Ecological Design Strategy

Woolley Colliery Road

Rouse Homes Ltd.

Report Ref: ER-6218-05

Report Reference:	Ecological Design Strategy Woolley Colliery Road
Report Reference:	ER-6218-05
Written by:	Christopher Shaw BSc (Hons) MCIEEM Principal Ecologist
Technical review:	Peter Brooks BSc (Hons) MA, MCIEEM, CEnv Managing Director
QA review:	Charlie Foreman BSc (Hons) Assistant Ecologist
Approved for issue:	Peter Brooks BSc (Hons) MA, MCIEEM, CEnv Managing Director
Date:	08/09/2022

Unit A, 1 Station Road,
Guiseley, Leeds, LS20 8BX
Phone: **01943 884451**
01943 879129
www.brooks-ecological.co.uk
Registered in England Number
5351418

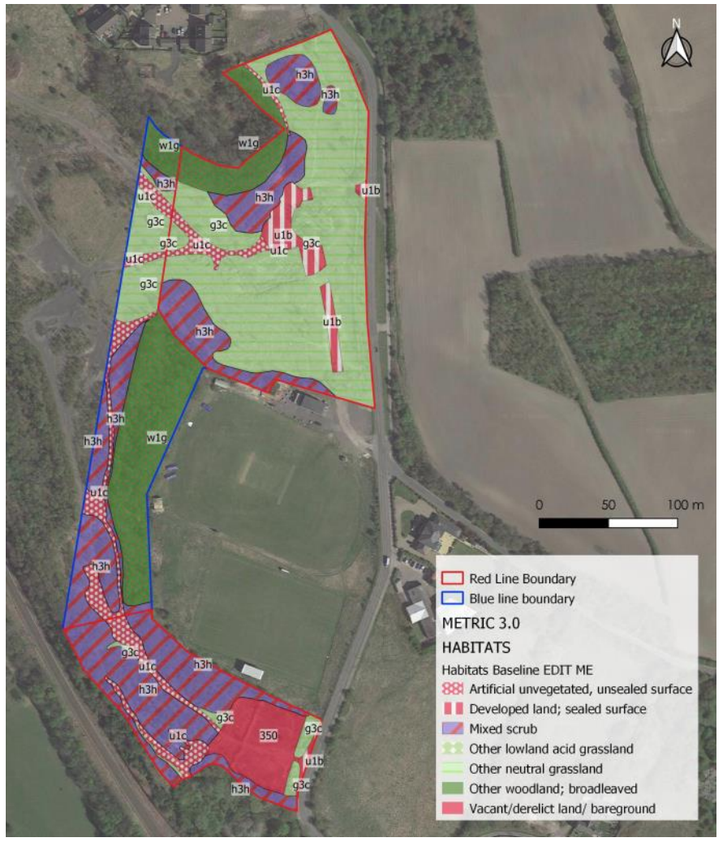
Introduction

The following Ecological Design Strategy (EDS) has been produced for Rouse Homes Ltd. to demonstrate how mitigation and enhancement measures can be designed into their residential scheme at Woolley Colliery Road.

As the scheme is only at Outline Stage, and the Site Layout is likely to change at Reserved Matters, the following document aims to set out opportunities and outlines potential locations for mitigation and enhancements measures, but is by no means meant to be prescriptive. This document should give the Local Authority confidence when making their decision that Ecological issues on Site are being given due consideration and can be adequately addressed on Site, either within the red line boundary, or within extensive blue line land under the client's control.

It is envisioned that as well as providing re-assurance to the LPA, this document will ultimately be used to guide the Design Team when finalising the Site Layout at the Reserved Matters, and will form the basis of the final Biodiversity Management Plan (BMP).

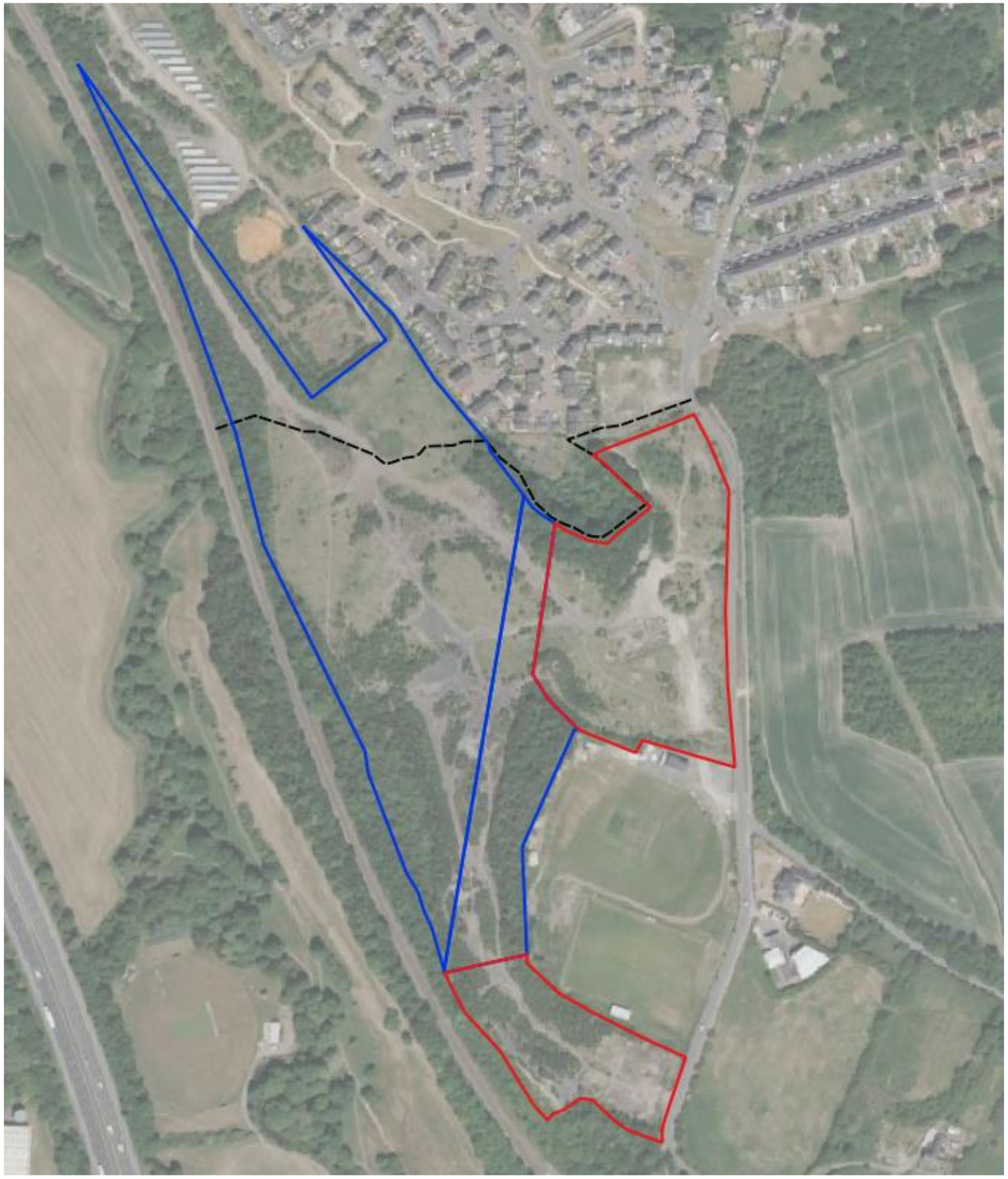
The Site's Ecological baseline is presented in Brooks Ecological reports ER-6218-01–A to 04. Information from these reports will be used to inform this EDS.



◄ Baseline habitats mapped to UK Habitat Classification

Extent of red and blue line boundaries. ►

Line between Wakefield and Barnsley district boundaries shown by dashed black line



Aims and Delivery

Aims

This report illustrates how the biodiversity value of onsite land, within Public Open Space, can be maximised, generating Habitat Units that contribute towards the Site's Biodiversity Net Gain score.

The report also aims to show that through the use of blue line land within the wider colliery, a 'No net loss' in biodiversity can be achieved, and that mitigation for protected or notable fauna can be provided.

Scope of Plan

This plan relates to the proposed residential development scheme, as presented in PDG Architecturals 'Sketch Masterplan'; as shown opposite.

Period the Plan

With the introduction of Biodiversity Net Gain, the Developer will be responsible for the creation and establishment works for a 30-year period.

The Biodiversity Management Plan will detail in full the habitat creation, establishment, management and monitoring works for this 30 year period.

Delivering the plan

The following EDS is designed to be informative only, and will feed into the BMP, once the Site Layout has been fixed at Reserved Matters.

It will be at the BMP stage that the Developer will appoint either a Specialist Ecological Management Company (SEMC) or a company working under the direction of an Ecological Clerk of Works (ECoW) to oversee the delivery of the BMP, prior to any works commencing on-site.

The ECoW would be a qualified Ecologist and member of the Chartered Institute of Ecology and Environmental Management, or be otherwise approved by the LPA.

Many of the aspects covered by the plan, especially those pertaining to invertebrates, will need to be implemented at least 12 months prior to works commencing on Site, so that replacement habitat and foodplants can establish prior to vegetation clearance.

Key Constraints

Invertebrates

The main Ecological Constraint at this Site is the presence of six 'important' invertebrate species, as identified during an Invertebrate Assessment undertaken by Conops Entomology Ltd in 2019.

Based on the survey information collected and through consultation with the Local Planning Authority Ecologist, the Invertebrate interest is considered to be of County Importance. This is based on the presence of dingy skipper (*Erynnis tages*), small heath butterfly (*Coenonympha pamphilus*), small blue (*Cupido minimus*) and leaf beetle (*Longitarsis dorsalis*). Two other species (alder leaf beetle and fruit-fly) were also recorded on site, however these do not warrant their current status and are likely to be downgraded.

Common Lizard

A population of Common lizard has been known to inhabit similar habitat within the wider colliery, to the northwest. These were recorded in 2019, and updating surveys are currently underway to difemerine whether this species has since colonized the Site.

Bats

The Site and wider colliery could be expected to attract reasonable levels of bat activity, and further survey is underway to establish the Site's importance to this group.

Existing Habitats

The Site currently supports a mix of 'medium distinctiveness' habitats, including grassland (mostly neutral, but with elements of acid and calcareous influence), scrub and woodland.

Biodiversity Net Gain

The Environment Bill (2021) stipulates that all developments will need to demonstrate a 10% net gain. Although this will not be legally enforced until November 2023, the Local Planning Authority is requesting that the scheme demonstrate a net gain.

Opportunities and Themes

Notable Invertebrates

Habitat creation will seek to provide the specific conditions required for notable invertebrates to breed and expand on Site, such as the small blue, small heath and dingy skipper butterflies.

This will include promoting the spread of larval food plants such as kidney vetch within calcareous grassland and common birds foot trefoil and fine grasses.

Wildflower grassland

Areas of naturalistic wildflower meadow, sown and managed within areas of POS, can provide high value habitat for groups such as invertebrates, and create an impressive backdrop to the development.

Homes for declining birds & bats

New builds often fail to provide opportunities for nesting birds and roosting bats, with the eaves and verges being well-sealed.

A wide range of designs are now available on the market which can either be fixed to the masonry, or built discreetly into the fabric of new walls.

Woodland

New woodland planting, within areas of naturally dry and wet ground, will provide high value habitat for a wide range of faunal groups, providing food, shelter and improving connectivity through the landscape. Woodlands also provide eco-system services such as reducing flood risk and capturing carbon.

Deadwood & Refugia's

Woodlands make better habitats where deadwood can accumulate, wood chippings spread on woodland floors are slowly broken down by fungi, wood piles make homes for invertebrates, reptiles and small mammals. They also slow the release of carbon into the atmosphere.

Neutral Grassland (Creation)

Specification

Preparation (retained grassland)

This covers any grassland retained along the site boundaries, i.e. along the banks of Mill Dam Drain.

Grassland to be cut hard (10-20mm cutting height) and scarified in October, with all cuttings/ thatch to be collected and removed. Aim will be to create 50% bare ground to vegetation ratio.

Preparation (new soils)

This covers any 'made ground areas', where habitat and soils have been removed during construction, and are re-instated as part of landscaping operation.

No more than 5cm of topsoil will be spread over the subsoil profile. Spread using back actor, spread and firmed. Not driven over and compacted. IMPERATIVE: all soil handling and spreading to be supervised and sanctioned by ECoW- failure is very likely if not.

Seed mixes

The following seed mixes, or suitable alternatives as approved by the ECoW, will be used:

- Emorsgate EL1 - Flowering lawn mix
- Emorsgate EM2 - General Purpose Meadow mix
- Emorsgate EM8 - Wet Meadow Mixture

Areas to be sown with each seed mix are shown in the figure opposite.

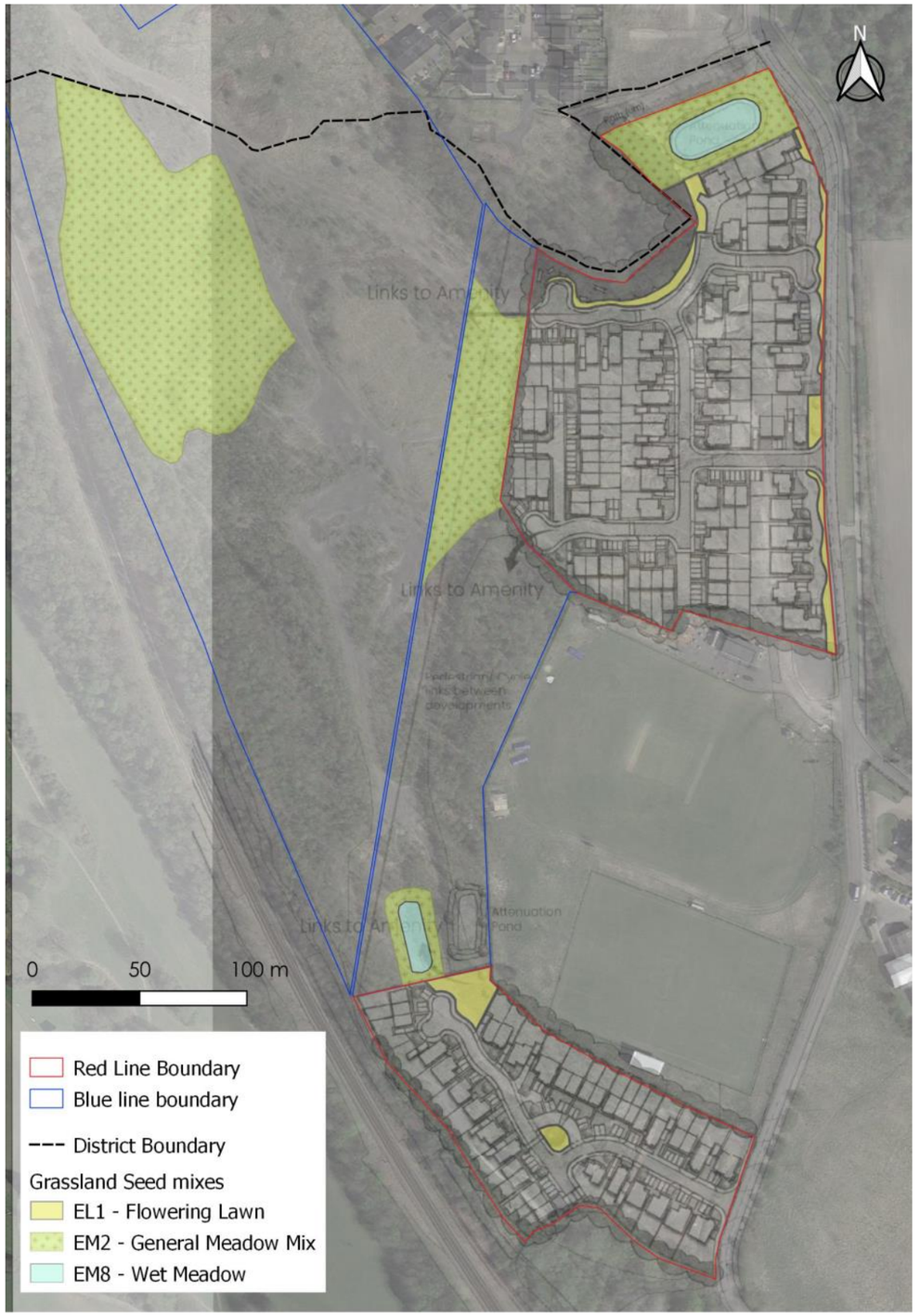
Sowing

Seed according to supplier's instructions.

If soils have been spread before September, any weed growth that has established in the meantime will be sprayed off with glyphosate and a seedbed be re-prepared.

Seed will either be broadcast by hand or by approved lightweight machinery at c. 40kg/ha.

Following seeding, the area will be lightly rolled to incorporate the seed with the growing substrate.



Calcareous Grassland (Creation)

Rationale

As a result of the colliery's past use, the grassland is primarily neutral, but has patches of both acidic and calcareous influences. The aim here will be not to lose and replace existing grassland, from neutral to calcareous, but to shift a larger area of the swards towards a more calcareous community. This will be done on a south facing slope.

Specification

Preparation

The grassland will be cut and heavily scarified in September / October, with all arising collected and removed from site. The aim will be to create at least 50% bare ground within the sward.

Under ECoW direction a fine calcareous substrate (to be agreed) will be spread and locally incorporated into the soil in this area.

Sowing

Once the calcareous substrate has been incorporated, a bespoke seed mix (as detailed below) will be broadcast, by hand, at a rate of between 2-4g/m2.
The seeds and lime will then be raked in to the scarified ground. Following seeding, the area will be lightly rolled to incorporate the seed with the growing substrate.

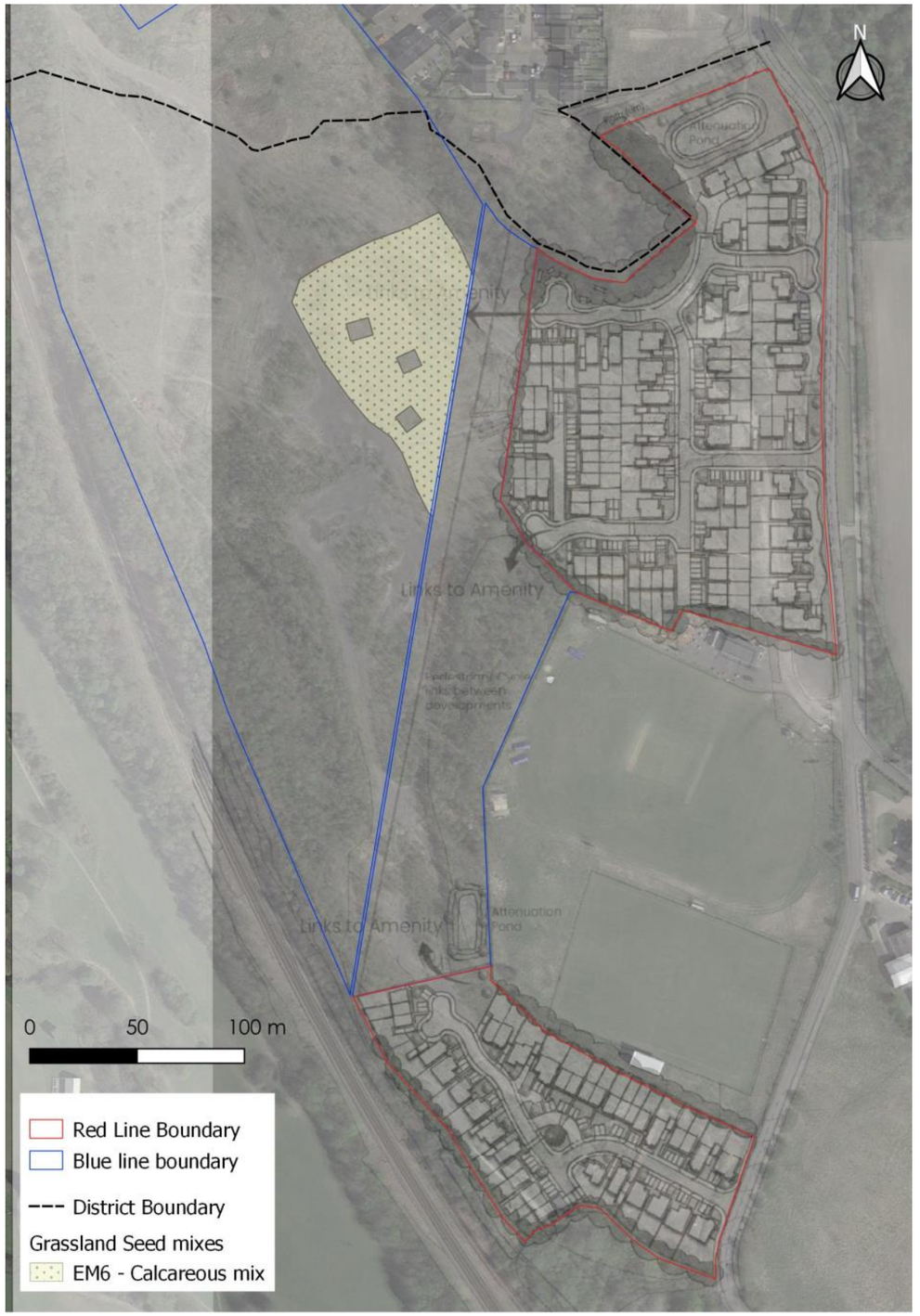
Seed mixes

The flowering swards should have a high density of flowers. Most standard mixes do not have a high enough proportion of flowering plants that are suitable for invertebrate mitigation, so a bespoke mix or additional ordering of supplementary flower seed is advised.

A standard seed mix for calcareous soils will be sown, such as Emorsgate Seeds EM6 (*Meadow Mixture for Chalk and Limestone Soils*). Where necessary, these will be supplemented by the following species to create a bespoke mix.

- common bird's-foot trefoil (*Lotus corniculatus*)
- hawkbits (*Leontodon spp.*)
- hawkweeds (*Hieracium spp.*)
- kidney vetch (*Anthyllis vulneraria*)
- labiates (*Lamiaceae*)
- meadow vetchling (*Lathyrus pratensis*)
- mignonettes (*Reseda spp.*)
- other trefoils (*Fabaceae*)
- other vetches (*Vicia spp.*)
- red clover (*Trifolium pratense*)
- St. John's wort (*Hieracium spp.*)
- wild carrot (*Daucus carota*)

Areas to be sown with each seed mix are shown in the figure opposite.



Grassland (Establishment & Management)

Management

Within the BMP, management will be targeted at the relevant DERA Metric condition criteria.

Year 1–All grassland types

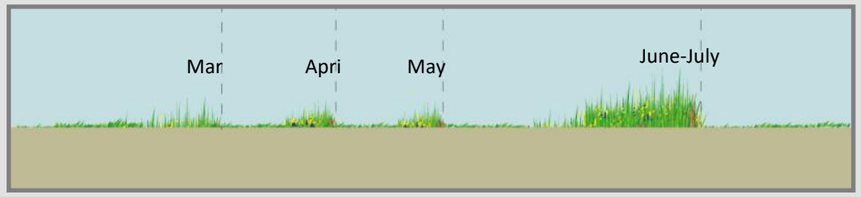
Five cuts, collect arisings and remove from Site.

Use a weed wipe three times in year 1 to kill off weeds - spear thistle, creeping thistle, broad-leaved dock, clustered dock, wood dock, curled dock, nettle, ragwort, and others, according to ECoW recommendations. Operatives must be proven competent in weed identification.

Year 2 onwards

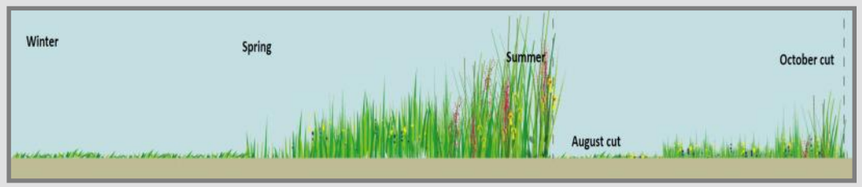
EL1–Flowering Lawn

Cut once per month during the growing season, leave for 5 weeks in June. Arisings may be left to rot *in situ* unless condition is deteriorating.



EM2, EM6 & EM8 –Meadow mixes

Two cuts, once in August and again in October–remove arisings. Continue to spot treat competitive weed species each year until under control according to ECoW.



Monitoring

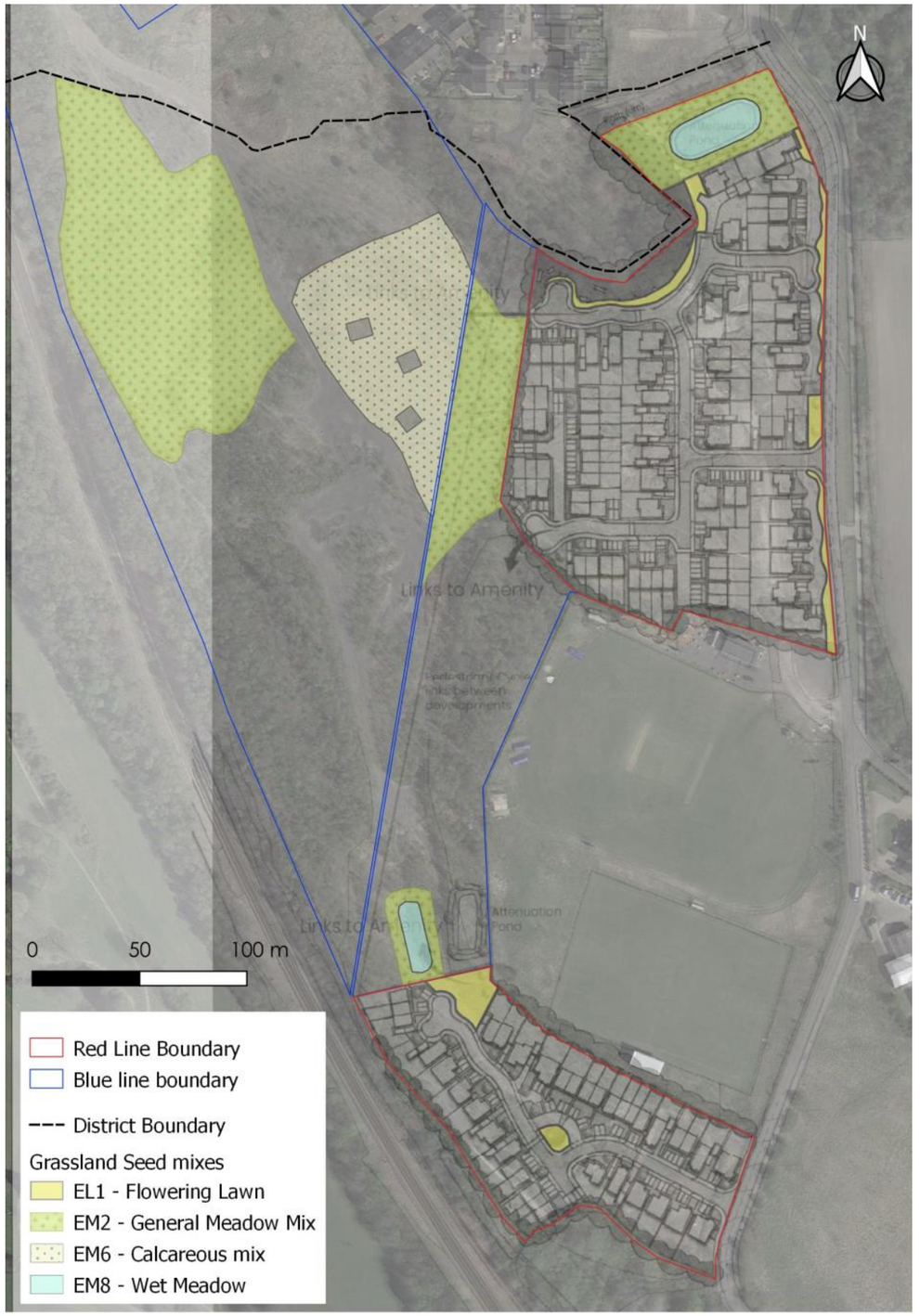
Ecological Clerk of Works year 2 and 5 monitoring visit to check trajectory to condition requirement.

Output

ECoW report year 2 and 5.

Remedial action options

- Increase weed control if undesirable species establish
- Soil scrape to reduce nutrients
- Re-seed and replant locally



Open Mosaic Sward (Creation & Management)

Rationale

An open mosaic sward on low-fertility calcareous soils will be created, in order to provide compensatory habitat for notable invertebrates, such as the Small Blue.

Specification

Preparation

Low-fertility calcareous material derived from the site will be scraped and collected, and then back spread in suitable locations within the blue line land. This will be supplemented by additional calcareous aggregate if deemed necessary by the Ecological Clerk of Works. Material collected from Site will be selected based on the presence of kidney vetch and other calcicoles.

To be successful, the calcareous material will be spread over areas that are exposed to full sun for much of the day, including the key period between 10:00 and 16:00 h, and be created on nutrient-poor subsoils to promote a patchy sward dominated by flowering plants. Such conditions are present within the blue line area.

Seed mixes

A mosaic of fine-leaved grasses and a range of flowering plants are required to fulfil the requirements of the open mosaics. It is likely that a commercially sourced seed mixture may not be suitable, but a bespoke mix should be specified to include the following species:

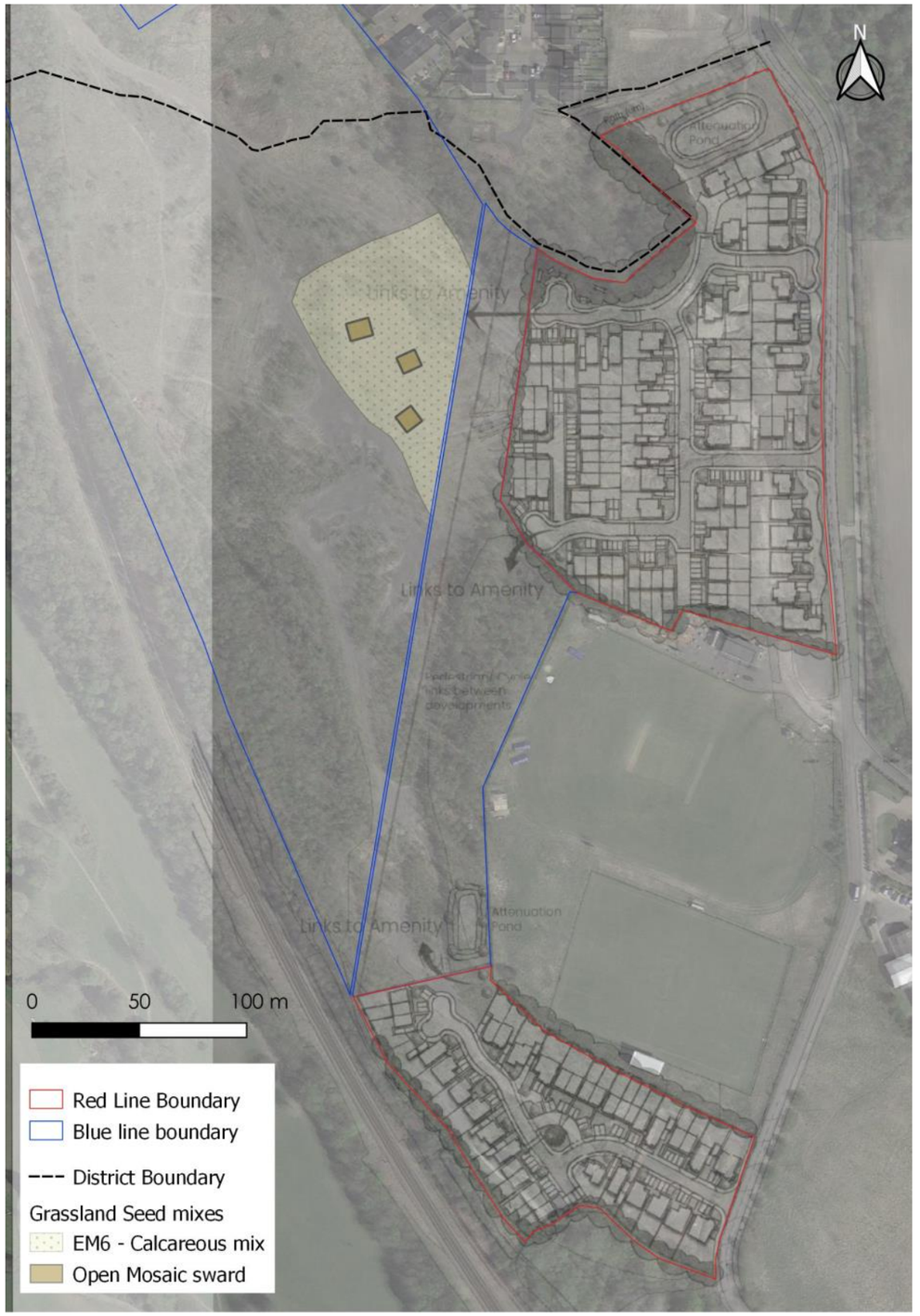
- common bird's-foot trefoil (*Lotus corniculatus*)
- hawkbits (*Leontodon* spp.)
- hawkweeds (*Hieracium* spp.)
- kidney vetch (*Anthyllis vulneraria*)
- other trefoils (Fabaceae)
- other vetches (*Vicia* spp.)
- red clover (*Trifolium pratense*)
- wild carrot (*Daucus carota*)

Sowing

Seed will either be broadcast by hand or by approved lightweight machinery at c. 40kg/ha.

Management

This area will be subject to regular disturbance, in order to ensure the sward remains low and that bare ground comprises approximately 50% of the habitat mosaic. This will involve a single cut and heavy scarification in September and another cut and scarification in April each year.



Broadleaved Woodland (Establishment)

Aim

The aim will be to steer the existing dense birch scrub into a well-structured and diverse broadleaved woodland.

Establishment

Stratification

The woodland will be thinned out by 50% in the first year. This work will be undertaken by a suitable arboriculture contractor, under the direction of a suitable experienced Ecologist.

The aim will be to open up areas so as to allow underplanting with a more diverse range of woody species.

This work will be undertaken between the period of November and February, inclusive.

Planting (understory / canopy species)

Once the woodland has been thinned, a mix of blossom species will be planted within and along the edges of the woodland. This will include:

- apples (*Malus domestica* agg.)
- blackthorn (*Prunus spinosa*)
- cherry plum (*Prunus cerasifera*)
- field maple (*Acer campestre*)
- hawthorn (*Crataegus monogyna*)
- plums (*Prunus domestica* agg.)
- rowan (*Sorbus aucuparia*)
- willows (*Salix* spp.)

These will be planted as bare root whips during the dormant period (October to February).

The species selected will benefit the Site's invertebrate interest, but will also provide a source of food for birds and small mammals.

Seeding

Once the understory has been planted, the woodland floor will be seeded with Emorsgate Seed mix EW1–Woodland Mix.

This will be sown according to the suppliers instructions.

Broadleaved Woodland (Management)

Management

Year 2 -5

Keep a 0.5m diameter around each tree clear of weeds to minimise competition during establishment.

If there is a prolonged dry spell, check soil moisture and water each tree station to saturation at a sufficient frequency to ensure the health of the tree

Check the trees continue to grow upright and don't lean.

Check tree guards and stakes are firmly secured in the ground.

Check trees for pest damage and remove any grass or weeds growing inside the tree guards.

Create standing deadwood by ring barking and creating monoliths from selected birch trees. To be done under the direction of a suitably qualified ecologist and arboriculture consultant.

All timber and brash to be retained on Site, within woodland, in log/ brash piles .

Years 5-30

Monitor and replace dying trees.

Remove any Invasive Non-native weeds that may colonise.

Continue to thin out birch trees as and when required, with an aim of creating clearings within woodland covering 10-20% area in total.

Faunal Provision (Invertebrate mitigation)

Invertebrate Bank

Invertebrate banks are essentially mounded materials. These features will be constructed in a variety of ways, with some banks being partially compacted with machinery, whereas others will be allowed to settle naturally to encourage niche variation, through slumping, and retain lots of interstitial spaces between the aggregate material in which ground beetles can live.

The banks will be constructed with calcareous material, either scraped from site, or as new calcareous aggregate that is brought into the Site.

At least 3 of these features will be created on site. Each will be constructed on a southerly facing aspect, with each being at least 10m in length, and built with a range in height from 1m–3m.

Banks will be created in a variety of shapes, including crescent and sinuous, with some being further diversified by the creation of small cliff faces dug into the bank, to provide nesting locations for solitary bees and wasp species.

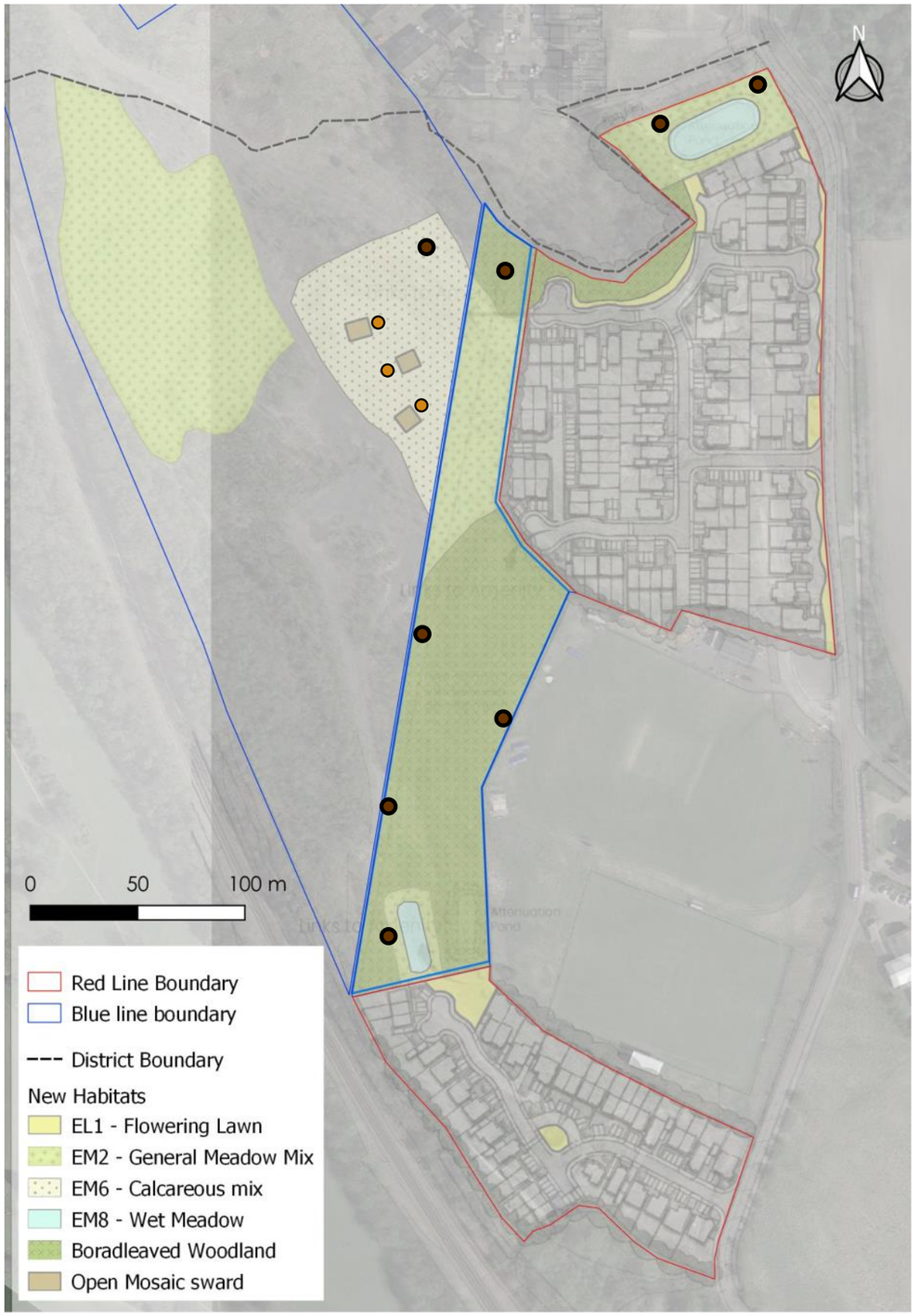
Once constructed, the banks will be sown with suitable calcareous grassland seed mix.

Log piles

At least 8 log piles will be created on Site; with half created within areas of woodland and half within flower rich grassland.

These will be created using material arising from the initial Site clearance operation, and topped up over the 30 year period from routine management of the woodland.

Within the log piles, some material will be inserted vertically into the ground, to replicate standing deadwood (minimum height–1m).



Faunal Provision (Bat boxes)

Specification

Box Type	No.	Plan ref.
Integrated Eco Bat Box	15	Blue dots

Location Notes

The exact location of boxes will be shown in the BMP, once the Site layout has been fixed, and the housing types known.

The figure opposite illustrates how boxes would be sited.

Boxes will be sited as high as possible on new builds, ideally directly below the eaves or verges.

Boxes will not be positioned directly above windows, to prevent potential conflict with new homeowners.

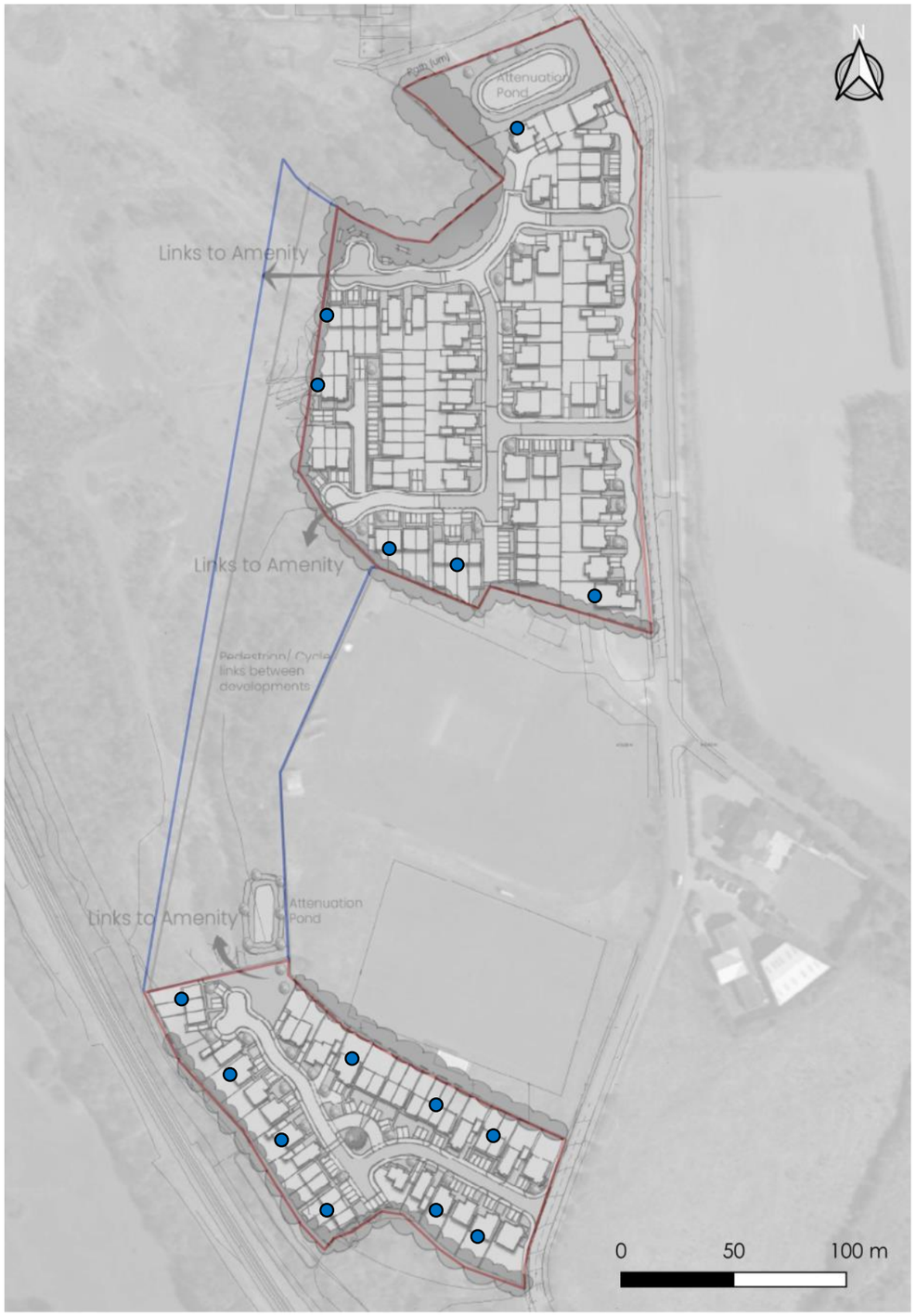
A range of elevations have been selected, so as to provide a variety of potential roost environments.

Where possible, boxes have been positioned so as to face onto retained boundary hedgerows or new rear gardens. This fronts them onto favourable habitat and enables boxes to be discreet.

Front elevations and elevations fronting onto new roads have been avoided, to avoid illumination from street lights.

Installed

During construction.



Faunal Provision (Bird boxes)

Specification

Box Type	No.	Plan ref.
Manthorpe Swift Brick	30	Green dots*

* 1 dot denotes 3 bricks.

Although designed to attract swift, swift bricks have been shown to act as 'universal' bird boxes, being used by other declining garden birds such as house sparrow, house martin, and starling.

Location Notes

The exact location of boxes will be shown in the BMP, once the Site layout has been fixed, and the housing types known.

The figure opposite illustrates how boxes would be sited.

These will be installed in groups of three on a single elevation. Ideally with one directly below the apex of the verge, and the other three at the bottom of each verge.

Boxes will not be positioned directly above windows, to prevent potential conflict with new homeowners.

Installed

During construction.

Faunal Provision (Hedgehog Highway)

Rationale

Hedgehogs have seen significant declines over the last few decades, with one of the major factors being loss of habitat. This species is listed under Section 41 of the NERC Act (2006) as a 'Species of Principal Importance'.

New Public Open Space (POS) and private gardens provide excellent habitat for hedgehogs and, whereas previously these gardens were accessible to this species by virtue of hedgerow planting, a shift in industry practice to hard borders (fences and walls) has inadvertently excluded hedgehog from this extensive foraging resource. Simply providing a means of access into and between these new gardens and POS can very easily and cheaply increase the amount of habitat available to hedgehog, as shown in the figure opposite.

Specification

At least one hedgehog access hole (measuring at least **13cm x 13cm**) will be installed in each new garden and boundary fence line, allowing connectivity between rear gardens and POS.

This will be done by contractors during the fence's installation. These will be either purpose-made panels such as those supplied by Jackson Fencing, or be cut into standard fences by contractors during installation. Where concrete gravel boards are used, either purpose-built ramps to access holes in the fence panels or underpasses beneath the boards will be made.

All holes will be labelled 'Hedgehog Highway' (see photo above right) so homeowners know why they are there. This will reduce the risk of holes being sealed.

Raising Awareness (Information board

Ecologically planned and managed habitats need to be understood by users if they are to appreciate them and become motivated to protect and enhance them for wildlife.

With Specialist Ecological input, the client will install a custom designed information board in the most advantageous location on site.

This will summarise the importance of the woodland buffer.

At least two information boards will be installed near to the access points into the POS, as shown by black circles on the figure opposite.