



Colchester Institute, Clacton-on-Sea
Biodiversity Net Gain Feasibility Phase
Report

On Behalf of Barefoot & Gilles

Version 1 | January 2024

Document Control

Version	Date	Produced by	Reviewed by	Notes	Metric Used
V1	16 th January 2024	Amber Stringer MSc, Assistant Ecologist	Sara Curtis MSc, Principal Ecologist	Feasibility Stage	Statutory Biodiversity Metric

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This report does not purport to provide legal advice. This report provides a summary of preliminary Biodiversity Net Gain (BNG) calculations pre and post development of the Site.

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Executive Summary

Biodiversity Net Gain (BNG) Calculations were undertaken by Practical Ecology Ltd to assess the biodiversity impacts of the proposed development at Colchester Institute, Church Road, Clacton-on-Sea, CO15 6JQ, herein referred to as the 'Site'. The calculations were performed using DEFRA Statutory Metric¹ and are based on the proposed site plan for the Site, with measurements calculated by Practical Ecology Ltd, following a Preliminary Ecological Appraisal² undertaken in 2023. The project is currently at feasibility stage and as such, no landscape plans are available. This report is therefore an indicative example of how biodiversity net gain can be delivered onsite.

The proposals include demolition of the existing building, car park, pathways, and the clearance of scrub, grassland, and trees to facilitate the construction of flats, associated car park, access road, landscape planting and private gardens.

Pre-development, the habitats onsite comprise:

Developed land; sealed surface; car park; introduced shrubs; ground level planters (u1b; 804, 845)

Other neutral grassland, scattered scrub, tree, mown, invasive non-native (g3c; 10, 200, 106, 524)

Habitats were assessed during a Site walkover, undertaken in November 2023 using the UK Habitat Classification System³ and condition assessments included with the DEFRA Statutory Metric.

The Site has a baseline of 0.53 habitat biodiversity units (BU). Through the application of the mitigation hierarchy, habitats of highest ecological importance, namely the onsite medium tree will be retained as part of the proposals. The proposals include biodiverse green roof, tree planting, other neutral grassland, and native hedgerow, non-native and ornamental hedgerow within the Site. There are opportunities on the Site to deliver a net gain of 0.89 habitat BU, resulting in 65.99% habitat units (net change of 0.35 habitat units). With the recommendations outlined within this report, the proposed development could deliver an overall net gain for habitats which is above the national targets which will be enforceable in early 2024, of 10% net gain.

1 Introduction

1.1 Document Purpose

This document provides a summary of the Biodiversity Net Gain (BNG) Calculations that Practical Ecology Ltd were commissioned to undertake on behalf of Fabric First Architects to provide information pertinent to the development of Colchester Institute, Church Road, Clacton-on-Sea, CO15 6JQ, herein referred to as the 'Site'. This document only provides information regarding the biodiversity importance of habitats according to the Defra Metric calculator for pre- and post-development, and the biodiversity unit change. Assessments for protected and/or Priority Species are not included, and the relevant species-specific reports should be referred to for information regarding necessary mitigation and enhancements.

The purpose of this report is to detail the findings of a BNG calculation and assessment to inform a planning application for the Site. This includes:

- Calculating the pre- and post-development biodiversity unit value;
- Determining the change in biodiversity unit value as a result of the proposals for the Site;
- Advising if the project will deliver a minimum 10% net gain in unit.

While 10% net gain will become a mandatory requirement of the Environment Act 2021, the statutory instruments and secondary legislation to mandate this requirement are yet to be put in place with their roll-out now deferred by the government until early 2024. The National Planning Policy Framework (NPPF) 2023 does not quantify a specific percentage of net gain, but is encouraged by the Tendring District Council⁴, with areas covered under the plan to deliver at least 10% net gain.

1.2 The Site

The Site is approximately 0.25 ha (central OS grid reference TM 18055 14931, postcode CO15 6JQ) and is located in Church Road, Clacton-on-Sea. The Site comprises hardstanding, in the form of a car parking and pathways, a building, as well as scrub, grassland, and trees. A Site boundary (red line) is shown in Figure 1 below.



Figure 1: Base Map with Site Boundary (Red) from Google Earth, 2023.

1.3 Proposals

The proposals include demolition of the existing building, car park, pathways, and the clearance of scrub, grassland and trees to facilitate the construction of residential flats with associated car park, access road, and private gardens. A proposal plan has been included in Appendix 1 (2248-SK-10-001-G).

1.4 Project Background

A Preliminary Ecological Appraisal (PEA) was prepared by Practical Ecology Ltd on 23rd November 2023² to inform the baseline ecological information pertaining to the Site. The PEA includes the results of a desk study and an ecological walkover survey and the requirement for further surveys and mitigation as deemed appropriate to ensure compliance with legislation and policy.

2 Methods

2.1 DEFRA Statutory Biodiversity Metric

A BNG calculation was undertaken for the Site to provide a quantitative approach to measuring biodiversity for pre- and post-development habitats. These were completed by Amber Stringer MSc, an Assistant Ecologist with over 3 months' experience, using the DEFRA Statutory Biodiversity Metric.

Habitat types were analysed using the UK Habitat Classification system⁵, a habitat classification tool compatible with Statutory Biodiversity Metric calculator. Habitat classification and condition assessments were undertaken during the PEA, which was undertaken by Mike Bailey BA(Hons) PGCE ESAS, a Senior Ecologist with over 12 years of experience, licenced to undertake bat surveys and to disturb bats under Natural England Level 2, 3 and 4 Bat Survey Licences (numbers 2017-28389-CLS-CLS, 2021-10129-CL19-BAT, and 2021-10336-CL20-BAT) and Amber Stringer MSc, an Assistant Ecologist with over 3 months' experience in ecological consultancy.

As part of the BNG assessment, a desk study was undertaken to evaluate the strategic significance of the Site with reference to local plans and strategies and the distinctiveness of the habitats assigned onsite.

Post-development area calculations were taken from Fabric First Architects proposed site plan (see Appendix 1).

The report follows guidance from the Chartered Institute of Ecological and Environmental Management (CIEEM) Biodiversity Net Gain Report and Audit Templates⁶ and has been prepared with regards to the British Standard for BNG BS 8683:2020 and was completed with reference to the CIRIA BNG Good Practice Principles for Development⁷.

2.2 Limitations

There are currently no detailed landscape proposals for the scheme, and therefore assumptions have been made for the purpose of the BNG Metric regarding the specific habitat types and condition of the post-development habitats. These assumptions were considered reasonable and based on all available evidence, however, the calculations should currently be considered an indicative draft rather than a wholly accurate representation of post-development habitats until such a time as detailed landscape drawings are provided. Should a detailed landscape strategy be produced, the BNG Metric calculations should be updated.

Due to the seasonal growth patterns of plants, ecological surveys may be limited by the time of year in which they are undertaken. Some plant species are not readily identifiable in November as distinguishing flowers and fruits may not be visible. Therefore, this survey may not provide a complete list of the plants present, or which may utilise the Site throughout the year. However, due to the nature of the habitats, mapping and recording these types and conditions were assigned using professional judgement with reference to appropriate guidance.

There were no other limitations identified during the site visit or the BNG calculations.

3 Biodiversity Metric Calculations

3.1 Baseline

The pre-development habitats, their areas and condition are available in the metric calculations (which should be read in conjunction of this report) and locations are in the figure in Appendix 2.

The Site area is 0.25 ha and has a pre-development baseline of 0.53 biodiversity units (BU). The value of the Site lies within the 'other neutral grassland' of poor condition and the scattered small and medium trees, mapped as individual urban trees, with the remaining areas of the Site comprising building, car park and paths, mapped as 'developed land; sealed surface', wooden decking area mapped as 'artificial unvegetated; unsealed surface', and introduced shrubs, and ground level planters.

Developed land; sealed surface; car park, ground level planters (u1b; 804, 845)

No condition assessment for buildings, hardstanding, ground level planters, and introduced shrub is required within the BNG metric.

Other neutral grassland, scattered scrub, tree, mown, invasive non-native (g3c; 10, 200, 106, 524)

Areas of other neutral grassland are present in the northern, eastern and western sections of the Site. The grassland was infrequently managed resulting in a varied sward height in places. Grassland species present include perennial ryegrass (*Lolium perenne*), creeping bent (*Agrostis stolonifera*), and false oat grass (*Arrhenatherum elatius*). Forb species present were ribwort plantain (*Plantago lanceolata*), yarrow (*Achillea millefolium*), herb robert (*Geranium robertianum*), common spurge (*Euphorbia peplus*), broad-leaved dock (*Rumex obtusifolius*), ground ivy (*Glechoma hederacea*), groundsel (*Senecio vulgaris* L.), smooth sow thistle (*Sonchus oleraceus*), thistle (*Asteraceae* sp.), cleavers (*Galium aparine*), chickweed (*Stellaria media*), red dead nettle (*Lamium purpureum*), common nettle (*Urtica dioica*), black nightshade (*Solanum nigrum*), and comfrey (*Symphytum* sp.). Other species present were pendulous sedge (*Carex pendula*), and yucca sp.

Tree species present include mature Norway maple (*Acer platanoides*), mature sycamore (*Acer pseudoplatanus*), mature apple (*Malus* sp.), mature purple plum (*Prunus cerasifera* 'Nigra'/'Pissardii'), semi-mature rowan (*Sorbus aucuparia*), and a holly sapling (*Ilex aquifolium*), which were present in the north of the Site. Scattered scrub is present within the grassland comprising bramble (*Rubus fruticosus*), elder (*Sambucus nigra*) and cherry laurel (*Prunus laurocerasus*). Additionally, non-native wall cotoneaster (*Cotoneaster horizontalis*) and buddleia (*Buddleja*) were present on the western and southern boundary. This area of grassland has been assessed as 'poor' and is considered to have low ecological importance. Details of the condition assessment are in Appendix 4.

3.2 Proposed Design

Table 1: The Post-development Habitats Metric

Habitat	Area (ha/km)	Distinctiveness	Condition Aim	BGN Unit Created
Developed Land; Sealed Surface	0.16 ha	Very Low	N/A	0
Other Neutral Grassland	0.03 ha	Medium	Moderate	0.20
Vegetated Garden	0.01 ha	Medium	N/A	0.02
Biodiverse Green Roof	0.05 ha	Medium	Moderate	0.22
Urban Tree	Retained -0.0163 Created -0.1018	Medium	Moderate	Retained -0.13 Created -0.31
Native Hedgerow	0.14 km	Low	Moderate	0.47
Non-native and Ornamental Hedgerow	0.004km	Very Low	Poor	0

The approximate post-development habitat areas are shown in Appendix 3 which were taken from the proposed site plan show in Appendix 1. A summary of the post-development habitats metric from the proposed site plan and recommendations is shown in Table 1 below and should be read in conjunction with the BNG Metric.

The proposals for the Site have been developed with reference to the mitigation hierarchy. This is a stepwise approach first seeking to avoid impacts, then to minimise them, then take onsite measures to mitigation and finally compensation for unavoidable impacts. The Site has been designed to retain features of highest ecological importance, namely the medium tree with the majority of the built development within habitats of lowest ecological importance, namely the developed land; sealed surface, the other neutral grassland, and artificial unvegetated; unsealed surface.

The proposed design for the Site is shown in the proposal plan in Appendix 1 (2248 SK 10-001-G). This includes the loss of c.0.05 ha of ‘other neutral grassland’, c.0.003 ha ‘introduced shrub’ and c.0.0013 ha of ‘ground level planters’ to facilitate the construction of new building, biodiverse green roof, native hedgerow, other neutral grassland, vegetated garden, and non-native and ornamental hedgerow. With the exception of one medium sycamore tree, all small trees are being lost as part of the proposals and replaced with twenty-five small trees.

Within the feasibility plans, a full landscape plan has not been provided. However, an indication on the number and location of trees and replacement other neutral grassland have been recommended to compensate for the losses involved. The proposals should also include a hedgerow and a biodiverse green roof, both of which are not currently habitats present on the Site, providing an additional resource for fauna.

It is proposed that twenty-five small urban trees are planted to compensate for the loss of four small trees, as well as retaining the medium sycamore tree on the northern boundary. All trees have been proposed to be managed to a moderate condition. This can be achieved by the tree being native, the tree canopy is predominantly continuous, with gaps in the canopy cover making up <10%, little or no evidence of adverse impact on the tree health by human activities, no current regular pruning regime, allowing the tree to retain

>75% of expected canopy for their age range and height, more than 20% of the tree canopy area is oversailing vegetation beneath, and natural ecological niches for vertebrates and invertebrates are present, such as cavities, ivy, or loose bark are encouraged. Recommended species include native species or species with a known wildlife benefit including rowan (*Sorbus aucuparia*), wayfaring tree (*Viburnum lantana*), hazel (*Corylus avellana*), dogwood (*Cornus sanguinea*), silver birch (*Betula pendula*), and buckthorn (*Rhamnus cathartica*). This should include a range of plant types that provide a range of resources across different seasons, along with fruit and berry producing species, such as crab apple (*Malus sylvestris*), wild cherry (*Prunus avium*), bird cherry (*Prunus padus*) and rowan (*Sorbus aucuparia*).

Areas of other neutral grassland, managed to achieve a moderate condition have been proposed. This can be achieved by seeding with an appropriate mix including forb, grasses, sedges, and rushes and managed to create a more diverse sward through provide a varied sward height and, bare ground cover between 1% to 5%. This will increase the species richness and sward variation, which will provide better foraging habitat for invertebrates, birds, and small mammals. As well as, ensuring non-native invasive species are kept to below 5% cover.

Along the boundaries of the Site, native hedgerow planting has been suggested. To achieve mixed scrub at 'moderate' condition, >90% of the hedgerow to be free of no schedule 9 of Wildlife and Countryside Act 1981 (as amended) invasive non-native plant species. If the hedgerow as an average height and width larger than 1.5 m, gaps on the hedge canopy under 5 m, and makeup less than 10%, and gaps between the ground and base of canopy under 5 m for 90% of the hedgerow length. Additionally, any damage and invasive and neophyte species was considered under 10% of the hedgerow. Any undisturbed ground and perennial vegetation were greater than 1 m in width, however, within the hedgerow there was dense areas of nettles, causing the condition to be lower.

Additionally, adjacent to the proposed building, ornamental hedgerow planting has been suggested. This habitat does not require a condition assessment within the BNG metric, and so has a condition fixed at poor.

A biodiverse green roof has been proposed, in which will be managed to achieve moderate condition. To achieve this, the vegetation structure is varied, providing opportunities for vertebrate and invertebrate, ensuring a single structural habitat component or vegetation type does not account for more than 80% of the total habitat area. The habitat parcel contains different plants species that are beneficial for wildlife, i.e. flowering species which provide nectar sources for a range of invertebrates at different times of year. As well as, ensuring non-native invasive species are kept to below 5% cover. Additionally, the roof has a varied depth of 80 – 150 mm; at least 50% is at 150 mm and is planted and seeded with wildflowers and sedums or is pre-prepared with sedums and wildflowers.

These recommendations for the post-development habitats for the Site provides 0.89 BU, which results in a net change of 65.99% in habitat units (baseline units = 0.53, post-development units = 0.89). There are no hedgerows present onsite pre-development. Therefore, the creation of hedgerows onsite will create a net gain of 0.47 hedgerow units. Habitats retained and created will be managed and monitored for a minimum of 30 years post-development to satisfy the conditions for BNG in the Environment Act 2021, as well as best practice guidelines. Retained and created habitats should be secured through a Landscape and Ecological Management Plan (LEMP) as a planning condition. The management will be adapted based on monitoring results to ensure the best desired outcomes and conditions are achieved with remedial actions included should habitats fail to establish or reach their target condition.

Additional species-specific biodiversity enhancement measures outlined within the PEA report² be implemented and are detailed in the discussion section of this report. Although these are not included within the BNG metric, these features will further enhance the Site for biodiversity.

3.3 Biodiversity Net Gain Calculations Summary

A summary of the pre- and post-development Metric calculations are shown in Table 2 below.

Table 2: Summary of Onsite Biodiversity Net Gain Calculations

Onsite Baseline Value	Habitat units	0.53
	Hedgerow units	Zero Units Baseline
Onsite Post - development Value	Habitat units	0.89
	Hedgerow units	0.47
On-site Net Unit Change	Habitat units	0.35
	Hedgerow units	0.47
On-site Net % Change	Habitat units	65.99%
	Hedgerow units	-
Total Net Unit Change	Habitat units	0.35
	Hedgerow units	0.47
Total Net % Change	Habitat units	65.99%
	Hedgerow units	Zero baseline units - % cannot be calculated

4 Discussion and Conclusion

4.1 Biodiversity Net Gain

While 10% net gain is a requirement of the Environment Act 2021, the statutory instruments and secondary legislation to mandate this requirement are yet to be put in place with their role-out now deferred by the government until early 2024. Additionally, Tendring District Council encourages net gain, with areas covered under the plan to deliver at least 10% net gain.

The BNG metric indicates the Site could deliver a net-gain of 0.35 BU for area habitats (baseline of 0.53 BU to post-development of 0.89 BU). This represents a net-gain of 65.99% habitat units. Additionally, the BNG metric indicates a net-gain of 0.47 BU for hedgerow (baseline of zero BU to post-development of 0.47 BU, however this cannot be represented as a percentage due to the baseline of 0%.

The trading rules of the metric are satisfied for habitats as same distinctiveness, or better habitats could be delivered onsite through habitat retention and creation.

4.2 Protected Species Consideration

Although not calculable in the metric, the PEA report¹ suggested mitigation and enhancement measures which will provide an overall net gain for biodiversity. These measures include:

- Landscape proposals incorporating night scented plants or those species beneficial to bats;
- A two bat boxes should be integrated or mounted on the new building, at least 3 m high on a south to south western aspect, away from direct light sources and with a clear line of flight;
- Four bird boxes; two 28mm and two 32mm hole fronted boxes to be mounted on trees or on the building and should be placed 2-4m high on a north to north eastern aspect, with a clear flight line;
- Two hedgehog houses could be installed in quiet areas of the Site; and
- A log pile or loggers to provide additional habitat for invertebrates, common amphibians, and small mammals. This can be included in a quiet corner of the Site, possibly in the south-east.

4.3 Conclusion

With the recommendations included within this report for habitat retention and creation, the proposed development could deliver an overall net gain for habitats which is above the national targets of 10% which will be mandatory in early 2024. To inform the BNG Metric and a planning application for the Site, landscape proposals will be required, including details of habitat retention, creation, and enhancements.

References

¹ <http://publications.naturalengland.org.uk/publication/6047259574927360>

² Practical Ecology Ltd, 2023, Colchester Institute, Clacton-on-Sea, PEA Report, Version 1 (December, 2023)

³ Butcher, B., Cary, P., Edmonds, R., Norton, L., and Treweek, J., (2020), UK Habitat Classification – Habitat Definitions V1.1 at <http://uk.hab.org>

⁴ Tendring District Council, 2022. Tendring District Local Plan 2013-2033 and Beyond, Section 2. [online] Available at: https://www.tendringdc.gov.uk/sites/default/files/documents/planning/Planning_Policy/Section_2/Tendring%20District%20Local%20Plan%202013-2033%20and%20Beyond%20-%20Section%20_AC.pdf

⁵ <https://ukhab.org/>

⁶ CIEEM (2021). Biodiversity Net Gain Report and Audit Templates Chartered Institute of Ecology and Environmental Management, Winchester, UK.

⁷ CIRIA (2019) Biodiversity Net Gain. Good Practice Principles for Development (C776F).

Appendix 2: Pre-development Habitat Map



Map data ©2023 Google

Title:	BNG Pre-development Habitats V1
Project:	Colchester Institute, Clacton-on-Sea
Produced by:	Drawings: A. Stringer Reviewed by: S. Curtis
Notes:	Overlaid on Clacton Site Plan Existing
Date:	15/01/2024



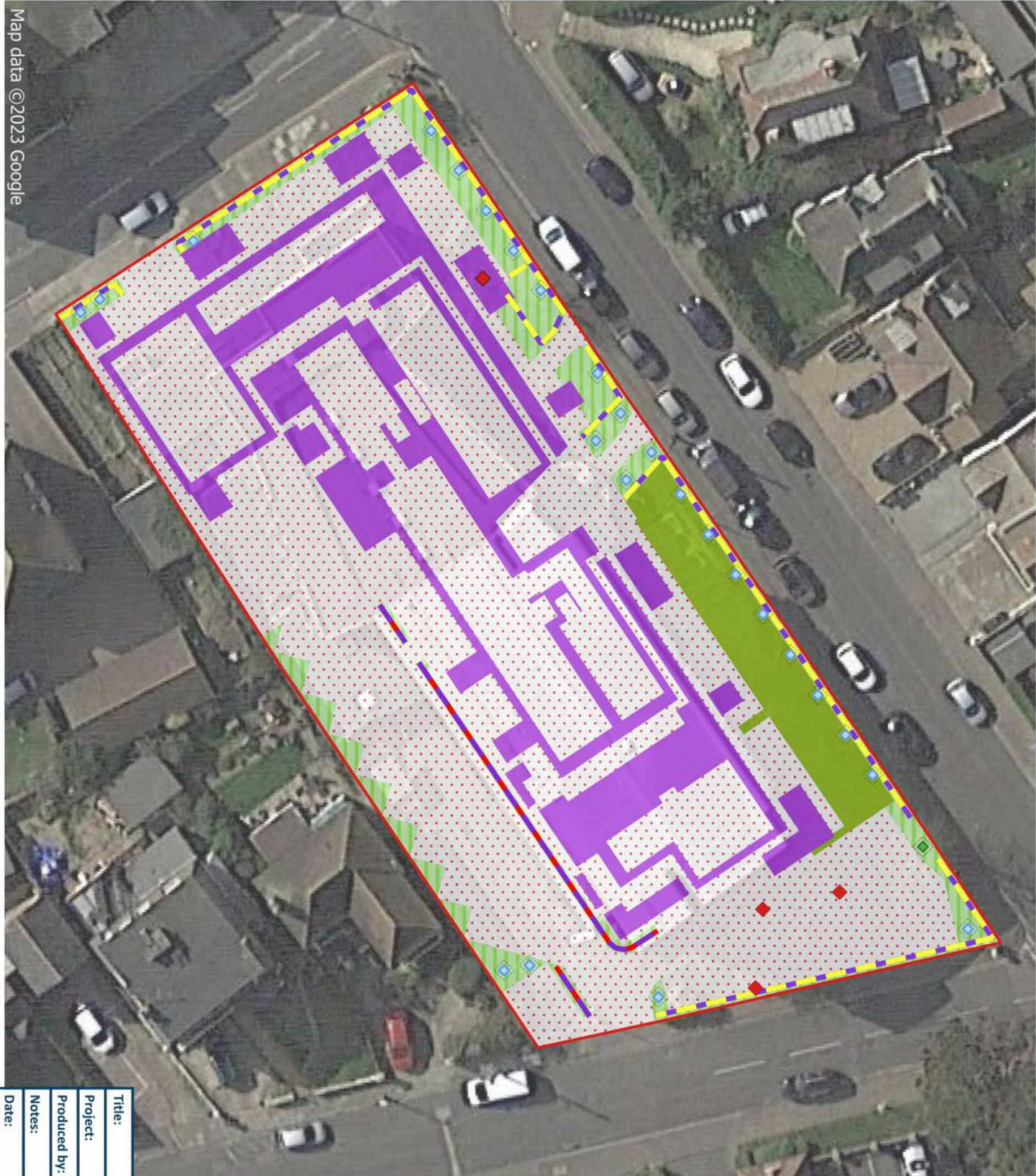
Legend

- Site Boundary
- Developed Land Sealed Surface
- Introduced Shrub
- Artificial Hard Structures
- Ground Level Planters
- Other Neutral Grassland
- Small Urban Tree
- Medium Urban Tree

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Appendix 3: Post-development Habitat Map



Map data ©2023 Google

Legend	
	Site boundary
	New Urban Small Tree
	Retained Urban Medium Tree
	Lost Urban Tree
	Native Hedgerow
	Non-native and Ornamental Hedgerow
	Develop Land Sealed Surface
	Biodiverse Green Roof
	Vegetated Garden
	Other Neutral Grassland



Title:	BNG Post-Development Habitats V1
Project:	Colchester Institute, Clacton-on-Sea
Produced by:	Drawings: A. Stringer Reviewed by: S. Curtis
Notes:	Overlaid on 2248-SK-10-001-G
Date:	15/01/2024



Appendix 4: Condition Assessments of Existing Habitats

Habitat	Condition	Passed Criteria	Failed Criteria
Other Neutral Grassland	Poor	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 – Irregularly managed, so areas of longer sward height.	The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type (and relative to Footnote 3 suboptimal species which may be listed in the UKHab description) - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.
		Cover of bracken Pteridium aquilinum is less than 20% and cover of scrub (including bramble Rubus fruticosus agg.) is less than 5% – No bracken onsite, and some bramble onsite, but less than 5%.	There are 10 or more vascular plant species per m ² present, including at forbs that are characteristic of the habitat type – this criterion is essential for achieving Good condition for non-acid grassland types only. There were not 10 or more vascular plants species per m ² , this habitat had more than 10 species, but not within a m ² as certain species were clustered and not widespread enough.
			Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens – No bare ground onsite.
			Combined cover of species indicative of suboptimal 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 ⁴ (as listed on Schedule 9 of WCA5) are present, this criterion is automatically failed." – Buddleia and cotoneaster are present.
Ground Level Planters	N/A - Other		
Artificial unvegetated, unsealed surface	N/A - Other		
Developed land; sealed surface	N/A - Other		
Introduced Shrub	N/A - Other		

Condition Assessment Criteria (Individual Trees – Urban)	Criterion Passed (Y or N) for each tree/group of trees				
	T1 – Sycamore	T2 – Purple Plum	T3 – Rowan	T4 – Crab Apple	T5 – Norway Maple
The tree is a native species (or at least 70% within the block are native species).	N	N	Y	Y	N
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).	Y	Y	Y	Y	Y
The tree is mature (or more than 50% within the block are mature).	Y	N	N	N	Y
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.	N	N	N	N	N
Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.	N	N	N	N	N
More than 20% of the tree canopy area is oversailing vegetation beneath.	Y	Y	Y	N	Y
Condition	Moderate	Poor	Moderate	Poor	Moderate