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Procter & Gamble Ltd

P&G Reading Innovation Centre

Preliminary Ecological Appraisal



Procter & Gamble Ltd
P&G Reading Innovation Centre
Preliminary Ecological Appraisal
and Bat Suitability Assessment

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It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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Ove Arup & Partners Ltd
13 Fitzroy Street
London
W1T 4BQ
United Kingdom
www.arup.com

ARUP

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1 Summary

Ove Arup and Partners Ltd. were commissioned by Procter & Gamble UK to undertake an extended Phase 1 Habitat survey and bat suitability assessment for the Reading Plant site in Berkshire, hereafter referred to as 'the site'. The report reviews relevant legislation, planning policy and guidance, describes the results of the survey and desk study and outlines recommendations for mitigation, enhancements and further survey work.

An extended Phase 1 Habitat survey of the site was undertaken on 13th June 2016, in accordance with current guidelines by two suitability experienced ecologists. Information obtained from this survey has been supplemented by an ecological data search, where information on statutory and non-statutory sites and protected or otherwise notable species records was obtained within 2km of the site.

There are eight non-statutory sites within 2km of the site, with the nearest being River Kennet/ Kennet and Avon Canal Local Wildlife Site, located approximately 0.7 km north-west. All of the non-statutory sites were assessed as being sufficiently isolated from the site, as such they are not expected to be affected by the proposed development.

Buildings and hardstanding dominate the site, with limited areas of introduced shrub, amenity grassland and scattered trees. Wall spray *Cotoneaster horizontalis* a Schedule 9¹ species was also recorded on site. Two buildings located within the construction zone have moderate to low potential to support roosting bats. Vegetation on site provides potential nesting habitat for birds, including protected or otherwise notable species previously recorded in the surrounding area, and for an array of invertebrates including mining bees, recorded to the north of the site.

A bat emergence and re-entry survey has been undertaken for Building B1 and Building D and no evidence of roosting bats found. Recommendations for measures that should also be employed to prevent unnecessary harm to wild mammals during site preparation and construction have also been made. The clearance of any vegetation should be programmed outside of the main breeding bird season (March to August inclusive), to avoid disturbance of and harm to nesting birds. If this is not possible, a suitably qualified ecologist should check for the presence of breeding birds prior to the commencement of work.

Enhancements should be incorporated into the proposed development to ensure a net gain in biodiversity in accordance with the planning policy. Consideration should be given to green and brown roofs as well as green walls. Green roofs should comprise biodiverse wildflower roofs and brown roofs should be left to colonise naturally. Native species should be incorporated, including appropriate trees, shrubs and ground flora. The proposed buildings should incorporate bat and bird boxes.

¹ Her Majesty's Stationery Office (HMSO), (1981); 'Wildlife and Countryside Act 1981.'

2 Introduction

2.1 The project

Ove Arup and Partners Ltd. were commissioned by Procter & Gamble (P&G) UK to undertake an extended Phase 1 Habitat survey and bat suitability assessment for their Reading Plant in Berkshire. The site predominantly comprises buildings and hardstanding (see Appendix A), with areas of ornamental planting. This proposed development is located south of Reading town centre on the B3031 Basingstoke Road and is surrounded by areas of residential housing to the east and west and industrial units to the north and south.

The proposed development is of a two storey research and development facility within Procter and Gamble's existing Reading site. The facility will comprise laboratories, offices, storage warehousing, associated access, car parking and hard and soft landscaping works. The works comprise:

- Demolition of the south-western wing of the existing Gillette building, the ground floor security gatehouse and ancillary sub-station and external store buildings;
- Refurbishment of the southern half of the retained Gillette building and erection of a rear extension in the form of a new research and development office and laboratory accommodation (Class B1) and associated storage warehousing (Class B8);
- Refurbishment of the façade of the northern half of the retained Gillette building;
- Provision of a 190 space multi-storey car park to the south of the Gillette building formed of four storeys comprising eight levels. Further parking at grade, adjacent and in the currently vacant land to the north and rear of the existing Gillette building;
- Ancillary plant and engineering works including switch room, generator and transformer buildings;
- Associated hard and soft landscaping works, including access and circulation; and
- Formation of a new northern vehicular access to the application site.

This report presents the findings of the extended Phase 1 Habitat survey and bat suitability assessment, alongside desk study data obtained from local record centres. It details recommendations for mitigation, enhancements and further surveys, as necessary, in order to:

- Provide information on the type, location, extent and distribution of habitats on the site;

- Review the potential of the site to support protected or otherwise notable species;
- Identify key ecological constraints to the proposed development and inform the need for further ecological surveys;
- Assess the implications of the findings in relation to the proposed development and, where appropriate, recommend suitable mitigation and/or enhancements to ensure compliance with planning policy and legislation; and
- Advise on any further survey work that may be required to ensure legal compliance or to further inform the detailed design process.

2.2 Authors

This report was written by Lexie Slingerland and Kate Harrington, both of whom are members of the Chartered Institute of Ecology and Environmental Management (CIEEM).

Kate is a Chartered Environmentalist and full member of CIEEM, having gained over six years of experience providing professional ecological consulting services, since completing a BSc (Hons) in Biology and MRes in Ecological and Environmental Sciences both from the University of Southampton. Kate has experience in a broad range of protected species and extended Phase 1 Habitat surveys, and is has in depth understanding of ecological assessment, having produced the ecological input for BREEAM, Ecological Impact Assessment and Preliminary Ecological Assessment reports. Kate has also undertaken a variety of post-application works including, soft strip and exclusion of bats, reptile and great crested newt translocation and ecological clerk of work roles, and has previous experience of working for nature conservation bodies. She currently holds a Level 2 bat class licence, and Level 1 great crested newt class licence.

Lexie is currently a graduate member of CIEEM and has gained experience with the planning and management of a diverse range of ecology projects, including scheduling surveys, managing resources, public interface, and producing outputs and reporting. Her survey experience includes Phase 1 Habitat Surveys, bats, badger, water vole, reptile and great crested newt surveys. Lexie also holds a Natural England survey licence for great crested newts.

3 Planning policy and legislation

3.1 Planning policy

The following national planning policies are relevant for this site:

- The Natural Environment White Paper 2011² sets measures to protect and improve the health of ecosystems. It recognises that nature works as a system with a variety of functions and benefits (ecosystem services), that ecological networks are at a landscape scale and also introduces biodiversity offsetting to ensure that developments have no loss of biodiversity overall;
- National Planning Policy Framework³ (NPPF) states that ‘the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and should provide net gains in biodiversity, contribute to the Government’s commitment to halt the overall decline in biodiversity by establishing coherent ecological networks that are more resilient to current and future pressures’;
- UK Post-2010 Biodiversity Framework 2012⁴ sets out a structure for action across the UK between now and 2020. It aims to help deliver the 20 Aichi targets set out within the Convention of Biological Diversity Strategic Plan for Biodiversity 2011–2020⁵ and the EU Biodiversity Strategy 2011⁶. A major commitment is to produce a National Biodiversity Strategy and/or Action Plan (NBSAP);
- Biodiversity 2020⁷ targets actions in order to halt the loss of England’s biodiversity by 2020. It also includes actions to contribute to international commitments including integrating large-scale approach to conservation on land and sea, putting people at the heart of biodiversity policy, reducing environmental pressures and improving our knowledge;
- Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006⁸ lists living organisms and habitats of principal importance for the purpose of conserving biodiversity, and includes priority species and habitats listed under the UK Biodiversity Action Plan (BAP). Within Berkshire, 788 priority species have been recorded and include stag beetle *Lucanus cervus*, great crested newt *Triturus cristatus* and sand lizard *Lacerta agilis*;

² HM Government, (2011); ‘The Natural Choice: securing the value of nature.’ Available at: <https://www.gov.uk/government/publications/the-natural-choice-securing-the-value-of-nature>. Accessed June 2016.

³ Department for Communities and Local Government, (2012); ‘National Planning Policy Framework.’ Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>. Accessed June 2016.

⁴ UK Post-2010 Biodiversity Framework. Available at: <http://jncc.defra.gov.uk/page-6189>. Accessed June 2016.

⁵ Strategic Plan for Biodiversity 2011 – 2020. Available at: <https://www.cbd.int/sp/>. Accessed June 2016.

⁶ EU Biodiversity Strategy to 2020. Available at: <http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm>. Accessed June 2016

⁷ Department for Environment, Food and Rural Affairs, (2011), ‘Biodiversity 2020: A strategy for England’s wildlife and ecosystem services.’ Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf. Accessed June 2016.

⁸ Secretary of State, (2010); ‘Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 - Habitats and Species of Principal Importance in England.’

- The UK BAP is a detailed plan for conserving key habitats and species considered to be of particular significance within a UK and was produced in accordance with the 1992 UN Convention on Biological Diversity. The UK Post-2010 Biodiversity Framework has now succeeded the UK BAP, however lists of priority species and habitats remain as an important reference source; and
- Birds of Conservation Concern⁹ (BoCC) has assessed a total of 244 UK bird species and placed each into one of three lists indicating an increasing level of conservation concern. Currently 67 species are of 'highest conservation concern' (Red list).

The following local planning policies are relevant for this site:

- The Berkshire Biodiversity Strategy¹⁰ is targeting halting the loss of biodiversity by working at the local level to identify and implement opportunities to protect the natural environment. Berkshire priority species include house sparrow *Passer domesticus*, Eurasian tree sparrow *Passer montanus*, noctule bat *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus* and brown long-eared bat *Plecotus auritus*;
- Reading Core Strategy 2008¹¹ sets out the Council's adopted planning strategy for the Borough. It has a vision to maintain and enhance the quality of landscape and biodiversity features, to ensure that components of biodiversity are used sustainably, and that previously developed land containing significant biodiversity will be retained and incorporated into development; and
- The Reading Borough - Sites and Detailed Policies Document.–¹² provides the detailed planning policies and identify the specific development sites and designations necessary to deliver the Reading Core Strategy.

3.2 Legislation

The following legislation is relevant for this site:

- Wildlife Countryside Act 1981¹³ (as amended) (WCA) is the primary means of protecting wildlife in the UK, including all wild birds and their

⁹ Eaton, M., Aebisher, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Nobel, D., Stroud, D. and Gregory, R., (2015), 'Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds, Dec 2015. Available at: <https://www.britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf>. Accessed June 2016.

¹⁰ Berkshire Local Nature Partnership, (2014), 'The Natural Environment in Berkshire, Biodiversity Strategy 2014-2020.' Available at: <http://berkshirelnp.org/images/Biodiversity%20Strategy%20Small.pdf>. Accessed June 2016.

¹¹ Reading Borough Council, (2012) 'Reading Borough Local Development Framework- Sites and detailed policies document.' Available at <http://www.reading.gov.uk/media/1046/Core-Strategy-Adopted-January-2008/pdf/Core-Strategy-Adopted-Jan08-Altered-Jan15.pdf>. Accessed June 2016.

¹² Reading Borough Council, (2008) 'Reading Borough Local Development Framework- Core Strategy.' Available at <http://www.reading.gov.uk/media/1049/Sites-and-Detailed-Policies-Adopted-October-2012/pdf/SDPD-Adopted-Oct12-Altered-Jan15.pdf>. Accessed June 2016.

¹³ Her Majesty's Stationery Office (HMSO), (1981); 'Wildlife and Countryside Act 1981.'

nests and certain animals and plants. This legislation makes it an offence to kill, injure or take any wild bird or to take, damage or destroy the nest of any wild bird while that nest is in use or being built. Special penalties are given for these offences when related to birds listed on Schedule 1. The WCA makes it illegal to intentionally disturb any wild bird listed in Schedule 1 of the Act while it is building a nest or is in, or near a nest containing eggs or young or to disturb the dependent young. It also prohibits the planting in the wild or causing the growth of invasive species listed in Schedule 9 of the Act;

- The Conservation of Habitats and Species Regulations 2010¹⁴ (as amended) (Habitats and Species Regulations 2010) provides protection for European Protected Species (EPS), including bats and their habitats;
- Countryside and Rights of Way (CROW) Act 2000¹⁵ strengthens the WCA in relation to threatened species and requires the publication of a list of living organisms and habitat types considered to be of principal importance in conserving biodiversity (the former UK Biodiversity Action Plan¹⁶). This ensures that Government Departments have regard for the conservation of biodiversity;
- Natural Environment and Rural Communities (NERC) Act 2006¹⁷ requires the publication of a list of organisms and habitat types considered to be important in conserving biodiversity in consultation with Natural England (the Section 41 list¹⁸) and extended the requirement to have regard for conserving biodiversity to all public authorities; and
- Wild Mammals (Protection) Act 1996¹⁹ makes it an offence to intentionally cause any unnecessary suffering by certain methods, including crushing and asphyxiation to wild mammals.

¹⁴ HMSO, (2010); 'The Conservation of Habitats and Species Regulations 2010.'

¹⁵ HMSO, (2000); 'Countryside and Rights of Way Act 2000.'

¹⁶ UK Biodiversity Standing Committee, (2007); 'UK Biodiversity Action Plan Priority Species and Habitats.' Available at: <http://jncc.defra.gov.uk/page-5705>. Accessed June 2016.

¹⁷ HMSO, (2006); 'Natural Environment and Rural Communities Act 2006.'

¹⁸ Secretary of State, (2010); 'Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 - Habitats and Species of Principal Importance in England.'

¹⁹ HMSO, (1996); 'Wild Mammals (Protection) Act 1996.'

4 Methodology

4.1 Desk study

In June 2016, an ecological data search was undertaken for information on statutory and non-statutory sites and protected or otherwise notable species records held by the following resources:

- Thames Valley Environmental Records Centre, including data on:
 - Boundaries of sites of wildlife importance (statutory & non-statutory sites and other nature reserves);
 - Descriptions of sites of wildlife importance (not available for all sites);
 - Records for legally protected species;
 - Records for designated (notable) but not legally protected species;
 - Records of invasive species;
 - Information on habitats including NERC Act S41 Habitats of Principal Importance (previously called UKBAP priority habitats); and
 - Conservation Target Areas and Biodiversity Opportunity Areas;
- Berkshire Ornithological Club for bird records; and
- The Berkshire and South Buckinghamshire Bat Group for bat records.

The data search was centred at Ordnance Survey national grid reference SU 71600 70481 and covered the site and immediate surrounds to a 2 km radius. Only records of protected and notable species dated from within the last 10 years were considered in the baseline review. Records older than 10 years are no longer considered to be representative of the status of biodiversity in the local area, due to the changes in habitats over time and resulting changes in species distribution.

4.2 Field survey

An extended Phase 1 Habitat survey of the site was undertaken on 13th June 2016 under suitable weather conditions, by Arup ecologists Kate Harrington and Lexie Slingerland. The survey followed the Joint Nature Conservation Committee (JNCC) Phase 1 Survey Guidelines²⁰. The site was systematically walked over, and species indicative of each habitat type were recorded where present. Target notes have been used to provide additional descriptions of particular note, including key and characteristic plant species, sensitive or valuable ecological habitats and areas with suitability for protected species where they exist. The

²⁰ Joint Nature Conservation Committee (JNCC), (1993); 'Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit, Revised Reprint 2010.' JNCC. Peterborough. Available at: http://jncc.defra.gov.uk/PDF/pub10_handbookforphase1habitatsurvey.pdf. Accessed June 2016

survey included a search for invasive species listed on Part II of Schedule 9 of the WCA¹³.

The survey was ‘extended’ to also assess the potential of the site to support protected and notable species, with a particular focus on bats. The site was evaluated for its suitability to support foraging, commuting and roosting bats. Trees and buildings on site were assessed for their potential for use by roosting bats, and where possible, structures were internally inspected. Habitats recorded within the site boundary were assessed taking into account the wider environment, to identify any habitats with the potential to be utilised as foraging or commuting resources. The assessment of the proposed development site for bats was carried out in accordance with the Bat Conservation Trust’s good practice guidelines (see Table 1).²¹

Table 1: Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement (Bat Surveys for Professional Ecologists, 2016).

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by

²¹ Bat Conservation Trust, (2016); ‘Bat Surveys for Professional Ecologists; Good Practice Guidelines. 3rd Edition.’

	their size, shelter, protection, conditions and surrounding habitat.	commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree lined watercourses and grazed parkland. Site is close to and connected to known roosts.
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4.2.1 Limitations

No account can be made for the presence or likely absence of a notable or protected species on any one survey occasion, since they may travel over wide areas and/or have large home ranges. Species may return to or colonise a site at any future time. This is not considered to be a significant limitation in this instance, as a professional judgement allows for the likely presence of these species to be predicted with some certainty for this site. Further surveys would be recommended if required.

5 Baseline ecological conditions

5.1 Designated sites

No statutory designated sites were identified within 2km of the site. However, eight non-statutory designated sites were identified within the search radius.

Table 2 describes each non-statutory site identified within 2km of the site. The closest is River Kennet/Kennet and Avon Canal Local Wildlife Site (LWS) located 0.7 km north-west. Considering the scale and nature of the proposed development, and the isolated nature of the site from all recorded non-statutory designated sites, it is considered unlikely that there would be a potential for these sites to be affected by the proposed development.

Table 2: Non-Statutory Sites within 2 km of the Site.

Site Name	Approximate Distance and Direction from the site (km)	Description
River Kennet/ Kennet and Avon Canal LWS	0.7 km north-west	The River Kennet is one of the best examples of a chalk river nationally, and is an UK BAP Priority Habitat. The Kennet & Avon Canal section is also fed by water from the River Kennet and is also calcareous in nature. Supports mute swan <i>Cygnus olor</i> and cuckoo <i>Cuculus canorus</i> .
The Cowsey LWS	0.9 km east	This west-facing hillside stretches over 17.8 hectares (ha) and is largely covered by mature scrub and broadleaved woodland which surrounds grassy enclaves. There are natural springs, one supporting a ribbon of wetland plants in a shallow valley, one feeding a small pond and another drains an area of mature woodland. Some grassland areas are locally damp and support patches of rushes. There are fragments of richer grassland by the north-western boundary and sandy, acidic grassland occurs in an area rich with large anthills. The site is lowland mixed deciduous woodland (Section 41 habitat of principle importance) and supports 11 ancient woodland indicator species.
Fobney and Kennet Valley Meadows LWS	1.0 km north-west	A large area of permanent pasture with some wet grassland and patches of swamp vegetation. The site has a good series of ditches, with tall wetland and aquatic species and a small area of woodland. Dragonflies and damselflies seen here include the common darter <i>Sympetrum striolatum</i> , banded demoiselle <i>Calopteryx splendens</i> and common hawker <i>Aeshna juncea</i> .
Shinfield Park, Nores Hill LWS	1.4 km south-east	A mixture of woodland including areas of semi-natural ancient woodland. These areas have a canopy of ash <i>Fraxinus excelsior</i> and oak <i>Quercus robur</i> with hazel <i>Corylus avellana</i> coppice below. Dormouse <i>Muscardinus avellanarius</i> has been recorded at this site in 1987.
Whitely Park Farm/St	1.4 km north-east	A diverse site based in the grounds of the Reading University Student Village, but squeezed between accommodation blocks, housing estate and a public open space. The site is

Patrick's Hall LWS		important in holding mixed broadleaved semi-natural woodland and a range of associated habitats, including two ponds, both very different in character – one open and one enclosed. The woodland has some mature oak and ash with abundant suckering elm <i>Ulmus minor var. vulgaris</i>, some of which is now quite tall. Sycamore <i>Acer pseudoplatanus</i> is establishing in abundance in places and some exotic species have been planted in some areas. Willows <i>Salix sp.</i> are found along the outflow of the pond. The site is important however, for its bird fauna holding a number of species listed on both the red and amber lists as BoCC. The site is lowland mixed deciduous woodland (Section 41 habitat of principle importance) and supports bullfinch <i>Pyrrhula pyrrhula</i>, linnet <i>Carduelis cannabina</i>, lesser spotted woodpecker <i>Dendrocopos minor</i>, spotted flycatcher <i>Muscicapa striata</i> and song thrush <i>Turdus philomelos</i> (Section 41 species of principle importance).
Holy Brook LWS	1.5 km north	The central section it flows through the Fobney and River Kennet Meadows. To the east its course is adjacent to housing and through commercial and industrial areas. The site ends at the Reading Inner Distribution Road. Here the Brook is canalised within concrete revetments which are absent in the rest of its length. Alder <i>Alnus glutinosa</i> and willows line the banks and a variety of wetland species are found along the banks. A number of notable invertebrates have been recorded in Holy Brook and water vole has been recorded in the central and western sections. The Holy Brook LWS is Chalk River (Section 41 habitat of principle importance) and supports house sparrow and mute swan.
The Grove LWS	1.7 km south-east	A small mosaic of rank grassland, scrub, secondary woodland, broadleaved plantation and two ponds completely enclosed by roads towards the north of Shinfield. The majority of the site consists of a mosaic of scrub and a tall grassland sward which is dominated by forbs. Scrub is encroaching throughout the sward, where it ranges from scattered hawthorn <i>Crataegus monogyna</i>, to dense areas of bramble <i>Rubus fruticosus</i> with young sapling oak, hawthorn and ash. Towards the north lies an area of scrubby, relatively disturbed secondary woodland. The canopy is predominately ash and oak (relatively young) over a mix of hawthorn, field maple <i>Acer campestre</i>, hazel and elder <i>Sambucus nigra</i>. Mixed tree planting has occurred with species such as ash, pine <i>Pinus sp.</i>, hawthorn and the occasional dogwood <i>Cornus sanguinea</i>, whitebeam <i>Sorbus aria</i> and wayfaring <i>Viburnum lantana</i> tree.
Great Lea Pond LWS	1.9 km south	Great Lea Pond consists of a mosaic of silted pools and bare mud, now heavily shaded by willow scrub, which is grading into secondary woodland. Most of the pools have no emergent vegetation due to dense shading. The main interest of the site is the population of water-violet <i>Hottonia palustris</i>, which is located throughout the pools and particularly in the most open area, towards the north. The dense scrub/secondary woodland has a canopy of willow with some oak and ash and an understorey of elder, hawthorn and blackthorn <i>Prunus spinosa</i>.

5.2 Habitats

A Phase 1 Habitat Map detailing the findings of the habitat survey is shown in Appendix A. The habitats recorded on the site are listed below, in addition to their associated alphanumeric reference codes, as detailed in the JNCC Phase 1 Habitat Guidelines:

- Buildings (J3.6);
- Introduced shrub (J1.4);
- Amenity grassland (J1.2);
- Broadleaved scattered trees (A3.1);
- Tall ruderal (C3.1);
- Bare ground (J4);
- Ephemeral/short perennial (J1.3); and
- Scattered scrub (A.2).

The site is dominated by buildings and hardstanding. There are areas of well-maintained amenity grassland and ornamental introduced scrub planting surrounding building entrances and car parking areas (within the south-east quarter of the site).

Six cherry *Prunus avium* trees were recorded at the main entrance (east of the site), five scattered ornamental trees and two silver birch *Betula pendula* were recorded in the car park (south-east corner of the site) and three copper beech *Fagus sylvatica* 'Purpurea' trees were scattered around the central car parking area.

There is a small area of scattered shrub comprising cherry to the west of Building A.

An area of tall ruderal grassland is present surrounding the access roads to the north of the site, the area surrounding Building H is trimmed periodically.

5.3 Species and species groups

5.3.1 Plants

No notable plant species were identified on site or within 2 km of the site.

Wall spray was identified at two locations within the survey area. The locations are identified as TN1 within Appendix A. Wall spray is listed within Schedule 9 of the WCA¹³, which makes it an offence to plant or cause this species to grow in the wild.

5.3.2 Invertebrates

A search of local biodiversity records identified that, stag beetle have previously been recorded 1.5km northeast of the site.

Mining bees *Andrena* sp. were identified within the tall ruderal area to the north of the site (see TN2 Appendix A). An entomologist would be required to confirm the species and whether it is notable, however, the colony is outside of the construction boundary, and will not be disturbed by construction activities. Given that the site lacks the diversity of plant species and habitats associated with stag beetle and other notable invertebrate assemblages, it is considered unlikely that the site supports notable invertebrate assemblages.

5.3.3 Amphibians

Common frog *Rana temporaria* has been recorded within 600m of the site, to the east and the west, and smooth newt *Lissotriton vulgaris* has been recorded 1.4km north-east of the site. No great crested newts *Triturus cristatus* have been recorded within 2km.

There are no waterbodies or suitable amphibian habitat recorded on site, therefore, amphibians are unlikely to be present onsite.

5.3.4 Reptiles

Slow worm *Anguis fragilis* have been recorded within 600m south and grass snake *Natrix natrix* have been recorded 1.6km north-west and south of the site.

There is a lack of suitable habitat onsite for reptile, in addition, grass snake is typically associated with water. Considering current disturbance at the site associated with the maintenance of the amenity grassland and lack of connectivity to suitable habitat outside the site, it is unlikely that any reptiles occur at the site.

5.3.5 Birds

There have been no recent records for black redstart *Phoenicurus ochruros* with the last recording in November 2005. However, recent clearance works onsite (see TN3 Appendix A) have created areas of suitable foraging habitat for this species, and black redstart may move back into this area in the future.

With respect to the Schedule 1¹³ bird species, the site lacks suitable foraging or nesting habitat for barn owl *Tyto alba*, hobby *Falco subbuteo*, osprey *Pandion haliaetus*, goshawk *Accipiter gentilis* and peregrine *Falco peregrinus* all of which have been recorded within 2 km of the site. Brambling *Fringilla montifringilla*, redwing *Turdus iliacus*, fieldfare *Turdus pilaris* and firecrest *Regulus ignicapillus* have also been recorded within 2km of the site. However, these species are migratory species that winters in the UK or breed further south and are therefore highly unlikely to breed at the site.

The scattered trees and introduced shrub on site provides suitable foraging and nesting habitat for a number of bird species. This includes species listed on the BoCC that have been recorded in the surrounding area, such as starling *Sturnus vulgaris*, house sparrow, swift *Apus apus*, black-headed gull *Chroicocephalus ridibundus*, lesser black-backed gull *Larus fuscus*, common gull *Larus canus*, stock dove *Columba oenas* and song thrush.

Red kite *Milvus milvus* a Schedule 1 bird species, was observed flying over the site during the site visit. Collared dove *Streptopelia decaocto* and blackbird *Turdus merula* were observed on Building D and Building B1 roof top during the survey and feral pigeon *Columba livia domestica* were observed nesting under the ledge of building B1 at ground level.

5.3.6 Bats

Common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle, noctule, brown long-eared bat, Daubenton's bat *Myotis daubentonii*, and serotine *Eptesicus serotinus* have been recorded within 2km of the site.

Building B1 and Building D are considered to have moderate to low bat roosting potential, and have been classified as such due to the number of potential roosting features recorded, the location of each building within, and connectivity to the wider environment, and the level of evidence for current bat use of each potential roosting feature.

Building A and Building B3 are also considered to have moderate to low bat roosting potential. The remaining buildings on site appeared to be well sealed with no obvious holes or crevices. Consequently, these have been classified as being of negligible potential to support roosting bats.

No scattered trees across the site exhibited any features that could provide roosting habitat for bats, such as splits, holes and cracks and were therefore assessed of negligible to support roosting bats.

Furthermore, the site has low to negligible habitat features present, with a lack of features that could be used by commuting or foraging bats. These may include lines of trees and scrub with links to gardens and river corridors.

5.3.7 Badgers

Badger have been recorded 1.1km to the north and 1.4km to the south of the site, however no evidence of badger were recorded on site during the survey. Given the extent of building and hard standing, there is negligible potential for badger to be using the site.

5.3.8 Other mammals

No mammal signs were recorded during the survey. However, common wild mammals, such as red fox *Vulpes vulpes*, are likely to forage and roam within the site.

6 Recommendations

The following recommendations are based on the current construction boundary and proposed works as detailed within Appendix B. Further surveys are likely to be required if the construction boundary changes. An ecologist should be contacted if the construction boundary or the proposed works are altered to discuss the need for further surveys.

6.1 Further surveys

6.1.1 Arboricultural Survey

It is recommended that an arboricultural consultant is commissioned to carry out a survey in accordance with British Standard (BS) 5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations'²². The purpose of this survey would be to record the trees that could be affected by the proposed development, including their Root Protection Zones, and identify measures that should be implemented to ensure the longevity of these trees during construction and operation.

6.1.2 Bat surveys

Further bat surveys are recommended on Building D and Building B1 due to their classification as being of moderate to low potential to support roosting bats. As a precautionary approach, it is recommended that one emergence and one re-entry survey is conducted on each potential bat roost feature recorded on these buildings. Evidence drawn from these surveys can then be used to determine whether the buildings are in use by roosting bats, and whether an EPS licence would need to be sought from Natural England prior to demolition.

Building A and Building B3 are have moderate to low potential to support roosting bats. These buildings are currently outside of the construction boundary and do not require further surveys (see Appendix B). However, further surveys may be required if changes are made to the construction boundary. An ecologist should be consulted to discuss potential disturbance.

Subsequently to the first draft of this report a bat survey has been undertaken by FOA ecology and the findings are included in Appendix C of this report. The main conclusion is that:

Based upon the findings of the bat detector surveys, there is no evidence that the buildings are currently used by roosting bats.

²² British Standards Institute, (2012), 'BS 5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations.'

6.2 Mitigation

6.2.1 Invasive Plants

Prior to construction activities, fencing should be set up around each stand of wall spray to an appropriate distance to demarcate an exclusion zone. Signage should be placed on the fences at each exclusion zone to indicate the species present, that the area is not to be entered without permission, and should have appropriate contact details for the site Environmental Manager. This is to ensure that site staff are aware of the presence of invasive species, and so that vehicles and staff cannot unknowingly enter these areas and risk causing an offence by spreading invasive plant material around site.

Movements of vehicles or staff within these exclusion zones should be prohibited, and should only be allowed following documented consent by the site Environmental Manager.

6.2.2 Scattered Trees

Results from the arboriculture survey should be used to inform the positioning of Root Protection Zones for trees at risk of harm from roost compaction or severance throughout construction works. Suitable fencing should be erected in accordance with guidance of an arboricultural consultant prior to any construction activities.

6.2.3 Birds

Vegetation clearance work (including the lopping of any overhanging branches) should be programmed outside of the main breeding bird season (March to August inclusive) where possible. This will reduce the risk of disturbance or harm to any breeding birds, their active nests or young during construction, which would lead to an offence under the WCA.

If this is not possible, a suitably qualified ecologist would be required to check for the presence of breeding birds prior to the commencement of demolition or clearance work. Where any active nests are found, a buffer zone would need to be cordoned off around the nest to safeguard the nest and young. This would need to remain in place until the young have all fledged and left the immediate area around the nest site. Larger buffer zones would need to be implemented and applied around breeding sites for Schedule 1 species until all young had fledged and left the nest and immediate area. The ecologist would advise on the extent of buffer zones and when these may be lifted. It should be noted that, whilst the main breeding season is between the periods stated above, nesting does occur at other times of the year, so vigilance should be applied, and workers on site notified of this risk.

6.2.4 Other mammals

Measures need to be employed during the construction of the proposed development to avoid an offence under the Wild Mammals Protection Act 1996¹⁹.

Any deep holes and trenches should be covered overnight and planked escape routes provided for any wildlife that may fall in. In addition, any hazardous liquids that are held on-site should be stored in a secure lock-up. These measures should be implemented through a Construction and Environmental Management Plan (CEMP) or similar. Hoarding around the perimeter of the site would also minimise the likelihood of any wild mammals gaining access to the site.

6.3 Enhancements

The following general enhancements are recommended to ensure a net gain in biodiversity in accordance with the NPPF and local planning policy. The detailed design of such enhancement measures should be advised by an ecologist once detailed plans are in place. Some high level enhancements include:

- The provision of a range of habitats and planting structure, such as native trees, scrub, grassland, and ephemeral habitats with high plant species diversity. This will provide habitat for invertebrates, nesting sites and shelter for birds, and foraging resource for bats. Should space at ground level be a constraining factor, a green wall or green roof should be considered, alongside maximising the biodiversity opportunities of any balconies or terraces, in order to provide new habitat areas;
- Where green roofs are incorporated into the design, deadwood and/or standing wood piles should be installed to provide additional habitat areas for invertebrates; and
- The provision of bat and bird boxes within the proposed building façade. Specific bird box designs should be selected that attract notable species recorded in the area such as swift, house sparrow and starling.

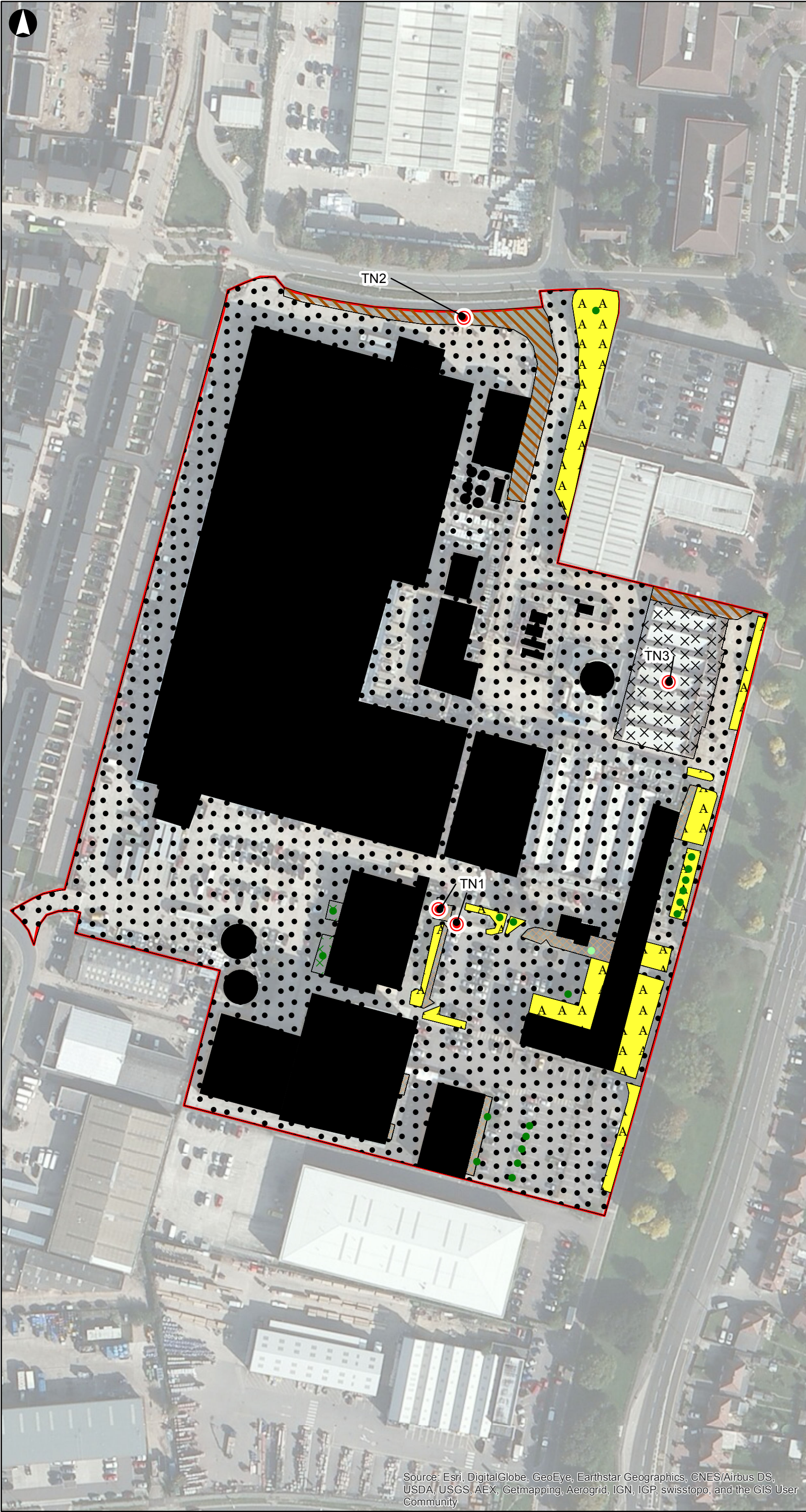
The further survey requirements associated with the site are likely to result in more detailed recommendations for enhancements and mitigation, particularly for bats. All recommendations within this report should be read alongside those contained within further protected species reports as appropriate, and when published.



Appendix A

Phase 1 Habitat Map

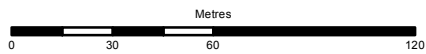
A1



- Legend
- Survey Boundary
 - A2.2 - Scrub - scattered
 - C3.1 - Other tall herb and fern - ruderal
 - J1.2 - Cultivated/disturbed land - amenity grassland
 - J1.3 - Cultivated/disturbed land - ephemeral/short perennial
 - J1.4 - Introduced shrub
 - J3.6 - Buildings
 - J4 - Bare ground
 - A2.2 - Scrub - scattered
 - A3.1 - Broadleaved parkland/scattered trees
 - A3.2 - Coniferous parkland/scattered trees
 - Target Note

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P1	07-07-16	KH	NH	NH
Issue	Date	By	Chkd	Appd



ARUP

13 Fitzroy Street
London W1T 4BQ
Tel +44 20 7636 1531 Fax +44 20 7580 3924
www.arup.com

Client
Proctor & Gamble

Job Title
Reading Plant

Drawing Title
**Figure 1:
Phase 1 Habitat Map**

Scale at A3
1:2,250

Job No 249765-01	Drawing Status ISSUE	Issue P1
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Appendix B

Construction Boundary

B1

NOTES

Do not scale dimensions from this drawing except for Local Authority planning purposes.

The contractor is responsible for checking dimensions, tolerances and references. Any discrepancies to be verified with the Project Manager before proceeding with this work.

This drawing is copyright to dhp and may not be reproduced in any form without prior written consent.

All current drawings and specifications for the project must be read in conjunction with the designer's hazard and environment assessment record.

Scale 1:1250
0 50m

PLANNING

PD	11.16	Issued For Planning	AP
Rev	Date	Description	Chk

2/3 Brooklands Road
Weybridge
Surrey KT13 0RH
T 01932 850100
W www.dhpa.co.uk



Project
P&G Reading
452 Basingstoke Road
Reading RG2 0QE

Drawing
Proposed Site Location Plan

Drawn By	SP	Date	10.16
Project Manager	Scale	1:1250	
Project No.	Drawing No.	Stage/Rev	
5504	2000	P / 0	



Appendix C

Bat Detector Survey Report

C1



**P&G Innovation Centre,
452 Basingstoke Road,
Reading,
RG2 0RX**

Bat Detector Survey Report

Ove Arup & Partners Ltd (Arup)

September 2016



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1. EXECUTIVE SUMMARY

1.1 MAIN FINDINGS

No roosting bats were identified (observed or detected) to emerge from Building B1 or Building D during either of the dusk emergence detector surveys carried out on the 28th July 2016 and 31st August 2016. In addition, no roosting bats were identified to re-enter these buildings during either of the dawn re-entry surveys carried out on the 29th July and 1st September 2016.

A modest amount of incidental (foraging and / or commuting) bat activity by noctule *Nyctalus noctula* and pipistrelle bats (common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and/or unconfirmed pipistrelle species *Pipistrellus sp.*) was encountered.

1.2 MAIN CONCLUSIONS

Based upon the findings of the bat detector surveys, there is no evidence that the buildings are currently used by roosting bats.

1.3 MAIN RECOMMENDATIONS

Nonetheless, precautionary mitigation measures are recommended (i.e. contractor awareness of roosting bats and formalisation of a protocol as to the steps to be taken in the event that a bat or bats is / are found during the proposed works) alongside good practice measures for minimisation of external light spillage



2. INTRODUCTION

2.1 SCOPE OF WORKS & OBJECTIVES

Ove Arup & Partners Ltd (Arup) commissioned FOA Ecology Ltd to undertake bat detector survey work of the existing Buildings B1 and D at Proctor & Gamble UK (P&G), Basingstoke Road, Reading in order to confirm the presence / likely absence of roosting bats from the buildings.

During the previous bat building inspections undertaken by Arup on 13th June 2016, the buildings had been identified to possess features that provide suitable access points / roost sites for bats.

In the event that a bat roost or roosts does / do occur within the buildings, the proposed works could result in an offence being committed, e.g. in the event that a current bat roost is disturbed / destroyed and / or individual roosting bats are killed or injured as a result of the works.

Accordingly, bat detector survey work was recommended, in accordance with current BCT bat survey guidance (Collins, 2016).

2.2 POLICY & GUIDANCE

All bat species are fully protected under the Wildlife & Countryside Act 1981, as amended, Countryside and Rights of Way Act 2000 and the Conservation of Habitats and Species Regulations 2010, as amended.

Taken together, this makes it an offence to intentionally or deliberately capture, kill or injure or disturb bats (whether in a roost or not), and intentionally or recklessly damage, destroy or obstruct access to their roosts. In addition, existing legislation (subsequent to the amendment of the Conservation Regulations) and planning policy is currently being re-interpreted and emerging thinking is that there is legal basis for the protection of important bat foraging and commuting habitats or else for mitigation and/or compensation for its loss.

Further, several species of bat are also Priority Species in the National Biodiversity Plan and species of principal importance for the conservation of biodiversity in England, including soprano pipistrelle bat, which is known to roost in buildings (including modern buildings), is a common bat species and thus is frequently encountered during development works.

The Countryside & Rights of Way (CROW) Act 2000 affirms that Biodiversity Action Plan (BAP) species (as well as habitats) are material considerations within the planning system.



3. METHODOLOGY

3.1 EMERGENCE/RETURN SURVEY METHODOLOGY

A limited desk study was carried out in order to identify designated sites and ancient woodland within a 1 km radius of the site.

A total of four bat detector surveys of Building B1 and D were conducted, consisting of two dusk / dawn couplets. The first survey was a dusk emergence detector survey carried out on the 28th July 2016 which was followed by the second survey, a dawn re-entry detector survey on the 29th July 2016.

The third survey was a dusk emergence detector survey carried out on the 31st August 2016 which was followed by the fourth survey, a dawn re-entry detector survey on the 1st September 2016.

In terms of methodology, in accordance with recently published guidelines (Collins, 2016) and best practice, the dusk 'emergence' surveys commenced 20 minutes before sunset and continued until emergence was considered to have finished (i.e. 1.5 hours after sunset), whereas the dawn 're-entry' surveys commenced 90 minutes before sunrise and continued until 15 minutes after sunrise.

The 3 surveyor team comprised: Fleur Oliver (2015-14626-CLS-CLS), Mary Barnard (2016-24544-CLS-CLS), Helen Ruffhead, Sophie O'Hehir and / or Martin Hunt.

The surveyor team used a variety of bat detectors, including time-expansion (Pettersson D240X), full spectrum (Pettersson M500), heterodyne (Batbox Duet) and frequency division devices (Anabat Express), with all bat calls being recorded (using Roland R-05 recorder for Pettersson D240X detector, Yoga tablet for Pettersson M500 or the Anabat Express itself). Following the surveys, the bat recordings were analysed using the relevant bat analysis software packages (i.e. BatSound and Analook), to species level where possible.

3.2 LIMITATIONS

The first three detector surveys were undertaken within the key survey window during which period maternity roosts may be identified (May - August: Collins, 2016), whilst the fourth survey was taken on the dawn of 1st September which (strictly) falls just outside of this optimal window. However, this is not thought to have altered the findings of this bat assessment.

In addition, every effort was made to schedule all four of the detector surveys during suitable weather conditions, i.e. mild, dry and non-windy conditions. Indeed, as demonstrated in the weather table provided in the appendix, the weather conditions are considered to have been suitable on all survey occasions.

To summarise, taken together the detector surveys are considered to be robust and enable the survey conclusions to be reliably drawn.



4. SURVEY RESULTS

No roosting bats were identified (observed and / or detected) by any of the 3 surveyors to emerge from or re-enter the buildings during either the dusk emergence or dawn re-entry bat detector surveys.

Indeed, only a modest amount of incidental (foraging and / or commuting) bat activity by noctule and pipistrelle bats (common pipistrelle, soprano pipistrelle and pipistrelle species [unrecorded or else with peak frequency between that of common and soprano pipistrelle]) was encountered.

This full survey data is provided in the tables in Appendix 1.



5. DISCUSSION

5.1 ROOSTING

Based upon the findings of the building inspections together with the detector surveys, there is no evidence that the buildings are currently being used by roosting bats.

5.2 COMMUTING & FORAGING

Based upon the findings of the surveys where only a very modest amount of foraging and / or commuting bat activity was detected, it can be concluded that the site does not constitute any ecologically significant / high quality commuting or foraging habitat resource for bats.



6. RECOMMENDATIONS

6.1 ROOSTING

Despite no direct evidence of roosting bats having been gained, the following precautionary mitigation measures are nonetheless recommended:

- Contractor awareness of roosting bats; and,
- Formalisation of a protocol as to the steps to be taken in the event that a bat or bats is / are found during the construction works. It is suggested that the following protocol should be followed: works to cease immediately and the project ecologist to consult with Natural England regarding the possible need for the works to be resumed under a bat licence from Natural England.

6.2 KEY DISPERSAL & FORAGING AREAS

No key dispersal or foraging areas were identified; however, the modest bat activity that was encountered indicated the use of the tree line along to the east of both buildings, as well as the landscaped shrubbery to the west of Building D, for foraging by a pipistrelle bat or low numbers of pipistrelle bats.

6.3 MITIGATION & ENHANCEMENT

General mitigation and enhancement measures for the loss of potential roost features and modest areas of bat foraging and commuting habitat are recommended, including new planting of native, bat-friendly species and the installation of suitable bat boxes into the new building or on suitably sized, retained trees.

6.4 LIGHTING GUIDANCE

Although the bat species encountered at the site during the survey work, i.e. noctule and pipistrelle species (common pipistrelle, soprano pipistrelle and pipistrelle species), are characterised as being tolerant of and / or attracted to forage within externally lit areas, other bat species (e.g. long-eared bat species and some *Myotis* species) are known to be dissuaded from using lit areas (Fure, A. 2006).

Consequently, as good practice, it is advised that any proposed additional external lighting of the proposed development should be minimised.

In addition, many other species benefit from dark corridors, e.g. nocturnal species such as hedgehog.

The Bat Conservation Trust and Institute of Lighting Engineers suggests several means by which external lighting can be minimised, as follows:

- Do not provide excessive lighting. Use only the minimum amount of light needed for safety.
- Use narrow spectrum bulbs to lower the range of species affected by lighting, use light sources that emit minimal UV light and avoid the white and blue wavelengths of light to avoid attracting lots of insects (which results in reduction of insects in other areas that bats may be using for foraging).
- Lights should peak higher than 550 nm or use glass lantern covers to filter UV light. White LED lights do not emit UV but have been shown to disturb slow flying bat species.
- The use of low or high-pressure sodium lamps instead of mercury or metal halide lamps.
- Mercury lamps used should be fitted with UV filters.
- The brightness should be as low as legally possible.



- The times during which the lighting can be used should be limited to provide some dark periods.
- The lighting should be directed to where it is needed to avoid light spillage.
- Any upward lighting should be minimal or avoided to avoid light pollution. Also eliminate any bare bulbs.
- The spread of light should be kept near to, or below the horizontal - flat cut off hoods are best. Also, light can be restricted to selected areas by fitting hoods which direct the light below the horizontal plane, at preferably an angle less than 70 degrees.
- Limiting the height of lighting columns and directing light at a low level, which reduces the ecological impact of the light. However, higher mounting heights allow lower main beam angles, which can assist in reducing glare.
- For pedestrian lighting, use low-level lighting that is as directional as possible and below 3 lux at ground level, but preferably below 1 lux.
- Increase the spacing of lanterns.
- Use embedded road lights to illuminate the roadway and light only high-risk stretches of roads, such as crossings and junctions, allowing head lights to provide illumination at other times.
- Use lighting design software and professional lighting designers to predict where light spill will occur.
- Avoid using reflective surfaces under lights.
- Use temporary, close-boarded fencing until vegetation is mature enough to shield sensitive areas from lighting.
- Road or track ways along areas important for foraging bats should contain stretches left unlit to avoid isolation of bat colonies.
- No bat roost (including access points) should be directly illuminated.

6.5 FURTHER SURVEYS

No further surveys will be required.



7. REFERENCES

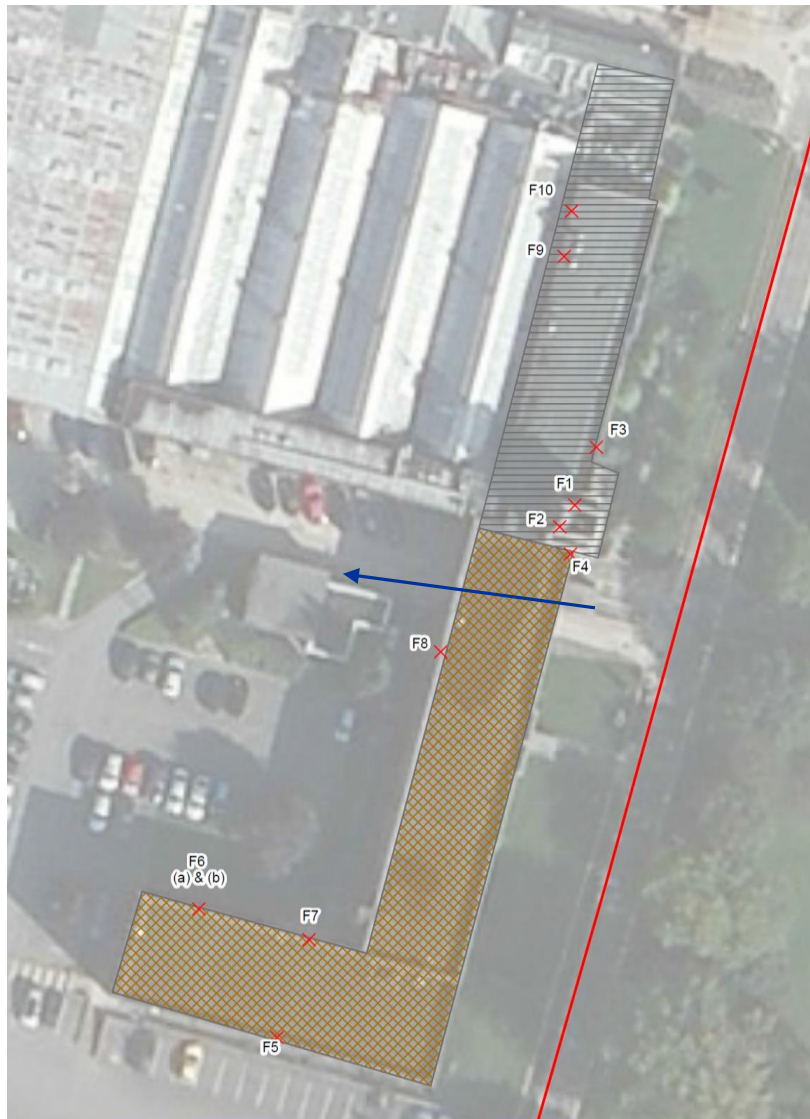
BCT & ILE, 2009 Bats and Lighting in the UK, Bats and the Built Environment Series

Collins, 2016 Bat Surveys for Professional Ecologist 9Good Practice Guidelines, 3rd edition

Fure, A. 2006 Bats and lighting The London Naturalist, No. 85, 2006

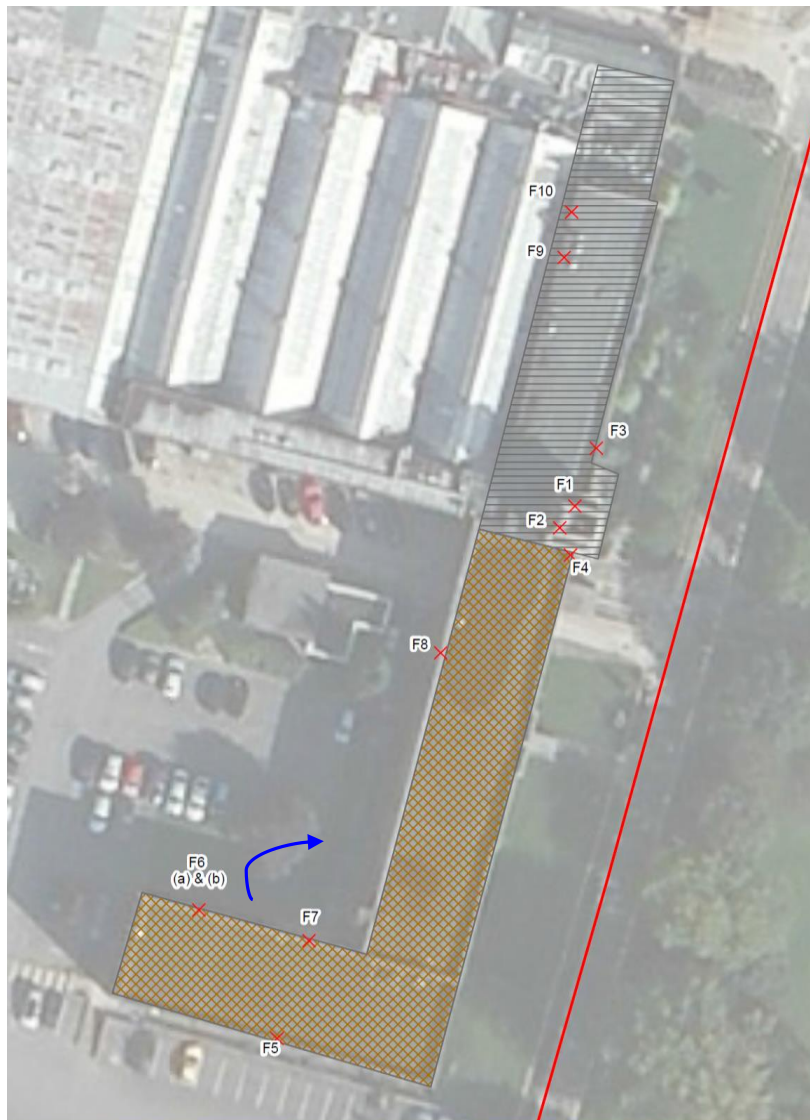
8. APPENDIX 1 – BAT ACTIVITY MAPS

28/07/2016 – Surveyor 1





31/08/2016 - Surveyor 1





9. APPENDIX 2 – BAT DETECTOR SURVEY DATA

Weather:

Weather conditions for each detector survey are provided in the table below:

Survey type and time of dusk/dawn	Survey Date	Weather
Sunset – 20:57	28/07/2016	18°C, dry, still, 5/8 cloud
Sunrise – 05:24	29/07/2016	15°C, dry, light wind, 5/8 cloud
Sunset – 19:51	31/08/2016	18°C, dry, 78% humidity, 8 mph wind, 2/8 cloud
Sunrise – 06:17	01/09/2016	11°C, dry, 94% humidity, 2 mph wind, 6/8 cloud

Results:

Results are summarised below for each surveyor during each survey.

Dusk Detector Survey at P&G Reading, 28 July 2016

Surveyor 1 was positioned on the roof in view of features 1 and 2, located on the main tower.

Time	Species detected	Comments
21:31	Noctule	Observed to fly from the east of the buildings in a westerly direction at significant height above the buildings, in the direction of the extensive high quality bat foraging habitat (watercourses, large system of lakes and meadows) which extends from 500 m west of the site
22:01	Pipistrelle sp.	Unseen, brief and quite distant
22:09	Common pipistrelle	Unseen, brief and quite distant
22:27	Common pipistrelle	Unseen, brief and quite distant



Surveyor 2 was positioned in view of features 3 and 4 on the east elevation, in front of the tower.

Time	Species detected	Comments
21:24	Pipistrelle sp.	Heard not seen, brief and faint, 27 minutes after sunset.
21:28	Pipistrelle sp.	Heard not seen, brief.
21:30	Pipistrelle sp.	Heard not seen, brief.
22:00	Pipistrelle sp.	Heard not seen, brief and very faint.
22:08	Common pipistrelle	Heard not seen, foraging.
22:27	Common pipistrelle	Heard not seen.

Surveyor 3 was positioned in view of feature 5 on the south elevation of Building D.

Time	Species detected	Comments
21:20	Noctule	Not observed, detected on recorder, 23 minutes after sunset.
21:26	Noctule	Not observed, detected on recorder.

Dawn Detector Survey at P&G Reading, 29 July 2016

Surveyor 1 was positioned in view of feature 8 on the west elevation of Building D.

Time	Species detected	Comments
04:23	Soprano pipistrelle	Unseen, brief, considered foraging in shrubbery to rear of southern half of building, 1 hour and 21 minutes before sunrise.
04:25-04:26	Soprano pipistrelle	Unseen, brief, with foraging as above, 1 hour and 19 minutes before sunrise.
04:40	Common pipistrelle	Observed to fly through covered vehicular access way and off to the east away from the building, 44 minutes before sunrise.

Surveyor 2 was positioned in view of features 10 and 9 on the north end of the west elevation of Building B1.

Time	Species detected	Comments
04:40	Common pipistrelle	Heard not seen, brief, 44 minutes before sunrise.



Surveyor 3 was positioned in view of features 6a, 6b and 7 on the north elevation of Building D.

Time	Species detected	Comments
04:22	Soprano pipistrelle	Heard not seen, brief, 1 hour and 2 minutes before sunrise.
04:40	Common pipistrelle	Heard not seen, brief. Not detected on recorder, 44 minutes before sunrise.

Dusk Detector Survey at P&G Reading, 31st August 2016

Surveyor 1 was positioned in view of features 6a, 6b and 7 on the north elevation of Building D.

Time	Species detected	Comments
20:20	Noctule	Not observed, detected on recorder, 29 minutes after sunset.
20:51	Common pipistrelle	1 individual circling tree adjacent north elevation (of south corner). Not seen emerging from building but precise origin unable to confirm. Circling and foraging behavior continuous for 2 minutes. Foraging and social calls. 1 hour after sunset.
21:09	Noctule	Not observed, detected on recorder.

Surveyor 2 was positioned in view of features 9 and 10 on the west elevation of the northern section of Building B1.

Time	Species detected	Comments
20:21	Noctule	Heard not seen, brief, 30 minutes after sunset.
21:09	Noctule	Not observed, detected on recorder.
21:11	Noctule	Not observed, detected on recorder.

Surveyor 3 was positioned in view of feature 8 on the west elevation of the building.

Time	Species detected	Comments
20:21	Noctule	Heard not seen. Brief pass, 30 minutes after sunset.
20:53	Common pipistrelle	Heard not seen, foraging. 1 hour and 2 minutes after sunset.
21:05	Pipistrelle sp.	Heard not seen, foraging.
21:10	Noctule	Heard not seen. Very brief pass.



Dawn Detector Survey at P&G Reading, 1st September 2016

Surveyor 1 was positioned on the roof in view of features 1 and 2, located on the main tower.

Time	Species detected	Comments
No bats seen, heard or detected on recorder.		

Surveyor 2 was positioned in view of features 3 and 4 on the east elevation of Building B1 and D.

Time	Species detected	Comments
No bats seen, heard or detected on recorder.		

Surveyor 3 was positioned in view of feature 5 on the south elevation of Building D.

Time	Species detected	Comments
No bats seen, heard or detected on recorder.		