

Bats and Lighting Specifications

BAT SENSITIVE LIGHTING

Due to the presence of a lesser horseshoe bat maternity roosts within the Silverwood School Site, please see the following overarching principals which must be included within the lighting strategy and design considerations for the masterplanning of the development. The location of the roosts is appended to this document.

Overarching principles to be observed within the ecologically sensitive lighting strategy includes the following:

- Bat roosting areas and other bat sensitive areas (e.g. key commuting and foraging habitats), must be either retained at their existing Lux level or not exceed 0.5 Lux at all heights;
- Column height will be carefully considered to ensure minimal light spill is achieved, with fittings preferably <0.5 m in height;
- All lamps will be fitted with UV filters or lack UV elements when manufactured;
- A warm white spectrum (<2700 Kelvin) will be adopted as this will reduce impacts of blue light upon wildlife;
- LED lamps will be used where possible;
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. They can be considered for specific cases where the lighting professional and project manager are able to resolve the issues of unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased light scatter from surfaces and poor facial recognition;
- Luminaires with an Upward Light Ratio above zero will be used;
- Any lights installed should incorporate PIR/motion sensors if possible, which are set on a short interval once triggered (<5 minutes);
- If/ where outside security lighting is required these will be specified with ecologist and lighting engineer input to avoid later unchecked installation by the householders. These should be set on a motion-sensors and timers to decrease the light pollution impacts. These lights will also be directed away from vegetation (and hooded/cowled where necessary) and be of the lowest intensity/brightness necessary for their purpose;
- Where required, accessories such as baffles, hoods or louvres will be used on the lamps to reduce light spill;
- The potential for glare to act upon dark corridors must be considered and managed where possible; and

- The orientation of fences, walls, the open space of gardens and other permanent features can be used to achieve the lighting strategy parameters.

A lighting strategy or design is required. Lux contour plans should be produced by a qualified lighting engineer. The following requirements are recommended:

- All modelling should include the combined effect of internal and external light spill;
- Four horizontal calculation planes used; one at ground level, one at 1 m in height, one at 3 m in height and one at roof height;
- Vertical calculation planes should be used where appropriate to show the illumination directly upon the edges of the habitat features used by foraging and commuting bats;
- Each plot should be accompanied by their minimum, average and maximum Lux values;
- Where dimming, PIR or variable illuminance states are to be used, a plot should accompany each of these states;
- The contours for 0.1, 0.2, 0.5, 1, 2 and 3 Lux (and up to 10 Lux in 1 Lux intervals) must be clearly shown as well as contours for values above these in either 5 or 10 Lux intervals;
- Modelled plots should not include any light attenuation factor from new or existing planting due to the lag time between planting and establishment and the risk of damage, removal or failure of vegetation which may result in difficulties in enforcing the screening effect or when undertaking post-construction compliance surveys;
- Only a maintenance factor of 1 may be used in order to best replicate the brightness of luminaires to be expected at 'Day 1' of operation; and
- The lux contour plots should be accompanied by an explanatory note from the lighting engineer to list where, in their opinion, sources of glare (essentially the experience of high contrast between a light source and the surrounding darkness) acting upon the dark corridors may occur and what has been done/can be done to reduce their impacts (hoods, screening, orientation, reconfiguration etc).

REFERENCES

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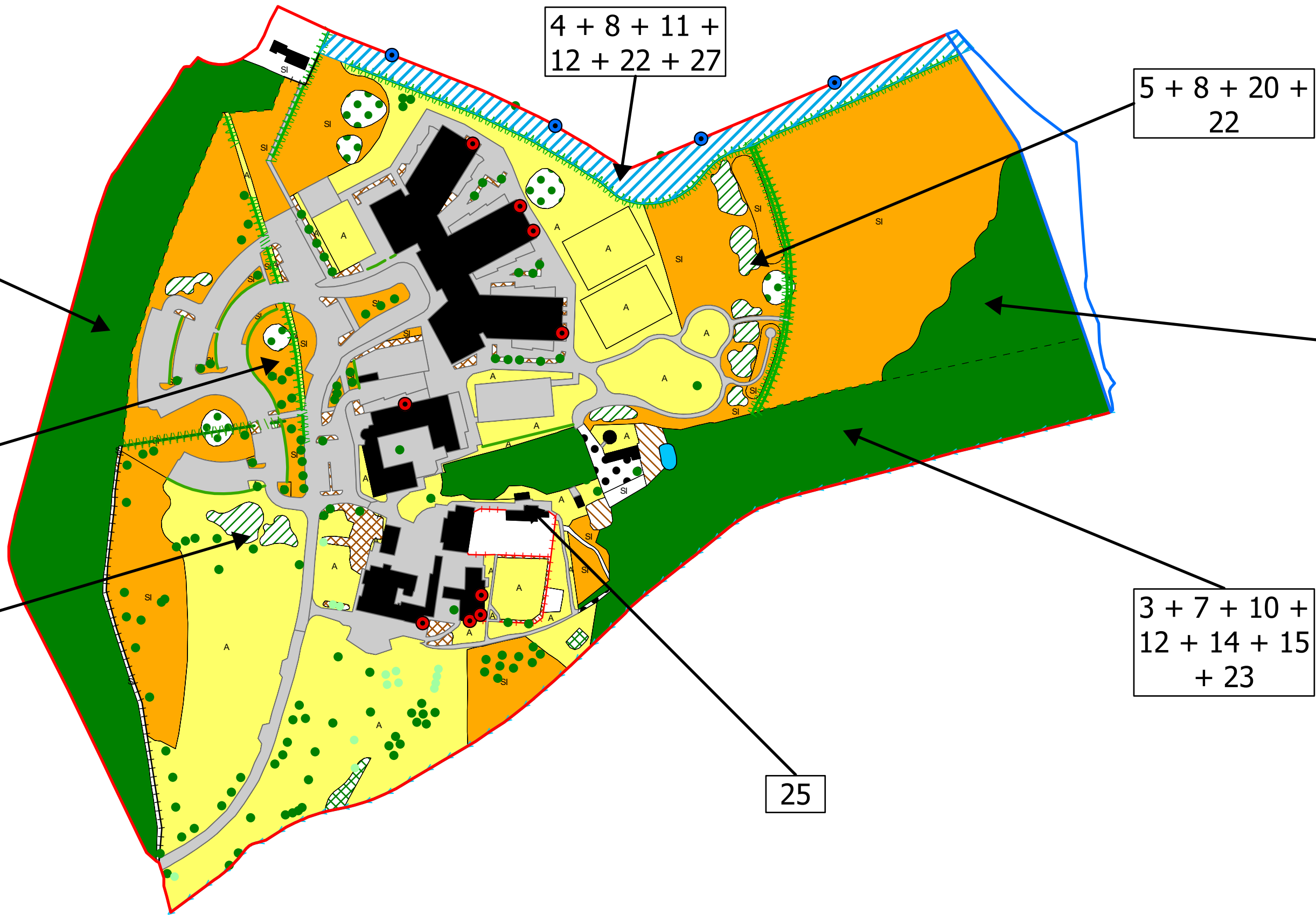
APPENDIX A – LOCATION OF BAT ROOSTS



0 50 100 Meters

Construction:

- 1: Preparation and implementation of Construction Environmental Management Plan (CEMP) through Condition to set out specific measures, supervision and monitoring to avoid or minimise all potential construction related effects arising from; lighting, vibration, noise, dust and pollutants affecting retained vegetation, using industry best practice methodologies and guidance. All ecological elements to be supervised by a suitably qualified ecologist (Ecological Clerk of Works – EcoW) and carried out by ecologists and ecological contractors.
- 2: Preparation of Landscape and Ecology Management Plan (LEMP) through Condition to introduce a long-term programme of high quality and appropriate management of retained, enhanced and newly created habitats to increase habitat diversity, quality and ecological value. All works to be supervised by a suitably qualified ecologist and carried out by ecologists and ecological contractors.
- 3: Boundary habitats and individual trees will not be subject to an increase in lighting levels (<0.5 lux) during the construction phase. There will be no construction lighting used between dusk and dawn, to minimise impacts on nocturnal species i.e. bats and badgers.
- 4: Creation of a 12m wide dark bat corridor along the northern boundary, which will be have a 6m wide bund created along the area directly to the north of the new school building which will be planted with a mix of species including evergreens (holly and yew) as well as large standard trees. Planting of this belt of trees and shrubs will be completed prior to the start of construction to provide immediate screening from potential light spill. Monitoring of the lux levels will commence and if required close board fencing will be erected to screen the corridor from increased light levels until vegetation has grown in sufficiently. Minimal management along this area will encourage species such as bramble and nettle to grow to discourage human access. This buffer zone will support and protect the key connective habitat along the northern boundary during the construction phase.
- 5: Additional landscape planting (standard trees and hedgerows) have been strategically placed in order to create and promote dark corridors across the Site for bat species, in particular lesser horseshoe bats. Dark corridors in an east to west direction and a south to north direction have been created to maintain commuting routes for lesser horseshoe bats from the onsite maternity roost, to ensure the continued ecological functionality of this roost that is linked to the Bath and Bradford-on-Avon bat SAC.
- 6: Installation of a 20m buffer of Site demarcation fencing around tree 27 will be installed to protect the tree and the bat roost within it from accidental damage and to maintain functionality of the Bechstein's bat roost until a natural England EPS license has been granted to fell the tree.
- 7: Provision of a minimum of 10 no. artificial bat boxes that are known to support woodland specialist bat species such as Bechstein's bats, will be mounted on retained mature trees throughout the Rowdeford woodland parcels, in April/May ahead of any construction works commencing. These boxes will provide enhancement for crevice dwelling woodland bat species. Boxes will be a mixture of 3 X Schwegler 1FW, 5 X Schwegler 2FN and 2 X bark boxes
- 8: Approximately 0.782 km of native species rich hedgerows and 0.301 of native species poor hedgerows will be planted or enhanced within the Site to improve the ecological value and connectivity across the Site. This will include planting of new hedgerows to create additional bat corridors. Hedgerow 1 will be enhanced through gap planting and long-term management.
- 9: Creation of approx. 0.46ha of wet woodland, 0.18ha of mixed woodland copse, 1ha of amenity grassland and 2.66ha of species rich neutral grassland and approximately 100 additional trees planted across the Site as part of the landscape design. In ecologically sensitive areas such the traditional orchard, the grassland will be scarified and overseeded by hand to avoid damage to the trees by machinery. These habitats will help to increase the biomass of invertebrate prey species and therefore increase the foraging potential for bats species utilising the Site
- 10: No Site boundary habitats will be exposed to operational lighting levels that exceed 0.5 lux to ensure their continued functionality for light sensitive species of bat and other nocturnal animals. Lighting has also been carefully planned to maintain dark corridors, and lighting of existing roosts or retained trees has been avoided. Operational lighting for the site has been designed by specialist lighting consultants in consultation with the project ecologists to ensure the continued ecological functionality of the site for bats, (in particular lesser horseshoe bats). Luminaries have been selected to be LED type with a low colour temperature of 3000K, warm white, to avoid attracting invertebrate species, especially moths in order to prevent degradation of adjacent retained habitats. Luminaries within the site will function on PIR timers to ensure the site has minimal impacts on nocturnal wildlife from artificial lighting. Existing luminaries within the site will be upgraded to the new lighting specification to further minimise the effects of artificial lighting.
- 11: Monitoring of lux levels to ensure no illumination of the northern dark corridor through Lux level mapping during summer to ensure 0.5 lux levels are achieved at year 1, 3 and 5 of operation.
- 12: Monitoring of bat activity through static detectors deployed within the northern dark corridor, woodland parcels and other identified flight paths from the maternity roost during summer to compare activity levels at year 1, 3 and 5 of operation.



13: The LEMP will be implemented during operation to manage the retained, enhanced and created habitats within the proposed development site. Habitats will be monitoring every 5 years and the results will feed into updated LEMP specifications.

14: Installation of Site demarcation fencing/tree protection fencing to protect root zones throughout the Site in accordance with BS5837:2012 to prevent accidental access and use of signage as necessary, especially along both the western boundary and southern boundary of the LWS woodlands to protect from accidental damage and to maintain functionality of the woodland for bats and badgers throughout the construction period.

15: No dig construction, or change in levels, as appropriate within root protection zones to ensure the on-going vitality and viability of the woodland areas and root protection areas of important retained trees.

16: Installation of a 30m buffer of Site demarcation fencing will be installed to protect setts from accidental damage and to maintain functionality of the setts throughout the construction period. This buffer will act as a no dig construction area, planting is permitted within the buffer but must be carried out by hand to minimise disturbance. Badger access holes will be provided in all temporary and permanent fencing at the site and in particular along the northern boundary. Fencing holes need to be a minimum of 250mm (H) x 200mm (W).

17: During construction, open excavations will be covered at night or suitable ramps will be placed in trenches to allow for the escape of any trapped mammals such as badgers and hedgehogs.

18: Pre-construction badger surveys will be carried out to ensure no new setts have been excavated within or adjacent to the working area. Checks will be made by an Ecological Clerk of Works to ensure the demarcation fencing around the setts is maintained during construction to avoid accidental damage. If considered necessary, a Natural England badger licence will be sought to ensure legal compliance in terms of disturbance of any setts and any requirements for exclusions/sett closure/provision of artificial setts is addressed.

19: Production and implementation of a Precautionary Method Statement for herptiles (reptiles and amphibians) to ensure their protection during pre-commencement works and the construction phase of the development. Use of an Ecological Clerk of Works as required during construction.

20: Phased directional reduction in vegetation height and extent (first cut to 15cm, to 5cm and then to ground level) with arisings being removed from areas that will be affected by construction. Vegetation maintained with a short sward height until construction works commence. Precautionary hand search followed by destructive search of the dry ditch with adjacent stone wall overseen by an Ecological Clerk of Works.

21: Avoidance of potential effects on actively nesting birds, young, eggs and nest through the avoidance of vegetation clearance works between February and August inclusive, or through the use of a suitably qualified ecologist who has confirmed no nesting activity present within 48 hours of clearance between February and August.

22: Increased potential nesting and foraging habitat in newly created hedgerows, planted trees and within the bat mitigation corridor for common garden bird species.

23: Provision of a minimum of 20no. nest boxes within suitable mature trees.

24: Any trees with potential roost features for bats that are due to be removed, will be subject to an aerial climbing survey prior to soft felling to ensure no bats are present.

25: Monitoring of the lesser horseshoe maternity roost population within the Site by conducting emergence/re-entry surveys at year 1, 3, 5 and 10 of operation.

26: 3 Schwegler 2FR and Schwegler 3 1FR bat tubes will be installed in the new Silverwood school building to enhance the building for roosting bats. The tube dimensions are 470mm (H) x 200mm (W) x 125mm (D) and will be integrated into the building elevations, in proximity to the dark bat corridor and avoiding being in proximity to external lighting and windows where possible. Five 2FE or 1FF Schwegler bat boxes will be installed on the east facing gable wall of the orangery and the south and east face of the Orchard Building and the northern face of the Buzzard Block to enhance the Site for roosting bats (the walls are not high enough on the Music Building and Courtyard Buildings).

27: The proposed northern fence line will require hedgehog and badger access. Fencing holes need to be a minimum of 250mm (H) x 200mm (W) to allow access for both hedgehogs and badgers.



- Land Owned by Wiltshire Council
- Site Boundary
- Bat Mitigation Corridor
- Indicative Bat Box Locations (Measure 26)
- Indicative Badger Access Points in Fenceline (Measure 27)
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A2.1 - Scrub - dense/continuous
- A3.1 - Broadleaved Parkland/scattered trees
- B2.2 - Neutral grassland - semi-improved
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- G1 - Standing water
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.4 - Introduced shrub
- J3.6 - Buildings
- J4 - Bare ground
- J5 - Other habitat
- J5.1 - Hardstanding
- G2 - Running water
- J2.1.1 - Intact hedge - native species-rich (Created)
- J2.1.1 - Intact hedge - native species-rich (Enhanced)
- J2.2.2 - Defunct hedge - species-poor
- J2.4 - Fence
- J2.5 - Wall
- J2.1.2 - Intact hedge - species-poor (Created)
- A3.1 - Broadleaved tree
- A3.2 - Coniferous tree

CLIENT	Wiltshire Council		
PROJECT	Rowdeford School - New Special School - Further Ecological Surveys		
TITLE	Integrated and Embedded Ecological Mitigation and Enhancement Masterplan		
SCALE @ A1	CREATED BY	CHECKED BY	
1:2,000	JS	KN	
REFERENCE	REVISION	DATE ISSUED	
J00405-019		21/5/2021	
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