Emsworth

Lighting Assessment



4.1.4 Survey Results

The results of the monitoring are displayed in Table 4.

Table 4. Lighting Results

Reference	Recorded Illuminance (Lux)				
	Facing Up	Facing North	Facing East	Facing South	Facing West
L1	2.30	4.10	0.12	0.45	0.99
L2	2.57	1.66	0.54	3.01	5.21
L3	8.62	10.30	1.24	1.46	0.85
L4	9.38	13.03	2.14	3.62	0.85
L5	15.01	12.07	6.65	1.32	0.59
L6	0.44	6.02	2.21	0.33	0.15
L7	0.10	0.09	0.2	0.02	0.00
L8	0.00	0.00	0.02	0.03	0.00
L9	0.00	0.00	0.02	0.02	0.00
L10	0.00	0.00	0.01	0.02	0.00
L11	0.00	0.00	0.01	0.04	0.00
L12	0.00	0.00	0.00	0.01	0.00

Following the environmental lighting survey, it was concluded that the proposed development site and the surrounding area should be classified as 'Environmental Zone E2 – Low district brightness, in accordance with the ILP guidance limits outlined within Table 2, this is considered representative of relatively dark outer suburban locations. Therefore, the permitted light trespass limit at an off-site receptor in the pre-curfew period (typically considered to be 07:00-23:00) is 5 lux and in the post curfew period (typically considered to be 23:00-07:00) is 1 lux.

4.2 Receptors

The term 'receptors' includes any persons, locations or systems that may be susceptible to changes in environmental factors as a consequence of the development.

4.2.1 Residential Receptors

During the site survey key residential properties were identified which have the potential to be impacted by obtrusive light from the proposed development, as highlighted in Table 5. Reference should be made to Figure for an illustration of the residential receptors used for the purposes of this assessment.

Land Rear of 15 - 27 Horndean Road, Emsworth

Lighting Assessment



Table 5. Residential Receptors

ID	Description	ILP Environmental Zone
R1	31 Horndean Road	E2
R2	31 Horndean Road	E2
R3	35 Horndean Road	E2
R4	58 Horndean Road	E2
R5	27 Horndean Road	E2
R6	25 Horndean Road	E2
R7	23 Horndean Road	E2
R8	21 Horndean Road	E2
R9	19 Horndean Road	E2
R10	17 Horndean Road	E2
R11	15 Horndean Road	E2

Each receptor was input into the model at a height of 4.0m (bungalows and single storey building at height of 1.5m) at a distance of 10 cm from the building façade in order to represent illuminance at first floor window level, representing a typical bedroom, which is deemed to be the most sensitive receptor room.

4.2.2 Ecological Receptors

Lighting associated with the operational phase of the proposed development has the potential to impact on receptors of ecological sensitivity within the vicinity of the site. The Conservation (Natural Habitats, &c.) Regulations (2017) and subsequent amendments require competent authorities to review planning applications and consents that have the potential to impact on European designated sites (e.g. Special Areas of Conservation). Following a review of the site and immediate surrounding area using the online MAGIC facility, there are no areas of ecological sensitivity immediately adjacent to the site.

In accordance with the condition, it has been assumed that there is a low risk for a number of bat species to utilise the tree line to the south, west and east of the development site for commuting/foraging purposes. In order to represent worst case scenario, the assessment has assumed that potential bat species on site will be highly sensitive to artificial light.

For the purposes of the assessment, ecological receptor locations have been included at a number of points along the length the tree line to the west of the proposed site, at heights of 4m. Table 6 below provides a reference for these locations whilst a full spatial illustration of modelled ecological receptors is included in Figure 3.

Land Rear of 15 - 27 Horndean Road, Emsworth

Lighting Assessment



Table 6. Ecological Receptors

ID	Description
E1	South Eastern Boundary
E2	Southern Boundary
E3	Southern Boundary (West)
E4	Western Boundary (South)
E5	Western Boundary
E6	Western Boundary (North)
E7	Eastern Boundary
E8	Eastern Boundary
E9	Eastern Boundary (North)



5.0 Lighting Assessment

Potential impacts associated with the proposed lighting design at locations in the vicinity of the site were assessed as described in the following sections.

5.1 Obtrusive Light Modelling

A layout of the development was provided by architects for the project, ADP Architects Limited. These were used to create a lighting design detailed in Figure 5 to develop a model within DIALux of the proposed development. Reference should be made to Figure 4 for a 3D representation of the proposed model.

The model is only able to accurately represent the effects of solid structures such as buildings and walls on light obtrusion. Non solid barriers such as trees and hedges cannot be accurately modelled and therefore the effects of these are dealt with qualitatively outside the model calculations.

The assessment has looked at the effect of the development in the pre-curfew and post-curfew periods. Both scenarios are based on all the lighting associated with the development. This therefore represents 24-hour operation and can be viewed as worst case scenario within post-curfew periods (after 23:00).

The assessment consists of comparing the measured baseline illuminance levels at each of the receptor locations against the predicted light obtrusion from the lighting model. Where it was not practicable to measure existing illuminance at the receptor location, monitoring results from the nearest equivalent representative monitoring location are used.

The ULR of the proposed development has been calculated and referenced to the maximum permitted limitations for the relevant Environmental Zones of the receptor locations, as detailed in Table 2.

5.1.1 Model Results

Residential Receptors

Table 7 compares the measured baseline data and the modelled proposed development lighting arrangements. These results are compared against the ILP pre-curfew and post-curfew criteria limits for ILP Environmental Zone E2, in accordance with the classifications detailed in Table 2.

Land Rear of 15 - 27 Horndean Road, Emsworth

Lighting Assessment



Table 7 Residential Receptor Assessment Results

ID	ILP Pre-curfew Criteria (Lx)	ILP Post-curfew Criteria (Lx)	Measured Baseline Illuminance (lx)		Predicted Model Illuminance (lx)	Increase in Illuminance from Baseline to Proposed (lx)	
			Baseline Minimum	Baseline Maximum		Baseline Minimum	Baseline Maximum
R1	5.0	1.0	0.00	0.03	0.02	0.02	0.00
R2	5.0	1.0	0.00	0.03	0.17	0.17	0.14
R3	5.0	1.0	0.12	4.10	0.12	0.00	0.00
R4	5.0	1.0	0.12	4.10	0.02	0.00	0.00
R5	5.0	1.0	0.54	5.21	0.00	0.00	0.00
R6	5.0	1.0	0.54	5.21	0.01	0.00	0.00
R7	5.0	1.0	0.00	0.20	0.01	0.01	0.00
R8	5.0	1.0	0.85	10.30	0.01	0.00	0.00
R9	5.0	1.0	0.85	10.30	0.01	0.00	0.00
R10	5.0	1.0	0.85	13.03	0.01	0.00	0.00
R11	5.0	1.0	0.59	15.01	0.00	0.00	0.00

The model predicts that there will be negligible increases in the minimum baseline obtrusive light levels at receptor R2. However, the ILP pre-curfew and post-curfew criteria for Environmental Zones E2 are not predicted to be exceeded as a result of the development. As such, the proposed development is not predicted to result in any significant adverse impacts with respect to local sensitive residential locations.

Ecological Receptors

When determining the likely impacts of lighting associated with the proposed development on sensitive ecological receptors, the assessment has considered the effect of lighting pre-mitigation. Table 8 presents the modelled proposed light trespass values along sections of potential bat commuting/foraging routes. Impacts are considered potentially significant where predicted illuminance exceeds 1 lux at ecological receptors. If this is the case, further consideration should be given to mitigation measures.

While some bat species, such as Pipistrelle are more tolerant with light levels above this criteria, it reflects worst case assumptions concerning the sensitivity of those species present to background illuminance levels. It is believed that most bat emergence requires light levels below 1 lux for late emerging species, up to 14 lux for those that emerge earlier (Noctule and Pipistrelle). These lighting levels of 1 lux are required to ensure that bat commuting and foraging routes are not impacted and that dark corridors to the south and west of the site are retained.

As such, the assessment criteria represents worst case scenario in terms of impacts on emergence, commuting and foraging (Bat Conservation Trust, 2011).

Land Rear of 15 - 27 Horndean Road, Emsworth

Lighting Assessment



Table 8 Ecological Receptor Assessment Results

ID	Predicted Model Illuminance
E1	0.00
E2	0.01
E3	0.01
E4	0.00
E5	0.01
E6	0.01
E7	0.06
E8	0.01
E9	0.03

As illustrated by Table 8, light trespass associated with the proposed development does not exceed 1 lux at any of the modelled locations adjacent to the site boundary. As such the proposed development is not predicted to result in any significant adverse impacts with respect to local sensitive ecological receptors.

5.1.2 Dark Sky Assessment

The model has been used to calculate the predicted Upward Sky Ratio (ULR) of the proposed lighting scheme. Model outputs predict a sky glow figure (ULR) of 0.0%. This has been achieved by the use of flat glass LED luminaires and bollards specifically designed to negate upward light spill. As illustrated in Table 2, the ILP sky glow limitation for an area classified as Environmental Zone E2 is 2.5% ULR. As such the proposed lighting scheme meets the ILP sky glow limitations and is therefore not considered to result in detrimental impacts on the dark sky landscape.

Land Rear of 15 - 27 Horndean Road, Emsworth

Lighting Assessment



6.0 Conclusions

WYG Environment Planning Transport (WYG) were commissioned by Metis Homes to undertake a Lighting Assessment for a residential development at Land Rear of 15- 27 Horndean Road, Emsworth.

The assessment has concluded that the risk of the proposed scheme resulting in exceedances of either the ILP pre-curfew or post-curfew obtrusive light limitations at local residential receptors will be low. As such the proposed development is not predicted to result in any significant adverse impacts with respect to local sensitive residential locations.

The risk of the proposed development resulting in significant exceedances of 1 lux along potential bat foraging/commuting routes is considered to be low. As such, dark corridors beyond the limits of the site are expected to be retained.

The assessment has concluded that, provided the specified lighting design is implemented, the sky glow levels associated with the development will not have a significant effect on the surrounding dark sky landscape.

The proposed lights to be installed at the development site are low level, with directional LEDs that are downward facing resulting in a zero upward light spill. The lights will be regulated and will not be in operation after 1am to ensure minimal light pollution to the night sky.

The assessment demonstrates that the proposed development does not conflict with any national or local planning policies.

Land Rear of 15 - 27 Horndean Road, Emsworth

Lighting Assessment



Units and Abbreviations Used

CIBSE	Chartered Institute of Building Services Engineers
CIE	Commission on Illumination
ILP	Institute of Lighting Professionals
LDF	Local Development Framework
LP	Local Plan
CS	Core Strategy
DPD	Adopted Development Plan Documents
SPD	Adopted Supplementary Planning Documents
SG	Endorsed Supplementary Guidance Documents
NGR	National Grid Reference
PPS	Planning Policy Statement
NPPF	National Planning Policy Framework
Lx	Lux
ULR	Upward Lighting Ratio
WYG	WYG Planning and Environment

Land Rear of 15- 27 Horndean Road, Emsworth Lighting Assessment



Figures



Executive Park
Avalon Way
Anstey
Leicester
LE7 7GR



Tel: 0116 234 8000
Fax: 0116 234 8002
e-mail: leicester@wyg.com

WYG ENVIRONMENT

This map is based upon Ordnance Survey material reproduced by WYG on behalf of Her Majesty's Stationary Office, © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to civil proceedings. Licence Number AL 553611

Project:

Land Rear of 15- 27
Horndean Rd, Emsworth

Client:

Metis Homes

Drawing Title:

Figure 1: Site Boundary

creative minds safe hands

DRAWN BY	CHECKED BY	DATE	REVISION
BM	NA	11.06.19	A



Tel: 0116 234 8000
Fax: 0116 234 8002
e-mail: leicester@wyg.com

WYG ENVIRONMENT

This map is based upon Ordnance Survey material reproduced by WYG on behalf of Her Majesty's Stationary Office, © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to civil proceedings. Licence Number AL 553611

Project:

Land Rear of 15- 27
Horndean Rd, Emsworth

Client:

Metis Homes

Drawing Title:

Figure 2: Monitoring
Locations

DRAWN BY	CHECKED BY	DATE	REVISION
BM	NA	11.06.19	A



Executive Park
Avalon Way
Anstey
Leicester
LE7 7GR



Tel: 0116 234 8000
Fax: 0116 234 8002
e-mail: leicester@wyg.com

WYG ENVIRONMENT

This map is based upon Ordnance Survey material reproduced by WYG on behalf of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to civil proceedings. Licence Number AL 553611

Project:

Land Rear of 15- 27
Horndean Rd, Emsworth

Client:

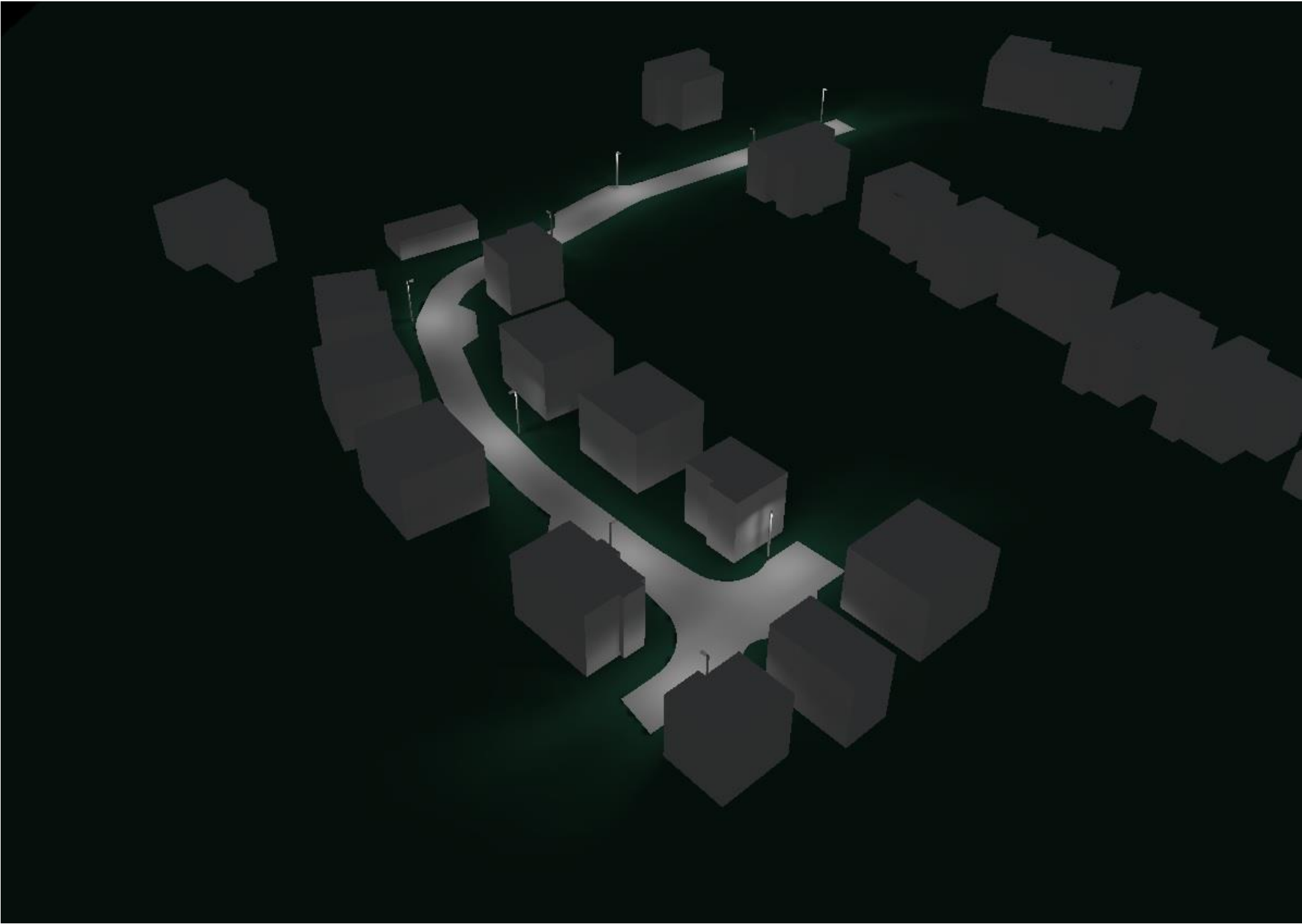
Metis Homes

Drawing Title:

Figure 3: Existing Residential
and Ecological Receptors

creative minds safe hands

DRAWN BY	CHECKED BY	DATE	REVISION
BM	NA	11.06.19	A



Tel: 0116 234 8000
Fax: 0116 234 8002
e-mail: leicester@wyg.com

WYG ENVIRONMENT

This map is based upon Ordnance Survey material reproduced by WYG on behalf of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to civil proceedings. Licence Number AL 553611

Project:

Land Rear of 15- 27
Horndean Rd, Emsworth

Client:

Metis Homes

Drawing Title:

Figure 4: 3D Representation
of Proposed Model

DRAWN BY	CHECKED BY	DATE	REVISION
BM	NA	11.06.19	A

Tel: 0116 234 8000
Fax: 0116 234 8002
e-mail: leicester@wyg.com

WYG ENVIRONMENT

This map is based upon Ordnance Survey material reproduced by WYG on behalf of Her Majesty's Stationary Office, © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to civil proceedings. Licence Number AL 553611

Project:

Land Rear of 15- 27
Horndean Rd, Emsworth

Client:

Metis Homes

Drawing Title:

Figure 5: Simplified Lighting Scheme

Symbol	Luminaire
	DW Windsor KIRIUM PRO1 8LED 3k A4 CLO 700mA UMSUG 42 0018 0000 100 KIRIUM PRO1 8LED A4 CLO MODULE 2222Lm (6m High)

DRAWN BY	CHECKED BY	DATE	REVISION
BM	NA	11.06.19	A





Report Conditions

This Report has been prepared using reasonable skill and care for the sole benefit of Metis Homes ("the Client") for the proposed uses stated in the report by [WYG Environment Planning Transport Limited] ("WYG"). WYG exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

No liability is accepted, or warranty given for; unconfirmed data, third party documents and information supplied to WYG or for the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report. WYG does not purport to provide specialist legal, tax or accounting advice.

The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary, and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The "shelf life" of the Report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.