



MEC
Consulting Group

LIGHTING



Barlestone Road, Newbold Verdon, Leicestershire
Lighting Impact Assessment
October 2024

Report Ref: 24832-LIGH-0401 Rev C

Barlestone Road, Newbold Verdon, Leicestershire

Lighting Impact Assessment

October 2024

REPORT REF: 24832-LIGH-0401 Rev C

CLIENT: David Wilson Homes East Midlands

ENGINEER: MEC Consulting Group Ltd
The Old Chapel
Station Road
Hugglescote
Leicestershire
LE67 2GB

Tel: 01530 264 753
Email group@m-ec.co.uk

REGISTRATION OF AMENDMENTS

Date	Rev	Comment	Prepared By	Checked By	Approved By
February 2024	-	First issue	Callum Astle BA MSc Environmental Consultant Lighting	Nathan Allen MEnvSci Senior Environmental Consultant Lighting	Tim Rose BA (BA Hons) MCIHT MTPS Director
March 2024	A	Updates following client comments and addition of community facility	Callum Astle BA MSc Environmental Consultant Lighting	Nathan Allen MEnvSci Senior Environmental Consultant Lighting	Alexander Bennett BSc(Hons) MCIHT Managing Director
April 2024	B	Updated parameter plan	Alexander Bennett BSc (Hons), MCIHT, MTPS Managing Director		
October 2024	C	Updated masterplan	Callum Astle BA MSc Environmental Consultant Lighting	Emma Harris Utilities Coordinator	Alexander Bennett BSc (Hons) MCIHT Managing Director

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CONTENTS

1.0	INTRODUCTION	4
2.0	SITE DESCRIPTION	5
3.0	POLICY AND GUIDANCE	6
4.0	ASSESSMENT METHODOLOGY	8
5.0	BASELINE CONDITION	10
6.0	RECEPTORS	12
7.0	LIGHTING ASSESSMENT	14
8.0	CONCLUSIONS	16

APPENDICES

- A. INDICATIVE MASTERPLAN AND PARAMETER PLAN
- B. LIGHTING LAYOUT

1.0 INTRODUCTION

General

1.1 MEC Consulting Group Ltd (MEC) has been commissioned by David Wilson Homes East Midlands to undertake an External Lighting Impact Assessment in support of a proposed development on Barlestone Road, Newbold Verdon, Leicestershire. A site location plan is provided in Figure 2.1 and an indicative masterplan and parameter plan is contained in **Appendix A**.

1.2 The project description is;

Outline planning application (all matters reserved except vehicular access) for the erection of up to 240 residential dwellings (Use Class C3), retention of the existing accesses off Barlestone Road and the creation of new accesses off Barlestone Road, land safeguarded for a cemetery and a health centre (Use Classes E(e)), public open space and associated infrastructure.

1.3 This report assesses, in terms of artificial lighting, the likely effects of the proposed development. The lighting assessment includes information on the baseline lighting conditions within the area, quantitatively assesses the potential effects of the proposed lighting on surrounding sensitive receptors and if required considers possible mitigation measures to reduce potential light spill into neighbouring properties and ecological receptors, and upward light (which can create sky glow). Indicative illuminance lux plot for exterior areas of the proposed development is included in **Appendix B**.

Disclaimer

1.4 MEC has completed this report for the benefit of the individuals referred to in paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from MEC.

1.5 MEC accepts no responsibility or liability for:

- a) The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
- b) The issue of this document to any third party with whom approval for use has not been agreed

2.0 SITE DESCRIPTION

Existing Site

2.1 The proposed site is currently comprised of green fields. The site is bound:

- To the north by Newbold Verdon Equestrian Centre and farmland, with the main source of light being from the Equestrian Centre.
- To the east by Farmland, with no major source of light.
- To the south by Barlestone Road, with the main sources of light from street lighting.
- To the West by Farmland Farmland with no major source of light.
- As a result of the development the existing flood lit equestrian jumping area will be removed therefore these existing lights will not impact the proposed residential development

2.2 A site layout plan is provided in Figure 2.1 below.

Figure 2.1: Site Layout Plan



3.0 POLICY AND GUIDANCE

Environmental Protection Act 1990 / Clean Neighbourhoods and Environment Act 2005

- 3.1 Light pollution was introduced within the Clean Neighbourhoods and Environment Act (2005) as a form of statutory nuisance under the Environmental Protection Act (the 'EPA', 1990), which states: "artificial light emitted from premises so as to be prejudicial to health or nuisance."

National Planning Policy Framework

- 3.2 The National Planning Policy Framework (NPPF), published in December 2023, sets out the governments planning policies for England and how they are expected to be applied and provides a framework for local plans. With regards to lighting, the following is stated;

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.

National Planning Practice Guidance November 2019 Lighting

- 3.3 This report also has taken into account the relevant questions the PPG advises on how to consider light within the planning system detailed below;

- What light pollution considerations does planning need to address?
- What factors can be considered when assessing whether a development proposal might have implications for light pollution?
- What factors are relevant when considering where light shines?
- What factors are relevant when considering when light shines?
- What factors are relevant when considering how much the light shines?
- What are relevant when considering possible ecological impacts of lighting?
- What other information is available that could inform approaches to lighting and help reduce light pollution?

Relevant British Standards and Design Mitigation

- 3.4 The most applicable British Standards for lighting that relates to the proposed development are:
- BS EN 12464-2 Lighting of Work Places – Outdoor Work Places, 2014
 - BS 5489-1:2020 Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas

Hinckley and Bosworth Borough Council's Site Allocations and Development Management Policies DPD (2016)

3.5 Policy DM7 Preventing Pollution and Flooding states the following:

Adverse impacts from pollution and flooding will be prevented by ensuring that development proposals demonstrate that

“All reasonable steps are taken through design, siting and technological solutions to ensure the abatement of obtrusive light to avoid sky glow, glare and light intrusion.”

Institute of Lighting Professional Documents

3.6 The following Institute of Lighting Professional (ILP) guidance documents have been consulted with regard to lighting from the proposed development;

- PLG 04- Guidance on Undertaking Environmental Lighting Impact Assessments, ILP, 2013;
- Guidance Note 08/23 Bats and artificial lighting in the UK ILP, 2023
- Guidance Notes for the Reduction of Obtrusive Light, ILP, 2021;

Inbuilt Mitigation within the Design

3.7 Along with complying with the guidance listed above any potential lighting design will include the following mitigation:

- Lighting solutions will be selected to reduce light pollution. Specifically, designed luminaires will be selected to minimise the upward spread of light. The optics in the lanterns will control the distribution of light to avoid overspill, sky glow and glare.
- Glare will be kept to a minimum by ensuring the main beam angle of all lights directed towards any potential observer is not more than 85°. Higher mounting heights allow lower main beam angles, which can assist in reducing glare.
- Lighting will be restricted to the task area using horizontal cut-off optics and zero tilts.
- A curfew will be operated and the duration of any lighting will be minimized. (switch off or part-night dimming).

4.0 ASSESSMENT METHODOLOGY

4.1 Guidance notes produced by the Institution of Lighting Professionals are among the most commonly referenced guidance notes for good practice within the lighting design industry.

4.2 The methodology of this report is as follows:

- Undertake a baseline survey and identify the environmental zone of the site and surrounding sensitive receptors in accordance with ILP GN01/21 and PLG 04;
- Produce a detailed 3D model using industry-standard light modelling software and quantitatively assess the following parameters; light intrusion, source intensity and upward light spill/sky glow; and
- If required, consider possible mitigation measures to reduce potential light intrusion into neighbouring properties and ecological receptors, upward light (which can create sky glow) and visual source intensity (glare).

4.3 In accordance with Guidance Notes for the Reduction of Obtrusive Light, the following definitions are used to describe lighting effects in this assessment:

- Light intrusion – light intrusion into windows (the spilling of light beyond the boundary of a property which may cause a nuisance to others).
- Skyglow – a combination of direct upward light and indirect upward light, (the upward spill of light into the sky which can cause a glowing effect and is often seen above cities when viewed from a dark area).

4.4 The ILP Guidance Notes for the Reduction of Obtrusive Light: GN01/21 define environmental zones appropriate to the location of the proposed development shown in Table 4.1:

Table 4.1: Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness (SQM ~15 to 20)	Sparsely inhabited rural areas, villages or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small-town centres of suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

4.5 The environmental zone appropriate for the proposed development is considered to be Zone E2. The obtrusive light limits defined in ILP GN01/21 are summarised in Tables 4.2 to 4.4.

Table 4.2: Maximum values of vertical illuminance on properties

Application conditions	Environmental Zone				
	E0	E1	E2	E3	E4
Pre-curfew (07:00-23:00)	n/a	2lx	5lx	10lx	25lx
Post-Curfew (23:00-07:00)	n/a	<0.1 lx*	1lx	2lx	5lx
*Note: If the installation is for public (road) lighting then this may be up to 1 lx.					

- 4.6 Skyglow is the brightening of the night sky caused by artificial lighting resulting from the reflection of radiation (visible and non-visible); ULR (Upward Light Ratio) is the maximum permitted percentage of luminaire flux that goes directly into the sky. The ILP limits for ULR are shown in Table 4.4 below

Table 4.3: Maximum values of upward light ratio (ULR) of luminaries

Application conditions	Environmental Zone				
	E0	E1	E2	E3	E4
Upward Light ratio (ULR)/%	0	0	2.5	5	15

5.0 BASELINE CONDITION

- 5.1 The site was visited, during night-time conditions on the 2nd November 2023, to assess the general ambience of the site itself.
- 5.2 The development site currently comprises arable farmland.
- 5.3 The environment surrounding the proposed site is low district brightness, categorised as an E2 Environmental Zone in accordance with the ILP Guidance Notes (see Table 4.1).
- 5.4 The night-time survey was carried out to determine lux levels on the surrounding roads adjacent to the site and to establish existing lighting conditions.
- 5.5 The ILP Guidance Note 08/18 specifies that readings should be taken at ground level on the horizontal plane and in at least one direction on the vertical plane at 1.5-2.0m above the ground. The orientation should be perpendicular to the dominant light sources or perpendicular to the surface/edge of the feature. Further measurements at other orientations may prove beneficial in capturing the influence of all luminaires in the proximity of the site.
- 5.6 The weather conditions during the light survey were cold, very wet, heavy rain and strong winds. The temperature was 8.6 C, the wind speed was 4.7m/s westerly, and there was 100% cloud cover.

Figure 5.1: Light Monitoring Location



Table 5.1: Survey Results

Location	Location Description and key Source of Light	Measured Illuminance Lux					Skyglow Levels
		Facing Up	Facing North	Facing East	Facing South	Facing West	
1	Roadside, southern site boundary. Street Lighting.	4.21	0.63	8.75	2.15	1.00	16.43
2	Roadside, southern site boundary. Street Lighting.	13.59	1.07	9.79	1.61	0.59	15.45
3	Roadside, southern site boundary. Street Lighting.	11.54	0.62	17.01	7.26	0.42	15.54
4	Roadside, southern site boundary. Street Lighting.	5.82	2.02	5.22	1.43	1.21	15.57
5	Roadside, southern site boundary. Street Lighting.	0.14	0.10	0.17	0.20	0.39	17.46

6.0 RECEPTORS

6.1 Following the site visit, a desktop survey of the site and liaison with the project team the following light-sensitive receptors have been identified (see Figure 6.1);

- Residential (yellow)
- Ecological (green)

Figure 6.1: Ecological and Residential Receptor Locations



Residential receptors

6.2 The following residential properties surrounding the site have been identified and assessed based on their proximity to the site and the potential impact of the proposed lighting on them. Each receptor has been modelled at 4.0m to represent a first-floor bedroom. The locations of these receptors are visually presented in Figure 6.1 as well as in Table 6.1.

Table 6.1: Residential Receptor Locations

Receptor	Location Description	Height (m)	Environmental Zone (ILP)
R1	Four Winds	4	E2
R2	Newbold Verdon Medical Practice	4	E2
R3	4 St George Close	4	E2
R4	104 Preston Drive	4	E2
R5	88 Preston Drive	4	E2
R6	11 Mill Lane	4	E2
R7	The Firs	4	E2

Ecological receptors

- 6.3 The ILP Guidance Note 08/23 specifies that when a planning application includes additional artificial lighting, developers should ensure that a lighting assessment is done alongside an ecological assessment. Lighting can impact light-sensitive species such as bats by impacting roosting, commuting and foraging behaviour.
- 6.4 Following consultation with project ecologists, there is potential that a number of bat species are anticipated to use the treeline surrounding the site. Therefore, ecology receptors have been located along the woodland at a height of 4m. The locations of these receptors are visually presented in Figure 6.1, as well as in Table 6.2 below.

Table 6.2: Ecological Receptor Locations

Receptor	Location Description	Height (m)
Eco 1	Northern site boundary near to trees/hedgerows.	4
Eco 2	Trees/hedgerows on western boundary	4
Eco 3	Hedgerow in northwestern section of the site	4
Eco 4	Treeline/hedgerow on northern boundary	4
Eco 5	Hedgerow in northeastern section of the site.	4
Eco 6	Hedgerow on eastern boundary	4
Eco 7	Hedgerow in southeastern section of the site	4
Eco 8	Hedgerow in southeastern section of the site	4

7.0 LIGHTING ASSESSMENT

- 7.1 A site plan (shown in **Appendix A**) was provided by the project architect for this development and the lighting criteria has been discussed with the project team. A 3D model has been produced using a range of industry-standard light modelling software including Lighting Reality and Dialux, the model only considers the effect of solid structures so natural structures such as trees will be assessed qualitatively outside the model calculations.

Light Intrusion Residential Receptors

- 7.2 Table 7.1 compares the modelled light intrusion at the surrounding residential properties with the relevant ILP environmental zone criteria as specified in Tables 4.1 and 4.2. For this assessment based upon the site location and survey results, this will be Environmental Zone E2 – Rural Area of Low-level brightness with the criteria being 5 lux pre curfew and 1 lux post curfew.

Table 7.1: Residential Receptor Results

Receptor	Predicted model vertical illuminance	ILP Pre-curfew criteria (Lx)	ILP Post Curfew Criteria (Lx)
R1	0.00	5lx	1lx
R2	0.00	5lx	1lx
R3	0.00	5lx	1lx
R4	0.03	5lx	1lx
R5	0.00	5lx	1lx
R6	0.00	5lx	1lx
R7	0.00	5lx	1lx

- 7.3 The results in the table above show that with the proposed development in place, lighting from the site will not exceed the recommended ILP pre- and post-curfew criteria.

Ecology Receptors

- 7.4 The ILP Guidance Note 08/23 specifies that acceptable lux limits should be used to assess the impact of lighting upon ecological species including bats. Therefore, following consultation with project ecologists and the LPA, impacts will be considered significant where predicted vertical illuminance levels exceed 1 lux. The results of this assessment can be found in Table 7.2 below.

Table 7.2: Ecology Receptor Results

Receptor	Predicted model vertical illuminance
E1	0.01
E2	0.03
E3	0.03

Receptor	Predicted model vertical illuminance
E4	0.07
E5	0.01
E6	0.20
E7	0.11
E8	0.12

- 7.5 The results show that lux levels along the woodland surrounding the development will be below 1 lux therefore lighting is not anticipated to have a significant impact on any light-sensitive species using this space.

SkyGlow

- 7.6 The model has been used to calculate the predicted Upward Lighting Ratio (ULR) of the proposed external lighting scheme. Model outputs predict a sky glow figure (ULR) of 0.0%. As illustrated in Table 4.2, the ILP sky glow limitation for an area classified as Environmental Zone E2 is 2.5% ULR. As such the indicative lighting scheme meets the ILP sky glow limitations and is therefore not considered to result in detrimental impacts on the dark sky landscape.

8.0 CONCLUSIONS

- 8.1 MEC has been commissioned by David Wilson Homes East Midlands to undertake an External Lighting Impact Assessment in support of a proposed development on Barlestone Road, Newbold Verdon, Leicestershire.
- 8.2 With the proposed development in place, lighting from the site will not exceed the recommended ILP pre- and post-curfew criteria.
- 8.3 Lux levels along the light sensitive ecological areas surrounding the development will be below 1 lux therefore lighting is not anticipated to have a significant impact on any light-sensitive species using this space.
- 8.4 The proposed lighting scheme will comply with all relevant British Standards and the Institution of Lighting Professionals lighting guidelines and will serve to ensure safety and security of all areas of the development can be effectively maintained.



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APPENDICES



APPENDIX A



- KEY**
- SITE BOUNDARY
 - INDICATIVE PUBLIC OPEN SPACE
 - RETAINED EXISTING VEGETATION
 - INDICATIVE PROPOSED TREES AND PLANTING
 - INDICATIVE BUILT FORM
 - CORRECTED VIEWPOINT 5 (DRAFT REGULATION 16 NEIGHBOURHOOD PLAN)
 - INDICATIVE SWALES
 - EXISTING BYWAY OPEN TO ALL TRAFFIC
 - UNCLASSIFIED ADOPTED ROAD
 - EXISTING FOOTPATH
 - POTENTIAL PEDESTRIAN CYCLE CONNECTION
 - RETAINED VEHICULAR ACCESS ROUTE TO EQUESTRIAN CENTRE/ PROPOSED ACCESS TO CEMETERY
 - PROPOSED PEDESTRIAN ACCESS POINT
 - RETAINED PROW ACCESS POINTS
 - PRIMARY VEHICULAR ACCESS POINT
 - EXISTING BARLESTONE ROAD CROSSING POINTS
 - NEW BARLESTONE ROAD CROSSING POINTS
 - INDICATIVE FOUL PUMPING STATION
 - AGRICULTURAL ACCESS
 - PRIVATE DRIVE ACCESS TO (EXISTING) WILLOWBROOK COTTAGE
 - DRAINAGE OUTFALL

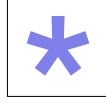
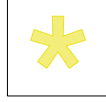
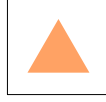
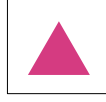
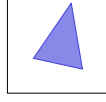
BARLESTONE ROAD, NEWBOLD VERDON – INDICATIVE MASTERPLAN

Issue:

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KEY

-  SITE BOUNDARY
-  PROPOSED OPEN SPACE
including sustainable urban drainage basins
-  PROPOSED DEVELOPMENT PARCELS
including roads/ footpaths/ infrastructure
-  LOCATION OF PROPOSED LAND
SET ASIDE FOR CEMETERY
-  SAFEGUARDED COMMUNITY
FACILITY LAND
-  INDICATIVE AREA REQUIRED FOR
INTERNAL ACCESS ROADS
not within the residential land use
-  INDICATIVE AREA REQUIRED FOR
PROPOSED ACCESS ROADS
not within the residential land use
-  PRIMARY VEHICULAR
ACCESS POINT
-  LOCATION OF INDICATIVE
PROPOSED BASINS
-  LOCATION OF EXISTING WATER
FEATURE
-  AGRICULTURAL ACCESS
-  PRIVATE DRIVE ACCESS TO (EXISTING)
WILLOWBROOK COTTAGE
-  PROPOSED INDICATIVE AREA OF PLAY
-  PROPOSED ACCESS TO CEMETERY
-  PROPOSED PEDESTRIAN/ CYCLE
ACCESS
-  RETAINED PROW ACCESS POINTS
-  DRAINAGE OUTFALL

*All features and areas shown to a tolerance of 10m

BARLESTONE ROAD, NEWBOLD VERDON – PARAMETER PLAN

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APPENDICES



APPENDIX B



STREET LIGHTING SPECIFICATION

- STREET LIGHTING TO BS 5489-1:2020 & BA EN 1301-2:2015 P4 (EAV 5.00 TO 7.0 LUX, EMIN 1.00) AND P5 (EAV 3.00 TO 4.50 LUX, EMIN 0.60) FOR SUBSIDIARY ROADS.
- COLUMNS TO BE INSTALLED AT THE REAR OF THE FOOTWAY, WHERE WITHIN VERGES TO BE SET BACK TO A MINIMUM OF 1.0m FROM KERBLINE.
- COLUMNS 6m TUBULAR STEEL GALVANISED WITH GLASS FLAKE ROOT COLUMN WITH POST TOP MOUNT. REQUIREMENTS GLASS FLAKE ROOT TO 150mm ABOVE DEPTH. MINIMUM DOOR SIZE 500mm X 100mm. PLANTING DEPTH 750mm. BASE DIAMETER 140mm, SHAFT DIAMETER 76mm.
- LANTERN
ASD LIGHTING HWD2 3K12 400 M1 CLO 1.75KLM./ ASD LIGHTING HWD2 3K12 500 M1 CLO 2.12KLM.
- (PROJECT MAINTENANCE FACTOR 1.00).

NOTES:

- DO NOT SCALE THIS DRAWING.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH REPORT 24832-LGH-0401.

STREET LIGHTING KEY

PROPOSED LIGHTING COLUMN
LANTERN MANUFACTURER: ASD LIGHTING
LANTERN NAME: HDW2
QUANTITY 84
LAMP TYPE: 12 LED 3000K WARM WHITE
WATTAGE: 16W
OPTIC: 400 M1 CLO 1.75KLM

PROPOSED LIGHTING COLUMN
LANTERN MANUFACTURER: ASD LIGHTING
LANTERN NAME: HDW2
QUANTITY 21
LAMP TYPE: 12 LED 3000K WARM WHITE
WATTAGE: 19W
OPTIC: 500 M1 CLO 2.12KLM

ECOLOGICAL LIGHT MONITORING LOCATION
QUANTITY 15

7.5 LUX ISO CONTOUR
5.0 LUX ISO CONTOUR
1.0 LUX ISO CONTOUR

B	AMENDMENTS TO MASTERPLAN	CA	DH	AB	09.10.24
A	AMENDMENTS TO DRAWING	CA	NA	AB	21.03.24
-	FIRST ISSUE	CA	NA	AB	06.02.24
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M-EC
Consulting Development Engineers
Telephone: 01530 264 753
Email: group@m-ec.co.uk
Website: www.m-ec.co.uk
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CIVIL ENGINEERING



TRANSPORT



FLOOD RISK & DRAINAGE



STRUCTURES



GEO-ENVIRONMENTAL



ACOUSTIC AIR



UTILITIES



GEOMATICS



LIGHTING



EXPERT WITNESS



MEC
Consulting Group

E: group@m-ec.co.uk
W: www.m-ec.co.uk