Parliament Hill School, Highgate Road, London, NW5 1RL

Bat & Bird Box Specification

July 2018

Job No. 6340.2

Contact:
Ben Ashbury, GSS Architecture
Tel: 01536 219018
E-mail: bfla@gotch.co.uk

The Ecology Consultancy
Tempus Wharf
33a Bermondsey Wall West
London SE16 4TQ
Email: toni@ecologyconsultancy.co.uk
Tel: 0207 378 1914

Client: Farrans Construction Ltd C/o Gotch Saunders & Surridge LLP

Approved by: Wendy McFarlane MA MSc MCIEEM

Date: 02 July 2018

Written by: Verity Heard BSc MSc GradCIEEM

1 INTRODUCTION

Background

1.1 This is a memorandum report by the Ecology Consultancy for Farrans Construction Ltd which documents the specification for a selection of boxes targeting three bird species i.e. house sparrow, starling and swift and two crevice dwelling bat species at Parliament Hill School, Highgate Road, London, NW5 1RL.

1.2 Farrans Construction Ltd have been granted planning permission to demolish buildings along the western and southern edge of site, in between Parliament Hill & William Ellis School and construct the following:

- a three storey building along the southern boundary (Parliament Hill School); enclose inner courtyard,
- a two storey extension towards northern boundary (William Ellis School);
- a single storey building along Highgate Road (La SWAP Sixth Form) and;
- refurbish the existing dining hall, along with associated alterations to boundary treatment, new multi-use games areas, hard and soft landscaping throughout the site;

1.3 The planning permission is subject to a number of conditions. Condition 6 relates to the siting and quantity of bird and bat boxes, and states that:

'Full details, in respect of the following, shall be submitted to and approved in writing by the local planning authority before the relevant part of the work commences:
a) All hard and soft landscaping and means of enclosure of all unbuilt open areas including pedestrian access points on Highgate Road and planting adjacent to the new sports hall facade.
b) Details of all tree replacements, including species, sizes (of immediate contribution to amenity), location.
c) Details of biodiversity enhancements including a plan showing details of bird and bat box locations and types and indication of species to be accommodated.
d) Details of planted screen(s) on the boundaries with Clevedon Mansions and Lissenden Mansions.

Reason: To ensure that the landscaping is carried out within a reasonable period; to maintain a high quality of visual amenity in the scheme; to protect the amenities of neighbouring occupiers and to secure appropriate features to conserve and enhance wildlife habitats and biodiversity measures, in accordance with policies D1, D2, A1, A2 of the Camden Local Plan 2017'.

1.4 The following document provides details on the number, type/model, location, installation/attachment method and maintenance of bird nesting and bat roosting boxes. A plan showing the location of boxes is included as Appendix 1.

Site Context and Status

1.5 The development site is centred on Ordnance Survey National Grid reference TQ 282 860 and is located in Gospel Oak within the Borough of Camden, London.

1.6 The site comprises a school complex set within mature landscaped grounds and playing fields. It is on a gentle slope from north to south and the buildings have been built in to the slopes throughout the site. Highgate Road lies immediately east of the site. However, in the west of the site it is well connected to surrounding habitats via

tree lines and shrubs which is directly connected to Hampstead Heath and a large playing field.

2 TARGET SPECIES

Birds

2.1 Bird Species of Principal Importance to the Conservation of Biodiversity in England (SPI) identified within the London and Camden Biodiversity Action Plans (BAPs), for which the site could provide suitable habitat include: swift, house sparrow and starling. All nesting birds are protected by the Wildlife and Countryside Act 1981 (as amended) (see Appendix 3).

Bats

2.2 Boxes to attract common pipistrelle and soprano pipistrelles bats have been specifically chosen as these species are known to utilise domestic buildings and are also of conservation concern (JNCC, 2016) . They have also been recorded on site during the Bat Presence/Absence survey conducted in 2016 (Innovation Group, 2016). Estimates from the National Bat Colony Survey suggest that pipistrelle species have undergone a population decline of approximately 70% between 1978 and 1993 (SBP, 2011). All bat species are London BAP Priority Species. Soprano pipistrelle is an SPI.

2.3 Bats are European Protected Species protected by the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (as amended) (see Appendix 3).

3.0 SPECIFICATIONS

Approach

3.1 It is recommended that both hanging boxes and those integrated into the building structure are incorporated. The integrated system requires less maintenance, is more durable with a life span equal to the building's fabric and with a less visible alteration to the building.

3.2 Each bird and bat species require different box types with different designs, sized opening and positioning. The table in Appendix 2 shows the requirements of each species and the optimum location and positioning for each box.

4 GUIDELINES

4.1 The following ecological and design requirements were considered in choosing the type, location, orientation and number of bird and bat boxes:

- Boxes will have no impact on the building's performance;
- Locating swift boxes on aspects out of direct sunlight, built in under eaves/soffits (if present) for increased protection from the elements and away from predators (cats, magpies, squirrels, rats) and vandalism;
- Grouping of bird boxes on buildings to increase uptake by communal species;
- The use of a terrace type house sparrow box and grouping of swift boxes to maximise uptake by these colonial nesting species;
- Avoiding (where possible) locating boxes on front elevations of buildings, above windows/balconies or where boxes are easily overlooked/disturbed or in close proximity to mechanical outlet extractors;
- Avoiding locations likely to be subject to increased light levels;
- Presence of an uninterrupted drop below swift boxes of a minimum of 5m; and
- Locating bird boxes in close proximity to green space and potential foraging habitat.

5 BOX TYPES

Birds

Swift

5.1 Swifts are a bird species that are commonly associated with urban areas. For many years they have depended on the voids in roof structures for nesting, but their populations are now in serious decline. This is partly because of problems they face in finding nest places in modern designed buildings e.g. roof tiles are replaced with modern equivalents or flat roofs, and wooden soffits replaced with uPVC. Swifts are an Amber List Bird of Conservation Concern (BoCC4)[1] (Eaton *et al*., 2015) species.

[1] Birds of Conservation Concern status is prioritised into high concern (Red), medium concern (Amber) and low concern (Green) (Eaton *et al*, 2015). Red-list species are those that are globally threatened according to the IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery. Amber-list species are those with an unfavourable conservation status in Europe; those whose population or range has declined moderately in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations. Green-list species are those that fulfil none of the criteria.

5.2 Fortunately, swift nest boxes and nest bricks that can be built into walls, eaves and soffits are now widely available and in several different forms. These are self-contained and self-maintaining, and can be incorporated into the building design with no impact on the building's performance (see examples below). Integrated features are preferable as these have potentially more stable thermal qualities than boxes attached to the exterior of the new build. Ecosurv boxes are recommended as these can be designed on a bespoke basis and can be clad with materials which match the external fabric of the building (http://www.ecosurv.co.uk/products) (see examples below).

5.3 Swift boxes need to be installed at least 5 metres (m) above ground level and have unobstructed airspace in front of the box entrance to allow for uninterrupted ingress/egress.

Swift Box with Brick facing

Swift Box with Stone facing

House sparrow

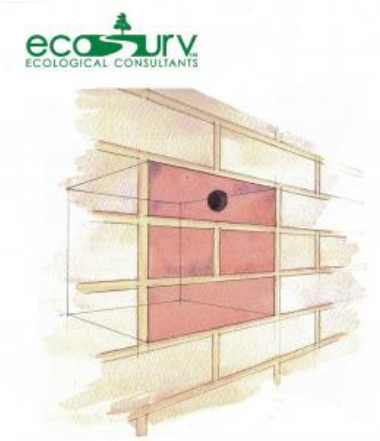
5.4 House sparrows have suffered catastrophic decline in their numbers over recent years, and the loss of nest sites through redevelopment and refurbishment may be partly responsible. Nest boxes specifically designed for this species are available, which provide for the colonial nesting of two or more pairs (see examples below). House sparrow is a Species of Principle Importance and Red List BoCC4 (Eaton et al., 2015).

5.5 We recommend the terrace style nest boxes, with multiple nesting boxes per unit, made by Schwegler ideal for the social nature of the house sparrow. In addition to a 1B Schwegler Nest Box suitable for trees. These boxes should have a 32mm entrance hole attractive to house sparrows in addition to other species such as blue tits and great tits.

Starling

5.6 Starling numbers have declined markedly across much of northern Europe and the UK. Long-term monitoring by the British Trust for Ornithology (BTO) shows that starling numbers have fallen by 66 per cent in Britain since the mid-1970s. The cause of the starling decline in the UK is unknown, however, may be due to their food supply declining or becoming less available during dry summers and the loss of suitable cavities in buildings and trees for nesting (RSPB,2016). Starling are a London and Camden Biodiversity Action Plan Priority Species.

5.7 We recommend installing the Schwegler 1SG Starling nest box in trees and the Ecosurv integrated starling nest box.

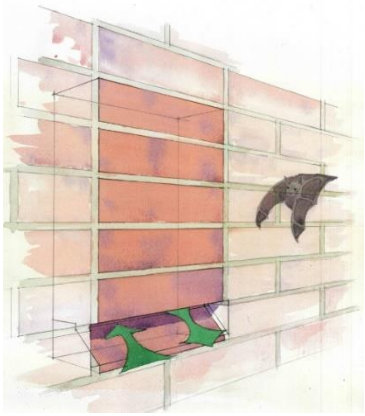


Bats – Crevice dwelling

5.8 Man-made roosts can provide stable micro-climates for bats. Loss of natural roosts has increased the importance of man-made structures for bats to the point that artificial roosts are becoming essential for the survival of many bat species.

5.9 There are numerous styles and designs of bat boxes that can be positioned on houses both externally and internally. The fully integrated bat box by Habibat (see below) is recommended for new buildings and the Schwegler 1FQ for existing buildings.

5.10 These boxes are designed with an angled internal floor allowing droppings to fall out of the entrance slot, removing the need for cleaning (by licensed bat ecologists) and creating a grip-able surface for bats to enter. Both boxes have an integrated V system to increase the surface for bats to roost against and allowing them to move around. The integrated habibat box can be faced with a number of products to suit the design build including, brick, block, stone, wood or a rendered finish, ensuring the box is unobtrusive and aesthetically pleasing.



Habibat 001 Bat Box

Schwegler 1FQ bat box

6 LOCATION & NUMBER

6.1 To provide suitable nesting possibilities for each of the target species the following quantity of boxes for each species is recommeded:

Building/integrated boxes

2 x Ecoserve swift box

1 x 1SP Schwegler Sparrow Terrace

1 x Habibat 001 bat box

2 x 1FQ Schwegler bat box

Tree boxes

1 x 1B Schwegler bird nest box

1 x 3S Schwegler Starling nest box

3 x 1FF Schwegler bat box

3 x 2FN Schwegler bat box

6.2 As several of the target species are gregarious species their nesting boxes have been grouped together to allow communal nesting (see Appendix 1).

6.3 The positioning of each box follows the requirements for each target species in accordance with the Design for Biodiversity guidelines (Gunnell *et al*., 2013).

BIRDS

Swift

6.4 The swift box will be positioned as close to roof level as possible on the south western elevation of the Teaching block building (see Appendix 1). This elevation allows the highest uninterrupted drop from the boxes and is out of direct sunlight which should prevent overheating of the nests due to the close proximity of scattered trees.

House sparrow

6.5 There will be one terrace box (1SP) with six nesting holes positioned on the western elevation of the existing WES building (see Appendix 1). This elevation has a space on either side that is devoid of windows and therefore presents the least amount of disturbance both to the birds and residents. It is also adjacent to a large playing field which leads onto Hampstead Heath.

6.6 The box will need to be positioned as close to the roof line as possible, under any gutters or soffits to allow maximum height and protection.

6.7 The Schwegler 1B nest box with a 32mm entrance hole will be positioned on the mature tree in the east and west of the site that is within close proximity to other soft landscaping. Lighting is likely to be reduced in this area and it is located away from the main access road and carparking.

6.8 The boxes should be placed on the trunk at least 2m in height, facing south-east as this allows exposure to the sun in the morning, but allows relief from constant, direct sunlight in the afternoons. It should be attached using adjustable straps to take into account annual incremental growth of the tree's stem, and primary and secondary lateral branches.

Bat – Crevice dwelling.

6.9 One integrated bat box (Habibat 001) will be positioned within the south west elevation of the teaching block building (see Appendix 1). The box will need to be positioned as high as possible (minimum of 5m), close to the roof line, underneath any gutters to allow maximum uninterrupted drop from the box and it should be positioned as far away from the emergency exit lighting and door.

6.10 A south west elevation was chosen as warm roost temperatures are important in summer for pregnant and lactating females and their young. This location likely to be sheltered from strong winds and exposed to the sun for part of the day. A number of suitable trees are also present providing suitable commuting routes and a grassland is also proposed nearby, likely to attract a wide variety of insects for bats to prey on.

6.11 The 1FF and 2FN Schwegler bat boxes shall be located on mature trees throughout the site (see Appendix 1). The majority will be located in the east adjacent land belonging to Hampstead Heath and away from proposed lighting. This location is also where the majority of bat foraging and commuting activity was noted during the bat presence/absence survey undertaken by Innovation group environmental services (2016).

7 MAINTENANCE

7.1 Any building works in the vicinity of the bird boxes, or maintenance to them, should be timed to avoid breeding periods, which are as follows; common nesting birds March-August (inclusive) (Newton *et al*. 2011).

7.2 House sparrow and all multi-purpose nest boxes should be cleaned out on an annual basis (or at least bi-annually) at the end of the breeding season (autumn-winter), removing the old nests, dead birds etc. Swift boxes are self-contained and self-maintaining and will not require cleaning out.

7.3 Fixings/attachments of all boxes should be checked for safety and effectiveness on an annual basis (autumn-winter).

7.4 The design of the bat boxes means that cleaning and maintenance of them is not required. However, if there is need for the boxes to be moved in future this must be carried out by a licenced bat ecologist.

7.5 The access/egress points on the boxes must not be obscured by vegetation or other obstructions. Bats and birds will cling to the surface immediately beneath the egress/ingress before accessing the box, so it is important that this area remains clear.

7.6 Artificial lighting must not directly illuminate the bird and bat boxes to be installed as part of the development. The locations chosen are based on the lighting plan provided and in areas where lighting is low (Harvey First Class Services, 2018). Light

spill should be limited within the trees and areas of proposed new landscaping. Lighting recommendations (See Appendix 4) should be incorporated into the design in order to improve the likelihood of bats utilising these boxes and increase levels of bat activity in the vicinity.

8 REFERENCES

BCT, ILE (2009) Bats and Lighting in the UK. - *Bats and the Built Environment Series.* Available at: http://www.bats.org.uk/data/files/bats_and_lighting_in_the_uk__final_version_version_3_may_09.pdf

BCT (2008). Bats and lighting in the UK – *Bats and the built environment series.* http://www.bats.org.uk/publications_download.php/243/BATSANDLIGHTINGINTHEUKJan08.pdf

Camden Biodiversity Action Plan (2013) https://www.camden.gov.uk/ccm/content/leisure/outdoor-camden/wildlife-and-nature-conservation/camden-biodiversity-action-plan.en

Du Feu, C. (1989). BTO Guide 20: Nest Boxes. British Trust for Ornithology

Eaton, M.A., Aebischer, N.J., Brown, A. F., Hearn, R., Lock, L., Musgrove, A.J., Noble, D., Stroud, D., Gregory, R. (2015). Birds of Conservation Concern 4: The Population Status of Birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 102, pp296–341. [on-line]. Available from http://www.britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf [Accessed: 02.07.18].

Gunnell, K. Murphy, B. & Williams, C. (2013) *Designing for Biodiversity: A Technical Guide for New and Existing Buildings – 2nd Edition*. RIBA Publishing, London.

Fure, A. (2006) *Bats and Lighting*. The London Naturalist, No. 85.

Gunnell, K., Grant, G. and Williams, C. (2012) *Landscape and Urban Design for Bats and Biodiversity*. Bat Conservation Trust, London.

Harvey First Class Services (2018) External Lighting

Innovation Group Environmental Services (2016) Bat Presence/Absence survey.

Jones, J (2000). *Impact of Lighting on Bats*. Bat Conservation Trust, London.

JNCC (2016) *UK BAP priority terrestrial mammal species. Available at:* http://jncc.defra.gov.uk/page-5170[Accessed: 02.07.18].

Lack, D. *The Life of the Robin.* 4th Edition Collins 1965.

Langevelde, V.F., Ettema, J.A., Donners, M., WallisDeVries., M.F. and Groenendijk., D. (2011) *Effect of Spectral Composition of Artificial Light on the Attraction of Moths*. Biological Conservation 144 : 2274-2281The Ecology Consultancy (2013) *Moberly Sports Centre, London.* Preliminary Ecological Appraisal.

National Planning Policy Framework, Government (2012). http://planningguidance.planningportal.gov.uk/ [Accessed: 27/06/18].

Rawson, H. E. A. Bird's Song in Relation to Light. Trans. Herts Natural History Society 17 1932.

RSPB (2018) Common Starling Bird Facts https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/starling

Schwegler (2010). Available from www.schwegler-natur.de [Accessed: 27/06/2018].

Swift Conservation. http://www.londons-swifts.org.uk

The Mayor of London's Office and the Biodiversity Partnership (2007) London Biodiversity Action Plan

Appendix 1: Proposed plans

Figure 1 : Location of bird and bat boxes – site plan

Appendix 2: General outline of roosting and nesting requirements (taken from Gunnell et al., 2013)

Species	Access dimensions	Roost/nesting dimensions	Height of entry	Aspect of roost	Materials and other comments
Bats	20-50mm (w) x 15-20mm (h)	Any size as long as some components of the area are crevices in the region of 20-30mm. Greater total areas of about 1 sq. m would be useful for nursery (summer) roosts. Male roosts contain smaller numbers of bats or even individual bats.	2-7 m	Summer nursery roosts on most southerly or westerly aspect for solar heating. However, the risk of overheating should be considered. A location that provides a stable microclimate may work better than one that heats up quickly and loses heat quickly. Male roosts and winter hibernation roosts on northerly aspects.	Rough (for grip), natural materials such as untreated timber, stone or masonry is preferred. Not toxic or corrosive with no risk of entanglement. Suitable thermal properties (reducing 24-hour fluctuations), but allowing suitable thermal gain for summer roosts. North facing boxes used for hibernating will benefit from using insulating materials. Large crevice spaces (particularly in the vertical dimension) can provide a range of temperatures, which will allow the bats to move according to their temperature needs. Access not lit by artificial lighting.
Swift	At least 65mm (w) x 33mm (h). This excludes starlings. The bottom of the hole should be no more than 5cm above the floor of the nest.	Floor area at least 350cm^2 e.g.: 12cmx30cm, 17.5cmx20cm, 15cmx25cm Preferably larger where space is available. Headroom as low as 75mm when space is constrained; recommended greater than 100mm where space is available.	At least 5m above ground and away from obstructions and creepers. Preferably integrated in to buildings, but where not possible external (under the eaves).	In shade, out of direct sunlight and away from windows.	Boxes made from concrete, masonry or marine ply or else compartments created within a suitable part of the building. It is important to have several potential nest sites for swifts in one area.
House sparrow	32mm diameter round hole. Bottom of the hole must be no less than 150mm from the base of the box.	150mm (w) x 250mm (h) x 150mm (d).	Ideally within the structure at soffit/eaves level, but otherwise as an external box at the same location. At least 3m high for starlings and 2m for sparrows.	Out of direct sun; preferable east-facing.	It is important to have several potential nest sites in one area. Can be as close as 150mm apart.

Starling	45mm diameter round hole.	180mm (w) x 300mm (h) x 180mm (d)	Under the eaves of a building or on a mature tree. Atleast 4m from the ground	Out of direct sun; preferable east-facing.	Gregarious in nature, one or more boxes close to each other beneficial

Appendix 3: Legislation

BATS

All species of bat are fully protected under The Conservation of Habitats and Species Regulations 2017 (as amended) through their inclusion on Schedule 2. Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of Schedule 2 species (e.g. all bats)
- Deliberate disturbance of bat species as:

  a) to impair their ability:

  (i) to survive, breed, or reproduce, or to rear or nurture young;

  (ii) to hibernate or migrate

  b) to affect significantly the local distribution or abundance of the species
- Damage or destruction of a breeding site or resting place (strict liability)

Bats are also currently protected under the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5. This is subject to the defence: incidental result of an otherwise lawful operation. Under this Act, they are additionally protected from:

- Intentional or reckless disturbance of an animal or obstruction of access to any place of shelter or protection,

The NERC Act 2006 states that 'every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity', otherwise known as the Biodiversity Duty. Under Section 41 of the Act, the Secretary of State must publish a list of the living organisms and types of habitat which in the Secretary of State's opinion are 'Species of Principal Importance for the purpose of conserving Biodiversity' (SPIBs). This list is based on priority species recognised by the UK Biodiversity Action Plan (BAP), and in addition to Annex II species listed under The Conservation of Habitats and Species Regulations 2010 (as amended). The S41 SPIBs list replaces the list published under Section 74 of the Countryside and Rights of Way (CRoW) Act 2000 as those species of material consideration to the planning process.

How is the legislation pertaining to bats liable to affect development works?

A European Protected Species Mitigation (EPSM) licence issued by the relevant competent authority (e.g. Natural England) will be required for operations likely to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young and hibernate). The licence is to allow derogation from the relevant

legislation but also to enable appropriate mitigation measures to be put in place and their efficacy to be monitored.

The legislation may also be interpreted such that, in certain circumstances, important foraging areas and/or commuting routes can be regarded as being afforded *de facto* protection, for example, where it can be proven that the continued usage of such areas is crucial to maintaining the integrity and long-term viability of a bat roost.

BIRDS

With certain exceptions, all birds, their nests and eggs are protected under Sections 1-8 of the Wildlife and Countryside Act 1981 (as amended). Among other things, this makes it an offence to:

- Intentionally kill, injure or take any wild bird
- Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built
- Intentionally take or destroy an egg of any wild bird

Certain species of bird, for example the barn owl, black redstart, hobby, bittern and kingfisher receive additional special protection under Schedule 1 of the Act and Annex 1 of the European Community Directive on the Conservation of Wild Birds (2009/147/EC). This affords them protection against:

- Intentional or reckless disturbance while it is building a nest or is in, on or near a nest containing eggs or young
- Intentional or reckless disturbance of dependent young of such a bird

To avoid contravention of the Wildlife and Countryside Act 1981 (as amended), works should be planned to avoid the possibility of killing or injuring any wild bird, or damaging or destroying their nests. The most effective way to reduce the likelihood of nest destruction in particular is to undertake work outside the main bird nesting season which typically runs from March to August. Where this is not feasible, it will be necessary to have any areas of suitable habitat thoroughly checked for nests prior to vegetation clearance.

Those species of bird listed on Schedule 1 are additionally protected against disturbance during the nesting season. Thus, it will be necessary to ensure that no potentially disturbing works are undertaken in the vicinity of the nest. The most effective way to avoid disturbance is to postpone works until the young have fledged. If this is not feasible, it may be possible to maintain an appropriate buffer zone or standoff around the nest.

Appendix 4: Best Practice Lighting Recommendations for Bats

Lighting

The following mitigation strategies have been taken from Bat Conservation Trust Landscape and Urban Design for Bats and Biodiversity (Gunnell *et al*., 2012) and other referenced sources:

- Minimise light spill by eliminating any bare bulbs and upward pointing light fixtures. The spread of light should be kept near to or below the horizontal plane, by using as steep a downward angle as possible and/or shield hood. Flat, cut-off lanterns are best;
- Use light sources that emit minimal ultra-violet light (Langevelde *et al*., 2001) and avoid the white and blue wavelengths of the light spectrum, so as to avoid attracting insects and thus potentially reducing numbers in adjacent areas, which bats may use for foraging;
- Limiting the height of lighting columns to eight metres and increase the spacing of lighting columns (Fure, 2006) can reduce the spill of light into unwanted areas such as the aforementioned habitats;
- For pedestrian lighting, low level lighting that is directional and below three lux at ground level, but preferably below one lux should be used;
- Use embedded road lights to illuminate the roadway and light only high-risk stretches of roads (crossings and junctions);
- Avoid using reflective surfaces under lights or light reflecting off windows (e.g. onto bat flight lines);
- Only the minimum amount of light needed for safety and access should be used and or turned off when the site is not in use;
- Artificial lighting proposals should not directly illuminate tree lines, which may be of value to foraging or commuting bats and birds (e.g. the trees along the northern and western boundaries of the site);
- Artificial lighting should not directly illuminate any bat roosting features that are installed within the proposed development;
- Lux levels should be below five lux and the lights should be controlled via a passive infrared (PIR) sensor, only operating when activated by motion within proximity of the light;
- Lighting that is required for security reasons should use a lamp of no greater than 2000 lumes (150 Watts) and be PIR sensor activated, to ensure that the lights are not on only when required (Jones, 2000; BCT, 2008);
- Uplighters should be avoided, particularly at the base of trees and within the aforementioned habitats; and

- If possible ‘dark zones’ could be created by limiting or removing lighting within a 5 - 10m buffer between lit areas and the dark, vegetated boundary habitat. Scattered ‘dark zones’ and dark corridors bisecting the site should also be provided to further enhance commuting/foraging behaviour for bats.

The Ecology Consultancy is part of the Temple Group.

Making places better for people and wildlife

London - Tempus Wharf, 33a Bermondsey Wall West, London, SE16 4TQ
T. 020 7378 1914 **W.** www.ecologyconsultancy.co.uk **E.** enquiries@ecologyconsultancy.co.uk

- **Sussex -** The Old Dairy, Barcombe Mills Road, Lewes, East Sussex BN8 5FF **T.** 01273 813739
- **East Anglia -** Thorpe House, 79 Thorpe Road, Norwich NR1 1UA **T.** 01603 628408
- **Midlands -** 9 The Mews, Trent Park, Eastern Avenue, Lichfield WS13 6RN **T.** 01543 728971
- **North -** Trinity Walk, Unit G37b, Market Walk, Wakefield, West Yorkshire WF1 1QR **T.** 01924 683558
- **Scotland -** 3 Coates Place, Edinburgh Scotland EH3 7AA **T.** 0131 225 8610