Crow Ecology

Creating a Nest for your Project & Nature

Wildlife Enhancement Plan (WEP)

Site**:** 19/04192/PLF - Change of use of land for the siting of 5 no. holiday lodges with associated works, including landscaping, excavation of a lake, erection of a staff facilities building and erection of a building for storage of bins and equipment – Eastfield, Feoffee Common Lane, Barmby Moor, YO42 1PG

Clients**:** Series One Design Associates Limited on behalf of their client

Date of Preliminary Site Survey: 7th August 2020

Prepared by Chris Crow BSc (Hons), ACIEEM.

NE Bat License No: 2015-11015-CLS-CLS
NE Great Crested Newt License No: 2015-18094-CLS-CLS
NE Barn Owl License No: CL29/00149

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Validity of survey data and report. The findings of this report are valid for 18 months from the date of survey. If work has not commenced within this period, an updated survey by a suitably qualified ecologist will be required.

Contents

1.Introduction

Crow Ecology was commissioned by Series One Design Associates Limited on behalf of their client to produce a Wildlife Enhancement Plan (WEP) for the for the proposed: 19/04192/PLF - Change of use of land for the siting of 5 no. holiday lodges with associated works, including landscaping, excavation of a lake, erection of a staff facilities building and erection of a building for storage of bins and equipment – Eastfield, Feoffee Common Lane, Barmby Moor, YO42 1PG The WEP is required to discharge Planning Condition 14 from East Riding of Yorkshire Council (ERYC)[1].

1.1 – Planning approval

The client secured planning permission in 2020 to change the use land for the siting of 5 no. holiday lodges with associated works, including landscaping, excavation of a lake, erection of a staff facilities building and erection of a building for storage of bins and equipment
The planning permission had two conditions relating to ecology, this WEP is required to discharge Planning Condition 14. Please see below planning condition 14[1]:

Within one month of commencement of development a Wildlife Enhancement Plan (WEP) shall be submitted to and approved in writing by the Local Planning Authority. The WEP shall be compiled by a suitably qualified ecologist and must be over and above any avoidance, mitigation measures required to neutralise the impacts of the development on wildlife, in order to improve the ecological condition of the development site after the development is complete. It may include, but not be restricted to the undermentioned enhancement measures:
A timetable for implementation;
A detailed plan showing the locations and specifications of the enhancement measures;
Detailed design and plans of the lake, which shall conform to the guidance provided in the Natural England Technical Information Note: TIN079 Illustrated guide to ponds and scrapes.

Detailed design principles should demonstrate:
The boundaries of the lake has no straight lines to allow the lake to fit into the landscape;
The sides of the lake have a variety of gradients, some shallow and some steep, to accommodate water voles and wetland birds;
The depth of the lake varies, to allow different species to use the lake for example amphibians and invertebrates.
The edges will be planted up with native marginal and aquatic species, to encourage wildlife to colonise.
Roosting and nesting opportunities for birds and bats;
Foraging opportunities for bats, birds and barn owls;
Habitat and hibernacula for amphibians;
Insect boxes and log piles,
A landscaping strategy which incorporates wildlife friendly landscaping throughout the site and utilise British native species of local provenance wherever possible.
The development shall be carried out in accordance with the approved details and the enhancement measures retained thereafter unless otherwise agreed in writing by the Local Planning Authority.

This condition is imposed to comply with paragraph 170 of the National Planning Policy

Framework (NPPF), section 40 of the Natural Environment and Rural Communities Act (NERC) 2006 and ERLP Strategy Document policy ENV 4.

The following chapters will provide the Ecological enhancements suitable for this project site.

2. Hedgerow and Tree Planting – Mitigation Strategy for the loss of Hedgerow and Trees to allow new vehicular access route

Under the approved development a new vehicular access route will be created and the existing access closed. This will involve the loss of Hedgerow and some planted trees. Approximately 5m in length of Common Hawthorn *Crataegus monogyna* hedgerow will be lost and approximately 60m^2 of Mixed Plantation woodland will be lost. The hedgerow is species poor as only two species are present; the other being one stand of Dogwood *Cornus sanguinea.* The Mixed Plantation woodland is diverse but is still relatively immature.

To mitigate for this loss, the existing entrance way will be replaced with a hedgerow species Any gaps in the existing hedgerow will also be planted. In addition, a Hedgerow and Tree boundary will also be planted along an existing boundary within the project site (see appendices 1).

These continuous lines of hedgerow and hedgerow and tree habitats will benefit many species such as invertebrates, birds and bats and potentially amphibians. It will provide further opportunity for birds to feed and shelter and possibly nest. It will provide bats with a continuous corridor for them to forage and commute. Please see plate 2.1.

Plate 2.1 – Existing Hedgerow and Tree Habitat where the proposed new access will be located (L) and the existing entrance that will be planted with hedgerow (R).

2.1 – Native Hedgerow Species to plant

The following species have been recommended due to the location of the proposed planting and their prominence within the Vale of York[2].

- Dogwood – Supports a number of insects and lepidoptera sp. The berries are also eaten by birds.

- Hawthorn – Provide a food source for invertebrates and birds. The dense composition also provides nesting opportunities.
- Alder Buckthorn – Good food source for insects and lepidoptera sp. The berries are also eaten by birds.
- Common hazel *Corylus avellana* - Supports a number of insects and lepidoptera sp. The nuts are also eaten by birds and mammals.
- Holly *Ilex aquifolium* - Holly provides protection from the winter weather due to its dense evergreen foliage. The berries provide a food source for many birds. Its flowers provide nectar and pollen for insects.
- Blackthorn *Prunus spinosa* - Provide a food source for invertebrates and birds. The dense composition also provides nesting opportunities.
- Guelder Rose *Viburnum opulus* - Nectar for insects. Fruits for birds and small mammals. Note: leaves, bark and berries are all poisonous to humans.
- Spindle *Euonymous europaeus* - Supports a number of insects and lepidoptera sp. The berries are also eaten by birds. Note: berries will induce vomiting in humans.

It is strongly recommended to create a species-rich hedgerow along the existing boundary within the project site. A species-rich hedgerow is defined as: "which contain five or more native woody species in a 30-metre length"[3]. This will boost biodiversity on-site post construction.

The planting of the existing entrance can be planted with less species if desired to match the existing Common hawthorn hedge but it is recommended to include also at least one other species such as Blackthorn due to their similar characteristics as Hawthorn.

2.2 – Native Tree Species to plant

These trees will be planted along with the hedgerow along an existing boundary stock fence within the project site. This boundary is approximately 120m in length and it is recommended to plant a tree every 10m along this boundary to create a Hedgerow and Tree habitat. The following species have been recommended due to the location of the proposed planting, their biodiversity value[4] and their prominence within the Vale of York[2].

- Pedunculate Oak *Quercus robur* – Oak trees are excellent for both bats and birds. Oak trees provide more biodiversity than any other native tree. The oak attracts many varieties of insect which provide a food source for both bats and birds. The flowers and leaf buds provide a food source for insects. The fallen leafs beneath the tree provide a food source for many invertebrates. The fallen acorns are foraged by badgers and deer too. Holes and crevices in the tree bark also provide bird nesting opportunities for birds and roosting potential for bats.
- Wild Cherry *Prunus avium* – The fruits provide a food source for birds. The flowers provide nectar and pollen for bees. The foliage provides a food source for a number of invertebrates.
- Ash *Fraxinus excelsior* - Supports a number of insects and lepidoptera sp. and seeds are eaten by birds and mammals.
- Hornbeam *Carpinus betulus* - Supports a number of insects and lepidoptera sp. and birds eat their seeds. Also, its dense foliage provides nesting opportunities.
- Aspen *Populus tremula* – Good food source for invertebrates and birds.

- Field Maple - *Acer campestre* - Supports a number of insects and lepidoptera sp. and fruits are eaten by small mammals.
- Crap apple *Malus sylvestris* - Supports a number of insects and lepidoptera sp. and fruits are eaten by birds and mammals.

2.2 – Timing

January	February	March	April	May	June	July	August	September	October	November	December

The above timescale is when it is best to plant Hedgerow and Trees. This is when the tree/hedgerow is dormant and therefore can cope with being moved[5].

Do not plant if the soil is water logged or is frozen (you cannot get the spade in).

Depending on the WEP approval, planting should take place in late early 2021.

2.3 - Planting Hedgerow Species[6]

- Choose whips that are small (40-60cm); they are cheaper, grow quicker and have a higher survival rate.
- To estimate numbers work on the basis of 6-8 plants/m. This will give a dense hedgerow. This will also allow for the tree species to be planted.
- Clear the planted area of weeds.
- Make a slot with a spade (V-shaped) and place the whip with stake into the slot. Cover over with the dug soil and firm over but do not compact soil[5].
- As rabbits are present in this project site it is recommended to put 'tree guards/shelters' around the whips and stake to prevent them being eaten. Once established take these guards off.

2.4 – Maintaining Hedgerow Species

This is the largest factor to ensure you have a healthy hedgerow. The more maintenance you do in the early years will result in less maintenance overall.

Below is a timetable of how to maintain your hedgerow;

YEAR 1	
March	Check Shelters
April	Apply foliar acting herbicide
July	Check losses
September	Check Shelters, pull out tall weeds (cut tall weeds between trees)
November	Replace losses
YEAR 2	
March	Check shelters

April	Apply foliar acting herbicide
July	Check losses
September	(cut tall weeds between trees)
November	Replace losses , Check shelters, pull out tall weeds
YEAR 3	
January	(Apply residual herbicide)
March	Check shelters
April	Apply foliar acting herbicide
July	Check losses
September	(Cut tall weeds between trees)
November	(replace losses) Check shelters, pull out tall weeds
YEAR 4	
March	Check shelters
April	(Apply foliar acting herbicide)
YEAR 5 AND ONWARDS	
Gradual removal of stakes and shelters. Occasional spot weeding around any trees still in need.	

Table 2.1 – Maintenance schedule for the Hedgerow Source - https://www.britishhardwood.co.uk/planting-and-maintenance-advice

Following one full year of growth, shape the hedgerow (A shaped is the most wildlife friendly design) by trimming the side and leading shoots.

Please see WEP map (appendices 1).

2.5 – Planting Tree Species

- Tree whips to be around 2m tall[7].
- Plant at 10m intervals.
- Clear the planted area of weeds.
- Dig a pit deep and wide enough for the root system to bed into and place the whip with stake into the pit. Cover over with the dug soil and firm over but do not compact soil[5].
- As rabbits are present in this project site it is recommended to put 'tree guards/shelters' around the whips and stake to prevent them being eaten. Once established take these guards off.

2.6 – Maintaining Tree Species

Please see table 2.1.

2.7 - Pruning

The entire tree species in the hedgerow should be pruned during the winter months. However, this does not apply to the following species: Wild Cherry. This should be pruned in summer to avoid disease. Check no nesting birds are present before pruning.

Please see WEP map (appendices 1).

2.8 – Understory Planting

It is also important to plant understory plants that are suited to the semi-shade. They attract insects that use the plants to forage, resulting in a food source for many birds and small mammals. In addition, these plants will provide natural colour to the proposed development. Recommended mix to plant and the ratio are:

%	Latin name	Common name
0.5	Achillea millefolium	Yarrow
1.2	Agrimonia eupatoria	Agrimony
2.5	Alliaria petiolata	Garlic Mustard
2	Centaurea nigra	Common Knapweed
0.4	Clinopodium vulgare	Wild Basil
0.6	Digitalis purpurea	Foxglove
1	Galium album - (Galium mollugo)	Hedge Bedstraw
2	Geum urbanum	Wood Avens
1	Hypericum perforatum	Perforate St John's Wort
1	Leucanthemum vulgare	Oxeye Daisy
1	Plantago lanceolata	Ribwort Plantain
0.3	Primula veris	Cowslip
1	Prunella vulgaris	Selfheal
2	Silene dioica	Red Campion
1	Stachys sylvatica	Hedge Woundwort
2	Torilis japonica	Upright Hedge-parsley
0.5	Vicia cracca	Tufted Vetch

Table 2.2 – Recommended understory hedgerow plants. Source - https://wildseed.co.uk/mixtures/view/12 (2020).

3. Wildlife Pond

The pond will be in the centre of the development. It will approximately have a surface area of 1000m^2. This may change if the tracks on the perimeter have to come in to protect the roots of the trees within the hedgerows.

Pond recommendations[8,9]:

- Water Supply – This pond is going to be mostly surface rain water run-off and natural filling. This is the most suitable way to create a pond because it is the most natural process. This in-turn will benefit many different species that inhabit it. This pond will likely become a seasonal pond due to the water supply it feeds off. Occasional late summer drying kills fish and therefore beneficial to the biodiversity of the pond, even if the year's amphibian's off-spring maybe lost.

- Bed – The simplest way to create the bed is to excavate below the normal summer water table. Once excavated seal with clay or a geo-synthetic clay pond liner. This pond will be clay lined.

- Size – The size of the pond is optimal size for invertebrates and amphibians.

- Depth - The pond itself should be landscaped to have deep and shallow areas. Most species prefer shallow waters as light can penetrate and promote vegetation growth. This provides a food-source for many species. The depth should vary from 0.4m to 1-1.5m[9]. It is recommended to create 'steps' down to the depth of 1.5m (see figure 3.1)

- Margins – The proposed layout of the pond has irregular margins which are optimal for many species.

- Gradient – The shoreline will have a variety of gradients, some shallow, some steep to accommodate different species.

- Substrate – Lined ponds need to be buried with at least 15cm of nutrient-poor, stone-free subsoil. Do not use farm or garden soil because these will produce algal blooms. Soil gathered from the site during excavation will be suitable.

- Finish – Leave the excavation rough, do not smooth off bed surface. Allow for hummocks and hollows on the bed and around the edge.

- Stocking - It would be advised to plant native species that favour invertebrates. You can allow for natural introduction to occur but if you are targeting a certain populations of species it may be advisable to plant. It would be advised to plant native species that favour invertebrates and amphibians (see table 3.1). In the shallow areas (0-0.4m) between 25-50% of the area should have emergent/marginal plants.

Species	Depth (m)
Submerged Pants	
Stoneworts *Chara spp.*	<2.0
Common Water Startwort *Callitriche stagnalis*	<1.0
Spiked Water-milfoil *Myriophyllum spicatum*	0.7-2.0
Fennel Pondweed *Potamogeton pectinatus*	0.5-2.5
Mare's-tail *Hippuris vulgaris*	<1.0
Floating-leaved plants	
Amphibious Bisort *Polygonum amphibium*	0.4-2.0
Emergent/marginal plants	
Water Forget-me-not *Myosotis scorpioides*	0-0.2
Water Mint *Mentha aquatica*	0-0.2
Bur-reeds *Sparganium spp.*	<1.0
Purple Loosestrife *Lythrum salicaria*	0-0.2
Yellow Iris *Iris pseudacorus*	0-0.2
Great Willowherb *Epilobium hirsutum*	0-0.2
Common Reed *Phragmites australis*	<1.5

Table 3.1 – Plant species that predominately favour invertebrates/amphibians and warbler sp.[9]

3.1 – Other Considerations

It is worth considering the following accessories to enhance the pond even further;

- Stones and Rocks – Stones and rocks at the bottom of the pond and around the edges of the pond will provide shelter for amphibians and a perch for invertebrates such as Dragonflies. The stone and rocks can be collected during the Grounds clearance construction phase.
- Creating a 'beach' so small mammals can drink from the lake. This area can be slopped so they can drink without getting trapped.
- Planting a tree that favours wetter soil such as Bay Willow *Salix pentandra,* Common Alder *Alnus glutinosa* or Downy birch *Betula pubescens.* These species are local to the region[2] and will provide a perch for birds and invertebrates foraging in/near the pond.

3.2 – Timing

January	February	March	April	May	June	July	August	September	October	November	December

You can build a pond anytime of the year but it best done in the spring. This gives the plant species time to bed in and grow.

3.3 – Planting

Planting should take place 1-2 weeks after filling the pond. Plant the species that require a greater depth first. Fill again, and gradually plant your way upwards and out of the pond. Planting should be done in single-species stands for all types of plants with 0.5m spacing.

3.4 – Maintenance

There may be algal blooms in the first year until the submerged vegetation establishes. Cut back vegetation to half their size in winter. This will control the growth and ensure a successful growth the following spring[9].
The pond should need very little maintenance once established but it is important to clear dead organic matter from the pond such as dead plants and leaf litter[9].

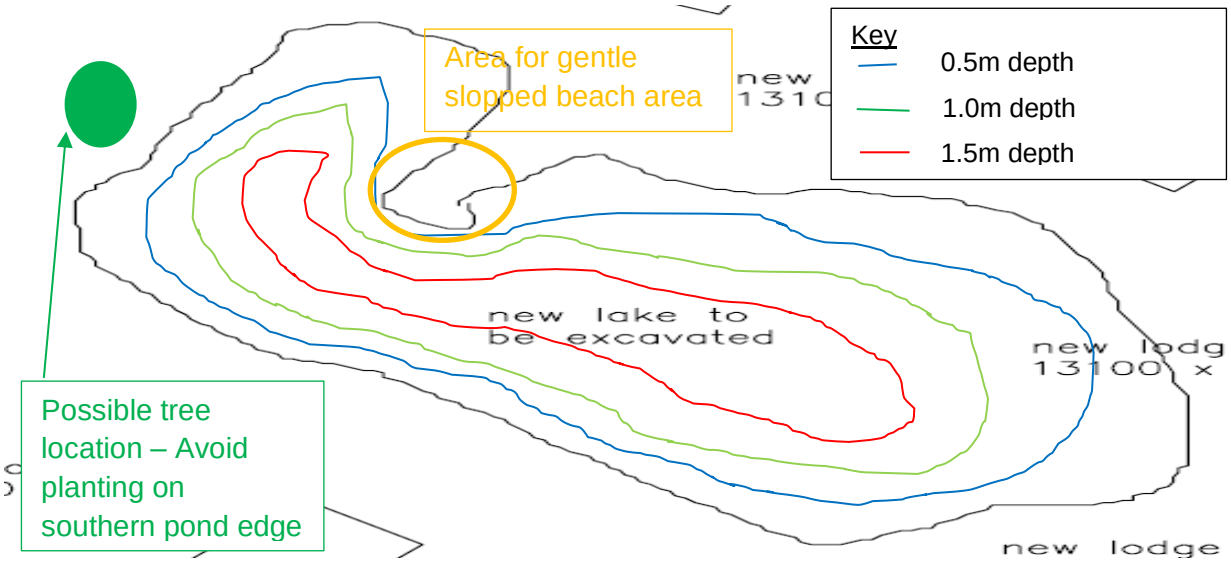


Figure 3.1 – The 'step effect' to create deeper and shallow water areas.

4.The Excavated Spoil Heap (Mound)

The excavated spoil heap will be created by the excavation of earth to create the pond. This spoil heap will act as a screen between the project site and the neighbouring dwelling. This mound creates an excellent opportunity for a number of habitats to be created. The mound will have a steeper sided south facing slope to create more habitats.

The client also wishes to create a mound adjacent to the Black Dike Drain on the southern boundary. This would still be suitable providing the measures in the CEMP: Biodiversity document are strictly adhered to during the construction process (See appendices 1 for proposed layout of this mound). The following recommendations will apply to both mound habitats.

4.1 – Bare Ground[10]

Bare areas (especially on the south facing slope) will provide habitats for invertebrates and possibly reptiles in the future. Butterflies need bare ground to warm up so they can fly. Some bee species burrow underground. Reptiles, like the butterflies need to bask to create energy to be able to hunt.

These mounds will have bare ground areas on the south facing slope. The remaining slopes will have the topsoil from the grounds' clearance placed upon it and planted with the Grassland and Wildflower mix recommended in section 4.2.

4.2 - Grassland & Wildflower Mix

A Grassland & Wildflower mix for clay soils is recommended for this mound as the excavated soil will mostly compromise of clay substrate. This mixture will provide a food-source for invertebrates and in-turn other species (see table 4.1).

Wild Flowers

%	Latin name	Common name
0.5	Achillea millefolium	Yarrow
2	Betonica officinalis - (Stachys officinalis)	Betony
3.5	Centaurea nigra	Common Knapweed
1	Filipendula ulmaria	Meadowsweet
2.5	Galium verum	Lady's Bedstraw
0.4	Lathyrus pratensis	Meadow Vetchling
0.5	Leucanthemum vulgare	Oxeye Daisy
0.5	Lotus corniculatus	Birdsfoot Trefoil
1	Plantago lanceolata	Ribwort Plantain
1	Primula veris	Cowslip
1	Prunella vulgaris	Selfheal

%	Latin name	Common name
2	Ranunculus acris	Meadow Buttercup
2	Rhinanthus minor	Yellow Rattle
1.4	Rumex acetosa	Common Sorrel
0.4	Silaum silaus	Pepper Saxifrage
0.2	Silene flos-cuculi - (Lychnis flos-cuculi)	Ragged Robin
0.1	Trifolium pratense	Wild Red Clover

Grasses

%	Latin name	Common name
10	Agrostis capillaris	Common Bent
2	Alopecurus pratensis	Meadow Foxtail (w)
2	Anthoxanthum odoratum	Sweet Vernal-grass (w)
1	Briza media	Quaking Grass (w)
36	Cynosurus cristatus	Crested Dogstail
24	Festuca rubra	Slender-creeping Red-fescue
1	Hordeum secalinum	Meadow Barley (w)
4	Phleum bertolonii	Smaller Cat's-tail

Table 4.1 – Grassland and Wildflower mix suitable for the main substrate of the mound (clay), Source - https://wildseed.co.uk/mixtures/view/5

4.3 – Timing

January	February	March	April	May	June	July	August	September	October	November	December

The timetable above is the best time to create a suitable bedding area for the seeds and when the seeds should be sown.

4.4 – Planting

- 4g/m^2
- Prepare the mound by removing weeds either by hand or with an herbicide.
- The land should then be dug-over and raked over to create a medium tilth.
- The soil should be rolled or treaded down to create a firm surface.
- Seeds should be sown in either autumn or spring and sown by hand broadcasting or by machine.
- The seeds should then be rolled or treaded down but not covered.

4.5 – Maintenance

- Most of the sown meadows seeds are perennials so they will take time to germinate. They will not usually flower in the first year.

- Weeds and dominant grasses will be abundant in the first year so they need to be controlled by mowing. If planted in autumn do not cut in spring, the annuals should be allowed to flower and then cut in mid-summer/late summer once the flowers have died off and the vegetation removed. This cut will allow the meadow mixture to develop.

4.5.1 – Long-term management

Once established, to maintain a healthy sward, the wildflower grassland should be cut once per year in early September. The cuttings should be left for up to 7 days to allow any seedlings to drop to the ground. It is then important to remove to cuttings to keep soil fertility low. Any weeds should be removed by hand or spot treat with herbicide.

5. Wildflower Planting

It is recommended that a Wildflower mix is to be planted between the 'office and staff facilities' building and the track leading to the holiday lodges. This will further boost the biodiversity of the site by transforming Poor Semi-improved grassland into a species rich haven for invertebrates and therefore a food source for many other species (see WEP Map appendices 1).

5.1 - Grassland & Wildflower Mix for the area adjacent 'office and staff facilities' building and the track leading to the holiday lodges

A Grassland & Wildflower mix for loamy soils is recommended for this area of land as the Vale of York soil is a mixture of glacial deposits[11] (see table 5.1).

Wild Flowers

%	Latin name	Common name
0.5	Achillea millefolium	Yarrow
3	Centaurea nigra	Common Knapweed
1	Daucus carota	Wild Carrot
2.5	Galium verum	Lady's Bedstraw
0.3	Geranium pratense	Meadow Cranesbill
1.2	Knautia arvensis	Field Scabious
0.5	Lathyrus pratensis	Meadow Vetchling
0.4	Leontodon hispidus	Rough Hawkbit
0.5	Leucanthemum vulgare	Oxeye Daisy
0.5	Lotus corniculatus	Birdsfoot Trefoil
1	Malva moschata	Musk Mallow
0.5	Plantago lanceolata	Ribwort Plantain
0.5	Plantago media	Hoary Plantain
1	Primula veris	Cowslip
1	Prunella vulgaris	Selfheal
2	Ranunculus acris	Meadow Buttercup
1	Ranunculus bulbosus	Bulbous Buttercup
1.5	Rhinanthus minor	Yellow Rattle
1	Rumex acetosa	Common Sorrel
0.1	Trifolium pratense	Wild Red Clover
20		

Grasses

%	Latin name	Common name
8	Agrostis capillaris	Common Bent
3	Anthoxanthum odoratum	Sweet Vernal-grass (w)

%	Latin name	Common name
3	Briza media	Quaking Grass (w)
32	Cynosurus cristatus	Crested Dogstail
10	Festuca ovina	Sheep's Fescue
20	Festuca rubra	Slender-creeping Red-fescue
3	Phleum bertolonii	Smaller Cat's-tail
1	Trisetum flavescens	Yellow Oat-grass (w)

Table 5.1 – Grassland and Wildflower mix suitable for the main substrate of this area (clay), Source - https://wildseed.co.uk/mixtures/view/6

5.1.1 – Timing

January	February	March	April	May	June	July	August	September	October	November	December

The timetable above is the best time to create a suitable bedding area for the seeds and when the seeds should be sown.

5.1.2 – Planting

- 4g/m^2
- Prepare by removing weeds either by hand or with an herbicide.
- The land should then be dug-over and raked over to create a medium tilth.
- Seeds should be sown in either autumn or spring and sown by hand broadcasting or by machine.
- The seeds should then be rolled or treaded down but not covered.

5.1.3 – Maintenance

- Most of the sown meadows seeds are perennials so they will take time to germinate. They will not usually flower in the first year.
- Weeds and dominant grasses will be abundant in the first year so they need to be controlled by mowing. If planted in autumn do not cut in spring, the annuals should be allowed to flower and then cut in mid-summer/late summer once the flowers have died off and the vegetation removed. This cut will allow the meadow mixture to develop.

5.1.4 – Long-term management

Once established, to maintain a healthy sward, the wildflower grassland should be cut once per year in early September. The cuttings should be left for up to 7 days to allow any seedlings to drop to the ground. It is then important to remove to cuttings to keep soil fertility low. Any weeds should be removed by hand on spot treat with herbicide.

5.2 – Bat-friendly Planting

In addition to the wildflower planting, beds could be created adjacent to the borders of the tracks and planted with night-scented plants that attract night-flying insects. This will create foraging opportunities for bats within the central location of the development that has not previously existed. The following species are recommended (some species have been excluded as they are non-native to reduce the potential spread into the neighbouring landscape)[12]:

- Common knapweed *Centaurea nigra*
- Musk Mallow *Malva moschata*
- Ox-eye daisy *Leucanthemum vulgare*
- Primrose *Primula vulgaris*
- Red campion *Silene dioica*
- St John's wort *Hypericum perforatum*
- Borage *Borago officinalis*
- Feverfew *Tanacetum parthenium* Hyssop
- Marjoram *Origanum majorana*

5.2.1 – Timing

January	February	March	April	May	June	July	August	September	October	November	December

The timetable above is the best time to create a suitable bedding area for the seeds and when the seeds should be sown.

5.2.2 – Planting

- Prepare by removing weeds either by hand or with an herbicide. Try to evenly spread each species of plant seeds along the bedding area.
- The land should then be dug-over and raked over to create a medium tilth.
- Seeds should be sown in either autumn or spring and sown by hand broadcasting or by machine.
- The seeds should then be rolled or treaded down but not covered.

5.1.3 – Maintenance

- Most of the species are perennials so they will take time to germinate. They will not usually flower in the first year.
- Weeds and dominant grasses will be abundant in the first year so they need to be controlled by mowing. If planted in autumn do not cut in spring, the annuals should be allowed to flower and then cut in mid-summer/late summer once the flowers have died off and the vegetation removed. This cut will allow the species recommended to develop.

5.1.4 – Long-term management

Once established, to maintain a healthy sward, the recommended should be cut once per year in early September. The cuttings should be left for up to 7 days to allow any seedlings to drop to the ground. It is then important to remove to cuttings to keep soil fertility low. Any weeds should be removed by hand on spot treat with herbicide.

6. Proposed Tree/Shrub planting

The proposed layout has areas dedicated to new tree/shrub planting. Except the Mixed plantation woodland that will be cleared for the new vehicular access route all other tree habitats will remain.

6.1 – Native Tree/Shrub Planting

There is an opportunity to plant native species that provide a food-source for invertebrates (and in-turn bats) and birds throughout the year. The following species are recommended not only for their biodiversity value[4] but also because they also remain relatively small or are easily pruned to manage their size: this will help retain the views of the surrounding landscape for their clients.

- Blackthorn - Provide a food source for invertebrates and birds. The dense composition also provides nesting opportunities.
- Wild Cherry – The fruits provide a food source for birds. The flowers provide nectar and pollen for bees. The foliage provides a food source for a number of invertebrates.
- Crab apple – Its flowers provide a good nectar source for many insects and its fruits are eaten by birds and mammals.
- Dog rose *Rosa canina* - Its flowers provide a good nectar source for many insects and its fruits are eaten by birds.
- Dogwood – The leaves are eaten by some species of moths' caterpillars. Its flowers provide a good nectar source for many insects and its fruits are eaten by birds and mammals.
- Hawthorn - Hawthorn berries provide a food source for many birds. Its prickly stems provide protection for nesting birds. The hawthorn tree also attracts many insects that provide a food source for young chicks.
- Hazel - The leaves are eaten by some species of moths' caterpillars. It also supports a number of butterfly species. The nuts provide a food-source for a number of birds. The flowers are a good source of pollen for bees.
- Holly - Holly provides protection from the winter weather due to its dense evergreen foliage. The berries provide a food source for many birds. Its flowers provide nectar and pollen for insects.

The species listed will provide shelter for nesting birds and a food source for birds and insects. Aesthetically, these species will also provide beautiful colours during the Spring-Autumn months.

6.1.1 - Timing

January	February	March	April	May	June	July	August	September	October	November	December

The above timescale is when it is best to plant Shrub species. Do not plant if the soil is water logged or is frozen (you cannot get the spade in).

6.1.2 - Planting Tree/Shrub Species[7]

- Choose whips that are small (40-60cm); they are cheaper, grow quicker and have a higher survival rate.
- Work on the basis of 1 plant/m^2.
- Clear the planted area of weeds.
- Make a slot with a spade (V-shaped) and place the whip with stake into the slot. Cover over with the dug soil and firm over but do not compact soil.
- As rabbits are present in this project site it is recommended to put 'tree guards/shelters' around the whips and stake to prevent them being eaten. Once established take these guards off.

6.1.3 - Maintaining Shrub species

This is the largest factor to ensure you have a healthy shrub. The more maintenance you do in the early years will result in less maintenance overall.

Below is a timetable of how to maintain your shrub;

YEAR 1	
March	Check Shelters
April	Apply foliar acting herbicide
July	Check losses
September	Check Shelters, pull out tall weeds (cut tall weeds between trees)
November	Replace losses
YEAR 2	
March	Check shelters
April	Apply foliar acting herbicide
July	Check losses
September	(cut tall weeds between trees)
November	Replace losses , Check shelters, pull out tall weeds
YEAR 3	
January	(Apply residual herbicide)
March	Check shelters
April	Apply foliar acting herbicide
July	Check losses
September	(Cut tall weeds between trees)
November	(replace losses) Check shelters, pull out tall weeds
YEAR 4	
March	Check shelters

April	(Apply foliar acting herbicide)
YEAR 5 AND ONWARDS	
Gradual removal of stakes and shelters. Occasional spot weeding around any trees still in need.	

Table 6.1 – Maintenance schedule for the Hedgerow Source - https://www.britishhardwood.co.uk/planting-and-maintenance-advice

Following one full years of growth, shape the shrub species to the desired shapes by trimming the side and leading shoots.

6.2 – Shrub/Herbaceous Planting

The landscape design has a number of tree/shrub areas dotted within the development. The following species are recommended not only for their biodiversity value[4] but also because they also remain relatively small (<1m) or are easily pruned to manage their size. The optimal locations for these species the areas in-between the holiday lodges and edging the entrance way track up to the 'timber shed for bins and storage of equipment'.

- Common box *Buxus sempervirens* – Its flowers provide nectar for insects and its dense compact growth provides shelter for birds, small mammals and insects.
- Lavender *Lavendula angustifolia* – Although not a native species this plants' flowers nectar for insects and the flower heads are eaten by birds. In addition, the fragrance of lavender is favoured by humans.
- Common bilberry *Vaccinium myrtillus* – Small fruit producing shrub that is edible for birds and small mammals. The flowers also provide nectar for bees.
- Musk Mallow – Provides nectar for bees and butterflies.
- Tutsan *Hypericum androsaemum* – The flowers attract insects and the berries are eaten by birds and small mammals.
- Shrubby cinquefoil *Potentilla fruticose* - Provides nectar for bees and butterflies.
- Betony *Stachys officinalis* - Provides nectar for bees and butterflies.

6.2.1 – Timing

January	February	March	April	May	June	July	August	September	October	November	December

The timetable above is the best time to create a suitable bedding area for the seeds and when the seeds should be sown. The seeds will be planted between March-May 2021.

6.2.2 – Planting

Planting will take place is the shrub areas identified within the landscape plan. Planting can either be done by seed or from plugs.

- Prepare by removing weeds by hand or with an herbicide.
- The land should then be dug-over and raked over to create a medium tilth.
- Seeds should be sown in either autumn or spring and sown by hand broadcasting or by machine.

- The seeds should then be rolled or treaded down but not covered.
- If using plugs, dig a hole wider than the plug, place the plug in the soil and cover over.
- Water the plug adequately according to size.

6.3.3 – Maintenance

- Weeds and dominant grasses will be abundant in the first year so they need to be controlled by hand. If planted in autumn do not prune in spring, the annuals should be allowed to flower and then cut in mid-summer/late summer once the flowers have died off and the vegetation removed.

6.3.4 – Long-term management

Once established and if necessary, pruning of the shrubs should take place in late winter-early spring. Any weeds should be removed by hand or spot treat with herbicide.

7.Semi-Natural Habitats

There are areas of the site that should be set-aside for natural regeneration. This will allow plant and animal species to occur naturally on the site.

7.1 – Justification

The LPA have requested 'a landscaping strategy which incorporates wildlife friendly landscaping throughout the site'[1]. These areas, along with the other enhancements discussed within this document will provide Wildlife enhancements throughout the site and more ecological value than what is going on-site.

7.2 - Location

These will be areas within the corners of the development. They will be not disturbed by humans and thereby allowed to grow without interference. Please see WEP map (appendices 1).

7.3 - Maintenance

These areas will allow natural regeneration. These habitat areas should be cut every 2-3 years between Autumn-Late Winter to stop succession occurring.

8.Bird Boxes

To enhance the breeding bird potential of the site, bird boxes chosen for this site are Schwegler 1B boxes with different size openings for different species (please see appendices 2).

8.1 - Justification

Three bird boxes are to be erected to compensate for the 5m loss of Hedgerow and 60m^2 loss of Mixed plantation woodland. The boxes, along with the proposed new hedgerow and tree planting once mature, will provide nesting opportunities on the newly developed site

8.2 – Location

Please see WEP map (appendices 1).

The boxes should be situated[13]:

- 2 to 4 metres up a tree.
- Unless there are trees which shade the box during the day, face the box between north and east, thus avoiding strong sunlight and the wettest winds.
- Make sure that the birds have a clear flight path to the nest without any clutter directly in front of the entrance.
- Tilt the box forward slightly so that any driving rain will hit the roof and bounce clear.

8.3 - Location Justification

The locations of these boxes are on the retained trees within the Mixed plantation woodlands. The trees provide natural protection and shelter.

8.4 – Timing

The box can be erected anytime but optimally before February 2021 so it is ready for the breeding season which is 1st March to 31st August[14].

9.Bat Boxes

Bat boxes will further enhance the biodiversity of the project site and provide roosting potential that currently has none. One crevice box and one hollow box is specified to provide roosting opportunities for different species (please see appendices 3).

9.1 - Justification

The boxes selected will provide roosting opportunities on the newly developed site.

9.2 – Location

Please see WEP map (appendices 1).

The locations of these boxes are on the retained trees within the Mixed plantation woodlands. These boxes should be placed ideally[15]:

- Where bats are known to feed close to hedges and tree lines
- Ideally at least 4m above the ground (where safe installation is possible)
- Sheltered from strong winds and exposed to the sun for part of the day (usually south or south-west)
- These boxes are 'self-cleaning' so very little maintenance is needed.

9.3 - Location Justification

The locations of these boxes are on the trees within the Mixed plantation woodland habitats within the SW section of the project site and the NE section of the project site. The surrounding habitat has a moderate-high foraging suitability[16] especially along the project sites surrounding hedgerows and Black dike drain. Beyond there are the woodland ecotones that provide excellent foraging opportunities. This, therefore is not only allowing the bats to forage/commute closer to a potential roost but also this action enhances the biodiversity of the site.

9.4 – Timing

The box can be erected anytime but optimally before April 2021 so it is ready for the maternity season which is May-September[16].

10. Hedgehog Box

Not only would this boost the biodiversity of the project site but contribute to the conservation of this declining native species (please see appendices 4). Hedgehogs are in a state of decline. Since 2000, rural populations have declined by at least a half and urban populations by up to a third in the same period[17]. Hedgehogs are listed on the UKBAP[3] and LBAP[18].

10.1 - Justification

The project site has suitable habitats for Hedgehogs such as the hedgerows both on and off-site. A hedgehog box will potentially support this species and help halt this dramatic decline.

10.2 – Location

See WEP map (appendices 1). One box will be located adjacent to the neighbouring hedgerow in the NE corner of the development.

10.3 – Location Justification

Providing a hedgehog box along the neighbouring eastern hedgerow would provide shelter for this species and ideal foraging habitat leading in to the hedgerow and the grassland within the project site. Avoid facing the entrance in a North-East bearing.

10.4 – Timing

The boxes can be cited anytime but optimally before March 2021 so it is ready for the breeding season which is April-September[17].

11. Log Piles

There is the opportunity to increase the invertebrate biodiversity on the project site and provide refuge for amphibians. In its current state the Poor Semi-improved grassland provides very little biodiversity but with the enhancements stated in this document, it is likely that invertebrate species numbers will increase. These log piles/hibernacula will provide shelter for such species.

11.1 - Justification

The LPA have requested that log piles are cited within the project site[1].

11.2 – Location

See WEP map (appendices 1).

11.3 – Location Justification

11.3.1 – Pond

This location has been selected as it will provide some sunlight but not too much as the proposed single stand of tree planting will provide shade during the hottest part of the day.

Creating a log pile near the pond will provide a habitat for invertebrates, amphibians and possibly reptiles in the future years as the project site develops and matures. Placing a log pile near the pond will potentially increase the survival rate of amphibians[19].

11.3.2 – Adjacent to the Mounds

Creating a log pile adjacent to the mounds will provide direct access to a food source for many invertebrates.

11.4 – Timing

The log piles can be created at any time of the year.

11.5 – Creating a log Pile

The development of the project site will create lots of useful items for these piles. The development of the project site also provides an excellent opportunity to collect ‘cut-offs’ and unwanted building materials that can be added to the log piles and therefore are free. The trees cleared during the creation of the new vehicular access can also be used. The log piles will provide a habitat at little or no cost. Any un-treated wooden cut-offs can also be used.

- Lay the largest logs first and then progress in a pyramid shape with smaller logs.
- Ideal height would be 1m.

- Use square treated wooden pegs to provide stability if needed.
- Apply twigs, small branches around the log pile to increase the biodiversity of the pile
- Place fallen leaves within the pile to again increase the biodiversity of the pile.
- Only maintain if the pile destabilises and falls, if so re-build.

Please see appendices 5.

12. Amphibian Hibernacula

The development will have a pond and there is the Black Dike Drain adjacent to the southern boundary. This will provide any potential amphibians with a refuge over the non-breeding months and again will enhance the biodiversity on-site. See appendices 6 for an example of such a hibernaculum.

12.1 - Justification

The LPA have requested an amphibian hibernacula[1]. In addition, the newly created pond and adjacent Black dike drain may have Amphibians present or may do in the future.

12.2 – Locations & Specifications

Please see WEP map (appendices 1).

- The optimal location for this hibernaculum would be adjacent to south shoreline edge of the new pond to provide warmth throughout the day.
- There is an opportunity to create the hibernaculum by recycling material collected such as fallen branches, twigs, bricks and rocks.
- The closest area of access track should also be 'smoothed off' to ground level to allow amphibians access to and from Black Dike drain. If this is not possible then a gentle gradient slope should be created on each side of the track. The length of modified track should be a minimum of 2m.

12.3 – Location Justification

Locating the hibernaculum to the south of the newly created pond will provide heat throughout the day in the winter months. Amphibians use hibernacula's during winter to keep warm. The hibernaculum location is also very close to the pond (2m) and approximately 40m from Black Dike drain and therefore is excellent for amphibians, as they are wasting less energy in reaching the pond or hibernacula and therefore have more energy to breed.

12.4 – Timing

The amphibian hibernaculum will be constructed before December 2020 so any potential amphibians have somewhere to hibernate over winter.

13. Insect boxes

These insect boxes will complement the log piles and the proposed native planting. Please see appendices 7.

13.1 - Justification

The LPA have requested that insect boxes are cited within the project site. These boxes will further boost the biodiversity on the site. Four boxes are recommended.

13.2 – Location

See WEP map (appendices 1).

13.3 – Location Justification

The insect boxes will be cited:

- On an existing fence-post of the stock fence' boundary within the project site
- On the newly planted single stand tree adjacent to the pond once mature
- A tree on the edge of the mixed plantation woodland adjacent to the new buildings
- On an existing fence-post of the southern boundary stock fence

13.4 – Timing

The insect boxes can be erected at any time of the year.

14. Planning Policies

14.1 The Wildlife and Countryside Act (WCA) 1981 (as amended)[20]

The long title of the WCA 1981 as amended;
An Act to repeal and re-enact with amendments the Protection of Birds Acts 1954 to 1967 and the Conservation of Wild Creatures and Wild Plants Act 1975;

- to prohibit certain methods of killing or taking wild animals;
- to amend the law relating to protection of certain mammals;
- to restrict the introduction of certain animals and plants;
- to amend the Endangered Species (Import and Export) Act 1976;
- to amend the law relating to nature conservation, the countryside and National Parks and to make provision with respect to the Countryside Commission;
- to amend the law relating to public rights of way; and for connected purposes.

14.1.1 – Animals

Animals are protected under Schedule 5 of the WCA. It is illegal to;

- capture, kill, disturb or injure animals deliberately
- damage or destroy a breeding or resting place
- obstruct access to their resting or sheltering places (deliberately or by not taking enough care)
- possess, sell, control or transport live or dead animals, or parts of them
- take eggs

14.1.2 Birds

Birds, their eggs and nest are protected under by UK law under the following act:
Wildlife & Countryside Act (as Amended) 1981: Schedules 1-4 and in some cases 9.
To summarise, you would be breaking the law by;

- intentionally kill, injure or take birds
- intentionally take, damage or destroy a nest while it's being used or built
- intentionally take or destroy a bird's egg/s
- possess, control or transport live or dead bird, or parts of them, or their eggs
- sell birds or put them on display for sale
- use prohibited methods to kill or take birds

Birds that are listed as a schedule 1 bird are provided further protection. Additionally, it is an offence to:

- disturb them while they're nesting, building a nest, in or near a nest that contains their young
- disturb their dependent young

14.2 The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[21]

The Conservation of Habitats and Species Regulations 2017 is an EU directive and consolidates all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994 in respect of England and Wales. The 1994 Regulations transposed Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law. The Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species. These sites form a network termed Natura 2000 and include Special Areas of Conservation and Special Protection Areas. All European bats species and their roosts are listed in Annex IV and some bat species are also listed in Annex II giving those species even greater protection. Section 43 of this law states that it is an offence to:

- capturing, killing, disturbing or injuring European protected species deliberately
- damaging or destroying a breeding or resting place
- obstructing access to their resting or sheltering places (deliberately or by not taking enough care)
- possessing, selling, controlling or transporting live or dead protected species, or parts of them
- taking eggs

14.3 The Natural Environment and Rural Communities (NERC) Act (2006)[22]

'An Act to make provision about bodies concerned with the natural environment and rural communities; to make provision in connection with wildlife, sites of special scientific interest, National Parks and the Broads; to amend the law relating to rights of way; to make provision as to the Inland Waterways Amenity Advisory Council; to provide for flexible administrative arrangements in connection with functions relating to the environment and rural affairs and certain other functions; and for connected purposes'.
In regards to the planning process sections 40 and 41 are of particular importance:
'Section 40 (1) Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.'
Section 41 lists habitats and species of primary importance to the conservation of biodiversity therefore making these habitats and species a consideration in the planning process.'

14.4 National Planning Policy Framework (NPPF) (February 2019)[23]

This policy states under section 15 'Conserving and enhancing the natural environment' under the Habitats & Biodiversity section that;

174. To protect and enhance biodiversity and geodiversity, plans should:
a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas

identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

175. When determining planning applications, local planning authorities should apply the following principles:
a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts),
adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.
176. The following should be given the same protection as habitats sites:
a) potential Special Protection Areas and possible Special Areas of Conservation;
b) listed or proposed Ramsar sites; and
c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.
177. The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

14.5 UK Biodiversity Action Plan (UKBAP)[3] and Local BAP[18]

UK BAP priority species and habitats were those that were identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP). The original lists of UK BAP priority species and habitats were created between 1995 and 1999, and were subsequently updated in 2007, following a 2-year review of UK BAP processes and priorities, which included a review of the UK priority species and habitats lists. The aim of the 'Species and Habitats Review' was to ensure that the UK BAP lists of priority species and habitats remained up-to-date and focussed on the correct priorities. This was the first full review of the lists, generated over 10 years previously, and provided an opportunity to take into account emerging new priorities, conservation successes, and the huge amount of

new information that had been gathered since the original lists were created. Selection of priority species and habitats for the priority lists followed consideration by expert working groups against a set of selection criteria, based on international importance, rapid decline, high risk, and habitats of importance for key species.
As a result of new drivers and requirements, the' 'UK Post-2010 Biodiversity Framework, published in July 2012, has succeeded the UK BAP. In particular, due to devolution and the creation of country-level biodiversity strategies, much of the work previously carried out under the UK BAP is now focussed at a country level.
The UK BAP lists of priority species and habitats remain, however, important and valuable reference sources.

LBAP have two targets: to reflect and help implement the national priorities identified in the UK Action Plans, and to identify and address local priorities and local distinctiveness.

14.6 Local Planning Policy[24]

The East Riding Local Plan 2012 – 2029 Strategy Document outlines the council's planning policy targets. Policy ENV4 is the leading planning policy with regards to biodiversity.

Policy ENV4: Conserving and enhancing biodiversity and geodiversity

A. Proposals that are likely to have a significant effect on an International Site will be considered in the context of the statutory protection which is afforded to the site.

B. Proposals that are likely to have an adverse effect on a National Site (alone or in combination) will not normally be permitted, except where the benefits of development in that location clearly outweigh both the impact on the site and any broader impacts on the wider network of National Sites.

C. Development resulting in loss or significant harm to a Local Site, or habitats or species supported by Local Sites, whether directly or indirectly, will only be supported if it can be demonstrated there is a need for the development in that location and the benefit of the development outweighs the loss or harm.

D. Where loss or harm to a National or Local designated site, as set out in Table 9, cannot be prevented or adequately mitigated, as a last resort, compensation for the loss/harm must be agreed. Development will be refused if loss or significant harm cannot be prevented, adequately mitigated against or compensated for.

E. Proposals should further the aims of the *East Riding of Yorkshire Biodiversity Action Plan (ERYBAP)*, designated Nature Improvement Areas (NIAs) and other landscape scale biodiversity initiatives. To optimise opportunities to enhance biodiversity, proposals should seek to achieve a net gain in biodiversity where possible and will be supported where they:

1. Conserve, restore, enhance or recreate biodiversity and geological interests including the Priority Habitats and Species (identified in the *ERYBAP*) and Local Sites (identified in the *Local Sites in the East Riding of Yorkshire)*.
2. Safeguard, enhance, create and connect habitat networks in order to:

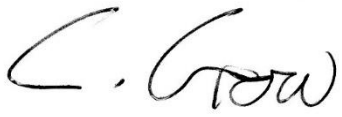
   i. protect, strengthen and reduce fragmentation of habitats;
   ii. create a coherent ecological network that is resilient to current and future pressures;
   iii. conserve and increase populations of species; and
   iv. promote and enhance green infrastructure.

Figure 14.1 – Planning policy ENV 4 of East Riding Local Plan 2012 – 2029 Strategy

15. WEP Timetable & Responsibilities for Implementation

WEP Implementation	Start date (provisional)	Duration	Responsibility
Hedgerow & Tree planting	March 2021	3 months	Developer – Mr Farrow
Wildlife Pond	March 2021	6 months	Developer – Mr Farrow
Excavated Spoil Heaps	September 2020	6 months	Developer – Mr Farrow
Wildflower planting	September 2021	3 months	Developer – Mr Farrow
Bat-friendly planting	September 2021	3 months	Developer – Mr Farrow
Proposed tree/shrub planting	September 2020	12 months	Developer – Mr Farrow
Semi-natural habitats	Ongoing	For 3 years	Developer – Mr Farrow
Bird boxes	February 2021	1 month	Developer – Mr Farrow
Bat boxes	February 2021	1 month	Developer – Mr Farrow
Hedgehog box	February 2021	1 month	Developer – Mr Farrow
Log piles	September 2021	3 months	Developer – Mr Farrow
Amphibian Hibernacula	September 2021	3 months	Developer – Mr Farrow
Insect boxes	September 2021	1 months	Developer – Mr Farrow
Completion Date	May, 2022		Developer – Mr Farrow

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



Chris Crow, BSc (Hons) ACIEEM.
September 2020
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Report printed on recycled paper

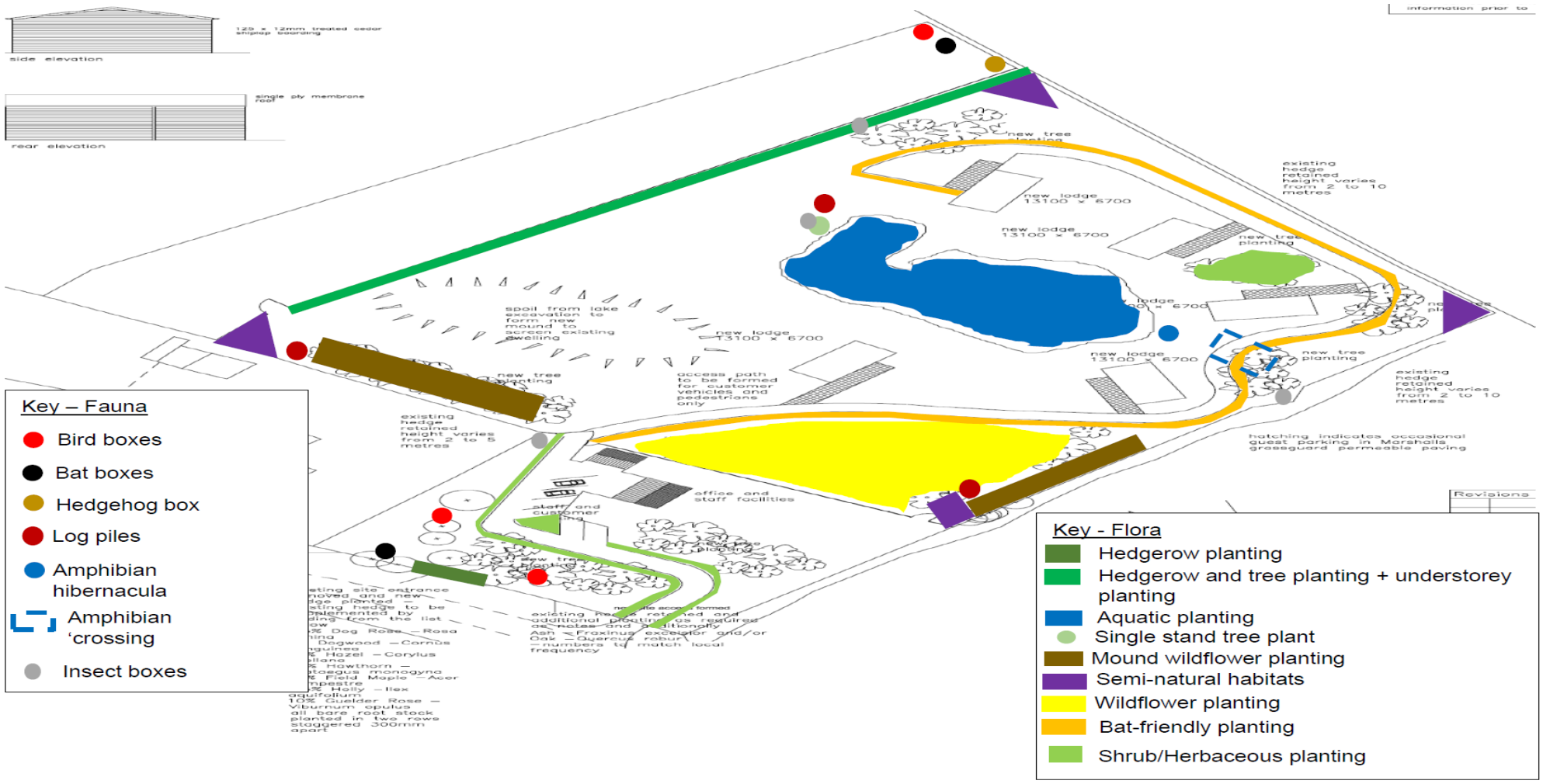
16. References & Bibliography

1) Unknown (2020). *FULL PLANNING PERMISSION* 19/04192/PLF East Riding of Yorkshire Council
2) Unknown, (2013) *Tree and Shrub Species for Hull and East Yorkshire* [PDF] HEYwoods.
3) Unknown (2019) *UK BAP Priority Species and Habitats* [Online] Available at: https://jncc.gov.uk/our-work/uk-bap/#uk-bap-priority-species-and-habitats Accessed 16/08/20
4) Unknown (No date) *List of Wildlife attracting plants* [PDF] Staffordshire County Council
5) Unknown (no date) *How to Plant a Tree* [online] Available at: https://www.woodlandtrust.org.uk/plant-trees/advice/how/ Accessed 16/08/20
6) Unknown (no date) *Wildlife Hedgerow* [online] Available at: https://treegrowing.tcv.org.uk/grow/planting/hedge Accessed 24/11/18
7) Unknown (2016) *TE1: Planting standard hedgerow tree* [online] Available at: https://www.gov.uk/countryside-stewardship-grants/planting-standard-hedgerow-tree-te1 Crown Copyright Accessed 24/11/18
8) Unknown (2010) '*Illustrated guide to ponds and scrapes*' Natural England Technical Information Note TIN079 Natural England
9) Sutherland, WJ & Hill, DA. (1995). *Managing Habitats for Conservation*: Cambridge University Press.
10) Unknown (no date) *How to create invertebrate and reptile mounds* [PDF] Save our Magnificent Meadows
11) Unknown (1977) *Geological Survey Ten Mile Map – South Sheet* British Geological Survey
12) Unknown (2015) *Encouraging Bats* [PDF] Bat Conservation Trust
13) Unknown (No date) *Making and Placing a Bird Box* [online] Available at: https://www.rspb.org.uk/birds-and-wildlife/advice/how-you-can-help-birds/nestboxes/nestboxes-for-small-birds/making-and-placing-a-bird-box Accessed 16/08/20.
14) Unknown (2015) *Wild birds: surveys and mitigation for development projects* Crown Copyright [Online] Available at: https://www.gov.uk/guidance/wild-birds-surveys-and-mitigation-for-development-projects Accessed 16/08/20
15) Unknown, (No date). *Bat Boxes* [Online]: Bat Conservation Trust. Available at: http://www.bats.org.uk/pages/bat_boxes.html Accessed 16/08/20
16) Collins, J (ed) (2016*) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn).* The Bat Conservation Trust, London
17) Unknown (2015) *The State of Britains Hedgehogs 2015* [PDF] British Hedgehog Preservation Society
18) Unknown (2010) *East Riding of Yorkshire BAP Strategy* [PDF] East Riding of Yorkshire Council
19) Unknown (no date) *Garden Wildlife – Dead Wood* [PDF] The Wildlife Trusts
20) Unknown, (No date). *Wildlife and Countryside Act 1981* [Online]: Crown Copyright. Available at: http://www.legislation.gov.uk/ukpga/1981/69/contents Accessed 16/08/20.
21) Unknown, (No date). The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 [Online]: Crown Copyright. Available at: https://www.legislation.gov.uk/ukdsi/2019/9780111176573/contents Accessed 16/08/20
22) Unknown, (No date). *Natural Environment and Rural Communities Act 2006* [Online]: Crown Copyright. Available at: http://www.legislation.gov.uk/ukpga/2006/16/contents Accessed 16/08/20.
23) Unknown, (2019). *National Planning Policy Framework* [Online]: Crown Copyright. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf Accessed 16/08/20.
24) Unknown (2012) *The East Riding Local Plan 2012 – 2029 Strategy Document* [PDF] East Riding of Yorkshire Council

Crow Ecology
Creating a Nest for your Project & Nature

17. Appendices

Appendix 1 - WEP Map



Appendix 2 – Bird box

1B Schwegler Nest Box

View Images

Our bestselling nest box for garden birds

Schwegler

26mm & 32mm Hole: Brown▼

Availability: **In stock**

26mm & 32mm Hole NHBS Price: **£29.95** inc VAT

About this product

Natural cavity nest sites have declined dramatically so providing a nest box in your garden or woodland can provide much-needed breeding and roosting space for cavity-nesting species. The 1B is the bestselling nest box for garden birds and one of the official nest boxes of BTO's National Nest Box Week. The 1B nest box will attract a wide range of species and is available with different entrance hole sizes to prevent birds from competing with each other for the boxes. The 1B is available in four colours: brown, green, white and red. The nest box can be attached to the tree or wall using an aluminium nail or by hanging over a branch and is made from Woodcrete to ensure that it lasts for decades. The front panel is removable for inspection and cleaning.
Entrance hole sizes:

* **32mm entrance hole** will attract Great, Blue, Marsh, Coal and Crested Tit, Redstart, Nuthatch, Collared and Pied Flycatcher, Wryneck, Tree and House Sparrow and bats.
* **26mm entrance hole** suits Blue, Marsh, Coal and Crested Tit and possibly Wren. All other species are prevented from using the nest box due to the smaller entrance hole.
* **Oval entrance hole** (29 x 55mm) suits Redstarts because more light enters the brood chamber. It is also suitable for all other species which nest in the 32mm boxes.

These Woodcrete nest boxes are famous for their durability - lasting for at least 20-25 years. Woodcrete is a breathable blend of wood, concrete and clay which will not rot, leak, crack or warp, whilst preventing condensation and maintaining more constant temperatures inside than wooden boxes. Schwegler bird boxes are backed by conservation organisations, government agencies and forestry experts and experiments have shown that the highest density if bird populations (i.e. breeding pairs per hectare) is achieved with Schwegler nest boxes. They are carefully designed to provide a stable environment and to mimic natural nest and roost sites with internal brood chamber dimensions that are similar to natural woodpecker cavities. Schwegler have a patented method of installation on trees that prevents the tree trunk from growing over the hanger from which the box is suspended. A separate replacement front panel is also available.

23cm high x 16cm diameter. Aluminium tree-friendly nail and hanger included.

Source - https://www.nhbs.com/

Please note – this is an example of a suitable box, other brands and other companies are available.

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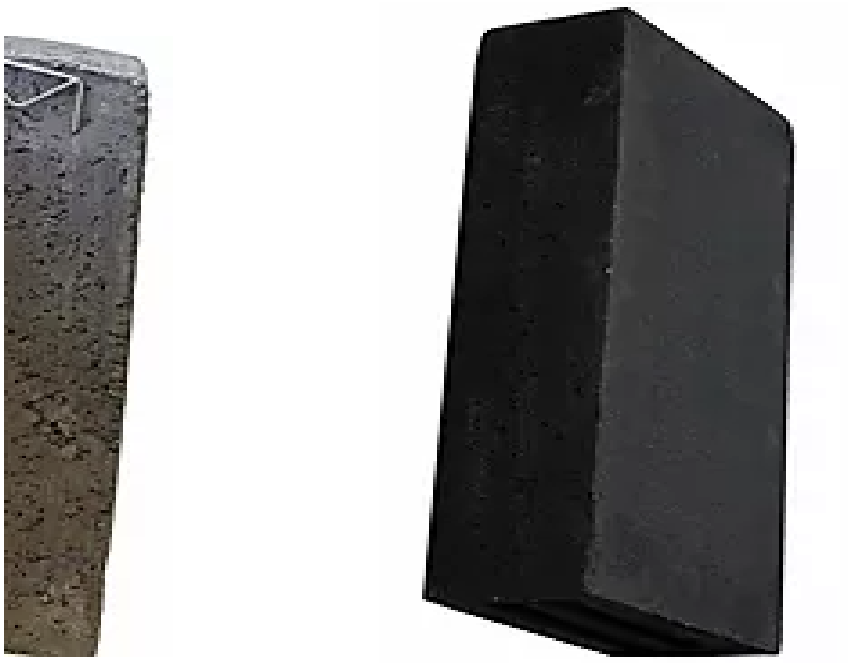
Appendix 3 – Bat Boxes

BAT BOXES

TWO CREVICE BAT BOX



£48

Individually Handmade - Specifications are in CM and approximate.

External: 43 high x 21.5 wide x 6.8 deep.

Internal: 41 x 16.5 x 1.8 crevices @ 2.

Made with small groups of crevice dwelling bat species in mind, such as pipistrelles. Approx. 6.75kg

MEDIUM HOLLOW BAT BOX

£60

Individually Handmade - Specifications are in CM and approximate.

External: 43 high x 21.5 wide x 13.5 deep.

Internal: 41 x 16.5 x 8.5

Made with larger groups of those species preferring a wider cavity in mind, such as Brown Long Eared, Noctules, Myotis Sp. Serotine. Approx. 6.75kg

Source – https://www.greenwoodsecohabitats.co.uk/shop

Please Note – This is an example of a suitable bat boxes, other boxes are available

Appendix 4- Hedgehog Box

View Images



- Provide shelter for hedgehogs in your garden
- Waterproof roof
- Predator protection tunnel

#234035 | Availability: **In stock**
NHBS Price: **£29.99** inc VAT ~~£36.95~~ (Save £9.96) $35/€30 approx.

About this product

Hedgehog numbers are rapidly declining across the UK and providing a refuge in your garden with the Wildlife World Hedgehog House will help to protect hedgehogs from predators and disturbance. Underneath the textured brushwood finish there is a sturdy steel frame covered with a waterproof felt lining. The wooden entrance door is manufactured from FSC wood and forms a short predator defence tunnel, small enough to deter access by dogs or badgers. The edges of the house can be pegged down using tent pegs to provide extra security. To encourage hedgehogs to use the house site it in a quiet corner of the garden and cover with leaves for extra camouflage. The edges of the hedgehog house are finished with decorative rattan and the box is supplied in a decorative hedgehog gift box, making it an ideal gift.

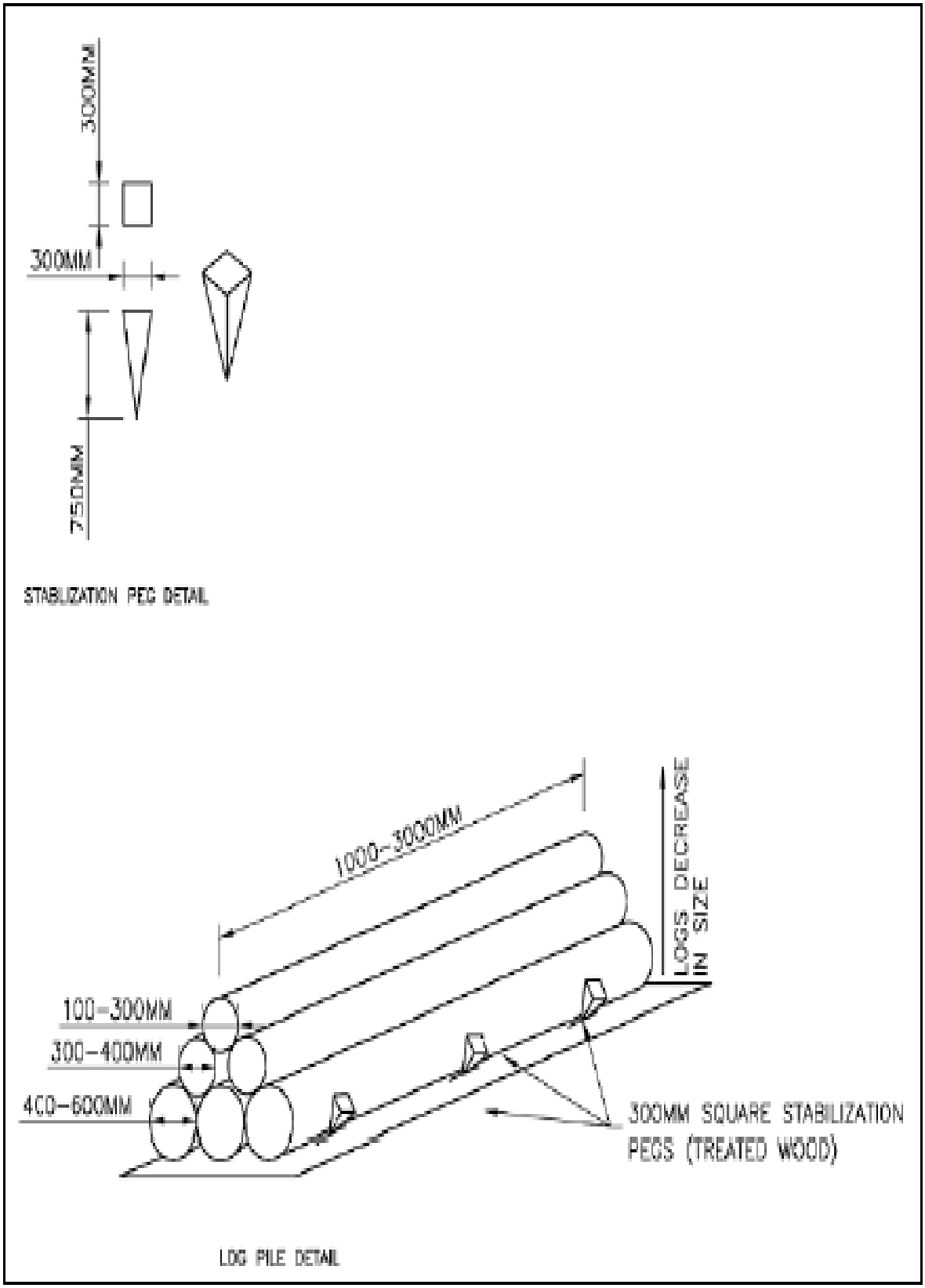
Specification

Dimensions: (H) 210 x (W) 380 x (D) 490mm
Weight: 1.9kg
Material: Steel frame, waterproof felt roof, brushwood exterior, FSC wooden door (painted brown), rattan edge

Source - https://www.nhbs.com/

Please note – this is an example of a suitable box, other brands and other companies are available.

Appendix 5 – Log Pile Diagram



Source – Unknown (2005) *Design Manual for Roads and Bridges*, Volume 10, Section 4 – Highways Agency

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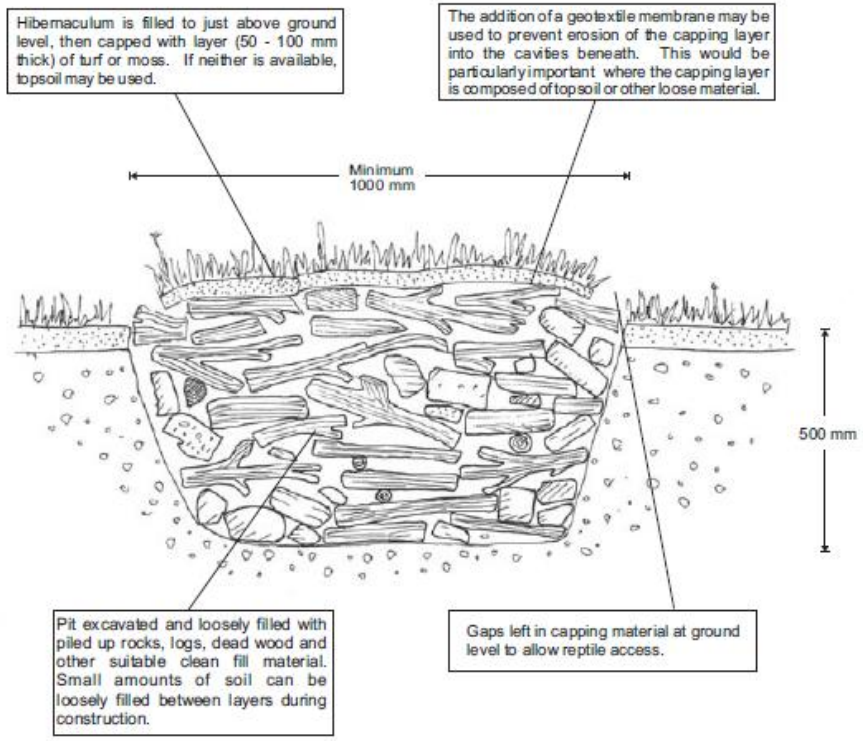
Appendix 6 – Hibernacula

ANNEX D HIBERNACULA DESIGN

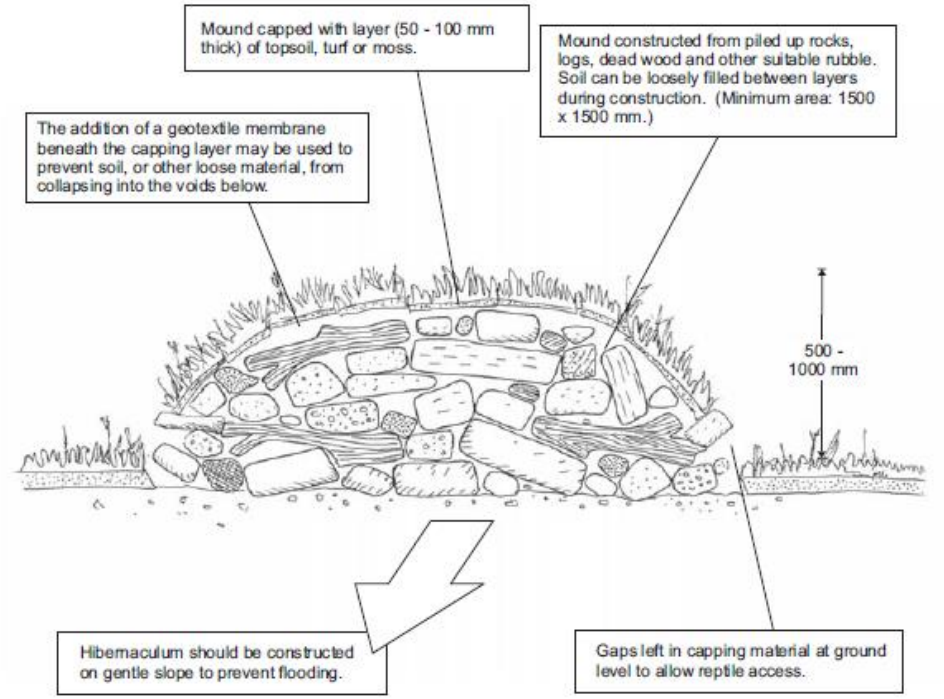
Hibernaculum on free-draining ground

Where ground conditions allow, the hibernaculum should be incorporated into a shallow pit. This design is more likely to remain frost-free, and will be less obtrusive and thus unlikely to be subject to interference.



Hibernaculum on impermeable ground

Where ground conditions are impermeable, then an 'above-ground' or mounded design should be utilised in order to prevent the hibernaculum from flooding. This design should also be used if it is not possible to excavate a pit for any other reason.



Appendix 7 – Insect Box

Insect Tower

Manufacturer: CJ Wildlife

- Provides a variety of habitats for insects
- Ideal for butterflies, solitary bees, lacewings and ladybirds

- **In stock**

£29.99
#217363
Price:£29.99ADD TO BASKET

About this product

The Insect Tower will provide valuable habitat in your garden 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 pine cones offer an excellent habitat for a range of other species.

Specification

Width: 21cm
Height: 65cm
Depth: 12.5cm
Weight: 3kg

Source - https://www.nhbs.com/

Please note – this is an example of a suitable box, other brands and other companies are available.