



Havant and South Downs College External Lighting Assessment

For Places for People Development

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Havant and South Downs College

1. INTRODUCTION

1.1 Purpose of Report

Hydrock Consultants has been appointed by Places for People Development to carry out external lighting assessment and an overview of the proposal for the development in support of an application for the approval of planning for a proposed residential development at Havant and South Downs College, College Road, Widley, Waterlooville.

1.2 Development Details

The proposed development looks to provide 102No residential units with a mix of flats and houses, on an existing car park (6,7,8,9 and 10) of Havant and South Downs College, Havant Campus.



Figure 1: Proposed of site.

2. LEGISLATION, POLICY AND GUIDANCE

2.1 National Legislation

National Legislation is given in the following documents:

- Wildlife and Countryside Act 1981;
- Environmental Protection Act 1990;
- Clean Neighbourhood and Environment Act 2005; and
- The Conservation of Habitats and Species Regulations 2017.

The statutory regime within these documents has been amended to include the light spill glare from lighting installations within different premises: 'artificial light emitted from premises so as to be prejudicial to health and nuisance'.

Under Section 79 of the Environmental Protection Act 1990, local authorities have a duty to take notice and act accordingly to investigate any complaint regarding artificial lighting of statutory nuisance. Once statutory nuisance may occur, local authorities must issue an abatement notice requiring that the nuisance cease or be abated within a set timescale.

2.2 National Planning Policy

The National Planning Policy Framework (NPPF) 2021 states that:

- Paragraph 185: Planning policies and decisions should also ensure that new development is appropriate for its location taking in 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:

- » Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

The Planning Policy Guidance (PPG) states that: "Artificial light provides valuable benefits to society, including through extending opportunities for sport and recreation, and can be essential to a new development. Equally, artificial light is not always necessary, has the potential to become what is termed 'light pollution' or 'obtrusive light' and not all modern lighting is suitable in all locations. It can be a source of annoyance to people, harmful to wildlife, undermine enjoyment of the countryside or detract from enjoyment of the night sky. 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.

2.3 Local Planning Policy

Havant Borough Council Local Plan (2014) contains the following relevant policies applicable to External Lighting:

DM10 – Pollution

DM18 Protecting New Development from Pollution

Proposals for the external lighting of facilities will only be permitted where:

- They would not give rise to an unacceptable level of illumination into the sky, open countryside or in village where present levels of illumination are low; or
- in urban areas and village where present levels of illumination are already significant, the proposal would have no detrimental impact on residential and visual amenity.

2.4 Legislation & Guidance for Lighting Effects on Bats

In the United Kingdom, all bats are protected by law. The following documents form the legislative framework for the protection of bats:

- The Wildlife and Countryside Act 1981;
- The Conservation of Habitats and Species Regulations (2017).

According to the above mentioned documents, it is illegal to:

- Intentionally or recklessly disturb a bat while it is occupying a structure of place of shelter or protection;
- Intentionally or recklessly obstruct access to a structure or place used by a bat for protection or shelter.

The Bat Conservation Trust has published documents that offer guidance on artificial lighting for new or existing developments around bat sensitive areas. Landscape and Urban Design for Bats & Biodiversity make the following recommendations:

- No bat roost should be directly illuminated;
- The type of lamp specified does not have an adverse impact on bats foraging and commuting patterns;
- The height of the lighting columns should be as low as possible;
- The light should be as low as guidelines permit;
- The lighting operational times should provide switch off intervals;
- Road and trackways in areas important for bat foraging and commuting areas should provide stretches left unlit to avoid isolations of bat colonies.

The Bat Conservation Trust and the Institute of Lighting Professionals (ILP) have produced Guidance Note 8: Bats and Artificial Lighting in

the UK. It summarises the impact of artificial lighting on bats and provides guidance on mitigation methods to reduce the impact on bats. This note shall be referred to throughout the report.

2.5 South Downs National Park

In May 2016 South Downs national Park Became a international Dark Sky Reserve (IDSR), with the aim of protecting and enhancing the dark skies.

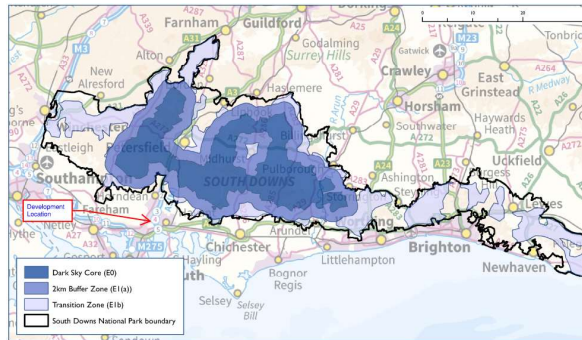


Figure 2 - Dark Sky Zones Map

The proposed development is not within the South Downs National Park however is within 4miles of the boundary. In order to protect the Dark Skies SD8: Dark Night Skies this policy isn't of major relevance to the proposed development however aspects of external lighting principles shall be adopted in order to reduce potential lighting pollution into the nights sky.

“Strategic Policy SD8: Dark Night Skies

1. *Development proposals will be permitted where they conserve and enhance the intrinsic quality of dark night skies and the integrity of the Dark Sky Core as shown on the Policies Map.*
2. *Development proposals must demonstrate that all opportunities to reduce light pollution have been taken, and must ensure that the measured and observed sky quality in the surrounding area is not negatively affected, having due regard to the following hierarchy:*
 - a. *The installation of lighting is avoided; and,*
 - b. *If lighting cannot be avoided, it is demonstrated to be*

necessary and appropriate, for its intended purpose or use

- c. *Any adverse impacts are avoided; or*
- d. *If that is not achievable, then adverse impacts are mitigated to the greatest reasonable extent.’*

Lighting which is proposed to be installed must meet or exceed the level of protection appropriate to the environmental zone, as shown on the Policies Map, as set out in the table below.”

Guidance within “TLL-10-SDNPA-Dark-Skies-Technical-Advice-Note-2018” sets out guidance to the approach of the lighting design to protect the dark skies. The following are believed to be the key principles:

- New lighting should not adversely degrade the sky quality beyond the immediate area to be lit
- Angle Lights Downward – no unnecessary light above or near the horizontal
- Lamps of 500 lumens and less are appropriate for most domestic purposes
- Point where the light is needed not in a direction that causes a nuisance to neighbours or wildlife
- Switch off when not needed. Use proximity sensors. Avoid dusk-till-dawn sensors
- Light to the appropriate illuminance – do not over light needlessly
- Lamps above 500 lumens should be installed in dark sky friendly fixtures that prevent unnecessary upward light

- Install at the lowest possible height to achieve lighting levels
- Avoid bright white and cooler temperature LED’s

2.6 Ecology Assessment

An ecological Environment Statement has been produced by Pro Vision, to assess the Proposed Development in relation to the likely significant effects it would have upon ecology and nature conservation.

The following sections have been highlighted with importance with regards to the external lighting strategy:

During the Phase I assessment of the habitats on site, the potential value of bat commuting, and foraging habitats were assessed in accordance with current guidance (Collins, 2016). The woodland along the east south and west boundaries provides potentially suitable habitat for commuting and foraging.



5.26 - Light spill within the development site may dissuade bats from utilising boundary woodland and tree lines as foraging and commuting habitat, although the site is currently well lit in the central section.

5.27 - The lighting design of the development will minimise any light spill along the woodland boundary to retain and enhance this corridor for bats. In line with current guidelines, on-site lighting will:

- not exceed 1lux on boundary features and lighting will be hooded or cowled to avoid light spill on these features (ILP, 2018).

3. BASELINE LIGHT SURVEY

The baseline survey consists of a desk top survey of the site and a night-time on-site survey of the area, identifying and commenting on the existing lighting profile across the entire site and immediately adjacent areas. This is completed through:

- An assessment of the site, adjacent areas and sensitive receptors;
- On site measurements of typical existing lighting conditions in terms of lighting levels (lux), light quality and possible existing light pollution issues;
- Establishing the site and surrounding area Environmental Zone ratings as per ILP guidance.

The survey and report clarify the known light pollution issues and will enable a review of the results against the criteria identified by the various lighting & environmental bodies, national & local policy and standards.

3.1.1 Desk Study

Guidance Notes for the Reduction of Obstructive Light GN01:2011 classifies environmental zones into five categories, Table 1 to the right describes these categories.

The lighting limitations for each environmental zone are described in Table 2, extracted from the same document.

Following the survey, the site has been assessed as being Environmental Zone E3 – Suburban.

3.1.2 Site Survey

The survey was undertaken on Tuesday 8th March 2022 between 7.30pm and 9.20pm. The survey was conducted during a normal working week where all lighting was operational. The weather was dry, clear skies with a moon phase in Waxing Crescent.

The measurements have been taken using a handheld lux meter, Extech HD450. Horizontal and vertical illuminance measures have been taken. Horizontal measurements were taken at ground floor and vertical were taken at 1500mm.

Spot measurements have been taken throughout the proposed site to record lux levels and to assess the lux profile of the existing luminaires. The survey was conducted throughout the proposed developable area at roughly 5 to 10metre spacings.

The site is lit by a series of low height columns, and bollards. Bollards were positioned along the site boundary with columns positioned throughout the car park and towards the main campus buildings. Several different types and styles of luminaire can be observed throughout the car parks.

Columns and Bollards throughout the main car park area where lit using incandescent lamps of a warm white around 2000 kelvin. A number of luminaires where no operational during the survey. Towards the main campus taller columns with LED cool white lamps.

All luminaires used had little directional light output resulting in vertical light spill on to the boundary.

All measurements have been captured in drawing 16422-HYD-00-00-DR-E-9500 shown in Appendix C.

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks.
E1	Natural	Intrinsically	National Parks, Areas of Outstanding Natural Beauty.
E2	Rural	Low District Brightness	Villages or relatively dark outer suburban locations.
E3	Suburban	Medium District Brightness	Small Town centres or suburb locations.
E4	Urban	High District Brightness	Town/City centres with high levels of night-time activity.

Zone	Sky Glow ULR [Max %]	Light intrusion (into windows) E _v [lux]		Luminaire intensity I [candela]		Building Luminance (pre-curfew)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average L [cd/m ²]
E0	0	0	0	0	0	0
E1	0	2	0(1*)	2500	0	0
E2	2.5	5	1	7500	500	5
E3	5.0	10	2	10000	1000	10
E4	15	25	5	25000	2500	25

Table 1: Environmental Lighting Categories.

Table 2: Obtrusive Light Limitations for Exterior Lighting Installations - General Observers.

ULR – Upward Light Ratio of the installation; E_v – Vertical illuminance in lux; I – Light intensity in candelas; L – Luminance in candelas per square meters.

*Permitted only from public road lighting installations

3.2 Site Survey Conclusion

The site is well lit with darker spots where luminaires have failed or were not operational at the time of the survey. Due to the nature of the fittings used, vertical illuminance of the boundary is high.

Energy usage is also thought to be high due to the use of Incandescent lamps.

This information will now be used to assess the site proposals and their residual effects on the surrounding areas and sensitive receptors.

4. INDICATIVE EXTERNAL LIGHTING STRATEGY

4.1 Relevant Standards and Guides

The following documents should be consulted and adhered to when designing the external lighting strategy for the scheme:

- ILP Guidance Notes for the Reduction of Obtrusive Light GN01:2020;
- ILP Guidance Note 08: Bats and Artificial Lighting in the UK;
- ILP PLG04: Guidance on Undertaking Environmental Lighting Impact Assessments;
- CIBSE Lighting Guide 6 (LG6) – Outdoor Environment;
- CIBSE SLL Code for Lighting 2012;
- BS 5489-1:2013 – Code of Practice for Design of Road Lighting;
- CEN/TR 13201-1: Road Lighting – Part 1: Selection of Lighting Classes;
- CIE – Guidelines for Minimising Sky Glow;
- Royal Commission on Environmental Pollution – Artificial Light in the Environment.

The ILP Guide for the Reduction of Obtrusive Lights is the primary document used by most local councils and planning departments to categorise the provision of external lighting. Where possible, the external lighting should be compliant to Dark Sky requirements and to Lighting Environmental Zone CIE E3.

4.2 External Lighting Proposal

It is proposed that the site is modelled using low height, directional column luminaires to provide sufficient illuminance on roads whilst also being mindful of the sensitive receptors on site. To integrate the site into the nearby residential areas, warm white LEDs which

have a colour temperature of 3000K are preferred. Warmer colour temperatures of light (with less blue wavelengths) have also been proven to have a lower impact to bats.

Where roads cross existing areas used by bats to migrate through the site, stretches of road can be left unlit to provide corridors of < 0.5 lux for bats to commute to different areas.

Where possible, residents should be educated about the flora and fauna in their local area and encouraged to install low lumen security lighting to reduce the lux levels falling onto sensitive receptors.

For all highways adopted by Hampshire County Council (HCC), a dimming profile in line with HCC lighting specification requirements will be applied: typically, luminaires are either dimmed or every second luminaire is switched off past a designated curfew time to reduce the overall light pollution of the development.

The external lighting controls as a minimum will consist of photocell and time clock arrangements.

4.3 Sensitive Receptors

The impact of the development on each of the sensitive receptors as identified in section 2.5 and 2.6 have been evaluated.

4.3.1 South Downs International Dark Sky Reserve (IDSR)

To protect the South Downs International Dark Sky Reserve (IDSR), the external lighting design shall ensure that:

- Task planes shall be solely lit using low intensity luminaires, ensuring spaces aren't over lit; and
- All Fittings selected have zero Upward Light Ratio (ULR); and

- Control luminaires via presents detection or partly off completely during post curfew times to switch off lighting when not needed; and
- All fittings used are low in height; and
- And all fittings are 3000k warm white fittings.

4.3.2 Commuting and foraging Bats;

Vertical lighting calculation surfaces shall be added along the site boundary of the proposed development. Lighting shall be designed to not exceed 1lux on boundary features and lighting will be hooded or cowled to avoid light spill. Any necessary lighting within the development will utilise security timers where possible and be LED lighting of a warm white spectrum (<2700 Kelvin) which will feature peak wavelengths higher than 550 nm. All luminaires shall be selected on the bases they have low to zero upward light ratio.

4.3.3 Adjacent residential properties

New and existing residential dwellings should be protected from obtrusive light spill. In line with Table 1, light intrusion into residential windows should be reduced as far as possible and meet Environmental Zone E3 limits of 10 lux (pre-curfew) and 2 lux (post-curfew).

Appendix A: Glossary of Terms

Atmospheric Conditions

The amount of particle pollution and presence of moisture and other gases in the atmosphere. Light is scattered by the particles and that coming back to an observer below causes the veiling impact of Sky Glow.

Aura

Localised halo of light above a lit area, caused by direct upward light or reflections from the ground and other surfaces. More obvious where light units are grouped relatively close together and / or of high power.

Ballast

Ballast is located internally within a luminaire and forms part of the lighting control gear. The ballast regulates the light output of the luminaire.

Curfew

The time after which stricter requirements (for the control of obtrusive light) will apply. Often a condition of use of lighting applied by the local planning authority.

Colour Rendering Index (CRI)

Ability of a light source to match colours in comparison with a full spectrum light source such as daylight or a tungsten lamp. On a scale of 0 – no colour matching, to 100 – full colour matching.

Environmental Zone (E0 – E4)

A classification method developed by the ILP to match appropriate lighting controls to the local environment:

- An E0 Zone is UNESCO Starlight Reserve, IDA Dark Sky Parks etc.;
- E1 Zone is an intrinsically dark landscape;
- E2 Zone as low district brightness;
- E3 Zone is medium district brightness; and
- E4 Zone is a City Centre location.

LED

Light emitting diode.

Lighting Illuminance

The illuminance or light level is the amount of light energy reaching a given point on a defined surface area, namely the luminous flux (i.e. lumens) per square meter. Illuminance is measured in lux.

Lux

The lux is the unit of illuminance and luminous emittance, measuring luminous flux per unit area. It is equal to one lumen per square meter. In photometry, this is used as a measure of the intensity, as perceived by the human eye, of light that hits or passes through a surface.

Sky Glow

Wide area of night sky scattering direct and indirect upward light back to an observer. Depends on atmospheric conditions and the amount of upward light. Very typical above urban areas.

SON

High-pressure sodium discharge lamp. Typically golden orange light or whiter light, but more modern versions available in a ‘whiter’ output. Very poor CRI of approximately 25.

SOX

Low pressure sodium discharge lamp. Orange light, essentially monochromatic, identifying only yellow colour with all others rendered as shades of grey. CRI 0.

ULR

Upward light ratio output.

Uniformity (UO)

The uniformity of illumination is the lowest calculated illuminance and the average illuminance of the working plane. Uniformity is calculated to ensure the lighting design provides a uniform illuminance in line with the required standards.

Appendix B: Survey Images

Image 1



Image 2



Image 3



Image 4



Image 5



Image 6

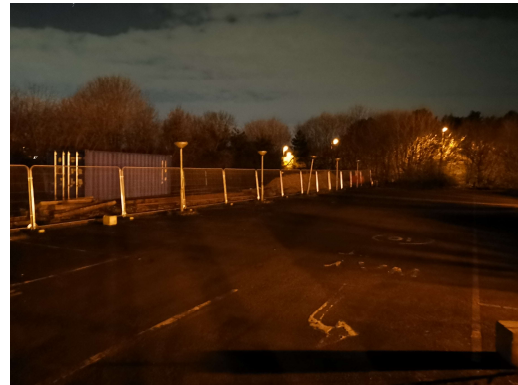


Image 7



Image 8



Image 9



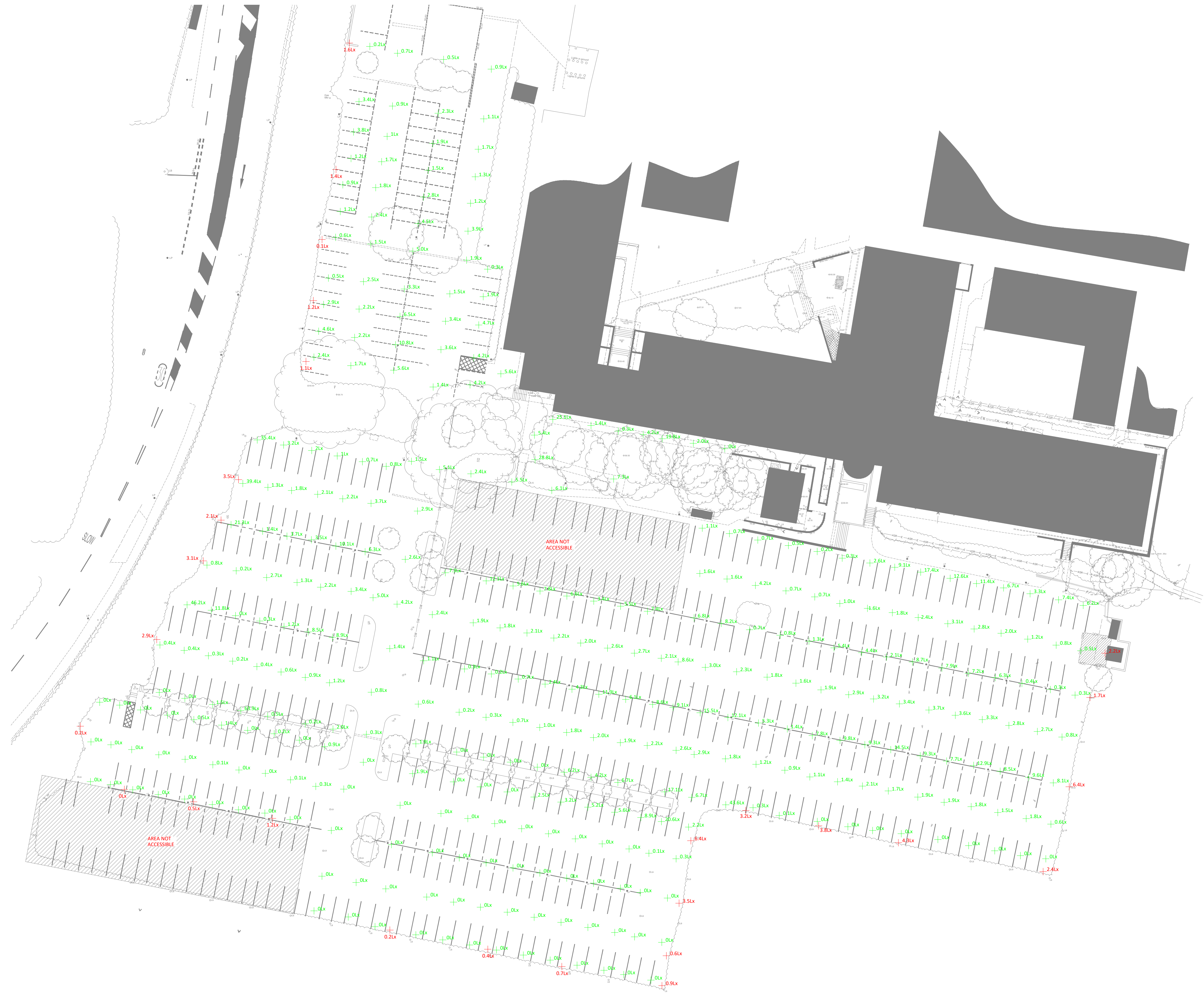
Image 10



Appendix C: Baseline Survey Measurements

Legend

- + 0.0 lux Horizontal Lux Level Reading, laid directly on the ground.
- + 0.0 lux Vertical Lux Level Reading, at 1500mm high above ground level.



KEY PLAN

NOTES

REVISIONS

P01	Suitable for review	JB	11.03.22	DW	11.03.22	ES	11.03.22
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REV	REVISION NOTES/COMMENTS	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
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CLIENT

PLACES FOR PEOPLE DEVELOPMENT

PROJECT

HAVANT AND SOUTH DOWNS COLLEGE

TITLE

EXTERNAL LIGHTING SURVEY

HYDROCK PROJECT NO. 16422		SCALE @ A0 1:250 @ A0	
STATUS DESCRIPTION SUITABLE FOR REVIEW		STATUS S3	
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 16422-HYD-00-00-DR-E-9500		REVISION P01	