Senior Living Urban Epsom Limited

Land at Epsom Hospital

Ecological Impact Assessment

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Executive Summary

Ove Arup and Partners Limited (Arup) was commissioned by Senior Living Urban Epsom Limited to undertake an Ecological Impact Assessment (EcIA) in support of a planning application for the redevelopment of the southern part of Epsom Hospital in Epsom, Surrey, KT18 7EG (approximate central grid reference TQ 20377 59754), hereafter referred to as the 'site'. The Proposed Development involves the demolition of all the buildings at the site, as well as the removal of some of the trees, as well as areas of scrub and amenity grassland. These removal works are required to accommodate the construction of two new buildings of between three and seven storeys to provide a new care community for older people.

Along the western boundary of the site, mature trees bordering private gardens provide important habitat for foraging, commuting and roosting bats. Three artificial bat boxes would be present within these trees at the time of construction. To avoid adverse effects to bats, the majority of trees along the western boundary of the site would be retained and protected during construction, and additional planting in this area is included in the landscape design to enhance the area for wildlife.

The Proposed Development would introduce new landscaping, including the greening of a pedestrian route through the centre of the site running north to south, two roof gardens, two biodiverse wildflower green roofs, native tree and shrub planting, widening and enhancement of the western boundary of the site, and landscaping throughout. This habitat creation would provide an overall increase in habitat for bats, birds, invertebrates, reptiles and amphibians, as well as features including hibernacula and bird and bat boxes.

Noise and lighting during construction has the potential to cause disturbance to commuting, foraging and (potentially) roosting bats; however the implementation of mitigation means that the residual effect is not considered to be significant. A lighting strategy has been developed that follows the BCT Guidance Note on Bats and Artificial Lighting[16] and minimises lighting along the western boundary through the creation of a 'dark zone'. This would result in a permanent reduction in disturbance to foraging, commuting and roosting bats throughout the operation of the Proposed Development, although the effect is not significant. Bird, bat, reptile, amphibian and invertebrate populations are expected to benefit in the longer-term due to enhancements included in the Proposed Development design.

1 Introduction

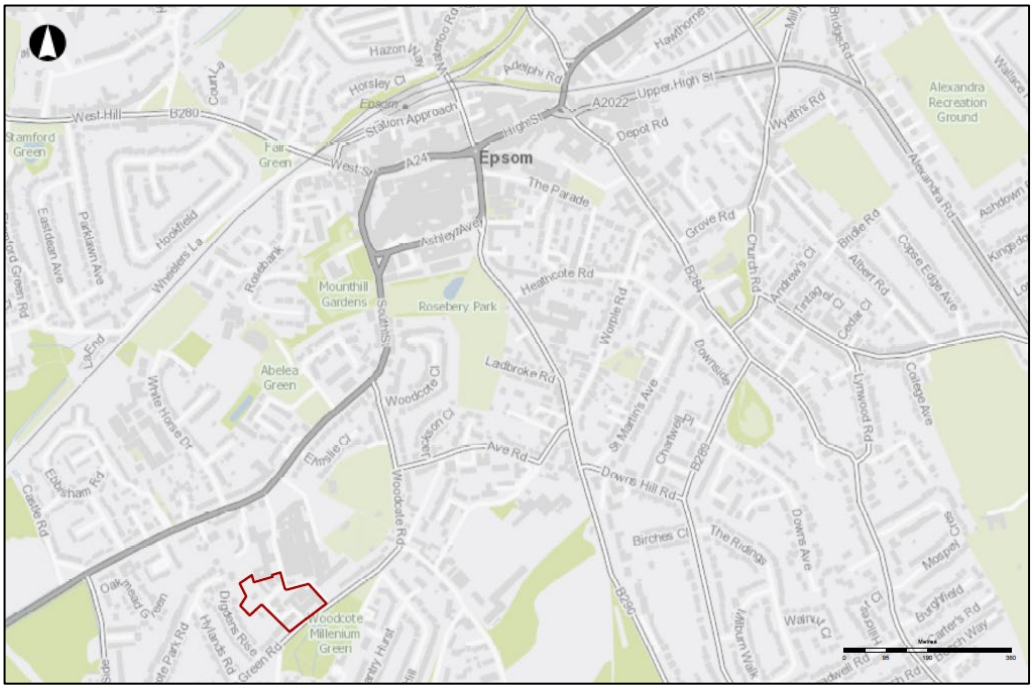
1.1 Background

Ove Arup and Partners Limited (Arup) was commissioned by Senior Living Urban Epsom Limited to undertake an Ecological Impact Assessment (EcIA) in support of a planning application for the redevelopment of the southern part of Epsom Hospital in Epsom, Surrey, KT18 7EG (approximate central grid reference TQ 20377 59754) hereafter referred to as the 'site'.

1.2 The Site

The site is 1.48 hectares (ha) in size, shown in Figure 1. The site is bound by suburban housing with scattered trees to the west, Woodcote Green Road to the southeast, with a large pond and woodland beyond, and Epsom Hospital to the north and east. The Proposed Development includes the construction of two new buildings of between four and nine storeys and the creation of a public green corridor, roof garden, and includes landscaping throughout.

Figure 1 The Site



1.3 Aims and Objectives

The purpose of this report is to assess the likely significant environmental effects of the Proposed Development on the ecology of the site during preparation, construction and operational stages. The assessment aims:

- To identify and describe all potentially significant ecological effects associated with the Proposed Development;

- To set out the mitigation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects;
- To identify how mitigation measures will/could be secured;
- To provide an assessment of the significance of any residual effects;
- To identify appropriate enhancement measures; and,
- To set out the requirements for post-construction monitoring.

1.4 Proposed Development

The Proposed Development would require the demolition of the existing hospital buildings, accommodation block and associated structures and redevelopment of the site to provide a new care community for older people arranged in two buildings, comprising 267 care residences, 10 care apartments and 28 care suites proving transitional care, together with ancillary communal and support services Use Class C2, 24 key worker units Use Class C3, children's nursery Use Class E, as well as associated back of house and service areas, car and cycle parking, altered vehicular and pedestrian access, landscaping, private amenity space and public open space.

The Proposed Development would introduce new landscaping, including greening of a pedestrian route through the centre of the site running north to south, and a central community plaza, two roof gardens, two biodiverse green roofs and landscaping throughout.

Construction is due to take place in March 2021, with completion achieved by early 2024.

1.5 Legislation, Planning Policy and Guidance

Details of the relevance of this legislation, planning policy and guidance is given in Appendix A.

1.5.1 Legislation

The interpretation of the survey findings and subsequent recommendations are in accordance with the following relevant legislation:

- Wildlife and Countryside Act 1981 (as amended);
- Natural Environment and Rural Communities (NERC) Act 2006;
- The Conservation of Habitats and Species Regulations 2017;
- Countryside and Rights of Way (CROW) Act 2000; and
- Wild Mammals (Protection) Act 1996.

1.5.2 Planning Policy

The planning policies relevant to this assessment comprise:

- National Planning Policy Framework (NPPF)[1];
- The England 2020 Biodiversity Strategy[2]; and
- Epsom and Ewell Core Strategy (2007)[3].

1.5.3 Guidance

The guidance documents that are relevant to this assessment comprise:

- UK Post 2010 Biodiversity Framework[4];
- Section 41 List;
- Birds of Conservation Concern;
- Biodiversity Planning in Surrey; and
- Epsom and Ewell Biodiversity Action Plan (BAP).

[1] Ministry of Housing, Communities and Local Government, (2019); 'National Planning Policy Framework.'
[2] Defra, 2011; 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services.'
[3] Epsom and Ewell Borough Council (2007); 'The Epsom and Ewell Core Strategy.'
[4] Joint Nature Conservation Committee and Defra, (2012); 'UK Post-2010 Biodiversity Framework Published by JNCC and Defra on behalf of the Four Countries' Biodiversity Group.'

2 Methodology

This section sets out the ecological issues to be addressed in this assessment, the methods and resources to be used and establishes the spatial and temporal limits for surveys and assessments.

2.1 Scope of the Assessment

The 'Zone of Influence' (ZoL) for a project is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities.

For the purposes of this assessment, the features considered and their ZoI were:

- Designated sites – on a precautionary basis, those up to 2km of the site were considered in the assessment. This takes into account the potential for direct disturbance to interest features of designated sites associated with vegetation clearance, earthworks, construction and landscaping operations both within and up to approximately 100m from the site;
- Habitats – within the site, due to vegetation clearance and earthworks, as well as effects from operation; and
- Legally protected and notable species – there is potential for bats roosting, commuting and foraging within and up to approximately 100m from the site to be impacted by habitat loss, lighting and obstruction by tall buildings.

2.2 Desk Study

A desk study was undertaken in August 2018 by Arcadis[5] which identified existing ecological information relating to the site and its surroundings. The Multi-Agency Geographical Information System (MAGIC) website and Surrey Biodiversity Information Centre (SBIC)[6] were consulted for recent records of protected species or species of conservation concern and protected or designated sites within 2 kilometres (km) of the site.

Only records of species from the last 10 years were used as it was considered that records older than this would not accurately reflect the distribution of species currently present within the study area.

Surrey Bat Group was also consulted for data relating to bats within a 2km radius of the site. This included records of bats, bat roosts and European Protected Species (EPS) Mitigation licence applications for bats.

[5] Arcadis (2018); 'Epsom Hospital – Ecological and Arboricultural Constraints Report.'
[6] Surrey Wildlife Trust (2019); Available: https://www.surreywildlifetrust.org/what-we-do/professional-services/records-centre Accessed: 14/01/2021.

2.3 Field Survey

2.3.1 Extended Phase 1 Habitat Surveys

Extended Phase 1 habitat surveys were undertaken on 26 July 2019 and 11 September 2019 following the standard methods as described in the Guidelines for Preliminary Ecological Appraisal (PEA)[7] and the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 Habitat Survey[8]. Full details of the survey and its recommendations are in the PEA Report[7].

The extended Phase 1 habitat survey included a walkover survey of all land within the Proposed Development site to identify habitat features suitable for supporting protected species, including roosting bats in buildings and trees following criteria from the Bat Conservation Trust (BCT) Good Practice Guidelines[9]. Buildings and trees were then categorised into one of the following levels of roost potential for bats: negligible; low; moderate; and high.

2.3.2 Bat Surveys

Following the identification of features with the potential to support roosting bats, surveys were undertaken to determine their use by bats. These bat surveys were designed in accordance with current guidance where possible[9] (notwithstanding constraints regarding survey timings, refer to Section 2.6) and comprised the following:

- Emergence and re-entry surveys in August and September 2019, and in April and May 2020;
- Tree climbing surveys in November 2019; and
- External and internal building inspections in December 2019.

Detailed methodology, including survey timings and weather conditions, and detailed results of the bat surveys can be found in the PEA Report[7].

2.4 Identifying Ecological Features

Ecological features that will be subject to an EcIA are identified and valued within a defined geographical context:

- International and European – Statutory sites designated or classified under international conventions or European legislation. Sites supporting a species or species' assemblage important in an international context. This includes those listed on Annexes I II, IV and V of the Habitats Directive and Annex I of the Birds Directive.
- National – Statutory sites designated under national legislation, for example Sites of Special Scientific Interest (SSSI). Sites supporting a species or

7 Arup (2021); 'Preliminary Ecological Appraisal.'
8 Joint Nature Conservation Committee JNCC (2010); 'Handbook for Phase 1 Habitat Survey.'
9 Collins, J. ed. (2016); 'Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd Edition.' The Bat Conservation Trust, London.

species' assemblage important in a national context. Habitats and species of principal importance under Section 41 of the NERC Act 2006.

- Regional - Sites supporting a population of a species or species' assemblage important in a regional context.
- Site - A regularly occurring native species or habitat that is widespread and common throughout the UK.

2.5 Impact Assessment

This EcIA has been undertaken in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) best practice guidance[10]. The impact assessment process involves:

1. Identifying and characterising impacts (see Section 2.5.1);
2. Incorporating measures to avoid and mitigate reduce these impacts;
3. Identifying appropriate compensation measures to offset significant residual effects;
4. Assessing the significance of any residual effects after mitigation (see 2.5.2);
5. Assessing cumulative impacts and effects, if any (see 2.5.3); and
6. Identifying opportunities for ecological enhancement.

2.5.1 Characterising Impacts

Impacts are actions resulting in changes to an ecological feature. Both positive and negative impacts of the Proposed Development are identified within this assessment, and described with reference to their extent, magnitude, duration, timing, frequency and reversibility.

2.5.2 Significance of Effects

Effects are the outcomes to an ecological feature, resulting from an impact. The assessment determines the significance of potential effects on ecological features identified within their respective ZoIs. For the purpose of this EcIA, a significant effect is defined as an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy or more wide-ranging enhancement of biodiversity).

Significant effects encompass impacts on the structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution). For habitats, conservation status is determined by the sum of the influences acting on the habitat that may affect its

[10] Chartered Institute for Ecology and Environmental Management CIEEM 2019; 'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.' Version 1.1. CIEEM, Winchester.

extent, structure and functions as well as its distribution and its typical species within a given geographical area. For species, conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

Effects can be considered significant at a wide range of scales from international to local. As features of less than local importance would not be a material consideration for the Proposed Development, only features of local or higher importance have been considered in this assessment.

2.5.3 Cumulative Impacts and Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location.

A cumulative impact assessment has been undertaken which considers whether impacts from any of the following developments will collectively result in a significant effect:

- Proposals for which consent has been applied which are awaiting determination in any regulatory process;
- Projects which have been granted consent, but which have not yet been started or which have been started but are not yet completed i.e. under construction;
- Proposals which have been refused permission, but which are subject to appeal, and the appeal is undetermined; and
- To the extent that their details are in the public domain, proposed projects that will be implemented by a public body but for which no consent is needed from a competent authority.

2.6 Assumptions and Limitations

No account can be made of the presence or absence of a species on any single survey visit, as animals regularly move between different sites used for breeding, foraging and shelter. Professional review of past records and habitat suitability, together with the level of survey effort employed, allows for sufficient certainty about the use of the site by species of conservation concern.

3 Baseline Ecological Conditions

The ecological baseline conditions described in this section, are those conditions existing in the absence of the proposed activities and attributes a value to the ecological features in accordance with Section 2.4.

Full details regarding the results of desk study and surveys that were used to inform the following information are contained in the PEA Report[7]. Features of site value or less have not been considered further in the assessment.

3.1 Designated Sites

The site is within a 2km proximity to five statutory designated sites: two Local Nature Reserves (LNRs); two Sites of Special Scientific Interest (SSSI); and one National Nature Reserve (NNR). There are also 16 non-statutory designated sites within 2 km of the site. These are described in detail in the PEA Report[7]. It is unlikely that designated sites within the surrounding area would pose any ecological constraints given their distance from the site, the urban context of the site, the lack of ecological connectivity and the nature and scale of the works proposed. These designated sites do not have potential to be impacted by the Proposed Development and are not considered further.

3.2 Habitats

3.2.1 Dense Scrub

Patches of dense scrub were recorded south of Rowan House and in the western part of the site. These stands were largely unmanaged and may provide foraging opportunities for reptiles and amphibians, which have been recorded within 2km of the site. Given the low the ecological value of these areas and since they are of limited extent, the habitat will not be assessed further.

3.2.2 Scattered Trees

Most scattered trees are located around the periphery of the site, including some mature and semi-mature. A hybrid poplar *Robusta Populus x canadensis 'Robusta'* along the western boundary of the site (T27) supports roosting bats and two other trees within the site have low bat potential (T25 and T33). Refer to Section 3.3.1 for further details regarding the baseline conditions with respect to bats and Appendix C of the PEA Report[7] for tree locations. Scattered trees also provide nesting and foraging habitat for birds and habitat for invertebrates. However, they provide limited ground cover and foraging opportunities for amphibians, reptiles and invertebrates. As this habitat enhances connectivity along the site boundary and provides habitat for bats, birds and invertebrates, they are considered to be of local value and will be assessed further.

The baseline conditions with respect to bat roost potential (BRP) is expected to change prior to the commencement of the Proposed Development. See Section 3.4 Future Baseline for this information.

3.2.3 Amenity Grassland

Patches of amenity grassland were scattered in small areas around some of the buildings. These small patches are managed and provide limited value to ecology and therefore will not be assessed further.

3.2.4 Introduced Shrub

Stands of introduced scrub were recorded along the eastern side of Rowan House and south and east of Woodcote Lodge, which were generally unmanaged. Species includes some native plants and offer habitat for invertebrates, and limited foraging opportunities for birds and bats. Given the limited ecological value and limited extent of this habitat, it will not be assessed further.

3.2.5 Buildings and Hardstanding

The site is primarily composed of buildings and hardstanding. These buildings are predominantly red brick and were both occupied and unoccupied. Refer to Section 3.3.1 for further details regarding the baseline conditions with respect to bats and to the PEA Report[7] for building locations. Four of the buildings, B1, B3, B4 and B9, have potential to support roosting bats and as such, are considered of local value and will be assessed further.

3.3 Protected and Notable Species

3.3.1 Bats

Tree Roosts

Two trees were found to have low BRP: T25; and T33, and a roost was recorded in T27, which was located along the western boundary of the site (approximate grid reference TQ 20300 59762). The survey results indicated the presence of a low number of roosting bats, either *Myotis* sp. or common pipistrelle. T27 was unlikely to be used as a maternity or hibernation roost given the high level of exposure to disturbance and noise and the lack of evidence indicating high usage by bats, such as clean and smooth internal walls. The results indicated that the tree instead supported a day roost for a low number of bats during the summer.

T27 is no longer present at the site, see the PEA Report[7] for full details. Three artificial bat boxes have been installed in its place close to the lost roost and to T25. For the purposes of this assessment, all three bat boxes are considered to contain roosting bats, as a precautionary approach.

Building Roosts

No bat roosts were confirmed in any of the surveyed buildings. However, it is considered that B1 has moderate potential to support roosting bats and B3 and B4 have low potential. They have features such as slipped tiles and gaps in soffit boxes that provide opportunities for bats to access the roof voids. No signs of roosting bats were observed during the internal inspections or during the

emergence and re-entry surveys, meaning that it is unlikely that these buildings support a maternity roost or other significant roost, although they do have low potential to support hibernating bats.

Commuting and Foraging Bats

The western edge of the site with private gardens beyond, where T25 and T27 is/was located, was found to provide important foraging, commuting and socialising habitat for common pipistrelle.

Noctule was recorded commuting across the site on most survey occasions. Soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus* and Nathusius' pipistrelle *Pipistrellus nathusii* were each recorded once during the surveys, likely commuting across the site. While Daubenton's bat, serotine and Natterer's bat were not confirmed during the surveys, these species have been recorded within 2 km of the site. Furthermore, a *Myotis* sp. was recorded on one occasion during the surveys, potentially returning to T27, which could have been Daubenton's bat.

All bat species are EPS that are fully protected under the Wildlife and Countryside Act 1981 as amended (WCA) and the Conservation of Habitats and Species Regulations 2017 (Habitats and Species Regulations). Soprano pipistrelle, brown long-eared bat and noctule are listed under the former UK BAP and Section 41 list, meaning they are priority species and must be considered by public authorities.

Roosting, foraging and commuting bats are considered to be of local importance to bats and will be assessed further.

3.3.2 Amphibians

The pond within Woodcote Millennium Green, to the southeast of the site, has potential to support great crested newt *Triturus cristatus* and other locally recorded amphibians. Great crested newt is a EPS that is fully protected under the WCA and Habitats and Species Regulations. It is also listed under the former UK BAP and Section 41 list. No waterbodies were recorded on site. The patches of trees, scrub and grassland within the site may offer shelter for amphibians outside the breeding season; however, these habitats are isolated from the pond by the expanse of roads and buildings, so the site is unlikely to support large numbers of amphibians. The temporary loss of this isolated terrestrial habitat is not considered to have potential to impact amphibians and will not be assessed further.

3.3.3 Other Mammals

The site provides very limited foraging opportunities for mammals such as European hedgehog *Erinaceus europaeus* and red fox *Vulpes vulpes*. There is potential for common mammal burrows to occur within areas of dense vegetation at the site. Red fox is a common species of low ecological value and will therefore not be assessed further. It is unlikely that the site provides important habitat for European hedgehog, considering the lack of suitable habitat and since the site is

highly disturbed. As a result, impacts to other mammals will not be assessed further.

3.3.4 Reptiles

Species records indicate the local presence of grass snake *Natrix natrix*, common lizard *Zootoca vivipara* and slow worm *Anguis fragilis* within 2km of the site. All UK reptiles are protected under Schedule 5 of the WCA and listed under the former UK BAP and Section 41 list. Grass snake are commonly found in wetland habitats, which could potentially include the pond at Woodcote Millennium Green. The narrow strips of scattered trees, scrub and grassland provide limited habitat for reptiles. However, suitable habitat is restricted and isolated by the expanse of roads and buildings, so the site is unlikely to support large numbers of reptiles and will therefore not be assessed further.

3.3.5 Birds

Common species of birds, such as blackbird *Turdus merula* and feral pigeon *Columba livia*, were recorded incidentally at the site, which are on the green list of Birds of Conservation Concern. There are records of protected species within 2km of the site including kestrel *Falco tinnuculus*, kingfisher *Alcedo atthis*, barn owl *Tyto aba* and green woodpecker *Picus viridis*, which may utilise the woodland and pond just outside the site.

The scattered trees, scrub and grassland may provide nesting opportunities and foraging habitat for a range of bird species. Some of the buildings may provide suitable nesting sites for common birds, such as feral pigeon. However, the site provides limited nesting and foraging opportunities to common birds and as such will not be assessed further.

3.3.6 Invertebrates

Some protected species of invertebrate have been recorded within 2km of the site, however the site does not contain habitats or features which could support these species. Due to the limited areas of managed habitats on site, the site is of limited potential value to invertebrates and will therefore not be assessed further.

3.3.7 Plants

No notable, rare or protected species of plant were recorded on site. However, cotoneaster and rhododendron were recorded at the site, of which some species are listed as invasive under Schedule 9 of the WCA. Japanese knotweed *Fallopia japonica* and Virginia creeper *Parthenocissus quinquefolia* could also spread onto the site from nearby areas. Butterfly bush *Buddleia davidii*, was recorded at the site and is an invasive species but is not listed under Schedule 9. Mitigation would be required to ensure legal compliance, but as invasive plants are not of ecological value, they will not be assessed further.

3.4 Future Baseline

There is potential for existing buildings to become increasingly derelict with time, potentially providing additional opportunities for bats to gain access to roost. The other habitats on site consist of small areas of scrub, amenity grassland and introduced shrubs. It is presumed that existing management of these areas would continue and are therefore not anticipated to change in value to wildlife within the next two years, prior to the commencement of works.

3.5 Summary of Baseline

This section provides a summary of the baseline being assessed for impacts and details their existing geographical level of importance.

Table 1 Geographic levels of importance of each ecological feature considered in this assessment

Ecological Feature	Geographic Level of Importance	Justification
Scattered Trees	Local	Two trees along the western boundary have low BRP and three trees contain artificial bat boxes. Several mature trees along the western boundary and adjacent private gardens provide important foraging and commuting habitat for common pipistrelle.
Buildings	Local	B1 has moderate potential and B3 and B4 has low potential to support roosting bats in the summer and all have a low potential to support hibernating bats.
Bats	Local	Trees and buildings within the site have BRP. Three artificial bat boxes have been erected on trees along the western boundary of the site, following the removal of T27 that supported roosting bats in early 2020. The mature trees bordering private gardens provide important foraging and commuting habitat for common pipistrelle.

Small areas of habitat with limited ecological value may provide refugia for reptiles and amphibians outside the breeding season, and nesting opportunities for birds. Invasive species have been recorded at the site and there is potential for mammal burrows to be present. The removal of these habitats and potential impacts on these features fall below the threshold for assessment, but precautionary mitigation would be required during vegetation clearance to ensure legal compliance.

4 Assessment of Effects and Mitigation

This section of the assessment identifies and characterises impacts, incorporating measures to avoid and mitigate these impacts, and assesses the significance of any residual effects after mitigation. Appropriate measures would be adopted during construction to protect the ecology of the area, with special attention to specified areas of ecological value.

4.1 Environmental Design

The Proposed Development has been designed to avoid and minimise ecological effects, mitigate impacts and provide ecological enhancements in line with the NPPF. These include:

- Landscape designed to integrate with existing features within and surrounding the site with the purpose of improving habitat connectivity. These include widening the western corridor to enhance the existing commuting routes for bats.
- The inclusion of native trees and native shrub planting to provide foraging opportunities for local wildlife, such as bats, birds, amphibians and reptiles.
- Retention of all trees now present along the western boundary of the site to protect the foraging and commuting corridor for bats.
- Two biodiverse roofs, one on the fourth storey roof close to the western boundary and one on the fifth storey roof of the southern part of west block adjacent to Woodcote Green Road, to provide habitat for invertebrates and further foraging opportunities for birds and bats.
- Native shrub planting and wildflower meadow along the western boundary to widen and enhance the existing ecological corridor to enhance the value of this boundary for bats and other wildlife.
- Three artificial bat boxes were installed in June 2020 and would be located to minimise disturbance associated with the Proposed Development. It is intended that these are located along the western boundary, close to the lost roost in T27.
- The inclusion of hibernacula, comprising log piles from trees felled on site and ‘insect hotels’ to provide habitat for invertebrates, amphibians and reptiles.
- Sensitive lighting with a ‘dark zone’ along the western side of the Proposed Development designed specifically for bats that utilise the woodland corridor and artificial roosts.

4.2 Embedded Ecological Measures

4.2.1 CEMP

A Construction Environmental Malmanagement Plan (CEMP) has been produced which specifies management measures required during construction to prevent

ecological impacts[11]. This includes measures regarding the protection of trees and control of dust, water quality and flow, noise and vibration and lighting.

4.2.2 Amphibians and Reptiles

Precautionary mitigation is required to avoid a legal offence as there is a low risk of reptiles and amphibians being present within vegetated areas of the site. During ground preparation, sensitive clearance should be undertaken under an ecological watching brief. Any potential hibernacula (log piles, fallen trees, rubble) should be subject to a destructive search by a suitably qualified ecologist and the vegetation cleared in stages to allow any reptiles and amphibians that may be present to be captured or to leave the area. This work should ideally be carried out in September and October (weather conditions permitting), when reptiles and amphibians are generally active and dispersing and outside the main breeding bird season (March to August). If not possible, this work would need to be undertaken between March and August, with the suitably qualified ecologist ensuring that no impacts to nesting birds result. Any individual reptiles found should be placed in a suitable receptor site.

4.2.3 Birds

Clearance and demolition should ideally be undertaken outside the main breeding season (March to August inclusive). If this is not possible, pre-clearance nesting checks would be required no more than 48 hours prior to the start of clearance and demolition works.

4.2.4 Common Mammals

Any deep holes and trenches should be covered overnight and planked escape routes provided for any wildlife that may fall in. In addition, any hazardous liquids that are held on site should be stored in a secure lock-up. To avoid unnecessary harm to wild mammals, any burrows that are encountered during site clearance works should be excavated sensitively, using hand tools where possible. Excavation would also ideally not occur between March and May inclusive, when female red fox and cubs may be below ground.

4.2.5 Tree Protection

Retained trees should be protected in accordance with the BS 5837:2012 Trees in relation to design, demolition and construction[12] and recommendations of the Arboricultural Report[13]. The Tree Constraints Plan from the Arborcultural Report is appended to the PEA Report[7].

[11] Morgan Sindall (2021); 'Guild Living, Epsom Construction Environmental Management Plan. Revision 05.'
[12] British Standards Institution (2012); 'BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.'
[13] RG consulting Ltd (2019); 'Arboricultural Report for the Proposed Development.'

4.2.6 Invasive Species

Invasive plant species should be removed and appropriately disposed of to prevent the spread of these species outside the site[14].

4.2.7 Pollution Prevention

Standard pollution prevention measures should be implemented in accordance with Pollution prevention for businesses[15].

4.3 Construction

4.3.1 Bats

Three buildings that are due to be demolished to accommodate the Proposed Development (B1, B3 and B4) have moderate to low potential to support roosting bats. However, no bat roosts were confirmed in any of the buildings indicating a likely absence of bats at that time. Three artificial bat boxes are located on trees along the western boundary of the site, as is T25 (which has low BRP), and these may therefore be subject to temporary noise and disturbance during construction from workers and site activities. Construction lighting may also disturb bats utilising the site as lit conditions can pose a barrier to movement[16]. Given that the bat boxes and T25 are in the least disturbed part of the site and works in this area comprise the removal of a car park and replacement with soft landscaping, disturbance from construction noise and site workers would be limited and for a short duration only and therefore disturbance effects on roosting bats are considered to be not significant.

The loss of small areas of trees, scrub and amenity grassland within the site may impact insect availability and the suitability of the site for foraging and commuting bats. The Proposed Development incorporates new landscaping, including trees, ornamental and native planting and green roofs. The landscape strategy is expected to provide an improved foraging resource for bats, particularly the biodiverse roofs, shrub planting and wildflower meadow along the western boundary. It is considered that the Proposed Development would increase the value of the site for foraging and commuting bats in the longer-term, although the effect is not significant.

4.3.2 Scattered Trees

The Proposed Development would require the removal of 22 trees/tree groups. However, the landscape strategy would increase the number of scattered trees at

[14] Her Majesty's Government (2014); 'Stop invasive non-native plants from spreading. How to identify, control and dispose of invasive non-native plants that can harm the environment. Available at: https://www.gov.uk/guidance/prevent-the-spread-of-harmful-invasive-and-non-native-plants
[15] Department for Environment, Food & Rural Affairs and Environment Agency (2016); 'Guidance - Pollution prevention for businesses.
[16] Bat Conservation Trust and the Institution of Lighting Professionals, 2018; 'Bat Guidance Note 08/18 Bats and artificial lighting in the UK. Bats and the Built Environment series.'

the site, with a total of 113 trees to be planted, although the majority of these would be non-native and they would take some time to mature to the level of the trees being lost. T25 and T33 both have bat potential and would be retained. On balance, it is considered that the potential effect on scattered trees is not significant.

4.3.3 Buildings

The loss of buildings on site has potential to lead to a loss of roosting habitat for bats and nesting habitat for birds. Effects of building demolition on bats are discussed in Section 4.3.1. The implementation of embedded ecology measures (refer to Section 4.2.3) would ensure compliance with legislation with respect to nesting birds. As such, the potential effect is not significant.

4.4 Operation

Disturbance to foraging and commuting bats along the western boundary and adjacent private gardens and roosting bats associated with bat boxes is anticipated to reduce during the operation of the Proposed Development, given that the existing car park would be replaced with landscaping and footpaths. Lighting for the Proposed Development has been designed to minimise adverse effects on bats, following the BCT Guidance Note on Bats and Artificial Lighting[16]. This includes the utilisation of low-level, glare-free lighting along the footpaths to enable wayfinding, as well as low level lighting to the landscaping. This also includes a 'dark zone' along the western boundary. As a result, the effect on bats would be beneficial, although not significant.

4.5 Mitigation

Lighting during construction should be sensitive bats in accordance with current guidance[16]. This is particularly pertinent with respect to the bat boxes in the western part of the site.

The lighting strategy for the operation of the Proposed Development should continue to be developed in accordance with current guidance[16], including specifying warm white spectrum (ideally <2700Kelvin) LED luminaires which have a peak wavelength of 550nm.

4.6 Residual Effects

Residual effects on bats, scattered trees and buildings due to habitat loss and disturbance are not significant, considering the implementation of mitigation.

4.7 Cumulative Effects

Two developments were identified within 1 km of the site that were considered to have potential to lead to cumulative effects, as shown in Table 2.

Table 2 Cumulative Developments

Application Reference	Development Description	Distance from Site	Conclusion
20/00762/TPO	Selective thinning of semi mature native species such as yew *Taxus baccata*, lime *Tilia* sp., cherry *Prunus* sp. and horse chestnut *Aesculus hippocastanum,* to remove deadwood and maintain clearance of buildings and footpaths. The proposed work is currently awaiting decision from the council.	Approx. 0.39km	The tree survey did not assess the potential of the trees for bats. All but one of the trees are in average or good condition. One, a yew is in poor condition due to ivy cover.
20/00041/FUL	Change of use from B1 (Business) to C3 (Residential) including demolition of existing builders yard buildings. Construction of 6 number two-storey, two-bedroom dwellings. The proposed project is currently awaiting decision from the council.	Approx. 0.49km	No environmental or ecological surveys have been conducted of the site or buildings.

A review of the planning documents indicates that none of these developments would result in adverse or beneficial effects on bats and therefore no cumulative effects have been identified.

4.7.1 Summary of Impacts and Residual Effects

Table 3 provides a summary of the impacts and the significance of any residual effects for each feature, the mitigation measures required and the means by which mitigation measures can be secured.

Table 3 Summary of impacts and significance of any residual effects

Feature	Impact	Significance of Effect without Mitigation	Mitigation	Significance of Residual Effects	Significance of Cumulative Effects
Construction					
Bats	Loss of potential roosting habitat – B1, B3 and B4	Not significant	N/A	Not significant	Not significant
	Disturbance to foraging and commuting bats	Not significant	Bat sensitive lighting	Not significant	Not significant
	Disturbance to bats roosting in bat boxes	Not significant	Bat sensitive lighting	Not significant	Not significant
Buildings	Habitat loss	Not significant	N/A	Not significant	Not significant
Scattered trees	Habitat loss and creation	Not significant	N/A	Not significant	Not significant
Operation					
Bats	Lighting may disturb foraging, commuting and roosting bats	Not significant	Bat sensitive lighting	Not significant	Not significant

4.8 Enhancement and Monitoring

Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures. It is important that development is sustainable and that projects produce a net gain for biodiversity and nature conservation. The NPPF promotes the inclusion of measures to enhance biodiversity within development proposals.

The proposed wildflower green roofs represent an ecological enhancement that would provide additional habitat for birds and invertebrates. The proposed landscape buffer of approximately 5m will be created along the south-western boundary of the site to enhance and better connect the woodland corridor used by bats. The buffer will include species-rich hedgerow planting, a new line of trees and shrub planting. The hibernacula, comprising log piles from trees felled on site and 'insect hotels' would provide potential hibernation and summer refuge for invertebrates and local populations of reptiles and amphibians. The bird boxes would be installed in suitable locations under direction of a suitably experienced ecologist, providing additional nesting and roosting opportunities for birds. Monitoring of bird and bat boxes should be undertaken to contribute to and benefit biodiversity records and inform research into the success of mitigation and enhancement measures for development.

5 Conclusions

No significant effects to the features assessed, comprising bats, buildings and scattered trees, are anticipated during construction or operation. Many of the trees along the western boundary of the site are being retained and a landscape buffer is being created along the south-western boundary to maintain and enhance this roosting, commuting and foraging habitat for bats. Lighting for the Proposed Development has been designed to minimise impacts to bats, following the BCT Guidance Note on Bats and Artificial Lighting[16]. This is expected to result in a beneficial effect during operation, although not significant.

Landscaping designs would enhance the ecological value of the site; ornamental and native tree and scrub planting throughout the site, with a focus on creating ecological corridors along Woodcote Road and the south-western boundary, biodiverse green roofs, hibernacula, bat and bird boxes would increase habitat on site for birds, bats, invertebrates, amphibians and reptiles. Hibernacula would provide potential hibernation and summer refuge for invertebrates and local populations of reptiles and amphibians. The bird boxes would provide additional nesting opportunities for birds.

The embedded ecological measures, avoidance, mitigation and enhancements provided by the Proposed Development would result in a longer-term increase in biodiverse habitats and opportunities for a range of local wildlife, including birds, bat, reptile, amphibians and invertebrates.

Appendix A

Legislation, Planning Policy and Guidance

A1 Legislation

- Wildlife and Countryside Act 1981 (as amended) (WCA) – this legislation comprises the primary means of protecting wildlife in the UK and provides the mechanism by which a number of international directives are implemented in the UK;
- Countryside and Rights of Way (CROW) Act 2000 – this act strengthens the details of the Wildlife and Countryside Act in relation to Sites of Special Scientific Interest (SSSI) and threatened species;
- The Conservation of Habitats and Species Regulations 2017 (Habitats and Species Regulations) – these regulations provide protection for European Protected Species and their habitats, such as bats and great crested newts;
- Natural Environment and Rural Communities (NERC) Act 2006 – the NERC Act puts an obligation on public authorities to have regard for the conservation of species and habitats of principal importance for the purpose of conserving biodiversity; and
- Wild Mammals (Protection) Act 1996 –makes it an offence to intentionally cause wild mammals any unnecessary suffering by certain methods, including crushing and asphyxiation.

A1.1 Bats

All bat species are fully protected under the WCA and the Habitats and Species Regulations, which together make it an offence to:

- Intentionally or recklessly capture, kill or injure bats;
- Deliberately disturb bats (including when they are outside their roosts) or intentionally or recklessly disturb roosting bats; or
- Damage or destroy their roosts or intentionally or recklessly obstruct access to their roosts (whether bats are present or not).

Under the Habitats and Species Regulations, disturbance includes any disturbance which is likely to impair their ability to survive, breed, reproduce, rear or nurture their young, hibernate, or to significantly affect the local distribution or abundance of the species.

A1.2 Great Created Newt

Great crested newt is fully protected under the WCA and Habitats and Species Regulations, which together make it an offence to:

- Intentionally or recklessly capture, kill, injure or disturb great crested newts; and

- Damage or destroy a breeding site or resting place for great crested newt or intentionally or recklessly obstruct access to any structure or place used for shelter or protection.

Under the Habitats and Species Regulations, disturbance includes in particular any disturbance which is likely to impair their ability to survive; breed or reproduce; rear or nurture their young; or hibernate or to affect significantly the local distribution or abundance of the species.

A1.3 Birds

All birds, their active nests and eggs are protected under the WCA. This legislation makes it an offence to kill, injure or take any wild bird or to take, damage or destroy the nest of any wild bird while that nest is in use or being built.

Special penalties are given for these offences when related to birds listed on Schedule 1. The WCA makes it illegal to intentionally disturb any wild bird listed in Schedule 1 of the Act while it is building a nest or is in or near a nest containing eggs or young, or to disturb the dependent young.

A1.4 Common Reptiles

Common lizard, slow worm and grass snake, are listed on Schedule 5 of the WCA, which makes it illegal to deliberately or recklessly injure or kill these species. These species are also listed under the former UK BAP and are on the Section 41 list of species of principal importance in conserving biodiversity.

A1.5 Common Amphibians

Common amphibians, including common toad, common frog and smooth newt, are only protected from sale under the WCA. Common toad is also listed under the former UK BAP and is on the Section 41 list of species of principal importance in conserving biodiversity.

A1.6 Invasive Plants

The WCA makes it an offence to cause plant species listed on Schedule 9 to grow in the wild.