Preliminary Ecological Appraisal and Bat & Protected Species Survey

Dean Denver
Dean Street
Liskeard
Cornwall
PL14 4AE

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SECTION 1 SUMMARY

1.1 Site Description and Proposal

It is proposed to demolish four buildings at Dean Denver, Dean Street, Liskeard, Cornwall, PL14 4AE and construct four residential dwellings with associated parking.

1.2 Survey Results

The site comprised four buildings surrounded by areas of hardstanding, modified grassland, introduced shrubs, and trees. The site was enclosed by walls, a hedgerow, and lines/pockets of trees. The habitats on site are considered suitable for common amphibians, foraging bats, badger, nesting birds, hedgehog, reptiles, and invertebrates. Buildings B1 and B2 were both confirmed to support roosting bats.

1.3 Impacts

It is understood that the buildings, modified grassland, introduced shrub and three trees will be removed (in addition to the two trees already removed) which could negatively impact common amphibians, foraging and roosting bats, badger, nesting birds, and hedgehog. External and internal lighting will be introduced in association with the four dwellings.

As detailed within the Biodiversity Metric Assessment, the development will result in a negative ecological impact (-92.43%) to biodiversity through the loss of trees and modified grassland.

1.4 Recommendations

A bat emergence survey (comprising three survey visits) will be required for Buildings B1 and B2 to confirm the impact of the proposed works. Mitigation, compensation and enhancement measures required for bats will be determined upon completion of the further surveys.

1.5 Conclusion

The proposed development represents a negative ecological impact to biodiversity through the loss of habitat and an unconfirmed ecological impact upon protected species (bats), through the loss of roosting habitat and introduction of lighting. Further surveys have been recommended to enable a full assessment of the impacts upon the bats.

SECTION 2 INTRODUCTION

2.1 Proposal

It is proposed to demolish four buildings at Dean Denver, Dean Street, Liskeard, Cornwall, PL14 4AE and construct four residential dwellings and associated parking.

2.2 Survey Objectives

The Preliminary Ecological Appraisal (PEA) and Bat & Protected Species Survey (BAPS) were undertaken to consider and assess the perceived ecological impacts associated with the proposal, including any perceived impacts to:

- Legally protected species or species of conservation concern;
- Legally protected habitats or habitats of conservation concern;
- Any statutory or non-statutory sites of conservation interest; and,
- Opportunities to provide biodiversity enhancement(s).

2.3 Site Description

The site was located in the south-western extent of the town of Liskeard. The site was bordered by residential properties with associated gardens and the B3254 (Figure 2.1). The surrounding landscape comprised residential buildings, commercial properties, carparks, agricultural land, hedgerows, and pockets of woodland. The A38 was located approximately 0.3 miles south of the site.

The survey site was approximately 0.1 ha and comprised four buildings surrounded by areas of hardstanding, modified grassland, sparsely vegetated urban land, introduced shrubs, and trees. The site was enclosed by walls, a hedgerow and lines/pockets of trees.

Figure 2.1. The site boundary (outlined in red) at Dean Denver

SECTION 3 SURVEY METHODS

3.1 Preliminary Ecological Appraisal

3.1.1 Scope of the Assessment

The zone of influence covers the extent of the site, the site boundaries, and areas directly adjacent to the site. The assessment considers designated sites, habitats, and species of importance for biodiversity conservation and protected species.

3.1.2 Desk-Based Review

A desk-based review was undertaken comprising ecological data including details of statutory designated for nature conservation or interest, together with records pertaining to protected species and habitats and/or species and habitats of conservation concern obtained from web-based resources including:

- Review of the Government's (DEFRA) mapping website MAGIC (www.magic.gov.uk);
- Cornwall Nature Recovery Network (https://lagas.co.uk/app/product/nature-recovery-network) and,
- Review of the Government's Natural England Open Data Geoportal website (https://naturalengland-defra.opendata.arcgis.com/).

MAGIC

Review of the DEFRA Magic website included a search of:

- International & European designated sites (Natura 2000 sites[1]) – within the survey area and within 10 km of the site boundaries;
- Statutory sites (e.g. Sites of Special Scientific Interest (SSSIs)) within a 1 km radius of the site;
- Priority habitats – within the survey area and within 1 km of the site boundaries;
- Protected species license records issued by Natural England since 2009 – within the survey area and within 4 km of the site boundaries; and,
- Great crested newt pond survey records within 4 km of the site boundaries.

[1] Natura 2000 is a European Union-wide network of nature conservation sites established under the EC Habitats and Birds Directives comprising Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

3.1.3 Field Survey

The field survey comprised a walkover assessment of all areas of the site using the UK Habitat Classification System methodology (UKHab Ltd., 2023). This is a standard technique designed for classifying and mapping British habitats. A condition assessment for each habitat was undertaken on site, where applicable, following the Statutory Biodiversity Metric Condition Assessment Methodology (Defra, 2024).

Each habitat was assigned the appropriate alphanumeric code followed by any relevant secondary codes in accordance with UKHab Category Definitions V2.0 (UKHab Ltd., 2023). These codes are shown on the UK Habitat Classification Map (Appendix 1). Apart from buildings, habitat areas below the minimum mappable unit of 25 m^2 will be denoted by target notes and secondary codes. Target notes are used to indicate specific features, important habitats and/or field signs. An indicative list of observed plant species was compiled (using the nomenclature of Stace, 2010) with the common name used in the main body of the report, and both the common and scientific names provided within Appendix 2.

The site survey was undertaken on the 9th January 2024 by Aby Sampson and Megan Hobbs. All areas within the site were surveyed and assessed for indicators of ecological value, including the presence or signs of any protected or rare habitats and species.

3.2 Bat & Protected Species Survey

The building survey comprised an external and internal inspection, conducted on 9th January 2024 by Aby Sampson and Megan Hobbs, with the aid of head and hand-held torches, an endoscope, close-range binoculars, an extendable ladder and a digital camera.

The aim of the survey was to assess levels of use by bats through the presence of actual animals or their field signs, such as droppings, insect prey remains and/or urine staining, and the potential suitability of the building for roosting.

The presence of other protected species, notably nesting birds and barn owl/s, was also investigated, including the presence and behaviour of any actual animals or their field signs, such as whitewash, pellets and or nest debris.

3.3 Statutory Biodiversity Metric Assessment

As recommended by the Defra Statutory Biodiversity Metric (2024), the habitat types were defined using the UK Habitat Classification System 2.0 (2023). For each site habitat feature, the metric records:

- Habitat type;
- Area or length;
- Distinctiveness;
- Condition;
- Strategic significance; and,
- Connectivity.

From the recorded parameters the metric calculates:

- 'Habitat units' for area habitats (e.g. grassland, woodland etc.);
- 'Hedgerow units' for hedges and lines of trees; and,
- 'River units' for rivers and streams.

The habitat values assigned to created and enhanced habitats include factors associated with 'risk' relating to the difficulty and/or time required to establish the new habitat type.

The following were used for calculation of the parameters, pre and post, development:

- Site visit on 9th January 2024; and,
- Proposed site plan – Appendix 3.

SECTION 4 SURVEY RESULTS

4.1 Desk-Based Review

4.1.1 Statutory Designated Sites

Statutory Sites of Nature Conservation Interest (International Importance)

The desk-based review identified one statutory site designated for nature conservation of international importance within 10 km of the site as summarised in Table 4.1 below.

Table 4.1. List of Statutory Sites of Nature Conservation Interest of International Importance

Designated Site	Reason for Designation	Distance from site
Phoenix United Mine & Crows Nest (SAC)	Designated for supporting Calaminarian grassland metallophyte communities and endangered cornish path-moss *Ditrichum cornubicum*. Other notable species include liverworts *Cephaloziella massalongi* and the endemic *C. nicholsonii*.	5.3 km northeast

Statutory Sites of Nature Conservation Interest (National Importance)

There were no statutory sites designated for nature conservation of national importance within 1 km of the site.

4.1.2 Priority Habitats

The desk-based review identified areas of deciduous woodland as priority habitat within 1 km of the site. The closest area of deciduous woodland was located approximately 500 metres south of the site boundary.

4.1.3 European Protected Species Licences (EPSLs)

Bats

The desk-based review identified four EPSL's for bats granted within 4 km of the site. The closest was located approximately 0.6 km southwest of the site.

Table 4.2: EPS licences granted for bats within 4km of the site:

Year	Species	Classification	Distance
2012	Lesser horseshoe, brown long-eared and common pipistrelle	Resting place	0.6 km southwest
2020	Lesser horseshoe, brown long-ear and common pipistrelle	Resting place	3.5 km southeast

2020	Lesser horseshoe and common pipistrelle	Resting place	3.7 km northeast
2020	Lesser horseshoe	Resting place	3.9 km north

Dormice

There were two EPSLs granted for dormice within 4 km of the site between 2013 and 2024. The closest was located approximately 1.1 km northeast of the site.

Table 4.3: EPS licences granted for dormice within 4km of the site:

Year	Species	Classification	Distance
2018	Hazel dormouse	Resting place	1.5 km northeast
2017	Hazel dormouse	Resting place	1.1 km northeast

Great Crested Newts

There were no great crested newt EPSL's, survey licence returns, or pond survey results (2017-2019) found within 4 km of the site.

4.2 Field Survey

The survey was undertaken in dry, cold weather as shown below in Table 4.4.

Table 4.4. Environmental conditions on 9th January 2023.

Temperature (°C)	Wind Speed (Beaufort Scale)	Cloud cover (%)	Precipitation	Sunset time
0	1	100	Snow flurries	N/A

Constraints on the survey:
The survey was undertaken in winter which may preclude spring and summer annual botanical species. However botanical diversity was considered sufficient to classify and assess the habitats present.

4.2.1 Habitats

The survey site was approximately 0.1 ha and contained four buildings, modified grassland, sparsely vegetated urban land, hardstanding, a non-native ornamental hedgerow, tree lines and trees.

Other Neutral Grassland

An area of species poor other neutral grassland was located within the north-eastern extent of the site (parcel A1). The average sward length of the grassland was 5 cm and the average number of species present was 6 species/m^2. The species present

largely comprised flowering plants and included common daisy, wild strawberry, creeping buttercup, herb-Robert, ground elder, ivy, broad leaved dock, crested dog's tail, broadleaved willowherb, lesser celandine, germander speedwell and wood avens. The species diversity of this parcel was low (poor condition). However the other criteria for this habitat are met (>20% herbs, presence of >1 non-intensive grass species and <30 % cover of perennial rye-grass and clover).

Hardstanding

Areas of hardstanding (A2) were present around the buildings, which consisted of a tarmac parking area and concrete pathways (Figure 4.3).

Sparsely Vegetated Urban Land

The north-western extent of the site comprised an area of scattered wood chippings and sparse vegetation (Figures 4.4 & 4.5). The area (A3 & A4) appeared to have previously been hardstanding. Species noted included lesser celandine, dandelion, primrose, common daisy, ivy, daffodil, germander speedwell, wood avens and harts-tongue fern. The vegetation cover was estimated to be approximately 40%.

Modified Grassland

An area of modified grassland (parcel A5) was located within the south-western extent of the site (Figure 4.1). The sward length of the grassland varied between 10 – 30 cm and the average number of species present was 5 species/m^2. The species dominating this area largely comprised creeping bent and Yorkshire-fog. Other species included broad-leaved dock, lesser celandine, common daisy, perennial ryegrass, dandelion, prickly sow thistle, wood avens, daffodil and hedge bedstraw.

The modified grassland was in poor condition due to the low species diversity and unvaried sward height present.

An area of introduced shrub was located within parcel A5 (Target Note 1, Appendix 1; Figure 4.2). Species identified included bramble, holly, cherry laurel, pendulous sedge, wild strawberry, and buddleia.

Figure 4.1 Modified grassland (A5)

Figure 4.2 Introduced shrub within parcel A5

Non-Native Ornamental Hedgerow

A non-native ornamental hedgerow (H1) formed the north-western boundary and measured approximately 0.7 m wide x 1 m high (Figure 4.6). The hedgerow predominantly comprised small-leaved honeysuckle with cherry laurel, cherry plum, holly and rhododendron present within the southern extent of the hedgerow. Other species noted included pendulous sedge.

Figure 4.3 Tarmac road within the south-eastern extent.

Figure 4.4 Sparsely vegetated urban land within the north-western extent.

Figure 4.5. Sparsely vegetated urban land within the north-western extent.

Figure 4.6. Non-native ornamental hedgerow on the north-western boundary.

Line of trees

A line of trees was present within the western corner of the site (H2) and along the north-eastern boundary (H3) (off-site). Tree line H2 was mixed broadleaved and conifer woodland, approximately 6 m in height. Species noted included beech, Japanese laurel, lawsons cypress and holme oak (Figure 4.7). Tree line H3, was located off-site adjacent to the north-western boundary. It was mixed broadleaved and conifer (mainly conifer) and was approximately 6 m in height. The tree line was predominantly yew with bay, cherry laurel, sycamore, holly, and Japanese laurel also noted (Figure 4.8).

The lines of trees were in moderate condition as there was little or no damage noted to the trees, the canopy was continuous and ecological niches were present.

Figure 4.7. Line of trees (H3) located at the western corner.

Figure 4.87. Line of trees (H2) located on the north-eastern boundary.

Individual trees

Three individual trees were located within the site. A small holly tree (T1) and a small pendulous birch (T2) were located within parcel A4 centrally within the grassland and amongst the introduced shrub, respectively. A medium Lawsons cypress tree (T3) was located adjacent to the line of trees (H2) within the western corner. These trees were of moderate condition as there was little or no damage noted to each tree, the canopy was continuous, the canopy over sailed vegetation beneath and ecological niches were present.

Two Lawsons cypress trees (T3a & T3b) that had recently been removed were noted within parcel A3. These trees were considered to have been in good and moderate condition, respectively. This was based on the species and the remaining tree stumps, which indicated the size of the trees (large and medium).

Figure 4.9. Stump of T3a within parcel A4

Figure 4.10. Stump of T3b within parcel A3

Buildings

Four buildings were present on site (Buildings 1-4).

Building 1

Building 1 (B1) was located within the northern extent of the site (Figure 4.11). The walls of the building were constructed from rendered concrete panels and the pitched gable roof was covered with concrete roof tiles. Hanging concrete tiles covered the gable ends and the eaves were surrounded with uPVC soffit boxes. One loft void was present within the building which measured approximately 2 m high x 9 m long x 6.5 m wide with bitumen felt underlay (Figure 4.12).

Figure 4.11 South-eastern elevation of Building 1

Figure 4.12. Loft space of Building 1

Building 2

Building 2 (B2) was located centrally within the site (Figure 4.13). The walls of the building were constructed from rendered concrete panels and the pitched gable roof was covered with concrete roof tiles. Hanging concrete tiles covered the gable ends

and the eaves were surrounded with uPVC soffit boxes. The verges of the roof were capped with plastic fittings. A loft void was present within the building which measured approximately 2 m high x 10 m long x 6 m wide with bitumen felt underlay (Figure 4.14).

Figure 4.13. South and eastern elevations of Building 2

Figure 4.14. Loft space of Building 2

Building 3

Building 3, a garage, was located immediately west of Building 1 within the northern extent of the site (Figure 4.15). The walls of the building were constructed from rendered concrete block and the flat roof was covered with roof felt. The building was inaccessible at the time of the survey.

Building 4

Building 4, a garage, was located immediately north of Building 2 and centrally within the site (Figure 4.16). The walls of the building were constructed from externally rendered concrete block. The shallow single pitched roof was covered with corrugated metal. The building was inaccessible at the time of the survey.

Figure 4.15. Southern and eastern elevations of Building 3

Figure 4.16. Southern and eastern elevations of Building 4

4.3 Bat & Protected Species Survey

Table 4.5 Environmental conditions on 9th January 2023.

Temperature (°C)	Wind Speed (Beaufort Scale)	Cloud cover (%)	Precipitation	Sunset time
0	1	100	Snow flurries	N/A

Constraints on the survey:
Open access was available into B1 and B2. There was no access into B3 and B4 at the time of the survey.

4.3.1 Bats

Building 1

Approximately 10-20 small-sized bat droppings, morphologically characteristic of pipistrelle species, were found scattered within the loft of building 1.

Multiple gaps and crevices were identified externally upon the building including gaps behind the wood panelling on the windows, under hanging tiles and mortar gaps at the verges.

Building 2

Several clusters of medium-sized bat droppings (~300), morphologically characteristic of long-eared species, were noted in the loft space of building 2.

Multiple gaps and crevices were identified externally upon the building including gaps under the hanging tiles and a large gap located near the ridge of the roof.

Buildings 3 & 4

Limited gaps were identified externally upon the buildings around the garage doors. Both buildings were inaccessible at the time of the survey therefore an internal inspection of these buildings will be required to assess the suitability for roosting bats.

4.3.2 Nesting birds

There were no bird nesting sites identified in association with the buildings.

4.4 Statutory Biodiversity Metric Assessment

The Biodiversity Metric Assessment shows that the development will result in a net loss of -90.65 % area habitat on site associated with the loss of trees and modified grassland. There will be a net gain of +44.20 % in the hedgerow habitat associated with the creation of 34 m of native hedgerow.

The strategic significance of each habitat present on site has been assigned through consideration of the location within the landscape, habitat type, inclusion within the Cornwall Local Plan (Cornwall Council, 2010) and the Cornwall Nature Recovery Network (https://lagas.co.uk/app/product/nature-recovery-network). The site does not lie within a strategic Nature Recovery Network area. Therefore, the site and habitats are considered to be of low strategic significance.

Trees T3a and T3b had been removed prior to the survey (Figures 4.9 & 4.10). These trees were considered to have been in good and moderate condition, respectively. This was based on the species and the remaining tree stumps, which indicated the size of the trees (large and medium).

The baseline and proposed habitats including habitat distinctiveness, condition, strategic significance and biodiversity units are presented in Table 4.6. Habitat area biodiversity unit change is summarized in Table 4.7 and hedgerow biodiversity unit change is summarized in Table 4.8. The baseline and proposed maps are presented in Appendix 4.

Table 4.6. Baseline Site Habitats

Map ref	Habitat type	Area (ha)/ length (km)	Habitat Distinctiveness	Habitat Condition	Strategic significance	Baseline biodiversity units
A1 A5	Vegetated garden	0.032	Low	N/A	Low	0.06
A2	Developed land, sealed surface	0.0278	V. low	N/A	Low	0.00
A3 A4	Sparsely vegetated land (ruderal/ephemeral)	0.0296	Low	Poor	Low	0.06
B1 B2 B3 B4	Built linear features	0.0142	V. low	N/A	Low	0.00
T3a	Large urban tree	0.0366	Medium	Good	Low	0.51
T3b T3	Medium urban tree	0.0326	Medium	Moderate	Low	0.30
T1 T2	Small urban tree	0.0081	Medium	Moderate	Low	0.07
	Total area habitat biodiversity units					**1.00**
H1	Non-native, ornamental hedgerow	0.034	V. low	Poor	Low	0.03
H2	Line of trees	0.013	Low	Moderate	Low	0.06
	Total hedge biodiversity units					**0.09**

Table 4.7. Area Habitat Biodiversity Unit Change Summary

Biodiversity Unit Type	Description		Biodiversity Units
Area Habitat	On-site baseline area habitat biodiversity units		1.00
	On-site area habitat retention, creation, and enhancement biodiversity units:		
	Retained	N/A	0.00
	Created	0.0234 ha built linear features 0.0362 ha developed land, sealed surface 0.027 ha vegetated garden 0.0117 ha façade-bound green wall (in poor condition)	0.07
	Enhanced	N/A	
Overall net unit change			-0.82
Overall on-site net % change			**-92.43%**
Trading rules satisfied			**No**

Table 4.8. Hedgerow Habitat Biodiversity Unit Change Summary

Biodiversity Unit Type	Description		Biodiversity Units
Hedges	On-site baseline hedge biodiversity units		0.09
	On-site area habitat retention, creation and enhancement units:		
	Retained	0.034 km line of trees	+0.05
	Created	0.034 km native hedgerow in poor condition	+0.07
	Enhanced	N/A	
Overall net unit change			**+0.03**
Overall on-site net % change			**37.41%**
Trading rules satisfied			**Yes**

SECTION 5 DISCUSSION

5.1 Proposed Development

It is proposed to demolish four buildings at Dean Denver, Dean Street, Liskeard, Cornwall, PL14 4AE and construct four new residential dwellings with associated parking.

5.2 Desk-Based Review

5.2.1 Statutory Designated Sites

Statutory Sites of Nature Conservation Interest (International Importance)

The desk-based review identified one statutory site (Phoenix United Mine & Crows Nest SAC) of international importance located within 10 km of the site.

There are no perceived direct or indirect impacts on the designated sites due to the intervening distance and the small scale of the development.

5.2.2 Priority Habitats

The desk-based review identified areas of deciduous woodland as priority habitat within 1 km of the site.

There are no perceived direct or indirect impacts on the priority habitats due to the intervening distance and the small scale of the development.

5.3 Amphibians

There were no ponds located within 1 km of the site and there were no records of great crested newt identified within 4 km of the site, therefore it is considered unlikely that great crested newt are present on site.

It is considered that common amphibians, which are less reliant on established ponds and have a widespread distribution, may be present.

The modified grassland and bases of the hedgerow/tree lines provide limited habitat for common amphibians.

Common toad is listed upon the UK Biodiversity Action Plan (UK BAP) and must be considered through the planning process. This and further species of amphibian may be considered through the Natural Environment & Rural Communities Act (NERC) 2006, with public bodies, including LPAs, minded to ensure due regard to the conservation of biodiversity of such species. Such considerations may seek to protect, re-establish, or create habitat suitable for amphibians, post-development.

It is understood that the modified grassland, sparsely vegetated urban land and individual trees will be removed. Therefore, precautionary measures, detailed within Section 6, will be required to ensure common amphibian species are not harmed or injured during the works.

5.4 Badger

There were no signs of badger noted during the survey. However, it is considered possible that badger/s may frequent the site when dispersing and/or foraging.

Badgers are protected by the Protection of Badgers Act 1992 and the Wildlife and Countryside Act 1981 (as amended), Schedule 6. Under the Wildlife and Countryside Act, it is illegal to intentionally kill, capture, injure or ill-treat any badger.

Precautionary measures should be employed to ensure no badgers are harmed or injured during the construction period of the development. These measures are detailed within Section 6.

5.5 Bats

There were four EPSL records for bats identified within 4 km of the site during the desk-based review. The closest was located approximately 0.6 km southwest of the site.

5.5.1 Roosting bats

Buildings 1 and 2 were confirmed to support roosting bats through the presence of bat droppings (morphologically characteristic of long-eared and pipistrelle species). Buildings 3 and 4 require further inspection to ascertain the level of suitability for roosting bats.

Further bat emergency survey of Buildings 1 and 2 will be required to confirm the impact of the proposed works by identifying bat species using the building, extent of

use (in terms of numbers of bats) and type of bat use (in terms of seasonality and functionality of use).

The results of the further survey will be required to assess the full impact of the development upon roosting bats. Mitigation and compensation measures will be required and will be determined upon completion of the further survey.

5.5.2 Dispersing & Foraging Bats

The tree lines and hedgerow provide foraging habitat, and dispersal routes for bats.

As a signatory to the Bonn Convention (Agreement on the Conservation of Bats in Europe) the UK has committed to protecting bat habitats, which necessitates the identification and protection from damage or disturbance of feeding areas and commuting routes. Accordingly, mitigation and compensation measures will be required for bat species.

It is understood that the modified grassland, sparsely vegetated urban land and individual trees will be removed. External and internal lighting will be introduced as part of the development. Therefore, measures (including a sensitive lighting plan), detailed within Section 6, will be required to ensure that dispersing and foraging bats are not negatively impacted by the proposal.

With the implementation of mitigation measures, it is anticipated that the development will have a neutral impact on dispersing and foraging bats.

5.6 Birds

The buildings, tree lines, hedgerow and individual trees provide nesting habitat and foraging habitat for birds.

All birds, their nests and eggs are protected under the Wildlife and Countryside Act 1981 (as amended).

It is understood that the buildings, hedgerow and individual trees will be removed, which will remove nesting habitat for birds. Therefore, mitigation and compensation measures, detailed within Section 6, will be required to ensure birds are not negatively impacted by the proposal.

With the implementation of mitigation and compensation measures, it is anticipated that the development will have a neutral impact on nesting birds.

5.7 Dormouse

There were two records identified for dormouse EPSLs within 4 km of the site, the closest being 1.1 km northeast. The non-native hedgerow present on site is considered unsuitable for dormice as it predominantly comprises small-leaved honeysuckle, which provides little or no nesting and/or foraging habitat. The tree lines, although provide limited habitat for dormice, are not connected to surrounding suitable habitat. Due to this it is considered unlikely that dormouse are present on site. Therefore, this species is not considered any further within this report.

5.8 Hedgehog

The modified grassland and bases of the tree lines and hedgerow provide foraging resources and shelter for hedgehog.

Hedgehog are listed as rare and most threatened species under Section 41 of the Natural Environment and Rural Communities Act (2006) with public bodies, including LPAs, minded to ensure due regard to the conservation of biodiversity of such species. Such considerations may seek to protect, re-establish or create habitat suitable for hedgehog post development.

It is understood that the modified grassland and hedgerow will be removed, which will remove habitat for hedgehog. Therefore, mitigation and compensation measures will be required and have been detailed within Section 6.

With the implementation of mitigation and compensation measures, it is anticipated that the development will have a neutral impact on hedgehog.

5.9 Reptiles

The modified grassland and bases of the tree lines and hedgerow provide limited habitat for reptiles.

Reptiles are protected against intentional killing and injury under the Wildlife and Countryside Act 1981 (as amended). Natural England states that activities such as site investigations and movements of machinery may breach this legislation by causing death or injury to reptiles (English Nature, 2004).

It is understood that the modified grassland and hedgerow will be removed, which will remove habitat for reptiles. Therefore, precautionary measures will be required to ensure no reptile species are harmed or injured during the works.

5.10 Invertebrates

The modified grassland, tree lines and individual trees provide suitable habitat for invertebrate species. It is understood that the modified grassland will be removed, which will remove habitat for invertebrates. Measures have been recommended within Section 6 to increase the habitat available for invertebrates within the site post development.

5.11 Non-native Invasive Plant Species

Small-leaved honeysuckle, cherry laurel, buddleia, rhododendron and Japanese laurel were noted on site (Target Note 2-6, Appendix 1). Rhododendron is an invasive species listed on Schedule 9 of the Wildlife & Countryside Act 1981 and the remainder are non-native species. All of these species should be removed from the site and disposed of responsibly as they are all species that outcompete native plant species.

5.11 Biodiversity Metric Assessment

The Biodiversity Metric Assessment shows that the development will result in a net decrease of -92.43 % area habitat units through the loss of trees and vegetated garden. The creation of façade-bound green walls upon the boundary walls of the new dwellings results in a 0.2 unit increase (1.7%).

There will be a net increase of +37.41 % in hedgerow habitat units through the creation of 34 m of native hedgerow.

Biodiversity units will need to be purchased from either the Cornwall Habitat Bank or an alternative Biodiversity bank. The number of units that will need to be purchased are 0.92 units.

SECTION 6 RECOMMENDATIONS

6.1 Ecological Impacts

It is understood that the buildings, modified grassland, sparsely vegetated urban land, hedgerow and individual trees will be removed which without mitigation will negatively impact bats, badger, birds and hedgehog. There will also be the introduction of external and internal lighting, which would negatively impact nocturnal species such as bats and hedgehogs. Further survey will be required to ascertain how bats use the buildings and the extent of the impacts to bats.

6.2 Further Survey

Further survey will be required to assess the impacts of the proposal upon bats, and to establish the mitigation and compensation measures that will be required to reduce or eliminate these impacts.

Further survey should include:

- Bat Emergence Survey
- Internal Survey of buildings 3 and 4

6.2.1 Bat Emergence Survey

The bat emergence survey must consist of three survey visits per building (Building 1 & 2), during the active period for bat species, which extends from May to August/September inclusive.

6.3 Mitigation Measures

The following mitigation measures are not dependent on the results of the further surveys and have been included as these will remain the same irrespective of the survey results (Appendix 5).

- **Habitat Management:** The modified grassland should be maintained at a short sward height prior to and during construction to discourage reptiles and amphibians from colonizing the site.

- **Excavations:** Any excavations or pipework, which are to remain open overnight, should be fenced or covered to prevent potential entrapment and/or injury of species such as badger and hedgehog.

- **Tree line Protection:** The root protection areas (RPA) of the retained habitats (trees) must be taken into account and buffered accordingly. This is to avoid direct damage through the compaction and disturbance of root protection areas which could cause deterioration of trees.

- **Lighting:** The avoidance of the use of any external lighting and/or implementation of a sensitive lighting plan (specification detailed in 6.3.1), ensuring that the boundary/adjacent habitats are not impacted by light spill.

- **Wildlife Gaps:** Any new fencing or walls to include wildlife gaps within the gravel boards or base of the walls (13 x 13 cm) to allow continuous access for hedgehogs across the site.

- **Non-Native and/or Invasive Species Removal:** Any non-native and/or invasive species should be removed from the site and disposed of responsibly.

6.3.1 Wildlife Sensitive Lighting Plan

A sensitive lighting plan will be required, to ensure that dispersing and roostingbats, are not negatively impacted by the proposal. The sensitive lighting plan should follow the below specification specifically ensuring that there is no light spill above 0.5 lux upon bat roosts, bat flight paths, retained, created and surrounding habitats. Further information can be found within Guidance Note 08/23: Bats and Artificial Lighting at Night.

External lighting should be avoided, however if lighting is required, will be installed adjacent to access, doorways, steps etc. only, at the minimum height permissible and directed below a 70-degree plane. Any external lighting associated with the development will be adapted to be based on a Passive Infrared Sensor (PIR) system (being motion-sensitive only to large objects) and on a short timer (no longer than 1 minute). Lighting will specifically not be positioned where it could illuminate surrounding vegetation (, tree linesetc.) or any areas beyond the development area (adjacent Westbourne Gardens).

LED luminaires which lack UV elements with glass glazing should be used instead of mercury or metal halide lamps. This type of lighting can be used more directionally and will reduce the range of light wavelengths emitted thus significantly reducing the levels of light which may attract increased levels of invertebrates. Such light should

be positioned to only illuminate the required areas, limiting light spill, both horizontally and vertically beyond the site.

A warm white spectrum (ideally <2700 Kelvin) should be adopted to reduce the blue light component. Luminaires should feature peak wavelengths higher than 550 nm to avoid the component of light most disturbing to bats (Institution of Lighting Professionals & the Bat Conservation Trust 2023). Additionally, hoods, cowls, louvers and/or shields should be used to further direct any lighting.

Internal lighting should be recessed where installed in proximity to windows and blinds should be fitted to reduce glare and light spill (Institution of Lighting Professionals & the Bat Conservation Trust 2023).

6.4 Compensation & Enhancement Measures

Habitat creation and wildlife provisions will be required to compensate for habitats lost and provide additional habitats for bats, birds, invertebrates and hedgehog (Appendix 6). The following compensation and enhancement measures are not dependent on the results of the further surveys and have been included as these will remain the same irrespective of the survey results.

- **Façade-Bound Green Walls:** Green walls will be created as boundaries between the new properties.

- **Bat, Bird and Invertebrate Provisions:** Inclusion of two inbuilt bat, bird and invertebrate provisions per building (Appendix 7, 8 & 9).

- **Habitat Pile:** Creation of one habitat pile within a relatively undisturbed area of the site to provide habitat for invertebrates (Appendix 9).

6.5 Management Plan

A habitat management and monitoring plan (HMMP) or Landscape and Ecological Management Plan (LEMP) will be produced detailing the measures in Section 5.2 and providing further details on monitoring.

6.5 Conclusion

The proposed development represents a negative ecological impact to biodiversity through the loss of habitat and an unconfirmed ecological impact upon protected species (bats), through the loss of roosting habitat and introduction of lighting. Further surveys have been recommended to enable a full assessment of the impacts upon the bats.

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APPENDICES

Appendix 1: UK Habitat Classification Survey Map
Appendix 2: Species List
Appendix 3: Proposed Plan
Appendix 4: Biodiversity Metric Assessment Plan
Appendix 5: Mitigation & Constraints Plan
Appendix 6: Compensation & Enhancement Plan
Appendix 7: Examples of Inbuilt Bat Roosting Provisions
Appendix 8: Examples of Inbuilt Bird Nesting Provisions
Appendix 9: Example of an Inbuilt Invertebrate Provision
Appendix 10: Examples of Habitat Piles

APPENDIX 1 **UK HABITAT CLASSIFICATION MAP**

Legend

- Red Line Boundary
- g3c - other neutral grassland
- g4 - modified grassland
- u1b5 - buildings
- u1e - built linear features
- u1f - sparsely vegetated urban land
- h2b - non-native & ornamental*hedgerow
- w1h - other woodland; mixed
- w1h6 - other woodland; mixed; mainly conifer*
- Fence
- 1 Target note 1 - Felled tree
- 2 Target note 2 - Introduced Shrub
- 3 Target note 3 - Small-leaved honeysuckle
- 4 Target note 4 - Cherry laurel
- 5 Target note 5 - Buddliea
- 6 Target note 6 - Rhododendron
- 7 Target note 7 - Japanese laurel
- Scattered conifer tree
- Scattered broadleaved tree

Secondary Codes	Secondary Code Description
33	Tree line
200	Tree
827	Garden
847	Introduced Shrub

UK Habitat Classification Map

Client: Sarah Yelland

Project: Dean Denver

Date: May 2024 | Ref: 230539

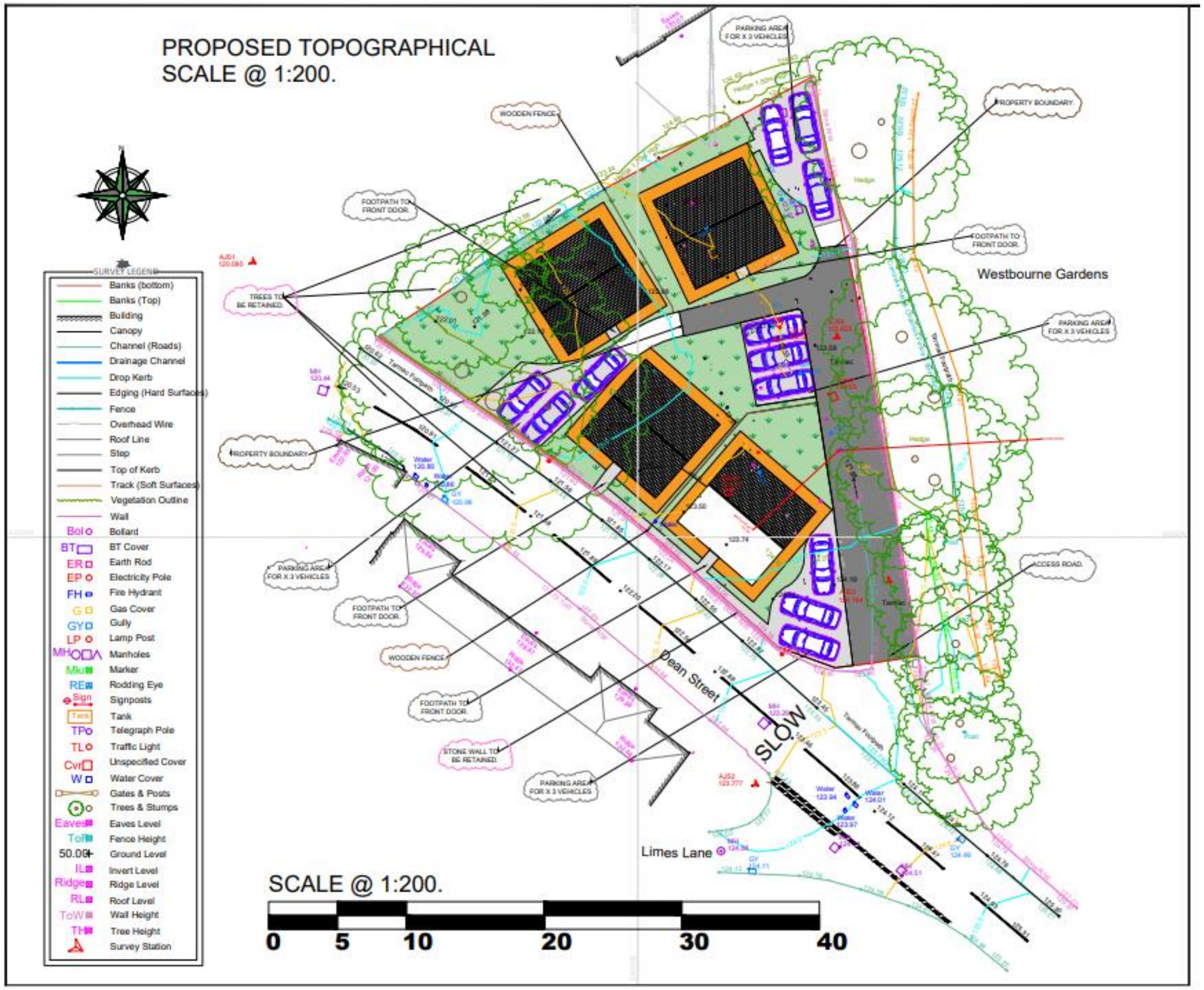
Rev: 01 | Author: ALS

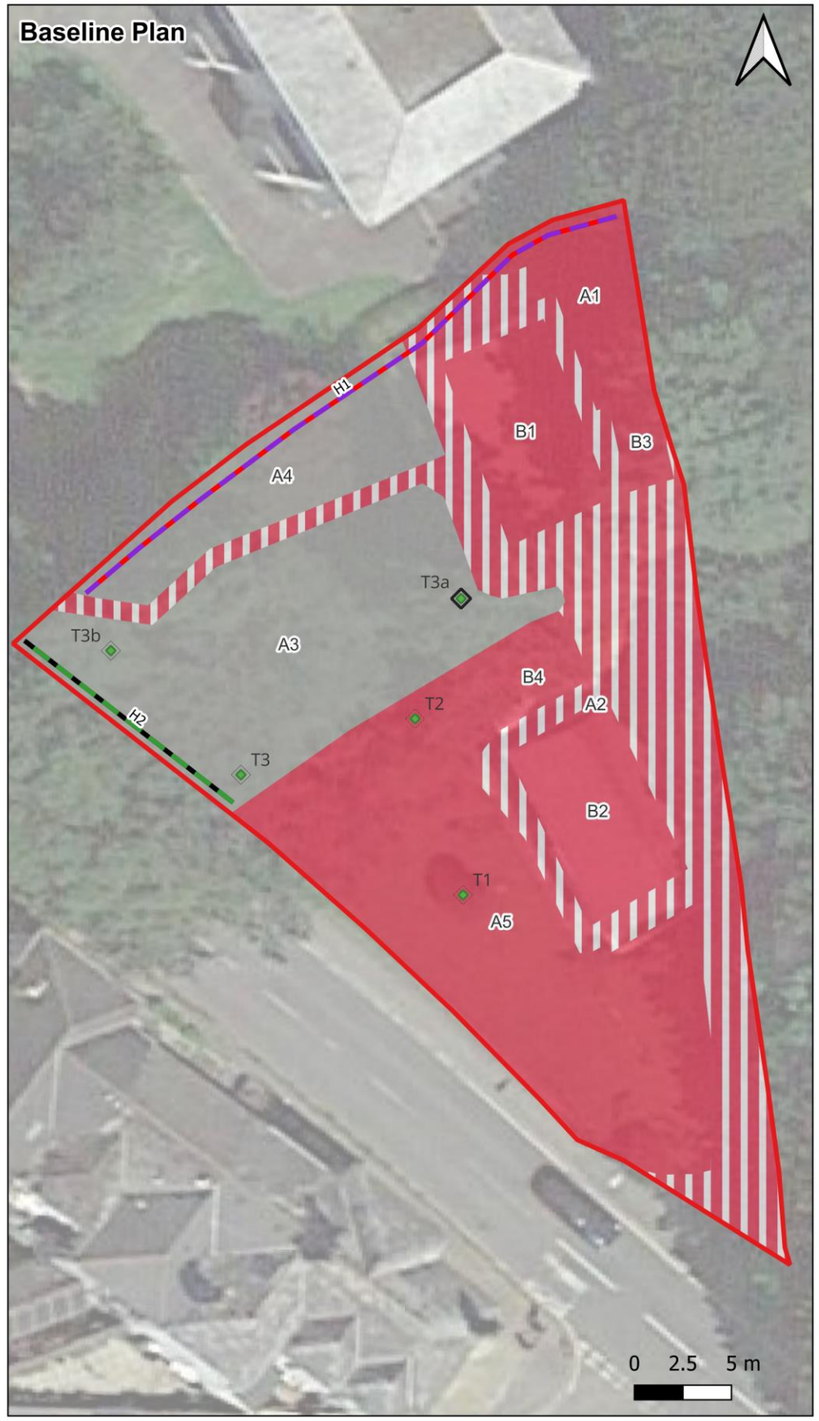
APPENDIX 2 SPECIES LIST

Common Name	Scientific Name
Plants	
Bay	*Laurus nobilis*
Bramble	*Rubus fruticosus agg*
Beech	*Fagus sylvatica*
Broad-leaved dock	*Rumex obtusifolius*
Broadleaved willowherb	*Epilobium montanum*
Buddleia	*Buddleja davidii*
Cherry laurel	*Prunus laurocerasus*
Celandine	*Chelidonium majus*
Crested dog's tail	*Cynosurus cristatus*
Cherry plum	*Prunus cerasifera*
Creeping bent	*Agrostis stolonifera*
Creeping buttercup	*Ranunculus repens*
Common daisy	*Bellis perennis*
Dandelion	*Taraxacum officinale*
Daffodil	*Narcissus species*
Germander speedwell	*Veronica chamaedrys*
Greater plantain	*Plantago major*
Ground elder	*Aegopodium podagraria*
Hedge bedstraw	*Galium mollugo*
Holly	*Ilex aquifolium*
Honeysuckle	*Lonicera periclymenum*
Harts-tongue fern	*Asplenium scolopendrium*
Holm oak	*Quercus ilex*
Herb-Robert	*Geranium robertianum*
Ivy	*Hedera helix*
Japanese laurel	*Aucuba Japonica*
Lawsons cypress	*Chamaecyparis lawsoniana*
Lesser celandine	*Ficaria verna*
Moss species	*Bryophyta*
Perennial ryegrass	*Lolium perenne*
Primrose	*Primula vulgaris*
Pendulous birch	*Betula pubescens*
Pendulous sedge	*Carex pendula*
Prickly sow thistle	*Sonchus asper*
Rhododendron	*Rhododendron species*
Small-leaved honeysuckle	*Lonicera microphylla*
Sycamore	*Acer pseudoplatanus*
Wood avens	*Geum urbanum*
Wild strawberry	*Fragaria vesca*
Yorkshire fog	*Holcus lanatus*
Yew	*Taxus baccata*
Amphibians	
Common toad	*Bufo bufo*
Great crested newt	*Triiturus cristasus*
Mammals	

Badger	*Meles meles*
Brown long-eared	*Plecotus auritus*
Common pipistrelle	*Pipistrellus pipistrellus*
Common toad	*Bufo bufo*
Great crested newt	*Triturus cristatus*
Hazel dormouse	*Muscardinus avellanarius*
Hedgehog	*Erinaceus europaeus*
Lesser horseshoe	*Rhinolophus hipposideros*

APPENDIX 3	PROPOSED PLAN





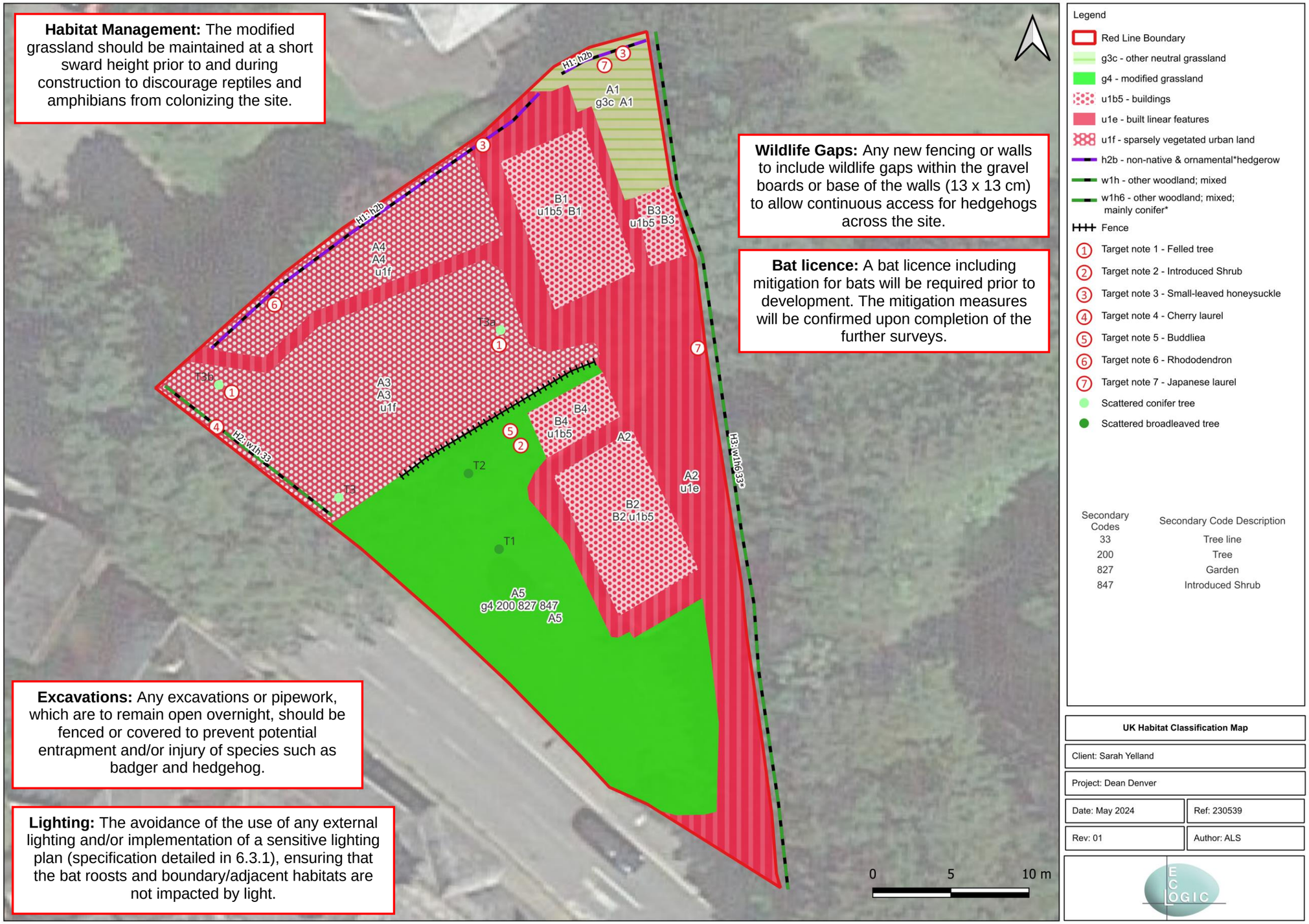
Key (Baseline)

- Red Line Boundary
- Built linear features
- Developed land; sealed surface
- Ruderal/Ephemeral
- Vegetated garden
- Non-native and ornamental hedgerow
- Line of trees
- Existing Large Urban Tree
- Existing Medium Urban Tree
- Existing Small Urban Tree

Key (Proposed)

- Red Line Boundary
- Built linear features
- Developed land; sealed surface
- Vegetated garden
- Line of trees
- Native hedgerow
- Lost
- Proposed Lost Urban Tree

Biodiversity Metric Assessment	
Client: Restormel Architectural Services	
Project: Dean Denver	
Date: May 2024	Ref: 240101
Rev: 01	Author: ALS


Habitat Management: The modified grassland should be maintained at a short sward height prior to and during construction to discourage reptiles and amphibians from colonizing the site.
Wildlife Gaps: Any new fencing or walls to include wildlife gaps within the gravel boards or base of the walls (13 x 13 cm) to allow continuous access for hedgehogs across the site.
Bat licence: A bat licence including mitigation for bats will be required prior to development. The mitigation measures will be confirmed upon completion of the further surveys.
Excavations: Any excavations or pipework, which are to remain open overnight, should be fenced or covered to prevent potential entrapment and/or injury of species such as badger and hedgehog.
Lighting: The avoidance of the use of any external lighting and/or implementation of a sensitive lighting plan (specification detailed in 6.3.1), ensuring that the bat roosts and boundary/adjacent habitats are not impacted by light.
H1: h2b
H2: w1h 33
H3: w1h6 33*
A1 g3c A1
B1 u1b5 B1
B3 u1b5 B3
A4 A4 u1f
A3 A3 u1f
B4 u1b5
A2 u1e
B2 B2 u1b5
A5 g4 200 827 847 A5
T1
T2
T3
T3a
T3b
0 5 10 m
Legend
Red Line Boundary
g3c - other neutral grassland
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u1b5 - buildings
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Fence
Target note 1 - Felled tree
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UK Habitat Classification Map
Client: Sarah Yelland
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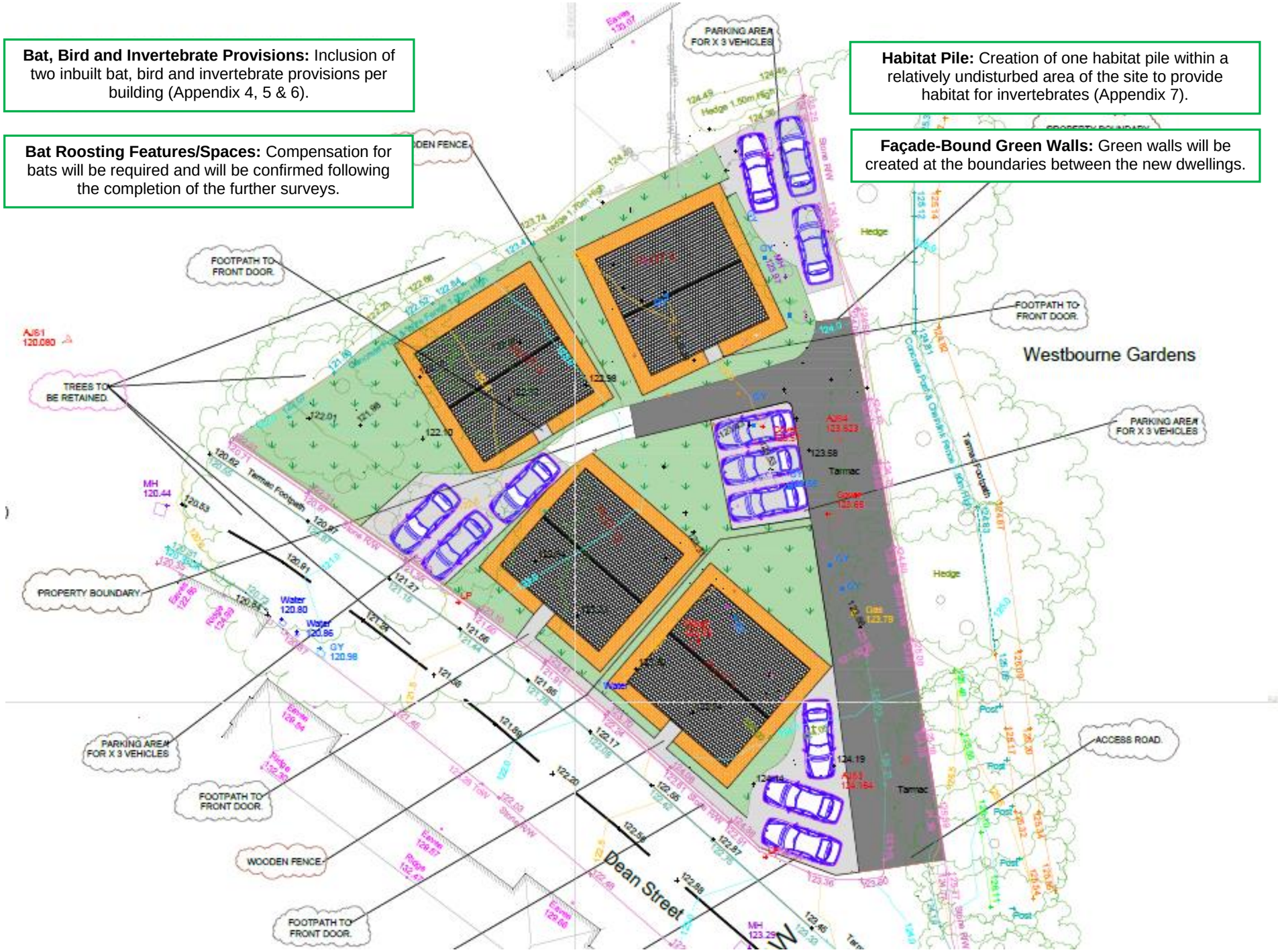
Date: May 2024
Ref: 230539
Rev: 01
Author: ALS

Bat, Bird and Invertebrate Provisions: Inclusion of two inbuilt bat, bird and invertebrate provisions per building (Appendix 4, 5 & 6).

Bat Roosting Features/Spaces: Compensation for bats will be required and will be confirmed following the completion of the further surveys.

Habitat Pile: Creation of one habitat pile within a relatively undisturbed area of the site to provide habitat for invertebrates (Appendix 7).

Façade-Bound Green Walls: Green walls will be created at the boundaries between the new dwellings.



APPENDIX 7 EXAMPLES OF INBUILT BAT ROOSTING PROVISIONS

Segovia Build-In Woodstone Bat Box

Material: Woodcrete

Width: 210 mm
Height: 500 mm
Depth: 170 mm
Entrance Width: 160 mm
Entrance Height: 25 mm

Position: Built into external wall, below eaves or at a minimum height of 4 m with the entrance face at the front, remaining exposed and visible. The boxes have removable sides so that an extension box can be placed next to this box, to create a larger roosting space.

Schwegler 1FR Bat Tube

Material: Woodcrete (75% wood sawdust, concrete and clay mixture)

Width: 200 mm
Height: 475 mm
Depth: 125 mm
Entrance Width: 150 mm
Entrance Depth: 20 mm
Weight: 9.5 kg

Position: Within external walls in place of a standard block on a southerly aspect, beneath eaves or at a minimum height of 4 m

Green & Blue Bat Block

Material: Cast concrete (75% waste materials from Cornish China Clay Industry)

Width: 215 mm
Height 440 mm
Depth: 120 mm

Position: Within external walls in place of a standard block on a southerly aspect, beneath eaves or at a minimum height of 4 m

APPENDIX 8 EXAMPLES OF INBUILT BIRD NESTING PROVISIONS

WoodStone Build in Open Nest Box

Suitable for: robins, wrens and blackbirds.
Material: Woodstone
Height: 180 mm
Width: 220 mm
Depth: 180 mm
Weight: 4.2kg

Position: Within external walls, at a minimum height of 3 m

Vivara Pro Estelle House Sparrow Terrace

Suitable for: House sparrows and individual blue & great tits
Material: Woodstone

Height: 210 mm
Width: 290 mm
Depth: 160 mm
Weight: 7.5 kg

Position: Within external walls, at a minimum height of 3 m

Schwegler Brick Nest Box (Type 24)

Suitable for: House sparrows, great tits, blue tits and nuthatches
Material: Woodcrete

Height: 235 mm
Width: 180 mm
Depth: 180 mm
Weight: 2.8 kg

Position: Within external walls, at a minimum height of 3 m

APPENDIX 9 EXAMPLE OF AN INBUILT INVERTEBRATE PROVISION

Bee Brick
Each bee brick includes nesting compartments for solitary nesting bees, including for egg laying and hibernation.

Bee bricks to be positioned within southerly elevations, which includes part or full sun, at approximately 1m above ground level, and ideally facing garden or boundary habitats.

Bee Brick - case in concrete: 215mm x 105mm x 65mm
http://greenandbluebuild.co.uk/product/bee-brick/

Habitat Pile

Size: 2-8m long x 1-1.5m high

Materials: Logs, brash, bramble cuttings, grass cuttings

Location: Create in marginal habitats adjacent to both low, open vegetation and dense vegetation

Creation:

- A mixture of materials, shapes and sizes are be used to increase complexity of the structure
- The central core of the structure is to be compacted and the outer layers laid loosely on top

Management:

- Add additional material to the habitat pile as it decomposes
- Consider partially burying, anchoring or securing with wire if located on a site with high public access