

Great Wilsey Park Parcel D1 Lighting Impact Assessment

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Executive Summary

To be read in conjunction with Drawing and calculations 25595-D-01A and Lighting Reality Calculations 25595-A-01.

HDS Lighting have been commissioned to produce a Lighting Impact Assessment (LIA) for the development of a community centre to be located within Plot D1 of Great Wisley Park. The brief was to look at how the impact of proposed exterior lighting could be designed to comply with current guidelines, whilst providing a minimised impact to the local environment and the native UK species of bats; enabling compliance with planning condition 44 and Environmental Statement 4.3.

A lighting environmental classification was undertaken in line with the Institution of Lighting Professionals (The ILP) recommendations: Guidance Notes 01/20 reduction of obtrusive light and Guidance Notes 8/30 Bats and Artificial Lighting. From this it was concluded that a local Zonal Classification for Parcel D1 met the criteria of E2 (relatively dark outer suburban location).

Assessments were undertaken to ascertain illuminance levels for that of the existing local environment and the proposed new section 38 adopted highways. Based on these findings lighting calculation were undertaken utilising similar equipment and a <3k colour rendering light source (warm white) to meet current guidance on bat requirements.

Proposed lanterns on lighting columns were designed to operate at a 0-degree inclination to avoid spill light above the horizontal. For parking areas calculations were based on the provision of a solar light source to reduce where possible both energy and maintenance costs. The use 1m high bollard lighting was proposed to pedestrian areas to allow a lower light source and reduce spill light.

Based on these findings calculations were produced and lighting proposal attained that demonstrated the ability of providing a compliant lighting system utilising a colour of light found to be in a spectrum sympathetic to the bats, whilst attaining compliance illuminance levels suitable for both vehicular and pedestrian traffic. This demonstrated a compliance with condition 44 and Environmental Statement 4.3.

1. Scope of Works

To provide a lighting proposal and lighting impact assessment (LIA). Including lighting calculations and design specifications, that demonstrates compliance with the Environmental Statement 4.3 and condition 44 of outline planning permission reference DC/15/2151/OUT.

The scope of the LIA is to include:

- Identification of relevant legislation, policy, standards and guidance (e.g. from the Institution of Lighting Professionals).
- The study area comprising of the site boundary and specific receptors within it (e.g. areas used as bat corridors).
- Desk top baseline survey to determine existing illuminance levels within the site and surrounding area, taking account of the receptor locations.
- Development of a conceptual lighting scheme on the basis of relevant standards/guidance and the proposed arrangement of uses on an illustrative master plan.
- The significance of effects should be categorised in accordance with their potential implications (e.g. for visual comfort, disturbance of wildlife or statutory nuisance) and should take account of typical incorporated (i.e. industry-standard) mitigation. Where any residually significant adverse effects may be identified, recommendations for further mitigation should be provided where practicable.

2. Site Location and Local Authority



Location of Great Wilsey Park Grid Ref :52°05'28.7"N 0°27'09.3"E

Adopted highways within the UK come under the Highways Act 1980 and whilst there is no requirement under this act to provide highway illumination Local Authorities choose to provide such and subsequently maintain lighting under a duty of care. For the UK, highway lighting is generally designed within the guidance of BS: 5489-1:2020 British Standards for Road Lighting.

The local planning authority for Great Wilsey Park is West Suffolk Council. West Suffolk Council have recently undertaken a lantern conversion program to convert its aging lighting assets from a (SOX/SON) discharge light to LED light source being of a lower wattage and similar lighting output. This reduces the authorities annual lighting energy expenditure and maintenance spend and provides a greater choice in the colour output of its street lighting.

3. The Project Parcel D1

Part of Parcel D1 encompasses a proposed Community Centre, together with onsite parking and access road. The site is accessed from the proposed adopted highway and forms part of a wider domestic dwelling new development.



Proposed Parcel D1 development

Proposal for Bat Boxes

Two 1bstock Bat Boxes (design B or C) will be integrated into the south-facing aspect of the Nursery close to the wall top, avoiding siting directly above windows and located where these will not be shaded by future tree growth. This design is self-cleaning and requires no on-going management. The boxes will provide roost sites suitable to support crevice-dwelling bat species including pipistrelle bats in the long-term.

4. Assessment For Lighting

Environmental Statement Appendix 4.3

Lighting Assessment VC101955 LI RP 0001 Aug 2015 outlines a set of design requirement for the Great Wisley Park Haverhill.

Since the report was submitted and approved as part of the outline planning permission, lighting practices and lighting equipment have evolved to encompass a more stringent set of criteria for lighting and bats. This together with both new and updated guidance from the ILP, and a revision to the British Standards for lighting BS:5489:2020 now provides a more calculated approach to how the interaction of lighting and it's environment.

Environmental Zone Classification

Great Wisley Park is located on the periphery of Haverhill, which is approximately 19Kms West of Sudbery and 20Kms East of Cambridge, having a population of circa 27,000.

Exterior public lighting within the UK generally falls within the design parameters of the current British Standards BS:5489-2020. For the implementation of lighting a Classification system is undertaken which encompasses several requirements beginning with an appropriate Environmental Zone derived from the Lighting Professionals (ILP) guidance note GN01/20Table2:

Guidance notes for the reduction of obtrusive light

Guidance Note 01/20

Table 2: 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, village 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

ILP guidance notes on Environmental classes

When the surrounding location of Great Wisley Park is referenced in the Zonal Classification, it can be described as a well inhabited rural and urban settlement of Suburban medium district brightness attaining a classification of E2.

Ecology Lighting for Nocturnal Wild life and Green Corridors

Guidance for bats and artificial lighting can be taken from: The ILP Guidance Note 08/23. These guidance notes set out to provide designers with an understanding of bats and their nocturnal habitats in relation to artificial lighting.

For the provision of this report and through received information, it is acknowledged that bats, birds and other native nocturnal species are active within the consented masterplan area.

For this reason, it is advised that where possible for highway and amenity lighting a colour rendering of CRI 3000K < is utilised.

Current highway lighting falls under BS:5489-2020 **P classification** and includes design parameters to mitigate any negative impact to the local bat population.

Where footways and cycle ways are adjacent to wild life corridors, then consideration is given to their requirement for illumination. Where this is found to be needed then the use of a low level light sources is considered, e.g. Illuminated Bollard lighting circa 1M above ground level.

It is recommended that an LED light source is used to allow a greater energy efficacy and a more direct control of lighting to avoid spill lighting.

It is not believed that the implementation of lighting columns will have a daytime negative effect on both indigenous and migratory birds.

Assessment of Proposed Road Classification

An assessment of the proposed road classification was undertaken in line with the requirements of BS 5489:2020 through the provision of traffic flow statistics, Crime and Risk Assessment. As the development is new this classification related to surrounding areas.

Risk Assessment for Lighting

For the required adjustment of lighting classifications based on the following criteria:

Ref	Factor	Comments
1.1	Road type	Unclassified
1.2	Road category	P classification
1.3	Environmental area	E2
1.4	Traffic volume (ADT)	No figures available
1.5	Speed	30mph
1.6	Traffic composition	Vehicular/Cyclist/Pedestrian
1.7	Ambient lighting	Low
1.8	Amenities(shops/Schools)	Yes
1.9	Cyclists	Yes
1.10	On street parking	Yes
1.11	Level of crime	No assessment
1.12	Existing lighting	Yes
1.13	Adjacent lighting	Existing on surrounding roads.
1.14	Junctions	Yes CE Classification
1.15	Pedestrian crossing	None
1.16	Bus route	Presumed No
1.17	Trees/Vegetation	Yes
1.18	Access (for maintenance)	Generally good

Severity of Injury	
H:	Major, Fatal or long term disabling injury or illness
M:	Moderate injury or illness
L:	Minor injury or illness

Probability	
H:	Highly likely
M:	Likely
L:	Possible

Hierarchy of Mitigation RR	
1.	Eliminate hazard (design out)
2.	Reduce risk at source (amend design)
3.	Provide information of residual risk

Ref	Hazard/Activity	Sev	Prob	RR	Comments
2.1	Overhead lines–HVCables	L	L	L	Not Known
2.2	Overhead lines–LVCables	L	L	L	Not Known
2.3	Overhead lined–BT	L	L	L	Not Known
2.4	Underground–ElecHV	L	L	L	Not Known
2.5	Underground–ElecLV	L	L	L	Not Known
2.6	Underground–BT(or similar)	L	L	L	Not Known
2.7	Medium & high pressure gas	L	L	L	Not Known
2.8	Significantwatermain	L	L	L	Not Known
2.9	Fibre optic comms	L	L	L	Not Known
2.10	Drainage	L	L	L	Not Known
2.11	Private apparatus	L	L	L	No
2.12	Mobile phone masts	L	L	L	Not Known
2.13	Railway-Adjacent	L	L	L	No
2.14	Railway–Level crossing	L	L	L	No
2.15	Near water	L	L	L	No
2.16	Fire/police/ambulance station	L	L	L	No
2.17	Hospital/health centre	L	L	L	No
2.18	Leisure/Educational facilities	L	L	L	No
2.19	Industrial/commercial property	L	L	L	No
2.20	Residential property	L	L	L	Yes

Lighting Classification for Highways and Cycleways/combined footways

From the Risk Assessment for Lighting analysis there are currently insufficient identified risks that would require an adjustment of the lighting class greater than the recommended class proposed from 'BS5489:2020 lighting class adjustments'.

Therefore the proposed lighting levels for an E2 rural application should remain with the P5 classification. BS:5489-2020 Table A5.

BRITISH STANDARD

BS 5489-1:2020

Table A.5 — Lighting classes for subsidiary roads

Traffic flow	Lighting class		
	E1 to E4 ^{A)}	E1 to E2 ^{A)}	E3 to E4 ^{A)}
	Pedestrian and cyclists only	Speed limit $v \leq 30$ mph	Speed limit $v \leq 30$ mph
Busy ^{B)}	P5	P4	P3
Normal ^{C)}	P5	P5	P4
Quiet ^{D)}	P6	P5	P4

NOTE 1 Table A.5 assumes no parked vehicles; see risk assessment in [4.3.3.2](#).

NOTE 2 An EV lighting class using vertical illuminance, from BS EN 13201-2:2015, Table 6, can be specified in addition to the general lighting class when there are particular concerns about crime and personal safety. EV is calculated at the typical height of a human face (1.5 m) and in relevant viewing orientations.

NOTE 3 To ensure adequate uniformity, the actual value of the maintained average illuminance is not to exceed 1.5 times the value indicated for the class.

NOTE 4 The actual overall uniformity of illuminance, U_o , needs to be as high as reasonably practicable (see [7.2.6](#)).

NOTE 5 The ambient luminance descriptions E1 to E4 refer to the environmental zone as defined in ILP GN01 [N2].

NOTE 6 The illuminance classes are suggested minimum levels. A risk assessment needs to be carried out to ensure that the light levels are adequate, particularly for pedestrians and cyclists.

^{A)} Environmental zone, as given in ILP GN01 [N2].

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

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

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

5. Concept Lighting Design – BS5489:2020

The proposed lighting concept has been developed with regards to the requirements of the outline permission and can be seen on drawing 25595-D-01. This design is for guidance purposes only and does not form part of a detailed construction or approved design.

For the purpose of the design it has been assumed that sufficient land ownership exists to install equipment whilst maintaining lighting column clearances for pedestrian and vehicular usage in line with BS:5489-1:20206.1.3 Lighting columns as hazards Table 1 (*Table 6*) below.

Table 1—*Recommended minimum clearances from edge of carriageway to face of lighting column*

Speed limit	Horizontal clearance
mph	m
≤30	0.8
40 to 50	1.0
60 to 70	1.5

Table 6

Equipment Specification/Design Considerations

Entrance Road

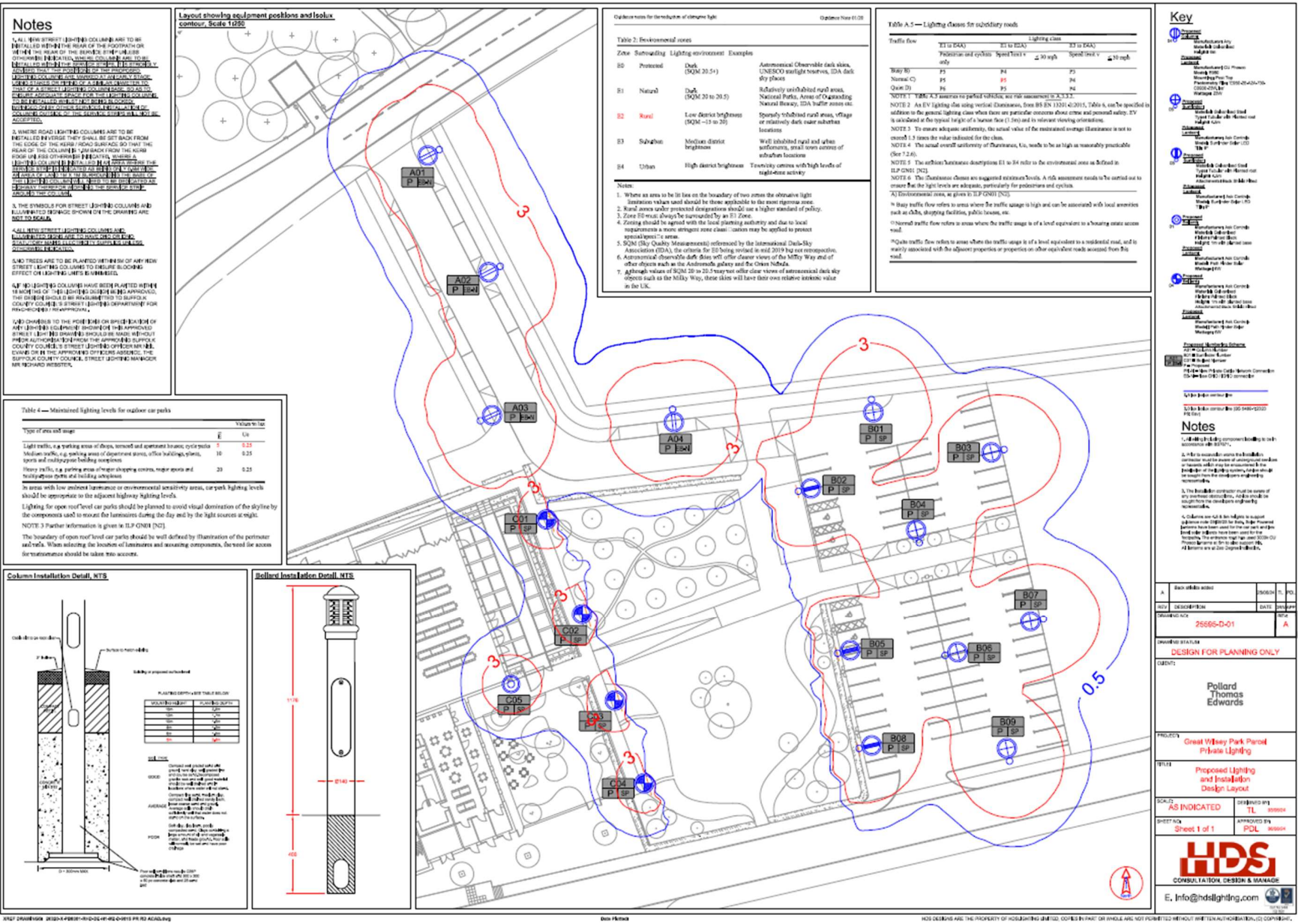
Lantern and column selection has been based upon the specification of approved equipment, as used on the adopted highway (section 38 development). This being a mains 240V AC powered CU Phosco E950 lantern placed on a 6m galvanised lighting column. The proposed lanterns will require to be fitted with a zero degree inclination to minimise light being transmitted beyond that of the section of highway to be illuminated and upwards above that of the lantern (sky glow). The colour rendering of the lantern are set to be is <3k (warm white) in appearance and represent a light spectrum which is more sympathetic to bats.

Car Park

Lantern is mounted at a lower mounting height of 4.5m incorporating the use of Solar Lanterns operating dusk until dawn with presence detection, this means light levels are reduced when the car park is not in use. The colour rendering of the lantern is <3k (warm white) in appearance and represent a light spectrum which is more sympathetic to bats.

Footpath Illumination

Lantern and column selection has been based upon the specification of approved equipment, as used on the adopted highway (section 38 development). This being a mains 240V AC powered 1m high bollard lighting with colour rendering of the lantern <3k (warm white) in appearance and represent a light spectrum which is more sympathetic to bats.



6. Lighting Design Conclusion

Based on the above findings a LIA was conducted together with the provision of lighting calculations for a proposed design.

The conclusion of the LIA was that a suitable night time illuminance could be achieved for Parcel D1 whilst meeting the requirements of planning condition 44. The proposed design further addresses current requirements for nocturnal animal habitat of bats as set out under the ILP Guidance Note 8/23.

From the design drawing it can be seen that the equipment selected meets current guidelines to minimize both light pollution and the requirement for a colour rendering <3k (warm white), and that the proposed use of solar powered lighting to the parking areas negates the requirement to provide mains electricity and hence offers a reduction in operating carbon emissions.

The provided lighting strategy and calculations therefore demonstrate that a compliance with Planning Condition 44 and Environmental Statement 4.3 can be met and implemented whilst providing suitable illumination for the public.

END

Appendix A

General reference Documents for Highway Lighting Design

BS: 7671 code of practice for electrical installations, The ILP Lighting Landscapes

The ILP GP03 code of practice for electrical safety in highway operations, Guidance Note 4 CDM,

Guidance Note 8 Bats and Artificial Lighting G39 of Public Highway Lighting.

Highways England, *Design Manual for Roads and Bridges: Road Lighting Design: TD501* Highways

England, *Design Manual for Roads and Bridges: Road Lighting Appraisal: TA501* Department for

Transport, "Statistical data set Accident and casualty costs (RAS60),"

British Standards Institution, *BS5489-1:2020 Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas*

British Standards Institution, *BS5489-1:2020 Code of practice for the design of road lighting: Table 1—Recommended minimum clearances from edge of carriageway to face of lighting column*

British Standards Institution, *BS5489-1:2020 Code of practice for the design of road lighting: Table A.2—lighting classes for traffic routes(v>40mph)*

<https://www.crashmap.co.uk/Search/https://roadtraffic.dft.gov.uk/manualcountpoints/https://www.ukplanningmaps.com/>