Newett Homes

Land off Northorpe Lane, Mirfield

ECOLOGICAL DESIGN STRATEGY (EDS)

Report Reference Number: FE90/EDS01

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1.0 INTRODUCTION

1.1 The following report has been prepared by Futures Ecology Ltd. on behalf of Newett Homes to discharge ecology conditions attached to planning permission 2021/62/91914/E, for land located off Northorpe Lane, Mirfield, Kirklees (central grid reference: SE 21490 21076) (Kirklees Council). This report details how the biodiversity units stated in the Biodiversity Impact Assessment are to be achieved post-development, along with roosting bat and nesting bird provisions and details of a sensitive lighting scheme.

SITE LOCATION AND CONTEXT

1.2 The Site is approximately 1.4ha in extent and comprises of a residential building with associated hardstanding, amenity grassland, ornamental planting, introduced shrub and tall ruderal vegetation to the northeast, with the rest of the site dominated by poor semi-improved grassland with areas of dense scrub, further tall ruderal vegetation and marshy grassland. The boundaries were largely formed by fences, with a single hedgerow located along the western boundary. The landscape beyond the Site is predominantly residential to the south and west. An arable field was present adjacent to the northern site boundary and broadleaved woodland, formed on a dismantled railway, was adjacent to the eastern site boundary.

PLANNING PERMISSION

1.3 The site has planning permission for the demolition of one dwelling and erection of 44 dwellings with access and associated infrastructure (Planning Reference: 2021/62/91914/E). The second ecology condition attached to the planning permission states;

"Prior to superstructure works of any dwellinghouse commencing, an Ecological Design Strategy (EDS) detailing how the biodiversity units for habitats, hedgerows and rivers stated in the Biodiversity Impact Assessment (Report Reference FE90_BIA02) are to be achieved post-development, along with roosting bat and nesting bird provisions as detailed in the EcIA and details of a sensitive lighting scheme shall be submitted to, and agreed in writing by, the Local Planning Authority. The EDS shall include the following.

a) Purpose and conservation objectives for the proposed works;

b) Review of site potential and constraints;

c) Detailed design(s) and/or working method(s) to achieve stated objectives;

d) Extent and location/area of proposed works on appropriate scale maps and plans;

e) Type and source of materials to be used where appropriate, e.g., native species of local provenance;

f) Timetable for implementation demonstrating that works are aligned with the proposed phasing of development;

g) Persons responsible for implementing the works;

h) Details of initial aftercare and long-term maintenance;

i) Details for monitoring and (where the results from monitoring show that conservation aims and objectives of the EDS are not being met) how contingencies and/or remedial action will be identified, agreed and implemented so that the development still delivers a measurable biodiversity net gain; and

j) Details for disposal of any wastes arising from works.

The EDS shall be implemented in accordance with the approved details and all features shall be retained in that manner thereafter."

2.0 PURPOSE AND CONSERVATION OBJECTIVES FOR THE PROPOSED WORKS

2.1 The purpose and conservation objectives of the habitat creation / management is to:

- Manage and create new habitats with ecological value as outlined in the Biodiversity Impact Assessment (Futures Ecology, FE90/BIA02, June 2022). This includes trees, wildflower, native scrub and hedgerow planting to help to offset losses within the site (an offsite contribution has also been made to Kirklees Council to achieve a 10% net gain overall).
- Monitoring of the habitats to ensure they reach their target conditions (as outlined within the Biodiversity Metric 3.0) and apply appropriate remediation, if required.
- Introduce new habitat features to improve the opportunities for foraging bats and birds and to provide shelter for these animals, and other faunal species, within the site. This relates to the provision of artificial boxes and integral features within new buildings.

2.2 Overall, the above will contribute to the aims of net biodiversity gain within the local area.

2.3 Newly created habitats include native trees, wildflower / species rich grassland (other neutral grassland), native mixed scrub and hedgerow planting, as well as amenity grassland (modified grassland), vegetated gardens, introduced shrub.

Table 1: Retained and Created Habitats Target Condition Summary

Habitat	Target Condition in accordance with the Natural England Biodiversity Metric 3.0
Retained (within private gardens)	
Native Hedgerow H1	Moderate
Created	
Amenity Grassland – Modified Grassland	Poor
Urban – Introduced shrub	Poor
Vegetated garden	Poor
Grassland – Other neutral grassland	Moderate
Heathland & Shrub – Mixed scrub	Moderate
Urban – Urban tree	Moderate
Native Species Rich Hedgerow	Moderate
Native Hedgerow	Poor
Hedge Ornamental Non-Native	Poor

3.0 REVIEW OF SITE POTENTIAL AND CONSTRAINTS

3.1 Clearance of any significant vegetation will take place outside of the bird breeding season (March to the end of August). If this is not possible, then a check for active nests should be carried out immediately before any works to the affected areas begin.

3.2 Vegetation clearance will be undertaken in a precautionary manner to protect any common toad or hedgehogs sheltering within the Site.

3.3 The site is bordered by broadleaved woodland along the eastern boundary, which is mapped within the Kirklees Wildlife Habitat Network (KWHN). Habitat enhancements along the eastern boundary will help to maintain and strengthen the KWHN.

4.0 DETAILED DESIGN(S) AND/OR WORKING METHOD(S) TO ACHIEVE STATED OBJECTIVES

4.1 Within the Biodiversity Impact Assessment (Futures Ecology, FE90/BIA02, June 2022) the Biodiversity Metric 3.0 shows that 2.94 Habitat Units and 1.52 Hedgerow Units can be delivered on site post development.

4.2 Areas of native scrub planting, wildflower seeding and native hedgerows will be created and managed for a minimum of 30-years. Monitoring and implementation of remedial measures will ensure that the habitat target conditions are achieved.

4.3 Details of planting have been included in a separate Landscape Masterplan (FDA Landscape, June 2022, Plan Ref: R/2470/1H).

4.4 The locations of the habitats can be found in Figure 1: Ecological Enhancement Plan.

MODIFIED GRASSLAND (AMENITY)

4.5 Amenity grassland will be created through the development. Due to the frequent cutting of these areas to maintain a short sward, the amenity grassland will be assumed to maintain a poor condition.

INTRODUCED SHRUB

4.6 New planting around new residential dwellings will be predominantly ornamental shrub planting, including species which produce fruit and nectar supplying a food resource for insects, birds and small mammals. Due to the non-native nature of this habitat type, it will be assumed to maintain a poor condition.

VEGETATED GARDENS

4.7 The residential gardens are outside the remit of this report as they will be privately owned. The habitat condition score for this habitat type has therefore been assumed to be poor.

OTHER NEUTRAL GRASSLAND (WILDFLOWERS)

4.8 Areas of wildflower seeding will be incorporated within scheme and managed to reach at least moderate condition.

4.9 The areas will be seeded with seed mix such as Emorsgate Standard General-Purpose Meadow Mixture EM2 (see species composition in Section 6).

4.10 Ground preparation will be required before the seed is sown. This includes aiming to select ground that is not highly fertile and does not have a problem with perennial weeds. To prepare a seed bed first remove weeds using repeated cultivation. Then plough or dig to bury the surface vegetation, harrow or rake to produce a medium tilth, and roll, or tread, to produce a firm surface.

4.11 Seed should be sown in the autumn or spring but can be at other times of the year if there is sufficient warmth and moisture in the soil.

4.12 Once established this should be managed as a meadow and cut late in summer season (July/ August), and arisings removed, like a hay crop, by leaving on site for around a week to let seed shed. This can be complemented with a cut in spring.

4.13 For this habitat to achieve a minimum of moderate condition this will require management to ensure that it meets a minimum of three of the assessment criteria listed below.

1. The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). Wildflowers, sedges and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward.
2. Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 & is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.
3. Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.
4. Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.
5. There is an absence of invasive non-native species (as listed on Schedule 9 of Wildlife and Countryside Act, 1981). Combined cover of undesirable species[1] and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.

4.14 From the above list the management should target 2, 4 and 5.

[1] Undesirable species are: creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, curled dock *Rumex crispus*, broad-leaved dock *Rumex obtusifolius*, common nettle *Urtica dioica*, creeping buttercup *Ranunculus repens*, greater plantain *Plantago major*, white clover *Trifolium repens*, cow parsley *Anthriscus sylvestris.*

MIXED NATIVE SCRUB

4.15 An area of mixed native scrub will be planted along the eastern and northern boundary of site with at least three woody species and no one species comprising more than 75% of the planting.

4.16 Scrub should be planted between October and March with biodegradable rabbit protection / tree ties as required. These should be bare root species c.40-60cm, planted c.2 to 3m apart though the distances should differ to try to create variation within the habitat.

4.17 This habitat will be managed to reach moderate condition. This will require management to ensure that it meets three of the condition criteria below.

1. Habitat is representative of UKHab description (where in its natural range). There are at least three woody species, with no one species comprising more than 75% of the cover (except common juniper, sea buckthorn or box, which can be up to 100% cover).
2. There is a good age range – all of the following are present: seedlings, young shrubs and mature shrubs.
3. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species[1] make up less than 5% of ground cover.
4. The scrub has a well-developed edge with scattered scrub and tall grassland and/or herbs present between the scrub and adjacent habitat(s).
5. There are clearings, glades or rides present within the scrub, providing sheltered edges.

4.18 From the above list the management should target 1, 2 and 3.

URBAN TREE

4.19 Tree planting will be undertaken throughout the scheme.

4.20 Trees should be planted between October and March with biodegradable rabbit protection / tree ties as required.

4.21 This habitat will be managed to reach moderate condition. This will require management to ensure that it meets three of the condition criteria below.

1. More than 70% of trees are native species.
2. Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide.
3. More than 50% of trees are mature[2] or veteran[3].

[2] A mature tree in this context is one that is at least 2/3 expected fully mature height for the species.

[3] All ancient trees are veteran trees, but not all veteran trees are ancient. A veteran tree may not be very old, but it has decay features, such as branch death and hollowing. These features contribute to its biodiversity, cultural and heritage value. Veteran trees can be classified if they have four out of the five following features:

1. Rot sites associated with wounds which are decaying >400cm2; 2. Holes and water pockets in the trunk and mature crown >5 cm diameter; 3. Dead branches or stems >15 cm diameter; 4. Any hollowing in the trunk or major limbs; 5. Fruit bodies of fungi known to cause wood decay.

4. There is little or no evidence of an adverse impact on tree health by anthropogenic activities such as vandalism or herbicide use. There is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.
5. Management regime has encouraged micro habitat sites for birds, mammals and insects e.g., presence of deadwood, cavities or loose bark etc.
6. Trees are immediately adjacent to other vegetation, and tree canopies are oversailing vegetation beneath.

4.22 From the above list the management should target 2, 4 and 5.

HEDGEROWS

4.23 H1 will be incorporated into a private garden and therefore management cannot be secured, however it is assumed it will be retained at Moderate condition.

4.24 Native beech hedging will be planted along the site entrance and to selected frontages to give structure to the site and separate drives and parking spaces. Ornamental, non-native, evergreen flowering hedges will be planted along selected frontages to give structure to the site and separate drives and parking spaces. These will be within private land and therefore they are assumed to reach poor condition.

4.25 A new native species rich hedgerow will be planted along the northern boundary of Site (H2). The newly created hedgerow will be planted with at least five native species per 30m section.

4.26 Once planted the native species rich hedgerow H2 will be allowed to establish and develop in height (>1.5m) and depth (>1.5m) within the first few years. After 3 years, the hedgerow will be cut back once per annum between January and February, to avoid the nesting bird season and to provide an overwintering food source (berries / fruit).

4.27 As and when required hedgerow H2 will be laid or coppiced to maintain dense cover at the base providing habitat and shelter for nesting birds and cover for foraging small mammals.

4.28 The native species rich hedgerows will be managed to reach moderate condition. This will require management to ensure that there are no more than 4 failures in total from the table below and that it does not fail both attributes in more than one functional group.

Table 2: Hedgerow Condition Assessment[4]

Attribute	Criteria	Description
A1. Height	>1.5m average along length	The average height of woody growth estimated from base of stem to the top of shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice). A newly planted hedgerow does not pass this criterion (unless it is > 1.5 m height).
A2. Width	>1.5m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (e.g., blackthorn suckers) are only included in the width estimate when they >0.5m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice[5]).
B1. Gap - hedge base	Gap between ground and base of canopy <0.5m for >90% of length (unless 'line of trees')	This is the vertical gappiness of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook[6]).
B2. Gap - hedge canopy continuity	Gaps make up <10% of total length and No canopy gaps >5 m	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall gappiness but are not subject to the >5 m criterion (as this is the typical size of a gate).
C1. Undisturbed ground and perennial vegetation	>1m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: Measured from outer edge of	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall gappiness but are not subject to the >5 m criterion (as this is the typical size of a gate).

[4] Ian Crosher *et al* 2019. The Biodiversity Metric 2.0: Auditing and accounting for biodiversity value: technical supplement (Beta version, July 2019). Natural England
[5] HedgeLink (http://hedgelink.org.uk/index.php) provides a resource of management advice for hedgerows.
[6] Defra (2007) Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London

Attribute	Criteria	Description
	hedgerow, and Is present on one side of the hedge (at least)	
C2. Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	The indicator species used are nettles (*Urtica spp*.), cleavers (*Galium aparine*) and docks (*Rumex spp*.). Their presence, either singly or together, should not exceed the 20% cover threshold.
D1. Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Neophytes are plants that have naturalised in the UK since AD 1500. For information on neophytes see the JNCC website[7] and for information on invasive non-native species see the GB Non-Native Secretariat website[8].
D2. Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (e.g., excessive hedge cutting).

4.29 From the above list the management will target A1, A2, B1, B2, C2, D1.

HABITAT FEATURES

4.30 A variety of types of bat and bird boxes will be installed on new buildings to increase availability of roosting and nesting sites. Log piles will also be provided within areas of public open space and hedgehog gaps will be provided within boundary fences. Specifications of these enhancements are detailed in Table 3 below and the locations of these are shown on Figure 1.

[7] https://jncc.gov.uk/
[8] https://www.nonnativespecies.org/

Table 3: Habitat Feature Specifications

Target species	Location	Product	Quantity
General bat species	On buildings facing south / south-west / south-east	Ibstock enclosed bat brick;	23
Swifts	Cluster of 2x swift bricks within close proximity of each other on buildings, positioned high up on gables.	Manthorpe swift nesting brick;	42
House sparrow	On new buildings high up under the eaves.	VIVARA PRO woodstone sparrow nest box;	3
General bird species	On new houses or garages positioned 2-4 m high.	VIVARA PRO woodstone nest box 32MM;	3
General bird species	On new houses or garages positioned 2-4 m high.	VIVARA PRO woodstone open fronted nest box;	3
Invertebrates, small mammals, amphibians etc.	Lay a stack of logs laid on their side. To prevent them rolling, drive a stake into the ground either side of the pile.	Log piles;	2

Target species	Location	Product	Quantity
Hedgehog	Gaps maintained in boundary treatments, with signage / information for homeowners to discourage them being covered. Signs from British Hedgehog Preservation Society.	Hedgehog Gap;	48

4.31 The boxes will be sited away from light spill and with a clear flight line leading to them.

4.32 The positioning of the boxes is approximate only and must be confirmed by the supervising ecologist when on site.

4.33 Given current supply chain issues affecting the manufacture and distribution of habitat boxes, the proposed boxes as detailed below may need to be amended to alternate manufacturers. The specifications of the boxes will, however, be similar to those of the proposed boxes.

LIGHTING DESIGN STRATEGY

4.34 Light spill from artificial light sources could disrupt the normal crepuscular or nocturnal patterns of protected species, such as bats and other wildlife. This could result in faunal species avoiding areas of retained or created habitat.

4.35 It is therefore necessary to implement a sympathetic lighting design to avoid impacts to wildlife, in accordance with the BCT Guidance Note 08/18 'Bats and Artificial Lighting in the UK' (2018)[9]. All luminaires installed within the scheme will meet the below specifications;

- All luminaires will lack UV elements when manufactured. Metal halide, fluorescent sources will not be used.
- LED luminaires will be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- Internal luminaires will be recessed where installed in proximity to windows to reduce glare and light spill.
- If required, the use of specialist bollard or low-level downward directional luminaires to retain darkness above will be used.
- Column heights will be carefully considered to minimise light spill.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.

[9] Bat Conservation Trust (BCT) and Institution of Lighting Professionals (ILP) Bats and artificial lighting in the UK, Bats and the Built Environment series, Guidance Note 08/18

- Luminaires will be mounted on the horizontal, i.e., no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.
- Accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed, if required.

5.0 EXTENT AND LOCATION/AREA OF PROPOSED WORKS ON APPROPRIATE SCALE MAPS AND PLANS

5.1 See Figure 1.

6.0 TYPE AND SOURCE OF MATERIALS TO BE USED WHERE APPROPRIATE, E.G., NATIVE SPECIES OF LOCAL PROVENANCE

6.1 Full species lists will be provided at Reserved Matters stage. Indicative tree and shrub mixes are shown in the separate Landscape Masterplan (FDA Landscape, June 2022, Plan Ref: R/2470/1H).

6.2 Manufacturers of the bat / bird boxes and hedgehog gap signs are provided in Table 3 above.

OTHER NEUTRAL GRASSLAND (WILDFLOWERS)

6.3 The areas will be seeded with seed mix, such as Emorsgate Standard General-Purpose Meadow Mixture EM2. The species composition for EM2 is listed below, but would be subject to change depending on stock availability:

15% Wild flowers

1.0%	Betony	*Betonica officinalis*
3.5%	Common Knapweed	*Centurea nigra*
0.1%	Wild Carrot	*Daucus carota*
1.0%	Meadowsweet	*Filipenula ulmaria*
0.3%	Lady's Bedstraw	*Galium verum*
0.5%	Oxeye Daisy	*Leucanthemum vulgare*
0.9%	Bird's-foot Trefoil	*Lotus corniculatus*
1.0%	Musk Mallow	*Malva moschata*
2.0%	Ribwort Plantain	*Plantago lanceolata*
0.1%	Cowslip	*Primula veris*
0.1%	Selfheal	*Prunella vulgaris*
1.0%	Meadow Buttercup	*Ranunculus acris*
3.5%	Tufted Vetch	*Vicia cracca*

85% Grasses

8.5%	Common Bent	*Agriostis capillaris*
34.0%	Crested Dog's tail	*Cynosurus cristatus*
25.5%	Red Fescue	*Festuca Rubra*
17.0%	Smooth-stalked Meadow-grass	*Poa pratensis*

7.0 TIMETABLE FOR IMPLEMENTATION DEMONSTRATING THAT WORKS ARE ALIGNED WITH THE PROPOSED PHASING OF DEVELOPMENT

7.1 The annual work program is outlined within the table below. This will cover an initial five-year period and is of capable of being rolled forward over a period of 30 years.

Table 4: Timetable of Implementation

Description of works	Years to be undertaken					Aftercare Period
	1	2	3	4	5	5- 30
Native Species Rich Hedgerow						
Planting October and March with biodegradable rabbit protection / tree ties as required. Planting will be avoided when the ground is particularly wet, to avoid waterlogging, or when the ground is frozen.	✓					
Like for like replacement of failed specimens as required. If gaps arise replant.	✓	✓	✓	✓	✓	✓
During the first five years of establishment of young saplings selective 'spot' spraying or strimming of weeds. Ensure plan species indicative of nutrient enrichment of soils dominate <20% cover of the ground.	✓	✓	✓	✓	✓	
Ensure there are no Schedule 9 of The Wildlife & Countryside Act 1981 (as amended) invasive plant species and neophyte species. Remove invasives in accordance with biosecurity measures under a specialist contractor if present.	✓	✓	✓	✓	✓	✓
Relax management on hedgerows once established to increase height (2-3m), width >1.5m and gaps between the ground and the base of the canopy <0.5m for >90% the length.						✓
Allow grassland along the hedgerow base to grow to provide a graduated sward height and habitat. Ideally at least 1m from the hedgerow.	✓	✓	✓	✓	✓	✓
Urban Trees in POS Areas						
Planting October and March with biodegradable rabbit protection / tree ties as required. Planting will be avoided when the ground is particularly wet, to avoid waterlogging, or when the ground is frozen.	✓					

Description of works	Years to be undertaken					Aftercare Period
	1	2	3	4	5	5- 30
Allow species to mature.	✓	✓	✓	✓	✓	✓
Selective 'spot' spraying or strimming of weeds. Not required if weed suppression matting used.	✓	✓	✓	✓	✓	
Like for like replacement of failed specimens as required with the same planting mix.	✓	✓	✓	✓	✓	✓
Examine stakes and ties for their effectiveness and requirement. If the specimen has yet to establish, replace or adjust ties, spacers and tubes as appropriate. If the specimen has established well, then remove all stakes, ties, spacers, tubes etc. and make good surfaces disturbed, filling any holes with suitable topsoil.	✓	✓	✓	✓	✓	
Other Neutral Grassland (Species Rich Grassland)						
Prepare ground and sow seed in spring or autumn ideally or can be sown at other times of the year if there is sufficient warmth and moisture.	✓					
Meadow grassland is not cut from spring through to late July/August to give the sown species an opportunity to flower. After flowering in July or August take a 'hay cut': cut back with a strimmer to c. 50mm. Leave the 'hay' to dry and shed seed for 1-7 days then remove from site. Mow the re-growth through to late autumn/winter to c 50mm and again in spring if needed.		✓	✓	✓	✓	✓
Ensure cover of undesirable species[10] and physical damage (from excessive poaching, damage from machinery use or storage, or any other damaging management activities) is below 5%.		✓	✓	✓	✓	✓
Cover of bracken less than 20% and cover of scrub and bramble less than 5%.		✓	✓	✓	✓	✓
Mixed Native Scrub						
Planting October and March with biodegradable rabbit protection / tree ties as required. Planting will be avoided when the ground is particularly wet, to avoid waterlogging, or when the ground is frozen.	✓					
Firm up plants, remove grass between plants.	✓	✓				
Any dead and dying specimens replaced in first five years.	✓	✓	✓	✓	✓	✓
Cut no more than 1/3rd scrub in any one area in any 5-year period.	✓	✓	✓	✓	✓	✓

[10] creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, curled dock *Rumex crispus*, broad-leaved dock *Rumex otusifolius*, common ragwort *Senecio jacobea*, common nettle *Urtica dioica*, creeping buttercup *Ranunculus repens*, white clover *Trifolium repens*, cow parsley *Anthriscus sylvestris,* marsh thistle *Cirsium palustre* and marsh ragwort *Senecio aquaticus*.

Description of works	Years to be undertaken					Aftercare Period
	1	2	3	4	5	5- 30
Ensure that there are at least three woody species, with no one species comprising more than 75% of the cover		✓	✓	✓	✓	✓
Manage to achieve a good age range – a mixture of seedlings, saplings, young shrubs and mature shrubs.		✓	✓	✓	✓	✓
Ensure pernicious weeds and invasive species make up less than 5% of the ground cover.		✓	✓	✓	✓	✓
Manage to ensure the scrub has a well-developed edge with un-grazed tall herbs.		✓	✓	✓	✓	✓
Habitat Features						
Installation of habitat boxes within new buildings / fences throughout the Site.	✓					
Other Regular Maintenance						
Litter Removal	✓	✓	✓	✓	✓	✓
Undertake the habitat monitoring assessment (Appendix A) every 3 years as a minimum and implement remedial actions if required. An ecologist will be required to undertake this assessment.			✓			✓

8.0 PERSONS RESPONSIBLE FOR IMPLEMENTING THE WORKS

8.1 The creation and ongoing management of habitats within the site will be the responsibility of Newett Homes, until such time that the site is passed to a management company. The responsibility to carry out the detailed management within this document will be included within future sale agreements, if applicable.

9.0 DETAILS OF INITIAL AFTERCARE AND LONG-TERM MAINTENANCE

9.1 See Sections 4 and 7.

10.0 DETAILS FOR MONITORING AND (WHERE THE RESULTS FROM MONITORING SHOW THAT CONSERVATION AIMS AND OBJECTIVES OF THE EDS ARE NOT BEING MET) HOW CONTINGENCIES AND/OR REMEDIAL ACTION WILL BE IDENTIFIED, AGREED AND IMPLEMENTED SO THAT THE DEVELOPMENT STILL DELIVERS A MEASURABLE BIODIVERSITY NET GAIN

10.1 The success of measures outlined in this document will be monitored and recorded in Aftercare Reports every 3 years (as a minimum). Habitat Monitoring Forms can be found in Appendix A. A progress report will be sent to the LPA reporting on progress of the work

programme and confirmation of required actions for the next management period. The Plan will be reviewed and updated every 3 years and implemented for perpetuity.

10.2 The Ecological Design Strategy will be amended, where necessary, and with agreement with the LPA, if management objectives are not being met and contingencies and/or remedial action are required.

11.0 DETAILS FOR DISPOSAL OF ANY WASTES ARISING FROM WORKS

11.1 Arisings from grassland cutting will be composted within a designated area within the Site, or else taken away.

11.2 Any branches from tree pruning works within the Site, will be used to top up log piles along the eastern boundary.

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APPENDIX A: HABITAT MONITORING FORMS BIODIVERSITY METRIC 3.0

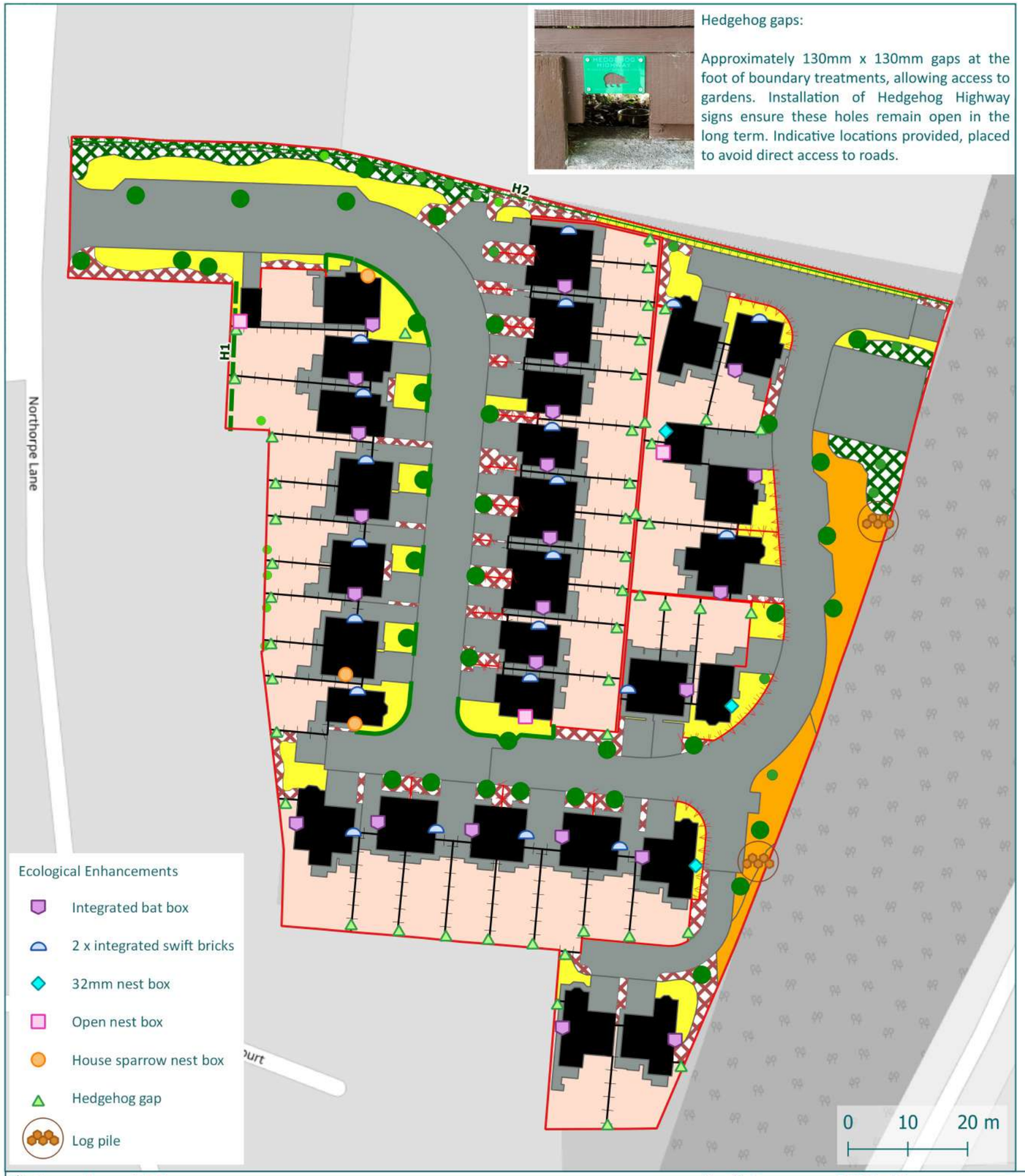
Date Assessment Undertaken:

Assessor:

Habitat & Condition Assessment Criteria	Does the habitat meet the criteria?	Notes on Improvements Required
Medium to High Distinctiveness Grasslands –Other Neutral Grassland		
1. The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). Wildflowers, sedges and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward.		
2. Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.		
3. Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.		
4. Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.		
5. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of undesirable species1 and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.		
Does the Other Neutral Grassland meet Moderate Condition? **(Passes 3 or 4 of 5 criteria)**		

Mixed Native Scrub		
1. Habitat is representative of UKHab description (where in its natural range). There are at least three woody species, with no one species comprising more than 75% of the cover (except common juniper, sea buckthorn or box, which can be up to 100% cover).		
2. There is a good age range – all of the following are present: seedlings, young shrubs and mature shrubs.		
3. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species1 make up less than 5% of ground cover.		
4. The scrub has a well-developed edge with scattered scrub and tall grassland and/or herbs present between the scrub and adjacent habitat(s).		
5. There are clearings, glades or rides present within the scrub, providing sheltered edges.		
Does the Habitat meet Moderate Condition? **(Passes 3 or 4 of 5 criteria)**		
Native Species Rich Hedgerow		
A1. >1.5 m average along length		
A2. Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')		
B1. Gaps make up <10% of total length and · No canopy gaps >5 m		
B2. >1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: measured from outer edge of hedgerow and is present on one side of the hedge (at least).		
C1. Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground		
C2. >90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species		

D1. >90% of the hedgerow or undisturbed ground is free of damage caused by human activities		
D2. >1.5 m average along length		
Does the Hedgerow meet Moderate Condition? **(No more than 4 failures in total; AND does not fail both attributes in more than one functional group)**		
Urban Trees		
1. More than 70% of trees are native species.		
2. Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide.		
3. More than 50% of trees are mature or veteran.		
4. There is little or no evidence of an adverse impact on tree health by anthropogenic activities such as vandalism or herbicide use. There is no current regular pruning regime so the trees retain >75% of expected canopy for their age range and height.		
5. Management regime has encouraged micro habitat sites for birds, mammals and insects e.g. presence of deadwood, cavities or loose bark etc.		
6. Trees are immediately adjacent to other vegetation, and tree canopies are oversailing vegetation beneath.		
Does the Habitat meet Moderate Condition? **(Passes 3 or 4 of 6 criteria)**		



Hedgehog gaps:

Approximately 130mm x 130mm gaps at the foot of boundary treatments, allowing access to gardens. Installation of Hedgehog Highway signs ensure these holes remain open in the long term. Indicative locations provided, placed to avoid direct access to roads.

Assorted bird boxes:
Fixed on the wall, high up under eaves, facing between north and east. Avoid doorways, windows or walkways.

Quanitity:
3 x open nest boxes
3 x 32mm nest boxes
3 x house sparrow nest boxes
42 x integrated swift boxes

Total: 51

Ibstock Integrated Swift Box

Woodstone Open Nest Box

Woodstone 32mm Nest Box

Woodstone House Sparrow Nest Box

Bat boxes:
Placed at least 4m above the ground, on south, south-eastern or south-western aspects, located away from artificial light sources.

Total: 23

Ibstock Integrated Bat Box

Log piles:
Placed within existing habitats along the south-western Site boundary, ideally using vegetation cleared from the Site.

Total: 2

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Carrwood Park, Swillington Common Farm, Selby Road, Leeds, LS15 4LG
Telephone: 01133 372185

Unit 9, The Tangent Business Hub, Weighbridge Road, Shirebrook, Mansfield, Derbyshire, NG20 8RX
Telephone: 01623 749709

Key

- Site Boundary
- Buildings [Developed land; sealed surface]
- Hardstanding [Developed land; sealed surface]
- Built Environment: Gardens (lawn and planting) [Vegetated garden]
- Amenity grassland [Modified grassland]
- Introduced shrub
- Neutral grassland - unimproved [Other neutral grassland]
- Mixed scrub
- Native Species Rich Hedgerow
- Native Hedgerow
- Retained Hedgerow
- Hedge Ornamental Non-Native
- Wall
- Fence
- Extra heavy standard [Urban tree; large]
- Heavy standard [Urban tree; medium]
- Standard [Urban tree; small]

Please note that should the design of the bat box / bird box be unavailable at the time of installation, a suitable similar alternative should be utilised.

Client:	Newett Homes	Plan Reference:	FE90_01	Author:	KEH
Project:	Land off Northorpe Lane, Mirfield	Project Reference:	FE90	Date:	7/6/2023
Title:	Figure 1 - Ecological Enhancement Plan	Report Reference:	FE90/EDS01	Scale:	1:750

C:\Users\kate.haymes\OneDrive - Futures Ecology Ltd\Projects\FE90_Land East of, 28, Northorpe Lane, Mirfield, WF14 0QN\QGIS - NEW\1. Plans\FE90_Biodiversity Net Gain Plan JH.qgs

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No dimensions are to be scaled from this drawing. All dimensions must be checked on site. Any measurements are for indicative pusposes.

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