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Ecological Impact Assessment

Land West of Arlington Business Centre
Allington Lane
West End
SO50 7DE

November 2023

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QUALITY CONTROL		
The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct.		
Prepared by	Assistant Ecologist Eleanor Kemp BSc (Hons) MSc	13/10/23
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This report remains valid for 12 months from date of issue. Survey data are valid for 12 months from the date the survey was undertaken.		

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Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living creatures are capable of migration and whilst protected species may not have been located during the survey duration, their presence may be found on site at a later date.

The views and opinions contained within the document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to works.

1. EXECUTIVE SUMMARY

- 1.1. Darwin Ecology Ltd was commissioned by White Planning on behalf of their client to undertake an Ecological Impact Assessment (EclA) at Land West of Arlington Business Centre, Allington Lane, West End, SO50 7DE. The assessment was required to support a planning application for the construction of a single static mobile home with associated landscaping. The assessment has been informed by a desk study and habitat walkover survey.
- 1.2. The site comprises bare earth, hardstanding, and a stream with neutral grassland banks. Scattered alder trees border the southeastern bank of the stream.
- 1.3. The northern and southern banks of the stream had high levels of Himalayan balsam *Impatiens glandulifera*, a Schedule 9 invasive plant species. A Construction Environmental Management Plan (CEMP) will be followed throughout the works to prevent the spread of this species and to ensure that there is a lack of incidental damage to retained and surrounding habitats throughout the works.
- 1.4. It is anticipated that the bare earth, a habitat of low intrinsic ecological value, will be lost during the works, but the hardstanding habitat, a habitat of negligible intrinsic ecological value, will be extended during the works. The scattered trees and the boundary stream, habitats of moderate to high ecological value, will be retained and enhanced during and after the works.
- 1.5. Any impacts to protected species are likely to be limited as the habitats within the site are of low value and unlikely to support any protected species. Therefore, no further surveys are recommended.
- 1.6. The wider area has suitable habitat likely to support bats, birds, terrestrial mammals, amphibians, and reptiles. It is therefore possible that these species could pass through the site on occasion and so mitigation measures have been recommended to avoid harm to these species during the construction phase should they access the site.
- 1.7. Outline enhancement recommendations have been made in order to ensure that opportunities are available for protected species following the completion of the development, and that the ecological value of the site is enhanced in the long-term.

2. INTRODUCTION AND BACKGROUND

- 2.1. Darwin Ecology Ltd was commissioned by White Planning on behalf of their client to undertake an Ecological Impact Assessment (EclA) at Land West of Arlington Business Centre, Allington Lane, West End, SO50 7DE. The assessment was required to support a planning application for the construction of one static mobile home with associated landscaping. The assessment has been informed by a desk study and habitat walkover survey.
- 2.2. The proposed drawings on which this assessment is based are provided at **Appendix 1, Proposed Plans**.
- 2.3. The survey and report follow the Bat Conservation Trust (BCT) Good Practice Guidelines (2023). The subsequent EclA follows the CIEEM Guidelines for EclA in the UK and Ireland (2018).
- 2.4. Habitats were broadly classified following guidance in the UK Habitat Classification V2 (UKHab Ltd 2023)

Site Overview

- 2.5. The site is located within a static mobile home park in a rural area approximately 7.42km northeast of Southampton city centre, and 3.61km east of Eastleigh town centre.
- 2.6. The site boundary comprises a 0.3ha area of bare earth and hardstanding comprising two plots for static mobile homes. The wider ownership is an approximately 1.5ha area of hardstanding, ornamental planting, and amenity grassland comprising ten plots for static mobile homes (inclusive of the two assessed). The site is bordered by a stream to the north, with the land north of the stream comprising pastoral fields, and by pastoral fields and scattered woodland to the south and east. The site is bordered on the southwestern aspect by a small patch of woodland and a collection of industrial buildings, and by pastoral fields on the northwestern aspect (see **Figure 1**).
- 2.7. The wider landscape comprises a mosaic of scattered, small areas of woodland and pastoral fields bordered by lines of trees, hedgerows, and a network of streams. The town of Eastleigh lays 2.51km west of the site comprising dense commercial and residential areas, and Southampton airport is situated 2.27km southwest of the site. The dense residential areas comprising the villages of Bishopstoke and Horton Heath lay 1.20km north and 1.78km east of the site respectively. Itchen Valley Country park, with associated forest, recreational grassland, and waterbodies, makes up the landscape south of the site, with its closest boundary being situated just south of the railway which lays 300m south of the site. Further, the River Itchen runs parallel to the site 634m west of the site. The M27 is situated 2.16km south of the site (see **Figure 2**).



Figure 1: Site location within the local landscape. The red line displays the assessed area which will be impacted by the works, the blue line displays the curtilage of the site. (Copyright Google Earth Pro, 2023).



Figure 2: Site location within the wider landscape (Copyright Google Earth Pro, 2023).

- 2.8. The process of EclA aims to identify, quantify and evaluate the potential effects of development-related or other proposed actions on habitats, species and ecosystems.
- 2.9. Potential effects on the following ecologically sensitive receptors have been considered during the EclA of the site:
- Statutory designated sites;
 - On-site habitats of intrinsic importance (such as buildings or discrete habitat features); and
 - Habitats with the potential to support protected species, including bats, dormice *Muscardinus avellanarius*, great crested newts *Triturus cristatus* and other common amphibians, common reptiles, birds, badgers *Meles meles*, otters, water voles and invertebrates.
- 2.10. As no impacts to hedgerows or woodland are indicated by the proposed works, and there are no hedgerows within the application site boundaries, dormice *Muscardinus avellanarius* are considered unlikely to be using the site and they are therefore not considered further in this report.

3. LEGISLATION & POLICY

General Wildlife Legislation

- 3.1. Wildlife in the United Kingdom (UK) is protected through European and national legislation, supported by national and local policy and guidance. Development can contribute to conservation and enhancement goals outlined by these various legislation and policy by retaining and protecting the most valuable ecological features within a site and incorporating enhancements to provide biodiversity net gain.
- 3.2. This section provides a brief summary of the principle legalisation and policy that triggers the requirement for PRA and further ecological assessments in the UK. The presence of protected species within a site are a material consideration during the planning process. PRAs and any necessary further ecological assessments provide an ecological baseline for a site and evaluation of the potential impact of proposals.
- 3.3. It is the responsibility of those involved with development works to ensure that the relevant legislation is complied with at every stage of a project. Such legislation applies even in the absence of related planning conditions or projects outside the scope of the usual planning process (i.e. permitted development projects or projects requiring Listed Building Consent only).

Bat Legislation

- 3.4. In England and Wales, all bat species and their roosts are legally protected under the European *Habitats Directive (1992)*; the *Conservation of Habitats and Species Regulations (2017)*; the *Wildlife and Countryside Act (1981) (as amended)*; the *Countryside and Rights of Way Act, 2000*; and the *Natural Environment and Rural Communities Act (NERC, 2006)*.
- 3.5. Barbastelle *Barbastella barbastellus*, Bechstein's *Myotis bechsteinii*, greater horseshoe *Rhinolophus ferrumequinum*, lesser horseshoe *Rhinolophus hipposideros*, brown long-eared *Plecotus auritus*, soprano pipistrelle *Pipistrellus pygmaeus*, and noctule *Nyctalus noctula* bats are all species of principal importance in England under *Section 41* of the *Natural Environment and Rural Communities Act 2006*.
- 3.6. You will be committing a criminal offence if you:
 - Deliberately capture, injure or kill a bat;
 - Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
 - Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
 - Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat; or
 - Intentionally or recklessly obstruct access to a bat roost.

- 3.7. The government's statutory conservation advisory organisation, Natural England, is responsible for administering European Protected Species (EPS) licences that permit activities that would otherwise lead to an offence.
- 3.8. A licence can be obtained if the following three tests have been met:
- Regulation 53(9)(a) - there is "no satisfactory alternative" to the derogation, and;
 - Regulation 53(9)(b) - the derogation "will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range" and;
 - Regulation 53(2)(e) - the derogation is for the purposes of "preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment".

National Planning Policy

- 3.9. The *National Planning Policy Framework (2023)* aims to minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. Chapter 15 'Conserving and enhancing the natural environment' details what local planning policies should seek to consider with regard to planning applications.
- 3.10. Planning policies and decisions should contribute to and enhance the natural and local environment by:
- 174 a) Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
 - 174 b) Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
 - 174 d) Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
 - 175) Plans should: distinguish between the hierarchy of international, national and local designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries;

176) Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural beauty which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and Broads. The scale and extent of development within all these designated areas should be limited, while development within their settings should be sensitively located and designed to avoid or minimise adverse impacts on the designated area.

3.11. Specific policies regarding habitats and biodiversity comprise:

179) To protect and enhance biodiversity and geodiversity, plans should:

- a) identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation and
- b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species and identify and pursue opportunities for securing measurable net gains for biodiversity.

180) When determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity resulting from a development cannot be avoid (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- b) development on land within or outside of Sites of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the feature of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees)

should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around development should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

Local Planning Policy

3.12. The local planning policy for the site is the Local Plan of Eastleigh Borough Council (adopted April 2022), which sets out the policies and plans to guide future development within Eastleigh until 2036

3.13. Relevant policies within the plan include:

Strategic policy S5, New development in the countryside

3.14. Planning permission will be granted for new development in the countryside provided it is related to:

- The provision of employment through agricultural development (policy DM17), the extension and replacement of existing employment uses (policy DM18) and the re-use of existing buildings (policy DM19);
- Residential extensions and replacement buildings (policies DM18 and 26), limited residential conversions (policy DM19), rural workers' dwellings (policy DM27) and accommodation for Gypsies, Travellers and Travelling Showpeople (policy DM31);
- Community, tourist, or visitor uses through the re-use of buildings including facilities for the interpretation of heritage assets (policies DM12);

3.15. In permitting new development in the countryside the Borough Council will seek to:

- Avoid adverse impacts on the rural, woodland, riparian or coastal character, the intrinsic character of the landscape including the avoidance of adverse landscape impacts on areas adjoining national parks and their settings, the significance of heritage assets and on the biodiversity of the area;
- Secure long-term beneficial management practices that will enhance the landscape and biodiversity of the countryside and coast;
- Avoid sterilisation of mineral resources, in accordance with the Hampshire Minerals and Waste Plan;
- Safeguard the best and most versatile agricultural land unless the benefit of the development clearly outweighs the loss; and

- Protect soils during construction wherever possible in line with the 'Defra code of practice for the sustainable use of soils on construction sites'.

Strategic policy S9, Green infrastructure

- 3.16. Through new development and other initiatives the Borough Council will seek to achieve the provision, retention and/or enhancement of the following forms of multi-functional green infrastructure, including provision of:
- Landscape scale strategic links across the Borough boundary, to and between the Borough's settlements, the countryside, the coast, and the major areas of open space including the country parks (see strategic policy S12);
 - Interconnected urban green infrastructure within the fine grain of existing and new development including green, cycle ways, paths and linkages between community facilities and open spaces to link community facilities;
 - Green stepping stones such as street trees, green roofs and walls, pocket parks and urban copses (see policy DM1, Chapter 5);
 - Connected habitats linking the network of designated sites and existing priority habitats, taking account of the Hampshire ecological network map (see policy DM11, Chapter 5);

Policy DM6, Sustainable surface water management and watercourse management

- 3.17. New development (excluding extensions to dwellings and changes of use), will only be permitted if it incorporates Sustainable Drainage Systems (SuDS). Wherever feasible, naturalised filtration should be included within the treatment train as follows:
- On sites of 1 hectare or more, or within 100m of the River Itchen SAC or Solent Maritime SAC, SuDS schemes should include at least three forms of naturalised filtration. On sites within 100m of headwaters and tributaries draining into a SAC, SuDS schemes should include at least three forms of naturalised filtration unless hydrological studies and project-level Habitats Regulations Assessment demonstrate this to be unnecessary to protect the integrity of the SAC and its qualifying features;
 - On other sites of between 0.5 hectares and 1 hectare, SuDS schemes should include at least two forms of naturalised filtration; and
 - On other sites of less than 0.5 hectares non-naturalised SuDS e.g. permeable paving will be considered where justified.
- 3.18. In order to reduce flooding and maintain water quality (in accordance with DM8) SuDS schemes should:
- 3.19. Be designed and monitored in accordance with the CIRIA C753 SuDs Manual or equivalent national or local guidance, noting that all receiving waters in the Borough should be classified as protected waters;
- 3.20. Manage surface water runoff as close to its source as possible;

- Ensure that discharge rates are reduced as far as possible and that on greenfield sites these should at least mirror greenfield rates before development;
 - Be provided as part of any application for outline or full planning permission;
 - Where discharge is to a wetland or wet woodland habitat, flows off site must mirror the natural hydrological pathways;
 - Include clear arrangements for their whole life management and maintenance.
- 3.21. Where a watercourse is present on a development site, it should be retained or restored into a natural state and enhanced where possible. The culverting of any watercourse will not generally be permitted, and development should wherever possible remove any existing culverts and increase onsite flood storage. Development should be laid out to enable maintenance of the watercourse.
- 3.22. Where development drains into a waterway connected to the Natura 2000 or Ramsar network a site specific Construction Environment Management Plan must be prepared before permission.

Policy DM8, Pollution

- 3.23. Development will not be permitted if it is likely to cause loss of amenity or impact on public health or other unacceptable environmental impacts through:
- Air pollution (including odours or particulate emissions);
 - Pollution of surface, underground, coastal waters or other watercourses;
 - Noise or vibration;
 - Light intrusion, both generally and with respect to the South Downs National Park's status as an International Dark Night Skies reserve; or
 - Land contamination.
- 3.24. Development susceptible to particular forms of pollution will not be permitted:
- Where it will be adversely affected by such pollution, unless measures can be taken that adequately mitigate the polluting effects; or
 - Where it would inhibit existing economic or other activities giving rise to acceptable polluting effects.
- 3.25. Where a development site is known or suspected to be contaminated, before the site is developed the Borough Council will require the contamination to be remediated to a standard where as a minimum it cannot be defined as 'contaminated land' under Part IIA of the Environmental Protection Act 1990.

Policy DM11, Nature conservation General Approach

- 3.26. The Council will work with statutory and voluntary agencies and developers, and will determine planning applications, to:
- Protect, conserve and enhance all: i. international, national and local nature conservation designations; and ii. networks of natural habitats and features, including the Local Ecological Network, Priority Biodiversity Areas and Priority Biodiversity Links, watercourses, wetland complexes, woodland trees, and trees and hedgerows important to biodiversity and local character; and facilitate their adaptation to climate change wherever possible;
 - Assist in achieving national, county and local biodiversity targets as set out in Biodiversity Action Plans (BAPs);
 - Seek a net gain of biodiversity on all development sites (including sites for redevelopment) through the protection, enhancement and connection of existing and provision of new habitats and features of nature conservation interest compatible with the native biodiversity characteristics of the Borough, having regard to local geodiversity and soils; and
 - Contribute to major elements of the PfSH Green Infrastructure Strategy and other strategies for the provision and enhancement of multifunctional green infrastructure including green routes, ecological networks and biodiversity enhancements (see strategic policy S9).
- 3.27. *International Designations:* Development which is likely (either individually or in combination with other developments) to adversely affect the integrity of an international or European nature conservation site will not be permitted subject only to imperative reasons of overriding public interest and securing any necessary compensatory measures in the absence of alternative solutions. A 'project level' Habitat Regulations Assessment will be required where there are likely significant effects or uncertainty. Any mitigation measures required to ensure no adverse impact must be implemented at the appropriate time.
- 3.28. The Council will work with PfSH, Natural England, the Environment Agency and other wildlife organisations to develop and implement with developers a strategic approach to the protection and enhancement of international and European sites from the direct and indirect effects of development. Within Eastleigh Borough this will include:
- Implementing: i. the Solent Recreation Mitigation Strategy (requiring contributions from residential developments within 5.6 kilometres of the Solent Special Protection Area to the Strategy); and ii. the interim and any future New Forest Recreation Mitigation Strategy if required; or alternative agreed site specific measures to address recreational disturbance;
 - Preserving the water quality and flows within the Itchen and Hamble, Southampton Water and Solent;

- Protecting the River Itchen SAC, in particular the maintenance and where appropriate restoration of habitats and qualifying species to favourable conservation status (as defined by article 1 of the Habitats Directive); and
- Seek contributions towards measures set out in the Southern Damselfly Conservation Strategy (or other strategy) specifically to deliver biodiversity net gain.

3.29. *National and Local Designations:* Development will not be permitted if it is likely (either individually or in combination with other developments) to have a direct or indirect adverse effect on a Site of Special Scientific Interest (SSSI), Site of Importance for Nature Conservation (SINC) or Local Nature Reserve (LNR) as shown on the policies map (or on a more recent plan provided by the Hampshire Biodiversity Information Centre) unless it can be demonstrated that:

- There are no alternative solutions;
- The adverse effects are unavoidable;
- Measures are taken to mitigate or, as a last resort, compensate for the adverse effects;
- There is an overall biodiversity net gain; and
- If there are any residual adverse effects which cannot be avoided, mitigated or compensated, the benefits of the development must clearly outweigh the adverse effects on the nature conservation value of the site and any broader impacts on national and local designations.

3.30. *Priority habitats, protected and priority species and the local ecological network:* Development will not be permitted if it is likely (either individually or in combination with other developments) to have a direct or indirect adverse effect on priority habitats, protected or priority species, or on the local ecological network unless it can be demonstrated that:

- There are no alternative solutions;
- The adverse effects are unavoidable;
- Measures are taken to mitigate or, as a last resort, compensate for the adverse effects;
- There is an overall biodiversity net gain; and
- If there are any residual adverse effects, the benefits of the development clearly outweigh the adverse effects on priority habitats, priority and protected species, and the local ecological network.

3.31. *Irreplaceable habitats:* Development will not be permitted if it results in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees), unless there are wholly exceptional reasons and a suitable compensation strategy exists.

- 3.32. *Buffers*: Buffers free from development will be provided to designated sites to avoid/mitigate impacts, including recreational impact and impacts on edge habitats, and to maintain dark skies.
- 3.33. *Surveys*: Development will not be permitted unless it can be demonstrated that:
- There have been thorough habitat and species surveys;
 - The great crested newt strategic survey and strategy have been considered in all developments within 500m of a great crested newt pond; and
 - The strategic bat trapping survey has been considered in all developments within the locality of a woodland or connected habitat networks.

Hampshire Biodiversity Action Plan

- 3.34. To advance biodiversity conservation in Hampshire, the following objectives have been identified:
- To audit the nature conservation resource of Hampshire;
 - To identify from the audit habitats and species of priority nature conservation concern, including those which are locally distinct;
 - To prepare action plans for habitats and species of priority concern and follow through with programmes of implementation and monitoring;
 - To ensure that data on habitats and species is sufficient to enable effective implementation and monitoring of biodiversity objectives;
 - To review general issues affecting biodiversity, such as agriculture and development, and chart a course of appropriate action;
 - To raise awareness and involvement in biodiversity conservation across all sectors;
 - To encourage individuals and organisations to review their role in biodiversity conservation and the resources required, and develop their own action in response to the Biodiversity Action Plan for Hampshire;
 - To maintain an ongoing partnership which will co-ordinate, develop and support action for biodiversity;
 - To monitor and review progress towards meeting the above objectives and the targets set out in the habitat and species action plans; and
 - To periodically update the Biodiversity Action Plan for Hampshire and its component habitat and species action plans to take account of changing circumstances.

4. METHODOLOGY

Desk Study

- 4.1. A desk study was undertaken for designated sites, EPS licences and habitat records within 2 km of the site:
- The MagicMap website was reviewed to obtain information on any designated sites of nature conservation interest within 2 km of the site and details of any EPS licences issued within 1 km, extended to 2 km for bats;
 - The Eastleigh Borough Council Planning Portal was searched for planning applications in the last two years that may have associated ecological documents detailing results of bat surveys; and
 - Google Maps and OS Leisure Maps was utilised to view aerial photographs and maps to assess the ecological context of the site within the wider landscape.
- 4.2. Natural England has developed a tool to help assess the potential risks to Sites of Special Scientific Interest (SSSIs) by proposed developments. These are known as 'Impact Risk Zones' (IRZs) and they define the area around a SSSI that could be sensitive to development, considering the particular sensitivities of the feature for which the site is designated.
- 4.3. The IRZs help inform whether a development proposal may affect a SSSI and if so, whether it is necessary for the Local Planning Authority (LPA) to seek pre-application advice from Natural England. Information on the IRZs was determined from the MAGIC website to determine if the LPA is required to seek consultation for the current development.

Habitat Walkover Survey

- 4.4. A habitat walkover survey was conducted by Assistant Ecologist Eleanor Kemp BSc (Hons) MSc at the Land West of Arlington on the 3rd October 2023.
- 4.5. The survey assessed habitats present within the application red line boundary for their potential to support protected species, including:
- Bats;
 - Great crested newts *Triturus cristatus*;
 - Common amphibians;
 - Reptiles;
 - Dormice *Muscardinus avellanarius*;
 - Other terrestrial mammals, including hedgehogs *Erinaceus europaeus* and badgers *Meles meles*;
 - Otters *Lutra lutra* and water voles *Arvicola amphibious*

- Breeding birds; and
- Invertebrates.

- 4.6. In combination with their nationally sparse distribution, the stream on site was assessed as being unsuitable for inhabitation by white clawed crayfish due to its small width, lack of suitable refuge, limited availability of aquatic macrophytes, and likely pollution from the neighbouring cattle pasture. Therefore, it is considered highly unlikely that white clawed crayfish *Austropotamobius pallipes* would be using the site and they are therefore not considered further in this report.
- 4.7. The site was also searched for non-native, invasive plant species, with particular care to search for the most commonly occurring and problematic species, such as Japanese knotweed *Fallopia japonica*, Indian balsam *Impatiens grandiflora* and giant hogweed *Heracleum mantegazzianum*.

Limitations

- 4.8. Ecological surveys are limited by factors that affect the presence of plants and animals such as the time of the year, weather, migration patterns. The survey was undertaken in September and therefore represents a valid sample of ecological evidence present on that date/season. The report is not designed, nor is it required to present a completed inventory of flora/fauna.
- 4.9. Ecological data is typically deemed valid for 18 months. This report remains valid for 2 years from the date of the survey, however, a walkover survey after 18 months may be required to demonstrate whether or not the habitats have remained as described.
- 4.10. The desk study does not include data from the local environmental records centre (LERC). However, following CIEEM guidelines (2017) it is possible to conduct a robust assessment without the need of LERC data, for example for small-scale projects or on sites such as;
- A field in active arable cultivation where there is no impact on any hedges, trees or water bodies;
 - A small area of cultivated garden/amenity grassland, as above; or
 - A small urban site comprising mostly asphalt or compacted hardstanding.
- 4.11. The area to be impacted is small (<0.5ha) and comprises only bare earth, hardstanding, neutral grassland, a stream, and scattered trees. The trees, neutral grassland, and stream present on site will be retained. Therefore the lack of LERC data is not considered a limitation to the ecological assessment of the site.

5. SURVEY RESULTS

Desk Study

- 5.1. There are two statutory designated sites within the site or within 2 km of the site boundary comprising a Site of Special Scientific Interest and a Special Area of Conservation. The site is also situated within the Impact Risk Zones for several SSSIs in the wider area including the River Itchen SSSI and Moorgreen Meadows SSSI. See **Table 1** below for further details.

Table 1: Statutory designated sites within 2km of the site at Land West of Arlington.

Designated sites	Name and designation type	Reason for designation	Approximate distance from site
Within Site Boundaries	There are no designated sites within the site boundaries		
Statutory Within 2km of Site	River Itchen SAC	A 304ha area which is a classic example of a sub-type 1 chalk river. The river is dominated throughout by aquatic <i>Ranunculus</i> spp. The headwaters contain pond water-crowfoot <i>Ranunculus peltatus</i> , while two <i>Ranunculus</i> species occur further downstream: stream water-crowfoot <i>R. penicillatus</i> ssp. <i>pseudofluitans</i> , a species especially characteristic of calcium-rich rivers, and river water-crowfoot <i>R. fluitans</i> . The site was further designated as an SAC due to the strong populations of southern damselfly which occur within the area (this site is one of the major population centres for this species in the UK), and the high densities of bullhead <i>Cottus gobio</i> populations which are supported by the river due to the good water quality, coarse sediments, and extensive beds of submerged plants.	30m northwest
	River Itchen SSSI	A 748ha area which has been notified for its classic chalk stream and river, fen meadow flood pasture, and swamp habitats. This is particularly for the formations of in-channel vegetation dominated by water Crowfoot, riparian vegetation communities, and side channels, runnels, and ditches associated with the main river and former water meadows. The site is also notified for significant populations of the nationally-rare southern damselfly <i>Coenagrion mercuriale</i> and assemblages of nationally-rare and scarce freshwater and riparian invertebrates, including the white-clawed crayfish <i>Austropotamobius pallipes</i> . This site is notified for otter <i>Lutra lutra</i> , water vole <i>Arvicola terrestris</i> , freshwater fishes including Atlantic salmon <i>Salmo salar</i> , and an assemblage of breeding birds.	30m northwest

- 5.2. There are three areas of ancient woodland within 1 km of the site, with the closest woodland being a site name Paynes Row which is situated 607 m south of the site.
- 5.3. There are 14 areas of priority habitat deciduous woodland within 1 km of the site, the closest being an unnamed area of 0.98 ha which is situated 82 m east of the site. Other priority habitats within 1 km of the site include lowland meadows, purple moor grass and rush pasture, a traditional orchard, and both low and high certainty chalk watercourses.

- 5.4. Additionally the site is within a Priority area for Countryside Stewardship measures addressing Lapwing *Vanellus vanellus* habitat issues.
- 5.5. A search of planning applications on the Eastleigh Borough Council planning portal revealed no past or pending applications with relevant ecological documents and surveys within 1 km of the site within the past two years.

Habitat Walkover Survey

- 5.6. Habitats present within the site boundary included bare earth, hardstanding, other neutral grassland, scattered trees, building footprints and a watercourse. See **Figure 3** for a Baseline Habitat Map. **Table 2** below outlines the summary of habitats identified on site, as well as their applicable secondary codes.

Table 2: Primary and secondary applicable habitat codes

Primary Habitat	UK Hab Primary Code	Applicable Secondary Code(s) used	Secondary Code(s) description
Other neutral grassland	g3c	32	Scattered trees
		502	Seasonally wet
		510	Bare earth
		511	Compacted substrate
		517	Recent management
		521	Unmanaged
		524	Invasive non-native species
Developed land; sealed surface	U1c	840	Caravan park or permanent campsite
Buildings	u1b5		

g3c other neutral Grassland, cleared. (Secondary codes 510, 511, 517, 524)

- 5.7. Bare earth made up the northeastern half of the site. The site appeared to have been cleared within the past few months, leaving large areas bare earth. Some areas of the bare earth had not been spread/removed, creating piles across the site.
- 5.8. There were moderate levels of encroachment from hardy vegetation, with recorded species including Yorkshire fog *Holcus lanatus*, dandelion *Taraxacum spp.*, chickweed *Stellaria media*, broad-leaved dock *Rumex obtusifolius*, common nettle *Urtica dioica*, cut-leaved cranesbill *Geranium dissectum*, chamomile species *Chamomile spp.*, mullein *Verbascum thapsus*, ribwort plantain *Plantago lanceolata*, and crack willow saplings *Salix spp.*. The majority of the encroaching vegetation had a short sward height of around 10cm, but this increased towards the edges of the site and the river bank.
- 5.9. Himalayan balsam was present in the northeastern corner of the bare earth habitat, along the bank of the stream.

u1c Artificial unvegetated - unsealed surface (secondary code: 840)

- 5.10. Hardstanding of a permeable compacted gravel and tarmac construction dominated the majority of the site.
- 5.11. This hardstanding was in a good condition, but had low levels of vegetation encroachment by broad-leaved dock in places.
- 5.12. A timber stable building had been constructed on the southwestern aspect of the site, being situated on the area of hardstanding. This structure was one-storey and of a timber panel construction. It had a multi-pitched roof of corrugated metal construction.
- 5.13. Two caravans were present on site, one on the southeastern boundary (Target note 1) and one on the northwestern boundary (Target note 2).
- 5.14. The northwestern half of the site also contained multiple vehicles and piles of general equipment and materials such as liquid gas, wooden pallets, a lawnmower, bins etc.

g3c other neutral Grassland (secondary codes: 32, 502, 521)

- 5.15. An area of neutral grassland was present along the southwestern and northern banks of the stream. It was dominated by stands of Himalayan balsam.
- 5.16. The sward, which was relatively species poor, had a sward height of around 30cm. Recorded species included creeping thistle *Cirsium arvense*, ground ivy *Glechoma hederacea*, bramble *Rubus fruticosus*, Yorkshire fog, common hogweed *Heracleum sphondylium*, rushes *Juncaceae spp.*, and dandelion.
- 5.17. A collection of around ten alder trees *Alnus glutinosa* were present along the southeastern bank of the stream. All the trees were fairly young, reaching a height of around 8-12m and only being around 20-30cm in diameter at chest height.

Watercourse

- 5.18. A small stream bordered the northeastern aspect of the site. This stream was around 3m wide at its widest point, but on average was around 1.5m wide. The watercourse was around 50cm deep at the deepest point, but on average was around 20-30cm deep.
- 5.19. The water was very clear, and the stream only contained low levels of litter, comprising a couple of large items such as a scooter. The flow was slow to medium speed, and the stream contained only low levels of algal weed, but no other vegetation.
- 5.20. The water quality appeared to be moderate (clear, but its location adjacent to a cattle field likely results in nutrient run-off pollution), and no fish or waterfowl were recorded. There is no physical barrier between the pastoral land bordering the stream to the north and the stream. This pastoral land is used to farm cattle, likely leading to nutrient run-off from the fields into the stream, resulting in low levels of nutrient pollution.
- 5.21. MAGIC.defra has this watercourse classified as a "low certainty chalk stream".

Protected Species

Bats

- 5.22. MagicMap has records of five EPS licences for bats within 2 km of the application site including:
- 2015-16719-EPS-MIT covered a property 543 m south of the site, permitting the destruction of a resting place of common pipistrelle *Pipistrellus pipistrellus*.
 - 2016-22386-EPS-MIT covered a property 1.80k m southeast of the site, permitting the destruction of a resting place of common pipistrelle, soprano pipistrelle, and brown long-eared bat.
 - 2019-39527-EPS-MIT covered a property 1.67 km southeast of the site, permitting the destruction of a resting place and breeding site of common pipistrelle, brown long-eared bat, and natterers bat *Myotis nattereri*.
 - 2019-39954-EPS-MIT covered a property 1.35 km northeast of the site, permitting the destruction of a resting place of common pipistrelle and soprano pipistrelle.
 - 2020-48450-EPS-MIT covered a property 1.49 km northeast of the site, permitting the destruction of a resting place of soprano pipistrelle.
- 5.23. The habitats of bare earth, neutral grassland, and hardstanding onsite are of limited ecological value to bats.
- 5.24. The presence of scattered trees are considered to be an important commuting feature for bats as they contribute further ecological structure to the nearby stream, which is an important linear features connecting the neighbouring priority woodland to the east of the site to the wider landscape to the west of the site. This tree line is highly likely to be utilised as habitat by commuting and/or foraging bats.
- 5.25. All trees on site were assessed for their potential to support roosting bats. The assessment concluded that none of the trees present on site were of the age or character to support roosting bats, and no potential roosting features were identified from the ground.
- 5.26. The site is likely used for foraging and commuting by a variety of bat species.

Great crested newt and common amphibians

- 5.27. MagicMap has records of one EPS licence for great crested newt within 1 km of the application site including:
- 2015-14283-EPS-MIT covered a property 543 m south of the site, permitting the damage and destruction of a resting place of great crested newt.
- 5.28. MagicMap has records of five further EPS licences for great crested newt between 1 km and 2 km of the application site including:

- 2020-44604-EPS-MIT covered a property 1.09 km northeast of the site, permitting the damage and destruction of a resting place of great crested newt.
- 2020-46989-EPS-MIT covered a property 1.09 km northeast of the site, permitting the damage and destruction of a resting place of great crested newt.
- EPSM2009-903 covered a property 1.71 km northeast of the site, permitting the destruction of a resting place of great crested newt.
- 2019-40025-EPS-MIT covered a property 1.37 km northeast of the site, permitting the damage and destruction of a resting place of great crested newt.
- 2018-35734-EPS-MIT covered a property 1.60 km northeast of the site, permitting the damage and destruction of a resting place of great crested newt.

- 5.29. There are six records of great crested newt class survey licence returns within 1 km of the site, predominantly being located within the Itchen Country park south of the site. There are a further three class survey licence returns between 1 km and 2 km from site.
- 5.30. There are no great crested newt pond surveys 2017-2019 within 1 km of the site, however, there are records of 3 pond surveys within 2 km of the site (two 10 FIG absent results and one 10 FIG present result).
- 5.31. There are no waterbodies within the application site and the closest discrete waterbody to the site is approximately 538m southeast. However, there are a network of watercourses surrounding the site, including a low certainty chalk stream which borders the site to the north.
- 5.32. Further, the Itchen Valley Country Park has a collection of interconnected waterbodies which lay 371 m southwest of the site. Whilst these waterbodies are separated from site by a railway line and road, there are a collection of small watercourses which connect these waterbodies to the stream bordering the northern aspect of the site, making movement of amphibian species possible.
- 5.33. The habitats on site offer limited suitability to support amphibian species, providing few opportunities for commuting, foraging, and resting. Further, there are no discrete refugia on site.
- 5.34. Due to the lack of suitable habitat and refugia, it is unlikely that these species will be present on site. However, due to the presence of shallow watercourses and suitable waterbodies in the surrounding environment, they are likely to be present within the wider area.

Reptiles

- 5.35. A search of MAGIC found no records of EPS licences for licensable works impacting reptiles within 1 km of the application site.

- 5.36. The bare earth and hardstanding on site have limited ecological value for reptiles, providing few opportunities for foraging, commuting, or resting. Furthermore, there is no discrete refugia on site. The area of other neutral grassland is unlikely to offer any opportunities for foraging, commuting, or resting for these species due to its small size.
- 5.37. Since the majority of the site contains unsuitable foraging, resting, and commuting habitat for reptiles, the site is unlikely to support populations of these species, and therefore their presence on site is unlikely.
- 5.38. The wider landscape, which the site has good connectivity to due to the lack of solid fencing, offers suitable foraging and resting habitat for reptiles. Therefore, there is potential that reptiles pass through and use the site on occasion.

Dormice and other terrestrial mammals

- 5.39. A search of MAGIC found no records of EPS licences for licensable works impacting dormice within 1 km of the application site.
- 5.40. There are no hedgerows or areas of woodland on site, and therefore the site has no habitat able to support dormice. Further, the site has limited connectivity to woodland within the wider landscape. Whilst dormice may be present in the woodland in the wider area, it is considered unlikely that they will be present within the site due to the lack of suitable habitat on site and the limited connectivity to suitable habitats.
- 5.41. No signs of badger activity e.g. latrines, snuffle holes, or sett entrances were recorded on site during the survey or within 30m of the site boundary. No hairs, paw prints or scat was recorded.
- 5.42. The habitats on site offer limited foraging, commuting, and resting opportunities for terrestrial mammals as the habitats on site are of little ecological value. The areas of woodland in the wider area provide suitable habitat for badger and hedgehog and so they may access the site occasionally to forage.

Otter and Water Vole

- 5.43. A search of MAGIC found no records of EPS licences for licensable works impacting otter or water vole within 2 km of the application site.
- 5.44. However, it is known that these species are present within the wider area and inhabit the River Itchen.
- 5.45. The habitats on site offer limited opportunities for commuting, foraging, and resting for these species, comprising predominantly habitats of limited ecological value such as hardstanding and bare earth. No evidence of Eurasian otter and water vole (such as scat, fur, or tracks) were identified on site.
- 5.46. Due to the small size of the site (<0.3ha) and the lack of suitable foraging and resting habitat or holt features on site it is considered highly unlikely that water voles or Eurasian

otters are present. However, due to their presence in the wider area and the high connectivity of the site, these species may pass through site on occasion.

Birds

- 5.47. The habitats on site offer little foraging, commuting, or nesting opportunities for these species. However, the scattered trees on the northeast corner of the site provides suitable nesting and foraging habitat for an assemblage of common garden birds. No bird nests were noted during the survey.

Invertebrates

- 5.48. There is poor diversity in the habitats on site and in the adjacent area with poor structural diversity in the grassland and stream banks which is not attractive for invertebrates. The hardstanding and bare earth are likely to have limited ecological value for these species.
- 5.49. The site likely supports low numbers of common invertebrates.



Image 1: Bare earth on the northern aspect of the site



Image 2: Hardstanding on the southern aspect of the site



Image 3: Target note 1



Image 4: Himalayan Balsam on the northern bank of the stream



Image 5: Scattered trees on the northern boundary of the site



Image 6: Bare earth and neutral grassland on the northwestern boundary of the site



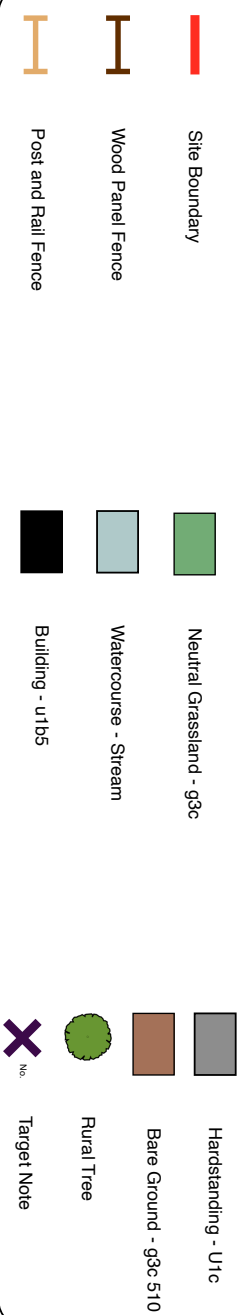
Image 7: Stream on the northern boundary of the site



Image 8: view of the site from the northeastern corner



***NOTE Areas are indicative and are not shown to exact scale.**



DARWIN
ECOLOGY

integrating nature conservation

Project: Land West of Arlington
Business Centre, Allington
Lane, West End, SO50 7DE

Figure 3: PEA Map

Date: October 2023

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6. IMPACT ASSESSMENT

Designated Sites

- 6.1. The site is located within Impact Risk Zones for several SSSIs which applies restrictions to large developments (50 or more houses), transport proposals, combustion processes etc. However the proposed works do not come under any description which would require the local planning authority to consult Natural England.
- 6.2. There is potential for nearby designated sites to be impacted temporarily by the works due to the potential for pollutants to enter the stream which connects the site to the River Itchen SAC.
- 6.3. A Construction Environmental Mitigation Plan (CEMP) will be required to ensure that no incidental damage or pollution of the surrounding and boundary habitats, particularly the neighbouring SAC and SSSI, occurs during and after the works. Further, this a CEMP is required to ensure that appropriate measures are taken throughout the construction process to ensure that negligible levels of pollutants enter the waterway adjacent to site and the surrounding habitats.
- 6.4. There is likely to be limited permanent impacts on the nearby designated sites due to the proposals as a 24m deep ecological buffer area will be created to divide the proposed site and the watercourse. This buffer will be bordered on the southern aspect by fencing to limit public access into the buffer area, thereby limiting the potential for pollutants to enter the watercourse or for erosion of the stream banks post-construction.
- 6.5. The addition of one new residential unit in the area has the potential to cause impacts to surrounding designated sites, green space and wildlife sites through increased footfall to these areas, however due to the low number of occupants, this impact is likely to be limited.
- 6.6. Overall, if the CEMP is followed and the correct mitigative actions are taken, there should be limited impacts to designated sites, priory habitats, and ancient woodland temporarily during the proposed works, and negligible permanent impacts once works have concluded.

Habitats

Status of Habitats on Site

- 6.7. It is anticipated that all of the currently bare neutral grassland habitat will be lost during the works, and replaced with new areas of non-permeable hardstanding. The current areas of artificial unvegetated-unsealed surface will be compacted further to create new areas of non-permeable hardstanding. These habitats are of low intrinsic ecological value, and their loss will have a negligible negative impact at the local level.
- 6.8. The other habitats on site, comprising the scattered trees, the watercourse, and the neutral grassland adjacent to the river, will be retained during the works. The watercourse and the

scattered trees have moderate intrinsic ecological value, and the neutral grassland, which is in poor condition due to the presence of invasive has low intrinsic ecological value.

- 6.9. Large amounts of Himalayan balsam was present along both banks of the stream bordering the northern boundary of the site. This species is a non-native and invasive plant species in the UK and is listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). It occurs in a variety of disturbed habitats, especially on riverbanks and waste ground. It is an offence to plant or to cause a non-native invasive species to spread in the wild.

Potential Impacts

- 6.10. Overall, the proposed will result in the loss of **Low** importance habitats, resulting in a permanent **Low** negative impact on a **Local** level.
- 6.11. Whilst the watercourse, scattered trees, and neutral grassland habitats are being retained as part of the proposals, there is potential for them to be modified or damaged incidentally through the works.
- 6.12. The increase in non-permeable hardstanding has the potential to negatively impact habitats surrounding the site, through localised pollution caused by surface water run-off from roads and parking, onto retained and protected habitats. This could result in damage or degradation of these habitats, creating a permanent **Moderate** negative impact on a **Local** level.
- 6.13. If the correct procedures are not followed, the works could result in the spread of Himalayan balsam.

Recommendations

- 6.14. *Habitat Screening:* Heras fencing will be installed along the outer edge of the development footprint to maintain any retained tree root protection zones and ensure that retained habitats are not negatively impacted by construction activities. Screening barriers will be implemented on habitat protection fencing during the construction phase of the development, to prevent dust and waste from the construction site from contaminating retained habitats at the boundaries of the site. No surface run-off from the construction site will be allowed to flow towards the retained habitats.
- 6.15. *Tree root protection zones:* All retained trees at site boundaries will be protected in accordance with British Standards BS 5837:2012. Root protection areas will be 12x the diameter at breast height (DBH) or the reach of the longest branch (whichever is greater), unless otherwise advised by a qualified arboriculturist. Trees located off site but with their roots on site should also be protected. No materials should be allowed to be stored within these root protection areas and no heavy machinery should run over them.
- 6.16. *Himalayan Balsam:* The plant can be controlled by pulling the plant by the roots by hand. The plants must be cut below the lowest node to stop regeneration. Pulled plants should then be burned off site or disposed in a permitted landfill. The banks of the stream

bordering the northern boundary of the site should be monitored quarterly during the first two years after cutting to ensure no Himalayan balsam re-colonise the bank.

- 6.17. Additionally, a good site hygiene should be maintained during the works which will include;
- The installation of fencing with clear signs indicating the presence of non-native species.
 - Personnel working on or between sites should ensure their clothing and footwear are cleaned before leaving the contaminated area.
 - Tracked vehicles should not be used within the area of infestation.
 - All vehicles leaving the infested area must be thoroughly pressure-washed in a designated area and material or water left after vehicles have been pressure-washed must be contained, collected and disposed of appropriately.
 - All wash facilities including wastewater from washing vehicles, equipment or personnel should be managed in a responsible way so as not to not cause harm to the environment.
- 6.18. A CEMP will be required to ensure that the likelihood of the spread of Himalayan balsam as a result of the works is minimised.
- 6.19. Given the above avoidance and mitigation strategies, it is considered likely that there will be limited residual impacts to the retained habitats and trees on and adjacent to the site.
- 6.20. However, compensation and enhancements will be required to achieve a net gain in biodiversity post development as required under the Environment Act 2021.

Compensation

- 6.21. *Scrub/boundary hedgerow planting:* It is recommended that areas of native scrub and shrubs are provided within the landscape proposals, particularly around the boundaries, to provide opportunities for nest birds, and foraging and shelter habitats for a range of protected species.
- 6.22. This will be achieved by planting a mixture of native scrub species such as hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa* and spindle *Euonymus europaeus*, along with complementary species such as honeysuckle *Lonicera periclymenum* and dog rose *Rosa canina*. This area can be managed to provide an edge-habitat along the boundaries of the site. Bramble should also be allowed to establish, to create a well structured scrub habitat along the site boundaries. A strip of rough grass should be established along the edge of the new scrub to provide additional structural diversity.
- 6.23. These compensation measures will provide smaller sections of higher quality habitat around the edges of the site to compensate for the loss of lower quality habitat, and improve the connectivity between the site and surrounding area.
- 6.24. After implementation of the above avoidance, mitigation and compensation measures, it is considered likely that there will be no residual impacts on habitats within the site.

Protected Species

Bats

Status on site

- 6.25. The majority of habitats on site offer limited foraging, commuting, and resting habitats for bats. The scattered trees provides good foraging and commuting habitat for bats.
- 6.26. None of the trees on site are of the age or character to support roosting bats. Potential Impacts
- 6.27. The habitats which will be lost are not suitable for bats and the trees of value are being retained.
- 6.28. The construction of new residential dwellings will increase the levels of light pollution in the area. Should any light spill onto the tree line, then this could deter bats from using this commuting path and cause habitat fragmentation.

Recommendations

- 6.29. Where new lighting is proposed, a sensitive lighting plan (including baseline and calculated lux contours) will be required to ensure that bats can continue to use the site, specifically ensuring that light spill does not impact the value of retained and protected habitats for this species by ensuring light levels during the operational phase do not exceed 0.5 lux or baseline levels. The lighting plan should be designed by a lighting engineer with direct consultation from a licensed bat ecologist and can be secured by pre-commencement condition. The lighting plan will then be approved and signed off by a licensed bat ecologist prior to finalising the plan, to ensure the scheme is suitable for bats.
- 6.30. Upward lighting must be avoided by fitting lights with downward facing baffles and fixtures to ensure no light spillage above an angle of 70°. Lighting will be triggered by motion sensors using a short timer where possible and in compliance with building regulations. Warm white LEDs will be used in preference to bright white LEDs. All lighting plans should be reviewed by a suitably qualified ecologist before finalising and submitting for approval.
- 6.31. See **Appendix** for further guidance regarding bats and lighting.

Reptiles and Amphibians

Status on site

- 6.32. While it is likely that reptiles and amphibians are present in the wider area, the application site itself lacks habitat which is suitable to support these species. Therefore, it is unlikely that the site at Land West of Arlington supports populations of these species.
- 6.33. Due to their presence in the wider area, and the lack of barriers preventing access to the site, these species may access site on occasion.

Potential Impacts

- 6.34. The habitats which will be lost are not suitable to support for reptiles or amphibians and there will be no significant loss of foraging or commuting habitats or refugia.
- 6.35. Due to the potential for reptiles and amphibians to pass through the site, in the absence of mitigation, the construction works have the potential to injure/kill individual reptiles and amphibians passing through the site.

Recommendations

- 6.36. Any ground vegetation within the application boundary should be maintained to a short sward length before the works begins to prevent the habitat becoming suitable for reptiles and amphibians.
- 6.37. Should the vegetation grow longer than 30cm then any vegetation clearance should be done by hand and only during the reptile key active season (March-September, inclusive). Weather should be 9 degrees or higher, and dry with no strong winds. This will allow active reptiles and amphibians to move to more suitable habitat nearby, if they are present within the working area.
- 6.38. In order to prevent creating suitable refuges for reptiles during construction, all stored materials should be raised off the ground on pallets or skids. Aggregates, such as gravel or sand, must be delivered in bulk bags and stored on pallets.
- 6.39. If the existing potential refugia are to be removed, they should be dismantled by hand with a licence ecologist present to ensure that no individuals of these species are harmed
- 6.40. Reasonable avoidance measures will be implemented on site during construction works to avoid injury/killing of reptiles or common amphibians, to include:
- Open excavations should be sloped to prevent entrapment; and
 - Any hazardous materials should be stored in a secure store or on raised pallets
 - The habitat fencing around the development area (detailed in the above habitats section) will provide a buffer between the surrounding tree lines and the construction works.
- 6.41. In the unlikely event that reptiles or amphibians are found within the site, the project manager should contact an ecologist to supervise the removal and release of these individuals.
- 6.42. Providing the above mitigation measures are complied with, it is anticipated that there will be no residual impacts of the current proposals on amphibians.

Dormice and Other Terrestrial Mammals

Status on Site

- 6.43. The site offers no suitable habitat to support hazel dormice, and there is limited connectivity between the site and habitat suitable for this species. Therefore, their presence on site is unlikely.
- 6.44. The site itself offers sub-optimal habitat for terrestrial mammals, however the wider ownership and nearby woodlands are likely to support badgers and hedgehogs which may be able to access the site.

Potential Impacts

- 6.45. If badgers and hedgehogs are able to access the site during proposed works, they may be injured due to the destructive activity or trapped in any excavations. The habitats which will be lost are sub-optimal for terrestrial mammals and will not result in a significant loss of foraging, commuting or resting habitat.

Recommendations

- 6.46. General mitigation measures are considered sufficient to protect terrestrial mammals during demolition and construction works within the application area. It is considered that the methods outlined under the reptile section will be sufficient to protect hedgehogs and badgers should they be present on site.
- 6.47. Any excavations should be covered or protected overnight to prevent entrapment. Ramps should also be placed in any excavations to provide a way out if any animals do become entrapped.
- 6.48. Any proposed new planting should contain native species to create a biological corridor between the site and the nearby nature reserve to encourage movement of animals in the area. The existing hedgerow and scrub should also be enhanced to enable this movement, with the addition of a wider range of native shrub and scrub species, and the filling in of any gaps present.
- 6.49. Given the above avoidance and mitigation strategies, it is considered likely that there will be no residual impacts on hedgehogs or badgers.

Otter and Water Vole

Status on Site

- 6.50. Whilst the River Itchen is known to contain populations of these species, the site itself does not offer any suitable habitat for these species and no evidence of these species was found within the site.

Potential Impacts

- 6.51. If otters and water voles are able to access the site during proposed works, they may be injured due to the destructive activity or trapped in any excavations. The habitats which will be lost are sub-optimal for these species and will not result in a significant loss of foraging, commuting or resting habitat.

Recommendations

- 6.52. General mitigation measures are considered sufficient to protect terrestrial mammals during demolition and construction works within the application area. It is considered that the methods outlined under the amphibian and reptile section, and the terrestrial mammal section, will be sufficient to protect otters and water voles should they be present on site.

Birds

Status on Site

- 6.53. The trees on site provide suitable nesting and foraging habitat for an assemblage of common garden birds. However, no birds nests were identified on site.
- 6.54. The other habitats on site are of limited value for these species

Potential Impacts

- 6.55. The scattered trees are being retained as part of the proposed plans, therefore there will be limited loss of nesting and foraging opportunities for birds.

Recommendations

- 6.56. If any vegetation removal is required, or the proposed plans change to include the removal of the trees, this removal should occur outside of the breeding bird season (February - August inclusive).
- 6.57. If any vegetation removal is required during the breeding bird season (February - August), a pre-works check by a suitability qualified ecologist will be conducted no more than 24 hours before the removal to ensure that no active nests are present. If active nests are recorded, a suitable buffer will be retained around these until all chicks have fledged (to be confirmed by a suitably qualified ecologist).
- 6.58. A wildlife friendly landscaping scheme is recommended to enhance the site and provide suitable foraging habitat for birds.

Invertebrates

Status of Invertebrates on Site

- 6.59. The application area has limited value for invertebrates, due to the lack of habitat diversity, and the low ecological value of the habitats present on site.

Potential Impacts

- 6.60. The habitats which will be lost have little ecological value to invertebrates and will be recreated and enhanced following the works.

Recommendations

- 6.61. Where possible, area of species rich grassland which will be attractive to invertebrates should be incorporated into the design of the site. Some areas of grassland should also be allowed to grow longer (for example, a 1m strip along the hedgerows) to help improve structural diversity on site. This strip could also be sown with an appropriate seed mix such as Emorsgate EM10 for a sward of tussocky grassland, or Emorsgate EM1 for a wildflower grassland, or similar as available.
- 6.62. Where new planting is considered in the plan, native tree and shrub species should be used to enhance the ecological value of the site.

7. ENHANCEMENT RECOMMENDATIONS

- 7.1. National planning policy states that all developments should seek to enhance onsite biodiversity whether impacts on protected species are recorded or not. Incorporating enhancement features into new or renovated buildings should be carefully considered. These features can be simple and inexpensive, please see below for specific recommendations.

Wildlife Beneficial Landscaping Scheme

- 7.2. Any future landscape planting should seek to enhance biodiversity, improve connectivity to the surrounding habitats and provide food and shelter for a wide range of wildlife. All amenity planting and formally landscaped areas should be designed using a variety of plant species beneficial for wildlife. These do not necessarily have to be native but should be chosen for their ability to provide nectar or fruit and should be non-invasive species. There are a number of specialist seed mixes available specific to certain soil types, growing conditions and designed to benefit different groups of species e.g. bees, butterflies, moths.
- 7.3. All habitats should be managed in a suitable way to encourage a wide variety of insects and other wildlife to use the site.
- 7.4. Further information regarding habitat creation, enhancement and management can be provided on request.

Habitats

- 7.5. In addition to the scrub planting outlined in the mitigation measures above, a native hedgerow with emergent trees is recommended to be created to contribute to the biodiversity net gain requirement for the site.
- 7.6. Native hedgerow tree and shrub species such as hawthorn, blackthorn, field maple (*Acer campestre*) and hazel (*Corylus avellana*) will be planted along at least one boundary to create a new section of hedgerow. Emergent fruit trees such as bird cherry and crab apple should be planted to provide fruit and flowers. This hedgerow can be managed for wildlife with a cut every two to three years, and no more than 50% of the hedge at one time to increase flower and berry production and maintain availability. Trimming should be carried out in late winter (January to February) so that birds and small mammals can feed on the berries through the winter.

Bats

- 7.7. Tree mounted bat boxes (at least one) can be installed on any mature trees at the site borders. The locations of these boxes must be agreed with a suitably qualified ecologist prior to installation to ensure they are appropriately positioned to maximise the potential for uptake by bats. Bat boxes should be installed at least 4 m from ground level and with unobstructed air space in front (see **Appendix**)

Bird Boxes

- 7.8. Tree-mount bird boxes (at least one) suitable for garden and rural species can be installed on any trees or building on site (see **Appendix**). Bird boxes should be installed at least 4 m from ground level and with unobstructed air space in front.
- 7.9. Within the development, wildlife friendly landscaping and the inclusion of native hedgerow planting at the perimeter of the site will provide additional nesting and foraging opportunities for bird species (see **Appendix** for further information).

Reptiles and amphibians

- 7.10. To provide new resting and hibernating habitat for reptile and amphibians, small deadwood piles or hibernaculum features can be incorporated at appropriate areas of the site, such as at the base of hedgerows (see **Appendix** for further details).
- 7.11. Longer grass and habitat diversity as described above will also benefit this species group.

Invertebrate Features

- 7.12. Habitats within the site can best be enhanced through appropriate management practices, although specific features, such as bee bricks, can be incorporated at the application site if desired (see **Appendix**).
- 7.13. Longer grass and habitat diversity as described above will also benefit this species group. The main aim of management for invertebrates is to maintain a diverse structure, with areas of short sward, bare ground, tussocks and flowering herbaceous plants. Native plants should be allowed to set seed to increase the availability of food (nectar and pollen) for foraging insects.
- 7.14. Inclusion of some standing water (even something as limited as a bird bath), could improve the value of the site for invertebrates.

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APPENDICES

1. Proposed Plans

2. Bats and Lighting

3. Mitigation, Compensation and Enhancement
Recommendations





THE IMPACT OF LIGHTING ON BATS

Bats favour a dark environment for both roosting and foraging as they are adapted to low-light conditions. Artificial lighting will disturb bats if the lighting covers roost access points, flight paths or foraging habitats.

The main peak of nocturnal insect abundance occurs at dusk and a delay in emergence results in a lower foraging rate for bats.

Artificial lighting creates a 'vacuum effect' for nocturnal insects. During the night nocturnal insects use the light of the moon* to navigate. However, artificial lighting and even sky glow above cities obscures the natural moonlight as it is closer

and radiates light in multiple directions.

Some species of bats have been recorded foraging around street lights such as *Pipistrellus* species and *Nyctalus* species. However, species that are less tolerant of artificial light are at a disadvantage when foraging as insects are drawn away from these species usual foraging grounds into the zones of artificial light.

Lighting must be considered in context to any development as increased lighting may cause roost abandonment, reduced reproductive success, and reduced foraging. Mitigation to reduce the impacts of lighting for bats is therefore of great importance in bat conservation.

Table 1: Summary of predicted impact of lighting for each species/genus

Impact	High	Medium	Low
Behaviour			
Maternity roost	All species	-	-
Night roost	<i>Rhinolophus hipposideros</i> <i>Rhinolophus ferrumequinum</i> <i>Myotis</i> spp. <i>Plecotus</i> spp.	<i>Pipistrellus</i> spp. <i>Nyctalus</i> spp. <i>Eptesicus serotinus</i> <i>Barbastella barbastellus</i>	-
Emergence	All species	-	-
Foraging	<i>Rhinolophus hipposideros</i> <i>Rhinolophus ferrumequinum</i> <i>Myotis</i> spp. <i>Plecotus</i> spp.	-	<i>Pipistrellus</i> spp. <i>Nyctalus</i> spp. <i>Eptesicus serotinus</i> <i>Barbastella barbastellus</i>
Commuting	<i>Rhinolophus hipposideros</i> <i>Rhinolophus ferrumequinum</i> <i>Myotis</i> spp. <i>Plecotus</i> spp.	-	<i>Pipistrellus</i> spp. <i>Nyctalus</i> spp. <i>Eptesicus serotinus</i> <i>Barbastella barbastellus</i>
Swarming	All species	-	-
Hibernation	All species	-	-

*For more information see Warrant, E., and Dacke, M. (2016) Visual Navigation in Nocturnal insects. *Physiology*, 31, 182-196.



Sources of light that can disturb bats include; light spill via windows, sport floodlighting, car headlights, roadside lighting, security lighting, aesthetic lighting of waterways, and aesthetic illumination of buildings. Glare will affect bats over greater distance than the target area directly illuminated.

Avoidance is the most effective method, but if this is not possible the following measures should be considered.

What lighting should I use?

- Low pressure sodium lights or 'warm' LEDs
- Wavelength above 540nm
- Colour temperature below 2700K
- Shielded lights that prevent light spill above a 70 degree angle
- Passive infrared (PIR) motion sensors



What to avoid:

- Lighting roost entrances, flightpaths, and foraging or commuting routes
- Reflective surfaces beneath lighting
- High level lights
- Non-directional lighting

Lighting should be considered at an early stage allowing impacts to be minimised through the design of the site.

Key Points

- Keep lighting intensity to the minimum level required
- Limit the times that lights are on to provide some dark periods (e.g. switching installations off between midnight and 5am)
- Dim lighting according to demand
- As an alternative to lighting pathways use paving materials that reflect moonlight
- Low level lighting allows darkness to be retained within higher vegetation
- Set dark habitat buffers - lighting should always be a minimum of 25m from vegetated margins and 40m from waterbodies
- Incorporate dark corridors within the site
- Compensate for the loss of dark areas by enhancing other dark areas
- Consider building design - install internal lighting away from windows



Wildflower Turf

Wildlife Friendly Landscaping



Wildflower turf is suitable for use in a wide range of applications to provide a naturalistic and attractive meadow landscape and provides a more reliable result compared with traditional seeding methods.

The seeded turf contains a diverse mix of native wildflower meadow species including grasses and flowering plants characteristic of lowland meadows on a range of soil types.

As the grassland matures, the meadow develops a characteristic composition with species that thrive on the local soil.



Wildflower turf provides an instant enhancement to any landscaping project with low maintenance and reliable establishment of native wildflower grassland.

Darwin Ecology Ltd are Accredited Partners of Wildflower Turf Ltd.

Accredited partners are trained in the use and installation of Wildflower Turf Ltd. products to deliver attractive and successful wildflower landscapes.



The flowers in the turf have been chosen to ensure that flowering plants are present from early spring through to autumn.

A diverse and thriving meadow will attract a huge range of invertebrates and pollinators to birds, reptiles and mammals.

Darwin Ecology can help you maximise the impact of your wildflower areas by designing and creating additional habitats for the species you will attract including rustic and visually pleasing deadwood habitats or hibernacula as shown.



TYPES OF BIRD BOXES



Vivar Pro Seville 32mm WoodStone Nest Box

- Manufactured from woodstone - increases longevity and provides a consistent internal temperature
- The nest box compensates for the lack of natural cavities that are found in trees
- Suitable for blue tits, tree sparrows, house sparrows, great tits, crested tits, nuthatches, coal tits and pied flycatchers
- Should be installed between 1.5m and 3m high



House Martin Nest Cups



Swallow Nest Bowl

- Suitable nest building mud is difficult for house martins and swallows to find
- Alterations to house construction and roof design have resulted in a decrease of suitable nesting sites
- Install swallow nest bowls within an outbuilding or garage that has flight access - 6cm below the ceiling
- Install house martin nest cups under the eaves of a house - minimum of 2m high



Swift Nest Box

- Swift numbers are declining partly due to a loss of nesting sites
- The entrance hole discourages other birds such as starlings and sparrows
- Install a minimum of 5m high with unobstructed airspace in front of the nest
- Integrated models of swift nest boxes are also available



5KL Schwegler Nuthatch Nest Box

- Manufactured from woodcrete
- Nuthatches prefer nest boxes with larger cavities. They will often occupy owl nest boxes and fill the entrance hole with mud reducing the size to approximately 32mm
- Nuthatches plaster mud on the internal walls of the cavity and line the floor with wood chipping and leaves to nest
- To discourage nuthatches from using owl nest boxes try installing the 5KL immediately adjacent



Open-fronted Nest Box

- Manufactured from woodstone - lifetime of 20-25 years
- Suitable for robin, wren, spotted flycatchers, and black redstart
- Best installed hidden from view on the wall of a building or hidden within ivy/honeysuckle as the boxes open-front may attract predators
- Install at a height of 1-3m



Sparrow Terrace Nest Box

- Sparrow populations are decreasing due to a lack of nesting sites
- Sparrows are a sociable species and prefer to nest in a colony
- Likelihood of uptake is increased if more nesting chambers are available (the example nest box shown contains three nesting chambers)
- Various other nest box designs are available
- Install at a minimum of 2m high



Tawny Owl Nest Box

- Install on a mature tree within a woodland (not on the outskirts)
- Install a minimum of 3m high
- Face the box entrance away from prevailing wind (generally avoiding west/south-west)



Little Owl Nest Box

- Prefer areas of mixed farmland and orchards
- Essential features; small entrance hole (70mm), narrow tunnel, and a dark nesting chamber
- Install on a horizontal tree branch/wall top or beam so that owlets can walk in/out prior to fledging
- Can be installed on any tree species apart from cherry - the cherry harvest coincides with the little owl breeding season
- Entrance hole should face the tree trunk
- Install at a minimum height of 3m



How to Install



Integrated bat boxes can be installed into the brickwork of buildings to provide a roosting spot for bat species.

Being embedded in the masonry of a building, they do not impact the exterior seal of structure and are commonly integrated in new builds.

With some modification or bespoke design, integrated bat boxes can be installed in such a way that it does not interfere with a building's exterior facade.

The 1FR bat tube has a 45 degree angle for bats to land on and crawl upwards into the bat tube. It has been designed to be installed within or adjacent to the the external skin of the block work or brickwork.

For a rendered finish, the 1FR bat tube can be built into the external skin of breeze blocks (acting as a block) and be rendered over (ensuring the access point is left clear). Ridges should be created in the render immediately below the access point, which will aid the bats when crawling into the bat tube.

For a brickwork finish, the 1FR bat tube should be installed within the brickwork, set back slightly to allow the front to either be rendered over or for a continuity of brick slips to be mortared over the top of the tube. The upper brick slip should overlap the access point and the lower brick slip should be in line with the 45 degree angle of the bat tube.

Alternatively, **Habibat** bat tubes can be purchased that are designed for brickwork design and can be custom made.





Raised Access Tiles



Location of the Raised Access Tiles

Anywhere that the access is not illuminated by artificial lighting at a height of 2-7m.

Access for summer maternity roosts should be placed on southerly or westerly aspects. Male roosts and winter hibernation roosts on northerly aspect.

Tiles can be flat and “pegged” outwards, or specialised bat access tiles can be purchased.



Raised access tiles can provide two uses; roosts for individual “crevice dweller” species that prefer to roost in narrow gaps or, providing access to larger roosting spaces such as loft voids.

Raised access tiles for bats can be easily incorporated in both roofs and hanging tiles by the methods below.

An Ecologist will advise on the best locations and use for your raised access tiles.

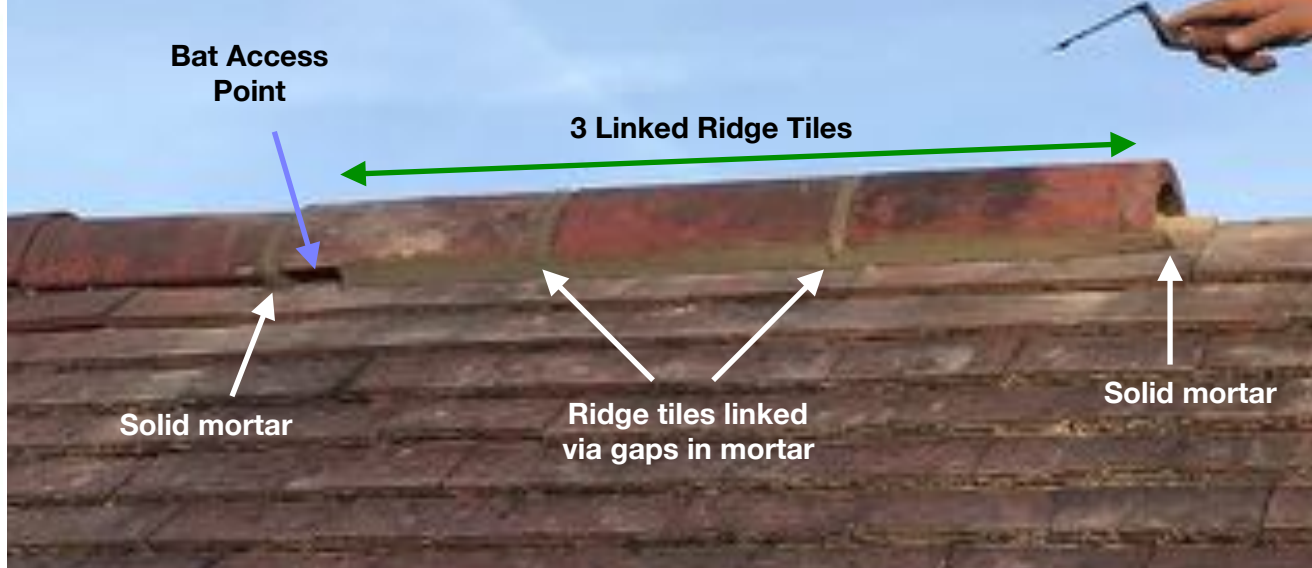


Construction of the Raised Access

The tiles can be pegged out using small amount of mortar/cement/pieces of tile placed under the bottom of the tile to raise it slightly from the one below.

Crevices should be pegged out to 20-30mm wide. However a wider gap may be required for a known maternity roosts

Create a small access hole in the felt that is 20-50mm wide x 15-20mm high. Gaps larger than this can be accessed by birds that may block the gaps with nesting material.

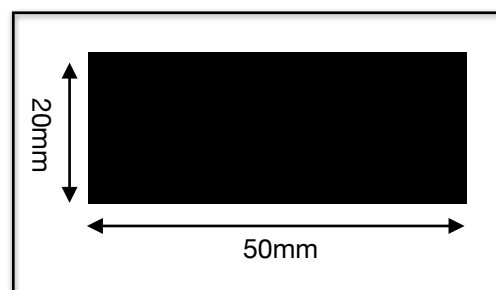


HOW TO CREATE

Note: Use three adjacent ridge tiles for one Ridge Tile Crevice Feature



1. Notch out the underside of a ridge tile measuring 20mm high by 50mm wide.



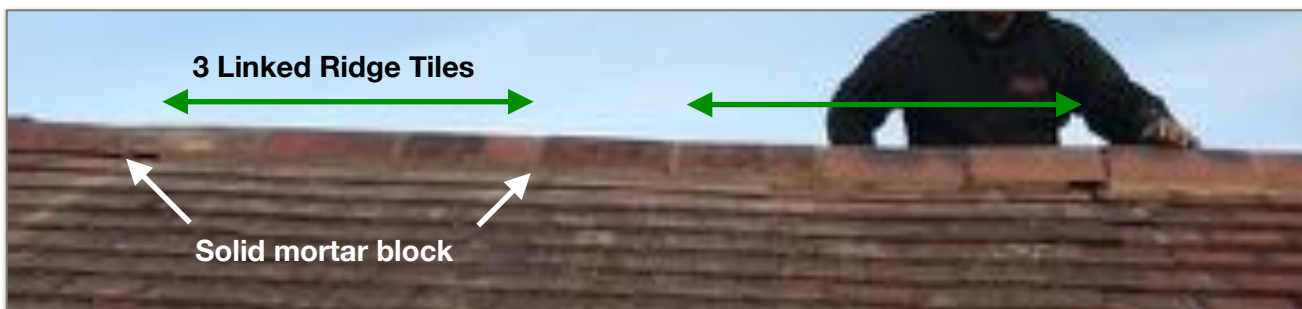
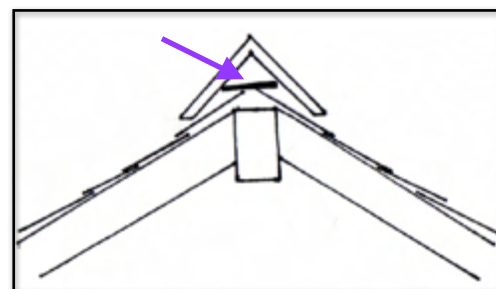
2. Or leave a gap in the mortar of the same size



3. Leave the gap mortar free when bedding the tile onto the ridge.



4. To ensure the three ridge tiles remain linked either; place a broken tile over the ridge and mortar only above the tile (left) or fill one side with mortar and leave the other side empty (do this on alternate sides to ensure the feature does not become draughty) (right).



5. At each end of the three linked ridge tiles insert a solid mortar block to reduce through draughts.



TYPES OF BAT BOXES



Schwegler 2F Double Front Panel

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for pipistrelle and Myotis species
- A second inner wooden panel is fitted adjacent to the front panel imitating a cavity wall



Schwegler 1FD Double Front Panel

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for pipistrelle and Myotis species
- A second inner wooden panel is fitted adjacent to the front panel imitating a cavity wall
- Small entrance hole discourages birds from using the box



Vincent Pro Bat Box

- Manufactured from timber and recycled plastic
- The front and the top of the box is black, which helps heat absorption
- Suitable for a range of species including pipistrelle species, Myotis species, and brown long-eared bats.
- No maintenance required



Schwegler 2FN

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for pipistrelle species, Myotis species, serotine, brown long-eared, noctule and Leisler's bats
- Dual entrance
- Birds and dormice have also been found using this box
- A newer model is now available, Schwegler 3FN, designed with smaller entrance holes which discourage birds and dormice



Schwegler 1FS Large Colony Box

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for a range of bats including pipistrelle species, Myotis species, Noctule, and brown long-eared bats
- Three grooved inner wooden panels are connected to the front panel, which are ideal for bats to cling to.
- Accommodates large summer colonies



Schwegler 1FF Colony Box

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for a range of crevice dwelling bats including pipistrelle species, barbastelle, noctule, and brown long-eared bats
- Rough wooden surface for bats to cling onto and climb



Greenwoods Ecohabitats Small Hollow Bat Box

- Manufactured from long-lasting ecostyrocete
- Lifetime - 20-25 years
- Suitable for a range of bats preferring a cavity space, including pipistrelle species, myotis species, noctule, and brown long-eared bats
- Suitable for hibernating bats



Bark Boxes Large Twin Crevice Bat Box

- Suitable for range of bat species providing roosting opportunities similar to naturally formed tree roosts.
- Thermal mass suitable for spring and autumn roosts.
- Natural and discreet appearance for hanging on trees.
- No maintenance required.
- Made from over 50% recycled materials./



Design and creation

Deadwood habitat piles offer valuable habitats for an array of saprophytic (deadwood eating) invertebrates that will in turn provide food for a wide range of predatory species of insects, birds, mammals, reptiles and amphibians.



On sites where vegetation structure is limited, brash and log piles provide an instant enhancement. Deadwood habitat piles also provide shelter and refuge opportunities for larger animals, particularly reptiles and amphibians.

They can also be suitable hibernation sites during the winter for reptiles, amphibians and small mammals including hedgehogs. Think bonfire!

Habitat piles should be located in sunny or part shaded sites. A compact central core, with larger woody material in contact with the ground is recommended to provide the damp and decomposing wood conditions that are most suitable for benefiting saprophytic invertebrates. The outer layers should be laid more loosely on top. This provides a diverse structure within the habitat pile and provides suitable cover and basking opportunities for reptiles.

Habitat piles should be maintained by adding material every few years as the pile decomposes and do not require much management.



To provide optimal conditions for reptiles, amphibians and mammals, log piles should contain a mixture of sizes and shapes with plenty of small diameter material included. This introduces voids of different sizes and creates a complex internal structure.

They can be created to be an attractive feature of the landscape where a more formal appearance is required.



Insect boxes and bug hotels



The provision of insect boxes and bug hotels provide a valuable resource for invertebrates, providing suitable nesting habitat for important native pollinators such as mason bees and leafcutter bees. They can also provide opportunities for a wide range of species to shelter and over-winter during the colder months.

Bug hotels are highly adaptable, and are therefore suitable for almost all developments and habitats. They can be made easily from a range of waste and plant materials, and more specialist items such as bee bricks can be purchased in order to target specific species.



Image: RSPB

Bug Hotel

These are easily implemented in almost any situation as bug hotels can be made from a range of materials, such as bricks, plant pots, tree cuttings, logs and broken tiles.

Bug hotels can also be adapted to benefit specific species, such as bees, woodlice, and ladybirds.

Other terrestrial species such as hedgehogs, reptiles and amphibians can also benefit from sheltering in a bug hotel.



Insect boxes

A range of prefabricated insect boxes such as the Green & Black Bee Brick (left) and the Woodstone Insect Box (above) are available and can be incorporated into or onto buildings or on trees to provide nesting habitats for a range of solitary bee species.