



Ecological Enhancement Plan

Land South of A259, Angmering

Contents

1.0 INTRODUCTION	4
BACKGROUND	4
PURPOSE AND OBJECTIVES	5
2.0 SITE REVIEW	5
3.0 ROLES AND RESPONSIBILITIES.....	5
<i>ECOLOGISTS</i>	5
<i>SITE WORKERS</i>	6
<i>TIMING OF WORKS</i>	7
4.0 METHOD OF WORKS PRE CONSTRUCTION.....	7
<i>REPTILE TRANSLOCATION</i>	7
<i>BADGERS</i>	11
<i>VEGETATION REMOVAL</i>	11
<i>GENERAL WORKING PRACTICES</i>	12
5.0 ECOLOGICAL ENHANCEMENTS.....	13
<i>BAT ROOST PROVISION</i>	13
<i>BIRD BOXES</i>	14
<i>LOG PILES</i>	15
6.0 PLANTING SCHEME.....	17
7.0 POST CONSTRUCTION	19
<i>FENCE LINE REMOVAL</i>	19
<i>MANAGEMENT AND MONITORING</i>	20
8.0 CONCLUSIONS	20
APPENDIX 1: SIGNAGE EXAMPLES	21
APPENDIX 2: LOCATION OF WILDLIFE BOXES AND ENHANCEMENTS.....	22
APPENDIX 3: PLANTING PLAN.....	23
APPENDIX 4: MASTER PLAN.....	24

LIABILITIES:

Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living animals and plants are capable of migration/establishing and whilst such species may not have been located during the survey duration, their presence may be found on a site at a later date. This report provides a snap shot of the species that were present at the time of the surveys only.

The recommendations contained within this document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to or during works.

1.0 Introduction

Background

- 1.1 The Ecology Partnership was commissioned by Redrow to write an Ecological Enhancement and Management Plan for land south of the A259 Angmering. The site is situated on the eastern edge of the village of East Preston in West Sussex, approximately 4 miles west of the town of Worthing (TQ 08100 03089 – site centre point). The site is approximately 5.7ha in size. The development area is smaller than the original survey area at approximately 3.19ha, with the survey area shown below in figure 1.
- 1.1 The aerial photograph overleaf (Figure 1) shows the site and its immediate surroundings. The red line depicts the approximate site boundary and survey area.



Figure 1: Approximate location of the site, indicated by red line boundary (Image taken 18/08/2020 © 2020 Google)

Purpose and Objectives

- 1.2 This document is designed to ensure that adequate enhancements for protected species is incorporated into the design of the scheme.
- 1.3 The aims, objectives and use of this document are to provide detailed information regarding the ecological enhancements required. This describes the checking and monitoring that would be implemented to ensure works are being undertaken in accordance with requirements, together with measures to ensure that appropriate corrective actions or mitigation measures are taken. Details regarding enhancements and habitat creation are also included with a view to significantly increase the biodiversity on site post-development.

2.0 Site Review

- 2.1 The 2020 PEA identified that the habitats on site are dominated an arable field with edge habitats including grassland and a northern tree line. The habitats on site are common and widespread
- 2.2 In terms of protected species, only common reptiles, both slow worm and common lizard, were considered to be present on site.
- 2.3 Consideration has been made for foraging bats, foraging and commuting badgers and besting birds. Hedgehogs are known locally and therefore also considered in the master plan.

3.0 Roles and Responsibilities

Ecologists

- 3.1 The Ecology Partnership will be on site when appropriate to monitor work so that no wildlife comes to harm and also to provide advice to site workers about best practices. The Ecology Partnership's duties include, but are not limited to:
- Monitoring site works;
 - Providing status reports and updates as necessary;

-
- Providing advice and liaising with workers on site as necessary;
 - Identifying environmental risks and developing appropriate environmental controls;
 - Delivering environmental training for site personnel and sub-contractors;
 - Liaising with client.

3.2 If an occasion arises which requires advice about a wildlife issue, then The Ecology Partnership's office can be contacted on **01372 364 133**.

Site Workers

3.3 It is expected that all site workers will act responsibly whilst on the development site and adhere to the wildlife protection zones. All site workers will be briefed on ecological issues with regards to fence lines, protection zones and timings. All site workers will receive a toolbox talk (TBT) with relation to reptiles and breeding/nesting birds that may be found on site.

3.4 All site workers are expected to:

- Dispose of litter in the litter bins provided;
- Report fence damage immediately;
- Report any protected species found within the construction work areas.

3.5 Under NO circumstances must site workers:

- Clear any hedgerows, scrub or trees before being checked for nesting birds by a suitably qualified person;
- Dump material in uncleared areas and 'wildlife protection zones';
- Move or damage fences (tree protection fences);
- Enter fenced off areas ('wildlife protection zones');
- Have fires or store materials in areas not previously agreed;
- Handle or catch animals (unless the animal is in immediate danger);
- Remove or disturb wildlife boxes.

3.6 If any site worker is unsure of any of the above points, then they must refer to the site manager.

Timing of Works

- 3.7 Recommended timings for specific works are referred to throughout this report.

4.0 Method of Works Pre Construction

Reptile Translocation

- 4.1 Before any works can take place on site, the areas of suitable reptile habitat which are to be affected by the development need to be fenced off, with suitable reptile fencing, to ensure reptiles do not move onto the development site.
- 4.2 The reptiles are located around the very edges of the site (see Reptile Survey, The Ecology Partnership October 2020). As such, it is possible to start the development prior to translocation, with the reptile fence line providing protection from any accidental encroachment. The location of the fence line is shown in figure 2 below, along side the area which is to become a receptor site. .



Figure 2: Red line shows the boundary of the site and the pink line shows the location of the reptile fence. The reptile fence line will retain all suitable habitat for reptiles on site during the initial build process. The pink shaded area is the receptor site.

- 4.3 The fence line should be established at any time of the year and is not restricted to seasons as the fence line will be established on the edge of the arable field, which does not support any features suitable for reptiles.
- 4.4 The receptor area will also need to be enhanced. The northern aspect will be planted with orchard trees and seeded or turfed to provide suitable tussock grassland. The grassland under / adjacent to the tree line is considered suitable currently, however, the reptile receptor area will need to be expanded to accommodate the reptiles on site.

-
- 4.5 Log and brash piles should be created within the receptor area to provide refugia for the translocated reptiles. They are also beneficial for amphibians, small mammals and saprophytic insects.
- 4.6 These enhancements should be completed as soon as possible to allow the habitats to develop before the reptile translocation. The edge habitat, which is currently considered to be of good quality for reptiles, will be maintained long and tussocky by the time of the translocation so that there is enough vegetation to provide foraging opportunities as well as cover from predators.
- 4.7 Once the receptor area is ready the reptile fencing will be set up around the reptile receptor habitat and around the edges of the site following the standard below (Figure 3). The receptor site will be protected by the reptile fence line during the construction process and act as a holding area for the reptiles.
- 4.8 These areas of suitable reptile habitat will be trapped using artificial refugia until there are 5 consecutive days of no catches. This should be done between April and September/October (in suitable weather conditions). Any reptiles found will be moved to the reptile receptor area. It is considered that initially the site should be trapped for 30 days, due to the relatively small areas of suitable habitat and the low population of reptiles found. However, this should be reviewed dependent on catch rates. After 30 days, if catch numbers are still high, the trapping will continue for another 30 days.
- 4.9 Once the trapping has been completed, or there are 5 no catch days, the grassland and scrub habitat will then be strimmed to 150mm, checked, and then finally strimmed down to ground level. This will be undertaken under ecological supervision. The arisings can be placed in several compost heaps within the retained habitat and added to hibernacula in the receptor area, providing good habitat for breeding slow worms.

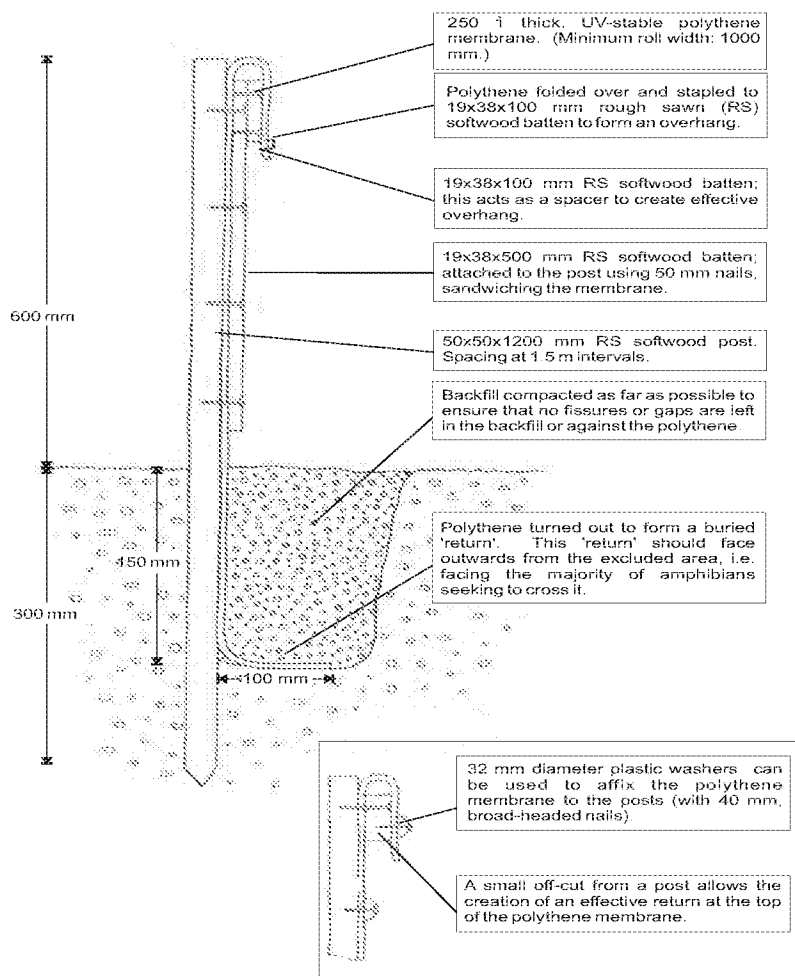


Figure 3: Fence line standards

- 4.10 Following strimming, the soil will need to be sensitively removed under ecological watching brief. A finger tip search will be carried out and then the soil can be slowly raked through with a toothed bucket. Any reptiles found will be caught and moved before the soil can then be completely removed.
- 4.11 For the final stage of the translocation process, any natural reptile refugia will need to be dismantled by hand or using sensitive machine work under close supervision of an ecologist. This includes the wood piles and brash piles present to the rear of the housing along the southern aspect of the site.
- 4.12 Once the translocation is complete, the reptile fence around the receptor area should be retained until construction has finished to prevent the translocated reptiles venturing on

to site. This will also aid in preventing machinery and works from entering the receptor area. Therefore, the fencing should be maintained to a high standard and will be periodically checked by an ecologist or site manager until it is ready to be removed. It is recommended that the site manager checks the fence line once per week. It is also recommended that an ecologist or suitably qualified person check the state of the fence line once a month. Signs can be used to inform site workers (Appendix 2).

4.13 It is considered that with the reptile fence line established prior to construction works on site, construction works can proceed within the arable field without constraints from reptiles, as all the suitable reptile habitat is retained around the very edges of the site. As such, the translocation of reptiles can take place during 2021 alongside / during the construction phase.

4.14 The fence line must be retained in situ until the ecologist on site is happy to remove the fence line. The fence line must be checked it is fit for purpose by the site manager.

Badgers

4.15 Prior to any site works the site should be walked and the edges of the site surveyed for the presence of badgers and their setts. The previous surveys did not identify badgers setts present on site, however, badgers are mobile and as such a precautionary approach should be taken (see General Working Practices).

Vegetation Removal

4.16 Breeding birds are likely to use the trees, and shrubs on site. The trees and vegetation edge are being retained and left in situ. Any vegetation removal which needs to be carried out should be done outside of the breeding bird season (March-September inclusive) or immediately after a nesting bird check by a suitably qualified ecologist. If active nests are identified, works in the vicinity of the nest must cease until the birds have fledged the nest.

-
- 4.17 Any ground vegetation clearance works should be undertaken prior to nesting bird season or be undertaken once a walkover assessment of the site has been undertaken.
- 4.18 It is understood that no trees are scheduled for removal.

Protective Fencing

- 4.19 Heras fencing and / or tree protection fencing (following industry standards BS 5837) will be established under the direction of the arboriculturalist around mature trees on the northern edge of the site. These must be retained in situ until after construction and will be removed under advice from the arboriculturalist. The site manager will monitor the fence lines to ensure that they are fit for purpose and ensure that no storage of materials, fires or damage to these areas occur.

General working practices

- 4.20 As badgers and other species such as foxes and hedgehogs maybe present in the wider landscape and have the potential to use the area, best practice guidelines should be followed to ensure that badgers and other mammals such as foxes are not harmed by the construction process;
- Any trenches or excavations on site should be either covered over at night or a plank of wood placed in so as to allow any mammals to escape if the animal were to accidentally fall in.
 - Any open pipes or conduits laid should be blocked off each night to prevent badgers/foxes/hedgehogs from entering them.
 - Construction work should only take place between dawn and dusk with no late evening work. This will reduce possible disturbance to badgers/foxes/hedgehogs as they emerge to forage and also reduce the risk of traffic casualties from late working site traffic.

5.0 Ecological Enhancements

Bat Roost Provision

- 5.1 Integrated bat tubes are to be incorporated into new houses set within suitable locations as shown in Appendix 2. These tubes will provide opportunities for crevice-dwelling species such as pipistrelles and require no maintenance. A total of 16 integral bat boxes have been designed into the scheme.
- 5.2 Habibat, in association with the Bat Conservation Trust, provide a range of boxes which are unfaced for render or designed to match the brickwork of the buildings (Figure 4). Other examples include the Schwegler 1WI box and the Schwegler 1FR tube (Figure 4). Either integrated tube is considered acceptable / or tubes of similar construction (dependent on availability as Schwegler boxes have been problematic to purchase). The tubes should be fitted as building works take place. They should be placed as high up in the brickwork as possible and positioned on various aspects to provide different niches within the site, with some facing south for summer/maternity roosts. The location of these integrated bat tubes are shown in appendix 2. A booklet will be created for future home owners informing them of what the tubes are for and the legal protection surrounding bat roosting sites.

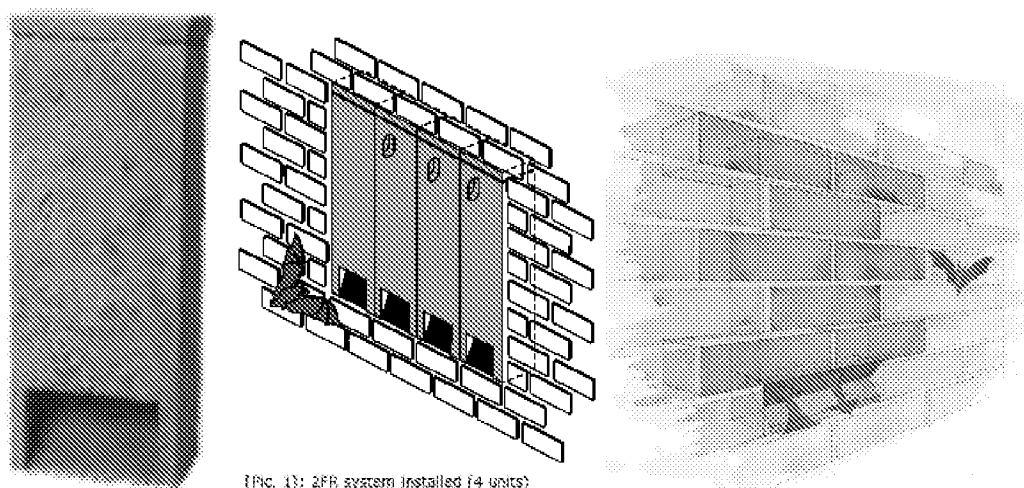


Figure 4: Bat tubes incorporated into the wall of a building to provide roosting space

- 5.4 To increase roosting opportunities around the site one Habibat Rocket Box (Figure 5 below) – A large stand alone pole-mounted bat box that provides extensive roosting space (location of these is shown in appendix 2 of the report) will be provided in the south western corner of the site, located around the SUDS pond.



Figure 5. Habibat Rocket Box

Bird Boxes

- 5.6 House sparrows are present within the local area. As such sparrow terraces (Vivara Pro Woodstone House Sparrow Nest Box stock code 90746 double chamber) will be included within ten of the new buildings. This will result in the provision of 20 nesting sites. The location of these boxes are shown in appendix 2.

Log piles

- 5.7 Log and brash piles have been recommended for the site to provide refugia and hibernacula for reptiles, amphibians and small mammals. They are also important for saprophytic bryophytes and saprophytic insects.
- 5.8 A total of 6 of these will be established around the edges of the site, as shown in Appendix 2 and under the direction of an ecologist. They will be placed in a variety of locations (damp and sunny spots) and next to existing vegetation, such as the hedgerows, so that there is cover immediately adjacent. They will contain a mixture of log piles and shapes with some small diameter material to create a diverse structure.

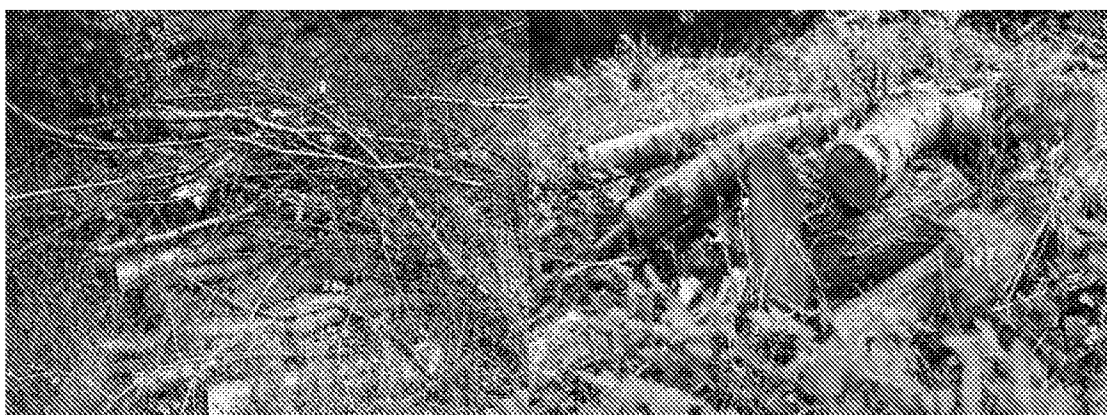


Figure 6: Examples of log and brush piles

Hedgehogs

- 5.9 This species has suffered substantial decline in recent decades for a variety of reasons, one of which is a decline in suitable habitat and connectivity around developments. Hedgehogs make use of natural log and brash piles in woodland to hibernate in the winter months and so supplementary log piles are to be established around the edges of the site.
- 5.10 Fence lines within the site, are to be made 'hedgehog friendly' allowing the gardens to be permeable to hedgehogs creating access through the connected gardens, see figure 5 below. The location of the hedgehog highways are shown in appendix 2. The hedgehog friendly network will be created within the site allowing species to move between the open parkland habitats and the back gardens.

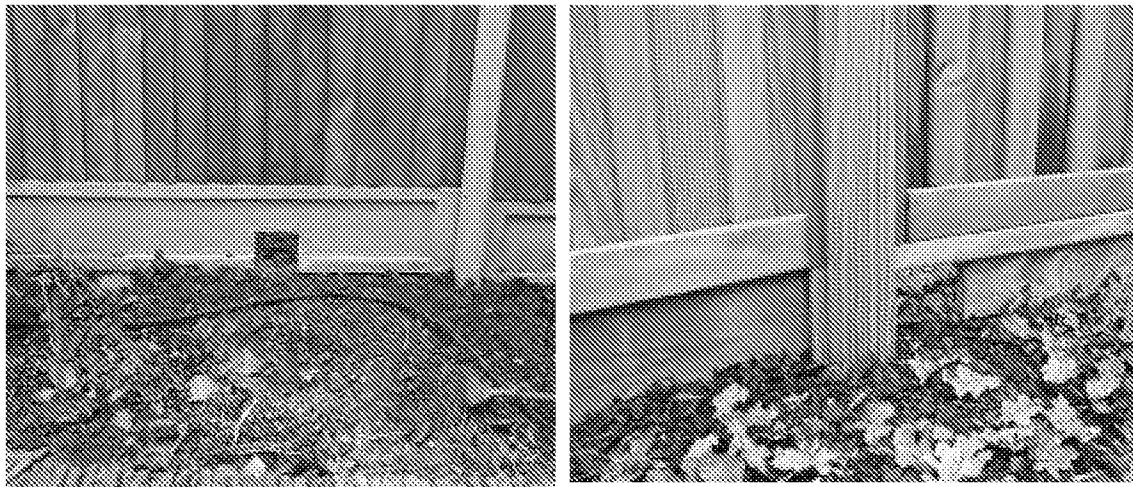


Figure 7: Hedgehog friendly garden fences

- 5.11 To ensure that new residents do not block these ‘highways’, small signs will be erected above the hole, such as those produced by the People’s Trust for Endangered Species (PTES), informing them of their purpose (Figure 6).



Figure 8: Hedgehog highway sign for fences (hedgehogstreet.org)

6.0 Planting Scheme

6.1 The landscape plans have been outlined in appendix 3. The aims of the planting scheme are shown within the illustrative landscape plan and include:

- The creation of species rich grassland habitat and community orchard;
- Creation of SUDS and a mixture of native shrub / scrub planting and grassland;
- The planting of new native species trees;

Species Rich Grassland

6.2 The area of grassland within the orchard habitat and around the SUDS reedbed will be sown with Meadowscape Pro Native Enriched which includes the following species;

- Autumn hawkbit (*Leontodon autumnalis*)
- Babys breath (*Gypsophila elegans*)
- Betony (*Stachys officinalis*)
- Birdsfoot trefoil (*Lotus corniculatus*)
- Black medic (*Medicago lupulina*)
- Bladder campion (*Silene vulgaris*)
- Borage (*Borago officinalis*)
- Cats ear (*Hypochaeris radicata*)
- Common columbine (*Aquilegia vulgaris*)
- Common Corncokle (*Agrostemma githago*)
- Common pink (*Dianthus plumarius*)
- Common knapweed (*Centaurea nigra*)
- Common poppy (*Papaver rhoeas*)
- Common toadflx (*Linaria vulgaris*)
- Common vetch (*Vicia sativa*)
- Cornflower (*Centaurea cyanus*)
- Cowslip (*Primula veris*)
- English marigold (*Calendula officinalis*)
- Field scabious (*Knautia arvensis*)
- Large bellflower (*Campanula latifolia*)

-
- Honesty (*Lunaria annua*)
 - Kidney vetch (*Anthyllis vulneraria*)
 - Lady's bedstraw (*Galium verum*)
 - Meadows cranesbill (*Geranium pratense*)
 - Nodding catchfly (*Silene pendula*)
 - Oxeye daisy (*Leucanthemum vulgare*)
 - Perforate st John wort (*Hypericum perforatum*)
 - Ragged robin (*Silene dioica*)
 - Rough hawkbit (*Leontodon hispidus*)
 - Salad burnet (*Sanguisorba minor*)
 - Self heal (*Prunella vulgaris*)
 - Tufted vetch (*Vicia cracca*)
 - Viper bugloss (*Echium vulgare*)
 - Wall flower (*Cheiranthus cheiri*)
 - White campion (*Silene latifolia*)
 - Red clover (*Trifolium pratense*)

- 6.3 Log piles (see details above) will be included within the SUDS area and the orchard area to provide new features of interest for local wildlife.

Native Scrub and Trees

- 6.4 Specimen trees to be planted along the streets and around the LEAP and LAP will include:
- Hazel (*Corylus avellana*);
 - Cherry (*Prunus avium*);
 - Crab apple (*Malus baccata*);
 - Field maple (*Acer campestre*);
 - Hornbeam (*Carpinus betulus*);
 - Aspen (*Populus tremula*)
- 6.5 New scrub planting will occur along the edges of the site, notably around the SUDS bed. This will help to improve wildlife corridors around the site for species such as badgers, small mammals and birds. It is recommended that native species be used including:

-
- Hazel (*Corylus avellana*)
 - Hawthorn (*Crataegus monogyna*);
 - Wayfaring tree (*Viburnum lantana*);
 - Field maple (*Acer campestre*);
 - Holly (*Ilex aquifolium*);
 - Elder (*Sambucus nigra*);
 - Privet (*Ligustrum vulgare*);
 - Dog rose (*Rosa canina*);
 - Honeysuckle (*Lonicera periclymenum*);
 - Spindle (*Euonymus europaea*),
 - Dog rose (*Rosa canina*).

- 6.10 Any new tree planting within gardens and along the street should use native species where possible. However, it is considered that non native and cultivars are acceptable within the built environment.

Orchard

- 6.11 Fruiting apple and pear (*Malus* red Windsor and *Pyrus* conference) should be planted in traditional spacing of about 7m between the trees. The grassland beneath should be seeded with the enriched species mixture as detailed above.

7.0 Post Construction

Fence line removal

- 7.1 Once habitat creation and enhancements have been completed in the wider landscaped areas the fence surrounding the reptile receptor area can be removed. This will allow the reptiles translocated pre-construction to disperse naturally into the surrounding area and beyond.

Management and Monitoring

- 7.2 A detailed management plan will be developed for the site to ensure that the new habitats created continue to be appropriately managed for wildlife. Activities will include maintaining and enhancing the tree lines, additional planting where required and traditional orchard maintenance.
- 7.3 A reptile survey will be carried out two years after completion of the site to monitor the reptile population on site and to inform future management.

8.0 Conclusions

- 8.1 The site has been subject to various ecological surveys to ensure that protected species and local wildlife have been considered as part of the scheme.
- 8.2 Enhancements have been included within the design and are; new tree planting, the use of log piles, and bat and bird boxes. All of these have been considered in terms of local wildlife.

Appendix 1: Signage Examples

WILDLIFE PROTECTION ZONE

**PROTECTIVE FENCING MUST
NOT BE MOVED**

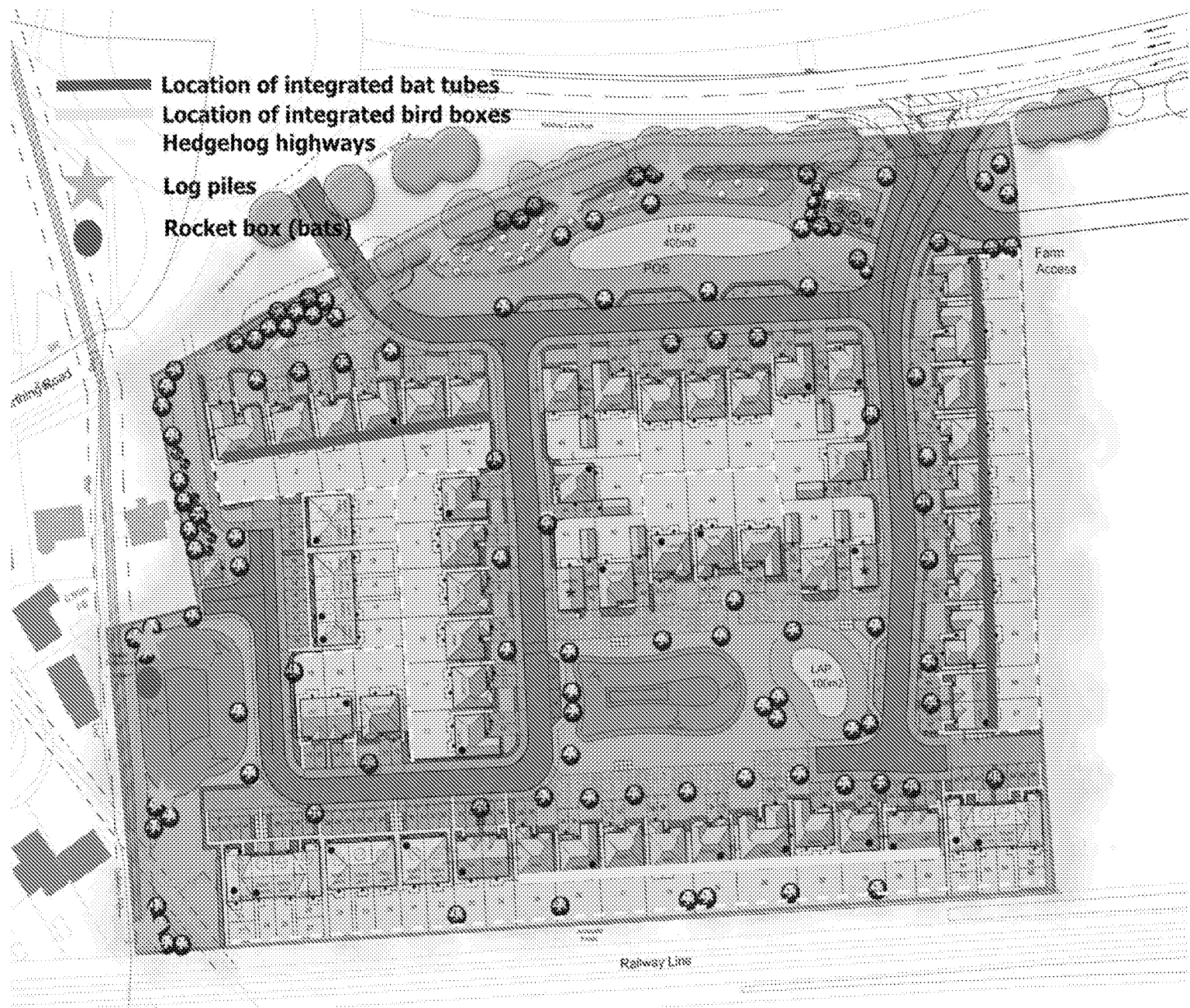
NO UNAUTHORISED ENTRY

NO MACHINERY

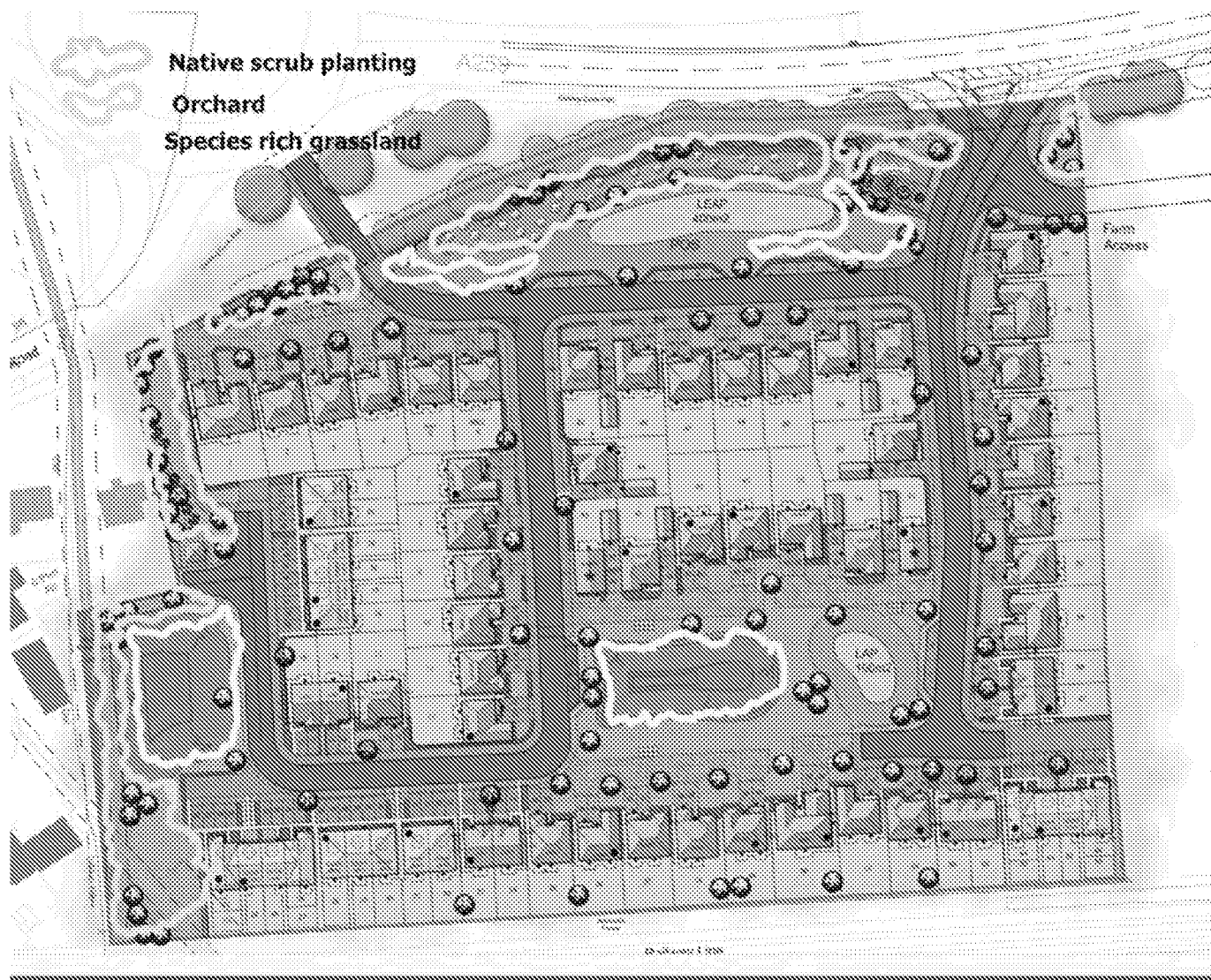
NO STORAGE OF EQUIPMENT

QUERIES SHOULD BE DIRECTED TO THE SITE ECOLOGIST

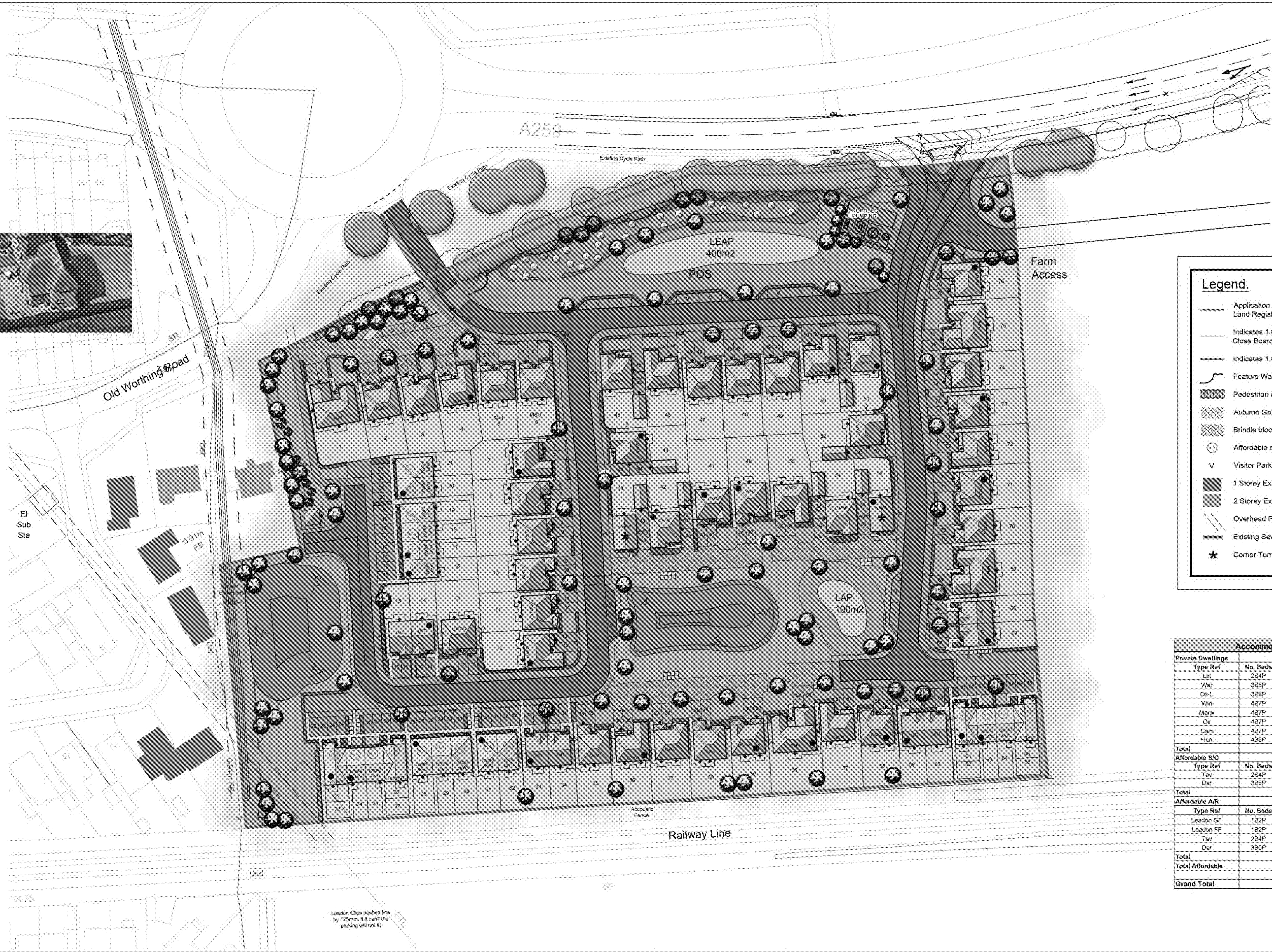
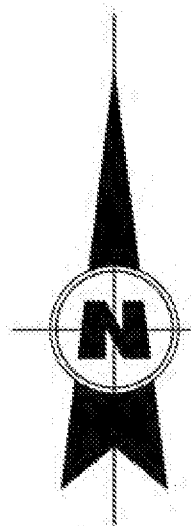
Appendix 2: Location of Wildlife Boxes and Enhancements



Appendix 3: Planting plan



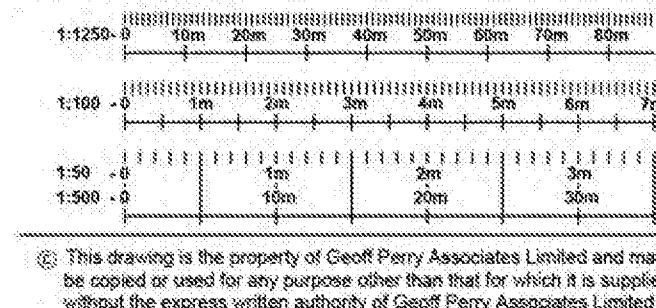
Appendix 4: Master plan



	Application Boundary - to be verified by Land Registry / Client
	Indicates 1.8m high Close Boarded Fencing
	Indicates 1.8m high Screen Wall
	Feature Wall
	Pedestrian crossing points
	Autumn Gold block paviours
	Brindle block paviours
	Affordable dwellings
	Visitor Parking Space
	1 Storey Existing Dwelling
	2 Storey Existing Dwelling
	Overhead Powerlines
	Existing Sewer
	Corner Turner with additional window

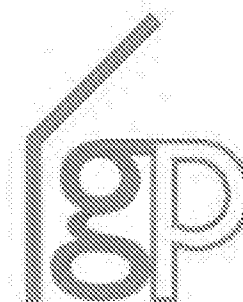
Accommodation Schedule				
Private Dwellings				
Type Ref	No. Beds	Sqft	No. Units	Total Sqft
Let	2B4P	984	8	7872
War	3B5P	1081	2	2162
Ox-L	3B6P	1318	8	10544
Win	4B7P	1240	8	9920
Marw	4B7P	1289	10	12890
Ox	4B7P	1318	7	9226
Cam	4B7P	1394	6	8364
Hen	4B8P	1769	4	7076
Total			53	68054
Affordable S/O				
Type Ref	No. Beds	Sqft	No. Units	Total Sqft
Tav	2B4P	865	4	3460
Dar	3B5P	1014	2	2028
Total			6	5488
Affordable A/R				
Type Ref	No. Beds	Sqft	No. Units	Total Sqft
Leadon GF	1B2P	506	4	2024
Leadon FF	1B2P	641	4	2564
Tav	2B4P	865	4	3460
Dar	3B5P	1014	5	5070
Total			17	13118
Total Affordable			23	18606
Grand Total			76	86660

The Contractor is to check and/or all building and site dimensions, levels and severer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications, and all other relevant standards and codes of practice. The Contractor is to ensure that the drawings are correct and complete on the drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided. This drawing is not intended to show details of foundations, ground conditions or ground contaminants. The Contractor is to ensure that the drawings are correct and complete. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspected and/or shown ground contaminants on or within the ground, should be further investigated by a suitable expert. Any earthwork construction should be carried out in accordance with the relevant standards and codes of practice. Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and services. A suitable method of foundation should be provided allowing for existing ground conditions. The Contractor is to ensure that the drawings are correct and complete. GPC Property Associates Limited do not accept any responsibility for any losses (financial or otherwise) to any Client or third party arising out of the Clients use of Developer or Contractor but not limited thereto (non-compliance with above mentioned provision

[illegible]

Title: PLANNING LAYOUT

Job No.	Drg No.	Rev.
A 924	03	W



**Geoff Perry
Associates Limited**

**The Shrubbery, 28 Erdington Road,
Aldridge, Walsall, WS9 8UH**

e: enquiries@geoffperryassoc.co.uk

t: 01922 744 900

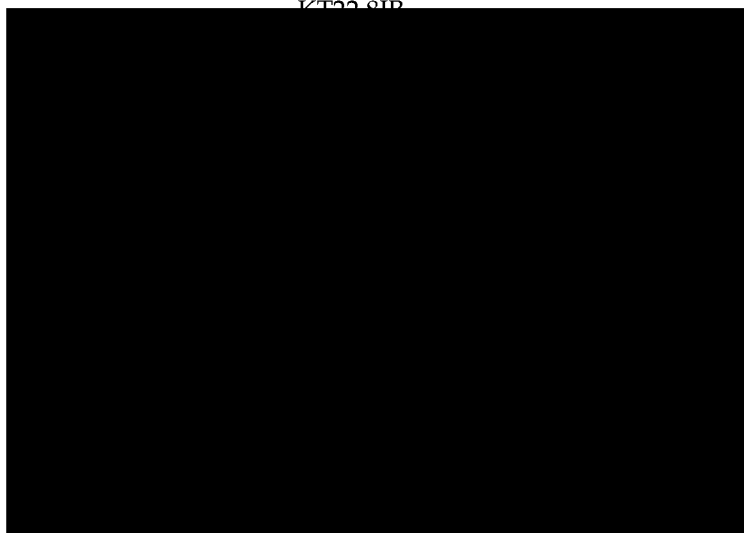
The Ecology Partnership Ltd

Thorncroft Manor

Thorncroft Drive

Leatherhead

KT22 8JP



Approved: Alexia Tamblyn MA (Oxon) MSc CEcol CEnv MCIEEM FRGS

Date: 06/07/2021