Elite Ecology

Passionate about Ecology

Twickenham Film Studios

Twickenham

Preliminary Ecological Appraisal

January 2021

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0. Executive Summary

This report has been prepared at the request of Ms. Alexandra Bamford (Boyer Planning) on behalf of Twickenham Film Studios. Elite Ecology were commissioned to undertake a Preliminary Ecological Appraisal at Twickenham Film Studios, The Barons, Twickenham, London, Greater London, TW1 2AW (Central OS Grid Reference: TQ 16902 74311). This survey effort involved both a desktop study and field survey being undertaken.

Under the current proposals, the proposed development will comprise the erection of a new block ("Block A") at the front corner of the site, together with the partial demolition of Block C and construction of a single-storey extension. The construction of an additional storey and external staircase to Block E, the construction of an additional storey above Block H and the refurbishment and modernisation of all existing blocks within the site.

Greenspace Information for Greater London Record (GiGL) was commissioned to carry out an ecological data search of all protected species and sites recorded within a 1km radius of the site. No records lay on the proposed re-development site itself, although a number of records are present in close proximity. Please see section 3 for a review of the records revealed.

The preliminary ecological appraisal survey revealed multiple habitats on site. The phase 1 habitat map, habitat codes and target notes for the site are located within Appendix D. The following habitats were recorded on site (in habitat code order):

- A3.3 – Mixed Scattered Trees
- J1.4 – Introduced Shrub
- J3.6 – Buildings
- J4 – Bare Ground

Designated Sites:

No designated sites revealed from the Ecological Data Set provided by GiGL were located on the site or directly adjacent to the site. Therefore, the proposed development will have no impact upon any designated sites as the works are due to remain within the site boundary.

Habitats:

No habitats of conservation concern were located on the site itself. Therefore, the proposed scheme of works will not impact upon any rare or valuable habitats.

Species:

Bats: Due to the amount of potential ingress/egress points and suitable roosting features, the structures at Twickenham Film Studios were deemed as having:

- Block B: **'Low'** potential for bat to roost and **'negligible'** to support nesting birds.
- Block C: '**Low**' potential for bat to roost and **'negligible'** potential for birds to nest.
- Block E: **'Low'** potential for bat to roost and **'negligible'** potential for birds to nest.
- Block H: **'High'** potential for bat to roost and **'Negligible'** potential for birds to nest.

Therefore, a minimum of one further activity surveys are required during the bat survey season (May to September, inclusive) on Blocks B, C, and E. A minimum of three surveys are required for Block H. It has been deemed that Block B will need one surveyor, Block C and E will need two surveyors each, and Block H will need seven surveyors.

No artificial lighting is to be shone on any scattered trees, shrubs, linear features, woodland or waterways. For the site itself, an artificial lighting plan is required. All lighting must avoid the features of interest for the local bat populations. This is required due to the habitats within the local landscape meaning there is likely to be foraging and commuting bats within the local landscape.

Birds: Any tree removal should be undertaken outside of the breeding bird season of March to August, inclusive. If works on trees are required to be undertaken during the nesting season, then a competent ecologist must be present on site to undertake a detailed check of vegetation for active birds' nests immediately before vegetation clearance and provide written confirmation that no birds will be harmed and /or that there are appropriate measures in place to protect nesting birds on site. Any such written confirmation must be submitted to the Local Planning Authority prior to any work first commencing.

Hedgehogs: As a purely precautionary measure, it is recommended that provisions are incorporated during the construction phase. This will be to create provisions for hedgehogs to escape in the form of creating slopes or the inclusion of ramps at the end of each working day from all trenches dug into the ground. Additionally, any pipework left on site that is greater than 150mm in diameter will need to be planked off. Should this information be strictly adhered to, then the development works will not negatively impact on the local mammal populations. Post development, one Eco Hedgehog Nest Box should be included into the site within an appropriate location. It is also recommended that small gaps are left within any boundary fencing (if used) to enable the specimens to continue to commute through the area (an example can be found within figure 3). This will ensure that the local hedgehog populations do not become fragmented within the local landscape.

Site Enhancements:

For the proposed site enhancements, please see section 5.4 of this report.

Biodiversity Net Gain:

Biodiversity Net Gain needs to be ensured within the scheme of works. A Biodiversity Net Gain Report has been commissioned to show how a minimum 10% gain in biodiversity can be achieved on site during and post development.

Contents

1 Introduction

1.1 Report rationale

This report has been prepared at the request of Ms. Alexandra Bamford (Boyer Planning) on behalf of Twickenham Film Studios. Elite Ecology were commissioned to undertake a Preliminary Ecological Appraisal at Twickenham Film Studios, The Barons, Twickenham, London, Greater London, TW1 2AW (Central OS Grid Reference: TQ 16902 74311). The survey effort involved both a desktop study and field survey.

The main purpose of this assessment was to identify the broad habitats (as stated in the JNCC Phase 1 Handbook) and the flora species present within the survey area, with any further evidence of protected species usage and/or features of potential ecological interest also included. The field survey was carried out on the 10th December 2020 by Mr. Richard Millington BSc (Hons) ACIEEM, Ecologist and Mr. Mattew Cotterill, BSc (Hons), Ecologist.

1.2 Site description and works

The site is situated in an urban setting in the settlement of Twickenham, London in the county of Greater London.

The site contains numerous habitat types. These come in the form of mixed scattered trees, introduced shrub, buildings, bare ground, Climbers on the Ivy. Overgrown Weeds (possibly under bare ground with emergent weeds). Some of these habitats could be utilised by protected species. Photographs of the site are found within **Appendix D**.

Within the wider landscape, further habitats are present. These come in the form of agricultural land, hedgerows, residential structures (and their associated gardens/land) and woodland. The habitats that surround the site also have the potential to be utilised by a variety of protected species.

The proposed development will comprise the erection of a new block ("Block A") at the front corner of the site, together with the partial demolition of Block C and construction of a single-storey extension. The construction of an additional storey and external staircase to Block E, the construction of an additional storey above Block H and the refurbishment and modernisation of all existing blocks within the site.

Figure 1: An aerial map showing the location of the land proposed for re-development at Twickenham Film Studios, The Barons (Yellow star) in relation to some of the local landscape.

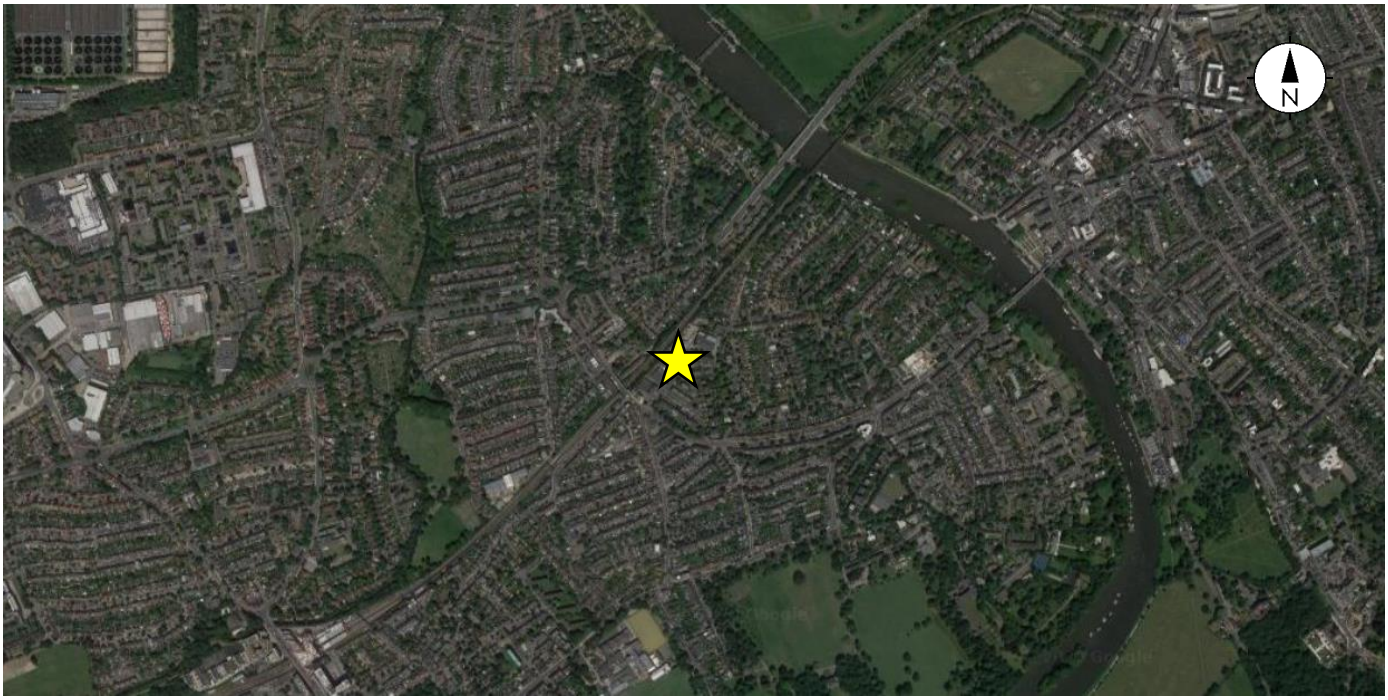
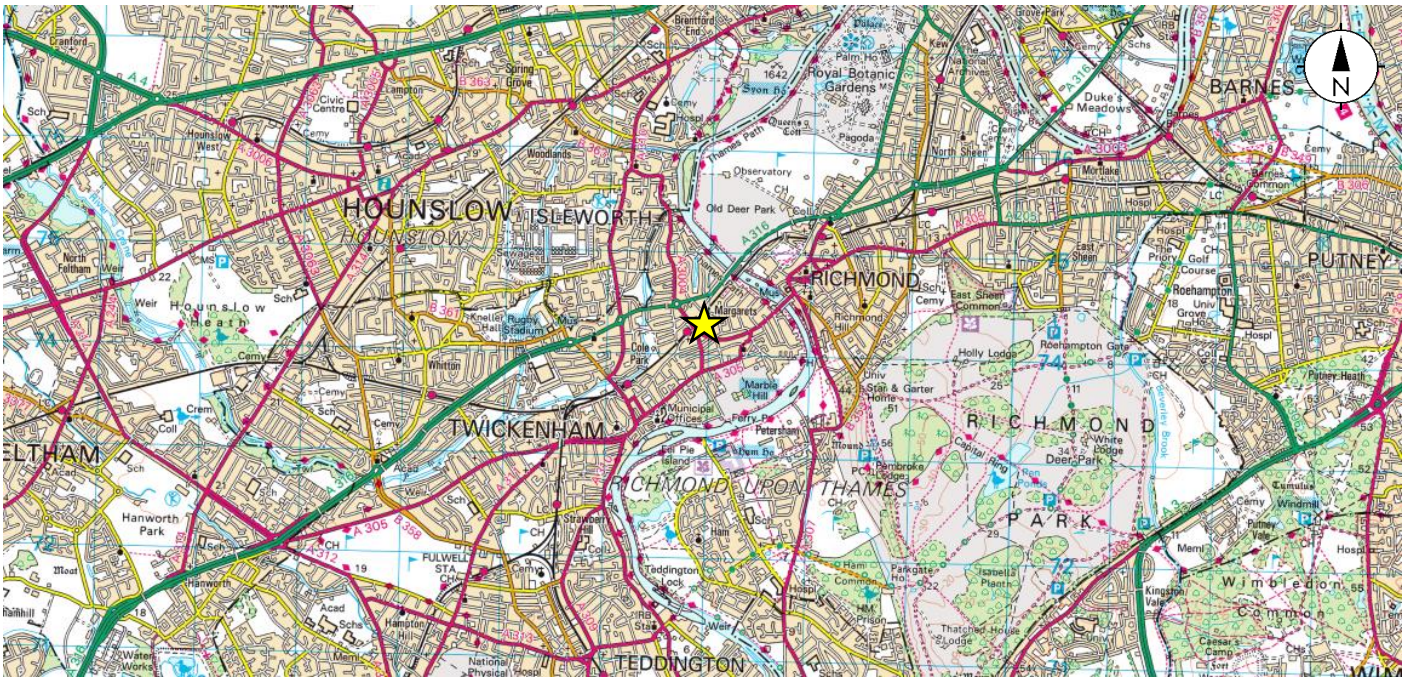


Figure 2: An OS map obtained from Bing showing the location of Twickenham Film Studios, The Barons (yellow star).



2 Survey Methodology

2.1 Desktop Survey

A variety of resources were independently consulted to assess the known local records within the nearby area and the importance of the site within the local landscape from an ecological perspective. The resources used were the Local Records Centre, www.naturalengland.org.uk, www.ordnancesurvey.co.uk, Google Maps, Google Earth and Bing Maps. A search of other relevant nature conservation information was made through the use of the Multi-Agency Geographic Information for the Countryside (MAGIC) database.

The local records centre was contacted to provide data on all protected species and sites within 1km of the proposed development site. Greenspace Information for Greater London (GiGL) was the relevant local record centre for this project.

2.2 Field Survey

A Preliminary Ecological Appraisal (previously referred to as an Extended Phase 1 Habitat Survey) was carried out using the method outlined in the JNCC Handbook for *Phase 1 Habitat Survey: a technique for environmental audit (2010)*. This method aims to map and describe the broad habitat types and notable features present on the surveyed site.

As part of the field survey, the floral species will be identified and noted down. This will consider the dominant, abundant, frequent, occasional and rare (DAFOR) species within each habitat on the survey site. The impacts of the proposed development scheme will be assessed by this report.

Each habitat will be assessed for the presence and/or the potential presence of protected species. The impacts of the proposed scheme of works on all potential protected species on site will be assessed. From this, either remedial action or recommended phase 2 presence/absence surveys will be devised.

Some of the classification codes and colours listed within the JNCC handbook may have been slightly modified for this project.

Habitat Surveys can be carried out at any time of the year, with the optimal time period falling between the months of April through until September. This survey was carried out in December 2020, which is outside of the optimal time period for flora surveys. Elite Ecology feels confident that this report reflects an accurate representation of the site's suitability for protected species to be present.

All sites surveyed by Elite Ecology will be run against the relevant Local Wildlife Site Criteria to assess whether or not they meet the required standards.

3 Desktop Survey Results

3.1 Statutory Sites

The ecological data received from GiGL revealed no statutory protected sites (e.g. LNR, SSSI, SPA, SAC or Ramsar) within the 1km radius of the site.

3.2 Non-Statutory Sites

The ecological data received from SER confirmed the presence of seven non-statutory protected site within 2km of the site. They are as follows:

Site Ref.	Site Name	Designation	Grid Reference	Approx. Distance (m)	Heading
M031	River Thames and tidal tributaries	Sites of Importance for Nature Conservation (SINCs)	TQ 302 806	488 (closest point)	NE
RiBI01	Royal Mid-Surrey Golf Course	SINCs	TQ 179 761	775	N
HoBII07	River Crane at St Margarets	SINCs	TQ 163 746	611	NW
RiBII18	River Crane at St Margaret's (Richmond side)	SINCs	TQ 164 746	600	NW
RiL02	Marble Hill Park and Orleans House Gardens	SINCs	TQ 172 736	490	S
RiL17	Twickenham Road Meadow	SINCs	TQ 174 750	608	NE
RiL25	Moor Mead Recreation Ground	SINCs	TQ 164 740	550	W

3.3 Woodland Sites

The information provided by GiGL revealed No Ancient and Semi-natural Woodland (ASNW) site within the 1km search radius.

3.4 Regionally Important Geological Sites (RIGS)

The information provided by GiGL revealed no RIGS within the 1km search radius.

3.5 Species Records

3.5.1 Amphibians

Within the ecological data search provided by GiGL, two amphibian species have been identified within 1km from the survey site. This comes in the form of common frog (*Rana temporaria*) and common toad (*Bufo bufo*), with the nearest record being of common frog located approximately 71m to the north-west from the site centroid.

3.5.2 Birds

Within the ecological data search provided by GiGL, a total of 37 bird species were revealed within 1km of the site centroid. The closest are of mute swan (*Cygnus olor*), house sparrow (*Passer domesticus*) and song thrush (*Turdus philomelos*) occurring approximately 71m north-west from the site centroid. A table with all of the collated bird species recorded can be found within Appendix B.

3.5.3 Crustacean

Within the ecological data search provided by GiGL, no crustacean species have been revealed within 2km of the site.

3.5.4 Fish

Within the ecological data search provided by GiGL, one fish species has been identified within 1km from the survey site. This comes in the form of European eel (*Anguilla anguilla*) located approximately 962m south from the site centroid.

3.5.5 Flora

Within the ecological data search provided by GiGL, seven floral species have been revealed in the search radius. The nearest record to the survey site is of mistletoe (*Viscum album*) identified approximately 292m north-east from the site centroid. A table with the collated flora species recorded can be found within Appendix B.

3.5.6 Fungi

Within the ecological data search provided by GiGL, no fungi species have been revealed within 1km of the site.

3.5.7 Invertebrates

Within the ecological data search provided by GiGL, seven species have been identified within a 1km radius of the site. The nearest record to the survey site is of stag beetle (*Lucanus cervus*) identified approximately 71m north-west from the site centroid. A table with the collated invertebrate species recorded can be found within Appendix B.

3.5.8 Mammals

Within the ecological data search provided by GiGL, 14 mammal species were revealed within 1km of the site. The nearest records to the survey site centroid are of hedgehog (*Erinaceus europaeus*), and an unidentified bat (*Vespertilionidae*), both identified approximately 71m north-west from the site centroid. A table with the collated mammal species recorded can be found within Appendix B.

3.5.9 Molluscs

Within the ecological data search provided by GiGL, no mollusc species have been revealed within 1km of the site.

3.5.10 Reptiles

Within the ecological data search provided by GiGL, no reptiles have been identified within 1km of the survey site.

4 Field Survey

4.1 Habitats

The preliminary ecological appraisal survey revealed multiple habitats on site. The phase 1 habitat map, habitat codes and target notes for the site are located within Appendix D. The following habitats were recorded on site and in the surrounding area (in habitat code order):

On Site:

4.1.1 A3.3 - Mixed scattered trees

Mixed scattered trees can be found on site along the south-eastern border, predominantly near blocks F & G, and Bloch H. Species include, Western Red Cedar (*Thuja plicata*), Holly (*Ilex aquifolium*), and Wild Cherry (*Prunus avium*). Form the proposed site plans provided (Hallow way 18.141.100.03) the scatted trees are to remain on site.

Scattered trees can be found immediately off site along the north-western boundary as screening for the adjacent railway track. These trees are not within the scope of works and have been left un-assessed. However, as they form a linear feature and provide a potential commuting and foraging area for bats some provisions must be made pertaining to artificial lighting (see **section 5.3**).

From the site plans it is un-clear if there are plans to remove two ash trees (*Fraxinus excelsior*) which are currently on the pathway outside the site boundary to the south of the proposed Block A. This confusion is caused by the mapping of a 3rd ash tree on the pathway to the south-east of block C. If these trees are to be removed provisions must be made (see **section 5.3**).

4.1.2 J1.4 - Introduced shrub

Introduced shrub can be found on site, predominantly near blocks F & G, and Bloch H. Species include, lavender (*Lavandula angustifolia*), and rose (*Rosa sp*). Plants such as lavender are beneficial to bat species, example of other flora species that are beneficial have been provided in **section 5.4**.

4.1.3 J3.6 – Buildings

The survey site consists 7 buildings, Block B, C, D, E, F, G, and H. This report focuses on blocks C, E and H as these buildings will see major developments that may have negative impact to protected species with the remaining structures going under refurbishment.

However, it should be noted that a small hole has been located on the south-east elevation of block B, a feature that could allow access for bat into the building. There for this building will need surveying.

Figure 3: An aerial photograph of the current structures at Twickenham Film Studios (as shown by the red outline) taken from the pre-application Document.

Block C

External Inspection:

The surveyed structure is constructed of solid brick, walls with a mix of pitched and flat sections of roof constructed with felt and a metal clad. Due to the use of felt and metal the building was found to have no broken/lifted tiles, features that could facilitate access to the interior however, gaps are present in the cladding to the rear of the building. Some of the walls have pebble dash, crack in the brickwork can be found on the walls that are not pebble dashed. Air vents a present throughout the structure. No skylights appear to be present. No evidence of bird's nests has been found externally.

Internal Inspection:

The structure was inspected for any evidence of bats and birds. The internal inspection revealed that the structure is currently in use for storage purposes. The internal inspection revealed no evidence of bats was found. No loft spaces present. No birds' nests have been found.

Block E

External Inspection:

The surveyed structure is constructed of solid brick, walls with a flat roof constructed with felt and a timber clad and lead flashing. Due to the use of felt the building was found to have no broken/lifted tiles, features that could facilitate access to the interior however there is some gapping under the felt that will allow access for crevice dwellers. Gaps can be seen under the barge boards are present, and holes can be found in the brickwork. Ivy (*Hedera helix*) can be seen growing at the rear of building.

A gap in a wooden board that seals a small gap between sections of the building can be seen. Air vents a present throughout the structure. skylights are present. No evidence of bird's nests has been found externally.

Internal Inspection:

The structure was inspected for any evidence of bats and birds. The internal inspection revealed that the structure is currently in use for storage purposes. The internal inspection revealed no evidence of bats was found. No loft spaces present. No birds' nests have been found.

Block H

External Inspection:

The surveyed structure is constructed of Cavity brick, walls with a flat roof constructed with felt, cladding and lead flashing. There is some gapping under the cladding and flashing that will allow access for crevice dwellers. Hanging tiles are present around the windows with gaps and missing tiles present. Air vents a present throughout the structure. skylights are present. No evidence of bird's nests has been found externally.

Internal Inspection:

The structure was inspected for any evidence of bats and birds. The internal inspection revealed that the structure is currently in use for office purposes. The internal inspection revealed no evidence of bats was found. No loft spaces present. No birds' nests have been found.

Summary of the building inspection

Due to the amount of potential ingress/egress points and suitable roosting features, the structures at Twickenham studio were deemed as having:

- Block B: **'Low'** potential for bat to roost and **'negligible'** to support nesting birds.
- Block C: '**Low**' potential for bat to roost and **'negligible'** potential for birds to nest.
- Block E: **'Low'** potential for bat to roost and **'negligible'** potential for birds to nest.
- Block H: **'High'** potential for bat to roost and **'Negligible'** potential for birds to nest.

Therefore, a minimum of 1 further activity surveys are required during the bat survey season (May to September, inclusive) on Blocks B, C, and E. A minimum of 3 surveys are required for Block H (please see **Section 5.3**).

4.1.4 J4 - Bare Ground and J5- other habitats (emergent weeds)

Much of the site comprises of hardstanding which is of no ecological concern. However, some emergent weeds are present such as dandelion (*Taraxacum officinale*), purple dead nettle (*Lamium purpureum*), nettle (*Urtica dioica*), field sow thistle (*Sonchus arvensis*), mallow (*Malva neglecta*) and Chinese cress (*Capsella bursapastoris*).

4.2 Species

The preliminary ecological appraisal survey revealed that the habitats that have been outlined for the proposed development area do contain protected species potential. The following assessment has also taken into account the adjacent habitats and connectivity to the wider landscape for all protected and rare species.

4.2.1 Amphibians (including great crested newts)

The site itself does not have the potential to support amphibians. Therefore, no further action is required. This is because of a lack of standing water within 500m of the site.

4.2.2 Badgers

The proposed re-development site was assessed for the presence of badgers. No evidence of any setts were found on site, or within a 50m radius of the boundaries.

4.2.3 Bats

The buildings on site have suitable roosting features for bats of varying potential as seen in **section 4.1.3**. Furthermore, the habitats on site are likely to support foraging bats. Therefore, further survey effort is required (please see section 5.3).

4.2.4 Birds

The proposed re-development site contains a number of habitats that have been deemed suitable to support nesting birds. This comes in the form of scattered trees. Due to this, further precautionary measures are necessary (please see section 5.3).

4.2.5 Hedgehogs

Hedgehogs (*Erinaceus europaeus*) are highly likely to be present within the local landscape, some of which may use the site. Despite this, the proposals will not affect any habitats that hedgehogs will be using, with no trenches proposed. No recommendations are apparent for this species.

4.2.6 Invertebrates

Common species found on site. the site has limited habitat. The proposed works will not affect any potential invertebrates. As such, no further surveys are required.

4.2.7 Reptiles

The habitats on site do not have the potential to support reptiles. Due to this, no further action is required (please see section 5.3).

4.3 Potential impacts of the works

Based upon the results from the desktop survey, field survey and using a degree of academic supposition, the uncompensated development impacts have been summarised as follows:

- Amphibians – **Negligible**
- Badgers – **Negligible**
- Bats – **Unknown**
- Birds – **High**
- Flora – **Negligible**
- Hazel Dormouse – **Negligible**
- Hedgehogs – **Moderate**
- Invertebrates – **Negligible**
- Reptiles – **Negligible**

5 Recommendations

5.1 Designated Sites

No designated sites revealed from the Ecological Data Set provided by GiGL were located on the site or directly adjacent to the site. Therefore, the proposed development will have no impact upon any designated sites as the works are due to remain within the site boundary.

5.2 Habitats

No habitats of conservation concern were located on the site itself. Therefore, the proposed scheme of works will not impact upon any rare or valuable habitats.

5.3 Species

The site was found to contain the potential to support protected and/or rare species. Therefore, the following recommendations are required for the site:

5.3.1 Bats

Due to the amount of potential ingress/egress points and suitable roosting features, the structures at Twickenham Film Studios were deemed as having:

- Block B: **'Low'** potential for bat to roost and **'negligible'** to support nesting birds.
- Block C: '**Low**' potential for bat to roost and **'negligible'** potential for birds to nest.
- Block E: **'Low'** potential for bat to roost and **'negligible'** potential for birds to nest.
- Block H: **'High'** potential for bat to roost and **'Negligible'** potential for birds to nest.

Therefore, a minimum of one further activity surveys are required during the bat survey season (May to September, inclusive) on Blocks B, C, and E. A minimum of three surveys are required for Block H.

It has been deemed that Block B will need one surveyor, Block C and E will need two surveyors each and Block H will need seven surveyors.

No artificial lighting is to be shone on any scattered trees, shrubs, linear features, woodland or waterways. For the site itself, an artificial lighting plan is required. All lighting must avoid the features of interest for the local bat populations. This is required due to the habitats within the local landscape meaning there is likely to be foraging and commuting bats within the local landscape.

5.3.2 Birds

Any tree removal should be undertaken outside of the breeding bird season of March to August, inclusive.

If works on trees are required to be undertaken during the nesting season, then a competent ecologist must be present on site to undertake a detailed check of vegetation for active birds' nests immediately before vegetation clearance and provide written confirmation that no birds will be harmed and /or that there are appropriate measures in place to protect nesting birds on site. Any such written confirmation must be submitted to the Local Planning Authority prior to any work first commencing.

5.3.3 Hedgehogs

As a purely precautionary measure, it is recommended that provisions are incorporated during the construction phase. This will be to create provisions for hedgehogs to escape in the form of creating slopes or the inclusion of ramps at the end of each working day from all trenches dug into the ground. Additionally, any pipework left on site that is greater than 150mm in diameter will need to be planked off. Should this information be strictly adhered to, then the development works will not negatively impact on the local mammal populations.

Post development, one Eco Hedgehog Nest Box should be included into the site within an appropriate location. It is also recommended that small gaps are left within any boundary fencing (if used) to enable the specimens to continue to commute through the area (an example can be found within figure 3). This will ensure that the local hedgehog populations do not become fragmented within the local landscape.

Figure 3: An image of an example hedgehog tunnel (obtained from RSPB).

5.4 Site Enhancements

For the proposed development works, the following site enhancement measures could be incorporated into the site post-development. These measures are optional but are bespoke to the site surveyed for the enhancement of biodiversity. Once the options have been finalised, the locations of these features should be placed on a master plan.

5.4.1 Bats

It is an option to install Eco Bat Boxes or Integrated Eco Bat Boxes on the trees and structures located within the proposed scheme of works. This will enhance the roosting opportunities within the area for the local bat populations.

The site can be enhanced by introducing a bat friendly planting scheme in the soft landscaping plan. The table below outlines species recommended by the Bat Conservation Trust, all of which could be incorporated into the site post development.

Additional compensation, enhancement and mitigation measures will be devised following the additional survey effort.

Flowers for borders	Trees, shrubs & climbers
Aubretia	Bramble
Candytuft	Buddleia
Cherry pie	Common alder
Corncockle	Dogrose
Corn marigold	Elder
Corn poppy	English oak
Echniacea	Gorse
English bluebell	Guelder rose
Evening primrose	Hawthorn
Field poppies	Hazel
Honesty	Honeysuckle (native)
Ice plant ‘pink lady’	Hornbeam
Knapweed	Ivy
Mallow	Jasmine
Mexican aster	Pussy willow
Michaelmas daisy	Rowan
Night-scented stock	Silver birch
Ox-eye daisy	**Herbs**
Phacelia	Angelica
Poached egg plant	Bergamot
Primrose	Borage
Red campion	Coriander
Red valerian	English marigolds
Scabious	Fennel
St. John’s Wort	Feverfew
Sweet William	Hyssop
Tobacco plant	Lavenders
Verbena	Lemon balm
Wallflowers	Marjoram
Wood forget-me-not	Rosemary
Yarrow	Sweet Cicely
	Thyme

5.4.2 Birds

The site could be enhanced for birds by installing a variety of bird boxes on site, such as an Apex Bird Box and an Apex Robin Box. Additional compensation, enhancement and mitigation measures will be devised following the additional survey effort.

5.4.3 Flora

At present, the site is not considered to have a diverse range of flora. Therefore, it is recommended that a small section of the site is converted into a 'wild meadow' that uses native wildflower seed mixes. A variety of these can be found on the Meadowmania or Wildflower Turf webpages.

To enhance the site for the local bat and bird populations several native shrubs and herbs could be included within the 'wild meadow' which will provide excellent foraging habitat. More information on shrubs for bats can be found on the wildlife trust website and more information on shrubs for birds can be found on the rspb website. There are several different shrubs to choose from but it is important to avoid invasive species such as buddleia, more information on invasive flora can be found on the rspb website.

5.4.4 Hedgehogs

The site could be enhanced for the local hedgehog population by installing at least two Eco Hedgehog Nest Boxes around the site. This will create more opportunities for hedgehogs within the local landscape.

5.4.5 Invertebrates

At present, the site is not considered to be of any importance to local invertebrate populations. In conjunction with the wildflower planting, it is recommended that at least two Bumblebee Boxes are incorporated into the scheme, along with at least two Bug Hotels. This will enhance the site for the local invertebrate populations, which will thus attract species further up in the trophic level.

The site would benefit from plants rich in a pollen source throughout the year to enhance the area for the potential of bees. In order to ensure a nectar source year-round it is important to use plants that are relevant to the season. The table below includes just a few examples of which plants thrive through the different seasons to ensure a bee friendly area.

SPRING	SUMMER	AUTUMN	WINTER
• Flowering Cherry • Crab Apple • Hawthorn • Bugle • Daffodils • Pulmonaria • Sea Thrift • Alliums • Grape Hyacinth	• Lavender • Agastache • *Erysimum* 'Bowles' Mauve' • Scabious • Comfrey • Foxgloves • Cardoon • Echinops	• Sedums • Single-flowered Dahlias • *Verbena bonariensis* • Japanese Anemones • Autumn Asters • *Actaea simplex*	• Snowdrops, • Winter Aconites, • Ivy, • Crocuses, • Winter Honeysuckle, • Hellebores, • Mahonia, • *Clematis cirrhosa*

5.5 Biodiversity Net Gain

Biodiversity Net Gain needs to be ensured within the scheme of works. A Biodiversity Net Gain Report has been commissioned to show how a minimum 10% gain in biodiversity can be achieved on site during and post development. Within this report the locations of the above Site Enhancements will be discussed as well as any further enhancements required to meet the minimum 10% gain.

6 References

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7 Appendices

Appendix A: Site Plans

Appendix B: Desktop Study Table

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Appendix E: Site Photographs

Appendix F: Biodiversity Legislation and Policy

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Appendix A: Site Plans.

Appendix B: Desktop Study Tables

Taxon Name	Common Name
Fish - Bony	
Anguilla anguilla	European Eel
Amphibians	
Bufo bufo	Common Toad
Rana temporaria	Common Frog
Birds	
Acanthis flammea	Common (Mealy) Redpoll
Alcedo atthis	Kingfisher
Anas crecca	Teal
Apus apus	Swift
Ardea cinerea	Grey Heron
Botaurus stellaris	Eurasian Bittern
Bucephala clangula	Goldeneye

Taxon Name	Common Name
Cuculus canorus	Cuckoo
Cygnus olor	Mute Swan
Delichon urbicum	Common House Martin
Dryobates minor	Lesser Spotted Woodpecker
Egretta garzetta	Little Egret
Falco tinnunculus	Kestrel
Ficedula hypoleuca	European Pied Flycatcher
Hirundo rustica	Swallow
Larus argentatus	European Herring Gull
Larus fuscus	Lesser Black-backed Gull
Loxia curvirostra	Red Crossbill
Luscinia megarhynchos	Nightingale
Melanitta nigra	Common Scoter
Milvus milvus	Red Kite
Motacilla cinerea	Grey Wagtail
Muscicapa striata	Spotted Flycatcher
Passer domesticus	House Sparrow
Phalacrocorax aristotelis	Shag
Phoenicurus ochruros	Black Redstart
Phylloscopus trochilus	Willow Warbler
Prunella modularis	Dunnock
Rallus aquaticus	Water Rail
Regulus regulus	Goldcrest
Spatula clypeata	Shoveler

Taxon Name	Common Name
Strix aluco	Tawny Owl
Sturnus vulgaris	Starling
Tringa ochropus	Green Sandpiper
Turdus iliacus	Redwing
Turdus philomelos	Song Thrush
Turdus viscivorus	Mistle Thrush
Mammals - Marine	
Phoca vitulina	Common Seal
Mammals - Terrestrial (excl. bats)	
Erinaceus europaeus	West European Hedgehog
Mammals - Terrestrial (bats)	
Chiroptera	Bats
Eptesicus serotinus	Serotine

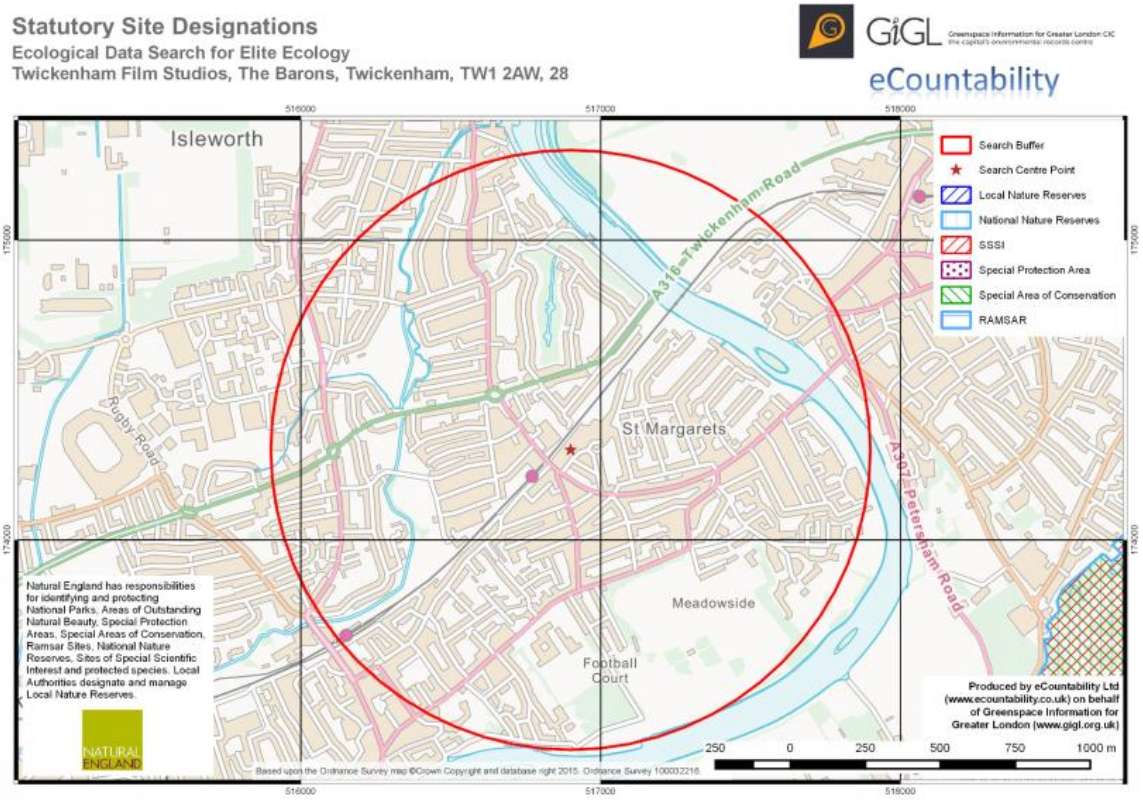
Taxon Name	Common Name
Myotis	Unidentified Bat
Myotis daubentonii	Daubenton's Bat
Nyctalus leisleri	Lesser Noctule
Nyctalus noctula	Noctule Bat
Pipistrellus	Pipistrelle Bat species
Pipistrellus pipistrellus	Common Pipistrelle

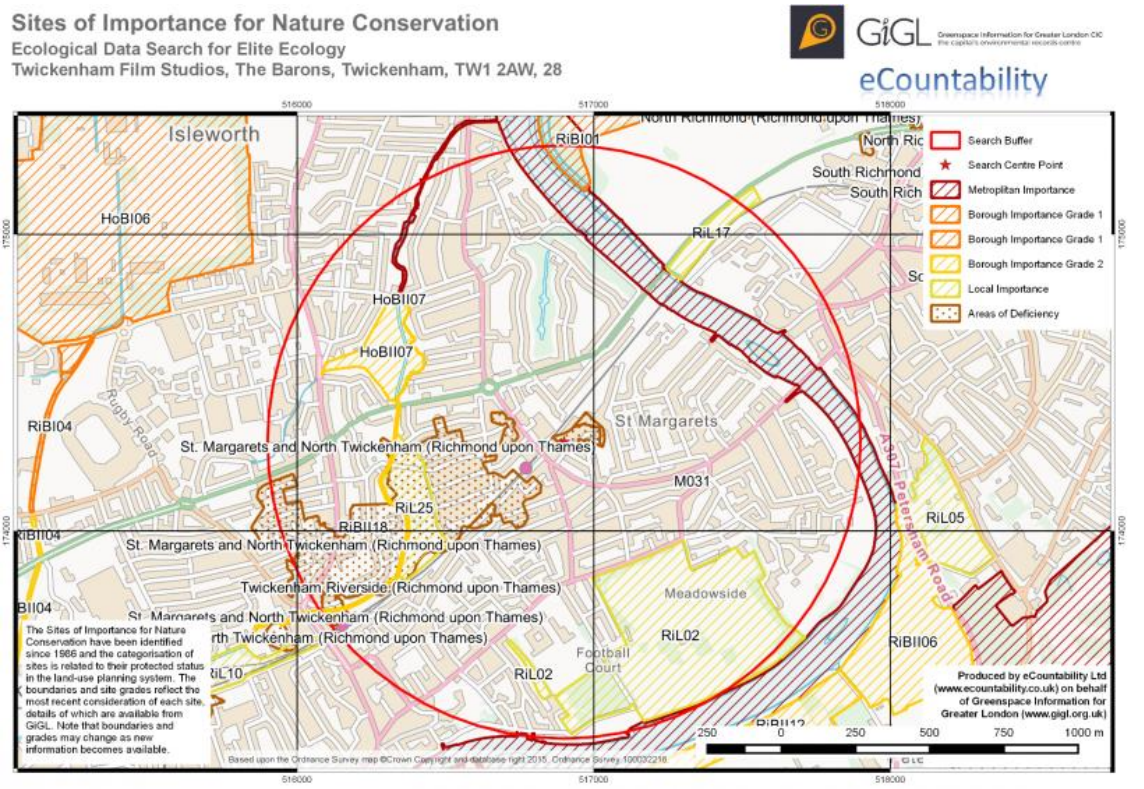
Pipistrellus pygmaeus	Soprano Pipistrelle
Plecotus	Long-eared Bat species
Plecotus auritus	Brown Long-eared Bat
Vespertilionidae	Bats
Higher Plants - Flowering Plants	
Angelica archangelica	Garden Angelica
Hyacinthoides non-scripta	Bluebell
Onobrychis viciifolia	Sainfoin
Ruscus aculeatus	Butcher's-broom
Tilia platyphyllos	Large-leaved Lime
Valeriana officinalis	Common Valerian
Viscum album	Mistletoe

Invertebrates - Spiders		
Argiope bruennichi	Wasp Spider	
Invertebrates - Dragonflies & Damselflies		
Sympetrum striolatum	Common Sympetrum	
Invertebrates - Beetles		
Lucanus cervus	Stag Beetle	
Pyrochroa coccinea	Black-headed Cardinal Beetle	
Invertebrates - Caddis Flies		
Psychomyia fragilis	A Caddis Fly	
Invertebrates - Butterflies		
Melanargia galathea	Marbled White	
Invertebrates - Moths		
Euplagia quadripunctaria	Jersey Tiger	

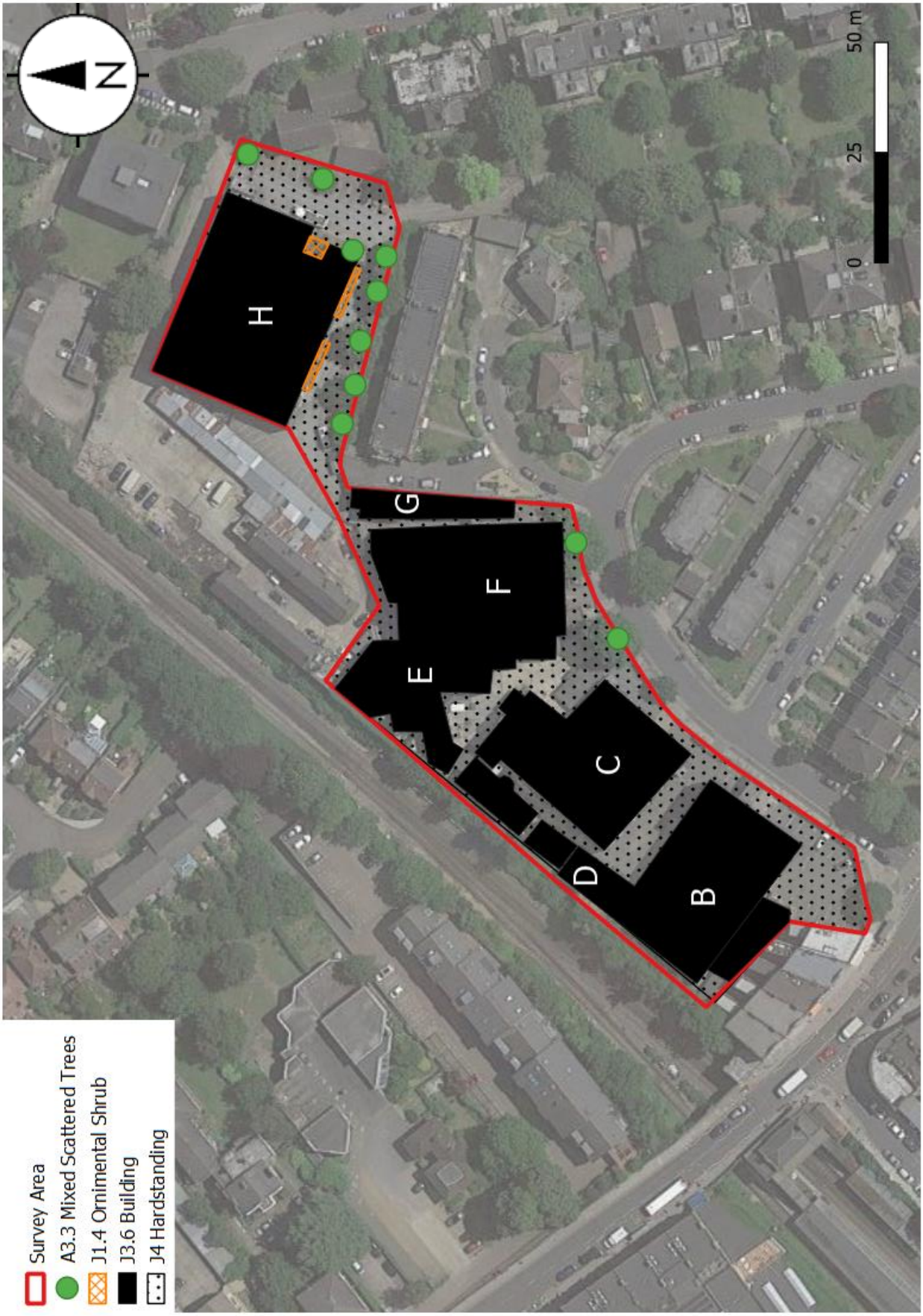
Appendix C: Desktop Study Maps

These maps have been produced by GiGL. All rights regarding the maps belong to them. No species map has been provided.





Appendix D: Phase 1 Habitat Ma



Appendix E: Site Photographs

These photographs are a summary of the habitats on site. Additional photographs of the site are available on request.

Plate 1: showing a gap under the facia board which Bats could utilise (yellow arrow).

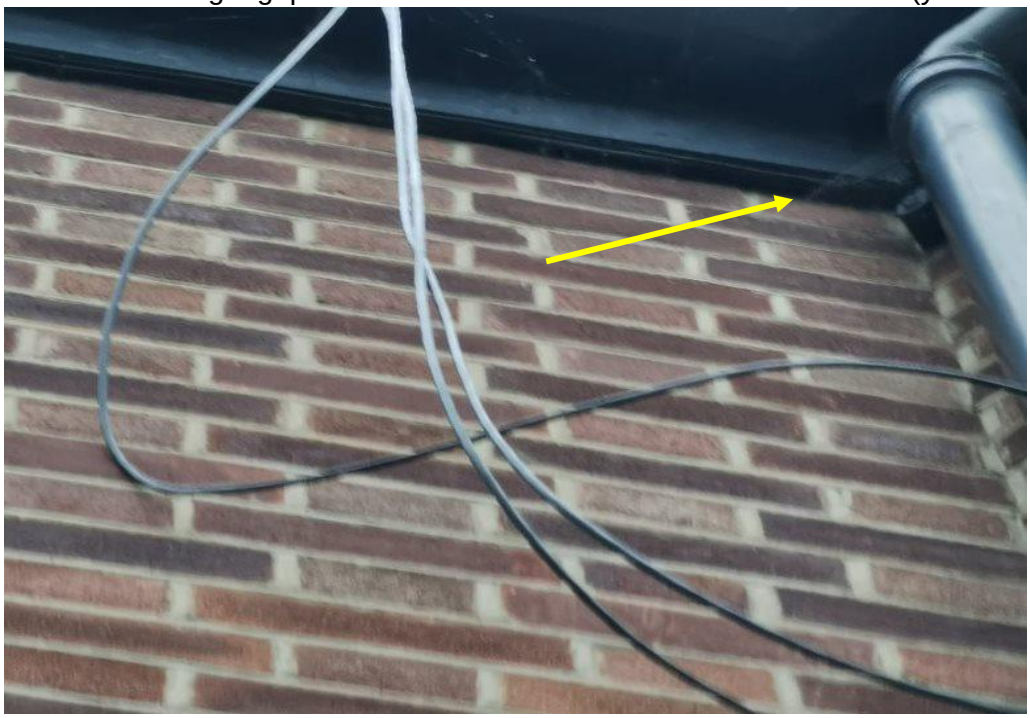


Plate 2: showing gaps under the wooden panelling

Plate 3: showing a hole in the wall.

Plate 4: showing a gap under the felt yellow arrow.

Plate 5: Image showing gaps between the walls (yellow arrows).

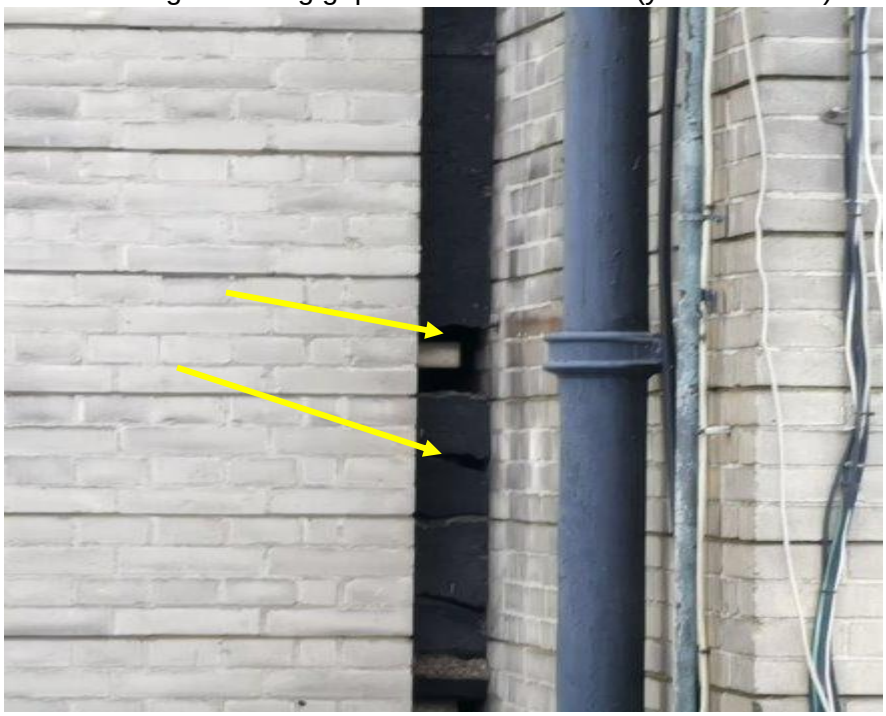


Plate 6: Image showing gaps under the lead flashing (yellow arrow).

Plate 7: Image showing gaps under the tiles.

Plate 8: showing damaged rendering

Appendix F: Biodiversity Legislation and Policy

General Legislation and Policy:

The framework of legislation and policy which underpins nature conservation in England. This is a material consideration in the planning process in England.

Conservation of Habitats and Species Regulations 2017 (Habitats Regulations 2010 as amended)

The Conservation of Habitats and Species Regulations 2017 consolidate and update the Conservation Regulations 1994 and the conservation of habitats and species regulations 2010 (and all their amendments). The Conservation of Habitats and Species Regulations 2017 are the principal means by which the EEC Council Directive 92/43 (The Habitats Directive) as amended is transposed into English and Welsh law.

The Conservation of Habitats and Species Regulations 2017 place duty upon the relevant authority of government to identify sites which are of importance to the habitats and species listed in Annexes I and II of the Habitats Directive. Those sites which meet the criteria are, in conjunction with the European Commission, designated as Sites of Community Importance, which are subsequently identified as Special Areas of Conservation (SAC) by the European Union member states. The regulations also place a duty upon the government to maintain a register of European protected sites designated as a result of EC Directive 79/409/EEC on the Conservation of Wild Birds (The Birds Directive). These sites are termed Special Protection Areas (SPA) and, in conjunction with SACs, form a network of sites known as Natura 2000. The Habitats Directive introduces for the first time for protected areas, the precautionary principle; that is that projects can only be permitted having ascertained no adverse effect on the integrity of the site. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest.

The Conservation of Habitats and Species Regulations 2017 also provide for the protection of individual species of fauna and flora of European conservation concern listed in Schedules 2 and 5 respectively. Schedule 2 includes species such as otter and great crested newt for which the UK population represents a significant proportion of the total European population. It is an offence to deliberately kill, injure, disturb or trade these species. Schedule 5 plant species are protected from unlawful destruction, uprooting or trade under the regulations.

The Wildlife and Countryside Act (WCA) 1981 (As amended)

The WCA, as amended, consolidates and amends pre-existing national wildlife legislation in order to implement the Bern Convention and the Birds Directive. It complements the Conservation (Natural Habitats. & c.) Regulations 1994 (as amended), offering protection to a wider range of species. The Act also provides for the designation and protection of national conservation sites of value for their floral, faunal or geological features, termed Sites of Special Scientific Interest (SSSIs).

Schedules of the act provide lists of protected species, both flora and fauna, and detail the possible offences that apply to these species.

The Countryside and Rights of Way (CRoW) Act 2000

The CROW Act, introduced in England and Wales in 2000, amends and strengthens existing wildlife legislation detailed in the WCA. It places a duty on government departments and the National Assembly for Wales to have regard for biodiversity, and provides increased powers for the protection and maintenance of SSSIs.

The Act also contains lists of habitats and species (Section 74) for which conservation measures should be promoted, in accordance with the recommendations of the Convention on Biological Diversity (Rio Earth Summit) 1992.

The Natural Environment and Rural Communities (NERC) Act 2006

Section 40 of the NERC Act places a duty upon all local authorities and public bodies in England and Wales to promote and enhance biodiversity in all of their functions. Sections 41 (England) and 42 (Wales) list habitats and species of principal importance to the conservation of biodiversity. These lists supersede Section 74 of the CRoW Act 2000. These species and habitats are a material consideration in the planning process.

The Hedgerow Regulations 1997

The Hedgerow Regulations make provision for the identification of important hedgerows which may not be removed without permission from the Local Planning Authority.

UK Biodiversity Action Plan

The United Kingdom Biodiversity Action Plan (UKBAP), first published in 1994 and updated in 2007, is a government initiative designed to implement the requirements of the Convention of Biological Diversity to conserve and enhance species and habitats. The UKBAP contains a list of priority habitats and species of conservation concern in the UK, and outlines biodiversity initiatives designed to enhance their conservation status. Lists of Broad and Local habitats are also included. The priority habitats and species correlate with those listed on Section 41 and 42 of the NERC Act.

The UKBAP requires that conservation of biodiversity is addressed at a County level through the production of Local BAPs. These are complementary to the UKBAP, however are targeted towards species of conservation concern characteristic of each area. In addition, a number of local authorities and large organisations have produced their own BAPs. UKBAP and Local BAP targets with regard to species and habitats are a material consideration in the planning process.

Planning Policy (England) and National Planning Policy Framework

In early 2012, the National Planning Policy Framework (NPPF) replaced much previous planning policy guidance, including Planning Policy Statement 9: Biological and Geological Conservation. The government circular 06/05: Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System, which accompanied PPS9, still remains valid. A presumption towards sustainable development is at the heart of the NPPF. This presumption does not apply however where developments require appropriate assessment under the Birds or Habitats Directives. The latest National Planning Policy Framework was updated in February 2019, with the section in relation to conserving the natural environment being located within section 15.

Section 15, on conserving and enhancing the natural environment, sets out how the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and, where possible, provide net gains in biodiversity. Opportunities to incorporate biodiversity gains into a development should be encouraged.

If a proposed development would result in significant harm to the natural environment which cannot be avoided (through the use of an alternative site with less harmful impacts), mitigated or compensated for (as a last resort) then planning permission should be refused.

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Species Specific Legislation

This section contains a summary of legislation with relation to the species present or potentially present in the survey area. The reader should refer to the original legislation for definitive interpretation.

Nesting and Nest Building Birds

Nesting and nest building birds are protected under the Wildlife and Countryside Act WCA 1981 (as amended). Some species (listed in Schedule 1 of the WCA) are protected by special penalties.

Subject to the provisions of the act, if any person intentionally:

- kills, injures or takes any wild bird;
- takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or
- takes or destroys an egg of any wild bird, he shall be guilty of an offence.

'Reckless' offences with regard to the disturbance of nesting wild birds included in Schedule 1 of the Wildlife and Countryside Act were added by the Countryside and Rights of Way Act 2000.

The Natural Environment and Rural Communities (NERC) Act 2006 places a duty on Government Departments to have regard for the conservation of biodiversity and maintains lists of species and habitats which are of principal importance for the purposes of conserving biodiversity in England and Wales. These lists include a number of bird species.

The reader is referred to the original legislation for the definitive interpretation.

Badger

The main legislation protecting badgers in England and Wales is the Protection of Badgers Act 1992 (the 1992 Act). Under the 1992 Act it is an offence to:

- wilfully kill, injure, take or attempt to kill, injure or take a badger;
- possess a dead badger or any part of a badger;
- cruelly ill-treat a badger;
- use badger tongs in the course of killing, taking or attempting to kill a badger;
- dig for a badger;
- sell or offer for sale or control any live badger;
- mark, tag or ring a badger; and
- interfere with a badger sett by:
- damaging a sett or any part thereof;
- destroying a sett;
- obstructing access to a sett;
- causing a dog to enter a sett; and
- disturbing a badger while occupying a sett.

The 1992 Act defines a badger sett as: "any structure or place which displays signs indicating current use by a badger".

Bats

All species of bat are fully protected under a variety of domestic, European and international legislation and conventions. These include:

- Bern Convention (Appendix II)
- Bonn Convention (Appendix II)
- Conservation Regulations (Northern Ireland) 1995
- Conservation of Habitats and Species Regulations 2010
- Countryside Rights of Way Act 2000
- Eurobats Agreement
- Habitats Directive (Annexes IV and II)
- Habitats Regulations 1994 (as amended) Scotland
- NERC Act 2006
- Wildlife and Countryside Act 1981 (as amended)
- Wild Mammals Protection Act

In addition to this, some species have additional protection by being listed on the UK Biodiversity Action Plan (UKBAP).

The legislation afforded to bats makes it illegal to possess or control any live or dead specimens, to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a bat while it is occupying a structure or place which it uses for that purpose.

All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), which protects birds, nests, eggs and nestlings from harm. In addition to this, some rarer species, such as barn owls are afforded extra protection.

National Planning Policy Framework, Section 15:

The published framework in 2018 replaces the previous Planning Policy Statement 9 and National Planning Policy (dated 2012).

Section 15: Conserving and enhancing the natural environment reaffirms the government's commitment to maintaining green belt protections and preventing urban sprawl, retains the protection of designated sites and preserves wildlife. It also aims to improve the quality of the natural environment and halt declines in species and habitats, protects and enhances biodiversity and promotes wildlife corridors.

Biodiversity 2020:

This sets out to halt overall biodiversity loss and support healthy well-functioning ecosystems by establishing coherent ecological networks, with more and better places for nature, to the benefit of wildlife and people. The government's policy is aimed at individuals, communities, local authorities, charities, business and government, which all have a role to play in delivering Biodiversity 2020.

Freshwater White-clawed Crayfish

The white-clawed crayfish is partially protected under Wildlife and Countryside Act 1981 (as amended). It is listed on schedule 5 and therefore afforded protection under Section 9 (1 and 5). Therefore, it is an offence to take white-clawed crayfish and to sell, or attempt to sell, any part of the species, alive or dead, or intend to buy or sell.

Great Crested Newt

The great crested newt (*Triturus cristatus*) is fully protected under a variety of legislation and conventions. These include:

- Bern Convention (Appendix II)
- Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)
- Conservation of Habitats and Species Regulations 2010
- EU Habitats Directive (Annex II and IV)
- Nature Conservation (Scotland) Act 2004
- NERC Act 2006 (Section 41 England; Section 42 Wales)
- Wildlife and Countryside Act 1981 (as amended)

In addition to this, the great crested newt has been listed as a priority species on the UK Biodiversity Action Plan (UKBAP).

This legislation covers all aspects of newt life stages (eggs, efts and adult newts) and makes it illegal to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a great crested newt while it is occupying a structure or place which it uses for that purpose.

Licenses can be obtained from Natural England (DEFRA) under the Conservation (Natural Habitats etc.) Regulations 1994, to permit activities for the purposes of:

- Regulation 44(2)(e): Preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment, or
- Regulation 44(2)(f): Preventing the spread of disease
- Regulation 44(2)(g): Preventing serious damage to any form of property or fisheries

Or

- If there is no satisfactory alternative.

The above regulations allow people to carry out activities which would otherwise be illegal.

Hazel Dormouse

Hazel Dormouse and their habitats are protected by:

- Wildlife and Countryside Act 1981 (as amended)
- Countryside Rights of Way (CROW) 2000
- The Natural Environment and Rural Communities Act 2006
- Conservation of Habitat and Species Regulations 2010

These make it an offence to:

- Capture, injure or kill a Hazel Dormouse
- Disturb a Hazel Dormouse
- Damage or destroy breeding or nesting sites in use by Hazel Dormice
- Disturb a Dormouse whilst it is occupying a structure or place that they use for shelter or protection
- Obstruct access to any structure or place that the Dormouse uses for shelter and protection.
- To possess or control any live or dead specimens.

Otter

Otters are fully protected by the European Habitats Directive (92/43/EEC) by being incorporated in annex II of the legislation. In addition to this, otters are listed on schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:

- To intentionally kill, injure or take an otter.
- To possess or control any live or dead specimens.
- To intentionally or recklessly damage, destroy or obstruct access to any structure, feature or place of shelter in use by otters.
- To intentionally or recklessly disturb an otter whilst it is in occupation of a feature or structure.
- To sell, possess or transport for the purpose of sale or publicly declare the desire to buy or sell otters.

Reptiles

All six native reptiles within Great Britain are legally protected, with the extent of protection varying dependent upon their rarity and conservation importance.

Those that receive full protection under the Wildlife and Countryside Act 1981 (as amended) are the rare sand lizard and smooth snake. These species also receive protection under the Conservation (Natural Habitats &c.) Regulations 1994 (also referred to as the Habitats Directive). This means that they are protected from deliberate disturbance, killing, injury or capture and the habitat in which they live is also fully protected against damage or destruction. Any activity involving disturbance or damage to habitats utilised by sand lizards or smooth snakes would require a licence issued by the Department of the Environment, Food and Rural Affairs (DEFRA) following consultation with the statutory nature conservation organisation (Natural England).

The remaining four reptile species are ‘partially protected’ under the Wildlife and Countryside Act 1981 (as amended), with these species being slow-worm, common lizard, grass snake and adder. This means that these species are protected against intentional killing, injuring and against sale, but their habitat is not protected. In planning terms this means that the presence of these species is a material consideration and there is a requirement to ensure that any reptile interest is safeguarded. If a proposed development is likely to have an impact on these reptiles, then the statutory nature conservation organisation must be notified, particularly if capture and translocation is being proposed. In some parts of the UK, sites that support common reptile species such as common lizards and slow-worms can qualify as County Wildlife Sites. Sites of this designation may receive protection in planning policy.

Water Voles

Water Voles are fully protected under the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:

- To intentionally kill, injure or take a water vole.
- To possess or control any live or dead specimens.
- To intentionally or recklessly damage, destroy or obstruct access to any structure, feature or place of shelter in use by water voles.
- To intentionally or recklessly disturb a water vole whilst it is in occupation of a feature or structure.
- To sell, possess or transport for the purpose of sale or publicly declare the desire to buy or sell water voles.

Non-Native Floral Species

It is an offence under schedule 9 of the Wildlife and Countryside Act 1981 (as amended) to plant or otherwise cause non-native flora to grow in the wild. This includes the transportation of earth that has previously had non-native species growing and includes the spread of the species.

All stands of non-native floral species need to be disposed of safely at a licenced landfill site according to the Environmental Protection Act (Duty of Care) Regulations 1991.

Appendix G: Bats and Artificial Light

Artificial lighting is known to affect bat's roosting and foraging behaviour, with lighting resulting in a range of impacts that includes roost desertion (BCT, 2009), delayed emergence of roosting bats (Downs et al., 2003), increased activity of some bat species and decreased activity by others (Stone et al., 2012).

An experimental approach using LED units, demonstrated that relatively fast-flying bat species, including the common pipistrelle, showed no significant impacts as a result of new artificial lighting, even when lighting was set at relatively high levels close to 50 lux.

In contrast, slow flying bats such as the myotid bats (Myotis spp.) showed sharp reductions in presence, even at low light levels of 3.6 lux (Stone et al., 2012).

Current recommendations for all bat species specifies that no bat roost should be directly illuminated.

Due to the impacts of lighting, mitigation and sensitive lighting design schemes are required for projects where bats are present. These should include bat friendly lighting plans that should aim to avoid lighting wherever possible. If this is not possible, then the minimisation of any lighting impacts is required by adopting the following measures:

- To introduce lighting curfews or use of PIR sensors.

  Lighting curfews can be an effective way of avoiding impacts on bats. These curfews may involve either turning off lighting or dimming light units at specific times of the night, dimming units at key times of the year, providing the luminaire allows for this option via a control unit. Lighting to be triggered by PIR sensors can be expected to be illuminated only when required and for a low proportion of time.

- To consider no lighting solutions where possible.

  Options such as white lining, good signage and LED cats eyes should be considered as preferable. Reflective fittings may help make use of headlights to provide any necessary illumination in some areas.

- To use only high pressure sodium or warm white LED lamps where possible.

  High pressure sodium and warm white LED lamps emit lower proportions of insect attracting UV light than mercury, metal halide lamps and white LED lighting. Generally, lamps should have a lower proportion of white or blue wavelengths, with a colour temperature <4200 kelvin recommended (BCT, 2014).

- To minimise the spread of light.

  The light spread should be kept at or near horizontal to ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Baffles, hoods, louvres and shields should be used where necessary to reduce light spill.

- To consider the height of the lighting column.

  While downward facing bollard lighting is often preferable, it should be noted that a lower mounting height does not automatically reduce impacts to bats as bollard lighting can often be designed to provide up-lighting. Where bollard lighting is considered to be the most appropriate system, bollard spacing or unit density should be kept to a minimum and units should be fitted with the appropriate hoods/deflectors to reduce any up-lighting.

- To avoid reflective surfaces below lights.

  The polarisation of light by shiny surfaces attracts insects increasing bat activity (BCT, 2012). Consequently, surface materials around lighting require consideration.

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The survey results purport the current status of the site and its potential for protected species utilisation at the time of surveying. It should not be viewed as a complete list of the possible flora and fauna species that could be using the site at different times of the year.

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