Goldcrest Land Plc

Hawley Mews, Camden

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ECOLOGY REPORT - LANDSCAPE DESIGN & ENHANCEMENTS

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Contents

1 INTRODUCTION

Goldcrest Land Plc, commissioned Kate Priestman Limited in September 2015, to undertake a Phase 1 Habitat Survey in line with the Ecology requirements of Code for Sustainable Homes, 2010 (Eco 1 to Eco 4) for Hawley Mews, Camden, London (hereafter described as the 'site').

The subsequent report[1] described the findings of the Phase 1 Habitat Survey and assessed each of the ecology credits that may be awarded to the subject site and redevelopment proposals, in accordance with Code for Sustainable Homes, 2010 criteria.

A second revision of the report was issued in February 2016 in order to incorporate changes to the landscape design scheme. The Code for Sustainable Homes Ecology Report (Rev.2)[1] in addition to this report, will be submitted to support planning application no. 2015/3383/P:

"Details of green roof and soft landscaping required by condition 11 of planning permission 2013/3794/P dated 04/06/2014 for redevelopment of former car park to provide three no. two bedroom mews houses".

Condition 11 reads:

"Full details in respect of the green roof and green wall as indicated on the approved plans shall be submitted to and approved in writing by the local planning authority before the relevant part of the development commences".

It is understood that the buildings shall not be occupied until the approved details have been implemented and that these works shall be permanently retained and maintained thereafter.

This report provides further advice and guidance with regards to the landscape design proposals for the site, in terms of type of planting, species and subsequent management, to ensure that they are maintained according to best practice guidance and uphold any legislative and policy requirements.

1.1 Background

The Phase 1 Habitat Survey visit was carried out in September 2015; at this time the Hawley Mews site comprised a vacant area of land located in the highly urbanised setting of Camden, London.

There were no buildings or structures on site and surface cover comprised hardstanding. The site was located adjacent to residential properties (north, east and south east) and commercial properties (south and west). Hawley Mews (road) provided access from the south.

[1] Hawley Mews, Camden - Code for Sustainable Homes Ecology Report, October 2015 (Ref. 0039_001). Kate Priestman Limited. Superceded by the following report: Hawley Mews, Camden - Code for Sustainable Homes Ecology Report, February 2016 (Ref. 0039_001 Rev.2). Kate Priestman Limited.

The proposed development comprises the construction of three residential properties. The buildings would be flat roofed and two-storeys in height.

1.2 Aims and Objectives

The aims and objectives of this report are as follows:

- to provide guidance regarding species that are appropriate for a living wall.
- Provide details regarding the type of living roof to install in order to maximise the species range.
- Detail management, outlining how the living roof and living wall planting will be maintained once installed.

1.3 Legislation, Policy and Guidance

This report is produced in accordance with relevant legislation, policy, best practice guidance and local biodiversity targets. Those that are relevant to this appraisal are summarised in the Appendices (A1).

1.4 Report Structure

Section 2 provides a summary of previous ecology studies undertaken on the site, Section 3 provides habitat/enhancement specifications and Section 4 provides advice on the management of the landscape features. Additional documentation is appended to the report.

2 BASELINE

The results of the Phase 1 Habitat Survey have influenced the landscape proposals for the site. The findings of this survey are summarised below.

2.1 Phase 1 Habitat Survey

Kate Priestman Limited undertook a Phase 1 Habitat Survey in September 2015 of the Hawley Mews site[1]. The survey was undertaken in order to inform the redevelopment proposals for the site and the ecology section of a Code for Sustainable Homes, 2010 assessment.

The study found that a number of sites designated for their nature conservation interest, were located within 2km of the subject site. A number of Priority Habitats were also located within close proximity. No sites of nature conservation importance were located within the site boundary or adjacent.

Habitat on site was found to be of relatively low ecological value, predominantly comprising hardstanding. Patches of tall ruderal species and climbing plants on site boundary fencing were of low intrinsic value, but were considered to be of some ecological value for birds and invertebrates as a foraging and refuge resource.

3 LANDSCAPE DESIGN & ENHANCEMENTS

In combining the interests of landscape and ecology, the scheme has been developed such that habitat creation will contribute to local and regional Priority Habitats and support Priority Species.

3.1 Enhancements

As part of the works, bird nest boxes and bat roost boxes will be installed within the fabric of the building (see Appendices A2). This will increase the nesting opportunities for local breeding bird populations and will increase roosting opportunities for local bat populations.

In addition, the proposed habitat creation (living roof and living wall) includes wildflower planting, which will increase the biodiversity value of the site for birds, invertebrates and bats; providing increased foraging and refuge potential (birds and invertebrates). The development proposals are considered likely to have a long-term beneficial effect on breeding bird, bat and invertebrate populations.

3.2 Living Wall

3.2.1 General

The provision of living walls within a development can significantly benefit biodiversity providing they are designed appropriately. They also provide other benefits such as increasing energy efficiency and minimising water runoff volumes. Living walls are especially valuable in an urban context where they can support species such as birds and invertebrates.

3.2.2 Type Chosen

The growing medium to support the living wall will be positioned at roof level. The plants will then effectively cascade down the wall surface from above. The following species have been suggested, as they are known to be of benefit to wildlife and are drought tolerant. In addition, they will provide visually appealing screening for properties that overlook the site.

- Ivy (*Hedera* spp.) - Ivy would provide year round cover and is already thriving on site. It needs very little management and is hardy. Ivy is of benefit to birds, invertebrates and bats.
- Clematis - Wild clematis/Old man's beard (*Clematis vitalba*) of benefit to birds, invertebrates and bats.
- Honeysuckles (*Lonicera* spp.) - including the native (*L. periclymenum*) of benefit to birds, invertebrates and bats.

3.3 Living Roof

3.3.1 General

The provision of living roofs within a development can significantly benefit biodiversity providing they are designed appropriately. They also provide other benefits such as increasing energy efficiency and minimising water runoff volumes.

Living roofs are especially valuable in an urban context with specific relevance to London. They contribute to Priority Targets; in particular the black redstart (*Phoenicurus ochruros*) is known to be supported by living roof systems. This species is protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) in addition to being a flagship species for London.

Other bird species, which can benefit from living roofs, include blackbird (*Turdus merula*), house sparrow (*Passer domesticus*), song thrush (*Turdus philomelos*), robin (*Erithacus rubecula*) and wren (*Troglodytes troglodytes*). Common invertebrates will quickly make use of these roofs but if designed appropriately, rare species associated with nutrient poor, sparsely vegetated habitats can benefit. Such species include declining bumblebee species (*Bombus sylvarum* and *B. humilis*) and butterflies (common blue *Polyommatus icarus*, brown argus *Plebeius agestis* and dingy skipper *Erynnis tages*).

3.3.2 Type Chosen

A living roof system such as that supplied by Wildflower Turf[2] will be used. The product has been developed to use a 'soil-less' system that is drought tolerant. The roof turf is made up of 41 UK native wildflowers and grasses, with a minimum of 50% wildflowers. The substrate that accompanies the turf has been developed to support plant growth whilst being free draining and lightweight.

Mounds of earth should be included in the roof design, and the turf placed over the mounds, this would create microclimates, which are of benefit to different species of invertebrates. In addition, small log piles and rocks placed across the roof would provide additional refuge for species.

The wildflower turf mats comprise the following species:

Grasses:

Crested Dogstail (*Cynosurus cristatus*)
Sheep's Fescue (*Festuca ovina*)
Slender Creeping Red Fescue (*Festuca rubra ssp. littoralis*)

Flora:

Autumn Hawkbit (*Scorzoneroides autumnalis*)
Betony (*Stachys officinalis*)
Birdsfoot Trefoil (*Lotus corniculatus*)
Bladder Campion (*Silene vulgaris*)
Cats Ear (*Hypochaeris radicata*)
Common Knapweed (*Centaurea nigra*)
Common Sorrel (*Rumex acetosa*)
Common Vetch (*Vicia sativa ssp. segetalis*)
Common Toadflax (*Linaria vulgaris*)
Cowslip (*Primula veris)*
Field Scabious (*Knautia arvensis*)
Greater Hawkbit (*Leontodon hispidus*)
Lady's Bedstraw (*Galium verum)*
Meadow Buttercup (*Ranunculus acris*)
Meadow Cranesbill (*Geranium pratense*)
Meadowsweet (*Filipendula ulmaria*)
Musk Mallow (*Malva moschata*)
Ox Eye Daisy (*Leucanthemum vulgare*)
Perforate St Johns Wort (*Hypericum perforatum*)

[2] http://www.wildflowerturf.co.uk/Products/wildflower-roof-turf.aspx

Ragged Robin (*Lychnis flos-cuculi*)
Red Campion (*Silene dioica*)
Ribwort Plantain (*Plantago lanceolata*)
Salad Burnet (*Sanguisorba minor*)
Self-heal (*Prunella vulgaris*)
Tufted Vetch (*Vicia cracca*)
Wild Carrot (*Daucus carota*)
Wild Marjoram (*Origanum vulgare*)
Wild Red Clover (*Trifolium pratense*)
White Campion (Silene latifolia) Yarrow (*Achillea millefolium*)
Black Medick (*Medicago lupulina*)
Clustered Bellflower (*Campanula glomerata*)
Hoary Plantain (*Plantago media*)
Rough Hawksbit (*Leontodon hispidus*)
Small Scabious (*Scabiosa columbaria*)
Vipers Bugloss (*Echium vulgare*)
Wild Pansy (*Viola tricolor*)
Thrift (*Armeria maritima*)

4 MANAGEMENT

If designed appropriately, living walls and roofs require minimal maintenance and ongoing management once established.

4.1 Living Wall

Watering of the living wall plants is needed for the first two weeks after installation to prevent them from drying out. After this time, the plants will need intermittent watering during long periods of dry weather. An annual check should be undertaken to remove any invasive and unwanted species. It may be necessary to replace any plants that have not established within the first few years.

4.2 Living Roof

Watering of the roof is needed for the first two weeks after installation to prevent the turf from drying out. After this time, the roof will need intermittent watering during long periods of dry weather.

Cutting of the roof is needed once every autumn (summer cut optional) using a strimmer. In addition, an annual check should be undertaken to remove species, which could damage the integrity of the roof structure and / or be invasive (for example, birch seedlings, buddleia).

Excessive vegetation dieback should be removed to prevent accumulation. Any clearance should be undertaken during winter months, however, it should be noted that a degree of dead vegetation can provide a habitat over the winter months for invertebrates as well as providing some protection for living plants and so a proportion should be retained.

It may be necessary to reseed or plug plant areas, which do not establish within the first few years. The wildflower mix should mean that the roof develops into a self-maintaining system and weeding is not necessary in the long term.

Consideration needs to be taken of the possible presence of breeding birds on the roof between the months of March and August (inclusive). Before any vegetation die back is removed, the roof should be checked for the presence of bird nests. If birds are found to be breeding, the area should be left until the birds have fledged.

APPENDICES

Contents:

A1 Legislation, Policy and Guidance

The principal legislation relating to ecological resources, that are relevant to this appraisal, are as follows:

- Wildlife and Countryside Act 1981 (as amended);
- Conservation of Habitats and Species Regulations 2010 (which consolidates all the various amendments made to the Conservation [Natural Habitats, &c.] Regulations, 1994);
- Countryside and Rights of Way (CROW) Act 2000; and,
- Natural Environment and Rural Communities (NERC) Act 2006.

Legislation is also in place to protect species. Those relevant to this report are detailed below:

A1.1 Bats

All species of bat are strictly protected in Europe and in the UK by the Wildlife & Countryside Act 1981 and the Conservation (Natural Habitats &c) Regulations 1994. This protection makes it illegal to intentionally kill, injure, capture or disturb bats, and to damage, destroy or prevent access to roost sites.

Bats are listed as priority species under the UK Biodiversity Action Plan (BAP).

A1.2 Breeding Birds

Under the Wildlife and Countryside Act 1981 (as amended), all birds, their nests and eggs are protected by law and it is thus an offence, with certain exceptions, to intentionally kill, injure or take any wild bird; intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built; and intentionally take or destroy the egg of any wild bird.

Additional protection is offered to those scarce species listed on Schedule 1 of the Act such that it is an offence to intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

A1.3 Invertebrates

Certain scarce or rare invertebrates are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), affording them protection against possession and sale and, in some cases killing and injury or deliberate destruction of their habitat.

The UK Priority Species lists invertebrate species that are considered to be especially threatened or scarce.

This report has also been produced in line with relevant policy and guidance. This includes the following:

A1.4 UK Post-2010 Biodiversity Framework

As a result of new drivers and requirements, the 'UK Post-2010 Biodiversity Framework', published in July 2012, has now succeeded the UK BAP. In particular, due to devolution and the creation of country-level biodiversity strategies, much of the work previously carried out under the UK BAP is now focussed at a country level. Additionally, international priorities have now changed: accordingly, the framework sets out the priorities for UK-level work to

support the Convention on Biological Diversity's (CBD's) Strategic Plan for Biodiversity 2011-2020 and its five strategic goals and 20 'Aichi Targets', agreed at the CBD meeting in Nagoya, Japan, in October 2010; and the new EU Biodiversity Strategy (EUBS) in May 2011. However, the UK BAP lists of priority species and habitats remain important and valuable reference sources.

The UK Biodiversity Action Plan (UK BAP) was produced in accordance with the 1992 UN Convention on Biological Diversity. It describes the UK's biological resources and commits a detailed plan for the protection of these resources, focusing on key habitats and species considered as being of particular significance to nature conservation within a UK context.

Priority species and priority habitats listed under the UK BAP and local BAP are addressed at all levels of UK planning policy, the aim of this being that development contributes to halting further losses and encouraging population enhancement.

Under the Natural Environment and Rural Communities (NERC) Act 2006, it is now the duty of all governmental departments to take Priority species into account as a material consideration in the determination of planning applications.

A1.5 The National Planning Policy Framework (NPPF)

The NPPF, published in April 2012 replaces all Planning Policy Statements and Guidance (PPSs and PPGs).

The stipulations for conservation and enhancement of the natural environment state that the planning system should minimise the impacts on biodiversity and where possible restore degraded or depleted habitats.

The main aim is to contribute to the government objective to halt the overall decline in biodiversity, through the establishment of coherent ecological networks that are more resilient to current and future environmental pressures. There has also been a range of conservation and enhancement principles established to guide planning processes and decisions.
Local planning authorities have been given responsibility to set the strategic approach for the creation, protection, enhancement and management of biodiversity networks through planning at the landscape-scale, often across local authority boundaries.

The NPPF emphasises the importance of local green space and states that Local Planning Authorities (LPA's) should plan positively for the creation, protection, enhancement and management of biodiversity networks and green infrastructure.

A1.6 The England 2020 Biodiversity Strategy

The England Biodiversity Strategy 2020 (August 2011) was published by Defra in response to the National Environment White Paper. It sets the Government's objectives for halting the net loss of biodiversity by 2020 and promotes the recognition of the intrinsic value of the benefits from biodiversity, by society.

It emphasises the landscape-scale and ecosystems approach for the demonstration of the benefits obtained from ecosystem services, their interactions and feedbacks rather than a species approach in order to establish more coherent and resilient ecological networks.

A1.7 BS42020: Biodiversity - Code of practice for planning and development

Published in August 2013, "The UK commitment to halt overall loss of biodiversity by 2020 in line with the European Biodiversity Strategy and UN Aichi targets, is passed down to local authorities to implement, mainly through planning policy. To assist organisations affected by

these commitments, BSI has published BS 42020 Biodiversity in planning and development – Code of practice, which offers a coherent methodology for biodiversity management.

The British Standard seeks to promote transparency and consistency in the quality and appropriateness of ecological information submitted with planning applications and applications for other regulatory approvals"[3].

A1.8 Camden Biodiversity Action Plan (2013-2018)

The Camden Biodiversity Action Plan (BAP) is a partnership document that outlines the priorities for biodiversity in Camden and sets out a programme of action to improve biodiversity across the borough. The plan draws together a series of actions that will ensure that best practice, policy and legislation are followed and Camden's residents are provided with opportunities to experience the natural world within a very urban environment.

The BAP comprises a partnership document, coordinated by Camden Council. It outlines how the public, private and voluntary sectors will work together to deliver tangible results for biodiversity.

It operates within the context of national and regional legislation and policy. That with specific relevance to Camden comprises:

- Local Development Framework 2010: Core Strategy Policy 15: Protecting and improving our parks and open spaces and encouraging biodiversity; Development Policy 22: Promoting sustainable design and construction, and; Development Policy 31: Provision of, and improvements to, open space and outdoor sport and recreation facilities.
- The Camden Plan.
- Camden Planning guidance: 1. Design (Section 6) Landscape design and trees; 3. Sustainability Section; 10 Brown roofs, green roofs and green walls; Section 13 Biodiversity; Section 14 Local food growing.
- Sites of Nature Conservation Importance Supplementary Planning guidance.
- Green Action for Change.
- Camden Parks and Open Spaces Action Plan 2012/13.
- Camden Tree Policy (2012).

The following action plan is of relevance to the subject site and proposals:

Action Plan 2: Built Environment

The built environment includes buildings, developments, streets, public realm and infrastructure. The main opportunities for providing biodiversity enhancements in the built environment are:

- *living roofs and walls;*
- *biodiversity enhancing landscaping;*
- *installation of artificial nesting and roosting sites;*
- *sustainable drainage systems (SuDS);*
- *trees.*

Current planning policy requires that developers consider biodiversity in their proposals and contribute to an overall biodiversity enhancement.

[3] http://shop.bsigroup.com/ProductDetail/?pid=000000000030258704

All developments to include living roofs wherever feasible, in line with Camden Development Policy 22. 75% of living roofs should be biodiverse extensive roofs, in line with best practice and guidance from the Environment Agency.

Encourage greening of the built environment through installation of sustainable living walls.

Include installation of species features such as bird and bat bricks. These should be targeted to Camden priority species.

Provide new roosting opportunities for bats across Camden.

Table 1 Protected and/or Priority Species for Camden

Species - common name	Species - scientific name
Birds	
Hedge Accentor	*Prunella modularis*
Song Thrush	*Turdus philomelos*
Common Starling	*Sturnus vulgaris*
House Sparrow	*Passer domesticus*
Redwing	*Turdus iliacus*
Eurasian Hobby	*Falco subbuteo*
Fieldfare	*Turdus pilaris*
Herring Gull	*Larus argentatus*
Common Redpoll	*Carduelis flammea*
Yellow Wagtail	*Motacilla flava*
Greylag Goose	*Anser anser*
Spotted Flycatcher	*Muscicapa striata*
Common Linnet	*Carduelis cannabina*
Common Kingfisher	*Alcedo atthis*
Brambling	*Fringilla montifringilla*
Tree Pipit	*Anthus trivialis*
Sky Lark	*Alauda arvensis*
Northern Lapwing	*Vanellus vanellus*
Sand Martin	*Riparia riparia*
Common Crossbill	*Loxia curvirostra*
Reed Bunting	*Emberiza schoeniclus*
Black Redstart	*Phoenicurus ochruros*
Ring Ouzel	*Turdus torquatus*
Common Tern	*Sterna hirundo*

Species - common name	Species - scientific name
Wood Warbler	*Phylloscopus sibilatrix*
Common Cuckoo	*Cuculus canorus*
Yellowhammer	*Emberiza citrinella*
European Turtle Dove	*Streptopelia turtur*
Lesser Spotted Woodpecker	*Dendrocopos minor*
Peregrine Falcon	*Falco peregrinus*
Firecrest	*Regulus ignicapilla*
Lesser Redpoll	*Carduelis cabaret*
Wood Lark	*Lullula arborea*
European Honey-buzzard	*Pernis apivorus*
Caspian Gull	*Larus cachinnans*
Green Sandpiper	*Tringa ochropus*
Eurasian Golden Oriole	*Oriolus oriolus*
Common Bullfinch	*Pyrrhula pyrrhula*
Short-eared Owl	*Asio flammeus*
Hawfinch	*Coccothraustes coccothraustes*
Red-backed Shrike	*Lanius collurio*
Arctic Tern	*Sterna paradisaea*
European Golden Plover	*Pluvialis apricaria*
Smew	*Mergellus albellus*
Osprey	*Pandion haliaetus*
Whimbrel	*Numenius phaeopus*
Grasshopper Warbler	*Locustella naevia*
Eursian Curlew	*Numenius arquata*
Little Egret	*Egretta garzetta*
Little Bittern	*Ixobrychus minutus*
Little Tern	*Sternula albifrons*
Mediterranean Gull	*Larus melanocephalus*
Merlin	*Falco columbarius*
Montagu's Harrier	*Circus pygargus*
Red Kite	*Milvus milvus*
Corn Bunting	*Emberiza calandra*
Eurasian Tree Sparrow	*Passer montanus*
Arctic Skua	*Stercorarius parasiticus*

Species - common name	Species - scientific name
Eurasian Wryneck	*Jynx torquilla*
Barnacle Goose	*Branta leucopsis*
Ruddy Shelduck	*Tadorna ferruginea*
Sandwich Tern	*Sterna sandvicensis*
Dartford Warbler	*Sylvia undata*
Eurasian Marsh Harrier	*Circus aeruginosus*
Barn Owl	*Tyto alba*
Common Greenshank	*Tringa nebularia*
Flowering Plants	
Cornflower	*Centaurea cyanus*
Chamomile	*Chamaemelum nobile*
Spreading Bellflower	*Campanula patula*
Marsh Sow-thistle	*Sonchus palustris*
Triangular Club-rush	*Schoenoplectus triqueter*
Mistletoe	*Viscum album*
Populus nigra subsp. betulifolia	*Populus nigra subsp. betulifolia*
Pennyroyal	*Mentha pulegium*
Creeping Marshwort	*Apium repens*
Caraway	*Carum carvi*
Corn Buttercup	*Ranunculus arvensis*
Divided Sedge	*Carex divisa*
Insects and Spiders	
Stag Beetle	*Lucanus cervus*
White-letter Hairstreak	*Satyrium w-album*
Wall Brown	*Lasiommata megera*
Grey Dagger	*Acronicta psi*
White Admiral	*Limenitis camilla*
Brindled Beauty	*Lycia hirtaria*
Buff Ermine	*Spilosoma luteum*
Centre-barred Sallow	*Atethmia centrago*
Cinnabar	*Tyria jacobaeae*
Dusky Thorn	*Ennomos fuscantaria*

Species - common name	Species - scientific name
Mouse Moth	*Amphipyra tragopoginis*
Sallow	*Xanthia icteritia*
Small Heath	*Coenonympha pamphilus*
Small Square-spot	*Diarsia rubi*
Beaded Chestnut	*Agrochola lychnidis*
Brown-spot Pinion	*Agrochola litura*
Double Dart	*Graphiphora augur*
Dusky Brocade	*Apamea remissa*
Knot Grass	*Acronicta rumicis*
Lackey	*Malacosoma neustria*
Large Nutmeg	*Apamea anceps*
Mottled Rustic	*Caradrina morpheus*
Mullein Wave	*Scopula marginepunctata*
Oak Hook-tip	*Watsonalla binaria*
Shaded Broad-bar	*Scotopteryx chenopodiata*
Shoulder-striped Wainscot	*Mythimna comma*
Small Phoenix	*Ecliptopera silaceata*
White Ermine	*Spilosoma lubricipeda*
Red-tailed Carder Bee	*Bombus (Thoracombus) ruderarius*
Narrow-bordered Bee Hawk-moth	*Hemaris tityus*
Oil Beetle	*Meloe proscarabaeus*
Terrestrial Mammals	
Soprano Pipistrelle	*Pipistrellus pygmaeus*
Common Pipistrelle	*Pipistrellus pipistrellus*
Daubenton's Bat	*Myotis daubentonii*
Noctule Bat	*Nyctalus noctula*
West European Hedgehog	*Erinaceus europaeus*
Brown Long-eared Bat	*Plecotus auritus*
Natterer's Bat	*Myotis nattereri*
Vespertilionidae	*Vespertilionidae*
Lesser Noctule	*Nyctalus leisleri*
Nathusius's Pipistrelle	*Pipistrellus nathusii*
Serotine	*Eptesicus serotinus*

Species - common name	Species - scientific name
Nyctalus Kuhl's Pipistrelle	*Nyctalus* *Pipistrellus Kuhlii*

A2 Bat Boxes and Bird Boxes

The following tables detail enhancement measures that are recommended for the site. These suggestions take into account the site locality, site conditions, survey results and local species targets and policy (see Appendices A1).

A3.1 Bat Boxes

Bats are frequently found in urban landscapes, often foraging in parks, gardens and other open spaces (for example, cemeteries) and roosting in crevices on buildings. Bats often use linear corridors of vegetation or buildings as flight paths.

Bats require roosts for rest (during the day), feeding (at night), reproduction and hibernation. Bat boxes are an effective means to provide shelter for the majority of bat species. They readily adopt these artificial boxes if they are of an appropriate design and placed in the correct location.

Bat box materials range from wood, brick, woodcrete (wood sawdust and concrete), concrete and clay. Materials are chosen which allow natural respiration, stable temperature, along with good durability. Boxes made of woodcrete have been successful in attracting bats and are considered to be more durable than wooden boxes.

Careful attention must be given to the placement of bat boxes, to ensure that bats will find and accept the roosts. Bat boxes can be attached to suitable locations under the eaves and overhangs of buildings, on suitable trees and on climbing plant-covered walls. Warm roost temperatures are important in summer for pregnant and lactating females and their young. In winter bats need constant cool temperatures for hibernation. The position of the bat boxes should therefore vary to maximise the roosting conditions available.

Bat boxes should be placed in secluded/low disturbance areas, where there are low levels of artificial lighting.

Table 2 Proposed Bat Box Installation

Suggested Box Type	Species	Proposed Number of Boxes	Installation Requirements
1WI Schwegler Summer and Winter Bat Box *Or,* Ibstock	Suitable for bat species, which typically inhabit buildings, such as common pipistrelles (*Pipistrellus pipistrellus*), serotine (*Eptesicus serotinus*) bats and occasionally noctule (*Nyctalus noctula*).	X2	Bat boxes should be positioned facing south or south west in a sheltered location. Positioning the boxes in this way will provide variation in microhabitat temperatures as required by bats whilst roosting and will increase the likelihood of the boxes being used.

Suggested Box Type	Species	Proposed Number of Boxes	Installation Requirements
Enclosed Bat Box 'C' *Or,* 1FR Schwegler Bat Tube			Obstructions such as branches or other items that may impede the bats' approach to the box should be cleared away underneath the box so the bats can land easily, before crawling into the box. All disturbance and monitoring of bat boxes must be undertaken by a suitably licenced person in order to not contravene legislation.

A3.2 Bird Boxes

Urban landscapes provide habitat for a variety of bird species, although there are often limited opportunities available for birds to nest and forage. Measures to provide additional foraging for birds are most effectively provided through habitat enhancements, and the provision of nest boxes is a straightforward method for increasing the opportunities available for nesting birds.

Careful consideration should be given to the species of bird to be attracted and that are known to use the site already: different styles of nest box suit different species of bird, and to ensure success, the most appropriate style of box should be provided.

Nest boxes can be attached to suitable locations under the eaves and overhangs of buildings, on trees and on walls (especially those covered by climbing plants). A wide variety of attachment methods are available for nest boxes, and it is possible to find a method that is appropriate to most situations.

It is recommended that a variety of box types should be chosen to encourage a diverse range of bird species. Woodcrete boxes are recommended for durability. They are made from a mix of sawdust, concrete and clay and are designed to be impervious to weather and predators, have excellent insulation properties, are rot proof and have an anticipated life of 25 years or more.

Table 3 Proposed Bird Box Installation

Suggested Box Type	Species	Proposed Number of Boxes	Installation Requirements
1SP Schwegler Sparrow Terrace	The Sparrow Terrace has been designed to help redress the balance of falling	X1	Face the box between north and east, avoiding strong sunlight and the

Suggested Box Type	Species	Proposed Number of Boxes	Installation Requirements
	house sparrow numbers.		wettest winds. Make sure that the birds have a clear flight path to the nest without any clutter directly in front of the entrance.
Schwegler Brick Nest Boxes - Type 24	Suitable for many small birds including great tit (*Parus major*), blue tit (*Cyanistes caeruleus*), marsh (*Poecile palustris*), coal tit (*Periparus ater*) and crested tit (*Lophophanes cristatus*), redstart (*Phoenicurus phoenicurus*), nuthatch (*Sitta europaea*), tree (*Passer montanus*) and house sparrow.	X1	