

Appendix 9.12

**FRAMEWORK ECOLOGICAL MITIGATION
STRATEGY**

FORT HALSTEAD, KENT
FRAMEWORK ECOLOGICAL
MITIGATION STRATEGY

A Report to: CBRE Ltd

Report No: RT-MME-127947-12

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REPORT VERIFICATION AND DECLARATION OF COMPLIANCE

This study has been undertaken in accordance with British Standard 42020:2013 “Biodiversity, Code of practice for planning and development”.

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The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management’s Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

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CONTENTS

1. INTRODUCTION	5
1.1 PROJECT BACKGROUND	5
1.2 SITE DESCRIPTION AND CONTEXT	6
1.3 DESCRIPTION OF DEVELOPMENT	6
1.4 DOCUMENTATION PROVIDED	6
1.5 CONSULTATION	7
1.6 MITIGATION STRATEGY STRUCTURE	7
1.7 FEATURES SCOPED OUT OF INCLUSION WITHIN THE FEMS	7
2. NATURE CONSERVATION SITES	8
2.1 BASELINE DATA	8
2.1.1 <i>Desk Study</i>	8
2.2 IMPACT ASSESSMENT	9
2.2.1 <i>Pre- and Mid-Development Impacts</i>	9
2.2.2 <i>Long-Term Impacts</i>	9
2.3 AVOIDANCE AND MITIGATION MEASURES	9
2.3.1 <i>Construction Phase Measures</i>	9
2.3.2 <i>Operational Phase Measures</i>	10
2.4 COMPENSATION AND ENHANCEMENT MEASURES	10
2.5 POST-DEVELOPMENT MANAGEMENT AND MONITORING	10
3. HABITATS	11
3.1 BASELINE DATA	11
3.1.1 <i>Field Survey</i>	11
3.2 IMPACT ASSESSMENT	12
3.2.1 <i>Pre- and Mid-Development Impacts</i>	12
3.2.2 <i>Long-Term Impacts</i>	12
3.3 AVOIDANCE AND MITIGATION MEASURES	12
3.3.1 <i>Habitat Retention</i>	12
3.3.2 <i>Construction Phase Measures</i>	12
3.3.3 <i>Operational Phase Measures</i>	12
3.4 COMPENSATION AND ENHANCEMENT MEASURES	12
3.5 POST-DEVELOPMENT MANAGEMENT AND MONITORING	13
4. BATS	14
4.1 BASELINE DATA	14
4.1.1 <i>Desk Study</i>	14
4.1.2 <i>Field Surveys</i>	14
4.2 IMPACT ASSESSMENT	14
4.2.1 <i>Pre- and Mid-Development Impacts</i>	14
4.2.2 <i>Long-Term Impacts</i>	15
4.3 AVOIDANCE AND MITIGATION MEASURES	15
4.3.1 <i>Further Surveys and Natural England Bat Licence Application/s</i>	15
4.3.2 <i>General Construction Phase Measures</i>	16
4.3.3 <i>Operational Lighting Strategy</i>	16
4.4 COMPENSATION AND ENHANCEMENT MEASURES	17
4.4.1 <i>Bat Roosting Boxes</i>	17
4.4.2 <i>Habitat Creation and Enhancement</i>	17
4.5 POST-DEVELOPMENT MANAGEMENT AND MONITORING	17
5. DORMICE	18
5.1 BASELINE DATA	18
5.1.1 <i>Desk Study</i>	18
5.1.2 <i>Field Survey</i>	18
5.2 IMPACT ASSESSMENT	18
5.2.1 <i>Pre- and Mid-Development Impacts</i>	18
5.2.2 <i>Long-Term Impacts</i>	18

5.3	AVOIDANCE AND MITIGATION MEASURES	18
5.3.1	<i>Natural England Licence Application/s</i>	18
5.3.2	<i>General Construction Phase Measures</i>	19
5.4	COMPENSATION AND ENHANCEMENT MEASURES	19
5.4.1	<i>Dormice Nest Boxes</i>	19
5.4.2	<i>Habitat Creation and Enhancement</i>	19
5.5	POST-DEVELOPMENT MANAGEMENT AND MONITORING	19
6.	TERRESTRIAL MAMMALS: BROWN HARE AND HEDGEHOG	20
6.1	SURVEY FINDINGS	20
6.1.1	<i>Desk Study</i>	20
6.1.2	<i>Field Survey</i>	20
6.2	IMPACT ASSESSMENT	20
6.2.1	<i>Pre- and Mid-Development Impacts</i>	20
6.2.2	<i>Long-Term Impacts</i>	20
6.3	AVOIDANCE AND MITIGATION MEASURES	20
6.3.1	<i>Construction Phase Measures</i>	20
6.3.2	<i>Operational Phase Measures</i>	20
6.4	POST-DEVELOPMENT MANAGEMENT AND MONITORING	20
7.	BIRDS	21
7.1	SURVEY FINDINGS	21
7.1.1	<i>Desk Study</i>	21
7.1.2	<i>Field Surveys</i>	21
7.2	IMPACT ASSESSMENT	22
7.2.1	<i>Pre- and Mid-Development Impacts</i>	22
7.2.2	<i>Long-Term Impacts</i>	22
7.3	AVOIDANCE AND MITIGATION MEASURES	22
7.3.1	<i>Construction Phase Measures</i>	22
7.3.2	<i>Operational Phase Measures</i>	22
7.4	COMPENSATION AND ENHANCEMENT MEASURES	22
7.4.1	<i>Replacement Nest Boxes</i>	22
7.4.2	<i>Habitat Creation and Enhancement</i>	23
7.5	POST-DEVELOPMENT MANAGEMENT AND MONITORING	23
8.	REPTILES	24
8.1	SURVEY FINDINGS	24
8.1.1	<i>Desk Study</i>	24
8.1.2	<i>Field Survey</i>	24
8.2	IMPACT ASSESSMENT	24
8.2.1	<i>Pre- and Mid-Development Impacts</i>	24
8.2.2	<i>Long-Term Impacts</i>	24
8.3	AVOIDANCE AND MITIGATION MEASURES	24
8.3.1	<i>Herpetofauna Mitigation Strategy</i>	25
8.3.2	<i>General Construction Phase Measures</i>	27
8.4	COMPENSATION AND ENHANCEMENT MEASURES	27
8.5	POST-DEVELOPMENT MANAGEMENT AND MONITORING	28
9.	INVASIVE NON-NATIVE SPECIES.....	29
9.1	SURVEY FINDINGS	29
9.1.1	<i>Desk Study</i>	29
9.1.2	<i>Field Survey Results</i>	29
9.2	IMPACT ASSESSMENT	29
9.2.1	<i>Pre- and Mid-Development Impacts</i>	29
9.2.2	<i>Long-Term Impacts</i>	29
9.3	MITIGATION	29
9.3.1	<i>Control of Rhododendron</i>	29
9.3.2	<i>Control of Cotoneaster</i>	31
9.3.3	<i>Monitoring of Japanese Knotweed</i>	31
9.4	POST-DEVELOPMENT MANAGEMENT AND MONITORING	31

10. SUMMARY	32
11. DRAWINGS	33
REFERENCES AND BIBLIOGRAPHY	37
APPENDICES	38

1. INTRODUCTION

1.1 PROJECT BACKGROUND

In July 2019, CBRE commissioned Middlemarch Environmental Ltd to develop a Framework Ecological Mitigation Strategy (FEMS) associated with a proposed development at Fort Halstead in Kent. This strategy is required to inform a hybrid planning application associated with the proposed redevelopment of the site.

A suite of baseline surveys was completed by Waterman Group between 2006 and 2013, the results of which are provided in an Ecological Appraisal (Report EED12715-102.R.2.3.7.LM) and Protected Species and Habitat Survey (Report EED12715-102.R.3.3.6.LM), and summarised in the ecology chapter of an EIA associated with a previous application, for which outline planning consent was granted. As part of this consent a future baseline was established based on a series of mitigation proposals. Where relevant, these mitigation proposals are referred to in this document.

Due to the amount of time that has elapsed since the previous surveys were completed, updated ecological surveys were required for the current planning application. As such, Middlemarch Environmental Ltd completed the following assessments at the site in 2018 and 2019:

- Preliminary Ecological Appraisal (Report RT-MME-127947-01);
- Preliminary Bat Roost Assessment (Report RT-MME-127947-02);
- Nocturnal Emergence and Dawn Re-entry Bat Surveys (Report RT-MME-127947-03);
- Bat Activity Surveys (Report RT-MME-127947-04);
- Badger Survey (Report RT-MME-127947-05);
- Botanical Survey (Report RT-MME-127947-07);
- Terrestrial Invertebrate Survey (Report RT-MME-127947-08);
- Reptile Survey (Report RT-MME-127947-09);
- Dormouse Survey (Report RT-MME-127947-10);
- Winter Bird Survey (Report RT-MME-127947-11);
- Pre-development Arboricultural Survey (Report RT-MME-128206-01); and,
- Arboricultural Impact Assessment (Report RT-MME-128206-02).

The FEMS accompanies the Biodiversity chapter for the Environmental Statement (ES) associated with the proposed development, which has been prepared by Middlemarch Environmental Ltd. The Biodiversity chapter provides a detailed assessment of the construction and completed development phase effects of the proposed development and should be read in conjunction with this report. The Biodiversity chapter also evaluates broad mitigation and compensation measures which form the basis for the measures detailed in this strategy.

Implementation of the control measures and mitigation proposals outline in the FEMS will ensure that the works proceed without breaching wildlife legislation, and that the favourable conservation status of potential ecological receptors will be maintained. The content of this document is guided by wildlife legislation and relevant planning policy and biodiversity targets.

During development of this FEMS the ecological mitigation hierarchy has been applied in accordance with the principals set out in the British Standard for Biodiversity (BS42020):

- Avoid;
- Mitigate;
- Compensate; and,
- Enhance.

1.2 SITE DESCRIPTION AND CONTEXT

The site is located off Star Hill Road in Halstead, Kent, centred at National Grid Reference TQ 4970 5922. It is an irregular shaped parcel of land that measures 131.89 ha in size.

At the time of the survey, the site comprised a defence research facility which contained a number of buildings with associated areas of hardstanding, surrounded by parcels of semi-natural and plantation woodland. Areas of neutral grassland, calcareous grassland and amenity grassland were also present, as well as patches of scrub and tall ruderal vegetation.

The site was bordered by the A224 Polhill to the north-east and Star Hill Road to the south-west. A mixture of arable and pastoral fields, pockets of woodland and farm buildings surround the site. The wider landscape was dominated by a rural setting, consisting of agricultural land interspersed with pockets of woodland and small settlements.

1.3 DESCRIPTION OF DEVELOPMENT

The proposals for the site are as follows:

Hybrid planning permission comprising:

In detail:

- *Demolition of existing buildings;*
- *Change of use and works to buildings Q13 and Q14 (including landscaping and public realm);*
- *Primary and secondary accesses.*

In outline:

- *Development of business space (use classes B1a/b/c) of up to 27,659 sq m GEA;*
- *Works within the 'X' enclave relating to energetic testing operations, including fencing, access, car parking;*
- *Development of up to 750 residential dwellings;*
- *Development of a mixed-use village centre (use classes A1/A3/A4/A5/B1a/D1/D2);*
- *Development of a one form entry primary school;*
- *Change of use of Fort Area and bunkers to Historic Interpretation Centre (use class D1) with workshop space;*
- *Roads, pedestrian and cycle routes, public transport infrastructure, car parking, utilities infrastructure, drainage;*
- *Landscaping, landforming and ecological mitigation works.*

1.4 DOCUMENTATION PROVIDED

The conclusions and recommendations made in this report are based on information provided by the client regarding the scope of the project. Documentation made available by the client is listed in Table 1.1.

Document Name / Drawing Number	Author
Fort Halstead – Design and Access Statement: 00556I	John Thompson and Partners
Site Location Plan: 00556I_S01 Rev D5	John Thompson and Partners
Land Use and Green Infrastructure Plan: 00556I_PP01 Rev D10	John Thompson and Partners
Building Heights Plan: 00556I_PP02 Rev D10	John Thompson and Partners
Access and Movement: 00556I_PP03 Rev D9	John Thompson and Partners
Demolition Plan: 00556I_PP04 Rev D8	John Thompson and Partners
Ecological Appraisal: EED12715-102.R.2.3.7.LM	Waterman Group
Protected Species and Habitats Survey: EED12715-102.R.3.3.6.LM	Waterman Group
Environmental Statement - Ecology and Nature Conservation	Waterman Group
Decision Notice (planning application number SE/15/00628/OUT)	Sevenoaks District Council

Table 1.1: Documentation Provided by Client

1.5 CONSULTATION

Details of the consultation which has been completed as part of the project is given in the accompanying Biodiversity chapter of the ES, which should be read in conjunction with this report.

1.6 MITIGATION STRATEGY STRUCTURE

Chapters 2 to 8 focus on each of the ecological features that have been identified as potential constraints to the development of the site, as follows:

- Chapter 2: Nature Conservation Sites
- Chapter 3: Habitats
- Chapter 4: Bats
- Chapter 5: Dormice
- Chapter 6: Terrestrial Mammals: Brown Hare and Hedgehog
- Chapter 7: Breeding and Wintering Birds
- Chapter 8: Reptiles
- Chapter 9: Non-native Invasive Plant Species

Each chapter provides a summary of the potential impacts of the proposed development on the ecological feature in the absence of mitigation, and then outlines avoidance, mitigation, compensation and enhancement proposals that will be implemented to address each of these impacts and ensure no loss of favourable conservation status. Detail regarding post-development safeguarding and monitoring is also provided, where known.

Chapter 10 provides a summary of the mitigation strategy. A confidential chapter relating to badgers is included in Appendix 2.

1.7 FEATURES SCOPED OUT OF INCLUSION WITHIN THE FEMS

Terrestrial Invertebrates

A Terrestrial Invertebrate Survey (Report RT-MME-127947-08) was undertaken at the site by Middlemarch Environmental in 2018. This confirmed that the most important area for invertebrates is the area of chalk grassland (unimproved calcareous grassland) in the southern part of the site. This habitat is being retained as part of the development and as such the most notable invertebrate species will not be displaced from the site as a result of the proposed development. Furthermore, it is anticipated that the general habitat retention, creation and enhancement measures outlined in Chapter 3 will increase the suitability of the site for a range of species groups, including invertebrates. As such, a separate chapter for terrestrial invertebrates has not been included within this document.

Great Crested Newt and Common Amphibians

There is no aquatic habitat suitable for breeding within the site. Reference to Ordnance Survey mapped data identified three waterbodies within a 250 m radius of the survey area, but these are located over 470 m away from the proposed works footprint and therefore it was considered unlikely that any amphibians, particularly great crested newts, will be encountered during the development works.

The measures outlined in Chapter 8 to ensure that reptiles are protected throughout the works will also safeguard common amphibians, should they be present within suitable terrestrial habitats within the site.

Otter, Water Vole and White-Clawed Crayfish

There are no watercourses or waterbodies on or adjacent to the site, and as such, otter, water vole and white clawed crayfish are not notable considerations with respect to the proposed development.

Other Species / Species Groups

The following species / species groups have been scoped out of further assessment due to a lack of desk study records and / or the absence of suitable habitats within the site and its surroundings: pine marten *Martes martes*, polecat *Mustela putorius*, red squirrel *Sciurus vulgaris* and stag beetle *Lucanus cervus*.

2. NATURE CONSERVATION SITES

2.1 BASELINE DATA

2.1.1 Desk Study

The desk study completed as part of the Preliminary Ecological Appraisal (Report RT-MME-127947-01) in 2018, included a search for European statutory nature conservation sites within a 5 km radius of the site (extended to 10 km for any statutory site designated for bats) and a search for UK statutory nature conservation sites and ancient woodland sites within a 2 km radius, using the Multi-Agency Geographic Information for the Countryside website.

Desk study data provided by Kent and Medway Biological Records Centre included records for UK non-statutory nature conservation sites within a 2 km radius of the site.

Nature conservation sites located in proximity to the site are summarised in Table 2.1, and are shown on Drawing C129747-12-01 in Chapter 11.

Site Name	Designation	Proximity to Survey Area	Description
UK Statutory Sites			
Westerham Mines	SSSI	6.55 km south-west	The principal interest of this site is the use of its abandoned ragstone mines by a variety of hibernating bats. With the increasing scarcity of bats in south-east England and the continued loss of the few suitable hibernacula remaining available to them, these mines represent an important winter refuge for bats in the county. Five species have been recorded hibernating here: Brandt's bat <i>Myotis brandti</i> , brown long-eared bat <i>Plecotus auratus</i> , Daubenton' bat <i>Myotis daubentoni</i> , Natterer's bat <i>Myotis nattereri</i> and whiskered bat <i>Myotis mystacinus</i> . The number of bats using the mines declined from the 1950s onwards, largely because of disturbance, but the fitting of grilles (allowing access for bats but not humans) and devices to maintain the air flow through the mines is thought to have led to an increase in numbers in recent years. However, it is very difficult to locate all the bats using the tunnels, and different species use them at different times during the winter. Thus, it is extremely hard to estimate the true numbers using the mines. There is also evidence that some use is made of the mines by bats in summer.
Non-statutory Sites			
Chevening Estate	LWS	10 m south-west	Reference to aerial imagery indicates that this LWS comprises woodland.
Woodlands West of Shoreham	LWS	10 m east	Encompasses several parcels of ancient semi-natural and replanted woodland.
Polhill Bank	KWT Reserve	150 m north-east	Comprises almost 4 ha of chalk grassland on a south-east-facing slope.
Crown Meadow Wood	WT Reserve	890 m south-east	No information provided.
Chevening Churchyard	LWS	920 m south-west	No information provided.
Woods and Pasture at Pratt's Bottom	LWS	1,360 m north-west	No information provided.
Key: SSSI: Site of Special Scientific Interest LWS: Local Wildlife Site KWT: Kent Wildlife Trust WT: Woodland Trust			

Table 2.1: Summary of Nature Conservation Sites

There are no SSSI located within a 2 km radius of the survey area, however, the survey area does fall within the SSSI Impact Risk Zone for Sevenoaks Gravel Pits SSSI, which is located 2.1 km to the south-east.

In addition to the sites detailed in Table 2.1, 81 parcels of ancient woodland located within a 2 km radius of the site were identified in the desk study, 17 of which form part of the site.

2.2 IMPACT ASSESSMENT

The Biodiversity chapter of the ES has identified the following sites which will be, or have the potential to be, impacted by the construction and/or operational phases of the proposed development:

- Westerham Mines SSSI;
- Chevening Estate LWS;
- Woodlands West of Shoreham LWS; and,
- Polhill Bank KWT Reserve.

In addition, the parcels of ancient woodland within and in close proximity to the site also have the potential to be impacted as a result of the proposals.

The remaining non-statutory sites are located at least 890 m from the site and are unlikely to be adversely affected by the proposed development. These have been scoped out of further assessment.

2.2.1 Pre- and Mid-Development Impacts

Non-Statutory Sites

Chevening Estate LWS and Woodlands West of Shoreham LWS are both located 10 m from the site boundary. The Biodiversity chapter of the ES acknowledges that these sites, as well as ancient woodland habitat within and adjacent to the site, could be temporarily adversely impacted during the construction phase of the development as a result of a localised increase in air pollutants (e.g nitrogen and dust deposition) from construction traffic and activities, leading to a decline in conservation status.

All ancient woodland is being retained, and a buffer of at least 15 m has been incorporated into the design of the proposed development.

2.2.2 Long-Term Impacts

UK Statutory Sites

The Biodiversity chapter of the ES reports that increased illumination associated with operational lighting has the potential to lead to the severance of commuting routes or a reduction in suitable foraging habitats for bats using Westerham Mines SSSI.

Non-Statutory Sites

Once the completed development is in use, there may be an increase in recreational disturbance of Chevening Estate LWS, Woodlands West of Shoreham LWS and Polhill Bank KWT Reserve, which could lead to the degradation of habitats and a subsequent decline in conservation status.

2.3 AVOIDANCE AND MITIGATION MEASURES

2.3.1 Construction Phase Measures

To avoid and mitigate for construction impacts on nature conservation sites, the following measures are proposed:

- In accordance with standing advice from Natural England and the Forestry Commission, a buffer zones of a minimum of 15 m will be implemented around all ancient woodland;
- Use of protective fencing (e.g. Heras fencing) to demarcate the works area. Retained woodland, trees and hedgerows will be protected in accordance with British Standard 5837:2012 "Trees in relation to design, demolition and construction - recommendations";
- Implementation of pollution prevention measures; and,
- Control of lighting, noise and vibration.

These measures should be implemented through the use of a Construction Ecological Management Plan (CEcMP), produced for each phase of the development.

2.3.2 Operational Phase Measures

Implementation of a Landscape and Ecological Management Plan (LEMP)

As the development will be brought forward in a phased manner, a LEMP will be produced for each phase to detail how all retained and created habitats will be managed in the long-term. Each LEMP would also include proposals for monitoring, to allow the success of management to be assessed and to inform requirements for any changes in management practices.

Each LEMP will also provide details regarding the ongoing management of the SuDS, to ensure that the system remains functional during the operational phase of the proposed development.

Access by residents into the more valuable woodland and grassland around the site will be discouraged through the implementation of a programme of access management, to include the provision of signage, information boards and appropriate pathways away from the most valuable habitats.

Implementation of an Operational Lighting Strategy

The 'Ecology and Nature Conservation' chapter (Waterman, 2015) of the EIA associated with the 2015 extant outline planning permission reported that 'an appropriate lighting mitigation strategy using low level / directional lighting along woodland edges and habitats of ecological value to retain and create dark corridors' would be provided. This has been carried forward to the current planning application, and outline proposals for operational lighting have taken into account ecological best practice guidance, to ensure impacts on valuable ecological features are minimised. Further details regarding bats and lighting are provided in Section 4.3.3.

2.4 COMPENSATION AND ENHANCEMENT MEASURES

The following enhancement measures for nature conservation sites / ancient woodland were previously committed to and are detailed in the 'Ecology and Nature Conservation' chapter (Waterman, 2015) of the EIA associated with the 2015 extant outline planning permission:

- Maintain and enhance woodland connectivity with the wider landscape; and,
- Include native woodland infill and scrub planting, of regional provenance.

These measures will be carried forward for the current planning application and can be implemented through the use of a LEMP.

2.5 POST-DEVELOPMENT MANAGEMENT AND MONITORING

The LEMP produced for each phase of the development (Section 2.3.2) will provide details regarding the long-term management and monitoring of the ancient woodland within the site.

3. HABITATS

3.1 BASELINE DATA

3.1.1 Field Survey

As part of the Preliminary Ecological Appraisal (Report RT-MME-129747-01) an Extended Phase 1 Habitat Survey of the site was undertaken over three survey visits in May 2018. Table 3.1 provides a list of the habitats recorded during this survey and their conservation status. A summary of the existing habitats is illustrated on Drawing C129747-12-02, provided in Chapter 11.

Habitat	Description	Habitat of Principal Importance?
Broadleaved plantation and mixed plantation woodland	Broadleaved plantation woodland borders the grassland fields in the western part of the site, whilst three blocks of mixed plantation woodland are present in the south-western and north-eastern parts of the site. Although not a Habitat of Principal Importance, plantation woodland provides connectivity across the site and supports a range of protected and notable species.	-
Broadleaved semi-natural woodland	Broadleaved semi-natural woodland is located throughout the site, the majority of which is ancient woodland. This habitat is classed as 'Lowland Mixed Deciduous Woodland', a Habitat of Principal Importance and Kent Biodiversity Strategy priority habitat.	✓
Hedgerows	Various lengths of species-poor defunct hedgerow, species-poor intact hedgerow and species-rich hedgerow with trees are located in the southern and western parts of the site. The hedgerows on site meet the criteria to be classed as Habitats of Principal Importance and Kent Biodiversity Strategy priority habitats.	✓
Scattered trees	Early-mature and mature trees are present throughout the site. These trees have intrinsic ecological value and cannot be replaced in the short to medium-term.	-
Unimproved calcareous grassland	This habitat dominates the southern part of the site, and meets the criteria to be classed as 'Lowland Calcareous Grassland', a Habitat of Principal Importance and Kent Biodiversity Strategy priority habitat.	✓
Amenity grassland, bracken, coniferous plantation woodland, semi-improved grassland, scattered scrub and tall ruderal vegetation.	Although not national or local priority habitats, the amenity grassland, bracken, coniferous plantation woodland, semi-improved grassland, scattered scrub and tall ruderal vegetation contribute to the structural and species diversity of the site.	-
Buildings, fencing and hardstanding.	These habitats have negligible intrinsic ecological value.	-

Table 3.1: Summary of Habitats within Site

A Botanical Survey (Report RT-MME-127947-07) was carried out at the site in 2018, which confirmed the following:

- CG2a *Festuca ovina* – *Avenula pratensis* grassland; *Cirsium acaule* – *Asperula cynanchica* sub-community to CG3 *Bromus erectus* grassland was identified in the south of the site. This unimproved calcareous grassland supported a high diversity of species and had high potential to support notable vascular plants associated with chalk grassland in Kent, though no such species were observed during the surveys.
- Parts of the grassland had been recently grazed by livestock, leading to presence of coarser species typically associated with nitrogen-rich neutral grassland, and both the grassland and woodland areas showed signs of deterioration through encroaching scrub.
- No protected plant species were observed during the suite of survey work. Numerous indicator species for calcareous grassland and ancient woodland were observed, contributing to the overall diversity and value of the habitats on site.
- Overall, the woodland and grassland on site were considered to be of district value, with potential for improvement through implementation of appropriate management.

Section 3.2 summarises the extent of habitat loss that will be required to allow the proposed development to proceed. Section 3.3 details those key habitat types that will be retained and protected and will form part of the landscaped areas, and Section 3.3 provides a summary of new habitats that will be created.

3.2 IMPACT ASSESSMENT

3.2.1 Pre- and Mid-Development Impacts

The proposed development has been designed to fall predominantly within the existing built footprint. Reference to the 'Land Use and Green Infrastructure Plan' (Drawing 00556I_PP01 Rev P1) prepared by JTP (2019) illustrates that the most important habitats, including all woodland, unimproved calcareous grassland and hedgerows will be retained. It is likely that some scattered trees will need to be removed to accommodate the development. Habitat loss will be limited to common and widespread habitats of low or negligible ecological value.

During construction, there is the potential for retained woodland, hedgerow and scattered tree habitats to be subject to root compaction and damage from construction vehicles and machinery.

3.2.2 Long-Term Impacts

There is the potential for retained and created habitats to be subject to disturbance and degradation due to residents accessing the site. Limited or inappropriate management of retained and created habitats could also lead to a decline in their conservation status in the long-term. For example, inappropriate management of woodland or hedgerows could result in vegetation becoming too dense, which could reduce its value to support nesting birds and other fauna, and inappropriate management of retained and created grassland areas could result in a loss of botanical diversity and succession to coarser vegetation types.

3.3 AVOIDANCE AND MITIGATION MEASURES

3.3.1 Habitat Retention

As detailed in Section 3.2.1, the development has been designed to avoid the loss of the most valuable habitats. Areas of key habitat (woodland, unimproved calcareous grassland and hedgerows) will be retained and protected.

3.3.2 Construction Phase Measures

The implementation of the measures outlined in Section 2.3.1 to protect nature conservation sites will also ensure that retained habitats are protected throughout construction works. These measures should be implemented through the use of a CEcMP for each phase of the development.

3.3.3 Operational Phase Measures

The LEMP for each phase of the development (see Section 2.3.2) will include:

- Habitat management proposals for all retained and created habitats, designed to maximise biodiversity value, to be implemented for ten years post-development; and,
- Proposals for monitoring of habitat types to allow the success of management to be determined and the requirement for any changes in management practices to be determined.

3.4 COMPENSATION AND ENHANCEMENT MEASURES

The following enhancement measures for habitats were previously committed to and are detailed in the 'Ecology and Nature Conservation' chapter (Waterman, 2015) of the EIA associated with the 2015 extant outline planning permission:

- Provide 'wildlife area' ... to the south-west of the site in the wider survey area. The 'wildlife area' would comprise a species-rich wildflower grassland area;
- Create and enhance habitats of ecological value to provide a net biodiversity gain;
- Include new tree planting, where possible, including fruiting varieties;
- Enhance all areas of calcareous grassland;
- Include ponds and sustainable drainage features to provide aquatic habitat; and,
- Create green infrastructure corridors to increase connectivity; and,

These measures will be carried forward for the current planning application and can be implemented through the use of a LEMP.

3.5 POST-DEVELOPMENT MANAGEMENT AND MONITORING

The LEMP for each phase of the development will outline the ongoing management measures required for the retained and created habitats. If the measures within this document are implemented, it is considered that valuable habitats within the site will fulfil their biodiversity potential and continue to support a range of species.

The proposed work schedule associated with the habitat creation works is not yet known, as these works will be phased and coordinated with the construction works schedule. A detailed timetable for habitat creation works will be determined once planning permission has been granted, the phasing schedule is fully understood and a development programme has been established.

4. BATS

4.1 BASELINE DATA

4.1.1 Desk Study

The desk study revealed records of at least seven species of bat (common pipistrelle, soprano pipistrelle, noctule, Leisler's bat, Natterer's bat, serotine and brown long-eared bat) within a 2 km radius of the site, in addition to records of unidentified pipistrelle, *Myotis*, and long-eared bat species. The most recent records dated from 2016 and the nearest records were attributable to common pipistrelle, Leisler's bat, Natterer's bat, brown long-eared bat and a *Myotis* species, all located on site.

4.1.2 Field Surveys

2007-2013 Surveys

Surveys completed by Waterman Group between 2007 and 2013 confirmed the presence of roosting bats in ten buildings: A13, A14, A25, F6, H38, HR1, HR2, M10, N10 and R29. Roosts used by low numbers of common pipistrelle were recorded in Buildings A13, A14, A25, M10, N10 and R29. Buildings HR1 and HR2 were each found to support a single hibernating brown long-eared bat. A small number of droppings resembling those of a *Myotis* species were recorded in Building F6, indicating use of this building as a summer roost. Since these surveys were completed, Buildings A25 and M10 have been demolished, and R29 has been subject to repair works.

2018 Surveys

During the Preliminary Bat Roost Assessment (Report RT-MME-127947-02), a total of 127 buildings were identified as having 'high' potential to support roosting bats, and 108 buildings were identified as having low potential to support roosting bats.

The suite of Dusk Emergence and Dawn Re-Entry Surveys completed in 2018 identified bat roosts in six buildings: A3, F11, N2, Q4, Q7 and R64. Building R64 was found to support a brown long-eared bat maternity roost. The other buildings supported day roosts for common pipistrelle. No bats emerged from or re-entered buildings A13, A14, F6, H38, HR1, HR2 or N10 during the 2018 surveys. However, bats are known to regularly move between roosts and as such these buildings remain a roost whether occupied or not.

The majority of the trees within the detailed planning application area possessed no potential roosting features and were therefore considered to have negligible potential to support roosting bats. However, a small number of trees were noted to have potential roosting features. Of these, nine were considered to have high potential to support roosting bats, three were considered to have moderate potential to support roosting bats and ten were considered to have low potential to support roosting bats.

Nine species of bat (common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, Daubenton's bat, whiskered bat, Natterer's bat, brown long-eared bat and serotine) were recorded utilising the application site for foraging and commuting purposes during the 2018 suite of surveys. Common pipistrelle was the most frequently recorded species, whilst low levels of activity by other species were recorded. Activity was concentrated around the site peripheries, particularly around areas of woodland.

4.2 IMPACT ASSESSMENT

4.2.1 Pre- and Mid-Development Impacts

Roosting Bats

Bat roosts/resting places have been identified in 13 buildings. As such, the building demolition/renovation works could result in the killing or injury of bats and the loss of roosts. Furthermore, if bats are roosting within any of the trees on site, in the absence of mitigation, there is the potential for tree removal works to result in the killing or injury of bats and the loss of roosts. There is also the potential for vibration, noise and illumination during the construction phase of the proposed development to disturb roosting bats in retained trees. Loss or disturbance of a bat roost would be in breach of the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended).

Foraging and Commuting Bats

Vegetation clearance and construction works could disturb foraging bats and damage suitable terrestrial foraging and commuting habitat, although given that the woodland and other valuable habitats across

the site will be retained and enhanced, this effect is not considered to be significant. However, construction phase lighting has the potential to cause fragmentation of dark corridors which may be utilised by foraging and commuting bats, and significant increase in noise or vibration may alter how bats utilise the site during the construction phase. Without mitigation this could have a negative impact on the populations of foraging and commuting bats using the site.

4.2.2 Long-Term Impacts

Disturbance and fragmentation arising from operational phase lighting could have a negative impact on the favourable conservation status of bats utilising habitats within the site for roosting, foraging and commuting purposes.

4.3 AVOIDANCE AND MITIGATION MEASURES

The avoidance and mitigation measures proposed will:

- Prevent killing or injury of bats, or destruction or disturbance of bat roosts;
- Ensure the favourable conservation status of bat populations at the site is maintained; and,
- Minimise disturbance to bat foraging and commuting habitat.

4.3.1 Further Surveys and Natural England Bat Licence Application/s

Buildings Supporting Bat Roosts (A3, A13, A14, F6, F11, H38, HR1, HR2, N2, N10, Q4, Q7 and R64)

As a bat roost/resting place has been identified in Buildings A3, A13, A14, F6, F11, H38, HR1, HR2, N2, N10, Q4, Q7 and R64, no unlicensed work can be undertaken which will contravene the legislation outlined in Appendix 1.

Prior to any works being undertaken which are likely to result in a breach of the legislation, a development licence must be obtained from Natural England. The licence application process will include the submission of a method statement detailing the current status of bats on site and how the favourable conservation status of the bat population will be maintained. Prior to a licence being issued, planning permission must be granted and relevant conditions relating to protected species and habitat issues must be discharged. Separate licence applications can be completed for each phase of the development, as required.

To inform the licence application at least three dusk emergence and/or dawn re-entry surveys must be undertaken during the bat activity season in line with Bat Surveys: Good Practice Guidelines published by the Bat Conservation Trust (Collins, 2016). The bat emergence/re-entry survey season extends from May to September. At least two of the surveys should be undertaken during the peak season for emergence/re-entry surveys between May and August and one of the three surveys should be a dawn re-entry survey. These surveys need to be carried out during the activity season closest to the start date of the proposed development to ensure that the data obtained is current and appropriate for assessment by Natural England.

Building R36 and Remaining Buildings with Roost Potential

Building R36 was found to be in poor structural condition, and it was recommended that this building be demolished during the winter months. This building, and the remaining buildings on site, were subject to a full suite of surveys in 2018 in line with Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016), and no bat roosts were identified. However, it is possible that bats have colonised these buildings in the intervening period. As such, prior to demolition of Building R36 and demolition of / works to the remaining buildings commencing, an updated suite of dusk emergence and dawn re-entry surveys should be completed. If any bat roosts are identified during these surveys, then works will need to be completed in accordance with a licence from Natural England, as outlined above.

Trees with Moderate and High Potential to Support Roosting Bats

To confirm whether any trees with roost potential (moderate or high) which are to be impacted by the proposed works support roosting bats, further surveys will need to be completed for any trees which are considered likely to be adversely impacted during each phase of the development. At this stage, final details of tree impacts are not known and surveys will need to be completed in advance of each phase, to inform any licensing requirements and the CEcMP produced prior to commencement of works.

There are two possible survey options: the trees can be subject to a Preliminary Roost Feature Inspection Survey using tree climbing equipment to access features that were inaccessible during the Preliminary Ground Level Bat Roost Assessment, or they can be subject to dusk emergence and dawn re-entry surveys.

Option 1: Preliminary Roost Feature Inspection Survey

Where safe to do so, trees will be climbed utilising tree climbing equipment. Any potential roost features will be internally searched using a torch and endoscope. If the feature on further inspection is found to be unsuitable for bats, then the status of the tree will be downgraded to low or negligible bat potential. If a roost is identified, if potential roost features extend beyond the reach of an endoscope, or if potential roost features show any signs of use by fauna, dusk emergence and dawn re-entry surveys will be required, as detailed in Option 2. Dusk emergence and dawn re-entry surveys will also be required for any trees considered unsafe to climb, or those that cannot be fully inspected for safety reasons.

Option 2: Dusk Emergence and Dawn Re-Entry Surveys

Bat Survey: Good Practice Guidelines published by the Bat Conservation Trust (Collins, 2016) recommends that for trees with high bat roosting potential at least three dusk emergence and / or dawn re-entry surveys be undertaken during the bat activity season to determine the presence / absence of roosting bats within the trees. At least one of the surveys should be a dawn re-entry survey, and at least two of the surveys should be undertaken between mid-May and August. For trees with moderate bat roosting potential, one dusk emergence survey and a separate dawn re-entry survey should be undertaken.

If any bat roosts are identified during the surveys, a Natural England Development Licence will be obtained to ensure works commence without breaching the Conservation of Habitats and Species Regulations 2017 or the Wildlife and Countryside Act 1981 (as amended). The licence application process will include the submission of a method statement detailing the current status of bats on site and how the favourable conservation status of the bat populations will be maintained.

Trees with Low Potential to Support Roosting Bats

If any of the trees identified in 2018 as having low potential to support roosting bats are to be impacted by the proposed works, then prior to works commencing, they should be subject to an Updated Preliminary Bat Roost Assessment to confirm their status. If the updated surveys confirm that no significant changes have occurred and these trees are classed as having low potential, then they should be soft felled under the supervision of a Licensed Bat Worker. However, if changes have occurred and any of these trees are upgraded to having moderate or high potential to support roosting bats, then they should be subject to further surveys, as detailed in the section above.

Buildings and Trees with Negligible Potential to Support Roosting Bats

The remaining buildings and trees were assessed in 2018 and considered to have negligible potential to support roosting bats. However, the survey data obtained was valid for 12 months from the survey date. As such, the survey effort will need to be updated prior to works commencing to establish if these buildings or trees have developed features that could be used by roosting bats in the interim.

4.3.2 General Construction Phase Measures

To minimise construction impacts on bats, the following measures are proposed:

- Appropriate timing of works – no night working will be carried out, thus minimising any temporary noise, vibration or light disturbance effects on foraging bats or bats using roosts within trees which surround the proposed development area; and,
- Protection of retained habitat – trees and hedgerows which are to be retained will be protected in line with the measure in Section 2.3.2 with respect to root protection areas. The installation of protective fencing will ensure that construction works are not carried out immediately beneath retained trees which may have moderate to high bat roost potential.

These measures will be implemented through the use of a CEcMP for each phase of the development.

4.3.3 Operational Lighting Strategy

As stated in Section 2.3.2, outline operational lighting proposals have taken into account ecological best practice, to minimise impacts on ecological features and ensure that dark corridors are maintained and created, particularly around woodland edges. Bats are particularly vulnerable to increases or changes in illumination. To ensure that lighting installed within the site will not illuminate important roosting, foraging or commuting areas for bats, the detailed lighting designs for each phase of the development should incorporate the following best practice principles outlined in the Bat Conservation Trust's publication 'Landscape and Urban Design for Bats and Biodiversity' (Gunnell *et al.*, 2012) and the Institution of Lighting Professionals and the Bat Conservation Trust's publication '*Bats and artificial lighting in the UK*' (Miles *et al.*, 2018):

- Do not provide excessive lighting. Use only the minimum amount of light needed for safety.
- Minimise light spill. Eliminate any bare bulbs and any upward pointing light. The spread of light should be kept near to or below the horizontal. Flat cut-off lanterns are best.
- Use narrow spectrum bulbs to lower the range of species affected by lighting. Use light sources that emit minimal ultraviolet light and avoid the white and blue wavelengths of the light spectrum to avoid attracting lots of insects. Lighting regimes that attract lots of insects result in a reduction of insects in other areas like parks and gardens that bats maybe using for foraging.
- Lights should peak higher than 550nm and use glass lantern covers to filter UV lights. White LED lights do not emit UV but have still been shown to disturb slow flying bat species.
- Reduce the height of lighting columns. Light at a lower level reduces impact. However, higher a mounting heights allow lower main beam angles, which can assist in reducing glare.
- For pedestrian lighting, use low-level lighting that is as directional as possible and below 3lux at ground level but preferably below 1lux.
- Increase the spacing of lanterns.
- Limit the times that lights are on to provide some dark periods.
- Avoid using reflective surfaces under lights.
- Use temporary close-boarded fencing until vegetation matures to shield sensitive areas from lighting.

An ecological review of lighting designs will be undertaken for each phase of the development.

4.4 COMPENSATION AND ENHANCEMENT MEASURES

The compensation and enhancement measures proposed will:

- Replace bat roosting features lost to development;
- Provide additional roosting features for bats;
- Replace foraging bat habitat lost to development; and,
- Improve retained habitat features to benefit foraging bats.

4.4.1 Bat Roosting Boxes

Further surveys as outlined in Section 4.3.1 and subsequent licence applications to Natural England will inform the requirements for the provision of bat boxes to compensate for roosts lost as a result of the development. Any replacement bat boxes will be provided in accordance with the licence

The following enhancement measures for bats were previously committed to and are detailed in the 'Ecology and Nature Conservation' chapter (Waterman, 2015) of the EIA associated with the 2015 extant outline planning permission:

- Provide a purpose-built bat house in the south-western part of the Site adjacent to the woodland and the QinetiQ area; and,
- Provide bat boxes, to be installed in the woodland and new builds.

It is therefore proposed that, in addition to the purpose-built bat house, one Schwegler 2F bat box and two Schwegler 2FDFP (or similar specification) bat boxes are installed on each of ten retained mature trees around the site peripheries and 20 integrated Habibat bat boxes are installed within buildings across the site. The bat boxes will be situated higher than 3 m from the ground to prevent any interference. The exact locations should be determined by a suitably qualified ecologist when the features are installed. These bat boxes will provide suitable roosting opportunities for a range of bat species.

4.4.2 Habitat Creation and Enhancement

The landscaping scheme has been designed to ensure that strong ecological networks and dark corridors are maintained and created across the site, providing suitable foraging and commuting habitats for a range of bat species. Further details are provided in Sections 3.3.1 and 3.4.

4.5 POST-DEVELOPMENT MANAGEMENT AND MONITORING

Monitoring of replacement bat roosts, if required, will be carried out in accordance with the Natural England licence. General maintenance checks of bat boxes should be completed annually by a suitably qualified ecologist, to ensure these roosting features remain fit for purpose. The long-term management of retained and created habitats will carried out in accordance with a LEMP for each phase of the development.

5. DORMICE

5.1 BASELINE DATA

5.1.1 Desk Study

Two records of dormouse were provided in the desk study, with the most recent dating from 2015 and the nearest located 510 m south of the site.

5.1.2 Field Survey

2012 Survey

During a Dormouse Survey completed by Waterman Group in 2012, a dormouse nest was recorded in a nest tube located within an area of semi-natural ancient woodland in the eastern part of the site. Mammal nests were also found within two other nest tubes at the northern extent of the site, although it was not possible to discern whether the nests had been constructed by dormouse or yellow-necked mouse.

2018 Survey

During the 2018 Dormouse Survey (Report RT-MME-127947-10), a single dormouse was identified in a nest tube located within an area of bramble scrub towards the southern extent of the site. The site supports a wide range of habitats which provide suitable nesting, hibernation, sheltering and foraging opportunities for dormice.

5.2 IMPACT ASSESSMENT

5.2.1 Pre- and Mid-Development Impacts

Whilst the majority of habitat suitable for dormouse will be retained i.e. woodland, some clearance of scrub habitats may be required to accommodate the proposed development. As such, there is the potential for the works to result in the accidental killing, injury or disturbance of dormice, the fragmentation of commuting routes and a reduction in foraging and nesting habitat, which would be in breach of the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended).

5.2.2 Long-Term Impacts

The main long-term risks to dormice will be through the insensitive management of suitable dormice features, such as woodland planting and hedgerows. Inappropriate, or an absence of, management of suitable dormice features, such as woodland and hedgerows could reduce the suitability of the site for this species. An increased presence of humans and domestic pets within the site could result in an increased risk of disturbance to dormice following completion of the proposed development. Overall, these impacts could negatively affect breeding success and thus could have a long-term impact on dormice populations within the area.

5.3 AVOIDANCE AND MITIGATION MEASURES

The avoidance and mitigation measures proposed will:

- Prevent killing or injury of dormice, or destruction or disturbance of dormice nests; and,
- Ensure the favourable conservation status of dormice populations at the site is maintained.

5.3.1 Natural England Licence Application/s

As dormice have been recorded within the survey area, no works should be undertaken which would breach the legislation outlined in Appendix 1. This includes clearing any vegetation that is used or could be used by dormice and that could also result in the killing/injury or disturbance of dormice.

Prior to any works being undertaken which are likely to result in a breach of the legislation, a development licence must be obtained from Natural England. The licence application process will include the submission of a method statement detailing the current status of dormice on site and a mitigation strategy to ensure the favourable conservation status of the dormouse population will be maintained. Prior to a licence being issued, planning permission must be granted and relevant conditions relating to protected species and habitat issues must be discharged. Separate licence applications can be completed for each phase of the development, as required.

5.3.2 General Construction Phase Measures

To minimise construction impacts on dormice, the following measure is proposed:

- Protection of retained habitat – trees and hedgerows which are to be retained will be protected in line with the measure in Section 2.3.2 with respect to root protection areas. The installation of protective fencing will ensure that construction works are not carried out immediately beneath retained trees which may have moderate to high bat roost potential.

These measures will be implemented through the use of a CEcMP for each phase of the development.

5.4 COMPENSATION AND ENHANCEMENT MEASURES

The compensation and enhancement measures proposed will:

- Provide additional nesting locations for dormice; and,
- Improve retained habitat features to benefit dormice.

5.4.1 Dormice Nest Boxes

The method statement submitted in support of the licence application/s to Natural England will inform the requirements for the provision of dormice nest boxes to compensate for nests lost as a result of the development. Any replacement nest boxes will be provided in accordance with the licence

The following compensation and enhancement measures of relevance to dormice were previously committed to and are detailed in the 'Ecology and Nature Conservation' chapter (Waterman, 2015) of the EIA associated with the 2015 extant outline planning permission:

- Provide dormice boxes, to be installed in the woodland; and,
- Creation of wild areas within the green infrastructure for domestic pets.

It is therefore proposed that a series of dormouse nest boxes are installed within suitable undisturbed locations around the site peripheries. The exact locations should be determined by a suitably qualified ecologist when the features are installed.

'Wild areas' would be created in the vicinity of residential properties to provide alternative areas for domestic pets away from areas of ecological value. It is recommended that these 'wild areas' comprise a mix of tussocky grassland and scrub. Further details regarding management of these areas should be provided in the LEMP for each phase of the development.

5.4.2 Habitat Creation and Enhancement

The habitat creation and enhancements proposed as part of the landscaping scheme for the proposed development have been designed so as to maximise biodiversity potential, which is likely to provide benefits for dormice. In particular, connectivity within the site and to the surrounding landscape will be maintained and enhanced. Further details are provided in Sections 3.3.1 and 3.4.

New planting should include species that provide suitable food sources to sustain dormice, such as hazel and oak.

5.5 POST-DEVELOPMENT MANAGEMENT AND MONITORING

Monitoring of replacement nest boxes, if required, will be carried out in accordance with the Natural England licence. General maintenance checks of nest boxes should be completed annually by a suitably qualified ecologist, to ensure these features remain fit for purpose. The long-term management of retained and created habitats will be carried out in accordance with a LEMP for each phase of the development.

6. TERRESTRIAL MAMMALS: BROWN HARE AND HEDGEHOG

6.1 SURVEY FINDINGS

6.1.1 Desk Study

Five records of hedgehog within a 2 km radius of the site were identified in the desk study. The most recent record dated from 2014 and the nearest record was located over 1.3 km north of the site. No records of brown hare were provided in the desk study.

6.1.2 Field Survey

The mosaic of woodland, hedgerows, grassland and scrub provides suitable foraging and refuge opportunities for terrestrial mammals, particularly hedgehog. The open grassland located around the site peripheries and adjacent areas of arable farmland may be utilised by brown hare.

6.2 IMPACT ASSESSMENT

6.2.1 Pre- and Mid-Development Impacts

During the construction phase of the proposed development, there is the potential for individual foraging terrestrial mammals to become trapped and harmed in open excavations, leading to a reduction in foraging success. In addition, vegetation clearance could disturb or damage habitats which may be used by terrestrial mammals. Without mitigation this could have a minor adverse effect on any populations within the local area.

6.2.2 Long-Term Impacts

Suitable habitat for terrestrial mammals will be retained and created around the site peripheries, and will remain connected to suitable habitats in the wider landscape. No long-term effects on populations of terrestrial mammals due to habitat loss or fragmentation are anticipated.

An increase in vehicle movements within the site during the nocturnal period has the potential to lead to an increase in hedgehog mortality due to collisions.

6.3 AVOIDANCE AND MITIGATION MEASURES

The avoidance and mitigation measures proposed will:

- Ensure no killing or injury of terrestrial mammals as a result of construction works.
- Reduce the potential for harm to hedgehogs during the operational phase of the development.

6.3.1 Construction Phase Measures

To minimise construction impacts on terrestrial mammals, the following measures are proposed:

- Cover excavations and pipework: any excavations that need to be left overnight should be covered or fitted with mammal ramps to ensure that any animals that enter can safely escape. Any open pipework with an outside diameter of greater than 120 mm must be covered at the end of each work day to prevent animals entering / becoming trapped.
- Sensitive vegetation clearance: clearance of vegetation should be undertaken in a sensitive manner, to ensure any terrestrial mammals that may be present can disperse into suitable habitats off site. In order to avoid the nesting bird season, it is likely that vegetation clearance will be undertaken when hedgehogs may be hibernating. Vegetation clearance should be supervised by a suitably qualified ecologist. Any hedgehogs found they will be moved to a suitable location outside of the works area.

These measures will be implemented through the use of a CEcMP for each phase of the development.

6.3.2 Operational Phase Measures

Suitable lighting, and a speed limit of 20 mph, will be adopted along the road network within the site, which will minimise the risk of road-related hedgehog mortality.

6.4 POST-DEVELOPMENT MANAGEMENT AND MONITORING

Given the minimal impact of the proposed development on terrestrial mammals, no post-development monitoring is considered necessary.

7. BIRDS

7.1 SURVEY FINDINGS

7.1.1 Desk Study

The desk study revealed records of a range of bird species protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) within a 2 km radius of the site, including barn owl, brambling, fieldfare, goshawk, hen harrier, hobby, honey-buzzard, marsh harrier, merlin, osprey, peregrine, red kite and redwing.

The desk study also provided records of 31 bird species listed as Species of Principal Importance, including 13 Birds of Conservation Concern 4 Red List species (corn bunting, cuckoo, house sparrow, lesser spotted woodpecker, marsh tit, skylark, song thrush, starling, tree sparrow, turtle dove, willow tit, yellow wagtail and yellowhammer) and four Birds of Conservation Concern 4 Amber List species (bullfinch, dunnoek, nightjar and reed bunting).

7.1.2 Field Surveys

2012 Breeding Bird Survey

During the Breeding Bird Survey undertaken by Waterman Group in 2012, a total of 45 bird species were identified over the course of the four survey visits. Bird species were recorded utilising woodland, scrub, grassland, mature trees and building habitats. Of these species, 27 species were confirmed as breeding or likely to be breeding.

Species recorded tended to be widespread generalist species. Species of note confirmed as breeding or likely to be breeding comprised house sparrow, song thrush and yellowhammer (Species of Principal Importance and Birds of Conservation Concern 4 Red List species), mistle thrush (a Birds of Conservation Concern 4 Red List species) and dunnoek (a Species of Principal Importance and Birds of Conservation Concern 4 Amber List species).

2018 Breeding Bird Survey

During the Breeding Bird Survey (Report RT-MME-127947-06), undertaken between May and July 2018, a total of 44 bird species were recorded breeding / probably breeding within the site, comprising:

- Six Species of Principal Importance for Nature Conservation in England and Birds of Conservation Concern 4 Red List species (linnet, marsh tit, skylark, song thrush, spotted flycatcher and yellowhammer);
- Mistle thrush and nightingale, also Birds of Conservation Concern 4 Red List species;
- Two Species of Principal Importance for Nature Conservation in England and Birds of Conservation Concern 4 Amber List species (bullfinch and dunnoek); and,
- Three Birds of Conservation Concern 4 Amber List species (kestrel, stock dove and tawny owl).

The remaining species recorded were fairly common and widespread generalist species.

The site was considered to be of district value in terms of its breeding bird interest.

2018-19 Winter Bird Survey

During the Winter Bird Survey, completed over four survey visits between December 2018 and February 2019, a total of 43 bird species were recorded using the habitats within the site, comprising:

- Four Species of Principal Importance and Birds of Conservation Concern 4 Red List species (marsh tit, skylark, song thrush and starling);
- Two Birds of Conservation Concern 4 Red List species also listed under Schedule 1 of the Wildlife and Countryside Act, 1981 (fieldfare and redwing);
- One additional Birds of Conservation Concern 4 Red List species (mistle thrush);
- Two Species of Principal Importance and Birds of Conservation Concern 4 Amber List species (bullfinch and dunnoek);
- Four additional Birds of Conservation Concern 4 Amber List species (black-headed gull, kestrel, meadow pipit and stock dove); and,
- Two additional species listed under Schedule 1 of the Wildlife and Countryside Act, 1981 (brambling and peregrine falcon).

The site is considered to be of high value to several woodland and generalist species, and supports a range of bird species of conservation concern.

7.2 IMPACT ASSESSMENT

7.2.1 Pre- and Mid-Development Impacts

The majority of habitats suitable for breeding and wintering birds will be retained, continuing to provide valuable nesting and foraging opportunities throughout the year. However many of the buildings which support nests for common species such as blue tit, great tit and pied wagtail will be removed, resulting in the displacement of this species into the surrounding area. Birds affected by noise and visual disturbance during construction works will likely be displaced into suitable retained habitats around the site peripheries.

Works directly affecting vegetation on site could result in injury or death of nesting birds and any dependent young, which would be in breach of the Wildlife and Countryside Act 1981 (as amended).

7.2.2 Long-Term Impacts

Inappropriate management of retained and created habitats could limit the availability of nesting and food sources within the site. Management activities timed to occur within the nesting bird season could lead to the injury or death of birds which would be in breach of the Wildlife and Countryside Act 1981 (as amended). An increased presence of humans and domestic pets within the site could result in an increased risk of disturbance to breeding birds following completion of the proposed development. Overall, these impacts could negatively affect breeding success and thus could have a long-term impact on bird populations within the area.

7.3 AVOIDANCE AND MITIGATION MEASURES

The avoidance and mitigation measures proposed will:

- Prevent the killing or injury of nesting birds; and,
- Minimise disturbance of nesting birds during construction works.

7.3.1 Construction Phase Measures

To minimise construction impacts on breeding and wintering birds, the following measures are proposed:

- Protection of retained habitat: trees and hedgerows which are to be retained will be protected in line with the measure in Section 2.3.2 with respect to root protection areas.
- Appropriate timing of works: building demolition / vegetation clearance should be undertaken outside the bird nesting season. The bird nesting season is weather dependent but generally extends between March and September inclusive (peak period March-August). If this is not possible (for example to ensure vegetation is cleared during the active season for amphibians) then any vegetation to be removed or disturbed should be checked by an experienced ecologist for nesting birds immediately prior to works commencing. If birds are found to be nesting any works which may affect them would have to be delayed until the young have fledged and the nest has been abandoned naturally, for example via the implementation of an appropriate buffer zone (species dependent) around the nest in which no disturbance is permitted until the nest is no longer in use.

These measures will be implemented through the use of a CEcMP for each phase of the development.

7.3.2 Operational Phase Measures

Details regarding the appropriate timing of vegetation management to avoid the nesting bird season will be provided in the LEMP for each phase of the development.

7.4 COMPENSATION AND ENHANCEMENT MEASURES

The compensation and enhancement measures proposed aim to:

- Replace foraging and nesting habitat lost to development;
- Ensure the favourable conservation status of bird populations at the site is maintained; and,
- Provide additional habitat for nesting and foraging birds.

7.4.1 Replacement Nest Boxes

The following compensation and enhancement measures of relevance to birds were previously committed to and are detailed in the 'Ecology and Nature Conservation' chapter (Waterman, 2015) of the EIA associated with the 2015 extant outline planning permission:

- Provide bird boxes, to be installed in the woodland and new builds; and,

- Creation of wild areas within the green infrastructure for domestic pets.

As such, the following nest boxes should be installed on retained mature trees within woodland / along woodland edges around the site peripheries to provide additional roosting opportunities for birds:

- 24 Schwegler 1B boxes, with 32 mm hole, suitable for use by small bird species such as great, marsh and coal tits, redstart, house sparrow and tree sparrow;
- 24 Schwegler 1N boxes, suitable for species such as robin, wren and pied wagtail;
- 24 Schwegler 3S Starling Boxes;
- Six Schwegler Owl Box No. 4, suitable for use by stock dove (woodpeckers will sometimes spend the night in this box too) and four Schwegler Owl Box No. 5, suitable for use by tawny owl;
- Three Barn Owl Nest Boxes and three Kestrel Nest Boxes;

In addition, the following nesting features should be installed on / integrated within new buildings:

- 12 Habibat Terraced Sparrow Boxes;
- 12 Habibat 003 Swift Boxes;
- 12 Habibat Starling Nest Boxes; and,
- 12 House Martin Terrace No 11.

The bird boxes should be installed at a height of at least 3 m to prevent any interference. The best time to install bird boxes is in late winter and early spring, to allow birds time to adjust to them prior to the nesting season. Exact locations will be agreed on site by a suitably qualified ecologist during construction works for each phase of the development.

As stated in Section 5.4.1, 'wild areas' would be created in the vicinity of residential properties to provide alternative areas for domestic pets away from areas of ecological value, with further details regarding management provided in the LEMP for each phase of the development.

7.4.2 Habitat Creation and Enhancement

The habitats which are to be created and enhanced as part of the proposed development will include those of value to nesting and wintering birds. Further details are provided in Section 3.4.

7.5 POST-DEVELOPMENT MANAGEMENT AND MONITORING

A maintenance check of bird boxes should be completed annually by a suitably experienced ecologist, to ensure these nesting features remain fit for purpose. Further information regarding the long-term management of retained and created habitats will be provided in a LEMP for each phase of the development.

8. REPTILES

8.1 SURVEY FINDINGS

8.1.1 Desk Study

The desk study revealed records of four reptile species within a 2 km radius of the site, comprising common lizard, slow worm, grass snake and adder. The nearest records were attributable to common lizard and slow worm, located on site. The most recent record was attributable to grass snake, dating from 2016.

8.1.2 Field Survey

2012 Survey

An 'exceptional' population of slow-worm and a 'good' population of common lizard was recorded on the site during surveys completed by Waterman Energy, Environment & Design Limited in 2012.

2018 Survey

During the 2018 Reptile Survey (Report RT-MME127947-09), the following populations were identified:

- A good population of slow-worm and a good population of common lizard, supported within an area of semi-improved calcareous grassland (Transect C) located within the southern part of the application site;
- An exceptional population of slow-worm and a low population of common lizard, supported within an area of semi-improved neutral grassland (Transect E) located outside of the application site boundary but within the ownership boundary at the southern extent of the survey area; and,
- A low population of slow-worm, supported within an area of grazed semi-improved calcareous grassland (Transect F) located outside of the application site boundary but within the ownership boundary at the south-western extent of the survey area.

8.2 IMPACT ASSESSMENT

8.2.1 Pre- and Mid-Development Impacts

Although the grassland areas within the southern part of the site where populations of slow worm and common lizard were identified will be retained, some suitable habitats will be lost to accommodate the proposed development. Retained habitats around the site peripheries will remain connected, preventing fragmentation and assisting reptile movement throughout the site and into the wider landscape.

During construction, there is therefore the potential for the killing, injury or disturbance to individual slow worms or common lizards utilising habitats at the site. Without mitigation, the works would likely cause a breach of wildlife legislation: these species are protected under the Wildlife and Countryside Act 1981 (as amended) from intentional killing or injuring.

8.2.2 Long-Term Impacts

Insensitive management, such as regular, close mowing of the retained grassland habitats within the site and harsh management of the scrub habitats, are likely to have negative implications on the suitability of habitats for reptiles in the long term.

The introduction of pets to the proposed development site could result in increased predation on reptiles, from domestic cats in particular.

8.3 AVOIDANCE AND MITIGATION MEASURES

English Nature (2004) identifies two aims that need to be achieved where reptiles are present on proposed development sites:

- (1) To protect reptiles from any harm that might arise during the development work; and,
- (2) To ensure that sufficient quality, quantity and connectivity of habitat is provided to accommodate the reptile population, either on-site or at an alternative site, with no net loss of local reptile conservation status.

As such, the avoidance and mitigation measures proposed will:

- Ensure no killing or injury of reptiles (or common amphibians) during construction works.
- Ensure that the favourable conservation status of reptile populations within the site is maintained.

8.3.1 Herpetofauna Mitigation Strategy

Reptile mitigation proposals for the proposed development site have been designed based on the best practice outlined in the Herpetofauna Workers Manual (Gent and Gibson, 1998) and Herpetofauna Groups of Britain & Ireland (1998) publications.

The level of risk posed by each phase of the development will be assessed as detailed designs are brought forward. At present, the following strategy is proposed.

Detailed Phase

The detailed phase of the development has been designed to avoid impacts on habitats where reptiles are known to be present. However, some suitable reptile habitat may need to be removed to accommodate this phase. As such, to ensure that no harm to individual reptiles occurs during site clearance works, it is proposed that a programme of habitat manipulation and destructive searches will be implemented. The clearance of terrestrial habitats will be undertaken in a sensitive manner in order to control any potential risk to reptiles (and common amphibians).

Site Clearance Protocol: Initial Habitat Manipulation

Between November and February, prior to the active season for herpetofauna and the nesting season for birds:

- Initial management of woody vegetation (trees, hedgerow) and longer grass, consisting of cutting to a height of 0.1 m – 0.2 m, with no impact on the ground or roots, can be completed under supervision of the Ecological Clerk of Works. Grass should be cut in a directional manner, towards retained habitats around the site peripheries.

Once the active period for herpetofauna has commenced:

- The site should be subject to a walkover by the Ecological Clerk of Works to determine any sensitive features and their locations with respect to proposed site activities (the survey will focus on the location of any potential refuges for herpetofauna e.g. piles of rubble / rubbish / logs / mammal holes etc). These will be checked and where possible removed from the area.

It should be noted that the active period for herpetofauna is weather dependent but is generally accepted to extend between March and October inclusive. Any reptiles or common amphibians which are found during the walkover should be translocated by the Ecological Clerk of Works into retained habitat around the site peripheries.

If vegetation suitable for nesting birds cannot be cleared prior to the bird nesting season, vegetation should be checked by a suitably qualified and experienced ecologist for nesting birds immediately prior to works commencing. If birds are found to be nesting any works which may affect them would have to be delayed until the young have fledged and the nest has been abandoned naturally.

Once the initial management and refugia clearance works have taken place and all arisings removed from the site, the site should be left for a period of one week to allow any reptiles or amphibians present to disperse into the retained habitat.

Site Clearance Protocol: Direct Search and Supervised Topsoil Strip

The proposed construction area will be searched by hand to ensure that no reptiles (or amphibians) are present. Suitably experienced ecologists will undertake all direct search works and all reptiles and common amphibians found will be moved to retained habitat around the peripheries of the plot.

Following the direct search, a topsoil strip will be undertaken under direct supervision of the Ecological Clerk of Works. The removal of roots of hedges / trees will be undertaken with care by an excavator to allow the careful inspection of the root areas. The removed hedge section/s and trees should be removed from site so as not to create new refuge features.

Receptor Site

Any reptiles (or common amphibians) which are found during the mitigation works will be translocated by suitably experienced ecologists using suitable personal protective equipment to the retained unimproved calcareous and semi-improved neutral habitats in the southern part of the site, outside of the works footprint. These habitats will not be subject to future development and will remain connected to further suitable habitats within the site and the surrounding landscape.

Management of Construction Footprint

Following the supervised vegetation clearance and soil strip works, the construction footprint will be subject to regular management, consisting of the removal of colonising vegetation, at least once every two weeks between April and October, to reduce the suitability of this area for reptiles.

All contractors should be made aware of the potential presence of reptiles on site during the initial site induction and regular tool box talks. In the unlikely event that a reptile is discovered within the development footprint during construction works, a suitably qualified ecologist should be contacted for advice on how to proceed.

Future Phases

Future phases of the development may require clearance of larger areas of suitable reptile habitat to accommodate cut-and-fill works. The extent of impacts will be assessed as detailed plans for future phases are brought forwards, but a combination of methods comprising fencing, trapping and sensitive site clearance are likely to be required to ensure that reptile individuals are removed from suitable habitats within the areas which will be impacted.

Fencing and Trapping

Herpetofauna exclusion fence will be erected to surround and divide the vegetated areas within the works footprint. Prior to installation of the fences the fence lines will be marked out on site and searched by a suitably experienced ecologist to ensure that the works do not impact reptiles and thereby cause a breach of the legislation.

The installation of fencing should be undertaken by a contractor with a detailed understanding of the specifications and requirement for a high standard completion of the works. Contractors without experience in the installation of reptile exclusion fencing will require full time supervision by a suitably experienced ecologist.

The Herpetofauna Groups of Britain & Ireland (1998) recommend the manipulation of the habitat within the works footprint to enhance the trapping & translocation process. This manipulation will involve the reduction of suitable habitat by strimming rough grass and bramble areas to 100 mm in height to produce islands of vegetation around which the reptiles will probably concentrate.

Refugia, consisting of roof felt 'tiles' approximately 500 mm x 500 mm, will be installed and placed along the fence lines and within areas of suitable basking habitat for reptiles. Refugia locations will be marked onto a plan to facilitate the trapping works, whilst reducing the requirement for visual identification measures on site. This will reduce the likelihood of the refugia being found by members of the public, leading to undue disturbance of the reptile population.

The success of the trapping is highly dependent on timing and weather conditions. Suitable weather conditions for these works as detailed in Gent & Gibson (1998) are summarised in Table 3.1.

Parameter	Value
Temperature	9 - 18° C
Sunshine	Preferable
Cloud	Acceptable
Wind	Low/None

Table 3.1 Weather Conditions for Reptile Trapping & Translocation
(adapted from Gent & Gibson, 1998)

Trapping is to be conducted over a period of a minimum of 30 days, during suitable weather conditions. If no individual reptiles are caught within 20 days of trapping, then trapping will cease. If individuals are caught during this 20 day period, then the full 30 days of trapping will occur. To ensure that the works footprint has been successfully cleared of reptiles, trapping will continue until there are 5 clear days of no capture or no records, even if this extends beyond the 30 days trapping period in suitable weather conditions.

Once trapping and translocation is complete, a destructive search of features deemed suitable for reptiles would then commence to ensure all reptiles have been caught.

Receptor Site

As for the detailed phase any reptiles (or common amphibians) which are found during the mitigation works will be translocated by suitably experienced ecologists using suitable personal protective equipment to the retained unimproved calcareous and semi-improved neutral habitats in the southern part of the site, outside of the works footprint.

Management of Construction Footprint

It is essential that the perimeter fence be inspected and maintained daily throughout the duration of construction activities to ensure that reptiles do not regain access to the site.

The external boundary fencing will be removed on completion of the works.

8.3.2 General Construction Phase Measures

To minimise construction impacts on herpetofauna, the following measures are proposed:

- Avoiding the creation of potential refuges such as stacked materials and topsoil;
- Cover excavations and pipework: any excavations that need to be left overnight should be covered or fitted with ramps to allow fauna to easily escape.

These measures will be implemented through the use of a CEcMP for each phase of the development.

8.4 COMPENSATION AND ENHANCEMENT MEASURES

The general habitat creation measures outlined in Section 5.3, including the creation of wildflower grassland and SuDS features, will provide new terrestrial and aquatic habitat and enhance the site for use by common reptile and amphibian species.

In addition, it is recommended that hibernacula are created in close proximity to attenuation features, in areas where they are unlikely to be disturbed, in order to provide additional hibernation and refuge habitat for herpetofauna. These hibernacula should be created using suitable logs from hedgerow clearance works. Figure 8.1 provides a schematic design for a hibernaculum. The exact number and locations of hibernacula should be determined by a suitably experienced ecologist as each phase of the development is brought forward.

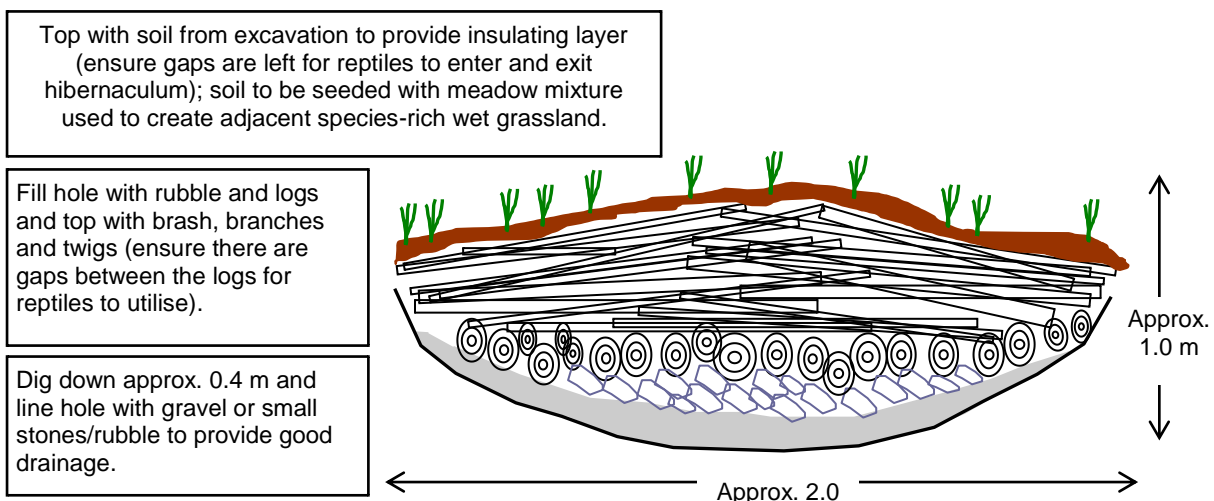


Figure 8.1: Design of Proposed Herpetofauna Hibernacula

As stated in Section 5.4.1, 'wild areas' would be created in the vicinity of residential properties to provide alternative areas for domestic pets away from areas of ecological value, with further details regarding management provided in the LEMP for each phase of the development.

8.5 POST-DEVELOPMENT MANAGEMENT AND MONITORING

To ensure that the favourable conservation status of reptile populations is maintained at the site, a scheme of monitoring will be instigated. Given the likely phased nature of the proposed development, it is proposed that reptile monitoring surveys of suitable habitats are undertaken every four years following the completion of the first phase of the development until four years after the completion of the final phase of the development. The proposed management of the retained and created habitats within the site in accordance with the LEMP for each phase of the development will ensure that habitats within the site are enhanced and managed in the long-term.

9. INVASIVE NON-NATIVE SPECIES

9.1 SURVEY FINDINGS

9.1.1 Desk Study

The desk study revealed records of 15 non-native invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) within a 2 km radius of the site, with recent records for several species dating from 2017. However, the nearest record was located over 1.4 km from the site, attributable to Himalayan balsam.

9.1.2 Field Survey Results

During the Phase 1 Habitat Survey completed as part of the Preliminary Ecological Appraisal (Report RT-MME-127947-01), a small amount of rhododendron was recorded growing within the Old Fort area, which is located in the centre of the site. In addition, an unidentified cotoneaster species was recorded within the area of mixed plantation woodland located to the north of Armstrong Close and west of Fort Road. As this cotoneaster could not be identified to species level, the possibility of it being an invasive species could not be ruled out.

Japanese knotweed was also recorded during the survey. This was located off site, approximately 300 m from the boundary, within an area of scrub adjacent to London Road.

9.2 IMPACT ASSESSMENT

9.2.1 Pre- and Mid-Development Impacts

Vegetation clearance and ground works have the potential to cause rhododendron or cotoneaster to spread in the wild. Rhododendron and five cotoneaster species (cotoneaster *Cotoneaster horizontalis*, entire-leaved cotoneaster *C. integrifolius*, Himalyan cotoneaster *C. simonsii*, hollyberry cotoneaster *C. bullatus* and small-leaved cotoneaster *C. microphyllus*) are listed as a non-native invasive species under Schedule 9 of the Wildlife and Countryside Act 1981, as amended, and therefore allowing these plants to spread in the wild is considered to be an offence under this legislation.

Should Japanese knotweed colonise the site prior to construction works commencing, there is also the potential for this invasive, non-native species listed on Schedule 9 of the Wildlife and Countryside Act 1981 to spread in the wild.

9.2.2 Long-Term Impacts

In the long-term, if there is any contaminated material re-used as part of the landscaping works at the site, and these species are not fully eradicated, there is the potential for them species to spread throughout the site again, thus potentially adversely impacting on the retained and created habitats within the site, and potentially also within the wider countryside.

9.3 MITIGATION

9.3.1 Control of Rhododendron

The following methodologies for controlling rhododendron are detailed within Forestry Commission best practice guidelines 'Managing and Controlling Invasive Rhododendron' (Edwards, 2006), which detail several options for the control of rhododendron within a development site.

Managing Rhododendron

All material within the rhododendron stand including soil around the root system which may be contaminated with seeds will be considered as contaminated. Rhododendron areas will be clearly marked out on site. All site operatives will be made aware of the requirements associated with the management of this species in order to help limit accidental spread through a toolbox talk or similar mechanism.

Treatment of Above Ground Rhododendron Material

The top woody growth of rhododendron can be manually removed to leave cut stumps with no remaining live branches or shoots. This operation can be performed by operators with chainsaws or clearing saws. The resulting cut woody material can be removed to a safe area for burning or chipped on site. Chips can be left

on site or bagged and removed. Freshly cut rhododendron material is difficult to ignite and benefits from being allowed to dry first.

Burning rhododendron waste is covered by the Waste Management Licensing Regulation (1994). The regulator (the Environment Agency) must be notified in advance and the amount burned in any 24 hour period must be less than 10 tonnes.

A build up of chipped rhododendron material can act as a mulch and prevent desirable vegetation species growing on the cleared site so, where possible, avoid this. Alternatively, a mulch of chipped material can be used to reduce the potential encroachment of rhododendron or other weed species.

If eradication of the rhododendron bushes is required a cut stump herbicide application can be applied. This technique involves applying Glyphosate herbicide to the surface of a stump on the same day of cutting. Drilling a reservoir on the stump surface to contain the herbicide has been shown to be a highly effective technique.

For removal of large plants, the Forestry Commission (2019) report that 'A stem injection control method has been successfully trialed in Western Scotland and Wales'. They continue:

Injecting herbicide directly into the stems of large rhododendron results in their death within six months. Not only is the dead material then easier to remove, but the application of the herbicide is more precise than in traditional methods, uses less product producing overall cost savings.

Control of Rhododendron Roots and Seed Bank

To control the spread of rhododendron on-site:

- Use of plant machinery and vehicles within the whole site will be limited until areas polluted with rhododendron have been identified and cleared.
- Only essential vehicles and plant machinery will be present in areas polluted with rhododendron. Care will be taken to ensure that polluted material is not dropped or transferred to other areas of the site. The use of wheeled rather than tracked vehicles is recommended as they are easier to clean if contaminated with rhododendron material.
- On leaving areas of the site known to contain rhododendron, any machinery that has been used will be thoroughly cleaned within a designated area. All hand tools and footwear will be cleaned off in a similar manner.
- Even with great care, a certain amount of regrowth would be expected and any will be treated by hand pulling of seedlings. Rhododendron is persistent, and repeat visits may be required at the site.

Disposal of Material Off-Site

The topsoil at the site is likely to be contaminated with rhododendron seeds and therefore it is recommended that soil is not removed from the site. However, if soil is to be removed from the site it should be disposed of to a licensed landfill site. Material should be excavated straight into awaiting containers to reduce the possibility of spreading the plant.

Hauliers must also ensure that during the removal of material off site, vehicles do not carry rhododendron containing soils on the wheels or bodies of their vehicles and that the vehicle is suitably covered or enclosed to prevent escape during transport.

Where the material is being carried to landfill sites for disposal or where vehicles are involved in movements on the site of production great care should be taken to clean off material at the point of discharge so as not to transport the rhododendron elsewhere. Vehicles will be brushed down to avoid spreading the seed bank. The disposal site will be checked in advance to ensure that they can receive material containing rhododendron.

Further Treatment of the Rhododendron Contaminated Area

In order to address any re-growth of rhododendron from the works area a long-term strategy involving hand pulling of seedlings will be required.

Hand-pulling is a simple procedure – operators walk in line through the area to be cleared and hand-pull all live seedlings by gripping the base of the stem and pulling at an oblique angle.

Control of small or young seedlings can be achieved without using herbicides, but only if the area involved is small, the density of seedlings to pull is low or sufficient numbers of operators are available. Larger seedlings or small bushes can also be pulled by hand.

A bag must be used to collect pulled seedlings for removal from site, or seedlings must be hung upside down on the branch of adjacent trees; if seedlings are left on top of the soil they can re-root in the humid/wet conditions where rhododendron is typically found.

Hand-pulling control usually takes a minimum of two years to totally eradicate rhododendron.

9.3.2 Control of Cotoneaster

Cotoneaster can be controlled / removed by the following methods:

- Mechanical – pulling out young seedlings and excavating the root mass.
- Chemical – spraying smaller plants with herbicide and treating stumps of larger plants after cutting.

Any contaminated material should be chipped or burned on site or removed to a licensed landfill facility as controlled waste.

9.3.3 Monitoring of Japanese Knotweed

The recognition and early (appropriate) management of Japanese knotweed can reduce the risk of excessive cost, potential prosecution and prevent physical damage to buildings and hard surfaces. As such, regular monitoring of the site and boundaries should be undertaken prior to and during construction works, to ensure that Japanese knotweed has not colonised the site. In the event that any Japanese knotweed is identified, all works should cease and a suitable method statement should be prepared to ensure that the works do not cause this species to spread.

9.4 POST-DEVELOPMENT MANAGEMENT AND MONITORING

A long-term monitoring programme of the development area is suggested to assess rhododendron and cotoneaster viability. Accordingly, it is proposed that an annual inspection of the site is conducted for each year throughout the construction period and for three years post-development to determine regrowth, and to ensure all contaminated areas are sprayed / cleared. Further treatment visits may be required based on the results of the monitoring.

10. SUMMARY

This document details avoidance, mitigation, compensation and enhancement proposals that will be implemented to ensure that the favourable conservation status of key ecological features will be maintained at the site prior to, during and after development. Much of the mitigation has been designed to ensure the long-term retention of existing key habitats and to create linking wildlife corridors through and around the site, allowing species movement into the wider landscape. In addition, existing habitats will be enhanced and new habitats, including ponds and species-rich grassland, will be created.

The document has identified mitigation proposals to ensure the long-term protection of protected and notable species or species groups which have either been recorded at or near to the site, or for which suitable habitats are present within the site. These species and species groups are: bats, dormice, brown hare, hedgehog, breeding and wintering birds and reptiles. A confidential chapter relating to badgers is included in Appendix 2.

Measures to prevent the spread of non-native invasive plant species have also been provided.

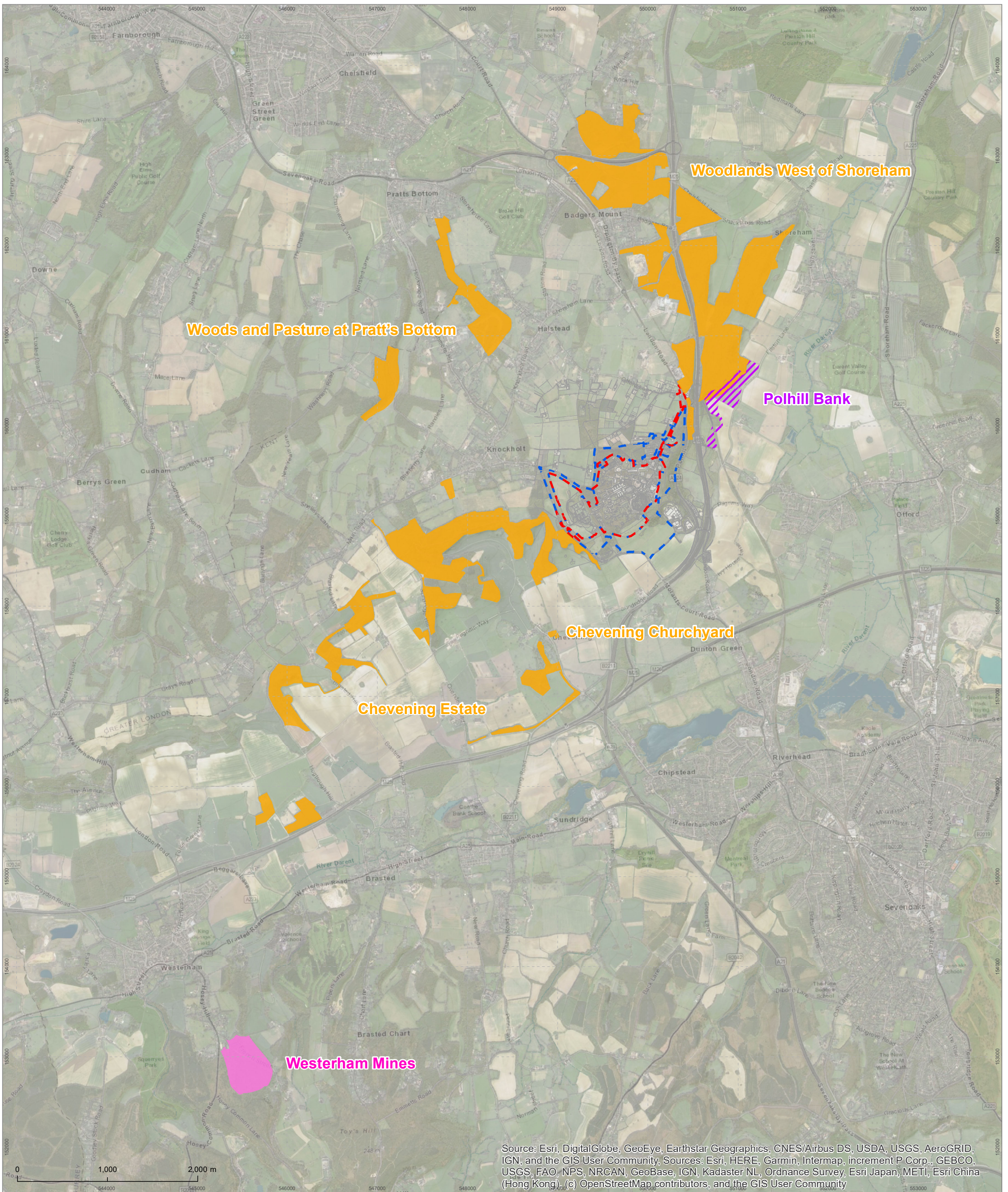
It is recognised that there will be interactions between mitigation proposals required for each of the key ecological features. Where possible, the work schedules for each of the species groups have taken into account the influence of other ecological constraints, however it is anticipated that there may be some minor amendment to proposed timescales in order to ensure a logical phasing and to minimise ecological impact.

It is proposed that the implementation of ecological mitigation will be overseen by a suitably qualified Ecological Clerk of Works who will provide advice to construction and landscaping contractors and manage the interaction between mitigation requirements for each species throughout the development process.

It is recommended that a Construction Ecological Management Plan (CEcMP) is produced and implemented for each phase of the development, in order to control adverse construction impacts. A Landscape and Ecological Management Plan (LEMP) for each phase of the development will be prepared and implemented, to ensure that the biodiversity value of habitats is maintained in the long-term.

11. DRAWINGS

Drawing Ref	Title
C129747-12-01	Summary of Nature Conservation Sites
C129747-12-02	Summary of Habitats
C129747-12-03	Summary of Species



- Legend**
- Local Wildlife Site
 - Kent Wildlife Trust Reserve
 - Site of Special Scientific Interest
 - Outline planning application boundary
 - Ownership boundary

Project		Fort Halstead, Kent	
Drawing		Summary of Nature Conservation Sites	
Client		CBRE Ltd	
Drawing Number	C127947-12-01	Revision	00
Scale @ A3	1:40,000	Date	September 2019
Approved By	HT	Drawn By	GT



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C127947-12-01



C127947-12-02

Legend

- - - Outline planning application boundary
- - - Ownership boundary
- X Scattered scrub
- Scattered trees
- ++++ Fence
- W W W W Native species-rich hedge and trees
- - - Species-poor defunct hedgerow
- Species-poor intact hedgerow
- A Amenity grassland
- SI Semi-improved neutral grassland
- SI Semi-improved calcareous grassland
- Unimproved calcareous grassland
- Bracken
- Tall ruderal
- Broad-leaved semi-natural woodland
- Broad-leaved plantation woodland
- Coniferous plantation woodland
- Mixed plantation woodland
- SI Poor semi-improved grassland
- Other habitat: Built-up area with scattered trees present in abundance throughout site
- Target notes:
 1. Species rich calcareous grassland within fence
 2. Species rich calcareous grassland outside fence
 3. The fort
 4. Verges of SI present in abundance throughout site
 5. Semi-natural ancient woodland

Project	Fort Halstead, Kent	
Drawing	Summary of Habitats	
Client	CBRE Ltd	
Drawing Number	C127947-12-02	Revision 00
Scale @ A3	1:8,000	Date September 2019
Approved By	HT	Drawn By GT

MIDDLEMARCH ENVIRONMENTAL

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Legend

- - - Outline planning application boundary
- - - Ownership boundary

Reptiles:

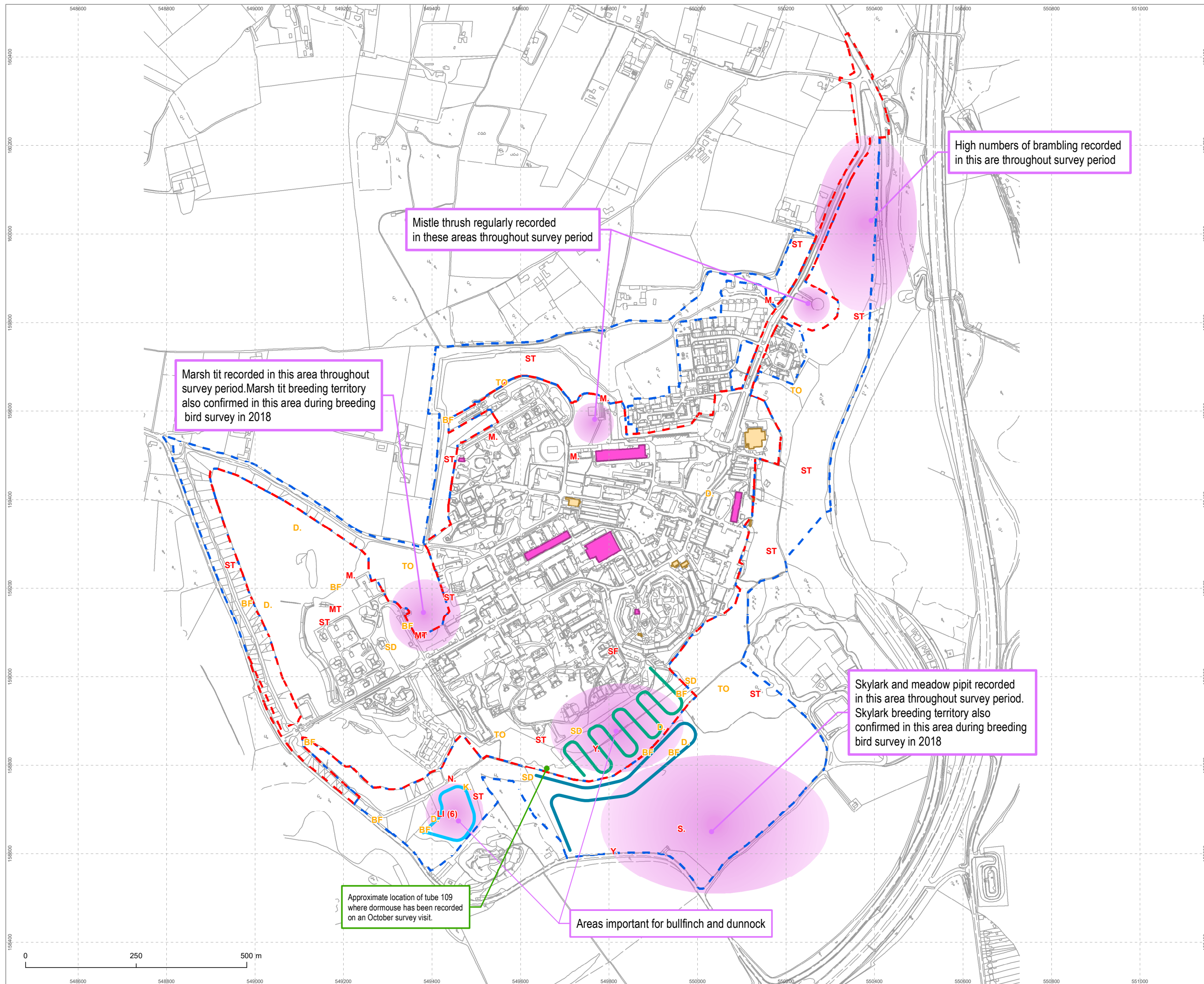
- Exceptional population of slow worm and low population of common lizard identified
- Good population of slow worm and good population of common lizard identified
- Low population of slow worm identified

Bats:

- 2018 bat roost
- Bat roost identified during previous surveys

Breeding Birds:

Red lists species	
ST	Song thrush
M.	Mistle thrush
SF	Spotted flycatcher
S.	Skylark
Y.	Yellowhammer
LI	Linnet
N.	Nightingale
MT	Marsh tit
Amber lists species	
TO	Tawny owl
SD	Stock dove
BF	Bullfinch
D.	Dunnock
K.	Kestrel



High numbers of brambling recorded in this area throughout survey period

Mistle thrush regularly recorded in these areas throughout survey period

Marsh tit recorded in this area throughout survey period. Marsh tit breeding territory also confirmed in this area during breeding bird survey in 2018

Skylark and meadow pipit recorded in this area throughout survey period. Skylark breeding territory also confirmed in this area during breeding bird survey in 2018

Approximate location of tube 109 where dormouse has been recorded on an October survey visit.

Areas important for bullfinch and dunnock

Project	Fort Halstead, Kent		
Drawing	Summary of Species		
Client	CBRE Ltd		
Drawing Number	C127947-12-03	Revision	00
Scale @ A3	1:8,000	Date	September 2019
Approved By	HT	Drawn By	GT



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APPENDICES

APPENDIX 1 Species Legislation

APPENDIX 2 Confidential Badger Appendix

APPENDIX 1

SPECIES LEGISLATION

Bats

Bats and the places they use for shelter or protection (i.e. roosts) receive European protection under The Conservation of Habitats and Species Regulations 2017 (Habitats Regulations 2017). They receive further legal protection under the Wildlife and Countryside Act (WCA) 1981, as amended. This protection means that bats, and the places they use for shelter or protection, are capable of being a material consideration in the planning process.

Regulation 41 of the Habitats Regulations 2017, states that a person commits an offence if they:

- deliberately capture, injure or kill a bat;
- deliberately disturb bats; or
- damage or destroy a bat roost (breeding site or resting place).

Disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong.

It is an offence under the Habitats Regulations 2017 for any person to have in his possession or control, to transport, to sell or exchange or to offer for sale, any live or dead bats, part of a bat or anything derived from bats, which has been unlawfully taken from the wild.

Whilst broadly similar to the above legislation, the WCA 1981 (as amended) differs in the following ways:

- Section 9(1) of the WCA makes it an offence to *intentionally* kill, injure or take any protected species.
- Section 9(4)(a) of the WCA makes it an offence to *intentionally or recklessly** damage or destroy, or *obstruct access to*, any structure or place which a protected species uses for shelter or protection.
- Section 9(4)(b) of the WCA makes it an offence to *intentionally or recklessly** disturb any protected species *while it is occupying a structure or place which it uses for shelter or protection*.

*Reckless offences were added by the Countryside and Rights of Way (CRoW) Act 2000.

As bats re-use the same roosts (breeding site or resting place) after periods of vacancy, legal opinion is that roosts are protected whether or not bats are present.

The following bat species are Species of Principal Importance for Nature Conservation in England: barbastelle bat *Barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii*, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, greater horseshoe bat *Rhinolophus ferrumequinum* and lesser horseshoe bat *Rhinolophus hipposideros*.

The reader should refer to the original legislation for the definitive interpretation.

Dormouse

Dormice and the places they use for shelter or protection receive European protection under The Conservation of Habitats and Species Regulations 2017 (Habitats Regulations 2017). They receive further legal protection under the Wildlife and Countryside Act (WCA) 1981, as amended. This protection means that dormice, and the places they use for shelter or protection, are capable of being a material consideration in the planning process.

Regulation 41 of the Habitats Regulations 2017, states that a person commits an offence if they:

- deliberately capture, injure or kill a dormouse;
- deliberately disturb dormice; or
- damage or destroy a breeding site or resting place.

Disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong.

It is an offence under the Habitats Regulations 2017 for any person to have in his possession or control, to transport, to sell or exchange or to offer for sale, any live or dead dormouse, part of a dormouse or anything derived from a dormouse, which has been unlawfully taken from the wild.

Whilst broadly similar to the above legislation, the WCA 1981 (as amended) differs in the following ways:

- Section 9(1) of the WCA makes it an offence to *intentionally* kill, injure or take any protected species.
- Section 9(4)(a) of the WCA makes it an offence to *intentionally or recklessly** damage or destroy, *or obstruct access to*, any structure or place which a protected species uses for shelter or protection.
- Section 9(4)(b) of the WCA makes it an offence to *intentionally or recklessly** disturb any protected species *while it is occupying a structure or place which it uses for shelter or protection*.

*Reckless offences were added by the Countryside and Rights of Way (CRoW) Act 2000.

Dormice are listed as Species of Principal Importance on the UK Post-2010 Biodiversity Framework (2012), and as such are material considerations in the planning process. Dormice are also listed on the Essex Biodiversity Action Plan.

Nesting Birds

Nesting and nest building birds are protected under the Wildlife and Countryside Act WCA 1981 (as amended). Some species (listed in Schedule 1 of the WCA) are protected by special penalties.

Subject to the provisions of the act, if any person intentionally: kills, injures or takes any wild bird; takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or takes or destroys an egg of any wild bird, he shall be guilty of an offence.

'Reckless' offences with regard to the disturbance of nesting wild birds included in Schedule 1 of the Wildlife and Countryside Act were added by the Countryside and Rights of Way Act 2000.

The Natural Environment and Rural Communities (NERC) Act 2006 places a duty on Government Departments to have regard for the conservation of biodiversity and maintains lists of species and habitats which are of principal importance for the purposes of conserving biodiversity in England and Wales. These lists include a number of bird species.

Reptiles

All of the UK's native reptiles are protected by law. The two rarest species – sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca* – benefit from the greatest protection.

Common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, adder *Vipera berus* and grass snake *Natrix natrix* are protected under the Wildlife and Countryside Act 1981 (as amended) from intentional killing or injuring.

Sand lizard and smooth snake are protected under The Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended) which together make it illegal to kill, injure, capture, handle or disturb these animals. Places they use for breeding, resting, shelter and protection are protected from being damaged or destroyed. It is also illegal to obstruct these animals from using such areas.

All native reptile species are listed as Species of Principal Importance on the UK Post-2010 Biodiversity Framework (2012), and as such are material considerations in the planning process.

This is a simplified description of the legislation. In particular, the offences mentioned here may be absolute, intentional, deliberate or reckless. Note that where it is predictable that reptiles are likely to be killed or injured by activities such as site clearance, this could legally constitute intentional killing or injuring.

The reader should refer to the original legislation for the definitive interpretation.

APPENDIX 2

CONFIDENTIAL BADGER APPENDIX

CONFIDENTIAL BADGER APPENDIX

CA.1 BASELINE DATA

CA.1.1 Desk Study

The desk study identified 19 records of badgers within a 2 km radius of the site, with the most recent records dating from 2017, and the nearest records located potentially within 1 km of the site.

CA.1.2 Field Surveys

2014 Survey

During a Badger Survey completed by Waterman Group at the site in 2014, a total of ten badger setts were recorded [REDACTED] and consisted of one active main sett with a potentially active annex sett covered in dense vegetation, one active subsidiary sett, two active outlier setts and six inactive outlier setts.

Eleven badger setts were also recorded [REDACTED] and consisted of one inactive subsidiary sett, two active outlier setts and eight inactive outlier setts.

Waterman Group considered it likely that the badger population observed in [REDACTED] formed a single badger territory due to its isolation from the badger population recorded [REDACTED].

2018 Survey

During the 2018 Badger Survey (Report RT-MME-127947-05), one main sett (Sett 1), one annex sett (Sett 2), three subsidiary setts (Setts 4, 5 and 6) and six outlier setts (Setts 3, 7, 8, 9, 10 and 11) were identified within the survey area. Sett monitoring over a two-week period indicated that three setts (Setts 1, 5 and 6) were in current use by badgers. In addition, several latrines were recorded around the site peripheries. Evidence of badger activity recorded during the survey is illustrated on Drawing C127947-12-04.

The woodland, hedgerows, grassland and scrub within the site provide ample opportunities for further sett building as well as suitable foraging habitat.

CA.2 IMPACT ASSESSMENT

CA.2.1 Pre- and Mid-Development Impacts

Badger Setts

It is understood that the main sett (Sett 1) [REDACTED], although it is understood that the sett is to be retained. However, in the absence of mitigation, the [REDACTED] may prevent badgers from moving between this sett and key foraging areas.

One of the active subsidiary setts (Sett 6) is located outside of the works footprint and will not be impacted as a result of the proposed development. However, the other active subsidiary sett (Sett 5) is located within an area [REDACTED]. In addition, there is the potential for badgers to excavate new setts within, or in close proximity to, the main construction footprint prior to works commencing. As such, there is the potential for works to impact badger setts and may result in the killing, injury or disturbance of badgers, which would be in breach of the Protection of Badgers Act 1992.

Foraging Areas

Within the site, construction works may result in both the permanent and temporary loss of habitats potentially used by badgers for foraging, including woodland, hedgerows and scrub. However, the majority of suitable habitat will be retained around the site peripheries and will remain connected, and extensive foraging areas for badger are available in the wider landscape, and as such it is considered that the effect of loss of foraging habitat is not significant.

In the absence of mitigation, badgers could become trapped in open excavations. In addition, construction phase lighting has the potential to cause fragmentation of dark corridors which may be utilised by foraging and commuting badgers.

CA.2.2 Long-Term Impacts

It is not anticipated that there would be significant long-term disturbance (other than habitat management works) of the habitats potentially utilised by badgers on or adjacent to the site. Operational phase lighting may prevent badgers from using illuminated areas of the site, although this is likely to be minimal. As such, no long-term effects on local badger populations are anticipated as a result of operational phase disturbance and lighting.

An increase in vehicle movements within the site during the nocturnal period has the potential to lead to an increase in badger mortality due to collisions, particularly along Crow Drive/Crow Road, which will become the primary vehicular route in and out of the proposed development.

CA.3 AVOIDANCE AND MITIGATION MEASURES

The avoidance and mitigation measures proposed will:

- Safeguard the status of badgers and to ensure compliance with the Protection of Badgers Act 1992;
- Ensure no killing or injury of badgers as a result of construction works;
- Ensure the favourable conservation status of the badger population at the site is maintained; and,
- Reduce the potential for harm to badgers during the operational phase of the development.

CA.3.1 Updated Survey and Natural England Badger Licence Application

Prior to the commencement of the proposed development, a Badger Survey (including sett monitoring) will be completed to provide an update on the current status of badgers at the site. The aim of survey will be to identify the locations of all existing and potential new setts and to determine their status with respect to their current use by badgers. The findings of the updated survey will be used to review and update the potential impacts of the proposed development and identify any additional mitigation that may be required.

If the need for sett closures is identified, or a 30 m standoff cannot be implemented around setts in current use, then a Badger Method Statement will be submitted to Natural England in support of a licence to enable the mitigation and construction works to proceed. Badger development licences are only issued for the period 1st July to 30th November, in order to avoid disturbing badgers during their breeding season.

To ensure enough time is available to identify any newly excavated setts and, if necessary, monitor and close them, an updated survey will be completed approximately 13 weeks prior to any works starting on the site (although consideration would also need to be given to the fact that badger setts can only be closed between July and November inclusive).

Any setts identified within or adjacent to the construction area that are confirmed not to be in current use will be closed and excavated by hand under supervision of a suitably qualified ecologist.

CA.3.2 General Construction Phase Measures

To minimise construction impacts on badgers, the following measures are proposed:

- Cover excavations and pipework: any excavations that need to be left overnight should be covered or fitted with mammal ramps to ensure that any animals that enter can safely escape. Any open pipework with an outside diameter of greater than 120 mm must be covered at the end of each work day to prevent animals entering/becoming trapped.
- Appropriate timing of works: no night working will be carried out, minimising the light disturbance of dark corridors which may be used by foraging badger.

These measures will be implemented through the use of a CEcMP for each phase of the development.

CA.3.3 Operational Phase Measures

Suitable lighting, and a speed limit of 20 mph, will be adopted along the road network within the site, which will minimise the risk of road-related badger mortality. However, to reduce the risk further, it is

proposed that badger tunnels are installed under main routes throughout the site, along with associated guide fencing.

In addition, suitable tunnels will be provided [REDACTED].

The locations of these tunnels should be informed by a badger bait marking survey, to ensure that well-used badger foraging and commuting routes are maintained within the site in the long-term.

CA.4 COMPENSATION AND ENHANCEMENT MEASURES

The following enhancement measure of relevance to badger was previously committed to and is detailed in the 'Ecology and Nature Conservation' chapter (Waterman, 2015) of the EIA associated with the 2015 extant outline planning permission:

- Provide an artificial badger sett in 2016 within the 'wildlife area' in advance of the construction of the new QinetiQ security fence in Phase 2.

However, it is now understood that as the main sett (Sett 1) will not be impacted as a result of the works, an artificial sett will no longer need to be provided. Should the plans change and the main sett will be impacted as a result of the proposed works, the requirement for an artificial sett should be re-assessed.

Suitable foraging habitat for badgers will be retained and created around the peripheries of the site, ensuring connective corridors are provided into the wider landscape. Management measures regarding retained and created habitats will be provided in a LEMP for each phase of the development.

CA.5 POST-DEVELOPMENT MANAGEMENT AND MONITORING

Monitoring of badger setts, if required, will be carried out in accordance with the Natural England licence.

The long-term management of retained and created habitats will be carried out in accordance with a LEMP for each phase of the development.

CA.6 DRAWINGS

Drawing Ref	Title
C127947-12-04	Summary of Badger Activity

CONFIDENTIAL

REDACTED VERSION – DRAWING NOT PROVIDED

CONFIDENTIAL

BADGER LEGISLATION

Badgers and their setts are protected under the Protection of Badgers Act 1992. The Protection of Badgers Act 1992 is based primarily on the need to protect badgers from baiting and deliberate harm or injury, badgers are not protected for conservation reasons. The following are criminal offences:

- To intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it.
- To wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so.

A badger sett is defined in the legislation as:

- *'Any structure or place that displays signs indicating current use by a badger'*.

'Current use' is not synonymous with current occupation and a sett is defined as such (and thus protected) as long as signs of current usage are present. Therefore, a sett is protected until such a time as the field signs deteriorate to such an extent that they no longer indicate 'current usage'.

Badger sett interference can result from a multitude of operations including excavation and coring, even if there is no direct damage to the sett, such as through the disturbance of badgers whilst occupying the sett. Any intentional or reckless work that results in the interference of badger setts is illegal without a licence from Natural England. In England a licence must be obtained from Natural England before any interference with a badger sett occurs.

Previous guidance from English Nature, Badgers and Development (English Nature, 2002) considered that the following types of activity may require licensing within certain distances of the sett entrances (these distances are not included within the Protection of Badgers Act, 1992):

- using very heavy machinery (generally tracked vehicles) within 30 m of any entrance to an active sett;
- using lighter machinery (generally wheeled vehicles), particularly any digging operation, within 20 m of any entrance to the active sett;
- light work such as hand digging or scrub clearance within 10 m of any entrance to the active sett.

However, some activities may cause disturbance at greater distances, including pile driving and the use of explosives. These activities require individual consideration to ensure that best ecological practice is followed, however, it is generally considered that a licence is more likely to be required if these works are undertaken within 50m of an active badger sett.

New guidance was issued by NE in 2009 which states that disturbance is something less than what might otherwise be considered damage to a sett, but it is also something more than limited noise or activity near a sett at levels which badgers commonly tolerate, without apparently being disturbed. NE therefore believes that badgers are relatively tolerant of moderate levels of disturbance at or near to badger setts, but such disturbance does not necessarily disturb the badgers occupying the setts. The disturbance, which different activities may or may not cause to a badger sett, should therefore be assessed on a case by case basis.

Although the above prescriptive distances are no longer referred to by NE, they can be used as an aid to assess where works would constitute a disturbance to each sett.

The reader should refer to the original legislation for the definitive interpretation.