ECOLOGICAL DESIGN STRATEGY REPORT

at

Longley Farm
Longley Lane
Huddersfield
West Yorkshire
HD9 2JD

JCA Ref:
22888h/JF

Date of Report:
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JCA Limited
Arboricultural & Ecological Consultants

Quality Assurance

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This report has been prepared and provided in accordance with the *British Standard 42020: Biodiversity – Code of practice for planning and development* and the *CIEEM's Code of Professional Conduct*

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1. Introduction

1.1 Purpose of the Report

1.1.1 In January 2025, JCA Ltd were commissioned by **J & E Dickinson** to produce an **Ecological Design Strategy** (**EDS**) for a site located at **Longley Farm, Longley Lane, Huddersfield, West Yorkshire, HD9 2JD,** hereafter referred to as 'the site'.

1.1.2 This report will aim to enhance the site's value to wildlife, through the retention of any existing features of value to wildlife, the creation of new habitats and the provision of new roosting/nesting opportunities within the proposed development.

1.2 Terms of Reference

1.2.1 We have been instructed by **J & E Dickinson** to produce an **Ecological Design Strategy**.

1.2.2 For this purpose, I have been supplied with the following documents and plans:

- General Arrangements Plan (Drawing number: 842-XQL-00-00-DR-L-0110), Xanthe Quayle Landscape Architects, July 2025.

1.3 Scope of the Report

1.3.1 This report is compiled in accordance with guidance outlined in the *National Planning Policy Framework* (NPPF) so that the development takes into account the value of ecosystem services and enhance ecological networks.

1.4 Details of Proposed Development

1.4.1 The development proposed at this site is for the extension of the existing cottage cheese unit, extension of the existing track and new areas of hardstanding.

1.5 Site Description

1.5.1 The site is situated to approximately 2km south of Holmfirth, at grid reference: SE 14527 06157.

1.5.2 The site currently consists of other neutral grassland, modified grassland, rhododendron scrub, aquatic marginal vegetation, ruderal vegetation, introduced shrub, developed land; sealed surface, artificial unvegetated, unsealed surface, buildings, sparsely vegetated urban land, pond and a non-native and ornamental hedgerow.

1.5.3 The site is located in a rural area and is bordered on all sides by agricultural pastureland with the River Ribble, which is located approximately 500m to the east.

1.5.4 The development proposed on this site is the extension of the existing cottage cheese unit, extension of the existing track and new areas of hardstanding.

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1.6 Previous Studies

1.6.1 A Preliminary Ecological Appraisal with Preliminary Roost Assessment was conducted by ecus Ltd. in November 2024 (Ref: 24178).

1.6.2 A Biodiversity Net Gain Assessment – Feasibility stage was conducted by ecus Ltd. in November 2024 (Ref: 24178).

1.6.3 An Amphibian Survey & Report was conducted by JCA Ltd. in June 2025 (Ref: 22888b/GB).

1.6.4 A Bat Emergence Survey Report was conducted by JCA Ltd. in July 2025 (Ref: 22888b/RPS).

1.6.5 A Biodiversity Accounting Assessment was conducted by JCA Ltd. in December 2025 (Ref: 22888c/RPS).

1.6.6 An Ecological Impact Assessment was conducted by JCA Ltd. in December 2025 (Ref: 22888g/JF).

1.7 Responsible Persons

1.7.1 **Ecological Responsibility**

JCA Ltd. are the organisation responsible for the production of this EDS. JCA Ltd. report on both ecological and arboricultural issues throughout the UK. All surveys and reports are undertaken and compiled in accordance with CIEEM's Professional Code of Conduct and the relevant survey guidance.

1.7.2 **Landowner and Land Manager**

The landowner and manager responsible for the site is **R J Dickinson**

1.7.3 **Management Organisation(s)**

R J Dickinson is responsible for the implementation of the EDS.

1.7.4 **Local Planning Authority (LPA)**

Kirklees Council are the LPA responsible for reviewing the EDS.

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2. Local Biodiversity Action Plan

2.1.1 If possible, JCA Ltd aim to incorporate Local Biodiversity Action Plan (LBAP) habitats within our enhancement plans. We also aim to attract and support LBAP species, through either directly planting LBAP floral species, or creating habitats that will attract these species. The LBAP that covers **Longley Farm** is the Kirklees BAP (KBAP).

2.1.2 The habitats listed within the KBAP can be seen below **in Table 1.**

Table 1: Habitats listed under KBAP.

Habitat	Key geographical areas in Kirklees
Arable field margins	Pennine foothills
Blanket bog	Uplands
Hedgerows	Pennine foothills
Inland rock outcrop and scree habitats	Valley slopes and quarries in any area
Lowland dry acid grassland	Valley slopes
Lowland heathland	Valley slopes
Hay meadows	Pennine foothills and mid-altitudinal grasslands
Lowland mixed deciduous woodland	Vally slopes and Pennine foothills
Open mosaic habitats on previously developed land	Urban areas
Ponds	Relevant to occurrence of protected species (white-clawed crayfish, great crested newt, water vole *L. natans*)
Reedbeds	Floodplain
Rivers	Floodplain
Traditional orchards	Pennine foothills
Upland flushes, fens and swamps	Uplands
Upland heathland	Uplands
Upland mixed Ashwood	Valley slopes (upland): component of upland oak woodland
Upland oak woodland	Uplands
Wet woodland	Floodplain: also, component of lowland mixed deciduous woodland and upland oak woodland
Wood-pasture & parkland	Pennine foothills and valley slopes
Scrub	Primarily valley slopes and Pennine foothills but can occur elsewhere. Includes open mosaic habitats on previously developed land (mostly in urban areas)
Other semi-natural grassland (wet/rush pasture and rough grassland)	Mid-altitudinal grasslands and Pennine foothills
Riverine	Floodplain: corridors include reedbeds and rivers

2.1.3 The species listed within the KBAP can be seen below in Table 2.

Table 2: Species listed under KBAP.

Group	Common name	Scientific name
Birds	Common bullfinch	*Pyrrhula pyrrhula*
Birds	Common grasshopper warbler	*Locustella naevia*
Birds	Common linnet	*Linaria cannabina*
Birds	Common starling	*Sturnus vulgaris*
Birds	Eurasian curlew	*Numenius arquata*
Birds	Eurasian tree sparrow	*Passer montanus*

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Birds	Grey partridge	*Perdix perdix*
Birds	Hawfinch	*Coccothraustes coccothraustes*
Birds	Hedge accentor (dunnock)	*Prunella modularis*
Birds	House sparrow	*Passer domesticus*
Birds	Northern lapwing	*Vanellus vanellus*
Birds	Red grouse	*Lagopus lagopus Scotica*
Birds	Reed bunting	*Emberiza schoeniclus*
Birds	Ring ouzel	*Turdus torquatus*
Birds	Sky lark	*Alauda arvensis*
Birds	Song thrush	*Turdus philomelos*
Birds	Spotted flycatcher	*Muscicapa striata*
Birds	Tree pipit	*Anthus trivialis*
Birds	Twite	*Linaria flavirostris*
Birds	Willow tit	*Poecile montanus*
Birds	Wood warbler	*Phylloscopus sibilatrix*
Birds	Yellow wagtail	*Motacilla flava*
Birds	Yellowhammer	*Emberiza citrinella*
Invertebrates	Northern wood ant	*Formica lugubris*
Invertebrates	Small heath butterfly	*Coenonympha pamphilus*
Invertebrates	Wall brown butterfly	*Lasiommata megera*
Invertebrates	White-letter hairstreak butterfly	*Satyrium w-album*
Fish	Atlantic salmon	*Salmo salar*
Fish	Brook lamprey	*Lampetra planeri*
Fish	Brown trout	*Salmo trutta*
Fish	European eel	*Anguilla anguilla*
Fish	River lamprey	*Lampetra fluviatilis*
Amphibians	Common toad	*Bufo bufo*
Amphibians	Great crested newt	*Triturus cristatus*
Reptiles	Adder	*Vipera berus*
Reptiles	Common lizard	*Zootoca vivipara*
Reptiles	Grass snake	*Natrix natrix*
Reptiles	Slow worm	*Anguis fragilis*
Terrestrial mammals	Brown hare	*Lepus europaeus*
Terrestrial mammals	Brown long-eared bat	*Plecotus auritus*
Terrestrial mammals	Mountain hare	*Lepus timidus*
Terrestrial mammals	Noctule bat	*Nyctalus noctula*
Terrestrial mammals	Otter	*Lutra lutra*
Terrestrial mammals	Polecat	*Mustela putorius*
Terrestrial mammals	Soprano pipistrelle	*Pipistrellus pygmaeus*
Terrestrial mammals	Water vole	*Arvicola terrestris*
Terrestrial mammals	West European hedgehog	*Erinaceus europaeus*

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3. Retention of Ecologically Valuable Features

3.1 Pre-development

3.1.1 For a comprehensive description of the site's current ecological value please see the accompanying Ecological Impact Assessment (EcIA) report produced by JCA Ltd. (Ref: 22888g/JF). A summary of the habitats and features present in this report can be seen below.

The site consists predominantly of the following habitats.

3.1.2 g3c – Other neutral grassland: 100 – Grazed, 522 – Native.

There are two areas of other neutral grasslands present on the center and east of the site. Both are dominated by native grass and wildflower species, the grassland on the south of the site has been used for grazing.

3.1.3 g4 – Modified grassland: 32 – Scattered trees, 108 – Frequently mown.

There is an area of modified grassland on the north and center of the site. The grassland has a very short sward and is dominated by rye grasses and clover. The grassland is frequently mown and contains scattered trees.

3.1.4 h3g – Rhododendron scrub: 32 – Scattered trees, 523 – Non-native, 524 – Invasive non-native species, 532 – Scattered grass.

There is an area of rhododendron scrub on the northeast of the site. The scrub is dominated by non-native species: pontic rhododendron (which is an invasive non-native species) and cherry laurel. There are several scattered trees and scattered grasses.

3.1.5 f2d – Aquatic marginal vegetation: 14 – Scattered rushes, 81 – Ruderal or ephemeral

There are areas of aquatic marginal vegetation on the banks of the pond on site which is dominated by reed grass and contains scattered rushes.

3.1.6 u1 – Urban: 81 – Ruderal or ephemeral.

There is a small area of ruderal vegetation on the centre of the site.

3.1.7 u1 – Urban: 523 – Non-native, 847 – Introduced shrub.

There is a small area of introduced shrub on the north of the site. The shrubs are composed of Japanese acuba *Aucuba japonica* only.

3.1.8 u1b – Developed land; sealed surface

There are areas of developed land sealed surface on the north of site, in the form of access to the existing buildings on site.

3.1.9 u1b5 – Buildings.

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There are six buildings on site. Building 1 is the only building to be impacted by the proposed development. The building is a single story constructed of traditional stone with a single pitched roof made of metal. There are wooden fascia boards on east and west elevations.

3.1.10 u1c – Artificial unvegetated, unsealed surface.

There is a farm track constructed of compacted hardcore on the east of the site and an area that has been recently cleared on the south of the site.

3.1.11 u1f – Sparsely vegetated urban land: 202 – Young trees – self set, 203 – Mature tree, 510 – Bare ground, 532 – Scattered grass.

There is an area of sparsely vegetated urban land present on the west of the site.

3.1.12 r1g – Other standing water: 41 – Pond (non-priority).

There is a pond at the centre of the site.

3.1.13 h2b – Non-native and ornamental hedgerow: 532 – Non-native, 829 – Vegetated garden.

There a single non-native and ornamental hedgerow on the north of the site, bordering a vegetated garden which is adjacent to site. The hedgerow contains mixed species, the vast majority of which are non-native species.

3.1.14 The site has the potential to support generalist invertebrates, amphibians, commuting/foraging badgers, commuting/foraging and roosting bats, nesting birds, commuting brown hare and hedgehog.

3.1.15 Pontic rhododendron *Rhododendron ponticum* was identified on-site in the scrub habitat.

3.2 Features to be Retained, Enhanced and Protected

3.2.1 The Proposed Development will see the retention of other neutral grassland, developed land, introduced shrub, all urban trees habitats and the non-native and ornamental hedgerow on-site to facilitate the development.

3.2.2 The Proposed Development will see the enhancement of the modified grassland (on and off site), rhododendron scrub and pond (non-priority) on-site to facilitate the development.

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4. Invasive Weed Eradication

4.1.1 Invasive plant species are those plants listed under Schedule 9, Part II of the Wildlife and Countryside Act 1981 (as amended) or described on the Non-Native Species Secretariat (NNSS) website. Invasive species include pontic rhododendron *Rhododendron ponticum*. Under the Wildlife and Countryside Act 1981 (as amended) it is an offence to plant or cause the spread of Invasive Plant Species in the wild and therefore it is a legal obligation to remove them.

4.1.2 Control of the pontic rhododendron *Rhododendron ponticum* on site should be dealt with prior to or during the construction process. The plants should be completely removed as part of the re-development to prevent their further spread throughout the site and into surrounding areas. Details of the measures required to control invasive plant species on site should be detailed in a separate report prior to commencing works on site.

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5. Habitat Creation

5.1 Summary

5.1.1 As the site contains only habitats of low conservation value, there is scope to enhance the sites wildlife value post development.

5.1.2 The proposed development will see the creation of the following habits:

- Other neutral grassland
- Artificial unvegetated; unsealed surface
- Bare ground
- Developed land; sealed surface
- 2 Individual trees (on-site)
- 24 Individual trees (off site)

5.1.3 The positions of the proposed new planting can be seen in **Appendix 1**.

5.2 Grassland Planting

5.2.1 Setting aside areas of grassland for wildflower planting would be beneficial to local invertebrate populations, particularly pollinators such as bees, butterflies, and moths. Increased invertebrate abundance would then benefit species that feed on invertebrates, such as birds and bats.

5.2.2 Species Selection: The species chosen include those that are shade tolerant as they will be subject to a degree of shading by the surrounding trees. Other species are those more typical of wildflower grassland planting, such as those that are nectar and pollen rich, and so will attract insects such as bees and butterflies. The grasses are visually attractive, and many are the host plant of butterfly species. It is anticipated that the insects that are attracted to the Site will then provide a food source for larger animals, thus encouraging species such as bats and birds to the site. The recommended seed mix is EM1 Basic General Purpose Meadow Mixture from Emorsgate Seed, sown at 40kg per hectare. A list of the species included within the seed mix can be seen below in Table 6.

Table 3: List of species in EM1 Basic General Purpose Meadow Mixture from Emorsgate Seeds.

Flowering Plants			Grasses		
Botanical Name	**Common Name**	**%**	**Botanical Name**	**Common Name**	**%**
Achillea millefolium	Yarrow	1.00	*Agrostis capillaris*	Common Bent	8.00
Anthyllis vulneraria	Kidney vetch	1.00	*Cynosurus cristatus*	Crested Dog's-tail	28.00
Betonica officinalis	Betony	0.40	*Festuca rubra*	Red fescue	24.00
Centaurea nigra	Common Knapweed	1.50	*Phleum bertolonii*	Smaller Cat's-tail	4.00
Galium album	Hedge bedstraw	0.40	*Poa pratensis*	Smooth-stalked meadow grass	16.00

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Galium verum	Lady's Bedstraw	1.50
Knautia arvensis	Field Scabious	0.40
Leontodon hispidus	Rough hawkbit	0.40
Leucanthemum vulgare	Oxeye Daisy	1.00
Lotus corniculatus	Birds-foot trefoil	0.60
Medicago lupulina	Black medick	1.00
Plantago lanceolata	Ribwort plantain	0.40
Plantago media	Hoary plantain	2.00
Primula veris	Cowslip	2.00
Prunella vulgaris	Selfheal	0.40
Ranunculus acris	Meadow Buttercup	0.40
Ranunculus bulbosus	Bulbous buttercup	1.60
Trifolium repens	White clover	4.00
	Total	**20**

Total	**80**

Planting Implementation: The key to creating sustainable, species-rich grasslands is to begin with a nutrient-poor base and then manage the land correctly.

Species-rich grasslands require much less management than amenity grassland. As they only require mowing twice a year, they will save a considerable amount of money in the long term.

It is recommended that the grassland planting is implemented after the completion of the development.

5.2.3 **Ground Preparation:**

Bare soil: If the area of ground to be converted into species-rich grassland is bare, then the following instructions should be implemented: At most sites, it is likely that the soil will have at one point been fertilised. To reduce fertility, remove the top 15 to 20 cm of topsoil to reveal the nutrient-poor subsoil. The nutrient rich topsoil should then be relocated elsewhere on site, i.e. in the garden spaces and shrub beds. Alternatively, a layer of the unearthed subsoil can be excavated and placed over the topsoil. This method will inhibit the growth of any weeds present in the topsoil. Another option is to dilute the topsoil by mixing in poor quality material such as crushed builders' rubble or spoil. Then, using a fork, break up the soil and rake the proposed seedbed to produce a fine, firm tilth. Remove any large stones and root fragments.

Existing Grassland: If the area of ground to be converted into species-rich grassland is an existing area of grassland, then the following instructions should be implemented: During the autumn (September / October) cut the grass very short and rake the land over vigorously to create patches of bare ground. When the lawn is cut, the cuttings must be removed from the site to prevent the nutrients being returned.

Sowing: The seed mix should be sown during early autumn (late August/ September). The seeds should be sown sparsely, at a rate of 2 to 5 grams per square metre. Mix the seed with damp sand or sawdust in a ratio of 1 to 3 in order to ensure the seeds are evenly distributed across the seedbed. Scatter the seed by hand, gently rake over and then lightly roll or tread the ground to settle the seeds in the soil.

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Management: Following sowing, remove any annual and perennial weeds that appear. The grassland should remain nutrient poor, therefore, do not add fertilisers at any point. The grassland should be cut only twice a year; once in the spring (early March to early April) and once in the autumn (late June to the end of August). Always remove the cuttings to prevent nutrients returning to the soil. Never cut the meadow shorter than 5cm. This cutting regime will prevent the grassland from succeeding in to scrub and woodland, whilst allowing the flowers to set seed for the following year, thus producing a sustainable and viable habitat. If after 2 years the grassland remains species poor, the land should be prepared in the method described above in Existing Grassland and the seed mix re-sown.

Table 4: Prescriptions for the implementation, management, and monitoring of modified grassland.

	Year	Action	Prescriptions	Time of year
Implementation	0	Ground preparation	Bare ground: To reduce fertility, remove the top 15 to 20 cm of topsoil to reveal the nutrient-poor subsoil. The nutrient rich topsoil should then be relocated elsewhere on Site, i.e. in the garden spaces and shrub beds. Alternatively, a layer of the unearthed subsoil can be excavated and placed over the topsoil. This method will inhibit the growth of any weeds present in the topsoil. Another option is to dilute the topsoil by mixing in poor quality material such as crushed builders' rubble or spoil. Then, using a fork, break up the soil and rake the proposed seedbed to produce a fine, firm tilth. Remove any large stones and any root fragments.	Aug - Sep
			Existing grassland: During September or October cut the grass very short and rake the land over vigorously to create patches of bare ground. When the grassland is cut, the cuttings must be removed from the Site to prevent the nutrients being returned.	Autumn
	0	Sow seed / lay turf	Seed should be sown in spring (March to April) or early Autumn (late August to September) at a rate of 40kg per ha.	Mar - Apr or Aug - Sep
First Year Management	1	Mow grassland	Mow newly sowing modified grassland regularly (every 7-10 days) during first year of establishment. Cut to a height of 40-60mm and remove the cuttings to prevent nutrients returning to the soil.	Aug
Annual Management	2 - 5	Mow grassland regularly	Mow regularly as a lawn between 25mm to 40mm. To permit flowering, reduce mowing regime from late June and cut every 4-6 weeks. Cuttings should be collected and removed from the site.	All year

5.3 Shrub & Hedgerow Planting

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5.3.1 Species Selection: The species have been selected for their hardiness, amenity value and value to wildlife, either in the form of flowers, berries, seeds or shelter. Species that are poisonous such as Spindle have been avoided. All hedgerow species will be procured and planted in accordance with British Standards BS 8545:2014.

Table 5: Recommended native shrub and Hedgerow species.

Botanical Name	Common Name
Acer campestre	Field maple
Carpinus betulus	Hornbeam
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Fagus sylvatica	Beech
Ligustrum vulgare	Wild privet
Prunus avium	Wild cherry
Prunus spinosa	Blackthorn
Sambucus nigra	Elder

5.3.2 Shrub Planting Implementation: Recommendations for good shrub planting practice are given below:

- **Site Preparation**: It is recommended that the shrub planting scheme is implemented after the completion of the development. The shrub beds must be installed before the shrubs are planted, care should be taken during development to ensure that soils within these beds are not contaminated with cement or other building materials.

  Loosen the soil to eliminate compaction and improve drainage. If the existing topsoil is of poor quality, a fertile, freely draining soil with neutral or slightly acidic pH should be imported.

- **Planting Hole:** A planting hole will be excavated to around two and three times the diameter of the rootball and no deeper than the roots. The sides and bottom of the hole should be roughened with the spade or fork. Soil amendments such as compost should not be added as this has been shown to be detrimental to successful establishment.

- **Planting**: The top layers of compost should be scraped away when planting container grown plants, with the point where the roots flare out being near the soil surface. Place the shrub in the centre of the hole and carefully refill ensuring soil is positioned between and around all of the roots in order to eliminate any and all air pockets. Firm the soil around the shrub gently, avoiding compacting the soil.

- **Mulching**: Woodchip mulch should be applied around the base of each shurb to a depth of no more than 75mm. This will conserve water close to the soil surface and inhibit weed growth.

- **Timing**: Planting should be carried out during the dormancy period for deciduous species (November to February).

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- **Positioning**: Shrubs within the amenity bed should be planted 1m apart, ideally with at least 1 example of each species planted within each bed. In larger shrub beds, shrubs should be planted in small groups (3-4) of the same species. Whips within the hedgerow scheme should be planted in two staggered lines, 30cm apart, and distributed evenly.

- **Management**: Hedgerows should be cut only once every two to three years, **not** annually. Cutting annually will prevent hedgerow species from flowering and fruiting, thus reducing their wildlife benefit. The best time to cut hedgerows is during late winter.

Table 6: Prescriptions for the implementation, management, and monitoring of mixed scrub.

	Year(s)	Action	Prescriptions	Time of year
Implementation	0	Scrub planting	The scrub should be planted at 2m x 2m spacing. All newly planted trees and shrub are to be thoroughly watered immediately after planting. Woodchip mulch should be applied around the base of each shrub to a depth of no more than 75mm. This will conserve water close to the soil surface and inhibit weed growth.	Nov - Mar
Management of Newly Planted Scrub	1 - 3	Watering	Newly planted shrubs to receive 50 litres of water per week for the first three years.	Apr - Aug
	1 - 5	Weeding	Any weeds found growing around the newly planted trees should be removed annually in subsequent years after planting. This should be done by manually without the use of herbicides.	Aug - Sep
	1 - 5	Mulching	New bark mulch should be applied around the base of each tree to a depth of no more than 75mm	Mar - Apr
	1 - 5	Replacement of dead shrubs	Replace dead shrubs, as necessary.	Nov - Mar
	2 - 5	Remove stakes & ties	Remove stakes, guards and ties when they are no longer needed.	All year
Management Once Established	5+	Coppicing	Coppice scrub on rotation every 7-15 years. This is to be undertaken outside of bird nesting season (February to September).	Nov - Jan

5.4 Tree Planting

5.4.1 Species Selection: The chosen species are all native to Britain and are already found on site. These species have attractive autumnal colours, berries, flowers, interesting bark and leaves and as such, the site should be attractive throughout the seasons for both residents and wildlife. The species selected have a range of life expectancies in order to provide the site with long term tree cover. Poisonous species have been avoided, as have species which commonly drop branches. Where appropriate trees have been planted in order to provide useful screening (**Appendix 7 & 8**).

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Trees have been positioned where they will provide the highest amenity possible, and are unlikely to conflict with other trees or structures as they attain their mature height and spread.

5.4.2 Tree Specifications: The following table details the specification for all the replacement trees. Consideration is given to availability, immediate impact, ease of installation and likelihood of successful establishment.

Trees should be container-grown and selected according to guidelines BS: 3936: Part 1: 1992 - Nursery Stock. This will ensure that they are of good form and in good condition.

Table 7: Native deciduous trees.

Botanical Name	Common Name
Acer campestre	Field Maple
Crataegus laevigata	Midland hawthorn
Betula pendula	Silver birch
Fagus sylvatica	Beech
Malus domestica	Apple
Malus sylvestris	Crab apple
Prunus padus	Bird cherry
Quercus rubra	Oak
Sorbus aria	Common Whitebeam
Sorbus aucuparia	Rowan
Tilia cordata	Small-leaved lime

5.4.3 Tree Planting Implementation: Recommendations for good tree planting practice are given below:

- **Site Preparation:** It is recommended that the tree planting scheme is implemented after the completion of the development. This will avoid damage to new trees from construction hazards such as re-grading of soils near roots and mechanical damage to tree crowns.

- **Planting Hole:** A planting hole will be excavated by hand and will be twice the diameter of the rootball and of equal depth. The sides of the hole should be roughened with the spade. The new tree should be offered into the hole and backfilled using the original soil material. Soil amendments such as compost should not be added as this has been shown to be detrimental to successful establishment.

- **Staking**: Staking will be required in order to secure the tree and prevent losses within the first years of establishment. It may be necessary to angle the stakes in order to avoid damaging the rootball. All trees are to be staked at a height of no more than 1 metre.

- **Tree Ties**: Adjustable and flexible tree ties will be used. These are to be attached at a point no more than one third of the way up the stem. Ties should be inspected after one year and adjusted as required. Only if establishment is particularly slow should stakes remain in place longer than three growing seasons.

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- **Mulching**: Woodchip mulch should be applied around the base of each tree to a depth of no more than 75mm. This will conserve water close to the soil surface and inhibit weed growth

- **Timing**: Planting should be carried out during the dormancy period for deciduous species (November to February).

- **Tree Guards**: Spiral type guards are to be incorporated around the base of each stem in order to reduce pest damage throughout the winter months and to prevent mechanical damage from strimmers and mowers.

- **Future work**: After completing any future tree works such as pruning or felling, all deadwood should be retained on site and created into log piles in suitable and sheltered positions. This will then provide habitat for flora and fauna such as fungus, invertebrates and amphibians.

Table 8: Prescriptions for the implementation, management, and monitoring of individual trees.

	Year(s)	Action	Prescriptions	Time of year
Implementation	0	Tree planting	All newly planted trees are to be thoroughly watered immediately after planting. Woodchip mulch should be applied around the base of each tree to a depth of no more than 75mm. This will conserve water close to the soil surface and inhibit weed growth.	Nov - Mar
Management of Newly Planted Trees	1 - 3	Watering	Newly planted trees to receive 50 litres of water per week for the first three years.	Apr - Aug
	1 - 3	Weeding	Any weeds found growing around the newly planted trees should be removed annually in subsequent years after planting. This should be done by manually without the use of herbicides.	Aug - Sep
	1 - 3	Mulching	New bark mulch should be applied around the base of each tree to a depth of no more than 75mm	Mar - Apr
	1 - 5	Replacement of dead trees	Replace dead trees, as necessary.	Nov - Mar
	2 - 3	Remove stakes & ties	Remove stakes, guards and ties when they are no longer needed. This is usually done in year 2 and 3 but may be later if trees need additional time to establish.	All year

5.5 Aftercare

5.5.1 All newly planted trees and shrub beds are to be thoroughly watered immediately after planting and during any prolonged periods of dry weather.

5.5.2 Once planted, trees and shrubs should be inspected on an annual basis for signs of poor condition or damage. Any trees or shrubs that die within the first 5 years after planting will be replaced with trees or shrubs of the same species and size.

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5.5.3 Any trees or shrubs in a private garden will be the responsibility of the house owner in the future.

5.5.4 Trees and shrubs in public open spaces will be the responsibility of the managing agent for the site whether it is a private company contracted to do the work or the Local Authority. All tree and shrub works should be completed outside of the breeding bird period (March to August).

5.5.5 Any weeds found growing around the newly planted trees and shrubs should be removed annually in subsequent years after planting. This will ensure the uptake of valuable resources such as water, nutrients and light. This should be done by manually without the use of herbicides.

5.5.6 Tree ties should be inspected annually, and adjusted if required. Tree ties and stakes should be removed within three years of planting unless establishment is deemed to be unusually slow.

5.5.7 New bark mulch should be applied around the base of each tree to a depth of no more than 75mm, each year for at least the first three years. This will conserve water close to the soil surface and inhibit weed growth.

5.6 Wildlife Pond

5.6.1 The existing pond on site will be enhanced. This will be done by increasing the diversity of the vegetation in the pond which should in turn increase oxygen levels, improve water quality, clear turbidity and support a multitude of different invertebrate and amphibian species.

5.6.2 It is proposed to utilise floating platforms to increase the area available for planting.

5.6.3 Plant species selection: The chosen species are all native to Britain and non-invasive in nature. Many are nectar and pollen rich, and so will attract insects such as bees and butterflies. It is hoped that the insects that are attracted to the site will then provide a food source for larger animals, thus encouraging species such as bats and birds to the site. Pond plants are found in four zones. These are:

- Submerged
- Floating leaved
- Emergent – Grow in shallow water
- Marginal – Grow on the pond edge

5.6.4 Species Specifications: A list of the recommended species can be seen below in Table 9.

Table 9: List of pond plant species.

Marginals				Emergent		
Botanical Name	**Common Name**	**%**		**Botanical Name**	**Common Name**	**%**

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Agrostis stolonifera	Creeping Bent	0		*Alisma plantago-aquatica*	Water Plantain	3
Ajuga reptans	Bungle	0		*Butomus umbellatus*	Flowering Rush	7
Alopecurus geniculatus	Marsh foxtail	4		*Iris foetidissima*	Stinking Iris	3
Apium nodiflorum	Fool's watercress	0		*Mentha aquatica*	Water mint	5
Butomus umbellatus	Flowering Rush	6		*Myosotis Scorpiodes*	Water Forget-me-not	0
Caltha palustris	Marsh marigold	8		*Persicaria amphibium*	Amphibious Bistort	3
Cardamine pratensis	Lady's Smock	0		*Potentilla palustris*	Marsh Cinquefoil	0
Eleocharis palustris	Common Spike-rush	4		*Ranunculus aquatilis*	Water Crowfoot	2
Epilobium hirsutum	Great Willowherb	0		*Sagittaria aquatilis*	Arrowhead	7
Eupatorium cannabinum	Hemp Agrimony	3		*Sparganium erectum*	Branched Bur-reed	0
Filipendula ulmaria	Meadowsweet	0			**Total**	**30**
Geum rivale	Water Avens	1		**Submerged oxygenators**		
Juncus effusus	Soft Rush	0		*Callitriche stagnalis*	Water Starwort	5
Lychnis flos-cuculi	Ragged Robin	0		*Ceratophyllym demersum*	Hornwort	5
Lycopus europaeus	Gipsywort	3		*Myriophyllum spicatum*	Spike Water Milfoil	5
Lysimachia nummularia	Creeping Jenny	1		*Potamogeton lucens*	Shining Pondweed	5
Lythrum salicaria	Purple Loosestrife	0		*Zannichellia palustris*	Horned Pondweed	5
Myosotis scorpioides	Water Forget-me-not	2			**Total**	**25**
Persicaria hydropiper	Water pepper	0		**Floating-leaved**		
Potentilla anserina	Silverweed	2		*Hydrocharis morsus-ranae*	Frogbit	3
Pulicaria dysenterica	Common Fleabane	0		*Potamogeton natans*	Broad-leaved Pondweed	4
Stachys palustris	Marsh Woundwort	0		*Ranunculus aquatilis*	Water Crowfoot/Buttercup	2
Veronica beccabunga	Brooklime	0		*Urticularia spp*	Bladderwort	3
	Total	**35**			**Total**	**10**

5.6.5 In smaller ponds submergent/aquatic plants benefit from being planted in containers (aquatic baskets), the containers should be lined with hessian or polypropylene fabrics to prevent soil washing out. One plant per square metre should be sufficient.

5.6.6 Wildlife ponds don't need to be maintained every year. It is useful for invertebrates and breeding amphibians to have shelter. This includes fallen leaves and vegetation in the pond. Every 5 years, marginal vegetation should be cut back, to prevent it engulfing the pond. Light dredging of debris can also be undertaken every 5 years.

5.6.7 This should be conducted in two stages. The first cut should be made in Autumn to prevent dead or dying foliage entering the pond and decomposing, which can reduce oxygen levels. The second cut should be delayed until early spring, to allow insects and larvae to hibernate. It's important to leave any removed vegetation and debris by the pond edge for at least 24 hours, to allow any animals to return to the pond. The emergent stems should not be cut to less than 6 inches in height from the waters surface.

5.6.8 It is recommended that the pond is enhanced after the completion of the development. This will avoid damage to the pond from construction hazards. Care should be taken during development to ensure that soils surrounding the pond are not contaminated with cement or other building materials.

5.6.9 Access should be restricted to ensure the banks of the pond are not being degraded.

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6. Faunal Boxes

6.1 Summary

6.1.1 In total **2** bat boxes, **3** bird boxes, **1** hedgehog shelters, **3** insect shelters and **2** amphibian hibernacula have been recommended. The location of each faunal box to be erected can be seen in **Appendix 2**.

6.2 Bat Roosting Opportunities

6.2.1 All British bat species are protected by both UK and EU legislation. This is in response to the declines experienced by many bat species over the past century. The cause of the decline could be linked to a number of factors, including habitat loss, pesticide over-use, habitat fragmentation, loss of roost sites and roost disturbance.

6.2.2 Pipistrelles typically roost within structures, but also use tree holes and crevices, whereas noctules are primarily tree roosting species. Noctule and Soprano Pipistrelle are listed within the KBAP. The boxes incorporated into this enhancement plan are therefore aimed at attracting Soprano Pipistrelle and Noctule bats.

6.2.3 Box Selection & Positioning: There is a wide range of different bat boxes available, including both internal and external designs. External designs include the traditional wooden and woodcrete boxes. Bat boxes should be positioned at least 5m high, with their front facing south, southwest or southeast (as recommended by the BCT). This will allow each box to gain a different amount of warmth from the sun, creating a range of different environmental conditions for bats to choose from. The selected boxes should be constructed of woodcrete or similar in order increase their life expectancy. A range of different designs should be selected in order to increase the likelihood of bats roosting within the site.

6.2.4 Where lighting is required, conditions should be imposed to ensure the impact of the lighting on the bats is kept to a minimum. Lighting will be situated away from areas of both retained and new trees and shrubs. Any lighting should be of a low level of luminance. The use of low pressure sodium lamps or high pressure sodium lamps is recommended instead of mercury or metal halide lamps. Overall levels on site should be as low as planning permits. Lighting column height near hedgerows or trees should be kept to a minimum as this reduces the ecological impact. Where lighting can be directed downwards at a more acute angle, taller columns can be used. Please refer to the Guidance Note 08/23 Bats and Artificial Lighting at night.

Table 10: Suggested Bat roosting opportunities to be installed as part of the proposed development.

Bat Box	Description	Details
Schwegler 1FD Bat Box (or a comparable design) 1 on existing mature tree	The Schwegler 1FD has been developed specifically for smaller bats as both the interior and the type and size of the entrance hole match the requirements of smaller species.	Dimensions Height: 360mm Diameter: 160mm

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	It features a special layout inside, such as a domed roof, an increased interior height and two grooved internal wooden front panels with precise spacing between them. This model has proved highly effective as a nursing area. The front panel can be removed for cleaning and inspection. This box is designed to be sited on trees using the galvanised steel hanger and aluminium nail provided. Schwegler bat boxes are backed by conservation organisations, government agencies and forestry experts and have the highest occupation rates of all nest boxes. They are carefully designed to mimic natural roost sites and to provide a stable environment.	Weight: 4.8kg
Schwegler 2FN Bat Box (or a comparable design) 1 on existing mature tree 	The 2FN bat box has two entrances - one at the front and one at the rear against the tree. It has a domed roof to allow the bats to form roosting clusters for warmth, and an increased internal height. This design has proved highly successful with larger bat species including noctule *Nyctalus noctula* and Bechstein's bats *Myotis bechsteinii*. This bat box is also designed to be effective against small predators and excludes draughts and light. Due to the opening on the bottom, this bat box does not require cleaning. It is manufactured from long-lasting WoodCrete, which should last for at least 20-25 years.	Dimensions Height: 360mm Diameter: 160mm Weight: 4.9kg

6.3 Bird Boxes

6.3.1 In the UK there are approximately 600 species of bird, each occupying a different habitat and present in a different region of the country. A small number of these regularly visit gardens and will quickly adopt new nest boxes, but only when the right box design is selected and situated correctly. Each species prefers a specific nest box design, with different dimensions and hole sizes. It is recommended that a breeding bird survey is carried out on site to inform and produce a robust and tailored Biodiversity Enhancement Report for this site.

6.3.2 Standard bird boxes: Birds such as most tit species, tree sparrows and nuthatches prefer standard nest boxes with a small hole opening and a perch at the entrance. The size of hole can vary depending on the bird species.

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6.3.3 Open-sided boxes: Birds such as Robins, Wrens and Blackbirds will only nest in boxes with an open front design. These should be positioned within dense vegetation, below 2m high. Robins and wrens prefer smaller boxes (25 x 15 x 12 cm) and Blackbirds larger boxes (30 x 18 x 15 cm).

Table 11: Suggested Bird nesting opportunities to be installed as part of the Proposed Development.

Bird Box Model	Description	Details
Vivara Pro Seville 32mm WoodStone Nest Box (or comparable design) 2 on existing mature tree 	Unlike a traditional wooden nest box, these boxes will not rot away or deteriorate and are guaranteed for 10 years. This robust material safeguards against attacks from predators such as woodpeckers, cats and squirrels, whilst also providing a well-insulated interior with a consistent internal temperature (important for breeding). These 32mm hole nest boxes are suitable for blue tits, tree sparrows, house sparrows, great tits, blue tits, nuthatches, coal tits and pied flycatchers and they are available in brown, green or grey to complement both natural woodland and garden settings.	Dimensions Height: 310mm Width: 200mm Length: 200mm Weight: 6.9kg Entrance hole diameter: 32mm
Vivara Pro Barcelona WoodStone Open Nest Box (or comparable design) 1 on existing tree 	Unlike a traditional wooden nest box, these boxes will not rot away or deteriorate and are guaranteed for 10 years. This robust material safeguards against attacks from predators such as woodpeckers, cats and squirrels, whilst also providing a well-insulated interior with a consistent internal temperature (important for breeding). These open nest boxes are suitable for wrens, robins, spotted flycatchers, pied and grey wagtails, song thrushes and blackbirds.	Dimensions Height: 240mm Width: 190mm Length: 175mm

6.3.4 2 standard bird boxes and 1 open-sided boxes should be placed on suitable trees, in a sheltered position (**Appendix 2**).

6.4 Insect Shelters

6.4.1 Insects are the primary food source for many of the rare or protected animals that regularly visit gardens. Thus encouraging insects into a site will then attract their

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predators, such as birds and bats.

6.4.2 Many insect species will hibernate over winter in their adult state, such as butterflies, ladybirds and lacewings. In nature, these insects would hibernate within features such as leaf litter or other plant debris. However, gardeners tend to over-maintain their gardens, often tidying these features away in the autumn. Therefore, these species can be encouraged to stay at the site all year round by erecting suitably designed boxes (Kirby 2003).

6.4.3 **3** boxes should be placed on posts between 0.5 to 2m, in a sheltered position (**Appendix 2**). Examples of insect Shelter design can be found in **Appendix 5** and below.



6.5 Hedgehog shelter

6.5.1 Hedgehog numbers have declined by 90% over the past 50 years due to a number of factors including habitat loss, fragmentation and parasites. Providing shelter and a means of dispersal in gardens will encourage hedgehogs to visit the site and utilise the natural space.

6.5.2 Hedgehog shelters are simple to construct. Situate in a quiet corner of a garden, preferably under vegetation. Dried leaves or hay are placed inside for bedding (Bunnell, 2014).

6.5.3 Providing shelter for hedgehogs within green spaces will encourage this species to visit the Site and utilise the natural space. **2** hedgehog shelters should be placed in a sheltered position. Dried leaves or hay are placed inside for bedding (Bunnell, 2014). An example of a hedgehog shelter is shown below.

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6.6 Amphibian Hibernacula

6.6.1 Dead wood and a thick litter layer provides a moist stable environment for overwintering amphibians. Providing a deep litter layer (100mm or more) of mainly deciduous bark mulch artificially creates a litter layer. Composted bark mulch is even better as it compacts well and holds moisture more effectively.

6.6.2 Fallen dead wood under which newts can shelter and feed may be supplemented with cut logs. These can be placed directly on the ground or in a shallow excavation with spoil and turf in between and on top of the logs. Where possible, log piles should be positioned in shady places where sunlight will not allow the logs to dry out.

6.6.3 Stone, rock, clean brick rubble (without cement residues) and old or misfired bricks can be used in a similar way to logs to provide shelter and feeding areas. Building successful rock and log piles can be time consuming and requires careful attention to the timing of delivery and spreading of materials. As with log piles, stone can be placed in shallow excavations made by taking spoil to spread amongst and over the logs or stones. On clay or slow-draining soils, great care must be taken to ensure drainage is adequate and the refuge is not in a flood zone, as the lower part could become waterlogged in heavy rain.

6.6.4 The position for rubble heaps can be anywhere within 200 metres of a pond, but in general, the closer they are to the ponds, the better. Refuges that blend into the environment are best. Avoid unattractive, messy heaps which have the appearance of fly-tipping as these may generate complaints. Encouraging moss and grass to grow on wood/stone piles by adding soil to the top and inside of heaps may increase the humidity and stability of the environment.

6.6.5 **2** amphibian hibernacula have been recommended (**Appendix 2**).

6.6.6 An example of an amphibian hibernacula can be seen in **Appendix 7.**

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7. Conclusion

7.1 Retention of Ecologically Valuable Features

7.1.1 The site contains habitats of moderate conservation value but are deemed to be common in the local vicinity. The planting of species-rich grasslands, individual trees, shrubs, hedgerows and aquatic plants will mitigate for the lost habitats and increase foraging, sheltering and breeding opportunities for amphibians, bats, birds, invertebrates and hedgehogs.

7.2 Faunal Boxes

7.2.1 **2** bat boxes will be positioned around the site on suitably sized existing trees. 3 bird boxes will be erected onto suitably sized existing trees. **3** mixed insect shelter will be erected onto posts surrounding the pond, **2** hedgehog shelters will be situated in the proposed scrub habitat. Finally, **2** amphibian hibernaculum should be situated in a sunny spot around the pond. The recommended location of each faunal box can be seen in **Appendix 2**.

7.3 Management and monitoring

7.3.1 Monitoring of faunal boxes and wildlife features over a 5 year period is recommended. Monitoring is key to understanding how habitat and wildlife features are being used by wildlife on site after the development. Without monitoring, and effective and adaptive management a scheme can't be maintained and revised.

7.3.2 It is recommended that a full management plan is created to inform people what is required on site to maintain biodiversity. Management plans can also be useful at later stages for fund bidding, by demonstrating that the proposed actions are a product of a logical decision-making process.

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8. References

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Bat Conservation Trust (BCT). <http://www.bats.org.uk/>

Google Maps. **<**http://maps.google.co.uk/**>**

Multiple-Agency Geographic Information for the Countryside (MAGIC). <http://www.magic.gov.uk/>

National Biodiversity Network (NBN) Gateway. <data.nbn.org.uk>

Natural England. < http://www.naturalengland.org.uk/>

Nature on the Map. Natural England. <www.natureonthemap.org.uk>

Relevant Legislation:

Wildlife and Countryside Act 1981 <http://jncc.defra.gov.uk/page-3614>

Conservation (Natural Habitats, &c.) Regulations 1994 (The Habitats Directive) (Amended 2010) <http://www.legislation.gov.uk/uksi/2010/490/contents/made>

Countryside and Rights of Way Act 2000 <http://www.legislation.gov.uk/ukpga/2000/37/pdfs/ukpga_20000037_en.pdf?view=interweave>

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Appendices

Appendix 1: Proposed Development Plan

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LONGLEY LANE

LONGLEY LANE

EXISTING BUILDING

ANY EXISTING VEGETATION TO BE RETAINED

WETLAND EDGE

POND

WETLAND EDGE

FLOATING PONTOON

WADING POOL

WETLAND EDGE

PROPOSED EXTENSION

WETLAND EDGE

WETLAND EDGE

MAINTENANCE ACCESS PATHWAY

EXISTING SITE ENTRANCE

LONGLEY LANE

MAINTENANCE ACCESS PATHWAY

RETAINING WALL AS PER ENGINEER DESIGN

DUNFORD ROAD

+(289.17)

+(289.30)

+(288.43)

+(287.27)

+(286.57)

+(286.66)

+(287.13)

+(286.81)

+(288.88)

+(290.76)

+(290.47)
Water Level

+(294.07)
Bottom of Bank

+(294.18)

+(294.65)

+(294.30)

+(294.85)

+(297.80)

+(299.58)

+(297.33)

+(291.25)

KEY

Planning application boundary

Existing building extents

Existing boundary wall/ Low stone wall

Proposed sandstone wall

Proposed Extension

Proposed indicative levels (refer to Engineer)
FFL: Finished Floor Level TOW: Top of Wall
TOK: Top of Kerb BOK: Bottom of Kerb

Existing levels (in brackets)
FFL: Finished Floor Level TOW: Top of Wall
TOK: Top of Kerb BOK: Bottom of Kerb

Gradients - Indicative (refer to Engineer)
Proposed (underlined)
Existing (in brackets)

Fall of Ground

Post and Wire Fence

Proposed Footpath

Proposed Accessway: Heavy duty HGV trafficable cell system, seeded with low growing meadow

Proposed Enbankment Reinforcement: Flex MSE or similar Vegetated Wall System: Hydro seeded

Proposed Enbankment Reinforcement: Geogrid Planting

Proposed Maintenance Track ; Self-binding gravel or [illegible]

Proposed hedge planting

Proposed Marginal Aquatic Planting

Proposed Mown Grass

Proposed Low Scrubland

Proposed Rough Grassland

Proposed Native Meadow

Proposed Woodland Understorey

Extents of Pond & Wading Pool

Proposed Pontoon: Floating Wetland

Proposed Wading Pool Plug Planting

Proposed Sedum Green Roof

Existing Tree (Removed)

Existing Tree (Retained)

Proposed Tree

SCALE 1:200

0m 5m 10m

GENERAL NOTES:

1. Do not scale from this drawing.
2. All levels, dimensions & setting out to be checked & agreed on site.
3. All dimensions are in millimetres unless otherwise stated.
4. All drawings must be read in conjunction with all Landscape, Civil, Geotechnical & Structural Engineers, National Highways, British Waterways and Architectural Documentation.
5. The contractor shall be responsible for confirming the position of all existing services, structures and works including building set out, in and around the site, prior to the commencement of works.
6. Contractor to confirm all dimensions and levels with Landscape Architect, prior to commencing work and ordering materials.
7. The contractor is to protect all listed structures during works.
8. This drawing is copyright protected & may not be reproduced in whole or part without written authority.
9. Typical detail drawings are to be considered as design intent and not construction drawings. Selected Fabricators and Manufacturer's to provide fabrication drawings for XQLA approval

REFER TO:

XQLA Drawings:
842-XQL-00-00-DR-L-0110 - General Arrangement
842-XQL-00-00-DR-L-0200 - Sections
842-XQL-00-00-DR-L-0300 - Typical Junction Detail-
842-XQL-00-00-DR-L-0400 - Softworks Plan
842-XQL-00-00-DR-L-0401 - Typical Softwork Detail
842-XQL-00-00-DR-L-0402 - Tree Protection Plan

Architects Drawing:
104-110-Proposed Cottage Cheese Site Plan Rev B

Refer to Architect's drawings for building interface
Refer to Arboricultural & Topographical survey

-	-	-	-	-
PL04	251222	Draft Planning	EL	XQ
PL03	250917	BNG Update	EL	XQ
PL02	250915	Retaining wall added	KoH	XQ
PL01	250804	First issue	SK	XQ
REVISION	DATE	DESCRIPTION	DRAWN BY	APPRVD BY

DRAFT PLANNING

842_LONGLEY FARM, HOLMFIRTH
PROJECT

GENERAL ARRANGEMENT
DRAWING NAME

1:200 @ A0	JULY'25	S2	PL04
SCALE	DATE	STATUS	REVISION

842-XQL-00-00-DR-L-0100
DRAWING NO.

SK	KoH	XQ
DRAWN BY	CHECKED BY	APPROVED BY

Xanthe Quayle Landscape Architects
01484 841000 studio@xanthequayle.com
Globe Arts Studio, Slaithwaite, HD7 5AD. Reg: 08308689 xanthequayle.com

Appendix 2: Faunal Boxes Plan

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Site name & address

Longley Farm, Longley Lane, Huddersfield, West Yorkshire, HD9 2JD

Key

- Red Line Boundary

Faunal Box Wildlife Feature

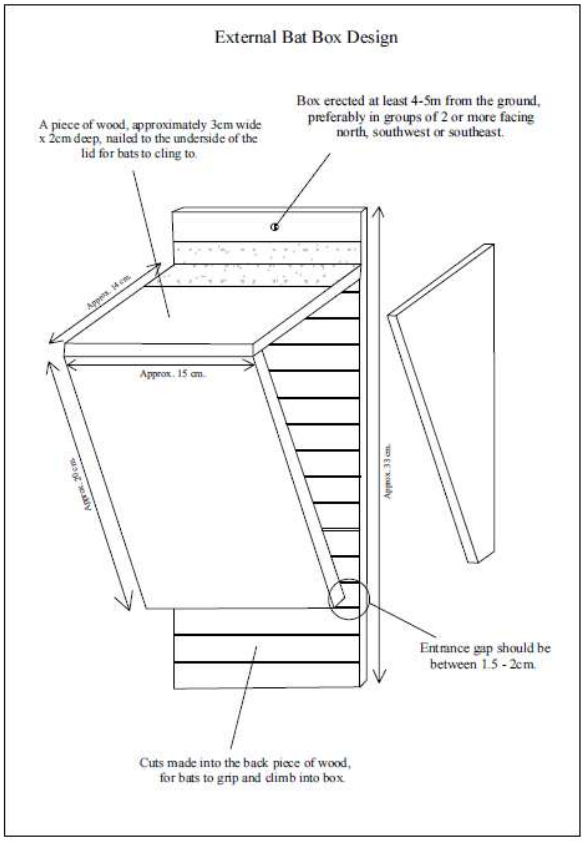
- Schwegler 1FD Bat Box (or a comparable design)
- Schwegler 2FN Bat Box (or a comparable design)
- Vivara Pro Barcelona WoodStone Open Nest Box (or comparable design)
- Vivara Pro Seville 32mm WoodStone Nest Box (or comparable design)
- Insect Shelter
- Amphibian Hibernacular
- Hedgehog Shelter

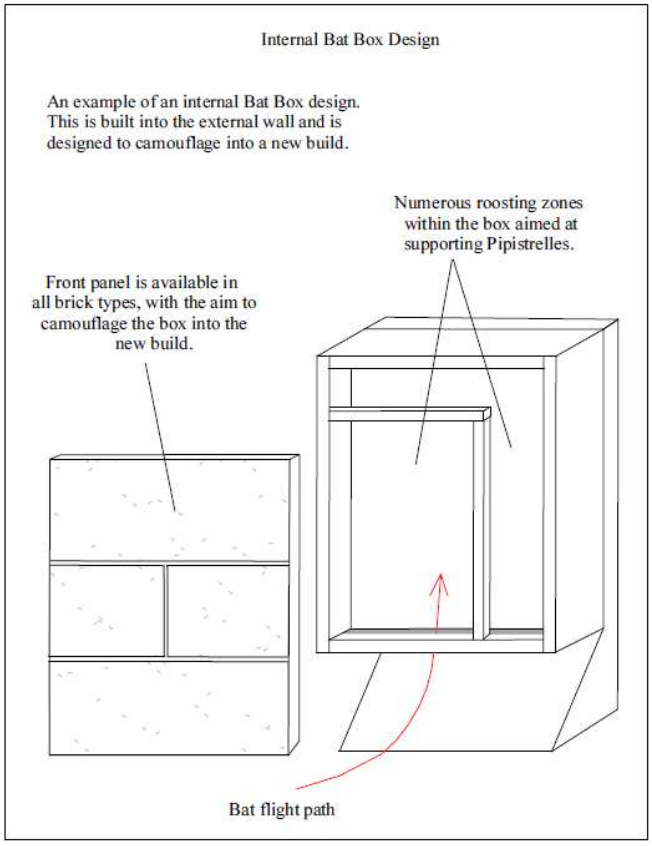
Scale 0 10 20 m

Site	Client
Longley Farm	J & E Dickinson
Project	**Author**
Ecological Design Strategy	JF
Plan ref	**Revision**
22888h/JF	0

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Appendix 3: Examples Artificial Bat Box Designs

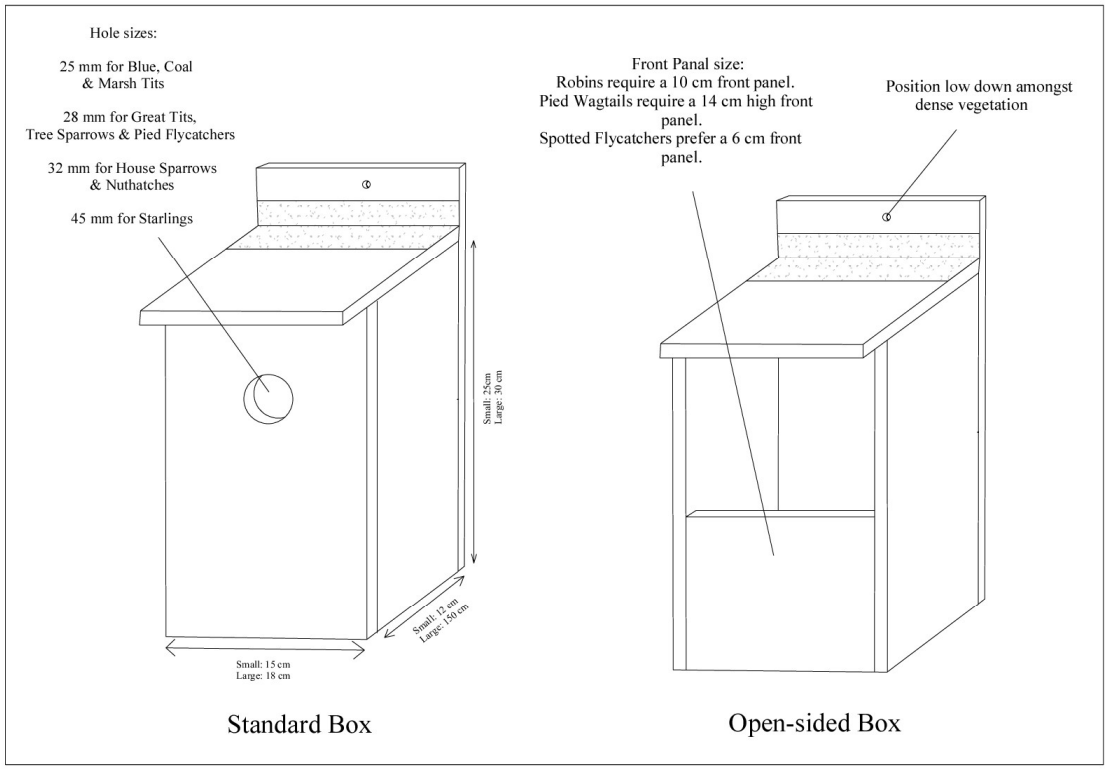




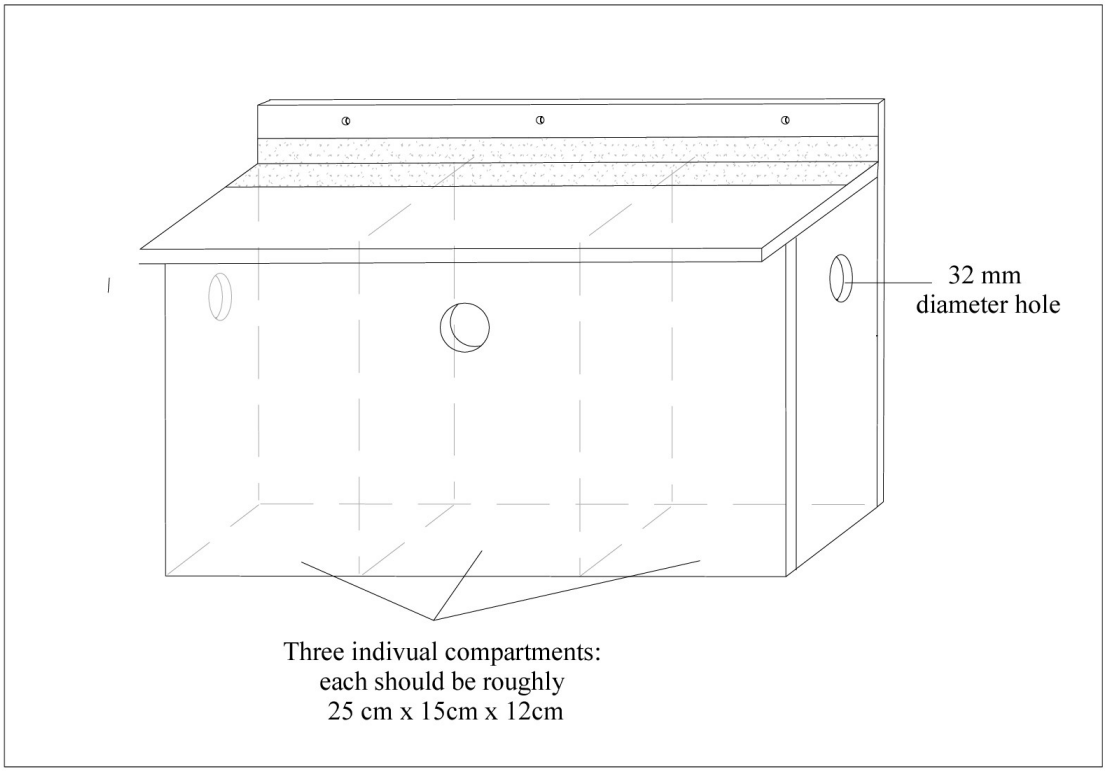
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Appendix 4: Examples Bird Box Designs

An example of two different bird box designs



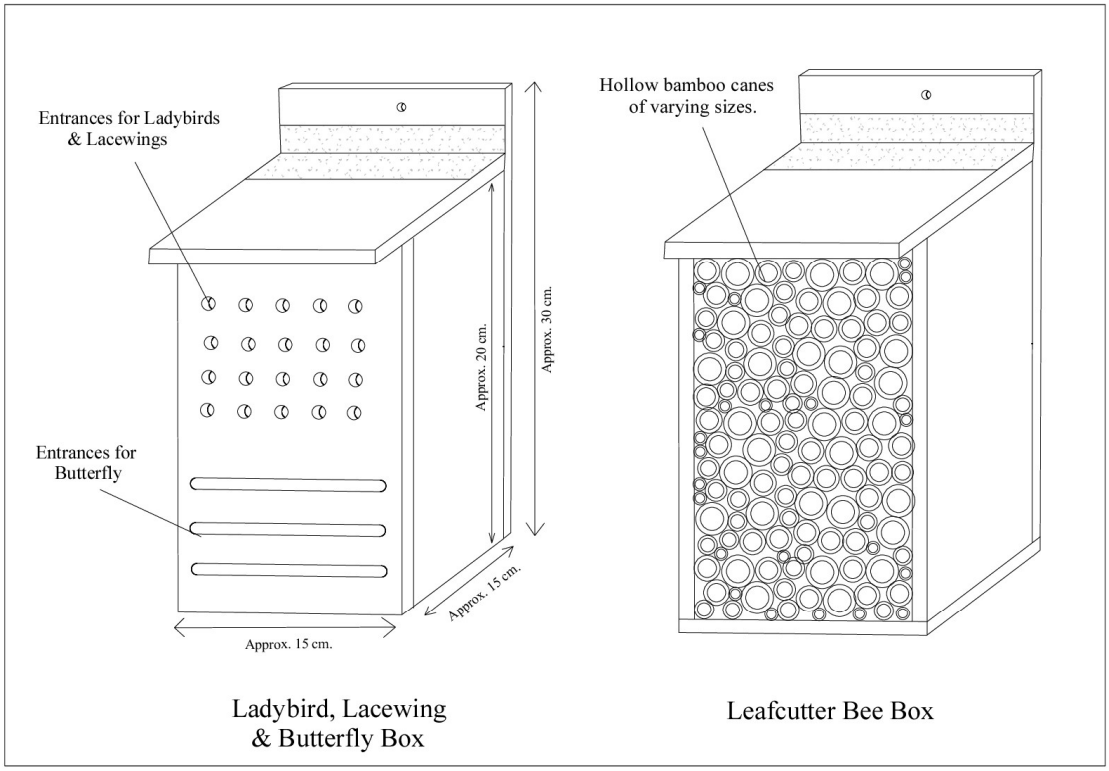
An example of a House sparrow box design



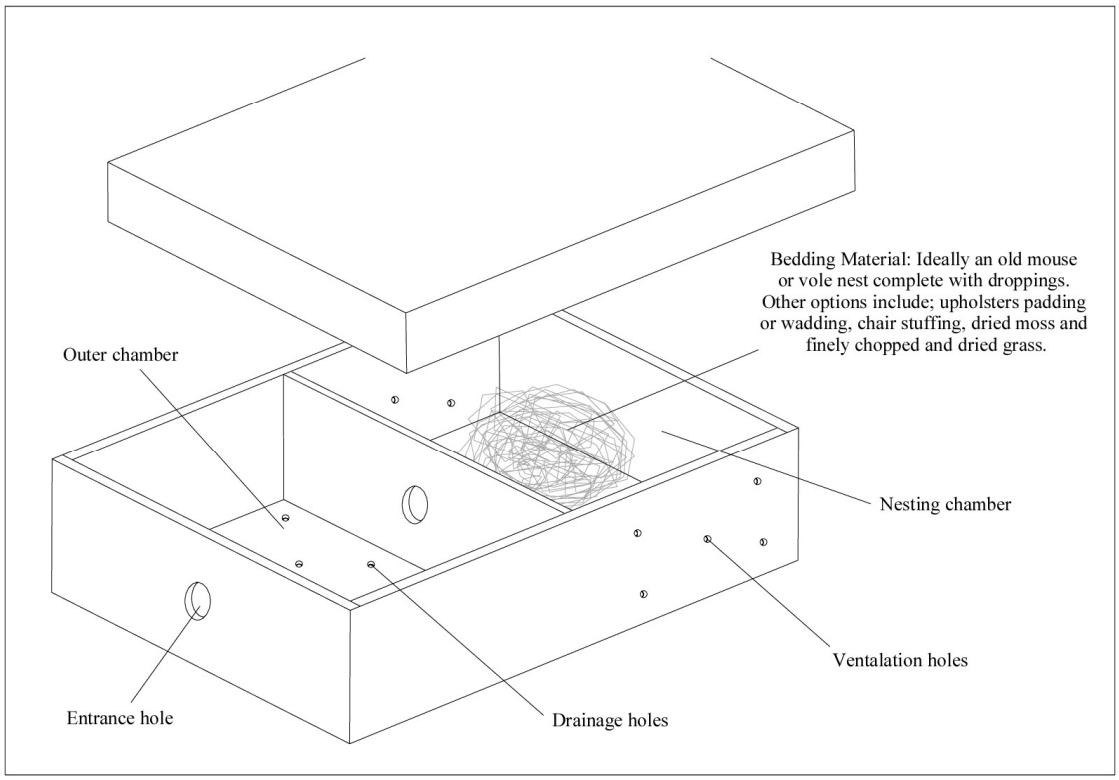
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Appendix 5: Examples of Insect Shelter Designs

An example of two different insect box designs

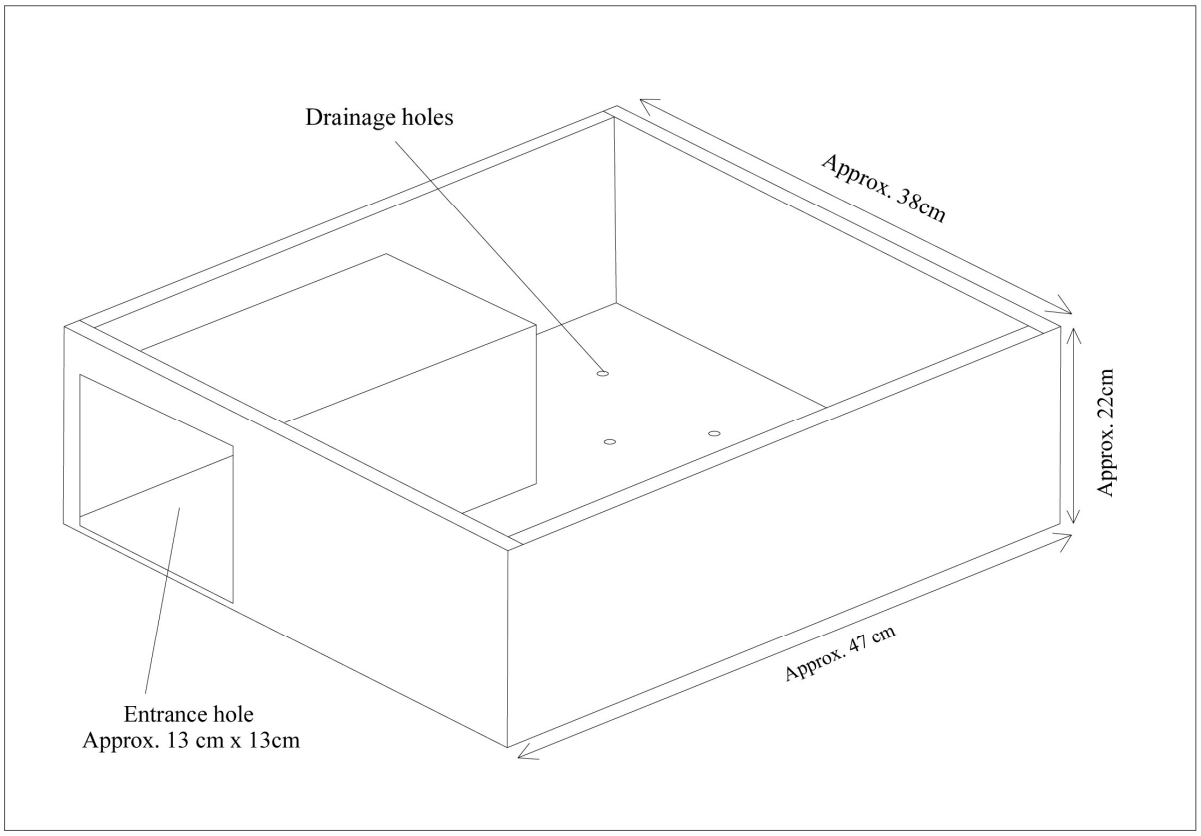


An example of a Bumblebee box design



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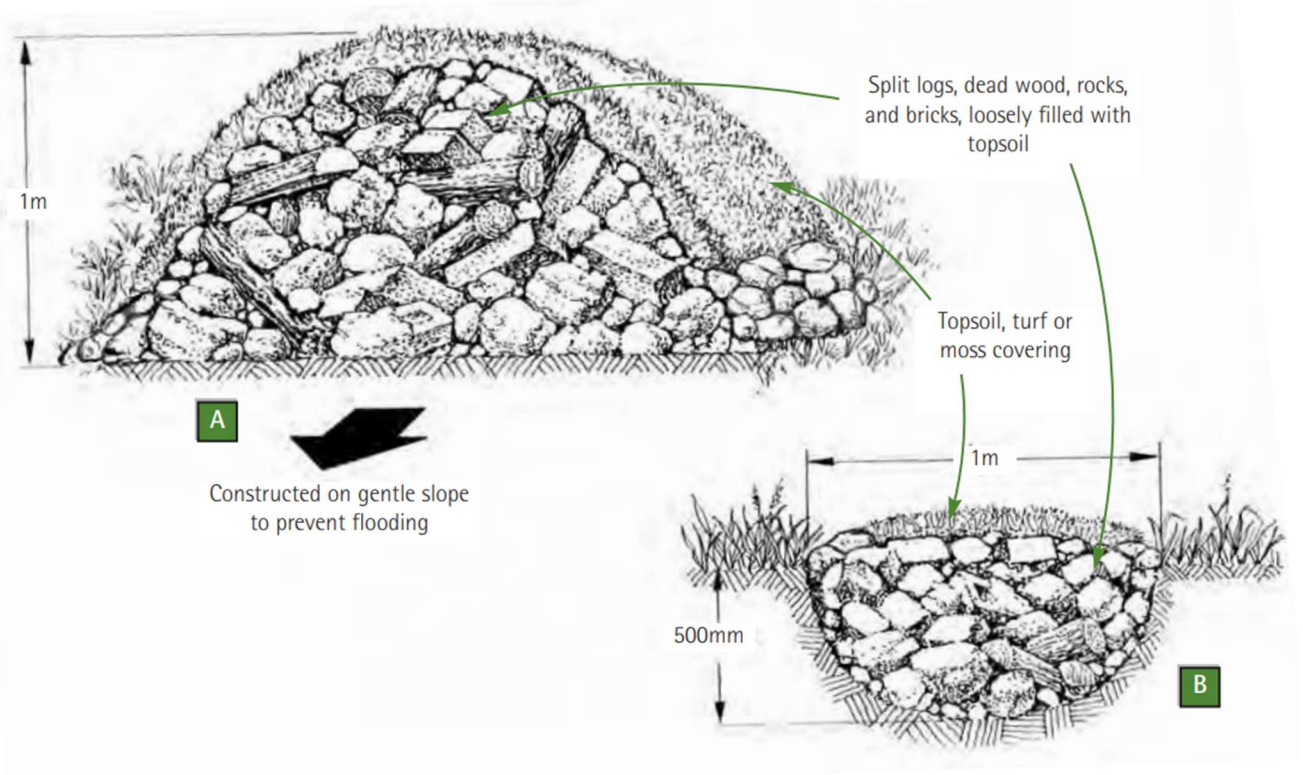
Appendix 6: Example of Hedgehog Shelter Design



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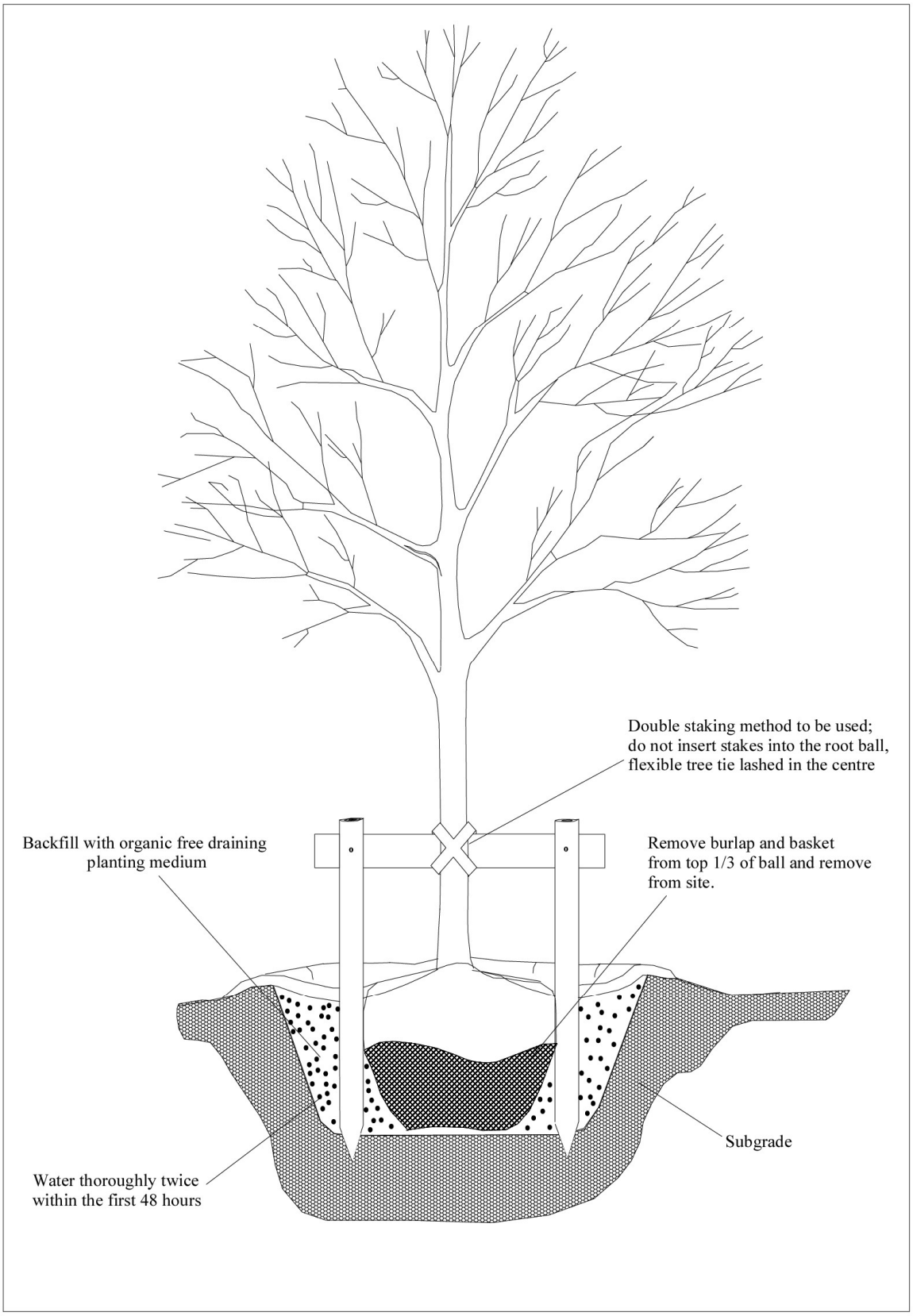
Appendix 7: Example of Amphibian Hibernacula

A) On impermeable ground
B) On free-draining soil



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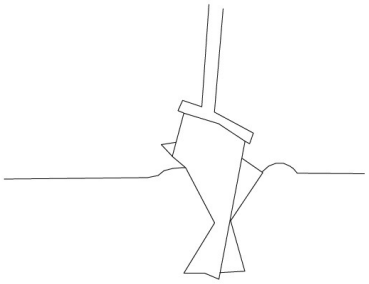
Appendix 8: Example of planting a tree in an open grass strip



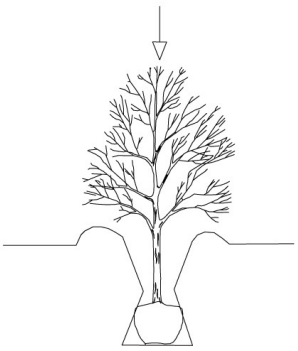
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Appendix 9: Example of planting a tree

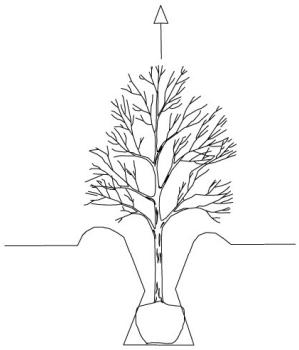
1) Make plenty of room for the transplants roots



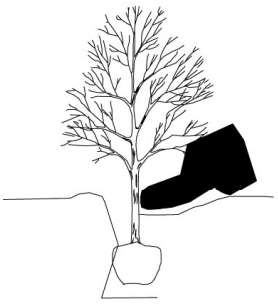
2) Ensure that the roots are pushed down as far as possible



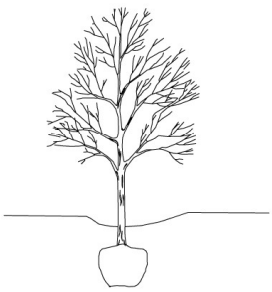
3) Withdraw the transplant slightly to spread roots



4) Firm up to exclude air pockets



4) Transplant in correct position



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Appendix 10: Author Qualifications

Adam West, Principal Ecologist

BSc (Hons) Animal and Wildlife Management, ACIEEM.

Adam joined JCA to lead the expanding ecology department. Having returned to education as a mature student, Adam studied Countryside Management for two years before undertaking a Batchelor's degree in Animal and Wildlife Management, for which he was awarded First Class Honours. Adam has many years' experience in ecological consultancy, working on projects ranging from individual planning applications to national infrastructure projects. Adam holds a Natural England Level 1 great crested newt survey class licence and a Natural England Level 2 bat survey class licence.

James Foster, Assistant Ecologist

BSc (Hons) Biology

James gained his undergraduate degree in biology in 2012 from University of Leeds. James has plenty of experience in ecology, having worked countless projects of different scales all over the north and midlands. James has over 11 years of experience surveying anything from reptiles to hedgerows and holds a Great crested newt licence level 1 and is working towards his bat licence and barn owl licence.

Rebecca Petch-Smith, Assistant Ecologist

MBiol (Hons) Zoology

Rebecca joined JCA in 2025 after spending 18 months in the teaching industry. Prior to this she graduated from the University of Leeds with a 2:1 Honours Integrated Master's degree in Zoology. As part of her degree programme, Rebecca spent time in Kenya conducting surveys on African ungulates. Rebecca began assisting on bat emergence surveys in 2024, after which, she gained employment as a Graduate Ecologist at JCA Ltd. She is currently conducting Preliminary Ecological Appraisals, Bat Scope Surveys and Biodiversity Net Gain Assessments and working towards her protected species licence.

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I hope that this scheme and methodology provides all the necessary information, but should any further advice be needed please do not hesitate to contact the author.

Signed

.....

James Foster *BSc (Hons)*
04/02/2026

Reviewed by

.....
Rebecca Petch-Smith *MBiol BSc (Hons)*

04/02/2026

For and on behalf of ***JCA Ltd***

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ECOLOGICAL SERVICES

Ecological Pre-Planning Services

- Phase 1 Habitat Surveys
- Great Crested Newt eDNA Sampling
- Protected species: Bat, Wintering and Nesting Bird, Badger, Amphibian, Otter, Water Vole, White-Clawed Crayfish, Dormice and Reptile Surveys.
- Preparation for Environmental Impact Assessment (EIA)
- Invasive Species Surveys
- Code for Sustainable Homes
- Butterfly & Insect Surveys

Ecological Post-Planning Services

- Biodiversity Enhancement Plans
- Protected Species Mitigation
- Ecological Management (Bat and Bird box installation and inspection)
- Planting Schemes
- Monitoring of bird or bat boxes.

ARBORICULTURAL SERVICES

Guidance for Architects & Developers

- British Standard 5837 Surveys
- Arboricultural Implications Assessments (AIA)
- Arboricultural Method Statements (AMS)

Advice for Engineers, Loss Adjusters and Insurers

- Tree Surveys for Subsidence
- Heave Assessment
- Tree Root Identification

Advice for Local Authorities and Social Housing

- Tree Safety Surveys
- Specialist Decay Detection
- Landscape and Orchard Design

Tree Advice for the Legal Profession

- Subsidence Litigation
- Personal Injury and Accident Investigation
- Expert Witness, Planning Inquiries and Appeals

Veteran Tree Management

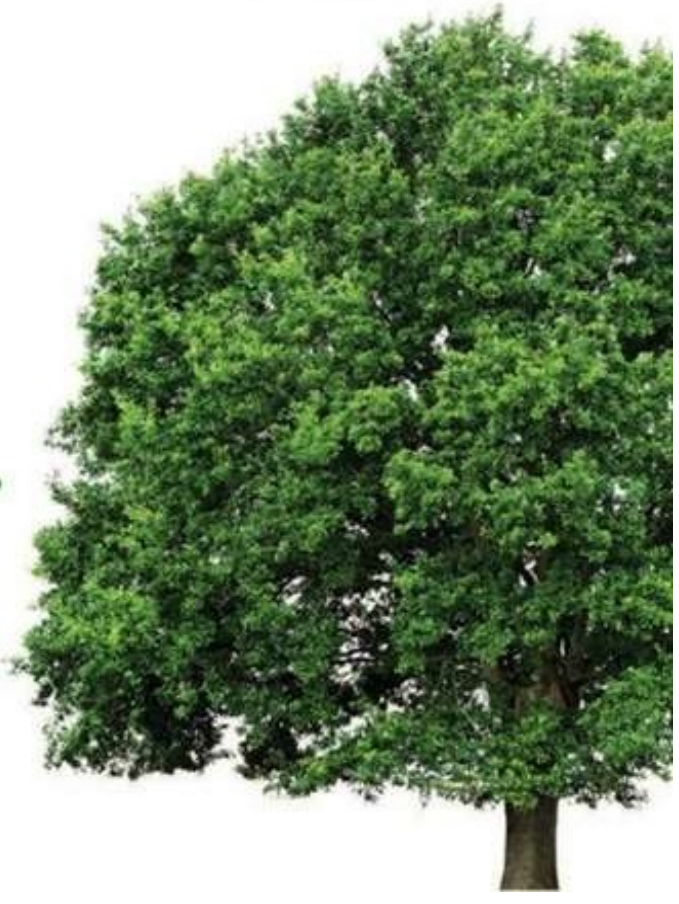
- Ancient Woodland Management
- Veteran Tree Management

Tree Health and Pest and Disease Management

- Pest and Disease Surveys
- Tree Health Checks
- Disease Mitigation and Control

JCA Limited

Arboricultural & Ecological Consultants



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