

1st August 2025

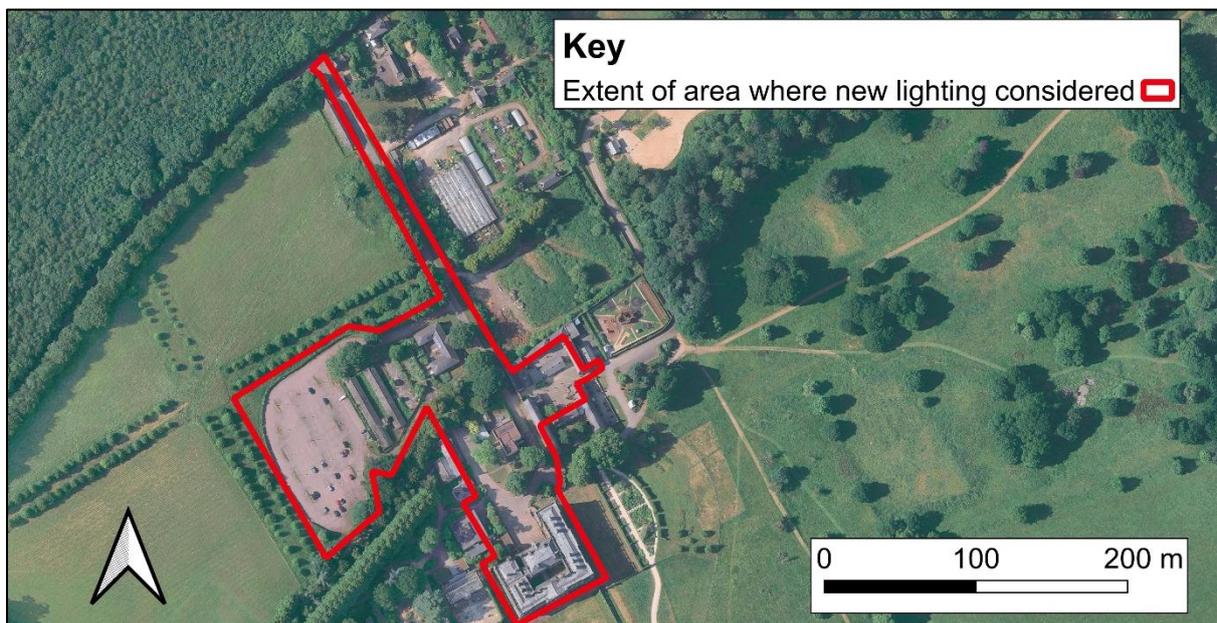
Dear Sir or Madam,

Subject: Northern College – Lighting Plan – Ecology Covering Letter

Introduction

Middleton Bell Ecology were commissioned by Mark Barrett of Northern College on 28th April 2025 to input into the design process for new external lighting across the Northern College site (Ordnance Survey Grid Reference: SE 3198 0320; Figure 1). This letter report provides a summary of the agreed outcomes detailing average lighting (lux) levels across the site, together with times of operation and colour temperature. We have also reviewed the outcome of this work against our knowledge of baseline lighting levels across the existing site.

Figure 1. Approximate extent of area where new external lighting considered



The existing external lighting at the Northern College site has been installed on *an ad hoc* basis, resulting in a wide variety of luminaire types. The system is prone to faults and is difficult to control. The requirement for a lighting re-design has also been prompted by two accidents, one of which was reportable and both of which were linked to existing site lighting.

The College shares the site with the National Trust who have an office within the College Coach House building. The National Trust also share the main access drive, car parks and amenity areas of the site with the College.

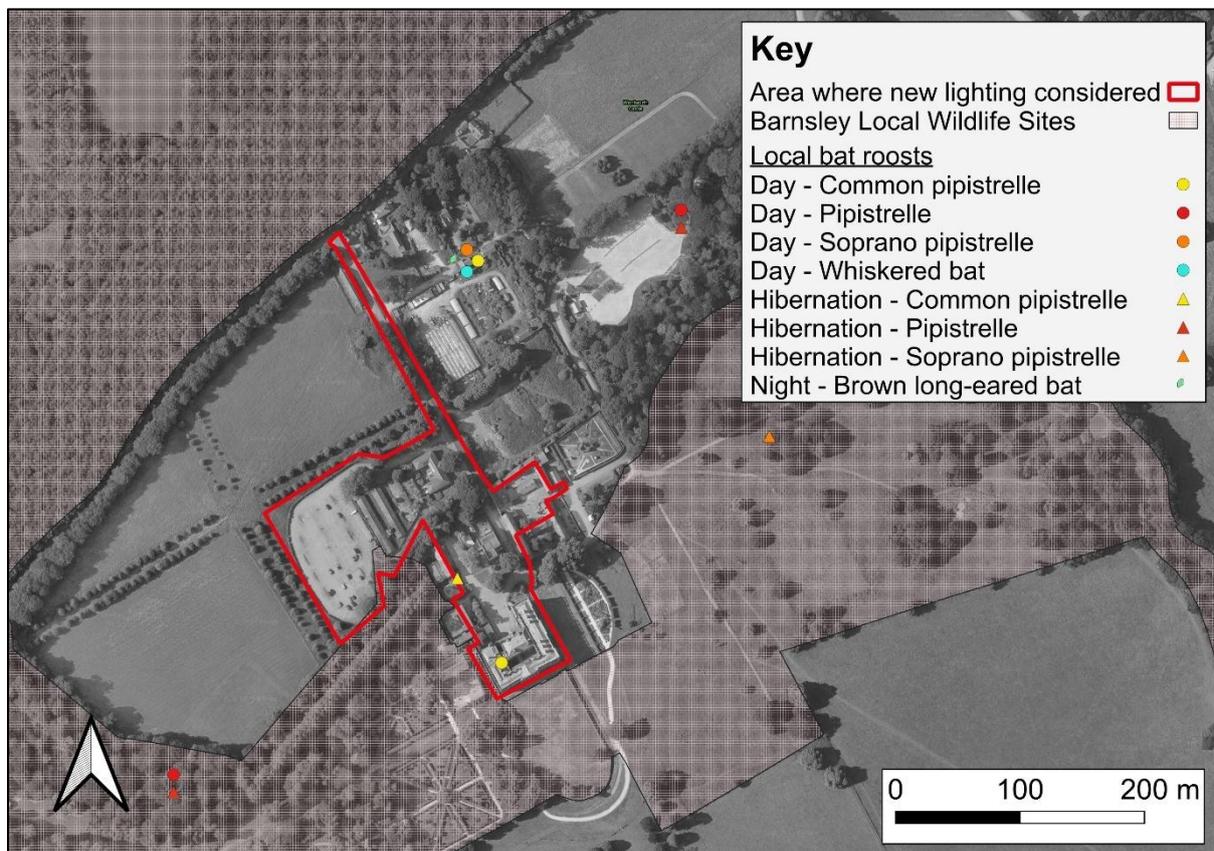
The aims of the lighting re-design are as follows:

- Reduce power consumption, through use of modern LED lights and timing controls.
- Bring all lights under a single control system.
- Make use of existing lighting infrastructure such as columns along access road, to reduce costs and waste.
- Ensure adequate levels of amenity, emergency and response lighting across the campus, that accord with the relevant British Standards.
- Enable lighting to be switched off when not required, and reduce light output during periods of low usage (where appropriate), to benefit site ecology.
- Set all lighting to a warm white colour (3000K) to reduce blue content.
- Use directional site lighting (low level where possible), in order to reduce upward light spill and avoid illumination of upper elevations of buildings.

Proximity of Local Wildlife Sites and Existing Bat Information

The area where new external lighting is proposed abuts and includes a small amount of Stainborough Park Local Wildlife Site, whilst also being located on the opposite side of Lowe Lane from Falthwaite and Lowe Wood Local Wildlife Site. Both Local Wildlife Sites contain extensive high-quality bat foraging habitat, with numerous known roosts recorded within Stainborough Park Local Wildlife Site (Figure 2). This site has been shown to meet four out of the five qualifying criteria for bat designation—only one of which is required for designation. Two bat roosts are located within the area where new lighting is under consideration. These roosts comprise a 2020 common pipistrelle hibernation roost (one bat), located behind a fascia board on the Old Coach House (Plate 1), with the second roost (a common pipistrelle day roost) located in the roof of Wentworth Castle.

Figure 2. Proximity of Northern College to Local Wildlife Sites and Local Bat Roosts



Given existing knowledge of the site, that the areas to be illuminated are already subject to artificial lighting, and that these areas primarily comprise lower building walls and/or hardstanding; it was concluded that no targeted baseline bat activity survey was necessary prior to the development of the lighting scheme.

Plate 1. Known common pipistrelle hibernation roost location on Old Coach House



Baseline lighting

In order to get an understanding of existing lighting levels, Robert Bell visited site at 23:00 on 16th July 2025 during a period of dry weather. A DJI Mini 4 Pro drone was used to take an aerial image of the site, with a Hannah HI97500 Portable Lux Meter used to take lighting measurements at ground level from selected locations across the site. It was noted that lighting in the main southwest car park was turned off at the time of this survey. A drone image with overlaid lux measurements is shown in Figure 3.

Guidance review

A review of guidance was undertaken by Ian Kitson, Senior Electrical Engineer at Waterman Building Services Ltd, to understand the level of lighting required (Table 1). This review determined that lighting on the roadway needed to achieve an average illumination of 10 lux, providing that traffic was slowed to 10 km/h. Within other areas of the site, it was considered the guidance supported an average illumination of 5 lux.

Robert Bell's input into the design process was informed by Guidance Note 08/23: Bats and Artificial Lighting at Night developed in partnership between the Institute of Lighting Professionals and Bat Conservation Trust (ILP, 2023). This guidance emphasises the importance of the mitigation hierarchy to avoid, minimize, and manage the ecological impacts of artificial lighting on bats. This guidance document stipulates that where lighting is necessary, it must be minimized through sensitive design strategies such as dark buffers, spectral selection (e.g., warm or red light), low luminance, and directional control.

Figure 3. Lux values at set locations on site, shown over drone image on 16th July 2025

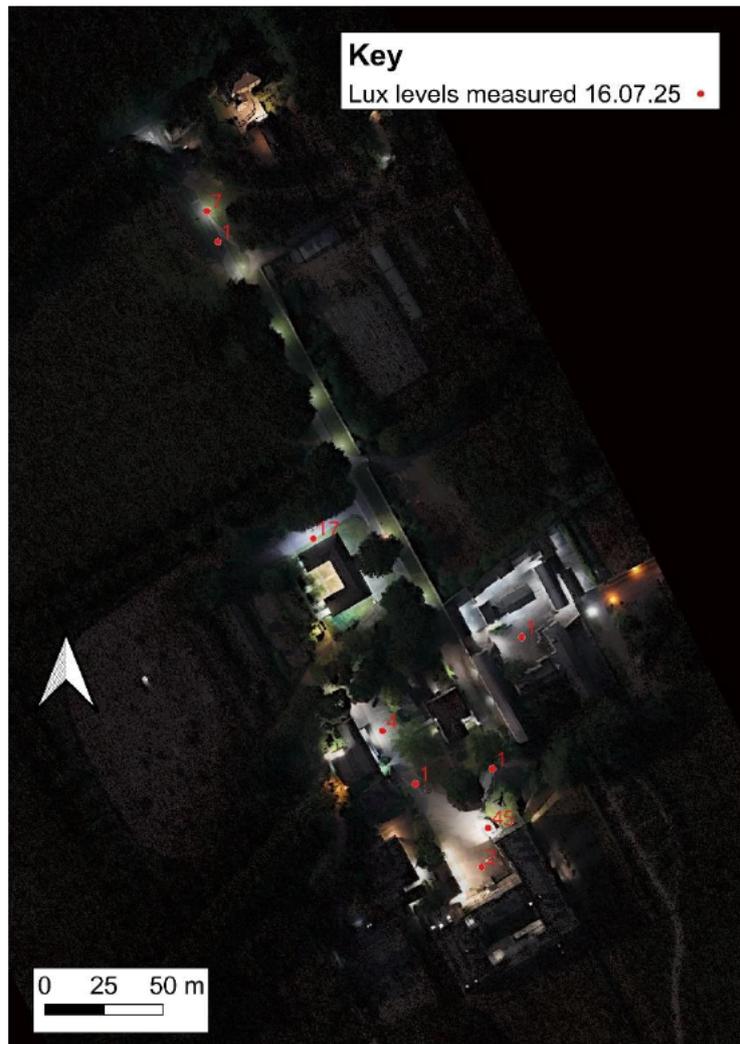


Table 1. Recommended illumination levels taken from relevant guidance documents relating to lighting of roads and car parking areas

Area	Guidance document				
	DFE Annex 2E	BS:12464-2 2024	SLL Code for Lighting	BS5489 -1	BS5489-1
Roadway	Slow Moving 10km/h 10lux	Slow Moving 10km/h 10lux, Regular Vehicle 40 km/h 20 lux	Slow Moving 10km/h 10lux, Regular Vehicle 40 km/h 20 lux	Class P2 = 10lux	N/A
Car Parking	10 lux	Light Traffic E.g. Parking Areas of Shops, terraced and apartment houses, cycle parks. - 5 lux; Medium Traffic e.g Office buildings, Multipurpose complexes - 10 lux			Light Traffic E.g. Parking Areas of Shops, terraced and apartment houses, cycle parks. - 5 lux; Medium Traffic e.g Office buildings, Multipurpose complexes - 10 lux

Lighting proposals

Taking recommended lighting levels into account, the external lighting requirements shown in Appendix 1 were developed. The lighting design is currently being re-worked to achieve these agreed levels. Although this document, which will include luminaire positions and types was not available at the time of writing this document, the principals informing its design are sufficient to allow consideration of the potential impacts.

It is agreed that all lighting is to have a warm white colour temperature (3000K) and would be downward facing. Existing lighting columns will be re-powered with new LED heads, with new bollards used in place of existing bollards and some limited use of appropriately powered downward facing flood lights. Escape lighting along the northeast elevation of Wentworth Castle will comprise non-maintained 6W bulkhead lights, which will activate only in the event of a power failure or activation of the fire alarm.

Lighting schedule

Light operation times have been reduced to those deemed necessary to allow safe use of the site. The External Lighting Strategy provided in Appendix 2 was written by Mark Barrett, Head of Estates and Facilities at Northern College following discussions with the Northern College team and a representative from the National Trust, with input from the ecologist.

For the purposes of lighting operation, the site is to be divided into two sections, with these areas shown on the plan in Appendix 1.

The first of these areas comprises the Main Drive and Car Park. Lighting in this area is to be run at full power between Sunset and 21:00 and from 06:00 to sunrise. Between 21:00 – midnight lighting is to be run at 50 % power, triggering to full power when a car or person passes a PIR sensor at either end. Between midnight and 06:00 the lighting within the Main Drive and Car Park will be off, unless activated by the a person/car passing a PIR sensor.

The second area detailed in the External Lighting Strategy comprises the Amenity Areas. Within these areas lighting is to be on at all times, unless the site is out of use, although such times are limited. It was considered that such lighting was required at all times due to health and safety and site security issues.

Ongoing lighting review

The need to balance external lighting use for safe site transit and ecological requirements is understood by the college. It is the intent of the college to monitor and manage light use down where possible, practicable and safe to do so.

Assessment

The external lighting design was developed with active input from an ecologist. This collaborative process led to a reduction in proposed illumination levels across the site, the removal of maintained (constantly illuminated) emergency lighting around Wentworth House, and restrictions on lighting operation times. A key example of such a modification is the client's agreement to reduce the speed limit on the access drive, which enabled a reduction in the average illuminance of this route from 20 lux to 10 lux.

Although light levels are expected to increase in some areas of the site—such as the main drive—during periods of full illumination, any associated negative ecological impacts are considered to be offset by several positive measures. These include scheduled periods when lighting in the car park and along the main drive will be either turned off or dimmed, the exclusive use of warm white lighting across the site, the removal of uplighting from the

northeast elevation of Wentworth Castle, and improved light control through sharper cutoffs and reduced spill associated with LED luminaires.

Ultimately, lighting levels have been aligned with relevant guidance, reflecting the need to ensure safety and accessibility on a residential site used by a diverse range of user groups. In addition, the enhanced control systems provided by the new lighting infrastructure will allow for further reductions in light output or operational hours in the future, where it is deemed safe to do so. Wider environmental benefits of the scheme include reduced energy consumption and associated carbon emissions.

Please do not hesitate to get in contact with any queries or comments.

Yours sincerely,

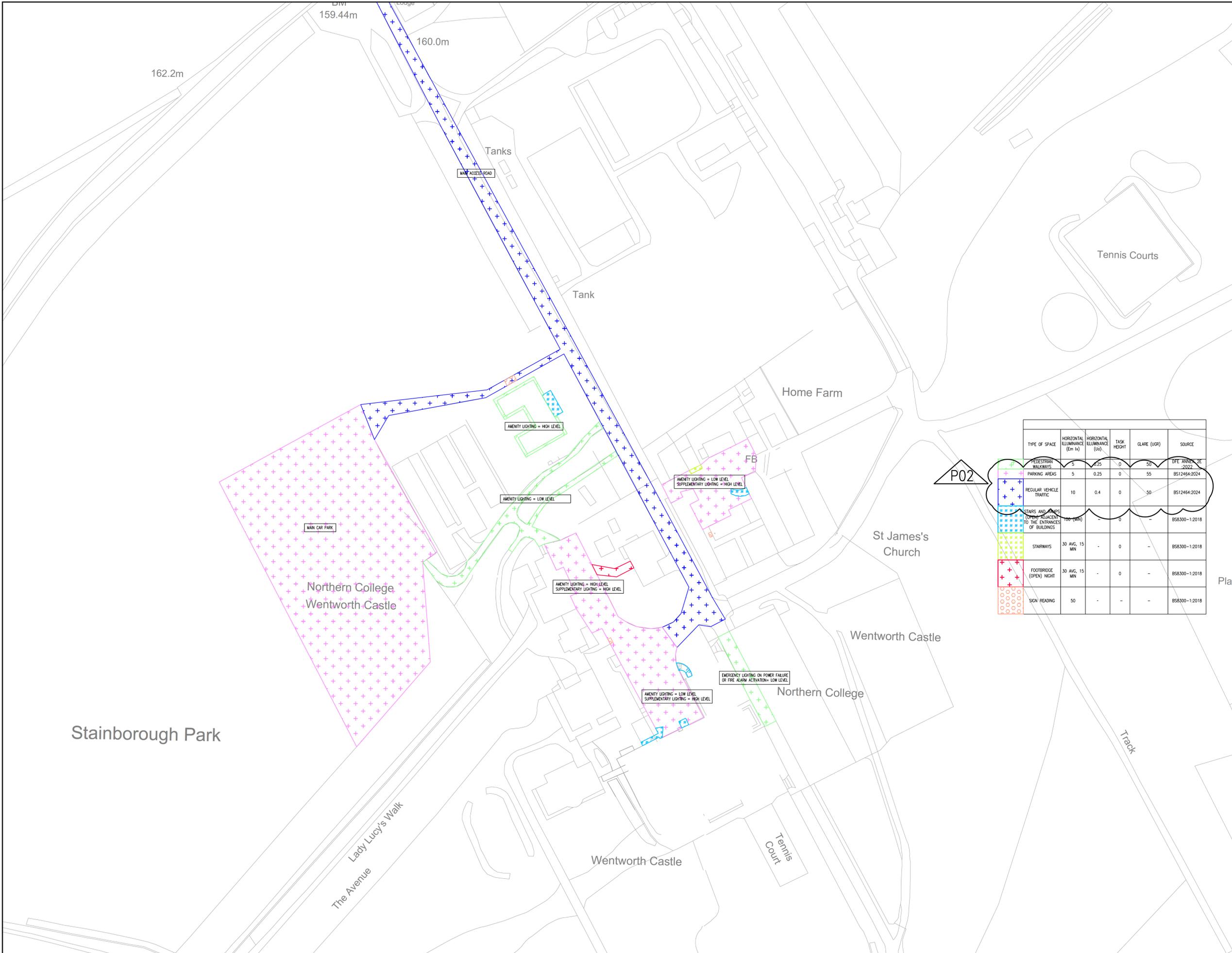


Robert Bell MCIEEM
Principal Ecologist

Reference

ILP (2023) Guidance Note 08/23: Bats and Artificial Lighting at Night. Institute of Lighting Professionals and Bat Conservation Trust.

Appendix 1. External Lighting Requirements Plan



This drawing is for engineering services only and is to be read in conjunction with all relevant architectural, structural, Waterman Building Services drawings and the contract specification.
 THIS IS NOT AN INSTALLATION DRAWING.
 All service routes and equipment locations are indicative, actual location to be determined from site dimensions.
 It is advised that all contractors, the requirements of the Health & Safety at Work Act, Act 1974 & subsequent amendments thereto are brought to the attention of all those who design, install or maintain the plant and equipment shown on these drawings or who are required to enter the areas shown on these drawings.
 DO NOT SCALE FROM THIS DRAWING.

GENERAL NOTES

1. THIS DRAWING IS INDICATIVE OF THE SITE SITUATION ON 10/02/24. ANY SUBSEQUENT CHANGES WILL NOT BE ILLUSTRATED ON THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH EXTERNAL LIGHTING REPORT - NCWC-WBS-ZZ-XX-DR-E-63200.

TYPE OF SPACE	HORIZONTAL ILLUMINANCE (Em lx)	HORIZONTAL ILLUMINANCE (Uo)	TASK HEIGHT	GLARE (UGR)	SOURCE
PEDESTRIAN WALKWAYS	5	0.25	0	50	DPE ANNEX 2E 2022
PARKING AREAS	5	0.25	0	55	BS12464:2024
REGULAR VEHICLE TRAFFIC	10	0.4	0	50	BS12464:2024
STAIRS AND LIFTS (OPENING TO THE ENTRANCES OF BUILDINGS)	100 (MIN)	-	0	-	BS8300-1:2018
STAIRWAYS	30 AVG, 15 MIN	-	0	-	BS8300-1:2018
FOOTBRIDGE (OPEN NIGHT)	30 AVG, 15 MIN	-	0	-	BS8300-1:2018
SIGN READING	50	-	-	-	BS8300-1:2018

Rev	Date	Description	By
P02	01.08.24	ROADWAY AND CAR PARK LEVELS AMENDED TO SUIT PEDESTRIAN'S COMMENTS	IK
P01	11.07.24	ISSUED FOR INFORMATION	IK

Project: **WENTWORTH CASTLE**
 Title: **ELECTRICAL SERVICES SITE PLAN EXTERNAL LIGHTING REQUIREMENTS**
 Client: **NORTHERN COLLEGE**



INFORMATION			
Designed by	IK	Checked by	MP
Drawn by	IK	Date	JULY 2024
Scale @ A3	1:500	Consultant File No	BSD15230
Work to be done	work to be done only	Revision	

NCWC-WBS-ZZ-XX-DR-E-63200 **P02**

Appendix 2. External Lighting Strategy

Northern College

Estates & facilities Department

External Lighting Strategy

1.0 Background

Northern College has reviewed its external lighting provision from the perspective of reducing the amount of energy consumed, improving efficiency and control and to ensure adequate levels of amenity, emergency and response lighting across the campus.

The college is cognisant of the impact of its lighting requirements on the ecology of the wider external conservation area and on the listed status of the buildings of the college campus.

The college has appointed Watermans Building Services to review the existing lighting system with a view to developing a new external lighting scheme which ensures compliance with the requirements for external lighting provision whilst improving the ability for the College to control to a higher degree its external lighting.

The college has also commissioned Middleton Bell to undertake an ecological review of the developed scheme to ensure that the scheme delivered minimises impact on the immediate ecology of the site.

This External Lighting Strategy seeks to identify areas where lighting can be better controlled and to identify strategies for the management of areas of external lighting to minimise light pollution, over-lighting of specific areas whilst maintaining safe levels of external light for residents and other users of the college. This would include arrangements for response by emergency responders, operational response and the provision of emergency lighting.

2.0 Lighting Strategy

2.1 Operational Periods

Northern College is an adult residential facility, being one of only two remaining in England. The college operates throughout the year and only closes fully over specific closed weekends when the college closes at 19.30 on a Friday and re-opens at 07.00 on the following Monday. The College operates 11 open weekends annually which are determined prior to the start of each academic year.

Over a normal operational week, the College opens to learners, visitors and staff on Monday morning running through the week with residential learners on site to Thursday evening. The College is open on Fridays and closes at 19.30 on Fridays which do not precede an open weekend.

This arrangement is extended over an open weekend when the college would be open on the Friday and Saturday nights for residential guests and would subsequently at 19.00 on the following Sunday following completion of classes on the Sunday.

The College shares the site with the National Trust who have an office within the College Coach House building. The National Trust also share the main access drive, car parks and amenity areas of the site with the College.

Whilst the college weekday open hours exceed the National Trust opening hours the National Trust are open all weekends throughout the year only closing on Christmas Day.

2.1 College Lights On/Off Periods (Main Drive & Car Park)

Table 1.0 Operational lighting times for college car parks/main drive for the college.

Period	College Open	College Close	AM Lights On	AM Lights Off	PM Lights On	PM Lights to 50%	PM Lights off (To PIR)	Additional Notes
Normal Week	07.00 Monday	19.30 Friday	06:00	Sunrise	Sunset	21:00	24:00	Staff & resident students on site using access routes, car parks and access to amenity areas during hours of darkness
Open Weekend	19.30 Friday	19.30 Sunday	06:00	Sunrise	Sunset	21:00	24:00	Staff & resident students on site using access routes, car parks and access to amenity areas during hours of darkness
Bank Holidays	College Closed	College Closed	06:00	Sunrise	Sunset	21:00	24:00	National trust staff on site at bank Holidays

Table 1.0

2.2 College Lights On/Off Periods (Amenity Areas)

Table 2.0 Operational lighting times for amenity areas for the college.

Period	College Open	College Close	AM Lights On	AM Lights Off	PM Lights On	PM Lights Off	Notes
Normal Week	07.00 Monday	19.30 Friday	06:00	Sunrise	Sunset	Sunrise	Staff and resident students are on site and using access routes, car parks and amenity areas during of darkness. Security patrols throughout the night and response to alarms and incidents

Period	College Open	College Close	AM Lights On	AM Lights Off	PM Lights On	PM Lights Off	Additional Notes
Open Weekend	19.30 Friday	19.30 Sunday	06:00	Sunrise	Sunset	Sunrise	Staff & resident students on site using access routes, car parks and access to amenity areas during hours of darkness. Security patrols throughout the night and response to alarms and incidents
Bank Holidays	College Closed	College Closed	NA	NA	NA	NA	College amenity lights off at 19.30 Friday and on 06.00 Monday. Refer also to NT amenity light requirement
Additional Closure Days	College Closed	College Closed	NA	NA	NA	NA	College amenity lights off at 19.30 Friday and on 06.00 Monday. Refer also to NT amenity light requirement

Table 2.0

2.3 National Trust Lights On/Off Periods (Main Drive & Car Park)

Table 3.0 Operational lighting times for The National Trust car parks/main drive (Shared with the College).

Period	NT Open	NT Close	AM Lights On	AM Lights Off	PM Lights On	PM Lights to 50%	PM Lights off (To PIR)	Additional Notes
Normal Week	07.00 Monday	19.30 Friday	06:00	Sunrise	Sunset	21:00	24:00	Lighting times as for college
Weekend	08:00 Saturday	17:00 Sunday	06:00	Sunrise	Sunset	21:00	24:00	Lighting times as for college
Bank Holidays	08:00 Saturday	17:00 Sunday	06:00	Sunrise	Sunset	21:00	24:00	Lighting times as for college

Table 3.0

2.4 National Trust Lights On/Off Periods (Amenity Areas)

Table 4.0 Operational lighting times for amenity areas for the National Trust.

Period	NT Open	NT Close	AM Lights On	AM Lights Off	PM Lights On	PM Lights Off	Notes
Normal Week	07.00 Monday	19.30 Friday	06:00	Sunrise	Sunset	24:00	Lighting times as for college
Weekends	08:00 Saturday	17:00 Sunday	07:00	Sunrise	Sunset	24:00	Lighting times as for college as
Weekends	08:00 Saturday	17:00 Sunday	07:00	Sunrise	Sunset	24:00	Lighting times as for college

Table 4.0

Note

Lights on/off times are based on wintertime conditions. During BST periods lighting will be adjusted accordingly to reduce further light use

3.0 Rationale

3.1 College Car Parks and Main Drive

External lighting in car parks and along the main drive will be set on timers and light sensors and programmed as indicated in table 1.0 and will operate at sunset or when the light sensor detects darkness requiring additional lighting.

The lights will be timed to reduce lux levels by 50% from 21.00 hours and will turn off at 24:00. During the lights off period (*From 24:00 to sunrise*) lights will operate on PIR detection allowing for visitors and operational/emergency response as vehicles/people pass each light standard/fitting. These will be timed to turn off after a short period of time.

3.2 College Amenity Areas

External lighting in college amenity areas will be programmed as indicated in table 2.0.

3.3 National Trust Car Parks and Main Drive

External lighting in car parks and along the main drive will be set on timers and light sensors and programmed as indicated in table 1.0 and will operate at sunset or when the light sensor detects darkness requiring additional lighting.

The lights will be timed to reduce lux levels from 21.00 hours and will turn off at 24:00. During the lights off period (*From 24:00 to sunrise*) the lights will operate on PIR detection allowing for visitors and operational/emergency response as vehicles/people pass each light standard/fitting. These will be timed to turn off after a short period of time.

3.4 National Trust Amenity Areas

External lighting in college amenity areas will be programmed as indicated in table 3.0.

4.0 On-Going Monitoring Commitment

The need to balance external lighting with the need for safe site transit in darkness as well as for ecological purposes is understood by the college. It is the intent of the college to monitor and manage light use down where possible, practicable and safe to do so.

There will be times when additional lighting time periods may be required for occasional events and celebrations and in such instances light use will be monitored to ensure levels reflect the intention to minimise light use where possible and safe to do so.

The college will monitor and manage the lighting to achieve the lowest possible use of external light on an ongoing basis.