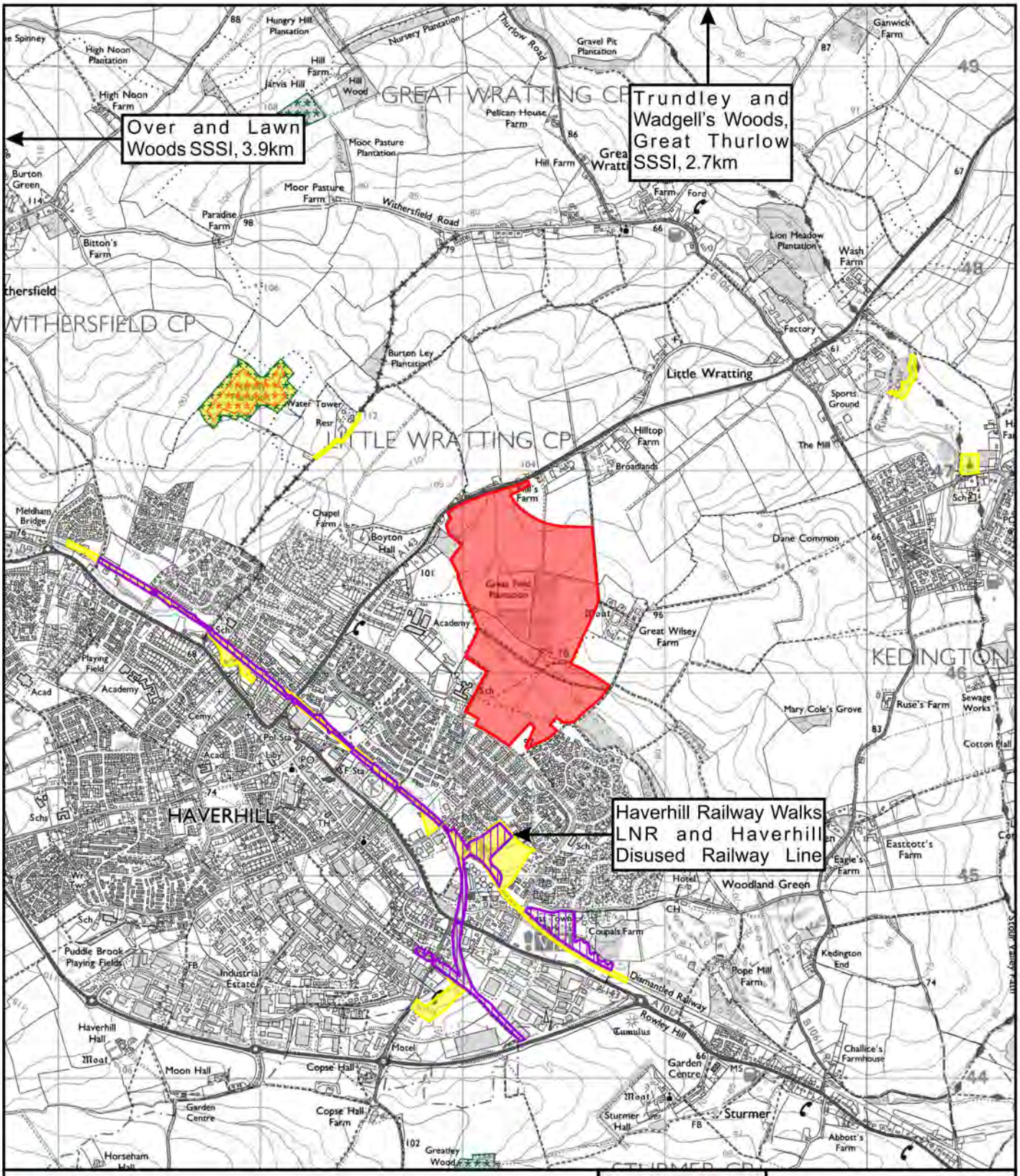
# PLANS

**PLAN ECO1**

Site Location and Ecological Designations




KEY:

- SITE LOCATION
- LOCAL NATURE RESERVE (LNR)
- COUNTY WILDLIFE SITE (CWS)
- ANCIENT WOODLAND
- ANCIENT REPLANTED WOODLAND

N

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

8110: GREAT WILSEY PARK, HAVERHILL

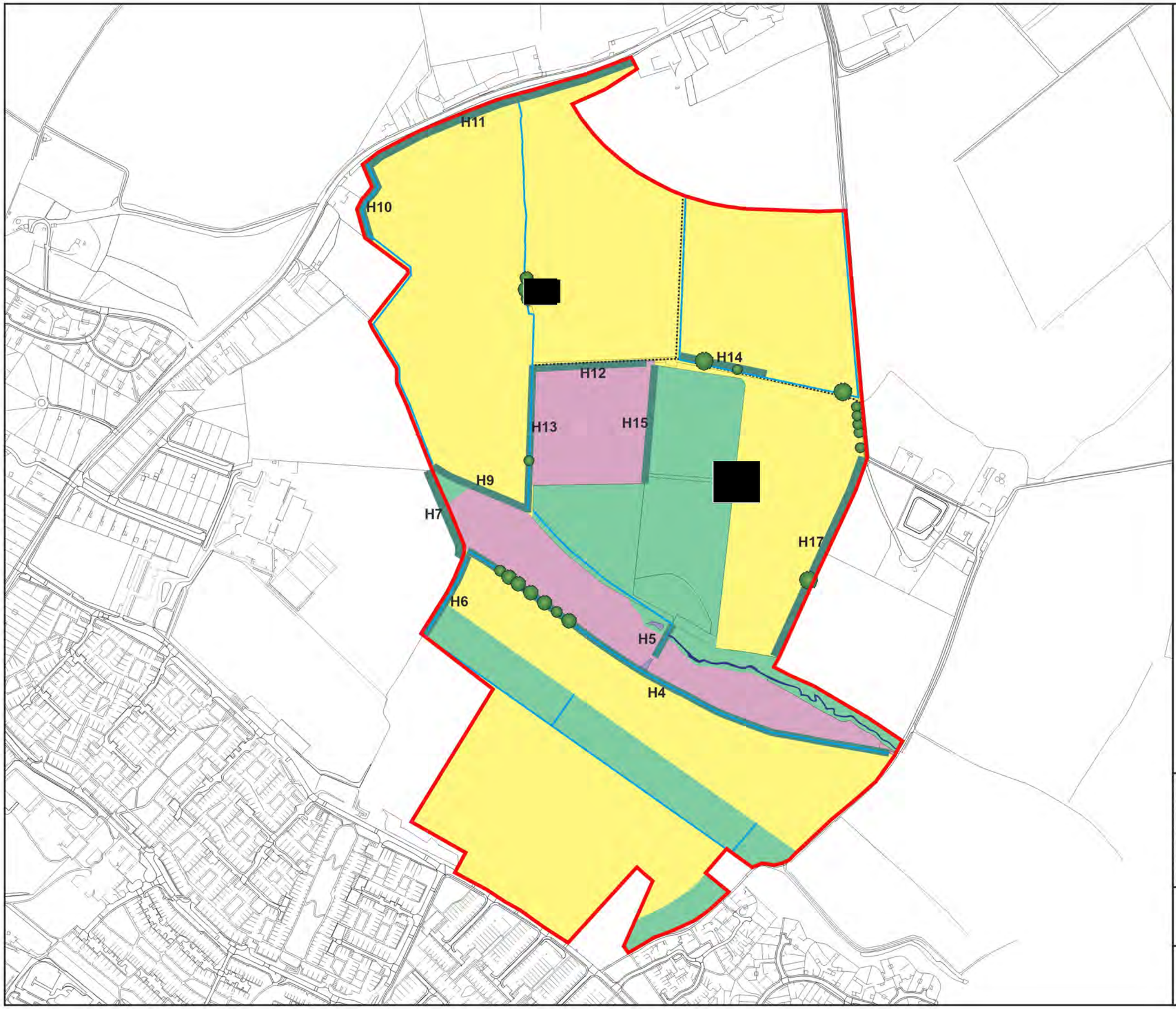
PLAN ECO1: SITE LOCATION AND ECOLOGICAL DESIGNATIONS

Rev: A

Jul 2019

# PLAN ECO2

Ecological Features




KEY:

- SITE BOUNDARY
- ARABLE LAND
- WOODLAND
- IMPROVED GRASSLAND
- DITCH
- STOUR BROOK TRIBUTARY
- POND
- HEDGEROW
- TREE
- TRACK
- [redacted]

N

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

8110: GREAT WILSEY PARK, HAVERHILL

PLAN ECO2:
ECOLOGICAL FEATURES

Rev: B

Dec 2019

# PLAN ECO3

Approach to Bat Surveys


**KEY:**

- TRANSECT ROUTE
- CONFIRMED BAT ROOST
- BAT HOP-OVER
- BAT FORAGING ROUTES
- DARK CORRIDOR
- (1) STATIC DETECTOR

N

*Based on Exterior Architecture Drawing No. ExA_1868_P_100 Illustrative Landscape Masterplan*

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

8110: GREAT WILSEY PARK, HAVERHILL

PLAN ECO3:
APPROACH TO BAT SURVEYS

Rev: B

Dec 2019

# PLAN ECO4

Approach to Bird Surveys

**KEY:**

TRANSECT ROUTE

N

*Based on Exterior Architecture Drawing No. ExA_1868_P_100 Illustrative Landscape Masterplan*

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

8110: GREAT WILSEY PARK, HAVERHILL

PLAN ECO4:
APPROACH TO BIRD SURVEYS

Rev: B

Dec 2019

ECOLOGYSOLUTIONS

Part of the ES Group

Ecology Solutions Limited | Cokenach Estate | Barkway | Royston | Hertfordshire | SG8 8DL

01763 848084 | east@ecologysolutions.co.uk | www.ecologysolutions.co.uk

REDROW HOMES

ECOLOGYSOLUTIONS

Part of the ES Group

# GREAT WILSEY PARK, HAVERHILL: INFRASTRUCTURE RESERVED MATTERS APPLICATION

## Ecological Implementation Strategy

Pursuant to Condition 42 of DC/15/2151/OUT

December 2019
8110.EIS.vf5

ecology solutions for planners and developers

**CONTENTS**


| | | |
|---|---|---|
| 1 | INTRODUCTION | 1 |
| 2 | ES MITIGATION MEASURES TO BE ADDRESSED | 3 |
| 3 | PURPOSE AND CONSERVATION OBJECTIVES | 10 |
| 4 | REVIEW OF SITE POTENTIAL AND CONSTRAINTS | 11 |
| 5 | EXTENT AND LOCATION / AREA OF PROPOSED WORKS | 13 |
| 6 | DESIGNATED SITES | 14 |
| 7 | GREEN SPINE / LINEAR COUNTRY PARK | 15 |
| 8. | WOODLAND AND SCRUB | 23 |
| 9 | HEDGEROWS AND TREES | 28 |
| 10 | ATTENUATION FEATURES | 31 |
| [redacted] | | [redacted] |
| 12 | BATS | 37 |
| 13 | OTTERS AND WATER VOLES | 40 |
| 14 | DORMICE | 41 |
| 15 | HEDGEHOGS | 45 |
| 16 | BIRDS | 47 |
| 17 | REPTILES | 50 |
| 18 | AMPHIBIANS | 52 |
| 19 | INVERTEBRATES | 54 |
| 20 | TIMETABLE OF WORKS | 55 |
| 21 | PERSONS RESPONSIBLE FOR IMPLEMENTING THE WORKS | 56 |
| 22 | MONITORING AND REMEDIAL MEASURES | 57 |
| 23 | DISPOSAL OF WASTES | 58 |

## PLANS

| | |
|---|---|
| PLAN ECO1 | Site Location and Ecological Designations |
| PLAN ECO2 | Ecological Features |
| PLAN ECO3 | Ecological Constraints |
| PLAN ECO4a | Ecological Implementation Strategy 1 |
| PLAN ECO4b | Ecological Implementation Strategy 2 |
| PLAN ECO4c | Ecological Implementation Strategy 3 |
| PLAN ECO4d | Ecological Implementation Strategy 4 |
| PLAN ECO5 | Phasing of Development |

## APPENDICES

| | |
|---|---|
| APPENDIX 1 | Hedgerow Removal Plan 5055-L-112 rev C |
| APPENDIX 2 | Bat Box Specifications |
| APPENDIX 3 | Hedgehog Gateway Specification |
| APPENDIX 4 | Hedgehog House Specifications |
| APPENDIX 5 | Bird Box Specifications |
| APPENDIX 6 | Reptile Hibernacula Specification |
| APPENDIX 7 | Stag Beetle Loggery Specification |
| APPENDIX 8 | Invertebrate Nesting Aid Specifications |

# 1. INTRODUCTION

1.1. Ecology Solutions was commissioned by Redrow Homes in October 2018 to prepare materials to address the requirements of planning conditions for the development at Great Wilsey Park as shown on Plans ECO1 and ECO2 (reference: DC/15/2151/OUT).

1.2. Condition 42 requires that an Ecological Implementation Strategy be submitted and approved prior to commencement of development. The condition states:

**No development shall take place on any phase or reserved matters application (including demolition, archaeological investigation, ground works and vegetation clearance) until an ecological implementation strategy for that particular phase or reserved matters application addressing the mitigation measures set out in Volume 2 Section 9 of the Environmental Statement dated September 2015, relevant appendices and subsequent Addendum document May 2016 has been submitted to and approved in writing by the local planning authority. The implementation strategy shall include the following:**

**a. ES mitigation measures to be addressed**
**b. Purpose and conservation objectives for the proposed works.**
**c. Review of site potential and constraints informed by up to date survey.**
**d. Detailed design(s) and / or working method(s) to achieve stated objectives.**
**e. Extent and location / area of proposed works on appropriate scale maps and plans.**
**f. Type and source of materials to be used where appropriate, e.g. native species of local provenance.**
**g. Timetable for implementation demonstrating that works are aligned with the proposed phasing of development.**
**h. Persons responsible for implementing the works.**
**i. Details of initial aftercare and long-term maintenance.**
**j. Requirement for monitoring and remedial measures.**
**k. Details for disposal of any wastes arising from works.**

**The implementation strategy shall be implemented in accordance with the approved details and all features shall be retained in that manner thereafter.**

**Reason: To ensure the satisfactory development of the site at the appropriate time to protect vulnerable ecological habitats and ensure the satisfactory development of the site.**

1.3. This report has been prepared to address the requirements of condition 42, providing details of the ecological implementation strategy to be adopted within the infrastructure phase of the Redrow development, with particular attention paid to the mitigation measures set out in Volume 2 Section 9 of the Environmental Statement, relevant appendices and subsequent Addendum. Due regard is had to the baseline information and long term objectives for the site where these are relevant. As necessary, mitigation strategies are proposed such that the development would be in line with all relevant legislative and planning policy requirements.

1.4. The focus of this document is on the mitigation strategies and protective measures that will be implemented during construction, i.e. the development of the site and establishment of the various habitats and features proposed. The long term of management and ecological enhancement of the site is focused on in the Landscape and Ecological Management Plan.

1.5. Both documents refer to the General Arrangement (GA) drawings and Planting Plans produced by Exterior Architecture in consultation with Ecology Solutions.

## 2. ES MITIGATION MEASURES TO BE ADDRESSED

### 2.1 ES Chapter

2.1.1 The mitigation measures described in the Ecology ES Chapter are summarised in Table 9.5 of that document. The effects concerned and the mitigation proposed are reproduced in the table below. A column has been added to the table to indicate where in this document and / or on the accompanying GA and Planting Plans the measures are detailed.

| POTENTIAL EFFECT | NATURE OF EFFECT | SIGIFICANCE | MITIGATION / ENHANCEMENT MEASURES | GEOGRAPHICAL FEATURES | RESIDUAL EFFECTS | DOCUMENT / PLAN REFERENCE OR COMMENT |
|---|---|---|---|---|---|---|
| **Construction** | | | | | | |
| **Statutory & Non-Statutory Sites** | | | | | | |
| **Dust Particles Exposure on LNR & CWS** | Temporary | Negligible | Work area sprayed with water during dry conditions | Local | Negligible | See section 6 of this document. |
| **Habitats** | | | | | | |
| **Arable Field Loss** | Permanent | Negligible | Diverse range of habitats will be created within previously arable dominated areas | Negligible | Minor/ Moderate Beneficial Long Term | Arable fields are largely occupied by housing parcels. Green spine proposals illustrated on GA and Planting Plans. |
| **Improved Grassland – Loss of fields** | Permanent | Negligible | Some fields to be retained along the water course, these will be enhanced with additional planting. More species rich meadow grassland habitats are to be created within the GI | Negligible | Negligible | See GA and Planting Plans and section 7 of this document. |
| **Field Margins – Partial loss** | Permanent/ Temporary | Negligible | Majority retained within hedgerows. New areas of grassland habitats created providing more coverage and diversity | Site | Minor Beneficial Long Term | For general protection of field margins, see GA and Planting Plans and section 7 of this document.<br><br>H19, H21, H23, H24 are not within the Redrow site. |
| **Field Margins – Partial loss of North/East 'Wildlife Conservation Areas' margins. (H19, H21 & H23/H24)** | Permanent/ Temporary | Minor Adverse Short Term | | Site | | |
| **Woodland - Loss of 1ha of Woodland Compartment W1** | Permanent | Minor/ Moderate Adverse Long Term | Additional woodland planting through the Application Site | Local | Moderate Beneficial Long Term at Local Level. | W1 is not within the Redrow site. |
| **Woodland - Loss of 0.3ha Recently Planted Plantation (TN5)** | Permanent | Minor/ Moderate Adverse Long Term | Additional woodland planting to compensate for losses | Local | | See GA and Planting Plans and section 8 of this document. |
| **Woodland – Damage from encroachment by equipment or materials** | Temporary/ Permanent | Minor/ Moderate Adverse Short Term | Retained habitats fenced off and 'toolbox' talks given to contractors. No dig methods where roads and footpath required. | Site | Negligible | See GA and Planting Plans and section 8 of this document. |
| **Woodland – Foliage coverage with dust particles** | Temporary | Minor Adverse Short Term | During dry periods water will be sprayed over the ground, suppressing dust. | Site | | See GA and Planting Plans and section 8 of this document. |

| POTENTIAL EFFECT | NATURE OF EFFECT | SIGIFICANCE | MITIGATION / ENHANCEMENT MEASURES | GEOGRAPHICAL FEATURES | RESIDUAL EFFECTS | DOCUMENT / PLAN REFERENCE OR COMMENT |
|---|---|---|---|---|---|---|
| **Hedgerows - Partial losses of hedgerows H4, H9, H13 & H14** | Permanent | Minor Adverse Long Term | Existing hedgerows strengthened with additional native species. Compensatory hedgerows planted. | Local | | See GA and Planting Plans and section 9 of this document. |
| **Hedgerows - Partial losses of HEGS hedgerows H11, H12, H21 & H23** | | | | Local | | For H11, H12 see GA and Planting Plans and section 9 of this document.<br>H21, H23 not within Redrow site. |
| **Hedgerows - Partial loss of hedgerows H19 'important' under REGS** | | | | Local | | H19 not within Redrow site. |
| **Hedgerows - Damage to existing and newly planted hedgerows from machinery, equipment and materials** | Temporary/ Permanent | Minor Adverse Medium Term | Retained habitats fenced off and 'toolbox' talks given to contractors | Site | | See GA and Planting Plans and section 9 of this document. |
| **Watercourses - Becoming clogged with rubbish/building material** | Temporary | Minor Adverse Short Term | 'Toolbox' talks given to contractors about sensitively of habitats | Site | | See GA and Planting Plans and section 10 of this document. |
| **Fauna** | | | | | | |
| **Badgers - Disturbance of badger clans within Application Site from habitat clearance** | Temporary | Minor Adverse Short Term | Retain buffer during initial site works. | Site | Negligible | See GA and Planting Plans and section 11 of this document. |
| [redacted] | | | | | | |
| **Birds (Breeding) – Removal of arable habitats** | Permanent | Minor Adverse Long Term | No arable habitats will be created. Additional nests and foraging provided in GI. | Negligible | Negligible | See section 16 of this document. |
| **Birds (Breeding) – Removal of hedgerow & part of woodland W1 removal during breeding season** | Permanent | Moderate Adverse in Short Term | Habitat removal to occur outside of breeding season or under supervision of an experienced ecologist. New hedgerows will be planted with fruiting bodies for foraging and dense structure for nesting. | Site | Negligible | See GA and Planting Plans and section 16 of this document.<br>W1 not in Redrow site. |
| **Breeding Birds- Habitat created benefit swift, starlings, song thrush, dunnock and house sparrow.** | Permanent | Minor Beneficial Long Term | GI will create additional hedgerow, trees, areas of open greenspace and residential gardens. | Local | Minor Beneficial Long Term | See GA and Planting Plans and section 16 of this document. |
| **Wintering Birds – Loss of arable habitats on skylarks** | Permanent | Minor Adverse Long Term | Displaced to surrounding arable field | Local | Negligible | See section 16 of this document. |

| POTENTIAL EFFECT | NATURE OF EFFECT | SIGIFICANCE | MITIGATION / ENHANCEMENT MEASURES | GEOGRAPHICAL FEATURES | RESIDUAL EFFECTS | DOCUMENT / PLAN REFERENCE OR COMMENT |
|---|---|---|---|---|---|---|
| **Dormice – Loss of habitats used by dormice – Isolation and injury/death** | Permanent | Minor/ Moderate Adverse Long Term | Removal of habitats under Natural England licence at appropriate times of the year. | Local | Negligible | Limited evidence of Dormice in Redrow site. No licence required (see ES Addendum comments below). |
| **Dormice Loss of hedgerow H23/H24** | Permanent | Negligible / Minor Adverse Long Term | | Site | Negligible | H23, H24 not in Redrow site. |
| **Dormice - Possible encroachment of construction machinery/materials into retained habitats used dormice** | Temporary | Minor | Retained habitats fenced off and 'toolbox' talks given to contractors | Site | Negligible | Limited evidence of Dormice in Redrow site. See GA and Planting Plans and section 9 of this document for hedgerow protection measures. |
| **Dormice – Deer grazing on new GI planting** | Temporary | Moderate Adverse Long Term | Fencing off or planting more mature species. | Site | Negligible | Limited evidence of Dormice in Redrow site. See section 14 of this document for protective measures. |
| **Reptiles - Loss of habitats used by reptile populations** | Permanent | Moderate Adverse Medium Term | Passive displacement will be undertaken in areas when habitat losses occur. | Local | Minor Beneficial Long Term | See GA and Planting Plans and section 17 of this document. |
| **Reptiles - Isolation of reptile populations from access roads/habitat loss** | Temporary/ Permanent | Minor/ Moderate Long Term | Ensuring populations are not isolated by displacement measures and additional habitats created | Site | | See section 17 of this document. |
| **Reptiles - Possible encroachment of construction machinery/materials into retained habitats used by reptiles** | Temporary | Minor Adverse Short Term | Retained habitats fenced off and 'toolbox' talks given to contractors | Site | Negligible | See GA and Planting Plans and section 17 of this document. |
| **Bats -Losses of woodland W1 will alter navigational and foraging behaviours** | Temporary | Minor Adverse Short Term | Linkages will be retained within other areas of woodland W1. Increased GI will provide alternative routes. | Site | Negligible | W1 not in Redrow site. |
| **Bats - Fragmentation of navigational corridors due to linear losses** | Temporary | Minor Adverse Short Term | Habitat 'Hop-overs' to be created near gaps and additional planting to ensure additional navigational routes | Local | | See GA and Planting Plans and section 12 of this document. |
| **Bats - Disruption of navigational and foraging routes by artificial lighting from construction works – common species of bat** | Temporary | Minor Adverse Short Term | Limit dusk working hours, where required direction lighting will be situated away from natural habitats. | Site | Negligible | See GA and Planting Plans and Lighting Strategy for Bats (Condition 44). |
| **Bats - Disruption of navigational and foraging routes by artificial lighting from construction** | Temporary | Moderate Adverse Short Term | | Local | | See GA and Planting Plans and Lighting Strategy for Bats (Condition 44). |

| POTENTIAL EFFECT | NATURE OF EFFECT | SIGIFICANCE | MITIGATION / ENHANCEMENT MEASURES | GEOGRAPHICAL FEATURES | RESIDUAL EFFECTS | DOCUMENT / PLAN REFERENCE OR COMMENT |
|---|---|---|---|---|---|---|
| **works – Barbastelle bats** | | | | | | |
| **Bats - Disruption of tree roosts and access to them, by artificial lighting from construction works** | Temporary | Minor Adverse Short Term | | Site | Negligible | See GA and Planting Plans and Lighting Strategy for Bats (Condition 44). |
| Operational Effects | | | | | | |
| **Statutory & Non-Statutory Sites** | | | | | | |
| **Increase in recreational disturbance on CWS & LNR.** | Temporary/ Permanent | Minor Adverse Long Term | Specific GI created for recreational activities i.e. off lead dog walking. Circular walks with semi natural features. | Local | Negligible | See GA and Planting Plans and section 6 of this document. |
| **Effects on Habitats** | | | | | | |
| **Woodland - Recreation disturbance on Great Field Plantation** | Temporary/ Permanent | Minor Adverse Long Term | Perimeter planting and fencing to focus public access to designated paths. Interpretation boards installed. | Local | Minor Beneficial Long Term | See GA and Planting Plans and section 8of this document. |
| **Woodland - Increased disturbance of woodland W1, due to possible access to new amenities** | Temporary/ Permanent | Minor Adverse Long Term | | Local | | W1 not in Redrow site. |
| **Woodland - Increased disturbance and possible damage of woodland W4 from extended play and public interference** | Temporary/ Permanent | Minor Adverse Long Term | | Local | | W4 not in Redrow site. |
| **Woodland - Increase in litter levels within woodland affecting ground flora and fauna** | Temporary | Minor Adverse Medium Term | Litter bins to be located at entry points to woodland and near public amenities | Local | | See GA and Planting Plans and section 8 of this document. |
| **Woodland - Disturbance through public short cuts through exiting and created hedgerow / margins** | Temporary | Minor Adverse Medium Term | Post and wire fencing to allow time for hedgerows to establish. | Site | Negligible | See GA and Planting Plans and section 8 of this document. |
| **Watercourse - Increase in recreational pressure of watercourse, particularly the central feature** | Temporary/ Permanent | Minor Adverse Long Term | Fencing and public interpretation boards to raise awareness of biological features. | Local | | See GA and Planting Plans and section 10 of this document. |
| **Residential Gardens** | Permanent | Minor beneficial Long Term | N/A | Site | Minor beneficial Medium Term | N/A |
| **New Woodland – Damage by the public** | Temporary | Minor Adverse in Medium Term | New woodland planting will be fenced off and managed | Local | Negligible | See GA and Planting Plans and section 8 of this document. |

| POTENTIAL EFFECT | NATURE OF EFFECT | SIGIFICANCE | MITIGATION / ENHANCEMENT MEASURES | GEOGRAPHICAL FEATURES | RESIDUAL EFFECTS | DOCUMENT / PLAN REFERENCE OR COMMENT |
|---|---|---|---|---|---|---|
| **New Habitats – Grassland, waterbodies, woodland, and individual tree planting** | Permanent | Moderate/ Major Beneficial Long Term | New habitats created | Local | Moderate/ Major Beneficial Long Term | See GA and Planting Plans and sections 7 to 10 of this document. |
| **New Habitats – Inappropriate Management** | Temporary/ Permanent | Moderate Adverse Short/ Medium/ Long Term | A Green infrastructure & Biodiversity Management Plan will be written | Local | Moderate Beneficial Long Term | See GA and Planting Plans and Landscape and Ecological Management Plan (Condition 7). |
| **Effects on Fauna** | | | | | | |
| [redacted] | | | | | | |
| **Birds – Domestic Cats and Slow Development of Habitats** | Temporary | Minor Adverse Medium Term | Existing habitats retained to allow possible refuge. Where possible more mature hedgerow species planted. Nesting boxes will provide opportunities while habitats mature. | Site | Negligible | See GA and Planting Plans and section 16 of this document. |
| **Birds – New GI** | Permanent | Minor Beneficial Long Term | Retention of hedgerows and the GI created will provide more refuge and foraging opportunities | Local | Minor Beneficial Long Term | See GA and Planting Plans and section 16 of this document. |
| **Dormice – Inappropriate Management of Habitats** | Temporary/ Permanent | Minor / Moderate Adverse Long Term | A Green infrastructure & Biodiversity Management Plan will be written | Site | Minor Beneficial Long Term | Limited evidence of Dormice in Redrow site. See GA and Planting Plans and section 14 of this document. |
| **Dormice – Degradation of existing/created habitats by public** | Temporary/ Permanent | Minor / Moderate Adverse Long Term | Habitats will be fenced off while they develop and interpretation boards specifying the importance of such areas | Site | | Limited evidence of Dormice in Redrow site. See GA and Planting Plans and section 14 of this document. |
| **Dormice – Predation by Cats** | Permanent | Minor Adverse Long Term | Dense hedgerow planting and nesting boxes installed for refuge opportunities while habitats develop. | Site | | Limited evidence of Dormice in Redrow site. See GA and Planting Plans and section 14 of this document. |
| **Reptiles – Predation by Cats** | Permanent | Minor Adverse Long Term | New grassland habitats will be created through the site with specific reptile features such as hibernacula, log piles and hedgerows. These will act as refuge and hibernation structures. | Site | Minor Beneficial Long Term | See GA and Planting Plans and section 17 of this document. |
| **Reptiles – Habitat Creation** | Permanent | Minor Beneficial Long Term | | Site | | See GA and Planting Plans and section 17 of this document. |
| **Reptiles – Degradation of existing/created habitats by public** | Temporary/ Permanent | Minor/ Moderate | Habitats will be fenced off while they develop and interpretation boards specifying the importance of such areas | Site | | See GA and Planting Plans and section 17 of this document. |

| POTENTIAL EFFECT | NATURE OF EFFECT | SIGIFICANCE | MITIGATION / ENHANCEMENT MEASURES | GEOGRAPHICAL FEATURES | RESIDUAL EFFECTS | DOCUMENT / PLAN REFERENCE OR COMMENT |
|---|---|---|---|---|---|---|
| **Bats – Street and Building Lighting** | Permanent | Moderate Adverse Short Term | Buffers will be created along habitats to limit the degree of light spill. Where lighting required, they will be directionally focused or shrouded. Lighting on buildings will only be placed where necessary. Additional GI will provide alternative foraging and commuting opportunities | Local | Negligible | See GA and Planting Plans and Lighting Strategy for Bats (Condition 44). |
| **Bats – Additional GI** | Permanent | Minor/ Moderate Beneficial Long Term | Additional GI created that will provide new commuting and foraging opportunities. GI will increase prey items as waterbodies and grassland habitats created. | Local | Minor/ Moderate Beneficial Long Term | See GA and Planting Plans and section 12 of this document. |
| **Cumulative Effects – North West Haverhill Development** | | | | | | |
| **Construction** | | | | | | |
| **Dust Particles Effects on Statutory Sites** | Temporary | Minor Adverse Short Term | Supress with spraying ground with water during dry periods | Borough | Negligible | See section 6 of this document. |
| **Loss of hedgerows** | Permanent | Minor Adverse Long Term | New hedgerow planting with GI | Site | | See GA and Planting Plans and section 9 of this document. |
| **Operational** | | | | | | |
| **Recreational pressures on Ann Sucklings Way & Norney Plantation CWS** | Permanent | Minor Adverse Long Term | | Borough | Negligible | See section 6 of this document. |

## 2.2 ES Addendum

2.2.1 The ES Addendum summarises the revised approach to be taken for Dormice, at paragraphs 9.2.8 and 9.2.9. Note that the reference to a nest is for an area outwith the Redrow phase of development.

**Since the submission of the planning application, the proposed mitigation measures have been amended; a Natural England licence will not be required. The survey results used techniques recommended within the most current available guidance, which demonstrated a single dormouse nest is situated within habitats to be retained by the proposals. No further nesting sites or evidence of dormouse nests were identified in nesting tubes within locations affected by the proposed development. From this evidence it has been concluded that the proposed development will not affect a breeding site or resting place, which are afforded strict protection under the Conservation of Habitats and Species Regulation 2010 (as amended), therefore a licence is not required to legitimise the works.**

**In situations where no evidence of dormouse activity has been identified in habitats effected by proposals, but dormice are known locally the Dormice Conservation Handbook confirms a licence can be avoided "if the proposed activity can be timed, organised and carried out to avoid committing offences". The guidance also confirms that where impacts can be completely avoided, the Regulations are not offended and a licence is not required. To ensure such circumstances a precautionary Outline Risk Assessment and Method Statement has been written on the basis of the current parameters plan (Appendix 9.6), this specifies habitat removal at appropriate time of the year so**

**avoiding potential offences under the Regulations. If dormice activity is confirmed then works will stop and a licence applied for.**

2.2.2 The strategies in the Dormouse Risk Assessment and Method Statement included as an Appendix to the Addendum have been adopted in full, as set out in section 14 of this document. The results of surveys undertaken by Ecology Solutions have shown that this remains a suitable approach.

2.2.3 Other information in the ES Addendum does not change the approach summarised in the table above.

# 3. PURPOSE AND CONSERVATION OBJECTIVES

## 3.1 Purpose of the Strategy

3.1.1 The purpose of this strategy is to address the mitigation measures set out in Volume 2 Section 9 of the Environmental Statement (ES) dated September 2015, relevant appendices and the subsequent Addendum document dated May 2016.

3.1.2 The scope of the ES relates to the wider site and the ecological receptors identified during work to inform the outline application. The current strategy relates solely to infrastructure reserved matters application for the land in the ownership of Redrow Homes.

## 3.2 Conservation Objectives

3.2.1 Specific objectives for the conservation of particular species or groups and particular habitats of nature conservation interest are set out in the relevant sections below. The nature of these objectives has been guided by the principles set out in UK and European wildlife legislation, notably the Wildlife & Countryside Act 1981 (as amended), the Conservation of Habitat and Species Regulations 2017 and the Natural Environment & Rural Communities Act 2006. Furthermore, the formulation of these objectives has also been influenced by national and local biodiversity and conservation targets, as set out in the UK Post-2010 Biodiversity Framework and the Sussex Biodiversity Action Plan (BAP).

3.2.2 The overarching objectives for nature conservation are as follows:

- To safeguard habitats and species that are important in the national and local context, and to maintain or enhance their conservation status as appropriate;
- To ensure that the site continues to support a similar complement of species to that already existing (with the exception of invasive non-native species); and
- To enhance the biodiversity of the site, where this is compatible with the above objectives.

3.2.3 Information on the existing situation at the site and its environs regarding habitats of ecological interest and the presence of protected species has been collated as part of the preparation of this document. This includes information gathered to inform the outline ES and the more recent 2018/19 surveys completed by Ecology Solutions. Together, this provides the baseline on which the mitigation strategies set out in this document are founded.

## 3.3 Detailed Designs and Working Methods to achieve Objectives

3.3.1 Information on the approaches to achieve the stated objectives is set out in the sections to follow. These are specifically designed to achieve the aims of the mitigation strategy set out in the ES and associated documents. They define the type and source of materials to be used where appropriate.

# 4. REVIEW OF SITE POTENTIAL AND CONSTRAINTS

4.1 This document has been informed by the background information accrued for the outline ES and by updated surveys undertaken by Ecology Solutions of the Redrow Homes site in 2018/19.

## 4.2 Constraints

4.2.1 The following main habitat / vegetation types were identified within the areas proposed for infrastructure within the site:

- Arable;
- Improved Grassland;
- Hedgerow;
- Watercourse;
- Pond;
- Ditch;
- Trees;
- Plantation; and
- Field Margins.

4.2.2 The location of these habitats is shown on Plan ECO2.

4.2.3 Habitats of value in the context of the site include mixed and broadleaf plantation, hedgerows, trees (especially where these also offer suitable nesting opportunities for bird species or potential roosting opportunities for bats), field margins, watercourse, ditches and ponds. The arable land and improved grassland are of limited intrinsic nature conservation value.

4.2.4 None of the above habitats pose an overriding ecological constraint in themselves that would prevent the development proceeding, with the majority of the habitats of greater value being retained and enhanced as part of the green infrastructure for the site.

4.2.5 Other ecological constraints within the areas of infrastructure are attributed to the known or potential presence of Badgers, bats, Otters, Water Voles, Dormice, Hedgehogs, birds, common reptiles, amphibians and invertebrates. These constraints are addressed by mitigation measures detailed in later sections of this document.

4.2.6 The ecological constraints are illustrated on Plan ECO3.

4.2.7 In addition, Haverhill Railway Walks Local Nature Reserve (LNR) and Haverhill Disused Railway Line County Wildlife Site (CWS) are present some 492m south of the site according to the ES. This is beyond the existing built-up area of Haverhill, and though the ES highlights the potential for dust deposition as an adverse effect, in Ecology Solutions' view this is highly unlikely given the distance and prevailing wind direction, even if there were not a requirement for standard good construction practice to minimise dust on surrounding residential areas. Ann Sucklings Way CWS and Norney Plantation CWS are further removed, at 729m and 990m according to the ES. These are cited in the cumulative effects assessment in terms of recreational effects.

## 4.3 Potential

4.3.1 The majority of the site consists of intensively managed arable fields, with areas of improved grassland. These are intrinsically of low ecological interest, with the large arable fields in particular offering relatively little for wildlife. The plantations are generally even-aged; Great Field Plantation has minimal understorey and a depauperate ground flora. The hedgerows, while a significant ecological asset, are gappy or missing in places.

4.3.2 Hence the site possesses excellent potential for wildlife gains, retaining and enhancing the best of the existing habitats, while promoting new opportunities through the strategies for green and blue infrastructure networks. The establishment of new habitats and future management of the network as a whole will deliver significant benefits.

4.3.3 Surveys undertaken to inform the outline planning application and those completed in 2018/19 identified a complement of bat species using the site for foraging and dispersal; some use of the site by Badgers, though this appears to have declined over time; a Dormouse nest along Hedgerow H13; an assemblage of breeding birds; the presence of two species of reptile, Common Lizard and Grass Snake; and the amphibians Common Toad and Smooth Newt. Otters and Water Voles are known to be present in the wider locality. The site is expected to support a range of common invertebrates, but interest will be limited by the intensive arable management.

4.3.4 Overall, there is significant potential to enhance the site for the species known to be present, and to provide opportunities for those present in the wider environment to colonise naturally over time.

## 4.4 Survey Information

4.4.1 This Ecological Implementation Strategy is informed by the range of survey work completed as part of the outline planning application, which has been reviewed in full, and surveys carried out by Ecology Solutions on behalf of Redrow Homes in 2018/19. The ecological constraints are well understood. The mitigation and enhancement strategy for this reserved matters application has adopted in full the approved measures in the Environmental Statement and ES Addendum accompanying the outline planning application. The strategy is therefore comprehensive and robust.

4.4.2 Full details of the updated survey work are provided in the Protected Species Survey Report which accompanies the Infrastructure RMA. The Protected Species Survey Report should be read in conjunction with this EIS for the full baseline information.

## 5. EXTENT AND LOCATION / AREA OF PROPOSED WORKS

5.1 The extent and location of all proposed works are shown on the GA and Planting Plans produced by Exterior Architecture in consultation with Ecology Solutions.

5.2 These detailed plans, which are at an appropriate scale, clearly show the locations of all new and retained habitats, the degree of habitat loss and creation, and the protective measures to be employed throughout the period of construction.

5.3 This strategy make reference to the GA and Planting Plans throughout, and should be read alongside those plans.

5.4 Summary plans (Plans ECO4a to d) are included within this EIS for an overview and ease of reference, but for the full detail refer to the GA and Planting Plans.

# 6. DESIGNATED SITES

6.1 This section is concerned with addressing the effects on Haverhill Railway Walks Local Nature Reserve (LNR) and Haverhill Disused Railway Line County Wildlife Site (CWS) as identified in the ES, as well as Ann Sucklings Way CWS and Norney Plantation CWS cited in the cumulative effects assessment.

## 6.2 Conservation Objectives

| |
|---|
| To avoid dust effects arising from development.<br><br>To avoid increased recreational disturbance. |

## 6.3 Designs and Working Methods

*Dust Suppression*

6.3.1 The preparation of the arable land for development is not considered likely to produce high levels of dust, but during periods of dry weather the work area will be sprayed with water.

6.3.2 A suitable vehicle and bowser will be kept on site, and the assessment of dust effects will be allocated to a suitable individual by the site manager, who will have ultimate responsibility for implementing the measure.

6.3.3 It should be noted that suppression of dust during construction is a routine measure adopted by Redrow Homes on all sites, particularly where existing residential properties and / or features of ecological importance are present. Hence this will be done in any event.

6.3.4 It is noted that the effects of dust on these designated sites were assessed as ‘negligible’ in the ES even before mitigation.

*Recreational Opportunities*

6.3.5 The Redrow scheme includes a significant expanse of new public open space, which will be delivered as part of the infrastructure phase of development, as set out in this document, the Landscape and Ecological Management Plan and the GA and Planting Plans. This new green infrastructure will be available for use by new residents, offering diverse opportunities for walking, dog-walking and general informal recreation. There will therefore be no adverse effects on the designated sites as a result.

# 7. GREEN SPINE / LINEAR COUNTRY PARK

7.1 This section is concerned with the establishment of the Green Spine and Linear Park, as shown on the GA and Planting Plans, and the mitigation of effects on grassland as identified in the ES.

## 7.2 Conservation Objectives

To avoid adverse effects on retained habitats through direct encroachment.

To avoid adverse effects on new establishing habitats through direct encroachment.

To establish high quality new habitats using appropriate native species mixes.

## 7.3 Designs and Working Methods

*Construction Phase Mitigation*

7.3.1 All habitats to be retained as part of development will be appropriately protected using robust fencing, i.e. Heras fencing or similar, as shown on the GA and Planting Plans.

7.3.2 Tree root protection areas, as defined on the GA and Planting Plans, will be safeguarded through fencing complying with the British Standard.

7.3.3 Site personnel will be briefed as to the presence of these important retained areas.

7.3.4 No storage of materials will be permitted within 10m of retained habitats, and vehicle movements within this area will be for essential works only.

7.3.5 These measures will be the responsibility of the site manager.

*Dust Suppression*

7.3.6 The preparation of the arable land for development is not considered likely to produce high levels of dust, but during periods of dry weather the work area will be sprayed with water.

7.3.7 A suitable vehicle and bowser will be kept on site, and the assessment of dust effects will be allocated to a suitable individual by the site manager, who will have ultimate responsibility for implementing the measure.

*New Habitats*

7.3.8 All new habitats will be appropriately protected using robust fencing, i.e. Heras fencing or similar, as shown on the GA and Planting Plans, until such time as they are properly established.

7.3.9 New planting undertaken as part of the infrastructure of the site will include native species with an emphasis on trees and plants of known value to wildlife.

7.3.10 Avenue trees (see GA and Planting Plans, Planting Schedule and Table 7.1 below) will be planted along primary roads screening play areas and parkland. This will help to increase connectivity throughout the site and offer habitats for nesting birds and invertebrates.

| **Avenue Tree Species** |
|---|
| Field Maple *Acer campestre* |
| Field Maple 'Elsrijk' *Acer campestre* 'Elsrijk' |
| Hornbeam *Carpinus betulus* |
| Hornbeam 'Fastigiata' *Carpinus betulus* 'Fastigiata' |
| Hornbeam 'Frans Fontaine' *Carpinus betulus* 'Frans Fontaine' |
| Hazel *Corylus avellana* |
| Beech *Fagus sylvatica* |
| Cherry 'Accolade *Prunus* 'Accolade' |
| Bird Cherry *Prunus padus* |
| Chanticleer Pear *Pyrus calleryana* 'Chanticleer' |
| Whitebeam *Sorbus aria* |
| Small-leaved Lime *Tilia cordata* |
| Large-leaved Lime *Tilia platyphyllos* |

**Table 7.1.** Avenue Tree species list.

7.3.11 The Linear Country Park will be a core component of the new development. Green corridors throughout the new development will serve as conduits for wildlife, encouraging natural processes to permeate into the establishing community. They will include new areas of wildflower grassland, native tree and shrub planting, and new swales and attenuation basins as part of the drainage strategy (see below).

7.3.12 The Northern Gateway Park will incorporate a large number of parkland trees (see GA and Planting Plans, Planting Schedule and Table 7.2 below), increasing the diversity and age range of tree species within site.

| **Parkland Tree Species** |
|---|
| Field Maple *Acer campestre* |
| Field Maple 'Elsrijk' *Acer campestre* 'Elsrijk' |
| Silver Birch *Betula pendula* |
| Downy Birch *Betula pubescens* |
| Himalayan Birch 'Jaquemontii' *Betulus utilis* 'Jaquemontii' |
| Hornbeam *Carpinus betulus* |
| Hornbeam 'Fastigiata' *Carpinus betulus* 'Fastigiata' |
| Hazel *Corylus avellana* |
| Hawthorn *Crataegus monogyna* |
| Beech *Fagus sylvatica* |
| Apple *Malus domestica* |
| Black Poplar *Populus nigra* |
| Cherry 'Accolade' *Prunus* 'Accolade' |
| Plum 'Avalon' *Prunus domestica 'Avalon'* |
| Gage 'Cambridge Gage' *Prunus domestica 'Cambridge Gage'* |
| Bird Cherry *Prunus padus* |
| Chanticleer Pear *Pyrus calleryana* 'Chanticleer' |
| Oak *Quercus robur* |
| White Willow *Salix alba* |
| Whitebeam *Sorbus aria* |
| Rowan S*orbus aucuparia* |
| Swamp Cypress *Taxodium distichum* |

| |
|---|
| Small-leaved Lime *Tilia cordata* |
| Common Lime *Tilia x europaea* |

**Table 7.2.** Parkland tree species list.

7.3.13 New areas of extensive tree planting will be under-sown with Emorsgate Seeds woodland mix (see GA and Planting Plans, Planting Schedule and Table 7.3 below).

| **EW1 Woodland Mixture Species** | **% per Mix** |
|---|---|
| **Wild Flowers** | |
| Garlic Mustard *Alliaria petiolata* | 3% |
| Ramsons *Allium ursinum* | 0.8% |
| Betony *Stachys officinalis* | 1.6% |
| Rough Chervil *Chaerophyllum temulum* | 1% |
| Foxglove *Digitalis purpurea* | 0.2% |
| Meadowsweet *Filipendula ulmaria* | 2% |
| Hedge Bedstraw *Galium album* | 1% |
| Water Avens *Geum rivale* | 1% |
| Wood Avens *Geum urbanum* | 0.2% |
| Bluebell *Hyacinthoides non-scripta* | 2.8% |
| Hairy St John's-wort *Hypericum hirsutum* | 0.8% |
| Primrose *Primula vulgaris* | 0.2% |
| Selfheal *Prunella vulgaris* | 1.5% |
| Red Campion *Silene dioica* | 2.7% |
| Ragged Robin *Lychnis flos-cuculi* | 0.2% |
| Wood Sage *Teucrium scorodonia* | 1% |
| | **20%** |
| **Grasses** | |
| Common Bent *Agrostis capillaris* | 10% |
| Sweet Vernal Grass *Anthoxanthum odoratum* | 2% |
| False Brome *Brachypodium sylvaticum* | 7% |
| Crested Dog's-tail *Cynosurus cristatus* | 28% |
| Tufted Hair-Grass *Deschampsia cespitosa* | 1% |
| Slender Creeping Red Fescue *Festuca rubra ssp. litoralis* | 20% |
| Wood Meadow-grass *Poa nemoralis* | 12% |
| | **80%** |

**Table 7.3.** Emorsgate Seeds EW1 Woodland Mixture species list.

7.3.14 An 'edible spine' will be established within the linear country park focusing on edible and foraging plants (see GA and Planting Plans, Planting Schedule and Table 7.4 below).

| **Edible Planting Species** |
|---|
| Wild Garlic *Allium ursinum* |
| Hazel *Corylus avellana* |
| Wild Strawberry *Fragaria vesca* |
| Crab Apple *Malus sylvestris* |
| Water Mint *Mentha aquatica* |
| Wild Marjoram *Origanum vulgare* |
| Dog Rose *Rosa canina* |
| Rowan S*orbus aucuparia* |

**Table 7.4.** Edible Planting species list.

7.3.15 Significant new tree planting will be undertaken in this area with an emphasis on orchard tree species (see GA and Planting Plans, Planting Schedule and Table 7.5 below).

| **Wild Orchard Tree Species** |
|---|
| Apple 'Annie Elizabeth' *Malus domestica* 'Annie Elizabeth' |
| Apple 'Red Falstaff' *Malus domestica* 'Red Falstaff' |
| Wild Cherry 'Amber Heart' *Prunus avium* 'Amber Heart' |
| Wild Cherry 'Knight Early Black' *Prunus avium* 'Knight Early Black' |
| Wild Cherry 'Penny' *Prunus avium* 'Penny' |
| Plum 'Avalon' *Prunus domestica* 'Avalon' |
| Plum 'Cambridge Gage' *Prunus domestica* 'Cambridge Gage' |
| Bird Cherry *Prunus padus* |

**Table 7.5.** Wild Orchard tree species list.

7.3.16 The planting schedule includes the provision of wet and dry grassland habitat, designed to encourage greater wildflower diversity, and the provision of swales and ponds as habitats containing taller vegetation. This habitat diversification will favour invertebrates and will in turn provide net gains for local wildlife.

7.3.17 Areas of amenity grassland within the infrastructure for the site will be seeded with a flowering lawn mix (see GA and Planting Plans, Planting Schedule and Table 7.6 below).

| **EL1 Flowering Lawn Mixture Species** | **% per Mix** |
|---|---|
| **Wild Flowers** | |
| Lady's Bedstraw *Galium verum* | 4% |
| Rough Hawkbit *Leontodon hispidus* | 0.5% |
| Oxeye Daisy *Leucanthemum vulgare* | 1% |
| Birdsfoot Trefoil *Lotus corniculatus* | 3.7% |
| Cowslip *Primula veris* | 3.0% |
| Selfheal *Prunella vulgaris* | 4.0% |
| Meadow Buttercup *Ranunculus acris* | 3.5% |
| Red Clover *Trifolium pratense* | 0.1% |
| | **20%** |
| **Grasses** | |
| Common Bent *Agrostis capillaris* | 8.0% |
| Crested Dog's-tail *Cynosurus cristatus* | 40.0% |
| Slender Creeping Red Fescue *Festuca rubra ssp. litoralis* | 28.0% |
| Smaller Cat's-tail *Phleum bertolonii* | 4.0% |
| | **80%** |

**Table 7.6.** Emorsgate Seeds EL1 Flowering Lawn Mixture species list.

7.3.18 The existing field margins are recognised to be of relatively higher botanical interest. These will be retained and subject to ongoing management to maximise their botanical interest. There will be no storage of materials or tracking over of these areas, and no new tree planting.

7.3.19 New areas of wildflower grassland are to be established throughout the Green Spine and Linear Park. These areas are currently principally intensive arable and improved grassland respectively. In conjunction with the drainage strategy, areas of dry and wet grassland will be established (see GA and Planting Plans, Planting Schedule and Tables 7.7 and 7.8 below).

7.3.20 Newly established meadows will be cut on an annual basis as required, with the arisings removed. These would be retained as 'habitat piles' in suitable locations to encourage reptiles.

| EM6 Meadow Mixture for Chalk & Limestone Soils Species | % per Mix |
|---|---|
| **Wild Flowers** | |
| Yarrow *Achillea millefolium* | 0.5% |
| Kidney Vetch *Anthyllis vulneraria* | 0.5% |
| Common Knapweed *Centaurea nigra* | 1.5% |
| Greater Knapweed *Centaurea scabiosa* | 2% |
| Wild Basil *Clinopodium vulgare* | 0.4% |
| Wild Carrot *Daucus carota* | 1% |
| Lady's Bedstraw *Galium verum* | 2% |
| Field Scabious *Knautia arvensis* | 1.5% |
| Rough Hawkbit *Leontodon hispidus* | 0.4% |
| Oxeye Daisy *Leucanthemum vulgare* | 0.5% |
| Bird's-foot Trefoil *Lotus corniculatus* | 0.6% |
| Sainfoin *Onobrychis viciifolia* | 1.5% |
| Wild Marjoram *Origanum vulgare* | 0.2% |
| Hoary Plantain *Plantago media* | 0.7% |
| Salad Burnet *Sanguisorba minor* | 2% |
| Cowslip *Primula veris* | 1% |
| Selfheal *Prunella vulgaris* | 1% |
| Meadow Buttercup *Ranunculus acris* | 1% |
| Bulbous Buttercup *Ranunculus bulbosus* | 1.5% |
| Small Scabious *Scabiosa columbaria* | 0.2% |
| | **20%** |
| **Grasses** | |
| Quaking-grass *Briza media* | 4% |
| Glaucous Sedge *Carex flacca* | 0.2% |
| Crested Dog's-tail *Cynosurus cristatus* | 32% |
| Sheep's-fescue *Festuca ovina* | 24% |
| Slender Creeping Red Fescue *Festuca rubra ssp. litoralis* | 12.6% |
| Crested Hair-grass *Koeleria macrantha* | 2% |
| Smaller Cat's-tail *Phleum bertolonii* | 4% |
| Yellow Oat-grass *Trisetum flavescens* | 1.2% |
| | **80%** |

**Table 7.7.** Emorsgate Seeds EM6 Meadow Mixture for Chalk and Limestone Soils species list.

| EM8 Meadow Mixture for Wetlands Species | % per Mix |
|---|---|
| **Wild Flowers** | |
| Yarrow *Achillea millefolium* | 0.2% |
| Sneezewort *Achillea ptarmica* | 0.2% |
| Betony *Stachys officinalis* | 1% |
| Common Knapweed *Centaurea nigra* | 2.5% |
| Meadowsweet *Filipendula ulmaria* | 2% |
| Lady's Bedstraw *Galium verum* | 2% |
| Rough Hawkbit *Leontodon hispidus* | 0.5% |
| Oxeye Daisy *Leucanthemum vulgare* | 0.5% |
| Bird's-foot Trefoil *Lotus corniculatus* | 0.7% |
| Greater Bird's-foot-trefoil *Lotus pedunculatus* | 0.5% |
| Ribwort Plantain *Plantago lanceolata* | 1% |
| Cowslip *Primula veris* | 1% |

| | |
|---|---|
| Selfheal *Prunella vulgaris* | 1.5% |
| Meadow Buttercup *Ranunculus acris* | 2% |
| Yellow Rattle *Rhinanthus minor* | 1.5% |
| Great Burnet *Sanguisorba officinalis* | 1.5% |
| Pepper-saxifrage *Silaum silaus* | 0.5% |
| Ragged Robin *Lychnis flos-cuculi* | 0.4% |
| Devil's-bit Scabious *Succisa pratensis* | 0.5% |
| | **20%** |
| **Grasses** | |
| Common Bent *Agrostis capillaris* | 10% |
| Meadow Foxtail *Alopecurus pratensis* | 1% |
| Sweet Vernal Grass *Anthoxanthum odoratum* | 3% |
| Quaking-grass *Briza media* | 2% |
| Crested Dog's-tail *Cynosurus cristatus* | 32% |
| Tufted Hair-Grass *Deschampsia cespitosa* | 1% |
| Slender Creeping Red Fescue *Festuca rubra ssp. litoralis* | 24% |
| Meadow Barley *Hordeum brachyantherum* | 1% |
| Meadow Fescue *Festuca pratensis* | 6% |
| | **80%** |

**Table 7.8.** Emorsgate Seeds EM8 Meadow Mixture for Wetlands species list.

7.3.21 Areas of tussocky grassland will be established using Emorsgate Seeds EG10 Tussock Grass Mixture (see GA and Planting Plans, Planting Schedule and Table 7.9 below) to create greater opportunities for reptiles and other wildlife.

| **EG10 Tussock Grass Mixture Species** | **% per Mix** |
|---|---|
| Meadow Foxtail *Alopecurus pratensis* | 2.5% |
| Crested Dog's-tail *Cynosurus cristatus* | 25.0% |
| Cocksfoot *Dactylis glomerata* | 20.0% |
| Tufted Hair-Grass *Deschampsia cespitosa* | 2.5% |
| Strong-creeping Red Fescue | 25.0% |
| Yorkshire Fog *Holcus lanatus* | 2.5% |
| Tall Fescue *Festuca arundinacea* | 12.5% |
| Meadow Fescue *Festuca pratensis* | 10% |
| | **100%** |

**Table 7.9.** Emorsgate Seeds EG10 Tussock Grass Mixture species list.

7.3.22 The periphery of the wildflower meadows will be planted with native tree species (see GA and Planting Plans, Planting Schedule and Table 7.10 below), bolstering the existing woodland edge and mature Oak trees present along the boundaries of the linear park.

| **Woodland Meadow Edge Tree Species** |
|---|
| Field Maple *Acer campestre* |
| Alder *Alnus glutinosa* |
| Silver Birch *Betula pendula* |
| Downy Birch *Betula pubescens* |
| Hornbeam *Carpinus betulus* |
| Hornbeam 'Fastigiata' *Carpinus betulus* 'Fastigiata' |
| Hornbeam 'Frans Fontaine' *Carpinus betulus* 'Frans Fontaine' |
| Hazel *Corylus avellana* |
| Beech *Fagus sylvatica* |
| Cherry 'Accolade' *Prunus* 'Accolade' |
| Cherry 'Knight's Early Black' *Prunus avium* 'Knight's Early Black' |

| |
|---|
| Bird Cherry *Prunus padus* |
| Oak *Quercus robur* |
| White Willow *Salix alba* |
| Goat Willow *Salix caprea* |
| Crack Willow *Salix fragilis* |
| Whitebeam *Sorbus aria* |
| Rowan S*orbus aucuparia* |
| Swamp Cypress *Taxodium distichum* |
| Small-leaved Lime *Tilia cordata* |

**Table 7.10.** Woodland Meadow Edge tree species list.

## 7.4 Initial Aftercare and Long-term Management and Maintenance

*Trees*

7.4.1 Watering will be required during periods of drought for no less than the first three years after planting to ensure satisfactory establishment.

7.4.2 Trees will be inspected every six months for the first two years to ensure that they are healthy, not diseased or damaged, or dead. After the first two years, trees can be inspected annually if found to be establishing well.

7.4.3 Any failed trees within the first five years will be replaced and maintained for a subsequent five years. Tree replacement will occur in early spring or late autumn.

7.4.4 Annual pruning will be completed between January and March. Emergency pruning will be undertaken immediately after a critical fault is identified.

*Grassland*

7.4.5 Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture.

7.4.6 **EG10 Tussock Grass Mixture.** Once established, tussocky grassland requires very little management.

7.4.7 In the first year, mow regularly to 40-60mm throughout the growing season to prevent annual weeds smothering the slower growing grasses. Cuttings will be removed if dense.

7.4.8 After the first year, unwanted perennial weeds can be occasionally spot treated.

7.4.9 Tussocky areas may need to be cut every 2-3 years between October and February to control scrub and bramble development. This should be done on a rotational basis, so that no more than half of the area is cut in any one year to allow an area of safe refuge for wildlife.

7.4.10 **EL1 Flowering Lawn Mixture.** Newly sown flowering lawns should be mown every 7-10 days during the growing season of the first year to a height of 40-60mm. Residual perennial weeds will be carefully dug out or spot treated.

7.4.11 After the first year the grass will be mown regularly to a height of 25-40mm. Management can be relaxed from late June for 4-8 weeks to allow for flowering (mowing may be suspended earlier to allow for Cowslip to flower). Heavy quantities of cuttings should be collected and removed from site.

7.4.12 **EW1 Woodland Mixture.** In established woodland the woodland mix requires very little management.

7.4.13 In young or open woodland with higher light levels, the mix should be cut annually in mid-summer until the tree cover has established.

7.4.14 **EM6 Meadow Mixture for Chalk and Limestone Soils and EM8 Meadow Mixture for Wetlands.** Newly sown meadows will be mown regularly throughout the first year of establishment to a height of 40-60mm. This will control annual weeds and help maintain balance between faster growing grasses and slower developing wild flowers. Cuttings will be removed if dense. Residual perennial weeds will be carefully dug out or spot treated.

7.4.15 In subsequent years, on poor shallow soils the grass will be cut once or twice at the end of the summer.

7.4.16 On deeper soils best results are usually obtained by traditional meadow management. This will include a cut to 50mm after flowering in July or August. The cuttings will be left to dry and shed seed for 1-7 days before being removed from the site. The grass can then be maintained at a height of 50mm through to spring.

7.4.17 Areas of new and retained and enhanced planting, as well as ponds and swales, will be monitored annually for the first five years to ensure that the species diversity and composition is developing in such a way as to enhance the site for wildlife.

7.4.18 Watering will be required during periods of drought to ensure satisfactory establishment. Watering will be undertaken as required to maintain healthy plant growth.

7.4.19 Dead or diseased plants will be removed and replaced with the same species immediately after identification.

# 8. WOODLAND AND SCRUB

8.1 This section is concerned with the establishment and management of existing and new woodland habitats, including Great Field Plantation, and the mitigation of effects on woodland as identified in the ES.

## 8.2 Conservation Objectives

To avoid adverse effects on retained habitats through direct encroachment.

To avoid adverse effects on new establishing habitats through direct encroachment.

To establish high quality new habitats using appropriate native species mixes.

To promote greater habitat diversity in existing woodland.

## 8.3 Designs and Working Methods

*Construction Phase Mitigation*

8.3.1 All habitats to be retained as part of development will be appropriately protected using robust fencing, i.e. Heras fencing or similar, as shown on the GA and Planting Plans.

8.3.2 Tree root protection areas, as defined on the GA and Planting Plans, will be safeguarded through fencing complying with the British Standard.

8.3.3 Site personnel will be briefed as to the presence of these important retained areas.

8.3.4 No storage of materials will be permitted within 10m of retained habitats, and vehicle movements within this area will be for essential works only.

8.3.5 These measures will be the responsibility of the site manager.

*Dust Suppression*

8.3.6 The preparation of the arable land for development is not considered likely to produce high levels of dust, but during periods of dry weather the work area will be sprayed with water.

8.3.7 A suitable vehicle and bowser will be kept on site, and the assessment of dust effects will be allocated to a suitable individual by the site manager, who will have ultimate responsibility for implementing the measure.

*New Habitats*

8.3.8 All new habitats will be appropriately protected using robust fencing, i.e. Heras fencing or similar, as shown on the GA and Planting Plans, until such time as they are properly established.

*Great Field Plantation*

8.3.9 Overall, while Great Field Plantation does offer opportunities to wildlife, it is of limited intrinsic nature conservation interest. The understorey is virtually absent and the field layer is very impoverished, with little light penetrating to the woodland floor. The aims of management are therefore to facilitate a gradual conversion to a more naturalistic woodland with greater structural diversity, focusing on native species as opposed to introduced conifers.

Conversion of Even-aged Plantation to Uneven-aged System

8.3.10 The principal advantage of the phased removal of conifers and the introduction of native broadleaves is that disruption to wildlife is minimised. A phased approach is therefore favoured over a clear-fell approach, which would have an adverse effect on protected and notable species, and is in any case unacceptable from a landscape and visual standpoint.

8.3.11 Three glades will be established in the woodland by felling conifer species. New understorey planting will be undertaken using native species. Existing broadleaved species will be encouraged to grow to maturity.

8.3.12 Felled timber will be cut into logs and set into 'loggeries' and more informal log piles to encourage saproxylic invertebrates. Felled trees will not be shredded or mulched.

8.3.13 New planting will exclusively be locally native species e.g. Oak *Quercus robur*; Hazel *Corylus avellana*, Hornbeam *Carpinus betulus*; Field Maple *Acer campestre*, Holly *Ilex aquifolium*, Guelder Rose *Viburnum opulus*; Hawthorn *Crataegus monogyna*; Spindle *Euonymus europaeus*, Honeysuckle *Lonicera periclymenum*, Dog Rose *Rosa canina*, Silver Birch *Betula pendula*, Cherry *Prunus avium*, Bird Cherry *Prunus padus*, Crab Apple *Malus sylvestris* and Rowan S*orbus aucuparia*. The aim will be to encourage strong growth of these species to canopy and understorey layer as appropriate.

Coppicing

8.3.14 Existing Hazel stools will be coppiced on a 15-year rotation to encourage greater structural diversity, and layered to produce new coppice stools and expand the understorey. Cut wood will be used to diversify the habitat through establishment of wood piles.

Ground Flora

8.3.15 The effects of habitat management on the ground flora will be monitored. Though the intention will be to encourage natural regeneration, if this proves difficult consideration will be given to the introduction of plug-planted locally native species.

Wildlife Opportunities

8.3.16 It is expected that the habitat enhancements will generate greater wildlife interest. Additional opportunities will be established by providing a series of bat, bird and invertebrate boxes (see following sections).

Public Use and Recreation

8.3.17 Public use of the woodland will be monitored and management operations adapted where necessary. Generally it is envisaged that fencing will be avoided. Where it is necessary to dissuade the public from accessing certain areas (for example around the Badger setts and where new planting has been undertaken) this will be by means of dead hedging or planting thorny species. If fencing must be used it will be suitable for the area, e.g. natural woven Willow or Hazel hurdles.

Boundary Hedgerow

8.3.1 A new native hedgerow will be established on the boundaries of Great Field Plantation to diversify the habitat and regulate public access. Subject to the detail of the Housing RMA layouts, which at the time of writing have yet to be finalised, specific access points will be facilitated.

Detailed Management Plan

8.3.2 Great Field Plantation represents a special case in terms of habitat establishment and management. The information in this and other documents set out the general prescriptions for management, protection and monitoring, but the detailed measures in terms of which trees to fell to establish glades, and which areas to coppice on which rotation will be subject to a further submission, for which Redrow Homes is content to accept a planning condition on the Infrastructure Reserved Matters permission. This allows time for further consultation on the detail of this key aspect of the green infrastructure, without unduly delaying the commencement of construction.

*Southern Plantation*

8.3.3 The woodland in the south of the site is currently a mixed plantation, with a good proportion of native species, though largely even-aged. Long term management will encourage growth of native species and diversification of the habitat.

8.3.4 Non-native conifers will be selectively felled to introduce habitat diversity, with timber retained as for Great Field Plantation.

8.3.5 An appropriate coppicing regime will be introduced on a 15-year rotation to encourage a vigorous understorey.

8.3.6 Bat and Dormouse ‘hop-overs’ will be established using native trees approximately 6m in height at edges of new accesses (see GA and Planting Plans for locations and detailed specifications of bat hop-overs). The species to be used are listed in Table 8.1 below.

| Bat Hop-over Tree Species |
|---|
| Hornbeam *Carpinus betulus* |
| Hornbeam 'Fastiagata' *Carpinus betulus* 'Fastiagata' |
| Hazel *Corylus avellana* |
| Beech *Fagus sylvatica* |
| Apple *Malus domestica* |
| Blackthorn *Prunus spinosa* |
| Oak *Quercus robur* |

**Table 8.1.** Bat Hop-over tree species list.

*Stour Brook Tributary*

8.3.7 Generally the woodland along the watercourse is more semi-natural than that of the plantations, with mature broadleaved trees and a good understorey and field layer. At this stage it is considered that minimal intervention is necessary. Enhancements will focus on the provision of dead wood piles for habitat diversification. The existing footbridge will be replaced to facilitate safe public access and recreation.

*New Woodland*

8.3.8 A significant area of new woodland is to be established in the northern area of the linear park adjacent to plot A1. This will be based around W8 / W10 NVC woodland as recommended in the ES. Tables 8.2 to 8.4 below set out the species to be used.

| No | Species | % |
|---|---|---|
| 129 | Downy Birch *Betula pubescens* | 8% |
| 161 | Hornbeam *Carpinus betulus* | 10% |
| 145 | Dogwood *Cornus sanguinea* | 9% |
| 562 | Hazel *Corylus avellana* | 35% |
| 65 | Spindle *Euonymus europaeus* | 4% |
| 113 | Holly *Ilex aquifolium* | 7% |
| 49 | Wild Privet *Ligustrum vulgare* | 3% |
| 49 | Crab Apple *Malus sylvestris* | 3% |
| 161 | Blackthorn *Prunus spinosa* | 10% |
| 49 | Buckthorn *Rhamnus cathartica* | 3% |
| 81 | Yew *Taxus baccata* | 5% |
| 49 | Wayfaring-tree *Viburnum lantana* | 3% |

**Table 8.2.** Woodland planting species list, Area 1.

| No | Species | % |
|---|---|---|
| 54 | Field Maple *Acer campestre* | 7% |
| 39 | Downy Birch *Betula pubescens* | 5% |
| 39 | Hornbeam *Carpinus betulus* | 5% |
| 31 | Dogwood *Cornus sanguinea* | 4% |
| 261 | Hazel *Corylus avellana* | 34% |
| 8 | Spindle *Euonymus europaeus* | 1% |
| 39 | Beech *Fagus sylvatica* | 5% |
| 16 | Holly *Ilex aquifolium* | 2% |
| 8 | Wild Privet *Ligustrum vulgare* | 1% |
| 16 | Crab Apple *Malus sylvestris* | 2% |
| 16 | Cherry *Prunus avium* | 2% |
| 39 | Blackthorn *Prunus spinosa* | 5% |
| 8 | Buckthorn *Rhamnus cathartica* | 1% |

| | | |
|---|---|---|
| 23 | Rowan *Sorbus aucuparia* | 3% |
| 16 | Yew *Taxus baccata* | 2% |
| 154 | Small-leaved Lime *Tilia cordata* | 20% |
| 8 | Wayfaring-tree *Viburnum lantana* | 1% |

**Table 8.3.** Woodland planting species list, Area 2.

| No | Species | % |
|---|---|---|
| 41 | Field Maple *Acer campestre* | 3% |
| 14 | Hornbeam *Carpinus betulus* | 1% |
| 27 | Dogwood *Cornus sanguinea* | 2% |
| 265 | Hazel *Corylus avellana* | 20% |
| 199 | Hawthorn *Crataegus monogyna* | 15% |
| 14 | Spindle *Euonymus europaeus* | 1% |
| 27 | Beech *Fagus sylvatica* | 2% |
| 27 | Holly *Ilex aquifolium* | 2% |
| 14 | Wild Privet *Ligustrum vulgare* | 1% |
| 14 | Crab Apple *Malus sylvestris* | 1% |
| 14 | Cherry *Prunus avium* | 1% |
| 27 | Blackthorn *Prunus spinosa* | 2% |
| 67 | Sessile Oak *Quercus petraea* | 5% |
| 199 | Oak *Quercus robur* | 15% |
| 14 | Buckthorn *Rhamnus cathartica* | 1% |
| 67 | Goat Willow *Salix caprea* | 5% |
| 67 | Grey Willow *Salix cinerea* | 5% |
| 14 | Elder *Sambucus nigra* | 1% |
| 14 | Rowan *Sorbus aucuparia* | 1% |
| 14 | Yew *Taxus baccata* | 1% |
| 186 | Small-leaved Lime *Tilia cordata* | 14% |
| 14 | Wayfaring-tree *Viburnum lantana* | 1% |

**Table 8.4.** Woodland planting species list, Area 3.

## 8.4 Initial Aftercare and Long-term Management and Maintenance

*Trees*

8.4.1 Watering will be required during periods of drought for no less than the first three years after planting to ensure satisfactory establishment.

8.4.2 Trees will be inspected every six months for the first two years to ensure that they are healthy, not diseased or damaged, or dead. After the first two years, trees can be inspected annually if found to be establishing well.

8.4.3 Any failed trees within the first five years will be replaced and maintained for a subsequent five years. Tree replacement will occur in early spring or late autumn.

8.4.4 Annual pruning will be completed between January and March. Emergency pruning will be undertaken immediately after a critical fault is identified.

*Shrubs*

8.4.5 Shrub planting will be inspected every three months to ensure that they are healthy, not diseased or damaged, or dead. Any failed species will be removed and replaced with the same species and size.

# 9. HEDGEROWS AND TREES

9.1 This section is concerned with the establishment and management of new hedgerows and trees, and the mitigation of effects on woodland as identified in the ES.

## 9.2 Conservation Objectives

To avoid adverse effects on retained habitats through direct encroachment.

To avoid adverse effects on new establishing habitats through direct encroachment.

To establish high quality new habitats using appropriate native species mixes.

## 9.3 Designs and Working Methods

*Construction Phase Mitigation*

9.3.1 All habitats to be retained as part of development will be appropriately protected using robust fencing, i.e. Heras fencing or similar, as shown on the GA and Planting Plans.

9.3.2 Tree root protection areas, as defined on the GA and Planting Plans, will be safeguarded through fencing complying with the British Standard.

9.3.3 Site personnel will be briefed as to the presence of these important retained areas.

9.3.4 No storage of materials will be permitted within 10m of retained habitats, and vehicle movements within this area will be for essential works only.

9.3.5 These measures will be the responsibility of the site manager.

*Dust Suppression*

9.3.6 The preparation of the arable land for development is not considered likely to produce high levels of dust, but during periods of dry weather the work area will be sprayed with water.

9.3.7 A suitable vehicle and bowser will be kept on site, and the assessment of dust effects will be allocated to a suitable individual by the site manager, who will have ultimate responsibility for implementing the measure.

*New Habitats*

9.3.8 All new habitats will be appropriately protected using robust fencing, i.e. Heras fencing or similar, as shown on the GA and Planting Plans, until such time as they are properly established.

*New Hedgerows*

9.3.9 The existing hedgerow network is a key green infrastructure asset and is to be retained and enhanced wherever possible. Unless otherwise stated on the Hedgerow Removal Plan 5055-L-112 rev C accompanying the outline application (see Appendix 1), new gaps established will generally be maximum of 12m to allow for Dormouse dispersal. Gaps in existing hedgerows will be reinforced with native species. New hedgerow and shrub planting will comprise native species as shown on the GA and Planting Plans and Planting Schedule and listed in Table 9.1 below.

| **Native Hedgerow and Shrub Species** |
|---|
| Field Maple *Acer campestre* |
| Dogwood *Cornus sanguinea* |
| Hazel *Corylus avellana* |
| Hawthorn *Crataegus monogyna* |
| Spindle *Euonymus europaeus* |
| Holly *Ilex aquifolium* |
| Wild Privet *Ligustrum vulgare* |
| Crab Apple *Malus sylvestris* |
| Wild Cherry *Prunus avium* |
| Dog Rose *Rosa canina* |
| Guelder Rose *Viburnum opulus* |

**Table 9.1.** Native Hedgerow and Shrub species list.

9.3.10 Hedgerows will continue to be managed. Management will aim to ensure continued good structure. Hedgerows will be cut on rotation, so that not all are cut in any one year. This will encourage greater availability of winter forage for birds. Hedgerows will be laid on rotation to encourage greater structural diversity.

## 9.4 Initial Aftercare and Long-term Management and Maintenance

*Trees*

9.4.1 Watering will be required during periods of drought for no less than the first three years after planting to ensure satisfactory establishment.

9.4.2 Trees will be inspected every six months for the first two years to ensure that they are healthy, not diseased or damaged, or dead. After the first two years, trees can be inspected annually if found to be establishing well.

9.4.3 Any failed trees within the first five years will be replaced and maintained for a subsequent five years. Tree replacement will occur in early spring or late autumn.

9.4.4 Annual pruning will be completed between January and March. Emergency pruning will be undertaken immediately after a critical fault is identified.

*Shrubs and Hedgerows*

9.4.5 Shrub and hedgerow planting will be inspected every three months to ensure that they are healthy, not diseased or damaged, or dead. Any failed species will be removed and replaced with the same species and size.

9.4.6 Pruning and dead-heading will be completed at the end of the plant flowering seasons (spring to autumn) as required.

# 10. ATTENUATION FEATURES

10.1 This section is concerned with the establishment and management of new attenuation features.

## 10.2 Conservation Objectives

To avoid adverse effects on retained habitats through direct encroachment.

To avoid adverse effects on new establishing habitats through direct encroachment.

To establish high quality new habitats using appropriate native species mixes.

## 10.3 Designs and Working Methods

*Construction Phase Mitigation*

10.3.1 All habitats to be retained as part of development will be appropriately protected using robust fencing, i.e. Heras fencing or similar, as shown on the GA and Planting Plans.

10.3.2 Tree root protection areas, as defined on the GA and Planting Plans, will be safeguarded through fencing complying with the British Standard.

10.3.3 Site personnel will be briefed as to the presence of these important retained areas.

10.3.4 No storage of materials will be permitted within 10m of retained habitats, and vehicle movements within this area will be for essential works only.

10.3.5 Particular regard will be had to the management of on-site waste disposal, with regular checks of watercourses being undertaken for signs of litter.

10.3.6 These measures will be the responsibility of the site manager.

*Dust Suppression*

10.3.7 The preparation of the arable land for development is not considered likely to produce high levels of dust, but during periods of dry weather the work area will be sprayed with water.

10.3.8 A suitable vehicle and bowser will be kept on site, and the assessment of dust effects will be allocated to a suitable individual by the site manager, who will have ultimate responsibility for implementing the measure.

*New Habitats*

10.3.9 All new habitats will be appropriately protected using robust fencing, i.e. Heras fencing or similar, as shown on the GA and Planting Plans, until such time as they are properly established.

*New Attenuation Features*

10.3.10 For the most part these new features will not be permanently wet, but some areas will be designed to retain water. The design of the attenuation basins throughout the linear park include small ponds designed to hold water, and a variety of shallow scrapes and channels, as well as embayments and spits. This diversity of slopes and banks offering varying water depths and retention will create a variety of micro-habitats for wildlife and will diversify the habitats currently present. Locally native aquatic and emergent species will be planted to encourage early naturalisation. Swales will be planted with appropriate mix of native species (see GA and Planting Plans, Planting Schedule and Tables 10.1 and 10.2 below).

| **Marginal Planting Species** |
|---|
| Fool's-water-cress *Apium nodiflorum* |
| Lesser Water Parsnip *Berula erecta* |
| Marsh-marigold *Caltha palustris* |
| Lesser Pond-sedge *Carex acutiformis* |
| Common Spike-rush *Eleocharis palustris* |
| Water Avens *Geum rivale* |
| Yellow Iris *pseudacorus* |
| Jointed Rush *Juncus articulatus* |
| Purple-loosestrife *Lythrum salicaria* |
| Water Mint *Mentha aquatica* |
| Water Forget-me-not *Myosotis scorpioides* |
| Reed Canary Grass *Phalaris arundinacea* |

**Table 10.1.** Marginal planting species list.

10.3.11 Newly established basins will be seeded with locally native species mixes and managed appropriately. Areas of dry and wet grassland will be established. The blue infrastructure network of swales will provide new foraging and dispersal opportunities for a variety of wildlife.

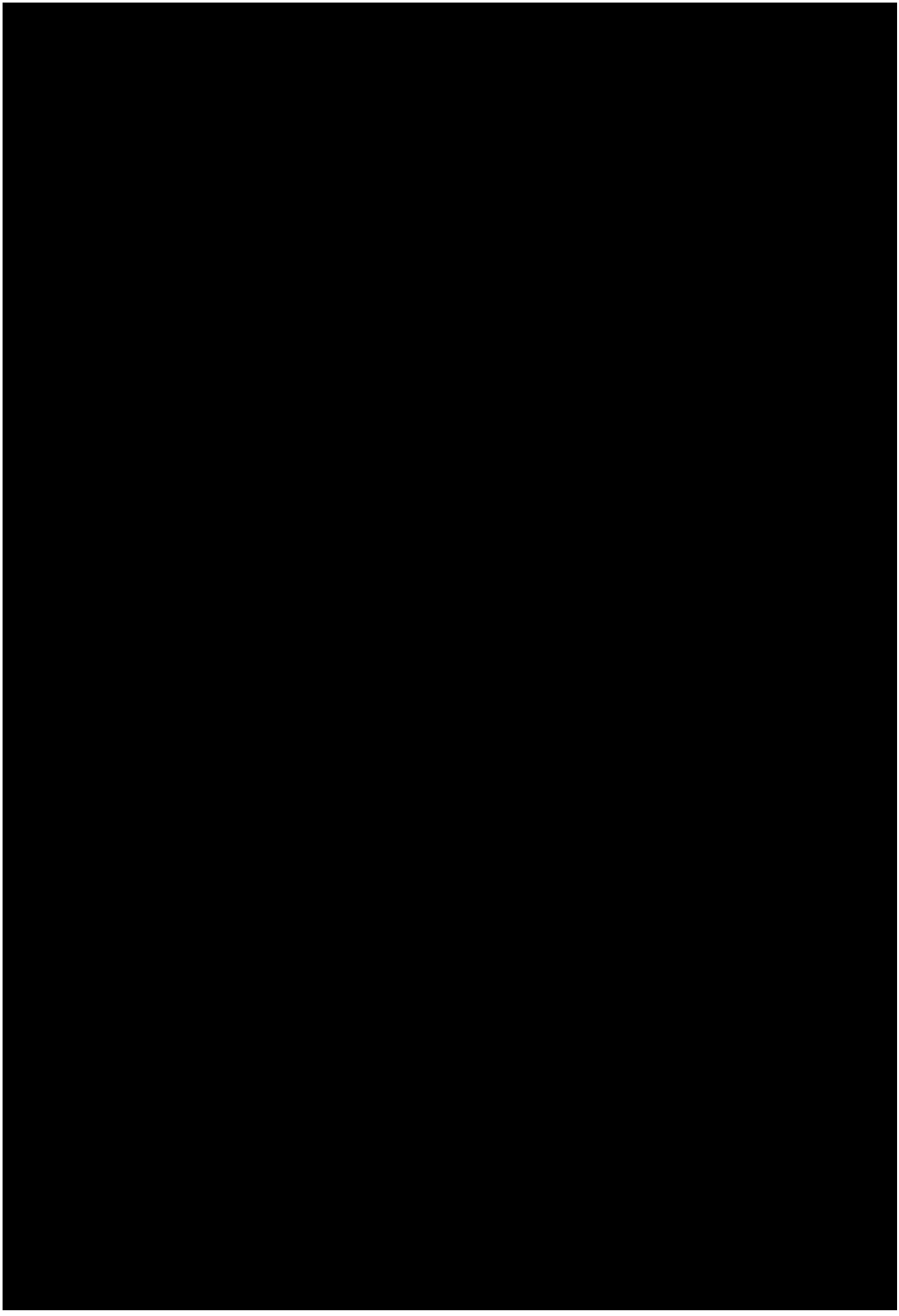
| **EP1F Wild Flowers for Pond Edges Species** | **% per Mix** |
|---|---|
| Sneezewort *Achillea ptarmica* | 2.5% |
| Wild Angelica *Angelica sylvestris* | 10% |
| Marsh-marigold *Caltha palustris* | 1% |
| Common Knapweed *Centaurea nigra* | 7.5% |
| Hemp-agrimony *Eupatorium cannabinum* | 5% |
| Meadowsweet *Filipendula ulmaria* | 15% |
| Water Avens *Geum rivale* | 2.5% |
| Square-stalked St John's-wort *Hypericum tetrapterum* | 2.5% |
| Yellow Iris *Iris pseudacorus* | 20% |
| Greater Bird's-foot-trefoil *Lotus pedunculatus* | 5% |
| Gypsywort *Lycopus europaeus* | 4% |
| Purple-loosestrife *Lythrum salicaria* | 3% |
| Water Mint *Mentha aquatica* | 0.5% |
| Common Fleabane *Pulicaria dysenterica* | 0.5% |
| Meadow Buttercup *Ranunculus acris* | 10% |
| Great Burnet *Sanguisorba officinalis* | 3% |
| Ragged Robin *Lychnis flos-cuculi* | 4% |
| Devil's-bit Scabious *Succisa pratensis* | 2.5% |
| Tufted Vetch *Vicia cracca* | 1.5% |
| | **100%** |

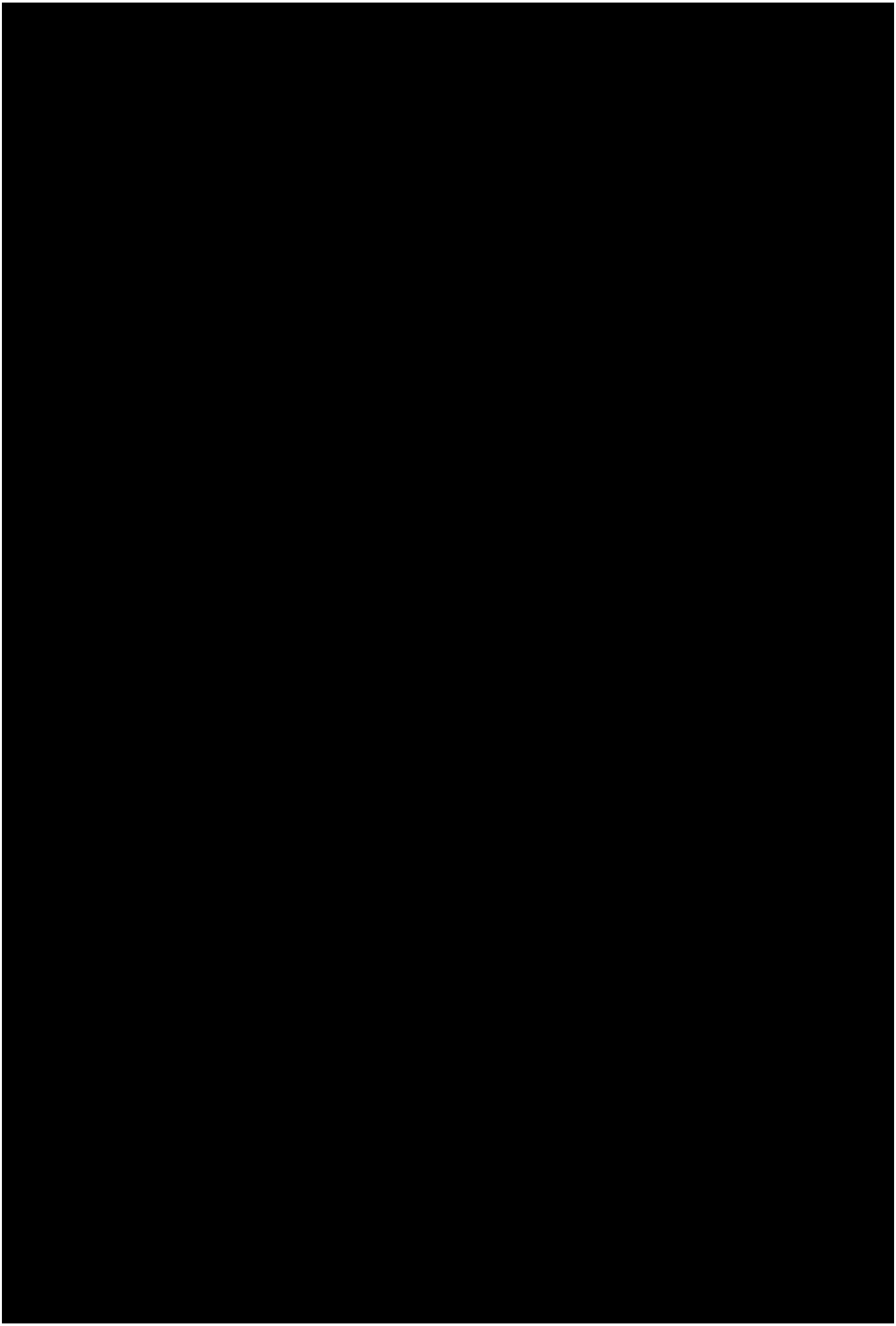
**Table 10.2.** Emorsgate Seeds EP1F Wild Flowers for Pond Edges species list.

## 10.4 Initial Aftercare and Long-term Management and Maintenance

10.4.1 **EP1F Wild Flowers for Pond Edges.** In the first year, annual weed growth should be cut back to encourage the development of a good perennial ground cover.

10.4.2 Once established, vegetation should be managed on a rotational basis, removing short sections every 2-3 years to provide a variation in structure. Dense stands of single species may also benefit from selective thinning. Vegetation removal should be undertaken between September and November to cause the least disruption to wildlife.





# 12. BATS

## 12.1 Baseline Conditions

12.1.1 Bat activity surveys completed in October 2018 and April to October 2019 across the Redrow site recorded a generally low level of activity. Areas shown to be of greater interest for bats are Great Field Plantation and Hedgerow H4, crossing the south of the site. Species recorded during the activity surveys include Common Pipistrelle *Pipistrellus pipistrellus*, Soprano Pipistrelle *Pipistrellus pygmaeus*, Nathusius' Pipistrelle *Pipistrellus nathusii*, Noctule Bat *Nyctalus noctula*, Leisler's Bat *Nyctalus leisleri*, Serotine Bat *Eptesicus serotinus*, Brown Long-eared Bat *Plecotus auritus*, *Myotis* sp. and Barbastelle *Barbastella barbastellus*. The results of the activity surveys completed by to inform the ES in 2014 and 2015 across the wider site recorded a similar assemblage.

12.1.2 Several trees with potential roost features were identified by in 2014, three of which were found to contain roosts. A single Pipistrelle species hibernation roost was identified within tree T28. Trees T44 and T49 were identified as having bat roosts but the species were not identified from eDNA testing. Nocturnal surveys concluded that T49 was used as a roost by Soprano Pipistrelle.

12.1.3 An emergence survey of the bat roost trees mentioned above was completed in September 2019. No emergence was observed but early registrations for Common Pipistrelle and Soprano Pipistrelle recorded by trees T28 and T49 would suggest that roosts for these species are present close by.

12.1.4 The 2018/19 dataset, combined with the information from the outline ES, provides a robust baseline from which to assess the effectiveness of mitigation and enhancement measures. As far as possible, future monitoring surveys will replicate the approach taken for the 2018/19 work.

## 12.2 Conservation Objectives

| |
|---|
| To avoid disturbance to bat foraging during construction. |
| To avoid possible adverse effects on known bat roosts. |
| To avoid effects on bat foraging during operation.. |

## 12.3 Designs and Working Methods

*Construction Phase Mitigation*

12.3.1 During the construction period no lighting will be present at night on identified bat foraging routes, as shown in the *Lighting Strategy for Bats* produced for Condition 44. This will be the responsibility of the site manager. The Ecological Clerk of Works will be able to advise on the location of these features.

12.3.2 Retained trees with roost potential will be safeguarded using Heras fencing or similar (see GA and Planting Plans for location of fencing) and site personnel briefed on the presence of bats as part of the site induction.

*New Habitat Planting*

12.3.3 To compensate for the partial loss of hedgerows, additional native species planting will be provided throughout the green infrastructure and open space area greater than that which is to be lost, as shown on the GA and Planting Plans. The retained hedgerows will be included within the green linkages and will be 'gapped up' with native species; this will increase species diversity, strengthen the hedgerows and improve the corridor for foraging bats.

12.3.4 Management of the hedgerows will be undertaken in an ecologically sensitive manner to enhance the nature conservation value. Such management will include allowing the hedgerow to reach at least a height of 3m. Once reached the hedgerow can be 'topped out' to maintain the height or to suit circumstances, with a width of at least 1-2m; a proportion of trees within the hedgerow such as Oak and Field Maple will be allowed to mature into standard trees to provide nesting and foraging opportunities for local wildlife and a varied habitat structure; and grassland along the hedgerow base will be allowed to grow to provide a graduated sward height and habitat.

12.3.5 To compensate for woodland losses additional native species woodland planting (that of which will be greater than to be lost) are to be incorporated into the scheme (see GA and Planting Plans).

12.3.6 The attenuation features to be established will offer new foraging resources for bats once established. Seeding with dry and damp grassland mixes, and establishing marginal vegetation will encourage use by invertebrates and increase the foraging opportunities for the local bat population.

*Dark Corridors*

12.3.7 Across the site, dark corridors have been designed to ensure and incorporate habitats of value to bats for foraging, potential roosting and commuting into the wider area – see the *Lighting Strategy for Bats*.

12.3.8 Other lighting considerations will also be implemented during construction and incorporated into the development in order to ensure minimal light spill from the site. Lighting will be directed to where it is needed, to avoid light spillage, particularly along the hedgerow and woodland edges; buffer zones will not be illuminated; lighting that is incorporated into the development design will be of a type that has a low attraction to insects; any upward lighting will be avoided; and security lighting on properties backing on to sensitive hedgerows and woodland will be low wattage LED which will provided on the properties at construction to forestall a future homeowner installing unsuitable lighting which could impact on bats.

*Bat Hop-overs*

12.3.9 In order to maintain the linkages and an area of darkness across the gaps created by the road access through the hedgerows, young plantation woodland and tributary corridor a 'hop-over' will be created. Details of the locations of the hop-overs and their specification in terms of planting are provided on the GA and Planting Plans. Hop-overs will be established early in the process.

*Bat Boxes*

12.3.10 The inclusion of a variety of bat boxes around the site on suitable trees, and particularly along the woodland edges will provide new potential roosting sites for bats within the local area. Boxes will be located in sheltered spots and placed at a height of at least three metres from the ground. Boxes will also be arranged around the site so that a number of different aspects are covered.

12.3.11 Illustrative locations of bat boxes are provided on Plans ECO4a to d; in practice the locations of the boxes will be determined on the ground by the Ecological Clerk of Works, who will ensure that the orientation and position of the boxes is appropriate, and that suitable trees are chosen.

## 12.4 Type and Source of Materials

12.4.1 Twenty Schwegler 2F Universal Bat Boxes, 20 Schwegler 1FF Flat Bat Box, and 5 Schwegler 1FW Hibernation Boxes (see Appendix 2) will be installed on suitable existing trees throughout the site.

## 12.5 Initial Aftercare and Long-term Management and Maintenance

12.5.1 Bat boxes will be checked periodically (once per year in March) for the first five years following installation, by a suitably experienced and licensed ecologist to ensure that they are still in situ and are not damaged. Boxes will be replaced if found to be damaged.

# 13. OTTERS AND WATER VOLES

## 13.1 Baseline Conditions

13.1.1 No evidence of use by Otters or Water Voles has been recorded in the existing waterbodies across the Redrow site and the wider site, but these species are known to be present in the River Stour, and the Stour Brook south of the site.

## 13.2 Conservation Objectives

> To avoid impacts on potential Otter and Water Vole habitat during construction.
>
> To establish and enhance suitable habitat for Otters and Water Voles within the site, to encourage natural colonisation in future.

## 13.3 Designs and Working Methods

13.3.1 Prior to any works in the vicinity of suitable habitats within the site, a check survey for Otters and Water Voles will be undertaken by an ecologist. In the event that evidence of these species is recorded, consideration will be given for the need for a Natural England licence, dependent on the nature of the works proposed.

*Fencing of Retained Habitats*

13.3.2 All retained watercourses will be fenced using Heras fencing or similar (as shown on the GA and Planting Plans) to avoid possible encroachment. All site personnel will be briefed as to the importance of these areas for wildlife as part of the site induction.

*Enhancements*

13.3.3 Though there is no evidence of their presence within the site at the time of writing, Otters and Water Voles are known to be present within the locality and the development represents an opportunity to provide greater opportunities for the species.

13.3.4 The network of attenuation features to be established as part of the Linear Park and drainage strategy, as well as the retained and enhanced ditches across the site, will be a valuable new area of potential habitat for Otters and Water Voles, should they colonise the site.

13.3.5 The provision of wet grassland associated with the drainage strategy will provide suitable overland habitat for dispersal.

# 14. DORMICE

## 14.1 Baseline Conditions

14.1.1 A Dormouse nest was recorded in a survey tube along Hedgerow H13, west of Great Field Plantation during a survey undertaken in April 2019. No other evidence of Dormice has been recorded within the Redrow site. A partial Dormouse nest was recorded in the south-east of the wider site in 2015 during surveys to inform the outline ES.

## 14.2 Conservation Objectives

| |
|---|
| To avoid potential killing or injury of any Dormice that may be present. |
| To establish and enhance suitable habitat for Dormice within the site. |

## 14.3 Designs and Working Methods

*Construction Phase Mitigation*

14.3.1 Notwithstanding that no evidence of Dormice has been recorded in the Redrow site, the highly precautionary approach advocated by the ES Addendum has nevertheless been adopted in full. At the time of writing there is no requirement for a Natural England licence.

14.3.2 During the construction period all contractors will be briefed about the importance of the habitats within the site for the range of species that have been identified, and that care should be taken when conducting any works near existing natural features. All vegetation removal will have been predetermined at the full planning stages, and no additional losses would occur until the project ecologists have confirmed so.

14.3.3 Where site offices, material and vehicle storage are proposed, and where the phased development commences all natural habitats will be fenced off with an appropriate buffer using Heras fencing or similar (the location of which is shown on the GA and Planting Plans). This will ensure that habitats are not degraded through soil compaction and interference by contractors and machinery.

*Timed Vegetation Removal – Hedgerows*

14.3.4 Where sections of hedgerow are to be removed these will generally be limited to a length of 12m. The methods below cover the methods for habitat removal during the winter and summer.

<u>Winter</u>

14.3.5 Vegetation checks and removal will be undertaken during the winter between November and March inclusive under the supervision of the Ecological Clerk of Works. This period will avoid the bird breeding season and the active period for Dormice, as they are more likely to be in hibernation underground. Searches of the vegetation will be undertaken prior to any vegetation removal whereby nests and any cavities within trees etc will be inspected for Dormice.

The clearance of vegetation will be undertaken by hand with no heavy machinery to be used in close proximity to the areas of removed, so avoiding any possible disturbance through noise and vibrations. All tree felling will also be undertaken during this period, provided there are no bat roosting constraints.

14.3.6 The vegetation will be cut down to approximately 10-15cm, to avoid disturbance to the ground and retain the roots and stumps, in order not to adversely affect any Dormice that may be hibernating at or below the surface. The hedgerow canopy will be removed from the stem, a small proportion of the hedge will be kept as a 'dead hedge', which will provide a feature within which Dormice could continue to move when they wake from hibernation, this also means that individuals will be able to move along such breaks into surrounding retained habitats.

14.3.7 The removal of the root systems of the cut vegetation will be undertaken when Dormice are active between April to October, although care will be taken to avoid periods of cold wet weather, when Dormice can go into torpor. All root removals will need to be supervised by a licensed ecologist. During this period the 'dead hedge' will also be removed from the site; care will be taken to ensure that there are no nesting birds present; if they are present then work will stop until young have fledged and a buffer created to ensure that the nest is not disturbed. These areas will also be searched for Dormouse nests prior to removal.

Summer

14.3.8 Vegetation will be cleared by hand during the summer when Dormice are active; this will be between May to late September, but clearance should ideally be undertaken in May to avoid separating young that would be dependent on their mothers. All vegetation that is scheduled for removal will be checked for bird and Dormouse nests before any removal is undertaken. All removal will take place under a watching brief by a licensed ecologist, whereby removal of small lengths (approximately 10m) will be undertaken over consecutive days, thus allowing time for any possible Dormice to move from the area. The removal of the canopy of vegetation will be undertaken by hand; this will ensure that sightings of Dormice are more likely. The root system of the vegetation should also be removed during this period so to avoid potential refuge and hibernation opportunities in the future.

*Timed Vegetation Removal – Woodland*

14.3.9 Small sections of woodland are to be removed to facilitate access roads in the south of the Redrow site, these are also well removed from the Dormouse nest recorded. Approaches for winter and summer vegetation removal were included in the outline application.

Winter

14.3.10 During the winter months (November to March) ground level vegetation will be removed from the woodland areas; this will persuade any Dormice that could potentially be present to move when they come out of hibernation. As with the above a 'dead hedge' will be provided to allow safe passage to surrounding retained habitats / woodland. The remaining tree stumps and any

ground removal will take place in the summer months when any Dormice present would be expected to have left the area (May to September).

Summer

14.3.11 Summer removal will take place between May and September. Small sections of the woodland compartments will be removed over a number of consecutive days. This will allow time and opportunities for any Dormice that might be present to move into adjacent retained habitats. Care will be taken to ensure that no habitats contain nesting birds.

*Habitat Enhancements and Management*

14.3.12 All existing and retained habitats will be enhanced with additional planting to ensure that poor structure and gaps are filled with native species that will benefit foraging, commuting and nest building. These will have a positive effect on Dormice but also other species.

14.3.13 Woodland compartments will be thinned to allow understorey shrub development, which are of more value to Dormice than the current tree canopy. Understorey species will be planted, including Oak, Honeysuckle *Lonicera periclymenum*, Hawthorn, Wayfaring-tree *Viburnum lantana*, Bramble *Rubus fruticosus*, Crab Apple *Malus sylvestris*, Cherry and Hazel.

14.3.14 Management will include coppicing, rotational cutting of sections of hedgerows at three to five year intervals and / or hedgerow laying; such measures will ensure increased fruiting bodies and understorey renewal of growth which will benefit invertebrates.

14.3.15 There will be a number of new habitats created within the site that will increase opportunities for Dormice to spread from their current isolation into the wider site and off site.

14.3.16 Generally, gaps established in existing hedgerows will be limited to 12m (see GA and Planting Plans), to facilitate movement of Dormice at ground level should they move into the area. To limit the requirement for individuals to go to ground taller shrubs / trees will be planted either side of any gaps, whereby management will ensure that the canopy is lifted to create a natural bridge over time. These measures are effectively the same as the bat hop-overs, and are in the same location. Similar measures will be adopted across the stream that runs through the site, whereby tree canopies will be encouraged to bridge the gap and potentially provide links to habitats where Dormice are currently absent.

*Nest Boxes*

14.3.17 Prior to any habitat losses a number of Dormice nesting boxes will be installed within woodland habitats.

14.3.18 Wooden nest boxes will be installed within habitat adjacent to any vegetation losses, these will increase the nesting opportunities within the site and thus increase the carrying capacity in the long term. These will be monitored to ensure they remain viable as nesting features, and will also be used for future assessment of the population.

### 14.4 Type and Source of Materials

14.4.1 All Dormouse boxes erected to inform surveys will be re-positioned and an additional 20 boxes will be installed within suitable and retained habitat. Locations for Dormouse boxes will be determined by the Ecological Clerk of Works.

### 14.5 Initial Aftercare and Long-term Management and Maintenance

14.5.1 Nesting boxes will be checked periodically (at least once a year in March) for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ and are not damaged. Boxes will be replaced if found to be damaged.

# 15. HEDGEHOGS

## 15.1 Baseline Conditions

15.1.1 The site contains suitable habitats for Hedgehog foraging and dispersal, including woodland and hedgerows.

## 15.2 Conservation Objectives

| |
|---|
| To avoid killing or injury of Hedgehogs during construction.<br><br>To provide greater opportunities for Hedgehogs within the site. |

## 15.3 Designs and Working Methods

*Construction Phase Mitigation and Vegetation Clearance*

15.3.1 Ground cover will be cleared outside of the winter hibernation period wherever possible. Where this is not possible, a check for hibernation nests will be completed by the Ecological Clerk of Works prior to clearance.

15.3.2 Scrub and tree removal will be carried out in a sensitive manner, using hand tools to clear the base of trees to be removed prior to any large machinery pulling out roots.

15.3.3 Any clearance of log piles or other Hedgehog shelter features will be subject to inspection by the Ecological Clerk of Works to ensure that Hedgehogs are absent. In the event that an individual is encountered, it will be carefully placed in an appropriate lidded box and immediately removed to an area of suitable habitat at the margins of the site away from working areas.

15.3.4 Any trenches or deep pits associated with construction that are to be left open overnight will be provided with a means of escape in case a Hedgehog enters. This is particularly important if the trench fills with water, and will take the form of a roughened plank of wood placed in the trench as a ramp to the surface.

*New Habitat Planting*

15.3.5 The retention of hedgerows along with additional buffer planting and grassland will provide continued opportunities for commuting and foraging Hedgehogs. New planting including native species and species of known wildlife value will offer new foraging resources for Hedgehogs.

15.3.6 Specific enhancements for invertebrates (see below) will provide additional foraging opportunities for Hedgehogs.

*Hibernation Boxes*

15.3.7 Hedgehog hibernation boxes and log piles will be installed in discreet locations throughout the development under the direction of the Ecological Clerk of Works.

*Hedgehog Gateways and Highways*

15.3.8 Though not strictly part of the Infrastructure RMA, access to new housing areas will be a benefit for Hedgehogs using the new green infrastructure, and through being connected new residential gardens will offer new potential habitat for Hedgehogs and other small mammals. Garden fences will be provided with a 'Hedgehog Gateway', a 13cm x13cm section of fence cut out at the base, to facilitate dispersal for Hedgehogs and other small animals (see Appendix 3). This will enhance the permeability of the new development for wildlife. In this way, where the residential areas intersect with the green infrastructure, Hedgehog Highways will become established.

## 15.4 Type and Source of Materials

15.4.1 Ten Schwegler Hedgehog Domes or Ecoplate Hedgehog houses (see Appendix 4) will be positioned in discreet locations within the site.

## 15.5 Initial Aftercare and Long-term Management and Maintenance

15.5.1 Hibernation boxes will be checked periodically (at least once a year) for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ and are not damaged. Boxes will be replaced if found to be damaged.

# 16. BIRDS

## 16.1 Baseline Conditions

16.1.1 Four wintering bird surveys were completed by Ecology Solutions in November and December 2018, and in January and February 2019. A total of 47 species were recorded, including 17 species that are listed as NERC species of principal importance, Suffolk LBAP and / or on the UK Birds of Conservation Concern Red and Amber list, as set out below:

Song Thrush *Turdus philomelos*
Skylark *Alauda arvensis*
Yellowhammer *Emberiza citrinella*
Kestrel *Falco tinnunculus*
Linnet *Carduelis cannabina*
Redwing *Turdus iliacus*
Stock Dove *Columba oenas*
Black-headed Gull *Chroicocephalus ridibundus*
Bullfinch *Pyrrhula pyrrhula*
Dunnock *Prunella modularis*
Mistle Thrush *Turdus viscivorus*
Starling *Sturnus vulgaris*
House Sparrow *Passer domesticus*
Reed Bunting *Emberiza schoeniclus*
Fieldfare *Turdus pilaris*
Mallard *Anas platyrhynchos*
Lesser Black-backed Gull *Larus fuscus*

16.1.2 Four wintering bird surveys were undertaken between November 2014 and February 2015 to inform the outline ES, recording a similar complement of species.

16.1.3 Three breeding bird surveys were undertaken by Ecology Solutions in April, May and June 2019.

16.1.4 Fifty species were recorded within or immediately adjacent to the site, including 18 species that are listed as NERC species of principal importance and / or on the UK Birds of Conservation Concern Red and Amber list, as follows:

Song Thrush *Turdus philomelos*
Skylark *Alauda arvensis*
Yellowhammer *Emberiza citrinella*
Kestrel *Falco tinnunculus*
Linnet *Carduelis cannabina*
Herring Gull *Larus argentatus*
Stock Dove *Columba oenas*
Black-headed Gull *Chroicocephalus ridibundus*
Bullfinch *Pyrrhula pyrrhula*
Dunnock *Prunella modularis*
Mistle Thrush *Turdus viscivorus*
Starling *Sturnus vulgaris*
House Sparrow *Passer domesticus*
Reed Bunting *Emberiza schoeniclus*
Fieldfare *Turdus pilaris*
Willow Warbler *Phylloscopus trochilus*
Lesser Black-backed Gull *Larus fuscus*
Tawny Owl *Strix aluco*

## 16.2 Conservation Objectives

To safeguard bird nesting and foraging habitats during construction.

To avoid damage or destruction of birds' nests during construction.

To provide greater opportunities for birds within the site.

## 16.3 Designs and Working Methods

*Nesting Bird Checks*

16.3.1 In order avoid impacts on nesting birds, and to avoid a potential offence under the Wildlife & Countryside Act 1981, all necessary clearance of vegetation would be undertaken outside of the bird breeding season (March to July inclusive) wherever possible. Where this is not possible, a check survey of vegetation by an experienced ecologist would be undertaken immediately prior to clearance. In the event that a nest was found to be present, the vegetation would be left uncleared with a 5m exclusion zone around it until the young had fledged.

16.3.2 The Ecological Clerk of Works would liaise closely with the site manager on all clearance of suitable nesting habitat.

*Fencing of Retained Habitats*

16.3.3 All retained woodland, trees, hedgerows and field margins will be fenced using Heras fencing or similar (as shown on the GA and Planting Plans) to avoid possible encroachment. All site personnel will be briefed as to the importance of these areas for nesting birds as part of the site induction.

*New Habitat Planting*

16.3.4 The scheme includes habitat enhancements through the planting of native and ornamental trees and shrubs. New areas of woody species planting throughout the site will in time mature into habitats suitable for use by foraging and nesting birds.

16.3.5 Areas of new tussocky wildflower grassland will provide further nesting and foraging opportunities for farmland birds such as Skylark.

16.3.6 The locations of these new habitats are shown on the GA and Planting Plans.

*Bird Boxes*

16.3.7 A series of bird boxes and Swift poles will be provided to enhance nesting opportunities for birds in the local area. A selection of hole- and open-fronted designs will be used in order to encourage a variety of species. The locations of the Swift poles are shown on the GA and Planting Plans.

16.3.8 Indicative locations of the bird boxes are shown on Plans ECO4a to d, but in practice these will be positioned on suitable mature trees under the direction of the Ecological Clerk of Works.

## 16.4 Type and Source of Materials

16.4.1 Twenty Schwegler 2H Open Front Bird Boxes, 20 Schwegler 1N General Purpose Deep Bird Boxes and 20 Schwegler 1B Bird Boxes will be installed on retained trees throughout the site. Swift poles will be erected within suitable areas within the site (see Appendix 5 and GA and Planting Plans).

## 16.5 Initial Aftercare and Long-term Management and Maintenance

16.5.1 Bird boxes will be checked periodically (at least once a year in March) for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ and are not damaged. Boxes will be replaced if found to be damaged.

# 17. REPTILES

## 17.1 Baseline Conditions

17.1.1 A presence / absence survey for reptiles has been completed from April to June 2019. The results of the surveys show that low populations of Grass Snake and Common Lizard are present, with the main areas of interest being Hedgerow H4 and the southern edge of the new plantation in the south of the site. The field margins to the north of Great Field Plantation were also seen to support small numbers of Common Lizard. These results are similar to those of surveys undertaken to inform the outline ES in 2014. That work also identified Slow Worm in the wider survey area, though not within the Redrow site.

## 17.2 Conservation Objectives

| |
|---|
| To safeguard reptile habitats during construction.<br><br>To provide greater opportunities for reptiles within the site. |

## 17.3 Designs and Working Methods

*Passive Displacement*

17.3.1 Where habitats used by reptiles exist mitigation measures will be put into place to ensure that no offence is caused under the Wildlife & Countryside Act. This will include passive displacement and fencing of sensitive areas.

17.3.2 The locations of existing field margins to be removed are shown on the GA and Planting Plans.

17.3.3 Passive displacement will involve the intensive management of the existing habitats favourable to reptiles, through a cutting regime which will encourage reptiles to move away from such areas. Cuts will be undertaken using a hand strimmer with an initial cut of 200mm followed by a cut of 100mm 24 hours later and then cut as short as possible. Displacement will occur ahead of development, when reptiles are active (between mid-March and October) and during favourable weather conditions. All cuttings and other debris will be removed to avoid creating places of refuge. Following the passive displacement exercise, topsoil will be stripped to remove any suitability for reptiles. All works will be undertaken under the supervision of a suitably qualified ecologist.

17.3.4 At the time of writing it is expected that all reptile mitigation measures would be undertaken by means of passive displacement, as specified in the ES and supported by the most recent survey findings. However, it is possible that passive displacement may not prove to be the most appropriate method in all circumstances, for example if the direction of displacement would not encourage reptiles to move into areas of larger suitable habitat, or where fragmentation is an issue. At the discretion of the Ecological Clerk of Works, in consultation with the site manager, a more formal capture and translocation exercise will be undertaken, involving the deployment of ‘tins’ and daily visits to the site during suitable conditions. Captured reptiles would be placed in a

cloth bag and removed to receptor sites identified for the purpose; the locations of these sites are shown on the GA and Planting Plans.

*Fencing of Retained Habitats*

17.3.5 All retained field margins will be fenced using Heras fencing or similar (as shown on the GA and Planting Plans) to avoid possible encroachment. All site personnel will be briefed as to the importance of these areas for reptiles as part of the site induction.

*New Habitat Planting and Hibernation Features*

17.3.6 Areas where reptiles have been recorded are to be included within the green infrastructure network. These will undergo enhancements with hibernacula created to offer refuge, shelter and hibernation opportunities away from residential areas. The locations of the hibernacula are shown on the GA and Planting Plans.

17.3.7 The green corridors will link to larger areas, which will have multiple uses, including amenity, access and conservation. Habitats will be established with a tussocky grassland structure with wildflower mixes; this will provide the nectar sources for invertebrate / prey items, basking areas and safe passages through undergrowth. Where tree removal is required the trunks will be kept and cut up and arranged within retained habitats; these will create basking opportunities, refuge and as they rot provide a foraging resource. The locations of these new habitats are shown on the GA and Planting Plans.

17.3.8 Management of grassland will be important for the longevity of suitable habitats. Cutting regimes will be rotated whereby only small parcels of a compartment are cut in one year.

## 17.4 Type and Source of Materials

17.4.1 Hibernacula will be created from materials sourced on site from tree management activities (see Appendix 6).

## 17.5 Initial Aftercare and Long-term Management and Maintenance

17.5.1 Hibernacula will be checked annually for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ and are not damaged. Hibernacula will be replaced if found to be damaged.

# 18. AMPHIBIANS

## 18.1 Baseline Conditions

18.1.1 No Great Crested Newts *Triturus cristatus* were recorded during earlier survey work in 2015. Additionally, there are no records for Great Crested Newts in the local area. Common Toads *Bufo bufo* and Smooth Newts *Lissotriton vulgaris* were recorded during Great Crested Newt surveys completed in 2014 and 2015. Ponds within the site and those within 500m were subject to eDNA testing in 2019 where permission was granted. The results of the eDNA testing were returned as negative.

## 18.2 Conservation Objectives

| |
|---|
| To safeguard amphibian habitats during construction. |
| To provide greater opportunities for amphibians within the site. |

## 18.3 Designs and Working Methods

*Precautionary Working Methods*

18.3.1 Construction works and pollution of surface water run-off could result in pollution of the ponds, field ditches and water course. To ensure there are no potential negative effects to the quality of the water all operations will be undertaken in accordance with standard guidance provided in the Environmental Agency Guidelines PPG5 Pollution Prevention Guidelines. In addition, the drainage strategy will be designed to ensure that surface water run-off is suitably treated prior to discharge.

18.3.2 Works to enhance ponds and ditches will be undertaken outside of the amphibian breeding period from March to June inclusive. The Ecological Clerk of Works will be consulted before this work is undertaken, and if necessary a check survey will be carried out.

18.3.3 No Great Crested Newts have been recorded within the site and a Natural England licence is not necessary to undertake the work.

*Retained and New Habitats*

18.3.4 Work to enhance and manage on site ditches, and to establish new wildlife-friendly attenuation features, will provide new aquatic habitats for amphibian species. New grassland habitats to be established within the site will offer new opportunities during the terrestrial phase.

18.3.5 The proposed development will include strong green linkages across the site (see GA and Planting Plans). Within the green infrastructure additional attenuation features. Permanently wet areas will include marginal native species planting, as shown on the GA and Planting Plans and Planting Schedule. These areas will offer new breeding habitats, while the grassland and woodland to be established (see GA and Planting Plans) will provide terrestrial opportunities.

18.3.6 Additional habitats suitable for use by invertebrate and amphibian species will be provided by creating log piles within the green linkages at the base of hedgerows, and in areas of woodland and grassland. The piles would be established using wood generated through maintenance of trees / woodlands within the site. These structures would benefit amphibians by providing places of shelter and or rest and potential hibernation opportunities along with increasing habitat for invertebrates.

*Road Crossings*

18.3.7 Where gaps in existing hedgerows are created as part of the development, dropped kerbs will be installed on either side of the road in that location to aid the movement of wildlife through the site.

## 18.4 Type and Source of Materials

18.4.1 Log piles will be created from materials sourced on site from tree management activities.

## 18.5 Initial Aftercare and Long-term Management and Maintenance

18.5.1 Log piles will be checked periodically for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ. Log piles will be replaced if found to be missing.

# 19. INVERTEBRATES

## 19.1 Baseline Conditions

19.1.1 Given the habitats present, it is likely an assemblage of common invertebrate species utilises the site, though the intensive arable management of the majority of the land will limit variety. There is no evidence to suggest that any rare or notable species would currently be present.

## 19.2 Conservation Objectives

| |
|---|
| To provide greater opportunities for invertebrates within the site. |

## 19.3 Designs and Working Methods

*New Habitat Planting*

19.3.1 The provision of new habitats of ecological interest including trees, wildflower grassland and wetland habitats, will offer new and enhanced resources for invertebrates.

*Nesting Aids, Log Piles and Bee Banks*

19.3.2 As a further enhancement, invertebrate nesting aids and log piles, along with bee banks and a bug hotel feature will be established within the green infrastructure of the site. These features, the locations of which are shown on the GA and Planting Plans, will provide new opportunities for invertebrates.

## 19.4 Type and Source of Materials

19.4.1 Log piles and 'loggeries' will be created from materials sourced on site from tree management activities (see Appendix 7). A series of bee banks, 10 Schwegler clay and reed insect nesting aids and a bug hotel feature will be installed throughout the site (see Appendix 8).

## 19.5 Initial Aftercare and Long-term Management and Maintenance

19.5.1 Nesting aids will be checked annually for the first five years following installation, by a suitably experienced ecologist to ensure that they are still in situ and are not damaged. Nesting aids will be replaced if found to be damaged. Bee banks will be checked annually as part of landscaping works, and re-established if they are deteriorating.

19.5.2 The initial aftercare and long-term management and maintenance of new and enhanced habitats is described in the habitats section above.

## 20. TIMETABLE OF WORKS

20.1 The timetable of works as set out in the previous sections is summarised below. The phasing of the development and particular actions that must occur before each phase is brought forward is summarised on Plan ECO5.

| Receptor | Action | Timing |
|---|---|---|
| Habitats | Habitat creation and enhancement | In concert with construction |
| [redacted] | | |
| Bats | Bat box installation | On retained trees as part of habitat enhancement works, spring 2020 |
| | Establishment of hop-overs | To be established in line with landscaping works associated with Infrastructure RMA |
| Otters | Pre-construction checks of suitable habitat | Prior to commencement of works |
| Water Voles | Pre-construction checks of suitable habitat | Prior to commencement of works |
| Dormice | Seasonal vegetation clearance | Winter clearance to be completed November to March inclusive. Stumps to be removed April to October under full supervision of an ECoW. Summer clearance May to late September under full supervision of an ECoW. |
| | Dormouse nest box installation | On retained trees spring 2020 |
| Hedgehogs | Clearance of log piles and other hibernation features | Under full supervision by ECoW between October and April; certified by ECoW between May and September |
| | Hedgehog hibernation box installation | In suitable habitat, from spring 2020 onwards |
| Birds | Nesting bird checks of vegetation to be removed | March to July inclusive, as required |
| | Bird box installation | On retained trees from spring 2020 onwards |
| | Swift pole installation | On completion of initial landscaping works in each area |
| Reptiles | Clearance of log piles and other hibernation features | Under full supervision by ECoW between November and March; certified by ECoW between April and October |
| | Passive displacement | Under full supervision by ECoW when reptiles are active (between mid-March and October) and during favourable weather conditions |
| | Hibernacula installation | From spring 2020 onwards, in line with landscaping works |
| Amphibians | Road crossings | In concert with construction |
| | Hibernacula installation | From spring 2020 onwards, in line with landscaping works |
| Invertebrates | Nesting aid installation | In suitable habitat from spring 2020 onwards |
| | Bee bank construction | As part of landscaping works, from spring 2020 onwards |

**Table 20.1.** Timetable for ecological mitigation and enhancement measures.

## 21. PERSONS RESPONSIBLE FOR IMPLEMENTING THE WORKS

21.1 Redrow Homes has ultimate responsibility for implementation of this strategy. The individual currently leading for Redrow Homes is Richard Franks, Senior Engineering Manager, and the responsibility for implementation will be his or that of his appointed successor.

21.2 It is the responsibility of the appointed individual at Redrow Homes to instruct appropriate experienced contractors to establish the various features and protective measures proposed, and also the responsibility of the appointed individual at Redrow Homes to instruct appropriate experienced ecologists and / or landscape contractors to check the work.

21.3 A suitably experienced Ecological Clerk of Works (ECoW) will be appointed by Redrow Homes to liaise with the site manager during construction. The ECoW will attend site at least once per month for a meeting with the site manager, and at any other times where an immediate presence is required.

21.4 It will be the responsibility of the site manager or his appointed representatives to deliver a site induction that includes reference to all wildlife issues identified in this document. The ECoW will liaise with the site manager on the content of the induction.

21.5 Clear channels between these parties and their associates on the ground will be in operation at all times, by email and telephone as appropriate.

21.6 Redrow and the landowner will establish a joint management company to manage and maintain the public landscape areas of Great Wilsey Park. The management company will be responsible for the ongoing maintenance of areas of soft landscaping within public open spaces, attenuation basins and Great Field Plantation.

## 22. MONITORING AND REMEDIAL MEASURES

22.1 Site visits by the Ecological Clerk of Works will be undertaken on a monthly basis throughout the programme of works to establish the infrastructure of the site. The ecologist will meet with the site manager and discuss progress of establishment, along with any problems that may have arisen. The Ecological Clerk of Works will also be available to attend site at short notice to discuss particular issues or observe specific works.

22.2 Effects on ecological receptors will be monitored, and conclusions drawn as to the significance of any effects, and any measures that may need to be implemented to mitigate for any effects identified. Following completion of the work, the effects will be analysed and any significant changes will be reported.

22.3 A separate comprehensive Biodiversity Monitoring Strategy for the infrastructure application has been prepared to address the requirements of Condition 45. That document should be referred to for full details of monitoring of newly established habitats and features.

## 23. DISPOSAL OF WASTES

23.1 Waste arising from the proposed works will be disposed of as per standard construction practice. A clear system so waste storage and disposal will be put in place as part of good site management. All waste arising will be stored in approved and secure locations and separated for disposal as appropriate.

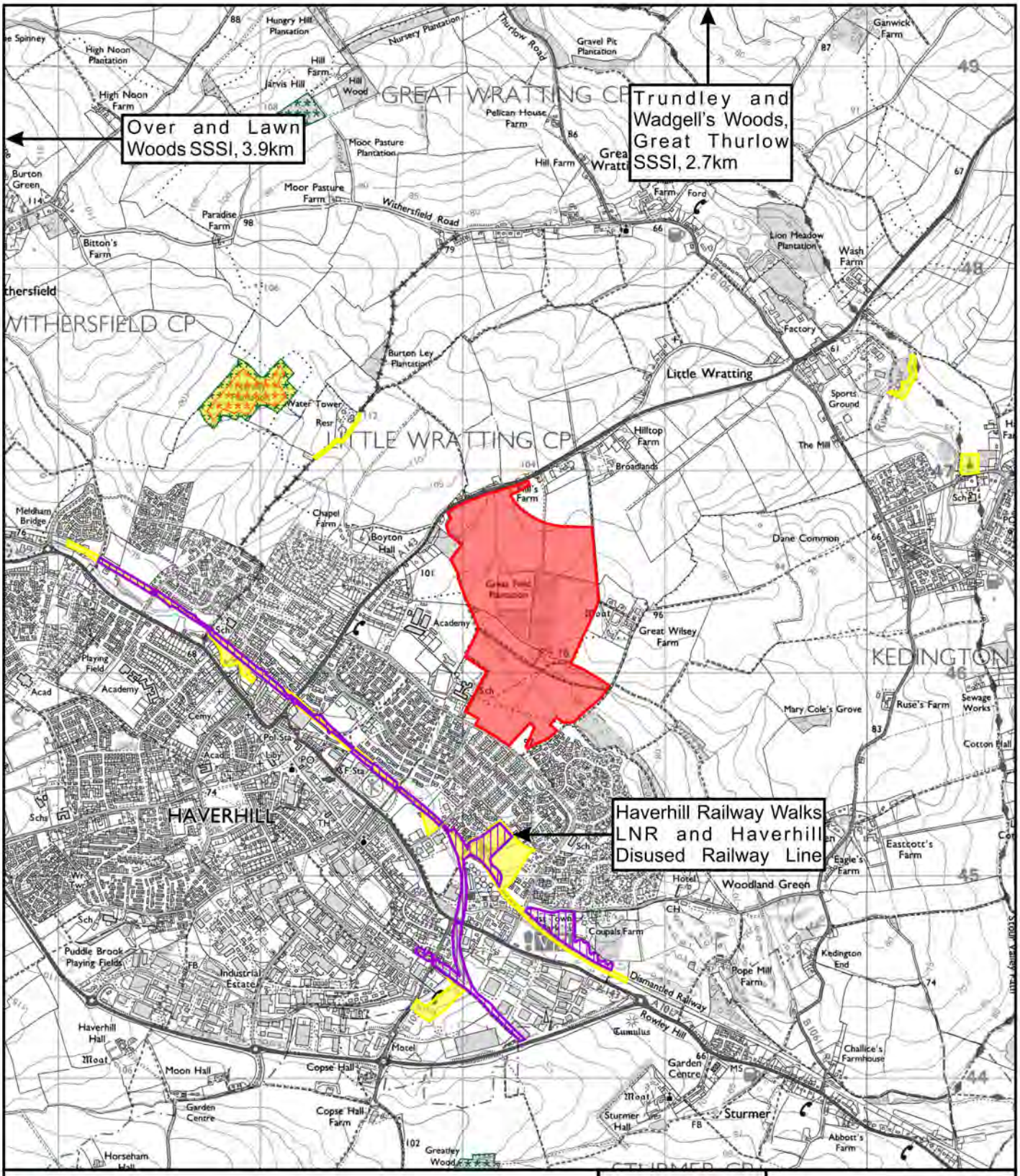
23.2 During the operational phase of the development, the appointed management contractor will allow for the off-site disposal of all litter and landscape maintenance waste. The contractor will be responsible for all waste disposal costs and approvals.

23.3 There are no known non-native invasive species within the Redrow site and therefore disposal of material of at an approved facility is not required.

# PLANS

**PLAN ECO1**

Site Location and Ecological Designations




KEY:

- SITE LOCATION
- LOCAL NATURE RESERVE (LNR)
- COUNTY WILDLIFE SITE (CWS)
- ANCIENT WOODLAND
- ANCIENT REPLANTED WOODLAND

N

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

8110: GREAT WILSEY PARK, HAVERHILL

PLAN ECO1: SITE LOCATION AND ECOLOGICAL DESIGNATIONS

Rev: A

Jul 2019

# PLAN ECO2

Ecological Features

H11
H10
H14
H12
H13
H15
H9
H7
H17
H6
H5
H4

KEY:

- SITE BOUNDARY
- ARABLE LAND
- WOODLAND
- IMPROVED GRASSLAND
- DITCH
- STOUR BROOK TRIBUTARY
- POND
- HEDGEROW
- TREE
- TRACK
- [redacted]

N

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

8110: GREAT WILSEY PARK, HAVERHILL

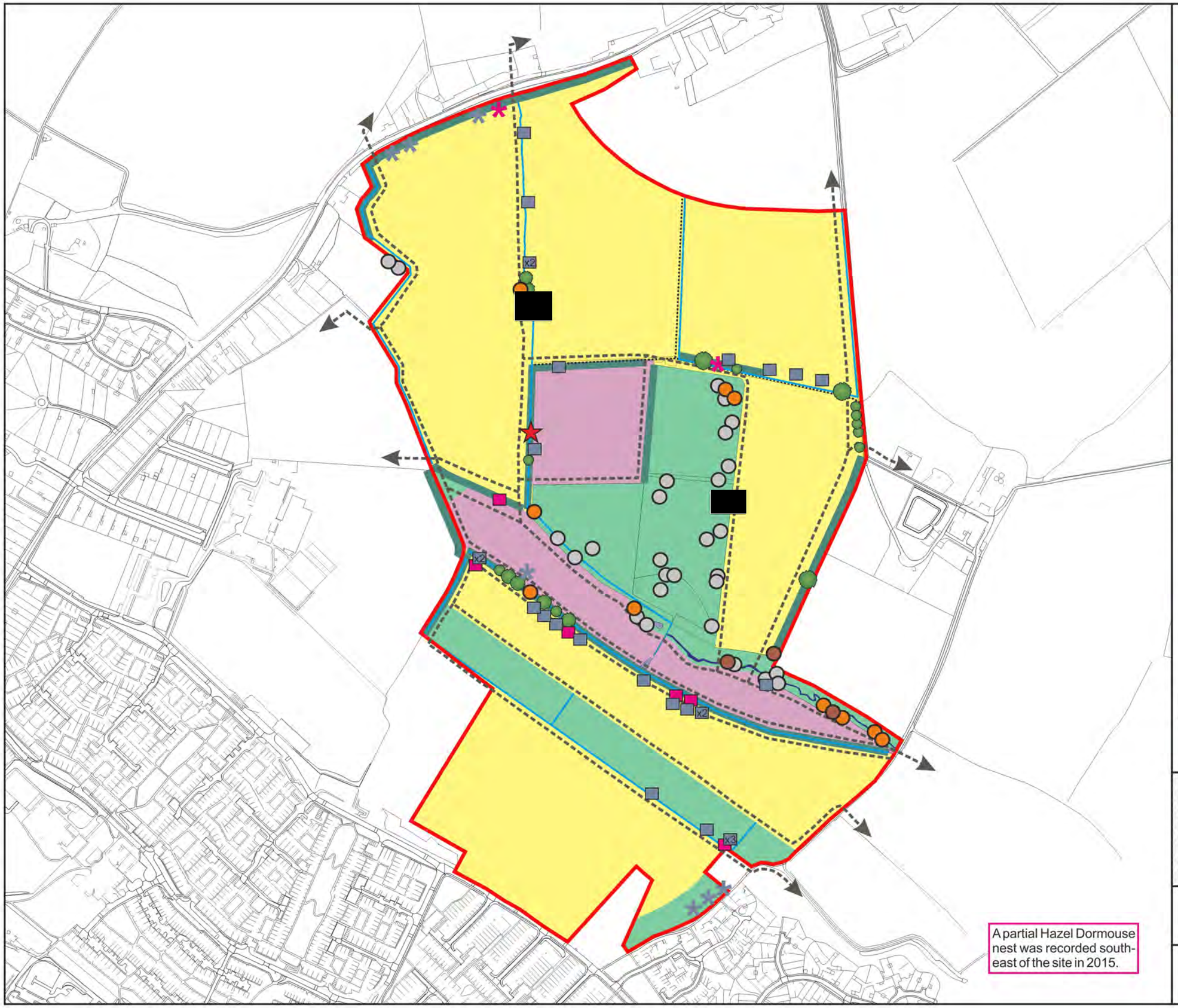
PLAN ECO2:
ECOLOGICAL FEATURES

Rev: B

Dec 2019

# PLAN ECO3

Ecological Constraints




**KEY:**

- SITE BOUNDARY
- ARABLE LAND
- WOODLAND
- IMPROVED GRASSLAND
- DITCH
- STOUR BROOK TRIBUTARY
- POND
- HEDGEROW
- TREE
- TRACK
- GRASS SNAKE RECORD IN 2014
- COMMON LIZARD RECORD IN 2014
- GRASS SNAKE RECORDED IN 2019
- COMMON LIZARD RECORDED IN 2019
- NUMBER OF REPTILES
- CONFIRMED BAT ROOST
- HIGH / MODERATE BAT ROOSTING POTENTIAL TREE
- LOW BAT ROOSTING POTENTIAL TREE
- BAT FORAGING ROUTES
- [redacted]
- DORMOUSE NEST RECORDED IN 2019

N

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

# 8110: GREAT WILSEY PARK, HAVERHILL

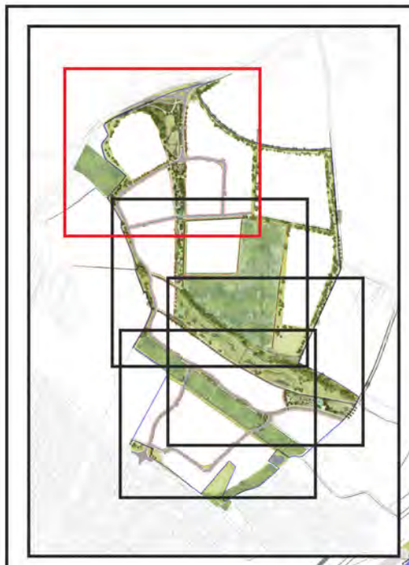
PLAN ECO3:
ECOLOGICAL CONSTRAINTS

Rev: B

Sep 2019

# PLAN ECO4a

Ecological Implementation Strategy 1



Bee bank to be created with south facing slope to encourage solitary bee species

Establishment of native hedgerows

Species rich field margins to be retained and enhanced

During the operation phase limit light spillage onto the green infrastructure network to prevent foraging bats from being deterred

New wild flower meadows, native planting and swales to provide wildlife corridors through development

New tree and understorey planting

Swift pole to be installed in new grassland area to offer nesting opportunities for Swifts

Hedgehog hibernation boxes and log piles to be positioned in strategic locations

Hibernaculum to provide shelter and hibernation opportunities

'Hedgehog Gateways' to be provided in all new garden fences

Establishment of wetland habitats, such as ponds, swales, basins and ditches, to be planted with native marginal planting and wildflowers for pond edges

New tussock grassland to provide opportunities for reptiles and other wildlife

Ensure trenches or open pits associated with the construction works have a means of escape for Badgers and Hedgehogs

New habitats for amphibians, including hibernaculum, grassland and ponds

'Bug Hotel' feature to aid learning and increase opportunities for invertebrates

[redacted]

Traffic management measures will reduce the likelihood of traffic collisions with Badgers

Create dark corridors for bats

Retain trees with bat roosting potential

Bat and bird boxes to be installed on retained and new trees

Bat and Dormouse hop-overs above street lighting

Dropped kerbs to aid movement of wildlife through site

During the construction phase no lighting will be present at night to benefit foraging bats

**KEY:**

- BAT HOP-OVER
- 2X HEDGEHOG HIBERNATION BOX
- REPTILE HIBERNACULUM
- BEE BANK
- BUG HOTEL
- 9X SCHWEGLER 2F, 1FF AND 1FW BAT BOX
- 11X SCHWEGLER 2H, 1N AND 1B BIRD BOX
- 1X SWIFT POLE
- 2X SCHWEGLER CLAY AND REED INVERTEBRATE NESTING AID
- MITIGATION MEASURE
- ENHANCEMENT MEASURE

N

*Based on Exterior Architecture Drawing No. ExA_1868_P_100 Illustrative Landscape Masterplan*

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

8110: GREAT WILSEY PARK, HAVERHILL

PLAN ECO4a: ECOLOGICAL IMPLEMENTATION STRATEGY 1

Rev: B

Dec 2019

# PLAN ECO4b

Ecological Implementation Strategy 2

New wild flower meadows, native planting and swales to provide wildlife corridors through development

Hedgehog hibernation boxes and log piles to be positioned in strategic locations

Establishment of wetland habitats, such as swales and ditches, to be planted with native marginal planting and wildflowers for pond edges

Bat boxes provided in woodland to increase roosting opportunities

Establishment of wetlands to encourage Water Voles

New wildflower meadow and gardens to provide opportunities for bees and other nectar feeding invertebrate species

New habitats for amphibians, including hibernaculum, grassland and ponds

Bee bank to be created with south facing slope to encourage solitary bee species

Hibernaculum to provide shelter and hibernation opportunities

Dark corridors for bats

Traffic management measures will reduce the likelihood of traffic collisions with Badgers

During the operation phase limit light spillage onto the green infrastructure network to prevent foraging bats from being deterred

Bird boxes provided in woodland to increase nesting opportunities

Enhanced opportunities for Badger foraging and sett building

Ensure trenches or open pits associated with the construction works have a means of escape for [redacted] and Hedgehogs

Dormouse nest boxes to be established in woodland

**KEY:**

- 3X HEDGEHOG HIBERNATION BOX
- REPTILE HIBERNACULUM
- BEE BANK
- 7X DORMOUSE NEST BOX
- 16X SCHWEGLER 2F, 1FF AND 1FW BAT BOX
- 24X SCHWEGLER 2H, 1N AND 1B BIRD BOX
- 3X SCHWEGLER CLAY AND REED INVERTEBRATE NESTING AID
- MITIGATION MEASURE
- ENHANCEMENT MEASURE

N

*Based on Exterior Architecture Drawing No. ExA_1868_P_100 Illustrative Landscape Masterplan*

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

8110: GREAT WILSEY PARK, HAVERHILL

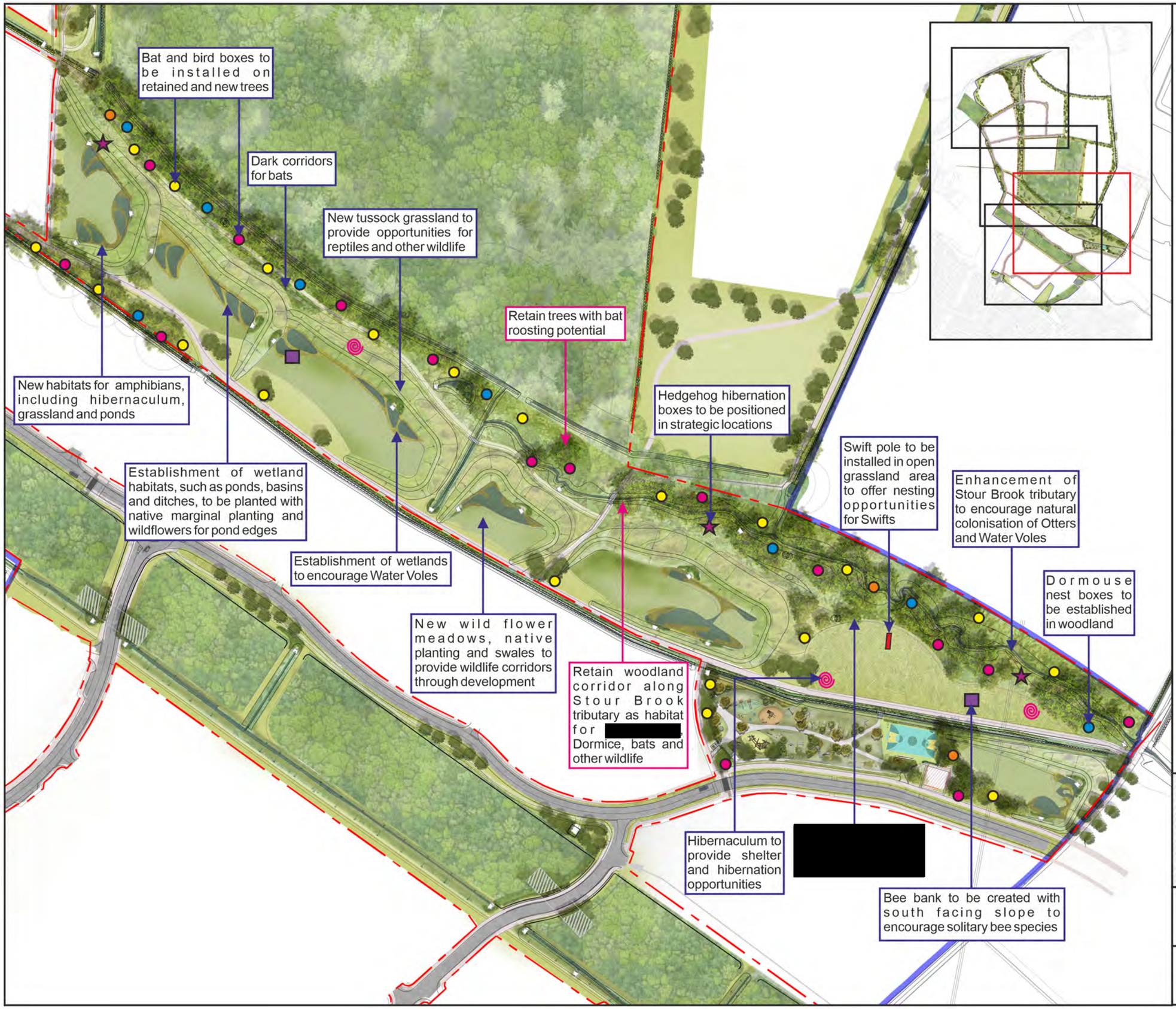
PLAN ECO4b: ECOLOGICAL IMPLEMENTATION STRATEGY 2

Rev: B

Dec 2019

# PLAN ECO4c

Ecological Implementation Strategy 3




**KEY:**

- 3X HEDGEHOG HIBERNATION BOX
- REPTILE HIBERNACULUM
- BEE BANK
- 8X DORMOUSE NEST BOX
- 15X SCHWEGLER 2F, 1FF AND 1FW BAT BOX
- 20X SCHWEGLER 2H, 1N AND 1B BIRD BOX
- 1X SWIFT POLE
- 3X SCHWEGLER CLAY AND REED INVERTEBRATE NESTING AID
- MITIGATION MEASURE
- ENHANCEMENT MEASURE

N

*Based on Exterior Architecture Drawing No. ExA_1868_P_100 Illustrative Landscape Masterplan*


ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk


8110: GREAT WILSEY PARK, HAVERHILL

PLAN ECO4c: ECOLOGICAL IMPLEMENTATION STRATEGY 3

Rev: B

Dec 2019

# PLAN ECO4d

Ecological Implementation Strategy 4

Traffic management measures will reduce the likelihood of traffic collisions with Badgers

Clearance of any ground vegetation outside of the winter hibernation period for Hedgehogs

Bird boxes provided in woodland to increase nesting opportunities

Dark corridors for bats

Ensure trenches or open pits associated with the construction works have a means of escape for Badgers and Hedgehogs

Bat boxes provided to offer new roosting opportunities

During the construction phase no lighting will be present at night to benefit foraging bats

Bat and Dormouse hop-overs above street lighting

Dormouse nest boxes to be established in woodland

Retain immature plantation as habitat for [redacted] Dormice, bats and other wildlife

Dropped kerbs to aid movement of wildlife through site

Establishment of wetland habitats, such as swales and ditches, to be planted with native marginal planting and wildflowers for pond edges

Hedgehog hibernation boxes to be positioned in strategic locations

**KEY:**

- BAT HOP-OVER
- 2X HEDGEHOG HIBERNATION BOX
- REPTILE HIBERNACULUM
- 5X DORMOUSE NEST BOX
- 5X SCHWEGLER 2F, 1FF AND 1FW BAT BOX
- 5X SCHWEGLER 2H, 1N AND 1B BIRD BOX
- 2X SCHWEGLER CLAY AND REED INVERTEBRATE NESTING AID
- MITIGATION MEASURE
- ENHANCEMENT MEASURE

N

*Based on Exterior Architecture Drawing No. ExA_1868_P_100 Illustrative Landscape Masterplan*

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

8110: GREAT WILSEY PARK, HAVERHILL

PLAN ECO4d: ECOLOGICAL IMPLEMENTATION STRATEGY 4

Rev: A

Dec 2019

**PLAN ECO5**

Phasing of Development

| Receptor | Action | Timing |
|---|---|---|
| Retained Habitats | Installation of protective fencing | Prior to work starting in March 2020 |
| Dormice | Seasonal vegetation clearance | Winter clearance to be completed November 2020 to March 2021 inclusive. Stumps to be removed April 2021 |
| | | Summer clearance May to late September 2020 |
| Hedgehogs | Clearance of log piles and other hibernation features | Winter clearance between October 2020 and April 2021; summer clearance between May and September 2020 |
| Reptiles | Clearance of log piles and other hibernation features | Winter clearance between November 2020 and March 2021; summer clearance between April and October 2020 |
| | Passive displacement | Between mid-March and October 2020 and during favourable weather conditions |

**KEY:**

- INFRASTRUCTURE MARCH 2020 TO MARCH 2021
- HOUSING APRIL 2020 TO AUGUST 2022
- HOUSING OCTOBER 2021 TO JUNE 2024
- HOUSING JUNE 2020 TO DECEMBER 2023

N

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

8110: GREAT WILSEY PARK, HAVERHILL

PLAN ECO5: PHASING OF DEVELOPMENT

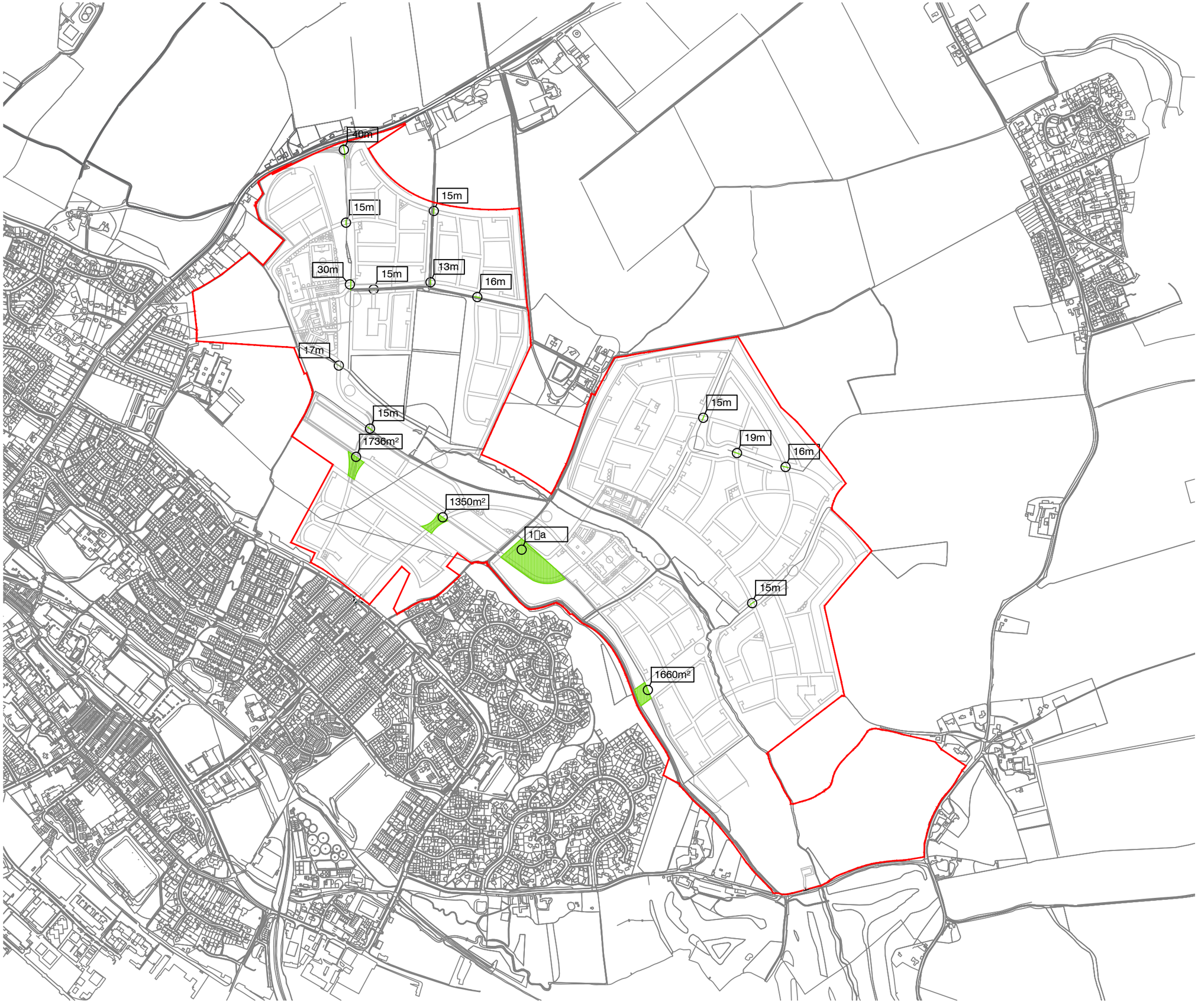
Rev: B

Dec 2019

# APPENDICES

# APPENDIX 1

Hedgerow Removal Plan 5055-L-112 rev C




## NOTES

All dimensions to be verified on site. Do not scale this drawing. All discrepancies to be clarified with project Landscape Architect.



N

Scale 1:10,000 @ A3

0 100 200 300 400 500m

| | | |
|---|---|---|
| Application boundary | 168.34ha |
| Hedgerow to be removed to facilitate road access (Total length) (Assumed 2.5 roadside clearance for visibility) | 241m |
| Woodland to be removed (Total area) | 1.47ha |

| rev | date | description | by |
|---|---|---|---|
| C | 10.08.15 | Coupals Road access / car park included | NJE |
| B | 06.08.15 | Change to site access | NJE |
| A | 21.07.15 | Change to road layout | SJ |

fpcr

masterplanning
environmental assessment
landscape design
urban design
ecology
architecture
arboriculture

FPCR Environment and Design Ltd
Lockington Hall
Lockington
Derby DE74 2RH

t: 01509 672772
f: 01509 674565
e: mail@fpcr.co.uk
w: www.fpcr.co.uk

client
HALLAM LAND MANAGEMENT LTD

project
Great Wilsey Park
Haverhill

drawing title
Hedgerow Removal Plan

| scale | drawn | date |
|---|---|---|
| 1:10,000@A3 | NJE | July 2015 |

drawing number
5055-L-112

rev
C

CAD file: 5055/LANDS/CAD/Masterplan 01.04.15

# APPENDIX 2

Bat Box Specifications

# Bat Boxes

Schwegler bat boxes are made from 'woodcrete' and have the highest rates of occupation of all types of box.
The 75% wood sawdust, clay and concrete mixture is ideal, being durable whilst allowing natural respiration and temperature stability. These boxes are rot and predator proof and extremely long lasting.

## 2F Bat Box

A standard bat box, attractive to the smaller British bat species. Simple design with a narrow entrance slit on the front.

*Woodcrete construction, 16cm diameter, height 33cm.*

## 1FF Bat Box

The rectangular shape makes the 1FF suitable for attaching to the sides of buildings or on sites such as bridges, though it may also be used on trees. It has a narrow crevice-like internal space to attract Pipistrelle and Noctule bats.

*Woodcrete construction.*
*Width: 27cm*
*Height: 43cm*
*Weight: 8.3kg*

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

# Bat Boxes

Schwegler bat boxes are made from 'woodcrete' and have the highest rates of occupation of all types of box.
The 75% wood sawdust, clay and concrete mixture is ideal, being durable whilst allowing natural respiration and temperature stability. These boxes are rot and predator proof and extremely long lasting.

## 1FW Bat Hibernation Box

This huge box is designed to provide a protected environment which is particularly important through the cold winter months when bats are hibernating. Three wooden panels within the box imitate crevices for roosting.

*Woodcrete construction, 38cm diameter, height 50cm, weight 28kg.*

*This heavy box requires secure mounting if placed above the ground and should be sited away from public areas.*

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

# APPENDIX 3

Hedgehog Gateway Specification

# Hedgehog Gateways

A 13 x 13 cm section cut out at the base of the gravel board or directly into the fence panel creating links between residential gardens and the surrounding landscape.

This will facilitate the dispersal of Hedgehogs and other small animals and enhance the permeability of the new development for wildlife.


ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

# APPENDIX 4

Hedgehog House Specifications

# Hedgehog Houses

## Schwegler Hedgehog Dome

The Schwegler Hedgehog Dome encourages Hedgehogs to settle in a particular area and provides year-round shelter featuring a weather proof cover and insulated floor.

## Ecoplate Hedgehog House

This large, environmentally friendly house is made from recycled plastic and is weather resistant and very durable. A hidden entrance tunnel inside makes it more difficult for predators to reach Hedgehogs inside.

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

# APPENDIX 5

Bird Box Specifications

# Bird Boxes

Schwegler bird boxes have the highest rates of occupation of all types of box.
They are designed to mimic natural nest sites and provide a stable environment with the right thermal properties for chick rearing and winter roosting.
Boxes are made from 'Woodcrete'. This 75% wood sawdust, clay and concrete mixture is breathable and very durable making these bird boxes extremely long lasting.

## 2H Open Fronted Bird Box

This box is attractive to robins, pied wagtails, spotted flycatcher, wrens and black redstarts.

*Dimensions 15 x 20 x 20 cm*

## 1N Deep Nest Box

A deeper than standard nest box which is ideal for Robins, Spotted Flycatchers, Pied Wagtails, Tits and Sparrows. Its depth offers protection from cats, Magpies, Jays and Martens.

*Two entrance holes, 30 x 50mm. Nesting area 15 x 21cm.*

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

# Bird Boxes

Schwegler bird boxes have the highest rates of occupation of all types of box.
They are designed to mimic natural nest sites and provide a stable environment with the right thermal properties for chick rearing and winter roosting.
Boxes are made from 'Woodcrete'. This 75% wood sawdust, clay and concrete mixture is breathable and very durable making these bird boxes extremely long lasting.

## 1B Bird Box

This is the most popular box for garden birds and appeals to a wide range of species. The box can be hung from a branch or nailed to the trunk of a tree with a 'tree-friendly' aluminium nail.

*Available in four colours and three entrance hole sizes. 26mm for small tits, 32mm standard size and oval, for redstarts for example.*

## Swift Pole / Tower

A Swift nest colony can be fitted to a steel lamp post or a timber telegraph pole. This provides nest sites for a colony of Swifts in an area with no suitable buildings present. The minimum height for a Swift Pole / Tower is 7m, but the higher the better.

*Multiple entrance holes, 55 x 33mm.*

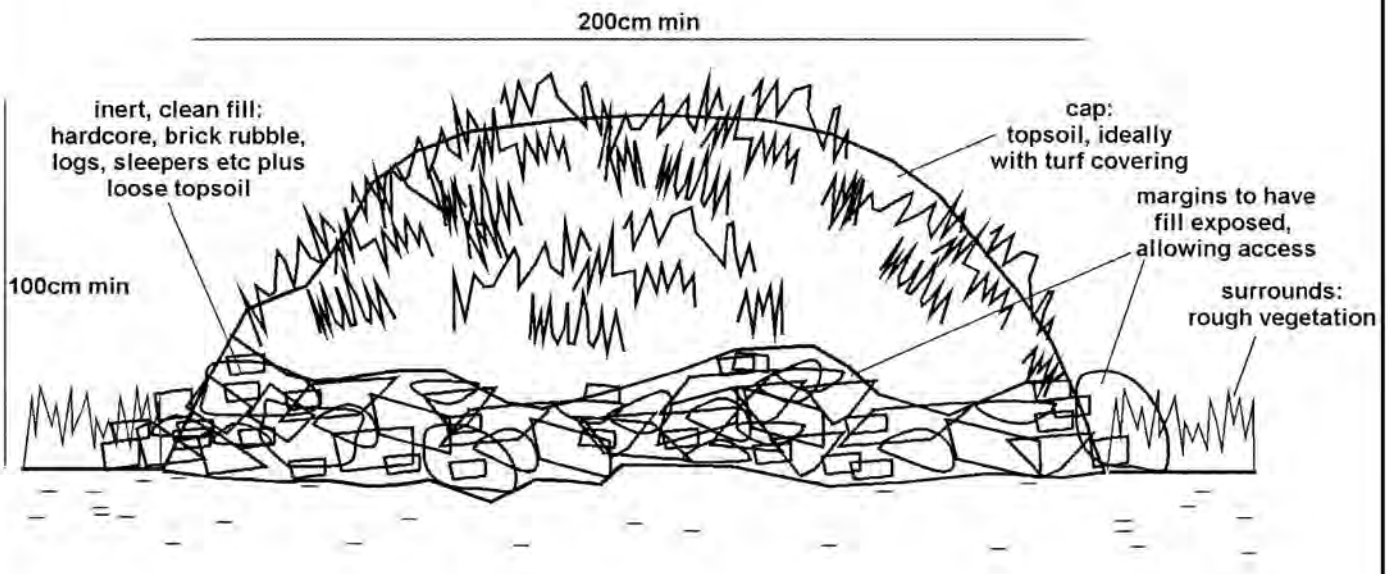
ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

# APPENDIX 6

Reptile Hibernacula Specification




ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

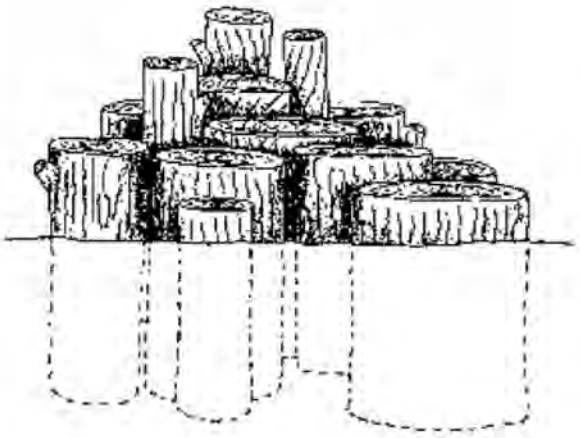
# HIBERNACULA DESIGN

# APPENDIX 7

Stag Beetle Loggery Specification

# Stag Beetle Loggery

Stag Beetles require dead wood to complete their life cycle, laying eggs underground by logs or stumps of dead trees. The larvae will then spend up to seven years slowly growing in size. A wide range of woods are used, especially Oak, but also Ash, Elm, Sycamore, Lime, Hornbeam, Apple and Cherry. Coniferous species are generally avoided. Adults emerge from the soil beneath logs or stumps from mid-May until July.



## Loggery

Large logs (10-50cm diameter) of hardwood (e.g.Oak, Beech, Sycamore, Ash) with bark still attached sunk c. 60cm into the ground, in partially shaded areas. Treated wood should not be used.

Information derived from *Stag Beetle: An advice note for its conservation in London.* London Wildlife Trust. http://www.wildlondon.org.uk/resourcefiles/20040625132051Stag+Beetles.doc

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

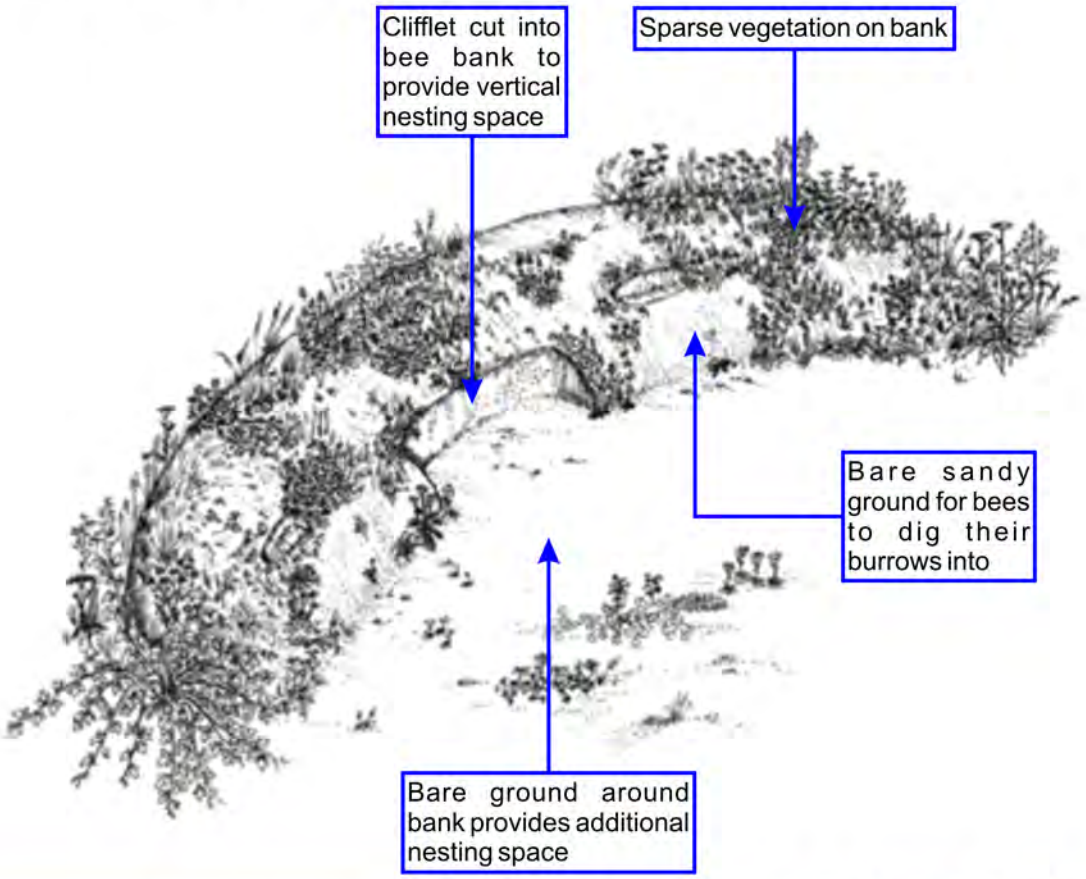
# APPENDIX 8

Invertebrate Nesting Aid Specifications

# Invertebrate Nesting Aids

## Bee Bank

Provides warm, sheltered patches of bare ground where solitary mining bees and other invertebrates nest. Made from sand, stones and other loose aggregates. Vegetation will be cut on a rotational basis so bare ground is always visible. Bee banks will be positioned in a wildflower meadow area to provide a nearby source of nectar and pollen for bees. The bee bank will be aligned to face south or south-east for maximum sunshine.




Information derived from *How to Create a Bee Bank*. Buglife. https://www.buglife.org.uk/sites/default/files/Bee%20bank%20booklet.pdf

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

# Invertebrate Nesting Aids

## Bug Hotel

Manmade structure providing nesting sites for solitary bees and wasps and hibernacula for ladybirds, woodlice and butterflies. It will be constructed using a variety of natural materials including logs, bark and bamboo sticks, to provide as many sheltering opportunities as possible.


## Schwegler Clay and Reed Insect Nest

An attractive insect nest which can be hung in any sunny, sheltered spot. Reeds on either side of a clay central section provide a range of environments to suit different insects (designed to attract only harmless insects).

*Dimensions: 290 x 225 x 205 mm*
*Weight: 5.7 kg*
*Schwegler woodcrete, clay, and reeds*

ECOLOGYSOLUTIONS
Part of the ES Group

Cokenach Estate
Barkway | Royston
Hertfordshire | SG8 8DL

+44(0)1763 848084
east@ecologysolutions.co.uk
ecologysolutions.co.uk

ECOLOGYSOLUTIONS

Part of the ES Group

Ecology Solutions Limited | Cokenach Estate | Barkway | Royston | Hertfordshire | SG8 8DL

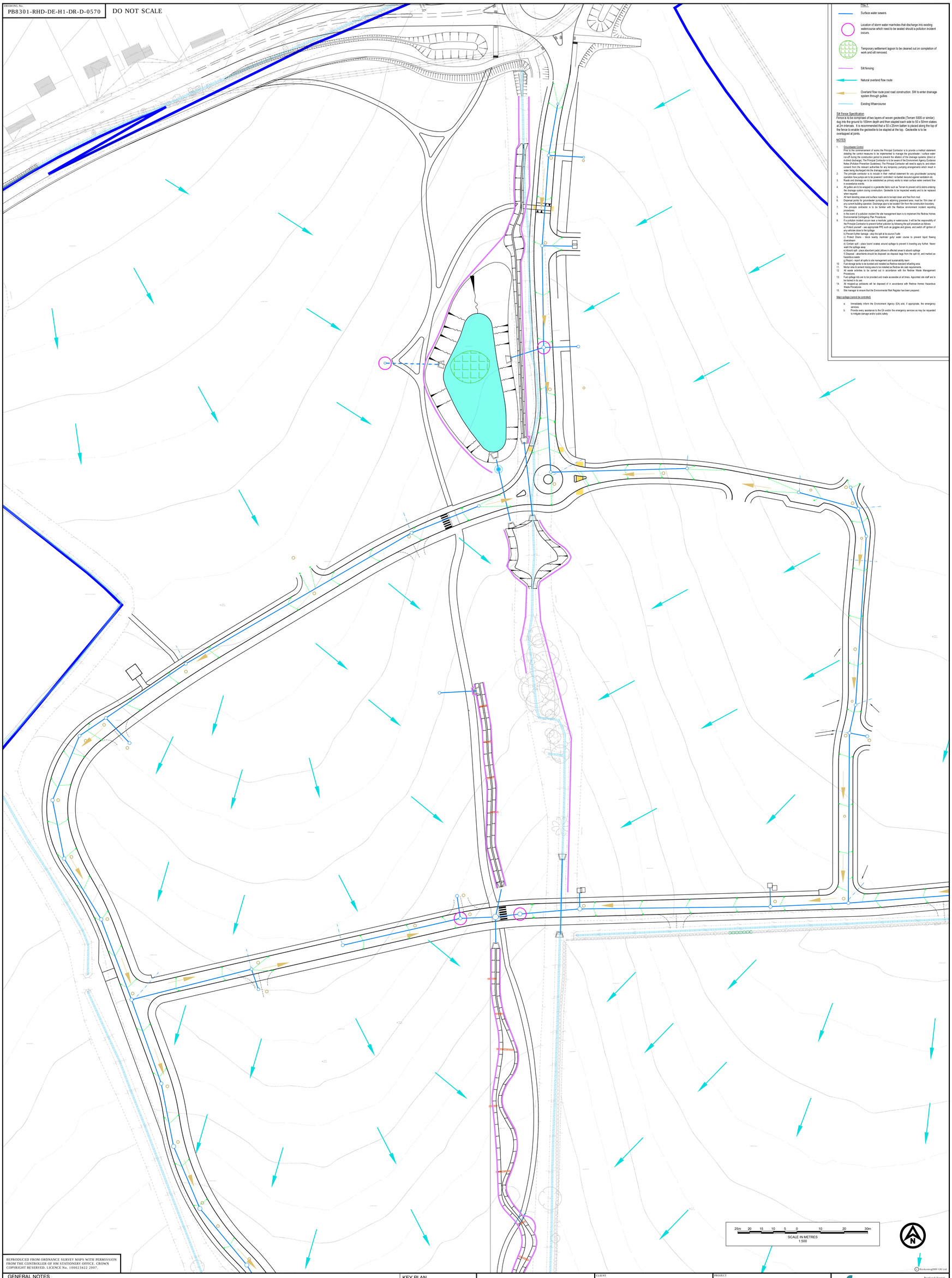
01763 848084 | east@ecologysolutions.co.uk | www.ecologysolutions.co.uk

# APPENDIX C

# ENVIRONMENTAL PLAN

DRAWING No.
PB8301-RHD-DE-H1-DR-D-0570

DO NOT SCALE

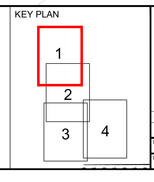





## GENERAL NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
3. ALL LEVELS ARE IN METRES RELATIVE TO ORDNANCE DATUM NEWLYN UNLESS NOTED OTHERWISE.
4. THIS DRAWING HAS BEEN BASED UPON SURVEY / OS INFORMATION SUPPLIED BY INTERLOCKS SURVEYS LIMITED, ROYAL HASKONING DHV SHALL NOT BE LIABLE FOR ANY INACCURACY OR DEFICIENCIES ARISING FROM IT.
5. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
6. ALL MATERIALS AND WORKMANSHIP WILL BE AS SPECIFIED IN THE SPECIFICATION UNLESS NOTED OTHERWISE.
7. ALL LEVELS, DIMENSIONS AND LOCATIONS ARE TO BE CHECKED BY THE MAIN CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK ON SITE.
8. ALL DRAINAGE WORKS TO BE IN ACCORDANCE WITH ANGLIAN WATER SPECIFICATIONS AND CURRENT VERSION OF SPECIFICATIONS FOR HIGHWAY WORKS.

KEY PLAN




| REV | DATE | DESCRIPTION | BY | CHK | APP |
|---|---|---|---|---|---|
| 01 | 03/07/19 | FIRST ISSUE | JBW | PV | DJ |

REVISIONS

DRAWING STATUS
INFORMATION

CLIENT
REDROW

PROJECT
GREAT WILSEY PARK

TITLE
RESERVED MATTERS
DRAINAGE
ENVIRONMENTAL PLAN
SHEET 1 OF 4

Royal HaskoningDHV
Enhancing Society Together
Portland Street,
Manchester One, 5th Floor
Manchester, M1 3LF
Tel +44(0)161 2361018
Email info.manchester@uk.rhdhv.com
Website www.royalhaskoning.com

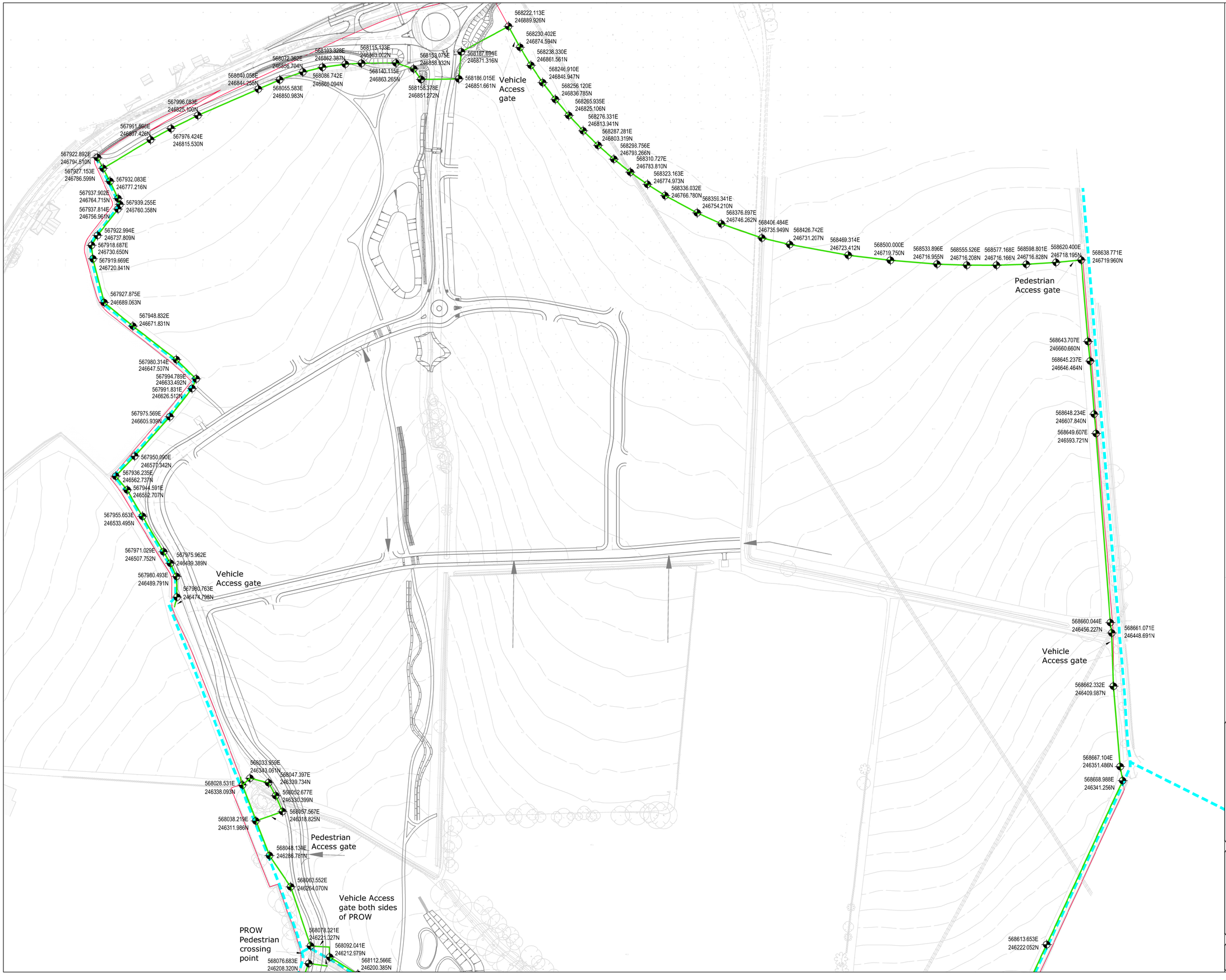
| DRAWN | CHECKED | APPROVED |
|---|---|---|
| RMV | PV | DJ |
| DATE | SCALE AT A0 | PROJECT NUMBER |
| JUL-19 | 1:500 | PB8301 |

DRAWING No.
PB8301-RHD-DE-H1-DR-D-0570

REVISION
I01

# APPENDIX D

# BOUNDARY AND PROW FENCING SETTING OUT PLAN



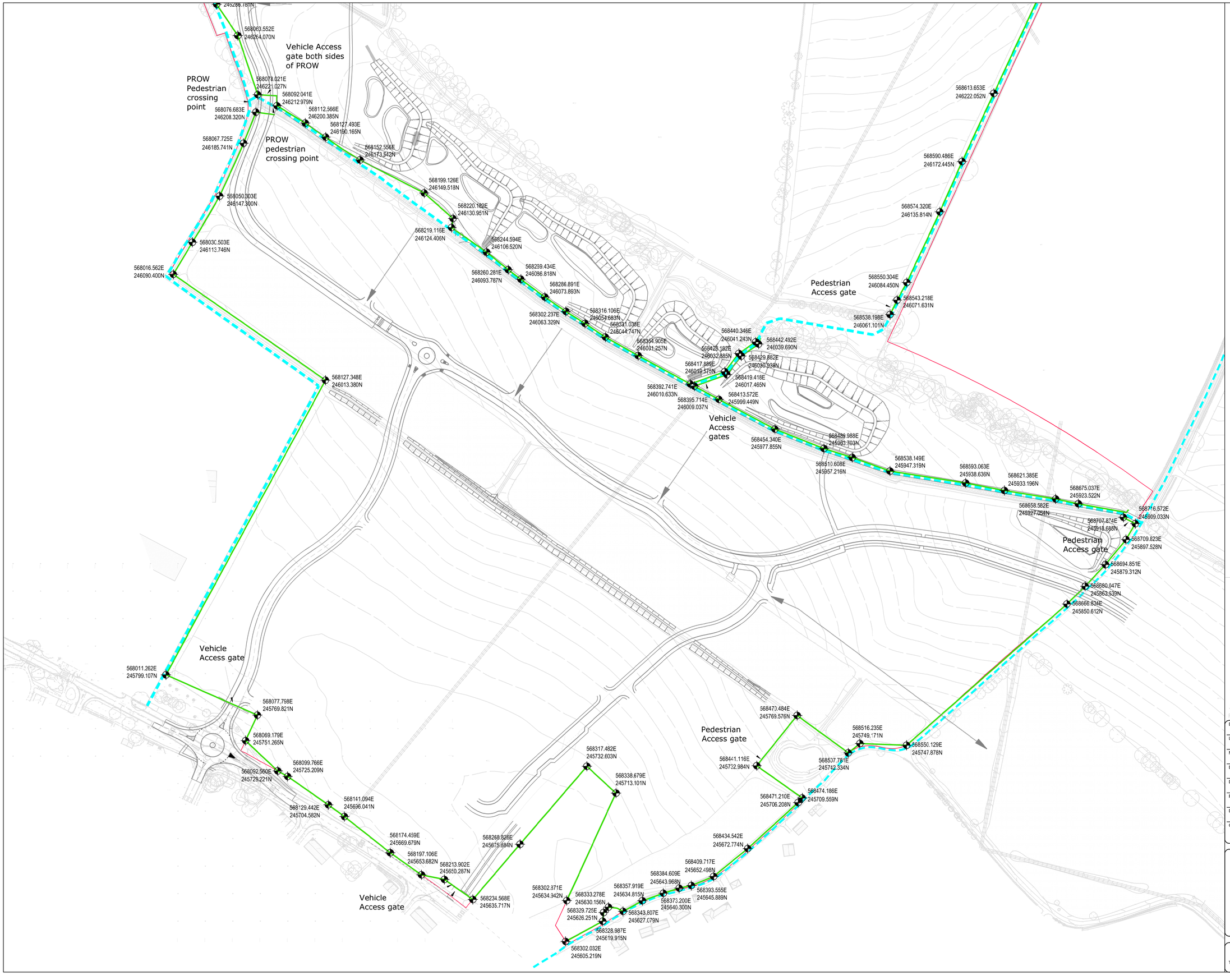

## KEY

- Protection Fencing
- Contract Boundary
- PROW route

| Rev | Date | Details | By |
|---|---|---|---|
| C | 20.12.19 | Updated following meeting with PROW Manager | RF |
| B | 25.07.19 | Position of PROW protection fencing revised. | RF |
| A | 09.04.19 | Updated to show vehicle & pedestrian access gates | RF |

| | |
|---|---|
| Development | **Great Wilsey Park** |
| Location | Haverhill |
| Marketing Name | |
| Drawing Title | Boundary & PROW Fencing setting out |
| Drawing Number | **8511-RED-ZZ-DR-C-001** |
| Revision | **C** |
| Scale @ A1 | 1:1250 |
| Drawn By | - |
| Date Started | April 2019 |
| Checked by | Date |


REDROW HOMES
**Redrow Homes (Eastern) Limited**
2 Aurum Court, Sylvan Way, Southfields Business Park,
Laindon Basildon, Essex SS15 6TU
Tel: 01268 886400 Web: www.redrow.co.uk


KEY
Protection Fencing
Contract Boundary
PROW route
Vehicle Access gate both sides of PROW
PROW Pedestrian crossing point
PROW pedestrian crossing point
Pedestrian Access gate
Vehicle Access gates
Pedestrian Access gate
Vehicle Access gate
Vehicle Access gate
Pedestrian Access gate
568063.552E 246264.070N
568078.021E 246221.027N
568092.041E 246212.979N
568076.683E 246208.320N
568112.566E 246200.385N
568127.493E 246190.165N
568067.725E 246185.741N
568152.556E 246173.542N
568199.126E 246149.518N
568050.303E 246147.300N
568220.182E 246130.951N
568219.116E 246124.406N
568244.594E 246106.520N
568030.503E 246113.746N
568016.562E 246090.400N
568239.434E 246096.818N
568260.281E 246093.787N
568286.891E 246073.893N
568316.106E 246054.683N
568302.237E 246063.329N
568331.038E 246044.747N
568354.905E 246031.257N
568127.348E 246013.380N
568392.741E 246010.633N
568395.714E 246009.037N
568440.346E 246041.243N
568442.492E 246039.690N
568426.182E 246032.885N
568429.862E 246030.938N
568417.889E 246019.575N
568419.418E 246017.465N
568413.572E 245999.449N
568454.340E 245977.855N
568489.988E 245963.703N
568510.608E 245957.216N
568538.149E 245947.319N
568593.063E 245938.636N
568621.385E 245933.196N
568675.037E 245923.522N
568658.582E 245927.054N
568716.572E 245909.033N
568707.874E 245918.688N
568709.823E 245897.528N
568694.851E 245879.312N
568680.047E 245863.539N
568666.834E 245850.612N
568613.653E 246222.052N
568590.486E 246172.445N
568574.320E 246135.814N
568550.304E 246084.450N
568543.218E 246071.631N
568538.198E 246061.101N
568011.262E 245799.107N
568077.798E 245769.821N
568069.179E 245751.265N
568092.560E 245729.221N
568099.766E 245725.209N
568129.442E 245704.582N
568141.094E 245696.041N
568174.459E 245669.679N
568197.106E 245653.682N
568213.902E 245650.287N
568234.568E 245635.717N
568268.626E 245675.884N
568302.871E 245634.942N
568333.278E 245630.156N
568329.725E 245626.251N
568357.919E 245634.815N
568343.607E 245627.079N
568328.987E 245619.915N
568302.032E 245605.219N
568373.200E 245640.300N
568384.609E 245643.968N
568409.717E 245652.498N
568393.555E 245645.889N
568434.542E 245672.774N
568471.210E 245706.208N
568474.186E 245709.559N
568317.482E 245732.603N
568338.679E 245713.101N
568470.484E 245769.576N
568441.116E 245732.984N
568537.781E 245742.334N
568516.235E 245749.171N
568550.129E 245747.878N
C 20.12.19 Updated following meeting with PROW manager. RF
B 25.07.19 Position of PROW protection fencing revised. RF
A 09.04.19 Updated to show vehicle & pedestrian access gates RF
Rev Date Details By
Development Great Wilsey Park
Location Haverhill
Marketing Name
Drawing Title Boundary & PROW Fencing setting out
Drawing Number 8511-RED-ZZ-DR-C-002
Revision C
Scale @ A1 1:1250
Drawn By -
Date Started April 2019
Checked by
Date
REDROW HOMES
Redrow Homes (Eastern) Limited
2 Aurum Court, Sylvan Way, Southfields Business Park, Laindon Basildon, Essex SS15 6TU
Tel: 01268 886400 Web: www.redrow.co.uk
Legal Dsclaimer TBC
This layout has been designed after due consideration of our Context & Constraints Plan