

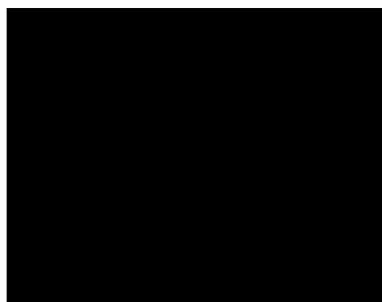


Daniels Industrial Estate, Bath Road, Stroud, GL5
3TJ

Ecological Design Strategy



September 2023



Document Control

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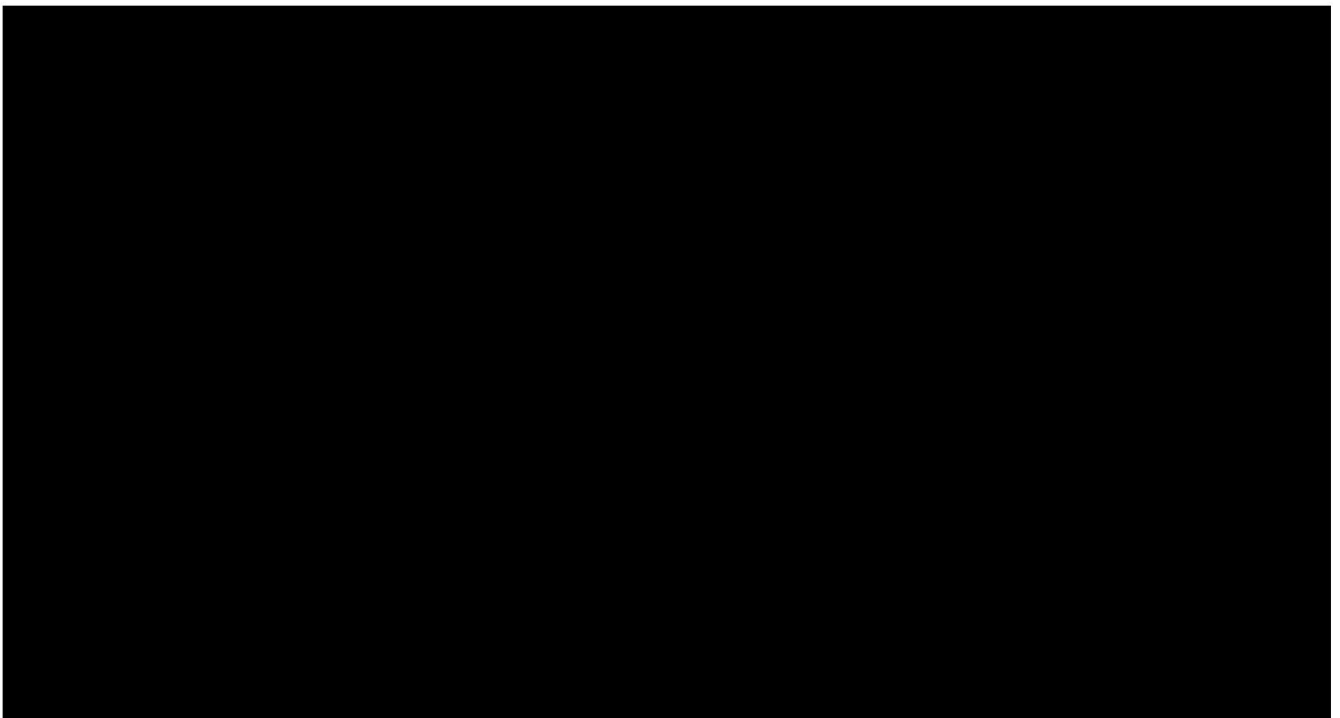
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Notice to Readers:

This report has been prepared by All Ecology with all reasonable skill, care and diligence, within the terms of the contract with the client. The actions of the surveyor on site, and during the production of the report were undertaken in accordance with the Code of Professional Conduct for the Chartered Institute of Ecology and Environmental Management (www.cieem.org.uk).

The flora and fauna detailed within this report are those noted during the field survey and from anecdotal evidence. It should not be viewed as a complete list of flora and fauna species that may frequent or exist on site at other times of the year.

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Reference to sections or particular paragraphs of this document taken out of context may lead to misrepresentation.

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1.0 Introduction

Background

- 1.1 All Ecology was commissioned to produce this document in respect of a proposed development at a site known as Daniels Industrial Estate, Bath Road, Stroud, GL5 3TJ.
- 1.2 The site is dominated by hard standing and buildings with small pockets of amenity grassland, scrub, woodland, trees and hedge which are common and widespread habitats.
- 1.3 An Ecological Appraisal of the site carried out by All Ecology Ltd in 2021 with subsequent bat emergence/re-entry surveys and Badger surveys.
- 1.4 The proposals for the site are for a new residential development. This will require the demolition of the buildings on site and general site clearance.
- 1.5 The following condition was attached to the planning permission for which the present report is intended to discharge:

Prior to the commencement of the development hereby approved, an Ecological Design Strategy (EDS) shall be submitted to the Local Planning Authority for agreement in writing. For the avoidance of doubt the EDS shall address the recommendations made within the submitted Ecological Appraisal, by All Ecology, dated March 2021; and shall focus on habitat enhancement within the development site. The EDS shall include the following;

- a) Purpose and conservation objectives for the proposed works.*
- b) Detailed designs and working methods to achieve stated objectives.*
- c) Tree retention and protection details.*
- d) Native tree, scrub and native species rich grassland planting and establishment details.*
- e) Erection of bat and bird boxes including box details and locations.*
- 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 proposed phasing of development.*
- h) Persons responsible for implementing the works.*
- i) Details of initial aftercare and long-term maintenance.*

The development shall be implemented in strict accordance with the EDS and thereafter retained and maintained as such.

REASON: In order to protect and enhance the site for biodiversity in accordance with policy ES6 of the Stroud District Local Plan 2015.

Objectives and Aim

- 1.6 The objectives of this document are to maximise the enhancement of the proposed development for biodiversity to meet policy requirements.
- 1.7 The aims of the EDS are to ensure that the new development is constructed and managed in accordance with planning approval and wildlife legislation, and ensure the delivery of the proposed ecological enhancements in order to maximise the potential for gains on site.
- 1.8 Ecological objectives are set out for which management proposals are specified for the construction phase and the operational phase of the development, which is expected to continue in perpetuity. This document should be read in conjunction with Peter Quinn Associates' Outline Landscape Proposals, the key points of which will be summarised here.

Site Location



Figure 1: Site location plan.

2.0 Development Description and Objectives

Development Description

- 2.1 The proposals for the site are for a new residential development of 111 units with associated roads, gardens and landscaping. This will require the demolition of the buildings on site and general site clearance.

Objectives

- 2.2 The objectives of the management are as follows:

Maintain and increase the value of commuting and foraging habitat for bats by creating new gardens, planting of shrubs, trees and by creation of grassland and hedges.

Increase the value for roosting bats by providing new roosting features on new buildings.

Maintain and increase the value of the site for bird species through habitat creation and installation of new bird boxes on buildings and trees.

Increase the value of the site for invertebrates through the creation of habitats and dead wood piles.

Ensure compliance with the legal protection of breeding birds.

Ensure compliance with the legal protection of bats.

Ensure compliance with the legal protection of Badgers.

3.0 Survey and Site Assessment

- 3.1 The site does not fall within, or in close proximity to, any statutory or non-statutory designated sites. An Ecological Appraisal of the site carried out by All Ecology Ltd in 2021 established the following with regard to habitats and their potential for protected species either on site or in the surrounding area.
- 3.2 The site is dominated by hard standing and buildings with small pockets of amenity grassland, scrub, woodland, trees and hedge which are common and widespread habitats. The hedgerow is species-poor being dominated by Wild Privet. The semi-natural broadleaved woodland is small in area and is of insufficient size to be classified as a NERC priority habitat. All the higher plants recorded within the study area are widespread and common, none are legally protected, nationally or county notable, listed in the WSBRC records or are listed in the UK or Wiltshire Biodiversity Action Plan. No invasive plant species were recorded.
- 3.3 The site provides limited foraging opportunities for Badgers within the amenity grassland, woodland and scrub; however, the woodland and scrub banks do provide opportunities for the construction of setts. Three potential Badger setts were found on site, two individual burrows on the northeast bank of the woodland and one burrow in the smaller scrub bank near the southwest site entrance. The two burrows in the northeast bank of the woodland had clear mammal runs leading towards them but both burrows appeared not to be in current use with leaf litter present within the entrances of the burrows. The burrow within the smaller scrub bank appeared clear of vegetation and leaf litter so may be in use. Subsequent Badger surveys carried out by All Ecology in September 2021 and May 2023 concluded that Badgers were absent from the site and a maximum of two of the three burrows were in use by Fox.
- 3.4 The site provides bird foraging and nesting habitat within the hedges, trees, and scrub. The grassland on site also provides limited foraging opportunities for common bird species. A number of the buildings provide nesting opportunities for birds with pigeons and Jackdaws present within some of the disused buildings.
- 3.5 The majority of the site consists of hard standing and buildings. There are areas of woodland, scrub and hedge which provide areas of cover for reptiles, and there were also a number of rubble, brash and stone piles in the northwest corner of the site. However, the areas of habitat are small and the site is largely isolated by roads and buildings. Given the site's isolation and limited extent of habitats, reptiles are expected to be absent from the site.
- 3.6 The site provides potential bat foraging and commuting habitat within and along the woodland edges and along the two banks of dense scrub containing standard trees; the trees and vegetation between Building 1 and 2 may also be utilised by foraging bats. The site is surrounded by urban area and this will limit any potential for notable bat species. Although their presence cannot be entirely ruled out it is most likely that the site is frequented by small numbers of common urban species such as pipistrelles.
- 3.7 No direct observations or signs of other mammal species were identified, although it is likely that hedgehogs may frequent the site.

- 3.8 There are no waterbodies on-site or immediately adjacent to support water vole or otter, and are not an issue for this scheme. The existing boundary habitat does not provide optimum habitat to support hazel dormouse, and the hedgerow is of low value and isolated.
- 3.9 The study area does not contain any ponds or other waterbodies suitable to support breeding great crested newt or other amphibians. There are no ponds identified on the OS map that lies within 250 m of the study area. Great crested newts are therefore not considered to be present within the study area and is not a constraint for the proposed development.

4.0 Management Proposals

4.1 The management proposals include the following summary items:

Retention of shrubs, trees and woodland ensuring the long-term health of trees.

Creation of habitats.

Fauna – enhancement.

Habitat Removal

4.2 All habitat removal would be undertaken in accordance with the accompanying CEMP.

Habitat Retention

4.3 Demarcation of areas of habitat retention through installation of Heras fencing creating exclusion zones.

4.4 Three trees in the northwest corner of the site and trees along the southwest boundary to be removed as necessary to allow for groundworks and installation of services. Works to carry out selective thinning, removal of dead wood from canopies and other works as recommended by arboricultural consultant and re-coppicing where advisable to ensure suitability for retention and long-term health of trees and shrubs. Within hatched area, in gaps between retained trees and shrubs, plant native trees (core mix) and shrubs (edge mix) at a density of 0.5/sqm and 1/sqm respectively to enhance screening and fill gaps.

4.5 Retain all other existing trees within POS and along northwestern boundary as shown. Carry out thinning, removal of ivy and dead wood from canopies and other works as recommended by arboricultural consultant to ensure suitability for retention within POS and long-term health of trees. Within hatched area, in gaps between retained trees, plant native trees (core mix) and shrubs (edge mix) at a density of 0.5/sqm and 1/sqm respectively to enhance screening and fill gaps.

Habitat Creation

4.6 The following is taken from the Peter Quinn Associates - Outline Landscape Proposals (21/533/01 A). This plan also presents the specification of the habitats to be created.

Landscape Design Principles

GENERAL

4.7 The approach to the landscape design of the site is to preserve and enhance its best elements and improve those that are either incongruous within the existing setting, or incompatible with the proposed residential redevelopment of the site.

4.8 The intention is to establish a landscape which creates a harmonious environment for existing and future residents whilst offering significant improvements for wildlife. The landscape has been designed to reflect and improve on existing local character.

- 4.9 Where there is opportunity within public areas along the southwestern and northwestern boundaries, existing trees and significant shrub groups will be retained and other large-growing native trees and shrubs planted. It is intended that the resultant green edge along these important boundaries will provide a significant and attractive foil to the development.
- 4.10 Elsewhere in the site, other public areas and front gardens will feature attractive landscaping designed and specified to provide long-term structure that can be easily maintained. Shrubs and perennials within front gardens have been selected to create a domestic character appropriate to the proposed residential setting.
- 4.11 The masterplan proposes a very significant increase in tree numbers. The choice of species has been guided by the eventual size of the tree, with large-growing native trees predominating around the southwestern and northwestern boundaries. Elsewhere within the site, a mixture of native and exotic trees will be specified as appropriate to their situation, with rear gardens featuring local varieties of dessert fruit trees on large-growing rootstock.
- 4.12 Wildflower meadow areas within public open spaces will be seeded and maintained as spring meadow to enhance their ecological value, whilst providing mown grass to coincide with the peak of use during the summertime.
- 4.13 The proposed landscape will lead to a significant and welcome greening of the site, which it is hoped will become an asset to the local area. An outline of the proposals is described below.

ADVANCED STOCK TREES

- 4.14 The maidens, feathered and standard trees to be planted where indicated. All advanced stock trees to conform to BS 3936.
- 4.15 UK native trees to be sourced from suppliers who are signed up to the UK Sourced and Grown Assurance Scheme and grown in the UK from UK-sourced seed. Native trees of species not available from UKSG suppliers should be labelled with the countries of origin (ie source country of stock and each country where grown).
- 4.16 Container-grown trees (CG) to be supplied in a container at least as large as the specified pot and kept moist at all times. Container-grown trees to be supplied in the containers in which they have been growing for a minimum of 6 months. Rootballed trees to be supplied with rootball wrapped within hessian (burlap) and kept moist between lifting and planting. Rootballs must be well-rooted through and appropriate to the age, size and species of tree. Rootballs should be supported by wire/timber as appropriate. Wire support to be removed at the time of planting. Hessian to be cut to allow free growth of roots or removed at the time of planting. All other trees to be supplied with roots wrapped in damp straw inside a black polythene bag min 130 microns thick. All trees supplied or planted outside planting season (Nov-March) to be container grown.
- 4.17 Large rootballed trees (>/= Standard) to be secured with Platypus rootball fixing system (Plati-Mat) or similar and approved, of the size appropriate to the tree (refer to manufacturer). All smaller rootballed trees, feathered trees and maidens to be planted with single short (1200mm long, 700mm above ground) stake. Stake to be tanalised softwood minimum 50mm cross section and driven into ground at an angle of c.45° to cross tree stem at c.400mm above GL. Stem to be secured to stake with light-duty rubber tree tie & spacer. Stake to be angled in order to brace the tree against the prevailing wind.

- 4.18 All other trees to be planted with 2 short stakes (1500mm long, 600mm above finished ground level) with crossbar, tree tie & spacer. Stakes to be Robinia, sweet chestnut or pressure-treated softwood min 75mm diameter installed vertically into base of pit (before tree is planted) with 900mm below finished ground level.
- 4.19 All trees to be planted in pit minimum 1m diameter by 600mm deep with 60g sterilised bonemeal incorporated into backfill of each tree. Backfill to be topsoil. Do not use compost in backfill except incorporated Mycorrmix Planting Compost mulch as described under "General" above.
- 4.20 Trees to be planted in position shown on plan. When it is not possible to plant in this position the contractor should refer back to developer for instruction.
- 4.21 All trees to be planted with "Root Rain Urban" product by Greenleaf.
- 4.22 Soil around all trees to be watered with 60 litres of water per tree immediately after planting to ensure settling of soil around roots/rootball.
- 4.23 All trees located within 3m of paved surfacing or a wall to be planted after "Reroot" 600mm ribbed sheet (www.greenblue.com) has been installed to 600mm depth along the edge of the paving/wall. Sheet to extend minimum 2m in either direction from the point on the edge of the paving/wall nearest the tree.
- 4.24 If the client advises that there is a significant likelihood of rabbit browsing, all trees to be protected immediately upon planting with recycled plastic mesh (mesh size 40 x 20mm max) to protect tree from ground to min 600mm above GL. Mesh to be attached to both sides of double tree stakes so that there is a minimum 50mm gap between trunk and mesh. For single tree stakes the mesh is to be formed into a cylinder of minimum diameter 300mm and securely attached to two smaller stakes (min. 25mm Ø, 900mm long, 600mm above ground) so that the tree is approximately central. The mesh is to be fixed so that there is no gap between it and the soil surface.
- 4.25 All trees planted in grass to be protected with Tom's Strimmer Guard and with 1.2 x 1.2m Biodegradable Mulchspat and fixings by Greenfix (www.greenfix.co.uk) installed after any remaining sward has been sprayed with translocated herbicide in a circle of 1.5m diameter. Sprayed circle to be covered with 75mm settled depth of composted BARK mulch (particle size 20-75mm) after mulchspat is installed.
- 4.26 Proposed foundation types and depths should be specified in line with NHBC guidelines on tree planting in relation to foundations to take into account existing and proposed tree species and soil shrinkability. The foundation depth of existing buildings and walls on and adjacent to the site should also be checked to ascertain the suitability of proposed trees.
- 4.27 Where dessert fruit trees are to be planted, these will be varieties bred or traditionally grown in the local area at the largest available size. If vigorous rootstock is not available then refer to client. If size specified is not available then use largest available size. If vigorous rootstock is not available then refer to client. Do not use smaller rootstocks.

HEDGES

- 4.28 Hedges to be planted at 6 or 7 plants per metre (as appropriate to species). Hedges to be arranged in a double staggered row with 45cm between rows. Unless otherwise specified, where a number of species/varieties are specified within a polygon (discrete area of a planting bed enclosed by lines), each type of plant should be well distributed and evenly spaced across the polygon in single species groups (ssg) of 1-3.

MIXED SHRUBS & PERENNIALS WITHIN GARDENS & ADJACENT AREAS

- 4.29 Beds to be planted with 3 - 6 plants per square metre (as appropriate to species and situation).
- 4.30 All trees and shrubs to conform to BS 3936.
- 4.31 All plants to be supplied at the size stated or greater. Undersized stock, unless expressly approved by the client, will be rejected and replanted with the specified stock at the Landscape Contractor's own cost.
- 4.32 Plants labelled CG to be supplied container grown in minimum 3 litre pots unless otherwise stated. All plants labelled BR to be supplied bare root. If bare root stock is not available or if planting takes place beyond the bare-root planting season, all such plants should be supplied and planted at the height specified as container grown stock as above. Herbaceous perennials supplied in the growing season should support growth of a height and breadth that matches the pot size.
- 4.33 UK native shrubs and young trees to be sourced from suppliers who are signed up to the UK Sourced and Grown Assurance Scheme and grown in the UK from UK-sourced seed where applicable. Species not available from UKSG suppliers should be labelled with the countries of origin (ie source country of stock and each country where grown).
- 4.34 All plants to be pit planted with 30g sterilised bonemeal incorporated into backfill.
- 4.35 Soil around all plants to be watered with 10 litres of water per plant immediately after planting to ensure settling of soil around roots/rootball.
- 4.36 All planting beds to be covered with 75mm settled depth of composted BARK mulch. Particle size to be 20-75mm. Bark to be cleared from leaves (including dormant herbaceous crowns) to leave plant wholly visible. Beds within or at edge of significant gravel areas to be mulched with gravel rather than bark.
- 4.37 If the client advises that there is a significant likelihood of rabbit browsing, all shrub and seedling stock beyond front gardens and contiguous shrub beds, to be protected immediately upon planting as follows:

Single-stemmed shrub and seedling stock to be protected with 600mm clear plastic spiral rabbit guard supported by a single bamboo cane.

Multi-stemmed or bushy stock to be protected with cylinder of recycled plastic netting guard 600mm high 300 diameter (mesh size max 40x20mm) secured by two bamboo canes. Guards to be fixed so that there is no gap between guard and soil surface.

NATIVE TREE AND SHRUB BED

- 4.38 A core mix of native trees to be planted at 0.5/sqm in single-species groups of 5-10 in gaps between existing trees where indicated
- 4.39 Between 2 and 4 weeks prior to initial herbicide application, all vegetation earmarked for removal within proposed areas of planting within public open space, to be cut to within 50mm of ground level and removed to compost area (as agreed on site).

Planting: All Beds

- 4.40 Ensure that there is a minimum topsoil depth of 4500mm across all tree and shrub beds.
- 4.41 2 weeks prior to ground preparation works outlined below, all beds proposed for planting with shrubs, perennials and seedlings (including boundary hedges, front gardens and planting within POS) to be sprayed with systemic herbicide. In addition, a 1.5m diameter circle around proposed standard trees in grass is to be sprayed with systemic herbicide, centred on each individual plant.
- 4.42 Two weeks later, all beds are to be cleared of any remaining vegetation not shown on planting plan or described as being retained, including all shrubs, weeds, grass and other bulky vegetable matter. All bricks, wire, timber, plastic and other debris greater than 50mm in any dimension showing at the surface to be removed to tip. Do not use stone picking machinery.
- 4.43 All beds (excluding native tree and shrub beds but including a 1m diameter circle around proposed individual trees and scrub in grass) to be spread with 75mm Maxwell Mycological Mycorrmax Planting Compost (ALS) before planting/tree pit excavation.
- 4.44 All small beds to be hand dug to a depth of 300mm to incorporate compost and to break up any compaction. Larger beds should also be hand dug to 300mm or ripped (to a depth of 450mm at 600m centres) if preferred. As the native topsoil is clayey, no rotovators or similar machinery shall be used in any planting beds. Do not use any machinery under tree canopies.
- 4.45 All beds within and adjacent to front gardens to be raised to level of adjacent kerb as necessary with topsoil from site. After planting, before bark mulching, all beds to be forked over by hand to relieve surface compaction.

SHORT GRASS

- 4.46 Grassed areas to be seeded as follows: Short mown grass in public areas to be seeded with Emorsgate mix EM1 "Flowering Lawn Mixture".

WILDFLOWER SEEDING

- 4.47 Areas annotated as "wildflower meadow" to be sown with Emorsgate mix EM3 "Special General Purpose Meadow Mixture" within the southwestern and northwestern public open spaces at a rate of 4g/sqm.
- 4.48 Seed and detailed sowing advice available from www.wildseed.co.uk (Limes Farm, Tilney All Saints, Kings Lynn, Norfolk, PE34 4RT. Tel 01553 829 028).

Preparation and sowing

- 4.49 All areas to be seeded to be cultivated by harrow or with fork, spade and/or rake to break up the surface of the soil to produce a fine tilth. Rotavators and other power cultivators shall not be used for any operation. Use of such machinery is likely to destroy topsoil structure and produce a capped layer which could impede drainage and set back germination and subsequent establishment. Do not use machinery of any sort beneath canopy of existing trees or within 2m of centreline of existing hedges where present.
- 4.50 Allow a fallow period of 2-3 weeks after cultivation for weed seeds to germinate and kill with systemic herbicide.
- 4.51 When topsoil is neither too dry nor so moist that the structure is damaged by machine passage, grade to smooth, flowing contours, removing all minor hollows and ridges.
- 4.52 Unless otherwise stated, finished levels after settlement to be level with adjoining paving, kerbs, manholes etc.
- 4.53 Rake to a true, even, surface to produce a suitable seedbed. Remove clumps of vegetation and other objects brought to the surface larger than 100mm in any dimension. Do not use stonepicking machinery in this operation as this will destroy soil structure.
- 4.54 Obtain approval of appearance of prepared soil areas before seeding.
- 4.55 Sow seed at a rate of 4g/sqm during March or September weather and soil conditions permitting. Inform Landscape Architect/client of intention to sow. Do not sow without Landscape Architect/client approval.
- 4.56 Spread seed evenly in two equal sowings in opposite directions. Mix with fine sand to ensure the correct sowing rate.
- 4.57 Do not cover or incorporate the seed. Firm with Cambridge roller immediately after sowing.

Timing of planting/seeding

- 4.58 Please note that all of the landscaping is to be installed during the first planting/seeding season after the completion of the development phase.

Management and Monitoring

Hedges

- 4.59 Ensure newly planted hedges are suitably cared for to enable successful establishment into a dense hedge that can be suitably maintained for both ornamental or wildlife value.
- 4.60 Routine operations will involve: watering at times of drought, ensuring sufficient water is applied to ensure trees remain healthy; removing shrub shelters after establishment of native hedgerows; pruning/clipping and re-shaping hedge species; removing weeds; hoeing or forking over beds; fertilising; topping up mulch; monitoring for pests and diseases; and replacing dead or dying specimens.

- 4.61 New whips will be checked regularly and any damaged or dead whips replaced. Management practices will include laying the hedges to encourage bushy growth low down and trimming only every two years or less. Management will be carried out in January and/or February only, avoiding periods of hard frost. Cuttings would be removed from the edge of the hedge after cutting. Ensure replacement planting is undertaken to the original specification into well-prepared ground.
- 4.62 Garden hedges will be under the control of the new occupants.

Wildflower Meadow

- 4.63 The main aims are to manage and enhance the grassland habitat by maintaining and then increasing floristic diversity. This will be achieved through the planting schedules and management detailed below followed by monitoring of the grassland communities.
- 4.64 In the first year of establishment, cutting regularly will reduce the mulching effect of fast growing species on the less competitive species, thereby increasing the diversity of the sward. Cutting and removal of arisings will result in much better establishment of the desirable species. This preferred method can also be done less frequently. The material needs to be removed from the habitat to avoid the build-up of nutrient levels.
- 4.65 In the first year, the first cut would be taken in early May to a height of 5 cm. Then for the second cut in the first year, the grassland would be cut late July/early August. This would be cut and left to dry and then turned at least once before bailing to encourage seed drop. A final cut in the first year would be undertaken approximately a month after the second cut. The removed materials would be bailed to encourage seed drop for the following year. The cuts would be made to around 5 cm height above ground.
- 4.66 In the second year and onwards the grassland would be managed with one or possibly two cuts per year, one in late July and possibly one in autumn in the event regrowth is vigorous. All arisings would be removed to reduce the available nutrients in the soil to allow a greater species diversity to develop. On no account would fertilisers be used. The grassland would be monitored biennially for the first five years after establishment by assessing the grassland in July before the cut; the results of this monitoring will inform whether a second cut is carried out that year.
- 4.67 Bare areas and areas of dead grass which become apparent, should be made good by over-seeding at the earliest available opportunity.
- 4.68 The grassland will be maintained to ensure the absence of invasive non-native species (as listed on schedule 9 of WCA, 1981). Combined cover of species indicative of sub-optimal condition and physical damage of the grassland habitat will account for less than 5% total area. On-going management will maintain a varied sward height with at least 20% of the sward less than 7 cm and at least 20% more than 7 cm.

Shrubs

- 4.69 Planting within and around the buildings and roads will be suitably cared for to enable successful establishment; to maintain growth and a high aesthetic appearance; and prevent planting beds becoming overgrown and untidy.

- 4.70 Routine operations will involve: watering at times of drought, ensuring sufficient water is applied to ensure shrubs remain healthy; pruning/clipping and re-shaping species to encourage bushiness; removing weeds; hoeing or forking over beds; fertilising; topping up mulch; monitoring for pests and diseases; and replacing dead or dying specimens as soon as possible when growing conditions permit.
- 4.71 When shrubs start to overlap or dominate less vigorous species, it may be necessary to remove some individual plants to retain the character of the bed. Thinning should take place as required in a logical process over several stages.
- 4.72 Monitor and replace failed planting with new equivalent plants between October and March or later if containerised stock is used and weather conditions permit. Dead head flowering shrubs following the flowering period to promote further flowering. NB: - Remove arisings from site.

Trees

- 4.73 To ensure new tree planting is managed to enable its successful establishment, and to promote healthy growth and attractive form.
- 4.74 Routine operations will involve: watering at times of drought, ensuring sufficient water is applied to ensure trees remain healthy; applications of slow release fertiliser; inspecting stakes and ties to trees and removing these as soon as trees are self-supporting to benefit tree establishment; re-firming trees in ground after strong winds, frost heave or other disturbances; monitoring and replacing failed planting with new plants between October and March; inspecting trees for pests and diseases; and forming and maintaining a mulch layer around the base of the tree to prevent weed competition.
- 4.75 Regular pruning will be avoided and tree canopies will be allowed to reach a minimum of 75% of expected canopy for their height and age.
- 4.76 Ensure replacement planting is undertaken to the original specification into well-prepared ground.

Gardens

- 4.77 Private gardens will be under the control of the new occupants.

Lighting

- 4.78 Street lights are proposed to light the new access roads. Private lighting on individual plots will utilise highly directional warm white LED lighting in down spots at 2.5 m high using warm white (2700 K) 8W LED lamps, 550 lumens with a 35 degree beam angle. These would be individually activated by PIR sensors on a 5 minute cut off to further reduce their impacts. These will assist in lighting only the areas where lighting is required and minimising light spill either directly or through reflected light, and lights would be positioned to avoid illumination of the boundary hedges.

Enhancement for Fauna

Installation of Bat Boxes

- 4.79 A total of 10 Schwegler 1FR Bat Tubes, or an equivalent, will be installed at the apices of gable ends of the buildings to provide new roosting sites for bats. A variety of locations and aspects have been chosen to maximise the chance of occupation, See Enhancement Plan for locations.

Installation of Bird Boxes

- 4.80 A total of 15 Schwegler Swift Nest Box 17C (double cavity), or an equivalent, will be installed into buildings across the site. The entrance should be at the apex of the wall height directly under the roof edge. It is very important to ensure that there are no protruding parts, roof parts, pipes, etc. below the entrance, as Swifts approach and fly away very steeply. Therefore, the area under the entrance should be unobstructed and lead directly to the ground. The double cavity nest box will be installed as it is advantageous that several nesting aids be installed for the formation of Swift colonies. See Enhancement Plan for locations. Five Schwegler Nest Box 2GR, or an equivalent, will be installed at heights between 2 – 4 m on retained mature trees in the north portion of the site.
- 4.81 All on-going management of habitats that could be utilised by nesting birds, hedges and woodland etc., would be carried out outside the bird nesting season of March to August inclusive. Bird boxes would be cleaned out at this time also to prevent a build-up of decaying nest debris. The specification of the bat boxes has been chosen to avoid the need for regular maintenance, which could disturb roosting bats, which requires a licence.

Dead wood piles

- 4.82 Four dead wood piles will be created within greenspace which will, in addition to landscaping of the site, will enhance the site for invertebrates with subsequent benefits to other fauna such as bats and birds.

Management Responsibilities

- 4.83 The implementation of this management plan will be the responsibility of Newland Homes who will instruct the strict adherence to this plan, with the available resources, as well as with assistance from area specialists where necessary to ensure that all measures are executed using best possible practice. All appointed sub-contractors will be approved as competent and knowledgeable in their position.

Mechanism for Ensuring Delivery

- 4.84 Upon completion of the habitat creation and establishment, a report will be produced and sent to the Council Ecologist detailing and confirming the works carried out including the provision of bat and bird boxes.
- 4.85 An information pack that will include a copy of this EDS, will be provided to the each of the new dwellings detailing the wildlife features that have been included in their new development and which species may be present, and the time of year that bird boxes can be cleaned out.

Schedule of Works

- 4.86 The following schedule of works sets out the annual management activities as well as the other planting on site and site monitoring following the first year of establishment.

Table 1: Schedule of works.

Action Required	Timings
Advanced Nursery Stock Trees	
Newly planted tree stock should be inspected for disease by a competent person and inform the Landowner or management company of a major deterioration in the condition of landscape element	Annually, in late autumn
Tree Surgery / Crown reduction as instructed by a qualified arborist. The works should only be carried out by qualified contractors with proof of adequate insurance cover	Annually inspect and monitor condition of trees - September
Pruning of epicormic or basal growth can normally be undertaken by unqualified personnel. Tree canopies will be allowed to reach a minimum of 75% of expected canopy for their height and age.	Annually - September
Weed control by ensuring no weed growth within a 500mm diameter of each tree. A suitable herbicide should be used in compliance with manufacturer's instructions	Annually – April and August
Fertilise using suitable slow release fertiliser as per manufacturer's instructions	Up until year 4 – April and August
Inspect guys, tree ties and stakes as scheduled and after strong winds. Replace loose, broken ties or decayed stakes to original specification	Every 3 months
Remove ties and stakes	3 years after planting
Remove dead trees and replace as per original specification	Annually until year 30
Water all trees during dry periods to ensure establishment, in the occurrence of a drought watering shall be undertaken by bowser and non-potable water	During dry periods until end of year 2 from implementation
Shrub and Tree Beds	
Newly planted stock should be inspected for disease by a competent person and inform the	Annually, in late autumn

Landowner or management company of a major deterioration in the condition of landscape element	
Tree Surgery / Crown reduction as instructed by a qualified arborist. The works should only be carried out by qualified contractors with proof of adequate insurance cover	Annually inspect and monitor condition of trees - September
Pruning of epicormic or basal growth normally be undertaken by unqualified personnel	Annually – September until year 5. Year 5 to 30 to be retained where appropriate to provide ecological resource.
Weed control by ensuring no weed growth within a 500mm diameter of each tree. A suitable herbicide should be used in compliance with manufacturer's instructions	Annually – April and August until year – ground flora allowed to establish thereafter.
Fertilise using suitable slow release fertiliser as per manufacturer's instructions	Up until year 4 – April and August
Inspect guys, tree ties and stakes as scheduled and after strong winds. Replace loose, broken ties or decayed stakes to original specification	Every 3 months
Remove ties and stakes	3 years after planting
Remove dead trees and replace as per original specification	Annually until year 5. Year 5 to 30 dead and decaying wood to be retained where appropriate to provide ecological resource. Additional planting where required.
Water all trees during dry periods to ensure establishment, in the occurrence of a drought watering shall be undertaken by bowser and non-potable water	During dry periods until end of year 2 from implementation
Wildflower Meadow	
Maintain grass area in a manner appropriate to the intended	Year 1 Monthly from August to October Year 2 Onwards Monthly from August to October
Cut and remove arisings if dense to 50mm high	
Leave grass sward meadow mix from spring through to late July/August to achieve a varied height before cutting to 50mm. Leave the 'hay' to dry and shed seed for 1-7 days then remove from site.	
Remove Litter and fallen leaves regularly to maintain a neat appearance	

Hedge Planting	
During dry periods till end of year 1 from implementation	Annually – March & August until year 4
Fertilise using suitable slow-release fertiliser as per manufacturer's instructions	Until year 4 – April and August
Prune hedge planting to reduce the height to 2.0m with vertical sides	January/February after year 2 and thereafter in alternate years.
Water buffer planting during dry periods to ensure establishment, in the occurrence of a drought order watering shall be undertaken by bowser and non-potable water	During dry periods till end of year 1 from implementation.
Defects	
Remove and replace plant losses to original specification	Annual – October until year 30
Notifiable weed growth and other injurious weeds or invasive plants / notifiable weed growth	
All areas affected shall be fenced off to minimise the possibility of unintentionally spreading the injurious weeds or invasive plants	May and August – Inspect, manage accordingly
Appoint specialist firm to undertake herbicide treatment to eradicate invasive plant	
Reviewing the maintenance and management plan	
Qualified personnel shall monitor / report and adjust the short-term maintenance plan and timings twice a year	Twice per annum
The long-term management plan including its objectives and deliverability should be reviewed every 5 years and should be adjusted as appropriate.	Every 5 years in perpetuity but for a minimum of 30 years

5.0 Plans

Enhancement Plan



