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Phase 2 Botanical Survey: UKHabs Survey/NVC/Important Plants Survey/Baseline Habitat Condition Assessment

Survey site address:
1a Boundary Road, Sturmer, Haverhill, CB9 7YH

Client:
John Mayhew

Survey date:
25th August 2025

Project:
This report is prepared to inform a planning application with West Suffolk Council. The proposal is described as the construction of a two storey R&D building.
[Unsubmitted]

Summary of Results and Recommendations

Important Habitats

Parcel	Condition	Distinctiveness	NVC	UKHabs Classification	s.41	Annex 1	Statutory Site	Wildlife Site	Magnitude of Importance
1 (offsite)	Moderate	High	CG3/CG7/MG1e/OV	g2a Lowland Calcareous Grassland	Y	Possible	N	Qualifying	**REGIONAL TO INTERNATIONAL**
2 (onsite)	Moderate	High	CG3/CG7/MG1e/OV	g2a Lowland Calcareous Grassland	Y	N	N	Qualifying	**REGIONAL**
2(i) (onsite)	Poor	High	MG1e	g3a Lowland Meadow	Y	N	N	Qualifying	**REGIONAL**

The remaining habitats (mixed scrub) are of no specific conservation value but have value at the **LOCAL** level. Losses will contribute to net losses of biodiversity.

Important Species

X3 species are considered **Important for being Essex rare and Nationally Scarce**

- Pyramidal orchid *Anacamptis morio* (Increasing nationally but ER)
- Lucerne *Medicago sativa sativa* (Moderate decline, ER)
- Wild marjoram *Origanum vulgare* (ER).

Recommendations

- A **Habitat/Species Translocation Plan** will be required for pyramidal orchid, wild marjoram and lucerne. The selected donor site is the adjacent grassland.
- A **Habitat Management and Monitoring Plan (HMMP)** will be required to fulfil any onsite or adjacent BNG obligations. This will detail how retained/enhanced and created habitats will be managed and monitored.
- A **Landscape Ecological Management Plan (LEMP**) or **Ecological Management Plan (EMP)** is likely to be requested via condition and will include long term management strategies for retained and created habitats not addressed by the BNG HMMP.
- **A Construction Ecological Management Plan (CEMP)** is likely to be requested via condition to address protection of retained habitats on site.

Separately to and regardless of BNG legislation, under Section15(193) of the National Planning Policy Framework (NPPF) (2024) and Circular 06/2005, the Local Planning Authority (LPA) has a duty to consider impacts on Section 41 Habitats of Principle Importance /Designated Sites during determination. The LPA will expect to see a satisfactory mitigation/compensation strategy is agreed or if this is not possible, wholly exceptional reasons (over-riding reasons of public interest) for the development.

Further detailed information including conclusions, justifications and opportunities for enhancement, is provided within the body of the report.

Version control

Status	Issue	Name	Date
Final	1	Fay Brotherhood BSc (Hons) MSc, FISC4, Senior Ecologist & Botanical Specialist	10/09/2025

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1.0 Introduction

<table>
<tr><th colspan="2">Background</th></tr>
<tr><td>Project Context</td><td>Arbtech Consultancy Ltd was instructed to undertake a Phase 2 Botanical Survey (variously referred to as the; “survey, report”). Project, site and client details are named on the title page. A plan of the proposal will be provided in Appendix 1 (when available if not included).</td></tr>
<tr><td>Previous Reports</td><td>Previous ecological reports have been produced for the site, with content relevant to the report. These include the following;

• Preliminary Ecological Appraisal (Arbtech, June 2025)</td></tr>
<tr><td>Rationale for Survey</td><td>Due to the site

1. Containing features indicating the possible presence of Important Habitats and Species (e.g. low nutrient calcareous soils, previously developed land, post-industrial land)
2. Being listed on Magic as hosting or being sited adjacent to Important Habitats.
3. Containing semi-natural habitats such as semi-improved or unimproved grassland or woodland
4. Containing positive indicator species for Important habitats (axiophytes[1])
5. Not being carried out by an FISC4+ botanist

A detailed Phase 2 Botanical survey by a suitably experienced (FISC4+ or equivalent) botanist was required in the form of a
• Combined NVC, UKHabs and Baseline Habitat Condition Assessment & Important Species Survey

Relevant information from the previous survey work is incorporated within the report.</td></tr>
<tr><td>Aims & Scope</td><td>The survey aims via a field visit to (within the limits of proportionality, practicality and the chosen sampling method), to achieve the following;

<table>
<tr><th colspan="2">Task</th><th>Aim</th></tr>
<tr><td>1</td><td>Collect a full species list</td><td>List all species on site, noting Important Plants and axiophytes[2] to determine the presence or likely absence of Important Species. These are defined as any plant species, subspecies or hybrid which is:</td></tr>
</table>
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</table>

[1] Axiophytes = worthy plants”. Indicators of habitat considered important for conservation, such as ancient woodlands, clear water and species-rich meadows.
[2] Axiophytes = worthy plants”. Indicators of habitat considered important for conservation, such as ancient woodlands, clear water and species-rich meadows.

			• Red-listed in England or Great Britain[3] • Occurring at fewer than 100 hectad[4] localities at country or GB level (country-scarce / nationally scarce) • Occurring at fewer than 15 hectad localities at country or GB level (country-rare/nationally rare) • Scarce or rare at regional, county or local level[5] • Undergoing post 1987 declines (BSBI data) • An important population • Listed under s.41 National Environment and Rural Communities Act 2006[6]; and/or • Listed under Schedule 5 Conservation of Habitats and Species Regulations 2017 (as amended); and/or • Listed under Schedule 8 Wildlife & Countryside Act 1981 (as amended). • Endemic
	2	**Classify the Habitat**	Fully (insofar as possible) classify the target habitat/s assisted by both UKHabs and National Vegetation Classification coding.
	3	**Assess Importance**	Identify the presence of any **Important Habitats** and their importance at a geographical level **(LOCAL, REGIONAL, NATIONAL, INTERNATIONAL),** those being. • Listed on local Biodiversity Local Biodiversity Action Plan/list • Habitats-Habitats of Principal Importance (e.g. those under S.41 NERC Act) • Annex 1 Habitats Directive habitats (International importance) • Irreplaceable habitats, which once lost cannot be recreated (Technical note T3 of CIEEM et al, 2019, National Planning Policy Framework 2023, Irreplaceable Habitat Regulations 2024) (International Importance) • Other important (and potentially irreplaceable) habitats such as waxcap grasslands (Local to international importance) • Meets local/county wildlife site criteria.
	4	**Determine the**	Defined as Ecologically Coherent Assemblages associated with specific habitats or conditions and considered to

[3] Following Stroh et al, 2014 A Vascular Plant Red-list for England. Available at: https://bsbi.org/wp content/uploads/dlm_uploads/England_Red_List_1.pdf
[4] Hectad records include records within 10x10km squares. Also see www.bsbi.org/maps
[5] This was ascertained through review of BSBI and British Bryological Society mapped plant distributions.
[6] Including species which are a conservation priority within England.

	presence or likely absence of Important Assemblages	be of high conservation value, up to international importance. Usually concerns the following; • Fungi[7] (e.g Internationally Important = (Grassland fungi (e.g Waxcap (CHEGD+) grasslands), Lignicolous saprotrophic fungi on beech and oak (beech and oak deadwood fungi), Montane heath mycorrhizal fungi, Fungi of Atlantic hazel and Atlantic oakwood + others) • Lichen[8] (Annex 1 assemblages - Temperate rainforest, Hyperoceanic acid montane rock/soils, Southern oceanic woodland assemblage + others)
5	**Perform a Baseline Habitat Condition Assessment**	Collect data to inform the habitat condition assessment required for BNG calculations.

This approach aligns with the characterisation of Important Ecological Features as defined by the Chartered Institute of Ecology and Environmental Management (CIEEM) within standing Ecological Impact Assessment (EcIA) guidelines[9].

The conclusions drawn from the assessment will facilitate the following assessments of;

1) Conservation value of the site.
2) Impacts and their magnitude.
3) Recommendations for compensation, mitigation and/or enhancement.

[7] Bosanquet, S.D.S., Ainsworth, A.M., Cooch, S.P., Genney, D.R, & Wilkins, T.C. (2018). Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 14 Non-lichenised Fungi. Joint Nature Conservation Committee, Peterborough.
[8] Sanderson, N. A., Wilkins, T.C., Bosanquet, S.D.S and Genney, D.R. 2018. Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 13 Lichens and associated microfungi. Joint Nature Conservation Committee, Peterborough
[9] Chartered Institute of Ecology and Environmental Management (CIEEM)., 2022. Guidelines for Ecological Impact Assessment in the UK and Ireland. Available at: https://cieem.net/wp-content/uploads/2018/08/ECIA Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf

2.0 Surveyor and Limitations

Surveyor Experience and Qualifications

The site survey was undertaken by Fay Brotherhood BSc, (Hons) MSc, FISC4, who is a botanical and habitats specialist with qualifications in Countryside Management, Wildlife Conservation and Environmental Management. Professionally, as both a consultant ecologist and a ranger she has 8 years of professional survey experience and over 20 years of amateur experience in the identification of plants, fungi, and more recently, lichens and bryophytes. She actively records in Hertfordshire and her home county of Leicestershire and is a member of the British Botanical Society of Britain and Ireland (BSBI) and the British Lichen Society (BLS).

Date of survey/s	Temperature (°C)	Humidity (%)	Cloud Cover (%)	Wind (km/h)	Rain
25/08/2025	30	45	01	0	None

Limitations

All limitations have been taken into account during the evaluation of the site and requirement for further surveys and mitigation.

Survey Effort	The assessment is based on knowledge of onsite habitat dynamics, wider landscape ecology and individual species ecology and biology as currently understood and whilst every effort has been made to describe the baseline botanical conditions within the survey area, and evaluate these features, this report cannot provide a complete characterisation of the site as this can only be provided via a number of visits carried out over the year to capture late or earlier emerging plant species that may not have been visible at the time of the survey. The grassland on site was impacted by a prolonged period of drought and the survey itself was impacted by the lateness in the season of the survey. This meant most grasses, mosses and Cladonia lichens were unidentifiable, which may have biased results. This was overcome by filling in the gaps left by potential absentees during manual analysis via texts and based on the local authors own understanding of the "Breckish" grasslands of the Lowestoft formation in Herts, Essex and Suffolk.
Biological Records Data (BRD)	Whilst planning policy and professional standards usually call for the inclusion of biological records data (BRD), no data has yet been obtained. • Considering the sites ecological context the purchase of BRD is recommended to provide information on local plant distribution and on the presence of any onsite or adjacent non-statutory sites, to enable a full impact assessment. • Non-Statutory Designated Sites: Where BRD not obtained and there is no publicly available site data, a precautionary assessment of the likelihood of presence in the surrounding area was made.

Desk Study Resources	Data gleaned from the desk study is based upon information provided by third parties. This has not been independently verified by Arbtech Consulting Limited. Publicly data from British Geological Society and the Landis Soilscapes App is of low resolution and ground truthing may be required to inform any required habitat creation works. Data on Magic cannot be relied upon to capture all Important Habitats, especially where they occur at the small and fragmentary scale.
Species-complexes and hybrids	Many cryptic taxa, namely including apomictic species under the genera *Hieracium, Rubus* and *Taraxacum*, could not be identified to species-level due to seasonal constraints. Plants across these genera can only be identified in the presence of all relevant vegetative parts, flowers and/or fruits. Furthermore, most species within these genera may only reliably be identified by country experts, of which there are 3 for *Hieracium,* 6 for *Rubus* and 1 for *Taraxacum*[10]. It is unrealistic to identify all cryptic taxa on any site which were recorded to aggregate level where appropriate. This limitation has therefore been addressed as far as is reasonably practicable and is not considered to be a significant constraint for the purposes of this survey and assessment. In addition to the above, the surveyor is not a specialist bryologist, although every attempt was made to record all visible bryophytes at the time of the survey.

[10] Rich, T., 2022. *The difficult plant problem*. BSBI News, volume 149, pages 23-29.

3.0 Desk Study

Results & Conclusions

The desk study included a review of the magic.gov.uk database for statutory and non-designated sites and relevant non-statutory designations such as Important Plant Areas within a 2km radius of the site (farther afield sites are included if considered relevant to the assessment). Landscape value and context as well as geology and soils is ascertained from Google Satellite and historic imagery as well as important (Schedule 41 NERC) habitats mapped on Magic and geology and soils mapping on British Geological Society Map Viewer and Landis Soilscapes app as well as any specific relevant information found via wider web search. In addition, any granted European Protected Species Licences (EPSL) for Schedule 5 (Wildlife & Countryside Act 1981) for plants held on magic.gov.uk database have been considered where these are within influencing distance of the site. Existing biological records including important and protected species and non-statutory designated sites within a 2km radius were obtained from Sussex Biodiversity Records Centre. The results of the full data search are presented within the accompanying PEA (Arbtech 2023) The results are used to provide a broader picture as to notable species likely to be present within the locale and potentially on site. The collected species list was later analysed against UK red data book lists and local rare plants registers to ascertain conservation value.

Location and Landscape plan in Appendix 2

Landscape Assessment	
Site Context	***National Grid Reference (central point)*** TL68724439 ***Site Area*** Approximately 0.14ha ***Geology and Soils*** The site is underlain by chalk, which itself is overlain by superficial deposits of the calcareous sands and gravels of the Lowestoft formation. The Lowestoft formation is the locally dominant superficial in this part of East Anglia, but here there are transitions ~70m from the site to the alluvial deposits and exposed chalk associated with the Stour Brook ~100m north of the site. These have weathered to form lime rich loamy and clayey soils with slightly impeded drainage and high fertility, suited to base rich pastures and classic chalky boulder clay ancient woodlands with some wetter areas and lime rich flush vegetation. The impeded drainage likely arises from clay dominated areas. ***Aspect & Topography*** The grassland is sited at the bottom of a north facing slope, which rises to 75m at the wider grassland parcels southern boundary, sloping gently, before rising to form a stepped embankment on the approach to the road (possibility that this involves made ground).

Site Description, History & Landscape Analysis

The site comprises a small, chain link and wooden post fence enclosed area of grassland at the edge of the car park of a soft play centre. This forms part of a wider triangle of rough grassland, scrub and an enclosure containing a settling pond at the juncture between the A4143 and A1017 at the southeastern tip of Haverhill. The grassland of which the proposed development area is part is boundaried by dense scrub belts which also run along either side of the two roads. The soft play centre is part of the wider Sturner Hill Industrial Estate and occupies most of the southeastern quadrant of Haverhill.

To the north of the site, across the A143 lies the grassland, trees and woodland/scrub complex of Haverhill Golf club, East Town Park (comprising Coupals Meadow and East Meadow), Millenium Meadow Recreation Ground, the Sturmer meadow path (disused railway) and Sturmer Meadow. The latter site lies immediately adjacent to the sites wider grassland parcel, separated by the road. Through the complex runs the Stour Brook and drains springs and ponds are a regular feature along its corridor, indicating a geology that is hydrologically active.

To the south, across the A1017 lies a network of large arable field, likely historically associated with the estate of Sturmer Hall.. Their layout is substantially different from that illustrated in the 1800's and has been subject to extensive field enlargement via hedgerow removal, most likely through the post war era. Some extant hedgerows are part of the older network but others are delineated by a likely Enclosures era network of generally narrow and gappy hedgerows, with occasional trees. The rural landscape as a whole surrounding Haverhill is a predominantly arable one. Woodlands are scattered throughout this landscape but are very small and highly fragmented, some being set within the middle of fields (likely associated with minor waterbodies or other features, all though none are mapped. A tumulus is recorded in the field to the immediate south, which survives within the current field with a spring close to it, indicating a long period of local land use or the possibility that grassland was present pre-Enclosure.

Site History

the 1800's the site was part of a network of agricultural fields. field layout. Assuming this contained grassland, the grassland on site and running through the verges and lawns of the estate is anticipated to be relic of a locally characteristic grassland type. Construction of the estate began in 1995. Its planning did not pay particular heed to the former hedgerow network in its design and all that remains is the trees/scrub associated with the former line of the Colne Valley Railway and a tributary of the Stour Brook, which appears largely to have been culverted. In 2000, Google Historic Earth demonstrates that a development was present on the site, which appeared to comprise a house and some rough trackways and enclosures that by their mostly vegetated state seem to indicate it was in a state of dilapidation. There remained more grassland parcels than are extant today and there was significantly less scrub, although it appears tree planting had taken place along the roads. The building had disappeared by 2003, with the soft play centre appearing by 2006, which claimed an enclosure of grassland as part of its grounds. The grassland parcels associated with the wider estate remained in situ, with only one to the far northwest being lost. From 2009 scrub began to become more prominent, progressively developing to its current extent. Unmanaged, the grassland will likely eventually be lost.

Figure 1: Development on site illustrated in 2000.

Local Important Habitats	Magic Maps indicates the locale contains fragmented examples of coastal floodplain grazing marsh, good quality semi-improved grassland (indicated by Magic metadata to comprise lowland meadow) and lowland calcareous grassland. The latter is the habitat lying closest to the site at ~714m west and this appears from Magic metadata to be a County Wildlife Site. Their content could reflect species and communities present on site.
Local Designations	**Designated Sites Summary** • The site is not subject to any National Statutory Designation. • The presence of Non-Statutory Designated Sites in the vicinity of the site cannot be established without data from the local Biological Records Centre, however one is known to be present within the wider industrial estate and the wider grassland parcel could well qualify as such. • There is only x1 Statutory Designated Site within 2km of the site and further afield (to ~10km) there is only x1 grassland site, indicating species and assemblages which may be present locally or on site. ***Important Plant Areas (Plantlife)*** The site could be contextually related to the nearest Important Plant Area **(Breckland IPA)** due to similar geological and climatic conditions creating congruity between the species assemblages it is designated for and those likely to be present on site. ***Summarised Botanical Value Map*** This categorises monads (1 x 1 km grid squares) as being of Low, Moderate or High botanical value according to the presence of Rare, Scarce and Threatened (RST) plant species and/or the proportion of Priority Habitat Positive Indicator (PHPI) species (axiophytes). This was developed

as a way of targeting appropriate areas for tree planting (Natural England, 2023) but can be used to assess the likelihood an area may host Important Species and Assemblages.
The site is in an area of **MODERATE** botanical value indicating that there is an increased likelihood of important species and assemblages being present locally.

Non-Statutory Sites

Name	Distance	Citation
No BRD available	N/A	*No available information on Non-Statutory Sites.*
Breckland IPA (Important Plant Area)	23km north	

Statutory Sites

Name	Distance	Citation
Haverhill Railway Walks LNR	~430m north	*. With much of its length now covered with scrub and larger trees, the railway provides a valuable wildlife corridor. It offers food and shelter to a wide range of birds, animals, insects and plants. All five kilometres (3 miles) of the disused line is now part of the Haverhill Local Nature Reserve.*
Ashdon Meadows SSSI	~10km south west	*Ashdon Meadows near Saffron Walden, are a small, but good example of unimproved neutral to calcareous grassland managed as hay meadows. A range of habitats is represented from dry calcareous grassland on the slopes to marshy grassland, fen and willow scrub. The site lies on Chalky Boulder Clay and supports the only known example of these grassland types in north-west Essex. Flora reflecting the transition from dry calcareous to marshy ground includes: Salad Burnet Poterium sanguisorba, Downy Oat Helictotrichon pubescens, Fen Rush Juncus subnodulosus, Fen Bedstraw Galium uliginosum, Ragged Robin Lychnis flos-cuculi with Marsh Marigold Caltha palustris, Greater Birdsfoot Trefoil Lotus uliginosus, Lesser Pond-sedge Carex acutiformis, Hemp Agrimony Eupatorium cannabinum and Purple Willow Salix purpurea on the valley floor.*

Biological Records Data	The BRD has not yet been purchased. BRD will be required to make a full assessment of local flora.

4.0 Field Survey Methodology

Methodology	
Nomenclature	Nomenclature follows that set out in Stace (2019). Nomenclature for other taxa (e.g bryophytes, lichens) use relevant internet resources as taxonomical changes are frequent within these groups.
Data Collection & Species Identification	Collection of species data was augmented with photographs, quadrat and important species/feature grid references and notes on habitat, relative abundance, relationships with other plants, abiotic variables (e.g. soil, aspect, topography) and other comments of note. Quadrat data was collected using an excel sheet on the surveyor's tablet or phone. Species were identified where possible the field. Where not possible, location notes and physical samples were taken in line with reference to codes of conduct for sample collection outlined in Rose et al (2006) and the Botanical Society for Britain and Ireland Code of Conduct and the Wildlife and Countryside Act 1981[11]. Where inappropriate (e.g. rare species), photographic samples were taken illustrating all identifying features. Identification of plants is made primarily via books, reputable online resources and verification by higher level botanists. Where uncertainty remains, the species are recorded to genus level. Any implications for habitat classification or the risk of missing an Important Species are noted in the report as a limitation.
Field Survey Methodology	**NVC Informative** An NVC survey aims to capture all plants present in similar (homogeneous) stands of plant composition and structure. In grassland, the majority of these plants are flowering plants, grasses, rushes and sedges, but some identification of bryophytes may be required for particular communities of plants. The method does not categorise the transition between vegetation types particularly well, and it is advised not to be used in these situations. The composition and structure of plant communities present in similar (homogeneous) stands of grassland was assessed. A brief walk-over of the habitat was undertaken to identify both similar and differing vegetation stands prior to commencing the survey, supported by the predictions made by desk study data. If significantly different communities were found to be present, this information was used to identify distinct sampling areas for quadrat placement. **NVC/UKHabs Methodology** Within relatively homogeneous stands of sufficient size, a minimum of five targeted quadrat samples (relevés) of an appropriate size for the habitat were deployed. These were of a minimum size of 2x2m, which is cited as the minimum acceptable size[12] for botanical data collection in standing guidance provided by Rodwell (2006)[13]. Quadrat survey was not extended for species-poor stands and/or those which are easily recognisable,

[11] Landowner permission is required before any plant may be uprooted

[12] UKHabs operates under 1m^2 methodology, but Rodwell has stated that quadrats under 2m^2 are not sufficient for capturing vegetation data.

[13] Rodwell, J.S., 2006. *National Vegetation Classification: User's handbook*. Available at: https://data.jncc.gov.uk/data/a407ebfc-2859-49cf-9710-1bde9c8e28c7/JNCC-NVC-UsersHandbook-2006.pdf

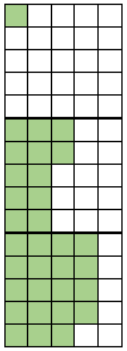
including scrub and swamp vegetation, which was simply described, and surveyed with reference to a) the UKHabs user manual **(UKHabs Working Group, 2018)** and b) **the relevé method (single quadrat or relevé plot (Minnesota Department of Natural Resources. 2007).**

NVC Open habitats	5 (more if considered necessary) 2x2m quadrats are placed within each similar stand corresponding to visually observable changes in vegetative characteristics, with a 10-figure grid reference recorded. 2x2m Quadrat placement choices must avoid single structure types, areas of unusually high species richness, or clear transitional zones to avoid bias and permit representative sampling. Some grasslands do present themselves as a mosaic and this can be captured via even sampling of the different sward and community types within it. It should be noted that swards tend towards variability across sites and transitions can be gradual and unavoidable. To counter this, the surveyor picked areas of sward that were clearly homogenous and displayed less "difference".

Recording Methodology

All plants within the quadrat were recorded alongside an estimation of percentage cover, using the DOMIN scale as illustrated in the table below, or percentage scores (later related back to DOMIN). Percentage totals are permitted to add up to over 100% to factor in the tendency for plants to layer themselves above one another. Measures for frequency during quadrat survey of habitats were calculated using the Domin scale (see table below) dependent upon abundance within any given sample. A constancy value of I-V was calculated for all species across all x5 quadrats.
Percentage covers were estimated by imagining the plant as grouped into a corner or lined against one edge of the quadrat, in terms of the number of squares filled by the plant on a 5 x 5 grid with each square representing 4% as illustrated in the table below.

Cover Estimates



4% of a quadrat
DOMIN = 4
Braun-Blanquet = 1*

48% of a quadrat
DOMIN = 7
Braun-Blanquet = 3

76% of a quadrat
DOMIN = 9
Braun-Blanquet = 5

*Below this = 1-3 on DOMIN or 1 on Braun-Blanquet

Domin Scores

Cover	Domin
91-100%	10
76-90%	9
51-75%	8
34-50%	7
26-33%	6
11-25%	5
4-10%	4
<4% (many individuals)	3
<4% (several individuals)	2
<4% (few individuals)	1

Data Processing & Analysus

UKHabs & NVC

The community on site was classified via methodologies and habitat descriptions set out in the National Vegetation Classification (Rodwell, 1998; Rodwell 2006), and the relevant British Plant Communities Volume (Rodwell, various dates). It was then further classified using UKHabs methodology

(UKHabs Working Group, 2018) using UK Habitat Classification Version 2.01 (UKHab Ltd, 2023). Use of the species lists within this was augmented by the supplementary species list and descriptions for cryptic UKHab grasslands document developed by Joshua Styles MSc AMRSB MCIEEM FISC Level 6. The collected quadrat/transect/releve data was compiled into a Floristic Data Table based on frequency and coverage. Frequency (as denoted by Roman numerals) refers to the number of times a species is found in the quadrats. The descriptive measure of frequency refers to constancy or rarity of species throughout the community. Using the DOMIN (or Braun-Blanquet) scale, species were ordered from greatest coverage and frequency to least coverage and frequency, in the understanding that NVC communities tend to be defined by their constant species.

NVC Frequency Scores		
Frequency class	**Percentage of quadrats**	**Descriptive measure**
V	81 – 100%	Constant
IV	61 – 80%	Constant
III	41 – 60%	Frequent
II	21- 40%	Occasional
I	1 - 20% (1 quadrat of 3 or 5)	Scarce

Table: Frequency scores and transpositions

Data Analysis

Floristic survey data was analysed with use of floristic tables and habitat descriptions across the Rodwell series[Error! Bookmark not defined.] to evidence c haracterisation. The software program. Modular Analysis of Vegetation Information System (MAVIS) (Smart, 2000) from the Centre of Ecology and Hydrology or its recent successor RMAVIS (Marshal et al, 2024)[14] was used to add further support to habitat characterisation. Post analysis, the potential community outputs were interpreted critically, taking into account any additional factors and variables that may impact final assessment. The output of MAVIS includes a series of "confidence scores". It is generally considered that 50% is the threshold for high confidence, whilst between 40-50 is interpreted as a "generally good fit". Where the result was ambiguous, strayed some distance from the surveyors own conclusions, or otherwise suspect, the analysis was ran a second time with any species that may have biased the outcome, such as ruderals, shrubs and tree seedlings. The rational for this is based on the final, open vegetation communities (OV) part of the classification for which the presence of such species may provide a false output for the community by overriding other vegetation.

It should be noted that MAVIS was purely used as a means of supplementary evidence and **was not used as a sole means of identification**. This is because vegetative communities rarely behave in a predictably ordered manner and assigning communities via computer program can be impossible where communities exhibit transitional elements, which many do.
This conforms with the NVC User's handbook which, in point 7.2 states:

[14] Marshall et al., (2024). RMAVIS v1.0: a Shiny application for the analysis of vegetation survey data and assignment to GB NVC communities. Journal of Open Source Software, 9(100), 6682, https://doi.org/10.21105/joss.06682

	"*The ecological interpretation of the results remains the responsibility of the surveyor. All that computer analysis can do is define sample groups on the basis of statistical similarities and differences: to characterise vegetation types from the end-groups produced by such analysis requires skill and experience. For comparison with NVC data, a first step is to construct floristic tables that summarise the frequency and abundance values of the constituent species among the samples.*" ***Species per m^2 Scores*** The quadrats are also used to gain sp/m^2 scores, allowing the compilation of a range and average.
Important Plants Survey	A full walkover of the wider parcel was conducted in an effort to capture as full a species list as is practically possible within the limitations of the survey effort and any timing caveats. The site was methodologically searched in a manner best suited to the site. Particular attention was paid during the walkover to structural elements such embankments, boundaries, slopes, areas of short, grazed grass, areas of hard standing, edge habitats, and other mosaic features and transitional zones, which would have been avoided during NVC sampling but may host niche species. Where important species were identified, abundance and distributional data was captured and mapped. This was tailored to each individual species and was dependent upon a variety of factors, such as growth form and overall extent. If any were identified, their presence, locations and growing conditions were recorded. Notes were made on overall relative abundance (where appropriate) via DAFOR (Dominant, Abundant, Frequent, Occasional, Rare) scores and on any other ecological incidental observations. During the survey, habitats were assessed for the likelihood that they could host any important species listed in the BRD or local citations which may not have been present at the time of visit. An assessment of the conservation value of plants present on site and the geographic magnitude of any impacts is given in **Section 8.0.**
Condition Assessment	The surveyor aimed to capture the relevant data required to inform condition assessment and habitat characterisation for the purposes of any future Biodiversity Net Gain Assessment required for the site. Data was collected to inform the criteria listed within the relevant tab under the Statutory BNG Condition Assessment Excel Workbook (Natural England (2024) and the results are incorporated later within the report.

5.0 Field Survey Result & Habitat Classification/Condition Assessment

Community Characterisation/Condition Assessment

The below table describes and analyses the communities on site, finishing with a condition assessment. An overall site species list is presented in Appendix 5. The below tables provide detail and justification for final UKHabs/NVC community classifications as well as assigning compliance with any criteria for Designated and Non Designated Sites or Priority or other Important Habitats. The data and floristic tables informing this is available in a separate spreadsheet, which can be made available on request.

Grassland Community Classification

Species Richness

The grassland of which the site is part was surveyed as x2 parcels sampling both short and sparse grass and longer areas, each encompassing x5 quadrats. This was done to gain a more comprehensive view of the local NVC subtype to avoid bias created by the plots specific conditions. 50 species of vascular plants (63 when the PEA results were included) were recorded around the wider parcel beyond the site, plus in the early successional parcel 1, x4 bryophytes and at least x1 species of terricolous lichen (*Cladonia* spp.). In parcel 2 (including the proposed development area), which was later successional there was only one species of bryophyte and no lichens.

Both parcels qualified as species rich (>15sp/m^2), when taking an average from the surveyed quadrats. They ranged from **12-26 sp per/2m^2.** Parcel 1 was the most species rich. Parcel 2 (i) is one of the sample plots from the original PEA, which was assessed from the original description rather than being subject to its own assessment.

Parcel	Description	#spp	Sp/m^2 range (bryophytes excluded)	Avg sp/m^2	Spp rich (15 sp/m^2)
1	Short, early successional vegetation	45	17, 21, 26, 25, 20	23	Y
2	Tall herb dominated vegetation (including development area)	28	12, 13, 14, 16, 22	15	Y
2(i)	Central and upper slopes of development area)	6		6	N

Habitat & Community Description

Parcel 1/2/2(i)

Habitat Description

The grassland forming the wider survey area comprises an area of calcareous grassland which has developed over an area of previously developed land**.** It is at present unmanaged but for the grazing of rabbits. **Parcel 1 (wider, offsite grassland parcel)** comprises a series of early to mid-successional areas which appear to have developed over the roadways, former foundations and other built infrastructure

associated with the previous development and continues up-slope towards the road. This is of a generally short average height of around 10cm. **Parcel 2 (development area)** which includes the area occupied by the proposed development site was dominated by tall herbs of up to a metre in length, in particular chalk knapweed *Centaurea debauxii.* The ratio of grass to **herbs/small sedges/bryophytes** appeared to be approximately **10:90** A bryophyte layer was present occupying ~30-50% of cover. This was more complex in the early successional parcel 1, where there was a higher proportion of bare substrate and *Cladonia* lichens (of the pixie cup group) were also present, despite lack of a mowing regime. This can be attributed to the combination of a low nutrient substrate and grazing by rabbits which together will limits growth. The substrate offers a plentiful bare ground resource in these areas and comprises largely sand and gravel, with scattered mixing/piles of building rubble, asbestos and stone of an origin not native to the locale. There was **no thatch,** and the sward was **sparse and open providing** opportunities for smaller species, poor competitors. and the setting of seed. The grassland contained numerous **indicators of calcareous/neutral grassland.**

Parcel 2(i) (central and upper sections of enclosure) supports a taller, closed sward, between 50-100cm, with markedly lower species diversity (Figure 5 & 6), of less than 6 vascular plant species per m^2. The assemblage includes abundant false oat grass *Arrhenatherum elatius*, common knapweed *Centaurea nigra*, ox-eye daisy *Leucanthemum vulgare*, occasional common hogweed *Heracleum sphondylium*, and rare teasel *Dipsacus fullonum*. This area represents a species-poor community and forms a transitional zone from the more diverse sward to the south of the grassland. In addition, natural succession is evident, with scattered scrub becoming established throughout (Figure 7). Scrub species comprise blackthorn *Prunus spinosa*, bramble *Rubus fruticosus*, dogrose *Rosa canina,* and eared willow *Salix aurita,* which was assessed as scoring **POOR** under condition assessment criteria.

Scrub

The proposed development contains some scrub and it is encircled with it on the eastern and southern boundaries, and the wider grassland is being encroached upon by a calcareous scrub assemblage (with bramble)* which has spread from roadside planting. In many places this occurs as scattered scrubs, whilst elsewhere, encroachment has led to replacement of grassland with dense scrub and without intervention, the grassland will likely be en-route to being lost within a decade.

*Comprising **dominant** hawthorn *Crataegous monogyna,* **frequent** dogwood *Cornus sanguineus,* great/goat willow *Salix cinerea/caprea,* dog rose *Rosa canina,* travellers joy *Clematis vitalba,* **occasional** wayfaring tree *Viburnum lantana,* sycamore *Acer pseudoplatanus,* blackthorn *Prunus spinosus*.

Caveats

The survey took place in the optimal period for surveying the habitat type but there are caveats to the above relating to visibility of species and reliability of the data thus collected in the impacts of drought in what was a late season survey. Much of the grass had died off and was either unidentifiable or difficult to identify and it was therefore unlikely that the surveyor captured the full range of graminoids or their true relative abundance. The same applied to bryophytes and *Cladonia* lichens, with only the bulky pleurocarp *Pseudoscleropodium purum* maintaining its likely usual cover. The survey would have missed in its entirety any suite of early season annual ephemerals (therophytes.[15]),

[15] Therophytes = specialists of summer parched habitats which complete their life cycle by late spring and survive summer in seed form.

early flowering orchids and some more delicate species. Some species listed in the June PEA (Arbtech, 2025) were not visible, and the PEA species list is included for the sake of completeness within the community description for Parcel 2 (which includes the development area). Species observed during the PEA but not during the NVC survey are highlighted in **bold.**

Community Description (Parcel x1)	**Community Description (Parcel x2)**
Constant/Dominant (NVC Constancy Class IV/V) **Grasses, rushes and sedges** – red fescue *Festuca rubra,* meadow fescue *Schedonorus pratensis,* false oat grass *Arrhenatherum elatius,* **Forbs** – chalk knapweed *Centaurea debauxii,* wild carrot *Daucus carota,* common ragwort *Jacobaea vulgaris,* ox eye daisy *Leucanthemum vulgare,* hawkweed oxtongue *Picris hieracoides,* agrimony *Agrimonia eupatoria,* yellow wort *Blackstonia perfoliata,* blue fleabane *Erigeron acer,* common restharrow *Ononis repens,* ribwort plantain *Plantago lanceolata* **Bryophytes –** x **Frequent (NVC Constancy Class III)** **Grasses –** common yellow sedge *Carex demissa,* tall fescue *Schedonorus arundinacea* **Forbs –** meadow bedstraw *Galium mollugo,* yarrow *Achillea millefolium,* perforate St John's wort *Hypericum perforatum,* black medick *Medicago lupulina,* cowslip *Primula veris,* selfheal *Prunella vulgaris,* salad burnet *Poterium sanguisorba,* rough clover *Trifolium pratense* **Bryophytes –** neat feather moss *Pseudoscleropodium purum* **Occasional (NVC Constancy Class II)** **Grasses –** common bent *Agrostis capillaris,* **Forbs –** lesser centaury *Centaurium pulchellum, field* horsetail *Equisetum arvensis,* wild marjoram *Origanum vulgare,* coltsfoot *Tussilago farfara* **Bryophytes –** pointed spear moss *Calliergonella cuspidata, yellow* feather moss *Homalothecium lutescens,* unidentified sp.	**Constant/Dominant (NVC Constancy Class IV/V)** **Grasses, rushes and sedges** – red fescue *Festuca rubra,* **Forbs** – chalk knapweed *Centaurea debauxii,* yarrow *Achillea millefolium,* common ragwort *Jacobaea vulgaris,* agrimony *Agrimonia eupatoria,* wild carrot *Daucus carota,* hedge bedstraw *Galium mollugo,* hawkweed oxtongue *Picris hieracoides,* ribwort plantain *Plantago lanceolata* **Bryophytes –** neat feather moss *Pseudoscleropodium purum,* **Frequent (NVC Constancy Class III)** **Grasses –** cocksfoot *Dactylis glomerata,* bramble *Rubus fruticosus* agg, false oat grass *Arrhenatherum elatius* **Forbs –** yellowwort *Blackstonia perfoliata,* **pyramidal orchid *Anacamptis pyramidalis*, meadow vetchling *Lathyrus pratensis*, ox eye daisy *Leucanthemum vulgare,*** **Bryophytes –** X **Occasional (NVC Constancy Class II)** **Grasses –** common bent *Agrostis capillaris,* **sweet vernal grass *Anthoxanthum odoratum*** **Forbs –** rosebay willowherb *Chamanerion angustifolium,* creeping thistle *Cirsium arvense,* blue fleabane *Erigeron acer,* common restharrow *Ononis repens,* creeping cinquefoil *Potentialla reptans,* tall fescue *Schedonorus arundinacea,* meadow fescue *Schedonorus pratensis,* **common vetch *Vicia sativa*, lesser trefoil *Trifolium dubium*, hogweed *Heracleum sphondylium*, teasel *Dipsacus fullonum*** **Bryophytes –** X **Rare (NVC Constancy Class I)**

	Rare (NVC Constancy Class I) **Grasses –** wood sedge *Carex sylvatica,* glaucous sedge *Carex flacca,* sheeps fescue *Festuca ovina,* small cats tail *Phleum bertolonii.* **Forbs –** rosebay willowherb *Chamaenerion angustifolium,* field bindweed *Convolvulus arvensis,* mouse ear hawkweed *Pilosella officinalis,* creeping cinquefoil *Potentilla reptans,* lucerne *Medicago sativa subsp. sativa,* dandelion *Taraxacum agg,* goats beard *Tragopogon pratensis,* Vicia sp (unidentified). **Bryophytes –** x **Lichens** – Terricolous pixie cup group *Cladonia spp.*	**Grasses – perennial ryegrass *Lolium perenne*** **Forbs –** lesser centaury *Centaurium pulchellum,* wild basis *Clinopodium vulgare,* smooth hawksbeard, *Crepis capillaris,* field horse tail *Equisetum arvense,* perforate St John's wort *Hypericum perforatum,* wild marjoram *Origanum vulgare,* creeping buttercup *Ranunculus repens,* **ladies bedstraw *Galium verum,* daisy *Bellis perennis,* fairy flax *Linum catharticum,* goats beard *Tragopogon pratensis,* rough hawkbit *Leontodon hispidus.*** **Bryophytes –** x
	UKHabs Indicator Species Assessment Parcel 1 **Acid:** **Calc:** *Agrimonia eupatoria (D), Centaurea nigra (D), Leucanthemum vulgare (D), Orchids (F?) Poterium sanguisorba (F) Blackstonia perfoliata (D), Ononis repens (D), Origanum vulgare (O)* **X8 (x8 = O-F)** **Meadow:** *Agrimonia eupatoria (D), Centaurea nigra (D) Carex flacca (R), Leucanthemum vulgare (D) Orchids (F) Poterium sanguisorba (F) Tragopogon pratensis (R) Primula veris (F)* **x8, (x7 = O-F)**	**UKHabs Indicator Species Assessment Parcel `2** **Acid:** **Calc:** *Agrimonia eupatoria (D), Centaurea nigra (D) Galium verum (R) Leucanthemum vulgare (F), Orchids (F), Blackstonia perfoliata (F) Ononis repens (O), Linum catharticum (R), Leontodon hispidus, (R)* **x9 (x6 = O-F)** **Meadow:** *Galium verum (R), Centaurea nigra (D) Lathyrus pratensis (R) Leucanthemum vulgare (F) Agrimonia eupatoria (D), Orchidacea (F) Tragopogon pratensis (R)* **x7(x4= O-F)**
NVC	***MAVIS Outputs & Analysis of fit*** MAVIS produced the following outputs, All results returned low confidence scores (substantially under 50). This suggests an unstable community containing elements of all, or one not officially described. It may also reflect a survey effort biased by drought. A second analysis of parcel 2 was performed including the species observed in the PEA that were no longer visible due to drought. These were given frequency scores (1-5) corresponding to their DAFOR scores (an errant methodology but can provide useful data). This did return a more solidified conclusion, raising the confidence score to a moderate one of 40. The fit or lack thereof to any NVC is discussed below, supported by the relevant Rodwell texts and frequency tables.	

Parcel 1 (short)	Parcel 2 (tall)	Parcel 1 (re-run)
NVC: MG1e 36.06	NVC: SD9a 35.60	NVC: MG1e 40.94

NVC: MG1a 31.39	NVC: MG1a 35.35	NVC: MG1a 39.85
NVC: CG3b 31.36	NVC: MG1e 34.19	NVC: SD9a 38.73
NVC: MG1 30.97	NVC: MC11b 33.07	NVC: MG1 38.38
NVC: CG3 30.85	NVC: SD9 33.01	NVC: MG5a 37.67
NVC: CG6 30.83	NVC: MC11 32.10	NVC: SD9 37.21
NVC: MG5a 30.29	NVC: MG9b 31.96	NVC: MG5 36.38
NVC: MG4a 30.02	NVC: MG1 31.91	NVC: SD9b 35.65
NVC: MG5 29.72	NVC: CG6 31.58	NVC: MG9b 35.65
NVC: CG3a 29.60	NVC: MG9 31.00	NVC: MG4a 35.01

Table: MAVIS runs

Manual Analysis

The results from MAVIS are altogether weak, but biased (particularly in the second run) towards **MG1e *Arrhenatherum* neutral grassland *Centaurea nigra* sub-community**, which qualifies as a form of **Lowland Meadow,** representing an unmanaged or degraded derivative or pre-cursor to **MG5 *Cynosurus cristatus-Centaurea nigra* grassland.**

However, the clearly calcareous, stony, thin soils, arid local climate and indicator species component (as supported by the UKHabs assessment (next section)) strongly indicate a form of continental calcareous grassland. This is explored first, prior to mesophytic possibilities.

Any analysis of this site must account for the fact that some members of the grass assemblage were unidentifiable or visually under-represented and as such of the finer leaved, or earlier dessicating Mesobromion members could have been missed. Wider correlations beyond the grasses are analysed, with assumptions made where necessary of species that could be present yet missing from the survey effort.

- ***Calcareous influence***
  The calcareous influence is represented in the MAVIS runs by Mesobromion communities **CG3b *Bromus erectus* grassland *Centaurea nigra* sub-community** and **CG6 *Avenula pubescens* grassland.** MAVIS will have been strongly influenced by the overarching dominance across the site of *Centaurea nigra* and the fact lack management has resulted in a bias towards communities of the Arrhenathereta. CG3b is certainly a “ranker” expression of the community. This does represent a partial fit in terms of the constancy of *C.nigra.* The site also hosts its preferential suite of tall herbs such as *Daucus carota, Jacobaea vulgaris, Galium mollugo* and *Achillea millefolium,* although Rodwell suggests that these should only occur as occasionals, where here they are constants. **Subcommunities CG3c *Knautia arvensis* and CG3d *Festuca rubra-Festuca arundinacea*** also have floristic affinities, with **CG3bc** mirroring the site in the presence of ranker mesotrophic grasses such as *Dactylis glomerata, Phleum pratense subsp. bertolonii, Agrostis spp, Taraxacum, Bellis perennis,* legumes, *Blackstonia perfoliata* and *Centaurium erythraea.* **CG3d** mirrors the site in the high proportions of *Festuca rubra* and *Schedonourus pratensis/arundinacea,* however the site is missing *Knautia arvensis* and *Centaurea scabiosa.* CG3 and 6 would seem to be automatically excluded by the seeming absence of key graminoids of the

	"Mesobromion alliance" (*Bromus erectus, Festuca ovina* agg, *Helictotrichon pratense, Koeleria cristata, Brachypodium pinnatum, Briza media)* (Of the above, only *Festuca ovina* was present, and that at very low levels). However it cannot be denied that the distinctive preferential herb suite is present and therefore the site does contain a CG3 influence. The key to calcicolous grassland in Rodwell should provide the primary analytical source and the output here conflicts sharply with those of MAVIS, which keys the community out around **CG7d *Festuca ovina-Hieracium pilosella-Thymus praecox/pulegioides* grassland *Fragaria vesca-Erigeron acer* sub-community.** (of the Koelerio-Phleon rather than mesobromion) The continental communities of CG7 are a plausible fit for calcareous sands and gravels in East Anglia, occurring over thin, stony, free draining, very low nutrient substrates, under rabbit grazing and including sites subject to historic disturbance. Its type location is Breckland and parts of Portland Down (Salisbury Plain). However, the key does not yield a tight fit due to the absence of some key members such as *Thymus* sp. That does not automatically exclude a community, as key members can be absent for a number of reasons (favouring of some species over others by management variables/loss of species as an inevitability of fragmentation/local variation) and one must look for wider patterns within the community. The community mirrors descriptions of CG7 in the presence of an open sward. *Festuca ovina* should be constant as isolated tussocks, with *Koeleria macrantha* the only other common member of the Mesobromion alliance, the absence of which defines the Xerobromion and therefore aligns better with the site (assuming no members of the grass assemblage were missed). *Festuca ovina* was a rarity in the samples but dessication made it impossible to assess distribution across the site as a whole. *Koeleria* was not identified at all, but this could well have been dessicated beyond recognition by this time of year. *Festuca rubra* can sometimes replace *F.ovina* as the dominant and that appears to be the case here. CG7 as a continental subtype of parched soils is a low competition environment wherein the growth of grasses and vigorous nitrophilic competitors tends to be checked by climate (and rabbits) and is rendered distinctive by a diverse and species rich assemblage of herbaceous dicotylydons, with a range of annual ephemerals (chaemophytes and therophytes) providing a distinctive springtime stamp. Here the community bias does indeed swing further towards herbaceous than grass cover. Bryophytes and lichens are also important and this does appear to be the case locally here, although dessication severely impeded the surveyor's ability to fully assess both species and true levels of cover. Of the core herbaceous constants that define CG7. *Thymus* species are absent from the site as is *Sedum acre. Pilosella officinarum* is present but at very low levels. The community matches in its low relative abundances of Mesobromion herbaceous species, such as such as *Carex flacca, Leontodon hispidus, Sanguisorba minor, Taraxacum* agg and *Galium verum*. It also matches in the presence of a range of "weedy" ruderals, therophyte annuals and pauciennials. These tend not to be abundant but impart a "coarse" look and most of the listed species are present on site at occasional to frequent cover, including *Jocobaea vulgaris, Potentilla reptans, Crepis capillaris (*at low amounts on this site), *Medicago lupulina, Erigeron acer, Blackstonia perfoliata, Centaurea erythraea* and *Linum catharticum.* There is scope for a wide range of smaller springtime therophytes to have been missed. Of the listed bryophytes, *Psuedoscleropodium purum* and *Homalothecium lutescens* were both present and further of the listed species could well be visible after rain (including lichens, which reduced to a dry biocrust were almost impossible to assess but may have included *C. pixidata*).

In conclusion to the discussion of CG7, it would appear that the associate community generally matches but a number of constants are missing or occur at low levels, including some traditionally defining species.

The climate and soils are typical of the continental, arid zone Xerobromion, which in the UK is represented by **CG1 *Festuca ovina-Carlina vulgaris* grassland** and this too was explored but rejected on the fact that whilst it shares some of the ephemerals and pauciennials, it is rare this community is accompanied by *Erigeron acer* and *Jacobaea vulgaris,* which are important on the site. This is also in the UK a community largely restricted to limestone. The Mesobromion. **CG2 *Festuca ovina-Avenula pratensis* grassland** was also assessed to determine fit with the calcareous leaning MG5b which is derived from CG2. This community is more closely associated with chalk downland and tends to be more typical of a continuous, closed, sheep cropped sward which may preclude it, although its relatively even patterns of distribution of a wide variety of herbs with no clear dominance patterns does have affinity with the shorter sward areas of the wider site. Again, the Mesobromion grass assemblage should be present, which was not the case.. It is related to CG7 with which it shares frequent *Thymus* spp and a characteristic member here is *Helianthemum nummularium.* Neither are characteristic here and overall we are pointed back towards the CG7/CG3 connection.

- ***Mesophytic influence***

  The second sphere of exploration lies within the neutral lowland meadow qualifying swards MG1 and MG5 which featured towards the top of the analysys, and both of which contain calcareous leaning expressions. Rodwell himself states that "on brown calcareous soils over lime rich parent materials, it may be difficult to partition samples between MG5 and more mesophytic swards of the Mesobromion". **MG5c *Galium verum* subcommunity** is the one of most calcareous influence, followed by **MG5a *Lathyrus pratensis* sub-community**. In general, the feature distinguishing MG5 from CG types is the abundance of *Festuca rubra* (over *F.ovina*), other than in **MG1d *Pastinaca sativa* sub-community** where the opposite can be true. *Agrostis capillaris* and *Anthoxanthum odoratum* is very much the case for the site*. This remains the case for the **MG1 *Arrhenatherum* neutral grassland** types, which are distinct for coarse leaved tussock grasses, in particular *Arrhenatherum elatius,* and a tall herb element dominated by *Centaurea nigra, Cirsium arvense* and *Urtica dioica.* Here, the *C.nigra* element matches but not the latter two species, which are present but only at low levels. Large umbellifers are also a distinct feature, which is not the case here. The grass component should be a fine leaved one of *F.rubra, Poa pratensis/trivialis, Lolium perenne* and *Elymus repens.* Aside from the clearly dominant *F.rubra,* this did not appear to be the case but was impossible to assess accurately due to conditions.

  Of the sub-communities, calcareous soils are represented by **MG1a vi/vii *Festuca rubra* subcommunity *Centaurea scabiosa/Geranium pratense* variants, MG1d *Pastinaca sativa,* MG1e *Centaurea nigra,* MG1e vi *Pimpinella saxifraga* variant.** The ***Centaurea scabiosa* variant is** excluded based on the lack of that species and the fact *F. rubra* should be replaced with *F.ovina.* However, this community does contain *Agrimonia eupatoria, Hypericum perforatum* and *Galium verum* as preferentials, which is the case on site. The ***Pastinca* sub-community** does have some affinities. Whilst it lacks *Pastinaca sativa* and there is no strong representation of *F.ovina* on site*,* it does match in the abundance of *A. capillaris,* and the fact that *Plantago lanceolata, Achillea millifolium* and *Jacobaea vulgaris* with *Galium verum* to a lesser degree are frequent associates. It also matches for the occasional presence of mesobromion species, *Poterium sanguisorba, Agrimonia eupatoria, Clinopodium vulgare, Origanum vulgare* and the fact that whilst bryophytes are locally abundant in earlier successional areas, they are generally sparse. The ***Centaura nigra* sub-**

community matches in that *Arrhenatherum* is not as consistently dominant but remains constant. The grasses *Avenula pratensis* and *Trisetum flavescens* would not have been visible but the herbaceous species *Agrimonia eupatoria, Leucanthemum vulgare, Jacobaea vulgaris, Hypericum perforatum, F, rubra, Achillea millefolium, Plantago lanceolata, Lathyrus pratensis, Achillea millefolium,* and *Primula veris* are all components. Where this differs from MG1d is the fact there is a well-developed bryophyte layer including *Psuedoscleropodium purum* which is preferentially frequent, and this is very much the case for the site. *Heracleum sphondylium* is common to all forms of MG1 and is frequent in the proposed development area but largely absent elsewhere. A notable absentee across the whole is *Lotus corniculatus* which is a distinct and constant component in both MG1 and MG5.

Returning again to MG5, the community appears to be missing *Cynosurus cristatus* which is a core community member and the relative abundances of core herbaceous components do not quite match, nor does it contain any of the rarities of this community. The *Galium verum* community bears some affinities in the presence of Mesobromiaon herbaceous species and sedges such as *Agrimonia eupatoria, Carex flacca,* and *Poterium sanguisorbum.* This community has a direct relationship with CG2, from which it is thought to be derived, and has already been excluded from the assessment.

**Anthoxanthum presents a wild card in that it was only occasional in the PEA and was not observed during the botanical survey. Despite being early flowering, this usually remains visible well into the season but given the hard conditions it is possible that it has senesced to disintegration or been browsed off.*

- ***Localised variants***
  Another plausible option is that this community represents an un-named calcareous community that appears to be distinct to the calcareous gravels/sands of the Lowestoft formation in Hertfordshire, Essex and Suffolk, which can never be slotted neatly into an NVC community and seem to contain elements of CG1, CG7 and SD8 *Festuca rubra-Galium verum* fixed dune grassland Interestingly this does not appear in the MAVIS analysis, although SD9 *Ammophila-arenaria-Arrhenatherum elatius* dune grassland appears several times. The SD9 influence may be explained by the combination of *Arrhenatherum elatius* and *Festuca rubra* as constants, and SD9a ***Typical* subcommunity** does match in the frequency of of *Ononis repens, Jacobaea vulgaris* and *Crepis capillaris,* however coastal grass *Ammophila arenaria* should be present and is not. It may be that undescribed inland variants exist.

  Further consideration is therefore given to the NVC adjunct documents, which detail a range of recently accepted or proposed post publication additions. In Mountford (2011)[16]

  - OV type Xero-mesophilous weed communities of prickly biennials on nutrient-rich soils ***Onopordum acanthium-Cardus nutans* community** is a continental thistle bed community of the southeast found in fragmentary form on calcareous soils in disturbed

16 Mountford, E. 2011. A compilation of proposed additions and revisions to vegetation types in the National Vegetation Classification. JNCC Report, No. 448.

	and waste places. The site hosts none of its typical species other than *Picris hieracoides* which occurs on site at a constancy rendering it a diagnostic community member. Further sampling is needed to characterise this alliance and its assemblages, o OV type Xero-mesophilous weed communities of biennials on nutrient-rich soils. ***Artemisia vulgaris-Tanacetum vulgare community*** (6)). A continental tall herb community typical of waysides in the southeast. Only two of the listed species are preferential on site, *Daucus carota* and *Picris hieracoides*. The descriptions of both these communities are too vague to be of use beyond the most obvious matches, but these two communities flavour vegetation throughout Breckland and East Anglia, and **OV *Onopordum acanthium-Cardus nutans/Artemisia vulgaris-Tanacetum vulgare* Xero-mesophilous weed community** do not fit closely but are the only community explored by the author that explains the importance of both *Daucus carota* and *Picris hieracoides* across the site. ***Summary*** On balance, the conclusions of the above discussion remain somewhat inconclusive. This is because the survey effort is likely missing earlier appearing members of the community and would have benefited from an earlier view of the grass component and early sampling of ephemeral therophytes, which would have enabled more detailed scrutiny between some closely related communities. Accounting for these limitations, the habitat/s on site is classified under the NVC as a form of calcareous grassland which through lack of management is developing in the direction of a form of MG1 *Arrhenatherum* neutral grassland. It is therefore considered to be transitional between; • **CG3b *Bromus erectus* grassland/ CG7d *Festuca ovina-Hieracium pilosella-Thymus praecox/pulegioides* grassland *Fragaria vesca-Erigeron acer* sub-community** • **OV *Onopordum acanthium-Cardus nutans/Artemisia vulgaris-Tanacetum vulgare* Xero-mesophilous weed community** • **MG1e *Arrhenatherum* neutral grassland *Centaurea nigra* sub-community** For further clarity we turn to the UKHabs Assessment, to determine through its criteria and via indicator species numbers and relative abundance whether the site conforms closest with **Section 41 Habitats of Principle Importance Lowland Meadow or Lowland calcareous grassland** and if the parcels qualify as **Annex 1 Calcareous Grassland.** **Parcel 2(i)** This parcel was not subject to formal NVC analysis but quite clearly complies with **Section 41 Habitat of Principle Importance Lowland Meadow MG1e Arrhenatherum neutral grassland Centaurea nigra sub-community,**
UKHabs Assessment	Using UKHabs coding and habitat descriptions (UK Habs Ltd, 2023), the following assesses the parcels conformation or lack thereof with higher distinctiveness/ **Section 41 Habitat of Principle Importance** acid, neutral and calcareous grasslands and lowland meadow classifications, If the parcel/s do not conform it is then tested against moderate and low distinctiveness grassland subtypes.

Parcel 1/2

To qualify under level 4 high distinctiveness grassland classifications **g2a Lowland calcareous grassland** or **g3a/b lowland meadow,** the parcels would need to adhere to the following criteria;

Meet at least two of the following;

1. >15 sp/m^2 (>12 for acid grassland) (including grasses and excluding bryophytes). **P1/2 PASS – P2(i) FAIL**
2. >30% cover of broadleaved herbs and sedges, excluding *Trifolium repens, Ranunculus repens* and injurious weeds. **PASS**
3. <10% cover of rye grasses and *Trifolium repens.* **PASS**

AND EITHER 4 OR MORE (2 OR MORE FOR g2A) of listed indicators at least 'present' on the DAFOR scale
PASS:
P1: Calcareous X8 (x8 = O-F) Meadow x8, (x7 = O-F)
P2: Calcareous x9 (x6 = O-F) Meadow x7(x4= O-F)
P2(i): Calcareous x2 (x2 = O-F) Meadow x2 (x2 = O-F)

OR THREE OR MORE (1 OR MORE FOR g1A) of these indicators at least 'occasional' on the DAFOR scale (but not limited to field corners or edges).
PASS

P1 and P2 pass all criteria but P2(i) fails on species per m^2. It still passes the criteria overall.
P1: The highest indicator species scores were returned from Calcareous indicators.
P2 (development area) The indicator species score returned equal results for both calcareous and lowland meadow indicators. However, looking at relative abundance scores, the number of calcareous indicator species at occasional to frequent relative abundance scored highest (x6 calc over x4 lowland meadow).
P2(i): The two indicators were shared over both lowland meadow and calcareous grassland

As such, P1 and P2 qualify as **g2a Lowland Calcareous Grassland** and P2(i) qualifies as **g3a Lowland Meadow.**

Annex 1 Calcareous Grassland Assessment
At Level 5, accounting for the fact the analysis was impeded by missing data, the wider grassland parcel **could qualify** as **g2a5 Dry grasslands and scrub on chalk or limestone; Lowland (Annex 1: 6210 Semi-natural dry grasslands and scrubland fascies on calcareous substrates (Festuco-Brometalia))** which subsumes CG1-9 in Lowland England. However, it might not due to its transitional nature and lack of fit to the cited communities. Given the surveys limitations this cannot be asserted with confidence, especially given the fact that on chalk in the Southeast, the presence of qualifying Mesobromion/Xerobromion communities described and included in Europe's but not in the NVC or UK's Annex 1 Habitat descriptions cannot be ruled out. There is also a risk that earlier appearing **Important Species** have been missed.

The proposed development area (**Parcel 2)** is subject to similar limitations, but these have been overcome to a degree by earlier survey in June, which has it running as calcareous grassland on a close boundary with **MG1e *Arrhenatherum* neutral grassland** which qualifies as **s.41 Lowland Meadow** and is therefore unlikely to qualify as **Annex 1 calcareous grassland.**

The proposed development area (**Parcel 2)** is not anticipated to qualify under Priority Feature Important **Orchid Site** as only one common and widespread species **Pyramidal orchid *Anacamptis pyramindalis*** was noted. The orchid value of the wider grassland could not be determined due to lack of earlier survey but the presence of additional species is possible.

In conclusion the proposed development area (Parcel 2) is not anticipated to qualify as Annex 1 Habitat but the wider site could.

Results

The results are summarized below.

Parcel	Distinctiveness	NVC	UKHabs Classification	s.41	Annex 1
1	High	CG3/CG7/MG1e/OV	g2a Lowland Calcareous Grassland	Y	Possible
2	High	CG3/CG7/MG1e/OV	g2a Lowland Calcareous Grassland	Y	N
2 (i)	High	MG1e	g3a Lowland Meadow	Y	N

Condition Assessment

Parcel 1 & 2

Medium/High Distinctiveness Grasslands Condition Assessment Sheet

A. "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). Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only."
P1/P2 = Pass P2 (i) = FAIL

B. Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.
P1/P2 PASS – The sward is of heterogenous height of 7-50cm maintained via **grazing by rabbits**. Arisings from mowing are **left in situ/removed. There was no thatch, and the sward was sparse and open, providing opportunities for smaller species, poor competitors. and the setting of seed. P2 (i) FAIL – Homogenous height and denser sward**

C. Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens[2].
PASS – there is a valuable/excessive bare ground resource of <5%% created by exposed substrate. In the context of this habitat, the bare ground proportion is considered appropriate

D. Cover of bracken Pteridium aquilinum is less than 20% and cover of scrub (including bramble *Rubus fruticosus* agg.) is less than 5%.

PASS – Bracken is not a locally characteristic member of the assemblage. Scrub is not problematic on site (were this applied to the rest of the habitat parcel this criterion would fail on scrub cover which occupies >50%)

E. "Combined cover of species indicative of suboptimal condition[3] 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 species4 (as listed on Schedule 9 of WCA5) are present, this criterion is automatically failed." **FAIL (Parcel 1 *Cotoneaster horizontalis*) PASS Parcel 2/2 (i)**

Additional Criterion - must be assessed for all non-acid grassland types

F. "There are 10 or more vascular plant species per m^2 present, including forbs that are characteristic of the habitat type (species referenced in Footnote 3 and 5 cannot contribute towards this count). Note - this criterion is essential for achieving Good condition for non-acid grassland types only."
P1/P2 PASS – P1 (i) FAIL

For non acid grassland types

Passes 5 or 6 criteria, including essential criterion A and additional criterion F.	Good (3)
Passes 3 - 5 criteria, including essential criterion A.	Moderate (2)
"Passes 2 or fewer criteria; OR Passes 3 or 4 criteria excluding criterion A and F."	Poor (1)

Parcel 1 passes 4 criteria including essential criterion A but fails additional criterion F and is therefore assessed as being in **MODERATE** condition
Parcel 2 passes 4 criteria including essential criterion A but passes additional criterion F and is therefore assessed as being in **MODERATE** condition
Parcel 2 (i) passes 3 criteria, fails essential criterion A and additional criterion F and is therefore assessed as being in **POOR** condition

.

Footnote 1 – Creeping thistle Cirsium arvense, spear thistle Cirsium vulgare, curled dock Rumex crispus, broad-leaved dock Rumex obtusifolius, common nettle Urtica dioica, creeping buttercup Ranunculus repens, greater plantain Plantago major, white clover Trifolium repens and cow parsley Anthriscus sylvestris.
Footnote 2 – For example, this could include small, scattered areas of bare ground allowing establishment of new species, or localised patches where not exceeding 10% cover.
Footnote 3 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement.

	Footnote 4 – Wildlife and Countryside Act 1981 (as amended)."

Photographs

Figure 1 – Parcel 1 viewed from southeastern corner

Figure 2 – Typical open sward of Parcel 1

Figure 3 – Former built infrastructure within Parcel 1

Figure 4 – rubble piles around the wider site

Figure 5 – taller sward of Parcel 1

Figure 6 – orchid assemblage as viewed in June in Parcel 1

Figure 7 – Development area boundary (Parcel 2)

Figure 8 – Development area (Parcel 2)

Figure 9 – Grassland viewed in June, dominated by knapweed and ox eye daisy, clearly transitioning to MG1e.

Figure 10: Mown lawn of soft play centre contains same assemblage as elsewhere

Figure 10: Mown lawn of embankments around soft play centre also features calcareous grassland

6.0 Incidental Observations

Incidental Observations	
Invertebrates	The survey was carried out on a fine and hot day of optimal flighting conditions for invertebrates. Invertebrate populations on site appeared to be abundant •
Reptiles & Mammals	The site and wider environs offer high habitat value to reptiles. A common lizard was observed at the southeastern corner of the wider site at TL686443
Non-native invasive species	Wall cotoneaster *Cotoneaster horizontalis* was present in places but was not at this time presenting a major problem. Left unmanaged it will.

7.0 Preliminary Wildlife Site and SSSI Assessment

Wildlife Site and SSSI Assessment	
Surrey Wildlife Site Criteria	The wider site is assessed for ***Compliance with Essex Wildlife Site Criteria***[17] **Lowland Meadows** **1.** All old, largely unimproved grasslands qualifying as MG5 or Essex Natural Area Priority Grasslands MG4 & MG8 – **FAIL** **Other Neutral grasslands** 1. Old, unimproved swards and more recent grasslands that do not qualify as MG5 or do not meet a known NVC community but have "demonstrable nature conservation value". They should support a diverse assemblage of flowering plants (herbs and grasses) or be the only grasslands present within a significant part of the county – **PASS – the grasslands around the estate represent some of the only semi-natural, species rich grassland remaining around Haverhill, most of it being lost to development.** 2. An example of the above that enhances invertebrate habitat, support notable populations of invertebrates and/or is deemed part of the essential foraging range of an invertebrate species of conservation interest. **UNKNOWN without further survey and/or data but likely PASS**

[17] https://www.chelmsford.gov.uk/media/el0kfhov/eb-103f-local-wildlife-site-selection-criteria.pdf

	3. An example of the above that contains features indicating long habitat continuity **– POSSIBLE PASS –development area contains anthills, although these aren't always concludive evidence of long continuity. Wider site subject to disturbance since 2000, although it is possible grassed areas around previous development were older.** **Lowland calcareous grassland** **1.** n Essex, surface exposures of chalk are restricted to the extreme north-west around Saffron Walden, and in the south, around Grays and Purfleet. The former areas w ere doubtless long-ago sheep walks – open extensively grazed sheep pastures – but have for many decades now been under arable cultivation, As a result, areas of recognisable chalk grassland flora in Essex are virtually limited to roadside verges, the narrow fringes along the clifftops of old quarries and churchyards. The extreme rarity of chalk grassland in Essex suggests that all sites supporting assemblages of chalk grassland species (see Appendix 5) should be considered for selection, with no lower size limit imposed. **PASS** **Species Criteria** 2. Only x2 calcareous grassland species listed in Appendix 5 are required to trigger eligibility as a wildlife site under Lowland Calcareous Grassland criteria. Of those, the wider site (**Parcel 1)** contains at least x4 and x2 were present in the development area. o Pyramidal orchid *Anacaptis pyramidalis* o Yellow wort *Blackstonia perfoliata* o Wild marjoram *Oreganum vulgare* o Salad burnet *Poterium sanguisorba*
SSSI criteria (Grassland)	A full SSSI assessment is not practical or appropriate in the context of this assessment but whilst the development area (Parcel 2) is unlikely to qualify alone, it is possible, given a fuller survey effort that the wider grassland of parcel 1, to which parcel 2 is functionally linked could conform with the SSSI qualification criteria laid out in Jefferson et al (2014) SSSI Guidelines - Chapter 3 - Lowland Grasslands 2014[18]

8.0 Assessment of Conservation Importance & Impact Assessment

Conservation Importance	
Assessment Methodology	Following the identification of stand types to community and, where possible, sub-community level, habitats, assemblages and species on site were assigned their conservation value and geographic importance.

[18] Jefferson, R.G., Smith, S.L.N. & MacKintosh, E.J. 2014. Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 3 Lowland Grasslands. JNCC, Peterborough. https://data.jncc.gov.uk/data/cf50f420-1b38-4253-89f8-1cb7ba010f27/SSSI-Guidelines-3-LowlandGrasslands-2019.pdf

A broad range of core best-practice guidance and legislation was used to support characterisation and assessment of importance, which includes the following:

- Biodiversity Gain Requirements (Irreplaceable Habitats) Regulations 2024[19]
- Joint Nature Conservation Committee (JNCC) UK BAP Priority Habitat descriptions[20]
- Guidelines for the Selection of Biological Sites of Special Scientific Interest (SSSIs)[21]
- JNCC supplementary advice on UK Annex I habitats[22]
- The Interpretation Manual of European Union Habitats[23]
- Local Wildlife Site Criteria

Following the identification of sward/stand types and important taxa, the relative importance of these along a geographic frame of reference was characterised. This was achieved with use of the below framework (Table 3.3), adapted from existing guidance including EcIA guidelines[24] and the Design Manual for Roads and Bridges, LA 108: Sustainability & Environment Appraisal LA 108 Biodiversity[25]

The conservation value of individual species was gleaned from the BSBI Plant Atlas 2020[26], any available BRD, the county Rare Plant List and the British Lichen and Bryophyte Societies websites and online resources.

Geographic scale	Assessment criteria for habitats Standards for Highways (2020) the Design Manual for Roads and Bridges, LA 108: Sustainability & Environment Appraisal LA 108 Biodiversity
International	European designated sites where identified habitats are a listed feature, including SACs and Ramsar sites for example. All habitats listed within Annex I Habitats Directive (Interpretation manual of EU Habitats link: https://www.mase.gov.it/sites/default/files/archivio/allegati/rete_natura_2000/int_manual_eu28.pdf).
National	• Nationally designated sites where identified habitats are a listed feature, including SSSIs and NNRs as examples. • All habitats which meet relevant criteria for a national designation but do not currently form part of such a designation (SSSI selection guidelines link: https://jncc.gov.uk/our-work/guidelines-for-selection-of-sssis/

[19] Available at: https://www.legislation.gov.uk/uksi/2024/48/contents/made
[20] Available at: https://jncc.gov.uk/our-work/uk-bap-priority-habitats/#list-of-uk-bap-priority-habitats
[21] Available at: https://jncc.gov.uk/our-work/guidelines-for-selection-of-sssis/#part-2-habitat-chapters
[22] Available at: https://sac.jncc.gov.uk/habitat/
[23] European Commission., 2013. Interpretation Manual of European Union Habitats. Available at: https://www.mase.gov.it/sites/default/files/archivio/allegati/rete_natura_2000/int_manual_eu28.pdf
[24] Available at: https://cieem.net/wp-content/uploads/2018/08/EcIA-Guidelines-v1.3-Sept-2024.pdf
[25] Standards for Highways., 2020. Available at: https://www.standardsforhighways.co.uk/search/af0517ba 14d2-4a52-aa6d-1b21ba05b465
[26] https://plantatlas2020.org/

	• All irreplaceable habitats which do not fall under Annex I habitat categories, including some examples of ancient woodland, saltmarsh and lowland fen for example
Regional	• All semi-natural national priority habitats which do not fulfil relevant criteria for a national designation and/or do not fall under defined irreplaceable habitat categories. • Habitats which lie within regionally designated sites where those habitats are a listed feature. • Habitats which meet published selection criteria for the designation of a regionally designated site.
County	• Habitats which lie within county designated sites (e.g. Local Wildlife Sites) where those habitats are a listed feature. • Habitats which meet published county designated site criteria
Local	• All habitats which do not meet the above criteria such, excluding habitats of negligible value to wildlife (e.g. hardstanding with no colonising vegetation). This may include widespread habitats such as g3c Other neutral grassland, g4 Modified grassland, etc.
Negligible	• Habitats which are unvegetated and associated with negligible wildlife interest (i.e. unvegetated hard standing)

Important Habitats

Habitats & Conservation Importance

Important Habitats of High Conservation Value

- Listed on local Biodiversity Local Biodiversity Action Plan/list (Local to National Importance)
- Habitat of Principal Importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006)
- Annex 1 Habitats Directive habitats (International importance)
- Irreplaceable habitats, which once lost cannot be recreated (Technical note T3 of CIEEM et al, 2019, National Planning Policy Framework 2023, Irreplaceable Habitat Regulations 2024) (International Importance)
- Other important (and potentially irreplaceable) habitats such as waxcap grasslands (Local to international importance)
- Meets local/county wildlife site criteria or designated as Non-Statutory Site.

Losses felt at COUNTY/REGIONAL/NATIONAL/INTERNATIONAL Magnitude

Habitats	Conservation Designation/Importance
1. **g2a Lowland Calcareous Grassland (Parcel 2 - onsite)** 2. **g3a Lowland meadow (Parcel 2 (i) – onsite)**	• Habitat of Principal Importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006) (**REGIONAL/NATIONAL** importance)

Potentially Important Habitats of High Conservation Value

Seasonal or survey effort constraints would necessitate further assessment via NVC survey by an FISC4+ botanist over 1 or more visits for clear classification.

Habitats	Conservation Designation/Importance
1. **g2a Lowland Calcareous Grassland (Parcel 1 - offsite)**	**POSSIBLE** Annex 1 Habitat (**INTERNATIONAL** importance)

Habitats of Low Conservation Concern
Not fulfilling criteria for Important Habitats. Common, widespread and easily re-creatable but providing an important resource for local wildlife, with losses felt at **LOCAL** magnitude and addressed via BNG.

Habitats	Conservation Designation/Importance
1. **h3h Mixed scrub (offsite)**	Low distinctiveness habitat of **LOCAL** conservation value.

Habitats of Negligible Conservation Concern
Unvegetated and associated with negligible wildlife interest (i.e. unvegetated hard standing)

Habitats	Conservation Designation/Importance
N/A	**N/A**

Important Species

The below table lists the conservation designations of **Important Species** within the parcels as drawn from the BSBI Plant Atlas 2020, the Essex Rare Plant Register and the British Lichen and Bryophyte Society online distribution resources.

Scientific Name	Common Name	Conservation Designations & Status
Anacamptis pyramidalis	Pyramidal orchid	Increasing nationally but Essex rare – abundant in handful of sites on the chalk, otherwise sporadic on verges
Medicago sativa sativa	Lucerne	Post 1987 moderate declines– native on Thames valley, casual elsewhere in Essex
Origanum vulgare	Wild marjoram	Essex rare – being lost on chalky boulder clay due to flailing/scrub encroachment

X3 species are considered **Important for being Essex rare and Nationally Scarce**

Schedule 9 Invasive species (s.9 WACA) – Locations marked on habitat maps in Appendix.

	No Schedule 9 Invasive Species are present on site. But one is present in Parcel 1 (offsite) None occur at a density that is at present particularly problematic • *Cotoneaster horizontalis* wall cotoneaster **In addition, the habitat would be suitable for the following bryophytes and considering that the bryophyte component of the site could not be satisfactorily sampled, there is a risk that an unidentified population may be present.** • chalk screw moss *Tortula vahliana,* a species of disturbed calcareous substrates, which is thought extinct in Essex • Large celled flapwort *Lophozia capitata (Nationally vulnerable – Possibly now extinct in Essex)* • Chalk notchwort *Lophozia perssonii (Possibly now extinct in Essex)* • Ribbon wort *Pallavicinia lyellii (Probably extict in Essex)* Other Essex vascular plant rarities that could have been present but not visible at the time of survey on account of having likely senesced include (amongst others) fine leaved sandwort *Minuartia hybrida,* field mouse ear *Cerastium arvense,* dwarf chickweed *Moenchia erecta,* four leaved allseed *Polycarpon tetraphyllum,* knotted pearlwort *Sagina nodosa, Trifolium scabrum, Centaureum pulchellum, Clinipodium acinos,* Autumn squill *Scilla autumnalis,* wall bedstraw *Galium parisience (2 sites known at Saffron walden),* cornsalad *Valerianella dentata*
Impact Assessment	**HABITATS** The development will without avoidance, mitigation or compensation lead to destruction of an **Important Habitat** in the form of a **Section 41 Habitat of Principle Importance, that may also represent Wildlife Site Qualifying Habitat.** Impacts will be of **COUNTY/REGIONAL** magnitude and will incur a substantial Biodiversity Net Loss. Via construction related impacts, the development could without avoidance, mitigation or compensation lead to damage/degradation to adjacent **Important Habitat** in the form of a **Section 41 Habitat of Principle Importance, that may also represent Annex 1 Habitat and Wildlife Site Qualifying Habitat.** Impacts could be of **REGIONAL to INTERNATIONAL** magnitude. **DESIGNATED SITES** The development will lead to Destruction/damage/degradation to/of a designated, qualifying as such, or functionally linked habitat, in the form of a **Wildlife Site.** **IMPORTANT SPECIES (PLANTS)** The development could, without mitigation lead to; o Individual destruction of plants of local and national importance, including species which are **Essex Rare or otherwise in decline.**

9.0 Recommendations & Enhancements

<table>
<tr><th colspan="2">Recommendations & Enhancements</th></tr>
<tr><td colspan="2">Recommendations</td></tr>
<tr><td>Habitat and Species Retention</td><td>
The site contains Important Habitats and the LPA will need to have due consideration for this in their decision making under the NPPF (2024).

Separately to and regardless of BNG legislation, under Section15(193) of the National Planning Policy Framework (NPPF) (2024) and Circular 06/2005, the Local Planning Authority (LPA) has a duty to consider impacts on Section 41 Habitats of Principle Importance/Irreplaceable Habitats/Designated Sites during determination. If no satisfactory mitigation/compensation strategy is agreed and there are no wholly exceptional reasons (over-riding reasons of public interest) for the development, then planning permission may be refused.

Any damage to or loss of Important Habitats/Species/Designated Sites must be avoided, mitigated or compensated as per the Mitigation Hierarchy as supported by the Statutory DEFRA BNG metric OR a bespoke LPA agreement if BNG is not achievable.

Application of the Mitigation Hierarchy
Separately to and regardless of BNG legislation, under Section15(193) of the National Planning Policy Framework (NPPF) (2024) and Circular 06/2005, the Local Planning Authority (LPA) has a duty to consider impacts on Important Habitats and Species during determination. If no satisfactory mitigation/compensation strategy is agreed and there are no wholly exceptional reasons (over-riding reasons of public interest) for the development, then planning permission may be refused.

Developers must follow the “avoid, mitigate, compensate” process chain of the mitigation hierarchy. The developer must demonstrate that they have sufficiently explored (and ruled out feasibility of) alternative options in terms of avoidance (alternative sites) and onsite retention/mitigation. Compensation should be presented as a last resort once all other options have been fully explored. Options are explored below.

<table>
<tr><th>Hierarchical Level</th><th>Mitigation Measures</th></tr>
<tr><td>Avoidance</td><td>As a first port of call, important habitats and species should be retained within the wider site design. To this end the following recommendations are made

Possible avoidance measures include;
• Remove as little habitat as possible beyond that required to facilitate the development.
• Following the principles of the Garden City movement[27], encapsulate as much existing green infrastructure e.g hedges, trees, watercourses and grassland (in the form of verges, lawns, greens, amenity space etc)</td></tr>
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</td></tr>
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[27] As embodied by Ebenezer Howard’s treatment of Welwyn Garden City, in which natural features were retained and integrated throughout to provide residents the social benefits of a

		into the development as possible to ensure existing flora and fungi communities (alongside the soil communities) are preserved within the developments grassed areas and can spread throughout any new green space. • Encapsulate locations of **Important Species** into areas of retained green space. • Retain all woodlands. • Enhance existing grassland via overseeding rather than destroying turf to create new "wildflower meadows". Adding new species and genetic material to the established grassland systems can cause local ecological damage by altering a locally characteristic assemblage/and/or polluting the local gene pool with non-native or non-local material. Use of green hay from local sites is a more ecologically sound strategy of enhancing grassland. Where avoidance is not possible, mitigation or compensation is required.
	Mitigation	Possible mitigation measures include • Translocate I**mportant Species** if their locale cannot be encapsulated into the development as greenspace. • Translocate the habitat. Neither avoidance nor mitigation is possible, compensation is required.
	Compensation	If the client has access to adjacent or nearby land, possible compensation measures include; • Create new grassland or enhance existing grassland to a higher value community and condition • Ensure all new habitat is designed to conform to a locally appropriate NVC community. If the client has **NO** access to adjacent or nearby land which may be suitable for compensatory habitat creation and as such, compensation can only be achieved via financial contributions under BNG/Bespoke LPA agreement
Further Survey	Whilst the survey is likely to have missed the assemblage of early spring/summer, the data gathered thus far is considered sufficient to inform an appropriately robust assessment of the habitat on site. However, the survey was carried out late in the season which means a good spread of peak season species were accounted for, however drought impeded the survey and bryophytes as well as plants of the early season were missed. However, whilst an earlier season survey would be required for the main grassland parcel, on the site itself, the risk of missing **Important Species** is reduced by the fact a June survey has already taken place and as such **no further surveys are required.**	

marriage between town and country living. This has resulted in the preservation of a relic meadow/acid grassland flora permeating the town and persisting 100 years later.

BNG	**Biodiversity Net Gain** A Biodiversity Net Gain (BNG) Assessment will be required to ascertain and determine the difference between the baseline and post development habitat value of the site. The development must achieve a 10% gain in habitat units if it is to achieve BNG. Developers must aim to achieve BNG on site or in land immediately connected to it. Should BNG not be achievable on site, the gains must be achieved via offsite measures. These take the form of BNG credits towards biodiversity improvement works on alternative BNG land. These are designed to be used as last resort and are paid per habitat unit. A legally binding Habitat Management and Monitoring Plan will be required to detail how BNG habitats would be managed into the future for at least 30 years. As Section 41 Habitats are present on site BNG is not likely to be achievable and a bespoke agreement with the LPA is likely to be required.
Management Plans	• A **Habitat/Species Translocation Plan** will be required for pyramidal orchid, wild marjoram and lucerne. The selected donor site is the adjacent grassland. • A **Habitat Management and Monitoring Plan (HMMP)** will be required to fulfil any onsite or adjacent BNG obligations. This will detail how retained/enhanced and created habitats will be managed and monitored. • A **Landscape Ecological Management Plan (LEMP**) or **Ecological Management Plan (EMP)** is likely to be requested via condition and will include long term management strategies for retained and created habitats not addressed by the BNG HMMP. • **A Construction Ecological Management Plan (CEMP)** is likely to be requested via condition to address protection of retained habitats on site.
Enhancements	
Grassland	• Any enhancements or habitat creation must focus around locally appropriate calcareous grassland communities.

10.0 Bibliography

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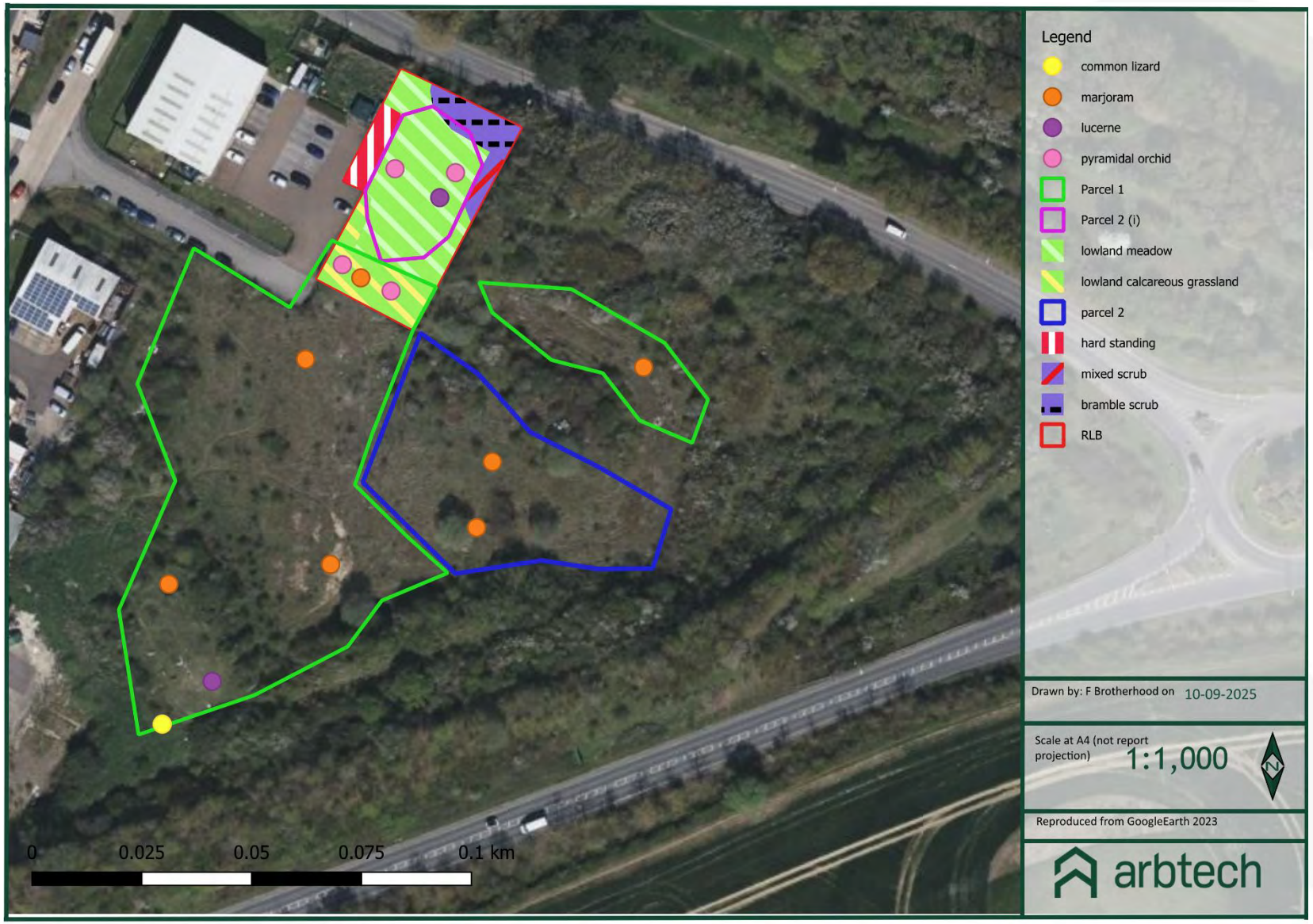
Appendix 1 – Habitat Classification Map



Appendix 2 – Floristic Tables

Parcel 1

Species	Common Name	Cover (DOMIN scale)					Frequency calculator	Min Domin	Max Domin	Abundance Range
Centaurea debauxii	chalk knapweed	5	2	6	4	4	V	2	6	2_6
Daucus carota	wild carrot	4	2	4	3	4	V	2	4	2_4
Festuca rubra	red fescue	5	3	3	3	3	V	3	5	3_5
Jacobaea vulgaris	common ragwort	3	2	2	3	3	V	2	3	2_3
Leucanthemum vulgare	ox eye daisy	3	3	3	4	5	V	3	5	3_5
Picris hieracoides	hawkweed oxtongue	4	3	4	5	5	V	3	5	3_5
Schedonorus pratensis	meadow fescue	4	5	3	2		IV	2	5	2_5
Agrimonia eupatoria	agrimony	2		3	3	4	IV	2	4	2_4
Arrhenatherum elatius	false oat grass	4	3		2	3	IV	2	4	2_4
Blackstonia perfoliata	yellow wort	3	2	2	1		IV	1	3	1_3
Erigeron acer	blue fleabane	-	3	2	2	2	IV	2	3	2_3
Ononis repens	common restharrow	2	4	-	4	2	IV	2	4	2_4
Plantago lanceolata	ribwort plantain	2	3	4	3	-	IV	2	4	2_4
Galium mollugo	hedge bedstraw	3	2	3			III	2	3	2_3
Achillea millefolium	yarrow	4	2	3			III	2	4	2_4
Carex demissa?	common yellow sedge		1		2	1	III	1	2	1_2
Hypericum perforatum	perforate St John's Wort	-	2	2	-	2	III	2	2	2_2
Medicago lupilina	black medick	-	-	4	3	2	III	2	4	2_4
Primula veris	cowslip	-	-	4	2	2	III	2	4	2_4
Prunella vulgaris	self heal	-	2	2	-	2	III	2	2	2_2
Poterium officinalis	salad burnet			2	4	3	III	2	4	2_4
Schedonorus arunindancea	tall fescue		1	4	2		III	1	4	1_4

Trifolium pratense	red clover			2	2	3	III	**2**	**3**	**2_3**
Pseudoscleropodium purum	neat feather moss	-	1	4	4	-	III	**1**	**4**	**1_4**
Centaurium pulchellum	lesser centaury		2			1	II	**1**	**2**	**1_2**
Agrostis capillaris	common bent			2		2	II	**2**	**2**	**2_2**
Calliergonella cuspidata	pointed spear moss				3	7	II	**3**	**7**	**3_7**
Equisetum arvense	field horsetail	-	1	3	-	-	II	**1**	**3**	**1_3**
Homalothecium lutescens	yellow feather moss	5	2	-	-	-	II	**2**	**5**	**2_5**
Origanum vulgare	wild marjoram	5	-	2	-	-	II	**2**	**5**	**2_5**
Moss	moss		2	5			II	**2**	**5**	**2_5**
Tussilago fargara	coltsfoot	1			1		II	**1**	**1**	**1_1**
Carex sylvatica	wood sedge		1				I	**1**	**1**	**1_1**
Carex flacca	glaucous sedge				2		I	**2**	**2**	**2_2**
Chamanerion angustifolium	rosebay willowherb	-	-	3	-	-	I	**3**	**3**	**3_3**
Cladonia spp	pixie cup x3 spp.	-	5	-	-	-	I	**5**	**5**	**5_5**
Convolvulus arvensis	field bindweed	-	-	2	-	-	I	**2**	**2**	**2_2**
Festuca ovina	sheeps fescue	-	4	-	-	-	I	**4**	**4**	**4_4**
Phleum bertolonii	small cats tail	-	-	2	-	-	I	**2**	**2**	**2_2**
Pilosella officinalis	mouse ear hawkweed	-	-	-	2	-	I	**2**	**2**	**2_2**
Potentilla reptans	creeping cinquefoil	-	-	3	-	-	I	**3**	**3**	**3_3**
Medicago sativa sativa	lucerne			1			I	**1**	**1**	**1_1**
Taraxacum agg	dandelion					2	I	**2**	**2**	**2_2**
Taragopogon pratensis	goats beard				1		I	**1**	**1**	**1_1**
Vicia sativa	common vetch				1		I	**1**	**1**	**1_1**
	Total number of species per quadrat	17	26	30	26	21	24			
	Bryophytes Excluded	16	24	29	25	20	22.8			

Parcel 2

Species	Common Name	Cover (DOMIN scale)					Frequency calculator	Min Domin	Max Domin	Abundance Range
Achillea millefolium	yarrow	2	3	3	4	3	V	2	4	2_4
Centaurea debauxii	chalk knapweed	8	8	5	8	9	V	5	9	5_9
Festuca rubra	red fescue	7	7	7	8	7	V	7	8	7_8
Jacobaea vulgaris	common ragwort	3	4	5	2	3	V	2	5	2_5
Pseudoscleropodium purum	neat feather moss	7	5	7	4	5	V	4	7	4_7
Agrimonia eupatoria	agrimony		2	3	3	1	IV	1	3	1_3
Daucus carota	wild carrot	3	2		4	3	IV	2	4	2_4
Galium mollugo	hedge bedstraw	2	4		2	1	IV	1	4	1_4
Picris hieracoides	hawkweed oxtongue		4	4	6	5	IV	4	6	4_6
Plantago lanceolata	ribwort plantain	3		2	3	2	IV	2	3	2_3
Blackstonia perfoliata	yellow wort	2		2		1	III	1	2	1_2
Dactylis glomerata	cocks foot	2		2		2	III	2	2	2_2
Rubus fruticosus agg	bramble	4		3	3		III	3	4	3_4
Agrostis capillaris	common bent			2		2	II	2	2	2_2
Arrhenatherum elatius	false oat grass				3	4	II	3	4	3_4
Chamanerion angustifolium	rosebay willowherb		3			2	II	2	3	2_3
Cirsium arvensis	creeping thistle	2				2	II	2	2	2_2
Erigeron acer	blue fleabane				2	1	II	1	2	1_2
Ononis repens	common restharrow	3	5				II	3	5	3_5
Potentilla reptans	creeping cinquefoil			3		1	II	1	3	1_3
Schedonorus arunindancea	tall fescue	3				1	II	1	3	1_3
Schedonorus pratensis	meadow fescue				3	2	II	2	3	2_3
Centaureum pulchellum	lesser centaury					1	I	1	1	1_1
Clinopodium vulgare	wild basil				1		I	1	1	1_1
Crepis capillaris	smooth hawksbeard		1				I	1	1	1_1

Equisetum arvense	field horsetail					2	I	**2**	**2**	**2_2**
Hypericum perforatum	perforate St John's Wort		2				I	**2**	**2**	**2_2**
Origanum vulgare	wild marjoram				2		I	**2**	**2**	**2_2**
Ranunculus repens	creeping buttercup			1			I	**1**	**1**	**1_1**
	Total number of species per quadrat	14	13	14	16	22	15.8			
	Bryophytes Excluded	13	12	13	15	22	15			

Appendix 5 - Proposed Development Maps

Appendix 6 - Landscape Map

Industry Guidelines and Standards

This report has been written with due consideration to:

- Chartered Institute of Ecology and Environmental Management (2017). Guidelines for Preliminary Ecological Appraisal. 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.
- Chartered Institute of Ecology and Environmental Management (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.
- Chartered Institute of Ecology and Environmental Management (2017). Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester.
- Chartered Institute of Ecology and Environmental Management (2020). Guidelines for Accessing, Using and Sharing Biodiversity Data in the UK. 2nd Edition. Chartered Institute of Ecology and Environmental Management, Winchester.
- British Standard 42020 (2013). Biodiversity – Code of Practice for Planning and Development.
- British Standard 8683:2021 (2021). Process for Designing and Implementing Biodiversity Net Gain.

Proportionality

The work involved in preparing and implementing all ecological surveys, impact assessments and measures for avoidance, mitigation, compensation and enhancement should be proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development. Consequently, the decision-maker should only request supporting information and conservation measures that are relevant, necessary and material to the application in question. Similarly, the decision-maker and their consultees should ensure that any comments and advice made over an application are also proportionate. This approach is enshrined in Government planning guidance, for example, paragraph 185 of the National Planning Policy Framework for England. The desk studies and field surveys undertaken to provide a Preliminary Ecological Appraisal (PEA) might in some cases be all that is necessary.

(BS 42020, 2013)