ECOLOGICAL ASSESSMENT TO INCLUDE: A PHASE 1 HABITAT SURVEY & PROTECTED SPECIES ASSESSMENT,

On a CORNER PLOT at ROSELEIGH CLOSE AND CAMBRIDGE PARK, EAST TWICKENHAM, LBRuT TW1 2JT.

Furesfen

Tel/fax 020 8974 6670
Mob.0786 750 7086
Email alison@furesfen.co.uk
Website: www.furesfen.co.uk

October 2022

Contents

CONTROL SHEET 3
INTRODUCTION 5
METHODOLOGY 7
PROTECTED AND NOTABLE SPECIES ASSESSMENT 7
RESULTS 10
PROTECTED AND PRIORITY SPECIES POTENTIAL from Desk study 12
Bat habitat assessment: Trees 14
Birds 15
Invertebrates 17
ASSESSMENT 18
RECOMMENDATIONS 24
LEGISLATION AND POLICY 26
REFERENCES 28
APPENDIX 1 Characteristic plants and bird species 29
Appendix 2 Ecology and Landscape Plan as supplied by Deon Lombard Architects Oct. 22 30
Appendix 3 Proposed wildlife pond and notes as supplied by Deon Lombard Oct. 22 31

CONTROL SHEET

Author	Alison Fure BSc, MSc C.ENV MCIEEM
Job Title.	PEA Report Corner plot at Roseleigh Close and Cambridge Park v. 4
Purpose	External use please read T&C's
	The information provided within this report is true at the time of writing. It has been prepared in accordance with the guidance of the MCIEEM professional institution's Code of Professional Conduct. It cannot be used for any purpose other than stated above without the permission of the author. It cannot be made available to the pubic domain until all accounts have been settled.

Abbreviations:

RBAP	Richmond Biodiversity Action Plan
BAP	Biodiversity Action Plan
HAP	Habitat Action Plan
SAP	Species Action Plan
SNCI	Site of Nature Conservation Importance
SMINC	Site of Metropolitan Importance for Nature Conservation
LBG	London Bat Group
BCT	Bat Conservation Trust
PBHA	Preliminary Bat Habitat Assessment
PEA	Preliminary Ecological Assessment

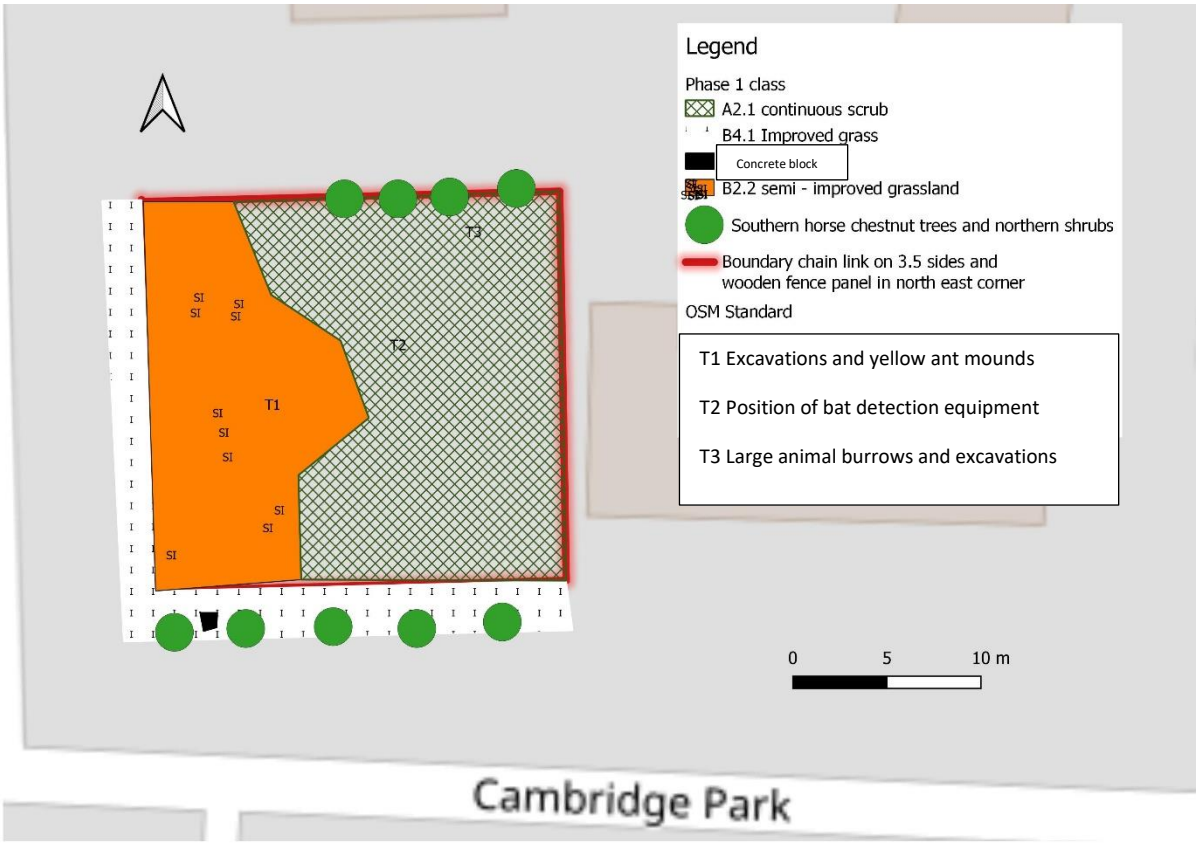


Fig. 1 Main habitats found onsite

SUMMARY

Furesfen was commissioned to carry out a Preliminary Ecological Appraisal (PEA), comprising a: Phase 1 habitat survey; protected species assessment to include a reptile presence/absence and bat activity; as well as an ecological evaluation of land at the corner of Roseleigh Close and environs. The main findings of the PEA are as follows:

- The site is not subject to any conservation designation. The next nearest statutory designated site is the river Thames.
- The site comprised scrub, semi – improved and improved grassland, 5 horse chestnut trees including at two with veteranized features. There was evidence of mammal activity at the site: - fox, small mammal including a small amount of bat commuting activity.
- Bats – The horse chestnut trees along Cambridge Park had moderate potential for roosting bats but should not be affected by this application unless fixed external lighting is used. If this changes surveys will be required unless motion sensors are employed.
- Breeding birds – bramble scrub and scattered trees on site have potential to support breeding birds. Any removal of these features should be outside of the breeding bird season or checked by an ecologist immediately prior to removal.
- Reptiles – habitats with low potential to support reptiles were present at the site. In order to comply with legislation, it is recommended the vegetation on site is managed to dissuade reptiles from using the site. A survey conducted on the site between September and October found no evidence of reptiles.

Other mammals – Fox are considered to be present on site and hedgehogs may pass through. To avoid possible contravention of the Wild Animals (Protection) Act 1996, due care and attention should be taken when carrying out works that will impact on the potential fox den, which should be carefully dug out using hand tools, avoiding the breeding season (March – July). Vegetation clearance should be undertaken outside of the hibernation period (November – March inclusively).

- Recommendations to enhance the biodiversity value of the site in accordance with national and local planning policies.

INTRODUCTION

Background

1.1 Furesfen was asked by Deon Lombard Architects to undertake a Preliminary Ecological Assessment including a: - Phase 1 extended habitat survey, a bat habitat assessment and a presence - absence reptile survey at a corner plot at Roseleigh Close and Cambridge Park, E. Twickenham in the London Borough of Richmond (LBRuT). Information on priority species, including mammals and birds was required.

Proposal

1.2 The proposal is for a two-storey building containing 3 maisonettes. The building footprint covers 30% of the site area. Small utility basements are proposed for each maisonette, primarily for housing renewable energy equipment.

1.3 The frontages are set back from both street boundaries; grassed perimeters will be achieved by the removal of the fencing along the street frontages. Along Cambridge Park the setback is nine metres from back of pavement, to clear the horse chestnut tree canopies and the root protection zones.

1.4 Ground water recharge, equivalent to pre-development greenfield conditions is anticipated; an attenuation pond, green roofs and a living wall are planned to help achieve this, along with additional features of biodiversity value such as a small wildflower meadow.

1.5 The only external lights within the proposal are for a small light within each portico directed at the front doors will be motion activated so that people can see the level threshold, door handle and door-bell at night.

Site description and designation

1.6 This is an undeveloped site at a corner site and is roughly square in shape, covering an area of some 562 sq. metres. A six-unit maisonette block is located to the east of the site, and a similar maisonette block is located beyond a garage unit to the north of the site. A large three storey mansion block, is located opposite the site on Cambridge Park.

1.7 Site boundaries are demarcated along Roseleigh Close to the west, Cambridge Park to the south, the garage unit side wall and timber boarded fence along the northern boundary, and a timber

boarded fence halfway down the eastern boundary. Along its street boundaries a wire chain-link fence is set 1.5m from the pavement boundary.

1.8 There are five mature horse chestnut trees along the Cambridge Park pavement – the two outliers and middle trees are designated with TPOs. Together with trees further east and west on both sides of the street, they form a distinctive avenue leading towards the Cambridge Park footpath connecting to the Thames Path.

Scope

1.9 The aim of this appraisal is to provide current baseline ecological information of the site. This will be used to identify any potential ecological constraints associated with the proposed development and/or to identify the need for additional survey work to further evaluate any impact that may risk contravention of legislation or policy relating to protected species and nature conservation.

Surveyor

1.10 The surveys were undertaken by A Fure Class 2 Bat Licence (Natural England licence number 2015-10381-CLS-CLS) Dormouse licence 2015-13814-CLS-CLS and full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

1.11 This appraisal has been prepared with reference to best practice guidance published by the Chartered Institute for Ecology and Environmental Management (CIEEM, 2018) and as detailed in British Standard 42020:2013 Biodiversity - Code of Practice for Biodiversity and Development (BSI, 2013).

1.12 The following key pieces of nature conservation legislation are relevant to this appraisal. A more detailed description of legislation is provided at Section 5 :

- The Conservation of Habitats and Species Regulations 2017 (commonly referred to as the Habitats Regulations);
- Wildlife and Countryside Act 1981 (as amended);
- Natural Environment and Rural Communities Act 2006;
- Protection of Badgers Act 1992; and
- Wild Mammals (Protection) Act 1996.

1.13 The National Planning Policy Framework (Department of Communities and Local Government, 2018) requires local authorities to avoid and minimise impacts on biodiversity and, where possible, to provide net gains in biodiversity when taking planning decisions.

METHODOLOGY

Desk Study

2.1 A search was undertaken using data from previous surveys as well as Magic website https://magic.defra.gov.uk/ for records of protected mammal and bird species.

PHASE 1 HABITAT SURVEY

2.2 A Phase 1 habitat survey (JNCC, 2010) of the site to identify and map the habitats present; A habitat survey of the main body of the site was carried out on 15.9.22 in dry and clear conditions. This survey covered the entire site and some of the environs. Habitats were described and mapped following standard Phase 1 habitat survey methodology (JNCC, 2010).

2.3 Records for dominant and notable plants are provided, as are incidental records of birds and other fauna noted during the course of the habitat survey.

2.4 Common names are used where widely accepted for amphibians, birds, mammals, reptiles and vascular plants. Scientific names are provided within the tables appended.

2.5 The site was also surveyed for the presence of invasive plant species as defined by Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

2.6 Target notes are used to provide information on specific features.

PROTECTED AND NOTABLE SPECIES ASSESSMENT

2.7 The suitability of the site for legally protected species was assessed on the basis of relevant desk study records combined with field observations from the habitat survey. The likely value of habitat for protected species occurrence was ranked on a scale from 'negligible' to 'present' as described in the table below.

2.8 The assessment of habitat suitability for protected or notable species was based on professional judgement drawing on experience of carrying out surveys and best practice survey guidance on identifying field signs which includes that for the following species: reptiles (Gent and Gibson, 2003); and bats. The protected species assessment of the site undertook to identify features with potential to support legally protected species including:

Badger and reptiles

2.9 Areas that might be used by Badger for foraging and sett building were assessed. A reptile presence/ absence survey has been completed.

Birds

2.10 The area within the boundaries of the site was assessed for its potential value for breeding birds during the survey. This consisted of recording singing male birds, sightings, and overhead registrations.

SITE EVALUATION

2.11 The site's ecological value has been evaluated broadly following guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) which ranks the nature conservation value of a site according to a geographic scale of reference: international, national, regional, county/metropolitan, district/borough, local/parish or of value at the site scale.

2.12 In evaluating the nature conservation value of the application area, the following factors were considered: nature conservation designations; species/habitat rarity; naturalness; fragility and connectivity to other habitats.

Table 1. Protected species assessment categories

Category	Description
Present	Confirmed by records or current study
High	Habitat present provides all of the known key requirements for a given species. Local records are provided by desk study. The site is within or close to a stronghold for a particular species. Good quality surrounding habitat and connectivity.
Moderate	Habitat provides all of the known key requirements for a given species/species group. Several desk studies records and/or site within suitable surrounding habitat. Factors limiting occurrence may include small habitat area, barriers to movement and disturbance.
Low	Habitat present is of relatively poor quality for a given species/species group. Few or no desk study records. However, presence cannot be discounted on the basis of national distribution, nature of surrounding habitats or habitat fragmentation.
Negligible	Habitat is either absent or of very poor quality for a particular species or species group. There were no desk study records. Surrounding habitat unlikely to support wider populations of a species/species group.

Limitations

2.13 The survey methods were in accordance with current guidance although it was undertaken late in the year. The information was deemed sufficient to evaluate the status of priority species by assuming that they were present and surveying accordingly.

2.14 Even where data for a particular species group is provided in the desk study, a lack of records for a defined geographical area does not necessarily mean that there is a lack of ecological interest, the area may simply be under-recorded.

2.15 Four figure grid references are often provided for protected species, which makes the precise location of species records difficult to determine and they could potentially be present anywhere within the given 1km x 1km square. Six figure grid references may be accurate to the nearest 100m only.

RESULTS

Desk study

3.1 The application site is not subject to a statutory nature conservation designation. There is 'habitat' within 200m and 215m respectively connected by the Thames Path. Most designated sites are on the opposite side of the Thames; a statutory LNR (Local Nature Reserve) within 1.6 km of the site, but it is an island in the Thames.

Table 2. Statutory and non-statutory designated nature sites and Priority habitats.

Site name Designation	Distance	Features/reason for designation
'Other habitat'	200m SE	MAGIC describes this as 'other undefined habitat'. It is assumed that this is part of the estate where there are 'larger' protected species
Marble Hill Park and Orleans House Gardens 29 ha Sites of Local Importance for nature conservation.	215m SW	Two large 18th century houses, formal parkland. Largely open green space with some woodland parcels. Former badger setts.
River Thames SMINC Site of Metropolitan Importance for Nature Conservation	200m SE closest point	The towpath, revetments and associated riverside vegetation provide important corridor and priority habitats and species. The riparian assemblages in Richmond are among the most important. Flyway for birds and bats entering and leaving the Metropolitan Area.
Petersham Lodge Woods and Petersham Meadows Sites of Borough Importance (opposite side of the Thames)	500m SE	Priority habitat broadleaved woodland and wet woodland and diverse well – managed meadows.
Richmond Park SAC and SSSI	1300m SE closest point	Acid grassland, heathland, wetlands and ancient and broadleaved woodland priority habitats.
Old Deer Park (see below)	1500m S	Mid- section is managed as a golf course. Mature trees in copses with a ha-ha. Old oak pollards pre-dating the GC.
Royal Botanic Gardens Kew Site of Borough Importance together with Old Deer Park	2,000m N	Mainly trees but grassland and more natural areas. Many bat and other protected species.
Ham Lands LNR SMINC	Within 1000m S	Grassland, broadleaved woodland and priority species including song thrush territories and unusual plant species.
Isleworth Ait LNR	1,600m North	Thames Island

PHASE 1 HABITAT SURVEY

Habitat

3.2 There were two main components to the matrix habitat: continuous scrub and semi – improved grassland. Improved grassland formed a perimeter feature on two sides. There were 5 mature horse chestnut trees on the southern boundary and 3 semi-mature shrubs/trees on the shared northern boundary (holm oak, hazel and cherry plum) along with laurel bushes. The main JNCC habitat descriptions were identified as:

A2.1 Continuous scrub

This was largely bramble. By looking under the brambles and old man's beard, yellow meadow ant mounds, animal runs, animal spoil and dung was seen. A large former badger sett/foxes earth was present in the north – east quadrant (no longer used by badgers). There were three smaller trees along the northern boundary and a large patch of laurel which often gives cover to burrowing animals.

B2.2 Semi – improved grassland

Although, late in the year to survey and drought conditions had desiccated many of the species, it was still possible to see the finer sheep's fescue and associates such as yellow meadow ant mounds where fine grained sandy soil was seen at the surface. The mounds were not in good condition, and some had been excavated, ants were present when disturbed. Offsite verge's that had been maintained as short sward had some of the characteristic acid - loving species.

B4 Improved Grassland - most of the grass on two verges outside the chain link fence. Grass which has been fertilised may lose many of the species typically found on unimproved grasslands. They have a very limited range of grasses in this case *Holcus lanata*. The following signs usually indicate substantial improvement:

- Bright green, lush and even sward dominated by grasses
- Low diversity of flowering plant species
- Perennial rye grass
- Crested dog's tail
- White clover
- Sorrel
- Dandelion
- Common daisy

Table 3. Photographs – Habitat features

Photo 1. Semi – improved grassland with tussocks and ant mounds, inside the chain - link fence

Photo 2. Dense bramble scrub looking south towards the horse chestnut trees, includes the veteran tree on the right which is in flower (note stone block at its base).

Photo 3. Mammal run, largely appears largely to be used by cats.

Photo 4. Yellow meadow ant mounds; these were not in good condition, but still occupied.

PROTECTED AND PRIORITY SPECIES POTENTIAL from Desk study

Table 4: Significant species

Species	**record**
Foxes	Appear to jump the fence. Toys, scat and earth on site. Fresh digging and smells.
Badger	Records within 215m and on site. Neighbours see badgers foraging along Roseleigh Close. Former sett on site now used by foxes. New fence erected after Storm Eunice by Cambridge Park ground staff excludes large animals.
Hedgehog	Suitable habitat and records within 200m & actual records within 215m
Stag beetle	Authors records within 50m
Song thrush	Red list of conservation concern: nearby records 215m
Slow worm	Desk study records.
Bats	Nine species of bat are recorded locally see separate table

Badgers and large animals

3.3 Badgers are seen by local residents. There were foraging signs along Roseleigh Close but it is unlikely that these large animals can gain access to the site. There has been a badger sett on the site in the past and there was evidence of deep and extensive excavations.

3.4 There has been recent replacement of a close board fence which has been installed flush to the ground. This was undertaken by the estate management. The new fence is along the north and part of the east section of the boundary. The remainder of the eastern boundary fence was chain link. The ground along this side is heavily compacted and the field signs have been removed.

3.5 However, foxes have taken over the area and there were signs in the NE quadrant of toys, nappies, shoes, food remains that the holes formed part of a breeding den this year. Foxes were seen during one of the visits in a nearby garden.

3.6 Foxes appear to jump the fence as the push – unders were too small for their use. Cats were seen using the push - under along Roseleigh Close. Two depressions under the fence along Cambridge Park were hedgehog sized.

Bats

Table 5: Status of bats recorded in the local catchment.

Species	Frequency	Main roosts sites
Common Pipistrelle	Common	Buildings nearby (LBG) Roosts on adjacent site (authors data). Roost visits locally.
Soprano Pipistrelle	Common **Priority species**	Buildings and trees especially near water (LBG). Large colonies have been recorded this year along the river at Kew/Mortlake, Ham as well as transient roosts
Nathusius's Pipistrelle *Pipistrellus nathusii*	Rare	Buildings Trees roosted within the catchment but its local status is variable. Richmond Park records
Daubenton's bat *Myotis daubentonii*	Declining in London region (Briggs, 2007)	Trees, structures and underground sites in the local area. Recorded at LWC, Richmond Park
Natterer's bat *Myotis nattereri*	Infrequent since 2009 at this location	Trees and structures. Former roost at Normansfield hospital
Noctule bat *Nyctalus noctula*	Becoming less common in London **Priority species**	Records at LWC
Leisler's bat *Nyctalus leisleri*	rare	No known roosts in the area flight records only but early registration
Serotine bat Eptesicus serotinus	Less common	Buildings Recorded at LWC, Kew and Orleans House Gallery
Brown Long-eared bat Plecotus auritus	Becoming rare in London **Priority species**	Several roosts known at linked sites Royal Botanic Gardens

Adapted from Mitchell-Jones (2007) Authors data, LBG=London Bat Group records, 2020 Briggs/Howard 2022

Bat habitat assessment: Trees

3.7 Three trees within the line of horse chestnuts presented with multiple features of potential bat interest. These were mainly voids but also splits and loose bark.

3.8 The trees will not be affected during development but any bats using the features may be disturbed by the effects of light spillage and so a bat habitat assessment was completed during the site visit.

3.9 There was one street light at the eastern end of Cambridge Park. There were no other lights at the site. The canopy of horse chestnuts only acts as a light shield for a short time in the year as it was badly affected by the leaf miner leading to an early senescence and leaf drop.

3.10 Although too late to undertake full bat emergence surveys, a static bat detector (Anabat Express) was left for two nights at the site (15th – 17th September). Overnight temperatures were ideal, ranging between 14 – 17 degrees centigrade in fine weather conditions.

3.11 The results indicated that three species of bat were recorded: - Noctule bat, Nathusius' and soprano pipistrelle bats. None of the latter foraged at the site, but appeared to be using the tree line as a commuting route.

3.12 None of the registrations were particularly early (sunset + 35 minutes). This indicated that bats had travelled from offsite locations. Toward the end of the evening, many social calls were recorded, indicative of song flighting or mating behaviour.

Birds

3.13 Tawny owl and song thrush occurred within 200m in the Desk study and a family of woodpeckers had bred in horse chestnut trees nearby. Green woodpecker was therefore considered, due to the presence of a food source (ants) but the holes in the trees were equally suitable for great spotted woodpeckers.

3.14 Observations for breeding birds were limited by the lateness of the year, but robin families and blue and great tits were seen during the survey. A table is appended.

Table 6. Photographs a selection of important mammal and bird features

Photo. 5. Cock's foot mounds, good structural habitat

Photo 6. Yellow meadow ant mounds: sandy soil at the surface and potential green woodpecker food.

Photo 7 Fox holes NE quadrant

Photo 8 Former badger sett on garage wall.

Reptile survey

3.15 The Desk study returned results for slow worms and so the opportunity was taken to arrange ten felts and mats over the grassland. They were checked on the following dates: -

1. 20.9.22
2. 22.9.22
3. 24.9.22
4. 26.9.22
5. 28.9.22
6. 4.10.22
7. 9.10.22

3.16 The study had some limitations due to the lateness of the year but seven post - breeding visits were thought to be sufficient for a presence or absence. No reptiles were found despite optimal weather conditions.

3.17 The mats indicated the presence of a large number of active yellow meadow ants as they quickly relocated to underneath a mat.

Invertebrates

3.16 A habitat suitability scoring for invertebrates was carried out due to the sightings of predatory insect species such as hornet; colonial species such as yellow meadow ants; amount of dead wood and nearby records of stag beetle and veteran trees. The results are tabulated below and in the photographs at Table 6.

Table 7: Invertebrate habitat assessment

Habitat element	Grade	comment
Decaying wood (veteran tree score A)	A - B	Two trees with veteranized features. Standing, lying deadwood, the most important resource. Note: - the Desk study returned stag beetle record.
Rotational management (even if accidental)	E	None noted
Nectar sources (flowering trees)	A	Seasonal effect: biomass of flowering trees horse chestnut, bramble etc. One tree was in autumn flower. Unusual to see hornet present over bramble.
Wet substrates	E	None although humidity apparent.
Open water	F	None
Structural patchwork	C	No, the yellow meadow ant mound has been overgrown with ruderal species but still present
Still air (suntraps)	B	Yes,
Still air (humid, shaded)	B	Shaded under trees
Ecoclines (pertains to grading)	C	Not graded
Bare earth	C	Bare earth patches were compacted.

3.17 The potential for the site to support protected species has been assessed using criteria provided in Table ABOVE, based on the results of the desk study and observations made during the site survey of habitats at the site. The following species are present or have the potential to be present at the site:

- Foxes and hedgehogs;
- Bats;
- Breeding birds;
- Reptiles;
- Invertebrates; and
- Invasive plant species.

Table 8. Protected species assessment

Habitat/species	Status	Likelihood
Bats	HIGH	Habitat present provides all of the known key requirements for a given species. Local records are provided by desk study. Roost potential and good quality surrounding habitat and connectivity. Mitigation/ further surveys required only if mature trees removed or external lighting employed.
Badger/ fox	HIGH	Badgers forage close to the site but are no longer able to enter. Foxes occupying site. Mitigation required.
Hedgehog	MODERATE	No nests seen on site but mitigation required.
Reptiles	LOW	Surveys did not find any reptiles.
Birds	HIGH	Most of the birds recorded were representative of the woodland bird community including: a great spotted woodpecker territory Song thrushes appeared in the desk study, a priority species or those that are material in any planning process. Foraging birds included. As habitats suitable for breeding birds will be removed as part of these plans, they will be considered further in the recommendations
Other species	PRESENT	Important insect associations included yellow meadow ants; only small overgrown mounds were recorded but still active. Hornet recorded. Many grassland insects were seen no further surveys but mitigation required.
Invasive species	PRESENT	Laurel and Green alkanet

ASSESSMENT

Discussion of Findings

4.1 The proposal site is not subject to a nature conservation designation. It does not contain any priority habitats. It is situated within an urban area surrounded by residential property and roads but contains components of habitats on which several species are dependent (fox, bats woodpeckers and others).

4.2 The site contains five horse chestnut trees, including two with veteranized features. These along with the yellow meadow ant associations are of Local or neighbourhood importance.

4.3 None of the trees are thought to be affected by the proposals. Current lighting proposals are within ILP Guidelines and will be on motion sensors.

Deadwood

4.4 Dead wood, fallen, hollow and felled dead wood are important habitats, and should be retained. Stag beetle appeared in the Desk Study. They have an affinity with dead wood.

4.5 The main areas of nature conservation importance requiring mitigation are areas used by mammals and birds, are the: -

- Grassland (yellow meadow ant mounds and grassland invertebrates);
- Bramble scrub (nesting birds and fox dens);
- Horse chestnut trees with potential for nesting birds and roosting bats; and
- Dead and lying wood.

Designated Nature Conservation Sites

4.6 No impacts are envisaged on statutory or non-statutory designated sites due to the small scale of the proposal. There are some constraints to the proposed development.

4.7 Under the principle of 'net-gain' as supported by planning policy, any habitats to be removed should be compensated through new habitat of recognised value to wildlife. A landscape planting scheme with 100% native of recognised wildlife value should be implemented. A small wild – flower meadow and a pond are proposed in the scheme.

Wildflower meadow

4.8 A wildflower meadow area is proposed in the south-west corner of the site. It would be seeded with acid soil meadow mix sourced from the UK. The meadow would be approximately 12 metres long and 7 metres across at its greatest width, covering an area of some 55 square metres. Recommendations have been made as to the source of seeds and the method of delineation from amenity areas.

4.9 An intensive green roof area of some 30 square metres in area would be provided on the main roof. Extensive green roof planting covering an area of some 14 square metres would be

provided to the flat roofs of the cycle and bin stores. The full details can be seen in the Design and Access statement and the Landscape plan is appended.

Ant Mounds

4.10 The translocation of the existing dead wood and yellow meadow ant mounds will aid the natural re – colonisation of invertebrates and seeds of local provenance into this area.

4.11 Protection of the new habitats will be key and new areas should be kept as dog free or dogs under control areas. This can be ensured by a small strategically placed notice, inserted into the lease or other means. A developing habitat will not thrive in the current level of dog faeces and incursions. Removal of nutrients is key to the success of a meadow.

Wildlife Pond

4.12 The proposed wildlife pond will be roughly kidney shaped, extending some 3.2 metres by 3.6 metres providing a water coverage area of some 5 square metres with wide margins for native wildlife and flora. The water depth across the pond ranges from 150 – 600mm.

4.13 A deeper area towards the centre of the pond with shallower perimeter areas having gradually sloping sides at about 20 degrees along the longest curve and the two 'arms' of the pond would allow safe access and egress for wildlife such as hedgehogs.

4.14 The pond would be sited in the south-west corner of the site adjacent to the proposed wild flower area, and outside the root protection zone and the overhanging horse chestnut trees to avoid excessive shade and leaves fouling the water. Shade over part of the pond would help to reduce problems with algae and is tolerated by most pond flora and fauna.

4.15 The pond would be located some 1.5 metres from the building. Foundation and waterproofing design would take account of the pond and ensure that no problems arise. Rainwater from the adjacent roof terrace area would be diverted directly through a pipe to the pond. It is preferable to use rainwater than tap water; it will naturally flush through every time there's heavy rain, contributing to the rainwater attenuation.

Species Mitigation

4.16 Further survey for these species or measures to mitigate potential impacts on them are recommended.

- Bats (if mature trees are felled or external lighting not on motion sensors is proposed);
- Reptiles depending on the results of the survey;
- Breeding birds (measures to protect nesting birds);
- Fox, hedgehog; and
- Invertebrates

Birds

4.17 The proposed works require the removal of large amounts of naturalised scrub, with potential to support breeding birds. This should be carried out between September to February inclusive, to avoid any potential offences relating to breeding birds during their main bird breeding season.

4.18 Where this is not possible, a check for nesting birds up to 48 hours prior to vegetation clearance must be undertaken by an experienced ecologist and if any nests are found, the nests must be protected until such time as the young have left the nest, as confirmed by an ecologist. If any nesting birds are found at any time during clearance works, works within the immediate surroundings of the nests must stop immediately and an ecologist consulted.

Reptiles

4.19 All species of reptile are protected from killing or injuring under the Wildlife and Countryside Act 1981 (as amended). Habitats on site with potential to support reptiles were restricted to semi-improved grassland, tall ruderal vegetation, and small areas of scrub. Consequently, there low potential for reptiles to be present at the site although none were found during surveys.

4.20 Once the grassland on site is mown in October it must be maintained as a regularly-mown sward that is unsuitable for reptiles until just before works commence.

4.21 Tall ruderal vegetation, areas of longer grass, shrubs and scrub areas that may provide cover or hibernation sites must be carefully removed by hand and with hand-held tools and taken off-site.

Hedgehog

4.22 Scrub, has the potential to support hedgehog. Hedgehog are a Species of Principal Importance. Hedgehog are also protected against intentional acts of cruelty under the Wild Animals (Protection) Act 1996, making them a material consideration for planning, and as such should be protected as part of the development and habitats enhanced for these species.

4.23 Ground level vegetation clearance in the scrub and hedgerows should be undertaken outside of the hibernation period (*November – March* inclusively) and during the hedgehog active season. This will ensure any hedgehogs present are not hibernating and therefore reduce the risk of death or injury if disturbed.

4.24 Vegetation clearance could be staged; the scrubby vegetation is first cut to 30m above ground level - outside the bird breeding season in *September/October*- followed later by a second cut where the vegetation is cut close to the ground. Prior to the second cut, the area should be searched for hedgehog by a suitably qualified ecologist. If any are found, they will be moved to suitable nearby habitat.

4.25 The new development should be permeable and will be unfenced except at the eastern boundary where there will be a gap of 150mm under the fence.

Fox

4.26 Evidence of foxes was identified on site, with several holes noted. Foxes were also seen using the gardens.

4.27 All wild mammals are protected against intentional acts of cruelty under the Wild Animals (Protection) Act 1996. To avoid possible contravention, due care and attention should be taken when carrying out works with the potential to impact on the suspected fox den.

4.28 The holes should be carefully dug out using hand tools, outside of the breeding season (March to July) and the area made inhospitable to encourage animals to relocate off site. Heavy plant machinery should not be tracked over this area until confident that any foxes have moved off site.

Invertebrates

4.29 The site contains grassland to be lost and although it is species-poor there were many invertebrates associated with it particularly yellow meadow ants. As such, this habitat is considered to be of neighbourhood value and some of the better mounds should be translocated.

4.30 The mounds should be moved to the south verge (with the horse chestnut trees) as this area will be protected during the construction period before moving to the area proposed for the new meadow. The old soil will carry seeds and other invertebrates. The larger dead wood should also be protected for re-use as it is important for deadwood invertebrates such as stag beetle.

Stag beetle

4.31 The stag beetle is a globally threatened species, protected under the Wildlife and Countryside Act 1981, as amended, and listed as a priority species for the UK and London Biodiversity Action Plans. This is highlighted due to the amount of dead wood on site which should be retained.

4.32 Its distribution has contracted in the last 40 years, although it is still locally common in a number of 'hotspots' such as the Thames Valley around London. It is believed that the destruction of its key habitat – dead wood – through the 'tidying-up' of woodlands and gardens is the prime reason for its decline, although in urban areas the impacts, cats and other predators will also be significant.

4.33 The stag beetle requires dead wood to complete its lifecycle. The eggs are laid underground by logs, or stumps of dead trees, and the larva (or grub) will spend up to seven years inside slowly growing in size.

4.34 A wide range of woods are used, especially oak, but also ash, elm, sycamore, lime, hornbeam, apple, cherry and even some garden tree varieties. The larvae do not eat the wood of live trees and shrubs, and are thus not a pest. Instead, they are an important decay agent, helping to return the minerals of dead plant material to the soil.

4.35 Adults emerge from the soil beneath logs or stumps from mid-May until late July. Males emerge earlier and appear to be more active as they search for females to mate, and can often be seen flying on sultry summer evenings an hour or two before dusk. As adults they are short-lived and generally die after mating, although occasionally some may over-winter in places such as compost heaps.

RECOMMENDATIONS

4.36 Measures to avoid direct impacts to birds and mammals, as well as maintain some ecological functionality should be provided and advisory comments are made in Table 9.

Table 9. Mitigation Measures

Features	Species	Summary Mitigation
Trees	Bats	Bat surveys are not required unless trees are to be affected by lighting.
Grassland/scrub	Hedgehog Bird nests	Areas of dense vegetation due for removal should be hand searched by a suitably licenced ecologist to check for reptiles or hedgehog. Vegetation clearance should be carried out outside of the hibernation season (November to March). Late September/October is a viable window. Please note that if scrub and shrub vegetation is to be removed within the bird breeding season, a search for, and protection of, active nests will be required (see below).
Den closure	Fox	Needs to be undertaken to comply with the 1996 Mammals Act
Prevent access	ALL	Some dog control, advisory notices, will be required in the new scheme to prevent residents using the informal areas for pet exercise. Restrict access to ponds from dogs to prevent invasives being imported from nearby sites.
Movement	Hedgehog	Hedgehog push – under will be ensured under fences or access provided in soil boards.
Movement	Bats	Bats will not commute along the horse chestnut tree line if it is lit so there will be no external lighting falling onto the trees.
Invasive species	Laurel Green alkanet	Removal of invasive species should be undertaken or green alkanet will spread to the wildflower meadow.

Table 9. Mitigation Measures

Features	Species	Summary Mitigation
Net Gain	Meadow plants	 Some method of delineation from the amenity area will be required to discourage use. It can be simply done, as here, at another part of the borough. It should include the translocated yellow meadow ant mounds, which will bring with them the seeds and other associated species (see below) to make the meadow of local provenance.
Wildflower meadow		This will be seeded with acid soil meadow mix sourced from the UK. The meadow would be approximately 12 metres long and 7 metres across at its greatest width, covering an area of some 55 square metres. Depending on availability seed will be sourced from https://wildseed.co.uk/ or https://www.wildflower.co.uk/products/wildflower-seed-mixtures/80-20-wildflower-meadows-seed-mixtures/
Translocation	Yellow meadow ant mounds	These have been translocated successfully in other parts of the borough and a write up on this is attached (King 2019). Initially, a few mounds could be moved to the area beneath the horse chestnut trees, as this will be in the root protection zone.
Pond		The pond will be roughly kidney shaped, extending some 3.2 metres by 3.6 metres providing a water coverage area of some 5 square metres with wide margins for native wildlife and flora. The water depth across the pond ranges from 150 – 600mm
Green roofs		An intensive green roof area of some 30 square metres in area would be provided on the main roof with an additional 14m on the ancillary flat roofs.
Dead wood	Lying dead wood/ trunk	The dead wood in the NE quadrant should be retained as habitat and protected during development.
Bird and bat boxes	Birds and bats	2x bird and 2 x bat boxes will be sited on the non-veteran horse chestnut trees on an east and south west elevation respectively. Thermocrete boxes will be sourced from NHBS but the models are not specified here due to problems of availability. https://www.nhbs.com/4?slug=bird-boxes

LEGISLATION AND POLICY

5.1 The Natural Environment and Rural Communities (NERC) Act came into force 1st Oct 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The list has been drawn up in consultation with Natural England, as required by the Act.

5.2 There are 56 habitats of principal importance included on the S41 list. These are all the habitats in England that were identified as requiring action in the UK Biodiversity Action Plan (UK BAP) and continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework.

5.3 Richmond's Biodiversity Action Plan (BAP) is a material consideration within any future plans. The plans exist to:

- Effectively conserve wildlife and remedy deficiencies;
- Develop targets and action plans for the conservation of habitats and species that are of international, national, regional, or local importance;
- Promote access to and enjoyment of wildlife; and
- Resolve conflicts between nature conservation and other interests
- Assist in achieving Net Gain within the planning process.

Badgers

5.4 The Badger is protected in Britain under the *Protection of Badgers Act 1992* and *Schedule 6* of the *Wildlife and Countryside Act 1981* (as amended). The legislation affords protection to Badger and Badger setts, and makes it a criminal offence to:

- wilfully kill, injure, take, possess, or cruelly ill-treat a Badger, or attempt to do so;
- interfere with a sett by damaging or destroying it;
- to obstruct access to, or any entrance of, a Badger sett; or to disturb a Badger when it is occupying a sett.

Mammals

5.5 Foxes are not given protection *pers se* but The Mammals Protection Act 1996 requires that animals are humanely removed from development sites. This means that animals should be removed by a licensed pest controller so that cruelty and suffering are avoided. This includes paying due regard to any cubs or dependant young.

Birds

5.6 All species of bird are protected under *Section 1* of the *Wildlife and Countryside Act 1981* (as amended). The protection was extended by the *Countryside and Rights of Way Act 2000*. The legislation makes it an offence to intentionally or recklessly:

- kill, injure or take any wild bird;
- take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
- take or destroy an egg of any wild bird.

Certain species of bird such as the kingfisher are listed on *Schedule 1* of the *Wildlife and Countryside Act 1981* (as amended) and receive protection under *Sections 1(4)* and *1(5)* of the Act. The legislation confers special penalties where the above-mentioned offences are committed for any such bird and make it an offence to intentionally or recklessly:

- disturb any such bird, whilst building its nest or it is in or near a nest containing dependant young; or
- disturb the dependant young of such a bird.

Non-native invasive weed species

5.7 Under the Wildlife and Countryside Act, 1981, it is an offence to allow the spread of Japanese knotweed into the wild and all waste containing Japanese Knotweed comes under the control of Part 11 of the Environmental Protection Act. This means that no part of the plant can be disposed of at the local waste transfer station or be put into sacks for the weekly refuse collection.

REFERENCES

Archer 1993 London Ecology Unit Handbook 21,

HMSO (2000) Countryside and Rights of Way Act 2000. HMSO, London.

HMSO (2006) Natural Environment and Rural Communities Act 2006. HMSO, London.

HMSO (2000) Conservation of Habitats and Species Regulations 2010. HMSO.

King, T., 2019 A technique for the translocation of ant colonies and termite mounds to protect species and improve restoration efforts

Emorsgate seeds https://wildseed.co.uk/

Joel Ashton wildlife ponds https://www.youtube.com/watch?v=lKrjMv6TMlU

Notes

Statutory designations include Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR).

Non-statutory sites are designated by local authorities (e.g. Sites of Importance for Nature Conservation or Local Wildlife Sites).

Legally protected species include those listed in Schedules 1, 5 or 8 of the Wildlife and Countryside Act 1981; Schedule 2 of the Conservation of Habitats and Species Regulations 2017; or in the Protection of Badgers Act 1992 (as amended).

Species of Principal Importance are those listed on Section 41 of the Natural Environment and Rural Communities Act, 2006.

Notable species include Species of Principal Importance under the Natural Environment and Rural Communities Act 2006; Local Biodiversity Action Plan (LBAP) species; Birds of Conservation Concern (Eaton et al., 2015); and/or Red Data Book/nationally notable species (JNCC, undated).

Notable habitats include Habitats of Principal Importance under the Natural Environment and Rural Communities Act, 2006; those included in an LBAP; Ancient Woodland Inventory sites; and Important Hedgerows as defined by the Hedgerow Regulations 1997.

APPENDIX 1

Characteristic plants and bird species

Table 10: Characteristic plants 15.9.22

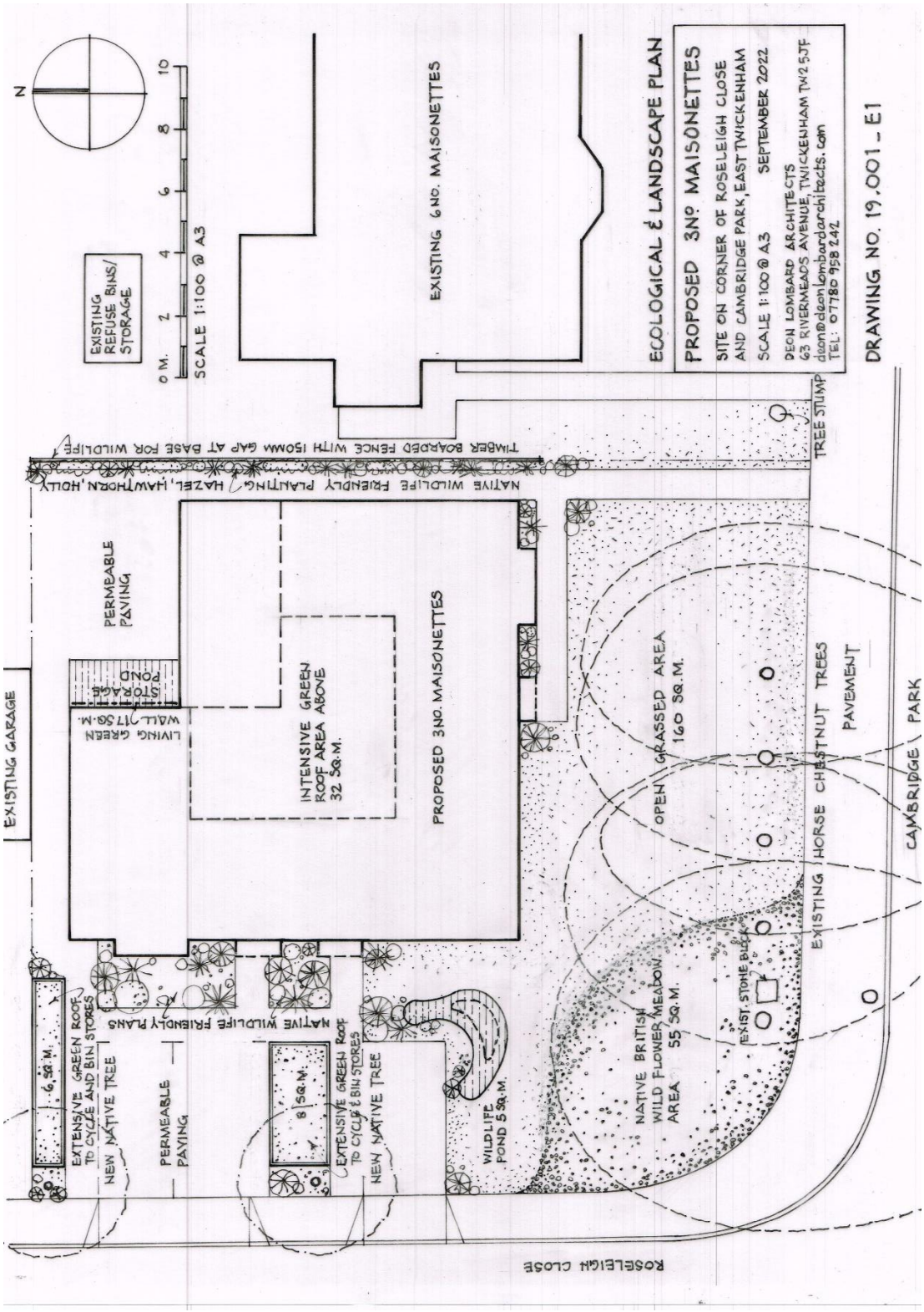
Scientific name	English name
Rubus fruticosus agg.	Bramble
Prunus laurocerasus	Cherry Laurel
Dactylis glomerata	Cock's-foot
Stellaria media	Common Chickweed
Senecio jacobaea	Common Ragwort
Taraxacum agg.	Dandelion
Arrhenatherum elatius	False Oat-Grass
Plantago major	Greater Plantain
Pentaglottis sempervirens	Green Alkanet
Corylus avellana	Hazel
Aesculus hippocastanum	Horse-chestnut
Ranunculus acris	Meadow Buttercup
Aster agg.	Michaelmas Daisy
Euphorbia peplus	Petty Spurge
Festuca ovina	Sheep's-fescue
Cyclamen hederifolium	Sowbread
Helianthus annuus	Sunflower
Viola odorata	Sweet Violet
Lycopersicon esculentum	Tomato
Clematis vitalba	Traveller's-joy
Holcus lanatus	Yorkshire-fog

Table 11: Characteristic bird species 15.9.22

Scientific name	**English name**
Parus caeruleus	Blue Tit
Columba palumbus	Wood Pigeon
Erithacus rubecula	Robin
Parus major	Great Tit
Prunella modularis	Dunnock
Psittacula krameri	Rose-ringed Parakeet

Appendix 2

Ecology and Landscape Plan as supplied by Deon Lombard Architects Oct. 22



Ecology and Landscaping Plan Deon Lombard 2022

Appendix 3 Proposed wildlife pond and notes as supplied by Deon Lombard Oct. 22

Size and Shape
The proposed wildlife pond would be roughly kidney shaped, extending some 3.2 metres by 3.6 metres providing a water coverage area of some 5 square metres with wide margins for native wildlife and flora. The water depth across the pond ranges from 150 – 600mm, which would suit the majority of pond flora and fauna to encourage a well-rounded ecosystem.

A deeper 'well' with a depth of about 600mm would be located towards the centre of the pond. Shallower perimeter areas having gradually sloping sides at about 20 degrees along the longest curve and the two 'arms' of the pond would allow safe access and egress for wildlife such as hedgehogs.

Siting

The pond would be sited in the south-west corner of the site adjacent to the proposed wildflower area, and outside the root protection zone and the overhanging horse chestnut trees to avoid excessive shade and leaves fouling the water. Shade over part of the pond would help to reduce problems with algae and is tolerated by most pond flora and fauna.

However, it is also important that the pond enjoys full sunlight from time to time. An open westerly aspect would ensure that this would be the case, with the water warming in spring making it more attractive to spawning frogs and toads.

The pond would be located some 1.5 metres from the building. Foundation and waterproofing design would take account of the pond and ensure that no problems arise. Rainwater from the adjacent roof terrace area would be diverted directly through a pipe to the pond. It is preferable to use rainwater than tap water; it will naturally flush through every time there's heavy rain, contributing to the rainwater attenuation.

Construction

Excavate a hole to the correct shape and size, some 200 – 300mm deeper than the finished water depths to allow for the installation of the pond lining and subsoil base layer. Install a waterproof butyl sheet with underfelt layers below and above, allowing for a 150 - 300mm depth for a tamped subsoil pond base layer over the full extent of the pond.

Trim the exposed lining edge to the shape of the pond, conceal with soil and edging stones/boulders well bedded in to form perches for insects, birds and concealed spaces for pondlife below. Distribute cobbles and pebbles in the shallow water areas, making it easier for wildlife to enter and exit the pond.

Gradually fill the pond, preferably with rainwater. If tap water is used, it should be left to naturalise for at least a week before adding any plants. No fish are to be added to the pond. Native wildlife would naturally populate the pond.

Pond Plants

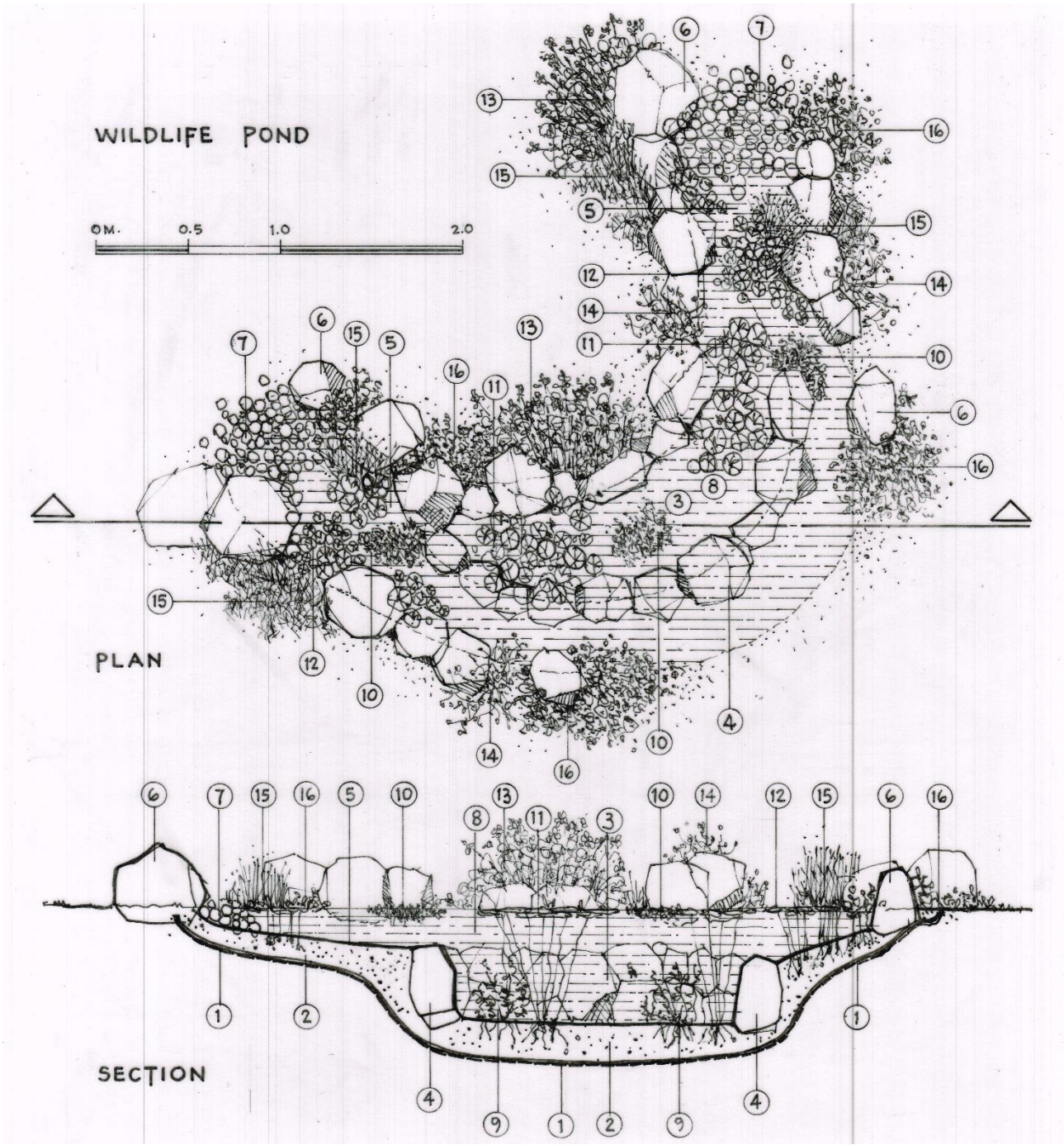
Adding plants to a pond is essential as they help to keep the water clean, clear, oxygen-rich and prevent algae from taking over. There are four categories of native pond plants for locating in and around ponds. The following pond plants are proposed:

Submerged (oxygenating) plants
Rigid hornwort (*Ceratophyllum demersum*) - an excellent native oxygenator for small ponds.
Water violet (*Hottonia palustris*).

Floating plants
Fringe lily (*Nymphoides peltata*) - roots under water providing a dense cover and algae control.
Frogbit (*Hydrocharis morsus-ranae*) - floats on the surface of the water.

Marginal plants
Marsh marigold (*Caltha palustris*) - provides an early source of pollen for bees and hover flies.
Lesser Spearwort (*Ranunculus flammula*).

Marsh plants
Pillwort (*Pilularia globulifera*) - the UK's only aquatic fern, currently in decline.
Brooklime (*Veronica beccabunga*).



1. Pond waterproof lining comprised of triple layer: butyl rubber waterproofing sheet sandwiched between underfelt layers
2. Subsoil base layer to pond varying in thickness from 150 – 300mm
3. Nominal 600mm deep 'well' with level bottom towards centre of pond
4. Rocks to 'well' perimeter retaining soil
5. Shallower water depth ranging from about 250 – 150mm to pond margins with sloping sides at about 20 degrees
6. Selected rocks/boulders arranged and bedded around pond perimeter
7. Cobbles and pebbles on shallower water shelf
8. Pond filled with rainwater
9. Water violet (*Hottonia palustris*)
10. Rigid hornwort (*Ceratophyllum demersum*)
11. Fringe lily (*Nymphoides peltata*)
12. Frogbit (*Hydrocharis morsus-ranae*)
13. Marsh marigold (*Caltha palustris*)
14. Lesser Spearwort (*Ranunculus flammula*)
15. Pillwort (*Pilularia globulifera*)
16. Brooklime (*Veronica beccabunga*)

References

Royal Horticultural Society, *RHS Encyclopedia of Gardening* Chapter 10 Water Gardening, Christopher Brickell (ed), Dorling Kindersley, ISBN 9781409383949 (2012)

World Wildlife Trust, www.org.uk

Royal Society for the Protection of Birds, www.rspb.org.uk

Joel Ashton: How to Make the Ultimate Wildlife Pond, u-tube video