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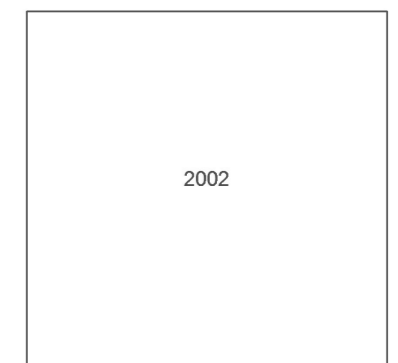
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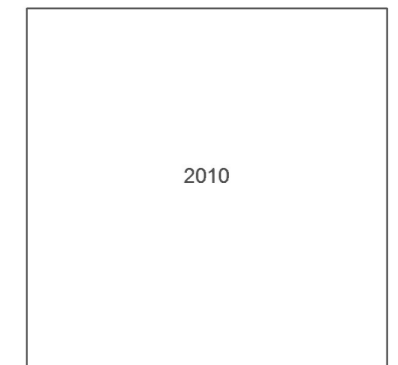
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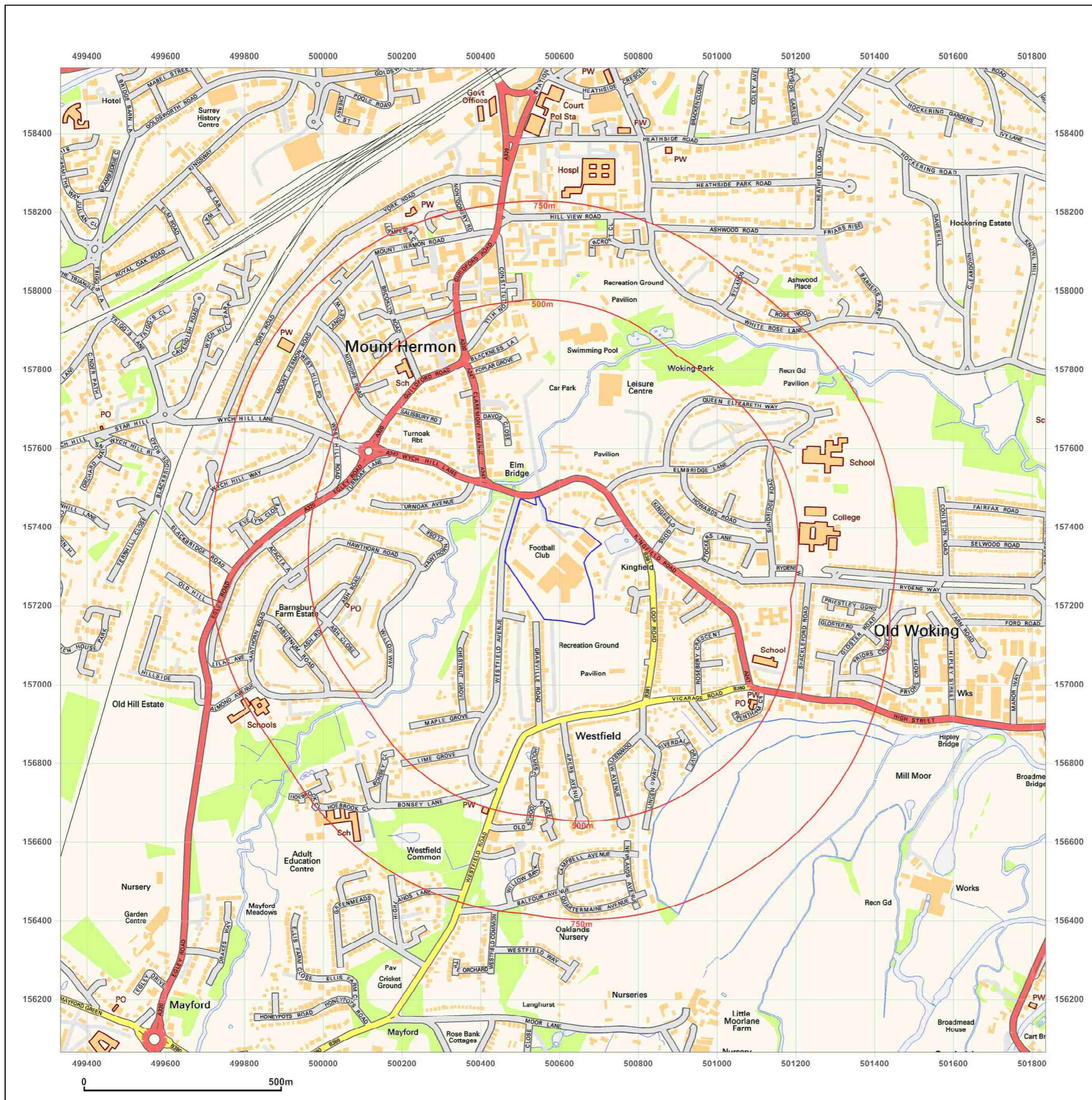
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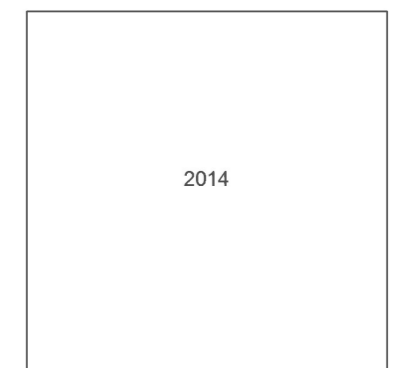
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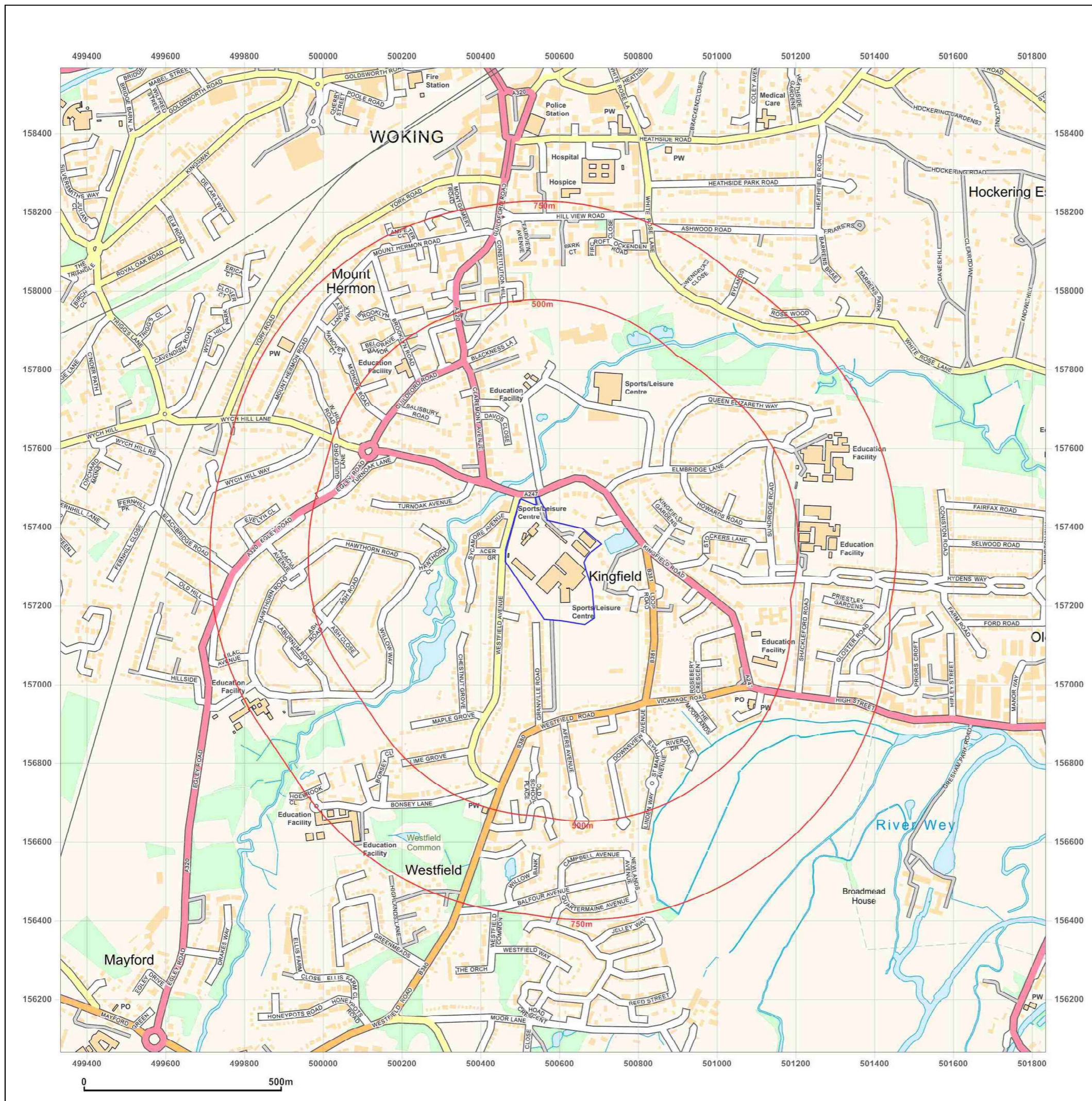
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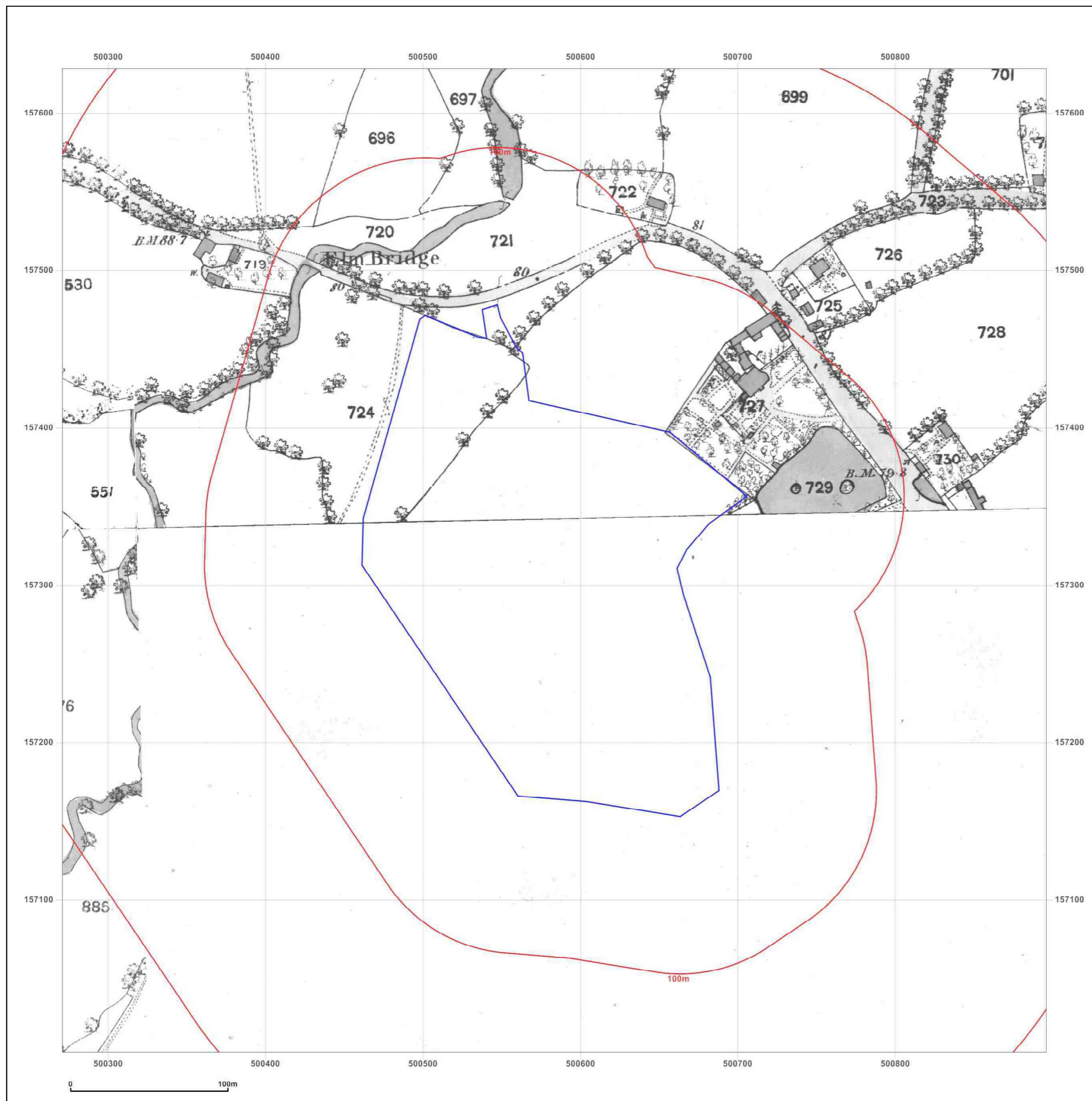
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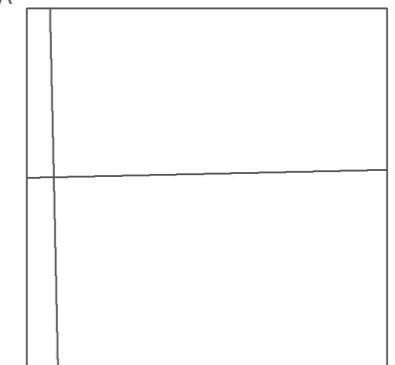
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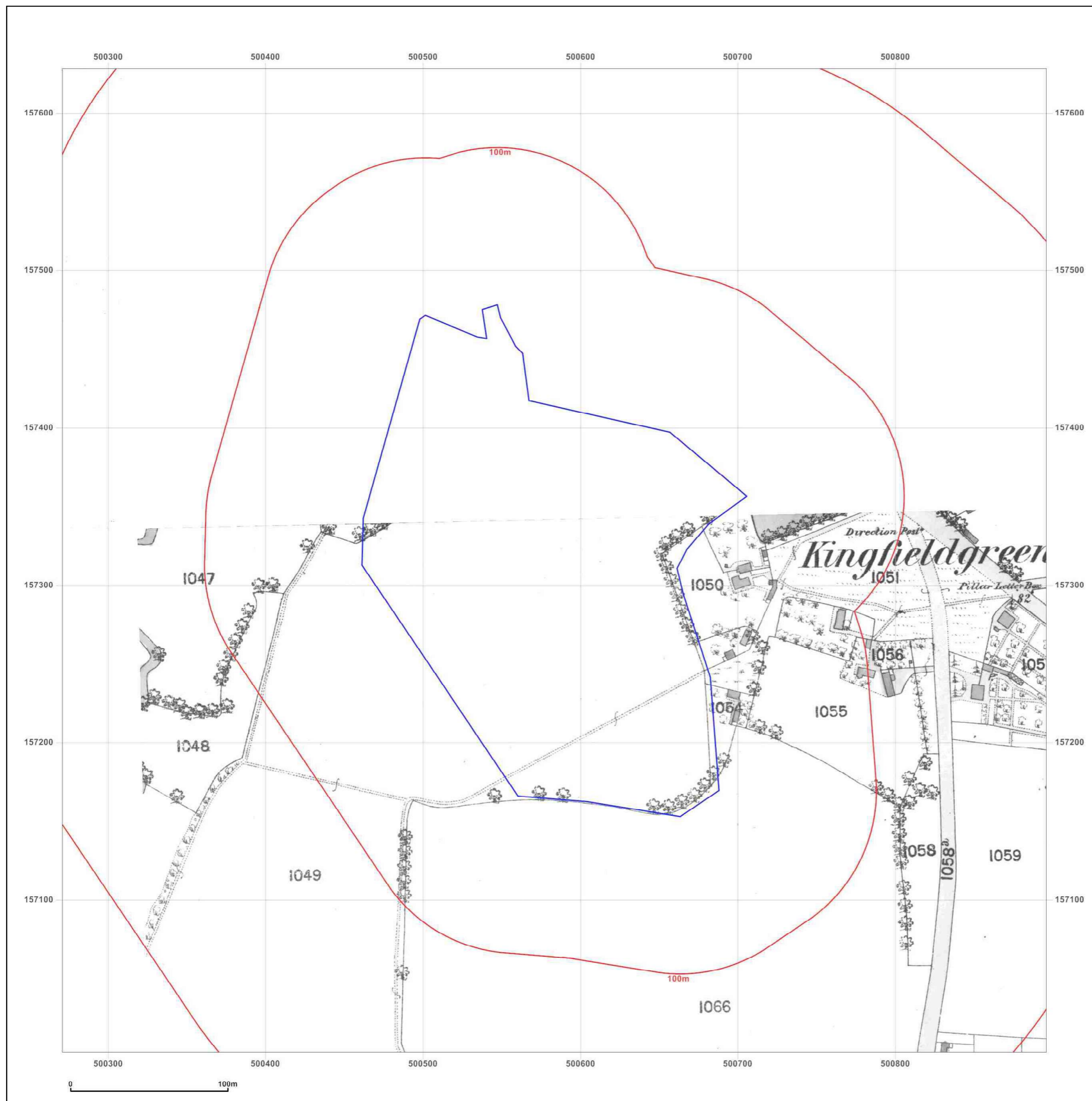
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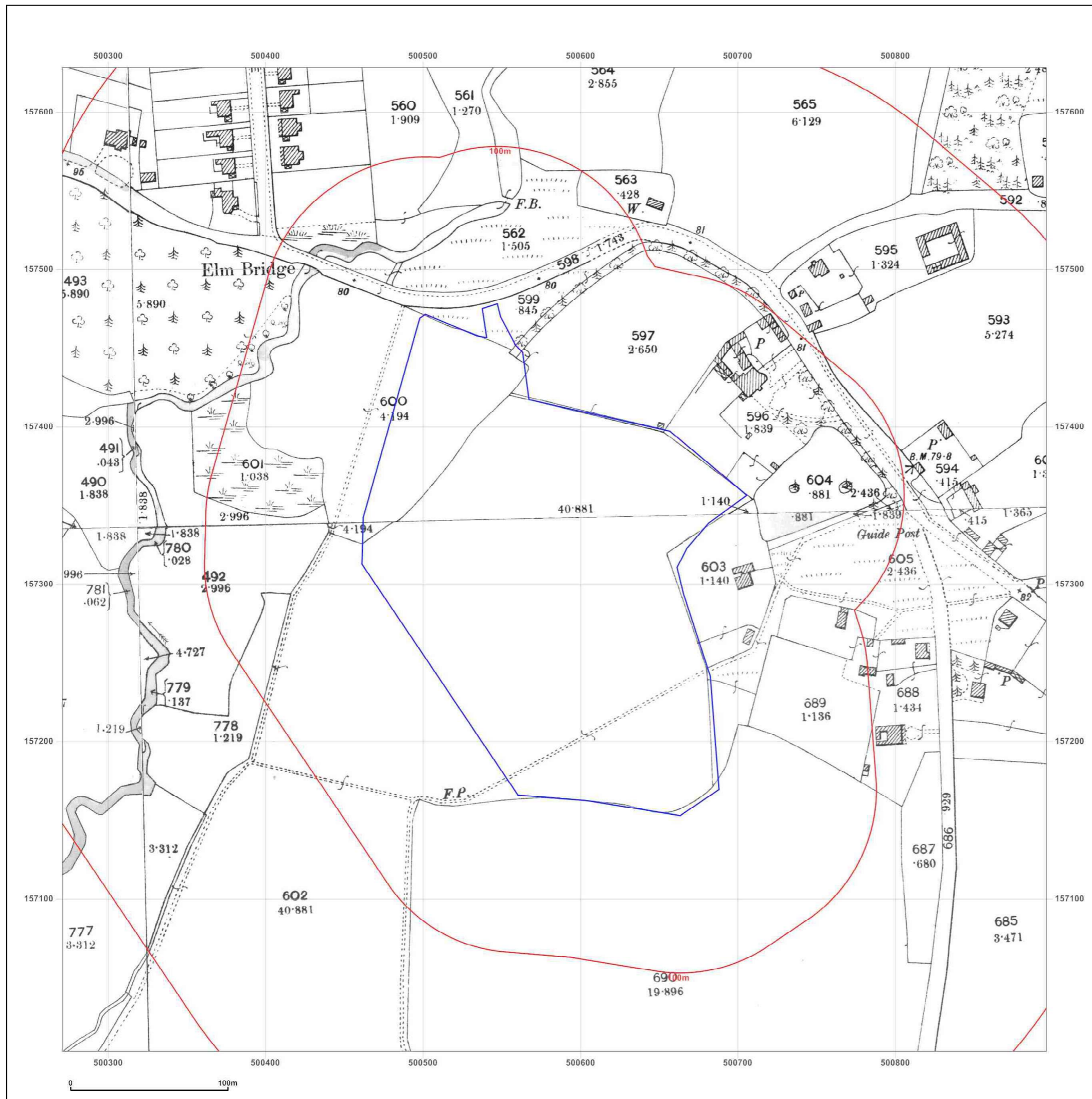
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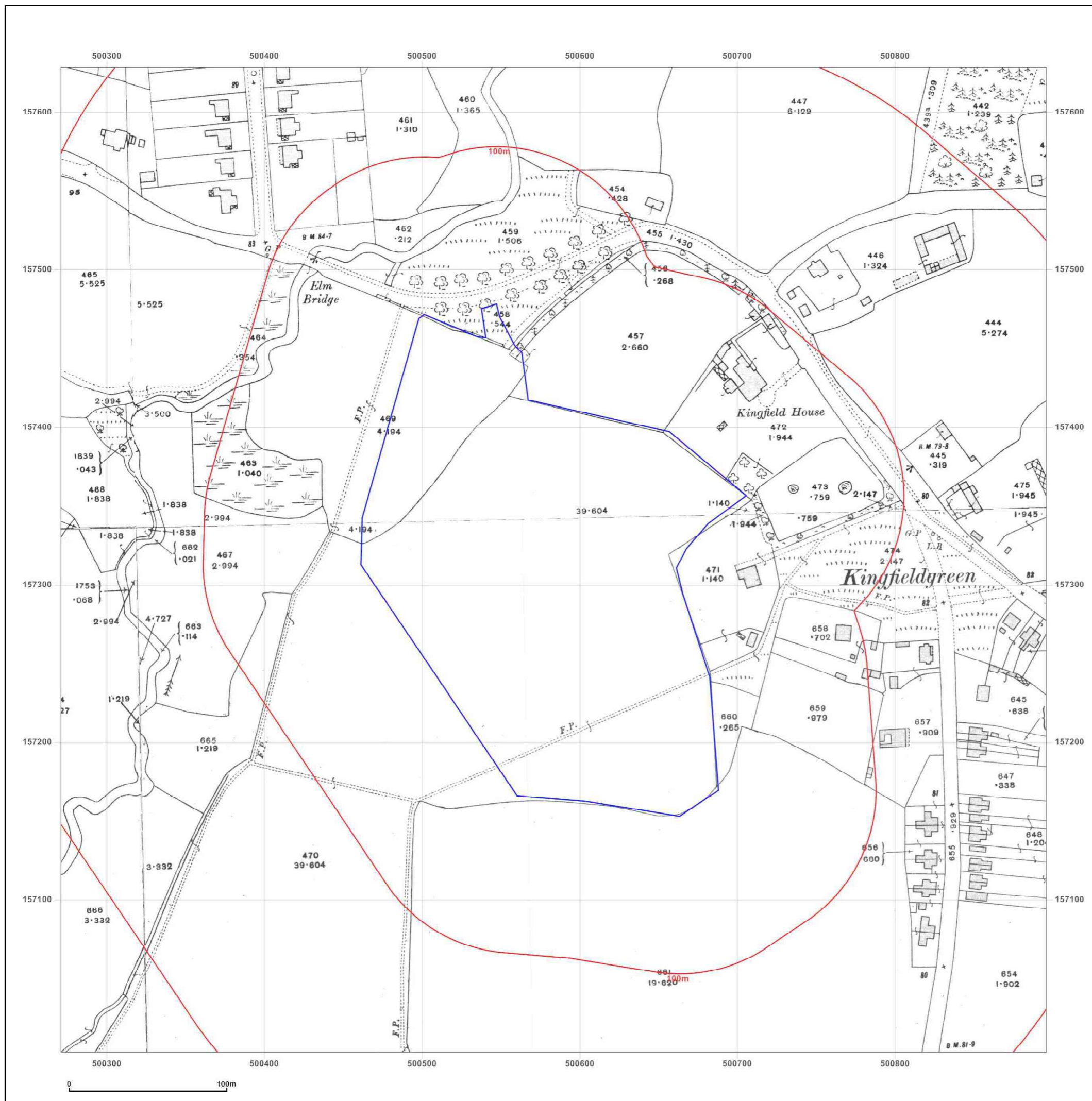
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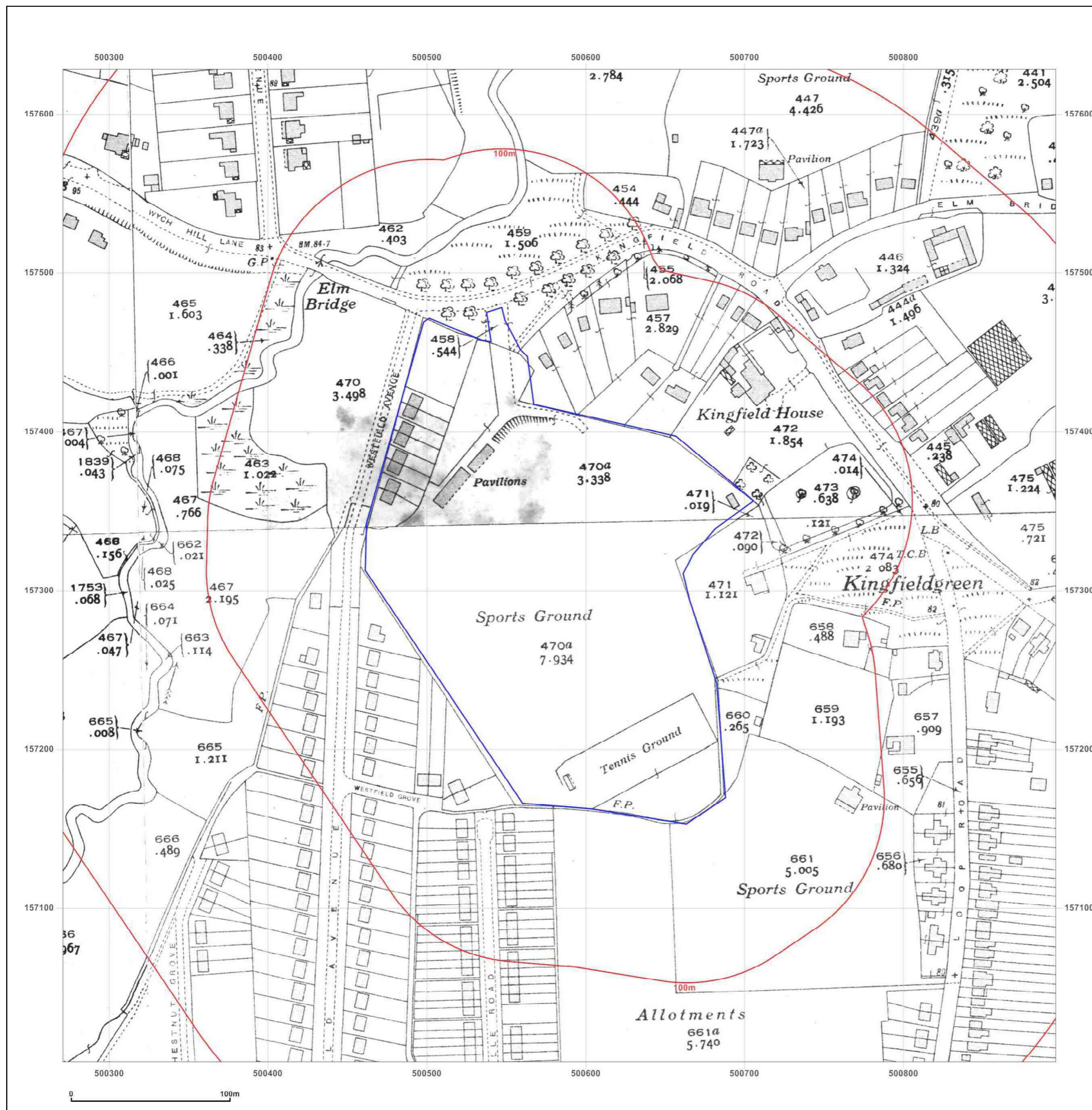
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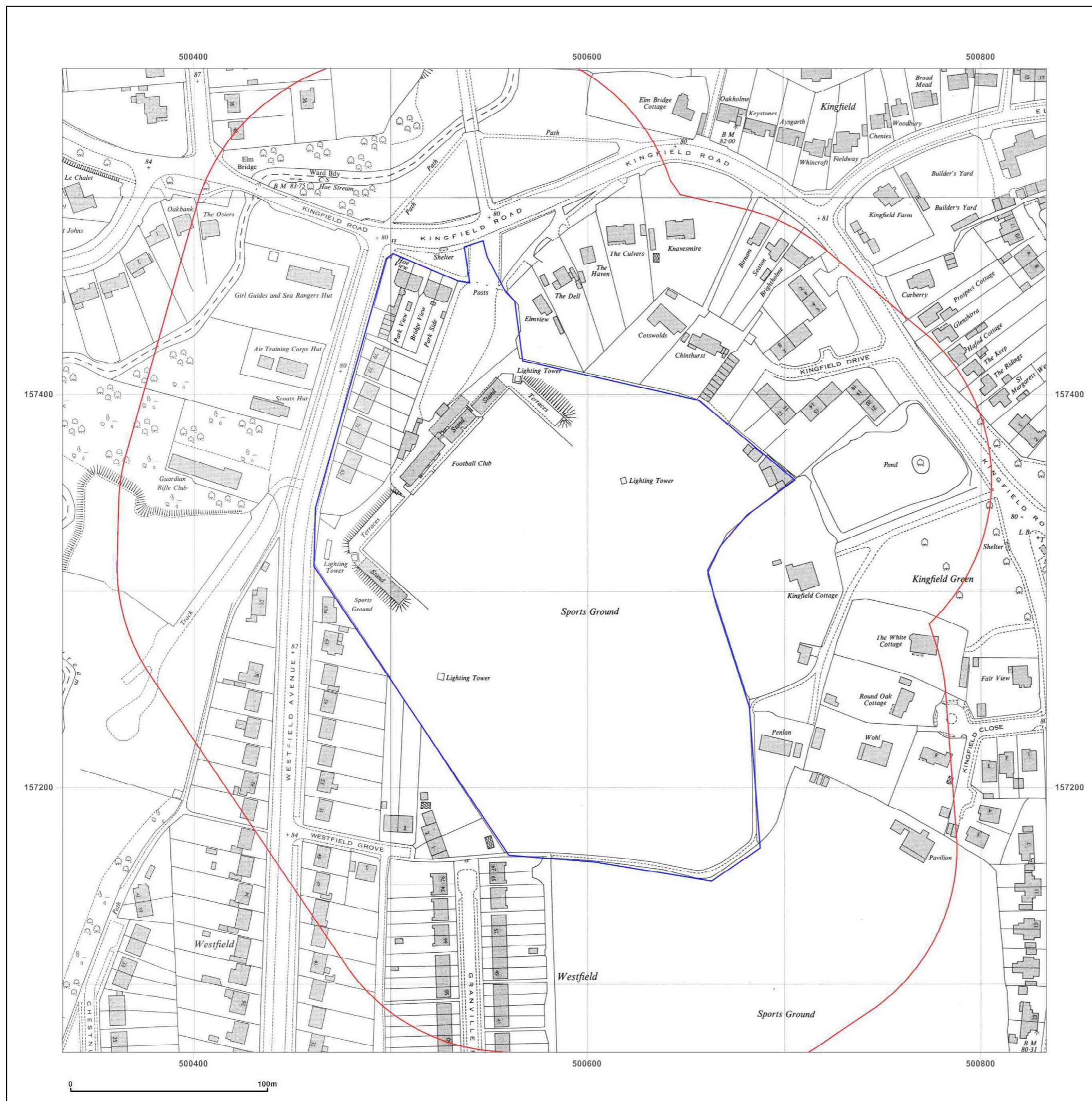
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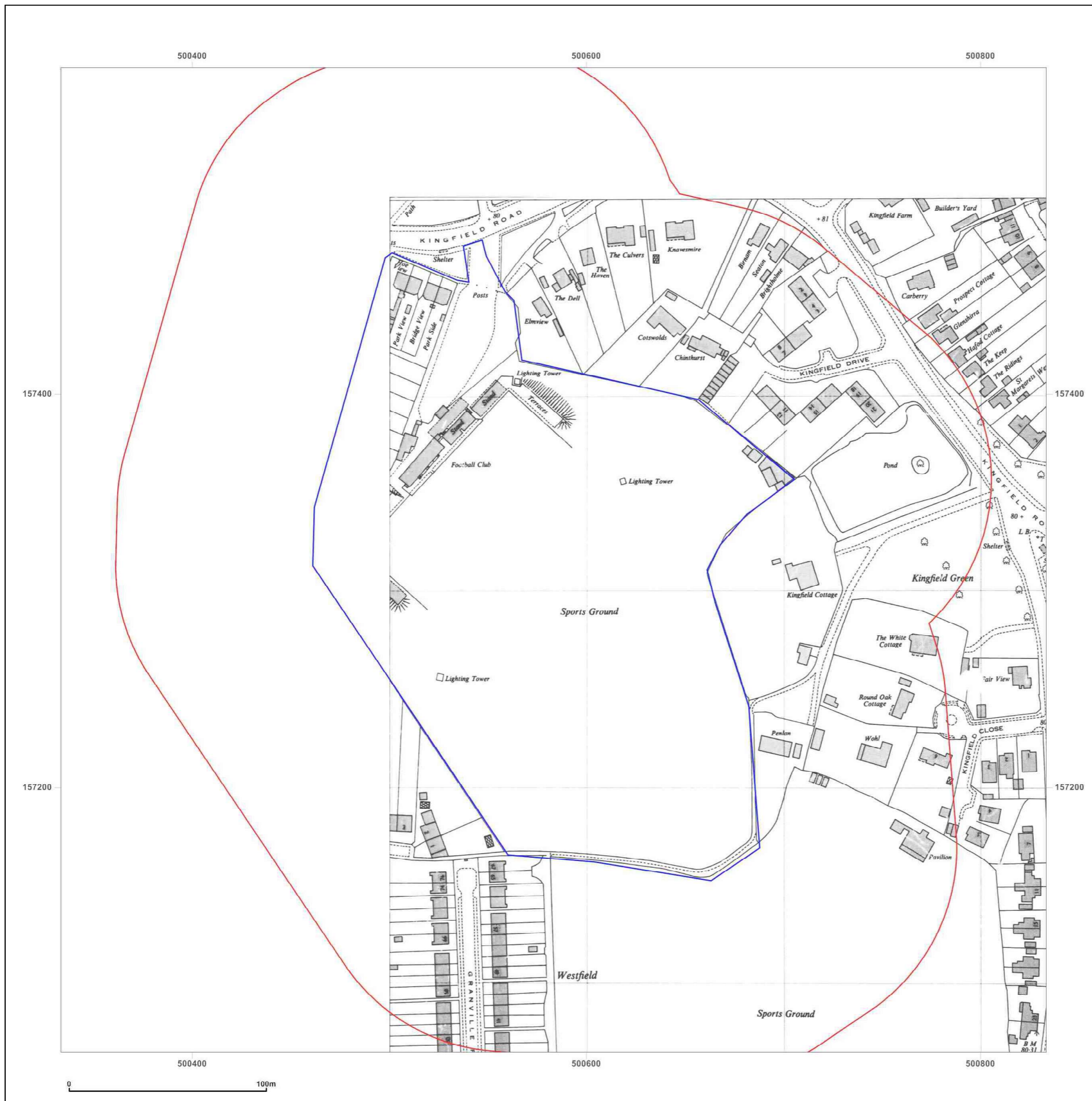
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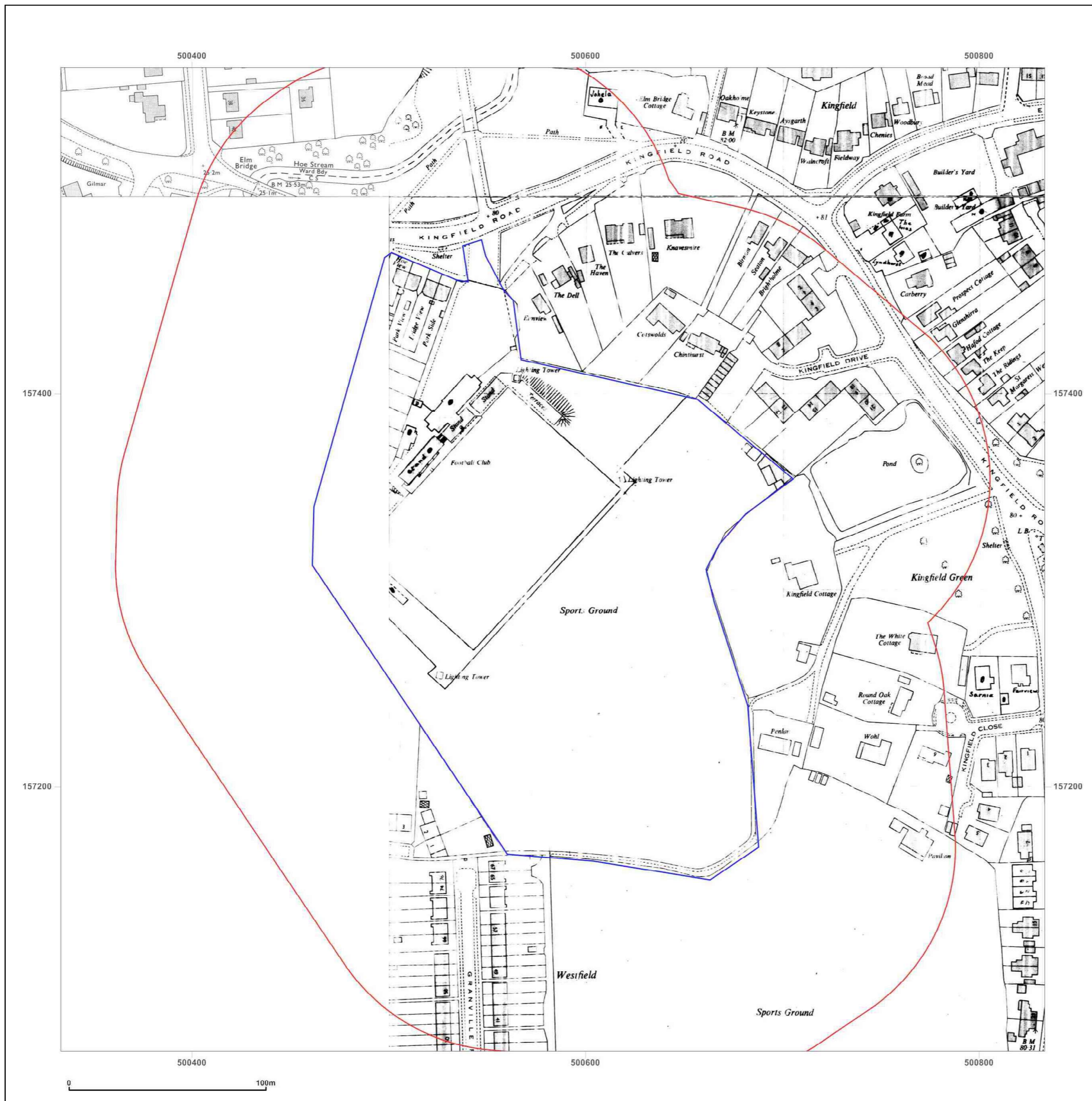
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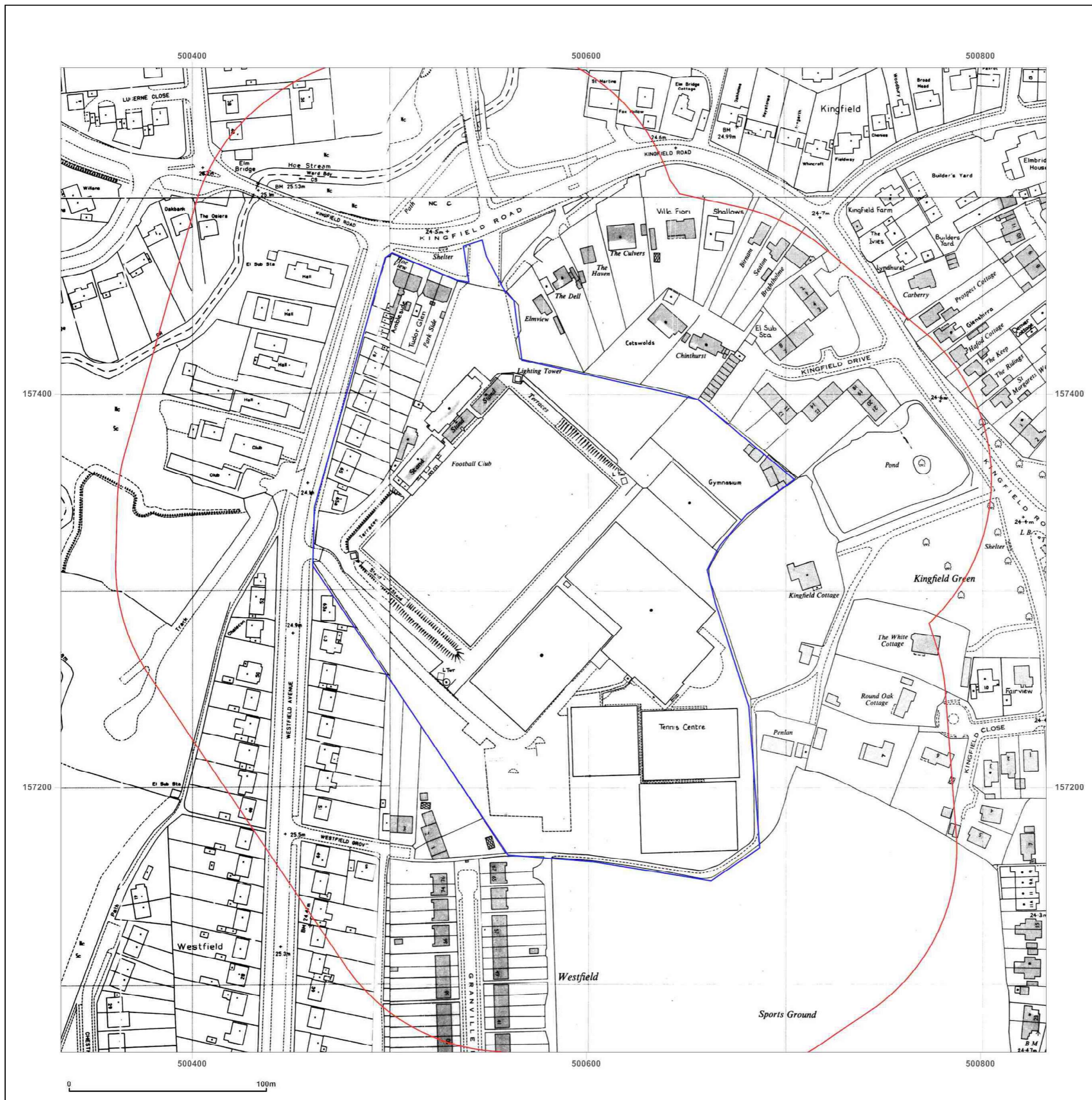
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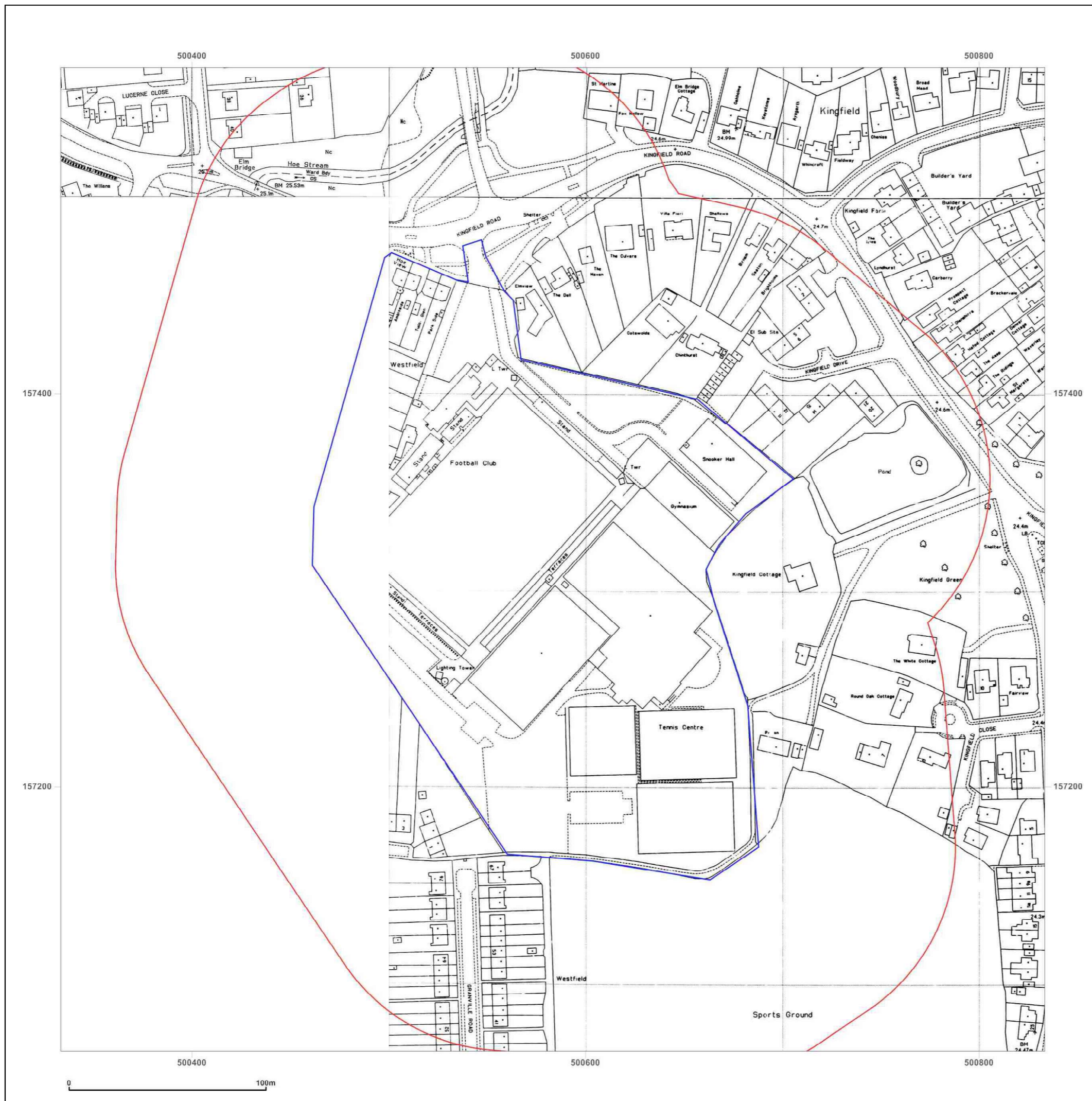
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## APPENDIX 4 – QUALITATIVE RISK ASSESSMENT METHODOLOGY



## QUALITATIVE RISK ASSESSMENT METHODOLOGY

The following Contaminated Land Risk Assessment methodology is based on CIRIA C552 (2001) *Contaminated Land Risk Assessment – A Guide to Good Practice*, in order to quantify potential risk via **risk estimation** and **risk evaluation**, which can be adopted at the Phase I stage. This will then determine an overall risk category which can be used to identify likely actions. This methodology uses qualitative descriptors and therefore is a qualitative approach.

The methodology requires the classification of:

- the magnitude of the **consequence** (severity) of a risk occurring, and
- the magnitude of the **probability** (likelihood) of a risk occurring.

The potential consequences of contamination risks occurring at this site are classified in accordance with Table A4.1 below, which is adapted from the CIRIA guidance.

**Table A4.1: Classification of Consequence**

Classification	Definition of Consequence
Severe	<ul style="list-style-type: none"> <li>• Short-term (acute) risks to human health.</li> <li>• Short-term risk of pollution of sensitive water resource or ecosystem.</li> <li>• Catastrophic damage to crops/buildings/property/infrastructure, including off-site soils.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>• Medium/long-term (chronic) risks to human health.</li> <li>• Medium/long-term risk of pollution of sensitive water resource or ecosystem.</li> <li>• Significant damage to crops/buildings/property/infrastructure (on or off-site).</li> <li>• Contamination of off-site soils.</li> </ul>
Mild	<ul style="list-style-type: none"> <li>• Easily preventable, permanent health effects on humans.</li> <li>• Pollution of non-sensitive water resources.</li> <li>• Localised damage to crops/buildings/property/infrastructure (on or off-site).</li> </ul>
Minor	<ul style="list-style-type: none"> <li>• Easily preventable, non-permanent health effects on humans, or no effects.</li> <li>• Minor, low-level and localised contamination of on-site soils.</li> <li>• Easily repairable damage to crops/buildings/property/infrastructure.</li> </ul>

The probability of contamination risks occurring at this site will be classified in accordance with Table A4.2 below which is also adapted from the CIRIA guidance. Note that for each category, it is assumed that a pollution linkage exists. Where a pollution linkage does not exist, the likelihood is zero, as is the risk.

**Table A4.2: Classification of Probability**

Classification	Definition of Probability
High Likelihood	Circumstances are such that an event appears very likely in the short-term or almost inevitable in the long-term; or there is already evidence that such an event has occurred.
Likely	Circumstances are such that such an event is not inevitable, but is possible in the short-term and is likely over the long-term.
Low Likelihood	Circumstances are such that it is by no means certain that an event would occur even over a longer period, and it is less likely in the short-term.
Unlikely	Circumstances are such that it is improbable that an event would occur even in the very long-term.

For each possible pollution linkage (source-pathway-receptor) identified, the potential risk can be evaluated, as presented in Table A3.3. Based upon this, CIRIA C552 presents definitions of the risk categories, together with the investigatory and remedial actions that are likely to be necessary in each case, as in Table A3.4. These risk categories apply to each possible pollutant linkage, and not simply to each hazard/source of contamination or sensitive receptor.

**Table A4.3: Overall Contamination Risk Matrix**

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Moderate risk	Low risk
	Low likelihood	Moderate risk	Moderate risk	Low risk	Very low risk
	Unlikely	Low risk	Low risk	Very low risk	Very low risk



**Table A4.4: Definition of Risk Categories and Likely Actions Required**

<b>Risk Category</b>	<b>Definition and likely actions required</b>
Very high	<ul style="list-style-type: none"> <li>• Severe harm to a defined receptor is very likely, or has already occurred.</li> <li>• The risk is likely to result in a substantial liability.</li> <li>• Urgent investigation (if not already undertaken) is likely to be required.</li> <li>• Urgent remediation is likely to be required.</li> </ul>
High	<ul style="list-style-type: none"> <li>• Harm to a defined receptor is likely.</li> <li>• The risk, if realised, may result in a substantial liability.</li> <li>• Urgent investigation (if not already undertaken) is likely to be required.</li> <li>• Remediation is likely to be required in the long term, possibly sooner.</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>• Harm to a defined receptor is possible, but severe harm is unlikely.</li> <li>• Investigation is likely to be required to clarify the level of potential liability and risk.</li> <li>• Some remediation may be required in the longer term</li> </ul>
Low	<ul style="list-style-type: none"> <li>• Harm to a defined receptor is possible, but is likely to be mild at worst.</li> <li>• Liabilities could theoretically arise, but are unlikely.</li> <li>• Further investigation is not required at this stage</li> <li>• Remediation is unlikely to be required.</li> </ul>
Very low	<ul style="list-style-type: none"> <li>• Harm to a defined receptor is unlikely, and would be minor at worst.</li> <li>• No liabilities are likely to arise.</li> <li>• Further investigation is not required at this stage</li> <li>• Remediation is very unlikely to be required.</li> </ul>

**APPENDIX 5 – LOCAL AUTHORITY CORRESPONDENCE**



**amm@jomasassociates.com**

**From:** amm@jomasassociates.com  
**Sent:** 16 August 2018 11:11  
**To:** 'Environmental.Health@woking.gov.uk'  
**Cc:** 'eh@jomasassociates.com'  
**Subject:** P1381J1460 - Kingfield Road, Woking - Land Contamination Enquiry

Good Morning,

Jomas Associates Ltd have been appointed as environmental consultants with regards to land contamination issues for a site located Woking Football Club, Laithwaite Community Stadium, Kingfield Road, Kingfield, Woking, GU22 9AA. The site location and boundary is shown below.



We are currently undertaking a Preliminary Risk Assessment / Phase 1 Desk Study for the site. As part of our investigations the following information sources will / have been consulted:

- Historical Ordnance survey mapping spanning dates 1871 – 2014.

- Environmental database report collating information from EA, BGS, Public Health England, Coal Authority, and Ordnance Survey sources (including recorded pollution incidents and licensing of potentially contaminative activities)
- BGS and EA geological and hydrogeological records
- A site walkover
- Available planning records from the Local Authority planning website

Does the Local Authority possess any additional information or records pertaining to land contamination issues at the site, which are not likely to be obtained via the above sources. Of principal interest would be:

- site investigation or remedial reports pertaining to the site or the site vicinity
- information relating to any potential landfilling in the site vicinity
- details of any private water supplies in the site vicinity
- any anecdotal information or specific local concerns that the local authority has / is aware of with regards land contamination in the site vicinity
- any local mapping resources which are unlikely to be supplied from Ordnance Survey
- records of tanks or fuel storage at the site

Kind regards,

**Alex Marcelo** BSc (Hons)

**Geotechnical Engineer**

**M:** 07403 927 087 / **T:** 0843 289 2187 / **E:** [amm@jomasassociates.com](mailto:amm@jomasassociates.com)

**A:** Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

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If you haven't voted for us already, please click the links below to vote for us (**it takes less than a minute**):

**'Best Construction Supplier to Work With' & 'Best Consultant to Work For'**





## APPENDIX B: Determining Effect Significance – Terminology and Approach

### Reference to ‘Impact’ and ‘Effect’

362. It is noted that the terms ‘impact’ and ‘effect’ are distinctly different. Having gained an understanding of the likely impact it is then important to know whether the change in environmental or socio-economic conditions results in a significant environmental effect. The impacts of the Proposed Development may or may not result in significant effects on the environment, depending on the sensitivity of the resource or receptor and potentially other factors (such as duration). The assessment of the likely significant effects of the Proposed Development is a requirement identified by Schedule 4 of the EIA Regulations.

### Receptor Sensitivity and Magnitude of Impact

363. To achieve a consistent approach across the different technical disciplines addressed within the ES (Volume 1), assessments will broadly define the sensitivity of the receptors that could be affected by the Proposed Development and the magnitude of impact or change from the baseline conditions in order to derive the resultant effect. Technical specialists will use their own approach or amend the approach stated below based on what is appropriate for their assessments.
364. Terminology to describe the sensitivity of receptors and magnitude of impact or change from the baseline conditions is broadly as follows:
- High;
  - Medium;
  - Low; or
  - Negligible.
365. Where there is no impact/change, no assessment will be required due to there being no potential for significant effects.
366. Each of the technical assessment chapters of the ES (Volume 1) will provide further detail on the definition of each of the above terms specific to the topic in question and will also provide the criteria, including sources and justifications, for quantifying the different levels of receptor sensitivity and ‘impact magnitude’. Where possible, this will be based upon quantitative and accepted criteria (for example, national standards for air quality and noise), together with the use of value judgement and expert interpretation.

### Identification of a Resultant Effect

367. The basis for determining the resultant effect generally takes into account the sensitivity of the receptor and magnitude of impact or change from the baseline conditions. A generic matrix that combines the sensitivity of the receptor and the magnitude of impact to identify the resultant effect is provided within Table 1.

**Table 1. Resultant Effects**

Receptor Sensitivity	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible



**Effect Scale**

- 368. The categories and definitions of the ‘scale’ of the resultant effect i.e. definitions of Major, Moderate, Minor and Negligible effects will be adjusted to suit the technical topic in question; where this is the case revised definitions of effect scale will be presented in the technical assessment chapters of the ES (Volume 1) and in ES Volume 2.
- 369. Where there is no impact to a receptor and therefore no effect, this will be stated.

**Effect Nature**

- 370. Table 2 provides definitions of the ‘nature’ of the resultant effect i.e. definitions of Adverse and Beneficial.

**Table 2. Definition of the Nature of the Resultant Effect**

Type of Effect	Description
<b>Adverse</b>	Detrimental or negative effects to an environmental / socio-economic resource or receptor. The quality of the environment is diminished or harmed.
<b>Neutral</b>	The quality of the environment is preserved or sustained or there is an equal balance of adverse and beneficial effects.
<b>Beneficial</b>	Advantageous or positive effect to an environmental / socio-economic resource or receptor. The quality of the environment is enhanced.

**Geographic Extent of Effect**

- 371. The ES (Volumes 1 and 2) will identify the geographic extent of the identified effects. At a spatial level, ‘site’ or ‘local’ effects are those affecting the site and neighbouring receptors, while effects upon receptors in Woking, beyond the vicinity of the site and its neighbours, are considered to be at a ‘district / borough’ level. Effects affecting Surrey are considered to be at a ‘regional’ level, whilst those which affect different parts of the country, or England as a whole, are considered being at a ‘national’ level.

**Effect Duration**

- 372. For the purposes of the ES, effects that are generated as a result of the demolition and construction works (i.e. those that last for this set period of time) will be classed as ‘temporary’; these maybe further classified as either ‘short term’ or ‘medium-term’ effects depending on the duration of the demolition and construction works that generate the effect in question. Effects that result from the completed and operational phases of the Proposed Development will be classed as ‘permanent’ or ‘long-term’ effects.

**Direct and Indirect Effects**

- 373. The ES will identify whether the effect is ‘direct’ (i.e. resulting without any intervening factors) or ‘indirect’ or ‘secondary’ (i.e. not directly caused or resulting from something else).

**Effect Significance**

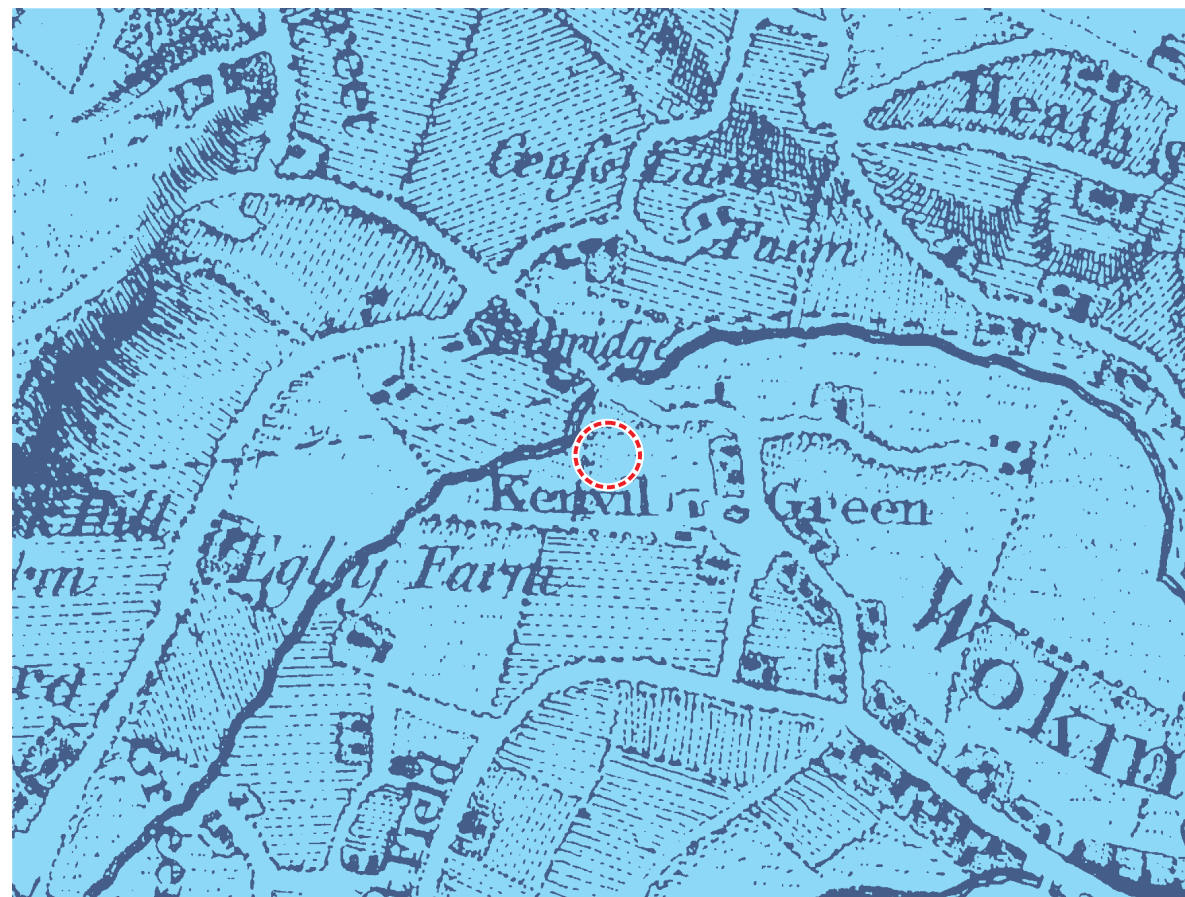
- 374. Following identification of an effect, the effect scale, nature, geographic extent and duration using the above summarised terminology, a clear statement will then be made within the ES as to whether the effect is significant or not significant. As a general rule, the following applies:
  - ‘Moderate’ or ‘major’ effects are deemed to be ‘significant’.
  - ‘Minor’ effects are considered to be ‘not significant’, although they may be a matter of local concern; and

- ‘Negligible’ effects are considered to be ‘not significant’ and not a matter of local concern.

- 375. Where mitigation measures are identified to either eliminate or reduce likely significant adverse effects, these will be incorporated into the ES, for example either through the design, or will be translated into demolition and construction commitments; or operational or managerial standards / procedures.
- 376. The ES will then highlight the ‘residual’ likely significant effects (those effects which remain following the implementation of suitable mitigation measures) and classifies these in accordance with the terminology defined above.



APPENDIX C: Historic Environment Assessment



**CARDINAL COURT**  
**Woking**  
**Surrey GU22**

County of Surrey

Historic environment assessment

April 2019





**CARDINAL COURT**  
**Woking**  
**GU22**

**Historic environment assessment**

NGR 500583 157309

Historic Environment Record search reference: 046/19

Sign-off history

issue no.	Issue date	Prepared by	Reviewed by	Project Manager	Notes
1	29/04/2019	Andrew Francis (Archaeology) Juan Jose Fuldain (Graphics)	Rupert Featherby Lead Consultant Archaeology	Christina Holloway	Issue to client
2	30/04/2019	Andrew Francis (Archaeology) Juan Jose Fuldain (Graphics)	Rupert Featherby Lead Consultant Archaeology	Christina Holloway	Comments from client incorporated

MOLA code: P19-074



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- Fig 7 Ordnance Survey 3rd edition 25":mile map of 1914 (not to scale)
- Fig 8 Ordnance Survey 25":mile map of 1935/6 (not to scale)

Note: site outlines may appear differently on some figures owing to distortions in historic maps. North is approximate on early maps.

## Executive summary

GoDev Woking Limited has commissioned MOLA to carry out a historic environment assessment in advance of proposed development at Cardinal Court, Woking, GU22 in the County of Surrey. The scheme comprises the demolition of the 20th century football stadium and single storey buildings being used as the David Lloyd Centre, Woking Snooker Centre and Woking Gymnastics Club and the construction of a new football stadium in the north-west of the site and residential housing in five blocks in the west and south of the site. A semisubmersed area below each residential building is proposed for car parking.

This desk-based study assesses the impact of the scheme on buried heritage assets (archaeological remains). Above ground heritage assets (historic structures) are not discussed in detail, but they have been noted where they assist in the archaeological interpretation of the site. Buried heritage assets that may be affected by the proposals comprise:

- **Isolated prehistoric artefacts.** There is a low to moderate potential for isolated prehistoric remains to be found based on its favourable location near to a source of water. Such remains would be of low heritage significance.

There is a low potential for remains from all other periods. The site was located in open fields some distance from the main area of settlement around Old Woking c 600m to the east. It remained open until the football stadium and semi-detached housing were constructed in the early part of the 20th century. Any foundations relating to this development would have truncated any potentially surviving archaeological remains.

Based on the evidence, no archaeological remains of high significance are expected within the site. However, in the light of the limited archaeological survival potential of the site and despite the size and nature of the excavation for the proposed development it is unlikely that the local authority would require further investigation prior to determination. However, given the limited archaeological investigation within the site it is likely that the local planning authority (LPA) would require investigation as part of a condition to ensure that no previously unidentified remains are lost without record. Such an investigation could take the form of a watching brief during ground works to determine the presence, nature and extent of the underlying geology and significance of any archaeological remains. Any archaeological work would need to be undertaken in accordance with an approved Written Scheme of Investigation (WSI) and could be carried out under the terms of a standard archaeological planning condition set out under the granting of planning consent.



# 1 Introduction

## 1.1 Origin and scope of the report

- 1.1.1 GolDev Woking Limited has commissioned MOLA (Museum of London Archaeology) to carry out a historic environment assessment in advance of proposed development at Cardinal Court, Woking, GU22; National Grid Reference (NGR) 500583 157309: Fig 1. The scheme comprises the demolition of the 20th century football stadium and single storey buildings being used as the David Lloyd Centre, Woking Snooker Centre and Woking Gymnastics Club and the construction of a new football stadium in the north-west of the site and residential housing in five blocks in the west and south of the site. A semisubmersed area below each residential building is proposed for car parking.
- 1.1.2 This desk-based study assesses the impact of the scheme on buried heritage assets (archaeological remains). It will enable the archaeological advisors to the local planning authority (LPA) to formulate an appropriate response in the light of the impact on any known or possible heritage assets. These are parts of the historic environment which are considered to be significant because of their historic, evidential, aesthetic and/or communal interest.
- 1.1.3 This report deals solely with the archaeological implications of the development and does not cover possible built heritage issues, except where buried parts of historic fabric are likely to be affected. Above ground assets (i.e., designated and undesignated historic structures and conservation areas) on the site or in the vicinity that are relevant to the archaeological interpretation of the site are discussed. Whilst the significance of above ground assets is not assessed in this archaeological report, direct physical impacts upon such assets arising from the development proposals are noted. The report does not assess issues in relation to the setting of above ground assets (e.g., visible changes to historic character and views).
- 1.1.4 The assessment has been carried out in accordance with the requirements of the National Planning Policy Framework (NPPF)(MHCLG 2019; see section 9 of this report) and to standards specified by the Chartered Institute for Archaeologists (CIfA 2014, 2017) and Historic England (EH 2008, HE 2015). Under the 'Copyright, Designs and Patents Act' 1988 MOLA retains the copyright to this document.
- 1.1.5 Note: within the limitations imposed by dealing with historical material and maps, the information in this document is, to the best knowledge of the author and MOLA, correct at the time of writing. Further archaeological investigation, more information about the nature of the present buildings, and/or more detailed proposals for redevelopment may require changes to all or parts of the document.

## 1.2 Designated heritage assets

- 1.2.1 Historic England's National Heritage List for England (NHL) is a register of all nationally designated (protected) historic buildings and sites in England, such as scheduled monuments, listed buildings and registered parks and gardens. The List does not include any nationally designated heritage assets within the site
- 1.2.2 The site is not within an Area of High Archaeological Potential or a Conservation Area.

## 1.3 Aims and objectives

- 1.3.1 The aim of the assessment is to:
- identify the presence of any known or potential buried heritage assets that may be affected by the proposals;
  - describe the significance of such assets, as required by national planning policy (see section 9 for planning framework and section 10 for methodology used to determine significance);
  - assess the likely impacts upon the significance of the assets arising from the proposals; and

- provide recommendations for further assessment where necessary of the historic assets affected, and/or mitigation aimed at reducing or removing completely any adverse impacts upon buried heritage assets and/or their setting.



## 2 Methodology and sources consulted

### 2.1 Sources

- 2.1.1 For the purposes of this report, documentary and cartographic sources including results from any archaeological investigations in the site and the area around it were examined in order to determine the likely nature, extent, preservation and significance of any buried heritage assets that may be present within the site or its immediate vicinity. This information has been used to determine the potential for previously unrecorded heritage assets of any specific chronological period to be present within the site.
- 2.1.2 In order to set the site into its full archaeological and historical context, information was collected on the known historic environment features within a 1km-radius study area around it, as held by the primary repositories of such information within Surrey which comprises the Surrey Historic Environment Record (HER). The HER is managed by Surrey County Council and includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources. The study area was considered through professional judgement to be appropriate to characterise the historic environment of the site. Occasionally there may be reference to assets beyond this, where appropriate, e.g., where such assets are particularly significant and/or where they contribute to current understanding of the historic environment.
- 2.1.3 The extent of investigations as shown on Fig 2 may represent the site outline boundary for planning purposes, rather than the actual area archaeologically investigated. Where it has not been possible from archive records to determine the extent of an archaeological investigation (as is sometimes the case with early work), a site is represented on Fig 2 only by a centrepoint.
- 2.1.4 In addition, the following sources were consulted:
- MOLA – in-house Geographical Information System (GIS) with statutory designations GIS data, the locations of all ‘key indicators’ of known prehistoric and Roman activity across Surrey, past investigation locations, projected Roman roads; burial grounds from the Holmes burial ground survey of 1896; georeferenced published historic maps; Defence of Britain survey data, in-house archaeological deposit survival archive and archaeological publications;
  - Historic England – information on statutory designations including scheduled monuments and listed buildings, along with identified Heritage at Risk;
  - Surrey History Centre – historic maps and published histories;
  - Groundsure – historic Ordnance Survey maps from the first edition (1860–70s) to the present day,
  - British Geological Survey (BGS) – solid and drift geology digital map; online BGS geological borehole record data;
  - GolDev Woking Limited – Proposed Ground Floor (Colour)((Leach Rhodes Walker, 2019); Preliminary Risk Assessment and Holes Logs (Jomas Associates Limited, 2019a and b); and Existing Site Survey (Woods Hardwick, 2018); and
  - Internet – web-published material including the LPA local plan, and information on conservation areas and locally listed buildings.
- 2.1.5 The assessment included a site visit carried out on the 20th February 2019 in order to determine the topography of the site, the nature of the existing buildings on the site, and to provide further information on areas of possible past ground disturbance and general historic environment potential. Observations made on the site visit have been incorporated into this report.

### 2.2 Methodology

- 2.2.1 Fig 2 shows the location of known historic environment features within the study area. These

have been allocated a unique historic environment assessment reference number (HEA 1, 2, etc), which is listed in a gazetteer at the back of this report and is referred to in the text. Where there are a considerable number of listed buildings in the study area, only those within the vicinity of the site (i.e., within 50m) are included, unless their inclusion is considered relevant to the study. Buildings and other features such as clay pits and lime kilns shown on historic maps are not listed but are discussed where they are considered relevant to the study. Conservation areas and archaeological priority areas are not shown. All distances quoted in the text are approximate (within 5m) and unless otherwise stated are measured from the approximate centre of the site.

- 2.2.2 Section 10 sets out the criteria used to determine the significance of heritage assets. This is based on four values set out in Historic England's *Conservation principles, policies and guidance* (EH 2008), and comprise evidential, historical, aesthetic and communal value. The report assesses the likely presence of such assets within (and beyond) the site, factors which may have compromised buried asset survival (i.e., present and previous land use), as well as possible significance.
- 2.2.3 Section 11 includes non-archaeological constraints. Section 12 contains a glossary of technical terms. A full bibliography and list of sources consulted may be found in section 13 with a list of existing site survey data obtained as part of the assessment.



## 3 The site: topography and geology

### 3.1 Site location

- 3.1.1 The site is located at Woking Football Club, Kingfield Road, Woking, GU22 (NGR 500583 157309: Fig 1). The site area is approximately 5 hectares (ha) and is bounded by residential housing to the north and east, a sports ground and residential housing to the south and Westfield Avenue and residential housing to the west. The site falls within the historic parish of Woking, within the county of Surrey.
- 3.1.2 The Hoe Stream is 265m to the west of the site.

### 3.2 Topography

- 3.2.1 Topography can provide an indication of suitability for settlement, and ground levels can indicate whether the ground has been built up or truncated, which can have implications for archaeological survival (see section 5.2).
- 3.2.2 The site is within the wide, shallow valley of the River Wey. To the south, east and west of the site the land is relatively flat, being at 25.0m above Ordnance Datum (OD). To the north-east the land rises up reaching a high point of 47.0m OD at Hoebridge Golf Club, located 1.6km to the north-east of the site and 40.0m OD at Mount Herman, located 830m to the north-west of the site.
- 3.2.3 A levelled site survey undertaken in 2018 shows that the site runs counter to the topography of the wider area in that it rises gradually from the north to the south-west with a low point of 24.0m OD in the north to a high point of 25.5m OD in the south-west (Woods Hardwick, 2018). This could be the result of ground works on the site in an area running from the north to south-west.

### 3.3 Geology

- 3.3.1 Geology can provide an indication of suitability for early settlement, and potential depth of remains.
- 3.3.2 The geology recorded on the site by the British Geological Service (BGS) comprises the Kempton Park Gravel formation overlying Bagshot Sand.
- 3.3.3 A geotechnical survey was undertaken by Jomas Associates Limited within the site in 2019 (Jomas Associates Limited 2019a and b). Four boreholes (BH) were sunk: BH 1 in the western part of the site; BH 2 in the north-eastern part of the site; and BH 3 and BH 4 both in the southern part of the site.
- 3.3.4 In BH 1 ground level was recorded at 24.9m OD. A 1.2m thick layer of made ground comprising of asphalt and gravel, brick and concrete overlay Kempton Park Gravel at 23.7m OD. The underlying Bagshot Sand was recorded at 3.5mbgl (21.4m OD).
- 3.3.5 In BH 2 ground level was recorded at 24.6m OD. A 0.2m thick layer of made ground comprising of compact gravel overlay Bagshot Sand. No Kempton Park Gravel was recorded in BH 2.
- 3.3.6 In BH 3 ground level was recorded at 24.8m OD. A 1.0m thick layer of made ground comprising of asphalt and sandy gravel overlay Kempton Park Gravel at 23.8m OD. The underlying Bagshot Sand was recorded at 2.7mbgl (22.1m OD).
- 3.3.7 In BH 4 ground level was recorded at 25.1m OD. A 0.7m thick layer of topsoil comprising of sandy clay overlay Bagshot Sand. No Kempton Park Gravel was recorded in BH4.
- 3.3.8 It is therefore expected that in the west of the site Kempton Park Gravels could be recorded immediately below any made ground and in the east of the site the Gravel either does not survive or was never present and Bagshot Sand would be directly below any made ground.

## 4 Archaeological and historical background

### 4.1 Overview of past investigations

- 4.1.1 There has been one investigation (**HEA 1**) within the site itself however, no further details are recorded. Within the study area there have been a further four investigations, all evaluations (**HEAs 2, 3a, 3b and 4**), so the area is not very well understood, archaeologically. An investigation to the south-west of the site (**HEA 3b**) recorded evidence for possible prehistoric activity in the form of a likely paleo-channel which contained worked and burnt flints of possible Neolithic date and three postholes containing possible in situ wooden posts. The remaining investigations found alluvial deposits; a number of undated ditches or field boundaries; and two sherds of residual Late Iron Age/Roman pottery sherds.
- 4.1.2 The results of these investigations, along with other known sites and finds within the study area, are discussed by period, below. The date ranges given are approximate.

### 4.2 Chronological summary

#### *Prehistoric period (800,000 BC–AD 43)*

- 4.2.1 The Lower (800,000–250,000 BC) and Middle (250,000–40,000 BC) Palaeolithic saw alternating warm and cold phases and intermittent perhaps seasonal occupation. During the Upper Palaeolithic (40,000–10,000 BC), after the last glacial maximum, and in particular after around 13,000 BC, further climate warming took place and the environment changed from steppe-tundra to birch and pine woodland. It is probably at this time that Britain first saw continuous occupation. Erosion has removed much of the Palaeolithic land surfaces and finds are typically residual. There are no known finds dated to this period within the study area.
- 4.2.2 The Mesolithic hunter-gatherer communities of the postglacial period (10,000–4000 BC) inhabited a still largely wooded environment. The river valleys would have been favoured in providing a dependable source of food (from hunting and fishing) and water, as well as a means of transport and communication. Evidence of activity is characterised by flint tools rather than structural remains. There are no known finds dated to this period within the study area.
- 4.2.3 The Neolithic (4000–2000 BC), Bronze Age (2000–600 BC) and Iron Age (600 BC–AD 43) are traditionally seen as the time of technological change, settled communities and the construction of communal monuments. Farming was established and forest cleared for cultivation. An expanding population put pressure on available resources and necessitated the utilisation of previously marginal land. A paleo-channel containing worked and burnt flints of possible Neolithic date and three postholes containing possible in situ wooden posts were found during an evaluation by Wessex Archaeology in 2011 (**HEA 3b**), 385m to the south-west of the site. Alluvial layers around these features recorded accumulations of burnt flint which may be the result of natural or deliberate deposition. Another alluvial deposit recorded Early to Mid-Iron Age pottery. A Neolithic flint axe (**HEA 5**) was found 905m to the north-west of the site.
- 4.2.4 In all likelihood the area may have been farmed with low density activity (e.g., grazing, occasional field ditches) or was woodland.

#### *Roman period (AD 43–410)*

- 4.2.5 There has been little evidence for fully Romanised settlement in the Woking area to date. Beyond the study area, archaeological investigation has identified Romanised native farmsteads at Woking Park Farm south of Old Woking (Crosby 2003, 4) and reused Romano-British material is notable in the fabric of the extant church at Old Woking. The nearest potential Roman road is the proposed extension to Margary's 151 (1967, 66) known as Lacuna 151, but this is 3.2km to the south-west of the site. The known Roman roads are 11.3km to the north (Margary 4a) and 21km to the south (Margary 15).
- 4.2.6 There has only been one Roman artefact recovered in the study area. An abraded Roman



sherd (**HEA 4**) was found during an evaluation in 1994 by SCAU at Westfield County First School 500m to the south of the site.

- 4.2.7 Throughout this period, the site was located some distance from the main roads and areas of settlement and probably lay within open fields being used for agricultural purposes.

#### *Early medieval (Saxon) period (AD 410–1066)*

- 4.2.8 Following the withdrawal of the Roman army from England in the early 5th century AD, Germanic ('Saxon') settlers arrived from mainland Europe, with occupation in the form of small villages and an economy initially based on agriculture. By the end of the 6th century a number of Anglo-Saxon kingdoms had emerged, and as the ruling families adopted Christianity, endowments of land were made to the church. Landed estates (manors) can be identified from the 7th century onwards; some, as Christianity was widely adopted, with a main 'minster' church and other subsidiary churches or chapels. In the 9th and 10th centuries, the Saxon Minster system began to be replaced by local parochial organisation, with formal areas of land centred on settlements served by a parish church.
- 4.2.9 Saxon settlement was situated at Old Woking south-east of the modern town and 600m south-east of the site. The placename is likely to derive from the name 'Wocc' or 'Wocca' and translates as 'people of Wocca' suggesting an early pre-Christian settlement at the location (Palmer 1991). Early variations of the name include 'Woccingas' and 'Uocchingas'. The pre-Christian 'Ingas' in a place name meaning 'people of' often came to refer to settlements where there was a religious centre in Christian times (Smith 2005, 84) which was the case with Woking.
- 4.2.10 The earliest written reference to Woking comes from a letter from Pope Constantine to Cuthbald's Abbey at Petersborough (Medchamstead) around 710. It related to two other monasteries dependent upon Peterborough at Verundes (Bermondsey) and Wocchingas (Woking; Crosby 2003, 7). In 780 a land grant of King Offa of Mercia confirms 20 hides of land to the church at Woking 'in which place the monastery is situated'. The monastery was almost certainly at the site of the present St Peters Church, outside the study area, 1.4km to the south-east of the site (Crosby 2003, 7 and Briggs 2011). There are no recorded early medieval remains within the study area.
- 4.2.11 Throughout this period the site was located to the north-west of the main area of settlement and probably lay within open fields being used for agricultural purposes.

#### *Later medieval period (AD 1066–1485)*

- 4.2.12 Following the Norman Conquest, William the Conqueror gave the church and manor of Woking to the Norman Osbern and Mayford to William Malet. There is one confirmed entry for Woking in the Domesday Book undertaken in 1086. At this time Woking comprised 33 villagers, 9 smallholders with 20 ploughs and a church held by Osbern also included was a meadow, 32 acres and woodland at 133 pigs (Palmer 1991).
- 4.2.13 Woking Manor was owned by the crown until 1466 when Lady Margaret Beaufort and her third husband, Sir Henry Stafford obtained it by royal grant. Upon her death in 1509 the manor reverted back to the Crown. For the next 253 years the manor passed through various owners until Lord Onslow bought it in 1752. The Onslow family continue to own the manor (VCH 1911, 381-90).
- 4.2.14 The manor house was at Woking Palace, 2.4km to the east of the site. There has been a house on that site since 1272 (Arnold 2009, 6).

#### *Post-medieval period (AD 1485–present)*

- 4.2.15 John Norden's map of 1594 (Fig 3) is small scale which depicts the site area as open fields to the north of the River Wey.
- 4.2.16 The earliest map depicting the Manor of Woking is that by John Remnant of 1719 (not reproduced due to poor quality). It shows the site in the west of the manor.
- 4.2.17 John Roque's map of Surrey of 1768 (Fig 4) adds a little further detail to the area. The site is still undeveloped just to the south of a main road and the Stanford Brook. A number of settlements and farms are shown but all some distance from the site.
- 4.2.18 The Ordnance Survey (OS) 1st edition 6":mile map of 1872/3 (Fig 5) is the first to show the

area in greater detail, confirming Roque's indication of open fields. A field boundary aligned north-east, south-west is shown within the northern third of the site and a footpath, also aligned north-east, south-west is shown in the southern third of the site. Market gardening is shown around Kingfieldgreen adjoining the east of the site. Open fields are shown surrounding the remainder of the site.

- 4.2.19 No change within the site is shown on the OS 2nd edition 6":1mile map of 1897 (Fig 6) and the OS 3rd edition 25":mile map of 1914 (Fig 7). The mapping shows that while the settlement of Kingfieldgreen to the east has grown, it has done so relatively slowly over the forty year period between maps.
- 4.2.20 The OS 25":mile map of 1935/6 (Fig 8) shows that a sports ground has been constructed in the centre of the site; tennis courts, pavilions/stands to the south; and semi-detached housing fronting Westfield Avenue in the north-western corner of the site.
- 4.2.21 More recent mapping (which has not been reproduced due to being of poor quality) shows that the existing pavilions/stands have been extended and additional building development to the north and south of the stadium has been constructed.



## 5 Statement of significance

### 5.1 Introduction

- 5.1.1 The following section discusses historic impacts on the site which may have compromised archaeological survival from earlier periods, identified primarily from historic maps, and information on the likely depth of deposits.
- 5.1.2 In accordance with the NPPF, this is followed by a statement on the likely potential and significance of buried heritage assets within the site, derived from current understanding of the baseline conditions, past impacts, and professional judgement.

### 5.2 Factors affecting archaeological survival

#### *Natural geology*

- 5.2.1 Current ground level is at 24.0m in the north of the site, rising gradually to 25.5m OD in the south-west. Based on geotechnical data from boreholes sunk in the northern part of the site, the level of natural geology within the site is as follows (Jomas Associates 2019a and b):
- The top of truncated Gravel is at 23.7–23.8m OD (1.2–1.0mbgl); and
  - The top of untruncated sand is 21.4–24.4m OD (3.5–0.2mbgl).
- 5.2.2 Between the top of the natural and the current ground level is modern made ground and undated made ground. The latter may potentially contain remains of archaeological interest.

#### *Past impacts*

- 5.2.3 Historic mapping shows that the area of the site has been open fields until the early 20th century when the sports ground in the centre of the site and tennis courts in the south were laid out; and semi-detached housing fronting Westfield Avenue in the north-west of the site were constructed. The type and extent of the foundations of the football stadium, pavilions/stands and tennis courts are not known, however, given the shallow depth of the underlying natural any foundations will have severely truncated or removed completely any archaeological remains within their extent.
- 5.2.4 The semi-detached housing would have had shallow stepped brick footing foundations which, given the limited lack of development within this part of the site, would have truncated any surviving archaeological deposits within their extent. These foundations will only have survived in the north-west corner of the site and are themselves now historical assets, albeit they have removed earlier remains.

#### *Likely depth/thickness of archaeological remains*

- 5.2.5 Archaeological remains, if present on the site, are likely to be found immediately below the topsoil, hardstanding and under and between foundations with any cut features extending into the natural geology to an unknown depth.

### 5.3 Archaeological potential and significance

- 5.3.1 The nature of possible archaeological survival in the area of the proposed development is summarised here, taking into account the levels of natural geology and the level and nature of later disturbance and truncation discussed above.
- 5.3.2 *The site has a low to moderate potential to contain prehistoric remains.* The site's location on well-drained gravel close to a reliable source of water would have made it an attractive area for settlement and farming. Worked and burnt flint and three postholes containing possible in situ wooden posts of possible Neolithic date; a Neolithic flint axe; and Early to Late Iron Age pottery suggests that there may be activity within the study area. Such remains would be of **low** heritage significance.

- 5.3.3 *The site has a low potential to contain Roman remains.* The site was located some distance from the main roads and no archaeological finds from this period have been identified within the study area.
- 5.3.4 *The site has a low potential to contain Saxon remains.* The site was located on the periphery of the main area of settlement which was concentrated at Old Woking, 600m to the south-east, probably in open fields. No archaeological finds from this period have been identified within the study area.
- 5.3.5 *The site has a low potential to contain medieval remains.* The settlement of Old Woking was concentrated around the Manor of Woking/Woking Palace, 600m to the south-east of the site and did not extend to within the study area. The site would have been in open fields. No archaeological finds from this period have been identified within the study area.
- 5.3.6 *The site has a low potential to contain post-medieval (early 20th century) remains.* Available historic mapping shows that semi-detached housing fronting Westfield Avenue in the north-west corner of the site was constructed. Post-medieval remains are likely to comprise the footings of these houses and any such remains would be of **low** heritage significance based on their evidential and evidential values. Deeply cut domestic features such as wells or cess pits may be present, which would be of **low** heritage significance as derived from their historical and evidential value.



## 6 Impact of proposals

### 6.1 Proposals

- 6.1.1 The proposed development is still to be finalised, although any scheme will comprise the demolition of the 20th century football stadium and single storey buildings being used as the David Lloyd Centre, Woking Snooker Centre and Woking Gymnastics Club. The current scheme indicates that a new football stadium is being constructed in the centre/north-east of the site and five residential blocks of up to 10 storeys with a semisubmersed area below each residential building for car parking is proposed along the eastern and southern boundaries (Leach Rhodes Walker, drg no. 7884- L(OO)79B, Proposed Ground Floor (Colour), 12/04/19).
- 6.1.2 The type and size of foundations are unknown, however, for the purposes of this assessment raft foundations for the new football stadium and piled foundations to a depth of c 17m AOD (c 8.5mbgl) for the five residential blocks have been assumed (Tsz Kan Woo *pers comm*, 29/04/19).

### 6.2 Implications

- 6.2.1 The identification of physical impacts on buried heritage assets within a site takes into account any activity which would entail ground disturbance, for example site set up works, remediation, landscaping and the construction of semisubmersed areas below each residential building and foundations. As it is assumed that the operational (completed development) phase would not entail any ground disturbance there would be no additional archaeological impact and this is not considered further.
- 6.2.2 It is outside the scope of this archaeological report to consider the impact of the proposed development on upstanding structures of historic interest, in the form of physical impacts which would remove, alter, or otherwise change the building fabric, or predicted changes to the historic character and setting of historic buildings and structures within the site or outside it.
- 6.2.3 The main potential for archaeological survival is the foundations of the early 20th century semi-detached houses which are of low heritage significance. There is likely to be possible survival for prehistoric remains and later medieval agricultural remains both of which are of low significance.
- Hardstanding construction*
- 6.2.4 Excavations for the construction for the hardstanding areas for the parking are likely to cause ground disturbance up to 1.0m below the ground surface, and deeper where there is levelling. Shallow archaeological remains within these areas would be severely truncated or removed completely but the bases of deeply cut features, such as boundary ditches etc. would survive although their context would be lost.
- Foundations for the football stadium*
- 6.2.5 The detail of the foundations for the proposed football stadium and residential accommodation is not known. However, it is anticipated that they could vary from shallow foundations for smaller lower buildings to piled foundations for larger taller buildings. The impacts of such are as follows:
- Excavation for standard strip and pad foundations would remove archaeological remains within the footprint of the foundation to a typical depth of 1.0–1.5mbgl as assumed for the purposes of this assessment. It is possible that the bases of deeply cut archaeological features such as pits, ditches and wells would remain intact beneath these impact levels, but their context would be lost.
  - Piling for larger buildings would entirely remove any archaeological remains from within the footprint of each pile. Pile caps and ground beams would have a similar impact as standard strip and pad foundations.
- Semisubmersed area below each residential building*
- Any archaeological remains would be entirely removed within the footprint of the proposed

*semisubmersed area*. There may be additional impacts from piling beneath each *semisubmersed area*. It is assumed for the purposes of this assessment that the *semisubmersed area* would be excavated following the insertion of the perimeter wall and prior to the insertion of piled foundations.

*Service / utilities trenches/ drains and planting*

- 6.2.6 The excavation of any new service trenches and drains would extend to a depth of 1.0–1.5mbgl as assumed for the purposes of this assessment. Ground intrusion from any tree planting and subsequent root action would potentially reach a similar depth. This would entirely remove any archaeological remains within the trench footprint or tree-root extent.



## 7 Conclusion and recommendations

- 7.1.1 There are no designated heritage assets within the site and it does not lie within an Archaeological Priority Area, as designated by Woking Borough Council.
- 7.1.2 Archaeological survival potential across the majority of the site is expected to be low reflecting the presence of existing foundations and the shallow depth of the underlying naturals, i.e., Gravel to the west and Bagshot Sands to the east. Prior to the construction of the existing football stadium and semi-detached housing in the early 20th century the site was open fields some distance from centres of habitation. Excavation for the foundations of the football stadium and semi-detached housing will have severely truncated or completely removed all archaeological remains within their footprint.
- 7.1.3 The scheme comprises the demolition of the 20th century football stadium and single storey buildings being used as the David Lloyd Centre, Woking Snooker Centre and Woking Gymnastics Club and the construction of a new football stadium and residential housing in five blocks in the west and south of the site with semisubmersed areas below each residential building for car parking.
- 7.1.4 The proposed football stadium is in an area which has been previously truncated and it is likely that given the shallow depth of the underlying naturals, any archaeological remains will have been severely truncated or removed completely. The excavation for the semisubmersed areas below each residential building would remove all archaeological remains within their footprint.
- 7.1.5 Table 1 summarises the known or likely buried assets within the site, their significance, and the impact of the proposed scheme on asset significance.

Table 1: Impact upon heritage assets (prior to mitigation)

Asset	Asset Significance	Impact of proposed scheme
Isolated prehistoric artefacts (low to moderate potential)	Low	Excavation of foundations for new football stadium; excavation of semisubmersed areas below each residential building for car parking; piling.  <b>Significance of asset reduced to negligible or nil.</b>
Evidence for 19th and 20th century field boundaries (low potential)	Low	

- 7.1.6 Based on the evidence, no archaeological remains of high significance are expected within the site. However, in the light of the limited archaeological survival potential of the site and despite the size and nature of the excavation for the proposed development it is unlikely that the local authority would require further investigation prior to determination. However, given the limited archaeological investigation within the site it is likely that the Woking Borough Council (WBC) would require investigation as part of a condition to ensure that no previously unidentified remains are lost without record. Such an investigation could take the form of a watching brief during ground works to determine the presence, nature and extent of the underlying geology and significance of any archaeological remains. Any archaeological work would need to be undertaken in accordance with an approved Written Scheme of Investigation (WSI) and could be carried out under the terms of a standard archaeological planning condition set out under the granting of planning consent.

## 8 Gazetteer of known historic environment assets

- 8.1.1 The gazetteer lists known historic environment sites and finds within the 1km-radius study area around the site. The gazetteer should be read in conjunction with Fig 2.
- 8.1.2 The Surrey HER data contained within this gazetteer was obtained on 08/03/2019 and is the copyright of Surrey County Council 2019.
- 8.1.3 Historic England statutory designations data © Historic England 2018. Contains Ordnance Survey data © Crown copyright and database right 2019. The Historic England GIS Data contained in this material was obtained in September 2018. The most publicly available up to date Historic England GIS Data can be obtained from <http://www.historicengland.org.uk>.

### Abbreviations

CA – Cotswold Archaeology

NHL – National Heritage List for England (Historic England)

SCAU – Surrey County Archaeological Unit

WA – Wessex Archaeology

HEA No.	Woking Description	Site code/HER/NHL No.
1	<b>Westfield Tip, Woking</b> Test Pits No further details recorded	ESE1839
2	<b>Moor Lane, Woking</b> Evaluation. CA The evaluation revealed a number of ditches, likely to be former field boundaries with the smaller ditches as internal drainage gullies or enclosures. For the most part these features remained undated. A single Late Iron Age or Romano-British find was considered to be residual.	ESE3202 MSE22626
3a	<b>Westfield Tip and Woking Park, Hoe Valley, Woking</b> Evaluation. WA, 2010 Two phases in advance of flood protection, landscaping, tip remediation and redevelopment alongside the Hoe Stream.  The first phase revealed a significant depth of alluvial deposits, late 19th and early 20th artefacts likely to have been washed up and deposited by the Hoe in a trench closest to the modern path of the stream, but no deposits of archaeological interest.	ESE3285
3b	<b>Westfield Tip and Woking Park, Hoe Valley, Woking</b> Trial Trench. WA, 2011 Second phase of evaluation by WA in advance of flood protection, landscaping, tip remediation and redevelopment alongside the Hoe Stream. The second phase revealed alluvial layers within all of the trenches, confirming that the site historically lay within the floodplain. Evidence for a 1963 flood was identified in two of the trenches, with a layer of alluvium sealing late 19th to 20th century made ground. Evidence of prehistoric activity was revealed towards the central area of the site, with a likely palaeo-channel containing worked and burnt flints of probable Neolithic date located close to three postholes containing, possible in situ, wooden posts. Alluvial layers within a handful of areas around these features recorded accumulations of burnt flint which may be the result of natural or deliberate deposition. A further ditch close to these features contained fragments of post-medieval/modern leather, most likely from the sole of a shoe. A number of ditches were also revealed in trenches close by. The majority could not be dated, but two recorded within one trench were cut into the same layer of alluvium and then, later, covered by another alluvial deposit, with pottery dated from the Early to Mid Iron Age recovered from one. The results of the evaluation indicate the potential of the central area for containing a number of different phases of activity, with earlier phases sealed by alluvial layers caused by the various flooding episodes, and further work was undertaken in 2011.	ESE3287 MSE19042 MSE19045 MSE19046



HEA No.	Woking Description	Site code/ HER/NHL No.
4	<b>Westfield County First School, near Woking</b> <i>Evaluation. SCAU, 1994</i> An archaeological evaluation of this disused school site, found a narrow gully and small pit of unknown date, thought likely to be of some antiquity, and one abraded sherd of Roman date.	ESE1843 MSE4979
5	<b>Woking</b> <i>Findspot – Neolithic flint axe</i> A Neolithic flint axe from Woking is in the British Museum (unregistered). No further details recorded.	MSE2804

## 9 Planning framework

### 9.1 National Planning Policy Framework

- 9.1.1 The Government issued the *National Planning Policy Framework* (NPPF) in March 2012 (DCLG 2012) and supporting *Planning Practice Guidance* in 2014 (DCLG 2014). The 2012 NPPF was revised and a new NPPF published in July 2018, with minor revisions in February 2019 (MHCLG 2019).

#### *Conserving and enhancing the historic environment*

- 9.1.2 The NPPF section concerning “Conserving and enhancing the historic environment” (section 12 of the NPPF 2012) has been replaced by NPPF 2018 Section 16 (unchanged in February 2019), reproduced in full below:

**Para 184.** Heritage assets range from sites and buildings of local historic value to those of the highest significance, such as World Heritage Sites which are internationally recognised to be of Outstanding Universal Value. These assets are an irreplaceable resource, and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations.

**Para 185.** Plans should set out a positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats. This strategy should take into account:

- a) the desirability of sustaining and enhancing the significance of heritage assets, and putting them to viable uses consistent with their conservation;
- b) the wider social, cultural, economic and environmental benefits that conservation of the historic environment can bring;
- c) the desirability of new development making a positive contribution to local character and distinctiveness; and
- d) opportunities to draw on the contribution made by the historic environment to the character of a place.

**Para 186.** When considering the designation of conservation areas, local planning authorities should ensure that an area justifies such status because of its special architectural or historic interest, and that the concept of conservation is not devalued through the designation of areas that lack special interest.

**Para 187.** Local planning authorities should maintain or have access to a historic environment record. This should contain up-to-date evidence about the historic environment in their area and be used to:

- a) assess the significance of heritage assets and the contribution they make to their environment; and
- b) predict the likelihood that currently unidentified heritage assets, particularly sites of historic and archaeological interest, will be discovered in the future.

**Para 188.** Local planning authorities should make information about the historic environment, gathered as part of policy-making or development management, publicly accessible.

#### **Proposals affecting heritage assets**

**Para 189.** In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets’ importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

**Para 190.** Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary



expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal.

**Para 191.** Where there is evidence of deliberate neglect of, or damage to, a heritage asset, the deteriorated state of the heritage asset should not be taken into account in any decision.

**Para 192.** In determining applications, local planning authorities should take account of:

- a) the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;
- b) the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and
- c) the desirability of new development making a positive contribution to local character and distinctiveness.

#### Considering potential impacts

**Para 193.** When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.

**Para 194.** Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of:

- a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional;
- b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II\* listed buildings, grade I and II\* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.

**Para 195.** Where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:

- a) the nature of the heritage asset prevents all reasonable uses of the site; and
- b) no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and
- c) conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and
- d) the harm or loss is outweighed by the benefit of bringing the site back into use.

**Para 196.** Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.

**Para 197.** The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.

**Para 198.** Local planning authorities should not permit the loss of the whole or part of a heritage asset without taking all reasonable steps to ensure the new development will proceed after the loss has occurred.

**Para 199.** Local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.

**Para 200.** Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.

**Para 201.** Not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm under paragraph 195 or less than substantial harm under paragraph 196, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.

**Para 202.** Local planning authorities should assess whether the benefits of a proposal for enabling development, which would otherwise conflict with planning policies but which would secure the future conservation of a heritage asset, outweigh the disbenefits of departing from those policies.

## 9.2 Local planning policy

9.2.1 Following the Planning and Compulsory Purchase Act 2004, Planning Authorities have replaced their Unitary Development Plans (UDPs), Local Plans and Supplementary Planning Guidance with a new system of Local Development Frameworks (LDFs). UDP policies have been either 'saved' or 'deleted'. In most cases archaeology policies are likely to be 'saved' because there have been no significant changes in legislation or advice at a national level.

9.2.2 Woking Borough Council's Core Strategy was adopted in October 2012. It covers the period to 2027 and provides a clear vision of what the area will look by then and the means to achieve it. The Policy relevant to buried heritage assets is:

#### CS20: Heritage and conservation

New development must respect and enhance the character and appearance of the area in which it is proposed whilst making the best use of the land available. New development should also make a positive contribution to the character, distinctiveness and significance of the historic environment, including heritage assets at risk through neglect, decay or other threats.

The heritage assets of the Borough will be protected and enhanced in accordance with relevant legislation and national guidance as set out in the National Planning Policy Framework. The definition of what comprises the heritage assets of the Borough is included in the Glossary and also where relevant identified on the Proposals Map.

There will be a presumption against any development that will be harmful to a listed building. Alterations and extensions to listed buildings must respect the host building in terms of scale, design, use of materials, retention of the structure and any features of special historic or architectural importance. Planning applications will be refused for any alteration or extension to a listed building that will not preserve the building or its setting. A listed building consent will be required for any development that will affect a statutory listed building.

On all development sites over 0.4 hectares an archaeological evaluation and investigation will be necessary if, in the opinion of the County Archaeologist, an archaeological assessment demonstrates that the site has archaeological potential.

Within Areas of High Archaeological Potential (as illustrated on the Proposals Map), development will not be permitted unless the following are satisfied:

- Submission of an archaeological assessment of the site.
- Where archaeological importance of the site has been identified, a programme setting out a full archaeological survey of the site has been submitted and agreed with the Council.

The Council will work proactively with all stakeholders to ensure the conservation, enhancement and enjoyment of the historic environment, including identifying opportunities to mitigate and adapt to climate change where that will not harm the integrity of the heritage asset.



## 10 Determining significance

10.1.1 'Significance' lies in the value of a heritage asset to this and future generations because of its heritage interest, which may be archaeological, architectural, artistic or historic. Archaeological interest includes an interest in carrying out an expert investigation at some point in the future into the evidence a heritage asset may hold of past human activity, and may apply to standing buildings or structures as well as buried remains. Known and potential heritage assets within the site and its vicinity have been identified from national and local designations, HER data and expert opinion. The determination of the significance of these assets is based on statutory designation and/or professional judgement against four values (EH 2008):

- **Evidential value:** the potential of the physical remains to yield evidence of past human activity. This might take into account date; rarity; state of preservation; diversity/complexity; contribution to published priorities; supporting documentation; collective value and comparative potential.
- **Aesthetic value:** this derives from the ways in which people draw sensory and intellectual stimulation from the heritage asset, taking into account what other people have said or written;
- **Historical value:** the ways in which past people, events and aspects of life can be connected through heritage asset to the present, such a connection often being illustrative or associative;
- **Communal value:** this derives from the meanings of a heritage asset for the people who know about it, or for whom it figures in their collective experience or memory; communal values are closely bound up with historical, particularly associative, and aesthetic values, along with and educational, social or economic values.

10.1.2 Consultation on draft revisions to the original *Conservation Principles* document which set out the four values was open from November 2017 until February 2018. The revisions aim to make them more closely aligned with the terms used in the NPPF (which are also used in designation and planning legislation): i.e. as archaeological, architectural, artistic and historic interest. This is in the interests of consistency, and to support the use of the Conservation Principles in more technical decision-making (HE 2017).

10.1.3 Table 2 gives examples of the significance of designated and non-designated heritage assets.

Table 2: Significance of heritage assets

Heritage asset description	Significance
World heritage sites Scheduled monuments Grade I and II* listed buildings Historic England Grade I and II* registered parks and gardens Protected Wrecks Heritage assets of national importance	Very high (International/ national)
Historic England Grade II registered parks and gardens Conservation areas Designated historic battlefields Grade II listed buildings Burial grounds Protected heritage landscapes (e.g. ancient woodland or historic hedgerows) Heritage assets of regional or county importance	High (national/ regional/ county)
Heritage assets with a district value or interest for education or cultural appreciation Locally listed buildings	Medium (District)
Heritage assets with a local (i.e. parish) value or interest for education or cultural appreciation	Low (Local)
Historic environment resource with no significant value or interest	Negligible
Heritage assets that have a clear potential, but for which current knowledge is insufficient to allow significance to be determined	Uncertain

10.1.4 Unless the nature and exact extent of buried archaeological remains within any given area has been determined through prior investigation, significance is often uncertain.

## 11 Non-archaeological constraints

11.1.1 The purpose of this section is to highlight to decision makers any relevant non-archaeological constraints identified during the study, that might affect future archaeological field investigation on the site (should this be recommended). The information has been assembled using only those sources as identified in section 2 and section 13.4, in order to assist forward planning for the project designs, working schemes of investigation and risk assessments that would be needed prior to any such field work. MOLA has used its best endeavours to ensure that the sources used are appropriate for this task but has not independently verified any details. Under the Health & Safety at Work Act 1974 and subsequent regulations, all organisations are required to protect their employees as far as is reasonably practicable by addressing health and safety risks. The contents of this section are intended only to support organisations operating on this site in fulfilling this obligation and do not comprise a comprehensive risk assessment.

11.1.2 It is anticipated that live services are present on the site, the locations of which have not been identified by this archaeological report. Other than this, no other non-archaeological constraints to any archaeological fieldwork have been identified within the site.



## 12 Glossary

<i>Alluvium</i>	Sediment laid down by a river. Can range from sands and gravels deposited by fast flowing water and clays that settle out of suspension during overbank flooding. Other deposits found on a valley floor are usually included in the term alluvium (e.g. peat).
<i>Archaeological Priority Area/Zone</i>	Areas of archaeological priority, significance, potential or other title, often designated by the local authority.
<i>Brickearth</i>	A fine-grained silt believed to have accumulated by a mixture of processes (e.g. wind, slope and freeze-thaw) mostly since the Last Glacial Maximum around 17,000BP.
<i>B.P.</i>	Before Present, conventionally taken to be 1950
<i>Bronze Age</i>	2,000–600 BC
<i>Building recording</i>	Recording of historic buildings (by a competent archaeological organisation) is undertaken 'to document buildings, or parts of buildings, which may be lost as a result of demolition, alteration or neglect', amongst other reasons. Four levels of recording are defined by Royal Commission on the Historical Monuments of England (RCHME) and Historic England. Level 1 (basic visual record); Level 2 (descriptive record), Level 3 (analytical record), and Level 4 (comprehensive analytical record)
<i>Built heritage</i>	Upstanding structure of historic interest.
<i>Colluvium</i>	A natural deposit accumulated through the action of rainwash or gravity at the base of a slope.
<i>Conservation area</i>	An area of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance. Designation by the local authority often includes controls over the demolition of buildings; strengthened controls over minor development; and special provision for the protection of trees.
<i>Cropmarks</i>	Marks visible from the air in growing crops, caused by moisture variation due to subsurface features of possible archaeological origin (i.e. ditches or buried walls).
<i>Cut-and-cover [trench]</i>	Method of construction in which a trench is excavated down from existing ground level and which is subsequently covered over and/or backfilled.
<i>Cut feature</i>	Archaeological feature such as a pit, ditch or well, which has been cut into the then-existing ground surface.
<i>Devensian</i>	The most recent cold stage (glacial) of the Pleistocene. Spanning the period from c 70,000 years ago until the start of the Holocene (10,000 years ago). Climate fluctuated within the Devensian, as it did in other glacials and interglacials. It is associated with the demise of the Neanderthals and the expansion of modern humans.
<i>Early medieval</i>	AD 410–1066. Also referred to as the Saxon period.
<i>Evaluation (archaeological)</i>	A limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area.
<i>Excavation (archaeological)</i>	A programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological remains, retrieves artefacts, ecofacts and other remains within a specified area. The records made and objects gathered are studied and the results published in detail appropriate to the project design.
<i>Findspot</i>	Chance find/antiquarian discovery of artefact. The artefact has no known context, is either residual or indicates an area of archaeological activity.
<i>Geotechnical</i>	Ground investigation, typically in the form of boreholes and/or trial/test pits, carried out for engineering purposes to determine the nature of the subsurface deposits.
<i>Head</i>	Weathered/soliflucted periglacial deposit (i.e. moved downslope through natural processes).
<i>Heritage asset</i>	A building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions. Heritage assets are the valued components of the historic environment. They include designated heritage assets and assets identified by the local planning authority (including local listing).
<i>Historic environment assessment</i>	A written document whose purpose is to determine, as far as is reasonably possible from existing records, the nature of the historic environment resource/heritage assets within a specified area.
<i>Historic Environment Record (HER)</i>	Archaeological and built heritage database held and maintained by the County authority. Previously known as the Sites and Monuments Record
<i>Holocene</i>	The most recent epoch (part) of the Quaternary, covering the past 10,000 years during which time a warm interglacial climate has existed. Also referred to as the 'Postglacial' and (in Britain) as the 'Flandrian'.
<i>Iron Age</i>	600 BC–AD 43

<i>Later medieval</i>	AD 1066 – 1500
<i>Last Glacial Maximum</i>	Characterised by the expansion of the last ice sheet to affect the British Isles (around 18,000 years ago), which at its maximum extent covered over two-thirds of the present land area of the country.
<i>Locally listed building</i>	A structure of local architectural and/or historical interest. These are structures that are not included in the Secretary of State's Listing but are considered by the local authority to have architectural and/or historical merit
<i>Listed building</i>	A structure of architectural and/or historical interest. These are included on the Secretary of State's list, which affords statutory protection. These are subdivided into Grades I, II* and II (in descending importance).
<i>Made Ground</i>	Artificial deposit. An archaeologist would differentiate between modern made ground, containing identifiably modern inclusion such as concrete (but not brick or tile), and undated made ground, which may potentially contain deposits of archaeological interest.
<i>Mesolithic</i>	12,000 – 4,000 BC
<i>National Record for the Historic Environment (NRHE)</i>	National database of archaeological sites, finds and events as maintained by Historic England in Swindon. Generally not as comprehensive as the country HER.
<i>Neolithic</i>	4,000 – 2,000 BC
<i>Ordnance Datum (OD)</i>	A vertical datum used by Ordnance Survey as the basis for deriving altitudes on maps.
<i>Palaeo-environmental</i>	Related to past environments, i.e. during the prehistoric and later periods. Such remains can be of archaeological interest, and often consist of organic remains such as pollen and plant macro fossils which can be used to reconstruct the past environment.
<i>Palaeolithic</i>	700,000–12,000 BC
<i>Palaeochannel</i>	A former/ancient watercourse
<i>Peat</i>	A build-up of organic material in waterlogged areas, producing marshes, fens, mires, blanket and raised bogs. Accumulation is due to inhibited decay in anaerobic conditions.
<i>Pleistocene</i>	Geological period pre-dating the Holocene.
<i>Post-medieval</i>	AD 1500–present
<i>Preservation by record</i>	Archaeological mitigation strategy where archaeological remains are fully excavated and recorded archaeologically and the results published. For remains of lesser significance, preservation by record might comprise an archaeological watching brief.
<i>Preservation in situ</i>	Archaeological mitigation strategy where nationally important (whether Scheduled or not) archaeological remains are preserved <i>in situ</i> for future generations, typically through modifications to design proposals to avoid damage or destruction of such remains.
<i>Registered Historic Parks and Gardens</i>	A site may lie within or contain a registered historic park or garden. The register of these in England is compiled and maintained by Historic England.
<i>Residual</i>	When used to describe archaeological artefacts, this means not <i>in situ</i> , i.e. Found outside the context in which it was originally deposited.
<i>Roman</i>	AD 43–410
<i>Scheduled Monument</i>	An ancient monument or archaeological deposits designated by the Secretary of State as a 'Scheduled Ancient Monument' and protected under the Ancient Monuments Act.
<i>Site</i>	The area of proposed development
<i>Site codes</i>	Unique identifying codes allocated to archaeological fieldwork sites, e.g. evaluation, excavation, or watching brief sites.
<i>Study area</i>	Defined area surrounding the proposed development in which archaeological data is collected and analysed in order to set the site into its archaeological and historical context.
<i>Solifluction, Soliflucted</i>	Creeping of soil down a slope during periods of freeze and thaw in periglacial environments. Such material can seal and protect earlier landsurfaces and archaeological deposits which might otherwise not survive later erosion.
<i>Stratigraphy</i>	A term used to define a sequence of visually distinct horizontal layers (strata), one above another, which form the material remains of past cultures.
<i>Truncate</i>	Partially or wholly remove. In archaeological terms remains may have been truncated by previous construction activity.
<i>Watching brief (archaeological)</i>	A formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons.



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- Historic England designation data
- Groundsure historic Ordnance Survey mapping
- Surrey County Council Historic Environment Record

### 13.3 Cartographic sources

John Norden's 250 years of map making in the County of Surrey, sheet 3b, 1594  
John Rocque's map of Surrey, 1768

#### Ordnance Survey maps

Ordnance Survey 1st edition 6" map (1872/3)  
Ordnance Survey 2nd edition 6" map (1897)  
Ordnance Survey 3rd edition 6" map (1914)  
Ordnance Survey 25" map (1935/6)

#### Engineering/Architects drawings

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Woods Hardwick; Woking Football Club and David Lloyd Gym, Woking Topographic Survey sheet 1 of 3, drg no. 0189-7-851A, 1:200 at A0, 26/09/2018

Woods Hardwick, Woking Football Club and David Lloyd Gym, Woking Topographic Survey sheet 2 of 3, drg no. 0189-7-852A, 1:200 at A0, 26/09/2018

Woods Hardwick, Woking Football Club and David Lloyd Gym, Woking Topographic Survey sheet 3 of 3, drg no. 0189-7-853A, 1:200 at A0, 26/09/2018

### 13.4 Available site survey information checklist

Information from client	Available	Format	Obtained
Plan of existing site services (overhead/buried)	not known	-	N
Levelled site survey as existing (ground and buildings)	Y	pdf	Y
Contamination survey data ground and buildings (inc. asbestos)	not known	-	N
Geotechnical report	Y	pdf	Y
Envirocheck report	not known	pdf	N
Information obtained from non-client source	Carried out	Internal inspection of buildings	
Site inspection	Y	Y	



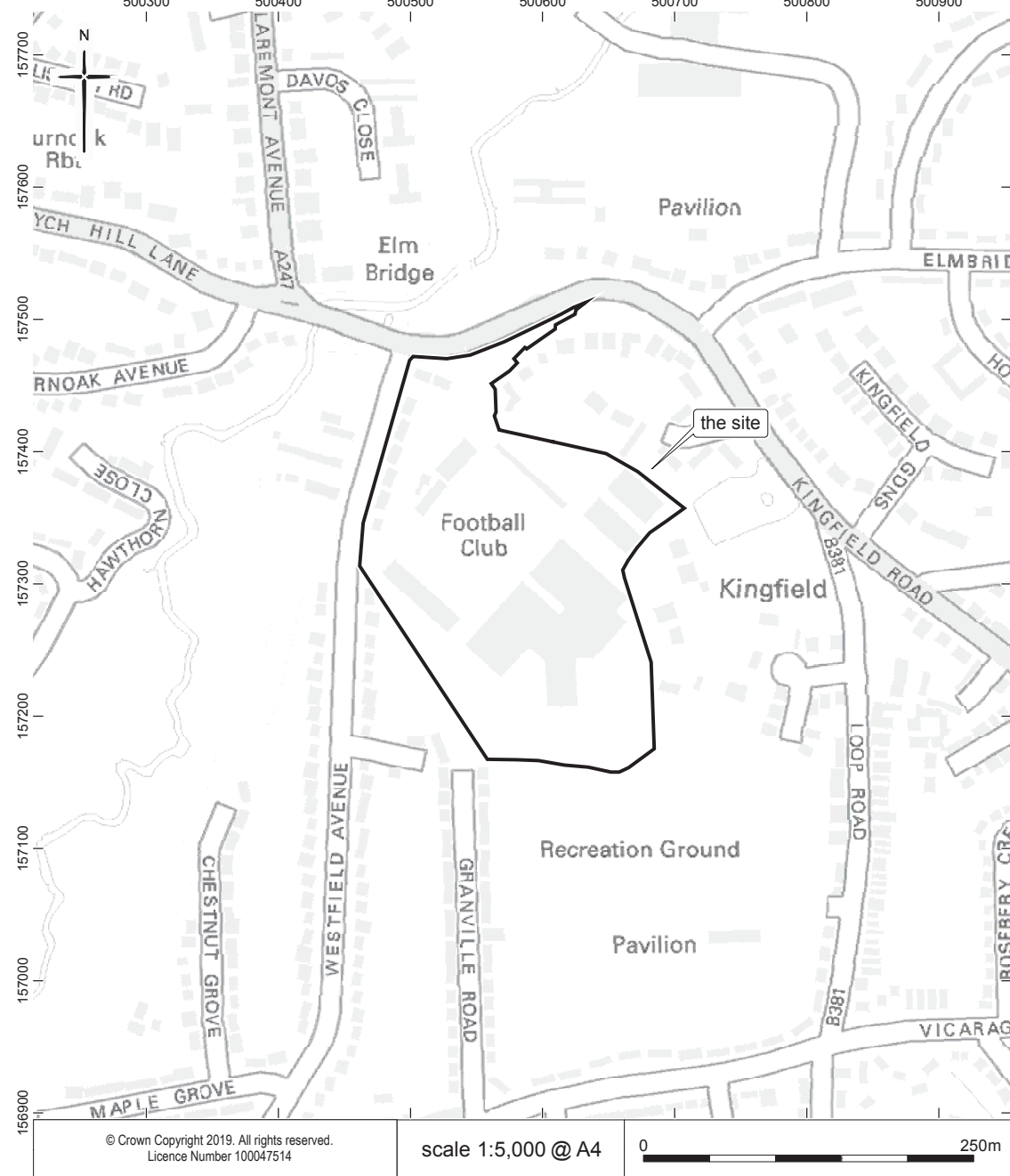
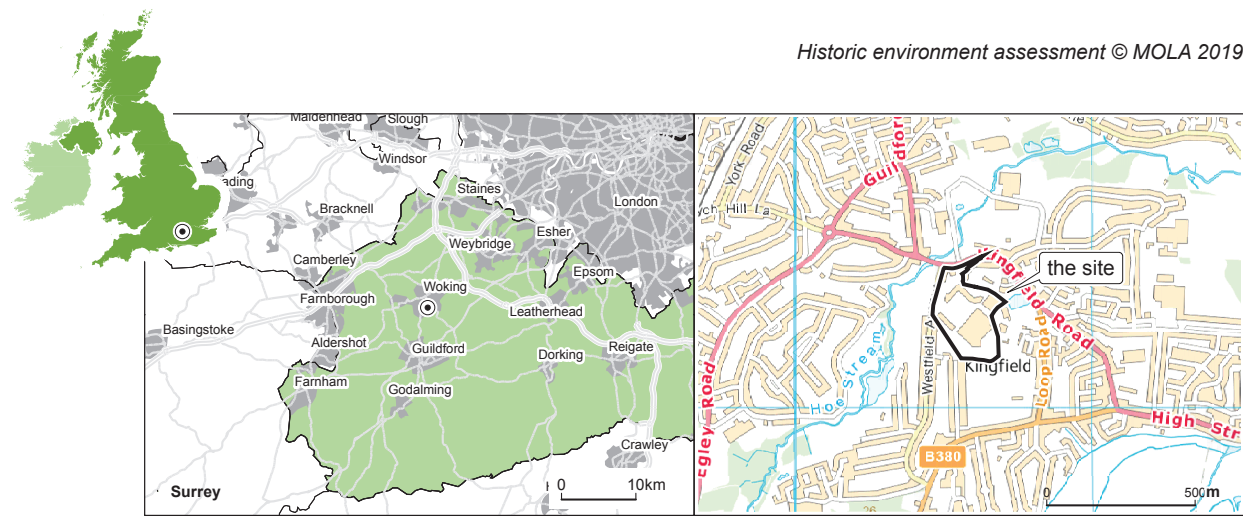


Fig 1 Site location

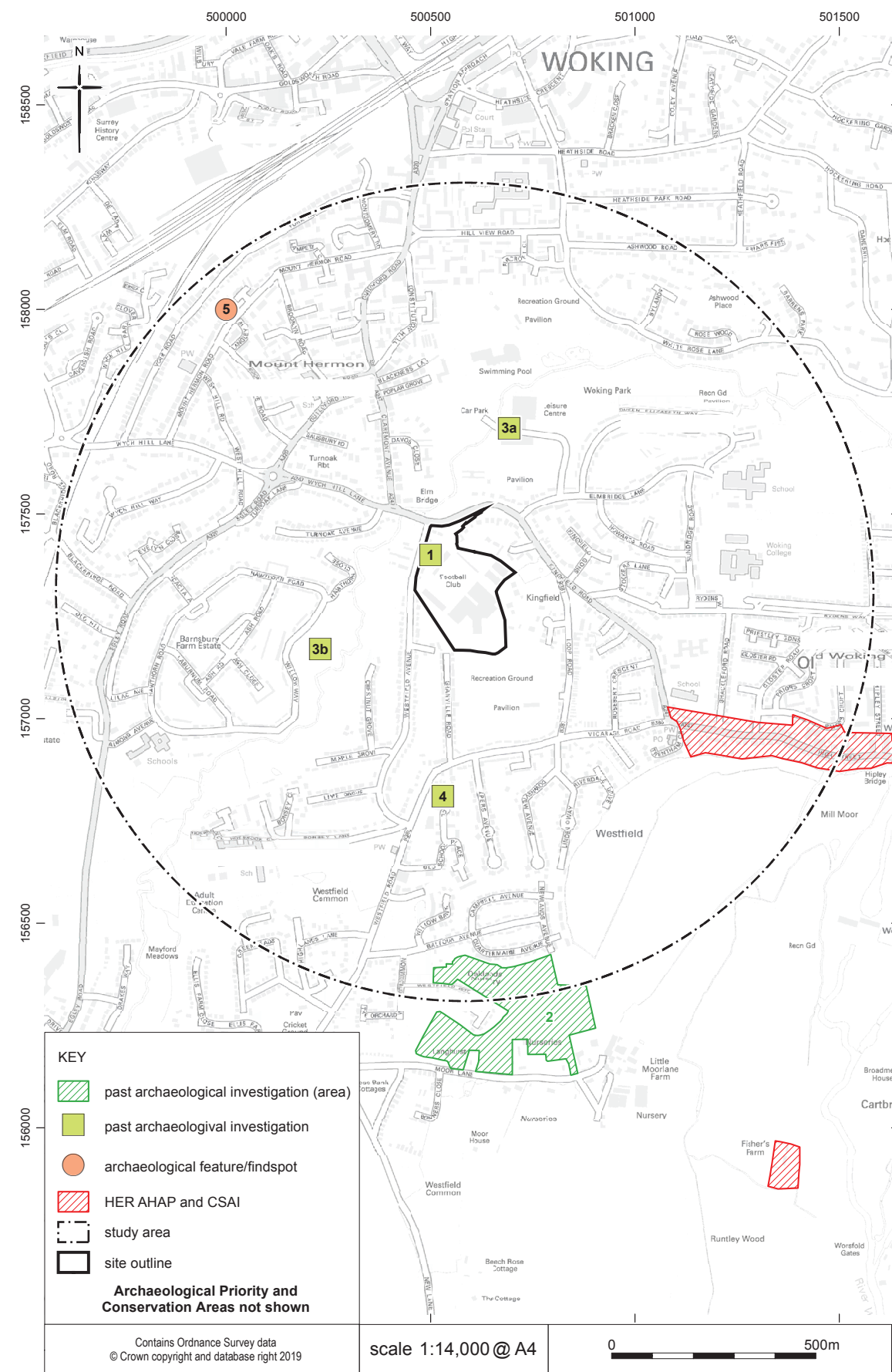


Fig 2 Historic environment features map



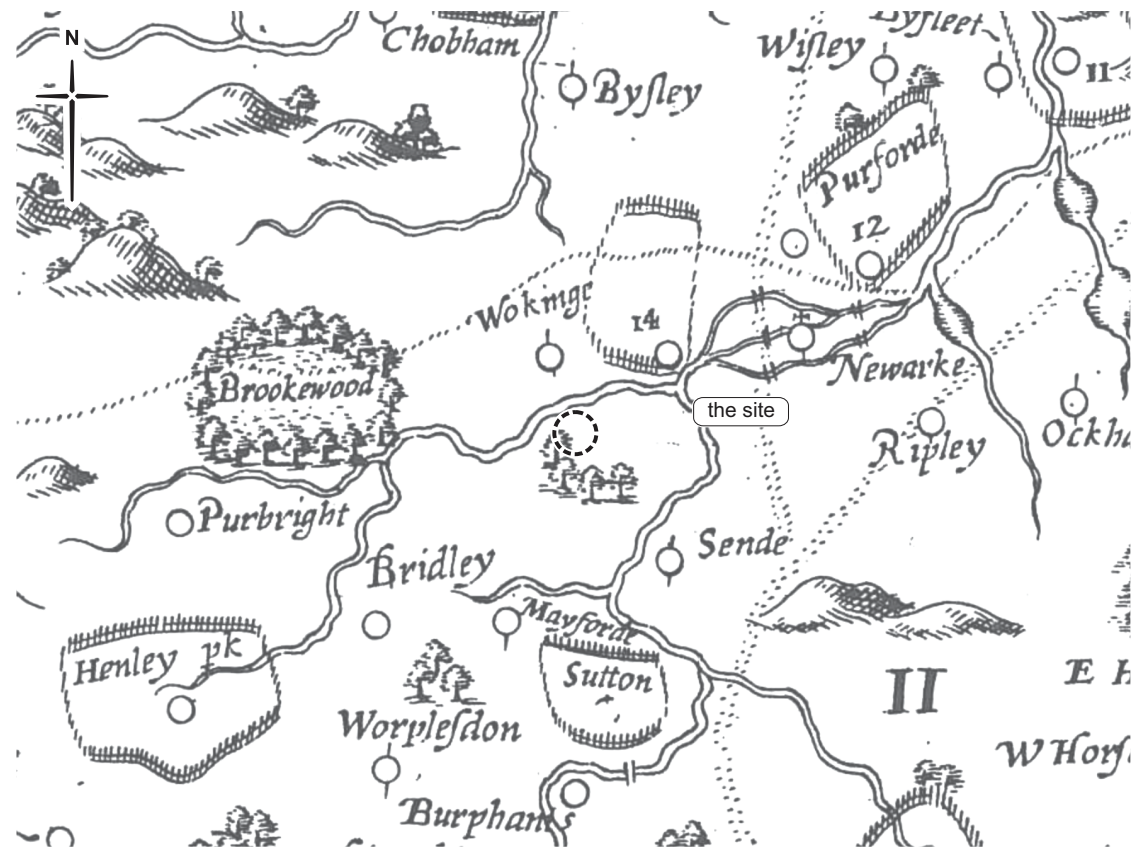


Fig 3 John Norden's 250 years of map making in the County of Surrey, sheet no. 3b, 1594.

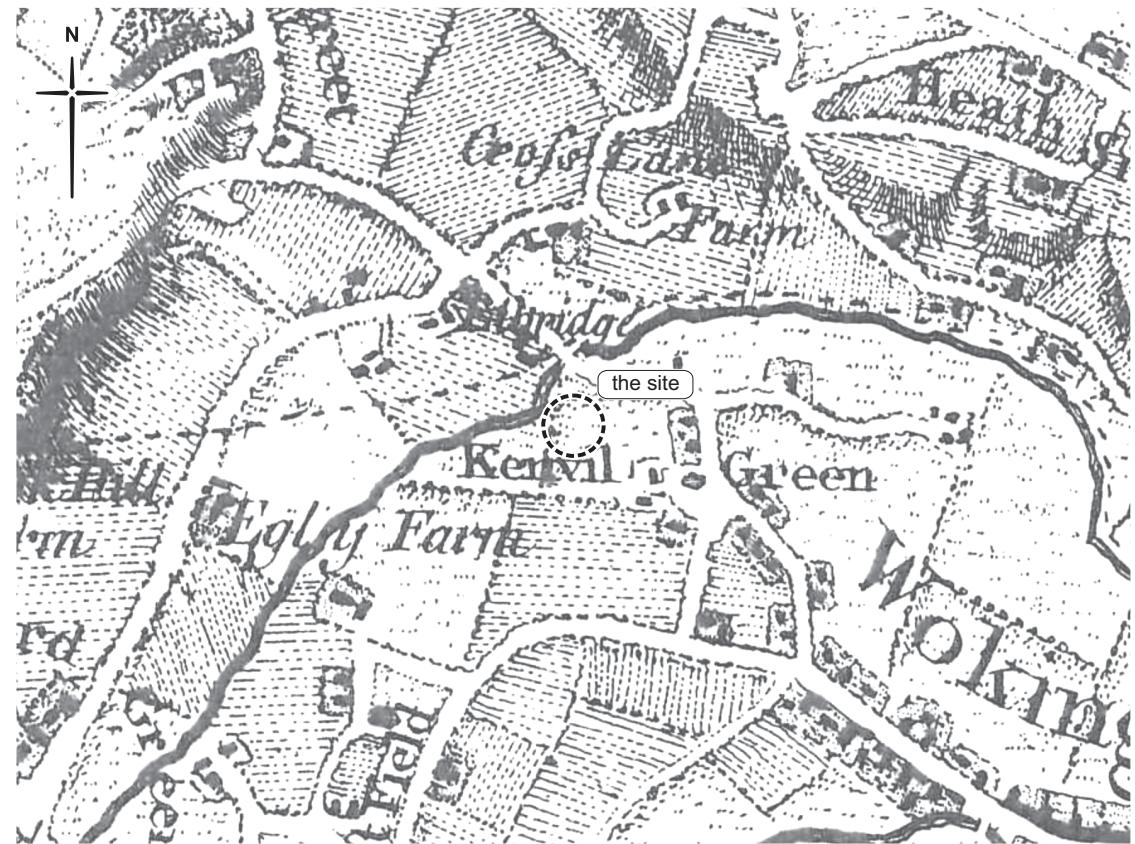


Fig 4 John Roque's map of Surrey, 1768.

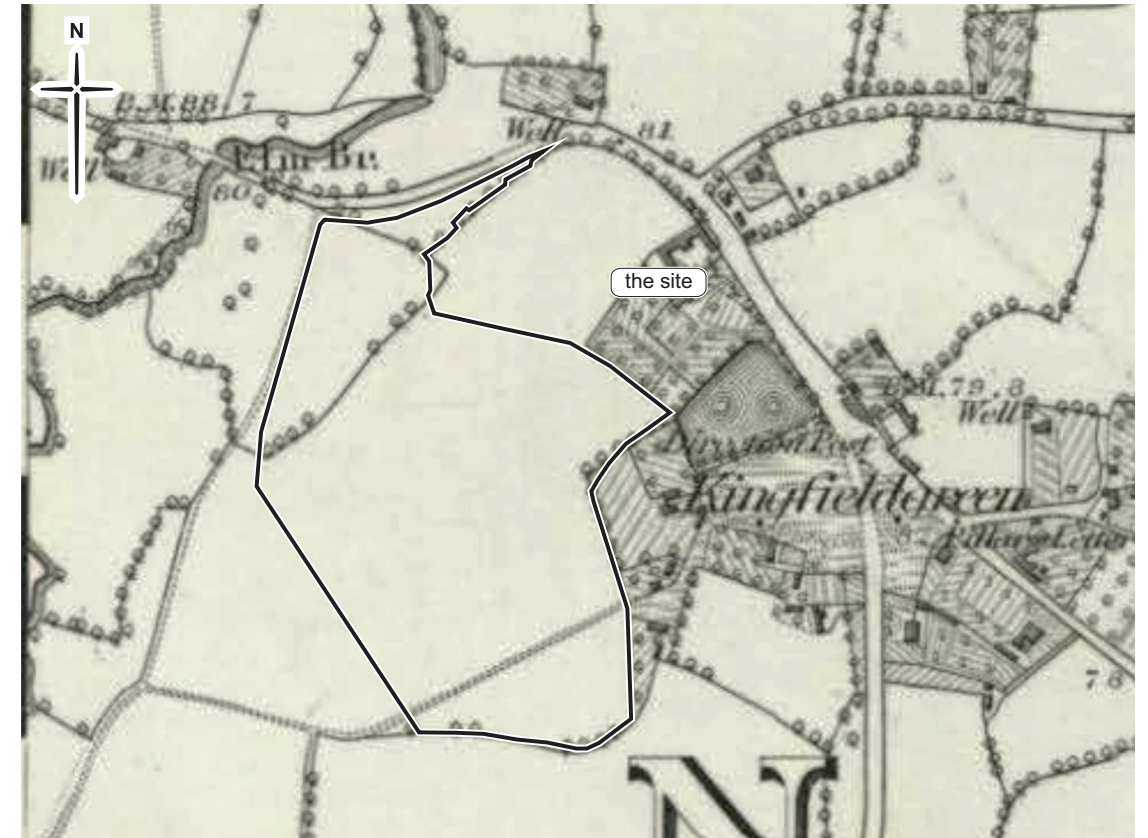


Fig 5 Ordnance Survey 1st edition 6":mile map of 1872/3 (not to scale).

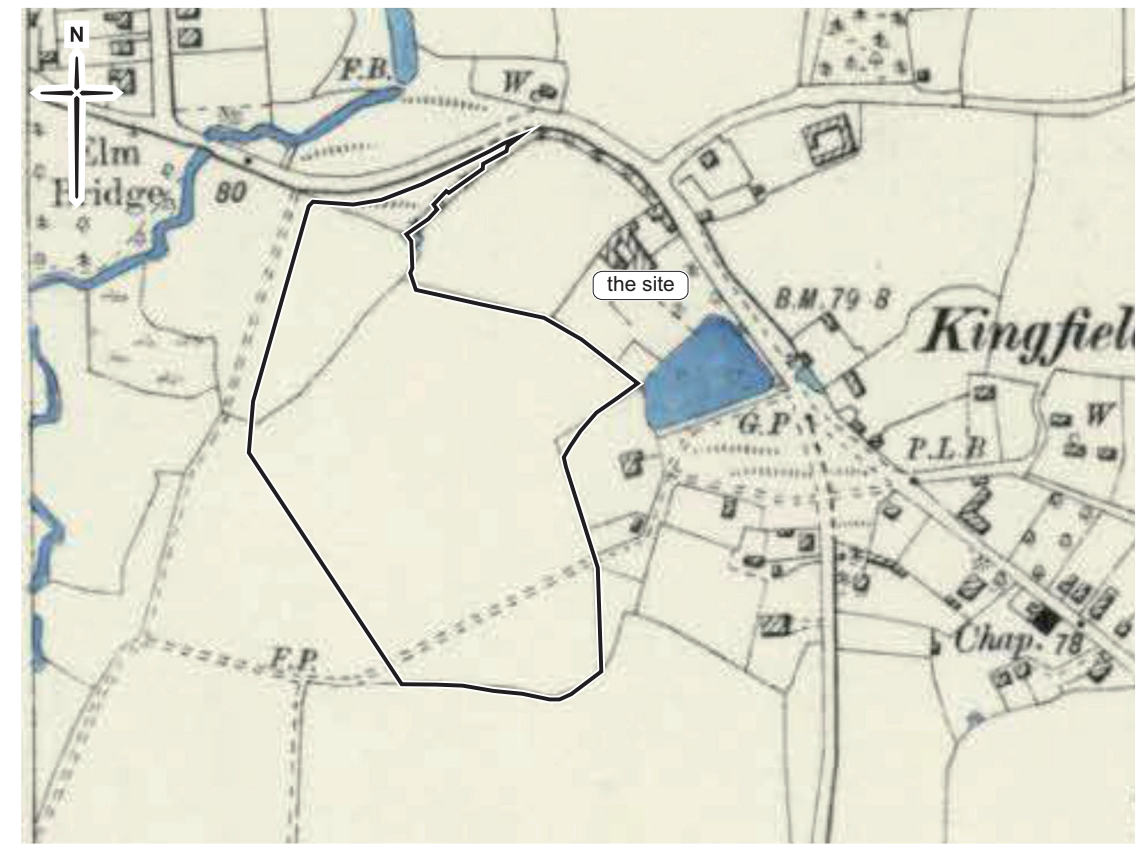


Fig 6 Ordnance Survey 2nd edition 6":mile map of 1897(not to scale).



APPENDIX D: Preliminary Ecological Appraisal

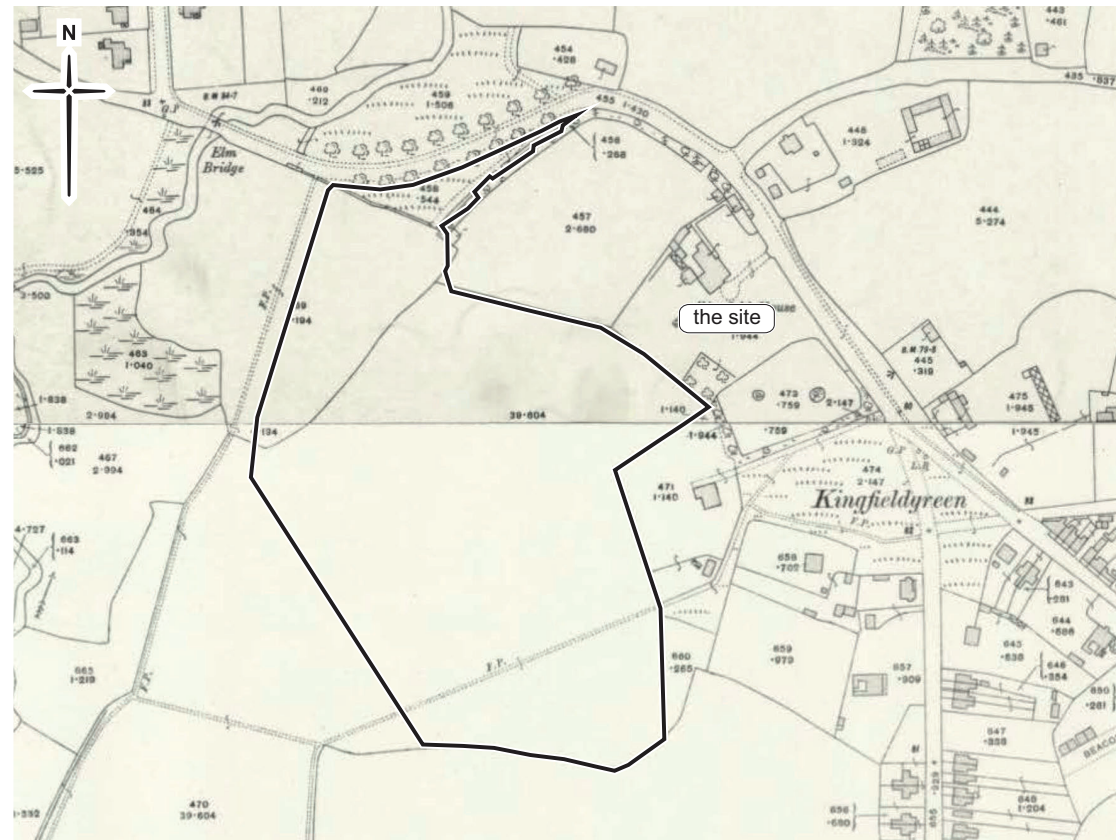


Fig 7 Ordnance Survey 3rd edition 25":mile map of 1914 (not to scale).

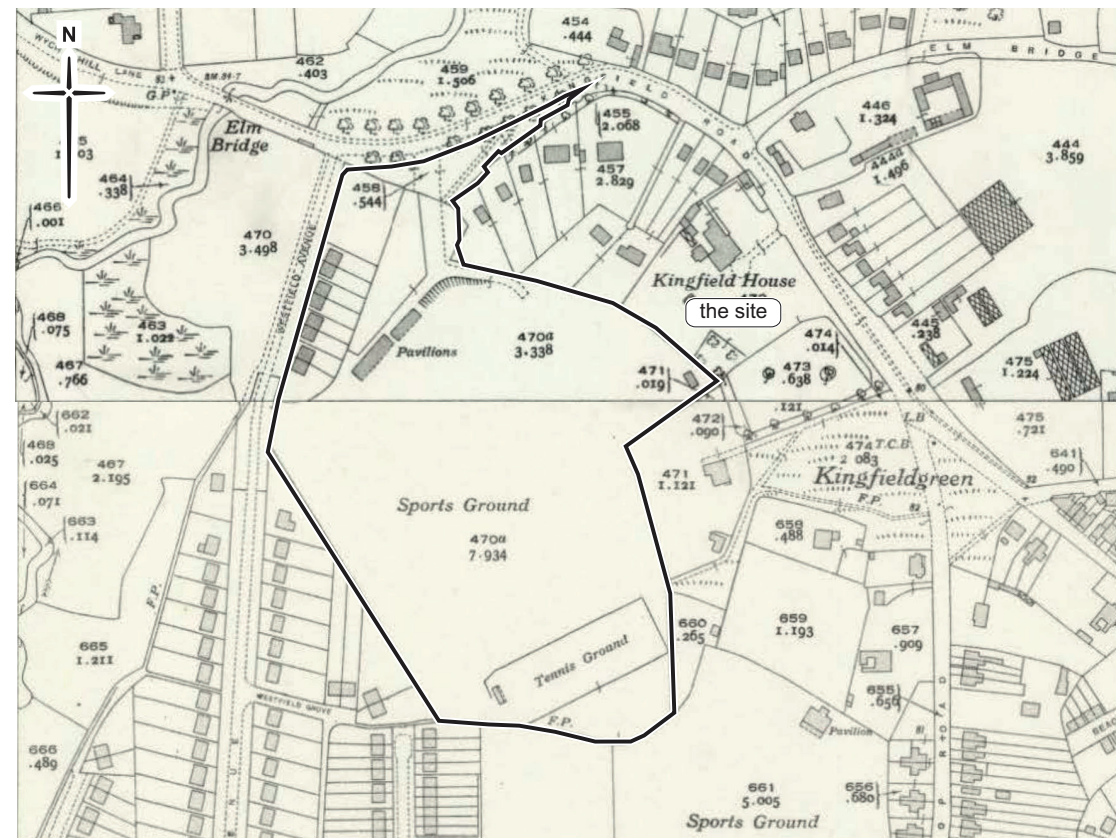


Fig 8 Ordnance Survey 25":mile map of 1935/6 (not to scale).



**Cardinal Court, Woking**  
**Preliminary Ecological Appraisal**  
 Report for GoldDev Woking Ltd

<b>Job Number</b>	7758			
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<b>Version</b>	<b>Checked by</b>	<b>Approved by</b>	<b>Date</b>	<b>Type</b>
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## LIABILITY

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## NOTE

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# Summary of key issues

The Ecology Consultancy was commissioned to carry out a Preliminary Ecological Appraisal (PEA), comprising a Phase 1 habitat survey, protected species assessment and ecological evaluation of land at Kingfield Road, Woking, to be known as Cardinal Court. The main findings of the PEA are as follows:

- The proposed development site comprised an existing football club, buildings associated with the football club and gym and leisure facilities, semi-detached and detached residential dwellings, hardstanding, scrub and introduced shrub, amenity grassland and scattered trees.
- The site is not subject to any statutory or non-statutory nature conservation designations. There are statutory designated sites within a 2km radius, the closest being White Rose Lane Local Nature Reserve (LNR) located approximately 815 metres to the east of the site. The nearest non-statutory designated site, Hoe Stream Site of Nature Conservation Importance (SNCI), is located approximately 30m north-west of the site.
- The habitats present within the proposed development site are considered to be of site value only. They are unlikely to support any rare species, or diverse assemblages or large populations of any noteworthy species.
- **Bats** – Four buildings with potential features with suitability to support roosting bats were identified on site, assessed as having low potential for roosting bats. In order to comply with legislation, further survey in the form of a Preliminary Roost Assessment is required to determine if any bats are using these buildings for roosting. This will be followed by emergence surveys if required, to be carried out during the active bat season (May – August). There were no trees with features suitable to support roosting bats recorded on site. The existing hedgerow and areas of introduced shrub on the site boundaries have the potential to support commuting and foraging bats, and provide a potential commuting and foraging corridor for bats through the landscape. These habitats should be retained within the development and enhanced where possible. Throughout the construction works and post development, appropriate lighting should be used to avoid light spill onto any retained or new commuting and foraging habitats.
- **Great crested newt** – habitats with potential to support great crested newt during their terrestrial phase were present on site, and there is a pond located approximately 30m to the east of the site. In order to comply with legislation, further survey work will be required to establish the presence/ absence of great crested newt on site. A Habitat Suitability Index (HSI) assessment can be carried out at any time, followed by an eDNA survey (mid April – end of June) on the pond. If the eDNA survey result is positive for great crested newts,



then population estimate surveys will be required (mid March – mid June). There is an option to avoid further surveys by following the Woking District Licensing Scheme, whereby a payment is made to contribute to strategic enhancements in the borough.

- **Reptiles** - The site contains suitable habitat to support widespread reptile species such as slow-worm, but these are limited to the areas of introduced shrub and scrub. Further surveys will not be required, but precautionary working practices must be adopted to ensure legal compliance for widespread reptile species.
- **Breeding birds** – breeding birds are likely to be present on site in the scattered trees, introduced shrub and scrub areas. In order to comply with legislation, vegetation removal should take place September to February inclusive which is outside of the main bird breeding season. Where removal outside the nesting season is not possible a check for nesting birds prior to vegetation clearance must be undertaken by an experienced ecologist and, if any nests are found, the nests must be protected until such time as the young have left the nest.
- Recommendations to enhance the biodiversity value of the development comprise inclusion of biodiverse roofs, Sustainable Drainage Systems (SuDS), wildlife planting, flowering lawn mix for any areas of amenity grassland, nesting features for birds and roosting features for bats.

# 1 Introduction

## BACKGROUND TO COMMISSION

- 1.1 The Ecology Consultancy was commissioned by GolDev Ltd in February 2019, to carry out a Preliminary Ecological Appraisal (PEA) of existing buildings and areas of land at Kingfield Road, Woking, in Surrey, to be known as Cardinal Court. The appraisal was carried out in order to provide ecological information to inform a planning application for the redevelopment of the site. This appraisal considers land within the site boundary (hereon referred to as 'the site') as indicated on the plan provided by the client (Leach Rhodes Walker Architects, 2018).

## SCOPE OF THE REPORT

- 1.2 The aim of this appraisal is to provide baseline ecological information about the site. This will be used to identify any potential ecological constraints associated with the development and/or to identify the need for additional survey work to further evaluate any impact that may risk contravention of legislation or policy relating to protected species and nature conservation. Where necessary, avoidance, mitigation/compensation and/or enhancement measures have been recommended to ensure compliance.
- 1.3 This appraisal is based on the following information sources:
  - a desk study of the site and land within a 2 kilometre (km) surrounding radius;
  - a Phase 1 habitat survey (JNCC, 2010) of the site to identify and map the habitats present;
  - a protected species assessment of the site to identify features with potential to support legally protected species; and
  - an evaluation of the site's importance for nature conservation.
- 1.4 This appraisal has been prepared with reference to best practice guidance published by the Chartered Institute for Ecology and Environmental Management (CIEEM, 2017).
- 1.5 The survey, assessment and report were conducted and written by Gemma Watkinson MBiolsci ACIEEM, an Ecologist with over three years' experience who is competent in carrying out Phase 1 habitat surveys and protected species assessments.



## SITE CONTEXT AND STATUS

1.6 The proposed development site is approximately 4.97 hectares (ha) in size and is centred on Ordnance Survey National Grid reference TQ 00574 57329. The site lies off Kingfield Road, in Woking, Surrey. The site is not subject to any statutory or non-statutory nature conservation designations. The site is bordered by playing fields to the south, and residential dwellings and gardens to north, east and west. The wider landscape comprises further residential dwellings and urban areas. Hoe Stream Site of Nature Conservation Importance (SNCI) and associated greenspace is located to the west of Sycamore Avenue, and a waterbody surrounded by woodland habitats is located adjacent to the east of the site.

## DEVELOPMENT PROPOSALS

1.7 The proposals are to remove all existing buildings and the majority of the existing landscaping from the site. The site will be redeveloped, repositioning the football club and stadium and include new residential housing with blocks up to nine storeys, high quality public amenity green spaces, courtyards and landscaped roofs accessible to residents (Leach Rhodes Walker Architects, 2018).

## RELEVANT LEGISLATION AND PLANNING POLICY

1.8 The following key pieces of nature conservation legislation are relevant to this appraisal. A more detailed description of legislation is provided in Appendix 5:

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

1.9 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2019) requires local authorities to avoid and minimise impacts on biodiversity and, where possible, to provide net gains in biodiversity when taking planning decisions.

1.10 Other planning policies at the local level which are of relevance to this development include the adopted Woking Borough Core Strategy (2012). Further information is provided in Appendix 5.

## 2 Methodology

### DESK STUDY

2.1 The following data sources were reviewed to provide information on the location of statutory designated sites<sup>1</sup>, non-statutory designated sites<sup>2</sup>, legally protected species<sup>3</sup>, Species and Habitats of Principal Importance<sup>4</sup> and other notable species<sup>5</sup> and notable habitats<sup>6</sup> that have been recorded within a 2km radius of the site. The search for statutory internationally designated sites was extended to include sites within a 5km radius of the site:

- Surrey Biodiversity Information Centre (SBIC), the local Biological Records Centre, principally for species records and information on non-statutory sites;
- MAGIC (<http://www.magic.gov.uk/>) - the Government's on-line mapping service; and
- Ordnance Survey mapping and publicly available aerial photography.

2.2 The full data search results are not presented in the report. However, relevant records provided by the desk study are provided in Section 3 of this report. Records for relevant protected or noteworthy species have been used to inform the assessment of the potential for protected species at the site and to provide a preliminary view of the site's ecological value.

### HABITAT SURVEY

2.3 A habitat survey of the site was carried out on the 19 February 2019 in mild (13°C), sunny and dry conditions with a gentle breeze and 2/8 cloud cover. It covered the entire site including boundary features. Habitats were described and mapped following standard Phase 1 habitat survey methodology (JNCC, 2010). Habitats were marked on a paper

<sup>1</sup> Statutory designations include Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR).

<sup>2</sup> Non-statutory sites are designated by local authorities (e.g. Sites of Importance for Nature Conservation or Local Wildlife Sites).

<sup>3</sup> **Legally protected species** include those listed in Schedules 1, 5 or 8 of the Wildlife and Countryside Act 1981; Schedule 2 of the Conservation of Habitats and Species Regulations 2017; or in the Protection of Badgers Act 1992 (as amended).

<sup>4</sup> **Species of Principal Importance** are those listed on Section 41 of the Natural Environment and Rural Communities Act, 2006.

<sup>5</sup> **Notable species** include Species of Principal Importance under the Natural Environment and Rural Communities Act 2006; Local Biodiversity Action Plan (LBAP) species; Birds of Conservation Concern (Eaton *et al.*, 2015); and/or Red Data Book/nationally notable species (JNCC, undated).

<sup>6</sup> **Notable habitats** include Habitats of Principal Importance under the Natural Environment and Rural Communities Act, 2006; those included in an LBAP; Ancient Woodland Inventory sites; and Important Hedgerows as defined by the Hedgerow Regulations 1997.



base map and subsequently digitised using ESRI ArcGIS software. Habitats were also assessed against descriptions of Habitat of Principal Importance (HPI) as set-out by the JNCC (BRIG, 2008)<sup>7</sup>.

- 2.4 Records for dominant and notable plants are provided, as are incidental records of birds and other fauna noted during the course of the habitat survey.
- 2.5 Common names are used where widely accepted – for amphibians, birds, fish, mammals, reptiles and vascular plants. Scientific names are provided for other groups but at first mention only if there is also an accepted common name.
- 2.6 The site was also surveyed for the presence of invasive plant species as defined by Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). However, detailed mapping of such species is beyond the scope of this commission and the locations on the habitat plan are indicative only.
- 2.7 Target notes are used to provide information on specific features of ecological interest (e.g. a badger sett) or habitat features that were too small to be mapped.

#### PROTECTED AND INVASIVE SPECIES ASSESSMENT

- 2.8 The suitability of the site for legally protected species was assessed on the basis of relevant desk study records<sup>8</sup> combined with field observations from the habitat survey. The likely value of habitat for protected species occurrence was ranked on a scale from 'negligible' to 'present' as described in Table 2.1.
- 2.9 The assessment of habitat suitability for protected or notable species was based on professional judgement drawing on experience of carrying out surveys of a large number of urban and rural sites and best practice survey guidance on habitat suitability and identifying field signs. Further information is provided in CIEEM's Sources of Survey Methods<sup>9</sup>.

<sup>7</sup> Data required to confirm that certain habitats (including rivers and ponds) meet criteria for Habitats of Principal Importance is beyond that obtained during a Phase 1 habitat survey. In these cases the potential for such habitats to meet relevant criteria is noted but further surveys to confirm this assessment may be recommended

<sup>8</sup> Primarily dependent on the age of the records, distance from the site and types of habitats at the site.

<sup>9</sup> <http://www.cieem.net/sources-of-survey-methods-sosm->

**Table 2.1: Protected species assessment categories**

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

- 2.10 The findings of this assessment establish the need for protected species surveys that are required to achieve compliance with relevant legislation. Surveys are commonly required for widespread species such as bats, great crested newt, reptiles and badger; but may be necessary for other species if suitable habitat is present.
- 2.11 Surveys may be required where a site is judged to be of low suitability for a particular species/species group. However, in some cases there may be opportunities to comply with legislation, without further survey, through precautionary measures prior to and during construction.

#### SITE EVALUATION

- 2.12 The site's ecological value has been evaluated broadly following guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) which ranks the nature conservation value of a site according to a geographic scale of reference: international, national, regional, county/metropolitan, district/borough, local/parish or of value at the site scale. In evaluating the nature conservation value of the site the following factors were considered: nature conservation designations; species/habitat rarity; naturalness; fragility and connectivity to other habitats.



## DATA VALIDITY AND LIMITATIONS

2.13 Every effort has been made to provide a comprehensive description of the site, however, the following limitations apply to this assessment.

- The protected species assessment provides a preliminary view of the likelihood of protected species occurring on the site. It should not be taken as providing a full and definitive survey of any protected species group. Additional surveys may be recommended if on the basis of the preliminary assessment or during subsequent surveys it is considered reasonably likely that protected species may be present.
- The ecological evaluation is preliminary and may change subject to the findings of further ecological surveys (should these be required).
- Even where data for a particular species group is provided in the desk study, a lack of records for a defined geographical area does not necessarily mean that there is a lack of ecological interest, the area may simply be under-recorded.
- Where only four figure grid references are provided for protected species by third parties, the precise location of species records can be difficult to determine and they could potentially be present anywhere within the given 1km x 1km square. Equally six figure grid references may be accurate to the nearest 100m only.
- The Phase 1 habitat survey does not constitute a full botanical survey or provide accurate mapping of invasive plant species. The survey was not completed within the optimal season for identifying plants.
- Ecological survey data is typically valid for two years unless otherwise specified.

2.14 Despite these limitations, it is considered that this report accurately reflects the habitats present, their biodiversity values and the potential of the site to support protected and notable species.

## 3 Results

### DESIGNATED SITES

#### Statutory designated nature conservation sites

3.1 The proposed development site is not subject to any statutory nature conservation designations. There are two European designated statutory sites within a 5km radius of the site, the closest of which is Thames Basin Heaths Special Protection Area (TBH SPA), approximately 3.1km north-west. There are three nationally designated statutory sites within a 2km radius of the site. The closest statutory site to the proposed development site is White Rose Lane Local Nature Reserve (LNR) located approximately 815 metres (m) to the north-east (see Table 3.1).

**Table 3.1: Statutory Designated Sites**

Site Name	Distance from site and orientation	Reason for designation
White Rose Lane (LNR)	815m north-east	Damp alder woodland beside the Hoe Stream. Wildlife observed within the site includes owls, bats, deer, frogs and various species of rare fungi.
Mayford Meadows (LNR)	860m south-west	Wetland management has encouraged the establishment of a rich, wet grassland flora and numerous trees have been coppiced and pollarded in order to enhance its biodiversity interest and provide suitable habitats for water vole.
Smart's and Prey Heaths Site of Special Scientific Interest (SSSI)	2km south-west	The site consists of a mosaic of heathland habitats including wet and dry heath, scrub and fringing woodland. The heathland supports characteristic heathland birds, including occasional breeding nightjar. The heathlands are predominantly damp, the sward being dominated by ling heather, cross-leaved heath, and purple moor grass. Other plants include creeping willow, dwarf gorse, deergrass, and long-leaved and round-leaved sundews.
Thames Basin Heaths Special Protection Area (TBH SPA)	3.1km north-west	The site consists of tracts of heathland, scrub and woodland. Less open habitats of scrub, acidic woodland and conifer plantations dominate, within which are scattered areas of open heath and mire. The site supports important breeding populations of a number of birds of lowland heathland, especially Nightjar and Woodlark, both of which nest on the ground, often at the woodland/heathland edge, and Dartford Warbler, which often nests in gorse. Scattered trees and scrub are used for roosting.  Together with the nearby Wealden Heaths SPA and Ashdown Forest SPA, the Thames Basin Heaths form part of a complex of heathlands in southern England that support important breeding bird populations
Thursley, Ash, & Pirbright	4.5km south-west	This site represents lowland northern Atlantic wet heaths, and contains several rare plants, including great sundew,

**Table 3.1: Statutory Designated Sites**

Site Name	Distance from site and orientation	Reason for designation
Chobham Special Area of Conservation (SAC)		bog hair-grass, bog orchid and brown beak-sedge. There are transitions to valley bog and dry heath. Thursley Common is an important site for invertebrates, including the nationally rare white-faced darter, and the site supports an important assemblage of animal species including European nightjar, Dartford warbler, sand lizard and smooth snake.

**Non-statutory designated nature conservation sites**

3.2 The proposed development site is not subject to any non-statutory nature conservation designation. There are nine non-statutory sites, designated as Sites of Nature Conservation Interest (SNCI) within 2km of the site. The closest is Hoe Stream SNCI, located approximately 30m north-west of the Woking Football Club site, separated from the site by Kingfield Road and Westfield Avenue. A summary of the non-statutory sites located within 2km of the site is presented in Table 3.2 below.

**Table 3.2: Non-Statutory Designated Sites**

Site Name	Distance from site and orientation	Reason for designation
Hoe Stream SNCI	30m north-west	The stream is important in the Borough and provides a valuable link and habitat corridor for the SNCI sites in the Hoe Valley SNCI corridor.
Mayford Meadows SNCI	500m south-west	The site includes marsh, swamp, fen, scrub, woodland and mesotrophic grassland. It supports a range of wetland habitats and is an important site for invertebrates (nationally scarce invertebrates are present) and passerines of damp meadows.
Barnsbury Meadow & Bonsey Lane Woods (including school) SNCI	740m south-east	The site contains wet grassland, broadleaved wet and dry woodland. The site forms an important part of a corridor of sites along the Hoe Valley, and is important for its habitat diversity including wet grassland and wet woodland. It supports an important invertebrate site and good populations of warblers and other passerines of damp meadows. The site has been identified as having potential to support otter.
Mill Moor SNCI	850m south-east	The site is situated on the floodplain of the River Wey, largely composed of semi-improved mesotrophic grassland, including central stands of wet grassland. Two ponds are present on site, and the site was selected for its species-rich wetland and ponds. Past records include at least 19 species typical of grassland of conservation interest in Surrey including 7 on the current draft Surrey Rare Plant Register. Although a recent survey has found it to have declined, with appropriate management it is thought that the site could regain some of its lost species.

**Table 3.2: Non-Statutory Designated Sites**

Site Name	Distance from site and orientation	Reason for designation
Westfield Common SNCI	1km south-east	The site contains woodland, scrub, wetland, grassland and ponds. It supports nationally scarce plant species, and there are records of great crested newt in two of the ponds. There are species rich areas of wet woodland, drains and ponds. This area has been selected for inclusion within the improvement plan for great crested newts in Woking Borough (ADAS, 2016).
River Wey – Woking SNCI (including Pyrford Place Lake)	1.3km south-east	A good quality river of county importance supporting a high density of invertebrates and water voles. The pond supports a range of species with a high diversity of aquatic species. It is also a good bird and amphibian site.
Basingstoke Canal SNCI	1.4km north	Important for aquatic plants and invertebrates, supporting nationally scarce and regionally rare species.
Hoe Stream Fields, Hoe Valley SNCI	1.8km east	Wet marshy grassland either side of the Hoe Stream. The site was selected for its Floodplain Grazing Marsh habitat. 14 species typical of grasslands of conservation interest in Surrey were recorded. Its position is important forming part of a larger area of wetland habitat as it is one of a number of sites along the Hoe Stream Valley.
Woodham Common SNCI	2km north	The site contains semi-natural woodland and remnant heathland. The site was selected as a significant area of relict heath with some significant areas of heath present and a good potential for heathland regeneration in some areas. Species recorded include deergrass, round-leaved sundew and common cottongrass confined to this part of Surrey. The site has an abundance of wood ant. The site's position is very important with Horsell Common SSSI to the west and New Zealand Golf Course SNCI to the east.

**Habitat inventories and landscape-scale conservation initiatives**

**Ancient woodland**

3.3 There are three areas of ancient semi-natural woodland identified within 2km of the site, the closest of which is located approximately 1.4km north-west of the site. There are no ancient woodland sites identified on or adjacent to the proposed development site.

**Habitats of Principal Importance**

3.4 There are no Habitats of Principal Importance (HPI) identified on or adjacent to the site on MAGIC's Priority Habitat Inventory. A search of MAGIC's Priority Habitat Inventory also revealed the presence of four HPI habitat types within 2km of the survey area: Lowland Heathland, Deciduous Woodland, Traditional Orchard, Wood-pasture and Parkland.



3.5 There are no records of veteran trees, Tree Preservation Orders or Conservation Area restrictions on site (The Ecology Consultancy, 2019).

### PHASE 1 HABITAT SURVEY

#### Overview

3.6 The proposed development site comprises hardstanding, existing buildings, amenity grassland, introduced shrub, continuous scrub, and bare ground.

3.7 Phase 1 habitat types on site are mapped in Figure 1 (Appendix 1), areas are given in Table 3.3. A description of dominant and notable species and the composition of each habitat is provided below.

**Table 3.3: Phase 1 Habitat Areas**

Phase 1 Habitat	Extent (ha)	%
Hard standing	2.49	50
Buildings	1.17	23
Amenity grassland	0.88	18
Introduced shrub	0.24	5
Continuous scrub	0.16	3
Bare ground / subsite	0.03	1
Total	4.97	100

#### Habitat description

##### Buildings

3.8 There are several existing buildings on site including domestic dwellings, leisure facilities and football stands. The buildings are described in Table 3.4 below:

**Table 3.4: Cardinal Court site, Woking - building descriptions**

Building number	Description	Potential roosting features
1	Gym building constructed of profile metal sheeting, with pitched or flat roofs of profile metal sheeting. Building 1 (B1) also had some timber cladding on the lower part of the eastern elevation, functioning as a screen.	None
2	Lower brick cavity wall, with the upper wall formed of profile metal sheeting and PVC windows. The pitched roof is of profile metal sheeting.	None
3	Two-storey building formed of cavity brick walls, with a hipped roof of concrete tiles, which were all seen to be tight, with tight ridge tiles. There was also a flat roof present on the single-storey section	None

**Table 3.4: Cardinal Court site, Woking - building descriptions**

Building number	Description	Potential roosting features
	of the building at the south-west, with timber soffit boxes which were in good condition. No gaps noted around the PVC windows.	
4	This is a small timber spa room, that looks to be new and in excellent condition. There were no gaps noted in the timber soffits, and the pitched roof with felt covering was in good condition.	None
5	A leisure facility building constructed of profile metal sheeting, with flat roof of profile metal sheeting.	None
6	A leisure facility building constructed of profile metal sheeting, with pitched roof of profile metal sheeting. It had a single-storey extension on the north-western elevation (B8).	None
7	This was a prefabricated portacabin, adjacent to the gym buildings. There were no gaps noted within the construction of the portacabin.	None
8	An extension to B6, with rendered brick walls, and timber windows, timber barge boards, no gaps noted, and a roof covering of profile metal sheeting.	None
9	A leisure facility building constructed of profile metal sheeting, with pitched roof of profile metal sheeting.	None
10	A pair of semi-detached dwellings, constructed of brick cavity walls, with a pitched roof and concrete tiles (Appendix 3, Photograph 1). There were hanging tiles beneath the first-floor bay windows on the north-eastern elevation and south-western elevations. There were PVC windows. There were PVC windows and also dormer windows in the roof covering, and a mono-pitched single storey extension on the south-western elevation.	Yes – hanging tiles, possible loft void
11	A pair of semi-detached dwellings, constructed of brick cavity walls, with a pitched roof and concrete tiles (Appendix 3, Photograph 1). There were hanging tiles beneath the first-floor bay windows on the north-eastern elevation and south-western elevations. There was a flat roof single-storey extension on the south-western elevation	Yes – hanging tiles, loft void
12	A two-storey dwelling constructed of cavity brick walls, and a pitched roof of concrete tiles with dormer windows (Appendix 3, Photograph 2).	Yes – possible loft void
13	This building was part of the football club. It was constructed of walls with a timber cladding, supporting a pitched roof with corrugated fibre-cement tiles. There were timber framed windows on the north-western elevation of the building, and the building was generally in good condition, with no gaps noted.	None
14	This was a single storey building with timber cladding walls supporting a mono-pitch roof of profile metal sheeting, and timber barge boards on the north-western elevation with no gaps noted beneath. There were PVC windows on the north-western elevation, and football stands on the south-eastern elevation, with a roof canopy of profile metal sheeting.	None
15	This was a prefabricated portacabin within the football club. There were no gaps noted within the construction of the portacabin.	None
16	Building 16 was a single storey building, L shape on plan, with cavity brick walls supporting a hipped roof of concrete tiles. Some lifted and some missing tiles were noted (Appendix 1, target note 5; Appendix 3, Photograph 3).	Yes – slipped and missing tiles

**Table 3.4:** Cardinal Court site, Woking - building descriptions

Building number	Description	Potential roosting features
17	A ticket gate constructed of blockwork walls supporting a hipped roof of concrete tiles, with no gaps noted.	None
18	A grounds-keeper's store constructed of blockwork walls supporting a flat roof of felt, with no gaps noted.	None
Football stands	The football stands had a profile metal mono-pitched roofing, with blockwork lower walls, with no gaps noted within the construction.	None
Garden sheds	There were also two timber sheds located adjacent to the eastern boundary of the site. These were in a poor state of repair, with one of the sheds having a large hole where the roof covering and wall meet, allowing potential access into the shed. The interior of the shed was accessed and found to be very cobwebby (Appendix 3, Photograph 4).	None

*Hardstanding and bare earth*

3.9 There were large areas of bare earth located in the middle of the site, between the leisure facility buildings and the football club. The majority of the areas around the existing buildings comprised hardstanding used for car parking, and the sports pitches to the south-east were also formed of hardstanding. Occasional ruderal species were recorded on the areas of bare earth and hardstanding, including herb Robert, Yorkshire-fog, common nettle, ash saplings, red dead-nettle, mugwort and fleabane species.

*Amenity grassland*

3.10 The largest area of amenity grassland was located in the centre of the site, forming the football pitch at the football club, dominated by perennial rye-grass.

3.11 There were also several smaller areas of amenity grassland located in the gardens of the domestic dwellings in the north-east of the site, along Kingfield Road at the north of the site and also adjacent to the south-eastern boundary of the site. These areas were frequently managed with a short sward, had frequent fescue species and daisy, with occasional creeping buttercup, cat's-ear, dandelion, and bent species, with cleavers, yarrow, groundsel, ribwort plantain, red dead-nettle, thyme-leaved speedwell, common mouse-ear, bittercress, spurge species, dove's-foot crane's-bill, common ragwort and ivy-leaved speedwell all recorded rarely (Appendix 3, Photograph 5).

*Introduced shrub*

3.12 The tall vegetation on the northern, eastern and south-eastern boundaries of the site comprised *Leylandii* and laurel, with occasional pine, elder and butterfly-bush also recorded. These areas were very shaded, and the ground flora was limited to ivy, cleavers, bramble, prickly sow-thistle and red dead-nettle on the edges.

3.13 Planters around the leisure facility buildings included palm species and bamboo species, rose species and apple species.

*Continuous scrub*

3.14 There was an area of bramble scrub located around the scattered trees at the east of the site, between the leisure centre buildings, on a large bund of soil (Appendix 1, TN6; Appendix 3, Photograph 6).

*Scattered trees*

3.15 Scattered trees located across the site include a mature pedunculate oak (Appendix 1, TN2), mature ash (Appendix 1, TN5) and semi-mature oak species, goat willow, poplar species and crack willow. Several semi-mature London plane were located along Kingfield Road at the north of the site.

*Hedgerow*

3.16 The north-eastern boundary of the site was formed of an outgrown hedgerow containing *Leylandii*, hazel, garden privet, laurel, elder, dog rose, ivy, hawthorn, horse-chestnut, ash and sycamore (Appendix 3, Photograph 7).

**PROTECTED AND INVASIVE SPECIES ASSESSMENT**

3.17 The potential for the site to support protected species has been assessed using criteria provided in Table 3.3, based on the results of the desk study and observations made during the site survey of habitats at the site. Other legally protected species are not



referred to as it is considered that the site does not contain habitats that would be suitable to support them. The following species/species groups are potentially present at the site:

- bats;
- great crested newt;
- breeding birds;
- reptiles; and
- badger.

3.18 The table also summarises relevant legislation and policies relating to protected and invasive species. Key pieces of statute are summarised in Section 1 and set-out in greater detail in Appendix 5.

**Table 3.3: Protected and Invasive Species Assessment**

Habitat/species	Status <sup>10, 11</sup>	Likelihood of occurrence
Bats	HR WCA S5	<p>The data search returned 17 records of bats within 2km of the site. The most recent records include common pipistrelle, natterer's bat, whiskered bat and brown long-eared bat in 2008, soprano pipistrelle and noctule bat in 2010, and Daubenton's bat in 2003.</p> <p><b>Roosting - buildings</b></p> <p><b>LOW:</b> The majority of the existing buildings on site were constructed of profile metal sheeting and other materials that did not offer any potential roosting features for bats. B16 had a hipped roof with many slipped and missing tiles, potentially leading into a roof void. B10 and B11 had hanging tiles on the exterior of the building, and B11 is likely to have a loft void. Although no slipped or missing tiles were noted during the walkover survey, a full inspection of the building was not carried out. A potential roof void is present in B12.</p> <p><b>Roosting - trees</b></p> <p><b>NEGLECTIBLE:</b> The majority of the scattered trees on the site were semi-mature and no trees were noted with any features suitable to support roosting bats.</p> <p><b>Foraging – habitats</b></p> <p><b>MODERATE:</b> The majority of the habitats present on site would not provide foraging opportunities for bats within the local area, and is restricted to the areas of introduced shrub and scattered trees on the boundaries of the site, the area of scrub between the buildings, and the outgrown hedgerow on the north-eastern boundary. These boundary habitats provide a potential commuting corridor for bats through the landscape, linking suitable foraging habitats such as the large waterbody north-east of the site and the Hoe Stream SNCI at the south-west.</p> <p><b>There are buildings on site with potential to support roosting bats. Therefore, bats will be considered further in this report.</b></p>
Great crested newt	HR WCA S5	<p><b>LOW:</b> There are five waterbodies within 500m of the survey site; a large waterbody located approximately 30m east of the site, three waterbodies located 145m, 200m, and 210m south-east of the site, to the east of Westfield Avenue, and one pond approximately 250m north of the site, to the north of Kingfield Road.</p> <p>The data search returned four records of great crested newt from within 2km of the survey site. The most recent record dates from 2016 and the records are to an accuracy of 1km only, from within the grid squares TQ0055, TQ0056, TQ0156 and SU9856. There are no water bodies on site, and suitable terrestrial habitats for great crested newt are restricted to the boundary hedgerows and areas of scrub and</p>

<sup>10</sup> The following abbreviations have been used to signify the legislation regarding different species: HR = Conservation of Habitats and Species Regulations 2017; WCA S1 = Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); WCA S5 = Schedule 5 of the Wildlife and Countryside Act 1981 (as amended); WCA S9 = Schedule 9 of the Wildlife and Countryside Act 1981 (as amended); PBA = Protection of Badgers Act, 1992.

<sup>11</sup> The following abbreviations have been used to signify the policy of conservation assessments applying to notable species: SPI = Species of Principal Importance under the NERC Act 2006; LBAP = Local Biodiversity Action Plan species; BoCC = Birds of Conservation Concern - amber list / red list (Eaton *et al.*, 2015); and/or RD/NN = red data book/nationally notable species (JNCC, undated).



**Table 3.3: Protected and Invasive Species Assessment**

Habitat/ species	Status 10, 11	Likelihood of occurrence
		<p>introduced shrub. The waterbody located approximately 30m north-east of the site is surrounded by suitable terrestrial vegetation, which links with the introduced shrub and outgrown hedgerow on the north-eastern and eastern boundaries of the site. The site is located approximately 500m north of Westfield Common, where there is a known metapopulation of great crested newts (RSK ADAS Ltd, 2016). Although not directly connected to the site, there are many private gardens that could create corridors for movements across the suburban landscape.</p> <p><b>Given that the waterbody adjacent to the north-east of the site has potential to support breeding great crested newts and there is suitable terrestrial habitat on site which is connected to this pond, this species is considered further in this report.</b></p>
Reptiles	WCA S5	<p><b>LOW:</b> The data search returned 8 records of widespread reptile species including grass snake, slow worm and common lizard within 2km of the site. Slow-worm has been recorded most recently in 2016 and grass snake and common lizard in 2015. The data search returned no records for rare reptile species (sand lizard, smooth snake) and there are not considered to be any suitable habitats for these species on site.</p> <p>Habitats on site considered suitable to provide refuge for reptiles are limited to the area of bramble scrub and introduced shrub on the boundaries of the site. These habitats would be suitable to provide cover for reptiles, but they are small and isolated by unsuitable habitats such as hardstanding and amenity grassland. The Hoe Stream SNCI to the south-west of the site provides a potential commuting corridor for widespread reptile species, but Westfield Avenue may act as a barrier against dispersal by widespread reptile species onto the survey site, and the site has very limited connectivity to suitable habitats for these species.</p> <p><b>Considering the above, there is low potential that reptiles occur at the site and as such they are considered further in this report.</b></p>
Breeding birds	WCA S5	<p><b>MODERATE:</b> The scrub, introduced shrub and scattered trees on site all have potential to support breeding by widespread bird species. Several common bird species were observed during the habitat survey: blackbird, great tit, blue tit, and wood pigeon.</p> <p>There were no suitable features to support nesting birds noted on any of the existing buildings.</p> <p>Several Species of Principal Importance (SPI) are listed in the data search as occurring within 2km of the site; Kingfisher, peregrine, dunnock, linnets and nightjar. However, there are not considered to be any suitable habitats on site to support these species, with the exception of dunnock.</p> <p><b>It is likely that breeding birds will occur at the site and as such they are considered further in Section 4 of this report.</b></p>
Badger	PBA	<p><b>NEGLIGIBLE:</b> An active mammal hole was recorded on site (Appendix 1, TN1; Appendix 3, Photograph 8), within the area of introduced shrub on the eastern boundary of the site. There was a large spoil heap with prints outside the entrance to the hole, but these were not characteristic of badger, and were characteristic of domestic cat (Appendix 3, Photograph 9). The hole did not have the characteristic shape of a badger sett hole, and is not considered to be used by this species. A further disused mammal hole and 2 active rabbits</p>

**Table 3.3: Protected and Invasive Species Assessment**

Habitat/ species	Status 10, 11	Likelihood of occurrence
		<p>burrows were also noted in this area. The potential foraging areas for badger would be limited to the areas of introduced shrub and amenity grass. No signs of badger such as latrines, runs or signs of foraging were recorded on site.</p> <p>There were no records of badger provided within the data search, and given the lack of definitive field evidence for this species and the relatively isolated location of the site, with fences on the boundaries of the site, it is unlikely that this species is found on site.</p> <p>As a fox was also seen on site during the survey, there is potential for there to be an active fox den within the burrows noted on site.</p> <p><b>Considering the above, there is negligible potential that badger may occur at the site and as such they are not considered further in this report.</b></p>
Invasive species	WCA S9	<p><b>LIKELY ABSENT:</b> There were no invasive species listed on Schedule 9 of the Wildlife and Countryside Act identified on site during the survey.</p> <p>The desk study returned no records for invasive species within 2km of the site.</p> <p><b>As invasive species listed on Schedule 9 have not been recorded on site, these species are not discussed further in this report.</b></p>



## NATURE CONSERVATION EVALUATION

- 3.19 The proposed development site is not subject to any nature conservation designations. It contains small areas of common and widespread habitats. The hedgerow on the north-eastern boundary of the site is a HPI and a habitat listed as a priority habitat for Surrey (Surrey Nature Partnership, 2018). Mature trees are also present on site, which have aesthetic value for the local area.
- 3.20 The site is situated within a suburban area, and the closest designated site is Hoe Stream SNCI located approximately 30m north-east of the site. The boundary habitats provide a potential commuting corridor for bats and other wildlife through the landscape, and connectivity to open countryside habitats, including the Hoe Stream SNCI.
- 3.21 The habitats on site were suitable for a range of note-worthy species, including SPI and priority species for Woking borough, as reported in the desk study or recorded during the survey, as follows:
- bats;
  - great crested newt;
  - slow-worm, grass snake and other widespread species of reptile;
  - dunnock, song thrush, and other widespread but declining species of birds that are also species of conservation concern<sup>12</sup>; and
  - hedgehog.
- 3.22 The habitats on the proposed development site are considered to be of site value only, with the exception of the hedgerow which would be of borough value. It is unlikely that the site would support rare species, or diverse assemblages or large populations of any noteworthy species.
- 3.23 Records for soprano pipistrelle and other species of bat were provided in the desk study, which are SPIs. It is not possible to confirm the value of bat populations that may be present at the site unless further surveys have been undertaken. Precautionary measures for foraging and commuting bats are provided in Section 4.
- 3.24 The existing introduced shrub and outgrown hedgerow on the boundaries of the site have a screening function and may also function as a green corridor for wildlife to cross the

<sup>12</sup> Birds of Conservation Concern - amber list / red list (Eaton *et al.*, 2015);

landscape. The landscaping will also contribute to other ecosystem services such as storm water attenuation and flood alleviation.

## 4 Potential Impacts and Recommendations

4.1 This section summarises the potential impacts on habitats and notable species that may be present at the site. The impact assessment is preliminary and further detailed assessment and surveys will be required to assess impacts and design suitable mitigation, where appropriate.

4.2 The following key ecological issues have been identified:

- habitat suitable for roosting, foraging and commuting bats is present - further survey work will be required to determine the use of the site by roosting bats;
- habitat suitable for terrestrial great crested newt is present on site – further survey work will be necessary to determine whether this species is considered likely to be present on site;
- habitat suitable for widespread reptiles is present – precautionary working measures must be undertaken to protect widespread reptile species;
- habitat suitable for mammals such as fox, rabbit and hedgehog is present on the site – measures must be taken to avoid killing or injuring mammals as detailed in the Wild Mammals (Protection) Act 1996;
- habitat suitable for breeding birds is present – measures must be taken to avoid killing birds or destroying their nests during vegetation clearance;
- habitats suitable for SPIs is present including hedgehog – these habitats should be retained on site where possible or replaced within the development with measures taken to continue accommodating these species on site post-development;
- a range of measures should be undertaken for ecological enhancement of the site within the development plan in line with national and local policy.

### CONSTRAINTS AND MITIGATION/COMPENSATION

#### *Designated Nature Conservation Sites*

4.3 No direct impacts are envisaged on statutory or non-statutory designated sites due to the distance of the site from any designated site. However, the inclusion of residential housing within the development may cause an increase in recreational pressure on the nearby Thames Basin Heaths SPA. The proposed development is located within 5km of this SPA, and within the zone of influence (ZOI) (Guildford Borough Council, 2017). The developer will need to make the appropriate payment into SANG provision. The Draft Site Allocations Habitat Regulations Assessment (AECOM, 2018) concludes that there

will be no likely significant effects on European sites as a result of recreational pressure or air quality derived from the Site Allocations. It confirms that each site allocation has sufficient Suitable Alternative Natural Greenspace (SANG) capacity to serve the increased population.

#### *Habitats*

4.4 The existing outgrown hedgerow with native species on the north-eastern boundary should be retained within the development, as hedgerows are listed as a priority habitat for Woking Borough (Surrey Nature Partnership, 2018). Impacts on this habitat should be avoided during development in line with national and local policy.

4.5 The areas of introduced shrub on the site boundaries which form a green corridor should also be retained on site where possible, to retain the commuting corridor for wildlife around the site. Where this is not possible, compensatory replacement habitat of equivalent but ideally greater value should be included within the designs for the new development, with at least twice the area being lost to be planted, to account for the time required for trees and shrubs to grow.

4.6 Scattered trees on site and along Kingfield Road should also be retained and protected within the development where possible. The current proposals include the removal of existing trees from site. Each tree removed should be replaced on site with at least two comparable trees. Environmental best practice measures, in accordance with British Standards Institution (2012) guidelines, should be implemented during the management works to protect trees.

#### *Bats*

4.7 All British species of bat are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017. Under this legislation it is an offence to deliberately capture, kill, disturb and damage or destroy a bat roost. Some species of bat are also Species of Principal Importance for Woking Borough (Surrey Nature Partnership, 2018).

4.8 Buildings B10, B11, B12 and B16 have features with the potential to support roosting bats. These buildings will be removed in the current proposals for the site. Further survey is required to determine the presence/likely absence of roosting bats in these buildings as outlined below to comply with legislation.



4.9 A Preliminary Roost Assessment (PRA) is required for the four buildings (B10, B11, B12 and B16) to identify the presence of a roost in line with best practice (Collins, 2016) and comply with legislation in relation to bats. The PRA should comprise an internal inspection (at any time), followed by presence/likely absence surveys if required, to be carried out between May and August. Should a bat roost be present, a licence from Natural England and a mitigation strategy may be required.

4.10 The existing areas of introduced shrub and outgrown hedgerow on the boundaries of the site that form a green corridor around the site, linking green areas should be retained within the development. The current proposals for the site retain much of the existing boundary planting, and the proposed landscaping on the boundaries of the site should include species that are of value to foraging bats.

4.11 It is also recommended that measures are implemented to avoid night-time lighting of features that could provide important flight lines and foraging habitats for bats, such as the introduced shrub and outgrown hedgerow on the boundaries of the site. Further advice on the locations and appropriate methods for controlling light emissions should be sought when commissioning the bat surveys listed above.

#### *Great crested newt*

4.12 Great crested newts are protected under the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended).

4.13 Great crested newt has been recorded within 2km of the site, and there is a waterbody located approximately 30m east of the site. The hedgerows, scrub and introduced shrub habitats within the proposed development area are suitable to support great crested newt during their terrestrial phase. There is a risk of an offence occurring through the removal of suitable habitat on site. The Great Crested Newt Rapid Risk Assessment tool<sup>13</sup> result was 'amber: offence' likely, due to the removal of suitable habitats from the site (e.g. area of bramble scrub) that are within 100m of a potential breeding pond.

4.14 Further survey work should be carried out to determine the presence of great crested newt within the pond to the east of the site. A Habitat Suitability Index (HSI) assessment and an environmental DNA survey should be completed on this pond during mid-April – end of June. However, it is recommended that this survey is carried out as soon as possible within the survey window, to allow for further population estimate surveys to be

<sup>13</sup> <https://www.gov.uk/government/publications/great-crested-newts-apply-for-a-mitigation-licence> - Method Statement template for great crested newt mitigation licence.

completed during the great crested newt survey season (mid-March – mid June) if the eDNA test shows a positive result for great crested newt.

4.15 If great crested newts are confirmed to be present, a European Protected Species Mitigation (EPSM) licence may be required. The findings and mitigation measures required may impose timing and methodological restrictions on works, to ensure the works proceed lawfully.

4.16 There is an option to avoid further surveys by following the Woking District Licensing Scheme, whereby a payment is made to contribute to strategic enhancements in the borough. Developers interested in taking part in the project should email the green infrastructure team on [green@woking.gov.uk](mailto:green@woking.gov.uk)<sup>14</sup>.

#### *Widespread reptiles*

4.17 Widespread reptiles are protected under the Wildlife and Countryside Act 1981 (as amended). The site contains some suitable habitat to support widespread reptile species, such as the continuous scrub which under the current proposals will be lost from the site. The majority of the habitats present on site are unsuitable to support reptiles. Consequently there is limited potential for reptiles to be present at the site and any populations present are likely to be small and comprised of widespread species such as slow-worm.

4.18 It is not necessary to carry out reptile surveys but precautionary working practices are required to protect any reptiles using the site (should they be present), and to comply with legislation. Areas of shrubs and scrub that may provide cover or hibernation sites must be carefully removed by hand and with hand-held tools. Prior to this, a suitably experienced ecologist will carry out a hand search of suitable habitat, and any possible refugia for reptiles will be moved. The vegetation clearance will comprise the clearance of vegetation above ground level, to a minimum height of 10 centimetres (cm), in the direction of retained habitat. This will encourage reptiles to be displaced to adjacent retained habitats. After 24 hours, vegetation clearance to ground level will be undertaken in the same direction. Any vegetation of value to breeding birds should be removed outside of the main breeding bird season, otherwise this work should be carried out when reptiles are active i.e. March to September.

<sup>14</sup> <https://www.woking.gov.uk/nature-and-sustainability/conservation-projects/great-crested-newts>

### Breeding birds

- 4.19 All wild birds and their nests are protected under the Wildlife and Countryside Act 1981 (as amended). The existing scattered trees, introduced shrub and scrub vegetation on site have potential to support widespread species of breeding bird.
- 4.20 Any tree and vegetation removal work should be carried out September to February inclusive, to avoid any potential offences relating to breeding birds during their main breeding season (Newton *et al.*, 2011).
- 4.21 If vegetation removal during the breeding season is unavoidable then potential nesting habitat must be inspected before work commences to identify active birds' nests. Should they be present, the nest and a suitable buffer of habitat around it must be retained until the young have left the nest.

### Hedgehog

- 4.22 Scrub and areas of introduced shrub on site have potential to support hedgehog. Hedgehog are an SPI and are listed as a priority species for Woking Borough (Surrey Nature Partnership, 2018), making them a material consideration for planning, and as such should be protected as part of the development and habitats enhanced for these species. Hedgehog are also protected against intentional acts of cruelty under the Wild Mammals (Protection) Act 1996.
- 4.23 Ground level vegetation clearance of the scrub and introduced shrub should be undertaken outside of the hibernation period (November – March inclusively), during the hedgehog active season, following the methodology provided for widespread reptiles above.
- 4.24 Any fencing to be included within the proposed development has the potential to fragment areas of foraging and nesting habitat of value to hedgehogs. It is therefore recommended that connectivity is maintained between the development and adjacent habitats by installing wildlife-friendly fencing, with gaps or tunnels in the bottom panels/gravel boards to allow easy passage for small mammals to continue foraging in this area. This can be achieved for example by cutting a hole (approximately 10x 10cm) in certain gravel boards, which is large enough for small mammals to pass through, but small enough to contain pets.

### Fox and rabbit

- 4.25 Potential fox dens and rabbit burrows were identified on site (Appendix 1, TN1 and TN3). All wild mammals are protected against intentional acts of cruelty under the Wild Mammals (Protection) Act 1996. To avoid possible contravention, due care and attention should be taken when carrying out works with the potential to impact on the suspected fox den and rabbit burrows.
- 4.26 All active holes that will be impacted by the proposed development should be carefully dug out using hand tools, outside of the breeding season (March to July) and the area made inhospitable to encourage animals to relocate off site. Heavy plant machinery should not be tracked over the area where active holes are present until confirmed that any foxes have moved off site.

### Other protected species

- 4.27 In the unlikely event that any other protected species are found during management works on site, the works must stop immediately and advice sought from a suitably qualified ecologist on how to proceed.

### Environmental best practice

- 4.28 Appropriate storage of fuels and chemicals will minimise the risk of accidental spillage. Sources of best construction practice and environmental management include CIRIA guidance (Connolly and Charles, 2005) and various Defra/ Environment Agency guidelines. This guidance relates to various pieces of legislation including the Environmental Damage (Prevention and Remediation) Regulations 2009.
- 4.29 Retained trees on the boundaries of the site should be protected in accordance with British Standards Institution (2012) guidelines.
- 4.30 If species that are listed as invasive under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) are identified on site during the course of the works, it is recommended that measures are undertaken with regards to these species, to ensure that there is no risk of spreading these species. Vegetation should be chemically treated and either burned or buried on site.

### FURTHER SURVEY REQUIREMENTS

- 4.31 Table 4.1 lists further survey requirements as recommended in the constraints section.



**Table 4.1: Further survey requirements**

Species/ Habitat	Survey Requirement	Number of surveys and seasonal considerations
Bats	Preliminary Roost Assessment  (including internal access and inspection of loft voids)	Single survey at any time of year (Collins (ed), 2016).
	Presence/likely absence surveys	One survey (where confirmed low potential for roosting bats) of buildings to be carried out between May and the end of August (Collins (ed), 2016).
Great crested newt	Great crested newt HSI Assessment	A HSI survey of the pond to the east of the site could be undertaken at any time of the year, but the optimum period is spring/summer for robust results (Oldham <i>et al.</i> , 2000).
	Environmental DNA survey	An eDNA survey can be carried out for planning, to confirm presence / absence. However, if presence is confirmed a great crested newt population survey may still be required for a licence application.  Note: Surveys are not required if using the Woking District Licensing Scheme (as outlined above).
Reptiles	Hand searching	Areas of dense vegetation due for removal should be hand searched by a suitably licenced ecologist to check for any reptiles (and hedgehog. Vegetation clearance should be carried out outside of the hibernation season (November to March).  Please note that if scrub and shrub vegetation is to be removed within the bird breeding season, a search for, and protection of, active nests will be required (see below).
Breeding birds	Nesting bird check	If vegetation clearance is carried out between September and the end of February, no survey is required. Otherwise, individual surveys are required up to 48 hours prior to demolition/vegetation clearance works (Newton <i>et al.</i> , 2011).

**OPPORTUNITIES FOR ECOLOGICAL ENHANCEMENT**

4.32 Planning policy at the national and local level and strategic biodiversity partnerships encourage inclusion of ecological enhancements in development projects. Ecological enhancements can also contribute to green infrastructure and ecosystem services such as storm water attenuation and reducing the urban heat island effect. The following measures would be suitable for integration into the site’s design, but may require a more detailed design to successfully implement.

*Green roof/ biosolar*

4.33 It is recommended that the proposed buildings incorporate areas of biodiverse roof where possible. To demonstrate the highest feasible and viable sustainability standards in line with London Plan Policies (GLA, 2016) it is recommended that a specification for

a biodiverse roof be drawn up by a company with a proven track record in delivering these features in London. Any biodiverse green roof should support at least 25 plant species.

- 4.34 A biodiverse green roof would provide additional benefits such as protecting and prolonging the life of the roof membrane, reducing building energy use by insulating the building in winter and keeping it cooler in summer, providing a SuDS function by reducing storm water run-off from the roof, reducing the urban heat island effect and local air/noise pollution. Combining a biodiverse roof with PV panels (biosolar roof) would also provide further benefits, such as the cooling effect the vegetation has on the PV cells, increasing their productivity in hot weather, as well as resulting in a more efficient use of roof space.
- 4.35 The green roof should follow UK standards (GRO, 2014) and include additional habitat features such as deadwood, varying substrate depths and areas of bare rocky substrate. This will provide good habitat for a range of invertebrates and birds including Surrey Biodiversity Action Plan species such as stag beetle.

*Sustainable Drainage System (SuDS)*

- 4.36 SuDS comprise a linked system of soft landscaping, green roofs, rain-water harvesting technologies including ponds, below ground drainage and porous surfacing which can be designed into a development to intercept and attenuate surface water and prevent flooding. Design of a SuDS would be appropriate to this development and should be considered as part of the site master plan. A SuDS would also increase biodiversity, for example by providing a series of habitats for wildlife to use, if appropriately planted – see below.

*Wildlife planting*

- 4.37 Any new landscaping within the proposed development should comprise wildlife planting, and should include native species and/or species of recognised wildlife value<sup>15</sup>. The use of nectar-rich and berry producing plants will attract a wider range of insects, birds and mammals and continue to accommodate those already recorded at the site.
- 4.38 Good horticultural practice should be utilised, including the use of peat-free composts, mulches and soil conditioners, native plants with local provenance and avoidance of the

<sup>15</sup> For example The Royal Horticultural Society (RHS) Perfect for Pollinators Scheme <https://www.rhs.org.uk/science/conservation-biodiversity/wildlife/encourage-wildlife-to-your-garden/plants-for-pollinators> and the joint RHS/Wildlife Trust’s Gardening With Wildlife In Mind Database <http://www.joyofplants.com/wildlife/home.php>

use of invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

- 4.39 Any areas of amenity grassland should use a flowering lawn mixture such as Emorsgate EL1 Flowering Lawn Mixture<sup>16</sup>. These contain slow growing grasses with a selection of wild flowers that respond well to regular short mowing.

#### *Provision of bird nesting and bat roosting opportunities*

- 4.40 The provision of bird boxes would be appropriate at this site. Many different designs are available including boxes to support colonial species such as house sparrow, a Species of Principal Importance for Woking Borough. Woodcrete bird boxes are recommended as they are long lasting compared to wooden boxes, insulate occupants from extremes of temperature and condensation and are available in a broad range of designs.

- 4.41 The provision of artificial bat roosting opportunities will also be appropriate at this site. These roosting opportunities may include bat boxes located on any retained mature trees on the boundaries of the site, or incorporated into the design of the new buildings, adjacent to suitable foraging and commuting habitats for bats. Bat boxes should be positioned between 3-5m above ground level facing south-east to south-west, in a location that will not be lit by artificial lighting. When incorporating more than one box, they should be placed apart from one another, ideally on different building facades. Models from Schwegler such as 1FF Flat Bat Box are appropriate for use on retained trees, suitable for the species potentially utilising the site, and do not require any cleaning. Integrated bat features such as Schwegler Bat Tube 1FR should be included within the designs of the new buildings, and are maintenance free. More information regarding the bat boxes are available through the Schwegler website<sup>17</sup>.

#### *Dead wood habitats*

- 4.42 It is recommended that, where possible, deadwood habitats are included on site. New log piles using untreated timber can be created within any public landscaped areas of the site to enhance the site, providing habitat for stag beetle and other invertebrates and fungi.

<sup>16</sup> <https://wildseed.co.uk/mixtures/view/56/flowering-lawn-mixture>

<sup>17</sup> [www.schwegler-natur.de](http://www.schwegler-natur.de)

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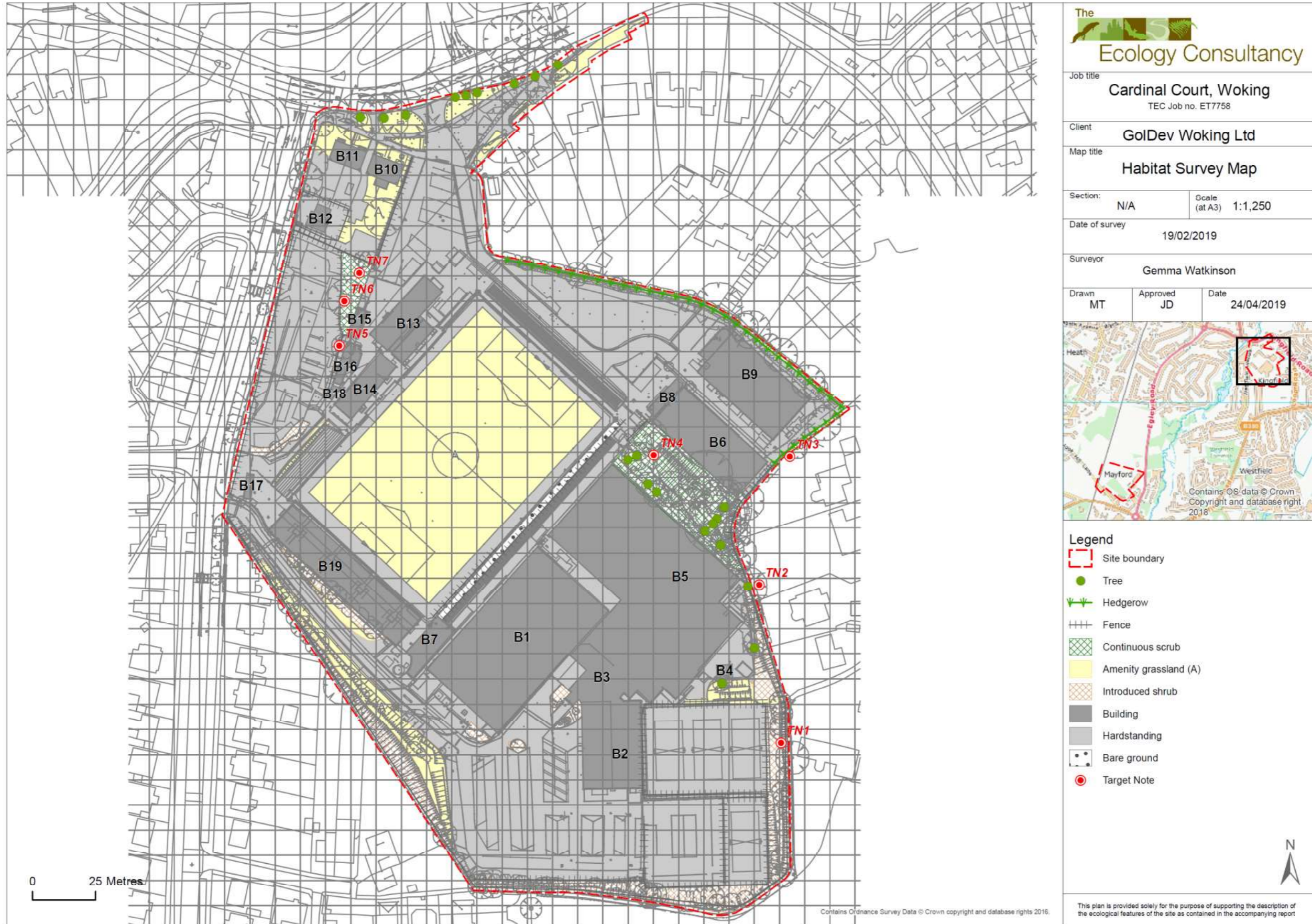
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## Appendix 1: Habitat Map

## Appendix 2: Target Notes



Figure 1: Habitat Survey Map



**Target Notes List for Cardinal Court site, Woking from the Phase 1 habitat survey and protected and notable species assessment carried out on the 19 February 2019.**

Target note (TN)	Description
1	Active mammal hole with large spoil heap, beneath the introduced shrub along the eastern boundary of the site. Hole splits and narrows, considered likely to be used by fox. One disused mammal hole and two active rabbit burrows also present in this area.
2	Mature pedunculate oak tree. Some ivy covering and obscuring view of main trunk. Ivy stems not more than 5cm diameter, negligible potential for roosting bats.
3	Out grown hedgerow containing <i>Leylandii</i> , hazel, garden privet, laurel, elder, dog rose, ivy, hawthorn, horse-chestnut, ash and sycamore.
4	Fox noted on site here, on a large bund of earth covered with bramble scrub. Not fully accessible to inspect, has potential to support a fox den.
5	Football club building with slipped and missing tiles – potential roosting features for bats.
6	Mature ash with small snag ends. Ivy covering main trunk, but stems were less than 5cm diameter. No potential roosting features noted, negligible potential for roosting bats.
7	Area of bramble scrub and scattered trees including semi-mature ash, hazel, garden privet, poplar and sycamore.

## Appendix 3: Photographs



**Photograph 1**

View of buildings B10 and B11, two pairs of semi-detached dwellings at north-west of site, with hanging tiles.



**Photograph 2**

Residential dwelling (B12) with dormer windows.



**Photograph 3**

View of south-eastern elevation of building B16 with slipped and missing tiles.



**Photograph 4**

Interior view of garden shed adjacent to the south-eastern boundary of the site, to the east of building B6. There is a hole in the roof, with dense cobwebs inside.



**Photograph 5**

View of amenity grassland area adjacent to south-western boundary of site, with introduced shrub along boundary.



**Photograph 6**

Area of dense continuous bramble scrub on a soil bund between buildings B5 and B6. A fox was seen here during the survey (TN3).





**Photograph 7**

Car parking areas at north-west of site, with outgrown hedgerow behind, on north-eastern boundary.



**Photograph 8**

Active mammal burrow within the introduced shrub along the eastern boundary of the site (TN1), with prints noted in the spoil heap.



**Photograph 8**

Active mammal burrow within the introduced shrub along the eastern boundary of the site (TN1), with prints noted in the spoil heap.



## Appendix 4: Plant Species List



**Plant Species List for Cardinal Court site, Woking compiled from Phase 1 habitat survey carried out on the 19 February 2019.**

Scientific nomenclature and common names for vascular plants follow Stace (2010). Please note that this plant species list was generated as part of a Phase 1 habitat survey and does not constitute a full botanical survey and should be read in conjunction with the associated results section of this PEA.

**Abundance was estimated using the DAFOR scale and additional notes taken as follows:**

D = dominant, A = abundant, F = frequent, O = occasional, R = rare, L = locally  
c=clumped, e=edge only, g=garden origin, p=planted, y = young, s=seedling or sucker, t=tree, h=hedgerow, w=water

SCIENTIFIC NAME	COMMON NAME	ABUNDANCE	QUALIFIER
<i>Acer pseudoplatanus</i>	Sycamore	R	h
<i>Achillea millefolium</i>	Yarrow	R	
<i>Aesculus hippocastanum</i>	Horse-chestnut	R	h
<i>Agrostis sp.</i>	Bent species	O	
<i>Artemisia vulgaris</i>	Mugwort	R	
<i>Bellis perennis</i>	Daisy	F	
<i>Buddleia davidii</i>	Butterfly bush	O	
<i>Cardamine sp.</i>	Bittercress species	R	
<i>Cerastium fontanum</i>	Common mouse-ear	R	
<i>Clematis vitalba</i>	Traveller's-joy	R	
<i>Conyza sp.</i>	Fleabane species	R	
<i>Corylus avellana</i>	Hazel	R	h
<i>Crataegus monogyna</i>	Hawthorn	O	h
<i>Cupressocyparis Leylandii</i>	Leyland cypress	F	t
<i>Epilobium sp.</i>	Willowherb species	R	
<i>Euphorbia sp.</i>	Spurge species	R	
<i>Festuca sp.</i>	Fescue species	F	
<i>Fraxinus excelsior</i>	Ash	O	t, s, y, h
<i>Galium aparine</i>	Cleavers	R	
<i>Geranium molle</i>	Dove's-foot crane's-bill	R	
<i>Geranium robertianum</i>	Herb Robert	R	
<i>Geum urbanum</i>	Wood avens	R	
<i>Hedera helix</i>	Ivy	O	
<i>Holcus lanatus</i>	Yorkshire-fog	R	
<i>Hypochaeris radicata</i>	Cat's-ear	O	
<i>Ilex aquifolium</i>	Holly	R	
<i>Lamium purpureum</i>	Red dead-nettle	O	
<i>Lauraceae</i>	Laurel species	LA	
<i>Ligustrum ovalifolium</i>	Garden privet	R	h
<i>Lolium perenne</i>	Perennial rye-grass	F	
<i>Lysimachia vulgaris</i>	Creeping-Jenny	R	
<i>Malus sp.</i>	Apple species	R	
<i>Pinus sp.</i>	Pine species	R	t
<i>Plantago lanceolata</i>	Ribwort plantain	R	
<i>Platanus x hispanica</i>	London plane	O	t
<i>Populus sp.</i>	Poplar species	R	t
<i>Prunus spinosa</i>	Blackthorn	R	h
<i>Quercus cerris</i>	Turkey oak	R	t
<i>Quercus robur</i>	Pedunculate oak	R	t
<i>Quercus sp.</i>	Oak species	O	
<i>Rosa canina</i>	Dog-rose	R	h

<i>Rosa sp.</i>	Rose species	R	
<i>Rubus fruticosus agg.</i>	Bramble	LF	
<i>Salix caprea</i>	Goat willow	R	t
<i>Salix cinerea subsp. oleifolia</i>	Grey willow (Common willow)	R	t
<i>Salix fragilis</i>	Crack willow	R	
<i>Sambucus nigra</i>	Elder	O	
<i>Senecio jacobaea</i>	Common ragwort	R	
<i>Senecio vulgaris</i>	Groundsel	R	
<i>Sonchus asper</i>	Prickly sow-thistle	R	
<i>Taraxacum agg.</i>	Dandelion	O	
<i>Tilia sp.</i>	Lime species	R	t, e, h
<i>Trifolium repens</i>	White clover	O	
<i>Urtica dioica</i>	Common nettle	R	
<i>Veronica hederifolia</i>	Ivy-leaved speedwell	R	
<i>Veronica serpyllifolia</i>	Thyme-leaved speedwell	R	

## Appendix 5: Legislation and planning policy

**Important notice:** This section contains details of legislation and planning policy applicable in Britain only (i.e. not including the Isle of Man, Northern Ireland, the Republic of Ireland or the Channel Islands) and is provided for general guidance only. While every effort has been made to ensure accuracy, this section should not be relied upon as a definitive statement of the law.

### A NATIONAL LEGISLATION AFFORDED TO SPECIES

The objective of the EC Habitats Directive<sup>18</sup> is to conserve the various species of plant and animal which are considered rare across Europe. The Directive is transposed into UK law by The Conservation of Habitats and Species Regulations 2017 (formerly The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)) and The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended).

The Wildlife and Countryside Act 1981 (as amended) is a key piece of national legislation which implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and implements the species protection obligations of Council Directive 2009/147/EC (formerly 79/409/EEC) on the Conservation of Wild Birds (EC Birds Directive) in Great Britain.

Since the passing of the Wildlife & Countryside Act 1981, various amendments have been made, details of which can be found on [www.opsi.gov.uk](http://www.opsi.gov.uk). Key amendments have been made through the Countryside and Rights of Way (CRoW) Act (2000).

Other legislative Acts affording protection to wildlife and their habitats include:

- Deer Act 1991;
- Countryside and Rights of Way (CRoW) Act 2000;
- Natural Environment & Rural Communities (NERC) Act 2006;
- Protection of Badgers Act 1992;
- Wild Mammals (Protection) Act 1996.

Species and species groups that are protected or otherwise regulated under the aforementioned domestic and European legislation, and that are most likely to be affected by development activities, include herpetofauna (amphibians and reptiles), badger, bats, birds,

<sup>18</sup> Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora



dormouse, invasive plant species, otter, plants, red squirrel, water vole and white clawed crayfish.

Explanatory notes relating to species protected under The Conservation of Habitats and Species Regulations 2017 (which includes smooth snake, sand lizard, great crested newt and natterjack toad), all bat species, otter, dormouse and some plant species) are given below.

**These should be read in conjunction with the relevant species sections that follow.**

- In the Directive, the term 'deliberate' is interpreted as being somewhat wider than intentional and may be thought of as including an element of recklessness.
- The Conservation of Habitats and Species Regulations 2017 does not define the act of 'migration' and therefore, as a precaution, it is recommended that short distance movement of animals for e.g. foraging, breeding or dispersal purposes are also considered.
- In order to obtain a European Protected Species Mitigation (EPSM) licence, the application must demonstrate that it meets all of the following three 'tests': i) the action(s) are necessary for the purpose of preserving public health or safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequence of primary importance for the environment; ii) that there is no satisfactory alternative and iii) that the action authorised will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range.

### Bats

All species of bat are fully protected under The Conservation of Habitats and Species Regulations 2017 through their inclusion on Schedule 2. Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of Schedule 2 species (e.g. all bats)
- Deliberate disturbance of bat species as:
  - a) to impair their ability:
    - (i) to survive, breed, or reproduce, or to rear or nurture young;
    - (ii) to hibernate or migrate<sup>3</sup>
  - b) to affect significantly the local distribution or abundance of the species
- Damage or destruction of a breeding site or resting place
- Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

Bats are also currently protected under the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5. Under this Act, they are additionally protected from:

- Intentional or reckless disturbance (at any level)
- Intentional or reckless obstruction of access to any place of shelter or protection
- Selling, offering or exposing for sale, possession or transporting for purpose of sale.

### *How is the legislation pertaining to bats liable to affect development works?*

A European Protected Species Mitigation (EPSM) Licence issued by the relevant countryside agency (e.g. Natural England) will be required for works liable to affect a bat roost or for operations likely to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young and hibernate). The licence is to allow derogation from the relevant legislation but also to enable appropriate mitigation measures to be put in place and their efficacy to be monitored.

Though there is no case law to date, the legislation may also be interpreted such that, in certain circumstances, important foraging areas and/or commuting routes can be regarded as being afforded de facto protection, for example, where it can be proven that the continued usage of such areas is crucial to maintaining the integrity and long-term viability of a bat roost<sup>19</sup>.

### Badger

Badgers receive protection under The Protection of Badgers Act 1992 which consolidates the previous Badger Acts of 1973 and 1991. The Act makes it an offence to:

- Wilfully kill, injure, take, or attempt to kill, injure or take a badger;
- Cruelly ill-treat a badger, including use of tongs and digging;
- Intentionally or recklessly damage, destroy or obstruct access to a badger sett or any part thereof;
- Intentionally or recklessly disturb a badger when it is occupying a badger sett; or,
- Intentionally or recklessly cause a dog to enter a badger sett.

### *How is the legislation pertaining to badgers liable to affect development works?*

A badger sett is defined in the legislation as "any structure or place which displays signs indicating current use by a badger". A Development Licence would be required from Natural

<sup>19</sup> Garland & Markham (2008) Is important bat foraging and commuting habitat legally protected? Mammal News, No. 150. The Mammal Society, Southampton.

England for any development works liable to directly impact an active badger sett, or to disturb badgers whilst in the sett. Natural England has issued guidelines on what constitutes a licensable activity.

Natural England published an interim guidance document entitled 'Badgers and Development, A Guide to Best Practice and Licensing' (2007), which provides guidance on how development can be carried out within the law and in a way that minimises the detrimental impact on this species. Natural England advises that foraging areas should be maintained or new foraging areas created and that access between setts and foraging/watering areas should be maintained or new ones provided (Natural England, 2007).

### Birds

With certain exceptions, all birds, their nests and eggs are protected under Sections 1-8 of the Wildlife and Countryside Act 1981 (as amended). Among other things, this makes it an offence to:

- Intentionally kill, injure or take any wild bird;
- Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built;
- Intentionally take or destroy an egg of any wild bird;
- Sell, offer or expose for sale, have in his possession or transport for the purpose of sale any wild bird (dead or alive) or bird egg or part thereof.

Certain species of bird, for example the barn owl, black redstart, hobby, bittern and kingfisher receive additional special protection under Schedule 1 of the Act and Annex 1 of the European Community Directive on the Conservation of Wild Birds (2009/147/EC). This affords them protection against:

- Intentional or reckless disturbance while it is building a nest or is in, on or near a nest containing eggs or young;
- Intentional or reckless disturbance of dependent young of such a bird.

### How is the legislation pertaining to birds liable to affect development works?

To avoid contravention of the Wildlife and Countryside Act 1981 (as amended), works should be planned to avoid the possibility of killing or injuring any wild bird, or damaging or destroying their nests. The most effective way to reduce the likelihood of nest destruction in particular is to undertake work outside the main bird breeding season which typically runs from March to

August<sup>20</sup>. Where this is not feasible, it will be necessary to have any areas of suitable habitat thoroughly checked for nests prior to vegetation clearance.

Those species of bird listed on Schedule 1 are additionally protected against disturbance during the breeding season. Thus, it will be necessary to ensure that no potentially disturbing works are undertaken in the vicinity of the nest. The most effective way to avoid disturbance is to postpone works until the young have fledged. If this is not feasible, it may be possible to maintain an appropriate buffer zone or standoff around the nest.

### Herpetofauna (Amphibians and Reptiles)

The sand lizard *Lacerta agilis*, smooth snake *Coronella austriaca*, natterjack toad *Epidalea calamita* and great crested newt *Triturus cristatus* receive full protection under The Conservation of Habitats and Species Regulations 2017 through their inclusion on Schedule 2. The pool frog *Pelophylax lessonae* is also afforded full protection under the same legislation. Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of species listed on Schedule 2
- Deliberate disturbance of any Schedule 2 species as:
  - a) to impair their ability:
    - (i) to survive, breed, or reproduce, or to rear or nurture young;
    - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate
  - b) to affect significantly the local distribution or abundance of the species
- Deliberate taking or destroying of the eggs of a Schedule 2 species
- Damage or destruction of a breeding site or resting place
- Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

With the exception of the pool frog, these species are also currently listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under this Act, they are additionally protected from:

- Intentional or reckless disturbance (at any level)

<sup>20</sup> It should be noted that this is the main breeding period. Breeding activity may occur outwith this period (depending on the particular species and geographical location of the site) and thus due care and attention should be given when undertaking potentially disturbing works at any time of year.



- Intentional or reckless obstruction of access to any place of shelter or protection
- Selling, offering or exposing for sale, possession or transporting for purpose of sale.

Other native species of herpetofauna are protected solely under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). Species such as the adder *Vipera berus*, grass snake *Natrix helvetica*, common lizard *Zootoca vivipara* and slow-worm *Anguis fragilis* are listed in respect to Section 9(1) & (5). For these species, it is prohibited to:

- Intentionally (or recklessly in Scotland) kill or injure these species
- Sell, offer or expose for sale, possess or transport for purpose of sale these species, or any part thereof.

Common frog *Rana temporaria*, common toad *Bufo bufo*, smooth newt *Lissotriton vulgaris* and palmate newt *L. helveticus* are listed in respect to Section 9(5) only which affords them protection against sale, offering or exposing for sale, possession or transport for the purpose of sale.

#### How is the legislation pertaining to herpetofauna liable to affect development works?

A European Protected Species Mitigation (EPSM) Licence issued by the relevant countryside agency (e.g. Natural England) will be required for works liable to affect the breeding sites or resting places of those amphibian and reptile species protected under The Conservation Habitats and Species Regulations 2010 (as amended). A licence will also be required for operations liable to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young and hibernate). The licences are to allow derogation from the relevant legislation but also to enable appropriate mitigation measures to be put in place and their efficacy to be monitored.

Although not licensable, appropriate mitigation measures may also be required to prevent the intentional killing or injury of adder, grass snake, common lizard and slow worm, thus avoiding contravention of the Wildlife and Countryside Act 1981 (as amended).

#### Invasive Plant Species

Certain species of plant, including Japanese knotweed *Fallopia japonica*, giant hogweed *Heracleum mantegazzianum* and Himalayan balsam *Impatiens glandulifera* are listed on Part II of Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) in respect to Section 14(2). Such species are generally non-natives whose establishment or spread in the wild may be detrimental to native wildlife. Inclusion on Part II of Schedule 9 therefore makes it an offence to plant or otherwise cause these species to grow in the wild.

#### How is the legislation pertaining to invasive plants liable to affect development works?

Although it is not an offence to have these plants on your land per se, it is an offence to cause these species to grow in the wild. Therefore, if they are present on site and development activities (for example movement of spoil, disposal of cut waste or vehicular movements) have the potential to cause the further spread of these species to new areas, it will be necessary to ensure appropriate measures are in place to prevent this happening prior to the commencement of works.

#### Wild Mammals (Protection) Act 1996

All wild mammals are protected against intentional acts of cruelty under the above legislation. This makes it an offence to:

- Mutilate, kick, beat, nail or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering.

To avoid possible contravention, due care and attention should be taken when carrying out works (for example operations near burrows or nests) with the potential to affect any wild mammal in this way, regardless of whether they are legally protected through other conservation legislation or not.

## B NATIONAL AND EUROPEAN LEGISLATION AFFORDED TO HABITATS

### Statutory Designations: National

Nationally important areas of special scientific interest, by reason of their flora, fauna, or geological or physiographical features, are notified by the countryside agencies as statutory **Sites of Special Scientific Interest** (SSSIs) under the National Sites and Access to the Countryside Act 1949 and latterly the Wildlife & Countryside Act 1981 (as amended). As well as underpinning other national designations (such as **National Nature Reserves** which are declared by the countryside agencies under the same legislation), the system also provides statutory protection for terrestrial and coastal sites which are important within a European context (Natura 2000 network) and globally (such as Wetlands of International Importance). See subsequent sections for details of these designations. Improved provisions for the protection and management of SSSIs have been introduced by the Countryside and Rights of Way Act 2000 (in England and Wales).

The Wildlife & Countryside Act 1981 (as amended) also provides for the making of **Limestone Pavement Orders**, which prohibit the disturbance and removal of limestone from such designated areas, and the designation of **Marine Nature Reserves**, for which byelaws must be made to protect them.

### Statutory Designations: International

**Special Protection Areas** (SPAs), together with **Special Areas of Conservation** (SACs) form the **Natura 2000** network. The Government is obliged to identify and classify SPAs under the EC Birds Directive (Council Directive 2009/147/EC (formerly 79/409/EEC)) on the Conservation of Wild Birds). SPAs are areas of the most important habitat for rare (listed on Annex I of the Directive) and migratory birds within the European Union. Protection afforded SPAs in terrestrial areas and territorial marine waters out to 12 nautical miles (nm) is given by The Conservation of Habitats & Species Regulations 2010 (as amended). The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended) provide a mechanism for the designation and protection of SPAs in UK offshore waters (from 12-200 nm).

The Government is obliged to identify and designate SACs under the EC Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora). These are areas which have been identified as best representing the range and variety of habitats and (non-bird) species listed on Annexes I and II to the Directive within the European Union. SACs in terrestrial areas and territorial marine waters out to 12 nm are protected under The Conservation of Habitats & Species Regulations 2010 (as amended). The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended) provide a mechanism for the designation and protection of SACs in UK offshore waters (from 12-200 nm).

**Ramsar** sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. The Convention covers all aspects of wetland conservation and wise use, in particular recognizing wetlands as ecosystems that are globally important for biodiversity conservation. Wetlands can include areas of marsh, fen, peatland or water and may be natural or artificial, permanent or temporary. Wetlands may also incorporate riparian and coastal zones adjacent to the wetlands. Ramsar sites are underpinned through prior notification as Sites of Special Scientific Interest (SSSIs) and as such receive statutory protection under the Wildlife & Countryside Act 1981 (as amended) with further protection provided by the Countryside and Rights of Way (CROW) Act 2000. Policy statements have been issued by the Government in England and Wales highlighting the special status of Ramsar sites. This effectively extends the level of protection to that afforded to sites which have been designated under the EC Birds and Habitats Directives as part of the Natura 2000 network (e.g. SACs & SPAs).

### Statutory Designations: Local

Under the National Sites and Access to the Countryside Act 1949 **Local Nature Reserves** (LNRs) may be declared by local authorities after consultation with the relevant countryside agency. LNRs are declared for sites holding special wildlife or geological interest at a local level and are managed for nature conservation, and provide opportunities for research and education and enjoyment of nature.

### Non-Statutory Designations

Areas considered to be of local conservation interest may be designated by local authorities as a **Wildlife Site**, under a variety of names such as **County Wildlife Sites** (CWS), **Listed Wildlife Sites** (LWS), **Local Nature Conservation Sites** (LNCS), **Sites of Biological Importance** (SBIs), **Sites of Importance for Nature Conservation** (SINCs), or **Sites of Nature Conservation Importance** (SNCIs). The criteria for designation may vary between counties.

Together with the statutory designations, these are defined in local and structure plans under the Town and Country Planning system and are a material consideration when planning applications are being determined. The level of protection afforded to these sites through local planning policies and development frameworks may vary between counties.

**Regionally Important Geological and Geomorphological Sites** (RIGS) are the most important places for geology and geomorphology outside land holding statutory designations such as SSSIs. Locally-developed criteria are used to select these sites, according to their value for education, scientific study, historical significance or aesthetic qualities. As with local Wildlife Sites, RIGS are a material consideration when planning applications are being determined.

## C NATIONAL PLANNING POLICY

### The National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) replaced Planning Policy Statement (PPS9) in April 2012, and was updated in 2018, as the key national planning policy concerning nature conservation. The NPPF emphasises the need for suitable development. The Framework specifies the need for protection of designated sites and priority habitats and priority species. An emphasis is also made for the need for ecological networks via preservation, restoration and re-creation. The protection and recovery of priority species – that is those listed as UK Biodiversity Action Plan priority species – is also listed as a requirement of planning policy. In determining a planning application, planning authorities should aim to conserve and enhance biodiversity by ensuring that: designated sites are protected from adverse harm; there is



appropriate mitigation or compensation where significant harm cannot be avoided; opportunities to incorporate biodiversity in and around developments are encouraged; planning permission is refused for development resulting in the loss or deterioration of irreplaceable habitats including aged or veteran trees and also ancient woodland.

#### The Natural Environment and Rural Communities Act 2006 and The Biodiversity Duty

The Natural Environment and Rural Communities (NERC) Act came into force on 1<sup>st</sup> October 2006. Section 40 of the Act requires all public bodies to have regard to biodiversity conservation when carrying out their functions. This is commonly referred to as the 'biodiversity duty'.

Section 41 of the Act (Section 42 in Wales) requires the Secretary of State to publish a list of habitats and species which are of 'principal importance for the conservation of biodiversity.' They are referred to in this report as Species of Principal Importance and Habitats of Principal Importance. This list is intended to assist decision makers such as public bodies in implementing their duty under Section 40 of the Act. Under the Act these habitats and species are regarded as a material consideration in determining planning applications. A developer must show that their protection has been adequately addressed within a development proposal.

## D LOCAL PLANNING POLICY

### Woking Borough Core Strategy

The Woking Borough Core Strategy (2012) deals with matters of strategic importance for the Woking area. Key chapters include Chapter 5 – *Borough wide policies*.

#### Policy CS7: Biodiversity and Nature Conservation

The Council is committed to conserving and protecting existing biodiversity assets within the Borough. It will require development proposals to contribute to the enhancement of existing biodiversity and geodiversity features and also explore opportunities to create and manage new ones where it is appropriate. This will include those habitats and species listed in the Surrey Biodiversity Action Plan (BAP). Any development that will be anticipated to have a potentially harmful effect or lead to a loss of features of interest for biodiversity will be refused.

The Council will encourage new development to make positive contribution to biodiversity through the creation of green spaces, where appropriate, and the creation of linkages between sites to create a local and regional biodiversity network of wildlife corridors and green

infrastructure. It will seek to retain and encourage the enhancement of significant features of nature conservation value on development sites.

Any development with potential impact on the SPA or the SAC will be subject to a Habitats Regulations Assessment to determine the need for Appropriate Assessment.

#### Policy CS17: Open space, green infrastructure, sport and recreation

All proposals for new residential development (other than replacement dwellings) will be required to contribute towards the provision of open space and green infrastructure, including the following:

- children's play areas and outdoor recreational facilities for young people.
- outdoor sports facilities.

Developers will be expected to contribute to provision through the Community Infrastructure Levy (CIL) or on larger sites through on-site provision and/or a S106 contribution as appropriate. Development involving the loss of open space will not be permitted unless:

- alternative and equivalent or better provision is made available in the vicinity
- or the development is directly related to the enhancement of the open space.

New residential units within five km of an SPA will be required to provide or contribute to the provision and improvement of Suitable Alternative Natural Greenspace (SANG) which is a component of Green Infrastructure and also its Strategic Access Management and Monitoring (SAMM). This land will be used to mitigate the impact and effect of residential development on the SPA, by providing informal recreation land of appropriate quality across Woking Borough. Standards for the provision of SANG are set out in the Council's Thames Basin Heaths SPA Avoidance Strategy 2010-15.

#### Policy CS22: Sustainable Construction

New residential development on greenfield sites will be required to meet the Code for Sustainable Homes level 5 (or any future national requirement) from now because of the relatively lower cost of developing such sites.

The Council will consider a case based on evidence of viability if an applicant can demonstrate that the requirement for code level 5 cannot be met. This will be considered on a case by case basis. New non-residential development of 1,000 sq.m or more (gross) floorspace is required to comply with BREEAM very good standards (or any future national equivalent).

All development is encouraged to make biodiversity enhancements such as green roofs and bird and bat boxes. All new residential development is encouraged to meet the 'ecology' elements of the Code.

#### Policy CS24- Woking's landscape and townscape

All development proposals will provide a positive benefit in terms of landscape and townscape character, and local distinctiveness and will have regard to landscape character areas. To protect local landscape and townscape character, development will be expected to:

- conserve, and where possible enhance existing character, especially key landscapes such as heathlands, escarpments and the canal/river network and settlement characteristics; maintain locally valued features, and enhance or restore deteriorating features
- respect the setting of, and relationship between, settlements and individual buildings in the landscape
- conserve, and where possible, enhance townscape character, including structure and land form, landscape features, views and landmarks, and appropriate building styles and materials
- support land management practices that have no adverse impact on characteristic landscape patterns and local biodiversity.
- Protect and encourage the planting of new trees where it is relevant to do so.

#### E REGIONAL AND LOCAL BAPS

A number of priority habitats and species have been identified in the Biodiversity & Planning in Surrey document (Surrey Wildlife Trust, 2014), for the Surrey Biodiversity Partnership.

Priority habitats and species within Surrey that are of relevance to this report include:

- Habitats:
  - lowland meadows (neutral grassland); and
  - Hedgerows.
- Species:
  - bats;
  - great crested newt
  - widespread reptiles – common lizard, grass snake, slow-worm
  - birds of farmland and the wider countryside – including song thrush, dunnock, and house sparrow; and
  - hedgehog.



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APPENDIX E: Information for Inclusion within an ES – Way Finding

Information for Inclusion in Environmental Statements, as Specified in Schedule 4 of the EIA Regulations 2017		How the EIA will address the Information Specifications
1.	A description of the development, including in particular:	
(a)	a description of the location of the development;	<b>ES Volume 1:</b> Chapter 1: Introduction;
(b)	a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;	<b>ES Volume 1:</b> Chapter 4: The Proposed Development; Chapter 5: Demolition and Construction;
(c)	a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used,	<b>ES Volume 1:</b> Chapter 4: The Proposed Development;
	...nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; and	<b>ES Volume 1:</b> Chapter 4: The Proposed Development; Chapter 5: Demolition and Construction;
(d)	an estimate, by type and quantity, of expected residues and emissions (such as water, ...	<b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); <b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)).
	...air, ...	<b>ES Volume 1:</b> Chapter 8: Air Quality; <b>ES Volume 3:</b> Air Quality;
	...soil and subsoil pollution,...	<b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); <b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)); Preliminary Risk Assessment (Scoping Report - Appendix);
	...noise, vibration, ...	<b>ES Volume 1:</b> Chapter 9: Noise and Vibration; <b>ES Volume 3:</b> Noise and Vibration;
	...light, ...	<b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); Chapter 11: Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare; <b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)); Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare;
	...heat, radiation and ...	<b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); Chapter 11: Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare; <b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)); Daylight, Sunlight, Overshadowing, Light Pollution

Information for Inclusion in Environmental Statements, as Specified in Schedule 4 of the EIA Regulations 2017		How the EIA will address the Information Specifications
		and Solar Glare;
	...quantities and types of waste produced during the construction and operation phases;	<b>ES Volume 1:</b> Chapter 4: The Proposed Development; Chapter 5: Demolition and Construction;
2.	A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.	<b>ES Volume 1:</b> Chapter 3: Alternatives and Design Evolution;
3.	A description of the relevant aspects of the current state of the environment (baseline scenario) ...	<b>ES Volume 1:</b> Chapter 2: EIA Methodology; Technical Chapters 6 - 11;
	...and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.	<b>ES Volume 1:</b> Chapter 2: EIA Methodology; Technical Chapters 6 – 11;
4.	A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, ...	<b>ES Volume 1:</b> Chapter 4: The Proposed Development; Chapter 6: Socio-Economics <b>ES Volume 3:</b> Socio-Economics
	...biodiversity (for example fauna and flora), ...	<b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); Chapter 4: The Proposed Development; <b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)); Preliminary Ecological Appraisal (Scoping Report - Appendix);
	...land (for example land take), ....	<b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); <b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)); Preliminary Risk Assessment (Scoping Report - Appendix);
	...soil (for example organic matter, erosion, compaction, sealing), ...	<b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); <b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)); Preliminary Risk Assessment (Scoping Report - Appendix);
	...water (for example hydromorphological changes, quantity and quality), ...	<b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); <b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA));

Information for Inclusion in Environmental Statements, as Specified in Schedule 4 of the EIA Regulations 2017		How the EIA will address the Information Specifications
		<b>Standalone Documents</b> Flood Risk Assessment Surface Water and Foul Drainage Strategy;
	...air, ...	<b>ES Volume 1:</b> Chapter 8: Air Quality; <b>ES Volume 3:</b> Air Quality
	...climate (for example greenhouse gas emissions, impacts relevant to adaptation), ...	<b>ES Volume 1:</b> Chapter 4: Proposed Development <b>ES Volume 3:</b> Greenhouse Gas Assessment;
	...material assets, cultural heritage, including architectural and archaeological aspects, and landscape...	<b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); <b>ES Volume 2:</b> Townscape and Visual Impact Assessment; <b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)); Historic Environment Assessment (Scoping Report - Appendix); <b>Standalone Documents</b> Heritage Statement
5.	A description of the likely significant effects of the development on the environment resulting from, inter alia:	
(a)	the construction and existence of the development, including, where relevant, demolition works.	<b>ES Volume 1:</b> Chapter 5: Demolition and Construction;
(b)	the use of natural resources, in particular land, soil, ...	<b>ES Volume 1:</b> Chapter 4: The Proposed Development; Chapter 5: Demolition and Construction;
	...water and ...	<b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); <b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)); <b>Standalone Documents</b> Flood Risk Assessment; Surface Water and Foul Drainage Strategy;
	...biodiversity, ...	<b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); Chapter 4: The Proposed Development; <b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)); Preliminary Ecological Appraisal (Scoping Report - Appendix);
	...considering as far as possible the sustainable availability of these resources;	<b>ES Volume 1:</b> Chapter 4: The Proposed Development; Chapter 5: Demolition and Construction; Technical Chapters 6 – 11;



Information for Inclusion in Environmental Statements, as Specified in Schedule 4 of the EIA Regulations 2017	How the EIA will address the Information Specifications
(c) the emission of pollutants, ...  ...noise, vibration,...  ...light, ...  ...heat and radiation, ...  ...the creation of nuisances, ...  ...and the disposal and recovery of waste;	<p><b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); Chapter 7: Highways and Transport; Chapter 8: Air Quality;</p> <p><b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)); Preliminary Risk Assessment (Scoping Report - Appendix); Highways and Transport Air Quality;</p> <p><b>ES Volume 1:</b> Chapter 9: Noise and Vibration;</p> <p><b>ES Volume 3:</b> Noise and Vibration;</p> <p><b>ES Volume 1:</b> Chapter 11: Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare;</p> <p><b>ES Volume 3:</b> Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare;</p> <p><b>ES Volume 1:</b> Chapter 11: Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare;</p> <p><b>ES Volume 3:</b> Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare;</p> <p><b>ES Volume 1:</b> Chapter 9: Noise and Vibration;</p> <p><b>ES Volume 3:</b> Noise and Vibration;</p> <p><b>ES Volume 1:</b> Chapter 4: The Proposed Development; Chapter 5: Demolition and Construction;</p>
(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);	<p><b>ES Volume 1:</b> Chapter 2: EIA Methodology (Summary of 'Topics Scoped Out From EIA); Technical Chapters 6 – 11;</p> <p><b>ES Volume 2:</b> Heritage, Townscape and Visual Impact Assessment;</p> <p><b>ES Volume 3:</b> EIA Scoping Report (refer Scoping Report (Topics Scoped Out From EIA)); Socio-Economics</p> <p><b>Standalone Documents</b> Flood Risk Assessment; Surface Water and Foul Drainage Strategy; Heritage Statement;</p>
(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;	<p><b>ES Volume 1</b> Technical Chapters 6 – 11;</p> <p><b>ES Volume 2:</b> Heritage, Townscape and Visual Impact Assessment;</p>

Information for Inclusion in Environmental Statements, as Specified in Schedule 4 of the EIA Regulations 2017	How the EIA will address the Information Specifications
(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; and	<p><b>ES Volume 1:</b> Chapter 4: The Proposed Development</p> <p><b>ES Volume 3:</b> Greenhouse Gas Emissions;</p>
(g) the technologies and the substances used.	<p><b>ES Volume 1:</b> Chapter 4: The Proposed Development; Chapter 5: Demolition and Construction; Technical Chapters 6 – 11;</p>
6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	<p><b>ES Volume 1:</b> Chapter 2: EIA Methodology; Technical Chapters 6 – 11;</p>
7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.	<p><b>ES Volume 1:</b> Chapter 4: The Proposed Development; Chapter 5: Demolition and Construction; Technical Chapters 6 – 11; Chapter 15: Mitigation &amp; Monitoring Schedule;</p>
8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU(c) of the European Parliament and of the Council or Council Directive 2009/71/Euratom(d) or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.	<p>See section 'EIA And The Scoping Process – Project Vulnerability' of this report;</p>
9. non-technical summary of the information provided under paragraphs 1 to 8.	<p>ES Non-Technical Summary;</p>
10. A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.	<p><b>ES Volume 1:</b> Chapter 2: EIA Methodology; Technical Chapters 6 – 11.</p>

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Project Reference: TEC00081





**PART 1 PLANNING REGISTER ENTRY**

**APPLICATION REFERENCE NUMBER: PLAN/2019/0452**

**Land South of Kingfield Road and East of Westfield Avenue, Westfield, Woking,  
GU22 9PF**


**The Town & Country Planning (Environmental Impact Assessment) Regulations 2017  
(as amended)**

**SCOPING OPINION**

The Local Planning Authority has been requested to provide a Scoping Opinion in respect of a proposed development including demolition of the existing buildings and structures followed by the construction of a new 10,001 capacity football stadium, approximately 2,500 sq.m of retail (Classes A1-A5) space, up to 1,250 residential units including affordable housing (Class C3) in 5 buildings ranging from 2 - 10 storeys in height, new public realm and a semi submersed area below each residential building to accommodate car parking, cycle stores, refuse stores and plant providing for up to 650 car parking spaces, along with approximately 1,250 cycle spaces.

This is the decision of the Local Planning Authority as regards scope of the Environmental Impact Assessment.

Signed.....  ..... (Case Officer - Benjamin Bailey)

Signed.....  ..... (Development Manager)

**PART 1 PLANNING REGISTER ENTRY**

**CONTENTS**

- 1.0 Background**
- 2.0 Site and Location**
- 3.0 Proposal**
- 4.0 Scoping Request Report Summary**
- 5.0 Consultation**
- 6.0 Assessment and Conclusion**

**1.0 Background**

- 1.1 The Local Planning Authority has been requested to provide a Scoping Opinion in respect of a proposed development including demolition of the existing buildings and structures followed by the construction of a new 10,001 capacity football stadium, approximately 2,500 sq.m of retail (Classes A1-A5) space, up to 1,250 residential units including affordable housing (Class C3) in 5 buildings ranging from 2 - 10 storeys in height, new public realm and a semi submersed area below each residential building to accommodate car parking, cycle stores, refuse stores and plant providing for up to 650 car parking spaces, along with approximately 1,250 cycle spaces.
- 1.2 Environmental Impact Assessment (EIA) is a structured process for identifying 'likely significant effects' of a development on the environment and the mitigation that may be required in order address any adverse effects. This information is reported in the form of an Environmental Statement (ES) and the EIA process is governed by The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended). An ES is required for development which is deemed to constitute EIA development and such developments are categorised as falling within either Schedule 1 or Schedule 2 of the Regulations. The EIA Regulations make a provision for applicants to ask the Local Planning Authority for a Scoping Opinion in order to establish the scope of an ES.
- 1.3 In accordance with Regulation 15(1) of the Regulations, the applicant wrote to the Local Planning Authority requesting a Scoping Opinion on 3 May 2019 and this is the formal response to that request in accordance with Regulation 15(4).
- 1.4 Following consideration of the request for a Scoping Opinion, the Local Planning Authority have consulted on the request in accordance with Regulation 15(4) and taken into account the specific characteristics of:-
  - (a) any information provided by the applicant about the proposed development;
  - (b) the specific characteristics of the particular development;
  - (c) the specific characteristics of development of the type concerned; and
  - (d) the environmental features likely to be significantly affected by the development.
- 1.5 Regulation 4(2) requires EIAs to identify, describe and assess the direct and indirect significant effects of the proposed development on the following factors:
  - (a) population and human health;
  - (b) biodiversity, with particular attention to species and habitats protected under any law that implemented Directive 92/43/EEC and Directive 2009/147/EC;
  - (c) land, soil, water, air and climate;
  - (d) material assets, cultural heritage and the landscape;
  - (e) the interaction between the factors referred to in sub-paragraphs (a) to (d).



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- 1.6 The proposal is considered to constitute a Schedule 2 development; the development falls within category 10(b) of Schedule 2 as an urban development project. At up to 1,250 residential units, the development exceeds the threshold of 150 dwellings set out in Schedule 2 (although this factor alone is not determinative), and includes the construction of a (replacement) sports stadium, with a greater capacity than the existing stadium on the site.
- 1.7 The prospective applicant considers that the proposals are likely to have significant effects in a set of environmental disciplines and so qualifies as EIA development. This application is a formal request for a scoping opinion under Regulation 15 of the EIA Regulations, to advise the prospective applicant on the scope of the Environmental Statement, which will support the planning application.

**2.0 Site and Location**

- 2.1 The site covers a total area of approximately 5ha in size and occupied by a football stadium (Woking Football Club); a collection of large-footprint low-rise buildings, including the Woking Snooker Centre, Woking Gymnastics Centre and David Lloyd facilities (including tennis courts); car parking; and a small number of residential properties situated in the north of the site. The site has an approximate 50:50 split between the hardstanding and green surfaces (i.e. the football pitch, trees and soft landscaping) of the site.
- 2.2 The primary entrance points (for both vehicles and pedestrians) are from Westfield Avenue and Kingfield Road, from the west and north of the site respectively. There are no statutory designations or listed buildings, conservation areas, scheduled ancient monuments or world heritage sites that fall within the site. The site is situated within an area with a low probability of flooding (Flood Zone 1), but is located to the south-east of the Hoe Stream which is located within Flood Zone 3.
- 2.3 The local area is predominantly comprised of residential dwellings, open spaces and waterbodies. Commercial and retail uses become more prominent further to the north of the site, where Woking Town Centre and Woking Railway Station are located (approximately 1.2km to the north of the site). The immediate surrounding buildings of the site are predominantly of 2-3 storeys in height, with some 4-5 storey buildings. The closest (Statutory) Listed Building to the site is Elmbridge Cottage (Grade II listed and situated approximately 120m to the north-east of the site). The closest Conservation Area to the site is the Mount Hermon Conservation Area, located approximately 430m to the west of the site.

**3.0 Proposal**

- 3.1 The proposed development includes demolition of the existing buildings and structures followed by the construction of a new 10,001 capacity football stadium, approximately 2,500 sq.m of retail (Classes A1-A5) space, up to 1,250 residential units including affordable housing (Class C3) in 5 buildings ranging from 2 - 10 storeys in height, new public realm and a semi submersed area below each residential building to accommodate car parking, cycle stores, refuse stores and plant providing for up to 650 car parking spaces, along with approximately 1,250 cycle spaces.

**4.0 Scoping Request Report Summary**

- 4.1 The request is supported by an EIA Scoping Report prepared by Trium Environmental Consulting LLP on behalf of the prospective applicants (Goldev Woking Ltd) which has

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been amended by an EIA Scoping Report Addendum dated 28 June 2019 relating to Water Resources, Drainage and Flood Risk. The EIA Scoping Report, and Addendum, sets out the intended scope for an Environmental Statement and the proposed methodology for assessing the effects. It identifies all potential environmental impacts and assesses whether or not they should be scoped into the EIA on the basis of the likelihood of significant environmental effects. The outcomes are set out in the table below:

Environmental Topic	Demolition and Construction	Completed and Operational
Socio Economics	In	In
Health	In	In
Highways and Transport	In	In
Air Quality	In *	In *
Noise and Vibration	In	In **
Wind Microclimate	In (qualitatively)	In
Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare	In (qualitatively)	In
Townscape and Visual	In	In
Archaeology (Buried Heritage)	Out	Out
Built Heritage	Out	Out
Geo-environmental (Land Contamination, Ground Conditions and Groundwater)	Out	Out
Water Resources, Drainage and Flood Risk	In (as per Addendum)	In (as per Addendum)
Ecology	Out ***	Out ***
TV and Radio	Out	Out
Waste and Recycling	Out	Out
Climate Change	In	In

Please Note:

\* Although dependant on the number of traffic movements generated / energy centre included at this stage

\*\* Apart from vibration, which has been scoped out, due to the site being located away from potential vibration sources

\*\*\* Assuming the absence of bats from the site

- 4.2 The report, and addendum, provides a detailed analysis of the resulting technical scope of the EIA and identifies which disciplines are not likely to have a significant environmental effect and are therefore 'scoped out'. Where topics are included in the EIA scope, the potential effects are introduced and methodology for assessment set out. The Planning Practice Guidance notes that the content of the ES should be limited to topic areas where significant effects are considered likely.

**5.0 Consultation**

- 5.1 In accordance with Regulation 15(4), the consultation bodies have been consulted. Their responses are summarised below:

Statutory Consultees:

- **Environment Agency:** *We have reviewed the submitted scoping report. We understand the report is proposing to scope out contaminated land and water*



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resources. Whilst we agree that there is no evidence of historic contaminative use of the site and it is therefore acceptable to be scoped out, disagree in relation to water resources, and consider that this topic should be scoped in the EIA. We have the following comments to make with regards to water resources. This will ensure that the environmental statement addresses the key environmental issues for this proposal. We understand Water Resources have been scoped out of the Environmental Impact Assessment on a risk based approach. To date there has been no water cycle study carried out for the borough of Woking. Therefore there is a potential cumulative risk of the expected growth in Woking and the impact on the environment. Water resources and drainage, specifically the capacity of the network and environmental capacity of the receiving waters, should be scoped in to the Environment Impact Assessment. Infrastructure upgrades may be required and a phasing approach to occupation may be identified. The developer should provide evidence from the water company that they do not foresee any problems with the proposal.

- **Natural England:** The potential impact of the proposal upon features of nature conservation interest and opportunities for habitat creation/enhancement should be included within this assessment in accordance with appropriate guidance on such matters. In terms of Internationally and Nationally Designated Sites the proposal appears unlikely to affect an Internationally or Nationally designated site. Should the proposal result in an emission to air or discharge to the ground or surface water catchment of a designated site then the potential effects and impact of this would need to be considered in the Environmental Statement. Should a Likely Significant Effect on a European/Internationally designated site be identified or be uncertain, the competent authority (in this case the Local Planning Authority) may need to prepare an Appropriate Assessment, in addition to consideration of impacts through the EIA process. The ES should assess the impact of all phases of the proposal on protected species. The ES should thoroughly assess the impact of the proposals on non-statutory sites, for example Local Wildlife Sites (LoWS), Local Nature Reserves (LNR) and Regionally Important Geological and Geomorphological Sites (RIGS). The ES should thoroughly assess the impact of the proposals on habitats and/or species listed in the UK Biodiversity Action Plan (BAP). The consideration of landscape impacts should reflect the approach set out in the Guidelines for Landscape and Visual Impact Assessment (Landscape Institute and the Institute of Environmental Assessment and Management, 2013, 3rd edition), the Landscape Character Assessment Guidance for England and Scotland (Scottish Natural Heritage and The Countryside Agency, 2002) and good practice. The ES should include a thorough assessment of the development's effects upon public rights of way and access to the countryside and its enjoyment through recreation. Soils should be considered under a more general heading of sustainable use of land and the valuing of the ecosystem services they provide as a natural resource, also in line with paragraph 170 of the NPPF. The assessment should take account of the risks of air pollution and how these can be managed or reduced. The ES should identify how the development's effects on the natural environment will be influenced by climate change, and how ecological networks will be maintained.

### Other Consultees:

- **Historic England:** On the basis of the information available to date, we do not wish to offer any comments. We suggest that you seek the views of your specialist conservation and archaeological advisers, as relevant.

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- **Archaeological Officer (SCC):** The precise scheme of any further archaeological work can be discussed further on the submission of detailed proposals. On the whole however, the Scoping report demonstrates an awareness of the need to consider the archaeological impact, and the supporting Desk Based Assessment is appropriate and provides sufficient information to show that it is unlikely that remains of such significance to warrant preservation in situ will be present. I therefore agree that any potential impact and necessary mitigation work can be dealt with via a suitably worded planning condition should permission be granted.
- **County Highway Authority (CHA) (SCC):** The Highway Authority require a detailed Transport Assessment. Comments on access (visibility splays), layout, sustainability (information on public transport, walking and cycling routes should be submitted, some car club bays should be added, cycle parking should be provided for every flat and 20% of parking spaces need to be designed for electric vehicles), modelling (all junctions listed would need to be assessed in detail, which might identify other issues with other junctions), full TRICS output for the multi-modal trip generation for the proposed development should be provided, a full Construction Management Plan will be required, a full Travel Plan will be required (with monitoring fee).
- **Sport England:** Sport England considers that the impact of a development on sports facilities or activities would not normally fall within the scope of an Environmental Statement. Consequently we do not wish to comment on the Screening or Scoping Opinion consultation. Any subsequent planning application should however consider the implications for sport. Sport England should be consulted on the planning application if it meets the statutory requirements contained within SI 2015/295 (development affecting playing fields) or the guidance for non-statutory consultation with Sport England contained within Planning Practice Guidance: Open Space, Sports and Recreation Facilities (Paragraph: 003).
- **Drainage and Flood Risk Team (WBC):** No comments received.
- **Environmental Health (WBC):** No comments received.
- **Contaminated Land Officer (WBC):** I have reviewed the EIR, with focus on land/contamination. From the EIR I noted the following key statements:
  - 97. With regards to 'Soil', the Preliminary Risk Assessment (presented in Appendix A of this report) confirms that the potential contamination risks anticipated to arise as a result of the Proposed Development (during demolition and construction, and once completed and operational) are all considered to range from 'moderate risk' to 'low risk'.
  - 98. In relation to potential contamination considered to be of 'moderate risk' or 'low risk' during demolition and construction works, it is anticipated that good practices (such as the implementation of a CEMP) will be implemented to ensure that the identified sensitive receptors are not affected. In terms of potential contamination considered to be of 'moderate risk' or 'low risk' once the Proposed Development is completed and operational, it is considered that mitigation measures will be incorporated by design (e.g. appropriately designed materials) to ensure that the identified sensitive receptors are not affected.
  - 99. Following the implementation of appropriate mitigation measures (which would be secured by appropriate planning conditions in accordance with standard practice), no likely significant adverse effects associated with 'Soil' are anticipated to arise as a result of the Proposed Development.



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- 100. Based on the above, land take and soil shall not be considered within the ES.
- Appendix A includes a Desktop Study report by Jomas Associates.

*In relation to the proposed redevelopment of the site I would be minded to recommend the below standard conditions, when a full application is made. I note the Desktop Study report by Jomas would be sufficient to meet the requirements of the desktop study component of the planning conditions.*

### **6.0 Assessment and Conclusion**

- 6.1 The comments of the Environment Agency are considered to have been addressed through the submission of the EIA Scoping Report Addendum dated 28 June 2019, which 'scopes in' Water Resources, Drainage and Flood Risk to the ES. The comments of Natural England are noted however the potential impact upon protected species can be considered outside of the ES taking account of the brownfield nature of the site in this instance (assuming the absence of bats from the site), as can opportunities for habitat creation/enhancement, for the same reason.
- 6.2 The potential impact upon Internationally, Nationally and Locally Designated Sites, through either emission to air (dependent on the number of traffic movements generated / energy centre included), or discharge to the ground or surface water within the catchment of any such designated site, will be considered under the topics of air quality and water resources, drainage and flood risk, which have been 'scoped in' to the ES. Consideration of landscape impacts will be contained under the topic of townscape and visual, which has been 'scoped in' to the ES. It should be noted that in the event air quality is later excluded from the ES (dependent on the number of traffic movements generated / energy centre included), air quality impact would still be required to be assessed through an air quality assessment submitted with the application as required by Policy DM6 of the Development Management Policies DPD (2016).
- 6.3 It is noted that the reference to the "Kingfield Road / Clarence Road junction" within the Highways and Transport section of the EIA Scoping Report is a typographical error and should instead read "Kingfield Road / Claremont Avenue junction"; this has been clarified by Trium Environmental Consulting LLP.
- 6.4 Following consideration by the Local Planning Authority, the proposed scope of the Environmental Statement (ES) included within the EIA Scoping Report prepared by Trium Environmental Consulting LLP (dated April 2019), as amended by the Addendum relating to Water Resources, Drainage and Flood Risk dated 28 June 2019, is accepted.
- 6.5 In conclusion, it is concurred that the likelihood of significant effects of the development is limited to the set of environmental disciplines identified within the EIA Scoping Report prepared by Trium Environmental Consulting LLP (dated April 2019), as amended by the Addendum relating to Water Resources, Drainage and Flood Risk dated 28 June 2019.
- 6.6 The environmental disciplines which should therefore be 'scoped in' to the ES are:
- Socio Economics
  - Health
  - Highways and Transport
  - Air Quality

To be placed on Parts 1 and 2 of the Planning Register

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- (although dependent on the number of traffic movements generated / energy centre included)
- Noise and Vibration  
(apart from vibration for the completed and operational phase, which has been scoped out due to the site being located away from potential vibration sources)
  - Wind Microclimate  
(qualitatively for demolition and construction phase)
  - Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare  
(qualitatively for demolition and construction phase)
  - Townscape and Visual
  - Water Resources, Drainage and Flood Risk
  - Climate Change
- 6.7 In addition, the basic requirements in Schedule 4 of the EIA Regulations, and information as to the cumulative effects and impact interactions, should be scoped in as required by the Regulations.

To be placed on Parts 1 and 2 of the Planning Register



# **Annex 4: Greenhouse Gas Emissions Assessment**

## Greenhouse Gas Assessment: Woking Football Club, Woking

November 2019



Experts in air quality management & assessment

### Document Control

<b>Client</b>	Woking Football Club	<b>Principal Contact</b>	Tsz Kan Woo (Trium Environmental Consulting LLP)
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<b>Job Number</b>	J3654
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<b>Report Prepared By:</b>	David Bailey and Pauline Jezequel
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### Document Status and Review Schedule

Report No.	Date	Status	Reviewed by
J3654A/3/F4	20 November 2019	Final	Laurence Caird (Associate Director)

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## 1 Introduction

- 1.1 This report provides a Greenhouse Gas (GHG) assessment for the Proposed Development which comprises the redevelopment of the site, following the demolition of all existing buildings and structures, to provide a replacement stadium with ancillary facilities, including flexible retail, hospitality and community spaces, independent retail floorspace (Classes A1/A2/A3), a medical centre (Class D1) and vehicle parking, plus residential accommodation comprising of 1,048 dwellings (Class C3) within 5 buildings of varying heights of between 3 and 10 storeys (and undercroft and part basement levels) on the south and west sides of the site, together with provision of new accesses from Westfield Avenue to car parking, associated landscaping and the provision of a detached residential concierge building. GHGs are gases which contribute to climate change and are defined further in Section 3.
- 1.2 The Proposed Development will lead to the direct and indirect release of GHGs, both during the demolition and construction phase, and throughout the lifetime of the development. This assessment estimates the GHG emissions associated with the Proposed Development taking a lifecycle approach and presents the mitigation provided by the scheme to minimise its GHG footprint.

## 2 Policy Background

- 2.1 In preparing this GHG assessment, consideration has been given to the requirements of national, regional and local planning policies.

### National Planning Policy

#### *National Planning Policy Framework*

- 2.2 The National Planning Policy Framework (NPPF)<sup>1</sup> sets out planning policy for England. It states that the purpose of the planning system is to contribute to the achievement of sustainable development, and that the planning system has three overarching objectives, one of which is an environmental objective:

*“to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy”.*

- 2.3 Part 14 of the framework is entitled *“Meeting the challenge of climate change, flooding and coastal change”* and sets out the strategy for minimising the climate change effects of new development.
- 2.4 Paragraph 150 states that *“New development should be planned for in ways that [...] can help reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government’s policy for national technical standards.”*
- 2.5 Paragraph 151 describes further that *“to help increase the use and supply of renewable and low carbon energy and heat, plans should: a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts); b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers”.*
- 2.6 In determining planning applications, the NPPF request that planning authorities should expect new development to:

<sup>1</sup> Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework, Available: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/6077/2116950.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf).

- comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and
- take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

### **Climate Change Act (2008)<sup>2</sup>**

17.2.7 The overarching Act in relation to climate is the Climate Change Act 2008. It provides for a Committee on Climate Change (CCC) with power to set out carbon budgets binding on the Government for 5 year periods.

17.2.8 In the 2009 budget, the first three carbon budgets were announced which set out a binding 34% CO<sub>2</sub>e<sup>3</sup> reduction by 2020; and the Government has since adopted the fourth and fifth carbon budgets to reduce CO<sub>2</sub>e by 50% by 2025 and 57% by 2030.

17.2.9 The CCC also produces annual reports to monitor the progress in meeting these carbon budgets. Consequent upon the enactment of the Climate Change Act, a raft of policy at national and local level has been developed aimed at reducing carbon emissions.

### **Climate Change Act 2008 (2050 Target Amendment) Order 2019<sup>4</sup>**

2.10 In June 2019, the Government passed an order to amend the 2050 carbon emissions target in the Climate Change Act 2008 from 80 % below 1990 levels to zero net carbon (i.e. 100 % below 1990 levels). This new target will essentially end the UK's contribution to climate change by 2050.

### **Energy Act (2013)<sup>5</sup>**

2.11 The Energy Act makes a provision for the setting of a decarbonisation target range, duties in relation to it and for the reforming of the electricity market for the purposes of encouraging low carbon electricity generation.

### **Climate Change and Sustainable Energy Act (2006)<sup>6</sup>**

2.12 The Climate Change and Sustainability Act enhances the contribution of the UK to combating climate change and securing a diverse and viable long-term energy supply by boosting the number of heat and electricity microgeneration installations in the United Kingdom.

<sup>2</sup> Her Majesty's Stationery Office, 2008. Climate Change Act 2008.

<sup>3</sup> Carbon dioxide equivalent (CO<sub>2</sub>e) is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO<sub>2</sub>e signifies the amount of CO<sub>2</sub> which would have the equivalent global warming impact.

<sup>4</sup> Her Majesty's Stationery Office, 2019. The Climate Change Act 2008 (2050 Target Amendment) Order 2019

<sup>5</sup> Her Majesty's Stationery Office, 2013. Energy Act 2013.

<sup>6</sup> Her Majesty's Stationery Office, 2006. Climate Change and Sustainable Energy Act 2006.

### **The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting<sup>7</sup>**

2.13 The National Adaptation Programme sets out government's response to the second Climate Change Risk Assessment, showing the actions government is, and will be, taking to address the risks and opportunities posed by a changing climate. It forms part of the five-yearly cycle of requirements laid down in the Climate Change Act 2008 to drive a dynamic and adaptive approach to building our resilience to climate change.

### **The Clean Growth Strategy<sup>8</sup>**

2.14 The Clean Growth Strategy sets out a comprehensive set of policies and proposals that aim to accelerate the pace of "clean growth", i.e. deliver increased economic growth and decreased emissions. In the context of the UK's legal requirements under the Climate Change Act, the UK's approach to reducing emissions has two guiding objectives:

1. To meet our domestic commitments at the lowest possible net cost to UK taxpayers, consumers and businesses; and,
2. To maximise the social and economic benefits for the UK from this transition.

2.15 The Strategy contains policies relating to the delivery of clean, smart and flexible power, including reducing power costs for homes and businesses and more transparent carbon pricing. It effectively replaces the "The Carbon Plan: delivering our Low Carbon Future" published in 2011.

### **Local Policies**

#### **Woking Core Strategy<sup>9</sup>**

2.16 The Woking Borough Council's Core Strategy is the Council's growth strategy for the borough. Spatial vision objective 6 relates to Climate Change and states Woking will; "*lead the way in high quality sustainable development that minimises the adverse impacts of climate change. This will be achieved through maximising opportunities for implementing renewable energy technologies, maximising the efficient use of energy and water in buildings and managing waste effectively*".

2.17 Policy CS22 within the Core Strategy relates to sustainable construction. Further details of the policy are found within the Woking Climate Change SPD, detailed below.

<sup>7</sup> Defra (2018) The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting

<sup>8</sup> HM Government (2017) The Clean Growth Strategy

<sup>9</sup> Woking Borough Council, 2012, Woking Local Development Document (Woking Core Strategy)



**Woking Climate Change SPD<sup>10</sup>**

2.18 Woking Borough Council is committed to addressing climate change locally. It aims to establish high standards of energy efficiency and renewable energy in all new developments and promote a 'climate neutral' approach to development, encompassing both carbon reduction and adaptation to changes in climate.

2.19 The SPD states; *“consideration of sustainability and climate change should be considered in all developments, not just those which have to meet the standards set out in policy CS22. Several key issues should be considered:*

- *the potential environmental impacts of the development, including those incurred during the construction of the development as well as unnecessary carbon emissions as a consequence of the development;*
- *making the best use of natural resources such as energy, water and waste;*
- *ensuring buildings are designed in such a way that carbon dioxide emissions are mitigated; and*
- *designing buildings and places so that they are adapted to climate change risks such as high temperatures, flooding and ground conditions.”*

2.20 Policy CS22 states that:

*“New residential development on previously developed land will be required to meet the energy and Carbon Dioxide (CO<sub>2</sub>) and water components of the Code for Sustainable Homes level 3 (or any future national requirement) from now until 31 March 2013, the energy and CO<sub>2</sub> and water components of at least Code level 4 from 1 April 2013 and the energy and CO<sub>2</sub> and water components of Code level 5 from 1 April 2016. New residential development is encouraged to meet the full requirements of each Code level, with particular encouragement for the material and ecology elements. Where the scale, nature and location of a development would justify a higher Code level, the Council will negotiate with developers to achieve that because of the lower cost of developing such sites.*

*New residential development on greenfield sites will be required to meet the Code for Sustainable Homes level 5 (or any future national requirement) from now because of the relatively lower cost of developing such sites.*

*The Council will consider a case based on evidence of viability if an applicant can demonstrate that the requirement for code level 5 cannot be met. This will be considered on a case by case basis.*

<sup>10</sup> Woking Borough Council, 2013, Climate Change Supplement Planning Document

*The Council will encourage proposals for residential extensions...to incorporate energy and water efficiency measures.”*

2.21 It uses a coded system to rank new developments on overall sustainability performance. One star is entry level above building regulations, with six stars being the highest performance, reflecting exemplar development in terms of sustainability. Depending on the sustainability ranking more stringent mandatory minimum standards for Energy and CO<sub>2</sub> emissions, and water will apply, as shown in the Table 1 below.

**Table 1: Code levels for mandatory minimum standards**

Code Level	Minimum % Improvement in Dwelling Emission Rate over 2010 Target Emission Rate	Maximum Indoor Water Consumption in Litres per Person per Day
Level 1 (*)	0% (compliance with Part L 2010 only is required)	120
Level 2 (**)	0% (compliance with Part L 2010 only is required)	120
Level 3 (***)	0% (compliance with Part L 2010 only is required)	105
Level 4 (****)	25%	105
Level 5 (*****)	100%	80
Level 6 (*****)	Net Zero CO <sub>2</sub> Emissions	80

2.22 Policy CS23 relates within the SPD relates to renewable and low carbon energy generation, and states; *“The Council recognises significant progress needs to be made if national targets for the generation of renewable energy are to be met and encourages the development of stand-alone renewable energy installations in the Borough. All proposals will be considered on their individual merits with regard to scale, location, technology type and cumulative impact on the surrounding area”.*

2.23 Further details for the ranking system as part of CS22, and all other climate change related policies can be found with the Climate Change SPD<sup>10</sup>.

### 3 Scope of Assessment

3.1 The EIA Directive 2014<sup>11</sup> sets out the rationale for incorporating climate change into the EIA process. It states:

*“Climate change will continue to cause damage to the environment and compromise economic development. In this regard, it is appropriate to assess the impact of projects on climate (for example greenhouse gas emissions) and their vulnerability to climate change.”*

3.2 The requirements of the EIA Directive 2014 have been adopted within UK EIA Regulations 2017<sup>12</sup> and require that the assessment provides:

*“A description of the likely significant effects of the development on the environment resulting from, inter alia:*

*(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change”.*

3.3 This assessment only covers the impact of the project on climate through the quantification of GHGs resulting from the Proposed Development. The impact of future climate change on the resilience of the Proposed Development has not been addressed in this report and is examined in ES Chapter 1 of the Environment Statement Volume 1 and subsequent technical chapters where relevant.

<sup>11</sup> Directive 2014/52/EU of the European Parliament and of the Council on the assessment of effects of certain public and private projects on the environment.

<sup>12</sup> See <https://www.gov.uk/guidance/environmental-impact-assessment#Preparing-an-Environmental-Statement1>.

### 4 Assessment Methodology

4.1 The GHG assessment has taken a whole life approach to develop a GHG footprint for the Proposed Development. The footprint sources considered include:

- Embedded GHGs from the material used in the construction of the Proposed Development;
- GHGs from traffic movements during construction of the Proposed Development;
- GHGs from energy consumed by the operation of the Proposed Development; and
- GHGs from transport associated with the operation of the Proposed Development.

4.2 Table 2 sets out the baseline and scenarios adopted by the assessment, key sources of data and methodologies used.

**Table 2: GHG Assessment Scenarios**

Development Phase	Baseline	Proposed Development	Methods and Data Sources	Reference
<b>Construction: Embedded Carbon</b>	The baseline is assumed to be zero.	The completed development as defined in Chapter 4 of the ES.	GHG calculation based on RICS GHG factors per GIA m <sup>2</sup> of development (see Figure 1).	ES Chapter 4.
<b>Construction: Transport</b>	The baseline is assumed to be zero.	Traffic generated by the construction of the Proposed Development.	Application of BRE factors for construction transport GHG relating to project value.	n/a
<b>Operation: Transport</b>	The baseline is assumed to be zero.	Opening year (2021) transport GHG emissions.	Application of 2021 GHG factors to km travelled by mode from transport assessment (see Table 4).	ES Chapter 7 and the Transport Assessment (Vectos)
<b>Operation: Energy</b>	The baseline is assumed to be zero.	The Proposed Development including proposals to meet Level 04 of the Code for Sustainable Homes	Proposed Development CO <sub>2</sub> from energy use for the proposed Development taking into account savings from the Energy Assessment.	Energy Strategy (Elementa)

4.3 The metric for assessing the climate change impacts of GHG emissions in this assessment is Global Warming Potential (GWP). This is expressed in units of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) over 100 years. This allows for the emissions of the six key GHG: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur



hexafluoride (SF6) expressed in terms of their equivalent global warming potential in mass of CO<sub>2</sub>e.

4.4 The assessment (using the methodologies referenced in Table 1 above) determines the baseline GHG emissions and the GHG emissions from the Proposed Development in the year of opening (first occupation) of the site (assumed to be 2021). The 'net emissions' are the change in the GHG emissions between the baseline and the Proposed Development, taking account of GHG reduction measures and offsetting.

### Construction

#### Embedded Carbon

4.5 Embedded GHG emission factors for construction are presented in Figure 1. The factors have been obtained from the Royal Institution of Chartered Surveyors (RICS) publication on a methodology to calculate embodied carbon of materials<sup>13</sup>.

4.6 The factors are provided as kilograms of CO<sub>2</sub> equivalent per m<sup>2</sup> of Gross Internal Area (GIA) for different development types and provide a method of calculating the embedded carbon in the development by multiplying the GIA area information for the Proposed Development by the appropriate carbon factors detailed in Figure 1.

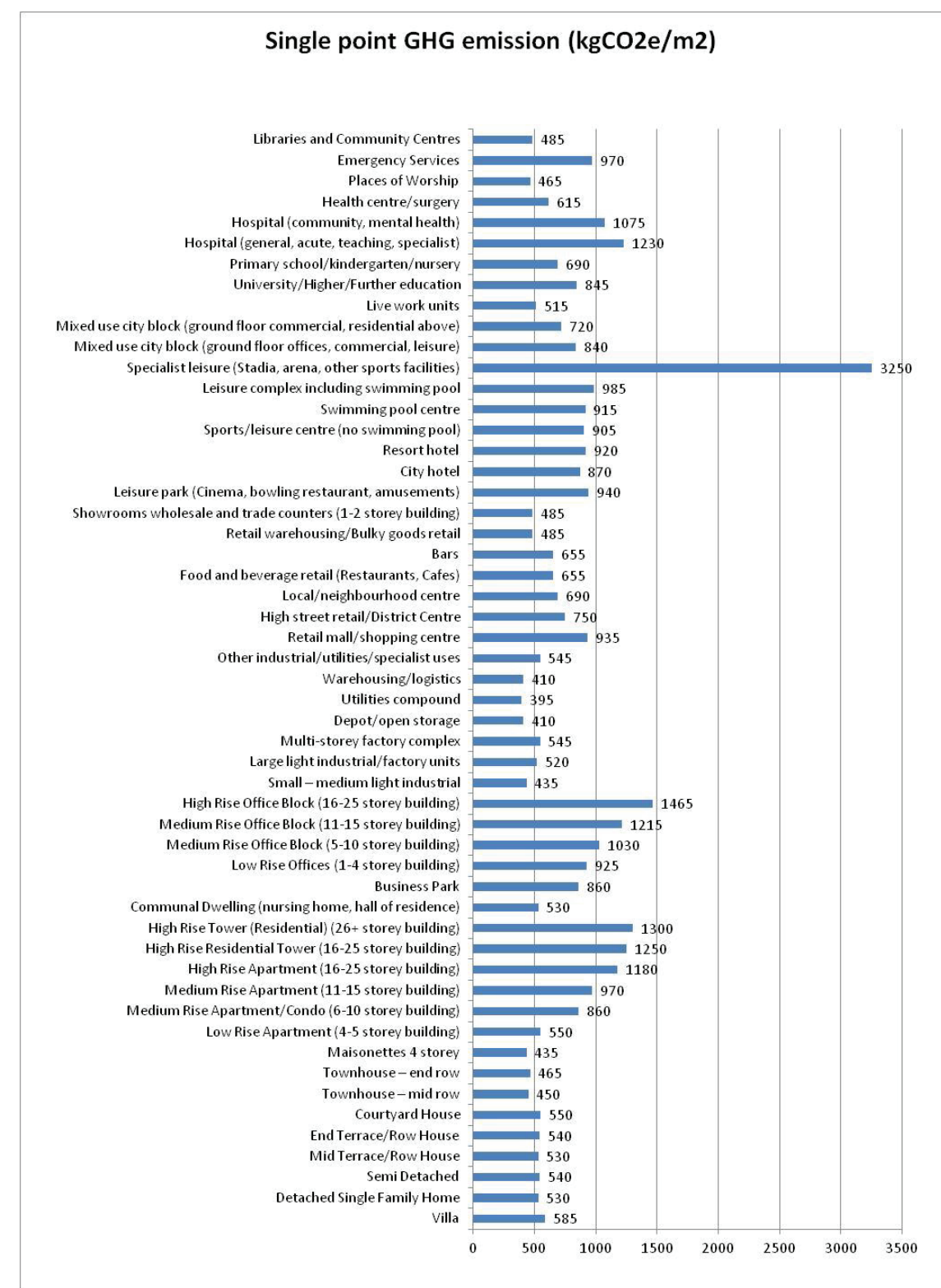
4.7 The derivation of the carbon factor used in the calculation of the embedded carbon emissions in this assessment is shown in Table 3.

**Table 3: Selected Embedded Carbon Factors**

Land Use Category	Use	RICS Carbon Factor (kgCO <sub>2</sub> e/m <sup>2</sup> )	RICS Category
C3	Residential	860	Medium Rise Apartment (6 – 10 storey building)
<b>Carbon Factor Used</b>		<b>860</b>	Medium Rise Apartment (6 – 10 storey building)
D2	Stadium	3,250	Specialist Leisure (Stadia)
D1	Medical Centre	615	Health Centre
A1 – A4	Flexible Retail	750	High Street Retail
A1 – A4	Commercial	750	High Street Retail
<b>Carbon Factor Used<sup>a</sup></b>		<b>3,250</b>	Specialist Leisure (Stadia)

<sup>13</sup> RICS, 2012. Methodology to calculate embodied carbon of materials. RICS information paper, IP 32/2012.

<sup>a</sup> The predominant land-use within this section of the Proposed Development is D2 Stadium (making up over 80% of the total GIA) therefore the appropriate carbon factor for this land use has been used to estimate the embedded carbon in this section of the Proposed Development.



**Figure 1: GHG Emission Factors for Materials used in Construction**

Figure reproduced from RICS, "Methodology to calculate embodied carbon of materials" RICS information paper, IP 32/2012.

**Construction Traffic**

4.8 The assessment considers GHG emissions from construction traffic. This is based on guidance from the Building Research Establishment (BRE)<sup>14</sup> that indicates 1,400 kg of CO<sub>2</sub>e from construction traffic per £100,000 of project value.

**Operation**

**Transport**

4.9 GHG emission factors for transport have been obtained from the Department of Business, Energy and Industrial Strategy (BEIS) publication on GHG Conversion Factors for Company Reporting<sup>15</sup> which sets out GHG emissions factors for a range of modes of transport valid for 2019.

4.10 Factors for 2021 (the year of first occupation) were determined by applying engine and fuel efficiency factors (sourced from the WebTAG data book<sup>16</sup>) to the 2019 BEIS factors, for different types of fuel/energy source, and vehicle size/type. A summary of the 2019 and 2021 GHG emission factors for selected modes of transport used in this GHG assessment are provided in Table 4.

<sup>14</sup> Building Research Establishment, 2015. Meeting Construction 2025 Targets The positive impact of BRE Group products and services.

<sup>15</sup> BEIS, 2019: UK Government GHG Conversion Factors for Company Reporting.

<sup>16</sup> Department for Transport (2019) TAG data book May 2019 v1.12, Available: <https://www.gov.uk/government/publications/tag-data-book>

**Table 4: 2019 and 2021 Transport GHG Factors by Mode (selected modes)**

Activity	Type	Unit	2019 BEIS factor (kg CO <sub>2</sub> e)	Calculated 2021 factor (kg CO <sub>2</sub> e)
Car Travel	Average car	km	0.17710	0.16633
Motorcycle travel	Average motorcycle	km	0.11551	0.10834
Taxis	Regular taxi	km	0.31764	0.19746
Bus	Local bus	passenger.km	0.12076	0.11854
Rail	National rail	passenger.km	0.04115	0.03782

4.11 The calculation of transportation GHG emissions is carried out by multiplying the transport GHG factors detailed in Table 4 above by km travelled by mode, as provided by the Transport Consultants, Vectos.

**Energy Consumption**

4.12 In terms of the baseline setting for energy use, the IEMA guidance acknowledges that baseline energy use for an existing building can be very difficult to calculate and recommends that baseline energy use either be considered to be zero, or an alternative baseline can be considered, whereby GHG emissions from an alternative development or building design are considered. In this case, the baseline energy consumption data is not available, therefore it has been assumed that the baseline energy consumption is zero to provide a conservative assessment.

4.13 CO<sub>2</sub> emissions that will be emitted as a result of the running of the energy systems employed by the Proposed Development have been obtained from the energy strategy (submitted as a separate supporting document to the planning application). These are based on the energy demand of the Development and published GHG emission factors for gas and electricity use. Further detail on the CO<sub>2</sub> factors and CO<sub>2</sub> emissions from energy consumption is provided in the Energy Strategy<sup>17</sup>.

**Significance of Effects**

4.14 For GHG emissions there are no recognised significance criteria.

4.15 In terms of defining significance, guidance from IEMA<sup>18</sup> has been adopted, which has identified three underlying principles to inform the assessment of significance, as follows:

1. the GHG emissions from all projects will contribute to climate change; the largest interrelated cumulative environmental effect;

<sup>17</sup> Elementa, 2019, Woking Football Club, Woking, Energy Strategy Report

<sup>18</sup> IEMA, 2017, "Assessing Greenhouse Gas Emissions and Evaluating their Significance".



- 2. the consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the EIA Directive – e.g. population, fauna, soil, etc.; and
  - 3. GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from a project might be considered to be significant.
- 4.16 Based on these principles, IEMA conclude that:
- 1. all projects create GHG emissions that contribute to climate change;
  - 2. climate change has the potential to lead to significant environmental effects; and
  - 3. there is a GHG emission budget that defines a level of dangerous climate change whereby any GHG emission within that budget can be considered as significant.
- 4.17 Therefore, in the absence of any significance criteria or a defined threshold, IEMA recommends that all GHG emissions are significant and that the EIA should ensure the project addresses their occurrence by taking mitigating action.
- 4.18 In terms of mitigation, IEMA recommends that mitigation should in the first instance seek to avoid GHG emissions. Where GHG emissions cannot be avoided, the development should aim to reduce the residual significance of a project's emissions at all stages. Where GHG emissions remain significant, but cannot be farther reduced approaches should be considered that compensate the project's remaining emissions.

## 5 Baseline Conditions

### Construction

- 5.1 The baseline embedded carbon for construction relates to the existing buildings on the site. There are a number of existing buildings on the site, which will be demolished. Any embedded carbon in the demolition materials is not additional to this project and a worst case assumption is taken that none of the materials are recycled or reused and therefore the baseline embedded carbon is assumed as zero.

### Operation

- 5.2 In terms of the baseline setting, the IEMA guidance acknowledges that baseline energy use and transport data for an existing building can be very difficult to calculate and recommends that baseline either be considered to be zero, or an alternative baseline can be considered, whereby GHG emissions from an alternative development or building design are considered. In this case, are no data available on the existing transport and energy use of the Site and, for the purposes of this assessment, a worst case assumption is used whereby the baseline transport and energy emissions are assumed to be zero.
- 5.3 In reality, the existing football stadium and David Lloyds leisure centre at the Site will contribute GHG emissions from transport movements to and from the site (in particularly private car trips) as well as from existing energy plant (likely to be in the form of gas-fired boiler plant) used to provide heat and hot water to the facilities. The assumption that the baseline GHG emissions are zero therefore represents a very much worst-case assessment.
- 5.4 A summary of the estimated baseline GHG emissions is provided in Table 5

**Table 5: Summary of Baseline GHG Emissions**

Development Phase		Baseline CO <sub>2</sub> e Emissions (tonnes/annum)	Comment/Rationale
Construction		0	Assumes that no materials in existing buildings are recycled or reused.
Operation	Transport	0	The baseline transport emissions are assumed to be zero (worst case assumption).
	Energy	0	The baseline energy emissions are assumed to be zero (worst case assumption).
	Total	0	Construction + Operation

- 5.5 The total assumed baseline GHG emissions are 0 tonnes/annum CO<sub>2</sub>e.

## 6 Likely Significant Effects

### Calculation of GHG Footprint

#### Construction – Embedded Carbon

6.1 The GIA for the residential element of the Proposed Development is 81,186 m<sup>2</sup>, and the GIA for the stadium including medical/commercial uses is 9,647 m<sup>2</sup>. To calculate the embedded carbon from construction, this total GIA is multiplied by the carbon factor obtained from RICS (Figure 1) that is judged to be most appropriate, as presented in Table 3. The calculation of the embedded carbon in the development is therefore:

Residential GIA (81,186 m<sup>2</sup>) x Carbon Factor (860 kgCO<sub>2</sub>e/m<sup>2</sup>) = 69,820 tonnes CO<sub>2</sub>e.

Stadium and medical/commercial GIA (9,647 m<sup>2</sup>) x Carbon Factor (3,250 kgCO<sub>2</sub>e/m<sup>2</sup>) = 31,353 tonnes CO<sub>2</sub>e.

**Total = 101,173 tonnes CO<sub>2</sub>e.**

6.2 The total embedded CO<sub>2</sub>e emissions for the Proposed Development are 101,173 tonnes.

6.3 Since the Development is to be constructed on land that is already developed, and does not lead to a loss in habitat, no land use change GHG emissions<sup>19</sup> are assumed to occur.

#### Construction – Transport

6.4 In addition to the embedded carbon in the materials used for construction, GHG emissions will be created by transportation of materials to site and operation of onsite plant and machinery. These emissions are typically materially smaller than embedded GHG emissions. Guidance from the Building Research Establishment (BRE) indicates 1,400 kg of CO<sub>2</sub>e per £100,000 of project value.

6.5 The project value for the Proposed Development has been provided by the Applicant. To reflect uncertainty in this figure given the current stage of design and pre-planning submission, a worst-case value has been assumed, which would result in construction transport GHG emissions of 2,500 tonnes of CO<sub>2</sub>e.

#### Operation – Transport

6.6 The assessment of transport related GHG emissions for the Proposed Development in the opening year are presented in Table 10. The transport data used in the assessment has been provided by Vectos, and has been split into work, education, leisure, and football trips.

<sup>19</sup> Land use change can result in GHG emissions for example by the removal of habitats (e.g. trees) that act as carbon sinks.

6.7 The assessment of transport-related GHG emissions multiplies GHG emission factors published by BEIS<sup>15</sup> and adjusted to the year 2021 for each mode of travel (see Table 4) by the distance travelled (obtained from the Transport Consultant), as reproduced in Table 6, Table 7, Table 8, Table 9, and the total GHG emissions presented in Table 10 below.

**Table 6: Assessment of Proposed Development GHG Emissions from Workplace Transport**

Mode	Workplace Travel GHG Emissions	
	Distance Travelled per Annum (km)	CO <sub>2</sub> e Tonnes (per annum) <sup>a</sup>
	2021	2021
National Rail	1,380,967	52.2
Bus	157,620	18.7
Taxi / Other	39,217	7.7
Car	4,652,228	773.8
Motorcycle	40,737	4.4
Cycle	87,177	0.0
Walk	65,944	0.0
<b>Total</b>	<b>6,423,890</b>	<b>856.9</b>

<sup>a</sup> CO<sub>2</sub>e emissions are calculated by multiplying distance travelled by CO<sub>2</sub>e factors by mode from Table 4.



**Table 7: Assessment of Proposed Development GHG Emissions from Education Transport**

Mode	Education Travel GHG Emissions	
	Distance Travelled per Annum (km)	CO <sub>2</sub> e Tonnes (per annum) <sup>a</sup>
	2021	2021
National Rail	132,262	5.0
Bus	141,761	16.8
Taxi / Other	0	0.0
Car	407,781	67.8
Motorcycle	0	0.0
Cycle	12,216	0.0
Walk	121,339	0.0
<b>Total</b>	<b>815,359</b>	<b>89.6</b>

<sup>a</sup> CO<sub>2</sub>e emissions are calculated by multiplying distance travelled by CO<sub>2</sub>e factors by mode from Table 4.

**Table 8: Assessment of Proposed Development GHG Emissions from Leisure Transport**

Mode	Leisure Travel GHG Emissions	
	Distance Travelled per Annum (km)	CO <sub>2</sub> e Tonnes (per annum) <sup>a</sup>
	2021	2021
National Rail	1,217,874	46.1
Bus	395,692	46.9
Taxi / Other	159,347	31.5
Car	7,901,468	1,314.3
Motorcycle	60,533	6.6
Cycle	127,517	0.0
Walk	296,977	0.0
<b>Total</b>	<b>10,159,407</b>	<b>1,445.2</b>

<sup>a</sup> CO<sub>2</sub>e emissions are calculated by multiplying distance travelled by CO<sub>2</sub>e factors by mode from Table 4.

**Table 9: Assessment of Proposed Development GHG Emissions from Football Transport**

Mode	Football Travel GHG Emissions	
	Distance Travelled per Annum (km)	CO <sub>2</sub> e Tonnes (per annum) <sup>a</sup>
	2021	2021
National Rail	1,217,874	46.1
Bus	395,692	46.9
Taxi / Other	159,347	31.5
Car	7,901,468	1,314.3
Motorcycle	60,533	6.6
Cycle	127,517	0.0
Walk	296,977	0.0
<b>Total</b>	<b>10,159,407</b>	<b>1,445.2</b>

<sup>a</sup> CO<sub>2</sub>e emissions are calculated by multiplying distance travelled by CO<sub>2</sub>e factors by mode from Table 4.

**Table 10: Overall Assessment of GHG Emissions from Transport**

Mode	Distance Travelled per Annum (km)		CO <sub>2</sub> e Tonnes (per annum) <sup>a</sup>		
	Baseline	Proposed Development	Baseline	Proposed Development	Net Emissions
	2019	2021	2019	2021	
National Rail	0	3,948,977	0	149	149
Bus	0	1,090,765	0	129	129
Taxi / Other	0	357,910	0	71	71
Car	0	20,862,944	0	3,470	3,470
Motorcycle	0	161,803	0	18	18
Cycle	0	354,427	0	0	0
Walk	0	781,237	0	0	0
<b>Total</b>	<b>0</b>	<b>27,558,063</b>	<b>0</b>	<b>3,837.0</b>	<b>3,837.0</b>

<sup>a</sup> CO<sub>2</sub>e emissions are calculated by multiplying distance travelled by CO<sub>2</sub>e factors by mode from Table 4.

### Operation – Energy Consumption

- 6.8 The CO<sub>2</sub> emissions from energy consumption of the Proposed Development are described in the Energy Assessment<sup>17</sup> which accompanies the planning application.
- 6.9 The Energy Assessment compares the Proposed Development to a notional “baseline” of compliance with Part L Building Regulations.
- 6.10 Table 11 summarises the improvement in performance for the Proposed Development for regulated CO<sub>2</sub> emissions, taking into account measures to address Part L1A and Part L2A of the building regulations<sup>20 21</sup> which requires a minimum improvement of 19% in the Dwelling Emission Rate over the Target Emission Rate for the residential section, and the non-residential section must comply with BREEAM standards.

**Table 11: Assessment of CO<sub>2</sub> Emissions from Energy Consumption**

Regulated Emissions	Regulated residential (Tonnes CO <sub>2</sub> per annum)	Regulated non-residential (Tonnes CO <sub>2</sub> per annum)	Site-wide (Tonnes CO <sub>2</sub> per annum) <sup>a</sup>
No energy strategy assuming Part L compliance	1,226	127	1,353
% Improvement	26.1%	20.2%	25.6%
With Energy Strategy	906	101	1,007

<sup>a</sup> Based on calculated values from the addition of the residential and non-residential improvements.

- 6.11 Table 11 shows that the Development will achieve a 25.6% improvement in carbon emissions over Part L 2013 compliance and therefore exceeds the improvement criteria set out in Part L1A and L2A of the building regulations. The residential section will achieve the minimum standards to comply with a Level 4 development within the policy CS22 in the Woking Climate Change SPD<sup>10</sup>.

### Total GHG Emission Footprint

- 6.12 Table 12 and Figure 2 summarise the GHG emissions for the Proposed Development in the opening year for each footprint element. The GHG emissions from embedded materials used in construction are annualised assuming a 60 year life. Annualising the embedded GHG emissions allows them to be compared on a like-for-like basis to the operational GHG emissions which are reported on a per annum basis.

<sup>20</sup> HM Government, 2010. The Building Regulations. Conservation of fuel and power L1A

<sup>21</sup> HM Government, 2010. The Building Regulations. Conservation of fuel and power L2A

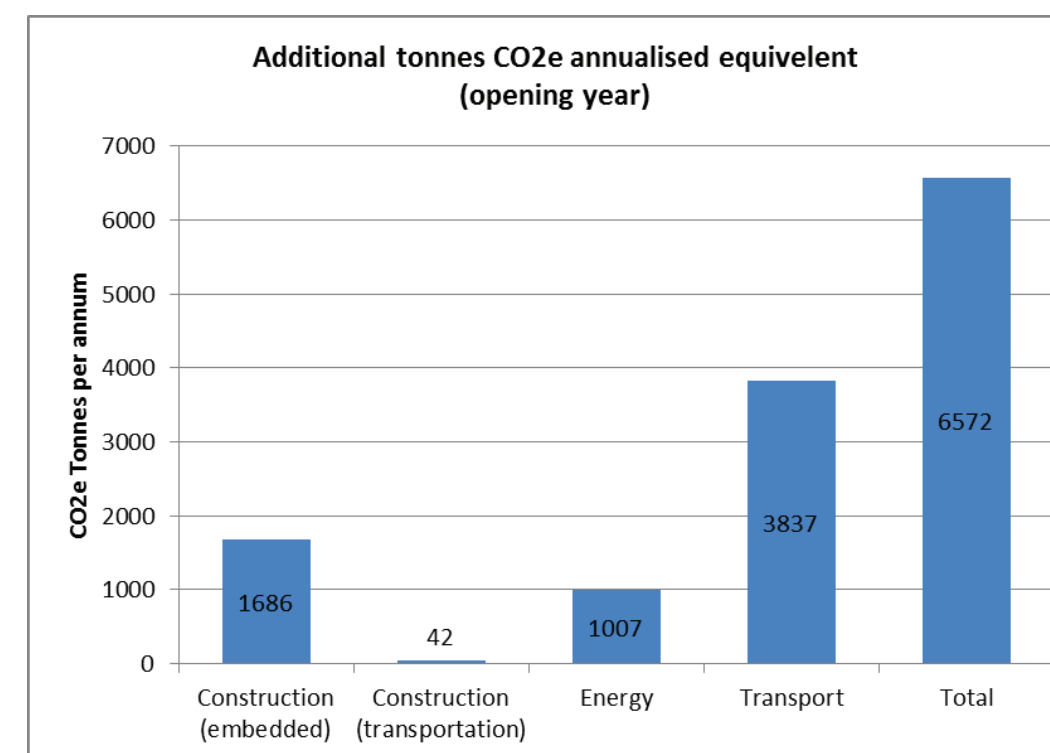
**Table 12: GHG Footprint for Proposed Development for Opening Year<sup>a</sup>**

Development Phase	Footprint Element	Tonnes of CO <sub>2</sub> e/annum		
		Baseline	Opening Year	Net Emissions
Construction	Embedded	0	1,686 <sup>b</sup>	1,686
	Transport	0	42 <sup>c</sup>	42
Operation	Transport	0	3,837	3,837
	Energy	0	1,007	1,007
<b>Total</b>		<b>0</b>	<b>6,572</b>	<b>6,572</b>

<sup>a</sup> All figures are rounded

<sup>b</sup> Total embedded emissions from construction (101,173 tonnes – see paragraph 6.2) divided by 60 year.

<sup>c</sup> Total transport emissions from construction (2,500 tonnes – see paragraph 6.5) divided by 60 year lifetime.



**Figure 2: Change in GHG Emissions for the Proposed Development in the Opening Year**

### Assessment of Significant Effects

- 6.13 IEMA guidance recommends any increase should be considered significant with a focus on mitigation through the following principles:



- a. seeking to avoid any increases at source and putting in place measures to reduce any residual emissions; and
  - b. compensating for any remaining emissions as far as possible.
- 6.14 IEMA guidance<sup>22</sup> makes clear that any increase in GHG emissions should be considered to be significant and therefore the GHG emissions from the Proposed Development are considered significant.

<sup>22</sup> IEMA, 2017, "Assessing Greenhouse Gas Emissions and Evaluating their Significance".

## 7 Mitigation

- 7.1 Mitigation adopted by the Proposed Development is described in this section for each element of the GHG footprint.

### Construction

- 7.2 Reducing GHG emissions from the construction phase should be focussed on procurement of sustainable materials, with consideration to the carbon footprint of the material from the extraction of raw materials, to production of construction products and the transport of products from factory to site. **ES Volume 1, Chapter 15: Mitigation and Monitoring** presents the environmental management and mitigation measures that the Applicant is committed to implementing throughout the demolition and construction works to, either eliminate, or reduce the significant of any likely environmental effects.

### Construction Activities

- 7.3 A Site Waste Management Plan (SWMP) will be developed prior to construction, outlining waste management plans for excavation and construction onsite. Opportunities to retain and reuse material generated by the site enabling works will be explored and exploited where available.
- 7.4 The selection of sustainable material with a low environmental impact and their sustainable procurement are to be a key parameter in the specification of material, together with their end-of-life disposal. Consideration will be given to materials specified, with the BRE's Green Guide to Specification and Environmental Product Declaration (EPDs) as methods available to guide this process.
- 7.5 Materials are to be locally sourced, and from recycled sources where viable and in line with the proposed design intent. Full consideration of the sites environmental context when specifying external materials will be given, providing long-lasting robust landscape. The design team will investigate various constructability techniques, including pre-fabrication and end-of-life disassembly.

### Operation

#### Transport

- 7.6 A Residential Travel Plan<sup>23</sup> (RTP) has been developed for the Proposed Development which sets out an overarching strategy; *"to ensure that travel made by residents and visitors of the site is carried out in the most sustainable means possible."*

<sup>23</sup> Vectos, 2019, Residential Travel Plan

7.7 To support the overarching objective, the following measures will be introduced:

- Create a legible, enjoyable and convenient hierarchy of routes into and around the site;
- encourage walking and cycling through a permeable network of streets and pedestrian/cycle routes and to facilitate easy access to bus services, thus making internal car use unnecessary;
- a total of 2,084 cycle parking spaces will be provided for the residential aspect of the development;
- there will be 7 points of pedestrian access and 3 points of cyclist access. Pedestrians will be able to access the site from all directions, whilst cyclist access will be from the north and west;
- all first new residents of the development will be given the option to receive a free week's travel voucher on local bus services. The TPC will also engage with local rail operators to investigate the possibility of extending the offer to rail vouchers;
- as part of the development all flats will have access to a folding Bike. There will be adequate cupboard storage space for these to be stored which will also include a plug for electric bike charging;
- the provision of car clubs encourages residents to adopt more sustainable travel habits and reduce overall levels of car ownership, with the knowledge that should an emergency arise, or the need to run an errand, collect a parcel, or vary their journey in another way, there is a flexible option which can be used as required on-demand.;
- the Travel Plan Co-ordinator will organise Personal Travel Planning (PTP) within the development. This focuses on individual households and how they can make sustainable travel choices given their specific lifestyles and needs. PTP will be offered to new households free of charge by the Site Owner;
- residents will be provided with information and advice concerning safe cycle routes to the Site, and the TPC will promote the health and economic benefits of cycling through the use of campaigns, such as National Bike Week; and
- the TPC will promote and raise awareness of the potential time, cost and environmental savings of home deliveries. All parcel deliveries will be collected at the community concierge, reducing the need for light goods vehicles to enter the Site.

7.8 A Matchday Travel Plan has also been produced to *"to reduce the proportion of travel undertaken by single occupancy cars, thus increasing travel by sustainable modes (including car sharing)"*. Measures to encourage sustainable travel include:

- Wayfinding signs for pedestrians will be erected at key locations around the stadium to indicate key off-site pedestrian routes. Information on the most direct pedestrian routes between the stadium and the town centre / railway station / park and walk locations will be promoted and made available to all ticket holders;
- cycle parking will be provided in convenient locations around the stadium. The exact number of cycle parking spaces to be provided will be agreed with the Council;
- travel information including bus and train timetables and fare information, and car sharing app information will be provided to visitors of the site to encourage sustainable travel; and
- the TPC will endeavour to promote sustainable travel to and from the stadium to all spectators and will maintain communications by the following methods:
  - Media release;
  - Newsletter;
  - Woking FC website;
  - Ticket information;
  - Use of Woking FCs social media pages / coverage to inform visitors of any changes; and
  - Text messages / email / social media.

### **Energy Consumption**

7.9 The design team have worked extensively on the energy strategy of the Development using the 'Be Lean', 'Be Clean', and 'Be Green' hierarchy to improve energy efficiency where possible<sup>17</sup>.

7.10 The Development achieves an overall total on-site carbon reduction of 25.6% relative to Part L of the Building Regulations, which complies with the Part L1A and L2A building regulations. To achieve to reductions, the following measures are proposed to minimise energy consumption, as set out in the Energy Strategy<sup>17</sup> and Sustainability Statement<sup>24</sup>:

- The proposed building fabric is designed to exceed the minimum fabric requirements of Building Regulations Part L, where possible and feasible. Building fenestration balances the need of good daylight, without leading to excessive summer time solar gain;
- the project is designed for natural ventilation, when climate allows, with mechanical ventilation with heat recovery (MVHR) systems providing ventilation when natural ventilation is not appropriate; and

<sup>24</sup> Elementa, 2019, Woking Football Club: Sustainability Strategy Report



- a range of low and zero carbon technologies will be implemented including Air Source Heat Pumps and photovoltaics.

7.11 Within the flexible use elements of the Proposed Development, spaces will be constructed to include very high levels of insulation and low air leakage, and a BREEAM rating of “Very Good” is targeted.

7.1 Facilities throughout the development will be provided with recycling facilities that will allow for source separation of waste within dwellings and non-residential buildings. This will cause indirect reductions in GHG emissions through reduced GHG emissions within the manufacturing process of goods.

7.2 The Sustainability Statement provides further details in respect of these mitigation measures.

**Mitigation Summary**

7.3 Table 13 sets out an assessment of the Proposed Development’s approach to mitigation against the mitigation principles described in IEMA guidance (as discussed in paragraph 6.13), to avoid and reduce GHGs where practicable.

**Table 13: Proposed Development Approach to Mitigation in Accordance with IEMA Mitigation Principles**

Development Phase	Avoid and Reduce GHGs
Construction	Reuse of material on site where possible. Minimising waste to landfill. Good practice measures to minimise energy use from construction activities.
Operation: Transport	Cycle and pedestrian access to the site including cycle parking for both the residential and stadium sections. Promotion of sustainable travel uses to residents and event visitors.
Operation: Energy	Suite of measures to ensure highly energy efficient buildings. On-site measures to be lean, be clean and be green will lead to a 25.6% reduction in GHG emissions compared to the Part L Baseline energy consumption.

**8 Residual Effects**

8.1 The mitigation measures described in Section 7 will be implemented to minimise the GHG emissions during construction and throughout the lifetime of the Proposed Development, however, a net increase in GHG emissions against the baseline GHG emissions, as summarised in Table 12 and Figure 2, will remain. It is expected that GHG emissions from transport will reduce throughout the Proposed Development’s lifetime due to decarbonisation of the electricity grid and increase in low and zero-carbon emission vehicles.

8.2 IEMA guidance makes clear that any increase in GHG emissions should be considered significant; however, the mitigation provided follows best practice and is in accordance with relevant local, regional and national policy on climate change. It is therefore judged that although the residual effects are described as significant these have been minimised through an appropriate degree of mitigation consistent with best practice and IEMA guidance.

**9 Summary**

9.1 The GHG assessment has identified that the Proposed Development will lead to GHG emissions, which are described as significant in accordance with IEMA best practice guidance on the assessment of GHGs for EIA. Mitigation is provided to avoid and reduce the GHG emissions, which follows the key principles of GHG mitigation in the IEMA guidance and is consistent with the requirements of relevant policy.

## 10 Glossary

<b>AQC</b>	Air Quality Consultants
<b>BRE</b>	Building Research Establishment
<b>CEMP</b>	Construction Environmental Management Plan
<b>CO<sub>2</sub>e</b>	Carbon Dioxide Equivalent
<b>EIA</b>	Environmental Impact Assessment
<b>EST</b>	Energy Saving Trust
<b>GHG</b>	Greenhouse Gas
<b>GIA</b>	Gross Internal Area
<b>IEMA</b>	Institute of Environmental Management and Assessment
<b>LZC</b>	Low and Zero Carbon
<b>PIR</b>	Passive Infrared Sensor
<b>RICS</b>	Royal Institution of Chartered Surveyors
<b>RTP</b>	Residential Travel Plan

## 11 Appendices

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## A1 Professional Experience

### **Laurence Caird, MEarthSci CSci MEnvSc MIAQM**

Mr Caird is an Associate Director at Air Quality Consultants Ltd with over 13 years' experience in the field of air quality and greenhouse gas assessment and management. He has been responsible for the production of air quality assessments for a wide range of projects and has produced carbon footprints and greenhouse gas assessments for a number of projects including EIA residential, commercial and mixed-use developments, industrial facilities and airports. Mr Caird is a member of the Institute of Air Quality Management and the Institution of Environmental Sciences, and is a Chartered Scientist.

### **Pauline Jezequel, MSc MEnvSc MIAQM**

Miss Jezequel is a Principal Consultant with AQC with nine years' relevant experience. Prior to joining AQC she worked as an air quality consultant at AECOM. She has also worked as an air quality controller at Bureau Veritas in France, undertaking a wide range of ambient and indoor air quality measurements for audit purposes. She now works in the field of air quality assessment, undertaking air quality impact assessments for a wide range of development projects in the UK and abroad, including for residential and commercial developments, transport schemes (rail, road and airport), waste facilities and industrial sites. Miss Jezequel has also undertaken a number of odour surveys and assessments in the context of planning applications. She has experience in monitoring construction dust, as well as indoor pollutant levels for BREEAM purposes.

### **David Bailey, BSc (Hons)**

Mr Bailey is an Assistant Consultant with AQC, having joined the Company in 2018. Prior to joining AQC he gained a degree in Environmental Science from the University of Brighton, where his studies included modules focused on Air Quality Management. He is now gaining experience in the field of air quality monitoring and assessment.

Full CVs are available at [www.aqconsultants.co.uk](http://www.aqconsultants.co.uk).

## **Annex 5: Trium's Climate Change Note**





# Climate Change Technical Note

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## 1. Introduction

- 1.1** This technical note describes a future climate scenario which has been developed using the future climate projections data published by the Met Office (UKCP18) in November 2018. UKCP18 projections consider the climate effects arising from a series of 'Representative Concentration Pathways' (RCP) emissions scenarios.
- 1.2** The purpose of this technical note is to present projection data for the future climate and to provide guidance to the EIA technical team on how to consider whether the effects of the Proposed Development (defined under the current climate conditions) may alter under the future climate scenario. In the context of the future climate condition, consideration needs to be given to:
- the change in the magnitude of impact of the Proposed Development;
  - receptor vulnerability;
  - vulnerability of the Proposed Development; and
  - resilience of the Proposed Development.

### Climate Projections

- 1.3** UKCP18 gives probabilistic projections<sup>1</sup> for a number of atmospheric variables, with different temporal and spatial averaging, for several future time periods, under four different future RCP emissions scenarios.
- 1.4** In general, the longer the lifetime of a development, the greater the uncertainty about the impact of climate change over time. Uncertainty is dealt with by presenting projections which are probabilistic in nature, and which give the probability of different climate outcomes.
- 1.5** To make use of the probabilistic projections, an emissions scenario and percentile outcome (i.e. the likelihood of the change in climate occurring) needs to be identified.
- 1.6** Once the emissions scenario and probabilistic projection have been identified, then this future climate projection should be used by all technical disciplines contributing to the Environmental Impact Assessment (EIA), to ensure consistency in approach.
- 1.7** The emissions scenario and climate projection utilized for this EIA are detailed within this document.

### Emission Scenarios

- 1.8** The RCP emission scenarios represent four distinct pathways (RCP2.6, RCP4.5, RCP6.0 and RCP8.5) developed for long-term and near-term climate modelling and provide time-dependant projections of atmospheric greenhouse gas concentrations. These pathways were developed based on a literature review of current climate modelling research and have been chosen to represent the full range of climate outcomes presented within the literature.
- 1.9** The emission scenarios represent assumptions in terms of climate policy, land use and technological development, with RCP2.6 representing the 'optimum' emission scenario (i.e. measures aimed at achieving the maximum reduction in GHG emissions).
- 1.10** At the other end of the scale, RCP8.5 assumes the highest emission scenario. It assumes that technological development will slow and that there will be little to no decarbonization of world power from new technology. It also assumes that no further climate mitigation or regulations to reduce climate change or air pollution will be implemented. Whilst this is possible, it is unlikely considering current global trends towards more rigorous climate policy and regulation and the progress in technological innovation and efficiency. RCP8.5 assumes that several long-term trends reverse or change significantly, for this reason RCP8.5 is not considered a reasonable scenario.

<sup>1</sup> Probabilistic projections give a range of possible climate change outcomes and their relative likelihoods i.e. unlikely, likely or very likely ranging across 10th to 90th percentiles.

- 1.11** More information on the RCPs can be found in the UKCP18 Guidance: Representative Concentration Pathways<sup>2</sup>.

### Adopted Emissions Scenario: RCP6.0

- 1.12** RCP6.0 has been used in the climate projections presented in this technical note as it represents the most reasonable emissions scenario with regards to climate policy, land use, and technological development.
- 1.13** The Intergovernmental Panel on Climate Change (IPCC)<sup>3</sup> reports between 2.0 and 3.7°C increase in temperature by 2100 for RCP6.0. Considering that current climate policies indicate 3.4°C of warming by 2100<sup>4</sup>, and global trends are moving towards better climate mitigation, policy and technology, this RCP has been identified as the most reasonable emission scenario for identifying future climate change projections.

<sup>2</sup> UKCP18 Guidance: Representative Concentration Pathways  
<https://www.metoffice.gov.uk/binaries/content/assets/mohippo/pdf/ukcp18/ukcp18-guidance-rcp.pdf>

<sup>3</sup> Intergovernmental Panel on Climate Change AR5 WG1  
[http://www.climatechange2013.org/images/report/WG1AR5\\_ALL\\_FINAL.pdf](http://www.climatechange2013.org/images/report/WG1AR5_ALL_FINAL.pdf)

<sup>4</sup> CAT warming projections <https://climateactiontracker.org/global/cat-thermometer/>



## 2. Approach to Assessment

1.14 These steps provide a guide to assessing climate change within the EIA. More information and guidance can be found in references listed in appendix C.

### Step 1: Define the Future Climate Condition

1.15 Within the ES chapter template, towards the end of the chapter you will see a section titled 'Climate Change'. Within this section of the chapter, firstly identify the climate variables that are relevant to your assessment. So, for example, the variables of relevance might be 'wind', 'temperature', 'humidity' etc.

1.16 The next stage is to determine how these variables change under the future climate scenario based on the information presented in appendix A. The future climate condition should be discussed in terms of the 50% probability level, but also acknowledge the predicted extremes at the 10% and 90% probability levels.

1.17 This stage defines the future climate condition that is relevant to your assessment.

### Step 2: Define Receptor Vulnerability

1.18 Receptors that have been identified for inclusion within the technical assessment need to be considered in terms of their vulnerability<sup>5</sup> (i.e. susceptibility or resilience to change) to changes in the future climate. The vulnerability of the resource / receptors (including identifying individual receptors / sub-groups) should be defined using the definitions provided below.

1.19 Vulnerability of a receptor should generally be defined as follows and presented in tabular format:

- **High vulnerability:** the receptor is directly dependent on existing and/or prevailing climatic factors, and reliant on these specific existing climate conditions continuing in future (e.g. river flows and groundwater level); or only able to tolerate a very limited variation in climate conditions.
- **Moderate vulnerability:** the receptor is dependent on some climatic factors, but able to tolerate a range of conditions (e.g. a species which has a wide geographic range across the entire UK).
- **Low vulnerability:** climatic factors have little influence on receptors.

1.20 Table 1 provides an example of receptor sensitivity and vulnerability presented within a table.

<sup>5</sup> Please note that 'receptor sensitivity' is different to the consideration of 'vulnerability'. Reference to **sensitivity** of a resource / receptor in the EIA assessment reflects the receptor's **value** in terms of its quality or condition, and expresses its **proneness** to being potentially impacted through a change in the existing environment (i.e. existing climate conditions) in which it resides, as a result of the implementation of a Proposed Development.

**Vulnerability** is defined as a receptor's **susceptibility** or **resilience** to a change in climate (i.e. change in the existing environment).

By way of an example to highlight this difference, a highly sensitive receptor does not mean that it is highly vulnerable to climate change, while conversely a low sensitive receptor may be highly vulnerable to climate change.

Taking account of receptor vulnerability within the assessment requires consideration of whether climate change will alter the existing environment (i.e. existing climate conditions) within which the resource / receptor resides, and as a result, making a judgement as to whether climate change will alter the magnitude of the impact (defined under the current climate conditions) experienced by the resource / receptor (based on its vulnerability) because of the implementation of the Proposed Development.

The higher the vulnerability of an individual resource / receptor to climate change, the greater the change in the magnitude of the impact.

For example, climate change alters the environment and for a high vulnerability receptor, results in amplifying the impact (of the Proposed Development) experienced by the receptor.

Conversely, an individual resource / receptor with a greater resilience (low vulnerability) to changes in the existing climate conditions is not likely to experience a change in the impact experienced as a result of the Proposed Development (i.e. no change in the magnitude of impact).

Please also note that there may be instances when a broad description of a resource / receptor group may comprise of sub-groups which may vary in their vulnerability to climate change. Where relevant, individual resource / receptors may need to be identified and considered as part of the climate change assessment.

Table 1. Summary of Receptor Sensitivity and Vulnerability for Assessment

Resource / Receptor (include as groups or as individual receptors as relevant)	Sensitivity (as per standard EIA criteria)	Vulnerability (as per the criteria cited above)

### Step 3: Magnitude of Impact, Nature and Scale of Effects and Effect Significance

1.21 Consider whether the magnitude of impact and resultant nature and scale of the effects of the Proposed Development (as defined earlier on in your chapter) during the operational phase will be worse or improved under the future climate conditions, and whether the changes alter the overall significance of effects identified for the Proposed Development, without climate change.

1.22 In most cases, there is likely to be an absence of published, accepted quantifiable methods for considering climate change effects for technical topics.

1.23 As such, this 'assessment' is likely to be qualitative and based on professional opinion which draws on the information available and acknowledges the level of uncertainty surrounding climate change projections.

1.24 Present your assessment as a narrative. Tables and supporting figures can be presented if helpful but are not essential. Appendix B gives examples of calculating the effect.

### Step 4: Identify any Mitigation Needed

1.25 If you identify any adverse significant effects (as a result of the impact of climate change), you will then need to identify appropriate mitigation.

1.26 When considering the adoption of mitigation to address any significant effects arising from changes in climate, consideration should be given to when the mitigation might be most usefully implemented over the duration of the scheme.

1.27 Mitigation measures include identifying appropriate resilience and adaptive management measures.

1.28 Resilience measures include design features (e.g. habitable rooms within residential units located above the flood level which accounts for climate change) and construction materials (e.g. materials resistant to increases in temperature), to provide an appropriate resilience to changes in the existing climatic conditions, as well as occurrences of extreme weather.

1.29 Adaptive management measures allow for the uncertainty surrounding climate change and its impact to be accounted for. Consideration should be given as to whether there are opportunities to introduce mitigation measures later into the project when there is more certainty over future climate projections. These measures could be secured through a commitment to prepare a management plan / strategy (or equivalent) which would periodically review the need for such measures and their integration into the scheme if / when required.

1.30 Where mitigation is proposed, consideration of the effectiveness of the measures should be taken into account, with reference to the resulting magnitude of impact and the resulting residual effect and its significance.

### 3. The Future Climate Condition for EIA

1.31 A summary of the future climate projections based on RCP6.0 is presented in appendix A and described below for the climatic variables temperature, precipitation, and total cloud cover. Table 2 provides a breakdown of the data provided for each climatic variable in appendix A. UKCP18 data for wind is not yet available, so UKCP09 data has been presented.

**Table 2. Climatic variables for which future climate projection data is provided**

Climatic Variable	Climate Projection	Variable	Temporal Average
Temperature	UKCP18 RCP6.0	Mean	Annual
			Seasonal
		Mean Daily Max	Annual
			Seasonal
		Mean Daily Min	Annual
			Seasonal
Precipitation	UKCP18 RCP6.0	Mean	Annual
Wind*	UKCP09 A1B	Mean	Annual
			Seasonal
Total Cloud	UKCP18 RCP6.0	Mean	Annual
			Seasonal

\*Note: UKCP18 probabilistic data for wind is not available, nor any RCP6.0 data for wind through alternative projections. For this reason, UKCP09 wind data has been presented for the A1B scenario, as it is comparable to RCP6.0.

#### Future London Climate Condition

1.32 The following description provides a high level overview of the future climate in London in 2100 under the UKCP18 using RCP6.0. Appendix A provides the data underlying this description.

#### Temperature<sup>6</sup>

1.33 Changes in temperature can have implications for the built and natural environment, built infrastructure, and human health. Increases in temperature can lead to impacts on human health, especially in urban areas such as London, where buildings can retain heat, leading to increased night-time temperatures. This is of particular interest when assessing developments within London, with its urbanised character and high population density.

1.34 The projected trends of climate changes in the 21<sup>st</sup> century indicate a move towards warmer, wetter winters and hotter, drier summers. Probabilistic projections show that there will be more warming in the summer than in the winter.

1.35 In summer, there is a pronounced north / south contrast when considering temperature changes, with greater increases in maximum summer temperatures over the southern UK compared to northern Scotland.

#### Precipitation<sup>7</sup>

1.36 Precipitation can have significant socioeconomic impacts on various timescales, and can have implications related to pluvial or surface flooding as surface run-off inundates the urban landscape. Flooding is one of the most socially and economically disruptive hazards within the UK, and has impacts on energy supply, transport and infrastructure.

1.37 Year to year, a high level of variability in precipitation has been observed, with a slight overall increase in UK winter precipitation over the last few decades.

1.38 Probabilistic projections show that while the probability of dry summers increases, the probability of wet summers reduces only slightly. Trends indicate drier summers, with reductions in rainfall largest in the south of England.

#### Wind<sup>8</sup>

1.39 Wind data is not available for RCP6.0, nor probabilistic projections for any of the RCP emissions scenarios. UKCP09 A1B data has been presented in appendix A.

1.40 UKCP18 guidance reports no significant trends in 'storminess', which is determined by maximum gust speeds, from the UK over the last four decades. Global projections over the UK suggest an increase in near surface wind speeds for the half of the 21<sup>st</sup> century during the winter. An increase in frequency of winter storms is also predicted. It should be noted that the increase in wind speed is modest compared to the variability observed.

#### Summary

1.41 This note provides a future climate condition for the technical assessment of the Proposed Development in relation to climate change. It has been developed to ensure consistency across the technical topics covered in the EIA.

1.42 The data provided within this technical note is up to date to 5th December 2018. It is acknowledged that more information will become available on the UKCP18 interface, and revision of this note shall be provided as appropriate.

<sup>6</sup> UKCP18 Factsheet: Temperature (2018) <https://www.metoffice.gov.uk/binaries/content/assets/mohippo/pdf/ukcp18/ukcp18-factsheet-temperature.pdf>

<sup>7</sup> UKCP18 Factsheet: Precipitation (2018) <https://www.metoffice.gov.uk/binaries/content/assets/mohippo/pdf/ukcp18/ukcp18-factsheet-precipitation.pdf>

<sup>8</sup> UKCP18 Factsheet: Wind <https://www.metoffice.gov.uk/binaries/content/assets/mohippo/pdf/ukcp18/ukcp18-factsheet-wind.pdf>



## Appendix A: Future Climate Projection Data

Table 3. UKCP18 Future Climate Projections: RCP6.0 Emissions Scenario

Climate Variable	Predicted Change from Baseline 2080s			Absolute Values 2080s		
	10 <sup>th</sup> Percentile	50 <sup>th</sup> Percentile	90 <sup>th</sup> Percentile	10 <sup>th</sup> Percentile	50 <sup>th</sup> Percentile	90 <sup>th</sup> Percentile
<b>Mean Air Temperature</b>	°C	°C	°C	°C	°C	°C
Annual Average	1.51	2.94	4.53	11.96	13.39	14.98
Winter Average	0.91	2.48	4.2	5.53	7.10	8.82
Spring Average	0.75	2.13	3.52	9.94	11.32	12.71
Summer Average	1.48	3.9	6.43	18.16	20.58	23.11
Autumn Average	1.32	3.11	5.01	12.53	14.32	16.22
<b>Maximum Air Temperature</b>	°C	°C	°C	°C	°C	°C
Annual Average	1.34	3.1	5	15.45	17.21	19.11
Winter Average	0.91	2.41	3.98	8.23	9.73	11.30
Spring Average	0.64	2.43	4.21	13.83	15.62	17.40
Summer Average	1.32	4.45	7.84	22.50	25.63	29.02
Autumn Average	0.85	3.21	5.89	15.69	18.05	20.73
<b>Minimum Air Temperature</b>	°C	°C	°C	°C	°C	°C
Annual Average	1.22	2.89	4.77	7.84	9.51	11.39
Winter Average	0.76	2.58	4.62	2.58	4.40	6.44
Spring Average	0.67	2.26	4.05	5.72	7.31	9.10
Summer Average	1.5	3.6	5.88	13.43	15.53	17.81
Autumn Average	1.03	3.19	5.53	8.60	10.76	13.10
<b>Precipitation</b>	%	%	%	mm / day	mm / day	mm / day
Annual Average	-6.21	-0.53	5.21	1.64	1.74	1.84
Winter Average	-2.51	16.23	36.76	1.69	2.02	2.37
Spring Average	-13.82	-5.95	2.61	1.41	1.54	1.68
Summer Average	-56.46	-26.31	5.52	0.74	1.26	1.80
Autumn Average	-1.97	6.69	15.83	1.88	2.04	2.22
<b>Total Cloud Anomaly</b>	%	%	%	(0-1)	(0-1)	(0-1)
Annual Average	-12.43	-6.22	0.04	0.60	0.64	0.68
Winter Average	-2.21	0.93	4.06	0.71	0.74	0.76
Spring Average	-11.24	-5.1	1.17	0.60	0.64	0.69
Summer Average	-32.67	-15.21	2.12	0.44	0.55	0.6
Autumn Average	-12.3	-5.25	1.31	0.58	0.63	0.67

Table 4. UKCP09 Future Climate Projections for Wind: A1B Emissions Scenario

Climate Variable	Predicted Change from Baseline 2080s			Absolute Values 2080s		
	10 <sup>th</sup> Percentile	50 <sup>th</sup> Percentile	90 <sup>th</sup> Percentile	10 <sup>th</sup> Percentile	50 <sup>th</sup> Percentile	90 <sup>th</sup> Percentile
<b>Wind</b>	n/a	M s <sup>-1</sup> 2	n/a	n/a	n/a	n/a
Annual Average	n/a	-0.065	n/a	n/a	n/a	n/a
Winter Average	n/a	-0.052	n/a	n/a	n/a	n/a
Spring Average	n/a	-0.154	n/a	n/a	n/a	n/a
Summer Average	n/a	-0.01	n/a	n/a	n/a	n/a
Autumn Average	n/a	-0.044	n/a	n/a	n/a	n/a

## Appendix B: Examples of Defining Effect ‘Scale within an EIA

Receptor Sensitivity	Magnitude of Impact			
	High	Medium	Low	Very Low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very Low	Minor	Negligible	Negligible	Negligible

### Example 1

‘Normal EIA’

Receptor A = High Sensitive  
 Magnitude of Impact = Low  
 Resultant Effect = Moderate

Climate Change

Receptor A = High Sensitive  
 Vulnerability = Low  
*(climate change has little influence on receptor as resilient to changes in existing environment / climate, so climate change unlikely to alter the magnitude of impact)*  
 Magnitude of Impact = Low  
 Resultant Effect = Moderate

### Example 2

‘Normal EIA’

Receptor A = High Sensitive  
 Magnitude of Impact = Low  
 Resultant Effect = Moderate

Climate Change

Receptor A = High Sensitive  
 Vulnerability = High  
*(receptor directly dependent on existing environment / climate, so change is likely to alter the magnitude of impact, i.e. change in the environment as a result of the Proposed Development)*  
 Magnitude of Impact = High  
*(qualitative judgement)*  
 Resultant Effect = Major

### Example 3

‘Normal EIA’

Receptor A = Low Sensitive  
 Magnitude of Impact = Low  
 Resultant Effect = Negligible

Climate Change

Receptor A = Low Sensitive  
 Vulnerability = Low  
*(climate change has little influence on receptor as resilient to changes in existing environment / climate, so climate change unlikely to alter the magnitude of impact)*  
 Magnitude of Impact = Low  
 Resultant Effect = Negligible

### Example 4

‘Normal EIA’

Receptor A = Low Sensitive  
 Magnitude of Impact = Low  
 Resultant Effect = Negligible

Climate Change

Receptor A = Low Sensitive  
 Vulnerability = High  
*(receptor directly dependent on existing environment / climate, so change is likely to alter the magnitude of impact, i.e. change in the environment as a result of the Proposed Development)*  
 Magnitude of Impact = High  
*(qualitative judgement)*  
 Resultant Effect = Moderate



## Appendix C: Policy and Guidance

### *Policy and Guidance*

- EU Guidance on Integrating Climate Change and Biodiversity into the Environmental Impact Assessment (2013)<sup>9</sup>
- IEMA Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation (Nov 2015)<sup>10</sup>
- UK Climate Change Risk Assessment Evidence Report (2017)<sup>11</sup>
- 2017 EIA Regulations<sup>12</sup>

TRIUM

<sup>9</sup> EU Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessments  
<http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf>

<sup>10</sup> IEMA EIA Guide to Climate Change Resilience and Adaptation  
[https://www.iema.net/assets/templates/documents/iema\\_guidance\\_documents\\_eia\\_climate\\_change\\_resilience\\_and\\_adaptation%20\(1\).pdf](https://www.iema.net/assets/templates/documents/iema_guidance_documents_eia_climate_change_resilience_and_adaptation%20(1).pdf)

<sup>11</sup> UK Climate Change Risk Assessment (2017)  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/584281/uk-climate-change-risk-assess-2017.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/584281/uk-climate-change-risk-assess-2017.pdf)

<sup>12</sup> EIA 2017 Regulations <http://www.legislation.gov.uk/uksi/2017/571/introduction/made>

# **Annex 6: EIA Scoping Report Addendum – Water Resources, Drainage and Flood Risk**





# CARDINAL COURT – EIA SCOPING REPORT ADDENDUM

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## Water Resources, Drainage and Flood Risk

28<sup>th</sup> June 2019

1. RMA Environmental will undertake a water resources, drainage and flood risk assessment to determine the potential effects of the Proposed Development. The assessment will consider the potential effects associated with the demolition and construction of the Proposed Development and once the Proposed Development is completed and operational.

### Baseline

#### Flood Risk and Surface Water Drainage

##### Proximity to Watercourses

2. The closest watercourse to the site is the Hoe Stream which is located approximately 50m to the north-west of the site. This watercourse is classified by the Environment Agency (EA) as a 'Main River'<sup>1</sup>. There is also a small pond situated approximately 30m to the east of the site. From reviewing Ordnance Survey mapping, there are no other significant water features within the site or surrounding area (approximately 500m radius, considered to be relevant to the assessment of potential water resources, drainage and flood risk effects).

##### Flood Risk

3. According to the EA's flood map for planning, the site is located entirely within fluvial Flood Zone 1 (low risk). Fluvial Flood Zone 2 (medium risk) and fluvial Flood Zone 3 (high risk) are located approximately 16m north-west of the site. Due to the close proximity of flood zones, it will be necessary to assess flood risk associated with climate change predictions to ensure that the proposed development is safe for its operational lifetime. Detailed consultation is already being undertaken with the EA and Woking Borough Council (WBC) (who are acting as the Lead Local Flood Authority), to ensure that the most up to date detailed flood modelling of the Hoe Stream is used when determining the extent of the flood risk at the site. This will be covered in a Flood Risk Assessment (FRA) which will accompany the planning application.
4. EA mapping indicates that the majority of the site has a 'very low' surface water flood risk. There are some ponded areas with up to a 'medium' surface water flood risk in the south and north of the site, associated with areas of hardstanding within the current site layout.
5. The WBC's Strategic Flood Risk Assessment (SFRA): Volume 2 – Technical Report (November 2015) identifies that the site is located within an area with "limited potential for groundwater flooding to occur" and the south-eastern corner of the site, is situated within an area with "potential for groundwater flooding to occur at the surface".
6. A Ground Investigation was undertaken (and a Geo-Environmental and Geotechnical Assessment (Ground Investigation) Report was prepared) by Jomas Associates in April 2019, which included the drilling of a number of boreholes on-site. Groundwater was recorded at depths of between 1.1m and 3.0m below ground level (bgl), most of which being located in the Kempton Park Gravel. The shallowest levels are located in the northern part of the site.
7. The WBC's SFRA identifies that the site lies within a postcode area with 33 records of overloaded sewer flooding.

<sup>1</sup> Main Rivers described by the EA as the following: "usually larger rivers and streams".

8. A review of the SFRA and EA flood maps, has identified that there are no other significant sources of flooding at the site, i.e. from reservoirs.
9. As the site is located within close proximity to Flood Zones 2 and 3, in terms of flood risk, property and the safety of future site users are considered to be of **Medium Sensitivity**.

#### Drainage

10. From reviewing the SFRA, the site is not located within a Critical Drainage Area (CDA).
11. As previously stated, the majority of the site has a 'very low' surface water flood risk with some small areas of ponding within hardstanding areas such as car parks.
12. Based on the above, surface water drainage, is considered to be of **Low Sensitivity**.

#### Water Resources (Water Demand and Wastewater (Foul Drainage))

13. According to the EA's *Water Stressed Areas- Final Classification 2013*<sup>2</sup> report, the site is located in an area which is classified to have a water stress classification of 'serious' for 2013 and its future scenarios. Whilst it is the remit of Affinity Water to ensure sufficient water supply is provided for new developments in Woking, sustainable design measures would need to be adopted to minimise the water demand of the Proposed Development.
14. It is likely that the Proposed Development will cause an increase in demand in wastewater flows and, considering that the site is located within an area which is classified to have a water stress classification of 'serious', water resources and infrastructure are considered to be of **High Sensitivity**.

#### Controlled Waters

15. The potential risk of contamination of controlled waters (surface water and groundwater), anticipated to arise as a result of the Proposed Development, during the demolition and construction of the Proposed Development, and once the completed Proposed Development is operational has been addressed in the Geoenvironmental section of the EIA Scoping Report. Therefore, it will not be addressed within this water resources, drainage and flood risk text.

#### Sensitive Receptors

16. From undertaking the baseline review of the site, the following sensitive receptors have been identified, along with their associated sensitivity:
  - Properties and the safety of future site users are considered to be of Medium Sensitivity;
  - Surface water drainage is considered to be of Low Sensitivity; and
  - Water resources and infrastructure are considered to be of High Sensitivity.

#### Potential Effects

17. The potentially significant environmental effects associated with the Proposed Development in relation to water resources, drainage and flood risk are as follows:
  - Groundwater interruption and / or possible dewatering requirements during the demolition and construction phase;
  - Increase in surface water run-off and subsequent flood risk, during the demolition and construction phase;
  - Flood risk (associated with Hoe Stream) to the site, from the added effects of climate change during the operation of the completed Proposed Development;
  - Increase in surface water run-off rates and subsequent flood risk, during the operation of the completed Proposed Development;
  - Potential increased mains water demand during operation of the completed Proposed Development; and
  - Potential increased foul drainage flows during operation of the completed Proposed Development.

<sup>2</sup> Environment Agency. 2013. Water Stressed Areas – Final Classifications.



## Outline Scope of Assessment

18. It is proposed that a water resources, drainage and flood risk assessment will be undertaken and presented in the form of a technical ES chapter.
19. The scope of work for the ES chapter will include:
  - A site walkover to complete a local water interests survey;
  - Consultation with the EA (and other relevant bodies) to acquire key background data and confirm the scope of the assessment, where necessary;
  - Review of baseline environmental records on local discharges, abstractions, hydrology and hydrogeology within the study area, via a Groundsure EnviroInsight report or similar and web-based data searches;
  - Assessment of effects in relation surface water and groundwater quantity (i.e. water resources and drainage) and flood risk, anticipated to arise during the demolition and construction of the Proposed Development, and once the completed Proposed Development is operational;
  - Provision of recommendations on mitigation measures to the Design Team; and
  - Preparation of an ES chapter in relation to the likely significant environmental effects of the Proposed Development on water resources, drainage and flood risk, including a summary of the FRA and Drainage Strategy, both of which would be submitted as standalone documents as part of the planning application.
20. A standalone FRA will also be prepared and submitted as part of the planning application.
21. The FRA will investigate the all potential sources of flooding at the site and for the Proposed Development; it will also demonstrate that any flood risk to the Proposed Development, or caused by the Proposed Development, will be mitigated through the use of appropriate design solutions and management procedures.
22. The FRA will be informed by consultation with key stakeholders including the EA, WBC, Affinity Water (the water provider) and Thames Water (the sewerage provider). In summary, the FRA will include the following:
  - Risk of flooding from all sources (e.g. tidal, surface water, groundwater and artificial water sources (e.g. reservoirs)) which could affect the site;
  - Details of any historical flooding events;
  - Acceptability of the proposed land use in relation to known flood zones;
  - Impacts/benefits of flood defences
  - Climate change effects;
  - Access and egress arrangements;
  - Mitigation measures embedded into the Proposed Development to reduce the risks associated with flooding (e.g. raised ground floors);
  - Residual flood risk; and
  - Volume of surface water runoff likely to be generated by the Proposed Development;
  - Details of existing and proposed surface water drainage; and
  - Appropriate strategies for surface water and foul drainage.
23. Through a well informed and considered design process with regard to flood risk, and surface water considerations, coupled with appropriate measures to manage the residual flood risk at the site following redevelopment, any potential likely significant effects associated with flooding and surface water drainage will be reduced as far as reasonably practicable.
24. The inclusion of sustainable drainage systems (SuDS) will ensure that run-off from the completed Proposed Development will be controlled and stored on-site, prior to discharge. A detailed surface water drainage strategy will be included within the FRA to ensure that surface water runoff is discharged



appropriately and is compliant with the target discharge rates. The strategy will allow for a reduction in surface water discharge rates compared to the existing situation, in line with local policy requirements. The design principles set out in the surface water drainage strategy and its conclusions will be presented in the Water Resources, Flood Risk and Drainage ES chapter.

25. Consultation will be undertaken with Affinity Water and, if necessary, infrastructure improvements may be required to supply the Proposed Development. Consultation with Affinity Water and details of water efficiency measures to reduce water usage will be summarised within the ES.
26. It is likely that the Proposed Development will give rise to an increase in wastewater flows. A foul drainage strategy (combined with the surface water drainage strategy) will be included within the FRA that will be submitted as part of the planning application. This will include consultation with Thames Water (sewerage provider) to determine whether there is capacity within the local foul sewerage network to supply the Proposed Development or if infrastructure improvements are required. The design principles set out in the foul drainage strategy and its conclusions will be presented in the Water Resources, Flood Risk and Drainage ES chapter.

END.



# **Annex 7: Bat Survey Report**

## Woking Football Club

### Bat Surveys

## Woking Football Club

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## Summary of Key Findings

The Ecology Consultancy was commissioned by Woking Football Club to determine the status of bats and any likely constraints to development arising from the demolition of four existing buildings and development of land at the proposed Woking Football Club, off Kingfield Road in Woking, Surrey. This assessment follows on from a Preliminary Ecological Appraisal (PEA) carried out by The Ecology Consultancy in February 2019 (The Ecology Consultancy, 2019) which identified buildings as having potential to support a roost. The existing trees on site were assessed as having low potential for roosting bats during the PEA, and no further survey work is required. However, they must be subject to a precautionary method of working, whereby the trees are carefully section felled. The main findings of the bat surveys are as follows:

- The site comprised 18 buildings and a football stadium, with areas of hardstanding, amenity grassland, introduced shrub, continuous scrub, scattered trees and a hedgerow recorded on site during the PEA. Of the 18 buildings, four were considered to have potential to support roosting bats (Building 10, Building 11, Building 12 and Building 16). All other buildings on site were considered to have negligible potential to support roosting bats. A Preliminary Roost Assessment (PRA) was undertaken on Buildings 10, 11, 12 and 16 in June 2019.
- Buildings 10 and 11 had low potential to support roosting bats and in line with current survey guidelines, one dusk emergence survey was carried out on these buildings on 8 July 2019.
- Building 16 had moderate potential to support roosting bats and in line with current survey guidelines, one dusk emergence survey and one dawn re-entry survey was carried out on 8 July 2019 and 2 August 2019 respectively.
- Following the PRA, Building 12 was considered to have negligible potential to support roosting bats, and no further survey work was required.
- No evidence of roosting bats was identified in any of the buildings B10, B11 and B16, and no bats were recorded emerging from these buildings during the dusk emergence survey or the dawn re-entry survey.
- Foraging and commuting activity by bats was recorded during the surveys, from individuals of three species of bat; noctule, common pipistrelle and soprano pipistrelle.
- As there is no roost identified within the buildings on site, a European Protected Species Mitigation (EPSM) licence will not be required from Natural England prior to works. The

final lighting design should avoid any extra lighting of the trees on the boundaries of the site or new areas of soft landscaping, to avoid disruption to commuting and foraging bats. Areas of new landscaping to be included on site should include night-scented species to provide alternative foraging areas for bats, to replace those that will be lost as a result of the proposed development.

# 1 Introduction

## BACKGROUND TO COMMISSION

- 1.1 The Ecology Consultancy was commissioned by Woking Football Club in April 2019 to assess the status of bats within buildings on site and any likely constraints to development at the proposed Woking Football Club, off Kingfield Road in Woking, Surrey. This assessment follows on from a Preliminary Ecological Appraisal (PEA) carried out by The Ecology Consultancy in February 2019 (The Ecology Consultancy, 2019) which identified buildings (Building 10, Building 11, Building 12 and Building 16) as having potential to support a roost. Other existing buildings on site were considered to have negligible potential to support roosting bats and no further survey work was considered necessary. The existing trees on site were assessed as having low potential for roosting bats during the PEA, and no further survey work is required. However, they must be subject to a precautionary method of working, whereby the trees are carefully section felled.

## SCOPE OF REPORT

- 1.2 The primary aims are, through a process of investigation and assessment, to determine if any bat roosts are present, what the type of roost may be, the species using them, their status and relative conservation importance and any likely impacts that could occur as a result of the proposals. Where impact is identified, appropriate mitigation and compensation measures are provided as supporting information to inform the planning application.
- 1.3 The assessment of a site for bats is based on the following sources of information, including that obtained from third parties and the results of surveys:
- a desk study including:
    - a data search for bat records within a 2km radius of the site;
    - an assessment of the surrounding habitats for their likely importance to bats;
    - the presence of any protected areas cited for their bat populations; and
    - the location and status of any nearby European Protected Species Mitigation licensed sites for bats.
  - a Preliminary Roost Assessment comprising a detailed building inspection;
  - DNA analysis of bat droppings found; and
  - emergence and re-entry surveys.



- 1.4 The elements listed above comprise the individual parts of the process that underlie the assessment. If, at preliminary assessment, the buildings and or trees do not provide any potential for a roost, the assessment can be stopped at this stage. If potential for a roost is identified, a suite of emergence/re-entry surveys will be required to confirm presence or likely absence, to determine the species present, and to characterise any roosts located. In cases where no roosts are identified or suspected during these surveys, the assessment can be halted at that stage. Where roosts are found to be present then an evaluation of the conservation value of the species concerned is made and the impacts of the development identified and addressed.
- 1.5 The surveys covered Building 10, Building 11, Building 12 and Building 16 within the planning application site boundary (hereon referred to as ‘the site’) as indicated on the plan provided by the client (Leach Rhodes Walker Architects, 2019).
- 1.6 This assessment has been prepared with reference to best practice guidance published by the Bat Conservation Trust (Collins, 2016) and as detailed in BSI Standards Publication 42020:2013 *Biodiversity – Code of Practice for Biodiversity and Development* (British Standards Institution, 2013) and BSI 8956:2015 *Surveying for Bats in Trees and Woodland* (British Standards Institution, 2015).
- 1.7 This report provides supporting information in the appendices with a georeferenced map of the survey results in Appendix 1, cross referenced photographs in Appendix 2 and raw survey data in Appendix 3.

#### SITE CONTEXT AND STATUS

- 1.8 The site is currently occupied by a football stadium (Woking Football Club); a collection of large-footprint, low-rise buildings, including the Woking Snooker Centre; David Lloyd Leisure Centre (including tennis courts), Woking Gymnastics Club; car parking; and a small number of residential properties situated in the north of the site. It is approximately 5 hectares (ha) in size and is centred on Ordnance Survey National Grid reference TQ 00574 57329. The site lies off Kingfield Road, in Woking, Surrey. The site is not subject to any statutory or non-statutory nature conservation designations. It is bordered by playing fields to the south, and residential dwellings and gardens to north, east and west. The wider landscape comprises further residential dwellings and urban areas. Hoe Stream Site of Nature Conservation Importance (SNCI) and associated greenspace is located to the west of Sycamore Avenue, and a waterbody surrounded by woodland habitats is located adjacent to the east of the site.

#### DEVELOPMENT PROPOSALS

- 1.9 The proposals are for the redevelopment of the site, following the demolition of all existing buildings and structures, to provide a replacement stadium with ancillary facilities, including flexible retail, hospitality and community spaces, independent retail floorspace (Classes A1/A2/A3), a medical centre (Class D1) and vehicle parking, plus residential accommodation comprising of 1,048 dwellings (Class C3) within 5 buildings of varying heights of between 3 and 10 storeys (and undercroft and part basement levels) on the south and west sides of the site, together with provision of new accesses from Westfield Avenue to car parking, associated landscaping and the provision of a detached residential concierge building (Leach Rhodes Walker Architects, 2019).

#### RELEVANT LEGISLATION AND PLANNING POLICY

- 1.10 The following key pieces of nature conservation legislation are relevant to this assessment, with a more detailed description of this legislation provided in Appendix 4:
- The Conservation of Habitats and Species Regulations 2017 (as amended);
  - The Wildlife and Countryside Act 1981 (as amended); and
  - Natural Environment and Rural Communities Act 2006.
- 1.11 The actions that could result in an offence occurring under the above legislation include: the disturbance of bats within a roost; loss or damage of a roost; blocking a roost entrance; or modification of a roost. If development proposals are likely to result in an offence then a European Protected Species Mitigation (EPSM) licence must be obtained from Natural England prior to works to provide a derogation from the legislation. Alternatively, where no more than three low conservation significance roosts are present and are used by low numbers of bats of no more than three of the (qualifying) species that EPSM licences are most commonly applied for, it may be possible to register the site under the Bat Mitigation Class Licence (BMCL) scheme. No like for like bat compensation is required for the majority of the species covered by BMCL.
- 1.12 The National Planning Policy Framework (Ministry of Housing, Communities and Local Government, 2019) requires local authorities to avoid and minimise impacts on biodiversity and to provide net gains in biodiversity when taking planning decisions. In addition, in England, under Section 40 of the Natural Environment and Rural Communities Act 2006, all public bodies are required to have regard to biodiversity conservation when carrying out their functions. This is commonly referred to as the ‘biodiversity duty’.

1.13 Other planning policies at the local level which are of relevance to this development include the adopted Woking Borough Core Strategy (2012).

## 2 Methodology

### DESK STUDY

- 2.1 A desk study was conducted to obtain data relating to bats within a 2km radius of the site, as made available by the Surrey Biodiversity Information Centre (SBIC), the local Biological Records Centre.
- 2.2 Additional contextual information was compiled from publicly available data sources:
- MAGIC (<http://www.magic.gov.uk>) – the Government’s on-line mapping service. Information was sought concerning: the presence of ancient semi-natural woodland (ASNW); statutory designated nature conservation sites<sup>1</sup>; and extant or historic European Protected Species Mitigation licences for bats; and
  - Ordnance Survey mapping and publicly available aerial photography to determine any features such as: running and standing water; woodland; tree lines; hedgerows; railway corridors; and the surrounding landscape uses.

### BAT SURVEYS

#### Personnel

- 2.3 The surveys were led by Demian Lyle BSc (Hons) MSc DIC MCIEEM, an ecologist with over 10 years’ commercial bat survey experience.
- 2.4 The emergence and re-entry surveys were led by Gemma Watkinson, assisted by Georgina Knibbs, Sarah Richardson, Charlotte Toon, Natalie Hughes, Alejandro Carreras, Samantha Shaw and Kalia Symeonidou.

#### Equipment

- 2.5 The surveys listed below made use of some or all the following equipment:
- an extendable ladder;
  - a video endoscope;
  - a handheld LED torch;
  - a high-powered torch for illuminating features at height;
  - close focussing binoculars;
  - bat dropping (DNA) collection kit;

<sup>1</sup> Statutory designations include Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR).



- Bat Box Duet, frequency division and heterodyne detector;
- Canon XA30 Infrared video camera and 500w IR light;
- Elekon Bat Scanner, frequency division detector;
- Elekon bat logger M, full spectrum detector;
- FLIR Thermal imaging camera T1020; and
- Anabat Express, Zero Crossing Analysis (ZCA) detector.

### Aims and Objectives

2.6 The aim of the survey methodologies outlined below is to establish the presence/likely absence of bat roosts within the trees and buildings within the site boundary. Once presence has been established the secondary aim is to obtain sufficient information to characterise the type of roost according to criteria set out in the current guidelines (Collins, 2016). This includes determining the function/s of the site by bats for maternity or hibernation roosts, transitional roosts, foraging and commuting. The gathered information is then used to inform an assessment of the potential impacts of the development proposals and to devise an appropriate and proportionate mitigation strategy.

### Field surveys

2.7 The survey methodologies below follow best practice guidelines (Mitchell-Jones & McLeish, 2004; Collins, 2016; The British Standards Institution, 2015). A standard recording form was completed for each building within the site boundary and for each tree that is likely to be impacted by the proposals. This included recording the main structural features and layout, any potential access points and roost features and photographs. The criteria used as a framework to assess the suitability for structures or trees to support roosting bats are provided in Appendix 5. This section provides methodologies for the primary survey types used to assess the status of bats at a site, depending on the particulars of the site and the commission, not all of these survey types may be carried out.

### Preliminary Roost Assessment - Buildings

2.8 The survey comprised an external inspection of each building, involving a detailed search of all accessible architectural features for bat droppings, urine staining, scratch marks, staining around suitable crevices and feeding remains. Window panes and other external surfaces were visually checked for droppings or other secondary evidence. A high-powered torch was used to illuminate recesses and crevices at height and these were inspected using close focusing binoculars. This included external features, such

as soffit boxes, roof tiles, hanging tiles, ridge areas and window casements. Any features that could potentially provide access into internal areas such as roof voids and cavity walls were noted.

### Emergence and Re-entry Surveys

2.9 A total of seven surveyors were employed to allow clear views of all potential roost entry/exit points identified on Building 10, Building 11 and Building 16 during the preliminary roost assessments. The dusk surveys commenced 15 minutes before sunset and continued for up to 120 minutes after sunset. The dawn survey commenced 90 minutes before sunrise and continued until fifteen minutes after. Each of the surveyors noted down details of any bat activity including; bat passes<sup>2</sup>, species, numbers, location, emergence or re-entry, foraging and commuting, recording details to a data sheet and a map. The surveyors employed a combination of heterodyne bat detectors for aural ID in the field, and/or, full spectrum or zero crossing detectors for sound analysis post survey.

### Post-Survey Analysis

2.10 The audio recordings may be analysed post survey using one or more of the following software: Analoook™ V3.3q., Bat Explorer™ or Kaleidoscope™, to confirm species identification and the timing of any passes. Any passes likely to have originated from one of the myotis species were determined to genus level only due to the complexity of differentiating between these species.

### Roost Characterisation

2.11 The results from the preliminary roost assessments and the emergence/-re-entry surveys are used to characterise any roosts that may be confirmed within the site. This follows standard criteria for roosts, classifying roost type<sup>3</sup> as described in the Natural England bat EPSM licence application form. Also included are variables such as: species; abundance; likely use; and importance throughout the year.

<sup>2</sup> For the purposes of this assessment a bat pass is taken to be a series of individual registrations by an individual bat that are emitted in a short sequence and either heard or recorded as a bat passes the position of the surveyor or the detection envelope of the recorder that is employed.

<sup>3</sup> Day, Night, Feeding Perch, Transitional, Satellite, Maternity, Hibernation, Foraging Area, Commuting Route, Swarming Site.

## EVALUATION AND IMPACT ASSESSMENT

### Evaluation

- 2.12 The conservation status of those species found to be roosting within the site or for which the site provides a measurable supporting function is drawn from published sources with the conservation significance of any roost provided according to accepted criteria<sup>4</sup>.
- 2.13 If emergence and re-entry surveys were carried out, then the foraging and commuting activity recorded during those surveys is summarised along with an outline interpretation of the function the site may provide for these activities.
- 2.14 The ecological importance of the site for bats has been assessed broadly following guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) which ranks nature conservation importance according to a geographic scale of reference: international and European; national; regional; metropolitan, county vice-county or other local authority-wide area; local or of value at the site scale. The following factors are considered when making this evaluation: nature conservation designations; rarity; vulnerability; distribution; and the conservation significance of any roosts.

### Impact Assessment

- 2.15 An assessment is provided on the likely impacts of the development proposals on any bat roosts located within or immediately adjacent to the site boundary. This assessment is made with reference to Section 6<sup>5</sup> of the Bat Mitigation Guidelines (Mitchell-Jones & McLeish, 2004) and Natural England's standing advice<sup>6</sup> and includes a summary of the scale of impact according to roost type and development effect. This section considers types of construction impact to bats and their roosts including; disturbance, loss, modification and fragmentation in relation to duration and timing. For the site as a whole, a statement is made on the geographic scale at which impact is deemed to be significant, following CIEEM guidance (CIEEM, 2018).

## DATA VALIDITY AND LIMITATIONS

- 2.16 It is important to note that even where data are held, a lack of records for a defined geographical area does not necessarily mean that there is a lack of ecological interest;

<sup>4</sup> Figure 4. *Guidelines for proportionate mitigation*, the Bat Mitigation Guidelines (Mitchell-Jones & McLeish, 2004) which assigns conservation significance to different types of bat roost on a sliding scale from Low to High

<sup>5</sup> *Predicting the Impact of Development*, the Bat Mitigation Guidelines (Mitchell-Jones & McLeish, 2004), assigns scale of impact to the favourable conservation status of bats according to type and extent of construction effect

<sup>6</sup> *Bats: surveys and mitigation for development projects*, first published 28 March 2015

the area may be simply under-recorded. Bats are highly mobile animals and can move roost sites both within and between years. Where surveys are not spread throughout the bat active season is possible that they could miss roosts that are occupied earlier or later in the year. However, where undisturbed, evidence of bats inside a building is likely to be detectable throughout the year. The detection of small numbers of crevice dwelling species may remain problematic in some cases, such as where droppings accumulate within an inaccessible void.

- 2.17 An internal inspection was not undertaken of the roof void present within Building 16 as the loft hatch was sealed shut. There was also no internal access to Building B12, as access was not granted at the time of the survey.
- 2.18 During the Preliminary Roost Assessment of Building 16, there was dense butterfly bush scrub adjacent to the western elevation of the building, obscuring the view of the western roof slope of the building and the brickwork. This scrub was still present during the dusk emergence survey, but was found to have been removed when the dawn re-entry survey was completed on 2 August 2019. Any additional potential roosting features were recorded after the dawn survey had ended.
- 2.19 Data from bat surveys should be considered to be valid for a period of 24 months, unless there are any gross changes to the buildings or other habitats within the site.



## 3 Results

### DESK STUDY

#### Data search

3.1 The data search from Surrey Biodiversity Information Centre returned 17 records of 7 species of bats, within a 2km radius of the site. There are three historic EPSM licences within a 2km radius of the site. There are no sites designated for bats within a 5km radius of the site. A summary of the most pertinent results is presented in Table 3.1 and Table 3.2 below.

**Table 3.1:** Summary of most pertinent data search results from the local environmental records centre

Species	Distance & Orientation (Km)	Date	Roost type	Notes
Soprano pipistrelle	1.2km south	2010	-	TQ0156.
Common pipistrelle	1.2km south	2010	-	TQ0156.
Brown long-eared	-	2008	-	SU95, TQ05.
Whiskered	-	2008	-	TQ05.
Pipistrelle sp.	0.55km south-west	2003	-	TQ0057.
Daubenton's	0.55km south-west	2003	-	TQ0057.
Natterer's	0.55km south-west	2003	-	TQ0057.
Noctule	1.2km south	2010	-	TQ0156.

**Table 3.2:** Protected sites and bat EPSM licences within 2km of the site boundary

Receptor	Distance & Orientation	Notes
Current EPSM licence	1.25km north-west	2014-6365-EPS-MIT. Licence to destroy a resting place for common pipistrelle.
Current EPSM licence	1.7km south-east	2014-4578-EPS-MIT. Licence to allow destruction of resting place for soprano pipistrelle.
Historic EPSM licence	1.8km north-east	EPSM2012-4690. Licence to allow destruction of a breeding site for soprano pipistrelle.

#### Surrounding habitat

3.2 The site is bordered by playing fields to the south, and residential dwellings and gardens to the north, east and west. The wider landscape includes further residential dwellings and urban areas. There is a large waterbody surrounded by woodland habitats located adjacent to the east of the site. Hoe Stream SNCI and associated greenspace is located to the west of Sycamore Avenue, approximately 140m west of the site, and has potential

to support foraging bats, and provide a commuting corridor for bats through the landscape. The site is connected by scattered trees and other vegetation to the Hoe Stream SNCI.

3.3 The majority of the habitats present on site would not provide foraging opportunities for bats within the local area, and foraging habitats are restricted to the areas of introduced shrub and scattered trees on the boundaries of the site, the area of scrub between the buildings, and the outgrown hedgerow on the north-eastern boundary. These boundary habitats provide a potential commuting corridor for bats, linking suitable foraging habitats such as the large waterbody north-east of the site and the Hoe Stream SNCI at the south-west.

### FIELD SURVEYS

#### Overview

3.4 The surveys have identified several potential roosting features for bats within Buildings 10, 11 and 16 on site. No bats were recorded emerging from these buildings during the emergence survey in July 2019, and no bats were noted re-entering Building 16 during the re-entry survey in August 2019.

3.5 There was foraging and commuting activity throughout each of the evening and dawn surveys from three species of bat; common pipistrelle, soprano pipistrelle and noctule.

#### Weather Conditions

3.6 The preliminary roost assessments and emergence/re-entry surveys were carried out in optimal weather conditions:

3.7 *PRA*: 4 June 2019, 22°C, light breeze (Beaufort 2), overcast with 7/8 okta<sup>7</sup> cloud cover and light drizzle at the end of the survey.

3.8 *Emergence Survey 1*: 8 July 2019, 21-19°C, gentle breeze (Beaufort 2), 8/8 okta cloud cover at start, and no rain. Sunset was at 21:18 and the survey commenced at 21:03 and continued until 22:48.

<sup>7</sup> An okta is a unit of measurement for cloud cover, based on an estimate of how many eighths of the sky are obscured by cloud.

3.9 *Re-entry Survey*: 2 August 2019, 18 - 16°C, no breeze (Beaufort 0), No cloud cover 0/8 okta and no rain. Sunrise was at 05:28 and the survey commenced at 03:58 and continued until 05:43.

### Preliminary Roost Assessment - Buildings

3.10 The building inspections covered Building 10, Building 11, Building 12 and Building 16 within the site. Each building is detailed individually below with a site plan provided in Appendix 1 and supporting photographs of key features in Appendix 2.

3.11 *Building 10: Description*. Building 10 is a semi-detached building converted into flats. It was constructed in approximately 1930-1950, of brick cavity walls with a pitched roof of clay tiles (Appendix 2, Photograph 1). The building is three storeys, including a loft conversion and a mono-pitched single storey extension on the south-western elevation. There were PVC windows, and hanging tiles beneath the first-floor bay windows on the north-eastern elevation and south-western elevations. There were soffits on the north-eastern and south-western elevations. The interior of the loft void was accessed during the survey, and the roof covering appears to have been refurbished within the last 5 years (Appendix 2, Photograph 2), with breathable roof membrane.

3.12 Within the garden areas of Building 10, there were two wooden sheds with a pitched roof covered with bitumen felt (Building 10a and Building 10b, Appendix 1, Figure 1).

3.13 *Building 10: Results*. The building was generally in good condition, with no gaps noted within the brickwork or soffits. The hanging tiles were found to be tight with no gaps, but there were several slipped tiles resulting in gaps in the roof covering, which would provide potential roosting features for bats. There was no evidence of bats found within the loft voids, but full access was not possible due to safety reasons as the ladder would not fit through the hatch.

3.14 Building 10 had low potential to support roosting bats, and one emergence survey was required on this building. The two sheds (Building 10a and Building 10b) had no potential roosting features recorded and were assessed as having negligible potential to support roosting bats.

3.15 *Building 11: Description*. A pair of semi-detached dwellings (B11a and B11b), constructed of brick cavity walls, constructed in approximately 1930-1950, with a pitched roof of clay tiles (Appendix 2, Photograph 3). The building was two-storey, and there were hanging tiles beneath the windows on the north-eastern and south-western

elevations. A small flat roof extension had been added to the rear of the western dwelling. There were three chimneys noted within the roof structure.

3.16 To the south of Building 11 there was a garage (Building 11c) of brick construction, with a hipped roof of clay tiles. A summer house (Building 11d) was also located to the south of Building 11 which was constructed of wooden panelling, with a flat felt roof.

3.17 *Building 11: Results*. The building was generally in good condition, with no gaps noted within the brickwork. However, there were several slipped tiles (Appendix 2, Photograph 4) resulting in gaps in the roof covering which would provide potential roosting features for bats. A hanging tile was noted missing on the south-western elevation (Appendix 2, Photograph 5), and there was also lifted lead flashing around the window on the north-eastern elevation and the central chimney. The roof tiles were found to be unlined during the loft inspection, and the loft voids cobwebby. There was no evidence of bats recorded within the loft voids (Appendix 2, Photograph 6).

3.18 Building 11 had low potential to support roosting bats, and one emergence survey was required on this building. The two external structures (Building 11c and Building 11d) (Appendix 2, Photograph 7 and Photograph 8) had no potential roosting features recorded and were assessed as having negligible potential to support roosting bats.

3.19 *Building 12: Description*. A two-storey dwelling constructed of cavity brick walls, and a pitched roof of clay tiles with dormer windows (Appendix 2, Photograph 9), and hanging tiles on the dormer windows. The building was likely to have been built after 1960 and had PVC soffits.

3.20 *Building 12: Results*. The building was generally in very good condition, with no gaps noted within the brickwork, and no gaps noted within the roof tiles or hanging tiles, or in the soffits. The only gap noted was a very small area of lifted lead flashing at the bottom of the dormer window on the eastern and western elevation. There was no loft void access, but there was no evidence of bats noted on the exterior of the building.

3.21 Given the overall good condition of the building, limited suitable access points into the building and that the very small area of lifted lead flashing was unlikely to lead anywhere, Building 12 is considered to have negligible potential to support roosting bats, and no further survey work was required on this building.



3.22 *Building 16: Description.* Building 16 was a single storey building, L shape on plan, with solid brick walls supporting a hipped roof of clay tiles. The loft hatch of the building was sealed and an internal inspection of the loft void was not possible.

3.23 *Building 16: Results.* The roof covering of the building was in a poor condition with many slipped and missing tiles noted (Appendix 2, Photograph 10). There were also areas of lifted lead flashing, a gap noted within the soffit on the southern elevation and holes within the brickwork on the southern elevation. During the PRA survey, there was a limited view of the north-western elevation of B16, due to the presence of tall, dense butterfly bush scrub (Appendix 2, Photograph 11). After the scrub had been removed, a bird nest box was noted fixed to the north-western elevation of the building (Appendix 2, Photograph 12).

3.24 Building 16 was assessed as having moderate potential to support roosting bats, and further survey work was required on this building, in the form of one evening emergence and one dawn re-entry survey.

**Emergence Survey 1**

3.25 There were no bats recorded emerging from any of the buildings (B10, B11 and B16) during the survey. Three species of bats, common pipistrelle, soprano pipistrelle and noctule were recorded using the site for foraging and commuting. In particular bats were recorded foraging around the trees to the north of B10, and around the amenity grassland to the south of B16. Full survey data can be found in Appendix 3. A summary is provided below:

- The first call recorded was a noctule at 21:24 (6 minutes after sunset). A noctule was recorded again at 22:08 and 22:09;
- Common pipistrelle was recorded a total of 109 times during the survey, between 21:27 (9 minutes after sunset) and 22:48; and
- Soprano pipistrelle was recorded a total of 21 times during the survey, between 21:43 (25 minutes after sunset) and 22:40.

3.26 *Sound Analysis:* All calls recorded could be identified to species level in sound analysis.

**Re-entry Survey**

3.27 No bats were seen to re-enter building B16 during the dawn re-entry survey. The survey recorded commuting and foraging by common pipistrelle and soprano pipistrelle. Full survey data can be found in Appendix 3.

3.28 The first call recorded was a soprano pipistrelle at 04:03, and the last bat recorded was a soprano pipistrelle at 04:52 (36 minutes before sunrise).

- Soprano pipistrelle was recorded 7 times during the survey, between 04:03 and 04:52; and
- Common pipistrelle was recorded 3 times during the survey, between 04:28 and 04:52.

3.29 *Sound Analysis:* All calls recorded during the survey could be identified to species level in sound analysis.

**ROOST CHARACTERISATION**

3.30 The table below provides a summary of the results of the assessment for each building included in the surveys.

**Table 3.3: Characterisation of roost type and status**

ID	Evidence	Species	Count	Potential/Type	Annual pattern of use
B10	Emergence survey and sound analysis	No roost present	-	-	-
B11	Emergence survey and sound analysis	No roost present	-	-	-
B12	Emergence survey and sound analysis	No roost present	-	-	-
B16	Emergence and re-entry surveys Sound analysis	No roost present	-	-	-

## 4 Evaluation and Impacts

### EVALUATION

#### Species

- 4.1 Common pipistrelle was the most commonly recorded species during the dusk emergence survey, and soprano pipistrelle was the most commonly recorded species during the dawn re-entry survey. Soprano pipistrelle and common pipistrelle bats are probably the most common and widespread species; found throughout the UK with pre-breeding population estimates grouped together at up to two million (Harris and Yalden, 2008). These species are believed to be common and widespread throughout Surrey and the data search returned records of these species within 2km, and EPSM licences to disturb roosts for both of these species within 2km of the site.
- 4.2 Noctule bats were also recorded during the surveys. This is another common and widespread species, and the data search returned records for this species within 2km of the site.
- 4.3 These species have not been recorded roosting within any of buildings B10, B11 or B16 during the dusk emergence and dawn re-entry surveys, and roosting bats are considered likely absent from the site.

#### Foraging and commuting

- 4.4 The site provides a function as a foraging and commuting resource used by at least three species of bat; common pipistrelle, soprano pipistrelle and noctule. In particular, foraging common pipistrelle and soprano pipistrelle bats were recorded using the trees north of buildings B10 and B11, and common pipistrelle were recorded foraging over the amenity grassland to the south of building B16.

#### Summary of the Site's Importance to Bats

- 4.5 The site is assessed as important to bats at the local level. This is due to the absence of any roosts for bats and the availability of suitable habitats on the site that provide opportunities for foraging and commuting bats within the local area including providing some connectivity between likely foraging areas.

### IMPACT ASSESSMENT

#### Species

- 4.6 Roosting bats are considered to be likely absent from the site, and in the absence of mitigation the development proposals are considered unlikely to result in the destruction and permanent loss of a roost used by bats. An EPSM licence is not considered necessary for the proposed works on site.

#### Foraging and commuting habitats

- 4.7 The development proposals for the site include the retention of existing trees on the boundaries of the site. It is considered that the proposed development will not result in the loss of commuting and foraging habitat for bats.
- 4.8 The development proposals to the site are likely to result in the long-term loss of small areas of foraging habitat through site clearance to facilitate construction. The boundary trees will be retained within the proposed development.

#### Summary of the Predicted Impact at Site Level

- 4.9 There is not considered to be any significant impacts on roosting, commuting and foraging bats at the site level.



## 5 Summary and Recommendations

### SUMMARY OF FINDINGS

- 5.1 This section summarises the findings of the surveys and the likely impacts on bats, bat roosts and supporting habitats that are present on the site, as described in previous sections of this report.
- 5.2 No ecological constraints have been identified on site in respect of bats.

### RECOMMENDATIONS

- 5.3 To ensure that the construction and operational phase of development does not cause any disruption to bat commuting routes, it is recommended that the final lighting scheme be designed to minimise any light spillage to the soft landscaped areas and trees on the site (BCT, 2018). The new lighting planned for the construction and operational phases of the development should be carefully designed to ensure that there is no additional light spill onto adjacent habitats, to ensure there will be no disruption to existing commuting routes and foraging areas.
- 5.4 Some generic proposals for mitigation, compensation and enhancement measures are provided in Appendix 6.

### Breeding birds

- 5.5 The bird nest box identified on the north-western elevation of B16 has potential to support nesting birds. All wild birds and their nests are protected under the Wildlife and Countryside Act 1981 (as amended).
- 5.6 It is recommended that the nest box on B16 is relocated or replaced on a tree that will be retained on site within the proposals. This should be carried out September to February inclusive, to avoid any potential offences relating to breeding birds during their main breeding season (Newton et al., 2011). If the nest box is removed/ moved during the breeding season, it must be checked before work commences to identify any active birds' nests. Should they be present, the nest box must be retained in situ on B16 until the young have left the nest.

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Mitchell-Jones, A.J. & McLeish, A.P. (2004) *The Bat Workers' Manual* 3<sup>rd</sup> Edition. Joint Nature Conservation Committee, Peterborough.

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## Appendix 1: Map of Survey Results and Compensation Measures



Figure 1: Map of Preliminary Roost Assessment survey B10, B11, B12 results

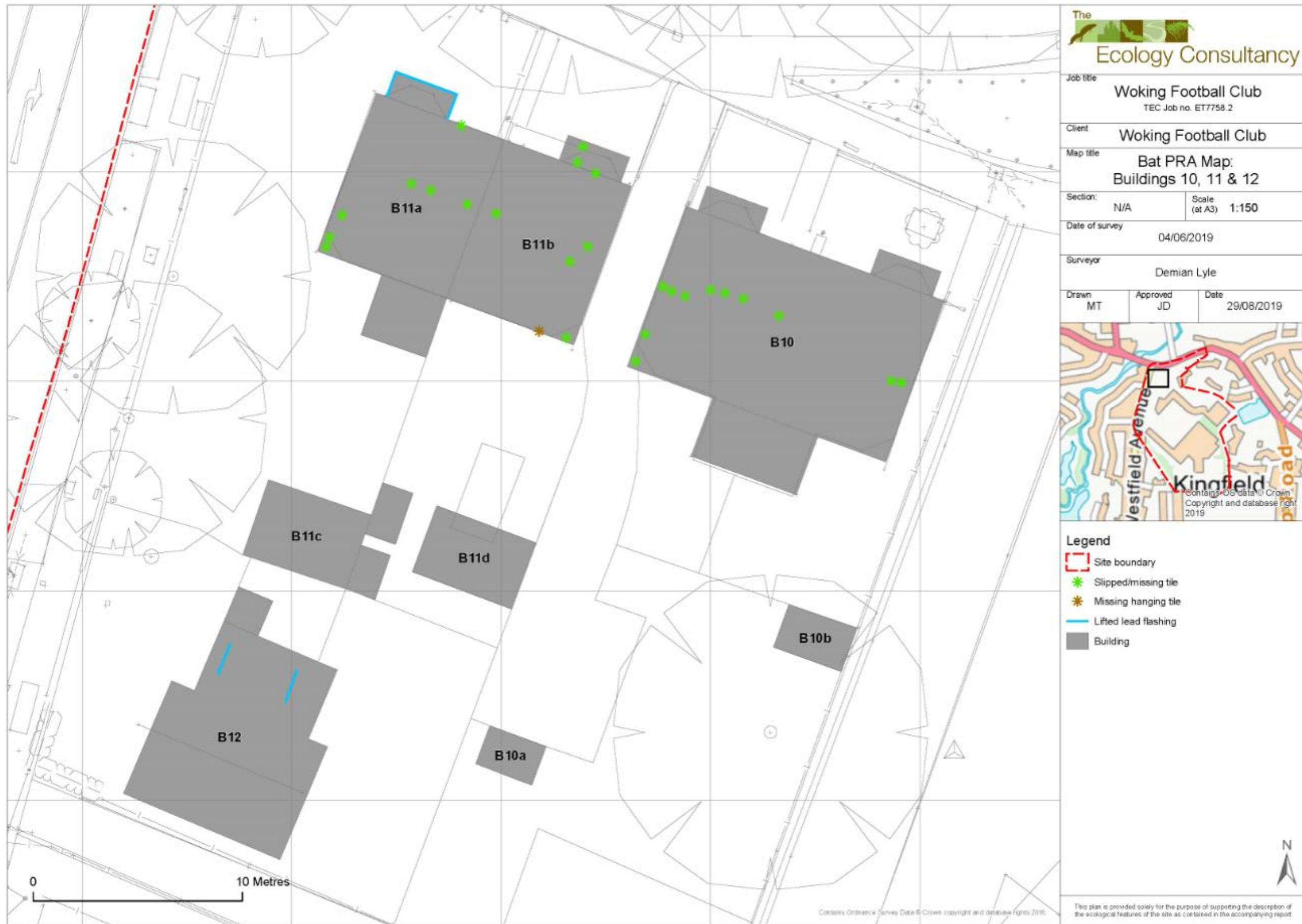


Figure 2: Map of Preliminary Roost Assessment survey B16 results

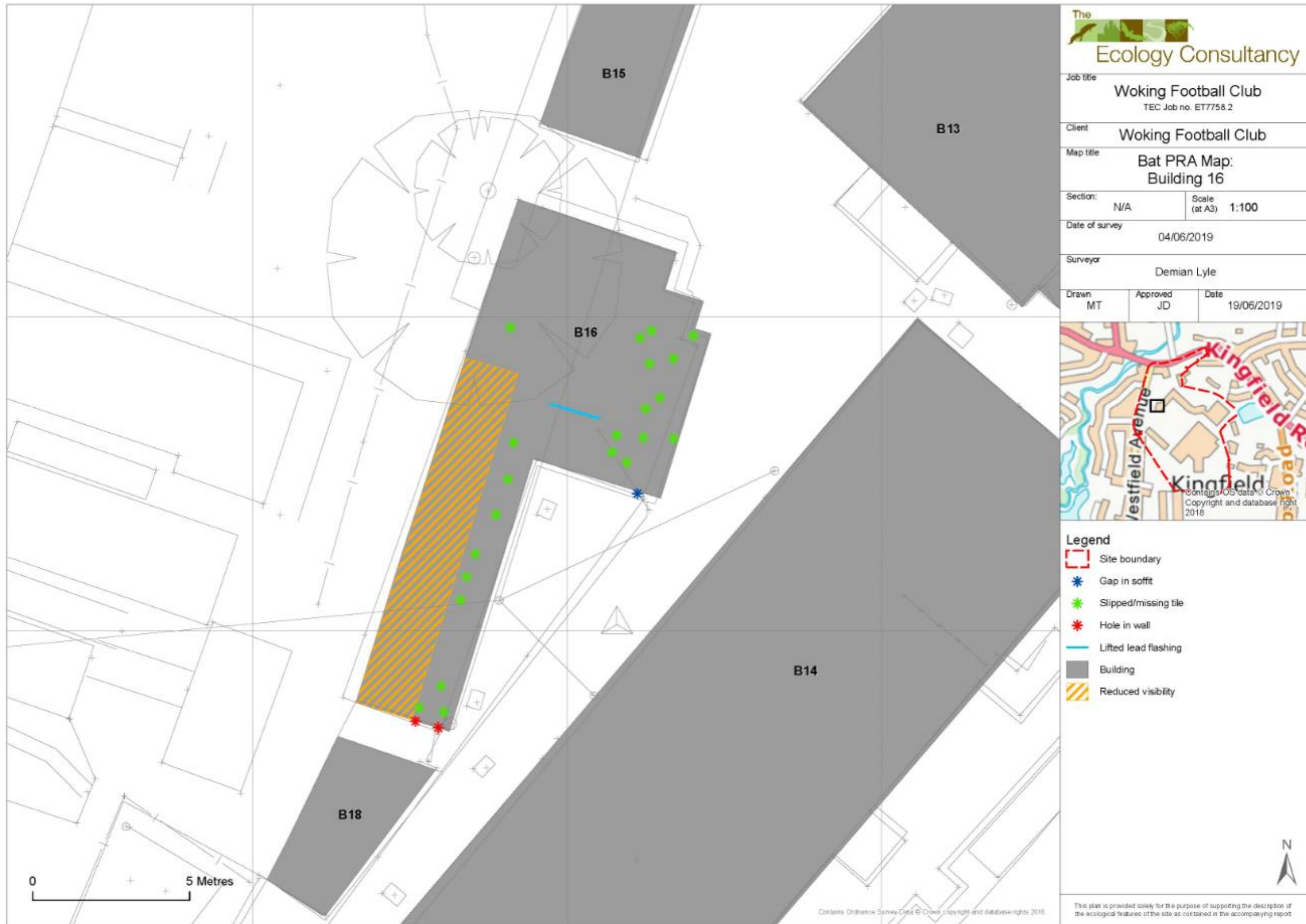




Figure 3: Map of bat emergence survey of B10 and B11 results – 8 July 2019

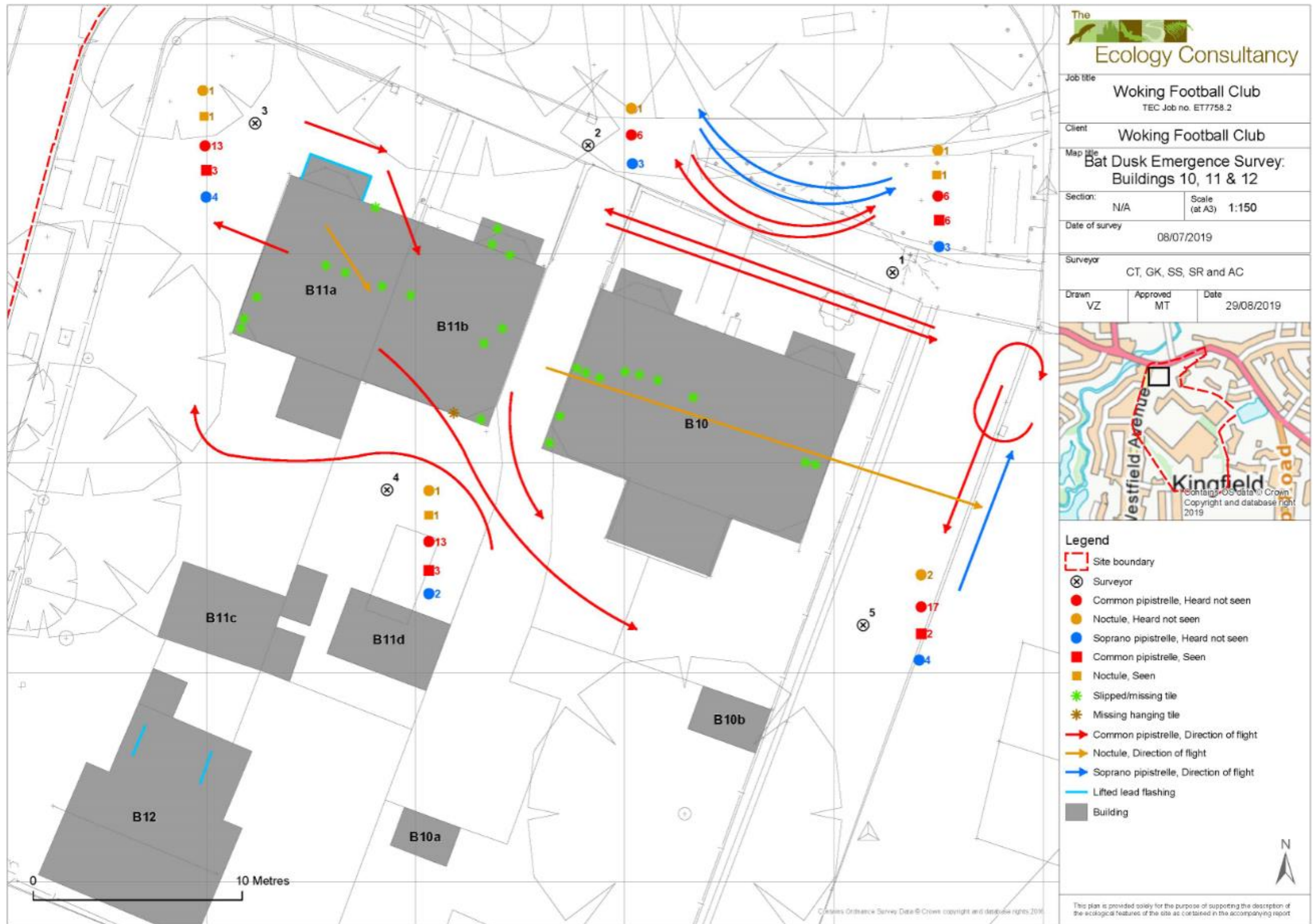




Figure 4: Map of bat emergence survey of B16 results – 8 July 2019

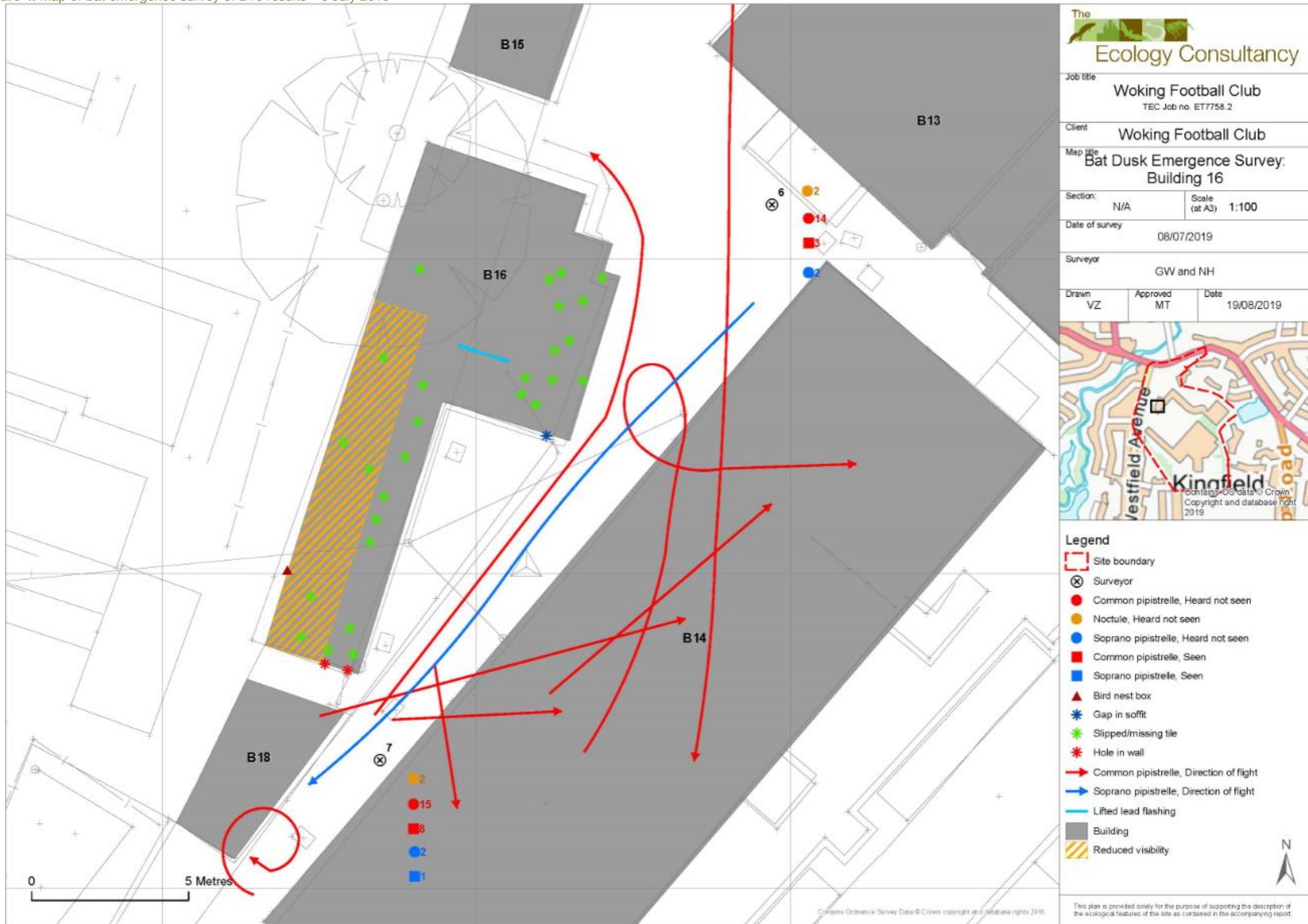
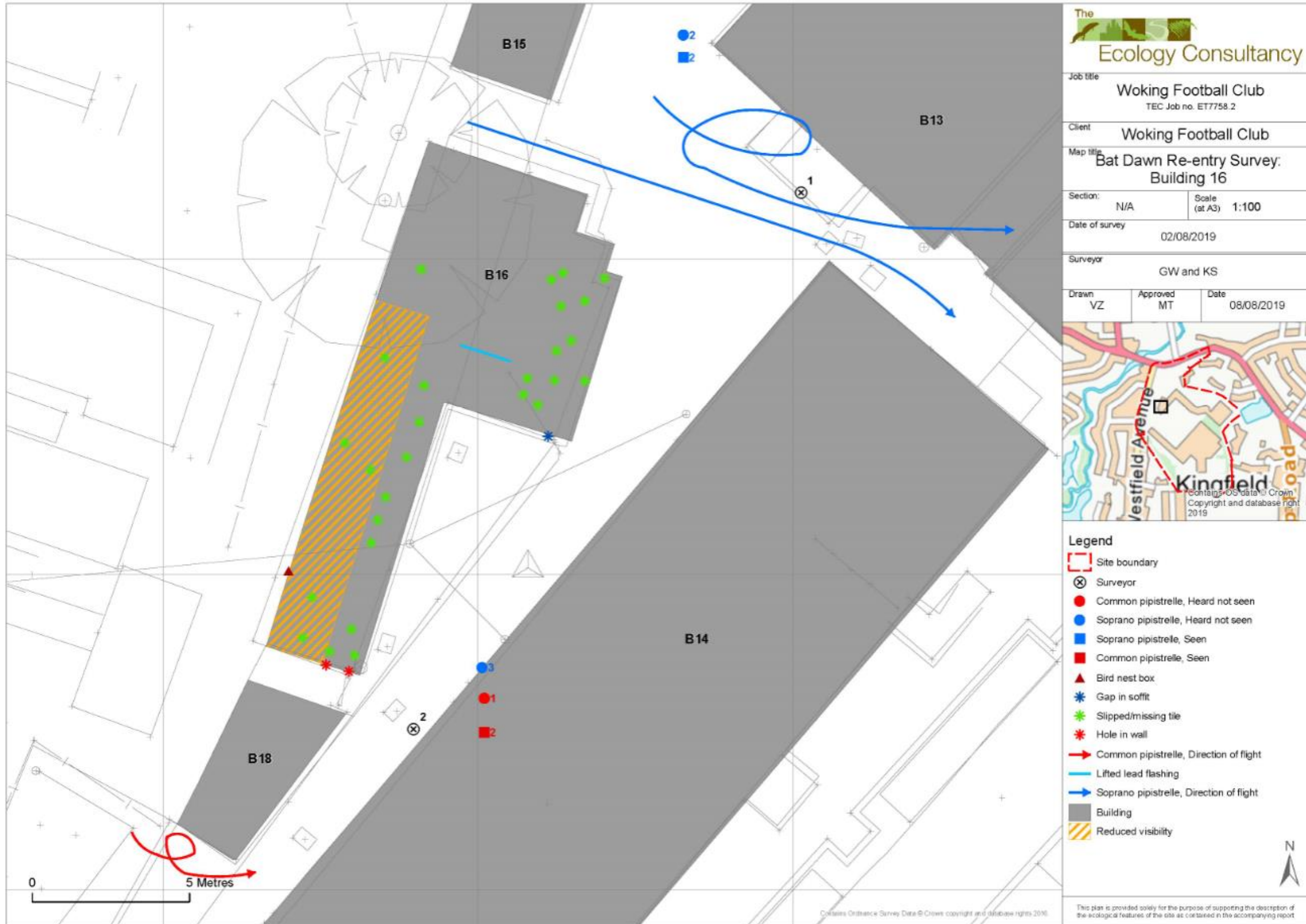




Figure 4: Map of bat re-entry survey of B16 results – 2 August 2019





## Appendix 2: Photographs

**Photograph 1**  
View of Building B10, with low potential to support roosting bats, viewed from the south.



**Photograph 2**  
View of inside of loft void of Building B10, appears to have been recently re-roofed with breathable membrane lining the tiles.



**Photograph 3**  
View of B11, as viewed from the north-west on Kingfield Road. Representative view of hanging tiles beneath bay windows.



**Photograph 4**  
Example of gap under roof tile on Building B11, to the south of the chimney.



**Photograph 5**  
View of lifted hanging tile and missing tile under window on building B11, on southern elevation.



**Photograph 6**  
View of inside of loft void of B11, with unlined tiles.



**Photograph 7**  
View of garage building B11c, as viewed from the north-west, with negligible potential to support roosting bats.



**Photograph 8**  
View of sheds and outbuilding B11d, as viewed from the north-west, with negligible potential to support roosting bats.





**Photograph 9**  
View of building B12, as viewed from the west, with negligible potential to support roosting bats.



**Photograph 10**  
South-eastern elevation of building B16, with several lifted/slipped tiles on the roof covering.



**Photograph 11**  
Buddleia shrubs obscuring view of the western elevation of building B16 during PEA and dusk/dawn surveys (taken 04/06/2019).



**Photograph 12**  
Western elevation visible after buddleia shrubs had been removed, with bird nesting box attached to building, and slipped and lifted tiles visible on roof covering.



## Appendix 3: Survey Data



Preliminary Roost Assessment Survey results – 04/06/2019

<b>Project</b>		7758.2 Woking Football Club		<b>Building reference</b>		Building 10	
<b>Surveyor</b>		D. Lyle		<b>Date</b>		04/06/2019	
<b>Grid ref – Easting, Northing</b>		500523	157452	<b>Equipment used</b>		Binoculars, high powered LED torch	
<b>General weather conditions</b>		Overcast, warm with light breeze,					
<b>Temperature</b>	22	<b>Cloud cover (0-8)</b>	7	<b>Wind (Beaufort 0-12)</b>	2	<b>Rain (0-5)</b>	0
<b>External Assessment</b>							
<b>Structure type</b>	Three storey including loft conversion, semi-detached dwellings			<b>In use as:</b>	Residential		
<b>Approximate age</b>	1930-1950			<b>Roof material</b>	Clay tiles		
<b>Roof shape</b>	Pitched			<b>Cladding?</b>	None	<b>Soffits?</b>	Yes
<b>Hanging tiles?</b>	Hanging clay tiles on north-east and south-west elevations			<b>Chimney?</b>	None	<b>Lead flashing?</b>	None lifted
<b>Shape of Building</b>	Rectangular			<b>Dormers?</b>	Yes	<b>Bargeboard?</b>	No
<b>Constructed of:</b>	Brick, likely to be cavity wall			<b>General condition</b>	Brickwork and tiles generally tight, small number of gaps noted		
<b>Internal Assessment</b>							
<b>Roof void present?</b>	Yes – not all was accessible			<b>Frame type</b>	-		
<b>Truss Type</b>	-			<b>Insulation type</b>	Fibre glass		
<b>Floor type (void)</b>	-			<b>Cavity in wall?</b>	Yes		
<b>Evidence of use by bats</b>	None noted on exterior of building or within loft void						
<b>Description / notes</b>							

<b>Project</b>		7758.2 Woking Football Club		<b>Building reference</b>		Building 11	
<b>Surveyor</b>		D. Lyle		<b>Date</b>		04/06/2019	
<b>Grid ref - Easting, Northing</b>		500508	157459	<b>Equipment used</b>		Binoculars, high powered LED torch	
<b>General weather conditions</b>		Overcast, warm with light breeze, dry.					
<b>Temperature</b>	22	<b>Cloud cover (0-8)</b>	7	<b>Wind (Beaufort 0-12)</b>	2	<b>Rain (0-5)</b>	0
<b>External Assessment</b>							
<b>Structure type</b>	Two-storey semi-detached dwellings			<b>In use as:</b>	Residential		
<b>Approximate age</b>	1930-1950			<b>Roof material</b>	Clay tiles		
<b>Roof shape</b>	Pitched			<b>Cladding?</b>	None	<b>Soffits?</b>	Yes
<b>Hanging tiles?</b>	Hanging clay tiles on north-eastern and south-western elevations			<b>Chimney?</b>	Yes	<b>Lead flashing?</b>	On north-west dormer
<b>Shape of Building</b>	rectangular			<b>Dormers?</b>	Yes	<b>Bargeboard?</b>	No
<b>Constructed of:</b>	Brick, likely to be cavity wall			<b>General condition</b>	Good		
<b>Internal Assessment</b>							
<b>Roof void present?</b>	Yes			<b>Frame type</b>	-		
<b>Truss Type</b>	King post			<b>Insulation type</b>	-		
<b>Floor type (void)</b>	-			<b>Cavity in wall?</b>	Yes		
<b>Evidence of use by bats</b>	None noted on exterior of building or within loft void						
<b>Description / notes</b>							



<b>Project</b>		7758.2 Woking Football Club		<b>Building reference</b>		Building 12	
<b>Surveyor</b>		D. Lyle		<b>Date</b>		04/06/2019	
<b>Grid ref - Easting, Northing</b>		518699	166900	<b>Equipment used</b>		Binoculars, high powered LED torch	
<b>General weather conditions</b>		Overcast, warm with light breeze, light drizzle towards end of survey.					
<b>Temperature</b>	22	<b>Cloud cover (0-8)</b>	7	<b>Wind (Beaufort 0-12)</b>	2	<b>Rain (0-5)</b>	0
<b>External Assessment</b>							
<b>Structure type</b>	Two-storey residential building			<b>In use as:</b>	Residential		
<b>Approximate age</b>	1960s			<b>Roof material</b>	Clay tiles		
<b>Roof shape</b>	Pitched			<b>Cladding?</b>	None	<b>Soffits?</b>	Yes-plastic
<b>Hanging tiles?</b>	Yes – hanging clay tiles on eastern and western elevations			<b>Chimney?</b>	None	<b>Lead flashing?</b>	Yes
<b>Shape of Building</b>	square			<b>Dormers?</b>	Yes	<b>Bargeboard?</b>	No
<b>Constructed of:</b>	Brick cavity wall			<b>General condition</b>	Good		
<b>Internal Assessment</b>							
<b>Roof void present?</b>	Yes – not accessed			<b>Frame type</b>	-		
<b>Truss Type</b>	-			<b>Insulation type</b>	-		
<b>Floor type (void)</b>	-			<b>Cavity in wall?</b>	Yes		
<b>Evidence of use by bats</b>	None noted on exterior of building						
<b>Description / notes</b>							

<b>Project</b>		7758.2 Woking Football Club		<b>Building reference</b>		Building 16	
<b>Surveyor</b>		D. Lyle		<b>Date</b>		04/06/2019	
<b>Grid ref - Easting, Northing</b>		518699	166900	<b>Equipment used</b>		Binoculars, high powered LED torch	
<b>General weather conditions</b>		Overcast, warm with light breeze,					
<b>Temperature</b>	22	<b>Cloud cover (0-8)</b>	7	<b>Wind (Beaufort 0-12)</b>	2	<b>Rain (0-5)</b>	0
<b>External Assessment</b>							
<b>Structure type</b>	Single storey			<b>In use as:</b>	Maintenance store		
<b>Approximate age</b>	1950s			<b>Roof material</b>	Clay tiles		
<b>Roof shape</b>	Hipped			<b>Cladding?</b>	None	<b>Soffits?</b>	Yes
<b>Hanging tiles?</b>	Yes – on southern and northern elevations			<b>Chimney?</b>	None	<b>Lead flashing?</b>	Yes
<b>Shape of Building</b>	square			<b>Dormers?</b>	None	<b>Bargeboard?</b>	None
<b>Constructed of:</b>	Solid brick walls			<b>General condition</b>	Moderate – many missing and slipped tiles, gaps in brickwork		
<b>Internal Assessment</b>							
<b>Roof void present?</b>	Yes – not accessed			<b>Frame type</b>	-		
<b>Truss Type</b>	-			<b>Insulation type</b>	-		
<b>Floor type (void)</b>	-			<b>Cavity in wall?</b>	No		
<b>Evidence of use by bats</b>	None noted on exterior of building						
<b>Description / notes</b>	Loft hatch sealed and internal access to loft void not possible. Dense shrubs adjacent to western elevation of building limited visibility of the brickwork and roof covering on the western elevation.						



### Evening Emergence Survey Results – 08/07/2019

<b>Project</b>		7758.2 Woking Football Club		<b>Building reference</b>		Building 10	
<b>Surveyor</b>		1		<b>Date</b>		08/07/2019	
<b>Survey no</b>		1		<b>Survey start/end times</b>		21:03 – 22:48	
<b>Sunset/rise time</b>		21:18		<b>Equipment reference</b>		Batlogger	
<b>Surveyor-Easting, Northing</b>		5000543	157464	<b>Surveyor location</b>			
<b>General weather conditions</b>		Breezy and warm					
<b>Temperature (start and end)</b>	18	<b>Cloud cover (0-8)</b>	8	<b>Wind (Beaufort 0-12)</b>	2	<b>Rain (0-5)</b>	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
21:24	N	1	S	C	W-E	Over building	
21:27	CP	1	NS	-	-	Heard not seen	
21:29	CP	1	S	C	W-E	Across N elevation of houses	
21:34	CP	1	S	F	W	Foraging overhead in trees, until 21:36	
21:40	CP	1	NS	F	-	Heard not seen	
21:42	CP	1	NS	F	-	Heard not seen	
21:43	CP	1	S	F	W	Foraging in trees overhead	
21:43	SP	1	NS	-	-	Heard not seen	
21:44	CP, SP	2	NS	F	-	intermittent	
21:50	CP	1	NS	F	-	intermittent	
21:53	CP	2	S	F	N	Along tree line	

<b>Project</b>		7758.2 Woking Football Club		<b>Building reference</b>		Building 10	
<b>Surveyor</b>		1		<b>Date</b>		08/07/2019	
<b>Survey no</b>		1		<b>Survey start/end times</b>		21:03 – 22:48	
<b>Sunset/rise time</b>		21:18		<b>Equipment reference</b>		Batlogger	
<b>Surveyor-Easting, Northing</b>		5000543	157464	<b>Surveyor location</b>			
<b>General weather conditions</b>		Breezy and warm					
<b>Temperature (start and end)</b>	18	<b>Cloud cover (0-8)</b>	8	<b>Wind (Beaufort 0-12)</b>	2	<b>Rain (0-5)</b>	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
<b>Time</b>	<b>Species</b>	<b>Number of bats</b>	<b>Seen/not seen (S/NS)</b>	<b>Activity type</b>	<b>Direction of flight</b>	<b>Notes (inc map ref)</b>	
21:54	CP	1-2	S	F	E	Overhead, north-east corner of building and trees until 22:10	
22:02	SP	1	NS	-	-	Heard not seen	
22:08	N	1	NS	-	-	Heard not seen	
22:16	CP	1	S	F	S	Along east of houses until 22:18	
22:19	CP	1	NS	-	-	Until 22:22	
22:22	SP, CP	2	NS	-	-	Heard not seen	
22:23	CP	1	NS	F	-	Until 22:33	
22:33	CP, SP	2	NS	-	-	Heard not seen	
22:37	CP	1	NS	F	-	Heard not seen	
22:46	CP	1	NS	F	-	Heard not seen	

<b>Project</b>		7758.2 Woking Football Club		<b>Building reference</b>		Building 10/ Building 11	
<b>Surveyor</b>		2		<b>Date</b>		08/07/2019	
<b>Survey no</b>		1		<b>Survey start/end times</b>		21:03 – 22:48	
<b>Sunset/rise time</b>		21:18		<b>Equipment reference</b>		Batlogger B10	
<b>Surveyor-Easting, Northing</b>		500517	157467	<b>Surveyor location</b>		North of B10 and B11	
<b>General weather conditions</b>		Mild					
<b>Temperature (start and end)</b>	22	<b>Cloud cover (0-8)</b>	7	<b>Wind (Beaufort 0-12)</b>	1	<b>Rain (0-5)</b>	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
<b>Time</b>	<b>Species</b>	<b>Number of bats</b>	<b>Seen/not seen (S/NS)</b>	<b>Activity type</b>	<b>Direction of flight</b>	<b>Notes (inc map ref)</b>	
21:24	N	1	NS	C	-		
21:29	CP	1	NS	C	-		
21:34	SP	1	NS	-	-	Very faint	
21:34	CP	1	NS	-	-		
21:53	SP, CP	2	NS	-	-		
21:58	SP	2	NS	C	-		
22:00	CP	1	NS	C	-		
22:02	CP	1	NS	C	-		
22:14	CP	1	NS	-	-		



<b>Project</b>		7758.2 Woking Football Club		<b>Building reference</b>		Building 11	
<b>Surveyor</b>		3		<b>Date</b>		08/07/2019	
<b>Survey no</b>		1		<b>Survey start/end times</b>		21:03 – 22:48	
<b>Sunset/rise time</b>		21:18		<b>Equipment reference</b>		Batlogger 2	
<b>Surveyor-Easting, Northing</b>		500505	157469	<b>Surveyor location</b>		NW corner of B11	
<b>General weather conditions</b>		Light breeze, heavy traffic					
<b>Temperature (start and end)</b>	8	<b>Cloud cover (0-8)</b>	8	<b>Wind (Beaufort 0-12)</b>	2	<b>Rain (0-5)</b>	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
<b>Time</b>	<b>Species</b>	<b>Number of bats</b>	<b>Seen/not seen (S/NS)</b>	<b>Activity type</b>	<b>Direction of flight</b>	<b>Notes (inc map ref)</b>	
21:24	N	1	S	C	SE	Over building	
21:30	CP	1	S	F	SE	Over building	
21:34	CP	1	S	C	W	Over building	
21:50	CP	1	NS	-	-		
21:52	SP	1	NS	-	-		
21:54	CP	1	S	C	SE		
21:58	SP	1	NS	-	-		
22:00	CP	1	NS	-	-		
22:08	N	1	NS	-	-		
22:11	CP	1	NS	-	-		
22:16	CP	1	NS	-	-		
22:19	CP	1	NS	-	-		

<b>Project</b>		7758.2 Woking Football Club		<b>Building reference</b>		Building 11	
<b>Surveyor</b>		3		<b>Date</b>		08/07/2019	
<b>Survey no</b>		1		<b>Survey start/end times</b>		21:03 – 22:48	
<b>Sunset/rise time</b>		21:18		<b>Equipment reference</b>		Batlogger 2	
<b>Surveyor-Easting, Northing</b>		500505	157469	<b>Surveyor location</b>		NW corner of B11	
<b>General weather conditions</b>		Light breeze, heavy traffic					
<b>Temperature (start and end)</b>	8	<b>Cloud cover (0-8)</b>	8	<b>Wind (Beaufort 0-12)</b>	2	<b>Rain (0-5)</b>	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
<b>Time</b>	<b>Species</b>	<b>Number of bats</b>	<b>Seen/not seen (S/NS)</b>	<b>Activity type</b>	<b>Direction of flight</b>	<b>Notes (inc map ref)</b>	
22:24	CP	1	NS	-	-		
22:25	CP	1	NS	-	-		
22:31	CP	2	NS	-	-		
22:35	CP	1	NS	F	-		
22:44	CP	1	NS	-	-		
22:45	SP	1	NS	-	-		
22:45	CP	2	NS	-	-		
22:47	SP, CP	2	NS	-	-		

<b>Project</b>		7758.2 Woking Football Club		<b>Building reference</b>		Building 10	
<b>Surveyor</b>		4		<b>Date</b>		08/07/2019	
<b>Survey no</b>		1		<b>Survey start/end times</b>		21:03 – 22:48	
<b>Sunset/rise time</b>		21:18		<b>Equipment reference</b>		Batlogger 21	
<b>Surveyor-Easting, Northing</b>		500508	157444	<b>Surveyor location</b>		South of B10	
<b>General weather conditions</b>		Cloudy, muggy, light breeze					
<b>Temperature (start and end)</b>	21-19	<b>Cloud cover (0-8)</b>	8	<b>Wind (Beaufort 0-12)</b>	2-1	<b>Rain (0-5)</b>	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
<b>Time</b>	<b>Species</b>	<b>Number of bats</b>	<b>Seen/not seen (S/NS)</b>	<b>Activity type</b>	<b>Direction of flight</b>	<b>Notes (inc map ref)</b>	
21:24	N	1	S	F	SE	High, feeding buzz heard	
21:33	CP	1	S	C	S		
21:50	CP	1	S	C	W		
21:59	CP	1	NS	C	-	2 faint passes	
22:00	CP	1	NS	C/F	-	2 closer passes	
22:09	N	1	NS	C	-	Distant	
22:13	CP	1	NS	F	-		
22:14	CP	1	S	C	E		
22:16	CP	1	NS	F	-		
22:18	CP	1	NS	F	-	Sounded close	
22:22	CP	1	NS	-	-	Faint, brief	
22:32	CP	1	NS	C	-		
22:33	CP	1	NS	-	-		



22:35	CP	1	NS	-	-	
22:38	SP	1	NS	-	-	
22:40	CP	1	NS	-	-	
22:45	CP	1	NS	-	-	
22:46	CP	1	NS	-	-	
22:48	CP	1	NS	-	-	

<b>Project</b>		7758.2 Woking Football Club0		<b>Building reference</b>		Building 1	
<b>Surveyor</b>		5		<b>Date</b>		08/07/2019	
<b>Survey no</b>		1		<b>Survey start/end times</b>		21:03 – 22:48	
<b>Sunset/rise time</b>		21:18		<b>Equipment reference</b>		Batlogger 5	
<b>Surveyor-Easting, Northing</b>		500534	157432	<b>Surveyor location</b>		South-east of B10	
<b>General weather conditions</b>							
<b>Temperature (start and end)</b>	19	<b>Cloud cover (0-8)</b>	8	<b>Wind (Beaufort 0-12)</b>	1	<b>Rain (0-5)</b>	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
<b>Time</b>	<b>Species</b>	<b>Number of bats</b>	<b>Seen/not seen (S/NS)</b>	<b>Activity type</b>	<b>Direction of flight</b>	<b>Notes (inc map ref)</b>	
21:25	N	1	NS	-	-		
21:30	CP	1	NS	-	-		
21:46	CP	1	NS	-	-		
21:50	CP	1	NS	-	-		
21:51	CP	1	NS	-	-		
21:53	CP	1	NS	-	-		
21:54	CP	1	NS	-	-		
21:57	CP	1	NS	-	-		
21:59	SP	1	NS	-	-		
22:00	CP	1	S	F	N	Foraging in front of surveyor	
22:03	SP	1	NS	-	-		
22:06	CP	1	NS	-	-		

<b>Project</b>		7758.2 Woking Football Club0		<b>Building reference</b>		Building 1	
<b>Surveyor</b>		5		<b>Date</b>		08/07/2019	
<b>Survey no</b>		1		<b>Survey start/end times</b>		21:03 – 22:48	
<b>Sunset/rise time</b>		21:18		<b>Equipment reference</b>		Batlogger 5	
<b>Surveyor-Easting, Northing</b>		500534	157432	<b>Surveyor location</b>		South-east of B10	
<b>General weather conditions</b>							
<b>Temperature (start and end)</b>	19	<b>Cloud cover (0-8)</b>	8	<b>Wind (Beaufort 0-12)</b>	1	<b>Rain (0-5)</b>	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
<b>Time</b>	<b>Species</b>	<b>Number of bats</b>	<b>Seen/not seen (S/NS)</b>	<b>Activity type</b>	<b>Direction of flight</b>	<b>Notes (inc map ref)</b>	
22:09	N	1	NS	-	-		
22:11	CP	1	NS	-	-		
22:15	CP	1	NS	-	-		
22:16	CP	1	S	F	SE		
22:22	SP	1	NS	-	-		
22:24	CP	1	NS	-	-		
22:27	CP	1	NS	-	-		
22:32	CP	1	NS	-	-		
22:38	SP	1	NS	-	-		
22:39	SP	1	NS	-	-		
22:44	CP	1	NS	-	-		
22:48	CP	1	NS	-	-		



<b>Project</b>		7758.2 Woking Football Club		<b>Building reference</b>		Building 16	
<b>Surveyor</b>		6		<b>Date</b>		08/07/2019	
<b>Survey no</b>		1		<b>Survey start/end times</b>		21:05-22:48	
<b>Sunset/rise time</b>		21:18		<b>Equipment reference</b>		Batlogger 25	
<b>Surveyor-Easting, Northing</b>		500507	157364	<b>Surveyor location</b>		South-east of B16	
<b>General weather conditions</b>		Overcast, muggy, mild					
<b>Temperature (start and end)</b>	21	<b>Cloud cover (0-8)</b>	8	<b>Wind (Beaufort 0-12)</b>	1	<b>Rain (0-5)</b>	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
21:24	N	1	NS	C	-		
21:38	CP	1	NS	F	-	Repeat passes until 21:42, did not emerge from B16	
21:45	CP	1	S	F	NE	Repeat passes not seen	
21:47	CP	2	S	F	S	One bat seen. Repeat passes	
21:49	CP	2	NS	F	-		
21:50	CP	1	S	C	N	Repeat passes	
21:51	CP	2	NS	F	-	Repeat passes until 21:53	
21:54	CP	2	NS	F	-	Repeat passes	
21:56	CP	2	S	F	Circling	At the south of the building, around amenity grass. Until 22:00	