# Ecological Design Strategy

# Land at Chidswell, Dewsbury

## Church Commissioners for England

Report Ref. ER-5091-10

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| Report Reference: | Ecological Design Strategy<br>Land at Chidswell, Dewsbury |
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# Introduction

Brooks Ecological Ltd was commissioned by Church Commissioners for England to produce an Ecological Design Strategy (EDS) for the proposed mixed use development east of Leeds Road in Chidswell, as shown in Figures 1 and 2.

This document aims to demonstrate how the proposed development could make a positive contribution to biodiversity focusing on the development area highlighted by the red line boundary, something that is set out in guidance such as the NPPF and BS:42020 - beyond mitigating or compensating any potential impacts. This is also set to become increasingly important, as Biodiversity Net Gain becomes better established within the planning system.

It is intended that this document will feed into the design of the Landscape Masterplan and Biodiversity Management Plan, by illustrating what habitat creation and ecological enhancement measures could feasibly be incorporated into the Site Layout to maximize biodiversity gain.

Ecological constraints and opportunities have been identified through a suite of detailed ecological studies undertaken across the 2018-2019 survey seasons; these include a Preliminary Ecological Appraisal, Bat Emergence, Great Crested Newt eDNA and Reptile Survey.

**Figure 1** Site Location Plan

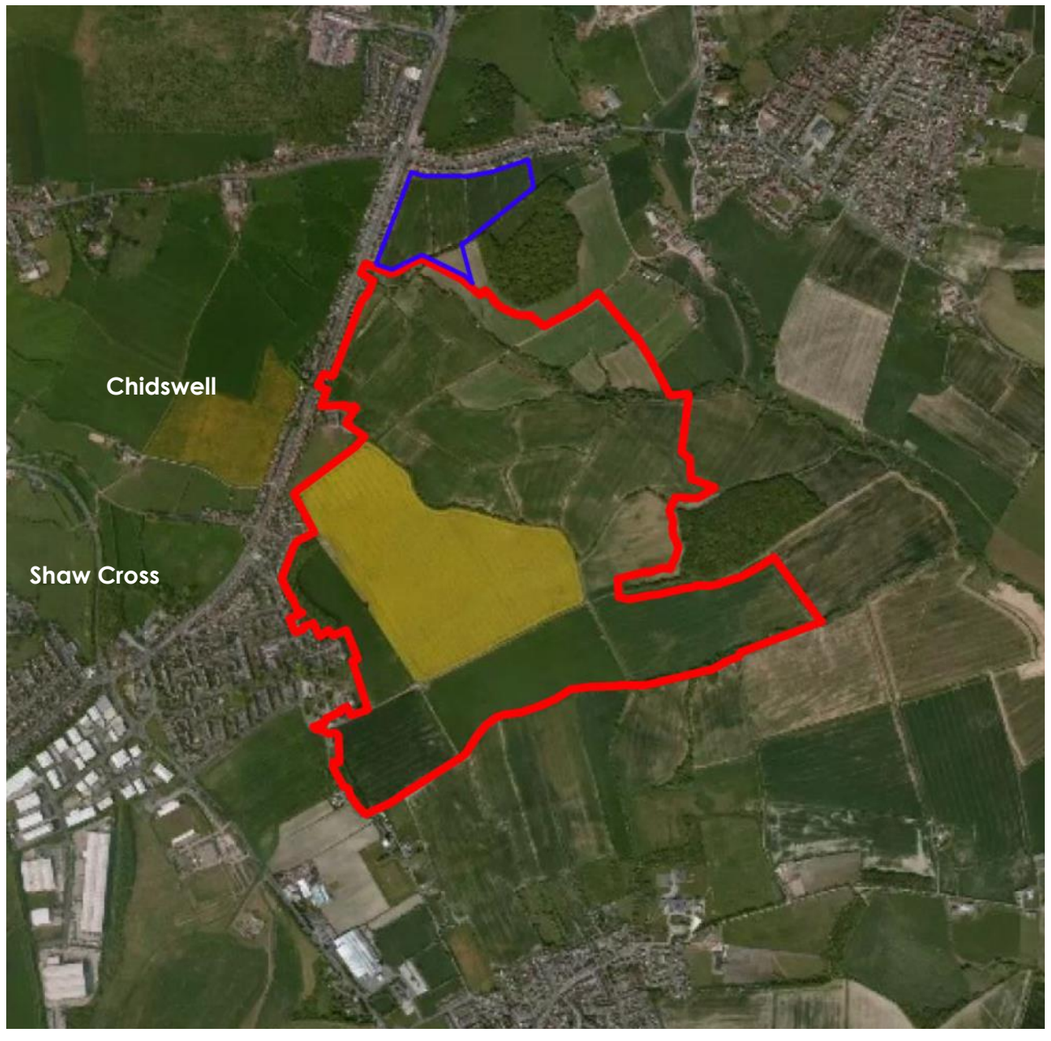



**Figure 2** Proposed Site Plan

# Ecological Constraints & Considerations

## Waterways

Two watercourses currently interact with the site, passing in a roughly west to east direction, connecting with Hey Beck to the east. Both are predominantly dry throughout the year and the on-site section offers enhancement opportunities.

## Scrub

Areas of scrub are noted particularly along the northern watercourse boundaries. Scrub is an important habitat for a diverse range of fauna and flora. Existing scrub shall be enhanced with significant additional scrub planting as part of the development design, connecting areas of wetland and woodland.

## Tree & Hedgerow Protection

Mature native trees and boundary hedgerows are of ecological value and it is recommended that these features be retained and protected, wherever feasible. The site features a predominance of oak and ash trees particularly associated with existing hedgerows. Two ancient woodlands sit just outside of the Site boundary; on site planting should enhance connectivity to these woodlands.
Retained vegetation will need to be protected to BS5837 throughout the construction period; details of which will be covered in the Site's Arboricultural Method Statement. Any loss in tree cover would be suitably compensated through high quality replacement planting.

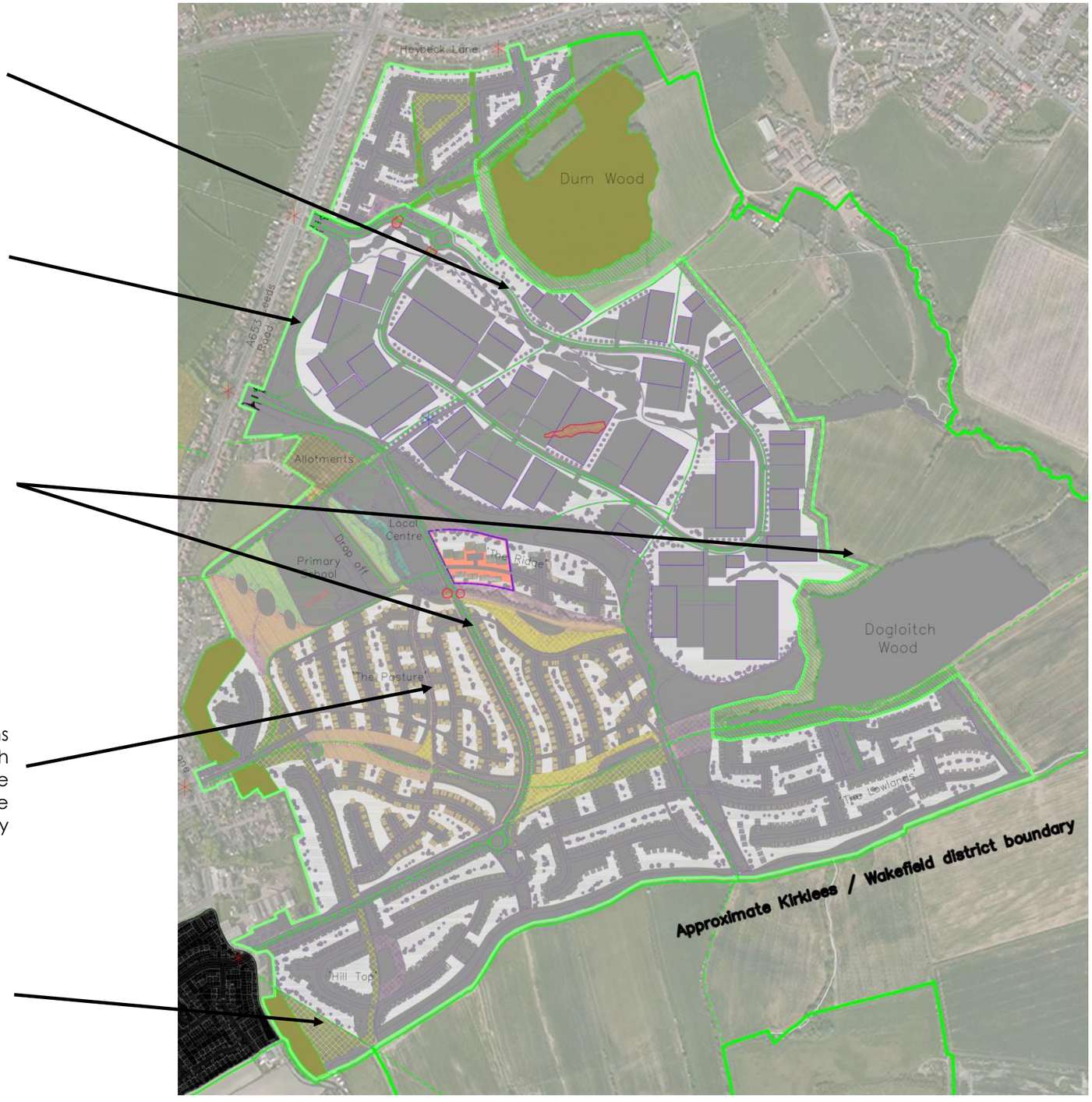
## Breeding birds

Breeding birds are widespread throughout the existing site. The development opens opportunities to provide enhanced habitats in the form of higher quality species rich grassland, scrub, woodland and wetland habitats. These habitat types are a feature of the existing site however they are poor quality and, with the exception of arable grassland, form a very low area of the site. The proposals will increase biodiversity and the area of suitable habitat for birds.

## Bat Roost

The site currently offers minimal bat roost potential with only 5 trees identified with bat roost potential. However the proposed development offers opportunities to install bat roosts within both new buildings and existing woodland trees, where appropriate and approved by a qualified ecologist, to encourage bat populations into the newly establishing habitats.

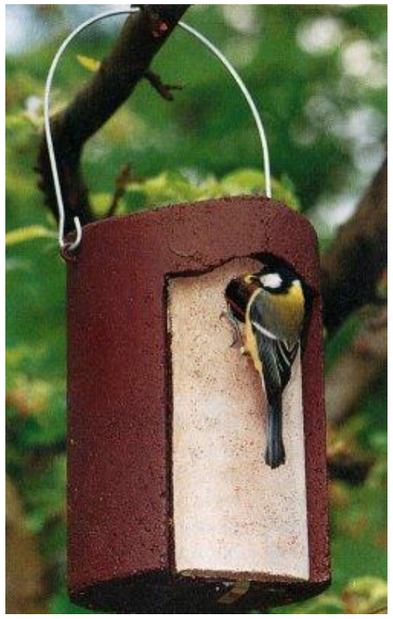
**Figure 3** Plan of known constraints and potential considerations



# Opportunities and Themes

## Wildflower grassland

Areas of taller wildflower rich grassland, sown and managed as the core Site grassland type, can provide cover and foraging resources for a wide range of faunal groups such as invertebrates, amphibians and reptiles, and create an attractive backdrop to the development throughout the summer months.



## Bird & bat box provision

New buildings often fail to provide opportunities for nesting birds and roosting bats, with a drive to create well insulated properties meaning that external structures be well sealed.

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

## Wetland habitats

Wetland habitats provide a range of permanently wet, seasonally wet to predominantly dry habitats which support a wide range of fauna and flora. As natural or designed systems they offer significant opportunities to enhance the biodiversity of a development.

## Log piles

Wood arising from tree clearance or pruning works could be retained on Site and made into deadwood piles. This provides valuable shelter and foraging for insects, amphibians, reptiles and small mammals such as hedgehog.

## Species-rich native hedgerows

New hedgerows, planted up with a variety of native species will provide shelter and a food resource for a wide variety of local wildlife, including nesting birds , small mammals and invertebrates.

# Wetland systems

## *Rationale*

The Site currently has an existing waterway network which it is important to retain. This network offers opportunities to create an enhanced natural habitat of wetland and associated marginal habitats running alongside the residential development, and also a more designed and publicly accessible wetland system which also acts as a site SUDs system associated with the industrial units. Both of these habitat types will provide valuable foraging and shelter opportunities for wildlife. All of the SUDs systems/ waterways are proposed as multi-functional areas with various degrees of public accessibility. They offer opportunities for access via formalised footpaths, through to natural play through to designed waterways which the public can sit next to and paddle in so there is a balance between habitat and public aesthetic. All wetland systems can be subject to a phased delivery in line with the development programme.

## *Objectives*

1. A diverse margin of aquatic vegetation present by Year 5, covering c.50% of waters surface.
2. A natural wetland habitat fully established by year 5 as per phased delivery.
3. A designed wetland SUDs system providing permanently wet, seasonally wet and predominantly dry wetland habitats in a range of pooled and fast flowing sections fully established by year 5.
4. Diverse invertebrate, amphibian, bird and small mammal community evident by Year 5.

## *Specification*

Timing

Any wetland enhancements would be best completed in late summer / early autumn, when effects of young amphibians/birds/mammals would be lower.

Reprofiling of topography to create wetland SUDs should be done outside of nesting bird season.

Seeding

The wetland margins would be seeded with Emorsgate seeds EP1 and planted with 9cm pot grown wetland herbaceous plants, including Myosotis scorpioides, Mentha aquatica, Caltha palustris, Geum rivale, Lythrum salicaria, Comarum palustre, Achillea ptarmica, in accordance with a detailed landscape specification

## *Management*

A single annual visit to remove leaf litter and rubbish, together with removal of emergent vegetation to ensure no more than 75% cover of the wetland surface. Annual examination for colonisation by invasive plants.

**Figure 5** Indicative wetland habitat

**Figure 4** Wetland habitat locations

# Woodland planting

## *Rationale*

There are two ancient woodlands adjoining the site—Dum Wood to the northern boundary, and Dogloitch Wood to the east. In addition to this there are bands of existing woodland running through the site which are to be retained. Additional native deciduous woodland planting within the development will provide valuable connectivity between the existing woodland blocks, enhanced by smaller clusters of native trees and individual street trees. Such a tree planting strategy will provide nesting and foraging opportunities for birds and insect populations.

## *Objectives*

1. Plant with locally sourced trees and shrubs in accordance with a detailed landscape design and planting specification.
2. Installation of native, deciduous trees within the residential street scene to enable birds and insects to transition between woodland blocks.
3. Installation of native, deciduous tree clusters within the industrial development set within a designed landscape of habitats to provide connectivity of the tree canopy connecting woodland blocks.
4. Developing woodland looks natural.
5. All trees to successfully establish within the 12 month defects period following completion of each phase of development, any which fail are to be replaced within the relevant phase's 12 month defects period, and new woodland blocks to have established into a diverse woodland habitat within 5 years per phase.

## *Specification*

Timing

New woodland planting and individual trees to be planted in early spring or late summer to early autumn, outside of the growing season, post construction.

Planting specification

All trees and woodland to be planted in accordance with a detailed landscape and planting plan.

In woodland block areas, plant in non-grid, naturalistic patterns.

Plant with UK provenance trees and shrubs.

Plant in staked tree shelters (rabbit gauge).

In the case of semi mature tree planting on the street scene, tree root balls must no be allowed to dry out prior to planting.

Tree planting areas are to be prepared immediately prior to delivery of trees to site in accordance with a phased programme to ensure that trees can be planted without delay into optimal planting conditions.

All trees to be planted as soon as possible following delivery to site.

## *Management*

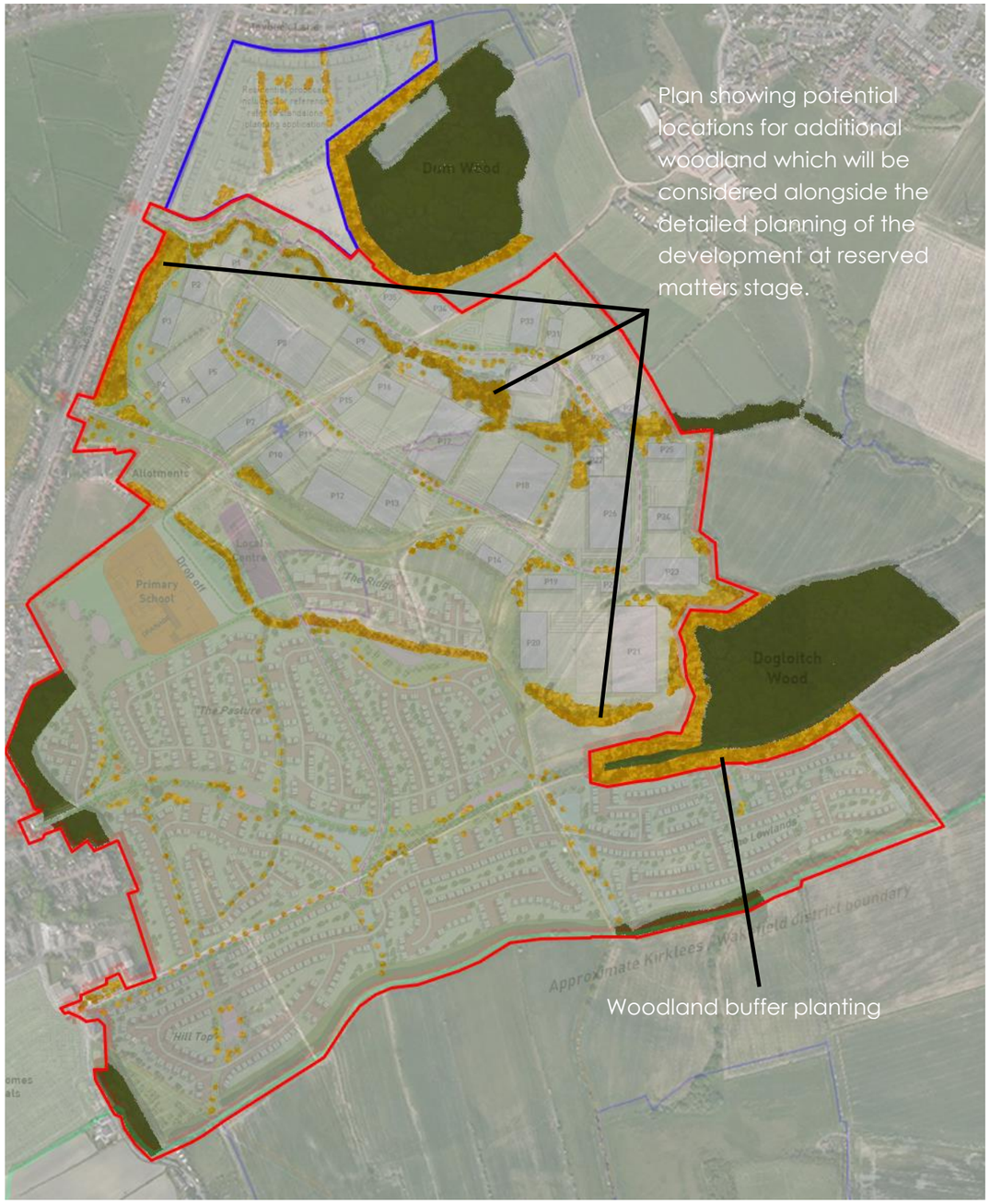
All trees to be regularly watered during dry weather conditions in the first year of establishment.

Monitor tree and woodland planting for any signs of pests, diseases, damage, die back or general failure to establish. Any trees showing such signs are to be replaced.

**Figure 6** Woodland planting

Existing woodland

Proposed woodland/ tree planting



# Scrub planting

## *Rationale*

Scrub planting is a high value habitat as it offers a diverse range of planting types and canopy heights to support a broad range of mammals, reptiles, insects and birds. Where planted near woodland and other suitable roost sites, scrub can also provide rich foraging for bat populations. This site offers opportunities for extensive scrub planting associated with deciduous woodland blocks, natural and designed wetland systems, species rich grassland and hedgerow networks creating a complex and diverse site wide ecosystem.

## *Objectives*

1. New scrub planting to lead to 50% increased cover of shrubs and trees.
2. 25% of area to comprise open grassy areas no smaller than 5m x 5m.
3. Increased local invertebrate population observed.

## *Specification*

Timing

Scrub areas to be planted as part of the construction programme in early spring or late summer to early autumn.

Planting specification

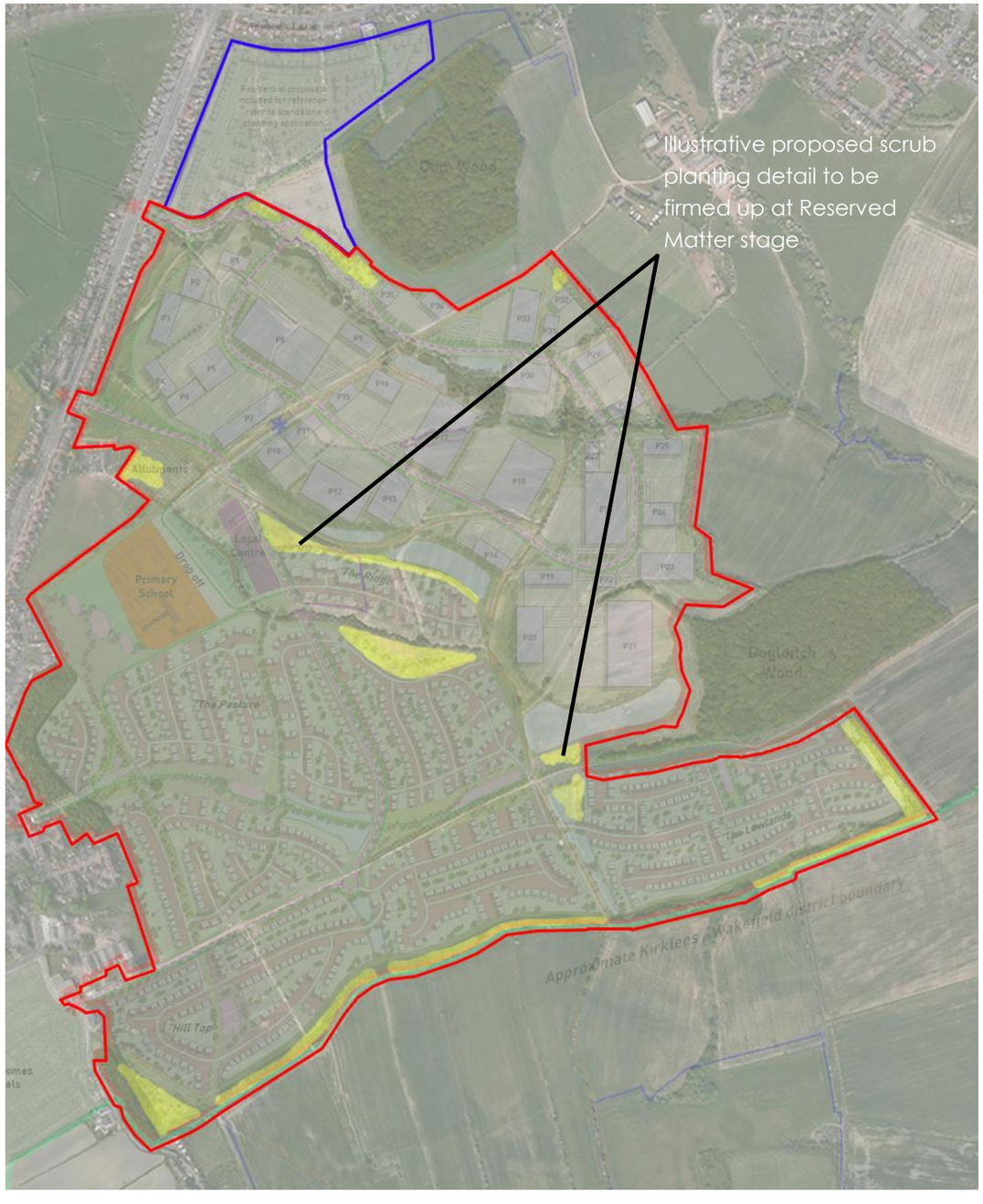
Plant with UK provenance trees and shrubs with appropriate species rich grass seed in accordance with a detailed landscape design and planting specification.
Plant in staked tree shelters (Rabbit gauge).
Ensure the planting site is prepared immediately before delivery of plants.
Plant trees and shrubs as soon as they have been delivered to site as part of a phased planting programme.
Grass seeding to be carried out following installation of trees and shrubs onto suitably prepared ground.

## *Management*

Ensure new trees and shrubs are sufficiently watered during dry weather.
Replace any trees and shrubs which fail due to pests, diseases, damage, die back or general failure to thrive within the 12 month defects period.
Monitor on an ongoing basis to ensure successful establishment of the scrub habitat and associated faunal communities.

**Figure 7** Scrub planting

Proposed scrub planting



# Wildflower grassland

## *Rationale*

Wildflower-rich grassland provides cover for foraging amphibians, reptiles and small mammals, as well as providing a summer-long resource of nectar, pollen and vegetative growth for a wide range of invertebrates. Species rich grassland also provides foraging and refuge for nesting birds. While species rich grassland can be very valuable as a large scale, continuous single habitat, this project offers the opportunity for significant species rich grassland planting as the ideal habitat to provide ribbons of connectivity between gardens, woodland, scrub, wetland, hedgerows, tree groupings and all the other transition habitats to tie the whole project together while also minimising the maintenance budget. Additional species rich grassland will be provided within the streetscene at detailed design stage.

## *Objectives*

1. Ensure the sward is allowed to growth sufficiently tall, so as to provide suitable cover for amphibians and reptiles
2. Ensure that 80% of species germinate and develop
3. Ensure that plants can flower.

## *Specification*

EM1 - General Purpose Meadow Mixture*, or equivalent

* Seed mixtures supplied by Emorsgate Seeds - https://wildseed.co.uk/mixtures

Preparation

No more than 5cm of topsoil will be spread over the subsoil profile. This will be loose tipped and spread with back actor to avoid compaction, and harrowed to a fine tilth ready for seeding.

Seeding

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.

## *Management*

Year 1

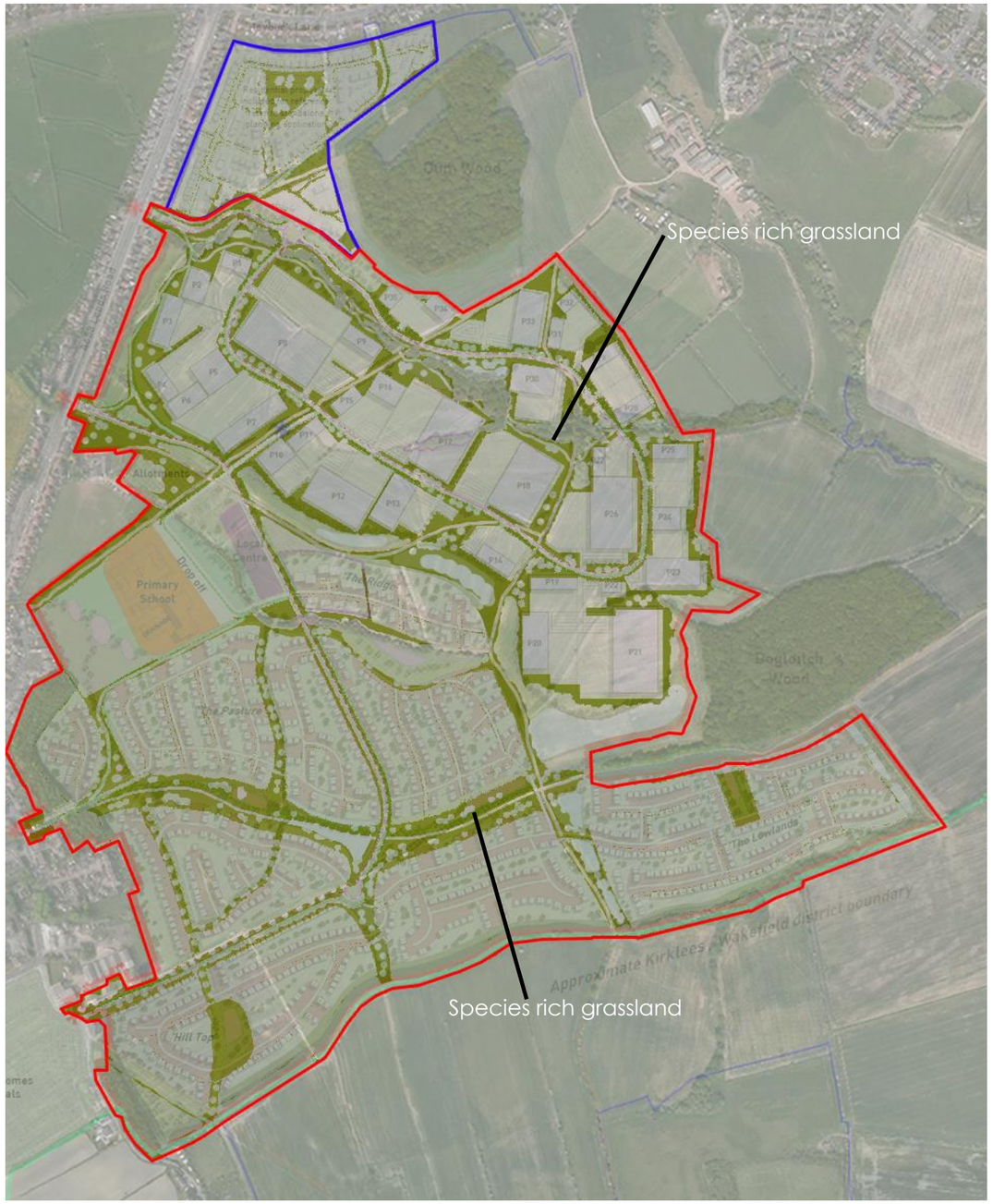
Five cuts, collect arisings and remove from site.

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. Operative must be proven competent in identifying these in their early stages to prevent killing off sown wildflowers.

Year two onwards

Single cut in late summer (August/ September), with arisings raked and removed and taken off site, or stored in a compost heap in a discrete location along the boundaries—to provide potential egg laying habitat for grass snake.

**Figure 8** Illustrative opportunities for wildflower grassland



# Species-rich Hedgerow

## *Rationale*

Existing hedgerows are in a poor condition, and could be enhanced through filling in gaps and better management. Hedgerow cover on site should be retained wherever possible. A continuous boundary hedgerow features, as shown, would provide connectivity between the site and surrounding area. Further to formal hedgerows, the same species should be used in a more relaxed planting to connect various other habitat types within the site.

Together, a strong network of mixed native hedgerows would create areas of dense woody planting, which could offer cover and a food source (nectar, pollen, berries, nuts, seeds) for a wide range of local wildlife, and strengthen connectivity.

## *Objectives*

1. Ensure the hedgerow thrives and knits together into dense linear features.

## *Specification*

<u>New hedgerows (pink lines)</u>
Planted up as double staggered rows of 60cm whips planted in rabbit guards at 1m centres, species will be those set out in schedule 1 below.

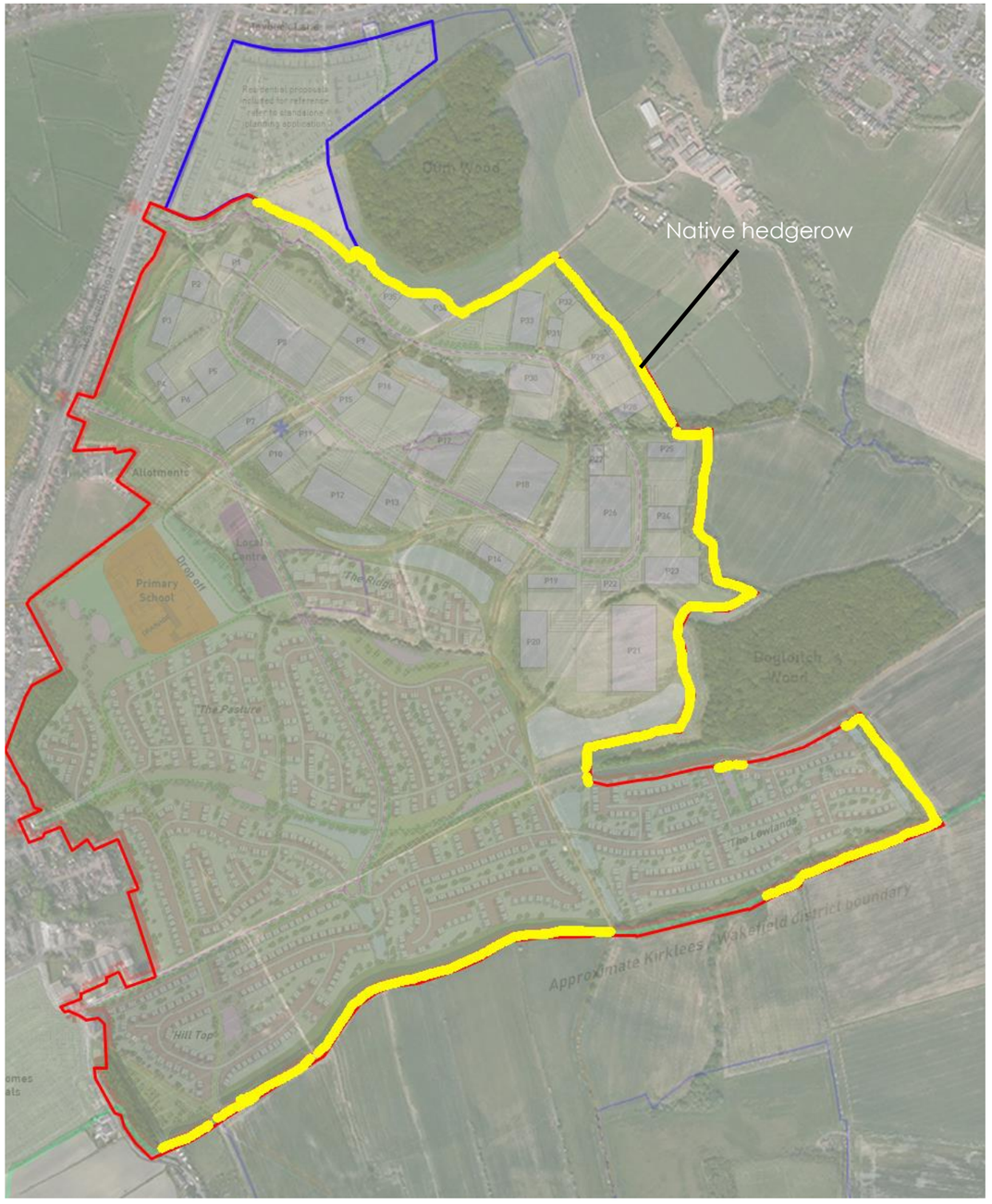
<u>Existing hedgerows</u>
Gaps will be filled in with double staggered rows of 60cm whips planted in rabbit guards at 1m centres, species will be those set out in schedule 1 below.

## *Management*

<u>New Hedgerow</u>
Years 1—5. Standard landscape establishment and maintenance.
Year 5 onwards: Single annual cut, comprising of only one side cut each year. The side cut would alternate each year so that there is always a supply of flowers and berries.

<u>Existing hedgerows:</u> Single annual cut, comprising of only one side cut each year. The side cut would alternate each year.

**Figure 9** Native hedgerow




**Schedule 1 Native Hedging**

| Scientific | English | % | Stock | Groupings | Centres and style |
|---|---|---|---|---|---|
| *Prunus spinosa* | Blackthorn | 30 | 1+1 BR | groups 5-9 | Double staggered row |
| *Cornus sanguinea* | Dogwood | 20 | 1+1 BR | groups 3-8 | Double staggered row |
| *Acer campestre* | Field Maple | 20 | 1+1 BR | groups 3-8 | Double staggered row |
| *Corylus avelanna* | Hazel | 5 | 1+1 BR | groups 3-8 | Double staggered row |
| *Ilex aquifolium* | Holly | 5 | 1ltr Pot | Scattered | Double staggered row |
| *Rosa canina* | Dog Rose | 5 | 1+1 BR | groups 3-8 | Double staggered row |
| *Malus sylvestris* | Crab apple | 5 | 1+1 BR | groups 3-5 | Double staggered row |
| *Viburnum opulus* | Guelder Rose | 5 | 1+1 BR | groups 3-5 | Double staggered row |
| *Lonicera periclymenum* | Honeysuckle | 5 | 1ltr Pot | Individuals | Scattered* |

# Recreation and landscaped street frontages

## *Rationale*

While formal recreation provision and landscaped street frontages do not, in and of themselves, offer any kind of high quality native wildlife habitat, they do form an important part of the wider local ecosystem enabling movement and connectivity throughout the site and are significant in their area and therefore significant in their impact. These spaces, when well designed, can provide a lush and visually pleasing backdrop to the extensive and ecologically rich habitat network this project offers. Wildlife links between the highly designed and the deliberately natural can be enhanced by the continued use of native species within the streetscene, and by ensuring that residential gardens (both front and back) as well as properties offer movement corridors, foraging and shelter opportunities for birds, mammals, reptiles and insects as they transition between habitat areas.

The opportunities for species rich grassland in these areas does not currently count towards the natural greenspace allocation, this additional resource will be included at detailed design stage.

## Objectives

1. Establishment of a network of native street trees connecting woodland areas.
2. Establishment of mixed native and ornamental shrub and perennial beds both in communal areas and private front gardens to visually enhance the streetscene and support wildlife corridors.
3. All communal grassed areas to be seeded, not with standard amenity grass seed but instead, with flowering lawn or a species rich grassland mix of suitable species which can withstand regular mowing. Low growing species such as daisies and clovers can withstand a mowing regime while still providing a foraging resource for invertebrates.

## *Specification*

<u>Timing and planting specification</u>

All planting and seeding to be carried out in accordance with a detailed landscape design and planting specification and in accordance with supplier guidelines as part of the construction programme.

## *Management*

In accordance with the landscape management plan.

Formal sports and recreation provision

Illustrative natural play with formal play areas incorporated

**Figure 11** Recreation, gardens and street frontages

# Faunal Boxes

## *Rationale*

*Bats*

Currently only 5 trees have been identified on site which have bat roost potential. In addition there are two buildings with low bat roost potential. Bats are an important part of the faunal community, the development offers the opportunity to install a number of bat roosts within residential and industrial buildings as well as within woodland settings.

A detailed bat box strategy will be required for each area of the development once a final detailed design layout has been completed. The strategy will identify suitable building and woodland locations for each type of bat box.

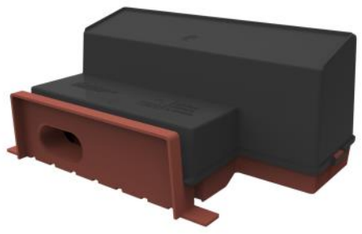
*Birds*

The Site currently lacks opportunities for hole nesting birds and so a number of boxes will be incorporated into the proposals. Due to the size of the site and diversity of habitats the development proposals offer, a range of bird boxes are proposed to be installed both into building elevations and on trees.

Locate bird boxes within residential properties and industrial units—specific locations to be specified at detailed design stage.

Boxes will be positioned as high up on buildings as possible, ideally directly below the eaves or verges.

Boxes will not be installed directly above doors, windows or main footpaths.

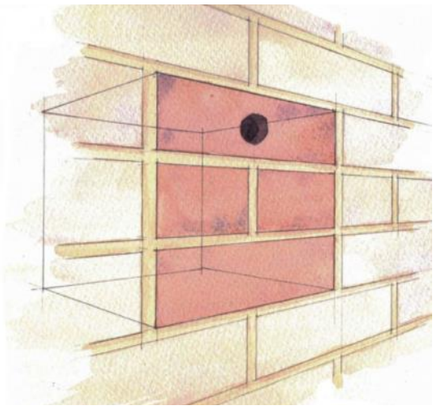


Example bat boxes to be installed onto mature woodland trees.

- Kent-style bat box
- Miramare Bat Box
- Vincent Pro Bat Box

Example bird boxes to be integrated into fabric of new builds.

- Manthorpe Swift Box
- Starling box



Example bat boxes to be installed onto mature woodland trees.

- Tawny owl box
- Kestral Box
- Schwegler hole fronted boxes

Example bat boxes to be integrated into fabric of new builds.

- Habibat Bat Box
- Ibstock Bat Box
- Schwegler Bat Tubes


**Figure 12** Faunal box locations

# Wildlife underpass connectivity

### *Rationale*

A network of green corridors can be designed into the scheme to allow wildlife to continue to move though the Site following construction.

These will be planted up with semi-natural habitats (native tree planting, wildflower grassland, wetland vegetation) to strengthen their connective function.

The site already offers opportunities for extensive wildlife habitat corridors softening the build infrastructure, however, these corridors are regularly interrupted by new roads, and thus, to prevent roads acting as barriers, dedicated wildlife underpasses can be strategically positioned around the Site.

Delivery can be phased in line with the construction programme with priority give to target areas such as key waterways and areas of species rich grassland which have particular value for birds and invertebrates thereby maximising the potential for movement through habitat areas.

An example is shown below

**Figure 13** Example wildlife underpass

★ Indicative locations for culvert installation which will be considered alongside the detailed planning of the development at reserved matters stage

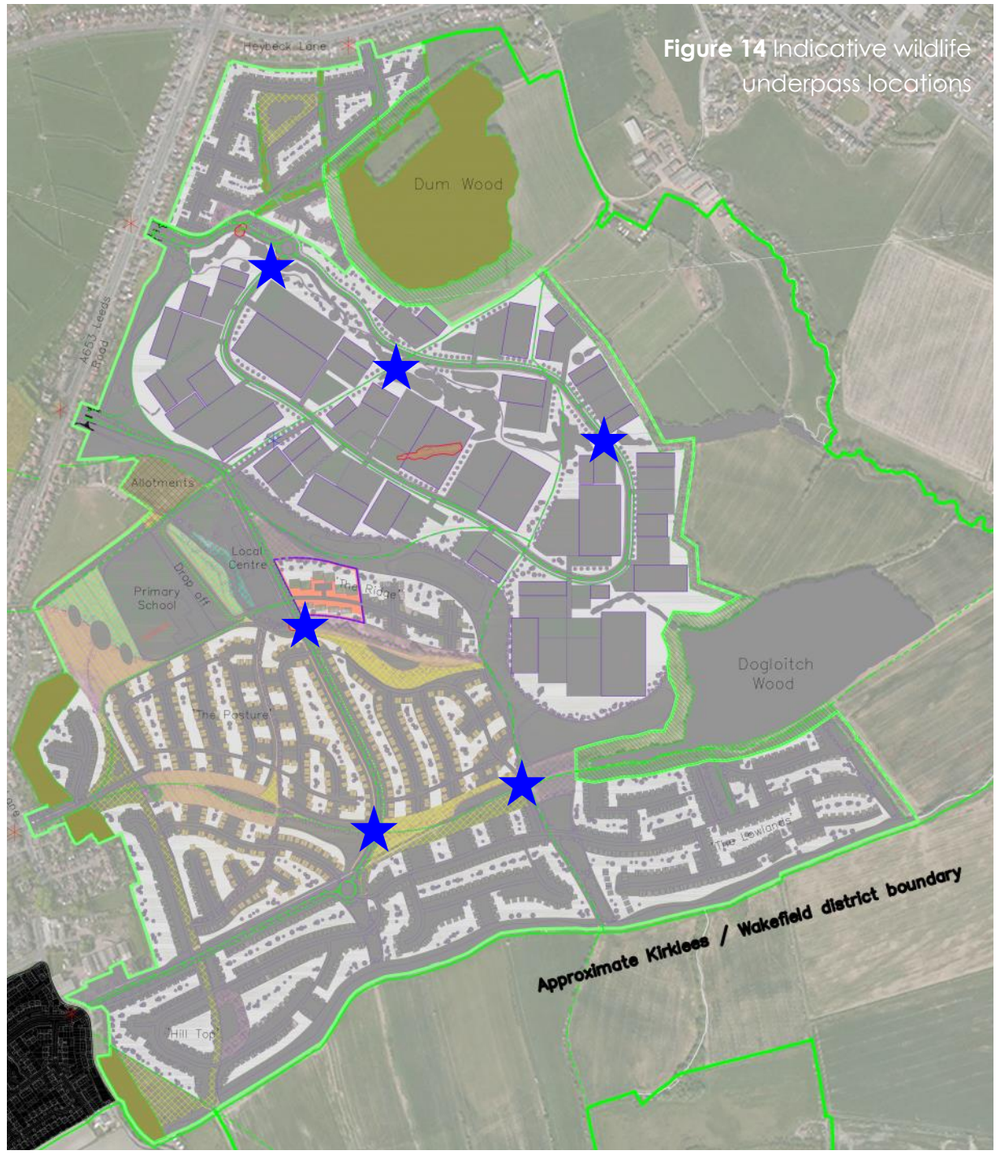



**Figure 14** Indicative wildlife underpass locations

# Log & Brash Piles

## *Rationale*

Fallen deadwood provides a valuable ecological resource for a wide range of organisms, and is a resource which has diminished in recent decades due to people 'tidying up'. The Site's development and ongoing maintenance will inevitably result in large volumes of timber and brash, which would otherwise be chipped and taken off Site. Instead, retaining this material on site, in a number of suitable locations, would provide a wide range of benefits, both in terms of carbon storage, habitat for saproxylic invertebrates and shelter for reptiles and amphibians.

| Specification | No. | Siting |
|---|---|---|
| Log and brash piles | 5 | Along boundaries |

**Location Notes**

Along habitat boundaries to be specified at detailed design stage.

Larger material could be arranged into attractive log piles in highly viable areas, such as near to the pond, whilst smaller material could be place discretely along the Site boundaries.

**Installation**

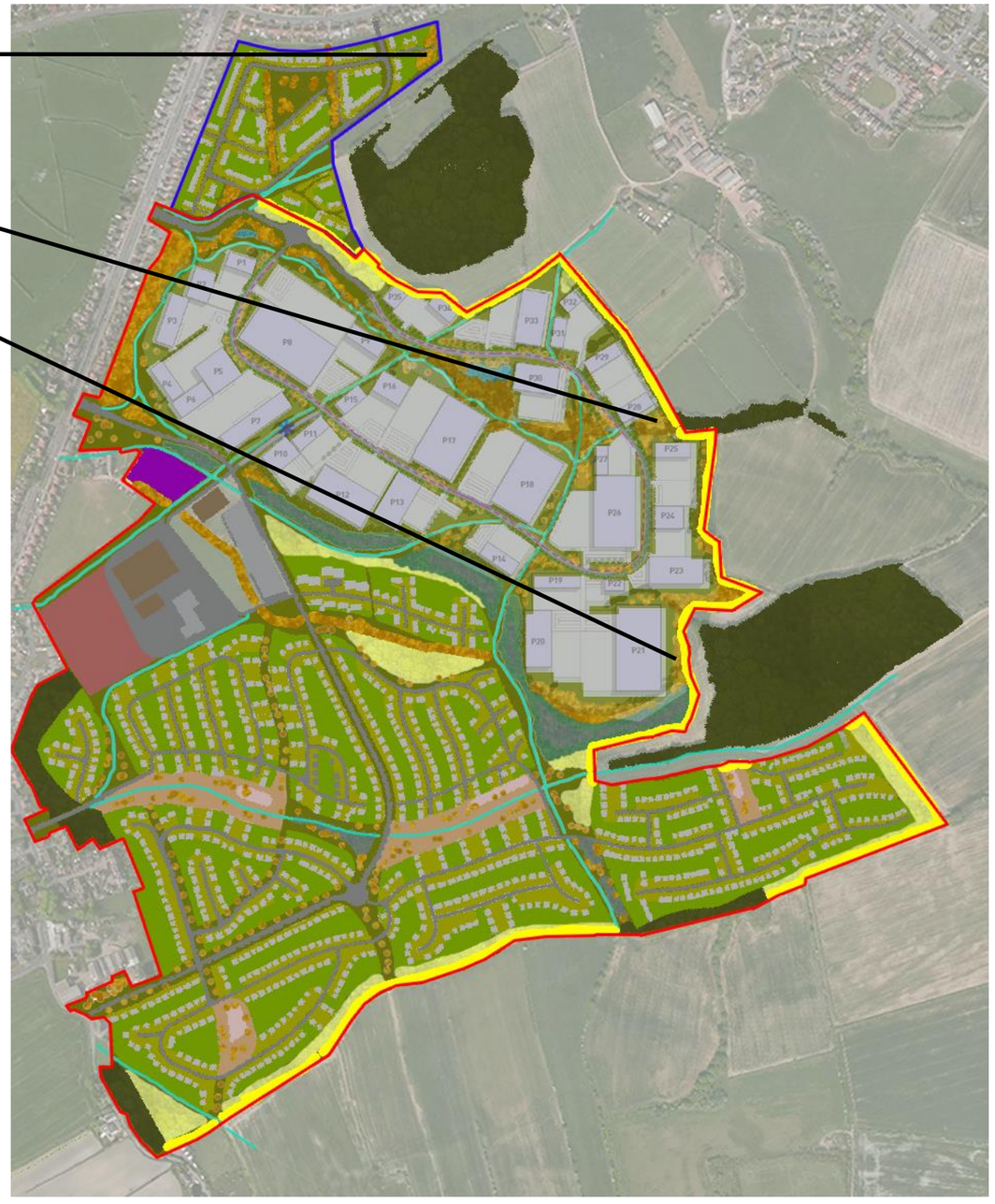
Material from initial vegetation clearance works stored on Site until landscaping is ready. Separate log piles then created as part of the landscaping works.

Log piles added to by landscape management team during the course of their work.

**When erected?**

During landscape works.

**Figure 15** Log pile locations



# Summary Ecological Strategy

### *Rationale*

The approach to the ecological design strategy of the site is to create a mosaic of habitats including new woodland, new scrub, species rich grassland, wetland ecosystems and new connective hedgerow which sit comfortably in the landscape and improve existing resources.

The following areas represent an approximate area per key habitat type based on the ecological concept produced for the purposes of this strategy. These areas will require further refinement once a detailed landscape design has been produced.

| | |
|---|---|
| Parks / recreation grounds | 36,768 sqm |
| Allotments | 7,675 sqm |
| Children's equipped/designated play areas; | 8,310 sqm |
| Amenity greenspace | 32,129 sqm |
| Natural / semi-natural greenspace | 76,458 sqm |
| Young people's provision | 12,838 sqm |

These areas do not include new ecological features such as hedgerows, or urban street frontage planting such as ornamental shrub planting and street trees, urban grassland or front and back gardens which represent an additional area.

**Figure 16** Ecology strategy plan