



Elite Ecology

Passionate about Ecology

Model Farm, Hexton



Biodiversity Net Gain Report

September 2024



01782 308418



Part of Harmil Environmental Ltd.
Company Reg Number: 11310919
Company VAT Number: 320559225

admin@eliteecology.co.uk
www.eliteecology.co.uk



The New Barn, Suites 2/3, Shellow Lane,
Gawsworth, Cheshire, CW12 2FQ



Document Control			
Document Properties			
Organisation	Elite Ecology		
Prepared For	Mr. Jeremy Tilston (JRT Architectural Design)		
Author	Mr. Connor Wild		
Approved (1 st Checker)	Mr. Marek Fraczek		
Approved (2 nd Checker)	Mr. Richard Millington		
Title	Model Farm, Hexton Biodiversity Net Gain Report		
Version History			
Date	Version	Status	Description/Changes
30/09/2024	V1	Draft	First Draft
02/10/2024	V1	Final Draft	Proofread

Biodiversity Net Gain Report

0. Executive Summary

This report has been prepared at the request of Mr. Jeremy Tilston (JRT Architectural Design) on behalf of the landowners. It relates to the proposed development works at Model Farm, Hexton, Hertfordshire, SG5 3JB, (Central OS Grid Reference: TL 10675 30608). For this report, a biodiversity impact assessment calculation has been made. This document should be read in conjunction with the completed Excel spreadsheet.

The site walkover revealed multiple habitats on site. The baseline Habitat Plan, habitat codes and target notes for the site are located within **Appendix C**. The following habitats were recorded on site and in the surrounding area (in primary habitat code alphabetical order):

- Artificial Unvegetated, Unsealed Surface
- Developed Land; Sealed Surface
- Mixed Scrub
- Modified Grassland
- Tall Forbs
- Rural Tree

Habitat Mitigation Score

Biodiversity Unit Type	Baseline Units		Post-Development Units Without Recommendations			Post-Development Units With Recommendations			
	On-Site	Off-Site	On-Site	Off-Site	% Net Gain	On-site	Off-site	Statutory Biodiversity Credits	% Net Gain
Area Habitats	1.20	N/A	0.12	N/A	-90.03	N/A	N/A	N/A	N/A
Linear Habitats	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Linear Habitat – Rivers and Streams	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

The initial score, without enhancements, resulted in a -1.08 unit loss (-90.03%) in the habitat mitigation. To reach the required 10% net gain in biodiversity, a total of 1.32 units will be need on site post development. As it stands there is a unit deficit of 1.20 units. Due to a significant portion of the land on site being under private ownership, it is impossible to enforce management and monitoring of any potential recommended habitats. Therefore, no additional recommendations can be made in accordance with the guidelines.

As the project has not met the DEFRA 10% increase in net gain for biodiversity, the client will be required to either find additional land for offsetting, make changes to the layout or purchase or purchase statutory biodiversity credits through Natural England. Alternatively, the client may wish to consult a private third party habitat unit brokers for prices for biodiversity units sold in the off-site private market.

Once an off-setting method has been agreed this document MUST be updated to provide evidence of a gain in biodiversity.

Species Specific Enhancements

A number of species-specific enhancements can be found in **Section 6.5**.

Contents

0. Executive Summary	3
1. Introduction	5
1.1 Report Rationale	5
1.2 Site Description	5
1.3 Proposals	6
1.4 Scope of Report	7
1.5 Biodiversity Net Gain Relevant Policies	7
2. Methodology	8
3. Baseline Conditions.....	10
3.1 Habitats	10
3.2 Strategic Significance.....	10
3.3 Species.....	10
4. Baseline Calculation and Proposal Impact	11
4.1 Existing Habitats	11
4.2 Proposed Habitats.....	12
4.3 Total Net Unit Change.....	12
4.4 Trading Rules	13
5. Recommendations.....	14
5.1 Habitats	14
5.2 Summary	15
6. Habitat Creation and Management	16
6.1 Soil Preparation.....	16
6.2 Species Specific Enhancements.....	16
7. Good Practice Principles for Development.....	19
8. References	21
9. Appendices	22
Appendix A: Site Plans.....	23
Appendix B: Habitat Condition Assessment Sheets	24
Appendix C: Baseline Habitat Map	26
Appendix D: New Habitat Map	27
Appendix E: Site Photographs	28
Appendix F: Biodiversity Net Gain Relevant Policies	31
Appendix G: Bats and Artificial Light.....	35
10. Notice to Readers: Conditions of this Report	36

1. Introduction

1.1 Report Rationale

This report has been prepared at the request of Mr. Jeremy Tilston (JRT Architectural Design) on behalf of the landowners. It relates to the proposed development works at Model Farm, Hexton, Hertfordshire, SG5 3JB, (Central OS Grid Reference: TL 10675 30608). For this report, a biodiversity impact assessment calculation has been made. This document should be read in conjunction with the completed Excel spreadsheet.

1.2 Site Description

The site is situated within the village of Hexton, Hertfordshire and is located 290m to the north of the village centre

The site measures approximately 0.14ha and contains multiple habitats. These include; artificial unvegetated, unsealed surface, developed land; sealed surface, mixed scrub, modified grassland, tall forbs, and rural tree.

The habitats on site could have the potential to support a number of protected species. The photographs of the site are found within **Appendix E**.

Within the wider landscape, further habitats are present. These come in the form of agricultural structures, amenity grassland, arable land, hedgerows, pastureland, residential structures (and their associated gardens and landscaping), scattered trees, and running and standing water. The habitats that surround the site also have the potential to be utilised by a variety of protected species.

Figure 1: An aerial map showing the boundary of the site at Model Farm, Hexton (as shown by the red outline).



Figure 2: An aerial map showing the boundary of the site at Model Farm, Hexton (as shown by the yellow star) in relation to some of the local landscape.

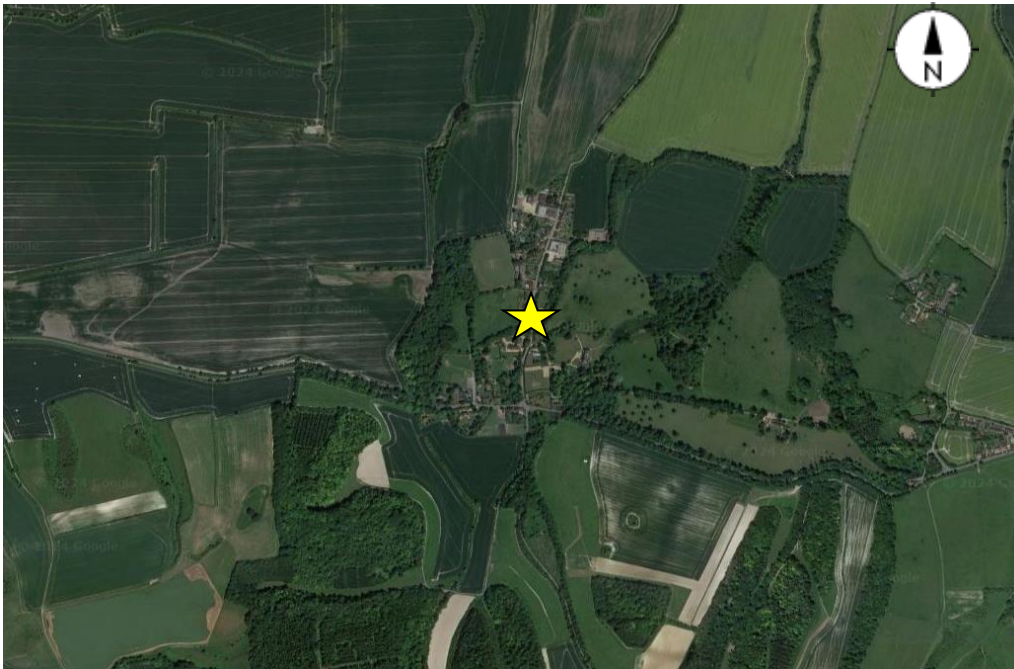
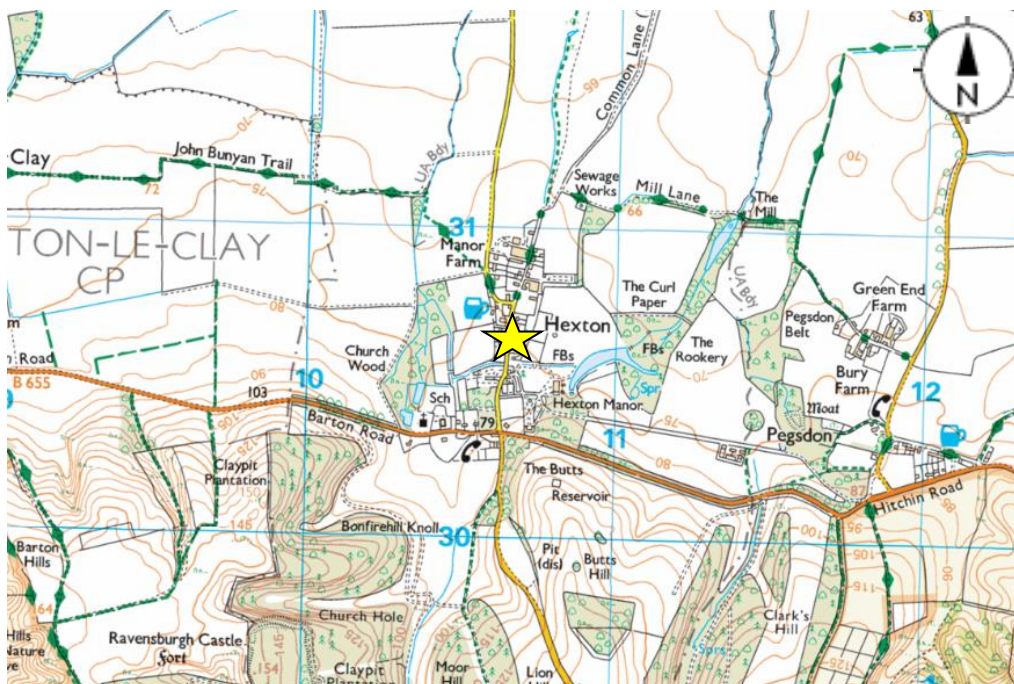


Figure 3: An OS map obtained from Bing showing the location of Model Farm, Hexton (yellow star).



1.3 Proposals

Under the current proposals, The barns onsite are to be converted into residential dwelling with associated hard and soft landscaping. This will result in both the permanent and temporary loss and/or alteration of some of the habitats located on the proposed re-development site. Please refer to **Appendix A** for the site plans.

1.4 Scope of Report

This report aims to:

- Establish the total number of baseline and lost habitat, hedgerow, and river units at the site of the proposed scheme.
- Establish the total number habitat, hedgerow, and river units that are to be created, retained and/or enhanced under landscape and ecological mitigation proposals at the proposed works site.
- Determine whether the proposed scheme will result in a net loss, no net loss, or a net gain for biodiversity.
- Make further recommendations to gain the required 10% minimum net gain for biodiversity.

1.5 Biodiversity Net Gain Relevant Policies

The appraisal has been compiled with reference to the following relevant nature conservation legislation, planning policy and the UK Biodiversity Framework from which the protection of sites, habitats and species is derived in England. These are:

- UK Biodiversity Action Plan (UKBAP).
- The Natural Environment and Rural Communities (NERC) Act 2006.
- The UK Post-2010 Biodiversity Framework (2011-2020).
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services.
- The National Planning Policy Framework (NPPF) 2021.
- Environmental Act 2021.
- Local policy.

A full explanation of these policies can be found within **Appendix E**.

2. Methodology

Personnel

Field surveys have been undertaken by licensed ecologist/s, members of the Chartered Institute of Ecology & Environmental Management (CIEEM) and members of Elite Ecology staff. A walkover of the site was undertaken on the 19th of August 2024 by **Mr. Matthew Cotterill**: PG Dip, Ecologist and **Miss. Rebecca Kay**: FdSc, Assistant Ecologist

The Biodiversity Net Gain Assessment has been carried out by **Mr. Connor Wild**: MSc Senior Ecologist, in line with CIEEM Guidelines on Good practice principles for development (2016), CIEEM A Practical Guide (2019) and BS 8683:2021 - Process for designing and implementing biodiversity net gain. This net gain report and assessment has been reviewed by **Mr. Richard Millington**: BSc (Hons), ACIEEM, CERPIT, MRSB, MARborA, Principal Ecologist.

Survey of Baseline Habitats and Condition

Habitat typing and condition assessments are undertaken during a Preliminary Ecological Appraisals (PEA) or similar studies. The baseline also considers historic records for the site and local area via a desktop study (satellite imagery, previous ecological reports), as well as additional surveys to assess the presence/absence of species in certain situations. Conditions of habitats and hedgerows are assessed using the scoring systems provided in the Statutory Biodiversity Metric Condition Assessment Sheets.

River assessments are carried out through a MoRPH5 Pro survey and River type survey. At least one MoRPH5 is undertaken per reach on site that will be directly or indirectly impacted. An additional MoRPH5 is undertaken upstream to record a more “natural setting” if required. This data is then processed via Cartographer to give the condition of the rivers on site.

Calculations of Baseline Habitats

Using Geographic Information Software (GIS), baseline habitats are measured in hectares (ha) using vector layer polygons. These measurements are then input into the DEFRA Small Site Statutory Biodiversity Metric Calculation Tool. Habitat condition and connectivity are then input into the calculator. The area of habitat retained is then entered into the calculation to give a final sum of baseline units and lost unit.

Each habitat has a base score of 1, this is then multiplied by the size of the habitat (ha). The habitat is then multiplied by its distinctiveness:

- Very low – 0
- Low – 2
- Medium – 4
- High – 6

The next multiplier is based on the condition of the habitat:

- N/A-other/agricultural – 0
- Poor – 1
- Fairly poor – 1.5
- Moderate – 2
- Fairly good – 2.5
- Good – 3

Calculations of Post-development Habitats

The calculation is informed by planning design, landscape plans, and proposed ecological mitigation. Plans are georeferenced into GIS and are similarly measured in hectares (ha) using vector layer polygons. These measurements are then converted into input into the DEFRA Small Site Statutory Biodiversity Metric Calculation Tool. A target condition will be assigned to each new habitat following the same scores as above. The calculator will generate a proposed time to hit this target condition and difficulty score.

3. Baseline Conditions

3.1 Habitats

The site walkover, completed on the 19th of August 2024, revealed multiple habitats on site. The UKHab habitat map, habitat codes and target notes for the site are located within **Appendix B**. The following habitats were recorded on site (in habitat code order).

On Site:

Habitats	Condition	Justification
Artificial Unvegetated, Unsealed Surface	N/A – Other	Condition automatically chosen by the metric.
Developed Land; Sealed Surface	N/A – Other	Condition automatically chosen by the metric.
Developed Land; Sealed Surface - Building	N/A – Other	Condition automatically chosen by the metric.
Mixed Scrub	Poor	Passes two out of five criterion in the condition assessment. For the full condition assessment please see Appendix B .
Modified Grassland	Poor	Passes 6 out of seven criterion in the condition assessment but fails criterion one which is essential for moderate and good condition. For the full condition assessment please see Appendix B .
Tall Forbs	Poor	Passes two out of five criterion in the condition assessment. For the full condition assessment please see Appendix B .
Rural Tree x 5	Moderate	Passes two five of six criterion in the condition assessment. For the full condition assessment please see Appendix B .
Rural Tree x 2	Moderate	Passes four out of six criterion in the condition assessment. For the full condition assessment please see Appendix B .

3.2 Strategic Significance

The following table shows the strategic significance of the site. This is compared against freely available sources such as the Multi Agency Geographic Information for the Countryside (MAGIC) and local policy maps

Habitats	Strategic Significance	Justification
All Habitats	Area/compensation not in local strategy/no local strategy	Area not identified in the local plan/strategy for biodiversity, nor is it deemed to be in a particularly ecologically valuable area.

3.3 Species

Elite Ecology was not instructed to carry out a preliminary ecological appraisal of the site. However, The site was found to be in use by a small population of common pipistrelle (*Pipistrellus pipistrellus*) bats based on the report produced by Samsara Ecology 2024. In addition to this DNA analysis of droppings found by CSA Environmental 2021 confirmed the presence of brown long-eared bats (*Plecotus auritus*). During the site walkover on the 19th of August 2024, a single brown long-eared bat was seen within the structure.

4. Baseline Calculation and Proposal Impact

4.1 Existing Habitats

The table below outlines the existing site status based on the most recent field survey.

Area Habitats

Habitat Description	Habitat Area (ha)	Distinctiveness	Score	Condition	Score	Baseline Habitat Units	Habitats Retention (ha)			Habitat Units Lost
							Retained	Enhanced	Lost	
Artificial Unvegetated, Unsealed Surface	0.0241	V.Low	0	N/A - Other	0	0.00	0.00	0.00	0.00	0.00
Developed Land; Sealed Surface	0.0160	V.Low	0	N/A - Other	0	0.00	0.0160	0.00	0.00	0.00
Developed Land; Sealed Surface - Building	0.0441	V.Low	0	N/A - Other	0	0.00	0.0441	0.00	0.00	0.00
Mixed Scrub	0.0209	Medium	4	Poor	1	0.08	0.00	0.00	0.02	0.08
Modified Grassland	0.0368	Low	2	Poor	1	0.07	0.00	0.00	0.04	0.07
Tall Forbs	0.0017	Low	2	Poor	1	0.00	0.00	0.00	0.00	0.00
Rural Tree	0.0814	Medium	4	Good	2	0.98	0.00	0.00	0.09	0.98
Rural Tree	0.0081	Medium	4	Moderate	2	0.06	0.00	0.00	0.09	0.06
TOTALS*	0.14*					1.20	126	0	0.08*	1.20
*Area Excluding Rural Trees										

Based on the above information, the on-site habitat biodiversity value is calculated at **1.20** habitat units, with **1.20** units lost during the development. Therefore, **0.00** habitat units will remain.

4.2 Proposed Habitats

Area Habitats

Habitat Description	Habitat Area (ha)	Target Distinctiveness	Score	Target Condition	Score	Time To Target Condition		Difficulty of Creation		Habitat Biodiversity Value
						Time (years)	Score	Difficulty	Score	
Developed Land; Sealed Surface	0.0214	V.Low	0	N/A - Other	0	0	1.000	Low	1	0.00
Vegetated Garden	0.0621	Low	2	Condition Assessment N/A	1	1	0.965	Low	1	0.12
TOTALS*	0.11									0.12

The above habitats, valued at **0.12** habitat units, combined with the remaining valued at **0.00** units, a habitat biodiversity value score of **0.12** habitat units is given by the metric calculation.

4.3 Total Net Unit Change

The net unit change for the area habitats on site is calculated at **-1.08**, which correlates to a loss of **-90.03%** in biodiversity units.

4.4 Trading Rules

With the above proposed habitats, the trading rules for area habitats are **not** satisfied. The table below breaks down the factors for passing or failing the trading rules:

Area Habitats Trading Summary			
Distinctiveness Group	Trading Rule	Trading Satisfied	Reason
Very High	Same habitat required – bespoke compensation option.	Yes	No net loss as habitats of this distinctiveness were not identified on site.
High	Same habitat required (=).	Yes	No net loss as habitats of this distinctiveness were not identified on site.
Medium	Same broad habitat or a higher distinctiveness habitat required ($\geq$).	No	-1.13 units are required from the same broad habitats* or higher distinctiveness. 1.04 units are to come from rural trees and 0.08 units are to come from scrub habitat.
Low	Same distinctiveness or better habitat required ($\geq$).	Yes	No net loss as proposals offset habitats of this distinctiveness.

5. Recommendations

5.1 Habitats

The net unit change for the area habitats on site is calculated at **-1.08**, which correlates to a loss of **-90.03%** in biodiversity units. The development therefore does not meet the DEFRA recommended 10% minimum net gain in biodiversity units.

In order to achieve the DEFRA recommended minimum 10% net gain in biodiversity units, the development has the following options:

Due to a significant portion of the land on site being under private ownership, it is impossible to enforce management and monitoring of any potential recommended habitats. Therefore, no additional recommendations can be made in accordance with the guidelines.

Option 1: Consult the private market to purchase off-site biodiversity units. This should ideally be within the same LPA area or National Character Area to maximise the points gained. The biodiversity metric indicates that a minimum of 0.80 appropriate low distinctiveness (or higher) biodiversity units are required to achieve a 10% net gain in biodiversity units.

Option 2: Acquire additional land off-site to use for biodiversity offsetting and habitat creation. This should ideally be within the same LPA area or National Character Area to maximise the points gained. These sites may be required to be registered as a biodiversity gain site, and habitat creation/enhancements and management must be secured for at least thirty years via a suitable legal agreement such as a planning obligation (section 106) with an LPA or a conservation covenant agreement with a responsible body.

Option 3: As a last resort, the client may wish to purchase Statutory Biodiversity Credits from the government. Please note that the prices of these Statutory Credits are kept intentionally uncompetitive. The client will need to provide evidence that the other above options have been explored in order to purchase these credits.

5.2 Summary

The initial score, without enhancements, resulted in a **-1.08** unit loss (**-90.04%**) in the habitat mitigation. To reach the required 10% net gain in biodiversity, a total of **1.32** units will be need on site post development. As it stands there is a unit deficit of **1.20** units.

A breakdown of the units required can be found below:

Unit Type	Target	Baseline Units	Total Units Required on Site Post Development	Units Deficit
Area Habitats	10.00%	1.20	1.32	1.20
Hedgerow	10.00%	N/A	N/A	N/A
Rivers	10.00%	N/A	N/A	N/A

As the project has not met the DEFRA 10% increase in net gain for biodiversity, the client will be required to either find additional land for offsetting, make changes to the layout or purchase or purchase Statutory biodiversity credits through Natural England. Alternatively, the client may wish to consult a private third party habitat unit brokers for prices for biodiversity units sold in the off-site private market.

Once an off-setting method has been agreed this document **MUST** be updated to provide evidence of a gain in biodiversity.

6. Habitat Creation and Management

6.1 Soil Preparation

SOILS: Subgrade/subsoil to be prepared in accordance with BS 8601:2013 and BS 4428:1989 and scarified or ripped to 300mm depth (excluding root protection areas of retained trees refer to Tree Protection Plan) prior to spreading topsoil to alleviate compaction and promote drainage. Imported and as saved topsoil to be in accordance with BS 3882: 2015 'Multipurpose Grade' with minimum soil organic matter contents 1% greater than the minimal value (or as approved). Imported topsoil (and 'as saved' if requested) is to be laboratory tested to BS 3882:2015 and ameliorated as required to meet the required characteristics as detailed within Table 1 of BS 3882:2015 specification.

New grasslands to use unimproved topsoil or low fertility topsoil to BS 3882:2015. Grass areas to be a minimum depth of 150mm, shrub beds 450mm depth, and forestry/transplants 300mm depth. Any weed/grass growth to be sprayed out with appropriate herbicide at least ten days prior to cultivation. All areas to be cultivated to a minimum depth of 150mm removing weeds and rubbish/stones greater than 20mm in size. Incorporate proprietary non peat compost to BSI PAS 100 to 50mm depth evenly worked into soil during cultivation.

6.2 Species Specific Enhancements

6.2.1 **Bats**

It is recommended that the development site should incorporate a minimum of the following:

- Two Eco Bat Box.

Including these boxes will providing further roosting opportunities. These should avoid any artificial lighting, whilst being sighted facing east, south-east, south, south-west, and/or west. The wooden poles are recommended to be at least partially shaded by some of the new trees. Boxes can be purchased by emailing admin@eliteecology.co.uk.

Due to the presence of a brown long-eared (*Plecotus auritus*) bats, bat lofts are required to be included above the car port for plot 1. Within these compensation features, it is necessary that modern breathable felt is avoided due to the danger of entanglement it poses to bats. It is recommended that Type 1F bitumen felt is used in these locations. **Figures 4 and 5** show a basic design of a bat loft. **The loft will need to measure a minimum of 2m (height) x 5m (width) x 5.5m (length)** as per the latest mitigation guidelines. Access into these lofts should be facilitated through four [Bat Access Tiles](#) (or similar) and three purposely lifted ridge tiles.

Within these loft areas, several additional measures could be included to ensure that the roost is of the highest value possible to the target species. These measures include incorporating a ridge and/or dormer vent upon the roof to allow bat access into the building. Additionally, two [Schwegler 1FQ Bat Boxes](#) (or similar) should be placed upon the interior gable end walls of each bat loft and a ply-board lining should be introduced [approximately] half way up the roof (heading towards the apex) in order to provide further roosting opportunities for the brown long-eared bats. Additionally, a licenced ecologist should seed the loft with old bat droppings recovered from the property, in order to encourage the bats to return and roost.

Figure 4: A generic example of a bat loft (not accurate to project).

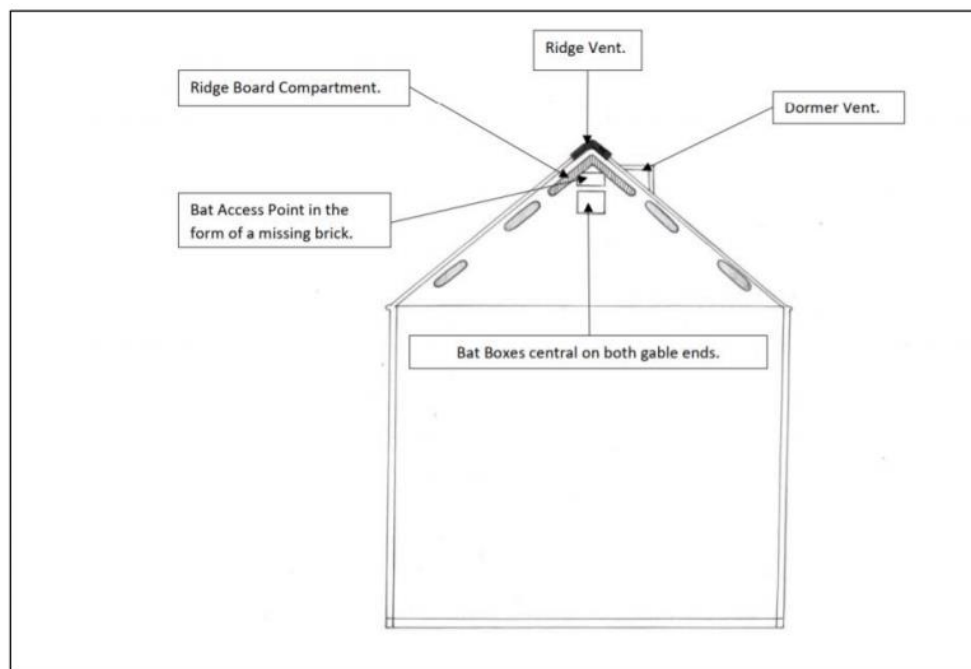
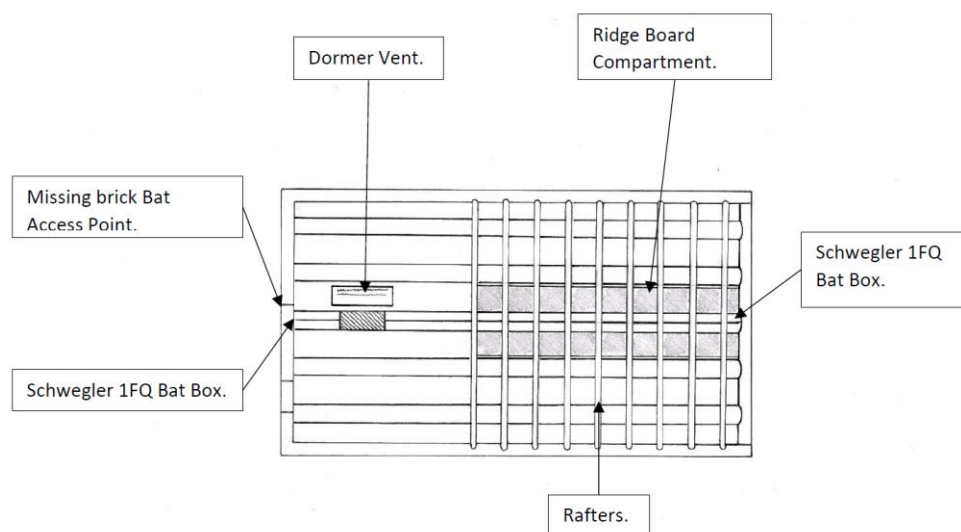


Figure 5: An illustration of the proposed bat loft design from an internal viewpoint
A generic example of a bat loft (not accurate to project).



This is to be in addition to the bat mitigation (one bat box on the southern elevation) that is proposed.

Artificial lighting **must avoid** linear features. If it is necessary to include artificial lighting in areas overlooking both hedgerows and trees, then this must include sensors to be triggered by larger bodies only. An artificial lighting plan should be drawn up to illustrate the spill of light. This is to include the proposed security lighting on the residential dwellings as well as all street lighting. This document should then be approved by a licenced bat ecologist. More information on bats and artificial lighting can be found within **Appendix G**.

6.2.2 **Birds**

The development site should be enhanced for birds by installing a variety of bird boxes on site. The development should incorporate a minimum of the following, placed on wooden poles within the wildflower planting area:

- Two Apex Bird Box.
- Two Large Bird Nest Box.

Boxes can be purchased by emailing admin@eliteecology.co.uk.

They must be placed between northern and eastern elevations, thus avoiding strong sunlight and the wettest winds. The wooden poles are recommended to be at least partially shaded by some of the new trees.

The entrance of the box must be kept clear of obstructions, such as branches and vegetation. All bird enhancements must be situated in a way that prevents access to predators, such as cats.

7. Good Practice Principles for Development

7.1 Principle 1: Mitigation Hierarchy

The site was found to be in use by a small population of common pipistrelle (*Pipistrellus pipistrellus*) bats based on the report produced by Samsara Ecology 2024. In addition to this DNA analysis of droppings found by CSA Environmental 2021 confirmed the presence of brown long-eared (*Plecotus auritus*) bats. During the site walkover on the 19th of August 2024, a single brown long-eared bat was seen within the structure. This report has included addition features to be incorporated.

7.2 Principle 2: Irreplaceable Habitats

No irreplaceable habitats occur on site. This report has offered recommendations for habitats of similar distinctiveness while staying where possible in the same broad habitat types.

7.3 Principle 3: Inclusivity

Feedback from the stake holders is welcome and this document is to be updated to fit requirements. This Biodiversity Net Gain Report has included recommendations to benefit the site while allowing it to be used for its intended purpose.

7.4 Principle 4: Risks

No habitats have been recommended therefore no post monitoring has been recommended. This principle has not been met.

7.5 Principle 5: Measurable Net Gain Contribution

The net unit change for the area habitats on site is calculated at **-0.5658**, which correlates to a loss of **-64.65%** in biodiversity units.

The net unit change for the linear habitats on site is calculated at **0.00**, which correlates to no net loss in linear biodiversity units.

7.6 Principle 6: Best Outcomes for Biodiversity

A gain has not been achieved. This principal has not been met.

7.7 Principle 7: Be Additional

A gain has not been achieved. This principal has not been met.

7.8 Principle 8: Net Gain Legacy

No habitats have been recommended therefore no post monitoring has been recommended. This principle has not been met.

7.9 Principle 9: Sustainability

No green infrastructure has been recommended for this project due to the scope of the proposed development. This principle has been met.

7.10 Principle 10: Transparency

Feedback from the stake holders is welcome and this document is to be updated to fit requirements. This Biodiversity Net Gain Report has included recommendations to benefit the site while allowing it to be used for its intended purpose.

8. References

- Bickmore, C. J. (2002). Hedgerow Survey Handbook. London: DEFRA
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (2011).
- Blakesley, D. & Buckley, P. (2010). Woodland creation for wildlife and people in a changing climate.
- Environment Act 2021, c. 30. Available at: <https://www.legislation.gov.uk/ukpga/2021/30/contents> (Accessed: 08 March 2024)
- Defra (2007a) Securing a Healthy Natural Environment: an action plan for embedding an ecosystems approach. PB12853. Defra London.
- Defra (2007b) An Introductory Guide to Valuing Ecosystems Services. PB12852. Defra London.
- Defra (2024) The Statutory Biodiversity Metric User Guide. Defra. London.
- Dietz, C., von Helversen, O. & Nill, D. (2009) Bats of Britain, Europe and Northwest Africa. London: A. C. Black.
- Gunnell, K., Grant, G. and Williams, C. (2012) Landscape and urban design for bats and biodiversity. Bat Conservation Trust.
- Institute of Ecology and Environmental Management, Professional Guidance Series.
- Kirby, P. (2013). Habitat Management for Invertebrates. Exeter: Pelagic Publishing.
- The natural choice: securing the value of nature (2011) (Natural Environment White Paper).
- Treweek J. et al. (2009) Scoping study for the design and use of biodiversity offsets in an English Context.
- Treweek J., Butcher B., and Temple H. (2010) Biodiversity offsets: possible methods for measuring biodiversity losses and gains for use in the UK. CIEEM In Practice.

9. Appendices

Appendix A: Site Plans

Appendix B: Habitat Condition Assessment Sheets

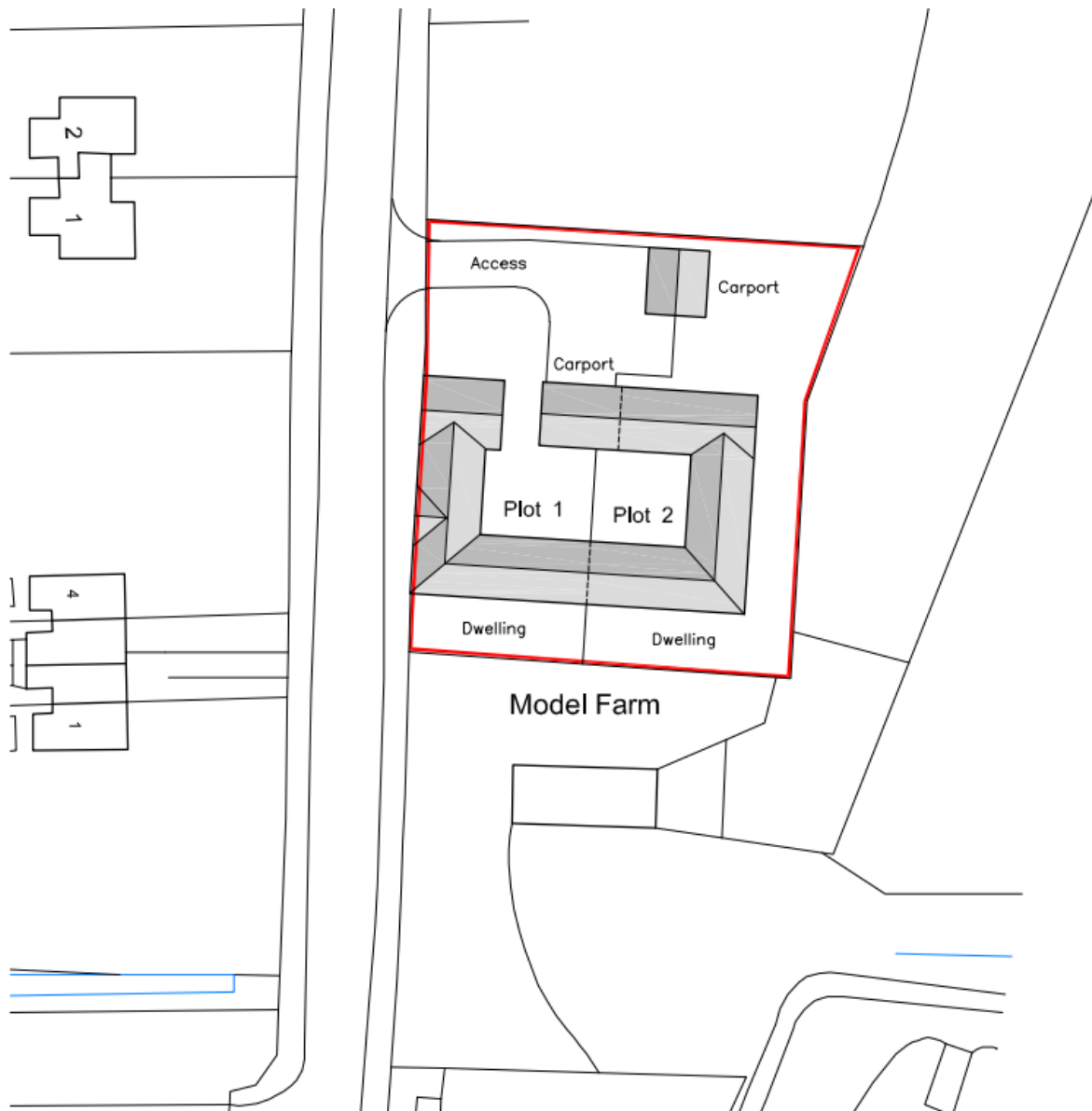
Appendix C: Baseline Habitat Map

Appendix D: New Habitat Maps

Appendix E: Site Photographs

Appendix F: Biodiversity Net Gain Relevant Policies

Appendix G: Bat and Artificial Light

Appendix A: Site Plans

0 5 10 15 20 25m

Project title MODEL FARM, HEXTON		
Drawing title BLOCK PLAN		
Scale A4-1:500	Date Oct 22	Drawn SC
Drg No. K1610-02		
 Tel: 01234 708286 Email: drawingoffice@cad.com www.campbellark.co.uk		

© This drawing is copyright.

Biodiversity Net Gain Report

Appendix B: Habitat Condition Assessment Sheets

Condition Assessment Criteria		Criterion Passed						
		T1	T2	T3	T4	T5	T6	T7
A	The tree is a native species (or at least 70% within the block are native species).	No	No	No	No	No	No	No
B	The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide (individual trees automatically pass this criterion).	Yes	Yes	Yes	Yes	Yes	Yes	Yes
C	The tree is mature (or more than 50% within the block are mature).	Yes	Yes	Yes	Yes	Yes	No	No
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.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
E	Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F	More than 20% of the tree canopy area is oversailing vegetation beneath.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Score		5	5	5	5	5	4	4
Condition		Good	Good	Good	Good	Good	Moderate	Moderate

Habitat: Modified Grassland		
Condition Assessment Criteria		Criterion Passed
A	There are 6-8 vascular plant species per m ² present, including at least 2 forbs (Essential criterion for moderate/good condition)	No
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.	Yes
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.	Yes
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.	Yes
E	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens) ² .	Yes
F	Cover of bracken <i>Pteridium aquilinum</i> is less than 20%.	Yes
G	There is an absence of invasive non-native plant species ³ (as listed on Schedule 9 of WCA ⁴).	Yes
Condition	Poor	Score
		6/7

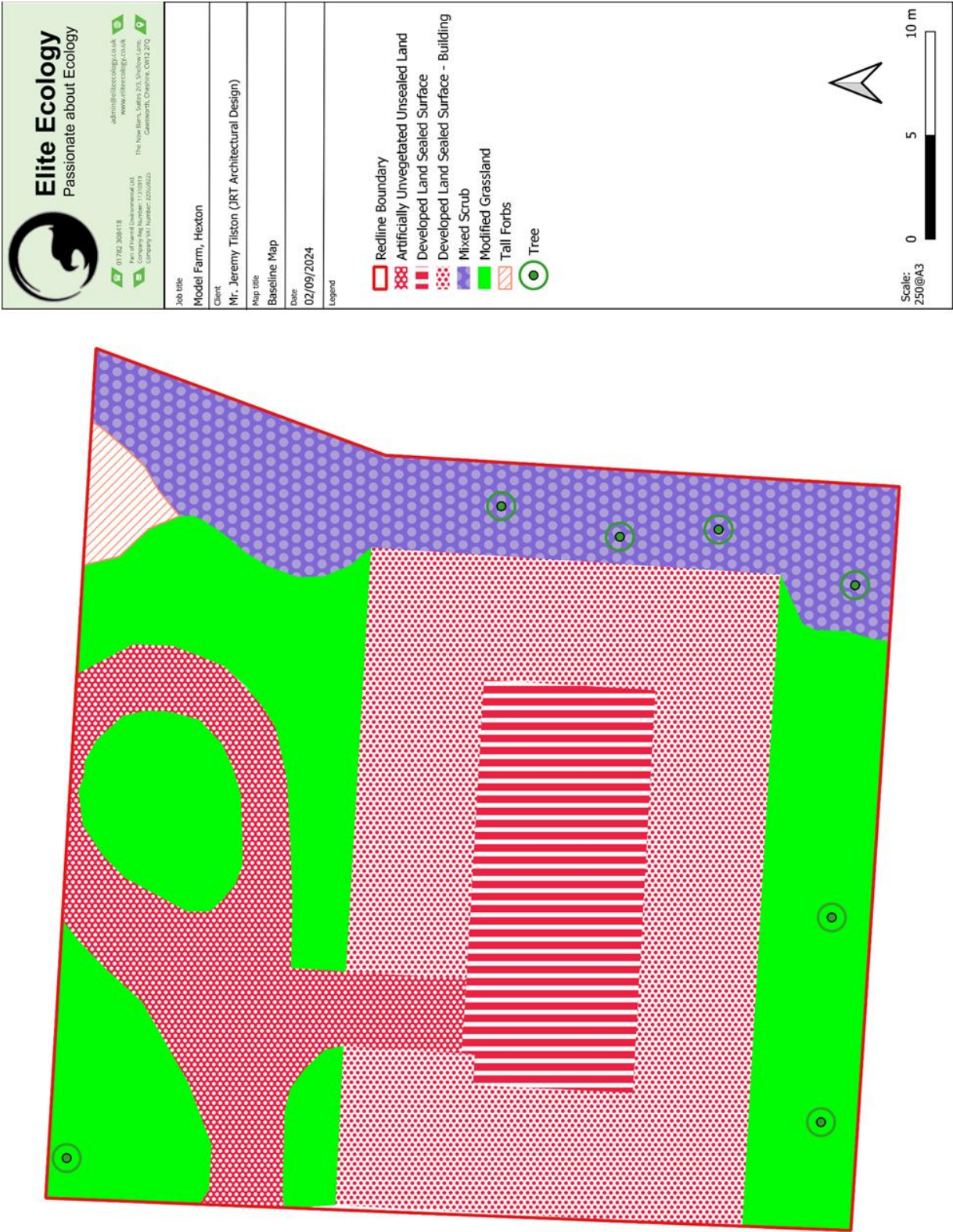
Biodiversity Net Gain Report

Habitat: Mixed Scrub			
Condition Assessment Criteria			Criterion Passed
A	"The parcel represents a good example of its habitat type - the appearance and composition of the vegetation closely matches its UKHab description (where in its natural range). - At least 80% of scrub is native, - There are at least three native woody species, - No single species comprises more than 75% of the cover		No
B	Seedlings, saplings, young shrubs and mature (or ancient or veteran) shrubs are all present.		No
C	There is an absence of invasive non-native plant species (as listed on Schedule 9 of WCA) and species indicative of suboptimal condition make up less than 5% of ground cover.		Yes
D	The scrub has a well-developed edge with scattered scrub and tall grassland and or forbs present between the scrub and adjacent habitat.		Yes
E	There are clearings, glades or rides present within the scrub, providing sheltered edges.		No
Condition	Poor	Score	2/5

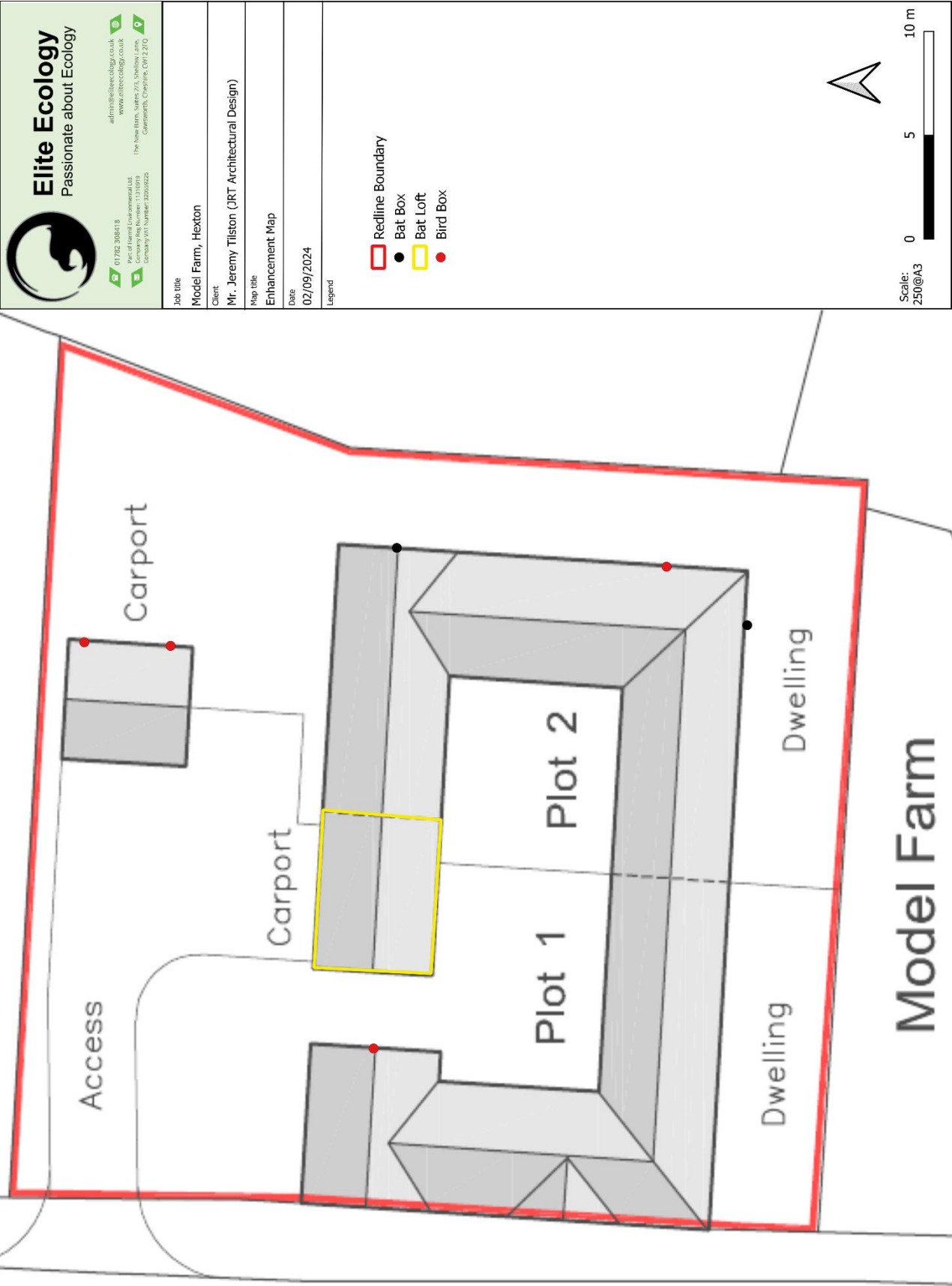
Habitat: Ruderal			
Condition Assessment Criteria			Criterion Passed
A	Vegetation structure is varied, providing opportunities for vertebrates and invertebrates to live, eat and breed. A single structural habitat component or vegetation type does not account for more than 80% of the total habitat area.		No
B	The habitat parcel contains different plant species that are beneficial for wildlife, for example flowering species providing nectar sources for a range of invertebrates at different times of year.		No
C	Invasive non-native plant species (listed on Schedule 9 of WCA1) and others which are to the detriment of native wildlife (using professional judgement) cover less than 5% of the total vegetated area . Note - to achieve Good condition, this criterion must be satisfied by a complete absence of invasive non-native species (rather than <5% cover).		Yes
Condition	Poor	Score	1/3

Habitat: Tall Forbs			
Condition Assessment Criteria			Criterion Passed
A	Vegetation structure is varied, providing opportunities for vertebrates and invertebrates to live, eat and breed. A single structural habitat component or vegetation type does not account for more than 80% of the total habitat area.		No
B	The habitat parcel contains different plant species that are beneficial for wildlife, for example flowering species providing nectar sources for a range of invertebrates at different times of year.		No
C	Invasive non-native plant species (listed on Schedule 9 of WCA1) and others which are to the detriment of native wildlife (using professional judgement) cover less than 5% of the total vegetated area . Note - to achieve Good condition, this criterion must be satisfied by a complete absence of invasive non-native species (rather than <5% cover).		Yes
Condition	Poor	Score	1/3

Appendix C: Baseline Habitat Map



Appendix D: New Habitat Map



Appendix E: Site Photographs

Plate 1: Image showing the developed, sealed land and the building.



Plate 2: Image showing the building.



Plate 3: Image showing the mixed scrub and trees.



Plate 4: Image showing the modified grassland and trees



Plate 5: Image showing the brown long-eared (*Plecotus auritus*) bats found during the site walk over.



Appendix F: Biodiversity Net Gain Relevant Policies

Environmental Act 2021

Part 6 on nature and biodiversity covers all areas of biodiversity net gain across two core sections. This Act mandates that all planning meets a minimum of a 10% gain in biodiversity calculated using the appropriate Metric and that the newly created habitats are secured for at least 30 years.

National Planning Policy Framework (NPPF)

While currently not a legal obligation, biodiversity and environmental net gains are mentioned in the revised National Planning Policy Framework (NPPF) within the following paragraphs (please refer to the NPPF for the full quotations):

Achieving sustainable development

Paragraph 8 Section C. *“an environmental objective – **to protect and enhance our natural, built and historic environment**; including making effective use of land, **improving biodiversity**, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”*

Preparing and reviewing plans

Paragraph 32. *“Local plans and spatial development strategies should be informed throughout their preparation by a sustainability appraisal that meets the relevant legal requirements. This **should demonstrate how the plan** has addressed relevant economic, social and **environmental objectives** (including **opportunities for net gains**). Significant **adverse impacts on these objectives should be avoided** and, wherever possible, alternative options which reduce or eliminate such impacts should be pursued. Where significant adverse impacts are unavoidable, suitable mitigation measures should be proposed (or, where this is not possible, compensatory measures should be considered).”*

Identifying land for homes

Paragraph 73 section C. *“consider the opportunities presented by existing or planned investment in infrastructure, the area’s economic potential and the scope for **net environmental gains**”*

Transport infrastructure:

Paragraph 104. *“Transport issues should be considered from the earliest stages of plan-making and development proposals, so that:
d) the environmental impacts of traffic and transport infrastructure can be identified assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for **net environmental gains**.*

Planning decisions:

Paragraph 119 *“Planning decisions and planning policy should a) encourage multiple benefits from both urban and rural land ... and taking opportunities to **achieve net environmental gains** - such as developments that would enable new habitat creation.”*

Conserving and enhancing the natural environment

Paragraph 174 Section D. “**minimising impacts on and providing net gains for biodiversity**, including by establishing coherent ecological networks that are more resilient to current and future pressures”

Habitats and biodiversity

Paragraph 179. “To protect and enhance biodiversity and geodiversity, plans should:

a) Identify, map and **safeguard components of local wildlife-rich habitats** and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, **enhancement, restoration or creation**;

and b) promote **the conservation, restoration and enhancement of priority habitats**, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing **measurable net gains for biodiversity**.”

Paragraph 180. “When determining planning applications, local planning authorities should apply the following principles:

a) if **significant harm to biodiversity** resulting from a development **cannot be avoided** (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then **planning permission should be refused**;

b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the **loss or deterioration of irreplaceable habitats** (such as ancient woodland and ancient or veteran trees) **should be refused**, unless there are wholly exceptional reasons and a suitable compensation strategy exists;

and d) development **whose primary objective is to conserve or enhance biodiversity should be supported**; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can **secure measurable net gains for biodiversity** or enhance public access to nature where this is appropriate.”

Local Plan**North Hertfordshire Local Plan 2011 - 2031****Policy SP12: Green infrastructure, landscape and biodiversity**

We will accommodate significant growth during the plan period whilst ensuring the natural environment is protected and enhanced. We will:

- a) Protect, identify, manage and where possible enhance a strategic multi-functional network of green infrastructure;
- b) Consider and respect landscape character, scenic beauty and locally sensitive features, particularly in relation to the Chilterns Area of Outstanding Natural Beauty;
- c) Protect, enhance and manage designated sites in accordance with the following hierarchy of designations and features:
 - Internationally designated sites
 - Nationally designated sites
 - Locally designated sites;
 - Non-designated sites that include important habitats and species
- d) Protect, enhance and manage biodiversity networks including wildlife corridors, ancient woodlands and hedgerows, wetland and riverine habitats, Local Geological Sites, protected species, priority species and habitats, and non-designated sites of ecological value and ensure measurable net gains for biodiversity; and
- e) Protect other open spaces and support provision of new and improved open space.

Policy NE4: Biodiversity and geological sites

Planning permission will only be granted for development proposals that appropriately protect, enhance and manage biodiversity in accordance with the hierarchy and status of designations and features listed in Policy SP12.

All development should deliver measurable net gains for biodiversity and geodiversity, contribute to ecological networks and the water environment, and/or restore degraded or isolated habitats where possible.

Applicants should, having regard to the status of any affected site(s) or feature(s):

- a) Submit an ecological survey that is commensurate to the scale and location of the development and the likely impact on biodiversity, the legal protection or other status of the site;
- b) Demonstrate that adverse effects can be avoided and / or satisfactorily minimised having regard to the hierarchy of protection below:
 - i. locating on an alternative site with a less harmful impact;
 - ii. providing adequate mitigation measures; or
 - iii. as a last resort compensated for. The acceptability of approach(es) to avoidance, mitigation and compensation will be commensurate with the status of the asset(s) likely to be affected by the application; Compensation is unlikely to be an appropriate solution for proposals affecting nationally or internationally designated sites other than in the most exceptional circumstances.
- c) Include appropriate measures to manage construction impacts by demonstrating how existing wildlife habitats supporting protected or priority species will be retained, safeguarded and managed during construction;
- d) Integrate appropriate buffers of complimentary habitat for designated sites and other connective features, wildlife habitats, priority habitats and species into the ecological mitigation and design. The appropriateness of any buffers will be considered having regard to the status of the relevant habitat. 12 metres of complimentary habitat should be provided around wildlife sites (locally designated sites and above), trees and hedgerows. It may be necessary to exceed this distance for fragile habitats such as ancient woodland or to provide appropriate root protection for mature trees; and
- e) Provide a long-term management and monitoring plan including mitigation measures as necessary. Local Geological Sites are ratified by the Herts & Middlesex Wildlife Trust (HMWT) and are afforded the same protection as Local Wildlife Sites.

Appendix G: Bats and Artificial Light

Artificial lighting is known to affect bat's roosting and foraging behaviour, with lighting resulting in a range of impacts that includes roost desertion (BCT, 2009), delayed emergence of roosting bats (Downs et al., 2003), increased activity of some bat species and decreased activity by others (Stone et al., 2012).

An experimental approach using LED units, demonstrated that relatively fast-flying bat species, including the common pipistrelle, showed no significant impacts as a result of new artificial lighting, even when lighting was set at relatively high levels close to 50 lux.

In contrast, slow flying bats such as the myotis bats (*Myotis* spp.) showed sharp reductions in presence, even at low light levels of 3.6 lux (Stone et al., 2012).

Current recommendations for all bat species specifies that no bat roost should be directly illuminated.

Due to the impacts of lighting, mitigation and sensitive lighting design schemes are required for projects where bats are present. These should include bat friendly lighting plans that should aim to avoid lighting wherever possible. If this is not possible, then the minimisation of any lighting impacts is required by adopting the following measures:

➤ **To introduce lighting curfews or use of PIR sensors.**

Lighting curfews can be an effective way of avoiding impacts on bats. These curfews may involve either turning off lighting or dimming light units at specific times of the night, dimming units at key times of the year, providing the luminaire allows for this option via a control unit. Lighting to be triggered by PIR sensors can be expected to be illuminated only when required and for a low proportion of time.

➤ **To consider no lighting solutions where possible.**

Options such as white lining, good signage and LED cat's eyes should be considered as preferable. Reflective fittings may help make use of headlights to provide any necessary illumination in some areas.

➤ **To use only high pressure sodium or warm white LED lamps where possible.**

High pressure sodium and warm white LED lamps emit lower proportions of insect attracting UV light than mercury, metal halide lamps and white LED lighting. Generally, lamps should have a lower proportion of white or blue wavelengths, with a colour temperature <4200 kelvin recommended (BCT, 2014).

➤ **To minimise the spread of light.**

The light spread should be kept at or near horizontal to ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Baffles, hoods, louvres and shields should be used where necessary to reduce light spill.

➤ **To consider the height of the lighting column.**

While downward facing bollard lighting is often preferable, it should be noted that a lower mounting height does not automatically reduce impacts to bats as bollard lighting can often be designed to provide up-lighting. Where bollard lighting is considered to be the most appropriate system, bollard spacing or unit density should be kept to a minimum and units should be fitted with the appropriate hoods/deflectors to reduce any up-lighting.

➤ **To avoid reflective surfaces below lights.**

The polarisation of light by shiny surfaces attracts insects increasing bat activity (BCT, 2012). Consequently, surface materials around lighting require consideration.

10. Notice to Readers: Conditions of this Report

All reports are certified products and cannot be shown, copied, or distributed to third parties without the written permission of Elite Ecology. No liability is accepted for the contents of the report, other than to that of the client(s). If any part of this report is altered without the written permission of Elite Ecology, then the whole report becomes invalid.

Elite Ecology agrees to supply ecological consulting services and advice of a preliminary or thorough nature as advised or commissioned. Upon commissioning Elite Ecology to undertake the work, the client(s) grant access to the site upon the agreed date. If no site access is available upon this date, Elite Ecology holds the right to charge the client(s) for lost staffing time and additional travel costs.

Elite Ecology undertake all site surveys with reasonable skill, care, and diligence, within the terms of the contract that has been agreed with the client and abiding by the Elite Ecology Terms and Conditions. The actions of the surveyors on site, and during the production of the report, were undertaken in accordance with the Code of Professional Conduct for the Chartered Institute of Ecology and Environmental Management.

The latest good practice guidelines put in place by Natural England or the relevant statutory conservation bodies have been followed by the surveyors on site. If those methodologies fail to identify a protected species during the survey efforts, no responsibility can be attributed to Elite Ecology. If any of these guidelines are adapted between the date(s) of the surveys being undertaken and the submission of this report, then Elite Ecology takes no responsibility for this.

Should any equipment be damaged or lost on site at the fault of the client(s), then Elite Ecology withholds the right to charge 100% above the current market value for that exact product or the nearest similar product.

The survey results purport the current status of the site and its potential for protected species utilisation at the time of surveying. It should not be viewed as a complete list of the possible flora and fauna species that could be using the site at different times of the year.

Elite Ecology has been provided with full payment for this report and thus the product has been released to the client(s) for the purpose of their planning application. If any part of the report is lost or altered without the written permission of Elite Ecology, then the entire report becomes invalid. Due to the potential for continual change within the natural world, this report is valid for **2 years only** from the date of the last survey visit. If this report is submitted after the 2 year deadline, then a further updated inspection will be required to ascertain whether the site remains in the same condition as it was when initially inspected.

No reliance should be made on any such comments in relation to the structural integrity of the features located on the surveyed site. All information within the report is based solely on evidence that has been found on site during the service provided. No individual opinion or inference will be made other than that of the suitably qualified ecologist appointed to the project.