



Sundial Planning Ltd

Cinders Lane, Yapton

Preliminary Ecological Appraisal

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Executive Summary

Contents	Summary
Site Description and Proposals	The application site is 1.75ha in area and is situated on the eastern edge of Yapton village (centred on OS Grid Reference: SU 98123 02611). The site is bordered by allotments to the north, residential properties to the west, an industrial building to the south beyond which lies arable and arable land to the east. There is a dry ditch along the eastern boundary and another along the western boundary. The site comprises a former horticultural nursery comprising greenhouses, shed and stables assumed to be associated with its previous use as a nursery, three residential properties (a bungalow and two static caravans), a workshop which is currently in use and a storage yard. The proposed development is for 51 dwellings with associated landscaping and infrastructure (HP16098003).
Previous Reports / Surveys	None known.
This Survey(s)	An extended Phase 1 habitat assessment to classify habitats and identify evidence or potential for protected and notable species or habitats.
Results	- The predominant habitat on-site is dense scrub with small areas of semi-improved grassland and hardstanding. The boundaries consist of treeline, hedgerow and fencing. - A number of scattered trees are present throughout the site, ranging from immature to mature. - A total of 14 buildings are present on-site, 6 of which were considered to be of low suitability to support roosting bats, with the remaining eight considered to be of negligible potential. - No signs of badger were identified during the survey however the site has a number of habitats suitable for foraging badgers. - No invasive species were identified on-site.
Recommendations	Recommendations for avoidance: - Nesting Birds: vegetation clearance of dense scrub is undertaken outside of nesting bird season (March to September inclusive). Recommendations for further surveys - Badgers: vegetation clearance is undertaken outside of nesting bird season (March to September inclusive to check if the mammal paths within the scrub on site lead to any potential badger setts within the immediate area off-site. Pre-commencement badger sett check is undertaken for a 30m radius surrounding the site, subject to access being granted. - Bats: The site assessed being of low value to foraging and commuting bats and three bat activity surveys are recommended between March to October inclusive with one transect conducted per



	season, plus a single automated bat survey per season with data to be collected over a minimum period of five consecutive nights. Vegetation clearance is to be conducted outside of the nesting bird season which runs from March to August inclusive to allow close inspection of the buildings externally. The six buildings considered to be of low suitability for roosting bats, will be surveyed a minimum of one survey (either a dusk or a dawn re-entry survey) which must be conducted from May to August inclusive to identify whether the building is utilised as a roosting location. • Great Crested Newts: non-licensed great crested newt Method Statement is prepared for the site. • Reptiles: reptile presence/likely absence comprising seven visits to the site between March and October subject to weather conditions to determine the current presence of reptiles on-site. Recommendations for enhancement: • Five bird and bat boxes are incorporated into the proposed development in order to enhance the habitat on-site. • It is recommended that native trees and shrubs are planted as part of the development proposals.
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1.0 Introduction

1.1 Background

WYG were commissioned by Sundial Planning in November 2016 to undertake an extended Phase 1 habitat survey at Cinders Lane, Yapton (here after referred to as 'the site') This report will inform a planning application for residential development of the site.. The current site layout in the form of a conceptual masterplan (Drawing No: HP16098 003) is shown in Figure 1, Appendix A.

1.2 Site Location

The site is 1.75ha in area and is situated on the eastern edge of Yapton village (centred on OS Grid Reference: SU 98123 02611). The site is bordered to the north by existing allotments, residential development to the west, the rear gardens of these properties fronting Cherry Avenue lie adjacent to the site, an industrial unit lies to the south of the site beyond which lies arable land and arable land also lies to the east.

The site consists of a former horticultural nursery with three disused glasshouses associated with the sites former use utilised for ad-hoc storage of various materials. The remaining land comprises fourteen buildings three of which are residential properties (a bungalow and two static caravans) and a storage yard. Access to site is gained from Bilsham Road (B2123), via a shared private track which also serves the Doctor's Surgery fronting Bilsham Road.

A large proportion of the land within the application site boundary comprises overgrown scrub and bare ground (hardstanding) with areas tall ruderal vegetation, poor semi-improved grassland, amenity grassland and scattered trees. The site is bordered by hedgerows, scattered trees, dry ditches and fencing.

1.3 Development Proposals

The masterplan proposes a development that will consist of 51 dwellings with associated landscaping and infrastructure (HP16098003).

1.4 Survey & Reporting Objectives

The Preliminary Ecological Appraisal consists of the following: A desk study to obtain existing information on statutory and non-statutory sites of nature conservation interest, and records of protected/notable species within the site and its environs;



- An extended Phase 1 habitat survey involving a walkover of the site to record habitat types and dominant vegetation, including any invasive species and a reconnaissance survey for evidence of protected fauna or habitats capable of supporting such species;
- An investigation of the trees from ground level for their potential to support bats and an external and internal assessment of buildings on-site, and
- An assessment of the potential ecological constraints to the proposed works at the site and recommendations for further surveys, avoidance, mitigation and enhancement where appropriate.



2.0 Planning Policy & Legislation

2.1 National Planning Policy

2.1.1 National Planning Policy Framework

Following the publication of the National Planning Policy Framework (NPPF) in March 2012, *Planning Policy Statement 9 (PPS9): Biodiversity and Geological Conservation* (2005) has been withdrawn. However, *ODPM 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and their impact within the Planning System* (the guidance document that accompanied PPS9) has not been withdrawn and, where more detailed guidance is required than is given within the NPPF, local planning authorities will continue to rely on *ODPM 06/2005*.

This guidance requires local planning authorities to take account of the conservation of protected species when determining planning applications and makes the presence of a protected species a material consideration when assessing a development proposal that, if carried out, would be likely to result in harm to the species or its habitat.

In the case of European Protected Species such as bats, planning policy emphasises that strict statutory provisions apply (including the *Conservation of Habitats and Species Regulations 2010* (as amended)), to which a planning authority must have due regard.

Where developments requiring planning permission are likely to impact upon protected species it is necessary that protected species surveys are undertaken and submitted to meet the requirements of paragraph 98 of *ODPM Circular 06/2005* which states that:

'The presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat.'

General guidance within the body of the NPPF which is also relevant includes the following statements:

"The planning system should contribute to and enhance the natural and local environment by:

- » protecting and enhancing valued landscapes, geological conservation interests and soils;*
- » recognising the wider benefits of ecosystem services;*
- » minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures."*



"Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife or geodiversity sites or landscape areas will be judged."

"When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- » *If significant harm resulting from a development cannot be avoided (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."*

2.1.2 Biodiversity 2020

Biodiversity 2020: A strategy for England's wildlife and ecosystem services replaces the previous *UK Biodiversity action Plan* and sets national targets to be achieved. The intent of *Biodiversity 2020*, however, is much broader than the protection and enhancement of less common species, and is meant to embrace the wider countryside as a whole.

The priority species and habitats considered under Biodiversity 2020 are those detailed under Section 41 of the NERC Act (as detailed below).

Local Biodiversity Action Plans (LBAP) identify habitat and species conservation priorities at a local level (typically at the County level), and are usually drawn up by a consortium of local Government organisations and conservation charities. Although no-longer accountable at a national level many are still managed and implemented at a local level.

2.2 Local Planning Policy

Arun District Council Local Plan 2003, general policy 29 – Nature Conservation Across the District states:

"Development will only be permitted on sites which contain semi-natural habitats, features of nature conservation interest, or within wildlife corridors, where these can be largely retained and sympathetically incorporated into the scheme. Legal agreements may be used to offset the loss of, or impact on, any nature conservation resource present on the site prior to development."



2.3 Legislation

2.3.1 The Wildlife and Countryside Act, 1981

This is the principal mechanism for the legislative protection of wildlife in the UK. This legislation is the chief means by which the *Bern Convention* (1982) and the *Birds Directive* (1979) are implemented in the UK. Since it was first introduced, the Act has been amended several times and includes the requirement to designate Special Protection Areas (SPAs) of particular importance to birds.

The Act makes it an offence to (with exception to species listed in Schedule 2) intentionally:

- ✧ kill, injure, or take any wild bird;
- ✧ take, damage or destroy the nest of any wild bird while that nest is in use; and/or
- ✧ take or destroy an egg of any wild bird.

In addition, the Act makes it an offence (subject to exceptions) to:

- ✧ intentionally or recklessly kill, injure or take any wild animal listed on Schedule 5; and/or
- ✧ interfere with places used for shelter or protection, or intentionally disturbing animals occupying such places.

The Act also prohibits certain methods of killing, injuring, or taking wild animals.

Finally, the Act also makes it an offence (subject to exceptions) to:

- ✧ intentionally pick, uproot or destroy any wild plant listed in Schedule 8, or any seed or spore attached to any such wild plant;
- ✧ unless an authorised person, intentionally uproot any wild plant not included in Schedule 8; and/or
- ✧ sell, offer or expose for sale, or possess (for the purposes of trade), any live or dead wild plant included in Schedule 8, or any part of, or anything derived from, such a plant.

Following all amendments to the Act, a total of 154 species of animal, including several mammals, reptiles, amphibians, fish and invertebrates are protected under Schedule 5. Schedule 8 contains 185 protected species of flora, including higher plants, bryophytes and fungi and lichens. A comprehensive and up-to-date list of these species can be obtained from the JNCC website.

Part 14 of the Act makes unlawful to plant or otherwise to grow in the wild any plant which is listed in Part II of Schedule 9.



Table 1 provides a comprehensive list of plant species listed in this schedule. It is recommended that plant material of these species is disposed of as bio-hazardous waste, and these plants should not be used in planting schemes.

Table 1: Invasive plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)

Common name	Scientific name
Perfoliate alexanders	<i>Smyrniium perfoliatum</i>
Red algae	<i>Grateloupia luxurians</i>
Variagated yellow archangel	<i>Lamiastrum galeobdolon</i> subsp. <i>argentatum</i>
Yellow azalea	<i>Rhododendron luteum</i>
Himalayan balsam	<i>Impatiens glandulifera</i>
Cotoneaster	<i>Cotoneaster horizontalis</i>
Entire-leaved cotoneaster	<i>Cotoneaster integrifolius</i>
Himalayan cotoneaster	<i>Cotoneaster simonsii</i>
Hollyberry cotoneaster	<i>Cotoneaster bullatus</i>
Small-leaved cotoneaster	<i>Cotoneaster microphyllus</i>
False Virginia creeper	<i>Parthenocissus inserta</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Purple dewplant	<i>Disphyma crassifolium</i>
Fanwort or Carolina water-shield	<i>Cabomba caroliniana</i>
Water fern	<i>Azolla filiculoides</i>
Hottentot fig	<i>Carpobrotus edulis</i>
Three-cornered garlic	<i>Allium triquetrum</i>
Giant hogweed	<i>Heracleum mantegazzianum</i>
Water hyacinth	<i>Eichhornia crassipes</i>
Giant kelp	<i>Macrocystis</i> spp.
Giant knotweed	<i>Fallopia sachalinensis</i>



Common name	Scientific name
Hybrid knotweed	<i>Fallopia japonica</i> × <i>Fallopia sachalinensis</i>
Japanese knotweed	<i>Fallopia japonica</i>
Few-flowered garlic	<i>Allium paradoxum</i>
Water lettuce	<i>Pistia stratiotes</i>
Parrot's-feather	<i>Myriophyllum aquaticum</i>
Floating pennywort	<i>Hydrocotyle ranunculoides</i>
Duck potato	<i>Sagittaria latifolia</i>
Floating water primrose	<i>Ludwigia peploides</i>
Water primrose	<i>Ludwigia grandiflora</i>
Water primrose	<i>Ludwigia uruguayensis</i>
Pontic rhododendron	<i>Rhododendron ponticum</i>
Rhododendron	<i>Rhododendron ponticum</i> × <i>Rhododendron maximum</i>
Giant rhubarb	<i>Gunnera tinctoria</i>
Japanese rose	<i>Rosa rugosa</i>
Giant salvinia	<i>Salvinia molesta</i>
Green seafingers	<i>Codium fragile</i>
Californian red seaweed	<i>Pilea californica</i>
Hooked asparagus seaweed	<i>Asparagopsis armata</i>
Japanese seaweed	<i>Sargassum muticum</i>
Laver seaweeds (except native species)	<i>Porphyra</i> spp
Australian swamp stonecrop or New Zealand pygmyweed	<i>Crassula helmsii</i>
Wakame	<i>Undaria pinnatifida</i>
Curly waterweed	<i>Lagarosiphon major</i>
Waterweeds	<i>Elodea</i> spp.



2.3.2 The Conservation of Habitats and Species Regulations 2010 (as amended)

The *Conservation of Habitats and Species Regulations 2010* (as amended) originally came into force in 1994 and were updated on 16th August 2012 to ensure the various provisions of Directive 92/43/EC (the *Habitats Directive*) are transposed in a clear manner. These regulations are predominately aimed at the conservation of habitats and species other than birds and complement the Wildlife and Countryside Act.

Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species (listed in Annexes I or II of the *Habitats Directive* respectively) to the European Commission. These sites, if ratified by the European Commission, are then designated as Special Areas of Conservation (SACs). The 2012 amendments include that public bodies help preserve, maintain and re-establish habitats for wild birds.

The Regulations also make it an offence to deliberately capture, kill, disturb or trade in the animals listed in Schedule 2, or pick, uproot, destroy, or trade in the plants listed in Schedule 5 (see Table 2).

Table 2: Schedules of the Conservation of Habitats and Species Regulations 2010 (as amended)

Schedule 2 -- European Protected Species of Animals		Schedule 5 -- European Protected Species of Plant	
Common name	Scientific name	Common name	Scientific name
Horseshoe bats	<i>Rhinolophidae</i> - all species	Shore dock	<i>Rumex rupestris</i>
Common bats	<i>Vespertilionidae</i> - all species	Killarney fern	<i>Trichomanes speciosum</i>
Wildcat	<i>Felis silvestris</i>	Early gentian	<i>Gentianella anglica</i>
Dolphins, porpoises and whales	<i>Cetacea</i> – all species	Lady's-slipper	<i>Cypripedium calceolus</i>
Dormouse	<i>Muscardinus avellanarius</i>	Creeping marshwort	<i>Apium repens</i>
Pool frog	<i>Rana lessonae</i>	Slender naiad	<i>Najas flexilis</i>
Sand lizard	<i>Lacerta agilis</i>	Fen orchid	<i>Liparis loeselii</i>
Fisher's estuarine moth	<i>Gortyna borelii lunata</i>	Floating-leaved water plantain	<i>Luronium natans</i>
Great crested newt	<i>Triturus cristatus</i>	Yellow marsh saxifrage	<i>Saxifraga hirculus</i>
Otter	<i>Lutra lutra</i>		
Lesser whirlpool	<i>Anisus vorticulus</i>		



Schedule 2 – European Protected Species of Animals		Schedule 5 – European Protected Species of Plant	
Common name	Scientific name	Common name	Scientific name
ram's-horn Snail			
Smooth snake	<i>Coronella austriaca</i>		
Sturgeon	<i>Acipenser sturio</i>		
Natterjack toad	<i>Bufo calamita</i>		
Marine turtles	<i>Caretta caretta, Chelonia mydas, Lepidochelys kempii, Eretmochelys imbricata, Dermochelys coriacea</i>		

2.3.3 Natural Environment and Rural Communities Act 2006

Section 41 (S41) of this Act requires the Secretary of State to publish a list (in consultation with Natural England) of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as public bodies including local and regional authorities, in implementing their duty under Section 40 of the Natural Environment and rural Communities (NERC) Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal (e.g. planning) functions. The S41 list includes 65 habitats of principal importance and 1,150 species of principal importance.

2.3.4 Hedgerow Regulations 1997

The *Hedgerow Regulations* were made under Section 97 of the *Environment Act* 1995 and came into force in 1997. They introduced new arrangements for local planning authorities in England and Wales to protect important hedgerows in the countryside, by controlling their removal through a system of notification. Important hedgerows are defined by complex assessment criteria, which draw on biodiversity features, historical context and the landscape value of the hedgerow.



3.0 Methodology

3.1 Desk Study

The Sussex Biodiversity Records Centre (SxBRC) provided the following data for a 2km radius of the site:

- ✧ Non-statutory nature conservation designations, such as Wildlife Sites;
- ✧ Protected species, such as badgers, great crested newts and bats; and
- ✧ Notable species, such as those listed in the local Biodiversity Action Plan.

Natural England's web-based Multi Agency Geographic Information for the Countryside (MAGIC) database also provided data for statutory sites designated for nature conservation within 2km of the site.

Please note that a lack of protected species data does not mean that such species are absent from an area, only that the biological records centre does not hold any records for that particular species. This study does not include landscape designations such as whether the site lies within a Conservation Area or whether there are any Tree Preservation Orders on the site.

3.2 Field Surveys

3.2.1 Habitats

The site was surveyed on the 15th December 2016, by WYG Consultant Ecologist, Ben Cooke, using standard Phase 1 survey methodology (JNCC, 2010). The 'extended' technique provides an inventory of the basic habitat types present and allows identification of areas of greater potential that require further survey. The vegetation and habitat types within the site were noted during the survey in accordance with the categories specified for a Phase 1 habitat survey (Joint Nature Conservation Committee (JNCC), 2010). Dominant plant species were recorded for each habitat present and target notes (TN) were used to describe the features of interest where necessary. The site was also appraised for its suitability to support notable flora in accordance with the Institute for Ecology and Environmental Management's *Guidelines for Preliminary Ecological Appraisal* (2013).

The site's hedgerows were also evaluated for importance with reference to the Hedgerows Regulations (1997).



3.2.2 Protected and Notable Species

The site was inspected for evidence of and assessed for potential to support protected and notable species. This includes species listed under the *Conservation of Habitats and Species (Amendment) Regulations 2010*, the *Wildlife & Countryside Act 1981* (as amended), and those given extra protection under the *Natural Environment and Rural Communities (NERC) Act 2006* and *Countryside & Rights of Way (CROW) Act 2000*, and the UK and local Biodiversity Action Plans.

The following species are considered within the assessment:

Badgers

The site was surveyed for evidence of badger setts or other badger activity such as paths, latrines or signs of foraging. Methodologies used and any setts recorded were classified according to published criteria (Harris, Cresswell & Jefferies, 1989). It is recommended in *Badgers and Development* (English Nature, 2011) that a 30 m buffer around the site is investigated for evidence of badger activity where possible.

Bats

Foraging and Commuting

The site was appraised using Bat Conservation Trust's (BCT) system to categorise the potential value of habitats and features for use by foraging and commuting bats, as follows:

- ✧ High Quality: Habitat is high quality for foraging activity and connected to the wider landscape by strong linear features for use by commuting bats.
- ✧ Medium Quality: Habitat is good quality for foraging activity and is connected to the wider landscape by linear features for use by commuting bats.
- ✧ Low Quality: Habitat is isolated and is limited in extent for use by bats for foraging. The site is not connected to the wider landscape by prominent linear features for use by commuting bats.

Roosts

A ground based external inspection was completed of trees and buildings within and directly adjacent to the site that could potentially be impacted by the works. The survey was carried out in line with methodology outlined in the Bat Conservation Trust's Bat Surveys for Professional Ecologist: Good Practice Guidelines (Collins, 2016) hereafter referred to as the 'BCT Guidelines'. High powered optics



were used to inspect features that were assessed as having potential to support roosting bats, such as:

- Rot holes in trees;
- Splits and cracks in tree bark;
- Woodpecker nest holes;
- Access points to structures.

Other factors that may influence roost establishment were also taken into account, such as aspect, shading, disturbance, lighting and the presence of features in the adjacent habitat that could be used by bats for commuting and foraging. Evidence searched for included:

- Bat droppings;
- Staining from urine or from the natural oil on bats' fur around well-used roosting places or access points; and
- Actual bat presence.

Features assessed as having potential to support roosting bats which could not be searched from ground level were also noted. Based on the findings, the trees on site were assigned a 'suitability' rating based on their potential to support roosting bats. The categories include negligible, low, moderate or high suitability and are based on a multitude of factors, including (but not limited to):

- Number of features suitable to support roosting bats;
- Type of feature;
- Age of the structure; and
- Location and disturbance of the structure.

Table 3 provides a summary of the bat roost suitability categories for trees.

Table 3: Guidelines for assessing the potential suitability of structures for bats (taken from BCT Guidelines)

Suitability	Roosting Habitat Description
Negligible	Negligible habitat features likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation) A tree of sufficient size and age to contain potential roosting features but with none seen from the ground or features seen with only very limited roosting



Suitability	Roosting Habitat Description
	potential.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

The buildings on-site were assessed internally and externally subject to available access. The trees on-site were subject to assessment for the suitability in relation to bats from the ground only using binoculars, no climbing inspections were undertaken.

Great Crested Newts

The site was assessed for suitability to support great crested newts *Triturus cristatus* with reference to the *Herpetofauna Workers' Manual* (Joint Nature Conservation Committee, 2003) and the *Great Crested Newt Conservation Handbook* (Langton, Beckett & Foster, 2001).

Reptiles

The site was assessed for suitability to support reptiles with reference to the *Herpetofauna Workers' Manual* (JNCC, 2003).

Hazel Dormice

The site was assessed for suitability to support hazel dormice *Muscardinus avellanarius* with reference to the *Dormouse Conservation Handbook* (Bright, Morris & Mitchell-Jones, 2006).

Other Species

The site was assessed for suitability to support other protected and notable fauna including birds, invertebrates and mammals with reference to the *Guidelines for Preliminary Ecological Appraisal* (IEEM, 2012).

Invasive Species

The site was searched for invasive plants e.g. floating pennywort *Hydrocotyle ranunculoides*, giant hogweed *Heracleum mantegazzianum*, Himalayan balsam *Impatiens glandulifera*, Japanese knotweed *Fallopia japonica* and New Zealand pygmyweed *Crassula helmsii*.



3.2.3 Limitations

The comprehensiveness of any ecological assessment will be limited by the season in which surveys are completed. The extended Phase 1 habitat survey was carried out in December, outside of the optimum survey season (April – September). However all habitat types onsite could be accurately identified, and if the site appeared to have the potential to support flora of conservation interest, further botanical surveys would have been recommended at the appropriate time. Therefore the timing of the survey is not considered to represent a significant limitation to the survey.

A full assessment of the suitability of all the on-site buildings to house roosting bats could not be conducted at the time of the survey due to the lack of access to the interior of the majority of structures (with the exception of Buildings 2 and 10). In addition the exteriors of buildings 1 and 5 could not be fully assessed due to the extensive growth of bramble scrub preventing access to the buildings.

The dense growth of vegetation also prevented access to sections of the site, particularly the south-eastern extent. It should be noted therefore the level of suitability of the site relating to various species on-site given may change based on further site visits which are recommended in this report.

To determine likely presence or absence of protected species, multiple visits at suitable times of the year are required. This particular survey focuses on assessing the potential of the site to support species of note considered of importance for conservation of biodiversity with reference to the National Planning Policy Framework (NPPF, 2012), especially those given protection under UK or European wildlife legislation.

Internal inspections of the buildings on-site could not be conducted as they were considered unsafe to access however the overall potential of these buildings to be utilised by bats was assessed externally. As a number of the buildings were considered to have bat roost suitably following this survey further dusk emergence/ pre-dawn return surveys have been therefore this is not considered a significant limitation to assessment.

The data search produced by SxBRC did not return any records of badgers as all data in relation to this species is held by the Badger Trust Sussex. An inquiry for data has been sent but no reply has been received.

If development does not commence by November 2018 it is recommended that the results of this survey are reviewed in order to determine whether any update surveys are required.



4.0 Baseline Conditions

4.1 Designated Sites

4.1.1 Statutory Sites

There are no statutory designated sites located within 2km of the site from the search undertaken by SxBRC. There is a further nine internationally designated sites located within 15km of the site. Details of these designations are provided in Table 1.

Table 1: European Statutory Designations within 15km of the Site.

Designated Site	Distance (km) and Direction	Reason for Designation
Duncton to Bignor Escarpment SAC	9.8km, N	Annex I habitats that are a primary reason for selection of this site: Asperulo-Fagetum beech forests
Pagham Harbour Ramsar	9.9km, W	Pagham Harbour comprises an extensive area of saltmarsh and tidal mudflats with surrounding habitats including lagoons, shingle, open water, reed swamp and wet permanent grassland. The intertidal mudflats are rich in invertebrate and algae, and provide important feeding areas for birds. The lower saltmarsh is dominated by common cord-grass. The area supports internationally important numbers of wintering pintail and nationally important species such as dark-bellied brent goose (<i>Branta bernicla</i>), grey plover (<i>Pluvialis squatarola</i>) and black-tailed godwit (<i>Limosa lapponica</i>).
Pagham Harbour SPA	9.9km, W	This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: During the breeding season; Little Tern (<i>Sterna albifrons</i>), 12 pairs representing 0.5% of the breeding population in Great Britain (Count as at 1995) Over winter; Ruff (<i>Philomachus pugnax</i>) 160 individuals representing at least 22.9% of the wintering population in Great Britain This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory



		species: Over winter; Pintail (<i>Anas acuta</i>), 628 individuals representing at least 1.0% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)
Arun Valley Ramsar	11.6km, NE	The Arun Valley is located between Pulborough and Amberley and comprises an area of wet meadows on the floodplain for the River Arun. The neutral wet grassland is dissected by a network of ditches and therefore subject to annual winter, and occasional summer flooding. These ditches support rich aquatic flora and invertebrate fauna including <i>Pseudamnicola confusa</i>. The area is of outstanding ornithological importance notably for wintering wildfowl and breeding waders such as Ruff (<i>Philomachus pugnax</i>).
Arun Valley SAC	11.6km, NE	Annex II species that are a primary reason for selection of this site: Ramshorn snail (<i>Anisus vorticulus</i>)
Arun Valley SPA	11.6km, NE	This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: Over winter; Bewick's Swan (<i>Cygnus columbianus bewickii</i>), 115 individuals representing at least 1.6% of the wintering population in Great Britain (5 year peak mean for 1992/93 to 1996/7) Assemblage qualification: A wetland of international importance. The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl Over winter, the area regularly supports 27,241 individual waterfowl (5 year peak mean for 1992/93 to 1996/97) including: Shoveler (<i>Anas clypeata</i>), Teal (<i>Anas crecca</i>), Wigeon (<i>Anas penelope</i>), Bewick's Swan.
Chichester Harbour Ramsar	14.4km, W	Chichester and Langstone Harbours are located on the south coast of England in Hampshire and West Sussex. They are large, sheltered estuarine basins comprising extensive sand- and mud-flats exposed at low tide. The two harbours are joined by a stretch of water that separates Hayling Island from the



		mainland. Tidal channels drain the basin and penetrate far inland. The mud-flats are rich in invertebrates and also support extensive beds of algae, especially Enteromorpha species, and eelgrasses Zostera spp. The basin contains a wide range of coastal habitats supporting important plant and animal communities. The site is of particular significance for waterbirds, especially in migration periods and in winter. It also supports important colonies of breeding terns.
Chichester Harbour SPA	14.4km, W	This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: During the breeding season; Little Tern Sandwich Tern (<i>Thalasseus sandvicensis</i>) On passage; Little Egret (<i>Egretta garzetta</i>) Over winter; Bar-tailed Godwit Little Egret This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: On passage; Ringed Plover (<i>Charadrius hiaticula</i>) Over winter; Black-tailed Godwit (<i>Limosa limosa</i>) Dark-bellied Brent Goose Dunlin (<i>Calidris alpina alpina</i>) Grey Plover Redshank (<i>Tringa tetanus</i>) Ringed Plover



Solent Maritime SAC	14.4km, W	Annex I habitats that are a primary reason for selection of this site Estuaries Spartina swards (<i>Spartinion maritimae</i>) Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) Annex I habitats present as a qualifying feature, but not a primary reason for site selection Sandbanks which are slightly covered by sea water all the time Mudflats and sandflats not covered by seawater at low tide Coastal lagoons Annual vegetation of drift lines Perennial vegetation of stony banks Salicornia and other annuls colonizing mud and sand Shifting dunes along the shoreline with <i>Ammophila arenaria</i> Annex II species present as a qualifying feature but not a primary reason for site selection Desmoulin's whorl snail (<i>Vertigo moulinsiana</i>)
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4.1.2 Non-Statutory Sites

There are no non-statutory designated sites located within 2km of the site from the search undertaken by SxBRC.

Ancient Woodland

There are no units ancient woodland located within 2km of the site. The closet of these is unnamed woodland, which covers approximately 0.75ha and lies approximately 2.5km north east of the site.

4.2 Habitats

Habitats recorded during the extended Phase 1 habitat survey are detailed below for the site. The habitat descriptions should be read in conjunction with Figure 2, which shows the location and extent of the habitats recorded.

4.2.1 Amenity Grassland

Well managed amenity grassland areas are confined to the gardens of the three residential properties located on-site. These areas are dominated by perennial rye grass (*Lolium perenne*) with scattered examples of red clover (*Trifolium pratense*), white clover (*Trifolium repens*) and ribwort plantain (*Plantago lanceolata*).



Photo 1. Amenity grassland comprising the eastern half of the residential property (B4).

4.2.2 Buildings

There are a total of fourteen buildings on-site; further details are provided within Section 4.3.2 below.

4.2.3 Ditch

A ditch (which was dry at the time of survey) approximately 0.5m wide and 150m in length runs along the majority of the western boundary of the site and is also entirely encapsulated by dense bramble (*Rubus fruticosus*) scrub. There was no indication of the presence of aquatic vegetation within the on-site ditch.



Photo 2. Southern end of the dry ditch running adjacent to the residential area to the west of the site.

4.2.4 Bare Ground/ Hardstanding

There are patches of bare ground throughout the site as well as hard standing tarmac areas, this is predominantly with the north eastern section of the site where Cinders Lane enters the site and then splits into two access routes for the residential properties and both the on-site work yard.



Photo 3. Area of bare ground to the north of Building 4, facing eastwards.



4.2.5 Introduced Shrub

Scattered introduced shrubs are present within the site comprising buddleia (*Buddleja* sp.) located along Cinders Lane in the north eastern section of the site.

4.2.6 Mixed Scattered Trees

Trees and taller shrubs are scattered throughout the site. A line of twenty recently lopped trees are located along the majority of the northern boundary which abuts the adjacent allotments. The majority are predominantly covered in a thin layer of ivy (*Hedera helix*). Another tree line comprised of conifers (*Cupressaceae* sp.) is located between buildings 8 and 9. Other scattered trees are distributed around the site some contained to the gardens of the on-site residential properties including beech (*Fagus sylvatica*) rowan (*Sorbus aucuparia*) and silver birch (*Betula pendula*) are located along the northern boundary of the garden of building 6. The remaining trees on-site are located adjacent Cinders Lane including willow sp. (*Salix* sp.), ash (*Fraxinus excelsior*) and eucalyptus sp. (*Eucalyptus* sp.).

The trees on-site are a combination of mature, semi-mature and immature species with negligible features such as cracks and crevices that could have potential suitability for bats.

4.2.7 Species-poor Hedgerows

There are two sections of laurel hedgerow (*Lauraceae* sp.) the first (HR1) situated at the entrance to the site which forms part of the southern boundary of the adjacent doctors surgery approximately 1m wide and 20m in length. The second (HR2) is located along Cinders Lane which forms part of the western boundary of the site adjacent to the allotments and is approximately 1m wide and 10m in length. A section of hawthorn (*Crataegus monogyna*) (HR3) also forms part of this western boundary and is approximately 1m wide and 25m in length.

4.2.8 Scrub

Dense bramble is the predominant habitat type on-site covering over half of the site, there are some areas of scattered bramble scrub they comprise a minority of the scrub cover on-site. Small amounts of tall ruderal vegetation such as nettle (*Urtica dioica*) are present within the areas of scrub.



Photo 4. Patch of dense bramble scrub to the south of building 4.

4.2.9 Semi-improved Grassland

Semi-improved grassland is present on-site in small areas adjacent to the residential properties and the disused greenhouses. The retention of this habitat types appears to result from frequent disturbance (through walking or vehicular traffic) which has prevent scrub from establishing. The grassland is predominantly perennial rye-grass (*Lolium perenne*) and red fescue (*Festuca rubra*).





Photo 5. Area of poor semi-improved grassland to the south of building 9.

4.2.10 Tall Ruderal

Small areas of tall ruderal vegetation are scattered throughout the site, located principally along the fringes and intermixed in areas of scrub. Species on-site predominantly include low-growing colonising species including stinging nettle, broad leaved dock (*Rumex obtusifolius*) and ribwort plantain (*Plantago lanceolata*).

4.3 Protected & Notable Species

4.3.1 Badgers

Desktop Study

No records of badgers (*Meles meles*) were returned through the data search.

Field Surveys

No badger setts or signs of specific badger activity were identified onsite; several mammal runs were noted on-site within the areas of bramble however it cannot be certain that these runs were created by badgers. Due to the highly active nature of the species, the suitability of habitats on-site, and the presence of some limited connectivity to suitable habitat offsite (i.e. a small patch of deciduous woodland to the south east), it is considered that the site offers **moderate potential** for foraging, commuting badgers, or for forming setts.

4.3.2 Bats

Up to a total of eleven bat species (including three indeterminate species-groups) were returned through the data search although not all of these relate to roosts; these are summarised in Table 4 below:

Table 4: Bat records within the 2km data search area

Common Name	Scientific Name	No. of Records	Nearest Record to Site (km)	Comments
Pipistrelle sp.	<i>Pipistrellus</i> sp.	7	0.28km, south west	Field record within residential area of Yapton



Bat Sp.	<i>Chiroptera</i> sp.	5	0.38km, north east	Recorded as part of a building inspection
Natterer's	<i>Myotis nattereri</i>	1	0.4km, north	Field record within residential area of Yapton
Noctule	<i>Nyctalus noctula</i>	1	0.4km, north	Field record within residential area of Yapton
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	2	0.72km, south east	Field record
Serotine	<i>Eptesicus serotinus</i>	4	0.72kmm, south east	Record of droppings as part of a building inspection of residential property in Yapton
Barbastelle	<i>Barbastella barbastellus</i>	4	Minimum of 1km, west	Commuting and foraging records from a four figure grid reference encompassing arable fields
Brown-long eared	<i>Plecotus auritus</i>	2	2km, north east	Field record
Daubenton's	<i>Myotis daubentonii</i>	1	2km, south east	Field record within surrounding habitat of arable fields
Long-eared sp.	<i>Plecotus</i> sp.	4	2km, north east	Recorded as part of a building inspection of Ford Church
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	2	2km, north east	Field record

Field Survey

Roosting Bats – Trees

A number of trees are present within the site boundary, the majority of which will be retained as part of the proposal (Drawing No: HP16098 003). All trees (immature, semi-mature and mature) within the site were assessed for their potential to support roosting bats and no features to support roosting bats such as cracks/ crevices were noted therefore the trees on site have been assessed as having ***negligible potential*** to support roosting bats.

Roosting Bats – Buildings



Of the fourteen buildings located on-site six have been assessed as having the potential to support roosting bats. The majority of the buildings on-site were assessed for their potential suitability to support roosting bats based on their exterior features as access to the interior of the structures was not available at the time of survey. The interior of Buildings 2 and 10 were the only buildings able to be assessed. The description of the roosting features on each of these buildings and their suitability to support roosting bats is described in Table 6 below.

Table 6: Potentially Suitable Building Roosting Feature Description and their Potential Suitability

Building Number	Description Potentially Suitable Building Features	Bat Roosting Suitability
1	Single storey workshops of breeze block construction with a corrugated roof. The window openings of the structure are boarded by wooden panels in some locations however others have been left open. At the time of survey much of the structure was not able to be externally surveyed due to lack of access through the associated work yard and the western side of the property being encompassed by dense scrub (Photo 6).	Low
2	A disused stable of concrete construction and a corrugated iron roof. The exterior of the property is clad with timber panelling. The interior of the building comprises of bare concrete walls and floor with roof supported by timber framing.	Negligible
3	Breeze block storage shed with a corrugated roof. The roof has a wooden extension which forms a soffit along the northern facade of the structure. The wooden fascia appears hollow with two gaps identified within the north facing side of the fascia, above the buildings access door and window (Photo 7). A gap is also present between the wooden overhang and the corrugated sheeting on the eastern side of the structure.	Low
4	A red brick bungalow with tiled roof. The property is in a good state of repair, no loose tiles were identified or gaps within the soffits around the property. Two potential access points were identified the first was a gap between the side roof panelling and the tiling at the western gable end of the property (Photo 8). A second gap was noted within the roof between the metal flashing a chimney vent and the roof tiling on the southern side of the property (Photo 9).	Low
5	Small outbuilding of breeze block construction with a corrugated roof and door. The door has partially collapsed inwards however closer inspection of the property was hindered as it is almost completely encompassed by dense scrub (Photo 10).	Low
6	Static Caravan of timber construction with a pitched roof. The soffits of the property were in a good state of repair and no exterior features providing access to the interior were noted.	Low
7	Static Caravan of timber and red brick construction with a pitched roof, which appears to be of relatively recent construction and/ or renovation. There were no exterior features noted which would provide access to the interior were noted.	Low

8	Disused greenhouse in relatively poor state of repair with the exterior partially covered by overgrown bramble. The interior of the property is utilised for storage and has become partially overgrown by a combination of former nursery planting and bramble.	Negligible
9	Disused greenhouse in relatively poor state of repair with the exterior partially covered by overgrown bramble. The interior of the property is also utilised for storage with minimal vegetation growing into the interior of the property.	Negligible
10	Disused greenhouse in a poor state of repair, the interior of which is fully encompassed by bramble scrub. A red-brick former gift shop is also contained within the interior of the greenhouse however the roof has partially collapsed as no features were identified inside to offer suitability for roosting bats.	Negligible
11	Corrugated storage shed with pitched roof and no internal roof void.	Negligible
12	Small metal garage with no internal roof void.	Negligible
13	Summer house of timber construction with a pitched roof located within the garden of building 4. The summer house has no internal roof void and is in a good state of repair with no features noted to provide internal access for bats.	Negligible
14	Wooden shed with a pitched roof located within the garden of building 4. The window ports are fitted with mesh and there is no internal roof void.	Negligible

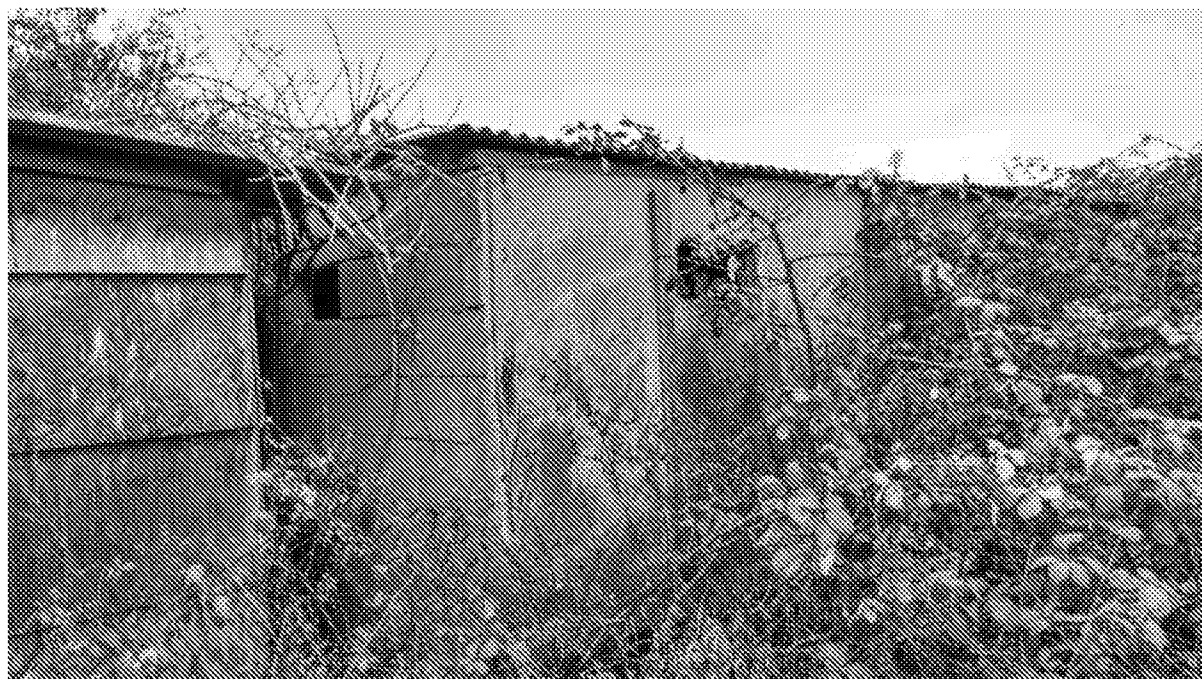


Photo 6. Western side of building 1 cover in dense bramble scrub.



Photo 7. Roosting feature in the form of a gap present within hollow wooden facade on the northern side of building 3



Photo 8. Roosting feature in the form of a gap between the tiling and the brick work at the western gable end of the property.



Photo 9. Roosting feature in the form of gap in the tiling beneath the flashing surrounding the base of the steam vent on the southern side of the property.

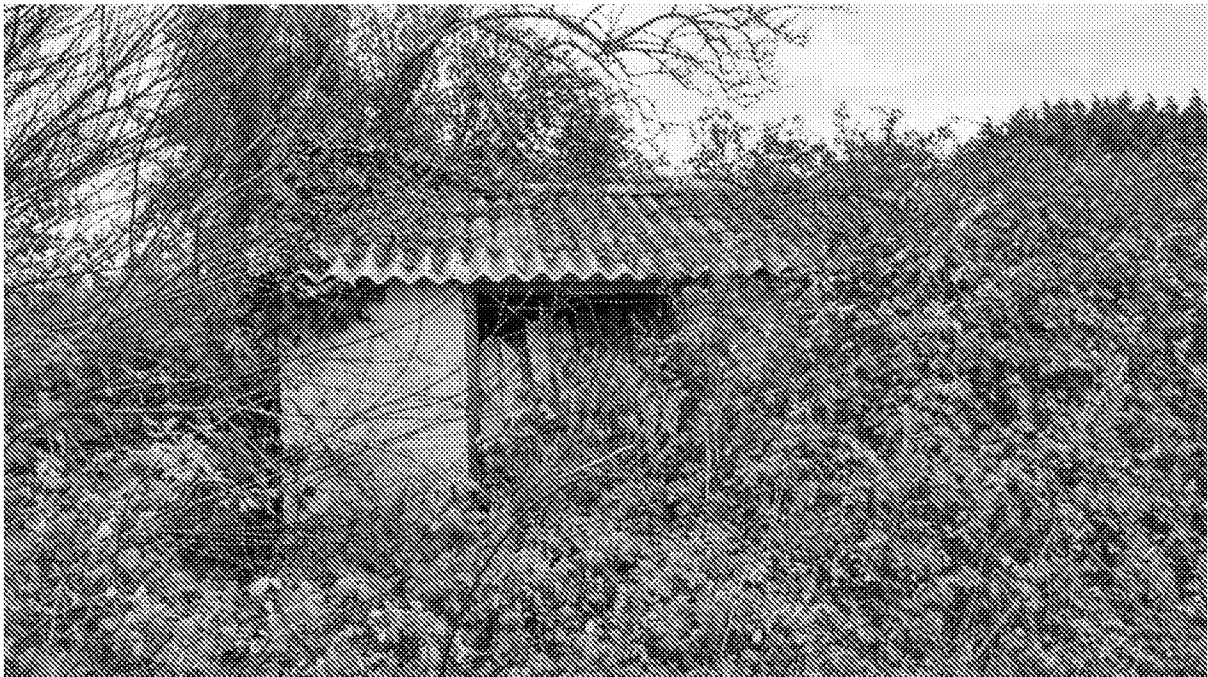


Photo 10. Building 5 encompassed by dense scrub.

Foraging and Commuting



The site comprises a matrix of habitats including patches of semi-improved grassland, hedgerows, scrub and tall ruderal, which would provide suitable habitat for foraging and commuting bats. The boundaries of the site in the form of treelines, fencing and hedgerows provide linear features which offer some suitable dispersal corridors for bats to commute to and from the site. The eastern and southern extent of the site is unlit, and there are several records of bats within the Yapton area. The habitat within the wider area surrounding the site comprises of residential areas to the north and west with arable fields divided by defunct hedgerows and disjointed treelines.

As such, due to the small size of the site, the matrix of habitats present, the number of bat records from within the nearby residential areas and the potential for roosting bats to be present, the site is considered to have **moderate suitability** for both foraging and commuting bats (BCT, 2016).

4.3.3 Birds

Desktop Study

A total of thirty legally protected bird species, listed on Schedule 1 of the W&CA (as amended) were returned through the data search, the majority of these records relate to breeding birds, these comprise garganey (*Anas querquedula*), common quail (*Carturnix coturnix*), Eurasian bittern (*Botaurus stellaris*), honey buzzard (*Pernis apivorus*), red kite (*Milvus milvus*), marsh harrier (*Circus aeruginosus*), hen harrier (*Circus cyaneus*), montagu's harrier (*Circus pygargus*), goshawk (*Accipiter gentilis*), osprey (*Pandion haliaetus*), hobby (*Falco subbuteo*), peregrine falcon (*Falco peregrinus*), spotted crane (*Porzana porzana*), avocet (*Recurvirostra avosetta*), stone-curlew (*Burhinus oedipnemos*), little-ringed plover (*Charadrius dubius*), black-tailed godwit (*Limosa limosa*), Mediterranean gull (*Larus melanocephalus*), little tern (*Sternula albifrons*), barn owl (*Tyto alba*), common kingfisher (*Alcedo atthis*), firecrest (*Regulus ignicapillus*), bearded tit (*Panurus biarmicus*), woodlark (*Lullula arborea*), cetti's warbler (*Cettia cetti*), Dartford warbler (*Sylvia undata*), savi's warbler (*Locustella luscinioides*), marsh warbler (*Acrocephalus palustris*), black redstart (*Phoenicurus ochrurus*) and common crossbill (*Loxia curvirostra*).

The data search also returned fourteen records of bird species of high (Birds of Conservation Concern Red List) and thirty two (BoCC Amber List) within the 2km data search. Records of species considered likely or proven to be breeding on-site include Eurasian wigeon (*Anas Penelope*), turtle dove (*Streptopelia turtur*), barn swallow (*Hirundo rustica*), willow tit (*Poecile montanus*), bearded tit (*Panurus biarmicus*), wood warbler (*Phylloscopus sibilatrix*), corn bunting (*Emberiza calandra*) and tree sparrow (*Passer montanus*).

Field Survey



The hedgerows, scattered trees, dense scrub and some of the on-site buildings located within the site boundary offer a matrix of habitats that would potentially support a range of breeding bird species. The extended Phase 1 habitat survey was undertaken outside of the nesting season (March to October inclusive) therefore no nesting behaviour was noted. However, a number of common species were recorded including blackbird (*Turdus merula*), robin (*Erithacus rubecula*) and wood pigeon (*Columba palumbus*) BoCC green listed species. The site is assessed as offering **high potential** for a range of common and widespread breeding bird species.

A nesting box (TN3) was also identified on-site fitted to a lopped tree situated along the western site boundary alongside Cinders Lane.

4.3.4 Great Crested Newts

Desktop Study

The data search returned nine post-2000 records of great crested newts (GCN) within the 2km data search area.

Field Survey

The proposed development site is dominated by suitable terrestrial habitat in the form of bramble scrub with a ditch which whilst dry provided connective linkages along the eastern boundary of the site in addition with debris piles offering potential as hibernacula for hibernating great crested newts.

The on-site ditch was found to be dry and did not support any aquatic botanical species suggesting it is wet at any other point in the year and it is not connected to any waterbodies located off-site. The network of hedgerows and treelines along the arable field margins surrounding the site are disjointed and gappy, therefore they do not offer direct connectivity to off-site suitable terrestrial habitat (area of woodland to the south east).

There is a system of agricultural drainage ditches within 500m of the site although there are no other waterbodies located within this radius. The nearest record of GCN was 560m to the north west of the site located within a residential area of Yapton. As the ditches are located off-site their suitability as potential breeding habitat or as a commuting route could not be determined at the time. The site has therefore been assessed as offering **low potential** for great crested newts.

4.3.5 Hazel Dormice

Desktop Study

No records of hazel dormouse (*Muscardinus avellanarius*) were returned through the data search.



Field Survey

Hazel dormice are an arboreal species often found in woodlands, hedgerows and scrub; the dense scrub, hedgerows and scattered trees on-site particularly within south eastern area of the proposed development site offer suitable terrestrial habitat. The density of the scrub within this section of the site prevented a detailed assessment of the habitat. Whilst the site supports vegetation that offer protection and are suitable food sources for this species, the scrub habitat at the site is relatively isolated. There is some connectivity to the arable land to the east and south, from the review of aerial photography however the hedgerow network surrounding the site is fragmented and gappy. Given that dormice are arboreal and there is little connectivity present to the surrounding area in conjunction with no records of dormice being returned by the SxBRC, the site is considered to be of **negligible potential** to dormice. This assessment is given further assurance as the site is situated within a largely intensively managed arable and built-up residential landscape and there are no local records for this species within a 2km radius of the site.

4.3.6 Invertebrates

Desktop Study

A total of fifty five records of invertebrates were returned by the SxBRC, of these five are classified as Sussex BAP species, four under the Species of Principal Importance in England (Section 41), one under the Habitats Directive Annex 2 (stag beetle (*Lucanus cervus*)), one nationally notable species (saltmarsh knot-horn moth (*Ancylosis oblitella*)) and a single IUCN - near threatened (scarce chaser dragonfly (*Libellula fulva*)).

Field Survey

The bare ground, semi-improved grassland and scrub habitats are likely to offer some suitability to invertebrates. However, these habitats are common and widespread within the area, and throughout the south of England, as such the site is assessed as offering **negligible potential** for notable and/or scarce invertebrate species

4.3.7 Reptiles

Desktop Study

A total of sixteen records of slow-worms (*Anguis fragilis*) were returned through the data search, the nearest record is located 75m north of the site within the garden of a residential property of Yapton.



Eleven records of grass snake (*Natrix natrix*) of these three were recorded prior to 2000. The nearest record was located approximately 420m to the north of the site located within a residential area of Yapton.

There are nine records of common lizard (*Zootaca vivipara*) of these three were historical records. The nearest is located approximately 420m to the north of the site located within a residential area of Yapton.

The only record of adder (*Vipera berus*) returned through the record is also a historical one dating from 1998 from the garden of a residential property within Barnham, 2km north west of the site.

Field Survey

The site is predominantly comprised of dense scrub with tall ruderal vegetation and semi-improved grassland mosaics which provides suitable habitat for reptiles including cover and protection, basking as the habitat interfaces, in addition the presence of debris, rubble and wood piles on-site offers potential refuge and locations for hibernation. The allotment adjacent to the northern boundary also offers potential hibernacula through the remnants of garden waste and compost located throughout and further suitable habitat for reptiles to bask and forage with numerous areas of unmanaged vegetation. The rubble pile located within the area of scrub to the south building 4 (TN1) could be utilised for the purpose of hibernation. A wood pile (TN2) was also located within same area of scrub thereby offering additional potential hibernacula on-site. The proposed development is located at the peripheries of a residential landscape within a wider arable landscape with little direct connectivity to off-site suitable terrestrial habitat for reptiles. The site is therefore considered to be of **moderate potential** for reptiles.



Photo 6. Rubble pile (TN1) encompassed by dense scrub located in the southern half of the site.



Photo 7. Wood pile (TN2) located at the fringes of a patch of bramble scrub to the south of building

4.3.8 Invasive Species

Desktop Study



SxBRC returned six invasive plants listed on Schedule 9 of the WCA 1981 (as amended in 2010) were returned from the data search area and these records are summarised in Table 5 below.

Table 5: Invasive plant records within the 2km data search area listed on Schedule 9 of the WCA 1981

English Name	Scientific Name	Comments
False Virginia creeper	<i>Parthenocissus inserta</i>	Six records were identified between 2005 -2011, the nearest of which is approximately 550m south of the site.
Giant hogweed	<i>Heracleum mantegazzianum</i>	Two records were identified in 2006, the nearest of which was approximately 2km south east of the site.
Indian balsalm	<i>Impatiens glandulifera</i>	Two records were identified in 2009 and 2010 respectively, approximately 2km from the site to the north and west.
Japanese knotweed	<i>Fallopia japonica</i>	A total of seven records were returned for Japanese knotweed, recorded between 1998 and 2007. The nearest record was 180m to the west of the site within a residential area of Yapton.
Montbretia	<i>Crocsmia x crocosmiiflora</i>	Six records were identified between 2005 -2011, the nearest of which is approximately 200m west of the site within Yapton.
Small-leaved cotoneaster	<i>Cotoneaster microphyllus</i>	A single record was identified in 1990 at least 200m to the west of the site.

Field survey

No invasive species were identified on-site during the extended Phase 1 habitat survey.



5.0 Ecological Impacts and Recommendations

5.1 Statutory and Non-statutory Sites

No statutory or non-statutory sites are located within a 2km radius of the development; however nine internationally designated sites were identified within 15km of boundaries of the site.

The Chichester and Langstone Harbour SPA/Ramsar is encompassed by the Solent Maritime SAC and is located 14.4km to the west of the site. The principal risk to the site is recreational disturbance which was identified as part of the Habitats Regulations Assessment for the Arun District Local Plan (UE Associates, 2010) however no significant effects were considered likely due to the distance of the site from the district council area. Local authorities which are situated closer to the Chichester and Langstone Harbour SPA/Ramsar and Solent Maritime SAC consider any proposed development within 5.6km of these sites to generate a significant recreational pressure (based on the result of the Solent Disturbance and Mitigation Project, Footprint Ecology 2009) and as a result these sites must make a financial contribution to the their management as mitigation. As the proposed development is located outside of this radius it is considered unlikely to result in a significant adverse impact.

Pagham Harbour SPA/Ramsar Site is located 9.9km to the west of the site and has likewise been identified as at risk from recreational pressure. The potential for significant effects was identified within the Local Plan HRA (UE Associates, 2010), however it was concluded that only new development within 5km of the SPA was likely to result in significant pressure. As such the proposed development is considered unlikely to result in a significant adverse impact.

Duncton to Bignor Escarpment SAC located 9.8km to the north of the site. are the appropriate management of non-native/invasive species and management of the resident deer population (UE Associates, 2010). The proposed development is not related to the management of the SAC and it is considered unlikely to result in a significant adverse impact.

Arun Valley SPA/Ramsar Site is located 11.6km to the north east of the site. The identified risks to the integrity of the SPA/Ramsar Site are water abstraction, waste water pollution and recreational pressure. Impacts as a result of abstraction and waste water treatment within Arun District were screened-out after consultation with the Environment Agency (UE Associates, 2010) who confirmed that there are no waste water discharges into the Arun Valley from treatment works serving the Arun District, nor are any water abstraction proposed. Furthermore the proposed development site is not hydrologically linked to the SPA/Ramsar Site. Following consultation with Natural England, it was also concluded that development within the Arun Local Plan was unlikely to cause significant recreational



impacts to Arun Valley. As the proposed development is 11.6km from the SPA/Ramsar Site it is considered unlikely to result in a significant adverse impact.

The potential for significant ecological impacts on the South Downs National Park as a result of recreational pressure is considered unlikely. All of the internationally designated sites situated within the within the National park have been identified and any significant impacts as a result of the proposed development have been deemed unlikely for the reasons described above. The South Downs National Park has been designated in large part due to the outstanding natural beauty of the region therefore any residual ecological impacts can be mitigated by the significant resources available to the park authority.

5.2 Habitats

From reviewing the masterplan (Drawing No: HP16098003), all the internal habitats are proposed to be lost which comprise areas of semi-improved grassland, hardstanding, tall ruderal vegetation and scrub. A number of mature trees are present along field boundaries and from the review of the masterplan (Drawing No: HP16098003) all mature trees will be retained as part of the development proposals.

The habitats of semi-improved grassland, tall ruderal vegetation and scrub are considered to be of low intrinsic ecological value as they are common and widespread throughout the wider area and southern England. However, they offer potential to support protected and notable species, as detailed within Section 3.3 below.

It is recommended that native planting is incorporated into landscaping at the site, which will benefit a range of species, including invertebrates, birds and bats. It is also recommended that bat and bird boxes are incorporated onto trees within the proposed development to enhance the habitats for these species.

5.3 Protected and Notable Species

5.3.1 Bats

Breeding, Resting and Hibernating Bats

All species of British bats and their roosts are fully protected under the *Wildlife & Countryside Act 1981* (as amended) and the *Conservation of Habitats and Species Regulations 2010* (as amended) (see Appendix B).

All of the trees (immature, semi-mature and mature) within and overhanging the site were assessed as being of negligible bat roost potential due to either their relative immaturity or general lack of



suitable features and roosting bats are not considered to pose a constraint to their removal. No further bat surveys of trees are therefore required.

Eight of the buildings on-site (2, 8,9,10,11,12,13 and 14) were considered to be of negligible potential for roosting bats due to lack of features likely to be suitable for roosting bats. No further surveys are therefore required on these buildings.

Six of the buildings on-site (1, 3,4,5,6 and 7) were considered to be of low potential due to the fact that the roof is sealed with no evidence of bats being present. Externally there are a few potential access points that may be suitable for roosting bats.

The buildings on-site were unable to be assessed internally. A further two of the buildings could not be assessed closely externally due to the presence of dense impenetrable scrub surrounding the buildings. Therefore it is recommended where scrub is densely surrounding the buildings, it is recommended that paths are cut into the vegetation to facilitate access surrounding the building so that an external and internal assessment of the buildings can be undertaken. It is recommended the clearance works are conducted outside of the breeding bird season as described in section 6.3.2 and under the supervision of a suitably qualified ecologist under a non-licence method statement, as described within section 6.3.4. Following a thorough external and internal inspections, if any buildings are still considered to be of low suitability to roosting bats, in line with Bat Survey Good Practice Guidelines 3rd Edition (Collins J, 2016) a minimum of one survey (either a dusk or a dawn re-entry survey) must be conducted from May to August inclusive to identify whether the building is utilised as a roosting location.

Foraging and Commuting Bats

The habitats on site were assessed as offering **low suitability** to support commuting and foraging bats. In accordance with the Bat Conservation Trust (BCT) Guidelines 2016, the site is 'medium' sized (1 - 15 hectares) with 'low' habitat quality.

The BCT (2016) guidelines recommend that three dusk activity surveys are to be carried out on-site, on a seasonal basis (spring – April/May, summer- June/July/August and autumn- September/October) between April and October along with a single automatic bat detectors on-site for a minimum of five consecutive nights per season.

5.3.2 Badgers

Badger and their setts are protected under the *Protection of Badgers Act 1992* and their welfare and mitigating for damage to their habitat are material considerations when considering planning applications.



As the on-site habitat comprises predominantly dense bramble scrub and some mammal runs were noted during the extended Phase 1 habitat survey albeit there was no direct evidence these were attributed to badger, it is recommended that where mammal runs are noted, paths are cut into the vegetation in order to locate any potential setts if present. It is recommended these works are undertaken outside of the nesting bird season which is between March and August inclusive.

5.3.3 Birds

All nesting birds are protected from disturbance whilst nesting by the *Wildlife and Countryside Act 1981* (as amended).

The hedgerows, trees, scrub, and buildings on-site would provide suitable nesting habitat for a range of bird species. The majority of the boundary vegetation onsite will be retained as part of the proposed development.

It is recommended that any vegetation clearance/building demolition (subject to results of further bat work that may be required) is carried out outside of nesting bird season, which runs from March to August. If vegetation clearance and/or/ demolition of buildings with bird nesting potential (particularly Buildings 8, 9 and 10 as the broken glass panes allow internal access to the disused greenhouses) is required during nesting season, it is recommended that a suitably qualified ecologist checks the vegetation for nests prior to removal. If an active nest is identified, a suitable buffer of vegetation should be retained around the nest until the young have fledged.

It is also recommended that further nesting opportunities are provided for birds through incorporating nest boxes within trees along the boundaries of the site and planting native trees and shrubs as part of the landscaping at the site. Refer to Appendix C and D for further details.

5.3.4 Dormice

Dormice are protected under the *Wildlife and Countryside Act 1981* (as amended) and the *Conservation of Habitats and Species Regulations 2010* (as amended).

Although the site is considered to contain suitable habitat the site was assessed as being of negligible potential to support dormice. As a result of the combination of the lack of records identified within the 2km radius of the site and the limited connectivity to off-site habitat, the site is not considered sufficient to support a population of dormice. As such no further recommendations are made with regards to this species.



5.3.5 Great Crested Newts

The great crested newt and its habitat are protected under the *Wildlife and Countryside Act 1981* (as amended) and the *Conservation of Habitats and Species Regulations 2010* (as amended) (see Appendix B).

Whilst there is suitable terrestrial habitat for great crested newts on site, the nearest pond is located approximately 640m south east of the site and nine recorded of GCN were identified within 2km none were located within 500m of the site.

It is recommended that a precautionary approach is taken and that a **non-licenced Method Statement** is prepared for the site. This will involve a toolbox talk to the contractors and a suitably qualified ecologist supervising the destructive search of the site. In the unlikely event that great crested newts are found on site all works will be required to stop.

5.3.6 Invertebrates

A number of invertebrate species are protected under the *Wildlife and Countryside Act 1981* (as amended) and the *Conservation of Habitats and Species Regulations 2010* (as amended). The current Biodiversity Action Plan (BAP) contains 411 invertebrate species.

The site was assessed as being of negligible value to scarce and/or notable invertebrate species given the widespread habitats that are present. As a result, no further invertebrate surveys are recommended for the site.

It is recommended that the log piles, along with any other dead wood, are retained on-site to provide suitable habitat for the stag beetle.

As an enhancement measure, it is recommended that insect boxes are incorporated into the new development and native trees and shrubs are planted on site. Refer to Appendix C and D for further details.

5.3.7 Reptiles

All species of native reptiles are protected under the *Wildlife and Countryside Act 1981* (as amended). The sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca* are further protected under *Conservation of Habitats and Species Regulations 2010* (as amended).

The site was assessed as having moderate potential for foraging, basking and hibernating reptiles due to the large area of suitable habitat within the site including dense scrub, areas of semi-improved grassland and rubble piles.



Therefore it is recommended that a reptile presence/ likely absence survey is undertaken between March – October to coincide with the reptile-active season. This requires seven survey visits spread out over a period of approximately two months.

It should be noted that dependent on the results of the presence/ likely absence surveys identifying the size of the reptile population on-site will determine the whether the identification of a suitable area off-site is required should a translocation be necessary. The current conceptual plan (Drawing No - HP16098 003) does not indicate there will be a suitable area on-site for a translocation receptor site to be located.

5.4 Other species

Hedgehogs

The hedgehog has the potential to occur at the site. Should any hedgehogs be found during site clearance, it is recommended that they be moved away from the works area by hand. Additionally care should be taken to avoid hedgehogs being harmed by any future constructions works; any pits or trenches where hedgehogs could become trapped should be covered at night or provided with a ladder/ramp to allow hedgehogs to escape.

5.5 Invasive Species

The *Wildlife and Countryside Act 1981* (as amended) recognises several invasive plant species list in Schedule 9 of the Act (see Appendix B, Table B2).

No invasive species were identified on site and therefore there are no further recommendations regarding invasive species.

5.6 Enhancements

In keeping with National Planning Policy, a number of potential biodiversity enhancements are proposed in Appendices D and E which could be incorporated into the final design where appropriate.

It is recommended that five bird and bat boxes are incorporated onto trees within the proposed development. It is recommended that a combination of open and closed fronted nesting boxes are utilised for birds and that Schwegler General Purpose bat box models 2F, 1FF and 1FD for roosting bats. It is also recommended that native trees and shrubs are incorporated where possible within the final design. This should benefit species such as birds, bats and invertebrates. Further details can be found in Appendix B and C.

Where possible in any new buildings, best practice should be considered and the use of Breathable Roof Membranes (BRM) avoided. Instead, Type 1F bitumen and hessian under felt may be considered



as an alternative. Ongoing research has confirmed that no BRM are bat-friendly and all pose a risk to bats. As these membranes wear over time the fibres in the membrane become loose. Bats become entangled in the fibres and, unable to escape, dehydrate, and starve to death. As well as posing a risk to bats, BRMs are also degraded by bats and the efficiency of the membrane is impaired (i.e. the use of BRMs in situations where bats are present is detrimental to the efficient functioning of the BRM as well as to bats. The research is summarized at <http://www.batsandbrms.co.uk/images.php>), further detail is provided in Waring *et al.* (2013).

Native trees and shrubs will be incorporated where possible within the final design although there are also many non-native species which could also benefit species such as birds, bats and invertebrates. Open space will be managed sensitively to benefit biodiversity. Further details of wildlife friendly species can be found in Appendix D.



6.0 Summary of Recommendations

6.1 Recommendations for avoidance:

- **Nesting Birds:** It is recommended that vegetation clearance of the areas of dense scrub is undertaken outside of nesting bird season (March to September inclusive). If this is not possible, it is recommended that a nesting bird check is carried out by an ecologist immediately prior to the removal of buildings and vegetation. If an active nest is found, it must be retained along within a suitable buffer until the young have fledged and cease to return to the nest.

6.2 Recommendations for further surveys

- **Badgers:** Vegetation clearance outside of the nesting bird season which runs from March to August inclusive to check if the mammal paths within the scrub on site lead to any potential badger setts within the immediate area off-site. It is also recommended that a pre-commencement badger sett check is undertaken for a 30m radius surrounding the site, subject to access being granted.
- **Bats:** The site has been assessed as of low value to foraging and commuting bats and three bat activity surveys are recommended between March to October inclusive with one transect conducted per season, plus a single automated bat survey per season with data to be collected over a minimum period of five consecutive nights. Vegetation clearance is to be conducted outside of the nesting bird season which runs from March to August inclusive to allow close inspection of the buildings externally. The six buildings considered to be of low suitability for roosting bats, will be surveyed a minimum of one survey (either a dusk or a dawn re-entry survey) which must be conducted from May to August inclusive to identify whether the building is utilised as a roosting location.
- **Great Crested Newts:** it is recommended that a precautionary measure is adapted and a non-licensed great crested newt Method Statement is prepared for the site.
- **Reptiles:** As the current on-site habitat was found to be suitable for reptiles, further reptile presence/likely absence comprising seven visits to the site between March and October subject to weather conditions to determine the current presence of reptiles on-site.



6.3 Recommendations for enhancement:

- Five bird and bat boxes are incorporated into the proposed development in order to enhance the habitat on-site. These will consist of open and closed fronted bird nesting boxes and Schwegler General Purpose bat box models 2F, 1FF and 1FD for roosting bats.
- It is recommended that native trees and shrubs are planted as part of the development proposals.



7.0 References

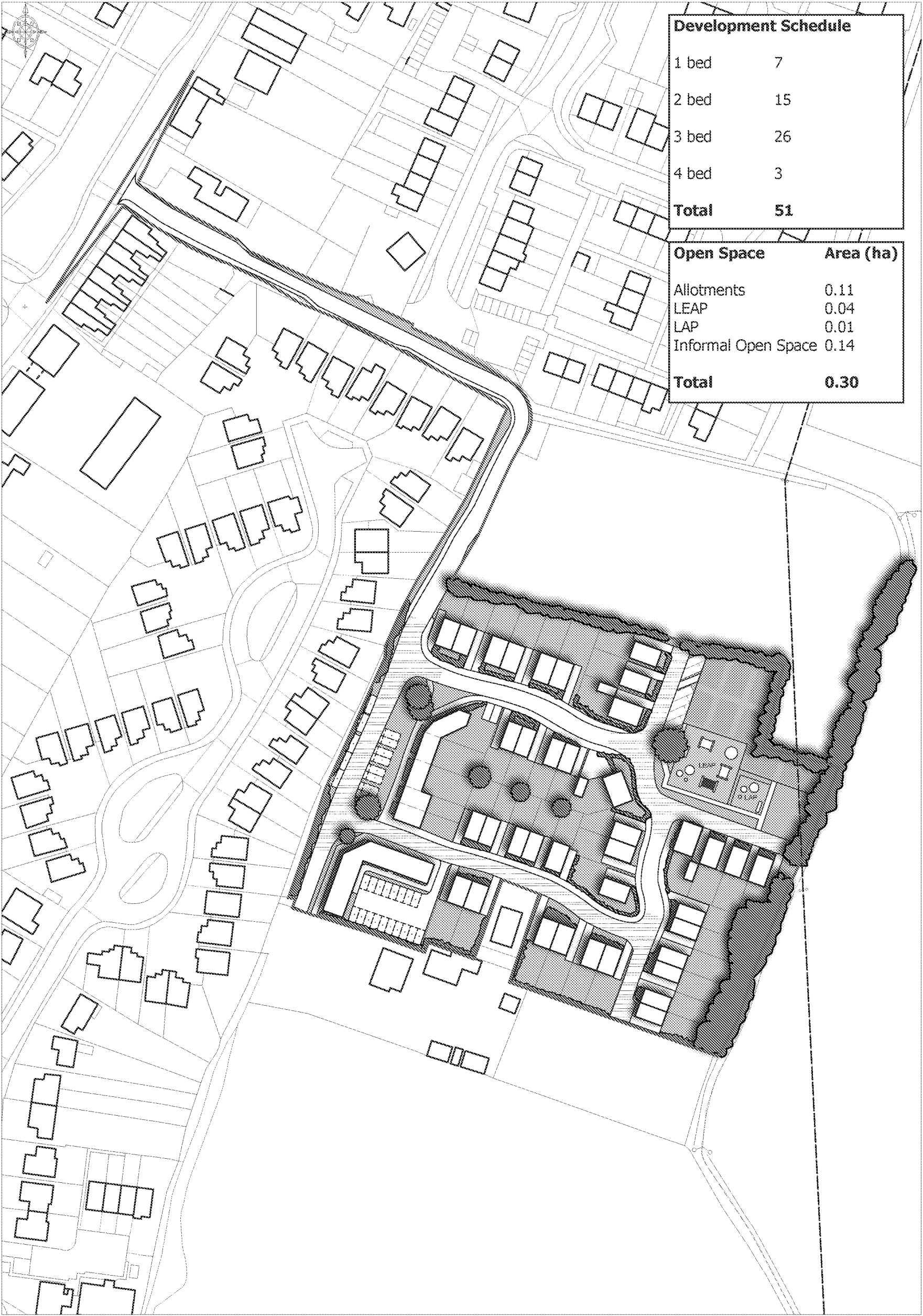
- Arun District Council (2007) Appropriate Assessment Screening Report.
- Bat Conservation Trust (2012). *Bat Surveys – Good Practice Guidelines, 2nd edition*. Bat Conservation Trust, London.
- Bright, P., Morris, M. & Mitchell-Jones, T. (2006) *The Dormouse Conservation Handbook*. Natural England.
- English Nature (2002). *Badgers and Development*. English Nature, Peterborough, UK.
- Eaton, M.A., et al. (2009). *Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and Isle of Man*. British Birds 102:296-341
- Gent, T. & Gibson, S. (2003). *Herpetofauna Workers' Manual*. JNCC, Peterborough.
- Harris, S., Cresswell, P. & Jeffries, D. (1989). *Surveying Badgers. An occasional publication of the mammal society – No. 9*. Mammal Society, London.
- Institute for Ecological Assessment (1995). *Guidelines for Baseline Ecological Assessment*. E & FN Spon, London.
- Joint Nature Conservation Committee (2010). *Handbook for Phase 1 Habitat Survey: A technique for environmental audit*. JNCC, Peterborough.
- Langton, T.E.S., Beckett, C.L. and Foster, J.P. (2001). *Great Crested Newt Conservation Handbook*. Froglife, Halesworth.
- Mitchell-Jones, A.J. & McLeish, A.P. (Eds) (2004). *Bat Workers Manual, 3rd Edn*. JNCC, Peterborough.
- Oldham, R.S., Keeble, J., Swan, M.J.S. & Jeffcote, M. (2000). Evaluating the suitability of habitat for the great crested newt *Triturus cristatus*. *Herpetological Journal*, **10(4)**, 143-155.
- RSPB (2002). *The Population Status of British Birds in the UK: Birds of Conservation Concern 2002-2007*.
- Strachan, R. & Moorhouse, T. (2006). *Water Vole Conservation Handbook (2nd Edn)*. Wildlife Conservation Research Unit, Oxford.
- Stillman, R. A., Cox, J., Liley, D., Ravenscroft, N., Sharp, J. & Wells, M. (2009) Solent disturbance and mitigation project: Phase I report.
- UE Associates (2010). Habitats Regulation Assessment for Arun District Local Plan.



Appendices



Appendix A – Figures



Land at Cinders Lane, Yapton

CONCEPTUAL LAYOUT

DWG N^o: HP16098 003
Conceptual Layout 003a

Drawn: MA

Checked: JH

Scale: 1:1250 @ A3

Date: 12/12/2016

Notes:

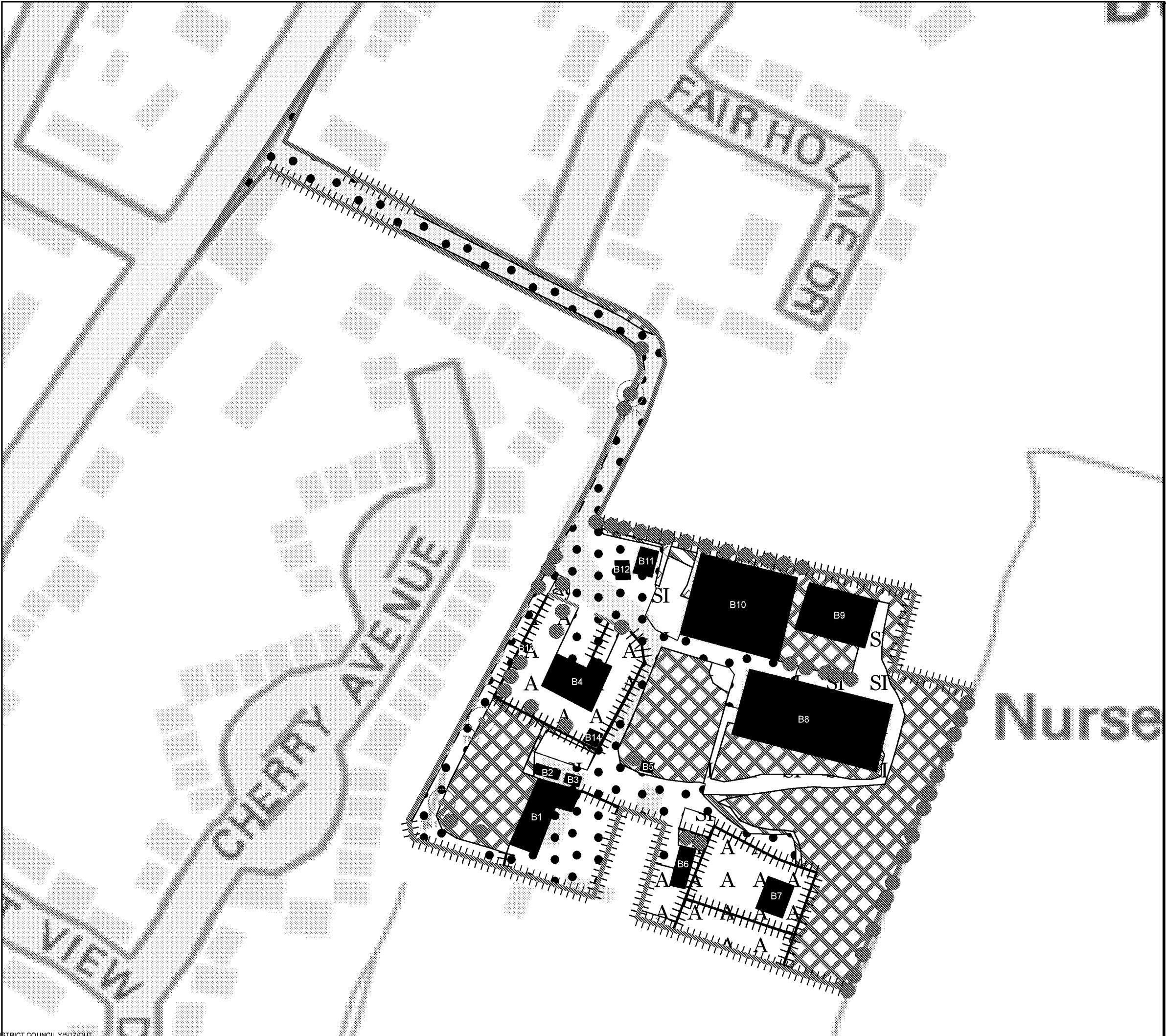
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This drawing is for illustrative purposes only and is subject to detailed topographical survey and site investigation, including ground conditions, contaminants, drainage, design and planning/ density regulation. The feasibility of the design shown, therefore, must not be relied upon. It has not been considered in respect of the CDM.

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Legend

- Amenity Grassland
- Bare Ground
- Building
- Dense Scrub
- Dry Ditch
- Fenceline
- Intact Species-poor Hedge
- Scattered Scrub
- Scattered Tree
- Semi-improved Grassland
- Tall Ruderal
- Wall
- Target Note
- Site Boundary



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WYG Planning & Environment

Cinders Lane, Yapton

Extended Phase 1 Habitat Survey Plan

	Drawn by: Date:	Checked By: Date:	Approved By: Date:
	BC 05.12.16	PL 17.01.17	CM 23.01.17
Project No:	Office	Type	Drawing No.
A0100671	45	94	Figure 2
			Revision

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Appendix B – Biodiversity and Environmental Legislation, Conventions & Threatened Lists



Introduction

The UK has ratified a number of Conventions and implemented legislation pertaining to the protection of biodiversity and habitats, either independently or as member state of the European Union. These are defined and summarised below.

Lists of threatened, endangered and extinct species are also provided, together with a summary explanation of each.

Bern Convention (1982)

The *Convention on the Conservation of European Wildlife and Natural Habitats* (the *Bern Convention*) was adopted in Bern, Switzerland in 1979, and was ratified in 1982. Its aims are to protect wild plants and animals and their habitats listed in Appendices 1 and 2 of the Convention, and regulate the exploitation of species listed in Appendix 3. The regulation imposes legal obligations on participating countries to protect over 500 plant species and more than 1000 animals.

To meet its obligations imposed by the Convention, the European Community adopted the *EC Birds Directive* (1979) and the *EC Habitats Directive* (1992 – see below). Since the Lisbon Treaty, in force since 1st December 2009, European legislation has been adopted by the European Union.

Biodiversity Action Plan (BAP)

The UK *Biodiversity Action Plan* (UKBAP – UK Steering Group, 1995; UK Biodiversity Group, 1998 - 2000) lists and prioritises habitats and species and sets national targets to be achieved. The intent of the UKBAP, however, is much broader than the protection and enhancement of less common species, and is meant to embrace the wider countryside as a whole.

The UKBAP has recently undergone a review (Biodiversity Reporting and Information Group, June 2007) resulting in the identification of 391 'Priority' Species Action Plans (SAPs), 45 'Priority' Habitat Action Plans and 162 Local Biodiversity Action Plans.

Local Biodiversity Action Plans (LBAP) identify habitat and species conservation priorities at a local level (typically at the County level), and are usually drawn up by a consortium of local Government organisations and conservation charities.

Birds Directive (BD)

The *EC Directive on the Conservation of Wild Birds* (79/409/EEC) or '*Birds Directive*' was introduced to achieve favourable conservation status of all wild bird species across their distribution range. In this context, the most important provision is the identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex 1 of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance.

Birds of Conservation Concern (BoCC)

This is a review of the status of all birds occurring regularly in the United Kingdom. It is regularly updated and is prepared by leading bird conservation organisations, including the British Trust for Ornithology (BTO), Joint Nature Conservation Committee (JNCC) and The Royal Society for the Protection of Birds (RSPB).



The latest report was produced in 2009 (Eaton *et al*, 2009) and identified 52 red list species, 126 amber species, and 68 green species. The criteria are complex, but generally:

- ✧ Red list species are those that have shown a decline of the breeding population, non-breeding population or breeding range of more than 50% in the last 25 years.
- ✧ Amber list species are those that have shown a decline of the breeding population, non-breeding population or breeding range of between 25% and 50% in the last 25 years. Species that have a UK breeding population of less than 300 or a non-breeding population of less than 900 individuals are also included, together with those whose 50% of the population is localised in 10 sites or fewer and those whose 20% of the European population is found in the UK.
- ✧ Green list species are all regularly occurring species that do not qualify under any of the red or amber criteria are green listed

Bonn Convention

The Convention on the Conservation of Migratory Species of Wild Animals or '*Bonn Convention*' was adopted in Bonn, Germany in 1979 and came into force in 1985. Participating states agree to work together to preserve migratory species and their habitats by providing strict protection to species listed in Appendix I of the Convention. It also establishes agreements for the conservation and management of migratory species listed in Appendix II.

In the UK, the requirements of the convention are implemented via the *Wildlife & Countryside Act 1981* (as amended), *Wildlife (Northern Ireland) Order 1985*, *Nature Conservation and Amenity Lands (Northern Ireland) Order 1985* and the *Countryside and Rights of Way Act 2000* (CRoW).

Global IUCN Red List

The International Union for Conservation of Nature (IUCN) Threatened Species was devised to provide a list of those species that are most at risk of becoming extinct globally. It provides taxonomic, conservation status and distribution information about threatened taxa around the globe.

The system catalogues threatened species into groups of varying levels of threat, which are: Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CE), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD), Not Evaluated (NE). Criteria for designation into each of the categories is complex, and consider several principles.

Habitats Directive

The *Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora*, or the '*Habitats Directive*', is a European Union directive adopted in 1992 in response to the Bern Convention. Its aims are to protect approximately 220 habitats and 1,000 species listed in its several Annexes.



In the UK, the *Habitats Directive* is transposed into national law via the *Conservation of Habitats and Species Regulations 2010* in England, Scotland and Wales, and via the *Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended)* in Northern Ireland.

Protection of Badgers Act 1992 (PBA 1992)

The main legislation protecting badgers in England and Wales is the *Protection of Badgers Act 1992* (the 1992 Act). Under the 1992 Act it is an offence to: wilfully kill, injure, take or attempt to kill, injure or take a badger; dig for a badger; interfere with a badger sett by, damaging a sett or any part thereof, destroying a sett, obstructing access to a sett, causing a dog to enter a sett or disturbing a badger while occupying a sett.

The 1992 Act defines a badger sett as: "any structure or place which displays signs indicating current use by a badger"

Species of Principal Importance in England

Section 41 (S41) of this Act requires the Secretary of State to publish a list (in consultation with Natural England) of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as public bodies including local and regional authorities, in implementing their duty under Section 40 of the *Natural Environment and rural Communities (NERC) Act 2006*, to have regard to the conservation of biodiversity in England, when carrying out their normal (e.g. planning) functions. The S41 list includes 65 habitats of principal importance and 1,150 species of principal importance.

The Conservation of Habitats and Species Regulations 2010

This is the main piece of legislation which transposes the *Habitats Directive* into national law. The Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species (listed in Annexes I or II of the Habitats Directive respectively) to the European Commission. These sites, if ratified by the European Commission, are then designated as Special Protection Areas (SPAs) within six years.

The Regulations also make it an offence to deliberately capture, kill, disturb or trade in the animals listed in Schedule 2, or pick, uproot, destroy, or trade in the plants listed in Schedule 5 (see Table B1).

Table B1 Schedules of the Conservation of Habitats and Species Regulations 2010



Schedule 2 – European Protected Species of Animals		Schedule 5 – European Protected Species of Plant	
Common name	Scientific name	Common name	Scientific name
Horseshoe bats	Rhinolophidae - all species	Dock, Shore	<i>Rumex rupestris</i>
Common bats	Vespertilionidae - all species	Killarney Fern	<i>Trichomanes speciosum</i>
Wild Cat	<i>Felis silvestris</i>	Early Gentian	<i>Gentianella anglica</i>
Dolphins, porpoises and whales	Cetacea – all species	Lady's-slipper	<i>Cypripedium calceolus</i>
Dormouse	<i>Muscardinus avellanarius</i>	Creeping Marshwort	<i>Apium repens</i>
Pool Frog	<i>Rana lessonae</i>	Slender Naiad	<i>Najas flexilis</i>
Sand Lizard	<i>Lacerta agilis</i>	Fen Orchid	<i>Liparis loeselii</i>
Fisher's Estuarine Moth	<i>Gortyna borellii lunata</i>	Plantain, Floating-leaved water	<i>Luronium natans</i>
Newt, Great Crested	<i>Triturus cristatus</i>	Yellow Marsh Saxifrage	<i>Saxifraga hirculus</i>
Otter	<i>Lutra lutra</i>		
Lesser Whirlpool Ram's-horn Snail	<i>Anisus vorticulus</i>		
Smooth Snake	<i>Coronella austriaca</i>		
Sturgeon	<i>Acipenser sturio</i>		
Natterjack Toad	<i>Bufo calamita</i>		
Marine Turtles	<i>Caretta caretta</i> , <i>Chelonia mydas</i> , <i>Lepidochelys kempii</i> , <i>Eretmochelys imbricata</i> , <i>Dermochelys coriacea</i>		

The 2010 Regulations consolidate and update the *Conservation (Natural Habitats, &c.) Regulations 1994* (the 1994 Regulations) and any amendments. It also contains new provisions to implement aspects of the *Marine and Coastal Access Act 2009* (the "Marine Act"), giving powers to the Marine and Coastal Access Act and Marine Enforcement Officers.

The Hedgerow Regulations 1997

The *Hedgerow Regulations 1997* were made under Section 97 of the *Environment Act 1995* and came into force in 1997. They introduced new arrangements for local planning authorities in England and Wales to



protect important hedgerows in the countryside, by controlling their removal through a system of notification. Important hedgerows are defined by complex assessment criteria, which draw on biodiversity features, historical context and the landscape value of the hedgerow.

Wildlife and Countryside Act 1981 (as amended)

This is the principal mechanism for the legislative protection of wildlife in the UK. This legislation is the chief means by which the '*Bern Convention*' and the *Birds Directive* are implemented in the UK. Since it was first introduced, the Act has been amended several times.

The Act makes it an offence to (with exception to species listed in Schedule 2) intentionally:

- ✧ kill, injure, or take any wild bird,
- ✧ take, damage or destroy the nest of any wild bird while that nest is in use, or
- ✧ take or destroy an egg of any wild bird.

In addition, the Act makes it an offence (subject to exceptions) to:

- ✧ intentionally or recklessly kill, injure or take any wild animal listed on Schedule 5,
- ✧ interfere with places used for shelter or protection, or intentionally disturbing animals occupying such places.
- ✧ The Act also prohibits certain methods of killing, injuring, or taking wild animals

Finally, the Act also makes it an offence (subject to exceptions) to:

- ✧ intentionally pick, uproot or destroy any wild plant listed in Schedule 8, or any seed or spore attached to any such wild plant,
- ✧ unless an authorised person, intentionally uproot any wild plant not included in Schedule 8,
- ✧ sell, offer or expose for sale, or possess (for the purposes of trade), any live or dead wild plant included in Schedule 8, or any part of, or anything derived from, such a plant.

Following all amendments to the Act, Schedule 5 'Animals which are Protected' contains a total of 154 species of animal, including several mammals, reptiles, amphibians, fish and invertebrates. Schedule 8 'Plants which are Protected' of the Act, contains 185 species, including higher plants, bryophytes and fungi and lichens. A comprehensive and up-to-date list of these species can be obtained from the JNCC website.



Part 14 of the Act makes unlawful to plant or otherwise cause to grow in the wild any plant which is listed in Part II of Schedule 9.

Table B2 provides a comprehensive list of plant species listed in this schedule. It is recommended that plant material of these species is disposed of as bio-hazardous waste, and these plants should not be used in planting schemes.

Table B2 Invasive plant species listed in Schedule 9 of the *Wildlife & Countryside Act 1981* (as amended)

Common name	Scientific name
Perfoliate alexanders	<i>Smyrniurn perfoliatum</i>
Red algae	<i>Grateloupia luxurians</i>
Variagated yellow archangel	<i>Lamiastrum galeobdolon</i> subsp. <i>argentatum</i>
Yellow azalea	<i>Rhododendron luteum</i>
Himalayan balsam	<i>Impatiens glandulifera</i>
Cotoneaster	<i>Cotoneaster horizontalis</i>
Entire-leaved cotoneaster	<i>Cotoneaster integrifolius</i>
Himalayan cotoneaster	<i>Cotoneaster simonsii</i>
Hollyberry cotoneaster	<i>Cotoneaster bullatus</i>
Small-leaved cotoneaster	<i>Cotoneaster microphyllus</i>
False Virginia creeper	<i>Parthenocissus inserta</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Purple dewplant	<i>Disphyma crassifolium</i>
Fanwort or Carolina water-shield	<i>Cabomba caroliniana</i>
Water fern	<i>Azolla filiculoides</i>
Hottentot fig	<i>Carpobrotus edulis</i>
Three-cornered garlic	<i>Allium triquetrum</i>
Giant hogweed	<i>Heracleum mantegazzianum</i>
Water hyacinth	<i>Eichhornia crassipes</i>
Giant kelp	<i>Macrocystis</i> spp.
Giant knotweed	<i>Fallopia sachalinensis</i>
Hybrid knotweed	<i>Fallopia japonica</i> × <i>Fallopia sachalinensis</i>



Common name	Scientific name
Japanese knotweed	<i>Fallopia japonica</i>
Few-flowered garlic	<i>Allium paradoxum</i>
Water lettuce	<i>Pistia stratiotes</i>
Parrot's-feather	<i>Myriophyllum aquaticum</i>
Floating pennywort	<i>Hydrocotyle ranunculoides</i>
Duck potato	<i>Sagittaria latifolia</i>
Floating water primrose	<i>Ludwigia peploides</i>
Water primrose	<i>Ludwigia grandiflora</i>
Water primrose	<i>Ludwigia uruguayensis</i>
Rhododendron	<i>Rhododendron ponticum</i>
Rhododendron	<i>Rhododendron ponticum</i> × <i>Rhododendron maximum</i>
Giant rhubarb	<i>Gunnera tinctoria</i>
Japanese rose	<i>Rosa rugosa</i>
Giant salvinia	<i>Salvinia molesta</i>
Green seafingers	<i>Codium fragile</i>
Californian red seaweed	<i>Pilea californica</i>
Hooked asparagus seaweed	<i>Asparagopsis armata</i>
Japanese seaweed	<i>Sargassum muticum</i>
Laver seaweeds (except native species)	<i>Porphyra</i> spp
Australian swamp stonecrop or New Zealand pygmyweed	<i>Crassula helmsii</i>
Wakame	<i>Undaria pinnatifida</i>
Curly waterweed	<i>Lagarosiphon major</i>
Waterweeds	<i>Elodea</i> spp.



Appendix C – Wildlife Boxes



Introduction

The information in this appendix relates to bat and bird boxes that can be easily incorporated into building and landscape plans. The information provided is not exhaustive and provides examples of some of the types of boxes available.

Including bat and bird boxes throughout the development site has a number of benefits:

- ✧ Any roosting or resting places lost as a result of the work will be replaced;
- ✧ The ecological value of the site will be enhanced;
- ✧ Priority species within the UK and local Biodiversity Action Plans (BAPs) will be encouraged.

Bats

For Buildings

The inclusion of a variety of bat bricks, tubes and boxes for buildings is recommended to encourage a diversity of bat species. Bat bricks and tubes require no maintenance.

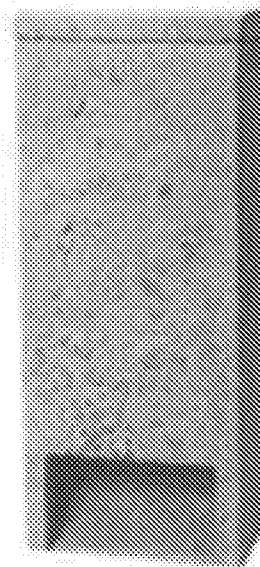
Bat Tube

Brick bat tubes are designed for buildings, or underneath bridges, arches or tunnels, where conditions are relatively humid. They are particularly useful for new buildings or bridges to attract bats, or to provide new roost sites where existing buildings with bats are being renovated.

This long box can be installed within brick masonry, beneath plasterwork or wood panelling, or incorporated into concrete structures such as factory buildings or bridges. Inside it contains a woodcrete surface, a roughened wood board, and a metal mesh, providing a choice of roosting areas depending on the weather conditions and the bats' habits. This box is maintenance-free as the entrance slit is at the bottom.

No painting required, but if painting is necessary a natural breathable paint should be used.

Width: 20cm; Height: 47.5cm; Depth: 12.5cm; Entrance Width: 15cm; Entrance Depth: 2cm; Weight: 13kg

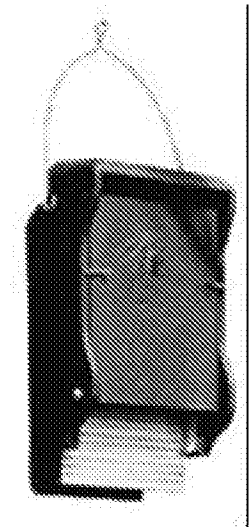




Bat Box

This type of box is made of woodcrete and is expected to last approximately 25 years. It has a narrow crevice-like internal space to attract Pipistrelle and Noctule bats. Woodcrete (75% wood sawdust, concrete and clay mixture).

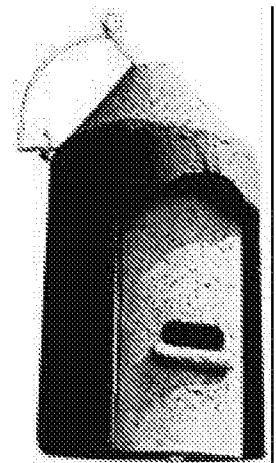
Width: 27cm; Height: 43cm; Weight: 8.3kg.



For Trees

Woodcrete boxes have the highest rates of occupation of all box types. The 75% wood sawdust, concrete and clay mixture allows natural respiration, stable temperature, and durability. They are long lasting (approx. 25 years) and are rot- and predator-proof. Hang from a tree branch near the trunk, or fix to a trunk with the supplied 'tree-friendly' aluminium nail. Attractive to smaller British bats.

Material: Woodcrete (75% wood sawdust, concrete and clay mixture); Diameter: 16cm; Height: 33cm; Weight: 4kg.



Bird Boxes

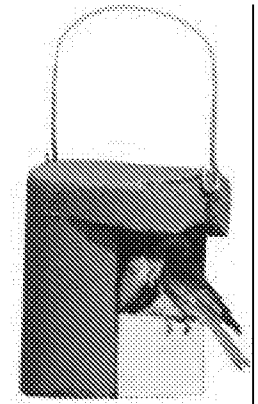
A variety of bird box designs could be installed throughout the development site to attract a diversity of species. Open fronted boxes will attract species such as robins, pied wagtails and spotted flycatchers, while boxes with entrance holes will attract tits, wrens and tree sparrows. Roost pockets will be used by roosting birds over the winter and by smaller species, such as wrens, for nesting in the spring.



Open Fronted Boxes

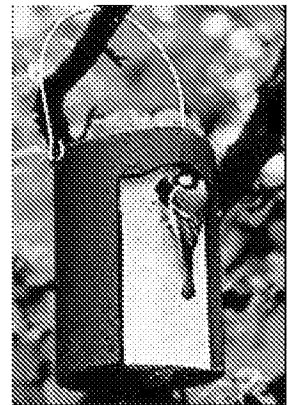
This box is attractive to robins, pied wagtails, spotted flycatcher, wrens and black redstarts and is best sited on the walls of buildings with the entrance on one side.

These woodcrete boxes are designed to mimic natural nest sites and provide a stable environment for chick rearing and winter roosting. They can be expected to last 25 years or more without maintenance.



Boxes with Entrance Holes

This box is attractive to smaller birds such as tits, wrens and tree sparrows. Sparrow terraces are also available.



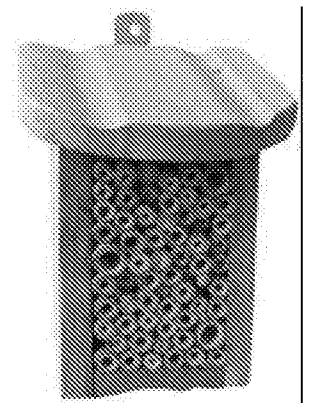
Insect Boxes

As with the bat and bird boxes, a variety of insect boxes is recommended to encourage a diversity of species.

Wooden Insect House

A general insect habitat for beneficial insects in summer and, later in the year, over wintering ladybirds and lacewings. Locate in a sheltered place near nectar or pollen plants or by a pond.

Durable and strong construction in acacia, oak or larch with no maintenance necessary. Dimensions: 22 × 13.5 × 13.5cm.

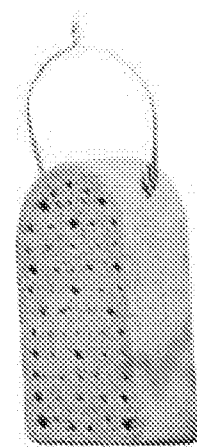




Woodcrete Insect House

An insect nest made from long-lasting, insulating, woodcrete, with holes of different sizes providing homes for a variety of beneficial insects such as bees and solitary wasps.

Dimensions: 14 × 8 × 26cm; Weight: 3.65kg





Appendix D – Wildlife – friendly planting

**Table E1 Shrub species of native origin or generally thought to be beneficial to wildlife**

(Source: 'Gardening with wildlife in mind', Natural England, 2008)

Common name	Scientific name
Hazel	<i>Corylus avellana</i>
Elder	<i>Sambucus nigra</i>
Goat willow	<i>Salix caprea</i>
Hawthorn	<i>Crataegus monogyna</i>
Dog rose	<i>Rosa canina</i>
Butterfly bush	<i>Buddleia davidii</i>
Guelder rose	<i>Viburnum opulus</i>
Gorse	<i>Ulex europaeus</i>
Broom	<i>Cytisus scoparius</i>
Wayfaring tree	<i>Viburnum lantana</i>
Shrubby cinquefoil	<i>Potentilla fruticosa</i>
Raspberry	<i>Rubus idaeus</i>
Alder buckthorn	<i>Frangula alnus</i>
Wild privet	<i>Ligustrum vulgare</i>
Barberry	<i>Berberis × stenophylla</i>
Barberry	<i>Berberis vulgaris</i>
Bell heather	<i>Erica cinerea</i>
Bilberry	<i>Vaccinium myrtillus</i>
Black currant	<i>Ribes nigrum</i>
Blackthorn	<i>Prunus spinosa</i>
Buckthorn	<i>Rhamnus catharticus</i>
Butcher's-broom	<i>Ruscus aculeatus</i>
Cherry laurel	<i>Prunus laurocerasus</i>
Cowberry	<i>Vaccinium vitis-idaea</i>
Cross-leaved heath	<i>Erica tetralix</i>
New Zealand holly	<i>Olearia macrodonta</i>
Daphne	<i>Daphne odora</i>
Dogwood	<i>Cornus sanguinea</i>
Field rose	<i>Rosa arvensis</i>
Firethorn	<i>Pyracanthus angustifolia</i>
Flowering Currant	<i>Ribes sanguineum</i>
Gooseberry	<i>Ribes uva-crispa</i>



Common name	Scientific name
Hebe 'Midsummer Beauty'	<i>Hebe species</i>
Hedgehog Rose	<i>Rosa rugosa</i>
Himalayan honeysuckle	<i>Leycesteria formosa</i>
Holly	<i>Ilex aquifolium</i>
Japanese quince	<i>Chaenomeles japonica</i>
Lilac	<i>Syringa vulgaris</i>
Mexican orange	<i>Choisya ternata</i>
Mezereon	<i>Daphne mezereum</i>
Midland Hawthorn	<i>Crataegus laevigata</i>
Oregon Grape	<i>Mahonia aquifolium</i>
Osier	<i>Salix viminalis</i>
Portugal laurel	<i>Prunus lusitanica</i>
Privet	<i>Lustrum ovalifolium</i>
Purple Willow	<i>Salix purpurea</i>
Snowy Mespilus	<i>Amelanchier canadensis</i> , <i>Amelanchier lamarckii</i>
Spindle	<i>Euonymus europaeus</i>
Spurge laurel	<i>Daphne laureola</i>
Sweet briar	<i>Rosa rubiginosa</i>
Wild privet	<i>Ligustrum vulgare</i>

Table E2 Tree species of native origin or generally thought to be beneficial to wildlife

(Source: 'Gardening with wildlife in mind', Natural England, 2008)

Common name	Scientific name
Pedunculate oak	<i>Quercus robur</i>
Ash	<i>Fraxinus excelsior</i>
Wych Elms	<i>Ulmus glabra</i>
Whitebeams	<i>Sorbus aria</i> agg.
Rowan	<i>Sorbus aucuparia</i>
Aspen	<i>Populus tremula</i>
Apple	<i>Malus domestica</i>
Bird Cherry	<i>Prunus pardus</i>
Common Alder	<i>Alnus glutinosa</i>



Crab apple	<i>Malus sylvestris</i>
Crack Willow	<i>Salix fragilis</i>
Downy Birch	<i>Betula pubescens</i>
False Acacia	<i>Robinia pseudoacacia</i>
Field Maple	<i>Acer campestre</i>
Hornbeam	<i>Carpinus betulus</i>
Juniper	<i>Juniperus communis</i>
Large-leaved lime	<i>Tilia platyphyllos</i>
Small-leaved lime	<i>Tilia cordata</i>
Pear	<i>Pyrus communis</i>
Scots Pine	<i>Pinus sylvestris</i>
Sessile oak	<i>Quercus petraea</i>
Silver birch	<i>Betula pendula</i>
Sweet chestnut	<i>Castanea sativa</i>
Wild Cherry	<i>Prunus avium</i>
Wild service-tree	<i>Sorbus torminalis</i>
Yew	<i>Taxus baccata</i>

Table E3 Gardening for bats

Aim at having flowers in bloom throughout the year, including both annuals and herbaceous perennials. Below are some suggestions, but this is not an exhaustive list. Flowering times are approximate, varying dependent on region. Regular dead-heading extends flowering period in many flowers.

A=annual, HA= hardy, annual, HHA=half-hardy annual, P=perennial, W=wild flower.

Flowers for borders			
St. John's Wort	<i>Hypericum</i>	P	March
Marigolds	<i>Calendula</i>	H/A	March-October
Aubrietia	<i>Aubrietia deltoidea</i>	P	March-June
Honesty	<i>Lunaria rediviva</i>	HB	March
Forget-me-not	<i>Myosotis</i> sp.	A/P	March-May
Elephant ears	<i>Bergenia</i>	P	April
Wallflowers	<i>Erysimum</i>	B	April-June
Cranesbills	<i>Geranium</i> sp.	P	May-September
Yarrow	<i>Achillea</i>	P	May-
Poppies	<i>Papaver</i> sp.	A	May- July
Dames violet	<i>Hesperis matronalis</i>	P	May-August



Red Valerian	<i>Centranthus ruber</i>	P	May-Sept
Poached egg plant	<i>Limnanthes</i>	HA	June-August
Knapweed	<i>Centaurea nigra</i>	P	June-September
Phacelia		HA	June-September
Ox-eye daisy	<i>Leucanthemum vulgare</i>	P	June-August
Evening primrose	<i>Oenothera biennis</i>	B	June-September
Candytuft	<i>Iberis umbellata</i>	HA	June-September
Sweet William	<i>Dianthus barbatus</i>	B	June-July
Blanket flowers	<i>Gaillardia</i>	P	June -
Verbena	<i>Verbena bonariensis</i>	HHa	June-October
Scabious	<i>Knautia arvensis</i>	P	July-August
Night-scented stock	<i>Mattiola bicornia</i>	HA	July-August
Pincushion flower	<i>Scabious</i> sp.	A/P	July-September
Cherry pie	<i>Heliotrope</i>	HHa	July-October
Mexican aster	<i>Cosmos</i> sp.	A/P	July-October
Cone flower	<i>Rudbeckia</i> sp.	A/P	August-November
Mallow	<i>Lavatera</i> sp.	P	August-October
Michaelmas daisy	<i>Aster</i> sp.	P	August-September
Ice plant 'Pink lady'	<i>Sedum spectabile</i>	P	September
Herbs – both leaves and flowers are fragrant			
Fennel	<i>Foeniculum vulgare</i>		July-September
Bergamont	<i>Monarda didyma</i>		June-September
Sweet Cicely	<i>Myrrhis odorata</i>		April-June
Hyssop	<i>Hyssopus officinalis</i>		July-September
Feverfew	<i>Tanacetum parthenium</i>		June-September
Borage	<i>Borago officinalis</i>		May-September
Rosemary	<i>Rosmarinus officinalis</i>		March-May
Lemon balm	<i>Melissa officinalis</i>		
Coriander	<i>Coprianrum sativum</i>		June-August
Lavenders	<i>Lavendula</i> sp.		
Marjoram	<i>Origanum</i> sp.		
Trees, shrubs and climbers important to insects			
Oak	<i>Quercus</i> sp.		large gardens only
Silver birch	<i>Betula pendula</i>		
Common alder	<i>Alnus glutinosa</i>		Suitable for coppicing
Hazel	<i>Corylus avellana</i>		Suitable for coppicing
Elder	<i>Sambucus nigra</i>		Small



Goat willow	<i>Salix caprea</i>		Suitable for coppicing
Hawthorn	<i>Crataegus monogyna</i>		Suitable for coppicing
Honeysuckle	<i>Lonicera</i> sp.		Grow a variety for succession
Dog rose	<i>Rosa canina</i>		Climber
Bramble	<i>Rubus fruticosus</i>		Climber
Ivy	<i>Hedera helix</i>		Climber
Buddleia	<i>Buddleja davidii</i>		Shrub
Guelder rose	<i>Viburnum opulus</i>		Shrub
Gorse	<i>Ulex</i> sp.		Shrub
Plants for pond edges and marshy areas			
Purple loosestrife	<i>Lythrum salicaria</i>	W	June-August
Meadow sweet	<i>Filipendula ulmaria</i>	W	June-September
Lady's smock	<i>Cardamine pratensis</i>	W	April-June
Water mint	<i>Mentha aquatica</i>	W	July-September
Angelica	<i>Angelica sylvestris</i>	W	July-September
Hemp agrimony	<i>Eupatorium cannabinum</i>	W	March-May
Marsh marigold	<i>Caltha palustris</i>	W	June-September
Creeping Jenny	<i>Lysimachia nummularium</i>	W	May-August
Fringed water lily	<i>Nymphoides peltata</i>	W	June-September
Water forget-me-not	<i>Myosotis scorpioides</i>	W	June-September

Allow part lawns to grow long in summer and cut in autumn, removing the clippings. Avoid using fertilisers. Compost heaps are food producers of insects too.

(Source: 'Gardening for bats', Bat Conservation Trust, 2004)