GRAVEN HILL, D1 SITE, BICESTER

Biodiversity Net Gain Assessment

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BNG Assessment
Final
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1 INTRODUCTION

1.1 Purpose and Scope of this Report

1.1.1 RPS was commissioned by Graven Hill Purchaser Ltd.to produce a Biodiversity Net Gain (BNG) assessment of an area of land within the former D Site at Graven Hill, Ambrosden, Bicester.

1.1.2 The Site is subject to an outline planning application.

1.1.3 An Ecological Assessment (EA) was undertaken by RPS in 2022 (RPS, 2022). This identified the need to undertake a BNG assessment of the Site, to support the planning application. The EA also made recommendations for biodiversity enhancements.

1.1.4 This BNG assessment report aims to:

- Calculate and assess the baseline ecological status and condition of current habitats identified on Site;
- Calculate the biodiversity value of the Site post-development; and
- Provide a summary of the habitat enhancements and creation proposals designed to ensure net gain is achieved.

1.1.5 The recommendations included within this report are the professional opinion of an experienced ecologist and therefore the view of RPS.

1.2 Biodiversity Net Gain Definition and Methods

1.2.1 Biodiversity Net Gain is defined in Baker *et al.* (2019) as:

"Development that leaves biodiversity in a better state than before"

1.2.2 The requirement for developments to seek to achieve BNG arises from the National Planning Policy Framework (NPPF, 2021), which states in Para. 174 that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by … minimising impacts on and providing net gains for biodiversity."

1.2.3 An accepted method of assessing BNG is through the use of biodiversity calculators to assess the biodiversity value of habitats pre- and post-development based on habitat type, distinctiveness and condition.

1.2.4 A biodiversity index is derived for the baseline and for the proposed development, and BNG is considered to be achieved where an increase in value is delivered (on or offsite), and where habitats of a higher value are not replaced exclusively with habitats of a lower value.

1.2.5 The methods of calculating BNG for this project followed the guidance produced by Natural England's Biodiversity Metric 3.1 (JP039) (Pank *et al.,* 2022). Defra made available its beta test BNG assessment tool in July 2019, which was subsequently updated in July 2021 and April 2022. This tool has been used for the assessment in this report. The tool and associated documents were downloaded from:

http://publications.naturalengland.org.uk/publication/6049804846366720

Condition Assessment

1.2.6 The Phase 1 Habitat Survey undertaken by RPS in 2020 identified that the majority of the Site comprised buildings, hardstanding, neutral semi-improved grassland and managed (mown) poor semi-improved grassland. Other habitats present included areas of dense and scattered scrub, dry ditches and semi-natural/plantation woodland. A number of waterbodies were identified within the Site boundary and within 500 m of it.

1.2.7 In order to undertake a condition assessment of the habitats present, a verification walkover of the Site was undertaken on 31st March 2022 by Elizabeth White MCIEEM, an RPS Senior Ecologist. The results of the updated Phase 1 Habitat Survey are shown on Figure 1.1.

1.2.8 In order to apply a habitat condition, the appropriate 'condition sheet' was first selected via the Table TS1-1a in the technical supplement provided by Pank *et al.* (2022).

1.2.9 The condition sheet was then used to assess the individual habitats by comparing how they scored against pre-set condition assessment criteria. The criteria describe what components are needed for the habitat to be of good, moderate or poor value.

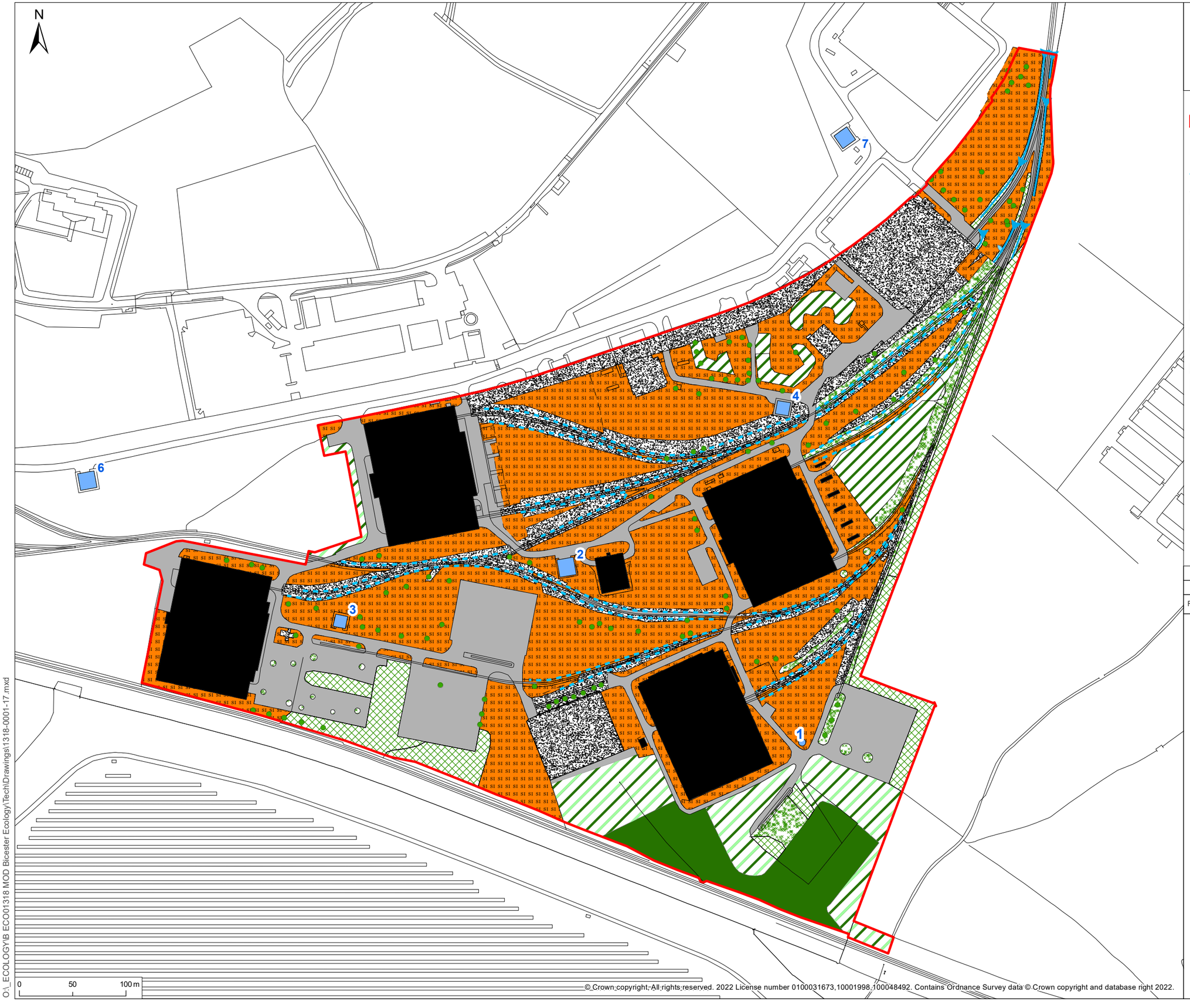
1.2.10 Each habitat was scored the following:

- 1 – Poor;
- 2 – Moderate; and
- 3 – Good.

1.2.11 The calculator allows these to be further divided and provides categories for fairly good and fairly poor. The ecologist undertaking the assessment used their professional judgement, considering the habitat condition assessment criteria, to decide when it was suitable to use these categories.

1.2.12 It should be noted that some habitats are given a fixed score and do not need assessing.

Figure 1.1: Pre-development Habitats (Phase 1 Habitat Survey – 2022)



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Legend

- Application boundary
- Broadleaved Tree
- Dry ditches
- Wet ditches
- Fence
- Bare Ground
- Building
- Poor Semi-Improved Grassland
- Mixed Plantation Woodland
- Broadleaved Plantation Woodland
- Scattered scrub
- Dense Scrub
- Pond
- Semi-Natural Broadleaved Woodland
- Semi-improved neutral grassland
- Hardstanding

Rev	Description	By	CB	Date

MAKING COMPLEX EASY

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Project: MOD Bicester Ecology

Title: Pre-development Habitats (Phase 1 Habitat Survey – 2022)

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2 BASELINE DESCRIPTION

2.1 Phase 1 Habitat Survey – Overview

2.1.1 The Phase 1 Habitat Survey identified the Site to predominantly comprise buildings, hardstanding and neutral semi-improved grassland. Other habitats present included areas of dense and scattered scrub and tall ruderal vegetation, dry ditches and semi-natural/plantation woodland. A number of waterbodies were identified within the Site boundary.

2.1.2 The habitats on Site had not changed significantly since the original survey in 2020, with the main changes resulting from vegetation growth and encroachment and ongoing demolition activities.

2.1.3 The once poor semi-improved grassland across the majority of the Site had developed into neutral semi-improved grassland which contained a rich species diversity. Buildings which were once present in the north of the Site had since been demolished, leaving areas of hardstanding.

2.1.4 The disused rail tracks had also been removed, in addition to the ruderal vegetation that was present alongside it.

2.1.5 A full list of the habitats identified on the Site is provided below:

- Semi-natural broadleaved woodland;
- Broadleaved plantation woodland;
- Mixed plantation woodland;
- Dense/continuous scrub;
- Scattered scrub;
- Scattered broadleaved trees;
- Semi-improved neutral grassland;
- Standing water;
- Dry ditch*;* and
- *Buildings, bare ground and hardstanding.*

2.1.6 The habitats in italics were considered to be of no ecological value or were not going to be impacted by the development and therefore are not considered further in terms of the BNG assessment.

2.2 Habitat Condition Assessment

2.2.1 The assessments below relate to the condition of the habitats present on Site at the time of the updated walkover survey undertaken in April 2022 (as shown on Figure 1.1). The extent, distinctiveness and condition of the baseline habitats on Site are summarised in Table 2.1 overleaf.

2.2.2 Numbers in the tables in this section are copied from those generated by the Defra metric. Note that the spreadsheet rounds figures of credits to two decimal places which occasionally generates apparent minor discrepancies due to rounding errors when numbers are placed into tables.

A1.1.1 Semi-natural Broadleaved Woodland

2.2.3 A block of semi-natural woodland was located to the south of the Site. The species here comprised of silver birch *Betula pendula*, poplar *Populus sp.* and oak *Quercus robur*. The understorey comprised of false fox-sedge *Carex otrubae*, pendulous sedge *Carex pendula*, bramble *Rubus fruticosus*, wood woundwort *Stachys sylvatica*, wood dock *Rumex sanguineus* and small balsam *Impatiens parviflora.*

2.2.4 Overall there was a good age distribution and structure of trees and good diversity of ground flora present. Following the Natural England condition assessment this would be categorised as being of a 'moderate' habitat condition.

A1.1.2 Broadleaved Plantation Woodland

2.2.5 Small blocks of planted woodland were located in the north east of the Site. They comprised of poplar, cherry *Prunus avium*, oak and hornbeam *Carpinus betulus.*

2.2.6 Overall there was a good age distribution and structure of trees and good diversity of ground flora present. Following the Natural England condition assessment this would be categorised as being of a 'moderate' habitat condition.

A1.3.2 Mixed Plantation Woodland

2.2.7 A block of plantation woodland was located to the south of the Site within an area of semi-natural woodland. The plantation canopy was dominated with Scot's pine *Pinus sylvestris*.

2.2.8 Overall there was a good age distribution and structure of trees and good diversity of ground flora present. Following the Natural England condition assessment this would be categorised as being of a 'moderate' habitat condition.

A2.1 Dense Scrub

2.2.9 Areas of dense scrub within the Site and wider area was dominated by willow species *Salix sp*. and bramble, with occasional rose *Rosa sp*., great mullein *Verbascum thapsus* and hard rush *Juncus inflexus*.

2.2.10 Sections of dense scrub ran along the sides of the disused railway tracks, creating a canopy over the streams in the north east of the Site. The scrub was dominated by bramble, with increasing quantities of hawthorn *Crataegus monogyna*, common gorse *Ulex europaeus* and willow species *Salix sp*., towards the northern end of the site.

2.2.11 Overall there was a good age range of species present and the areas of dense scrub were well-developed with sheltered glades present. Following the Natural England condition assessment this would be categorised as being of a 'moderate' habitat condition.

A2.2 Scattered Scrub

2.2.12 Small areas of scattered scrub with a similar species composition to that described in Paragraph 2.2.9 and 2.2.10 were found adjacent to areas of hardstanding and adjacent to the plantation woodland in the south of the Site and along the eastern boundary.

2.2.13 Following the Natural England condition assessment this would be categorised as being of a 'poor' habitat condition.

A3.1 Scattered Broadleaved Trees

2.2.14 A number of trees were located throughout the Site and wider area with species including, hawthorn, ash *Fraxinus excelsior*, alder *Alnus glutinosa*, horse chestnut *Aesculus hippocastanum* and sweet chestnut *Castanea sativa*.

2.2.15 A number of trees were located throughout the grassland in the north of the Site, comprising mature oak, with occasional ash, field maple *Acer campestre*, hawthorn and willow species.

2.2.16 Overall, the trees on Site were assessed as being of 'moderate' habitat condition.

B2.2 Semi-improved Neutral Grassland

2.2.17 Large areas of neutral semi-improved grassland were present across the Site and wider area, which were subject to regular management through cutting, creating an even, short sward.

2.2.18 Species within the sward included perennial rye-grass *Lolium perenne*, Yorkshire fog *Holcus lanatus*, creeping bent *Agrostis stolonifera*, red fescue *Festuca rubra*, meadow foxtail *Alopecurus pratensis* and cock's foot *Dactylis glomerata*. Herbaceous species present included yarrow *Achillea millefolium*, creeping buttercup *Ranunculus repens*, white clover *Trifolium repens*, ribwort plantain *Plantago lanceolata*, groundsel *Senecio vulgaris*, selfheal *Prunella vulgaris*, ragwort *Jacobaea vulgaris*, primrose *Primula vulgaris*, daisy *Bellis perennis* and dandelion *Taraxacum officinale agg*.

2.2.19 Additional species of false oat grass *Arrhenatherum elatius,* spear thistle *Cirsium vulgare*, cinquefoil *Potentilla sp*. common mouse-ear *Cerastium fontanum*, lesser celandine *Ranunculus ficaria*, red dead nettle *Lamium purpureum*, bristly ox-tongue *Helminthotheca echioides*, dove's-foot crane's-bill *Geranium molle* and glaucous sedge *Carex flacca* were also present, but less frequently.

2.2.20 Strips of diverse semi-improved grassland were identified along the banks parallel to the disused rail tracks. The species here were consistent with that of the other semi-improved grassland with the addition of goat's beard *Tragopogon dubious*, false fox-sedge, wild carrot *Daucus carota*, black knapweed *Centaurea nigra*, agrimony *Agrimonia eupatoria*, common spotted orchid *Dactylorhiza fuchsii*, ox-eye daisy *Leucanthemum vulgaris* and field horsetail *Equisetum arvense*.

2.2.21 Following the Natural England condition assessment these were categorised as being of a 'good' habitat condition.

G1 Standing Water

2.2.22 Waterbody P1 comprised a tall (approximately 2.5 m high) red-brick fire pit. The waterbody had steep brick sides with no aquatic or emergent vegetation.

2.2.23 The other four waterbodies (P2-P5) within the Site were formerly used as emergency fire resource ponds, constructed of concrete with sloping banks and slight kerbs around the edges. The waterbodies contained none or very limited aquatic and / or emergent vegetation.

2.2.24 Following the Natural England condition assessment these were categorised as being of a 'moderate' habitat condition.

Table 2.1: Baseline assessment of biodiversity value

Habitat type	Area (ha)	Distinctiveness score		Condition score		Strategic significance score		Value (biodiversity units)[a]	Area of habitat retained	Area of habitat enhanced	Baseline value of retained habitats	Baseline value of enhanced habitats	Area of habitat lost (ha)	Value of habitats lost
Developed land; sealed surface	4.649	Very low	0	N/A – Other	0	Low	1	0	0.001	0	0	0	0	0
Developed land; sealed surface	10.037	Very low	0	N/A – Other	0	Low	1	0	0.669	0	0	0	0	0
Other woodland; mixed	1.56	Medium	4	Moderate	2	Low	1	12.48	0.293	0	2.34	0	1.27	10.14
Other woodland; broadleaved	0.869	Medium	4	Moderate	2	Low	1	6.95	0.42	0	3.36	0	0.45	3.59
Mixed scrub (scattered scrub)	1.071	Medium	4	Poor	1	Low	1	4.28	0.004	0	0.02	0	1.07	4.27
Mixed scrub (dense scrub)	1.369	Medium	4	Moderate	2	Low	1	10.95	0.025	0	0.20	0	1.34	10.75
Modified grassland	10.164	Low	2	Good	3	Low	1	60.98	0.089	0	0.53	0	10.08	60.45
Other woodland; broadleaved (semi-natural broadleaved)	1.273	Medium	4	Moderate	2	Low	1	10.18	0.569	0	4.55	0	0.70	5.63
Sustainable urban drainage feature	0.057	Low	2	Moderate	2	Low	1	0.23	0.23	0	0	0	0.23	0.23
Urban tree[b]	3.9921	Medium	4	Moderate	2	Low	1	31.94	0	0	0	0	3.99	31.94
Total								**130.00**	**2.07**	**0**	**11.01**	**0**	**32.97**	**126.99**

a: Calculated as: area x distinctiveness x condition

b: Areas for urban street trees are calculated using the 'urban tree helper' tool provided with the Defra metric. This provides an 'area equivalent' to enable the value of street trees to be included in the total site value calculation, but as this is not a direct measurement of actual habitat area, it does not get included in the total site area. The urban tree score for the site post-development is based on estimates from landscape design drawings. As a precautionary basis, the target condition for the urban trees has been set as 'poor'. It may be possible to review this target condition upwards when final planting schedules are produced.

Urban tree helper						
Tree size	Number of trees and area (ha) for each condition state					
	Poor	Area	Moderate	Area	Good	Area
Small	0	0.0000	0	0.0000	0	0.0000
Medium	0	0.0000	109	3.9921	0	0.0000
Large	0	0.0000	0	0.0000	0	0.0000
Total	**0**	**0.0000**	**109**	**3.9921**	**0**	**0.0000**

3 BIODIVERSITY ENHANCEMENT STRATEGY

3.1 Habitats

3.1.1 Landscape mitigation has been embedded in the overall project design to minimise potential landscape and visual impacts and maximise enhancement of biodiversity of the Site. Indicative landscape proposals are shown on the Indicative Proposed Plan (drawing reference: 410_S-50) and has been informed by guidance detailed in the Design and Access Statement. The landscape proposals will be worked-up for subsequent Reserved Matters Application(s).

3.1.2 In the absence of a definitive landscape plan, the habitats on the proposed development Site are taken from the Parameters Plan (drawing reference: 410_S-51-P2). As such, the net gain assessment for the Site has assumed a worst-case scenario when considering the value of newly created habitats.

Wildlife Corridors and Structural Landscape Planting

3.1.3 Some areas of broadleaved and plantation woodland, grassland and scrub to the south and east of the Site would be retained for their biodiversity value, however the majority would be lost to allow for development.

3.1.4 Two wildlife corridors have been built into the landscape design; one in the west of the Site and one running north to south, through the central belt. These corridors would likely comprise wildflower meadow and native tree planting however, this would be decided at the RM stage.

3.1.5 The overall landscape planting for the Site would also likely include the creation of Sustainable Drainage Systems (SuDS) and areas of grassland.

3.1.6 This would deliver **22.70 habitat units.**

Development Area

3.1.7 The development area would include hardstanding in the form of warehouses, offices, roads, parking and service yards. This would deliver **0 habitat units.**

3.1.8 Areas of new habitats proposed for the Site post-development and the biodiversity value as derived from the Defra calculation tool are provided in Table 3.1 overleaf.

Table 3.1: Assessment of biodiversity value of post-construction habitat creation

Proposed habitat	Area (ha)	Distinctiveness score		Condition score		Time to target condition (years)	Temporal multiplier	Difficulty of creation / enhancement	Difficulty multiplier	Habitat units delivered[a]
Developed land; sealed surface	21.75	Very low	0	N/A – Other	0	0	0	Medium	0.67	0
Modified grassland	5.17	Low	2	Moderate	2	4	0.867	Low	1	17.93
Sustainable urban drainage feature	1.98	Low	2	Moderate	2	3	0.899	Medium	0.67	4.77
Total habitat creation										**22.70**

a: Calculated as: area x distinctiveness x condition x time x difficulty

4 SUMMARY

4.1 Habitats

4.1.1 The assessment above indicates that the development proposals for the Site will deliver a net loss of 75.57% (equating to **104.29 units**).

4.1.2 The BNG calculations have shown that the Site provided **138.00 units** prior to development; post-development, the proposed habitat creation as shown within the Parameters Plan would achieve **22.70 units,** and **11.01 units** would be provided from retained habitats resulting in a total post-development value of **33.71 units**.

4.1.3 A summary screenshot from the calculator tool is provided in Figure 4.1 below.

Figure 4.1: Biodiversity Metric 3.1 Calculation Tool Beta Test Headline Results

On-site baseline	*Habitat units*	138.00
	Hedgerow units	0.00
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	33.71
	Hedgerow units	0.00
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	-75.57%
	Hedgerow units	0.00%
	River units	0.00%
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	-104.29
	Hedgerow units	0.00
	River units	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	-75.57%
	Hedgerow units	0.00%
	River units	0.00%

4.2 Design Principals

4.2.1 There would be an emphasis on the habitat creation within the Site to reflect the habitat creation that has been designed within the wider Graven Hill development, including neutral grassland and scattered scrub. This would ensure an overall substantial habitat resource was created which provided connectivity across the Site.

4.2.2 There would also be a commitment to provide further tree planting, both as woodland and as individual trees or tree lines along roads and within the development parcels. This would include scattered tree and shrub planting within the green corridor and to reinforce retained woodland in the south of the Site and along the eastern boundary.

4.2.3 There would be elements of ornamental and non-native planting included within the proposals to satisfy landscape requirements. There would be a commitment to minimise non-native planting and to use species with a recognised benefit to wildlife.

4.2.4 There would be a commitment to ensuring the landscaping proposals included sufficient habitat creation to ensure a net gain was achieved.

4.3 Reserved Matter Stage

4.3.1 Following the RM application for the proposed development, this document will be updated to include the landscaping associated with it.

4.3.2 If, at any time the client, RPS ecologists, or LPA do not believe that there will be a biodiversity net gain on the Site overall, discussions will be had as to how achieve this (i.e. offsite mitigation or financial offsetting), and the report updated accordingly.

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