

**BIODIVERSITY ENHANCEMENT
PLAN SURVEY & REPORT**

at

**43 Bamford Way
Rochdale
Lancashire
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**Client:
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**JCA Ref:
14813f/AmB**

Date of Report: 23/01/2020



Quality Assurance

JCA ref.	Desktop Survey Completed:		Site Surveyed:		Report Completed:		Checked:	
	Date	Name	Date	Name	Date	Name	Date	Name
14813f /AmB	22/2/2019	Amanda Beck	PEA & Bat Scope 27/2/2019 Bat Emergence/ Re-entry surveys 13-6/2019, 27/6/2019	Amanda Beck	23/01/2020	Amanda Beck	23/01/2020	Amy Redick

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*.

Risk Assessment Completed	
Bio-security Procedure Completed	
Lone Worker Procedure Completed	



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Summary

A Biodiversity Enhancement Plan Report has been requested for **43 Bamford Way, Rochdale** by Rochdale Borough Council.

A Bat Scoping survey and Preliminary Ecological Appraisal were conducted on the 27th February 2019 Report No: JCA Ref:14813/AmB. Two bat emergence surveys on the 13th June and 27th of June 2019 Report No: JCA Ref:14813b/AmB. Surveys were conducted by Amanda Beck Cert/HE in Field Ecology, Diploma in Field and Conservation Ecology, Qualifying CIEEM Member.

This report is compiled in accordance with the guidelines of CIEEM's Biodiversity Net Gain Principles for developments 2016 & 2019.

A Desktop study was completed on the 22nd of February 2019 by Amanda Beck as part of this report in order to obtain any relevant ecological records that maybe present within a 2km radius of the site. This includes protected and notable species records, as well as nature conservation designations.

After the Bat Scoping and Bat emergence surveys were compiled it was advised that a Biodiversity Enhancement Plan should be designed by Rochdale Borough Council.

Measures to be implemented:

Pre-Construction:

- Programme of works and planning species approved by Rochdale Borough Council Ecologist.
- The eradication of invasive weed species using the methodology in **Section 4**.
- Toolbox talks for all contractors and site staff, provided by Ecological Clerks of Works.
- Access for contractors and site staff to Ecological Clerks of Works file, maintained by site manager.

During Construction:

- Installation of faunal boxes **see Appendix 2** for faunal box locations.
- Installation of hedgehog holes in fencing.
- Installation of approved lighting scheme.

Post Construction:

- Follow approved planting scheme, **see Appendix 1** for planting map, using species list in **Tables 1, 2, 3, 4 7 5**.



- Follow the programme of maintenance work for landscaping management and faunal boxes.



1 Introduction

1.1 Purpose of the Report

- 1.1.1 A Biodiversity Enhancement plan has been requested for **43 Bamford Way** by Rochdale Metropolitan Borough Council.
- 1.1.2 This report will aim to fulfil the planning conditions set by Rochdale Metropolitan Borough Council, with the ultimate aim of enhancing 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 JCA Ltd have been instructed by **Mohammed Sohail** to produce a Biodiversity Enhancement Plan.
- 1.2.2 For this purpose, JCA Ltd have been supplied with the following documents and plans:
- Site map.
 - Development Plans S440/001.
 - Extended Phase I Habitat Survey Report Ref:14813a, dated 13/3/2019.
 - Bat Emergence/Re-entry Survey Report Ref: 14813b, dated 8/7/2019.

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 to demolish the existing unoccupied residential dwelling and remove trees and vegetation to allow the construction of five new residential dwellings and parking facilities.

1.5 Site Description

- 1.5.1 **43 Bamford Way** is situated 19.9km north of Manchester, at grid reference: SD866128
- 1.5.2 The site is surrounded by residential properties, to the north is Bamford Academy school with playing fields, Rochdale Rugby Union club and Bamford Fieldhouse



Cricket Club. Further to the north and west are agricultural fields. To the south is Marland Golf course and Heywood cemetery. To the east is Rochdale cemetery.



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 **43 Bamford Way** is the Greater Manchester BAP (Reference).

2.1.2 The habitats listed within the Greater Manchester BAP are;

- Acid grasslands.
- Lowland dry acid grassland.
- Unimproved neutral grassland.
- Lowland meadows.
- Marshy grasslands.
- Hedgerows.
- Lowland mosslands.
- Reedbeds.
- Ponds and lodges.
- Canals
- Native woodlands-: Wet woodlands, upland Oak woodlands, lowland broadleaved and mixed deciduous woodlands.
- Upland heathlands, blanket bog.
- Urban manged greenspace.

2.1.3 The species listed within the Greater Manchester BAP are;

- All bat species.
- Black Redstart (*Phoenicurus ochruros*).
- Farmland birds.
- Great Crested Newts (*Triturus cristatus*).
- Brown Hare (*Lepus europaeus*).
- Mountain Hare (*Lepus timidus*).
- Native Black Poplar (*Populus nigra*).
- Twite (*Carduelis flavirostris*).
- Water Voles (*Arvicola amphibus*).
- Willow Tit (*Poecile montanus*).



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 Scoping report produced by JCA Ltd Ref:14813a, dated 13/3/2019 (Beck, 2019). A summary of the habitats and features present in this report can be seen below.
- 3.1.2 The site consists predominantly of amenity grassland, bare soil, buildings, dense scrub, embankment, fencing, hard standing, introduced shrubs, marshy grassland, scattered broad-leaved trees, scattered coniferous trees, tall ruderals and walls.
- 3.1.3 All habitats on site had moderate ecological value, consisting of dense scrub, marshy grassland, scattered broadleaved trees and hedgerows.
- 3.1.4 The site will not impact on any designated or non-statutorily conservation sites.
- 3.1.5 The vegetation on site has the potential to support foraging, commuting and roosting bats along with nesting and foraging birds. Dense scrub has moderate potential for nesting birds and hedgehogs and provides food for birds and insects.

3.2 Features to be Retained and Protected

- 3.2.1 The site contains habitats of moderate conservation value, with features deemed likely to support protected species.
- 3.2.2 The site contains the following valuable features:
- Hedgerows are a Greater Manchester BAP habitat and are to be retained where possible on the site.
 - Broad-leaved scattered trees.
 - Marshy grassland.
 - Dense scrub.



4 Invasive Weed Eradication

- 4.1.1 During the survey work Cotoneaster (*Cotoneaster horizontalis*) was observed on site, which is considered invasive. Invasive plant species are 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; Giant Hogweed, Giant Kelp, Japanese Knotweed, Japanese Seaweed, Himalayan Balsam, Horsetail and Floating Pennywort. 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.



5 Habitat Creation

5.1 Summary

- 5.1.1 As the site contains habitats of moderate conservation value, there is scope to greatly enhance the sites wildlife value post development.
- 5.1.2 The site is roughly **6,371m²**, with approximately **364m²** of amenity and garden spaces available. It is proposed to create approximately **37m²** of native mixed-species hedgerow and to plant **54** native broad-leaved trees. A wildlife pond is also proposed. Gabion baskets will contain native plant species.
- 5.1.3 As the centre of the site consists of hard standing of low conservation value, there is scope to greatly enhance the sites wildlife value post-development. The garden spaces that will be created within the development site can be improved in a number of ways, including patches of unimproved grassland planted in green spaces and the inclusion of hedgerows, which are Priority Habitats in the Greater Manchester BAP. This will increase invertebrate diversity, and in turn will provide a greater food source for birds and bats.
- 5.1.4 Gardens can support a surprising and diverse array of wildlife (Owen, 1991). There are number of practices that can maximise biodiversity in back gardens and are particularly relevant to this proposed development. Biodiversity enhancement can be achieved in a number of ways such as; minimising the use of pesticides, planting wildlife friendly vegetation, by creating wildlife features such as ponds and piles of logs or by providing artificial nesting and roosting sites.
- 5.1.5 The positions of the proposed new planting can be seen in **Appendix 1**.

5.2 Shrub & Hedgerow Planting

- 5.2.1 Species Selection: Species have been selected for their hardiness, amenity value and their value to local wildlife, either in the form of flowers, berries, seeds or shelter. Species that are poisonous such as Spindle have been avoided.
- 5.2.2 Shrub Specifications: Details of the specification for the newly planted shrubs are provided in **Table 1**, below.

Table 1: Mixed native hedgerow planting at 30 cm spacing, double staggered lines.

Botanical Name	Common Name	Size at purchase	% Required
<i>Cornus sanguinea</i>	Dogwood	Whips	(20%)
<i>Corylus avellana</i>	Hazel	Whips	(30%)
<i>Ilex aquifolium</i>	Holly	Whips	(30%)
<i>Lonicera periclymenum</i>	Honeysuckle	Whips	(20%)
Total			(100%)



5.2.3 Hedgerow 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 a 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 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 shrub 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).
- **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. Shrubs within the woodland shrub bed should be planted **2m** apart. 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. All hedgerow cutting should avoid bird nesting season (1st March – 31st August inclusive) unless a nesting bird survey has been undertaken within 48 hours prior to work commencing.



5.3 Tree Planting

5.3.1 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.

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.

5.3.2 Tree Specifications: Details of the specification for all the replacement trees in given in **Table 2**, below. 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 2: Native deciduous trees.

Botanical Name	Common Name	Size at Purchase	No. Required
<i>Viburnum opulus</i>	Guelder Rose	Standard	20
<i>Malus sylvestris</i>	Crab Apple	Standard	16
<i>Prunus padus</i>	Bird Cherry	Standard	20
<i>Salix caprea</i>	Goat Willow	Standard	30
<i>Sorbus aucuparia</i>	Rowan	Standard	20
Total			106

5.3.3 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 root ball and of equal depth. The sides of the hole should be roughened with a 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 trees and prevent losses within the first years of establishment. It may be necessary to angle the stakes in order to avoid damaging the root ball. 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.
- **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 strimmer's 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.

5.4 Aftercare

- 5.4.1 All newly planted trees and shrub beds are to be thoroughly watered immediately after planting and during any prolonged periods of dry weather.
- 5.4.2 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.
- 5.4.3 Any trees or shrubs private gardens will be the responsibility of the home owner in the future.
- 5.4.4 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 (1st March to 31st August inclusive).
- 5.4.5 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 manually without the use of herbicides.



- 5.4.6 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.
- 5.4.7 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.

5.5 Wildlife Pond

5.5.1 Pond Creation: Recommendations for constructing a wildlife pond are listed below:

- **Site Preparation**: It is recommended that the wildlife pond is created after the completion of the development. This will avoid substances from building work entering the pond and damaging the new pond lining as the result of ongoing construction works. Any vegetation and debris are to be removed from the soil surface. Any turf removed can be saved for use later in the pond construction. This can be done by hand or heavy plant, depending on the size of the pond.
- **Pond aspect** High quality wildlife ponds can be created anywhere. However, many pond plants and invertebrates thrive in sunny sheltered areas. The creation of a pond can attract wildlife and act as corridors for dispersal through vegetation. Clearings to the pond often support tall herb and scrub communities which are important terrestrial habitats for groups such as dragonflies and amphibians. Some invertebrate species prefer shaded or dappled light conditions. Recommended pond positions are to the east-west, which will generally be more floristically rich than north-south rides, as they provide a south-facing sunny edge. Sunny ponds should be created at least one and a half times wider than the height of the trees on the south side to maximise the amount of light reaching open water. Scallop within vegetation are good locations for ponds as they have the potential to prevent wind funnelling. Clearings should be large enough to provide sunlight for most of the day, but not too large or shelter will be compromised.
- **Marking the pond**: Using either spray paint, rope or sand, the outline of the pond can be marked on the bare ground. The outline should be as large as possible in the given space, as the final pond will be slightly smaller than this outline. The edge should be varied, as this adds both visual interest and potential for varied habitats within the pond.
- **Digging**: The pond can either be dug by hand or using heavy plant machinery, depending on the size and timescales involved. The edge of the pond needs to vary in slope, some edges should slope gradually and some should slope steeply. Gradually sloped edges should be used on parts of the pond which may be visited more by residents. The pond should be at least 60cm deep, and on larger ponds can be much deeper. Different levels can also be added for marginal and aquatic plants to sit on. Making sure the pond edges are level is imperative.



- **Lining the pond:** Before pond liner is introduced, a protective pond underlay must be laid, to protect the pond liner from any punctures underneath. The pond liner must cover the whole pond, allowing it to overlap over the edges.
- **Filling the pond:** Before filling the pond with water, soil that was removed from the ground when digging the pond can be added as a substrate for plants. Fill the pond with rainwater, by either collecting water or allowing the pond to fill naturally.
- **Remove excess pond liner:** Once the pond is full of water, excess pond liner can be trimmed around the edges. Turf or plants that were removed originally can be placed around the edge of the pond to hide the pond liner.
- **Timing:** Digging can be carried out any time of year, however, it's best to construct ponds in late winter, and stock with plants in early spring.
- **Maintenance work:** Wildlife ponds don't need to be maintained every year. Its 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. It's important to leave any removed vegetation and debris by the pond edge for a day, to allow any organisms to return to the pond.
- **Early years:** Monitor which plants are colonising the pond. Invasive plants can be controlled if caught early enough, cut back any bramble which flourishes in recently cleared areas around the pond.

5.5.2 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

5.5.3 Species Specifications: A list of the recommended species can be seen below in **Tables 3 & 4.**

Table 3: List of pond plant species.

Oxygenating Plants	
Botanical Name	Common Name
<i>Potamogeton crispus</i>	Curly Pondweed
<i>Ceratophyllum demersum</i>	Rigid Hornwort
<i>Ranunculus aquatilis</i>	Water Crowfoot
<i>Isolepis cernua</i>	Slender Club Rush



Table 4: List of pond plant species.

Marginal Plants		Emergent Plants	
Botanical Name	Common Name	Botanical Name	Common Name
<i>Ajuga reptans</i>	Bugle	<i>Butomus umbellatus</i>	Flowering Rush
<i>Myosotis scorpioides</i>	Water Forget-Me-Not	<i>Menyanthes trifoliata</i>	Bog bean
<i>Mentha citrata</i>	Water Mint	<i>Ranunculus flammula</i>	Lesser Spearwort
<i>Eupatorium cannabinum</i>	Hemp agrimony	<i>Sparganium eurycarpum</i>	Bur reed
<i>Lychnis flos-cuculi</i>	Ragged Robin	<i>Alisma plantago-aquatica</i>	Water Plantain
<i>Caltha palustris</i>	Kingcup	<i>Iris pseudacorus</i>	Yellow Flag Iris

5.6 Gabion Baskets

- 5.6.1 Gabion baskets filled with stone will be used to the front and along the entrance of the site. This will provide gaps and crevices for invertebrates to live among and provide colonisation opportunities for plants and mosses.
- 5.6.2 Plants could be grown over the gabion baskets to provide cover and shelter for invertebrates and birds. A list of these plant species can be seen in **Table 5** below.

Table 5: List of plant species.

Botanical Name	Common Name
<i>Hedera helix</i>	Common Ivy
<i>Lonicera periclymenum</i>	Honeysuckle
<i>Jasminum nudiflorum</i>	Winter Jasmine



6 Faunal Boxes

6.1 Summary

- 6.1.1 In total **three** bat bricks, **three** bird boxes and **two** insect boxes 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 All bats species are listed within the County BAP. Common Pipistrelle and Soprano Pipistrelle bats are the species most likely to roost within modern buildings. The bricks incorporated into this enhancement plan are therefore aimed at attracting Common Pipistrelle and Soprano Pipistrelle bats.
- 6.2.3 Box/Brick Selection & Positioning: There are a wide range of different bat boxes and bat bricks available, including both internal and external designs. External designs include the traditional wooden and woodcrete boxes. Internal designs include boxes that can be built into the walls, with a front which mimics the brickwork of the building, essentially becoming invisible. Other roost opportunities include cutting slots into soffit boxes, using bat bricks that lead into cavity walls and using lifted tiles to allow access into the loft.
- 6.2.4 **Bat bricks** have been selected to incorporate into **three** of the new buildings. The bricks are positioned high on the walls of the building, and the gap within the brick is only a few centimetres wide. These gaps are often overlooked by residents and so should not cause conflict with buyers. Bat bricks should be placed under the eaves at the apex of the south facing gable end walls. These bricks will then allow bats to access the cavity wall spaces (See **Appendix 2**).
- 6.2.5 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. 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 may be used. Please refer to the Bat Conservation Trust's, Bats and Lighting in the UK (2018).



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 the site to inform and produce a robust and tailored Biodiversity Enhancement Report for this site.
- 6.3.2 House Sparrow: House sparrows prefer to breed in small colonies in buildings. Therefore, erecting several boxes close together or choosing a House Sparrow 'Hotel' will greatly increase the chances of attracting House Sparrows. Boxes should be securely fastened below the eaves, or at least 3m above ground level. Boxes should be positioned so that the front is facing in an easterly direction, so as to avoid direct heat of the sun and prevailing wind and rain. Boxes should be around 25cm tall and 15cm deep with a hole size of around 32mm.
- 6.3.3 Swift boxes: Swift boxes should be positioned directly under the building's eaves, at least 5m from ground level and out of direct sunlight. The openings should not be obstructed by vegetation or other structures. The openings should face north, north-east or north-west. Boxes should ideally be constructed out of woodcrete to increase their life expectancy, or could be in the form of internal 'swift bricks'. The entrance hole should be around 3cm by 5cm.
- 6.3.4 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.
- 6.3.5 **One** standard bird box should be placed on a suitable mature retained tree, in a sheltered position and **one** house sparrow boxes and **one** swift boxes on houses (see **Appendix 2**).

6.4 Insect Boxes

- 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 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 **Two** insect boxes should be placed on fences, walls or trees between 0.5 to 2m, in sheltered positions (see **Appendix 2**).

6.5 Hedgehogs Holes

- 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 a means of dispersal in gardens will encourage hedgehogs to visit the site and utilise the natural space.
- 6.5.2 Access to gardens has become increasingly limited for hedgehogs, as fences and walls block their dispersal. A simple solution is to create a 13cm x 13cm access hole at ground level into fences within each garden to allow hedgehogs to freely move between green spaces (Bunnell, 2014).



7 Conclusion

7.1 Retention of Ecologically Valuable Features

- 7.1.1 The site contains habitats of moderate conservation value. Connectivity needs to be maintained by retaining scattered broad-leaved trees where possible. Twenty-seven trees are to be retained on site.

7.2 Habitat Creation

- 7.2.1 It is proposed to create roughly **37m²** of native mixed-species hedgerow, **364m²** of amenity grass and the planting of **54** native broad-leaved trees. A wildlife pond is also proposed. Gabion baskets will contain native plant species. These are described in Section 5 and their planting positions shown in **Appendix 1**.

7.3 Faunal Boxes

- 7.3.1 **Three** bat bricks will be positioned within the new buildings. **Three** bird boxes including designs aimed at supporting House Sparrows, Swifts and other generalist species will be erected onto the proposed buildings and trees. **Two** mixed insect boxes aimed at attracting Butterflies, Ladybirds and Lacewings will be erected onto a suitable size tree. Finally, hedgehog holes must be installed into the bottom of any new fencing proposed on site. Recommended locations of each faunal box can be seen in **Appendix 2**.

7.4 Management and monitoring

- 7.4.1 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.
- 7.4.2 It is recommended that a full management plan is created to maintain biodiversity on site. 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.



8 References

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- Perrow, M.R. (2008) *Handbook of ecological restoration: Volume 1, principles of restoration: V. 1: Principles of restoration*. Edited by Martin R. Perrow and Anthony J. Davy. Cambridge, United Kingdom: Cambridge University Press.

Websites:

- 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/>>
- Natural England. <<http://www.naturalengland.org.uk/>>
- Nature on the Map. Natural England. <www.natureonthemap.org.uk>

Relevant Legislation:

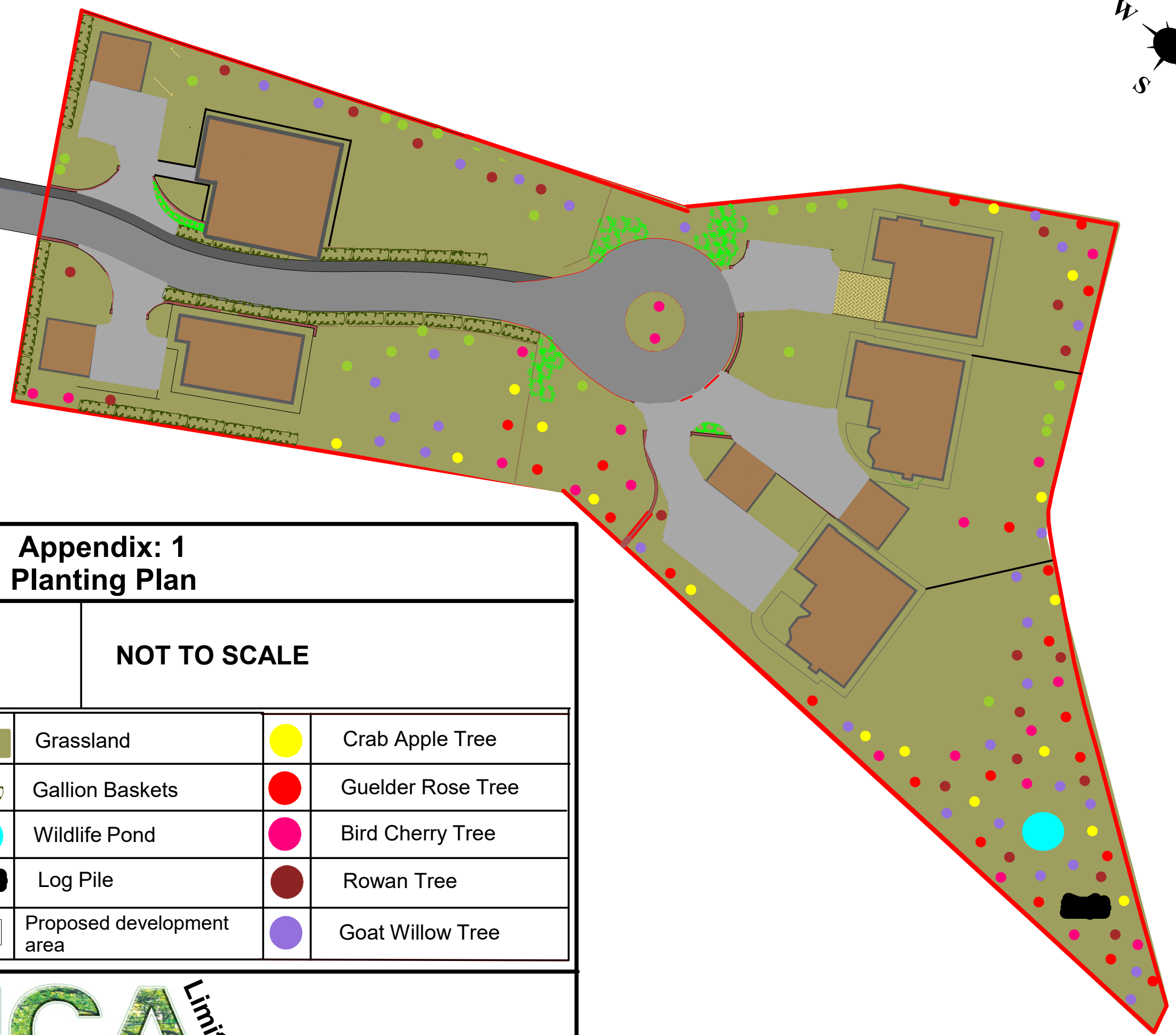
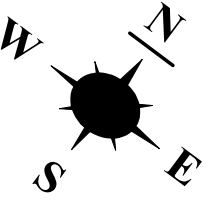
- Countryside and Rights of Way Act 2000
<http://www.legislation.gov.uk/ukpga/2000/37/pdfs/ukpga_20000037_en.pdf?view=interweave>
- National Planning Policy Framework (2012). Communities and Local Government.
- The Conservation of Habitats and Species Regulations 2017
<<https://www.legislation.gov.uk/uksi/2017/1012/contents/made>>
- Wildlife and Countryside Act 1981 as amended <<http://jncc.defra.gov.uk/page-3614>>



Appendices

Appendix 1: Planting Plan





Appendix: 1
Planting Plan

Address: 43 Bamford Way,
Rochdale, Lancashire, OL11 5NB
JCA Ref: 14813f/AmB

NOT TO SCALE

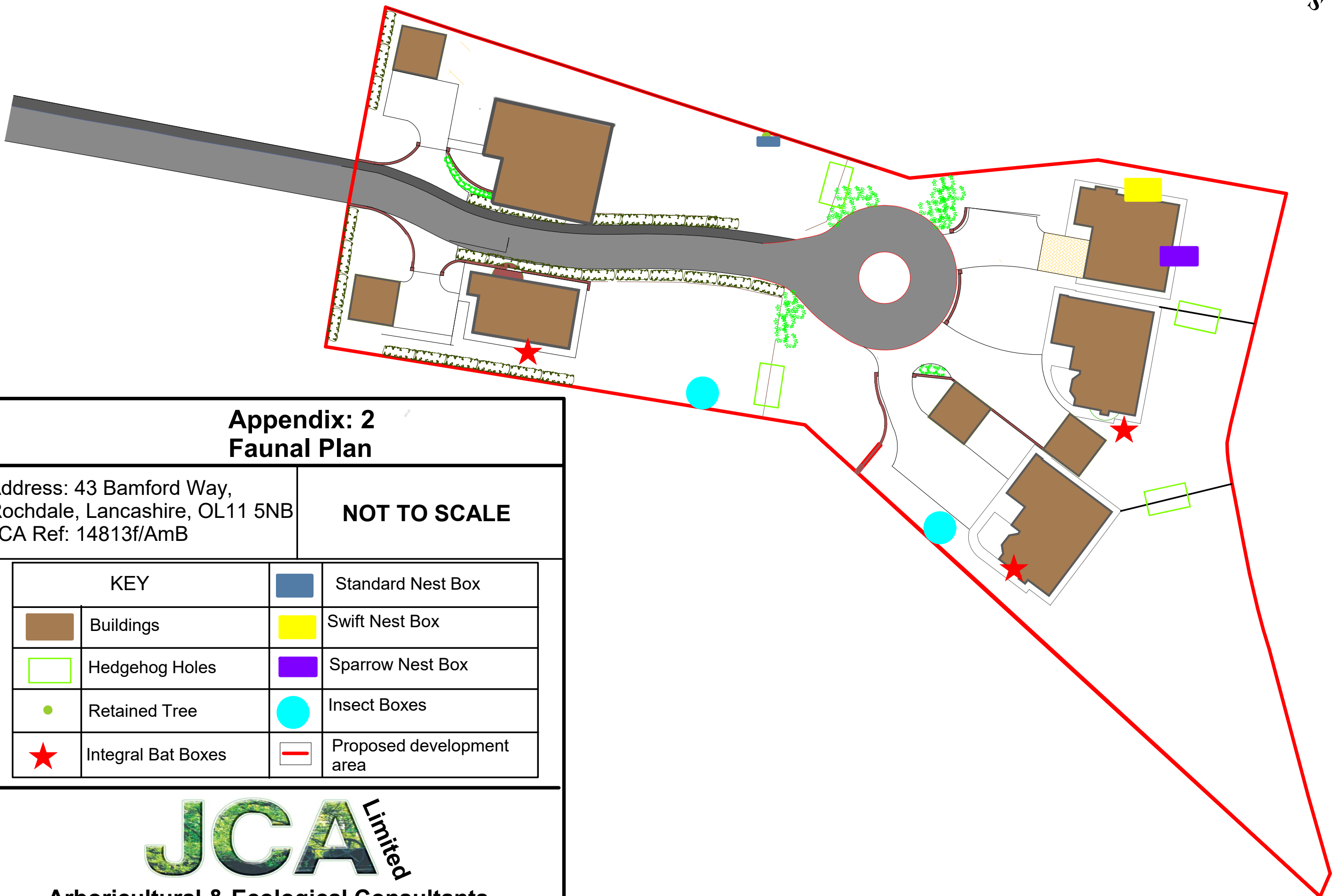
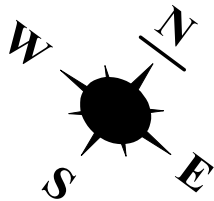
KEY			Grassland		Crab Apple Tree
	Trees being retained		Gallion Baskets		Guelder Rose Tree
	Hard Standing		Wildlife Pond		Bird Cherry Tree
	Native Hedgerow		Log Pile		Rowan Tree
	Buildings		Proposed development area		Goat Willow Tree



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Appendix 2: Faunal Boxes Plan





Appendix: 2 Faunal Plan

Address: 43 Bamford Way,
Rochdale, Lancashire, OL11 5NB
JCA Ref: 14813f/AmB

NOT TO SCALE

KEY			Standard Nest Box
	Buildings		Swift Nest Box
	Hedgehog Holes		Sparrow Nest Box
	Retained Tree		Insect Boxes
	Integral Bat Boxes		Proposed development area



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Appendix 3: Examples Artificial Bat Box Designs



Integral Habitat Bat Boxes for houses.

Dimensions: 215 mm wide x 440 mm high x 102 mm deep

Position Boxes a minimum of 2 metres but preferably 5 to 7 metres above ground. Avoid placement above windows, doors and wall climbing plants, thereby reducing the likelihood of predation by cats. A position near the eaves or gable apex of the property would be preferable.



Appendix 4: Examples Artificial Bird Box Designs

Vivara Pro WoodStone House Sparrow Nest Box



The House Sparrow Nest Box can be integrated into the masonry of a new house or fixed onto an external wall using strong screws and wall plugs (not included). If possible, it should be positioned near to vegetation and at a minimum of 2m above ground.

Dimensions 29cm width x 21cm height x depth 16cm

Woodstone Build-in Swift Box B



The WoodStone Build-in Swift Nest Box B is ideal for building into or mounting on a wall. This nest box should be sited at least five metres high, with a clear flight path and avoid south facing sites.

Dimensions 33.5cm width x 18.5cm height x depth 16cm



Appendix 5: Examples of Insect Shelter Designs

Insect Shelter Box

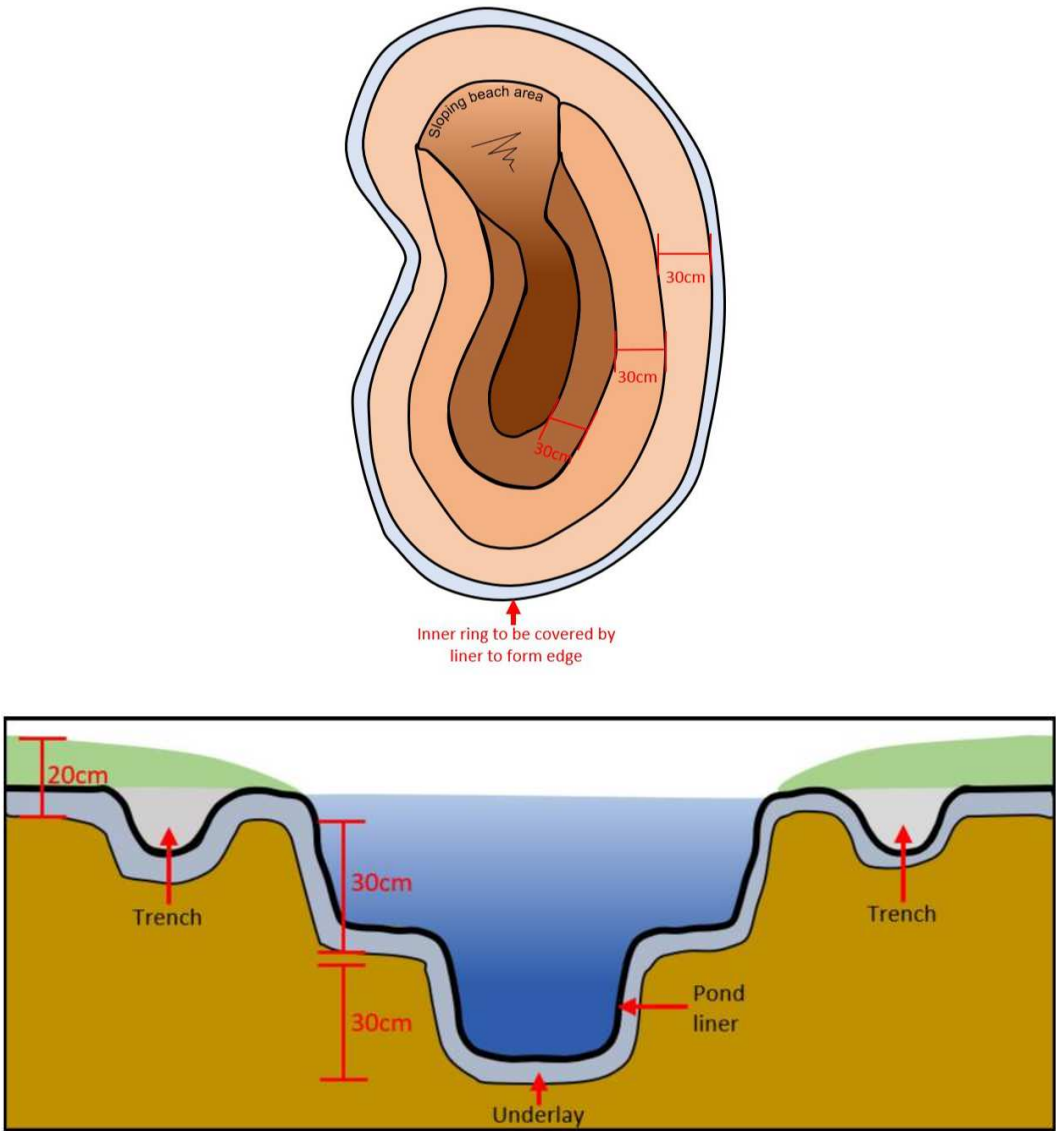


An Insect Tower provides habitat in gardens for solitary bees and other insects. The different sections of the Insect Tower have been designed to provide a habitat for a variety of insect species. The nesting tubes are ideal for solitary bees to build their nests in, the vertical slots are designed to encourage butterflies, other refuge holes are perfect for ladybirds and lacewings and the pinecones offer an excellent habitat for a range of other species.

Dimensions 21cm width x 65cm height x depth 12.5cm



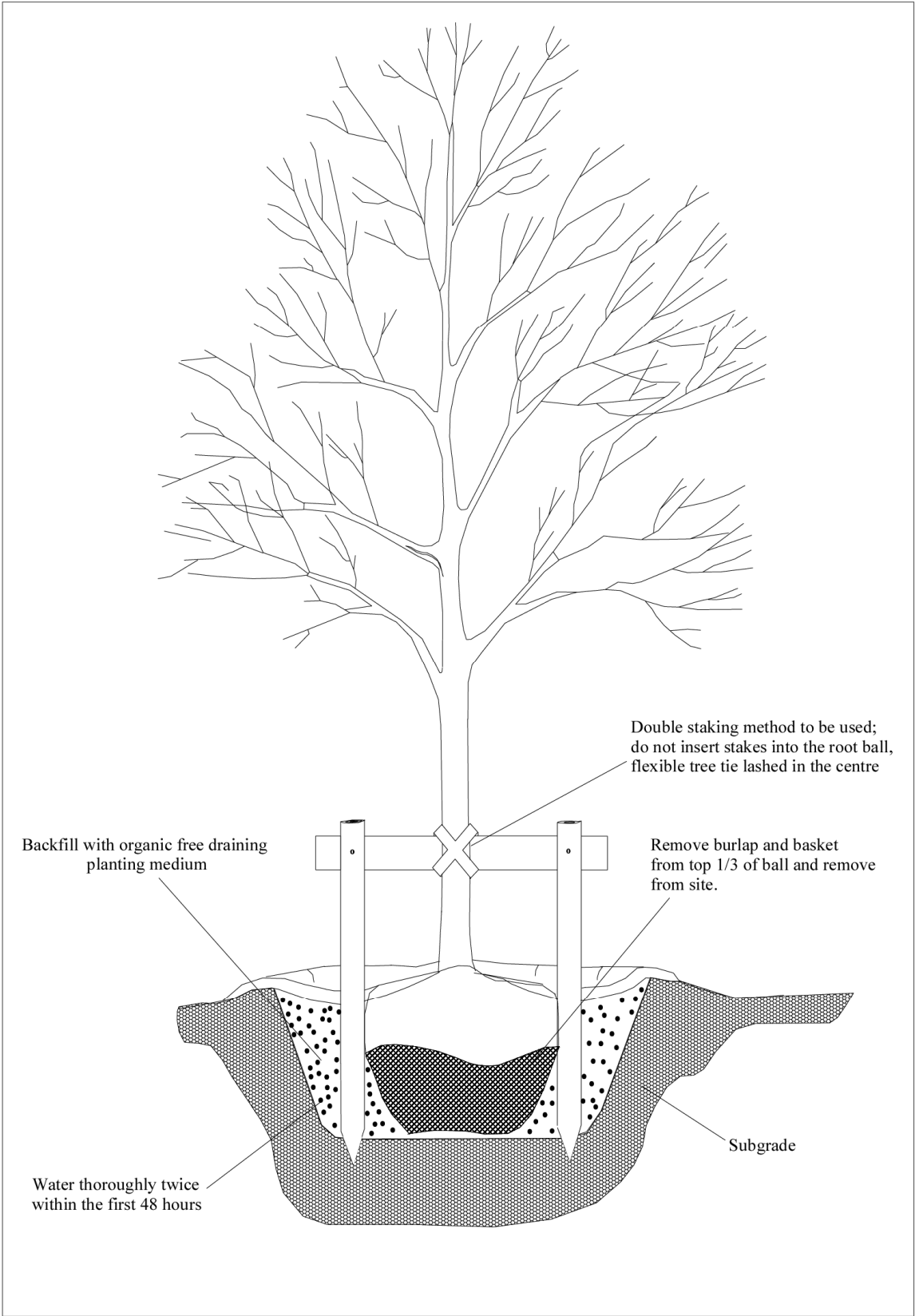
Appendix 6: Pond Creation



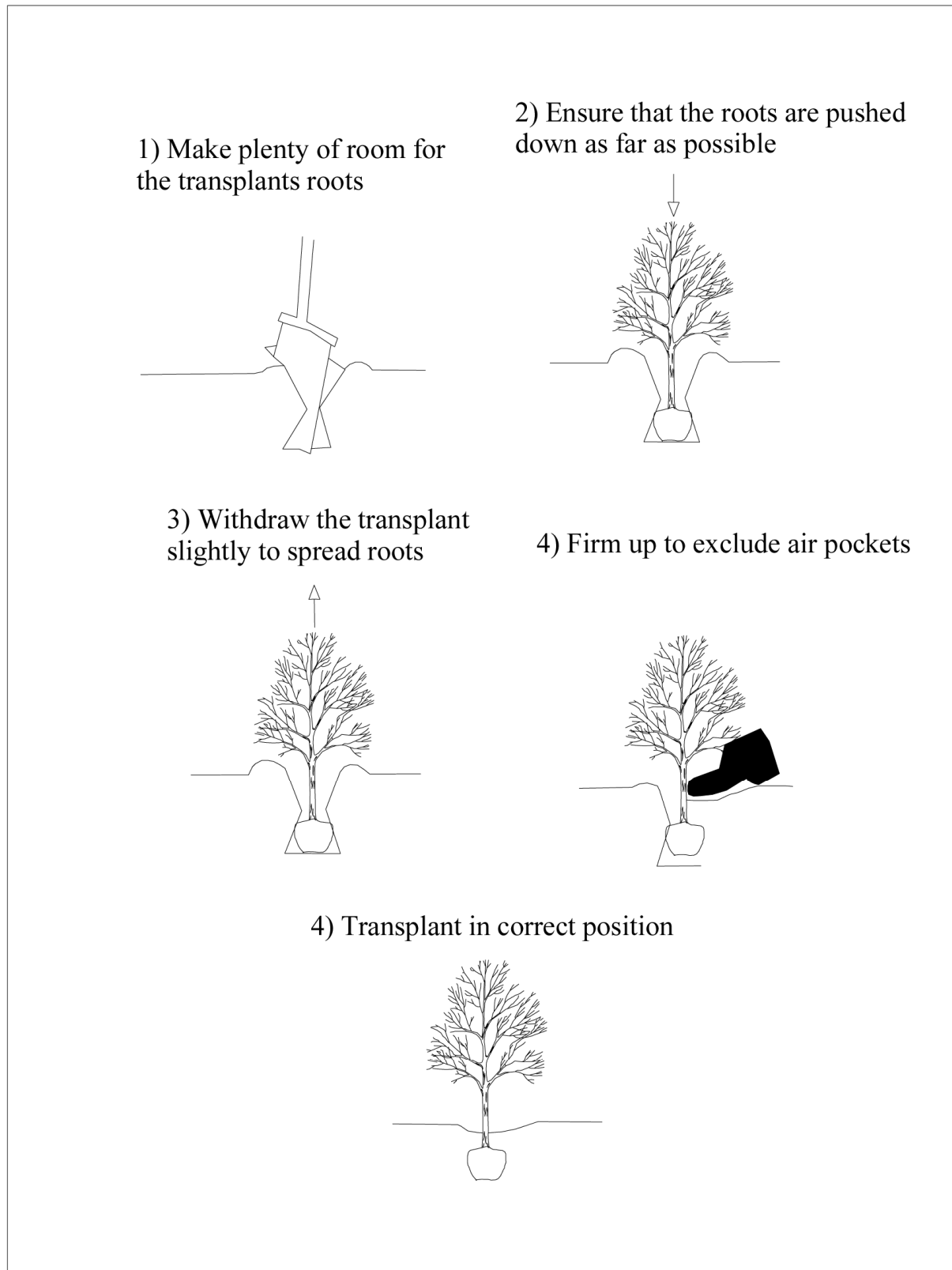
Diagrams to show shape and depth of levels in the newly created pond.



Appendix 7: Example of planting a tree in an open grass strip



Appendix 8: Example of planting a tree



Appendix 9: Author Qualifications

Principal Consultant and Managing Director

Jonathan Cocking

F.R.E.S., Tech. Cert. (Arbor.A), PDipArb (RFS) FArborA CBiol MSB. MICFor.

Jonathan is a Registered Consultant and Fellow of the Arboricultural Association and sits on its Professional Committee. He has 31 years' experience in the Arboricultural profession and served for eight years as Senior Arboriculturist with a large local authority before establishing JCA in 1997. Jonathan has since developed JCA's portfolio of services and its extensive client base. He is a Chartered Biologist, a Chartered Arboriculturalist and an Expert Witness with much experience of litigation work.

Technical Director

Toby Thwaites

BSc (Hons), HND (Arboriculture).

Toby joined JCA in 1998 after graduating in Ecology at the University of Huddersfield and has since graduated in Arboriculture at the University of Central Lancashire. A former JCA team leader and Consulting Arboriculturist, Toby is now Technical Director and oversees all office and on-site activities at JCA and is on hand to offer technical support and advice.

Consulting Staff: Ecology

Amanda Beck, Ecological Officer

Cert/He in Field Ecology, Diploma Field and Conservation Ecology, Qualifying CIEEM member.

Amanda joined JCA's ecology department in 2018, previously working as a freelance Ecological Consultant in North Wales and as a trainee Ecologist in South Wales. She has a background surveying botanical, amphibians, birds, terrestrial and marine mammals along with small mammal trapping and invertebrate research work on SSSI sites. She has practical experience in habitat management and creation when volunteering for North Wales Wildlife Trust. Amanda is currently studying for a MSc in Biological Recording and Ecological Monitoring with Manchester Metropolitan University. She is a member of the Butterfly Conservation Trust, Bat Conservation Trust, Botanical Society of Britain & Ireland and the British Hedgehog Preservation Society. Amanda is DBS checked and holds a Natural England level 1 bat licence and Natural England Level 2 Great Crested Newt licence and Great Crested Newt Licence for Wales.

Amy Reddick, Ecological Consultant

MSc Conservation Biology & Associate CIEEM member.

Amy joined JCA's ecology department in 2020 after working for an ecological consultancy in Yorkshire for the past 4 years. She possesses a Natural England Class II Bat Licence to handle bats and has experience undertaking surveys for various protected species including badgers, great crested newts, barn owls and otters. She is confident in identifying a range of botanical species and habitats in order to produce robust Preliminary Ecological Assessments. During her time as a consultant Amy has developed in depth knowledge of UK wildlife and habitat legislation and their relevance when assessing the impacts of development proposals. Amy has a CSCS card a Wilderness first aid certificate.

Charis Russell-Smith, Ecological Consultant

BSc Wildlife Conservation (Hons) & GradCIEEM.

Charis joined JCA in 2019, bringing with her 5 years' experience in ecological consultancy and two Natural England protected species class licences (Great Crested Newt Class I and Bat Class II). Her professional specialism is in bats and their ecology, having extensive experience of bat surveys, mitigation and call analysis. She is also competent at conducting preliminary ecological appraisals and phase II protected species surveys. Charis is an experienced ecologist who is able to collate accurate fieldwork data and deliver robust ecological evaluations, assessments and reports.

Joe Earnshaw, Trainee Ecologist

BSc (Hons), MSc Biodiversity and Conservation, Qualifying CIEEM member.

Joe joined the ecology department of JCA in 2018 after taking part in JCA's student training programme. He initially obtained a bachelor's degree in animal management from Askham Bryan College, York. He has since furthered his education and brings to the company an MSc in Biodiversity and Conservation from the University of Leeds. Joe has expertise in aquatic invasive species identification and control.



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



.....
Amanda Beck *Cert/He in Field Ecology, Diploma Field and Conservation Ecology,*
Qualifying CIEEM member
23rd January 2019

Proofread by



.....
Amy Reddick *MSc Conservation Biology, Associate CIEEM member*
23rd January 2019

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



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