Cambridgeshire County Council

# Phase 3 Cambridge Bio-Medical Campus

# Ecological Appraisal

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## 1.0 EXECUTIVE SUMMARY

1.1 An extended Phase 1 habitat survey and desk study were undertaken for a c.8.9ha site located to the south of Addenbrookes Hospital.

1.2 The desk study confirmed there are two nationally valuable statutory designated sites and six non-statutory designated sites located within the local area. A number of local protected and notable species records were also returned from the local area, including bats, otter, water vole and bird species typical of urban edge and farmland habitats.

1.3 The majority of the application site comprised arable habitat of generally low ecological value, though supports a number of farmland bird species through the year. The site was partially bounded by a damp ditch and established hedgerows and off-site woodland blocks that provided species and structural diversity. These features are hence considered to be of Local ecological value and will be retained in the proposed scheme and buffered within a continuous broad corridor of shrub, tree and grassland planting, providing enhanced foraging and commuting opportunities for a range of local fauna at the site level including foraging and commuting bats, and tree/shrub nesting birds.

1.4 Precautionary mitigation measures are provided to ensure site preparation and construction works minimise the risk of adverse impacts to nesting birds during the breeding season. Further recommendations are provided to ensure that works proceed in line with best practice to minimise the risk of an adverse impact to local watercourses, including those associated with local non-statutory sites.

1.5 A minor adverse impact is predicted on local farmland birds of species that utilise open arable habitats, due to the loss of this habitat from the site. Given the size and location of the site and the continued availability of similar habitat within the wider landscape residual effects due to displacement are not considered to be significant.

1.6 No other impacts on protected species are considered likely to occur as a result of the proposed scheme.

1.7 Recommendations are provided for habitat enhancement at the site level, with suitable species for inclusion within the planting scheme provided. The scheme will additionally provide two permanent ponds, a balancing facility and areas of more formal planting to provide a net biodiversity gain across the site.

1.8 The scheme has been designed to provide a strong ecological buffer to the neighbouring offsite Nine Wells Local Nature Reserve, and will simultaneously both deter pedestrian access from the site and provide alternative opportunities for recreation and amenity within the site boundary, including a network of pathways through landscaped areas, and features of interest including the ponds and more formal planted areas.

1.9 Given the generous green infrastructure proposed on site, careful scheme design and adherence to best practice construction methods, no impact is anticipated to the integrity of the neighbouring Nine Wells Local Nature Reserve or any other designated site.

# 2.0 INTRODUCTION

## Background

2.1 This report has been produced by FPCR Environment and Design Ltd. for Cambridgeshire County Council, and provides details of an extended Phase 1 habitat survey undertaken at a site to the south of Cambridge (central grid reference TL 464 545). See Figure 1 for site location.

2.2 The site is of approximate size 8.9ha and is located to the south of Dame Mary Archer Way and Addenbrookes Hospital. At the time of survey it was managed as a single arable field partially bordered by hedgerows and a ditch.

2.3 The wider landscape to the north encompasses Addenbrookes Hospital, including recent development, beyond which lies residential development, schools and colleges. To the west of the site a railway track runs north-south, beyond which lies the residential area of Trumpington. The landscape to the south and east is a mix of agricultural land, golf course and small woodland compartments, with residential development associated with Cambridge Road to the south-west, and Great Shelford to the south. Nine Wells Local Nature Reserve (LNR) lies closely adjacent to the site to the southwest. A public footpath borders the south-eastern perimeter of the site, and a sealed cycle path borders the opposite boundary to the north.

2.4 The objective of this Ecological Appraisal is to describe the baseline ecology of the site and immediate surrounding area, and determine whether the site has potential to support protected species. This investigation included a desk study and extended Phase 1 habitat survey.

## Proposed Development

2.5 Proposals are for further extension of the existing Bio-Medical Campus. Buildings will comprise a mix of laboratories and office space.

# 3.0 METHODOLOGY

## Desk Study

3.1 To support the field survey and further compile existing baseline information relevant to the site, ecological information was sought from third parties, including records of protected or notable species and sites designated for nature conservation interest. Organisations contacted included the Cambridgeshire and Peterborough Environmental Records Centre (CPERC).

3.2 Online sources of ecological data were also sought including:

- Multi Agency Geographic Information for the Countryside (Magic) website;
- Google Maps and aerial imagery

3.3 The search area of interest varied depending upon the likely significance and zone of influence of the data requested, as follows:

- Up to a 10km radius around the site was searched for sites of international importance with a statutory designation of Special Area of Conservation (SAC), Special Protection Area (SPA) and RAMSAR sites;

- Up to a 2km radius around the site for sites of national importance with a statutory designation of Site of Special Scientific Importance (SSSI) or National Nature Reserve (NNR);
- Up to a 1km radius around the site for sites of local importance with statutory designation of Local Nature Reserve, or non-statutory designation of Site for Importance for Nature Conservation (SINC) or the equivalent Local Wildlife Site (LWS), and;
- 1km search area was also covered for records of protected species and Priority Species (i.e. including former UK and Local Biodiversity Action Plan species) from the last 20 years.

3.4 Recent bird data was also provided for the 1km grid square TL4654 via South Cambridgeshire District Council, as submitted to the Council by Mr J. Meed.

### Habitat Survey

3.5 The site was visited on 26th May 2016 and an Extended Phase 1 habitat survey conducted. Extended Phase 1 habitat survey is a survey technique recommended by Natural England that largely follows JNCC 2010[1], with the scale of recording of habitat parcels adjusted to provide more detail for smaller sites. The survey comprised a walkover of the site, mapping the principal habitat types present and identifying the dominant or characteristic plant species present within these.

3.6 Any habitats suitable for, or features with the potential to support, protected or notable species were also assessed and recorded.

### Hedgerow Assessment

3.7 The value of the hedgerows present on the site was also assessed during the field survey using the standard Hedgerow Evaluation and Grading System (HEGS)[2] methodology to assess their conservation value. The following attributes were recorded:

- Canopy species present;
- Structure (height, width, shape and percentage gaps);
- Associated features (banks, ditches, grass verges, mature trees);
- Connectivity to other hedgerows, woods or ponds;
- Associated ground flora of interest.

3.8 Hedgerows can then be scored and graded accordingly:

1 ï High to Very High conservation value;

2 ï Moderately High to High conservation value;

3 ï Moderate conservation value;

4 ï Low conservation value.

3.9 The hedgerows were also assessed against the wildlife and landscape criteria of statutory instrument No: 1160 - The Hedgerow Regulations 1997. A series of 30m sections of hedgerows

[1] JNCC 2010. *Handbook for Phase 1 Habitat Survey - a technique for environmental audit*. ISBN 0 86139 636 7.
[2] Clements, D. and Toft, R. 1992. *Hedgerow Evaluation and Grading System (HEGS) - A Methodology for the ecological survey, evaluation and grading of hedgerows*.

were surveyed, recorded features including woody and floral species and associated features as detailed in the statutory document.

3.10 These were then classified against the criteria as laid down in the regulations, which specify in detail how the criteria are met. A brief summary is given below:

- Contains certain categories of species of birds, animals or plants listed in the Wildlife and Countryside Act 1981 or Red Data Book (JNCC Publications),
- Includes: (a) at least 7 woody species, on average, in a 30m length;

  (b) at least 6 woody species, on average, in a 30m length and has at least 3 associated features;

  (c) at least 6 woody species, on average, in a 30m length, including a black poplar tree, or large-leaved lime, or small-leaved lime or wild service tree; or

  (d) at least 5 woody species, on average, in a 30m length and has at least 4 associated features.

  *NB: The number of woody species is reduced by one in northern counties. The list of 56 woody species comprises mainly shrubs and trees. It generally excludes climbers (such as clematis, honeysuckle and bramble) but includes wild roses.*
- Runs alongside a bridleway, footpath, road used as a public path or byway open to all traffic and includes at least 4 woody species, on average, in a 30m length and has at least 2 of the associated features listed at (a) - (e) below.

  (a) a bank or wall supporting the hedgerow;

  (b) less than 10% gaps;

  (c) on average, at least one tree per 50m;

  (d) at least 3 species from a list of 57 woodland plants;

  (e) a ditch;

  (f) a number of connections with other hedgerows, ponds or woodland;

  (g) a parallel hedge within 15 metres.

## Fauna

3.11 During the site survey direct observations, signs of, or suitable habitat for, species protected by the Conservation of Habitats and Species Regulations 2010 (as amended) and/or the Wildlife and Countryside Act 1981 (as amended), and the Protection of Badgers Act 1992 was also recorded. Consideration was also given to the existence and use of the site by other notable fauna such as Schedule 1 bird species, breeding birds, species of Principle Importance under Section 41 of the Natural Environment and Rural Communities Act NERC Act (2006), Local Biodiversity Action Plan (LBAP) or Red Data Book (RDB) species.

### Birds

3.12 Incidental records of bird species encountered during the Phase 1 habitat survey were recorded.

**Bats**

3.13 Tree assessments were undertaken from ground level, with the aid of a torch and binoculars (where appropriate). These surveys were undertaken on 26th May 2016 by a licenced ecologist from FPCR (Natural England licence number 22940-CLS). During the survey potential roosting features for bats such as the following were sought (based on p16, British Standard 8596:2015[3]):

- Natural holes (e.g. knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar.
- Man-made holes (e.g. cavities that have developed from flush cuts or cavities created by branches tearing out from parent stems).
- Woodpecker holes.
- Cracks/splits in stems or branches (horizontal and vertical).
- Partially detached, loose or bark plates.
- Cankers (caused by localised bark death) in which cavities have developed.
- Other hollows or cavities, including butt rots.
- Compression of forks with included bark, forming potential cavities.
- Crossing stems or branches with suitable roosting space between.
- Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk).
- Bat or bird boxes.
- Other suitable places of rest or shelter.

3.14 Certain factors such as orientation of the feature, its height from the ground, the direct surroundings and its location in respect to other features may enhance or reduce the potential value.

3.15 Trees were classified into general bat roost potential groups based upon the presence of these features. Table 1 is based upon Table 4.1 and Chapter 6 in the BCT Good Practice Guidelines[4] and broadly classifies the roost potential categories of potential as accurately as possible.

3.16 Although the British Standard 8596:2015 document groups trees with moderate and high potential, these have been separated below (as per Table 4.1 in the BCT Guidelines) to allow more specific survey criteria to be applied.

**Table 1: Classification and Survey Requirements for Bats in Trees**

| **Classification of Tree** | **Description of** Category and Associated Features **(based on** Potential Roosting Features **listed above)** | **Likely Further Survey work / Actions** |
|---|---|---|
| Confirmed Roost | Evidence of roosting bats in the form of live / dead bats, droppings, urine staining, mammalian fur oil staining, etc. | A Natural England derogation licence application will be required if the tree or roost site is to be affected by the development or proposed arboricultural works. This will require a combination of aerial assessment by roped access bat workers (where possible, health and safety constraints allowing) and nocturnal survey during appropriate periods (e.g. nocturnal survey - May to August) to inform on |

[3] BS 8596:2015 *Surveying for bats in trees and woodland. Guide*. October 2015.
[4] Bat Conservation Trust 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines*.

| **Classification of Tree** | **Description of** Category and Associated Features **(based on** Potential Roosting Features **listed above)** | **Likely Further Survey work / Actions** |
|---|---|---|
| | | the licence.<br>Works to tree undertaken under supervision in accordance with the approved good practice method statement provided within the licence.<br>However, where confirmed roost site(s) are not affected by works, work under a precautionary good practice method statement may be possible. |
| High Potential | A tree with one or more Potential Roosting Features that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter protection, conditions (height above ground level, light levels, etc) and surrounding habitat. Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc. | Where the tree(s) will likely be affected by development a combination of aerial assessment by roped access bat workers (if appropriate) and/or nocturnal survey during appropriate period (May to August).<br>Following additional assessments, tree may be upgraded or downgraded based on findings.<br>If roost sites are confirmed and the tree or roost is to be affected by proposals a licence from Natural England will be required prior to development works. After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate. |
| Moderate Potential | A tree with Potential Roosting Features which could support one or more potential roost sites due to their size, shelter protection, conditions (height above ground level, light levels, etc) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status).<br>Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc. | Where the tree(s) will likely be affected by development a combination of aerial assessment by roped access bat workers and / or nocturnal survey during appropriate period (May to August).<br>Following additional assessments, tree may be upgraded or downgraded based on findings.<br>After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.<br>If a roost site/s is confirmed a licence from Natural England will be required prior to development works. |
| Low Potential | A tree of sufficient size and age to contain Potential Roosting Features but with none seen from ground or features seen only very limited potential.<br>Examples include (but are not limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes. | No further survey required but good practice removal operations may be required in certain circumstances. |
| Negligible/No potential | Negligible/no habitat features likely to be used by roosting bats | None. |

The Conservation of Habitats & Species Regulations 2010 (as amended) affords protection to ñbreeding sitesò and ñresting placesò of bats. The EU Commissionôs Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC, February 2007 states that these are places ñwhere there is a reasonably high probability that the species concerned will returnò

**Badger**

3.17 The standard methodology as recommended by Harris, Creswell and Jefferies[5] was followed to complete a thorough search for evidence which would indicate the presence of badgers both on the site and locally (where accessible). Evidence of badger occupation and activity sought included:

- Setts: including earth mounds and evidence of bedding and or runways between identified setts;
- Latrines: often located close to setts; at territory boundaries or adjacent to favoured feeding areas;
- Prints and established track or runways;
- Hairs caught on rough wood or fencing;

3.18 Other evidence: including snuffle holes, feeding and playing areas and scratching posts. The identification of these latter signs on their own does not necessarily provide conclusive evidence of the presence of badgers. A number of such signs need to be seen in conjunction before badgers can be confirmed as being present.

3.19 The status and the level of activity of setts identified were noted as follows:

- Main sett: usually continuously used with significant signs of activity, including a large number of holes and conspicuous spoil mounds;
- Annexe sett: usually found close to a main sett and connected to it by well used paths. Such setts may not be continuously occupied;
- Subsidiary sett: lesser-used setts usually comprising a few holes and without associated well-used paths. Such setts are not continuously occupied;
- Outlier sett: one or two holes without obvious paths, with a very sporadic use.

3.20 With the level of activity described as:

- Active: clear of debris, trampled spoil mounds and obviously active e.g. presence of prints, dislodged guard hairs;
- Partially active: some associated debris/moss/plants in the entrance. Could be used with minimal amount of excavation usually with signs in the vicinity of the sett e.g: badger paths etc.;
- Disused: partially or completely blocked/collapsed.

**Great Crested Newt**

3.21 A habitat suitability index (HSI) assessment was undertaken on the damp ditch along the northern site boundary. The HSI index provides a measure of the likely suitability that a water-body has for supporting newts. Whilst not a direct indication of whether or not a water body will support GCN, generally those with a higher score are more likely to support GCN than those with a lower score, and there is a positive correlation between HSI scores and water bodies in which GCN are recorded.

[5] Harris S., Creswell P., and Jefferies D. 1989. *Surveying Badger*, Mammal Society

3.22 Ten separate attributes are assessed for each pond to calculate the suitability of the ponds to support this species:

Geographic location
Water body area
Water body drying
Water quality
Shade
Presence of water-fowl
Presence of fish
Number of linked ponds
Terrestrial habitat
Macrophytic coverage

3.23 A score is assigned according to the most appropriate criteria level set within each attribute and a total score calculated of between 0 and 1. Water body suitability is then determined according to the scale set out in Table 2. Using the index score the predicted presence of GCN being found within a water body can be made, based on the proportion of ponds typically occupied at that suitability level.

**Table 2: HSI score and suitability for supporting great crested newts**

| HSI score | Pond Suitability |
|---|---|
| <0.5 | Poor |
| 0.5 - 0.59 | Below average |
| 0.6 ï 0.69 | Average |
| 0.7 ï 0.79 | Good |
| >0.8 | Excellent |

**Reptiles**

3.24 An assessment of the suitability of the habitats present to support common reptile species was completed at the time of each habitat survey. The assessment of suitability involved a review of habitats and habitat structure for suitable shelter for reptiles such as areas of scrub and woodpiles, grassland with well-developed and varied structure, areas suitable for basking, large tussocks etc. This assessment was based on the methodology detailed in the Herpetofauna Workers Manual[6] and the Froglife Advice Sheet 10[7].

**Water Vole**

3.25 The ditch and associated habitats within and adjacent to the site was assessed for evidence of, and suitability to support water voles during the extended phase 1 habitat survey. Survey methods for water vole broadly followed standard methodology of Strachan et al.[8] as described in the Water Vole Handbook and comprised inspection from the bank.

3.26 Assessment of habitat suitability was made, including:

- Degree of bank side and emergent vegetation;
- Bank shape and angle;
- Size of the water course, noting any flow.

[6] Gent, T. and Gibson, S. 1998. *Herpetofauna Workers' Manual*. JNCC, Peterborough.
[7] Froglife 1999. Froglife Advice Sheet 10 ï Reptile Survey.
[8] Strachan, R., Moorhouse, T. and Gelling, M. 2011. *Water Vole Conservation Handbook* 3rd edition. Wildlife Conservation Research Unit, Oxford.

3.27 The surveyed area was also examined for physical signs indicating the presence of water voles including:

- Latrine sites ï distinct piles of water vole droppings found near nest sites, at the ranges of territorial boundaries and where the animals enter and leave the water;
- Feeding stations ï areas with distinct neat piles of chewed lengths of vegetation along pathways or haul out platforms along the waterôs edge;
- Burrows ï burrow entrances are typically wider than high with a diameter between 4 and 8cm. Generally these burrow entrances are located at the waterôs edge;
- Lawns ï short grazed areas at the entrances to burrows;
- Prints ï identifiable prints in soft margins of the watercourse;
- Runways ï low tunnels that are pushed through the vegetation and often leading to burrows or feeding stations.

**Limitations**

3.28 The species data collated for the desk study is derived from records submitted by members of the public and from specialist volunteer group surveys. It does not represent a definitive list of species that occur in the local area, and the absence of records does not necessarily imply absence of such species.

3.29 The extended Phase 1 habitat survey was conducted at an optimal time of year for vegetation survey, and was therefore not limited by seasonality.

# 4.0 RESULTS

## Desk Study

4.1 Responses were received from the consultees, CPERC. A summary of the relevant information is provided below. Original data provided by CPERC is available by request.

### Statutory Designated Sites

4.2 There are no internationally important statutory designated sites located within 10km of the site.

4.3 The site lies within 2km of two SSSIs: Cherry Hinton Pit approximately 1.5km to the northeast, and Gog Magog Golf Course c.1.4km to the east. Further details are provided in Table 3 below, and site locations are shown on Figure 1.

**Table 3: Statutory Designated Sites**

| Site Name and Ref | Area (ha) | Primary Reason for Designation / Description | Proximity to Site (at closest point) |
|---|---|---|---|
| Cherry Hinton Pit SSSI<br><br>Ref. 1002799<br><br>Grid Ref. TL483557 | 12.78 | Primarily notified populations of great pignut *Bunium bulbocastanum*, moon carrot *Seseli libanoti,* grape hyacinth *Muscari neglectum* (all British Red Data Book species and nationally uncommon), and perennial flax *Linum perenne* ssp. *anglicum* (nationally uncommon) growing along road verges and within the quarry areas.<br>In addition, areas of herb-rich chalk grassland are present, dominated by upright brome *Bromus erectus* and supporting typical chalkland species such as wild thyme *Thymus praecox*, yellow-wort *Blackstonia perfoliata* and kidney vetch *Anthyllis vulneraria*.<br>Hedgerows, scrub and woodland provide additional habitats of general wildlife value. | 1.5km northeast |
| Gog Magog Golf Course SSSI<br><br>Ref. 1002996<br><br>Grid Ref. TL488541 | 88.1 | Supports species-rich calcareous chalk grassland type communities. The ‘roughsô and ‘semiroughsô of the golf course support grassland communities characterised by the presence of grasses such as upright brome *Zerna erecta*, red fescue *Festuca rubra* and false oat-grass *Arrhenatherum elatius*.<br>Many herbs are present including harebell *Campanula rotundifolia*, ladyôs bedstraw *Galium verum* and salad burnet *Sanguisorba minor*.<br>Of additional note is the occurrence of the nationally rare moon carrot and the locally rare perennial flax. Such sites also hold a good invertebrate fauna. | 1.4km east |

### Non-Statutory Designated Sites

4.4 There are six non-statutory designated sites located within the search area, comprising the Nine wells LNR, one County Wildlife Site, and four City Wildlife Sites. Summary details of non-statutory designated sites are provided in Table 4 and the locations are shown on Figure 1.

**Table 4: Non-Statutory Designated Sites**

| Site Name | Area (ha) | Grid Reference | Description | Proximity to Site |
|---|---|---|---|---|
| Nine Wells LNR | 1.18 | TL461541 | Contains several chalk springs, which form the source of the Hobson Conduit. Accessible via public and permissive paths. | 40m |
| Netherhall Farm Meadow County Wildlife Site (CoWS) | 0.51 | TL473550 | Contains more than 0.05ha of CG3 *Bromus erectus* (upright brome) calcareous grassland community. Supports frequent numbers of at least eight neutral grassland indicator species. | 800m |
| Hedgerow West of Babraham Road City Wildlife Site (CiWS) | 0.4 | TL466547 | Hedgerow at least 100m in length and 2m in width at its widest point with four or more woody species. | 5m |
| Hobson's Brook Mid CiWS | 0.3 | TL453551 | Chalk stream together with adjacent semi-natural habitat that has not been grossly modified through canalisation and/or poor water quality. | 490m |
| Hobson's Brook South CiWS | 0.24 | TL454544 | Chalk stream together with adjacent semi-natural habitat that has not been grossly modified through canalisation and/or poor water quality. | 220m |
| Red Cross Lane Drain CiWS | 0.16 | TL465547 | Supports five or more neutral grassland indicator species in frequent numbers. | 5m |

4.5 Nine Wells LNR is located within c.40m of the application site to the southwest. The LNR comprises a small woodland area surrounded by agricultural land and is accessible via a small number of public and permissive paths. It encompasses four main springheads linked by stream channels which issue from the base of a chalk hill, and which further downstream are channelled via the Hobson Conduit, created to deliver clean spring water to Cambridge city centre.

4.6 The LNR woodland includes many beech trees which were originally planted for firewood but have resulted in a detrimental effect on the watercourses due to the build-up of the acidic leaves, which is resulting in heavy silting and a change in oxygen levels. This is being addressed via regular management. Ash *Fraxinus excelsior* and blackthorn *Prunus spinosa* are also common, and the perimeter hedgerow includes hawthorn *Crataegus monogyna*, spindle *Euonymus europaeus* and field maple *Acer campestre*. Ground flora species include sweet violet *Viola odorata*, bluebell *Hyacinthoides non-scripta*, cowslip *Primula veris* and deadly nightshade *Atropa belladonna*. The woodland is used by a variety of bird species including yellowhammer *Emberiza citrinella*, sparrowhawk *Accipitier nisus*, bullfinch *Pyrrhula pyrrhula* and redwing *Turdus iliacus*.

**Species records**

4.7 Species records provided by CPERC were filtered by their distance from the development boundary (within 1km) and by date (within the last 20 years). Appendix A provides a summary of the closest record for each notable species.

4.8 Local bat records comprised single records for each of brown long-eared bat *Plecotus auritus*, and barbastelle *Barbastella barbastellus*, both from 2010 from locations near Netherhall Farm, Cambridge c.0.95km from the site. Two common pipistrelle *Pipistrellus pipistrellus* records and three soprano pipistrelle *P. pygmaeus* records were returned, the closest of each were from Trumpington Dismantled Railway c.0.86km to the northwest. Multiple Daubentonôs bat *Myotis daubentoni*, Natterercs bat *Myotis nattereri* and unidentified *Pipistrellus* sp. records have been returned from the local area.

4.9 A single badger *Meles meles* record was returned from within the search area, dated 2008. A single brown hare *Lepus europaeus* was returned from Great Shelford, approximately 1.1km to the south, and a single hedgehog *Erinaceus europaeus* from a recreational ground c0.7km to the northeast. Three otter records were returned, all from Hobsons Brook, two from approximately 0.7km from the site, and one within c.0.3km. Five water vole *Arvicola amphibious* records were additionally provided, again all from Hobson's Brook, the closest being located c.0.3km from the site to the southwest.

4.10 CPERC holds a small number of common frog *Rana temporaria* records from the surrounding area, and two great crested newt *Triturus cristatus* records, the closest records for each species lie approximately 1km from the application site. There were no reptile records returned from within 1km of the site, though there are common lizard *Zootoca vivipara* and grass snake *Natrix natrix* records from just beyond this radius (c.1.2km and 1.1km respectively).

4.11 Several notable bird records were returned from the search area, including a number of species typical of urban edge and farmland habitats from within the close proximity of the application site, or the site itself, including: corn bunting *Emberiza calandra*, dunnock *Prunella modularis*, lapwing *Vanellus vanellus*, linnet *Linaria cannabina*, quail *Coturnix coturnix*, reed bunting *Emberiza schoeniclus*, skylark *Alauda arvensis*, starling *Sturnus vulgaris* and yellowhammer *Emberiza citronella*. CPERC hold several bird records from the nearby Nine Wells LNR, including: bullfinch, hobby *Falco subbuteo*, kingfisher *Alcedo atthis*, redwing, song thrush *Turdus philomelos*, and yellow wagtail *Motacilla flava*.

4.12 Details of the notable farmland bird indicator species recorded during breeding surveys undertaken by Mr J. Meed between 2014 and 2016 within 1km grid square TL4654 are provided in Table 5. This grid square includes all areas of the application site, the Nine Wells LNR and adjacent fields.

4.13 In addition to the species listed in Table 5, a further seven BoCC Green listed (low conservation concern) farmland bird indicator species were recorded present during the above surveys, comprising :goldfinch *Carduelis carduelis,* greenfinch *Carduelis chloris*, green woodpecker *Picus viridis*, jackdaw *Corvus monedula*, swallow *Hirundo rustica*, whitethroat *Sylvia communis* and woodpigeon *Columba palumbus.* Kestrel *Falco tinnunculus*, lapwing *Vanellus vanellus* and rook *Corvus frugilegus* were noted to nest nearby.

**Table 5: Breeding bird pairs recorded 2014-2016 within grid square TL4654 and on-site by Mr J. Meed**

| Species | Legal / Conservation status[9] | Estimated Breeding Paris (Grid Square TL4654) | | | Recorded on site in 2016 | Recent Status in Cambridgeshire[10] |
|---|---|---|---|---|---|---|
| | | 2014 | 2015 | 2016 | | |
| Bullfinch *Pyrrhula pyrrhula* | Amber List S.41 NERC | 1 | 1 | 1 | - | Common but declined resident |
| Corn Bunting *Emberiza calandra* | Red List S.41 NERC | 2-3 | 3 | 7 | Successful fledging noted | Fairly common but much declined local resident |
| Cuckoo *Cuculus canorus* | Red List S.41 NERC | 0 | 0 | 1 | Nesting confirmed | Uncommon declined migratory breeder |
| Dunnock *Prunella modularis* | Amber List S.41 NERC | 6 | 8 | 14 | - | Widespread and abundant resident |
| Grey Partridge *Perdix perdix* | Red List S.41 NERC | 10 | 13 | 15 | Held a wintering population of up to 36 birds | Scarce resident |
| Linnet *Carduelis cannabina* | Red List S.41 NERC | 8 | 15 | 17 | Several pairs noted | Very common but declined resident |
| Mistle Thrush *Turdus viscivorus* | Red List | 1 | 2 | 2 | - | Common and widespread resident |
| Reed Bunting *Emberiza schoeniclus* | Amber List S.41 NERC | 1 | 1 | 4 | - | Common but declined resident |
| Skylark *Alauda arvensis* | Red List S.41 NERC | 21 | 22 | 33+ | Four breeding pairs | Common but much declined resident |
| Song Thrush *Turdus philomelos* | Red List S.41 NERC | 2 | 2 | 2 | - | Common but declined resident |
| Starling *Sturnus vulgaris* | Red List S.41 NERC | 1 | 2 | 2 | - | Very common but declined resident |
| Stock Dove *Columba oenas* | Amber List | 1 | 1 | 1 | - | Common resident |
| Yellowhammer *Emberiza citrinella* | Red List S.41 NERC | 7 | 11 | 13 | At least four breeding pairs | Common but declined resident |
| Yellow Wagtail *Motacilla flava* | Red List S.41 NERC | 2 | 1 | 1 | - | Fairly common but much declined migratory breeder |

[9] Birds of Conservation Concern (BoCC) 4: the population status of birds in the United Kingdom Red, Amber and Green list. Natural Environment and Rural Communities (NERC) Act, Section 41 (S41) as species which are of principal importance for the conservation of biodiversity in England

[10] Cambridgeshire Bird Report 2013, published by the Cambridgeshire Bird Club 2014.

## Extended Phase 1 Habitat Survey

### Habitats / Flora

4.14 The habitats described below correspond to those mapped on Figure 2. Plant species lists for the habitats are provided in Appendix B. Photographs of the habitats taken on 26th May 2016 are provided throughout the text.

Overview

4.15 The site comprised a single rectangular arable field, planted with a legume crop at the time of survey. Native species hedgerows bounded the field to the southwest (H1) and east (H2), and a steeply banked drainage ditch bordered the northern boundary. A public footpath, parallel hedgerow and tree groups lie off site but adjacent to hedgerow H2.

Hedgerows

4.16 Hedgerow H1 located to the southwest of the site was a c.140m long and 3.5m tall and comprised predominately of hawthorn *Crataegus monogyna* interspersed with occasional field maple *Acer campestre*, dogwood *Cornus sanguinea*, ash *Fraxinus excelsior*, blackthorn *Prunus spinosa*, dog rose *Rosa canina*, wayfaring tree *Viburnum lantana*, and bramble *Rubus fruticosus agg.*

4.17 The adjacent field margin (Plate 1) was uncut at the time of survey, and was of approximate width 5m. This supported abundant cockôs foot *Dactyls glomerata* and locally abundant cow parsley *Anthriscus sylvestris*, with occasional grasses including smooth meadow-grass *Poa pratensis*, meadow foxtail *Alopecurus pratensis* and false brome *Brachypodium sylvaticum*, and fobs including cleavers *Galium aperine*, hogweed *Heracleum sphondylium*, meadow buttercup *Ranunculus acris*, common nettle *Urtica dioica*, and bush vetch *Vicia sepium*. Given the width and moderate species diversity of this field margin, and the apparent lack of herbicide spraying, this feature appears to meet the criteria to be considered a habitat of principal importance under the NERC Act 2006 (arable field margin category).

4.18 Hedgerow H1 extended to within c.15m of the southern end of hedgerow H2. H2 was an outgrown hedgerow developing into a tree line of typical height 8-15m and approximate length 580m. This comprised abundant hawthorn with occasional sycamore *Acer pseudoplatanus,* field maple, dogwood, ash, wild privet Ligustrum vulgare, blackthorn, dog rose, wayfaring tree, and bramble. An off-site hedgerow ran parallel to H2 to the south, with a public footpath between the two. Two small woodland stands adjoined the off-site hedgerow on its southern side.

4.19 The field margin adjacent to H2 was less than 2m width, with abundant cow parsley and false brome along its length (Plate 2). This field margin did not meet the criteria for consideration as a habitat of principal importance under the NERC Act (2006) as field edge habitats were narrow and relatively species-poor.

4.20 Both hedgerows were comprised of mixed native species each had a reasonably wide and dense structure. Under the HEGS assessment hedgerow (H1) had moderately high to high ecological value (HEGs grade 2, Table 6), and hedgerow H2 had high to very high value (HEGs grade 1-). Both hedgerows met the criteria of habitat of principal importance under the NERC Act 2006, and hedgerow H2 was confirmed to be of importance under the wildlife and landscape criteria of the Hedgerows Regulations 1997.

4.21 No threatened arable species were recorded present during the survey.

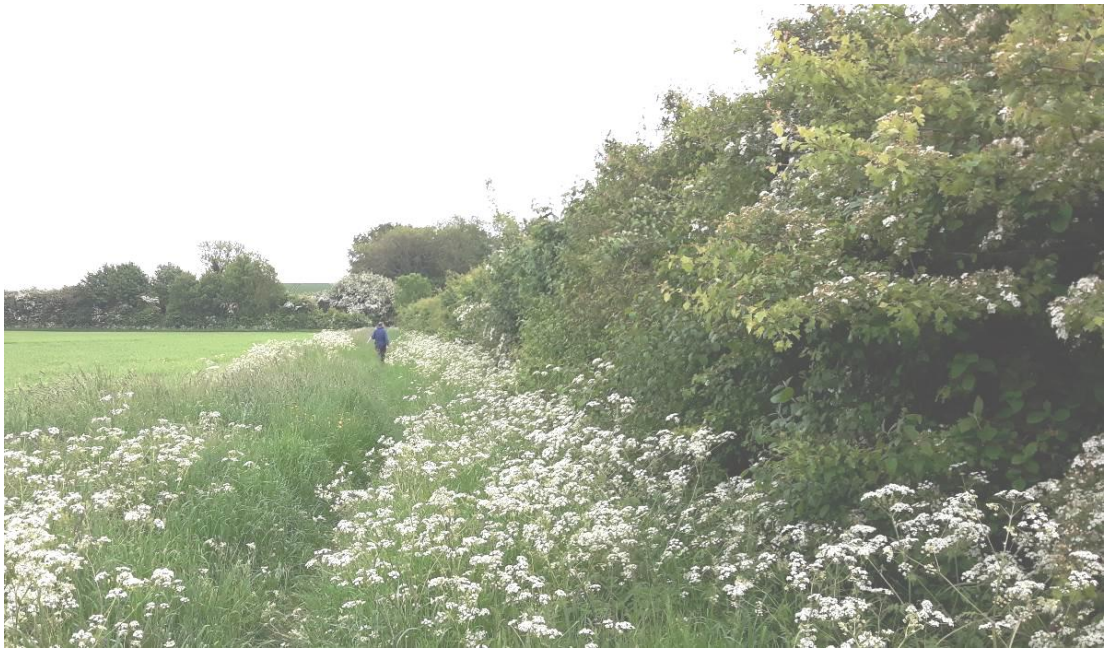

**Plate 1: Hedgerow H1 and field margin, looking southeast.**

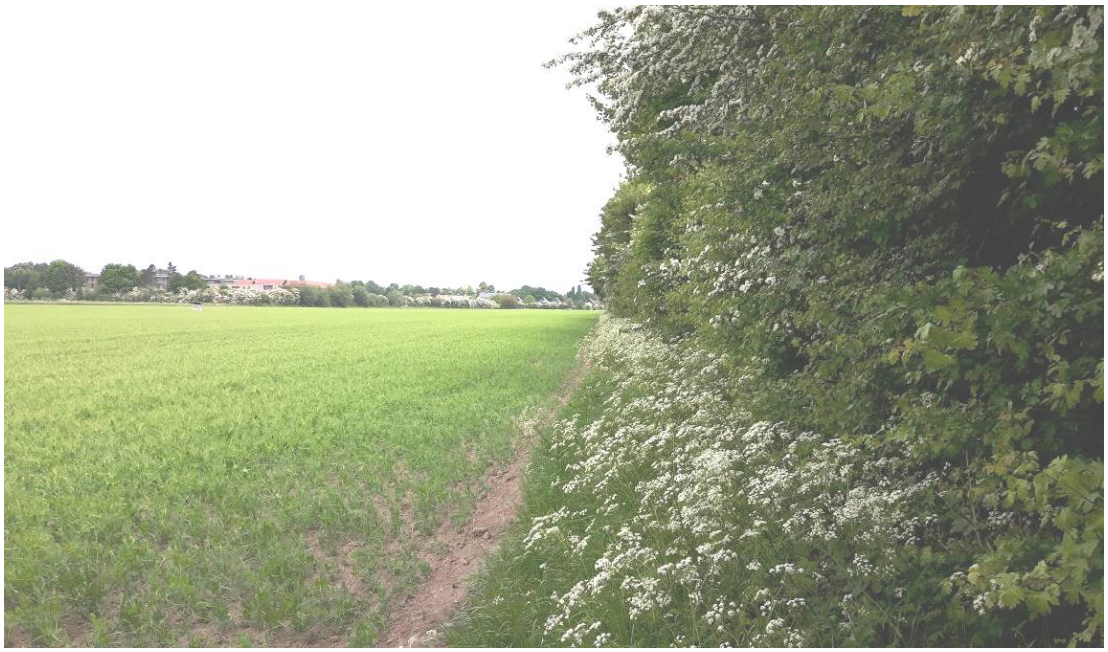

**Plate 2: Hedgerow H2 and field margin, looking northeast.**

**Table 6: Results of Hedgerow Assessment**

| Hedge | Woody Species present | HEGS Grade | Ave. Woody Species (sampled per 100m) | Associated Features | Adjacent to PRoW | Important Under Habitat Regs | Contains >80% Native Species |
|---|---|---|---|---|---|---|---|
| H1 | *Ac, Cm, Cs, Fe, Ps, Rc, Vl* | 2 | 5 | Grass verge | Y | N | Y |
| H2 | *Ac, Ap, Cm, Cs, Fe, Lv, Pi, Rc, Sn, Vl.* | 1- | 8 | NA | Y | Y | Y |

*Key: Ac Acer campestre* field maple, *Ap Acer pseudoplatanus* sycamore*, Cm Crataegus monogyna* hawthorn, *Cs Cornus sanguinea* dogwood, *Fe Fraxinus excelsior* ash, *Lv Ligustrum vulgare* privet, *Pi Prunus insititia* damson, *Ps Prunus spinosa* blackthorn*, Rc Rosa canina* dog rose*, Sn Sambucus nigra elder, Vl Viburnum lantana* wayfaring tree.

Ditch and adjacent grassland

4.22 A damp ditch demarked the northern site boundary. This ditch had a water level of <3cm, a muddy substrate and no flow at the time of survey, and supported a dense layer of duckweed *Lemnaceae* sp. An adjacent sealed pathway ran parallel to the ditch along the length of the site, with an intervening semi-improved grassland strip of c.2m width. A similar grassland strip bordered the southern edge of the path. The margins were shorter adjacent to the path, indicating regular mowing.

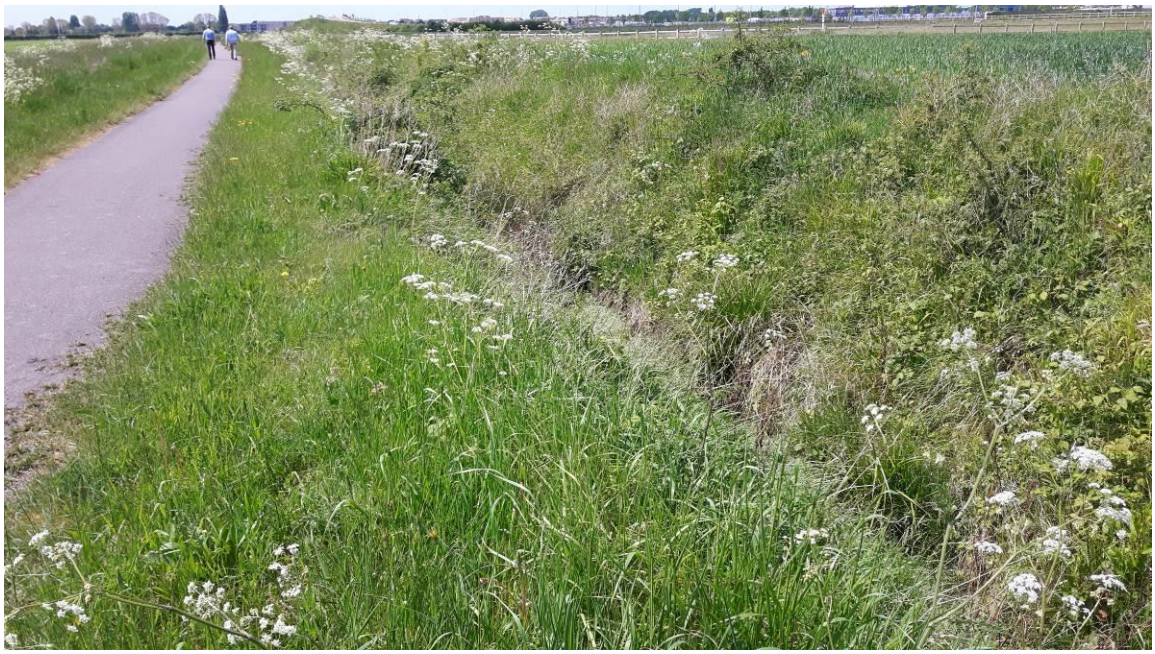

**Plate 3: Ditch, sealed pathway and field margin, looking southwest.**

4.23 Species characteristic of the sward included abundant meadow foxtail *Alopecurus pratensis*, with frequent cock's foot *Dactyls glomerata*, cow parsley *Anthriscus sylvestris*, ribwort plantain *Plantago lanceolata*, and dandelion *Taraxacum officinale* agg., and occasional / rare species including yarrow *Achillea millefolium*, daisy *Bellis perennis*, creeping thistle *Cirsium arvense*, dove's-foot crane's-bill *Geranium molle*, hogweed *Heracleum sphondylium*, Yorkshire fog *Holcus*

*lanatus*, common mallow *Malva sylvestris*, scented mayweed *Matricaria recutita* and bristly oxtongue *Picris echioides*.

**Fauna**

4.24 Perimeter hedgerows provided suitable nesting opportunities for a range of common urban edge and rural bird species. The arable land that formed the majority of the site was sown with a legume crop at the time of survey, with some suitability for use by ground nesting birds, and which would provide a seasonal foraging resource. Incidental bird records encountered during the extended Phase 1 habitat survey included chaffinch *Fringilla coelebs*, dunnock *Prunella modularis*, carrion crow *Corvus corone*, and jackdaw *C. monedula*.

4.25 None of the trees located within or bordering the site have potential to support roosting bats. Whilst the hedgerows and ditch provide suitable foraging and commuting habitat for bats and other wildlife, the arable field comprising the majority of the site provided generally low quality foraging habitat.

4.26 No evidence of the presence of badger was recorded within the site or adjacent habitats.

4.27 The ditch to the north was considered unsuitable to support breeding great crested newt (GCN) given its shallow and likely highly ephemeral nature (HSI score of 0.49 indicating poor suitability). There are no other water bodies present on site. The only known pond within 250m lies c135m to the north. This is a newly created balancing facility associated with a roundabout to the north, and lies to the opposite side of the busy Addenbrookeôs Road. This road represents a barrier to the movement of GCN onto the site, should they be present within this pond. A potential terrestrial route to the application site under a road bridge requires a commute of >275m.

4.28 Terrestrial habitats within the site including along the brook and adjoining grassland field margins are suitable to support GCN during this speciesôterrestrial phase, should GCN be present in the wider area.

4.29 Habitats along the length of the ditch provide suitable shelter and foraging opportunities for native reptiles, however these are limited to a narrow grassland strip that is subjected to regular disturbance and is not connected to suitable habitat in the wider landscape.

4.30 Vegetation bordering the ditch provided some suitable cover and foraging opportunities for water vole, however this was limited and subject to regular disturbance from dog walkers and other pedestrians.

4.31 No evidence or potentially suitable habitats for any other protected, rare or notable species were recorded.

# 5.0 DISCUSSION AND MITIGATION RECOMMENDATIONS

## Designated Sites Including the Nine Wells LNR

5.1 The degree to which designated sites receive consideration under the planning system and legislative protection depends on the designation itself and its level of importance and value. This ranges from sites of international importance protected by UK legislation that transposes European directives, to protection under UK legislation or national and local planning policy.

5.2 There are no internationally important statutory designated sites located within 10km of the site, and the closest SSSIs lie c.1.5km to the northeast (Cherry Hinton Pit SSSI), and c.1.4km to the east (Gog Magog Golf Course). Several arable fields lie between the application site and these SSSIs, and given their distance and relative isolation from the site neither is expected to be directly impacted by the proposed development. For indirect impacts (recreational use) see below.

5.3 The National Planning Policy Framework (NPPF) provides protection to non-statutory sites through local planning policies, and highlights the need to ensure protection is commensurate with their status with the hierarchy of protected sites. It also recognises the importance and contribution such sites make to wider ecological networks.

5.4 The three non-statutory sites that lie in close proximity to the application site: Nine Wells LNR, Hedgerow West of Babraham Road City Wildlife Site (CiWS) and Red Cross Lane Drain CiWS and connected waterways have potential to be adversely impacted by the proposed works due to pollution or movement of machinery and/or indirect damage to sites during construction. No direct habitat loss is anticipated from any non-statutory site.

5.5 All works will adhere to the advice provided in the now withdrawn Environment Agency document *Pollution Prevention Guidelines PPG5* (or any relevant national advice issued to supersede this regarding works near water and the prevention of pollution during construction works), to minimise the risk of adversely affecting local waterbodies and tributaries.

5.6 A significant area of the application site will be retained as green infrastructure (GI), and will be enhanced for biodiversity, as outlined below and illustrated in the Indicative Masterplan. This will ensure an overall net biodiversity gain is achieved at the site level. The GI will incorporate a continuous native tree and shrub buffer around the majority of the site perimeter and a network of pathways including a perimeter path through landscaped GI to provide a choice of recreation options through the site, and attractive alternatives to visiting the Nine Wells LNR. No direct public access will be created leading towards the LNR.

5.7 There is an existing footpath through the LNR that is used by walkers, joggers and bird watchers. Recreational use of this site is likely to increase once the site is occupied and operational, however given the non-residential nature of the development and provision of alternative amenity options and lack of a direct connecting route it is considered any increase will be of minor magnitude (non-significant) and restricted largely to office hours.

## Habitats and Flora

5.8 The degree to which habitats receive consideration within the planning system relies on a number of mechanisms, including:

- Inclusion within specific policy (e.g. veteran trees, ancient woodland and linear habitats in the NPPF, or non-statutory site designation),
- Identification as a habitat of principal importance for biodiversity under the NERC Act 2006 and consequently identification as a Priority Habitat within the local Biodiversity Action Plan (LBAP) and a Priority Habitat for England under Biodiversity 2020.

5.9 Under NPPF development should seek to contribute a net gain in biodiversity with an emphasis on improving ecological networks and linkages where possible.

5.10 The majority of the site comprised intensively managed arable land of negligible/low ecological value. The boundary hedgerows, ditch and associated grassland margins provided habitat corridors around the majority of the site perimeter however, and foraging, commuting and nesting opportunities for a range of local wildlife. Hedgerows and the field margin alongside H1 were considered to be habitats of principal importance under the NERC Act 2006, and hedgerow H2 is of importance under the Hedgerow Regulations 1997.

5.11 Both hedgerows will be retained within the scheme with no losses. Root protection area (RPAs) for individual trees and tree groups are provided in the separate Arboricultural Assessment (FPCR, 2016) and have been taken into account within the scheme design as these identify areas requiring suitable protection both during works and as part of the scheme layout. No vehicular access will be permitted within the RPAs unless suitable soil protection layers are used, and no storage of materials, installations of services, excessive cultivation for landscape installations or fires will be permitted in these areas.

5.12 The proposed scheme will deliver a generous GI that will include a broad, continuous ecological corridor around the site perimeter of minimum width 15m to the north fronting onto Dame Mary Archer Way (and incorporating the existing ditch), and 28m width along the southern edge adjacent to and buffering hedgerow H2. Areas of open grassland will be included at both the eastern and western ends of the site, and the planting scheme will incorporate a continuous linear block of native tree and shrub planting along the western, southern and eastern boundaries. Tree and shrub groups will be established within grassland areas throughout the GI, and the site interior will include a number areas of more formal planting and two permanent ponds to provide further amenity interest.

5.13 **The** planting scheme should give preference to the use of species bearing nectar, berries, fruit and nuts, as these enhance the foraging opportunities of local wild fauna including birds and invertebrates. Suitable species for inclusion within new mixed species hedgerow planting include: field maple, hawthorn, blackthorn, hazel *Corylus avellana*, spindle *Euonymus europaeus*, beech *Fagus sylvatica*, dogwood, holly *Ilex aquifolium*, wild cherry *Prunus avuim*, bird cherry *P. padus*, dog rose, honeysuckle *Lonicera periclymenum*, crab apple *Malus sylvestris*, oak *Quercus robur*, and guelder rose *Viburnum opulus*.

5.14 It is recommended that grassland areas are established using a suitable native grassland mix such as Emorsgate EM2 Standard Meadow Mix, EL1 Flowering Lawn Mixture, Germinal WFG2 Flowering Meadow or WFG20 Eco Species Rich Lawn or similar. Such areas should be managed

for biodiversity via annual or twice yearly mowing in early spring and/or late summer to cut and remove arisings to control scrub encroachment and encourage a tall and diverse sward that is of benefit to wildlife. Areas adjacent to sealed paths or mown grass paths can be cut as required.

5.15 Established hedgerows should be managed on a rotational basis, with either one side of the hedgerow cut annually or, selected hedgerow lengths cut both sides equating to no more than 1/2 of the total resource in any one year. This will ensure a continuous supply of foraging for local fauna throughout the year. Hedgerows should be cut in late November during frost free periods and outside of the bird nesting season. It is recommended that these are trimmed into an óAô profile to promote a wide base that is more beneficial to local wildlife. Where possible potential future mature hedgerow trees should be identified and left uncut to enable their successful growth into mature standards.

5.16 A new balancing facility is to be created towards the west of the site. It is recommended that this is designed with gently sloping banks, and if it is to be a permanent water body, with native marginal planting around the perimeter (Emorsgate EP1 Pond Edge Mixture or similar). If the balancing facility is however to hold water only following prolonged rainfall it is recommended that it is planted with a native wetland grassland mix such as Emorsgate EM8 Meadow Mixture for Wetlands or Germinal WFG9 Wetland and Pond Areas or similar. Marginal/wetland grassland areas should be cut once annually, either in early spring and/or late summer as above.

5.17 The design of the two permanent ponds towards the centre of the site has not yet been finalised. If possible these should also incorporate at least one gently sloping bank, to facilitate colonisation by semi-aquatic species including amphibians. It is strongly recommended that these ponds are not stocked with fish, as these will predate native species.

### Protected Species

5.18 Principal pieces of legislation protecting wild species are Part 1 of the Wildlife and Countryside Act 1981 (as amended) (WCA) and the Conservation of Habitats and Species Regulations 2010 (as amended). Some species, for example badgers, also have their own protective legislation (Protection of Badger Act 1992). The impact that this legislation has on the Planning system is outlined in ODPM 06/2005 Government Circular: Biodiversity and Geological Conservation ï Statutory Obligations and their Impact within the Planning System.

5.19 This guidance states that as the presence of protected species is a material consideration in any planning decision, it is essential that the presence or otherwise of protected species, and the extent to which they are affected by proposals is established prior to planning permission being granted. Furthermore, where protected species are present and proposals may result in harm to the species or its habitat, steps should be taken to ensure the long-term protection of the species, such as through attaching appropriate planning conditions.

5.20 In addition to protected species, there are those that are otherwise of conservation merit, such as species of principal importance for the purpose of conserving biodiversity under the NERC Act 2006. These are recognised in the NPPF, which advises that when determining planning applications, LPAôs should aim to conserve and enhance biodiversity by applying a set of principles including:

- *If significant harm resulting from a development cannot be avoided……., adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*

- *Development proposals where the primary objective is to conserve or enhance biodiversity should be encouraged.*

5.21 The implications for the proposed development with regard to the various species identified from the desk study and field survey, or those that are otherwise thought reasonably likely to occur, are discussed below.

**Breeding Birds**

5.22 Several records for red and amber listed bird species, species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), and those listed as species of principal importance under the NERC Act 2006 were returned from the search area. The site provides foraging habitat for a range of species and the hedgerows and associated trees provide suitable nesting habitat for common farmland and urban edge species.

5.23 Recent breeding bird surveys undertaken by Mr J. Meed have identified that the site and surrounding arable habitats supports a farmland bird assemblage including a number of common to fairly common but declining species such as skylark and yellowhammer. The presence of hedgerows and tree groups provided opportunities for a number of notable woodland edge and scrub species including bullfinch, dunnock and song thrush.

5.24 Proposals which will result in the loss of arable habitat will inevitably result in the loss of breeding corn bunting and skylark from the site. However, given the size of the site, its location and the continued availability of further arable habitats within the wider landscape residual adverse effects are not considered to be significant for this farmland bird assemblage.

5.25 The inclusion of a continuous wide landscape buffer along the sites perimeter along with areas of species rich grassland and an attenuation basin will in the long term provide enhancements for a range of notable bird species recorded within the wider area including bullfinch, dunnock, reed bunting and song thrush. Given the sites location adjacent to off-site arable habitat, the mosaic of new habitats proposed within the site are also considered to offer further nesting opportunities for cuckoo, linnet and yellowhammer. The inclusion of a wide landscape buffer will compliment those existing habitats present at Nine Wells LNR and provide further opportunities to a number of the bird species typical of woodland and woodland edge previously recorded here. Furthermore, the landscape buffer will strengthen habitat connectivity between offsite habitats including those present within Nine Wells LNR and the CiWS east of the site providing further enhancements to local bird populations.

5.26 All nesting birds, their nests and fledgling young are protected under the Wildlife and Countryside Act, 1981 (as amended). Construction operations could disturb bird species of nature conservation interest using the site for nesting and foraging, and disturbance during the breeding season may lead to nest desertion or the avoidance of the area. Increased activity adjacent to nesting areas may result in disturbance to the species. To avoid disturbance to breeding birds, any woody vegetation will be removed prior to the bird-breeding season (i.e. avoiding March to September inclusive). If this is not possible, the site will be checked beforehand by an experienced ecologist. If active nests are found, areas will be left untouched and suitably buffered from works until all birds have fledged. Specific advice will be provided prior to undertaking the clearance.

**Bats**

5.27 All species of bats and their roosts are listed on the Conservation of Habitats and Species Regulations 2010 (as amended) making it illegal to deliberately disturb any such animal or damage / destroy a breeding site or roosting place of any such animal. Bats are also afforded full legal protection under Schedule 5 of the Wildlife and Countryside Act 1981. Under this legislation it is illegal to recklessly or intentionally kill, injure or take a species of bat or recklessly or intentionally damage or obstruct access to or destroy any place of shelter or protection or disturb any animal whilst they are occupying such a place of shelter or protection. Some bat species, including soprano pipistrelle, are species of principal importance under the NERC Act. Barbastelle, brown long-eared bat, noctule *Nyctalus noctula* and soprano pipistrelle are listed as local Biodiversity Action Plan priority species in Cambridgeshire.

5.28 The site provides generally suitable foraging habitat for bats, particularly along the hedgerows and connecting ditch, and it is recommended that these features are retained within the scheme design, and enhanced to improve connectivity around the site perimeter and linking to off-site habitats as outlined above.

5.29 It is further recommended that at least 10 bat boxes be provided on suitable retained trees to provide enhanced roosting opportunities for local bat populations. Suitable designs include timber designs such as those available from nhbs.com, and the following woodcrete models: Schwegler 2F, 1FF, 2FN, 1FD, 1FW, AND 1FS. The provision of such enhancement features would be in accordance with National and Local Planning Policy.

5.30 The lighting scheme should be carefully designed adjacent to potential bat foraging areas including the ditch, hedgerows and associated trees, as well as any bat boxes provided. Where artificial lighting cannot be avoided the lighting scheme should be designed with reference to the Bat Conservation Trust and Institute of Lighting Professionals guidance[11,12,13] and designed to reduce spill and be downwardly directional. All new lighting should meet the current environmental standards of good practice in order to reduce potential light pollution and use the lowest intensity possible for its purpose. This will minimise light spill onto foraging routes and minimise potential disturbance caused through the lighting of corridors and potential roost sites. Adherence to the above guidance will ensure that the overall impact to bats caused by lighting the site will be negligible.

5.31 Given the proposed retention and buffering of all features of notable value to local bat populations (perimeter hedgerows, trees and the northern ditch), and the implementation of a sensitive lighting scheme, impacts will be limited to habitats of negligible value to bats (arable land). No further survey is therefore required, in line with the BCT survey guidlines[4].

**Badger**

5.32 No evidence of the presence of badger was recorded within the site or adjacent habitats and this species is not considered to be a potential ecological constraint to the proposed development.

[11] Bat Conservation Trust. 2009. *Bats and Lighting in the UK*. Bats and the Built Environment Series.
[12] Bat Conservation Trust. 2011. *Statement on the Impact and Design of Artificial Light on Bats*.
[13] Institute of Lighting Professionals. 2011. *Guidance notes for the reduction of Obtrusive Light*.

**Great Crested Newt**

5.33 GCN are afforded legal protection by Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) under which it is an offence to intentionally kill, injure or take a GCN (or attempt to), possess or control any live or dead specimen or anything derived from this species, intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter by a GCN, intentionally or recklessly disturb a GCN while it is occupying a structure or place which it uses for that purpose. GCN is also a European Protected Species, and under the Conservation of Habitats and Species Regulations 2010 it is an offence to deliberately capture or kill a GCN, deliberately disturb a GCN, deliberately take or destroy the eggs of a GCN, damage or destroy a breeding site or resting place of a GCN. This legislation applies to all life stages. GCN are also listed as a species of principal importance under the NERC Act.

5.34 A single GCN record was returned from within a 1km radius of the site, located c.950m to the northeast within an area of residential development, and to the opposite side of Addenbrookes Hospital. The single known pond within 250m lies c.275m from the site via the only possible terrestrial route, and the on-site ditch is highly ephemeral in nature and considered to have poor suitability for breeding GCN. Given the lack of suitable water bodies in the vicinity of the site GCN are not considered likely to be present within the site and are therefore do not pose a constraint for the development of the site.

**Reptiles**

5.35 All UK species of reptile are protected from killing and injury under the Wildlife and Countryside Act 1981 (as amended) and all are listed as species of principal importance under the NERC Act. The majority of the site does not provide suitable habitat for reptiles and there are no records of reptiles from within the 1km search area.

5.36 The arable land that forms the majority of the site lacks the structural diversity associated with suitability to support populations of reptiles, and hedge base habitats provided very limited basking opportunities, being shaded and overgrown. Habitats along the length of the ditch provided suitable shelter and foraging opportunities for native reptiles, however these were limited to a narrow grassland strip subjected to regular disturbance and is poorly connected to suitable habitat in the wider landscape.

5.37 The site was therefore considered to be of limited value to reptiles, and unlikely to support a viable reptile population. Retention of the ditch and a 5m wide buffer strip will retain connectivity for reptiles post-development should they be present in the local area. No specific mitigation is necessary for reptiles, which have a low likelihood of being present within the site.

**Water Vole**

5.38 Water vole is listed on Schedule 5 of the Wildlife and Countryside Act 1981, therefore is protected from deliberate or reckless killing, injury or taking, damage or destruction of its places of shelter, and disturbance whilst occupying those places of shelter. Water vole is also a species of principal importance under the NERC Act 2006 and a Local BAP species in Cambridgeshire.

5.39 Five water vole records were provided from the local area, all from Hobson's Brook to the west/southwest. The damp ditch along the northern site boundary is has some low potential to support water vole and connects with a tributary of Hobsonôs Brook. However given the existing disturbance levels, absence of field sign recorded and distance to a permanent watercourse, this

species is not considered to be present within the site and therefore is not a potential ecological constraint to the proposed development.

5.40 The ditch nevertheless is of ecological value and provides habitat diversity at a local level. It is therefore recommended that it is retained unmodified, together with a retained c.5m wide buffer strip of adjacent grassland. There must no intrusion of machinery, people or storage of materials within this buffer during construction.

## APPENDIX A – CONSULTATION DATA RECEIVED (Summary)

| Common Name | Scientific Name | Location | Grid Ref | Date | Selected Designations | Approx Dist (km) |
|---|---|---|---|---|---|---|
| Common frog | *Rana temporaria* | Cambridge | TL468556 | 2010 | HSD5 | 0.95 |
| Great crested newt | *Triturus cristatus* | Cambridge | TL468556 | 2010 | HabRegs2, HSD2p, HSD4, LBAP, S.41 NERC, WCA5 | 0.95 |
| Common lizard | *Zootoca vivipara* | Triangle North of Long Road CWS | TL457559 | 09/07/1998 | S.41 NERC, WCA5 | 1.2 |
| Grass snake | *Natrix natrix* | Trumpington | TL449547 | 2007 | S.41 NERC, WCA5 | 1.1 |
| Barnacle goose | *Branta leucopsis* | Clay Farm, Trumpington | TL4554 | 09/09/2013 | BD1 | 0.9 |
| Barn owl | *Tyto alba* | Cambridge | TL4655 | 09/11/2005 | WCA1i | 0.5 |
| Black redstart | *Phoenicurus ochruros* | Addenbrookes Hospital | TL4655 | 01/03/2012 | WCA1i | 0.5 |
| Black tern | *Chlidonias niger* | Clay Farm, Trumpington | TL4554 | 25/08/2013 | BD1, WCA1i | 0.9 |
| Brambling | *Fringilla montifringilla* | Addenbrookes Hospital | TL4655 | 30/12/2007 | WCA1i | 0.5 |
| Bullfinch | *Pyrrhula pyrrhula* | Nine Wells LNR | TL461541 | 29/11/2005 | S.41 NERC | 0.2 |
| Corn bunting | *Emberiza calandra* | Cambridge | TL461544 | 30/04/2002 | S.41 NERC | 0 |
| Dunnock | *Prunella modularis* | Great Shelford | TL463544 | 2012 | S.41 NERC | 0 |
| Fieldfare | *Turdus pilaris* | Netherhall Farm Meadow CWS | TL473550 | 17/02/2007 | WCA1i | 0.73 |
| Golden plover | *Pluvialis apricaria* | Trumpington | TL458547 | 19/11/2006 | BD1 | 0.36 |
| Green sandpiper | *Tringa ochropus* | Clay Farm, Trumpington | TL4554 | 02/05/2012 | WCA1i | 0.9 |
| Greenshank | *Tringa nebularia* | Clay Farm, Trumpington | TL4554 | 03/09/2012 | WCA1i | 0.9 |
| Grey partridge | *Perdix perdix* | Great Shelford | TL464540 | 2012 | LBAP, S.41 NERC | 0.35 |
| Greylag goose | *Anser anser* | Clay Farm, Trumpington | TL4554 | 01/09/2013 | WCA1ii | 0.9 |
| Hobby | *Falco subbuteo* | Nine Wells LNR | TL461541 | 13/07/2000 | WCA1i | 0.2 |
| House sparrow | *Passer domesticus* | Addenbrookes Hospital | TL4655 | 15/06/2004 | S.41 NERC | 0.5 |
| Kingfisher | *Alcedo atthis* | Nine Wells LNR | TL461541 | 05/07/2005 | BD1, WCA1i | 0.2 |
| Lapwing | *Vanellus vanellus* | Cambridge | TL463548 | 19/11/2006 | S.41 NERC | 0.2 |
| Lesser redpoll | *Acanthis cabaret* | Cambridge | TL457555 | 26/02/2001 | S.41 NERC | 1.1 |

| Common Name | Scientific Name | Location | Grid Ref | Date | Selected Designations | Approx Dist (km) |
|---|---|---|---|---|---|---|
| Linnet | *Linaria cannabina* | Great Shelford | TL460543 | 2012 | S.41 NERC | 0.1 |
| Little egret | *Egretta garzetta* | Clay Farm, Trumpington | TL4554 | 21/12/2013 | BD1 | 0.9 |
| Little gull | *Hydrocoloeus minutus* | Clay Farm, Trumpington | TL4554 | 16/06/2013 | BD1, WCA1i | 0.9 |
| Little ringed plover | *Charadrius dubius* | Clay Farm, Trumpington | TL4554 | 16/04/2013 | WCA1i | 0.9 |
| Marsh harrier | *Circus aeruginosus* | Cambridge | TL472547 | 12/05/2005 | BD1, WCA1i | 0.5 |
| Merlin | *Falco columbarius* | Great Shelford | TL4654 | 13/05/2006 | BD1, WCA1i | 0.2 |
| Osprey | *Pandion haliaetus* | Addenbrookes Hospital | TL4655 | 20/03/2012 | BD1, WCA1i | 0.5 |
| Peregrine | *Falco peregrinus* | Great Shelford | TL4654 | 27/11/2013 | BD1, WCA1i | 0.2 |
| Quail | *Coturnix coturnix* | White Hill, Great Shelford | TL467544 | 06/06/2003 | WCA1i | 0.17 |
| Red Kite | *Milvus milvus* | White Hill, Great Shelford | TL4654 | 08/04/2007 | BD1, WCA1i | 0.2 |
| Redwing | *Turdus iliacus* | Nine Wells LNR | TL461541 | 21/01/2007 | WCA1i | 0.2 |
| Reed bunting | *Emberiza schoeniclus* | Great Shelford | TL465545 | 2012 | S.41 NERC | 0 |
| Skylark | *Alauda arvensis* | Great Shelford | TL465543 | 2012 | LBAP, S.41 NERC | 0.17 |
| Song thrush | *Turdus philomelos* | Nine Wells LNR | TL461541 | 21/01/2007 | LBAP, S.41 NERC | 0.2 |
| Spotted flycatcher | *Muscicapa striata* | Cambridge | TL468550 | 16/05/2000 | S.41 NERC | 0.35 |
| Starling | *Sturnus vulgaris* | Great Shelford | TL4654 | 2012 | S.41 NERC | 0.2 |
| Yellow wagtail | *Motacilla flava* | Nine Wells LNR | TL461541 | 21/04/2004 | S.41 NERC | 0.2 |
| Yellowhammer | *Emberiza citrinella* | Great Shelford | TL463546 | 2012 | S.41 NERC | 0 |
| Barbastelle bat | *Barbastella barbastellus* | Netherhall Farm, Cambridge | TL47465514 | 2010 | HabRegs2, HSD4, LBAP, S.41 NERC, WCA5 | 0.95 |
| Bats | *Chiroptera* | Cambridge | TL468556 | 2010 | LBAP, S.41 NERC, WCA5 | 0.95 |
| Brown hare | *Lepus europaeus* | Great Shelford | TL47725410 | 23/03/2011 | S.41 NERC | 1.1 |
| Brown long-eared bat | *Plecotus auritus* | Netherhall Farm, Cambridge | TL47465514 | 2010 | HabRegs2, HSD4, WCA5 | 0.95 |
| Common Pipistrelle | *Pipistrellus pipistrellus* | Trumpington Dismantled Railway ex-CiWS | TL453549 | Sep-03 | HabRegs2, HSD4, WCA5 | 0.86 |
| Daubenton's | *Myotis* | *Contact Bat Group* | TL4653 | 04/02/2007 | HabRegs2, HSD4, WCA5 | 1 |

| Common Name | Scientific Name | Location | Grid Ref | Date | Selected Designations | Approx Dist (km) |
|---|---|---|---|---|---|---|
| bat | *daubentoni* | | | | | |
| Badger | *Meles meles* | Great Shelford | TL45 | 04/11/2008 | HabRegs2, HSD4, WCA5 | 1 record within 1km |
| Otter | *Lutra lutra* | Hobson's Brook, Great Shelford | TL458542 | 30/03/2009 | HabRegs2, HSD4, WCA5 | 0.3 |
| Water vole | *Arvicola amphibius* | Hobson's Brook, Great Shelford | TL459541 | 03/09/2015 | HabRegs2, HSD4, WCA5 | 0.3 |
| Natterer's bat | *Myotis nattereri* | *Contact Bat Group* | TL4653 | 04/02/2007 | HabRegs2, LBAP, WCA5 | 1 |
| Soprano pipistrelle | *Pipistrellus pygmaeus* | Trumpington Dismantled Railway ex-CiWS | TL453549 | Sep-03 | HabRegs2, LBAP, WCA5 | 0.86 |
| Hedgehog | *Erinaceus europaeus* | Nightingale Avenue Recreation Ground, Cambridge | TL46945534 | 22/05/2012 | HabRegs2, LBAP, WCA5 | 0.74 |
| Cinnabar | *Tyria jacobaeae* | Trumpington Dismantled Railway ex-CiWS | TL4554 | 04/09/1998 | S.41 NERC | 0.9 |
| Dot moth | *Melanchra persicariae* | Cambridge | TL4755 | 1996 - 1998 | S.41 NERC | 0.8 |
| Feathered gothic | *Tholera decimalis* | Cambridge | TL4755 | 1996 - 1998 | S.41 NERC | 0.8 |
| Goat moth | *Cossus cossus* | Cambridge | TL4755 | 17/07/2004 | S.41 NERC | 0.8 |
| Knot grass | *Acronicta rumicis* | Cambridge | TL4755 | 1998 | S.41 NERC | 0.8 |
| Basil thyme | *Clinopodium acinos* | Trumpington Dismantled Railway | TL457557 | 17/08/1997 | NS, S.41 NERC | 1.3 |
| Dittander | *Lepidium latifolium* | Cambridge | TL457557 | 28/06/1996 | S.41 NERC | 1.3 |
| Perennial flax | *Linum perenne* | Trumpington Dismantled Railway ex-CiWS | TL4555 | 04/07/1998 | NS | 1.15 |

## APPENDIX B – PHASE 1 HABITAT SURVEY SPECIES LISTS

Species lists are not exhaustive of all flora present in each habitat type.

| Common Name | Scientific Name |
|---|---|
| **Hedgerows** | |
| Field Maple | *Acer campestre* |
| Sycamore | *Acer pseudoplatanus* |
| Dogwood | *Cornus sanguinea* |
| Hawthorn | *Crataegus monogyna* |
| Ash | *Fraxinus excelsior* |
| Privet, wild | *Ligustrum vulgare* |
| Blackthorn | *Prunus spinosa* |
| Dog Rose | *Rosa canina* |
| Bramble | *Rubus fruticosus* agg. |
| Elder | *Sambucus nigra* |
| **Field Margins by Hedgerows** | |
| Meadow foxtail | *Alopecurus pratensis* |
| Cow parsley | *Anthriscus sylvestris* |
| Daisy | *Bellis perennis* |
| False Brome | *Brachypodium sylvaticum* |
| Common Mouse-ear | *Cerastium fontanum* |
| Creeping Thistle | *Cirsium arvense* |
| Cockôs Foot | *Dactyls glomerata* |
| Cleavers | *Galium aperine* |
| Wood Avens | *Geum urbanum* |
| Common Ivy | *Hedera helix* |
| Hogweed | *Heracleum sphondylium* |
| Red Dead-nettle | *Lamium purpureum* |
| Common Poppy | *Papaver rhoeas* |
| Ribwort Plantain | *Plantago lanceolata* |
| Greater Plantain | *Plantago major* |
| Smooth Meadow-grass | *Poa pratensis* |
| Meadow Buttercup | *Ranunculus acris* |
| Bramble | *Rubus fruticosus* agg. |
| Curled dock | *Rumex crispus* |
| **Field Margins by Ditch** | |
| Yarrow | *Achillea millefolium* |
| Meadow foxtail | *Alopecurus pratensis* |
| Cow parsley | *Anthriscus sylvestris* |
| Daisy | *Bellis perennis* |
| False Brome | *Brachypodium sylvaticum* |
| Common Knapweed | *Centaurea nigra* |
| Creeping Thistle | *Cirsium arvense* |
| Crosswort | *Cruciata laevipes* |
| Cockôs Foot | *Dactyls glomerata* |
| Field Horsetail | *Equisetum arvense* |
| Spurge | *Euphorbia* sp. |
| Cleavers | *Galium aperine* |
| Dove's-foot Crane's-bill | *Geranium molle* |
| Hogweed | *Heracleum sphondylium* |

| | |
|---|---|
| Hawkweed | *Hieracium* agg. |
| Yorkshire fog | *Holcus lanatus* |
| Common Mallow | *Malva sylvestris* |
| Scented Mayweed | *Matricaria recutita* |
| Bristly oxtongue | *Picris echioides* |
| Burnet-saxifrage | *Pimpinella saxifraga* |
| Ribwort Plantain | *Plantago lanceolata* |
| Greater Plantain | *Plantago major* |
| Annual Meadow-grass | *Poa annua* |
| Smooth Meadow-grass | *Poa pratensis* |
| Creeping Cinquefoil | *Potentilla reptans* |
| Meadow Buttercup | *Ranunculus acris* |
| Creeping Buttercup | *Ranunculus repens* |
| Bramble | *Rubus fruticosus* agg. |
| Common sorrel | *Rumex acetosa* |
| Curled dock | *Rumex crispus* |
| Broad-leaved Dock | *Rumex obtusifolius* |
| Smooth Sow-thistle | *Sonchus oleraceus* |
| Dandelion | *Taraxacum officinale* agg. |
| Goats-beard | *Tragopogon pratensis* agg. |
| Red Clover | *Trifolium pratense* |
| White Clover | *Trifolium repens* |
| Colt's-foot | *Tussilago farfara* |

## Key

- Site Boundary
- 1km_buffer
- 2km_buffer
- City Wildlife Site
- County Wildlife Sites
- Local Nature Reserves (LNR)
- Site of Special Scientific Interest (SSSI)
- Protected Road Verge
- Barbastelle
- Barn Owl
- Barnacle Goose
- Basil Thyme
- Bats
- Black Redstart
- Black Tern
- Blood-Vein
- Brambling
- Brown Hare
- Brown Long-eared Bat
- Bullfinch
- Cinnabar
- Common Frog
- Common Lizard
- Common Pipistrelle
- Corn Bunting
- Dark-barred Twin-spot Carpet
- Daubenton's Bat
- Dittander
- Dunnock
- Eurasian Badger
- European Otter
- European Water Vole
- Feathered Gothic
- Fieldfare
- Goat Moth
- Golden Plover
- Grass Snake
- Great Crested Newt
- Green Sandpiper
- Green-brindled Crescent
- Greenshank
- Grey Partridge
- Greylag Goose
- Hobby
- House Sparrow
- Kingfisher
- Knot Grass
- Lapwing
- Lesser Redpoll
- Linnet
- Little Egret
- Little Gull
- Little Ringed Plover
- Marsh Harrier
- Merlin
- Natterer's Bat
- Osprey
- Peregrine
- Perennial Flax
- Quail
- Red Kite
- Redwing
- Reed Bunting
- Skylark
- Song Thrush
- Soprano Pipistrelle
- Spotted Flycatcher
- Starling
- West European Hedgehog
- Yellow Wagtail
- Yellowhammer

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client
Cambridge County Council

project
Cambridge Biomedical Centre, Great Shelford

drawing title
SITE LOCATION AND CONSULTATION RESULTS PLAN

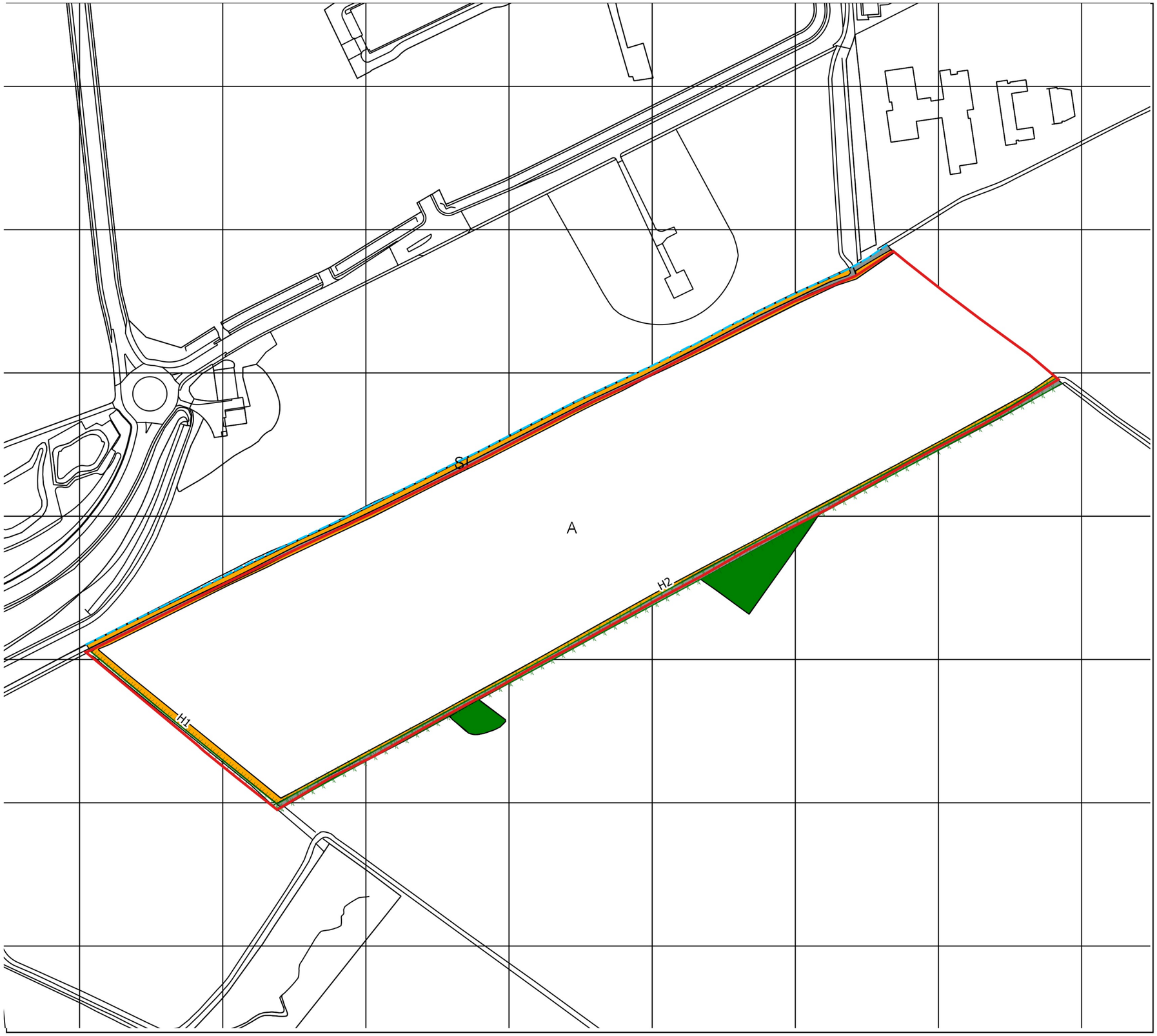
| scale | drawn | issue |
|---|---|---|
| 1:640.169 | HET | 14/7/2016 |

drawing / figure number
**Figure 1**

rev
**7307-E-01**

## Key

- Site Boundary
- Built Environment: Buildings/hardstanding
- Broadleaved woodland - semi-natural
- SI Neutral grassland - semi-improved
- A Cultivated/disturbed land - arable
- Intact hedge - native species-rich
- Hedge with trees - native species-rich
- Dry ditch

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Cambridge County Council

project
Cambridge Biomedical Centre, Great Shelford

drawing title
PHASE 1 HABITAT PLAN

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scale 1:640.169 | drawn HET | issue 14/7/2016

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Cambridgeshire County Council

## Cambridge Biomedical Campus

# Arboricultural Assessment

September 2016

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| Rev | Issue Status | Prepared / Date | Approved/Date |
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| | | | |

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## TABLES



## FIGURES



## APPENDICES

## 1.0 INTRODUCTION

1.1 This report has been prepared by FPCR Environment and Design Limited on behalf of Cambridgeshire County Council to present the findings of an Arboricultural Assessment and survey of trees located on land to the south of Dame Mary Archer Way (hereafter referred to as the site), OS Grid Ref TL 463 544, as shown in Figure 1. The survey was carried out on 26th May 2016.

1.2 The tree survey and assessment of existing trees has been carried out in accordance with guidance contained within British Standard 5837:2012 *'Trees in Relation to Design, Demolition and Construction - Recommendations'* (hereafter referred to as BS5837). The guidelines set out a structured assessment methodology to assist in determining which trees would be deemed either as being suitable or unsuitable for retention.

1.3 The guidance also provides recommendations for considering the relationship between existing trees and how those trees may integrate into designs for development; demolition operations and future construction processes so that a harmonious and sustainable relationship between any retained trees and built structures can be achieved.

1.4 The purpose of the report is therefore to firstly present the results of an assessment of the existing trees' arboricultural value, based on their current condition and quality and to secondly provide an assessment of impact arising from the proposed development of the site.

1.5 This report has been produced to accompany a proposed allocation of land for the development of Phase 3 of the Bio-Medical Campus to the south of Cambridge and has included an assessment of any impact to the tree cover. The site is approximately 8.91ha and will comprise a mix of office blocks and laboratories up to 3 storeys, multi-storey parking provision up to 4 storeys with associated roads and green infrastructure, including 5 – 15m landscape buffer around the boundaries. Potential access is proposed through the phase 2 consented development to the north of the site, connecting through to Dame Mary Archer Way. The survey has therefore focused on any trees present within or bordering the site that may potentially be affected by the future proposals or will pose a constraint to any proposed development.

1.6 The site consists of a single field compartment with boundary tree and hedgerow cover to the southern and western boundaries. The remaining boundaries were devoid of tree cover and no trees were positioned centrally within site.

1.7 It is understood following consultation with the Local Planning Authority, South Cambridgeshire District Council, that there are no Tree Preservation Orders or Conservation Area designations that would apply to any trees present on, or in close proximity to the assessment site and therefore no statutory constraints would apply to the development in respect of trees.

## 2.0 METHODOLOGY

2.1 The survey of trees has been carried out in accordance with the criteria set out in Chapter 4 of BS5837. The survey has been undertaken by a suitably qualified and experienced arboriculturalist and has recorded information relating to all those trees within the site and those adjacent to the site which may be of influence to any proposals. Trees were assessed for their

arboricultural quality and benefits within the context of the proposed development in a transparent, understandable and systematic way.

2.2 Trees have been assessed as groups where it has been determined appropriate. The term group has been applied where trees form cohesive arboricultural features either aerodynamically, visually or culturally including biodiversity or habitat potential for example parkland or wood pasture. An assessment of individual trees within groups has been made where a clear need to differentiate between them, for example, in order to highlight significant variation between attributes including physiological or structural condition or where a potential conflict may arise.

2.3 Trees have been divided into one of four categories based on Table 1 of BS5837, *'Cascade chart for tree quality assessment'*. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below). Category U trees are those which would be lost in the short term for reasons connected with their physiology or structural condition. They are, for this reason not considered in the planning process on arboricultural grounds. Categories A, B and C are applied to trees that should be of material considerations in the development process. Each category also having one of three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural or conservation values accordingly.

2.4 **Category (U) – (Red):** Trees which are unsuitable for retention and are in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years. Trees within this category are:

- Trees that have a serious irremediable structural defect such that their early loss is expected due to collapse and includes trees that will become unviable after removal of other category U trees.
- Trees that are dead or are showing signs of significant, immediate or irreversible overall decline.
- Trees that are infected with pathogens of significance to the health and/ or safety of other nearby trees or are very low quality trees suppressing adjacent trees of better quality.
- Certain category U trees can have existing or potential conservation value which may make it desirable to preserve.

2.5 **Category (A) – (Green):** Trees that are considered for retention and are of high quality with an estimated remaining life expectancy of at least 40 years with potential to make a lasting contribution. Such trees may comprise:

- Sub category (i) trees that are particularly good examples of their species, especially if rare or unusual, or are essential components of groups such as formal or semi-formal arboricultural features for example the dominant and/or principal trees within an avenue.
- Sub category (ii) trees, groups or woodlands of particular visual importance as arboricultural and / or landscape features.
- Sub category (iii) trees, groups or woodlands of significant conservation, historical, commemorative or other value for example veteran or wood pasture.

2.6 **Category (B) – (Blue):** Trees that are considered for retention and are of moderate quality with an estimated remaining life expectancy of at least 20 years with potential to make a significant contribution. Such trees may comprise:

- Sub category (i) trees that might be included in category A but are downgraded because of impaired condition for example the presence of significant though remediable defects, including unsympathetic past management and storm damage.
- Sub category (ii) trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals or trees occurring as collectives but situated so as to make little visual contribution to the wider locality.
- Sub category (iii) trees with material conservation or other cultural value.

2.7 **Category (C) – (Grey):** Trees that are considered for retention and are of low quality with an estimated remaining life expectancy of at least 10 years or young trees with a stem diameter below 150mm. Such trees may comprise:

- Sub category (i) unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.
- Sub category (ii) trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value or trees offering low or only temporary / transient screening benefits.
- Sub category (iii) trees with no material conservation or other cultural value.

### Tree Schedule

2.8 Appendix A presents details of any individual trees, groups and hedgerows found during the assessment including heights, diameters at breast height, crown spread (given as a radial measurement from the stem), age class, comments as to the overall condition at the time of inspection, BS5837 category of quality and suitability for retention and the root protection area.

2.9 General observations particularly of structural and physiological condition for example the presence of any decay and physical defect and preliminary management recommendations have also been recorded where appropriate.

### Hedgerows

2.10 For the purposes of this assessment, a hedgerow is described as any boundary line of trees or shrubs less than 5m wide at the base and are managed under a regular pruning regime. Hedgerows and substantial internal or boundary hedges (including evergreen screens) have been recorded including lateral spread, height and stem diameter(s). Where trees are present within a hedgerow that are significantly different in character from the remainder, these have been identified and recorded separately.

2.11 A tree survey in accordance with BS5837 does not assess hedgerows against the Hedgerow Regulations 1997 or specifically from an ecological perspective, and is outside the scope of this assessment.

### Other Considerations

2.12 It may be necessary during detailed design to undertake further assessment and accurate positioning of woody species within hedgerows and tree groups to assist structural calculations for foundation design of structures in accordance with current building regulations. Knowledge of

soil type was not known at the time of this tree assessment. If a current soil survey of the site has taken place then it must be read in conjunction with the results of the tree survey.

2.13 The exact position of individual trees or species included as part of a tree group, hedgerow or woodland should be checked and verified on site prior to any decisions for foundation design, tree operations or construction activity being undertaken. Further survey work would be required for calculating foundation depths in accordance with NHBC Chapter 4.2 Building near Trees.

### Conditions of Tree Survey

2.14 The survey was completed from ground level only and from within the boundary of the site. Aerial tree inspections or the internal condition of the stem/s or branches were not undertaken at this stage as this level of survey is beyond the scope of the initial assessment. Evaluation of tree condition given within this assessment applies to the date of survey and cannot be assumed to remain unchanged. It may be necessary to review these within 12 months, in accordance with sound arboricultural practice.

### Site Plans

2.15 Figure 1 (drawing no. 7307-A-01) identifies the assessment area including trees beyond the application boundary that may be affected by future development of the site and should not be considered as the application boundary.

2.16 The individual positions of trees and groups have been shown on the Tree Survey Plan, Figure 2 (drawing no. 7307-A-02). The positions of trees are based on a topographical / land survey, as far as possible, supplied by the client. Where topographical information has not identified the position of trees and hedgerows, their relation to any existing surrounding features has been plotted using a global positioning system and aerial photography to provide approximate locations. The crown spread, root protection area and shade pattern (where appropriate) are also indicated on this plan.

2.17 As part of the Arboricultural Impact Assessment, a Tree Retention Plan, Figure 3 (drawing no. 7307-A-03) has been prepared to show the proposed layout in relation to the existing tree cover allowing an assessment of any potential conflicts. The plan also identifies which trees would be required to be removed or retained as part of the proposed development.

### Tree Constraints and Root Protection Areas

2.18 Below ground constraints to future development are represented by the area surrounding the tree containing sufficient rooting volume for the specimen to have the best chance of survival in the long term which is identified as the root protection area (RPA). The RPA has been calculated in accordance with section 4.6 of BS5837 and requires suitable protection in order for the tree to be successfully incorporated into any future scheme. Where applicable the shape of the Root Protection Area has been modified to take into account the presence of any nearby obstacles (existing or past) which may have restricted root growth and the likely root distribution i.e. the presence of hard standing, structures and underground apparatus.

2.19 Where groups of trees have been assessed, the Root Protection Area has been shown based on the maximum sized tree in any one group and so may exceed the Root Protection Area required

for some of the individual specimens within the group. Further detailed inspection of the individual trees forming a group may be required where development impacts upon the group.

2.20 Above ground constraints such as the current and potential crown spread of the trees and an illustration of the shade pattern (where appropriate) have been considered and identified within the Tree Survey Plan and Tree Retention Plan plans to indicate their potential area of shading influence.

## 3.0 RESULTS

3.1 One individual tree, one tree group and two hedgerows were surveyed as part of the Arboricultural Assessment. Refer to Figure 2 – Tree Survey Plan and Appendix A – Tree Schedule for full details of the trees included in this assessment. The table below summarises the trees assessed. Several of the trees have been discussed in more detail following the table, owing to their physical condition or arboricultural significance.

**Table 1: Summary of Trees by Retention Category**

| | Individual Trees | Total | Groups of Trees | Total |
|---|---|---|---|---|
| Category U - Unsuitable | | 0 | | 0 |
| Category A (High Quality / Value) | | 0 | | 0 |
| Category B (Moderate Quality / Value | | 0 | G1, H1 | 2 |
| Category C (Low Quality / Value) | | 1 | H2 | 1 |

3.2 By virtue of the sites current use as arable farm land tree cover was restricted to the southern and western boundaries of the field compartment. The southern boundary tree group (G1) consisted of young, semi mature and mature trees including ash *Fraxinus excelsior*, blackthorn *Prunus spinosa*, field maple *Acer campestre*, hawthorn *Crataegus monogyna*, damson *Prunus insititia* and dogwood *Cornus sanguinea*. The tree cover had been allowed to outgrow vertically but had been managed laterally on the northern side through the use of tractor mounted flail mower. Dense ivy cover was observed on the main stems of many of the trees and small pieces of dead wood were present in the crown. Despite the minor defects observed G1 was considered retention category B for its moderate landscape value as buffer screening for the site.

3.3 Hedgerow H1 had been allowed to outgrown its original hedgerow form to provide a dense linear boundary to the west of the field compartment. Species forming the hedgerow included ash, blackthorn, field maple and hawthorn but was generally dominated by dogwood. The screening provided by the hedgerow and moderate quality of the contents resulted in H1 being considered retention category B.

3.4 T1 was a semi mature ash tree positioned at the southern end of H1 that had outgrown the surrounding hedgerow trees by approximately 5m and was therefore assessed separately. Although no major defects were noted at the time of the assessment T1 was considered to be of low arboricultural value and therefore retention category C.

3.5 Hedgerow H2 was positioned offsite beyond the northeastern corner and was also considered to be of limited quality and influence upon the site being considered retention category C.

## 4.0 ARBORICULTURAL IMPACT ASSESSMENT (AIA)

4.1 The following paragraphs present a summary of the tree survey and discussion of particular trees and groups recorded in the context of any proposed development in the form of an Arboricultural Impact Assessment in accordance with section 5.4 of BS5837. Any final tree retentions will need to be reconciled with the advice contained within this report.

4.2 The AIA has been based upon the Indicative Masterplan and seeks to outline the relationship between the proposals and the existing trees and hedgerows. The above drawing shows the proposals for phase 3 of the extension to the existing Cambridge Bio-Medical Campus to the south of Cambridge. The site is approximately 8.91ha and will comprise a mix of office blocks and laboratories up to 3 storeys, multi-storey parking provision up to 4 storeys with associated roads and green infrastructure, including 5 – 15m landscape buffer around the boundaries. Potential access is proposed through the phase 2 consented development to the north of the site, connecting through to Dame Mary Archer Way. An overlay of the above layout has been incorporated in the Tree Retention Plan (Figure 3) to assist in identifying the relationship and any potential conflicts between the proposals and the existing trees and hedgerows.

4.3 The proposals are currently in outline only and therefore further assessment at the Reserved Matters application stage will be required to ensure sufficient offset distances between the existing tree and hedgerow cover is achieved. Currently however, the proposals identify a large offset distance allowing extensive landscape buffers incorporating new tree planting and public footpaths adjacent to the southern boundary which are to connect into the existing public footpath network to the north, east and south of the site.

4.4 The proposals also identify an attenuation pond feature to the west of the site adjacent to H1 and T1. The final position of the pond will need to consider the extent of the crowns of the tree and hedgerow cover to prevent conflicts.

4.5 The current proposal identify the retention, incorporation and enhancement of all of the exiting tree and hedgerow features however, some minor loss of tree cover will be required where connections to the existing footpath are to be made. Further assessment of this minor impact will also need to be considered during a Reserved Matters application and / or an Arboricultural Method Statement following approval should permission for the scheme be granted.

### New Tree Planting

4.6 New tree planting will form an integral part of the new development however, proposals for new tree planting should be appropriate for the future use of the site and not just aim to improve the existing tree population.

4.7 As part of the development proposals an adequate quantity of structured tree planting has been demonstrated indicatively within or close to hard landscaped areas of car parking or alongside the primary access roads within the roadside verges. The purpose and function of this new tree

planting should be understood from the start of any design stages so that key objectives from a landscape perspective can also be achieved.

4.8 The landscaping scheme should consider the use of both native tree species (for their low maintenance requirements and nature conservation value) and ornamental species (for their contribution to urban design and amenity value). Species choices should be selected on the basis of their suitability for the final site use. Furthermore, during the design process consultation should be made with the Local Planning Authority to obtain information on their tree strategy and incorporate the planting proposals with any local policies and initiatives and/or Biodiversity Action Plans (BAP).

4.9 Careful consideration would need to be given to the following: ultimate height and canopy spread, form, habit, density of crown, potential shading effect, colour, water demand, soil type and maintenance requirements in relation to both the built form of the new development and existing properties. Through careful species selection, the landscape scheme shall reduce the risk of trees being removed in the future on the grounds of nuisance. Nuisance can be perceived in a number of ways and vary from person to person however most commonly, within the context of trees, low overhanging branches, excessive shading, seasonal leaf fall and the misinformed perception that trees close to buildings cause damage.

4.10 Tree planting should be avoided where they may obstruct overhead power lines or cables. Any underground apparatus should be ducted or otherwise protected at the time of construction to enable trees to be planted without resulting in future conflicts.

## Tree Management

4.11 The layout of the development is currently reserved for subsequent approval. In the course of a reserved matters application pursuant to layout, a review of the relationship between the layout and the retained trees should be undertaken by a qualified arboriculturalist to assess the existing tree cover and prepare a schedule of tree works.

4.12 All retained trees should be subjected to sound arboricultural management as recommended within section 8.8.3 of BS5837 *Post Development Management of Existing Trees,* where there is a potential for public access in order to satisfy the landowner's duty of care. Additionally, inspections annually and following major storms should be carried out by an experienced arboriculturalist or arborist to identify any potential public safety risks and to agree remedial works as required.

4.13 All tree works undertaken should comply with British Standard 3998:2010 and should therefore be carried out by skilled tree surgeons. It would be recommended that quotations for such work be obtained from Arboricultural Association Approved Contractors as this is the recognised authority for certification of tree work contractors.

4.14 All vegetation and, particularly, woody vegetation proposed for clearance should be removed outside of the bird-breeding season (March - September inclusive) as all birds are protected under the Wildlife and Countryside Act, 1981 (as amended) whilst on the nest. Where this is not possible, vegetation should be checked for the presence of nesting birds prior to removal by an experienced ecologist.

### General Design Principles in Relation to Retained Trees

4.15 In a subsequent Reserved Matters application following the final layout of the scheme, assessment of the distance of proposed development in relation to the calculated root protection area of retained trees should be made which will inform the final layout.

4.16 The routing of below ground services should also be considered with regard to the retained trees as part of a subsequent reserved matters application pursuant to layout. As recommended by the guidance given in section 7.7 of BS5837 services, where possible, should not encroach within the Root Protection Areas of retained trees. If below-ground services are proposed within a Root Protection Area, modifications to the alignment of the service route may need to be made in order to minimise adverse effects on root stability and overall tree health.

4.17 Consideration may also need to be given to the potential for tree roots of newly planted trees and hedgerows to affect or compromise the future services. As far as feasible, it would be preferable that proposed services near both the existing and any new planting should be ducted for ease of access and maintenance and grouped together to minimise any future disturbance.

## 5.0 TREE PROTECTION MEASURES

5.1 Retained trees will be adequately protected during works ensuring that the calculated root protection area for all retained trees can be appropriately protected through the erection of the requisite tree protection barriers. Measures to protect trees should follow the guidance in BS5837 and will be applied where necessary for the purpose of protecting trees within the site whilst allowing sufficient access for the implementation of the proposed layout. These have been broadly summarised below.

### General Information and Recommendations

5.2 All trees retained on site will be protected by suitable barriers or ground protection measures around the calculated RPA, crown spread of the tree or other defined constraints of this assessment as detailed by section 6 and 7 of BS5837.

5.3 Barriers will be erected prior to commencement of any construction work and before demolition including erection of any temporary structures. Once installed, the area protected by fencing or other barriers will be regarded as a construction exclusion zone. Fencing and barriers will not be removed or altered without prior consultation with the Project Arboriculturalist.

5.4 Any trees that are not to be retained as part of the proposals should be felled prior to the erection of protective barriers. Particular attention needs to be given by site contractors to minimise damage or disturbance to retained specimens.

5.5 Where it has been agreed, construction access may take place within the root protection area if suitable ground protection measures are in place. This may comprise single scaffold boards over a compressible layer laid onto a geo-textile membrane for pedestrian movements. Vehicular movements over the root protection area will require the calculation of expected loading and the use of proprietary protection systems.

5.6 Confirmation that tree protective fencing or other barriers have been set out correctly should be gained prior to the commencement of site activity.

**Tree Protection Barriers**

5.7 Tree protection fencing should be fit for the purpose of excluding any type of construction activity and suitable for the degree and proximity of works to retained trees. Barriers must be maintained to ensure that they remain rigid and complete for the duration of construction activities on site.

5.8 In most situations, fencing should comprise typical construction fencing panels attached to scaffold poles driven vertically into the ground. For particular areas where construction activity is anticipated to be of a more intense nature, supporting struts, acting as a brace should be added and fixed into position through the application of metal pins driven into the ground to offer additional resistance against impacts. Where site circumstances and the risk to retained trees do not necessitate the default level of protection an alternative will be specified appropriate to the level / nature of anticipated construction activity. The recommended methods of fencing specifications for this site have been illustrated in Appendix B.

5.9 It may be appropriate on some sites to use temporary site offices, hoardings and lower level barrier protection as components of the tree protection barriers. Details of the specific protection barriers for the site can be provided should the application be approved, as part of a site specific Arboricultural Method Statement for a Reserved Matters application and in accordance with the guidance contained within BS5837.

**Ground Protection**

5.10 Where it has been agreed, construction access may take place within Root Protection Areas if suitable ground protection measures are in place. Guidance on examples of appropriate ground protection for several different scenarios is provided in section 6.2.3 of BS5837. The location of and design for temporary ground protection should be detailed as part of an Arboricultural Method Statement required by conditioning should planning permission be granted. In all cases, the objective is to avoid compaction of the soil which can arise from a single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.

**Protection outside the exclusion zone**

5.11 Once the areas around trees have been protected by the barriers, any works on the remaining site area may be commenced providing activities do not impinge on protected areas.

5.12 All weather notices should be attached to the protective fencing to indicate that construction activities are not permitted within the fenced area. The area within the protective barriers will then remain a construction exclusion zone throughout the duration of the construction phase of the proposed development. Protection fencing signs can be provided upon request.

5.13 Wide or tall loads etc should not come into contact with retained trees. Banksman should supervise transit of vehicles where they are in close proximity to retained trees.

5.14 Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10m of a tree stem. No concrete should be mixed within 10m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree.

5.15 No fires will be lit where flames are anticipated to extend to within 5m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire.

5.16 Notice boards, telephone cables or other services should not be attached to any part of a retained tree.

5.17 Any trees which need to be felled adjacent to or are present within a continuous canopy of retained trees, must be removed with due care (it may be necessary to remove such trees in sections).

**Protection of Trees Close to the Site**

5.18 A number of trees were located on the boundaries of the site and therefore the root protection area and crown spread of these trees will need to be protected in the same way as all the retained trees within the site. All trees located outside the boundaries of the assessment site yet within close proximity to works should be adequately protected during the course of the development by barriers or ground protection around the calculated root protection area.

5.19 Any trees which are to be retained and whose Root Protection Areas may be affected by the development should be monitored, during and after construction, to identify any alterations in quality with time and to assess and undertake any remedial works required as a result.

**Protection for Aerial Parts of Retained Trees**

5.20 Where it is deemed necessary to operate a wide or tall load, plant bearing booms, jibs and counterweights or other such equipment as part of the construction works it is best advised that appropriate, but limited tree surgery, be carried out beforehand to remove any obstructive branches. Any such equipment would have potential to cause damage to parts of the crown material, i.e. low branches and limbs, of retained trees within the protective barriers. This is termed as ‘access facilitation pruning’ within BS5837. Any such pruning should be undertaken in accordance with a specification prepared by an arboriculturalist.

5.21 A pre-commencement site meeting with contractors who are responsible for operating machinery will be required, as described above, to firstly highlight the potential for damage occurring to tree crowns and to ensure that extra care is applied when manoeuvring machinery during such operations within close proximity to retained trees to avoid any contact.

5.22 In the event of having caused any branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with British Standard 3998:2010 and in agreement with the Local Planning Authority prior to correcting the damage, upon completion of development.

## 6.0 CONCLUSION

6.1 The proposals are currently in outline and therefore further consideration of the relationship between the existing tree cover and the development will be required to ensure a harmonious relationship is achieved. Based upon the current proposals however, all of the existing tree cover will be retained, incorporated and enhanced through new planting that will complement the current vegetation and increase the net canopy cover considerably.

6.2 On balance, the proposals should be considered a significant improvement on the current situation in terms of Arboriculture which will not only increase tree cover but will also provide greater habitat biodiversity and landscape screening between the proposed development and surrounding landscape.