



FUTURESECOLOGY

Homes by Honey

Penistone Road / Rowley Lane, Fenay Bridge

ECOLOGICAL DESIGN STRATEGY (EDS)

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APPENDICES

Appendix A: Natural England Biodiversity Metric 4.0 (BM)

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1.0 **INTRODUCTION**

- 1.1 The following Ecological Design Strategy (EDS) has been prepared by Futures Ecology Ltd. on behalf of Homes by Honey to discharge ecology conditions attached to planning permission 2020/29307 Kirklees Council for a site in Fenay Bridge, West Yorkshire. This report details how the biodiversity units stated in the Biodiversity Impact Assessment are to be achieved post-development.

SITE LOCATION AND CONTEXT

- 1.2 The site is located on land at Penistone Road / Rowley Lane, Fenay Bridge, West Yorkshire (central grid reference: SE 18736 14504). Comprising 2.44ha of arable land and hardstanding with a line of broadleaved trees along the northern boundary and an individual tree (T1) present in the southeast corner of the Site.

PLANNING PERMISSION

- 1.3 The EDS Condition reads:

“Plans and particulars relating to the Reserved Matters of layout and/or landscape shall include an Ecological Design Strategy (EDS) which demonstrates that a biodiversity net gain is achieved post-development. The EDS shall detail a minimum increase of 10% in habitat units and 10% in hedgerow units, based on an up-to-date review of the site’s ecological baseline value using the Biodiversity Metric 3.1 (or as amended). 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) Details on the establishment of the habitats on the site;*
- f) Type and source of materials to be used where appropriate, e.g., native species of local provenance;*
- g) Timetable for implementation demonstrating that works are aligned with the proposed phasing of development;*
- h) Persons responsible for implementing the works;*
- i) Details of initial aftercare and long-term maintenance;*
- j) 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*
- k) Details for disposal of any wastes arising from works.”*

BIODIVERSITY IMPACT ASSESSMENT (BIA)

- 1.4 From the completed BM 4.0, the value of the existing on-site habitats is **4.91 Biodiversity Habitat Units** and **0.59 Hedgerow Units** (see Appendix A).
- 1.5 Figure 1 outlines the habitat areas post development across the site.
- 1.6 Post development, the on-site habitat creation with long-term management (for a minimum of 30 years) will achieve **2.95 Biodiversity Habitat Units** and **0.83 Hedgerow Units**, which is a total net unit change of **-1.96 Biodiversity Habitat Units** and **+0.24 Hedgerow Units**. This equates to a **-39.94% net loss in Biodiversity Habitat Units** and a **+41.49% net gain in Hedgerow Units**.
- 1.7 As the development proposals cannot deliver a 10% net gain in Habitat Units on-site there is a requirement to secure a net gain via an alternative mechanism. A monetary contribution to fund offsite provision equating to 2.45 Habitat Units to achieve a 10% net gain is required.

2.0 PURPOSE AND CONSERVATION OBJECTIVES FOR THE PROPOSED WORKS

- 2.1 The aims and objectives of the EDS are to:
- Manage and create new habitats with ecological value as outlined in the Biodiversity Impact Assessment (Futures Ecology, FE305/BIA01, October 2023). This includes trees, wildflower, and native hedgerow planting to help offset losses within the site (a monetary contribution will be required to achieve a 10% net gain overall).
 - Monitor habitats to ensure they reach their target conditions (as outlined within the Biodiversity Metric 4.0) and apply appropriate remediation, if required.
 - Monitor to ensure there are no invasive species onsite and apply appropriate measures to remove, if required.
- 2.2 Overall, the above will contribute to the aims of net biodiversity gain within the local area.
- 2.3 Newly created habitats include amenity grassland (modified grassland), wildflower / species rich grassland (other neutral grassland), vegetated gardens and urban trees.

Table 1 Created Habitats and Target Condition Summary

Created Habitat	Target Condition in accordance with the DEFRA metric 4.0
Amenity Grassland – Modified Grassland	Moderate
Grassland – Other Neutral Grassland	Moderate
Urban – Urban Trees	Moderate
Native Species Rich Hedgerow	Moderate
Urban – Vegetated Gardens	Condition Assessment N/A

3.0 **REVIEW OF SITE POTENTIAL AND CONSTRAINTS**

- 3.1 No evidence of notable or protected species was noted at the time of baseline ecological assessments (see Ecological Impact Assessment, Futures Ecology Ltd, 27/10/23). Potential constraints which were identified comprised:
- Badgers are known to occur in the wider landscape although no evidence and limited potential for this species was noted onsite.
 - Limited extent of potential nesting bird habitat, namely in association with tree T1 and treeline TL1 (see Figure 1, Ecological Impact Assessment, Futures Ecology Ltd, 27/10/23).
 - The on-site habitats (tall ruderal vegetation, treeline) have the potential to support hedgehog *Erinaceus europaeus*.
 - Kirklees Wildlife Habitat Network (KWHN) is located at its closest c.15m east of the site, comprising an area of deciduous woodland.
- 3.2 Clearance of any significant vegetation (tree felling) will take place outside of the bird breeding season (March to end of August). If this is not possible, then a check for active nests will be carried out immediately before any works to the affected areas begin.
- 3.3 Vegetation clearance (tall ruderal vegetation, treeline) will be undertaken in a precautionary manner to protect any hedgehogs sheltering within the Site. During any excavations, an access ramp (or sloping gradient at one end of the excavation) must also be provided overnight to allow any potentially trapped animals, such as hedgehog or badger, an escape route.
- 3.4 Management of habitats within gardens and any bat / bird boxes installed upon residential properties will be limited as they will be under the control of householders. This includes vegetated gardens and urban street trees.
- 3.5 Deciduous woodland is present c.15m east of the Site, which is also mapped within the Kirklees Wildlife Habitat Network (KWHN). Landscaping along the southern boundary will connect to the offsite habitats mapped within the KWHN. The landscaping then extends around the western extent of the site. This will help to buffer and strengthen the KWHN in the mid-to-long term once these habitats have established.

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

- 4.1 Within the Biodiversity Impact Assessment (Futures Ecology, FE305/BIA01, October 2023) the Biodiversity Metric 4.0 shows that 2.95 Biodiversity Habitat Units and 0.83 Hedgerow Units can be delivered onsite post development.
- 4.2 Areas of wildflower seeding, native hedgerows and individual trees 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.

MODIFIED GRASSLAND (AMENITY)

- 4.3 Areas of amenity grassland will be created in public areas within the scheme. This habitat must achieve a minimum of Moderate condition.

Establishment

- 4.4 An amenity grass seed mix will be used such as Emorsgate EL1 Flowering Lawn Mix (see species composition in Section 7).
- 4.5 Seed is best sown in the autumn or spring. The seed must be surface sown and can be applied by machine or broadcast by hand. The seed does not need covering but should be rolled or treaded to ensure good soil to seed contact.

Management / Habitat Condition Objectives

- 4.6 To achieve a minimum of Moderate condition, this will require management to ensure that it meets a minimum of four of the following criteria including essential criteria A:
- A. There are 6-8 vascular plant species per m² present, including at least 2 forbs (this may include those listed in Footnote¹). *Note - this criterion is essential for achieving Moderate or Good condition.*
 - B. 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 vertebrates and invertebrates to live and breed.
 - C. Some scattered scrub (including bramble *Rubus fruticosus agg.*) may be present, but scrub accounts for less than 20% of total grassland area.
 - D. Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.
 - E. Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens). (See Footnote²).
 - F. Cover of bracken *Pteridium aquilinum* is less than 20%.

¹ 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* and cow parsley *Anthriscus sylvestris*.

² For example, this could include small, scattered areas of bare ground allowing establishment of new species, or localised patches where not exceeding 10% cover.

G. There is an absence of invasive non-native plant species (as listed on Schedule 9 of WCA). (See Footnotes^{3,4}).

- 4.7 From the above list the management should target A, C, D, F and G.

OTHER NEUTRAL GRASSLAND (SPECIES RICH WILDFLOWERS)

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

Establishment

- 4.9 The areas will be seeded with seed mix such as Emorsgate Basic General-Purpose Meadow Mixture EM1 (see species composition in Section 7).
- 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, weeds will first be removed using repeated cultivation. Then ploughed or dug to bury the surface vegetation; harrowed or raked to produce a medium tilth; and rolled or treaded, 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.

Management / Habitat Condition Objectives

- 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 including essential criteria A:
- A. The grassland is a good representation of the habitat type it has been identified as, based on its UKHab description - the appearance and composition of the vegetation closely matches the characteristics of the specific grassland habitat type. Indicator species listed by UKHab for the specific grassland habitat type are consistently present. Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.
 - B. 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.
 - C. Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens.

³ Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels, accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement.

⁴ Wildlife and Countryside Act 1981 (as amended)

- D. Cover of bracken is less than 20% and cover of scrub (including bramble) is less than 5%.
- E. Combined cover of species indicative of sub-optimal condition⁵ 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. If any invasive non-native plant species⁶ (as listed on Schedule 9 of WCA) are present, this criterion is automatically failed.
- F. There are 10 or more vascular plant species per m² present, including forbs that are characteristic of the habitat type. Note - this criterion is essential for achieving Good condition for non-acid grassland types only.

4.14 From the above list the management should target A, B, D and E.

TREES (INDIVIDUAL TREES: URBAN TREE)

4.15 A number of native urban trees are to be planted across the site and should achieve moderate condition.

Establishment

4.16 40 trees will be planted which must achieve “small” size class over a 30 year period.

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

Management / Habitat Condition Objectives

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

- A. Tree is a native species (or at least 70% within the block are native species).
- B. The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5m wide (individual trees automatically pass this criterion).
- C. The tree is mature (or more than 50% within the block are mature⁷).
- D. There is little or no evidence of an adverse impact on tree health by human activities (such as vandalism, herbicide or detrimental agricultural activity). And there is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.

⁵ Species indicative of sub-optimal condition for this habitat type include: 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* and cow parsley *Anthriscus sylvestris*. There may be additional relevant species local to the region and or site.

⁶ Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, by applying professional judgement.

⁷ A mature tree in this context is one that is at least 2/3 expected fully mature height for the species.

- E. Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.
 - F. More than 20% of the tree canopy area is oversailing vegetation beneath.
- 4.19 From the above list the management should target A, B, and D.

NATIVE SPECIES RICH HEDGEROW

- 4.20 A native, species-rich hedgerow will be planted along the southern boundary (NH1) must be managed to reach moderate condition.

Establishment

- 4.21 The newly created hedgerow will be planted with at least five native woody species per 30m.
- 4.22 Hedgerows should be planted between October and March with biodegradable rabbit protection / tree ties as required.

Management / Habitat Condition Objectives

- 4.23 Once planted the native species rich hedgerow NH1 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).
- 4.24 As and when required hedgerow NH1 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.
- 4.25 The native species rich hedgerow NH1 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

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 the 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 width	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 practice⁸).
B1. Gap – hedge base	Gap between ground and base of canopy <0.5m for >90% of length	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 Handbook⁹).
B2. Gap – hedge canopy continuity	Gaps make up <10% of total length; and no canopy gaps >5m	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).

⁸ HedgeLink (<http://hedgelinek.org.uk/index.php>) provides a resource of management advice for hedgerows.

⁹ Defra (2007) Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London

Attribute	Criteria	Description
C1. Undisturbed ground and perennial vegetation	>1m 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)	This is the level of disturbance (excluding wildlife disturbance) at the base of the hedgerow. Undisturbed ground is present for at least 90% of the hedgerow length, greater than 1m in width and must be present along at least one side of the hedgerow. This criterion recognises the value of the hedgerow base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.
C2. Nutrient-enriched 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 <i>Urtica</i> spp., cleavers <i>Galium aparine</i> and docks <i>Rumex</i> spp. Their presence, either singly or together, does not exceed the 20% cover threshold.
D1. Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native plant species (including those listed on Schedule 9 of WCA) and recently introduced species.	Recently introduced species refer to plants that have naturalised in the UK since AD 1500 (neophytes). Archaeophytes count as natives. For information on archaeophytes and neophytes see the JNCC website ¹⁰ , as well as the BSBI website ¹¹ where the 'Online Atlas of the British and Irish Flora' ¹² contains an up-to-date list of the status of species. For information on invasive non-native species see the GB Non-Native Secretariat website ¹³ .
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).

4.26 From the above list the management will target A1, A2, B1, B2, C2, D1, and D2.

VEGETATED GARDENS

4.27 The residential gardens are outside the remit of this report as they will be privately owned. The habitat condition score for this habitat type is N/A within the BM 4.0 to reflect this.

¹⁰ CHEFFINGS, C. M. et al. (2005) The Vascular Plant Red Data List for Great Britain. Species Status 7: 1-116. [online] Available on: <https://hub.jncc.gov.uk/assets/cc1e96f8-b105-4dd0-bd87-4a4f60449907>

¹¹ BOTANICAL SOCIETY OF BRITAIN AND IRELAND (BSBI). Definitions: wild, native or alien? [online] Available on: <https://bsbi.org/definitions-wild-native-or-alien>

¹² BSBI and Biological Records Centre (BRC) (2022) Online Atlas of the British and Irish Flora. [online] Available on: <https://plantatlas2020.org/>

¹³ GB NON-NATIVE SPECIES SECRETARIAT (GBNNS) (2022) Available on: <https://www.nonnativespecies.org/>

HABITAT FEATURES

- 4.28 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. 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 in Figure 1.

Table 3: Habitat Feature Specifications

Target Species	Location	Product	Quantity
General bat species	On perimeter buildings facing offsite habitats	Ibstock Enclosed Bat Brick B 	15
Generalist bird species such as Blue Tit and Great Tit	On buildings, at least 3m above ground. Avoid placing on Southern aspects, with North and East being preferred	Vivara Pro Seville 28mm Woodstone Nest Box 	3
Generalist bird species such as Blackbird, Wren, and Robin	On buildings, at least 3m above ground. Avoid placing on Southern aspects, with North and East being preferred. Place hidden from view, if possible, i.e. by trees, a wall, or fence with shrubs	Vivara Pro Barcelona Woodstone Open Nest Box 	3

Target Species	Location	Product	Quantity
Starling	On buildings, high up under the eaves	Vivara Pro Woodstone Starling Nest Box 	9 (In clusters of 3)
House Sparrow	On buildings, high up under the eaves	Vivara Pro Woodstone House Sparrow Nest Box 	9 (In clusters of 3)
Swift	At least 5m above the ground	Ibstock Swift Eco Habitat 	8
Hedgehog	Gaps maintained in boundary treatments, where feasible due to change in levels, with information for homeowners to discourage them being covered	Hedgehog Highway 	77

Target Species	Location	Product	Quantity
Invertebrates, Small Mammals, Amphibians, etc.	In an undisturbed place lay a stack of logs on their side. To prevent them rolling, drive a stake into the ground either side of the pile	Log Piles 	2

- 4.29 The boxes will be sited away from light spill and with a clear flight line leading to them.
- 4.30 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.

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

- 5.1 The Site proposals are for the development of 67 dwellings with associated infrastructure and landscaping according to the Site Layout Plan (Parker Peel, Drawing Ref: 2307-SI-02).
- 5.2 Details of planting have been included in two separate Soft Landscape Plans (Golby & Luck, Soft Landscape Proposals, October 2023, Plan Refs: GL2199 01A and GL2199 02A).
- 5.3 Post intervention habitats are shown on Figure 1.

6.0 **DETAILS ON THE ESTABLISHMENT OF THE HABITATS ON THE SITE**

- 6.1 The establishment of each habitat is detailed within Section 4.0.

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

- 7.1 Native species of local provenance will be used wherever possible within the scheme.

MODIFIED GRASSLAND (AMENITY)

- 7.2 An amenity grass seed mix will be used such as Emorsgate EL1 Flowering Lawn Mix. The species composition is listed below, but would be subject to change depending on stock availability:

20% Wildflowers

- 1.00% Yarrow *Achillea millefolium*
- 1.00% Kidney Vetch *Anthyllis vulneraria*

- 0.40% Betony *Betonica officinalis*
- 1.50% Common Knapweed *Centurea nigra*
- 0.40% Hedge Bedstraw *Galium album*
- 1.50% Lady's Bedstraw *Galium verum*
- 0.40% Field Scabious *Knautia arvensis*
- 0.40% Rough Hawkbit *Leontodon hispidus*
- 1.00% Oxeye Daisy *Leucanthemum vulgare*
- 0.60% Birdsfoot Trefoil *Lotus corniculatus*
- 1.00% Black Medick *Medicago lupulina*
- 0.40% Ribwort Plantain *Plantago lanceolata*
- 2.00% Hoary Plantain *Plantago media*
- 2.00% Cowslip *Primula veris*
- 0.40% Selfheal *Prunella vulgaris*
- 0.40% Meadow Buttercup *Ranunculus acris*
- 1.60% Bulbous Buttercup *Ranunculus bulbosus*
- 4.00% White Clover (ag) *Trifolium repens*

80% Grasses

- 8.00% Common Bent *Agrostis capillaris*
- 28.00% Crested Dogstail *Cynosurus cristatus*
- 24.00% Red Fescue *Festuca rubra*
- 4.00% Smaller Cat's-tail *Phleum bertolonii*
- 16.00% Smooth-stalked Meadow-grass *Poa pratensis*

OTHER NEUTRAL GRASSLAND (SPECIES RICH WILDFLOWERS)

- 7.3 Areas of wildflower seeding will be incorporated within the scheme. These will be seeded with seed mix such as Emorsgate Basic General-Purpose Meadow Mixture EM1. The species composition is listed below, but would be subject to change depending on stock availability:

10% Wildflowers

- 0.30% Yarrow *Achillea millefolium*
- 1.60% Common Knapweed *Centaurea nigra*
- 1.60% Oxeye Daisy *Leucanthemum vulgare*
- 1.60% Musk Mallow *Malva moschata*

- 1.60% Ribwort Plantain *Plantago lanceolata*
- 1.60% Salad Burnet *Poterium sanguisorba ssp sanguisorba*
- 0.70% Meadow Buttercup *Ranunculus acris*
- 0.50% Yellow Rattle *Rhinanthus minor*
- 0.50% Wild Carrot *Daucus carota*

90% Slow Growing Grasses

- 9.00% Common Bent *Agrostis capillaris*
- 31.50% Crested Dogstail *Cynosurus cristatus*
- 27.00% Red Fescue *Festuca rubra*
- 4.50% Smaller Cat's-tail *Phleum bertolonii*
- 18.00% Smooth-stalked Meadow-grass *Poa pratensis*

TREES (INDIVIDUAL TREES: URBAN TREE)

- 7.4 Tree planting will be undertaken across the site. Trees will include the below species and will be selected standards (girth at 1m height: 10 – 16cm; height: 3 – 6m).

- Silver Birch *Betula pendula*
- Field maple *Acer campestre*
- European hornbeam *Carpinus betulus*
- Sweet cherry *Prunus avium*

NATIVE SPECIES RICH HEDGEROW

- 7.5 A native species rich hedgerow will be planted along the southern boundary. The species mix will be as follows:

- 20% Common hazel *Corylus avellana*
- 35% Common hawthorn *Crataegus monogyna*
- 20% Common holly *Ilex aquifolium*
- 10% Dog-rose *Rosa canina*
- 15% Guelder-rose *Viburnum opulus*

VEGETATED GARDENS

- 7.6 Amenity grassland will be established within the gardens of residential properties. These will Rolawn Ltd Medallion Turf (or similar).

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

- 8.1 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 2 Timetable of Implementation

Description of works	Years to be undertaken					Aftercare Period
	1	2	3	4	5	5 – 30
Modified Grassland (Amenity)						
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.	✓					
Ensure cover of undesirable species ¹⁴ 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%.		✓	✓	✓	✓	✓
Other Neutral Grassland (Species Rich Wildflowers)						
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 ¹⁵ 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%.		✓	✓	✓	✓	✓
Individual trees						
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.	✓					
Allow species to mature.	✓	✓	✓	✓	✓	✓
Selective 'spot' spraying or strimming of weeds. Not required if weed suppression matting used.	✓	✓	✓	✓	✓	

¹⁴ Creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, curled dock *Rumex crispus*, broad-leaved dock *Rumex obtusifolius*, common ragwort *Senecio jacobaea*, 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*.

¹⁵ Creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, curled dock *Rumex crispus*, broad-leaved dock *Rumex obtusifolius*, common ragwort *Senecio jacobaea*, 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
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.	✓	✓	✓	✓	✓	
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.	✓	✓	✓	✓	✓	✓
Other Regular Maintenance						
Litter Removal	✓	✓	✓	✓	✓	✓
Undertake the habitat monitoring assessment (Appendix B) every 3 years as a minimum and implement remedial actions if required. An ecologist will be required to undertake this assessment.			✓			✓

9.0 PERSONS RESPONSIBLE FOR IMPLEMENTING THE WORKS

- 9.1 The long-term implementation of the plan will be secured by the developer (Homes by Honey) until the responsibility of delivery is transferred to a Management Company. The responsibility to carry out the detailed management within this document will be included within future sales agreements, if applicable.
- 9.2 This EDS will cover a 5-year rolling management period. However, habitat management and maintenance must be undertaken for a minimum period of 30 years and reach the target conditions as outlined within the BIA and as described in Section 4.0 above.
- 9.3 It will be the Management Company's responsibility to deliver and monitor the habitat management prescriptions that ensure a biodiversity net gain.
- 9.4 It will be made clear to the Management Company that any management prescription not carried out or changed that significantly alters the net gain objectives will need to be agreed with the Local Authority with any subsequent compensation implemented (where necessary).

10.0 DETAILS OF INITIAL AFTERCARE AND LONG-TERM MAINTENANCE

- 10.1 In order to ensure that the habitats created within the site reach and maintain their maximum value for nature conservation, all habitats will be monitored on a regular basis during continued management / maintenance prescriptions for the five-year rolling management period.
- 10.2 In addition, the work programme will be reviewed after three years by a suitably qualified and experienced ecologist, arboriculturist and landscape architect (where necessary). The results of monitoring will be used to inform possible revisions to this EDS if the aims and objectives are not being met.
- 10.3 The Management Company will be responsible for implementing the changes / any remedial actions required to ensure that the development delivers the biodiversity objectives (and thus the net gain targeted habitat conditions). Therefore, flexibility is essential, and the management regime should be altered in order to respond promptly to changing circumstances.
- 10.4 Following the five years plan period covered under this management plan, subsequent reviews will be completed by the Management Company and the monitoring and management completed in perpetuity in accordance with the revised EDS.
- 10.5 The above measures will ensure that the development will result in the habitats on site reaching their targets conditions in line with the BIA.

11.0 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

- 11.1 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 B. 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 in perpetuity.
- 11.2 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.

12.0 DETAILS FOR DISPOSAL OF ANY WASTES ARISING FROM WORKS

- 12.1 Waste arising from the works onsite will be removed by an appropriate carrier, including arisings from habitat management.
- 12.2 Arisings from grassland cutting will be composted within a designated area within the Site, or else taken away.
- 12.3 Any branches from tree pruning works within the Site, will be used to top up log piles throughout the site.

APPENDIX A: NATURAL ENGLAND BIODIVERSITY METRIC 4.0 (BM)

Penistone Road / Rowley Lane, Fenay Bridge

Headline Results

Scroll down for final results ▲

Return to results menu

On-site baseline	Habitat units	4.91
	Hedgerow units	0.59
	Watercourse units	0.00
On-site post-intervention (including habitat retention, creation & enhancement)	Habitat units	2.95
	Hedgerow units	0.83
	Watercourse units	0.00
On-site net change (units & percentage)	Habitat units	-1.96
	Hedgerow units	0.24
	Watercourse units	0.00
Off-site baseline	Habitat units	0.00
	Hedgerow units	0.00
	Watercourse units	0.00
Off-site post-intervention (including habitat retention, creation & enhancement)	Habitat units	0.00
	Hedgerow units	0.00
	Watercourse units	0.00
Off-site net change (units & percentage)	Habitat units	0.00
	Hedgerow units	0.00
	Watercourse units	0.00
Combined net unit change (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	-1.96
	Hedgerow units	0.24
	Watercourse units	0.00
Spatial risk multiplier (SRM) deductions	Habitat units	0.00
	Hedgerow units	0.00
	Watercourse units	0.00
FINAL RESULTS		
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	-1.96
	Hedgerow units	0.24
	Watercourse units	0.00
Total net % change (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	-39.94%
	Hedgerow units	41.49%
	Watercourse units	0.00%
Trading rules satisfied?	No - Check Trading Summaries ▲	

Unit Type	Target	Baseline Units	Units Required	Unit Deficit
Habitat units	10.00%	4.91	5.40	2.45
Hedgerow units	10.00%	0.59	0.65	0.00
Watercourse units	10.00%	0.00	0.00	0.00

APPENDIX B: HABITAT MONITORING FORMS BIODIVERSITY METRIC 4.0

Date Assessment Undertaken: Assessor:		
Habitat & Condition Assessment Criteria	Does the habitat meet the criteria?	Notes on Improvements Required
Modified Grassland		
A. There are 6-8 vascular plant species per m2 present, including at least 2 forbs (this may include those listed in Footnote ¹). Note - this criterion is essential for achieving Moderate or Good condition.		
B. 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 vertebrates and invertebrates to live and breed.		
C. Some scattered scrub (including bramble <i>Rubus fruticosus</i> agg.) may be present, but scrub accounts for less than 20% of total grassland area.		
D. Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.		
E. Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens). (See Footnote ²).		
F. Cover of bracken <i>Pteridium aquilinum</i> is less than 20%.		
G. There is an absence of invasive non-native plant species (as listed on Schedule 9 of WCA). (See Footnotes ³ and ⁴).		
Does the Modified Grassland meet Moderate Condition? (Passes a minimum of 4 of 7 criteria, including essential criterion A)		

Medium to High Distinctiveness Grasslands – Other Neutral Grassland		
A. The grassland is a good representation of the habitat type it has been identified as, based on its UKHab description - the appearance and composition of the vegetation closely matches the characteristics of the specific grassland habitat type. Indicator species listed by UKHab for the specific grassland habitat type are consistently present. Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only."		
B. Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.		
C. Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens.		
D. Cover of bracken is less than 20% and cover of scrub (including bramble) less than 5%.		
E. Combined cover of species indicative of sub-optimal condition 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. If any invasive non-native plant species (as listed on Schedule 9 of WCA4) are present, this criterion is automatically failed.		
F. There are 10 or more vascular plant species per m2 present, including forbs that are characteristic of the habitat type. Note - this criterion is essential for achieving Good condition for non-acid grassland types only.		
Does the Other Neutral Grassland meet Moderate Condition? (Passes a minimum of 3 of 6 criteria, including essential criterion A)		
Individual Trees		
A. The tree is a native species (or at least 70% within the block are native species).		

B. The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5m wide (individual trees automatically pass this criterion).		
C. The tree is mature (or more than 50% within the block are mature).		
D. There is little or no evidence of an adverse impact on tree health by human activities (such as vandalism, herbicide or detrimental agricultural activity). And there is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.		
E. Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.		
F. More than 20% of the tree canopy area is oversailing vegetation beneath.		
Does the Habitat meet Moderate Condition? (Passes a minimum of 3 of 6 criteria)		
Native Species Rich Hedgerow		
A1. Height: >1.5 m average along length		
A2. Width: >1.5m average along width		
B1. Gap – Hedge base: Gap between ground and base of canopy <0.5m for >90% of length		
B2. Gap – Hedge canopy continuity: Gaps make up <10% of total length; and no canopy gaps >5m		
C1. Undisturbed ground and perennial vegetation: >1m 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)		
C2. Nutrient-enriched perennial vegetation: Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground		
D1. Invasive and neophyte species: >90% of the hedgerow and undisturbed ground is free of invasive non-native plant species (including those listed on Schedule 9 of WCA) and recently introduced species		

D2. Current damage: >90% of the hedgerow or undisturbed ground is free of damage caused by human activities		
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)		



FUTURES ECOLOGY

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Key

Site Boundary

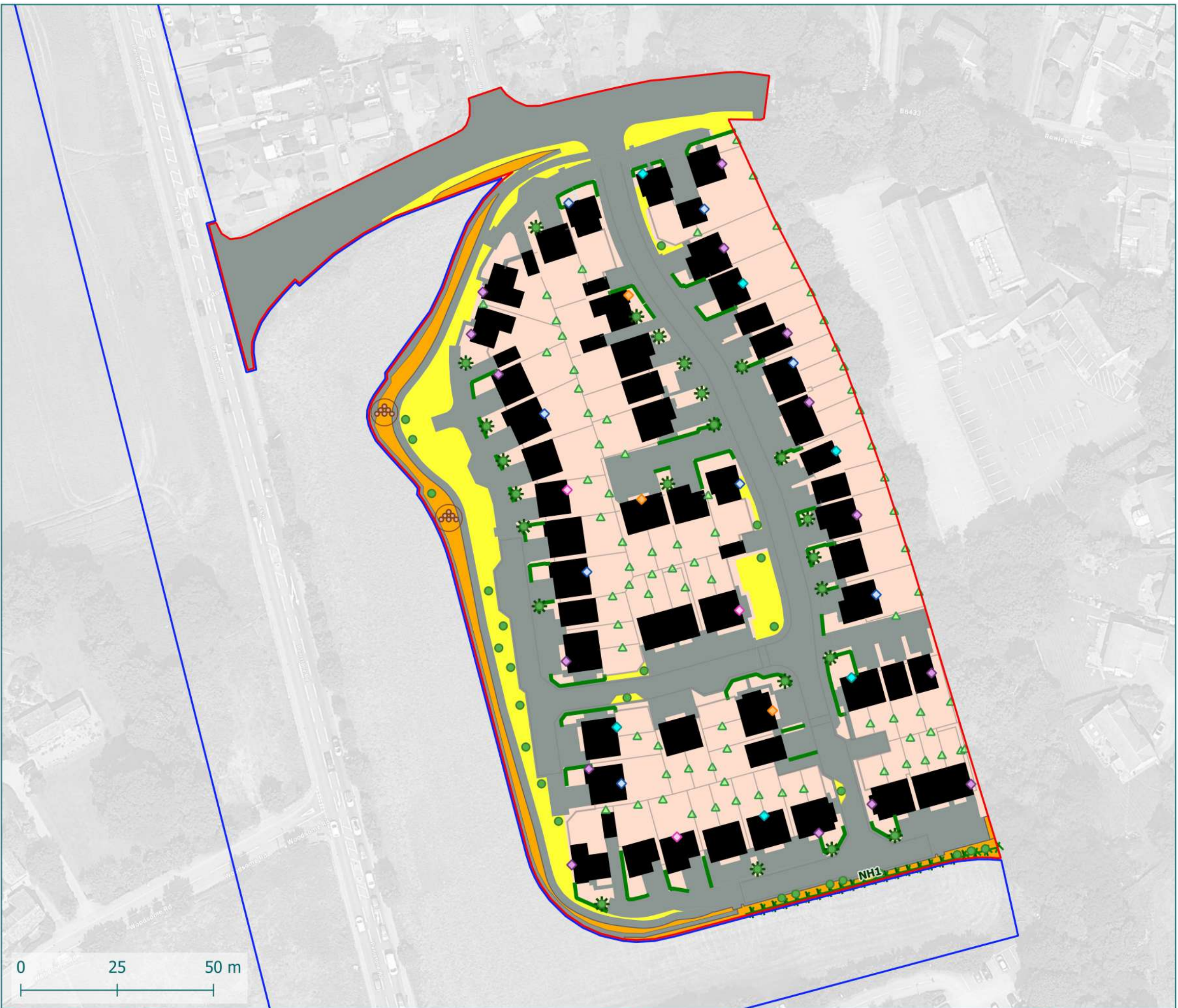
- Redline
- Blueline

Post-development Layers

- Buildings [Urban: Developed land; sealed surface]
- Hardstanding [Urban: Developed land; sealed surface]
- Gardens (lawn and planting) [Urban: vegetated garden]
- Cultivated/disturbed land - Amenity grassland [Grassland: Modified grassland]
- Neutral grassland - unimproved (other neutral grassland) [Grassland: Other neutral grassland]
- Intact hedge - species-poor [Native Hedgerow]
- Hedge with trees - native species-rich [Native Species Rich Hedgerow with trees]
- Small individual tree [Individual tree: Urban tree]
- Small individual tree [Individual tree: Rural tree]

Habitat Features

- Hedgehog Highways [77]
- Integrated Bat Box [15]
- Integrated Swift Box [8]
- Cluster of 3 x House Sparrow Terrace Boxes [3]
- Cluster of 3 x Starling Boxes [3]
- Bird boxes to comprise 3 x 28mm Entrance Closed Nest Boxes and 3 x Open Fronted Nest Boxes [6]
- Log Pile [2]



Client: Homes by Honey
Project: Penistone Road / Rowley Lane, Fenay Bridge
Title: Figure 1 - Bat & Bird Box Plan

Plan Reference: FE305_01
Project Reference: FE305
Report Reference: FE305/EDS01

Author: EP
Date: 3/4/2024
Scale: 1:1000



C:\Users\Emily.Padmore\Futures Ecology Ltd\James.Eales - Projects\FE305 Penistone Road Rowley Lane, Fenay Bridge\QGIS\1_Plans\FE305_Biodiversity Map Plan Futures Ecology
No dimensions are to be scaled from this drawing. All dimensions must be checked on site. Any measurements are for indicative purposes.
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