

ARCHAEOLOGICAL DESK BASED ASSESSMENT

Land behind Broadfields, Wivenhoe

JAC26990
Land behind Broadfields,
Wivenhoe
Final
March 2021

Quality Management

Version	Status	Authored by	Approved by	Date
Version 1	Draft for Comment	Robert Masefield	Robert Masefield	25.01.21
Version 2	Draft to include geophysical survey	Robert Masefield	Robert Masefield	29.01.21
Final	Final including development proposal	Robert Masefield	Robert Masefield	26.03.21

© Copyright RPS Group Plc. All rights reserved.

The report has been prepared for the exclusive use of our client and unless otherwise agreed in writing by RPS Group Plc, any of its subsidiaries, or a related entity (collectively 'RPS'), no other party may use, make use of, or rely on the contents of this report. The report has been compiled using the resources agreed with the client and in accordance with the scope of work agreed with the client. No liability is accepted by RPS for any use of this report, other than the purpose for which it was prepared. The report does not account for any changes relating to the subject matter of the report, or any legislative or regulatory changes that have occurred since the report was produced and that may affect the report. RPS does not accept any responsibility or liability for loss whatsoever to any third party caused by, related to or arising out of any use or reliance on the report.

RPS accepts no responsibility for any documents or information supplied to RPS by others and no legal liability arising from the use by others of opinions or data contained in this report. It is expressly stated that no independent verification of any documents or information supplied by others has been made. RPS has used reasonable skill, care and diligence in compiling this report and no warranty is provided as to the report's accuracy. No part of this report may be copied or reproduced, by any means, without the prior written consent of RPS.

Prepared by:

RPS

**Robert Masefield BSc (Hons) MA FSA MCIfA
Director – Heritage**

20 Farringdon Street
London, EC4A 4AB

T 07796338079

E masefieldr@rpsgroup.com

Prepared for:

Taylor Wimpey East London

EXECUTIVE SUMMARY

- Land at behind Broadfields, Wivenhoe, Essex has been assessed for its below ground archaeological potential in support of a planning application for residential development.
- The development comprises construction of residential development (Use Class C3), access, landscaping, public open space, and associated infrastructure works.
- The proposed development will not impact on any designated archaeological assets.
- This assessment has considered a low potential at the Site to contain Palaeolithic, Mesolithic, Neolithic or Bronze Age remains, a low-medium archaeological potential for settlement or landscape features of Iron Age and Roman date, a low potential for settlement activity of the Anglo-Saxon to post-medieval periods and a moderate potential for agricultural remnants of medieval to modern date.
- Aerial photographs suggest the possible presence of former enclosure ditches and former post-medieval field boundaries as cropmarks within the southern zone of proposed residential development. The possible enclosure may date to the late prehistoric or Roman periods. The identifications are, to some extent, confirmed as feint traces by geophysical surveys of 2019, whilst another possible rectangular enclosure was identified by an extension to the geophysical survey undertaken in January 2021. These surveys are provided Appendix 2 of this report.
- If prove to be of archaeological derivation they, and any other archaeological remains that may be present would most likely be of a local significance only.
- Ploughing is likely to have truncated archaeological remains such that only features cut into the geology below are likely to survive.
- Overall, given the Site's limited archaeological potential, it is considered unlikely that the proposed development of the Site would impact upon any significant archaeological assets which might preclude the development of the Site.
- It is likely that the archaeological advisor to Colchester Borough Council will request a programme of archaeological work at the Site but as remains of a high significance are not anticipated, it is suggested that this work could be secured by an appropriate planning condition attached to the granting of planning consent.

Contents

EXECUTIVE SUMMARY	I
1 INTRODUCTION AND SCOPE OF STUDY	1
2 PLANNING BACKGROUND AND DEVELOPMENT PLAN FRAMEWORK	2
National Planning Policy.....	2
Local Planning Policy	3
Relevant National and Local Designations	5
3 GEOLOGY AND TOPOGRAPHY	6
Geology	6
Topography	6
4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND WITH ASSESSMENT OF SIGNIFICANCE	7
Timescales used in this report.....	7
Introduction	7
Archaeological Events	7
Early Prehistoric – Palaeolithic.....	8
Mesolithic.....	9
Neolithic	10
Bronze Age	10
Iron Age	10
Roman	11
Anglo-Saxon	12
Medieval	12
Post Medieval & Modern (including map regression exercise)	13
Undated Evidence	14
Negative Evidence.....	14
Assessment of Significance	15
5 SITE CONDITIONS, THE PROPOSED DEVELOPMENT & REVIEW OF POTENTIAL DEVELOPMENT IMPACTS ON ARCHAEOLOGICAL ASSETS	17
Site Conditions	17
Proposed Development.....	17
Review of Potential Development Impacts on Archaeological Assets	17
6 SUMMARY AND CONCLUSIONS	19
FIGURES	22
PLATES	1

Figures

Figure 1: Site Location

Figure 2: HER Plot (Data from Colchester Borough Council HER)

Figure 3: 1777 Chapman & Andre

Figure 4: 1799 OSD

Figure 5: 1838 Wivenhoe & 1841 Elmstead Tithe Maps

Figure 6: 1874 Ordnance Survey 25 inch

Figure 7: 1936 Ordnance Survey 25 inch

Figure 8: 1970 Ordnance Survey 1:2,500

Figure 9: 1979-81 Ordnance Survey 1:2,500

Figure 10: 1983-88 Ordnance Survey 1:2500)

Figure 11: 1994 Ordnance Survey 1:2500

Figure 12: 2000 Google Earth Image

Figure 13: 2009 Google Earth Image

Figure 14: 2018 Google Earth Image

Figure 15: 2020 Google Earth Image

Figure 16: Proposed Development

Appendix 1: HER Gazetteer

Appendix 2: Geophysical Survey

Plates

Plate 1: View looking ENE from west side of the southern field

Plate 2: View facing north from central-western area of the Site

Plate 3: View looking north-east across Site from below the power line east of Alexandra Drive

Plate 4: View looking east from central area of the Site east of Alexandra Drive

Plate 5: View looking south from under power line in central area of the Site east of Alexandra Drive

1 INTRODUCTION AND SCOPE OF STUDY

- 1.1 This below ground archaeological desk-based assessment has been researched by Alex Slater, prepared by Robert Masefield of RPS Heritage on behalf of Taylor Wimpey East London.
- 1.2 The subject of this assessment, also known as the study site, is land behind Broadfields, Wivenhoe. The proposed area of residential development is approximately 3.5ha out of the 11.58ha site, including the northern open space, and is centred at TM 04549 23344 (Fig. 1) within the administrative area of Colchester Borough Council.
- 1.3 The proposed development comprises construction of residential development (Use Class C3), access, landscaping, public open space, and associated infrastructure works (Fig. 16). The eastern field area, east of the residential zone, will remain undeveloped open space.
- 1.4 Taylor Wimpey East London has commissioned RPS Heritage to establish the archaeological potential of the site and to provide guidance on ways to address any archaeological constraints identified.
- 1.5 In accordance with relevant policy and guidance on archaeology and planning, and in accordance with the 'Standard and Guidance for Historic Environment Desk-Based Assessments' (Chartered Institute for Archaeologists October 2020), this assessment draws together the available archaeological, topographic and land-use information in order to clarify the archaeological potential of the site.
- 1.6 This desk-based assessment comprises an examination of evidence on the Colchester and Essex HER's, Aerial Photographic plots held by the Colchester and Essex HER's and other sources including the results of a comprehensive map regression exercise.
- 1.7 A geophysical survey of the areas of proposed residential development has also been provided in support of the assessment (Appendix 2).
- 1.8 This assessment thus enables relevant parties to assess the archaeological potential of various parts of the site and to consider the need for design, civil engineering, and archaeological solutions to the archaeological potential identified.

2 PLANNING BACKGROUND AND DEVELOPMENT PLAN FRAMEWORK

- 2.1 National legislation regarding archaeology, including scheduled monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983 and 2002, and updated in April 2014.
- 2.2 In March 2012, the government published the National Planning Policy Framework (NPPF), which was most recently revised in June 2019. The NPPF is supported by the National Planning Practice Guidance (NPPG), which was published online 6th March 2014 and has since been periodically updated.
- 2.3 The NPPF and NPPG are additionally supported by three Good Practice Advice (GPA) documents published by Historic England: GPA 1: The Historic Environment in Local Plans; GPA 2: Managing Significance in Decision-Taking in the Historic Environment (both published March 2015). The second edition of GPA3: The Setting of Heritage Assets was published in December 2017.

National Planning Policy

- 2.4 Section 16 of the NPPF, entitled 'Conserving and Enhancing the Historic Environment' provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 16 of the NPPF can be summarised as seeking the:
- Delivery of sustainable development;
 - Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment;
 - Conservation of England's heritage assets in a manner appropriate to their significance; and
 - Recognition that heritage makes a contribution towards our knowledge and understanding of the past.
- 2.5 Section 16 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. Paragraph 189 states that planning decisions should be based on the significance of the heritage asset and that level of detail supplied by an applicant should be proportionate to the importance of the asset and should be no more than sufficient to review the potential impact of the proposal upon the significance of that asset.
- 2.6 *Heritage Assets* are defined in Annex 2 of the NPPF as: a building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. It includes designated heritage assets and assets identified by the local planning authority (including local listing).
- 2.7 Annex 2 also defines *Archaeological Interest* as a heritage asset which holds, or potentially holds, evidence of past human activity worthy of expert investigation at some point.
- 2.8 A *Nationally Important Designated Heritage Asset* comprises a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation.
- 2.9 *Significance* is defined as: The value of a heritage asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.
- 2.10 *Setting of a heritage asset* is defined as: The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a

setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

2.11 In short, government policy provides a framework which:

- Protects nationally important designated Heritage Assets;
- Protects the settings of such designations;
- In appropriate circumstances seeks adequate information (from desk based assessment and field evaluation where necessary) to enable informed decisions;
- Provides for the excavation and investigation of sites not significant enough to merit *in-situ* preservation.

2.12 The NPPG reiterates that the conservation of heritage assets in a manner appropriate to their significance is a core planning principle, requiring a flexible and thoughtful approach. Furthermore, it highlights that neglect and decay of heritage assets is best addressed through ensuring they remain in active use that is consistent with their conservation. Importantly, the guidance states that if complete, or partial loss of a heritage asset is justified, the aim should then be to capture and record the evidence of the asset's significance and make the interpretation publicly available. Key elements of the guidance relate to assessing harm. An important consideration should be whether the proposed works adversely affect a key element of the heritage asset's special architectural or historic interest. Additionally, it is the degree of harm, rather than the scale of development, that is to be assessed. The level of 'substantial harm' is considered to be a high bar that may not arise in many cases. Essentially, whether a proposal causes substantial harm will be a judgment for the decision taker, having regard to the circumstances of the case and the NPPF. Importantly, harm may arise from works to the asset or from development within its setting. Setting is defined as the surroundings in which an asset is experienced and may be more extensive than the curtilage. A thorough assessment of the impact of proposals upon setting needs to take into account, and be proportionate to, the significance of the heritage asset and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it.

2.13 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance the NPPF, by current Development Plan Policy and by other material considerations.

Local Planning Policy

2.14 The site is located within Colchester Borough Council.

2.15 The Colchester Borough Council Local Development Framework Core Strategy was adopted in 2008 and contains the following policy relating to the historic environment:

UR 2 – BUILT DESIGN AND CHARACTER

THE COUNCIL IS COMMITTED TO ENHANCING COLCHESTER'S UNIQUE HISTORIC CHARACTER WHICH IS HIGHLY VALUED BY RESIDENTS AND AN IMPORTANT TOURIST ATTRACTION. BUILDINGS, CONSERVATION AREAS, ARCHAEOLOGICAL SITES, PARKLANDS, VIEWS, THE RIVER AND OTHER FEATURES THAT CONTRIBUTE POSITIVELY TO THE CHARACTER OF THE BUILT ENVIRONMENT SHALL BE PROTECTED FROM DEMOLITION OR INAPPROPRIATE DEVELOPMENT. ARCHAEOLOGICAL ASSESSMENTS WILL BE REQUIRED ON DEVELOPMENT SITES THAT POSSESS

KNOWN ARCHAEOLOGICAL DEPOSITS, OR WHERE IT IS CONSIDERED THAT THERE IS GOOD REASON FOR SUCH REMAINS TO EXIST. IMPORTANT ARCHAEOLOGICAL SITES AND THEIR SETTINGS WILL BE PRESERVED IN SITU.

2.16 The Colchester Borough Council Local Development Framework Development Policies Document was adopted in October 2010 and contains the following policy relating to the historic environment:

POLICY DP14: HISTORIC ENVIRONMENT ASSETS

DEVELOPMENT WILL NOT BE PERMITTED THAT WILL ADVERSELY AFFECT A LISTED BUILDING, A CONSERVATION AREA, HISTORIC PARK OR GARDEN OR IMPORTANT ARCHAEOLOGICAL REMAINS. DEVELOPMENT AFFECTING THE HISTORIC ENVIRONMENT SHOULD SEEK TO PRESERVE OR ENHANCE THE HERITAGE ASSET AND ANY FEATURES OF SPECIFIC HISTORIC, ARCHAEOLOGICAL, ARCHITECTURAL OR ARTISTIC INTEREST. IN ALL CASES THERE WILL BE AN

EXPECTATION THAT ANY NEW DEVELOPMENT WILL ENHANCE THE HISTORIC ENVIRONMENT IN THE FIRST INSTANCE, UNLESS THERE ARE NO IDENTIFIABLE OPPORTUNITIES AVAILABLE. IN INSTANCES WHERE EXISTING FEATURES HAVE A NEGATIVE IMPACT ON THE HISTORIC ENVIRONMENT, AS IDENTIFIED THROUGH CHARACTER APPRAISALS, THE LOCAL PLANNING AUTHORITY WILL REQUEST THE REMOVAL OF THE FEATURES THAT UNDERMINE THE HISTORIC ENVIRONMENT AS PART OF ANY PROPOSED DEVELOPMENT. SUPPORT WILL BE GIVEN TO THE PROVISION OF CREATIVE AND ACCESSIBLE INTERPRETATIONS OF HERITAGE ASSETS.

CONSERVATION OF THE HISTORIC ENVIRONMENT WILL ALSO BE ENSURED BY:

(I) IDENTIFYING, CHARACTERISING, PROTECTING AND ENHANCING CONSERVATION AREAS;

(II) PROTECTION AND ENHANCEMENT OF EXISTING BUILDINGS AND BUILT AREAS WHICH DO NOT HAVE LISTED BUILDING OR CONSERVATION AREA STATUS BUT HAVE A PARTICULAR LOCAL IMPORTANCE OR CHARACTER WHICH IT IS DESIRABLE TO KEEP. SUCH BUILDINGS OR GROUPS OF BUILDINGS WILL BE IDENTIFIED THROUGH A LOCAL LIST WHICH WILL BE ADOPTED BY THE COUNCIL;

(III) PRESERVING OR ENHANCING LISTED BUILDINGS, SCHEDULED MONUMENTS, HISTORIC PARKS AND GARDENS, INCLUDING THEIR RESPECTIVE SETTINGS, AND OTHER FEATURES WHICH CONTRIBUTE TO THE HERITAGE OF THE BOROUGH; AND

(IV) KNOWN SITES OF ARCHAEOLOGICAL IMPORTANCE WILL BE CLEARLY IDENTIFIED AND PROTECTED, AND SITES THAT BECOME KNOWN, WHETHER THROUGH FORMAL EVALUATION AS PART OF A PLANNING APPLICATION OR OTHERWISE, WILL SIMILARLY BE PROTECTED ACCORDING TO THEIR IMPORTANCE.

HERITAGE STATEMENTS AND/OR ARCHAEOLOGICAL EVALUATIONS WILL BE REQUIRED FOR PROPOSALS RELATED TO OR IMPACTING ON THE SETTING OF HERITAGE ASSETS AND/OR KNOWN OR POSSIBLE ARCHAEOLOGICAL SITES, SO THAT SUFFICIENT INFORMATION IS PROVIDED TO ASSESS THE IMPACTS OF DEVELOPMENT ON HISTORIC ENVIRONMENT ASSETS TOGETHER WITH ANY PROPOSED MITIGATION MEASURES.

2.17 Colchester Council, by decision at the meeting of Full Council on Monday 1 February 2021, has formally adopted the Colchester Borough Local Plan 2013-2033: North Essex Authorities' Shared Strategic Section 1 Plan. The following vision statement is included:

"Vision for North Essex North Essex will be an area of significant growth over the period to 2033 and beyond, embracing positively the need to build well-designed new homes, create jobs and improve and develop infrastructure for the benefit of existing and new communities.

It will continue to be an attractive and vibrant area in which to live and work, making the most of its rich heritage, town centres, natural environment, coastal resorts, excellent educational facilities and strategic transport links which provide access to the ports, Stansted Airport, London and beyond. Rural and urban communities will be encouraged to thrive and prosper and will be supported by adequate community infrastructure.

Sustainable development principles will be at the core of the strategic area's response to its growth needs, balancing social, economic and environmental issues. Green and blue infrastructure and

new and expanded education and health care facilities enabling healthy and active lifestyles will be planned and provided along with other facilities to support the development of substantial new growth; while the undeveloped countryside and the natural and historic environment will be conserved and enhanced. Key to delivering sustainable development is that new development will address the requirement to protect and enhance the historic environment and settlement character.

At the heart of our strategic vision for North Essex is a new garden community, to be sensitively integrated within the existing historic built and natural environment, and based on Garden City principles...”

2.18 Policy SP 1 Presumption in Favour of Sustainable development reads as follows: .

“When considering development proposals the Local Planning Authorities will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework. They will always work pro-actively with applicants to find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area.

Development that complies with the Plan will be approved without delay, unless material considerations indicate otherwise.”

Relevant National and Local Designations

2.19 In terms of relevant designated heritage assets, as defined above and as shown on Figure 2, no designated World Heritage Sites, Scheduled Monuments, Historic Battlefield sites or Historic Wreck sites lie within the vicinity of the study site.

2.20 In line with relevant planning policy and guidance, this desk based assessment seeks to clarify the site’s archaeological potential and the need or otherwise for additional mitigation measures.

3 GEOLOGY AND TOPOGRAPHY

Geology

- 3.1 The solid geology of the London area is shown by the British Geological Association (BGS Online 2021) to comprise “Thames Group - Clay, Silt And Sand. Sedimentary Bedrock formed approximately 34 to 56 million years ago in the Palaeogene Period. Local environment previously dominated by deep seas” (<https://mapapps.bgs.ac.uk/geologyofbritain/home.html>).
- 3.2 These deposits are sealed by a layer of “Cover Sand - Clay, Silt And Sand. Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by wind blown deposits.”
- 3.3 Whilst there is no site-specific geotechnical data available, a borehole sequence is recorded at the extreme northern extent of the study site from a surface level of 33.5m OD, according to the British Geological Survey (BGS Online 2021; BGS ID: 558019; BGS Reference: TM02SW14 British National Grid (27700): 604450,223660). The record describes – ‘Loam’ to 4m in depth comprising ‘soil and gravel contaminated by black clay and silt’ above a 0.6m deposit of ‘Grey silt’ in turn sealing 2.7m of ‘Glacial Sand and Gravel’ comprising ‘sandy gravel; gravel- fine with some coarse, sub-angular to sub-rounded flints and sub-rounded quartzites and quartz sand; pale brown mostly medium’ above London Clay (brown weathered Clay) .

Topography

- 3.4 The Site is generally relatively level at c.33m OD in the northern area of proposed development, 31.75m OD in the central southern area and c. 30.5m OD at southern extent.

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND WITH ASSESSMENT OF SIGNIFICANCE

Timescales used in this report

Prehistoric

Palaeolithic	900,000 -	12,000 BC
Mesolithic	12,000 -	4,000 BC
Neolithic	4,000 -	2,500 BC
Bronze Age (including Chalcolithic)	2,500 -	800 BC
Iron Age	800 -	AD 43

Historic

Roman	AD 43 -	410
Saxon/Early Medieval	AD 410 -	1066
Medieval	AD 1066 -	1485
Post Medieval	AD 1486 -	1799
Modern	AD 1800 -	Present

Introduction

- 4.1 This chapter reviews the available archaeological evidence for the Site and the archaeological/historical background of the study site and surrounding area, and, in accordance with NPPF, considers the potential for any as yet to be discovered archaeological evidence on the study site prior to any assessment of any later development or below ground impacts.
- 4.2 What follows comprises a review of known archaeological assets within a 1km radius of the study site (Fig. 2), also referred to as the study area, held on the Colchester Historic Environment Record (HER) and the Essex HER, together with a historic map regression exercise charting the development of the study area from the 16th century onwards until the present day.
- 4.3 Chapter 5 subsequently considers the site conditions, later development and below ground impacts, and whether the proposed development is likely to impact archaeological assets and potential archaeological assets identified below.

Archaeological Events

- 4.4 A geophysical survey was undertaken on the Site by SUMO for this project in 2019 (SUMO 2019; ECC4411 on Fig. 2) in order to assess the potential of possible cropmarks previously known on the Site (MCC9022 on Fig. 2). The conclusions of the report read as follows:

“No anomalies have been detected that could be interpreted as being of archaeological origin. A number of responses of uncertain origin have been detected, one of which corresponds to a cropmark visible on aerial mapping. The other uncertain responses are likely to be due to modern agricultural practices or natural causes. The majority of features which are visible in the aerial imagery and that are recorded in the HER are not visible in the magnetic data; therefore, it is possible that these features are related to agricultural or funerary practices rather than settlement activity. This could explain the lack of magnetic differentiation between the natural and fill of the features.”

- 4.5 Despite the apparent clarity from the aerial photographs of an L-shaped ditch, which is shown on 19th century maps between 1838 and 1936 as a field boundary (see Figs 5 – 7), and the putative enclosure to the south-west of the connection of the L-ditch (see Figure 2 and the 2018 aerial photograph provided as Figure 14); the geophysical survey report was uncertain of their derivation. It did, however, confirm features that appeared to correspond to those cropmarks. The possible enclosure features would require intrusive investigation to confirm their origin and function.
- 4.6 This survey has now been updated in 2021 with a further c.2ha of survey to the immediate north of the previous survey, to account for the proposed northern extent of the development as shown on Figure 16. The western zone of this survey suggests the possibility of another possible rectilinear enclosure aligned on a north-east/south-west axis (see Appendix 2).
- 4.7 Further Events on the HER within the study area include archaeological monitoring along Colchester Road, Wivenhoe in 2015 c.500m to the north-west of the Site (ECC2910), a 1979 salvage excavation by Debbie Priddy, c.350m to the east of the Site (ECC3552) and a Heritage Statement of 20 The Cross, Wivenhoe, 2017 c.560m to the south-west of the Site (ECC4068).
- 4.8 The ECC2910 was devoid of interest whilst the findings of the salvage excavation west of Keelars Farm (ECC3552) are note detailed on the HER.
- 4.9 The Essex HER includes an archaeological evaluation and excavation was undertaken in 2007/2008 from c. 600m to the north-east of the Site at Fen Farm, Elmstead Market for Lafarge Aggregate Ltd (EEX54409; Essex Field Archaeology Unit 2008). The former quarry site is now shown as a large lake on Fig. 2. Multi-period archaeological remains were investigated from the Middle Bronze to the late Iron Age. The investigations are described in the period-based sections below.

Early Prehistoric – Palaeolithic

- 4.10 There is only one findspot of confirmed Palaeolithic date within the study area comprising two flakes found in an organic deposit of Cromerian (ie pre-Clacton) age, from Near Broad Lanes c.220m to the east of the Site (MCC6937 on Fig. 2 with the blue outline showing the quarry extent). A surface find of a flint blade from West of Keelars Farm, c.360m to the east of the Site might be of (later) Palaeolithic or Mesolithic to Neolithic date (MCC7120).
- 4.11 Essex County Council have characterised the potential for Palaeolithic remains for Essex including Colchester Borough (Zone 3 Kesgrave Gravels – Colchester). The mapping indicates these large areas, which includes the Site, have a moderate potential generally (see O'Connor 2015, Fig. 21). The following description is provided:
- “Trending southwest – northeast in central Essex, mostly beneath the till (boulder clay) cover, extensive linear areas of sands and gravels, the Kesgrave Sands and Gravels, mark very early courses of the Thames, originating from the Midlands or beyond... These sands and gravels were deposited over about 300,000 years, covering 10 or more cold – warm cycles. Changes in the proportions of the lithologies and analyses of the gradients of the river indicate that at around MIS 16 - 19 (c.700,000 years ago) the extended headwaters were lost and the catchment retracted to within the Cotswold crest. Consequently the Kesgrave Sands and Gravels are divided into the Sudbury (extensive catchment) and Colchester (reduced catchment) Formations...
- These sands and gravels were deposited over a long period time, from MIS 19 or 16-17 (c.700.00 years ago) to MIS 12, (c.450,000 years ago), representing 6 cold – warm cycles. Consequently the Kesgrave Sands and Gravels are divided into the older Sudbury (extensive catchment) and the younger Colchester (reduced catchment) Formations...”
- 4.12 The Site is situated over the Wivenhoe Gravel sub-group of ‘*Sudbury and Colchester Formations of the Kesgrave Sands and Gravels*’. ‘*Wivenhoe Gravel*’ as a sub-classification includes ‘*Wivenhoe Upper gravel MIS 13, Wivenhoe interglacial deposits MIS 13 and Wivenhoe Lower Gravel MIS 14*’. Although the deposits of the Colchester Formation are thought to have been largely deposited in

cold periods, when Britain was unoccupied, they represent at least 200,000 to 300,000 timespan before the Anglian Glaciation of c.450,000 years ago, and the recent identification of interglacial sites at Pakefield (the Norfolk Coast) dating to around 700,000 years ago and Happisburgh in on the Norfolk coast which dates to between 950,000 and 850,000 years ago, the potential for very early human remains in East Anglia is now becoming apparent.

4.13 O'Connor (ibid) further states (referencing 'LU' sub periods as defined in her report):

"Thus there is potential within the gravels of this period both for derived occupational evidence in cold climate gravel deposits, and also for the scarce (but very important, if detected) occurrence of less disturbed evidence in fine-grained horizons or buried land surfaces within the Formation that represent interglacial deposits from this time range. Some of these are known and mapped, included here as LU 4.

Interestingly, bearing in mind the presently known history of occupation of Britain (very sporadic before MIS 15, but with more common sites known from the Cromerian complex covering MIS 15 through to the onset of MIS 12, the Anglian glaciation), this pattern is represented in the Essex HER...

One record from LU 3 is that from Wivenhoe quarry, near Elmstead Market, east of Colchester (HER 7252), where Bridgland found two flakes in situ in the 2nd youngest terrace (Wivenhoe interglacial deposits)..."

4.14 This latter record appears to refer to the above two flakes from Near Broad Lanes (MCC6937) and provides more information on their derivation from Wivenhoe quarry.

4.15 The Wivenhoe formation Kesgrave Sands and Gravels (Sudbury and Colchester Formations) are described by O'Connor as follows:

"WIVENHOE

The sequence at Wivenhoe conforms to the cold – warm – cold pattern with:

5 Involuted stony silty-clay, humic but possibly due to reworking from (3) rather being organic in its own right

4 Wivenhoe Upper Gravel, horizontally-bedded gravels with occasional sand lenses (cold stage)

3 Organic silty clay with plant remains scattered pebbles, yielded two struck flint flakes, possibly lacustrine in an old meander cut-off (interglacial)

2 Sands, horizontally- and cross-bedded

1. Wivenhoe Lower Gravel, medium coarse sandy gravel (cold stage)."

4.16 Despite this geological context, which underlies the Site, the presence of Palaeolithic material is notoriously difficult to predict and is rarely found within shallow impact development contexts (such as residential developments). Gravel quarries tend to prove more productive. Overall, given the paucity of evidence from the nearby area, the archaeological potential at the site for the Palaeolithic period is considered to be low.

Mesolithic

4.17 There are currently no confirmed Mesolithic finds within the study area although the aforementioned blade find from West of Keelars Farm, c.360m to the east of the Site might be its date (MCC7120).

4.18 Mesolithic hunter-gatherer communities were typically attracted to areas close to rivers and estuaries for the procurement of game, wildfowl and fish resources and for use as key routes of communication. Given the proximity of the River Colne and the Blackwater Estuary it is likely that Mesolithic communities operated their mobility cycles in this general area.

- 4.19 However, the paucity of local Mesolithic finds to date suggests a generally low potential for the presence of occupation evidence such as camp sites (most usually identified by dense scatters of worked flintwork) and although stray finds of worked flint may be present in the ploughsoil there is a low potential for more significant evidence.

Neolithic

- 4.20 Archaeological evidence of the earliest farmers of the Neolithic is increasingly evident across Essex in general and archaeological investigations for Colchester Garrison to the north-east of the study area have produced early Neolithic pottery from a tree hole east of Mersea Road and circular pits of mid-late Neolithic date from Flagstaff Road confirming local presence.
- 4.21 A Neolithic arrowhead is recorded from the parish (British History Online). However (with the possible exception of the above flint blade find that could alternatively be of early Neolithic date) there are no Neolithic sites or finds within the study area or the Site. Although this may reflect a lack of local investigation, at present a low potential is appropriate for the presence of Neolithic occupation evidence at the Site itself.

Bronze Age

- 4.22 Evidence for more permanent settlement associated with the emergence of field-systems of the Bronze Age is similarly scarce do date within the study area. Bronze Age settlement and field-systems tend to concentrate on the lighter chalk and gravel geologies, which were well drained and easier to farm than the heavy claylands and therefore the presence Wivenhoe Gravel geology here implies some potential for archaeology of this date to be present.
- 4.23 Such occupation of the gravels was identified beyond the study area at the aforementioned Colchester Garrison project, where a Late Bronze Age settlement defined by pitting was identified at the former Cavalry Barracks east of Butt Road.
- 4.24 Within the study area, the evaluation and excavation ahead of mineral extraction at Fen Farm, Elmstead Market (EEX54409; Field Archaeology Unit 2008) identified a sequence of land use and development dating back as far as the Middle Bronze Age (c.1500-1000BC). This included a small Middle Bronze Age barrow cemetery built on a slight slope overlooking a small brook in the south-east area. Some Late Neolithic to Early Bronze Age worked flint at that site may indicate activity prior to the creation of the cemetery. A bronze spearhead which may be of Bronze Age date is also recorded from the parish (British History online).
- 4.25 There are no other finds of Bronze Age date currently recorded for the remainder of the study area on the Colchester HER and the potential for field-system or settlement evidence to be present is considered to be no more than low-moderate. It should be noted that the aerial photographic evidence for cropmarks (see ECC4411 on Fig. 2) and the geophysical surveys undertaken for the project (Appendix 2) indicate several ditches of unknown date in the southern zone of the Site. However, Bronze Age ditches (excluding ring-ditches of barrows) are usually shallow, with a low organic content, they are often not identified by geophysics, and it is therefore considered most likely that these features post-date the Bronze Age.

Iron Age

- 4.26 Further expansion of rural settlement took place in the region in the Iron Age, including areas of less favourable geology, suggesting settlement pressure and rising population. This appears to coincide with the emergence of larger tribal political entities which are named for the first time by Roman writers, including Caesar following his proto expedition to Britain in 55BC.
- 4.27 The late Iron Age regional capital of the major Trinovantes then Catuvelluani tribes comprised the famous earthwork dyke defended 'territorial oppida' of Camulodunum which covered several square miles of landscape of Colchester, mainly to the south of the River Colne well to the north-east of the

study area. The great Iron Age king Cunobelin held Colchester in the decades prior to the successful Roman invasion by Claudius of AD43. It is thought his royal farmstead was located at Gosbecks in the western area of Camulodunum, with his royal mint and a riverside trading centre at Sheepen adjacent to the River Colne.

- 4.28 Within the study area, an Iron Age inhumation burial associated with a loom weight and Iron Age sherds was found between 1934 and 1936 during gravel extraction to the south-west of Keelars Farm, Wivenhoe, c.550m to the south of the Site (MCC7095). Early to Middle Iron Age burial practices usually leave little trace in the archaeological record as exposure burial (excarnation) seems to have been generally preferred, but as cremation was the favoured means of Late Iron Age burial this burial probably pre-dated Late Iron Age Camulodunum (where urned cremations are commonly found).
- 4.29 A sherd of Iron Age pottery was also found west of Keelars Farm, 360m to the east of the Site (MCC7118).
- 4.30 A later Iron Age coin reported to date to (circa) 91BC was found via metal-detecting c.50m to the east of the central eastern edge of the Site (MCC10348). A Late Iron Age to earlier Roman coin was also found at c.750m to the north-west of the Site (MCC6796).
- 4.31 The excavation at Fenn Farm, from c.600m to the north-east of the Site (EEX54409; Field Archaeology Unit 2008) was mainly concerned with mitigation of impacts to Iron Age archaeology. Several pits of Early Iron Age date (c.700-300BC) contained burnt flint and after a gap in activity of c.300 years Late Iron Age features of c.100BC to AD43 included a curving boundary ditch with gully land divisions to the east, along with two four-post structures (possible fodder stores or granaries).
- 4.32 A large undated rectangular enclosure is shown by cropmarks from c.175m to the east of the Site. This would be typical of the Iron Age or Roman periods (see Fig. 2).
- 4.33 The Site itself has some potential for similar evidence of Iron Age landscape and the presence of settlement-related activities cannot be ruled at this stage. In particular it is possible that linear features identified in the southern area of the Site as cropmarks on aerial photographs (MCC9022) including a possible 115m diameter 'curvilinear enclosure, partially surrounded by a ditched trackway, irregular shape and indistinct', and as faint traces by the geophysical survey (ECC4411), might date to the Iron Age or Roman periods. The geophysical survey also suggests the possibility of enclosures in the central and north-western areas of proposed residential development (Appendix 2).
- 4.34 Overall a moderate potential for Iron Age agricultural features and/or settlement at Site is predicted.

Roman

- 4.35 Colchester (Camulodunum) played a key role in the early history of Roman Britain beginning with it being conquered by Claudius in AD43 when it is recorded that due to the importance
- 4.36 The Site lies approximately three miles to the south-east of the major Roman town of Colchester, around which were located a moderate density of farmsteads. The Colchester Garrison redevelopment (Merville Barracks) since 2002 and associated construction of housing on realised barracks and associated training grounds by Taylor Wimpey since 2004, has produced the significant Roman remains including a Roman circus. The project also investigated a wide zone of landscape of trackways and fields with late Iron Age origins, associated with several rural settlement sites, including two small villas.
- 4.37 It is likely that Wivenhoe also lay within contemporary farmland whose market for surplus produce was also located at Colchester.

- 4.38 The HER contains several finds of Roman date including a pottery sherd from west of Keelars Farm 360m to the east of the Site (MCC7117). Metal-detecting finds include a later 3rd century coin (AD 260-296) from 850m to the west of the Site (MCC9486).
- 4.39 A few more Roman artefacts were found at Fen Farm, from c.600m to the north-east of the Site, which would be consistent with agricultural use of this area (Field Archaeology Unit 2008).
- 4.40 Although no Roman period finds have been made at the Site itself, as noted for the Iron Age above, it is possible that linear features identified as cropmarks on aerial photographs including a possible enclosure (MCC9022) and as feint traces by the geophysical survey (ECC4411) (Appendix 2), might date to the period. Therefore, a moderate potential for Roman period agricultural features and/or settlement traces at Site is currently predicted.

Anglo-Saxon

- 4.41 The place name of Wivenhoe has an Old English meaning of Wifa's ridge or spur of land, and it has been suggested this refers to early Anglo-Saxon settlement (British History Online accessed January 12 2021).
- 4.42 The parish of Wivenhoe in the Hundred of Lexden dates from the late Saxon period. The Saxon Lord of the manor in 1066 was recorded as Aefric (or Alvríc) (ibid). In 1066 Wivenhoe Manor within the parish comprised a population of 1 (heads of households).
- 4.43 No archaeological remains or finds of Anglo-Saxon date have been recorded within the study area (including within the Fen Farm excavation).
- 4.44 As the present-day village pattern was established in the late Saxon period the main focus of local activity was concentrated at the historic core of Wivenhoe itself.
- 4.45 Overall, the Site is likely to have remained within marginal to settlement foci in the Anglo-Saxon period. Therefore, a generally low archaeological potential is considered at the Site for the Saxon period.

Medieval

- 4.46 In Norman Lord in 1086 was 'Nigel' of Wivenhoe and the Tenant in Chief was Robert Gernon (ibid). The Domesday Book records a relatively large population including five villagers, 20 smallholders and two slaves. Arable land is evidenced by references to two lord's plough teams and 2.5 men's plough teams, whilst there was also 12 acres of meadow and sufficient pasture for 60 sheep in 1066 rising to 87 by 1086, and woodland for 100 pigs. A mill is also recorded in Domesday and the annual value to lord of the land was 2 pounds 5 shillings and 12 pence in 1086 making it one of the wealthiest parishes in Lexden Hundred.
- 4.47 Henry I granted the manor of Wivenhoe to William de Munfitchet and the manor descended to his sisters (1267) then came into the overlordship Giles de Plaiz, Lord Plaiz. After his death (1302) it descended with the barony of Plaiz to Sir John Howard. Documentary records also indicate that in c. 1180 Richard Battle held land on Wivenhoe Heath.
- 4.48 Wivenhoe Manor occupied most of the parish, which extended into Elmstead. The manor included a deer park by 1427 in the south-east of the parish extending into Cockaynes in Elmstead. Of note is that in the mid-13th century Geoffrey (Richard Battle's brother) gifted St. John's Abbey in Colchester the ownership of 120 acres to the south of the road to Tendring (presumed via Elmstead) known as 'Withemorhad and Nordhei'.
- 4.49 Sheep rearing continued to be of particular importance to the parish throughout the medieval period with pasture for 236 sheep in 1327, whilst the manor supplied 176 sheep and lambs to Colchester market by 1425-6.

- 4.50 As with the late Saxon period the medieval main settlement of the period was around the historic core been around the Wivenhoe. The surrounding landscape, probably including the Site will have formed the agricultural hinterland within which individual farmsteads operated, much as today. The post-medieval map regression does not suggest the potential for any known post-medieval farms that might have had their roots in the medieval period, at the Site.
- 4.51 Medieval entries on the HER include Wivenhoe Park deer park (MCC8658) c. 650m to the north-west of the Site (MCC8658) which later became a 34-hectare landscaped park around the associated post-medieval country house (Wivenhoe Park Registered Park and Garden – National List 1000371).
- 4.52 Wivenhoe Heath (MCC9167), from some 50m north-west of the extreme northwest extent of the Site, is also of medieval origin. It was first shown on the 1777 Chapman & Andre Historic Map occupying an area north of Wivenhoe when it covered an irregular area of c.121ha. The heath is not shown subsequently but was enclosed by 1800.
- 4.53 The Parish Church of St. Mary within Wivenhoe dates to between the 13th century and c.AD1500 with extensive 19th century restoration. Like several the churches within Colchester it incorporates Roman brick in its fabric (British History Online accessed 12th January 2021).
- 4.54 Medieval (or Medieval to early Post-medieval) metalwork including coins and tokens have also been found from various locations within the study area by metal-detecting (MCC5795, MCC6086, MCC6277, MCC6229, MCC6230, MCC6467, MCC6467, MCC6467, MCC6537 and MCC9932).
- 4.55 Although agricultural boundaries (potentially those identified by aerial photographs and geophysics) may be present (moderate potential), the Site is likely to have remained within marginal to settlement foci in the period, a low archaeological potential for settlement is considered appropriate.

Post Medieval & Modern (including map regression exercise)

- 4.56 Wivenhoe port was an important part of Colchester port from the 16th century until the late 19th (when the river was no longer navigable for larger vessels). A record of 1584 indicates that the lord of Wivenhoe was able to levy charges on ships for anchorage as well as for 'royal fishes' and driftwood. Between 1565 and 1577 four quays were recorded.
- 4.57 In the late 16th and 17th century, as well as fishing, shipbuilding had become an established industry in Wivenhoe, with both industries remaining important until the mid 20th century. There were 12 ships, 12 masters and owners, and 51 mariners and fishermen in 1564.
- 4.58 Water transport also connected Wivenhoe with London which was a market for its oysters and sole in 1722. By 1810 the main occupation in Wivenhoe was fishing with 213 men out of the 2,309 population of 1891 fishermen and only 52 as agricultural labourers. However, fishing had dwindled by the mid 20th century.
- 4.59 The rural economy was still dominated by sheep in the 16th and 17th centuries with a key market for wool at Colchester. Arable also became increasingly important and a weekly corn market was recorded in 1766. There is archaeological evidence for a windmill on Wivenhoe Heath (which was probably related to a building shown nearby on a 1734 map), whilst a windmill in Wivenhoe Street was taken down in 1752 and in 1838 another post windmill was located at the corner of Belle Vue and Rectory Roads.
- 4.60 Field names just north of the Alresford road indicate that potters were located on the former heathland there. Other industries have latterly included aggregate extraction from the 1920's onwards.
- 4.61 A number of the HER records within the study area refer to Post Medieval and Modern standing buildings and archaeological remains which are not discussed in detail here unless relevant to the

Site but are listed in Appendix 1 and located on Figure 2. Many of the finds relate to metal-detecting finds recorded by the Portable Antiquities Scheme. Of note with regard to World War II defences is a former spigot mortar position at Colchester Road c.200m to the south-west of the Site (MCC5533) and a destroyed ammunition centre at Tower Road c.300m to the south-west (MCC5534). However, no World War II defences are noted on the HER for the Site.

- 4.62 During the later Post Medieval and Modern periods, our understanding of settlement, land-use and the utilisation of the landscape is enhanced by cartographic and documentary sources, which can give additional detail to data contained within the HER.
- 4.63 The 1777 Chapman & Andre map of Essex (Fig. 3) shows the Site in open land to the south-east side of Wivenhoe Heath and north-east of the hamlet of Wivenhoe Cross (north of the main settlement of Wivenhoe on the estuary). A tributary stream is depicted to the east side of the Site flowing south.
- 4.64 The 1799 Ordnance Survey Drawing (Fig. 4) shows further development at Wivenhoe Cross at the south extent of Wivenhoe Heat to the west side of the Site. 'Keelers Farm' is labelled to the east of the Site. The Site is divided by agricultural fields.
- 4.65 The 1838 Wivenhoe & 1841 Elmstead Tithe Maps (Fig. 5) shows the Site in more detail as comprising three fields to the east of the hamlet of Wivenhoe Cross. The boundary between the southern and central fields shows a now lost dog-leg that is visible on the 2018 aerial photograph (Fig. 14) and is plotted by the HER (see Fig. 2).
- 4.66 The 1st edition Ordnance Survey of 1874 and subsequent mapping to 1936 show no changes within the Site (Figs 6 and 7) but by 1970 the boundaries had been removed (Fig. 8). Wivenhoe's residential development had by now extended to close to the south-west side of the Site and the overhead power line is now shown across the centre of the Site (three pylons within the Site).
- 4.67 There are no further changes within the Site although the urban edge of Wivenhoe was built to the western edge of the Site by 1983-88 (Figs 9 and 10). A football ground was present to the north of the Site by 1994 (Fig. 11) and subsequent aerial photographs show little changes up until the present day (Figs 12 to 15).
- 4.68 Overall, historic mapping demonstrates that the Site remained farmland throughout the later post-medieval period. There is a high potential for post-medieval agricultural remnants and but a low potential for settlement and/or industrial archaeology within the Site.

Undated Evidence

- 4.69 As noted above undated ditch-like features recorded as cropmarks on aerial photographs in the southern area of the Site include a possible 115m diameter 'curvilinear enclosure, partially surrounded by a ditched trackway, irregular shape and indistinct' (MCC9022). These cropmarks are also potentially also defined as feint traces by the geophysical survey (ECC4411) and might theoretically date to the Iron Age or Roman periods.
- 4.70 A large undated rectangular enclosure is shown by cropmarks c.175m to the east of the proposed residential areas of the Site, with its north-west corner entering the eastern edge of the proposals eastern open space. This would be typical of the Iron Age or Roman periods but could also be later in date (see Fig. 2).
- 4.71 A number of other cropmarks shown on Figure 2 are also undated.

Negative Evidence

- 4.72 The Colchester Archaeological Trust watching brief of three permeation trial pits adjacent to Colchester Road Wivenhoe in 2015 was devoid of archaeological interest (ECC2910).

Assessment of Significance

- 4.73 Existing national policy guidance for archaeology (the NPPF as referenced in section 2) enshrines the concept of the ‘significance’ of heritage assets. Significance as defined in the NPPF centres on the value of an archaeological or historic asset for its ‘heritage interest’ to this or future generations.
- 4.74 No relevant nationally significant designated heritage assets as defined in the NPPF are recorded within, or within the vicinity of, the study site.
- 4.75 The Site is not located within an Area of high archaeological potential within Colchester Borough. The only undesignated archaeological assets recorded within the Site by HER comprise cropmarks of potential archaeological origin. These are most likely to be late prehistoric or later in date and of local significance.
- 4.76 This assessment has considered a low potential at the Site for Palaeolithic or Mesolithic activity. The geology may in theory contain artefacts or paleo-environmental information of Palaeolithic but in practice findings, particularly in situ material, are very rare in Colchester Borough.
- 4.77 The potential for Neolithic and Bronze Age archaeology is also considered to be low based on the HER. However, local finds and cropmark evidence suggest a moderate potential for Iron Age and Roman activity at the Site. In particular cropmark evidence within the southern area of the Site suggests the possibility of a prehistoric or later sub-square enclosure, along with potentially associated field boundaries and/or trackways. Geophysical survey provides some supporting evidence, with another possible enclosure identified in the western northern area of the proposed zone of residential development (SUMO 2019, updated 2021 – see Appendix 2). The survey report provided as Appendix 2 reflects some uncertainty on their derivation and intrusive investigation would be required to confirm their authenticity date and function. However, based on form the enclosures may be of later prehistoric or Roman date, although later derivations are also possible.
- 4.78 The eastern area of proposed open space partially corresponds with the north-west corner of a rectangular enclosure. This possible stock enclosure may be of Iron Age/Roman or perhaps medieval date but would not be subject to ground disturbance associated with the proposed development.
- 4.79 Current information indicates a low potential for Anglo-Saxon and a low potential for medieval occupation but a moderate potential for the presence of medieval buried archaeological landscape features. The potential for post-medieval and modern features is also low for settlement/industry and moderate for agricultural features.
- 4.80 The significance of any archaeological remains which may be present would be derived from their evidential value and contributions that could be made towards local research agendas.
- 4.81 Whilst it is likely that archaeological remains are present within the Site, especially based on the potential of the cropmarks in the southern area, on the basis of the above, any remains, should they occur on the Site, would in the context of the Secretary of State’s non-statutory criteria for Scheduled Monuments (DCMS 2013) most likely be of local significance.
- 4.82 As identified by desk-based work, archaeological potential by period and the likely significance of any archaeological remains which may be present within the study site is summarised in table form below:

Period:	Identified Archaeological Potential and Likely Significance (if present):
Palaeolithic & Mesolithic	Low potential, Low (Local) Significance
Neolithic & Bronze	Low potential for evidence related to human activity, Low (Local) Significance
Iron Age	Low to moderate potential. Low (Local) Significance subject to intrusive investigation of cropmarks

ARCHAEOLOGICAL DESK BASED ASSESSMENT

Roman	Low to moderate potential, Low (Local) Significance subject to intrusive investigation of cropmarks
Anglo-Saxon	Low potential, Low (Local) Significance;
Medieval	Low potential for settlement, moderate for agricultural features, Low (Local) Significance
Post Medieval & Modern	Low potential, likely to be of Negligible to Low (None/Local) Significance

5 SITE CONDITIONS, THE PROPOSED DEVELOPMENT & REVIEW OF POTENTIAL DEVELOPMENT IMPACTS ON ARCHAEOLOGICAL ASSETS

Site Conditions

- 5.1 The Site currently comprises arable land to the east side of Richard Avenue and the built western edge of Wivenhoe (see Fig. 15).
- 5.2 Plates 1 to 5 illustrate the open nature of the arable landscape. Ploughing will have levelled any earthworks and to some degree truncated any buried former land-surfaces and cut features.

Proposed Development

- 5.3 The proposed development comprises construction of residential development (Use Class C3), access, landscaping, public open space, and associated infrastructure works (see Figure 16).
- 5.4 Sports pitches and public open space are proposed to the north of the residential zone, whilst the field area to the east of the residential zone will also comprise open space.

Review of Potential Development Impacts on Archaeological Assets

- 5.5 The proposed development will not impact on any designated archaeological assets.
- 5.6 The Site is not located within a locally defined Archaeological Priority Area, nor are there any non-designated heritage assets located within the Site on the Colchester HER.
- 5.7 This assessment has considered a low potential at the Site for Palaeolithic or Mesolithic activity. The geology may in theory contain artefacts or paleo-environmental information of Palaeolithic but in practice findings, particularly in situ material, are very rare in Colchester Borough. In addition, there is a relatively shallow depth of ground impacts from residential developments compared with quarries for example, which are more likely to encounter such remains.
- 5.8 Later archaeology may be impacted via initial site preparation topsoil stripping (including for the proposed sport pitch, haul road and construction compound and soil storage), roads, foundations, services and attenuation. The proposed haul road would be aligned along the western edge of the northern POS with temporary construction compound to the north side of residential zone north of the overhead power lines. Although there may be impacts via reduced dig/topsoil stripping for the new sports pitches, the northern zone of the POS will be left open landscape and ground impacts there are not expected.
- 5.9 As noted, there is low potential for Neolithic and Bronze Age archaeology with the cropmark evidence in the central southern zone of the Site, if confirmed, most likely to be of Iron Age or late date. The eastern edge of the eastern area of open space corresponds with the north-western corner of a large rectangular crop-mark enclosure. However, this area will not require temporary or permanent groundworks and this feature would be unaffected. The foundations, services, surfacing and associated landscaping within the proposed residential zone is likely to result in a moderate to severe impacts to these features (should they be genuine). Therefore, it is recommended that the areas of the Site areas that would be affected by ground disturbance from construction are subject to archaeological trial trenching and resulting mitigation where necessary, as a condition of planning consent.

- 5.10 As remains of a high significance are not anticipated, it is suggested that this work could be secured by an appropriate planning condition attached to the granting of planning consent.

6 SUMMARY AND CONCLUSIONS

- 6.1 Land at behind Broadfields, Wivenhoe, Essex has been assessed for its below ground archaeological potential in support of a planning application for residential development.
- 6.2 The development comprises construction of residential development (Use Class C3), access, landscaping, public open space, and associated infrastructure works.
- 6.3 The proposed development will not impact on any designated archaeological assets.
- 6.4 This assessment has considered a low potential at the Site to contain Palaeolithic, Mesolithic, Neolithic or Bronze Age remains, a low-medium archaeological potential for settlement or landscape features of Iron Age and Roman date, a low potential for settlement activity of the Anglo-Saxon to post-medieval periods and a moderate potential for agricultural remnants of medieval to modern date.
- 6.5 Aerial photographs suggest the possible presence of former enclosure ditches and former post-medieval field boundaries as cropmarks within the southern zone of proposed residential development. The possible enclosure may date to the late prehistoric or Roman periods. The identifications are, to some extent, confirmed as feint traces by geophysical surveys of 2019, whilst another possible rectangular enclosure was identified by an extension to the geophysical survey undertaken in January 2021. These surveys are provided Appendix 2 of this report.
- 6.6 If prove to be of archaeological derivation they, and any other archaeological remains that may be present would most likely be of a local significance only.
- 6.7 Ploughing is likely to have truncated archaeological remains such that only features cut into the geology below are likely to survive.
- 6.8 Overall, given the Site's limited archaeological potential, it is considered unlikely that the proposed development of the Site would impact upon any significant archaeological assets which might preclude the development of the Site.
- 6.9 It is likely that the archaeological advisor to Colchester Borough Council will request a programme of archaeological work at the Site but as remains of a high significance are not anticipated, it is suggested that this work could be secured by an appropriate planning condition attached to the granting of planning consent.

Sources Consulted

General

British Library
Colchester Historic Environment Record
The National Gas Archive (National Grid)
The National Archive

Internet

Bombsight – <http://bombsight.org/#17/51.49200/-0.03924>
British Geological Survey – <http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html>
British History Online – <http://www.british-history.ac.uk/>
Domesday Online – <http://www.domesdaybook.co.uk/>
Historic England: The National Heritage List for England – <http://www.historicengland.org.uk/listing/the-list/>
Portable Antiquities Scheme – www.finds.org.uk

Bibliographic

Bridgland, D. *Quaternary River Terrace Deposits as a Framework for the Lower Palaeolithic Record (In Gamble and Lawson)* 1996

British History Online 'Wivenhoe', in *An Inventory of the Historical Monuments in Essex, Volume 3, North East* (London, 1922), pp. 231-234. <http://www.british-history.ac.uk/rchme/essex/vol3/pp231-234> [accessed 12 January 2021].

British History Online 'Wivenhoe: Economic history', in *A History of the County of Essex: Volume 10, Lexden Hundred (Part) Including Dedham, Earls Colne and Wivenhoe*, ed. Janet Cooper (London, 2001), pp. 282-287. British History Online <http://www.british-history.ac.uk/vch/essex/vol10/pp282-287> [accessed 12 January 2021].

Chartered Institute for Archaeologists Standard & Guidance for historic environment desk based assessment 2014, revised 2020

DCMS *Scheduled Monuments and Nationally Important Non-Scheduled Monuments* 2013

Department of Communities and Local Government *National Planning Policy Framework* 2012 (revised February 2019)

Department of Communities and Local Government/Department of Culture Media and Sport/English Heritage *National Planning Practice Guidance* 2014 (revised 2019)

Field Archaeology Unit (Essex County Council) 2008. Fen Farm, Elmstead Market, Essex. Archaeological excavation.

Historic England (formerly English Heritage) *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment* 2008 (new draft 2017)

Historic England Historic Environment *Good Practice Advice in Planning: 1 The Historic Environment in Local Plans* July 2015 unpublished document

Historic England Historic Environment *Good Practice Advice in Planning: 2 Managing Significance in Decision-Taking in the Historic Environment* July 2015 unpublished document

ARCHAEOLOGICAL DESK BASED ASSESSMENT

Historic England Historic Environment *Good Practice Advice in Planning: 3 The Setting of Heritage Assets* December 2017 unpublished document

Historic England *Understanding Historic Buildings. A Guide to Good Recording Practice.* 2016

Margary I. D. *Roman Roads of Britain* 1955

Mills, A.D. *A Dictionary of British Place Names* 1991

O'Connor, 2015. *Managing the Essex Pleistocene.* Final Project Report. Essex County Council.

Wymer *The Lower Palaeolithic Occupation of Britain 2 volumes* 1999

Cartographic

1777 Chapman & Andre

1799 OSD

1838 Wivenhoe & 1841 Elmstead Tithe Maps

1874 Ordnance Survey 25 inch

1936 Ordnance Survey 25 inch

1970 Ordnance Survey 1:2,500

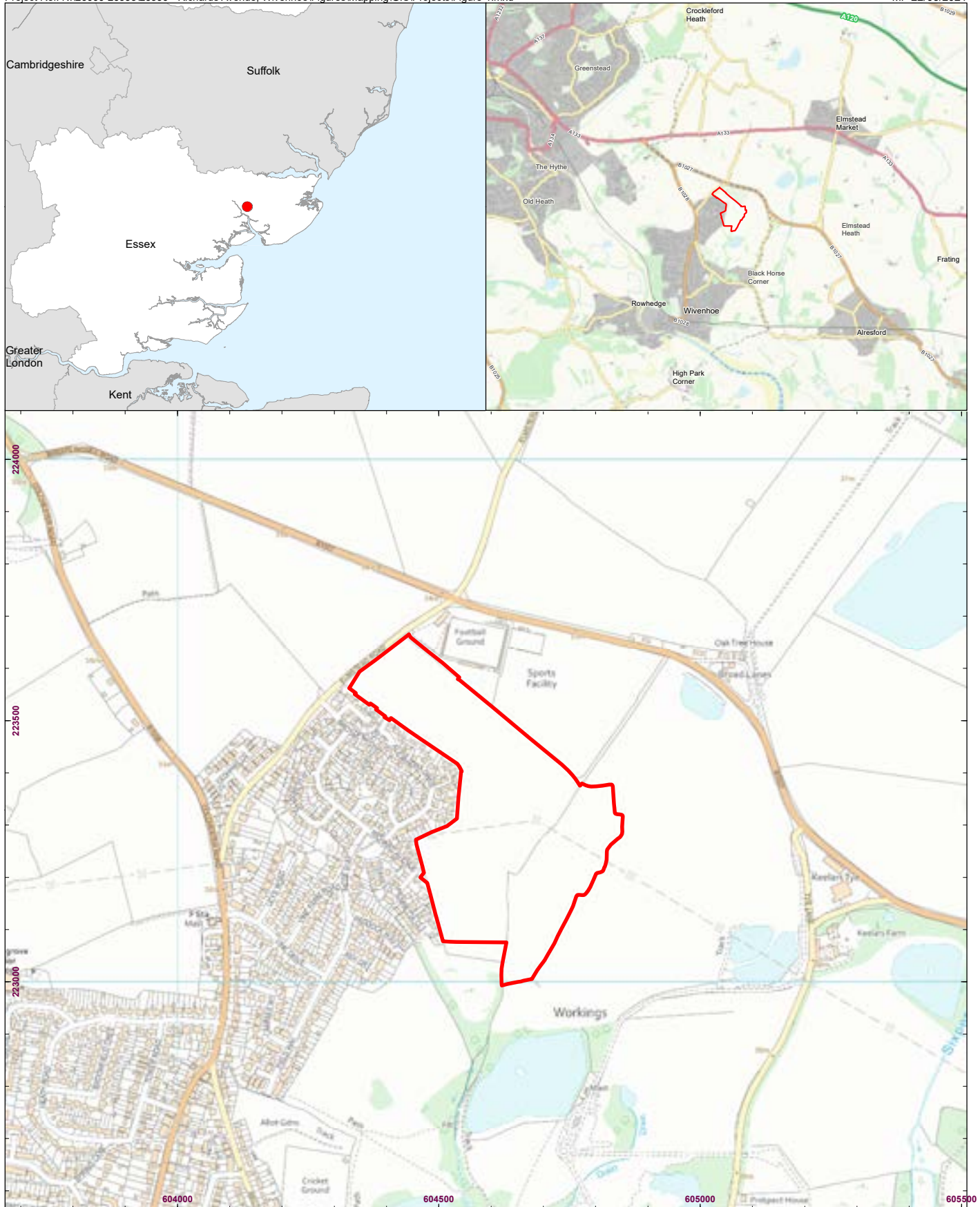
1979-81 Ordnance Survey 1:2,500

1983-88 Ordnance Survey 1:2500)

1994 Ordnance Survey 1:2500



FIGURES



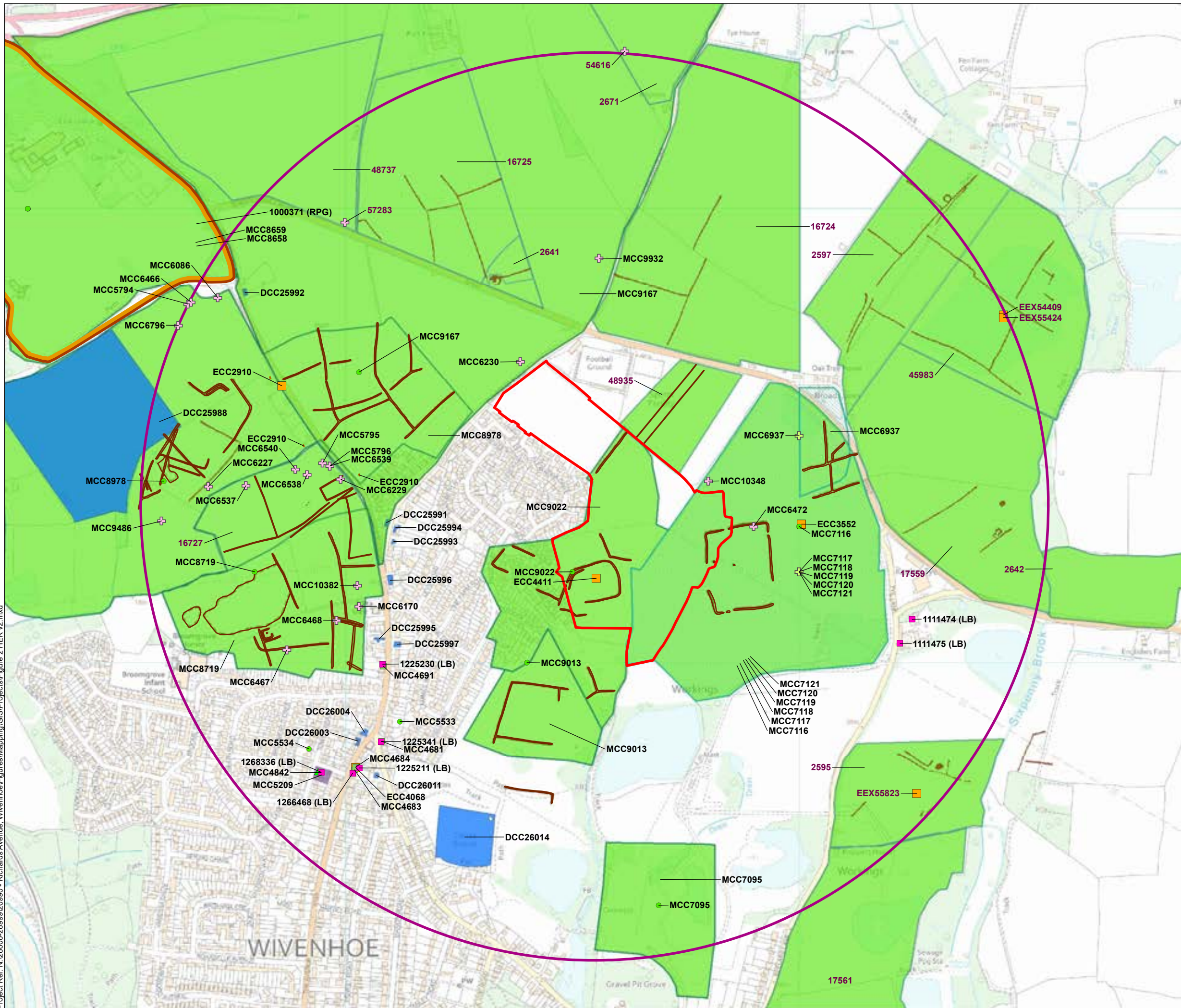
 Site Boundary



0 100 200m
Scale at A4: 1:10,000



Figure 1
Site Location



Legend

- Site Boundary
- Search Radius 1km
- Designated Heritage Assets:**
- Registered Park & Garden
- Grade II Listed Building
- Non-designated Heritage Assets:**
- Locally Listed Building
- HER Record (Point)**
- Portable Antiquities Scheme
- Find Spot
- Monument
- Industrial
- Building
- HER Record (Polygon)**
- Find Spot
- Monument
- Industrial
- Previous Archaeological Work:**
- HER Event (Point)
- HER Event (Polygon)
- NMP Feature

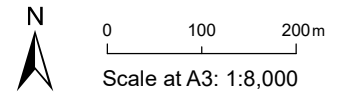
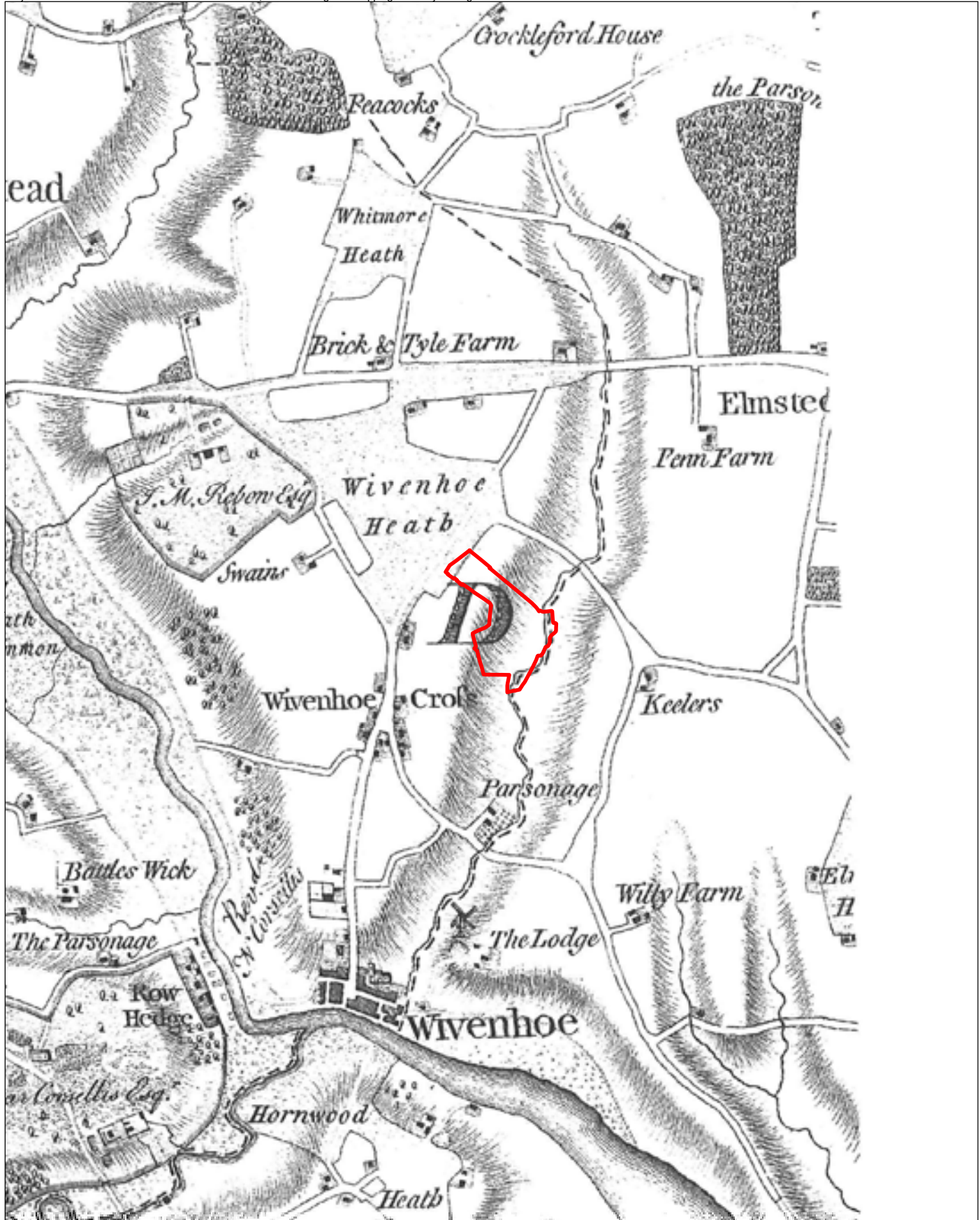


Figure 2

HER Plot



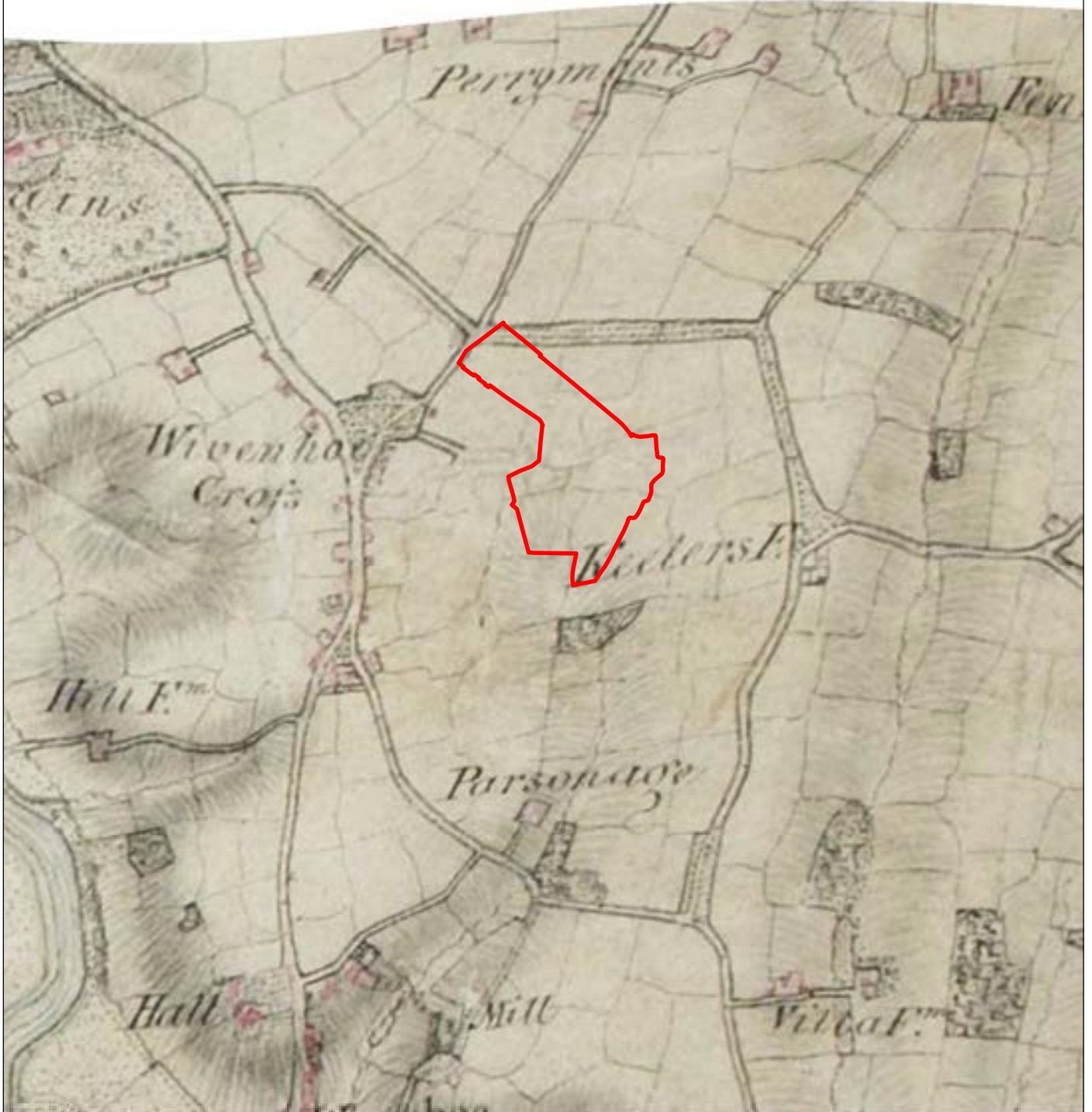
 Approximate Site Location



0 250 500 750m
Scale at A4: 1:25,000 approx.



Figure 3
1777 Chapman & Andre



 Approximate Site Location

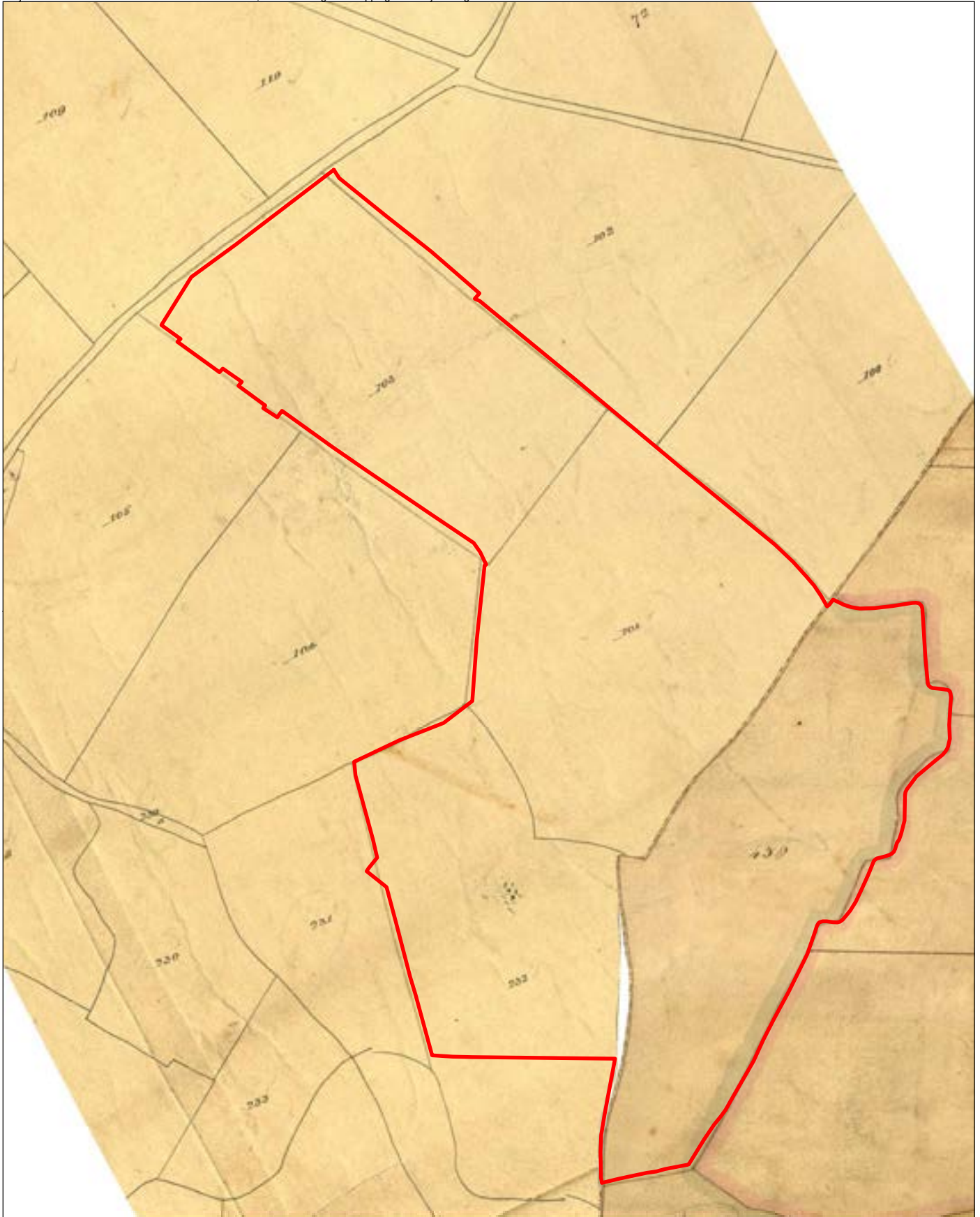


0 150 300 450m
Scale at A4: 1:15,000 approx.



Figure 4

1799 OSD



 Site Boundary

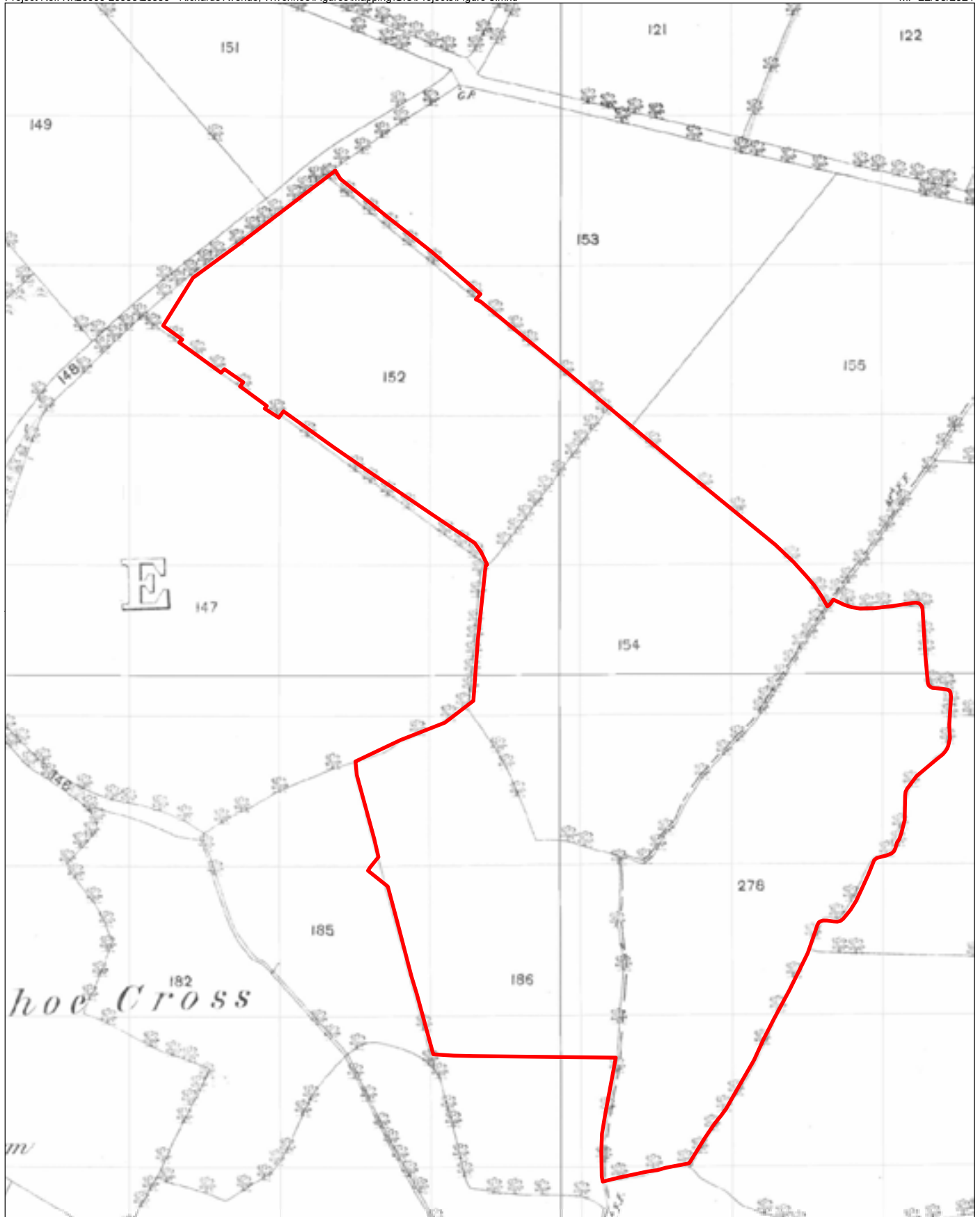


0 25 50 75m
Scale at A4: 1:3,500



Figure 5

1838 Wivenhoe & 1841 Elmstead
Tithe Maps



 Site Boundary

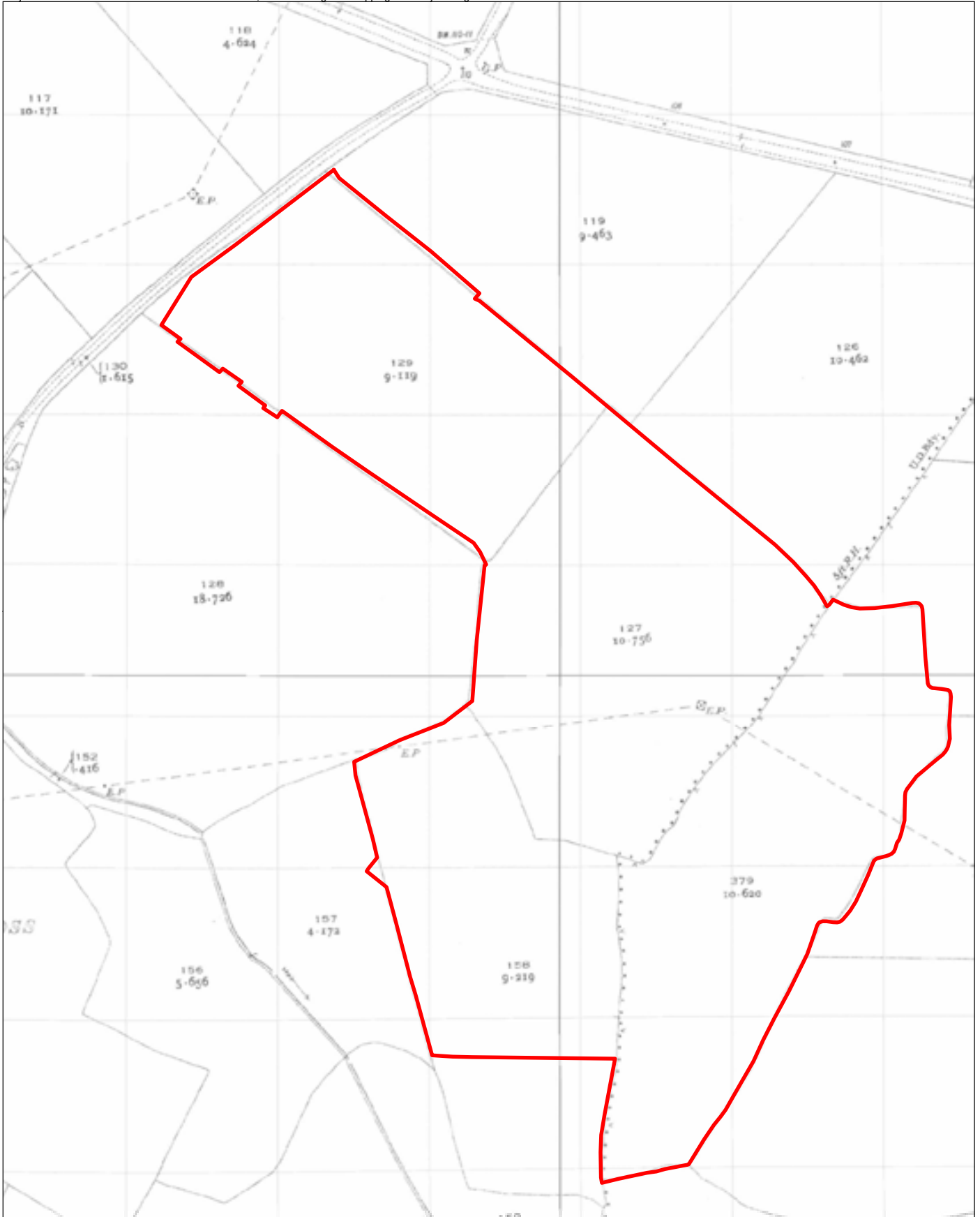


0 25 50 75m
Scale at A4: 1:3,500



Figure 6

1874 OS 25 inch



 Site Boundary

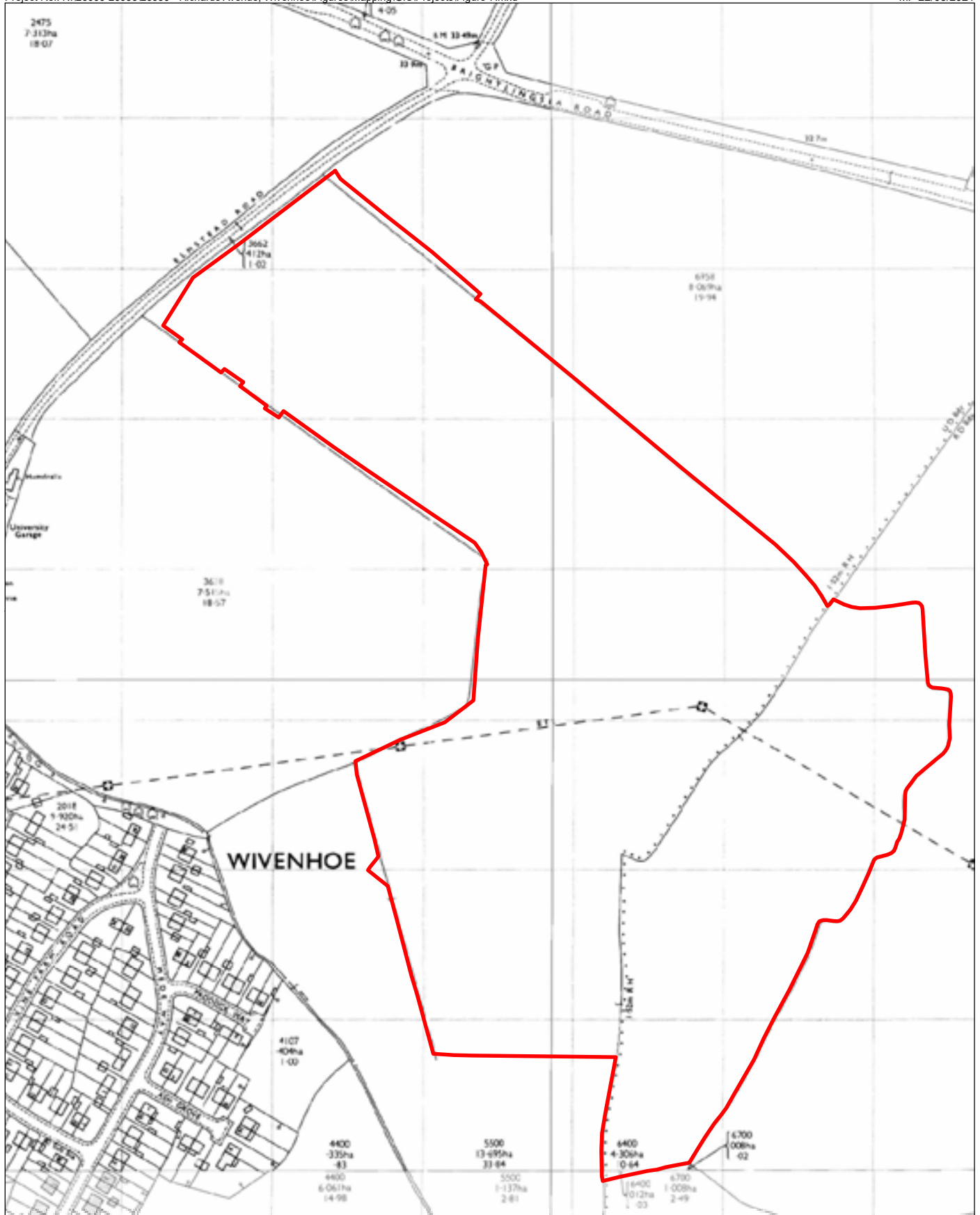


0 25 50 75m
Scale at A4: 1:3,500



Figure 7

1936 OS 25 inch



 Site Boundary

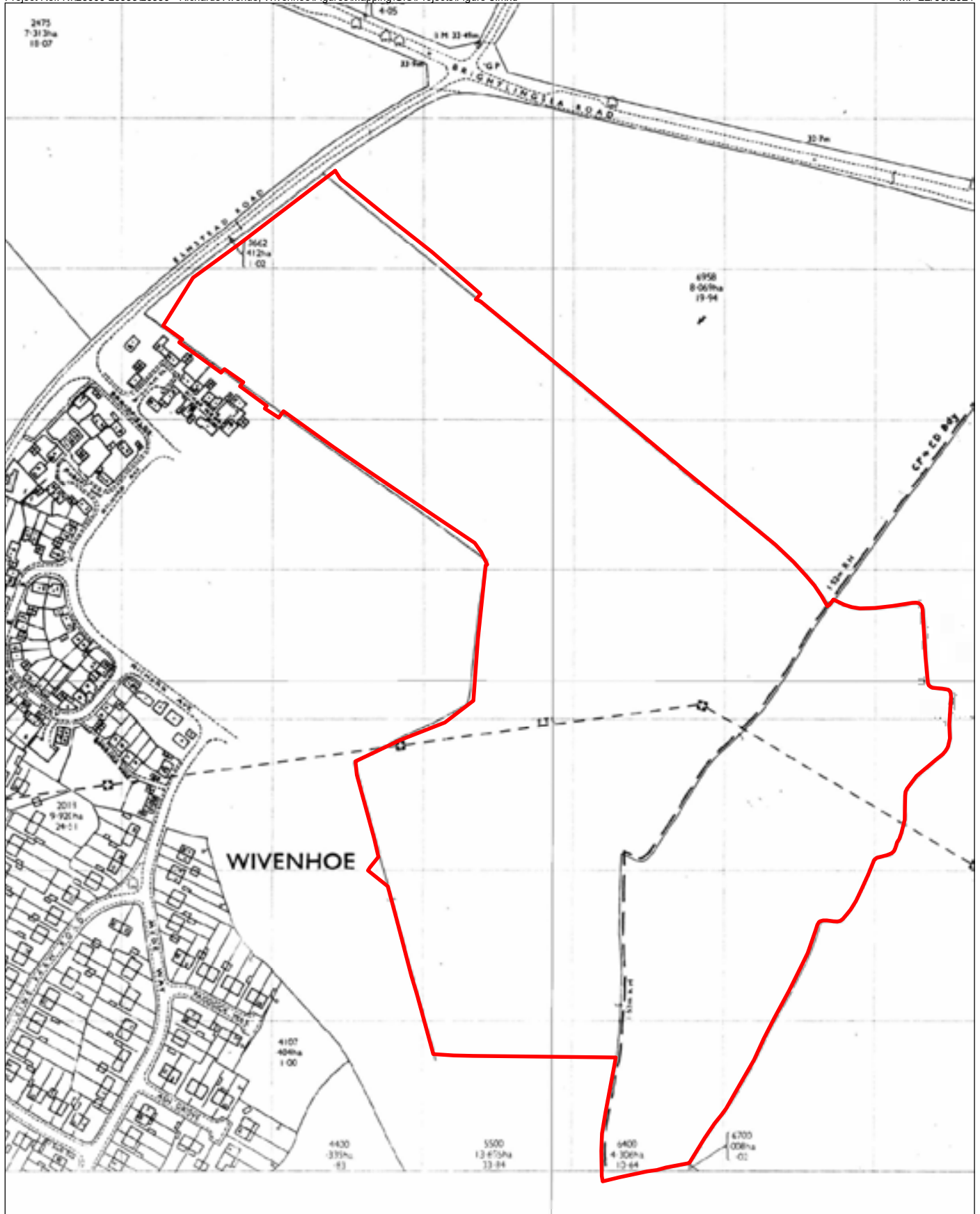


0 25 50 75m
Scale at A4: 1:3,500



Figure 8

1970 OS 1:2,500



 Site Boundary

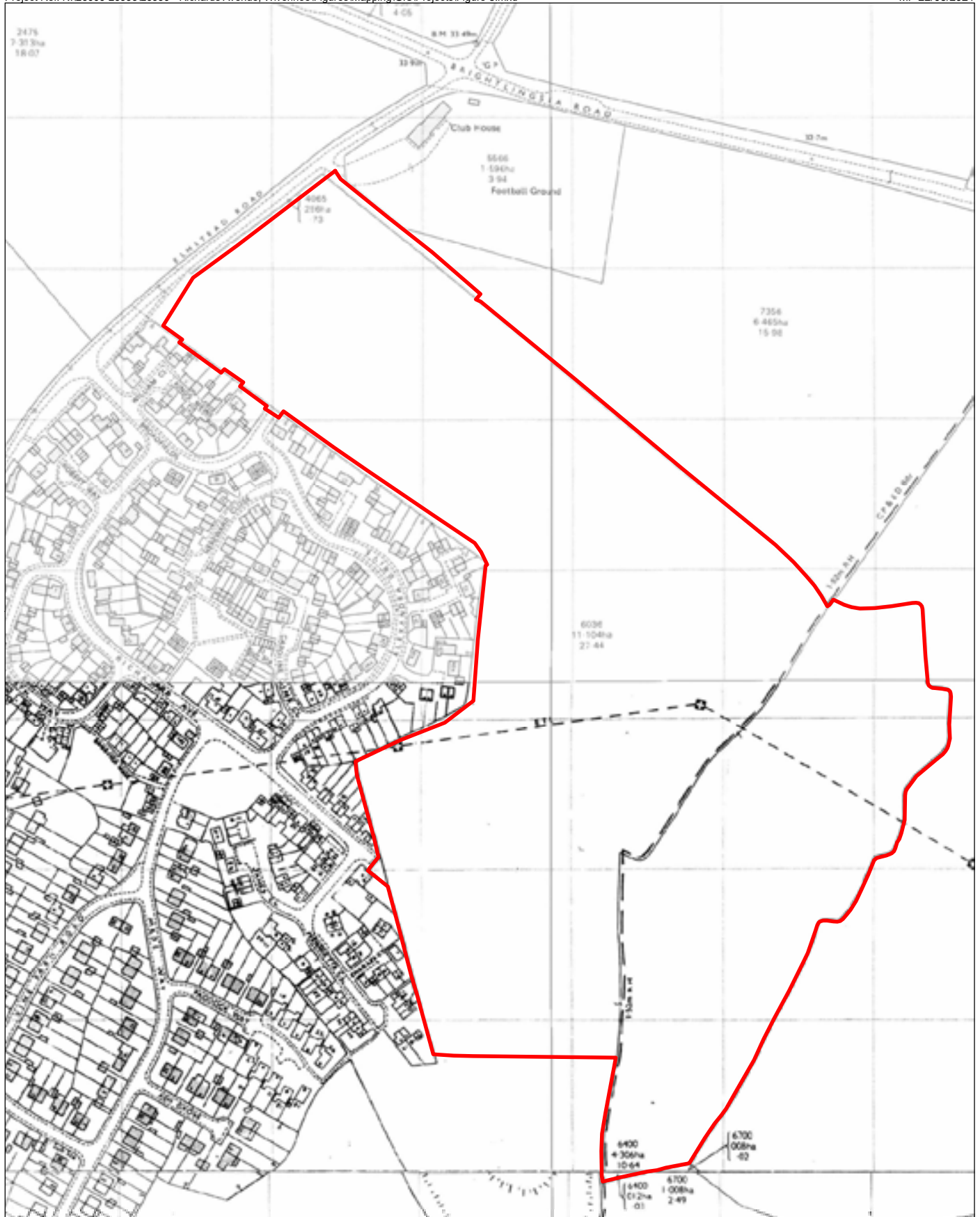


0 25 50 75m
Scale at A4: 1:3,500



Figure 9

1979-81 OS 1:2,500



 Site Boundary



0 25 50 75m
Scale at A4: 1:3,500



Figure 10

1983-88 OS 1:2,500



 Site Boundary



0 25 50 75m
Scale at A4: 1:3,500



Figure 11

1994 OS 1:2,500



 Site Boundary



0 25 50 75m
Scale at A4: 1:3,500



Figure 12

2000 Google Earth Image



 Site Boundary



0 25 50 75m
Scale at A4: 1:3,500



Figure 13

2009 Google Earth Image



 Site Boundary



0 25 50 75m
Scale at A4: 1:3,500



Figure 14

2018 Google Earth Image



 Site Boundary

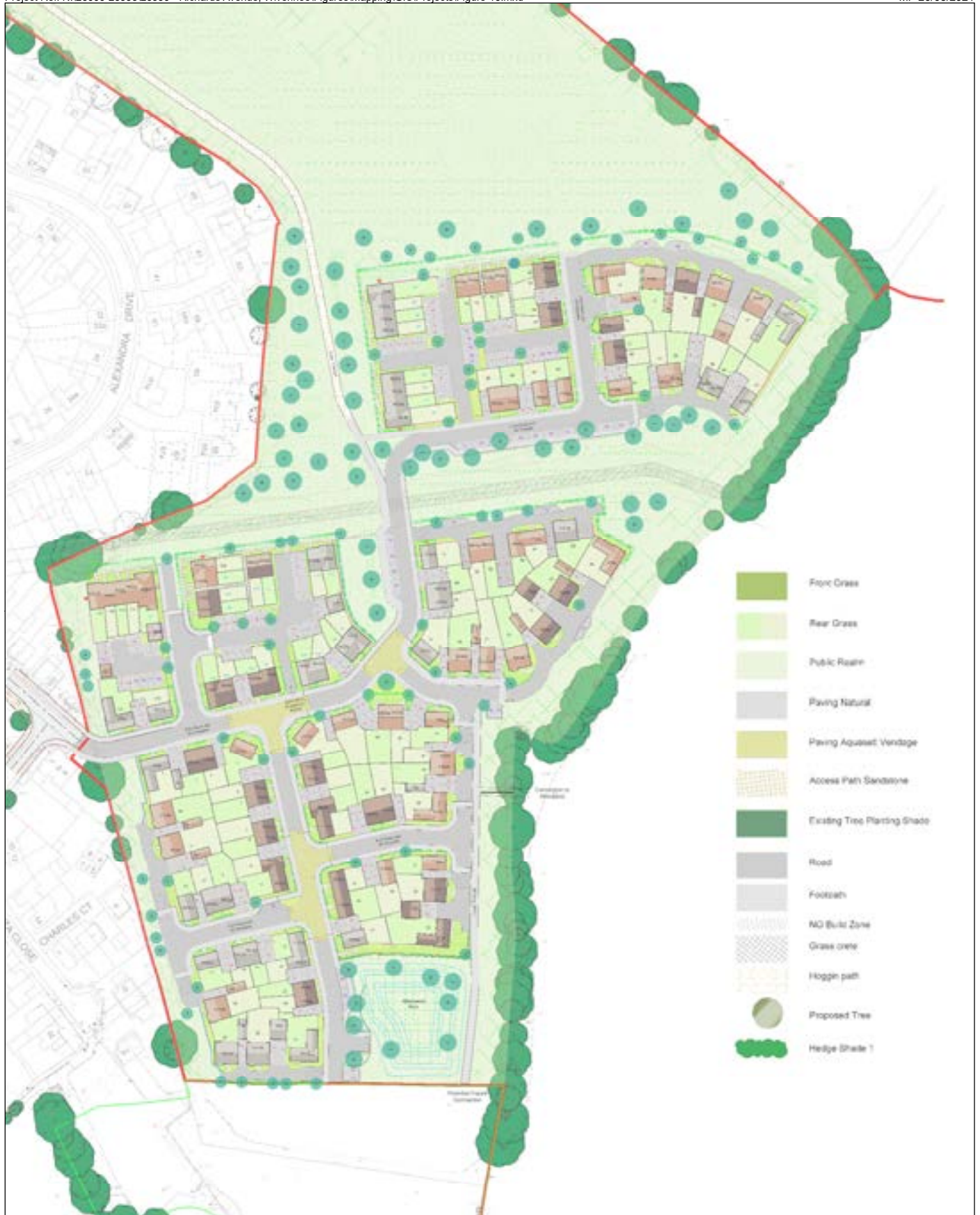


0 25 50 75m
Scale at A4: 1:3,500



Figure 15

2020 Google Earth Image



 Site Boundary



0 20 40 60m
Scale at A4: 1:2,000



Figure 16
Development Layout

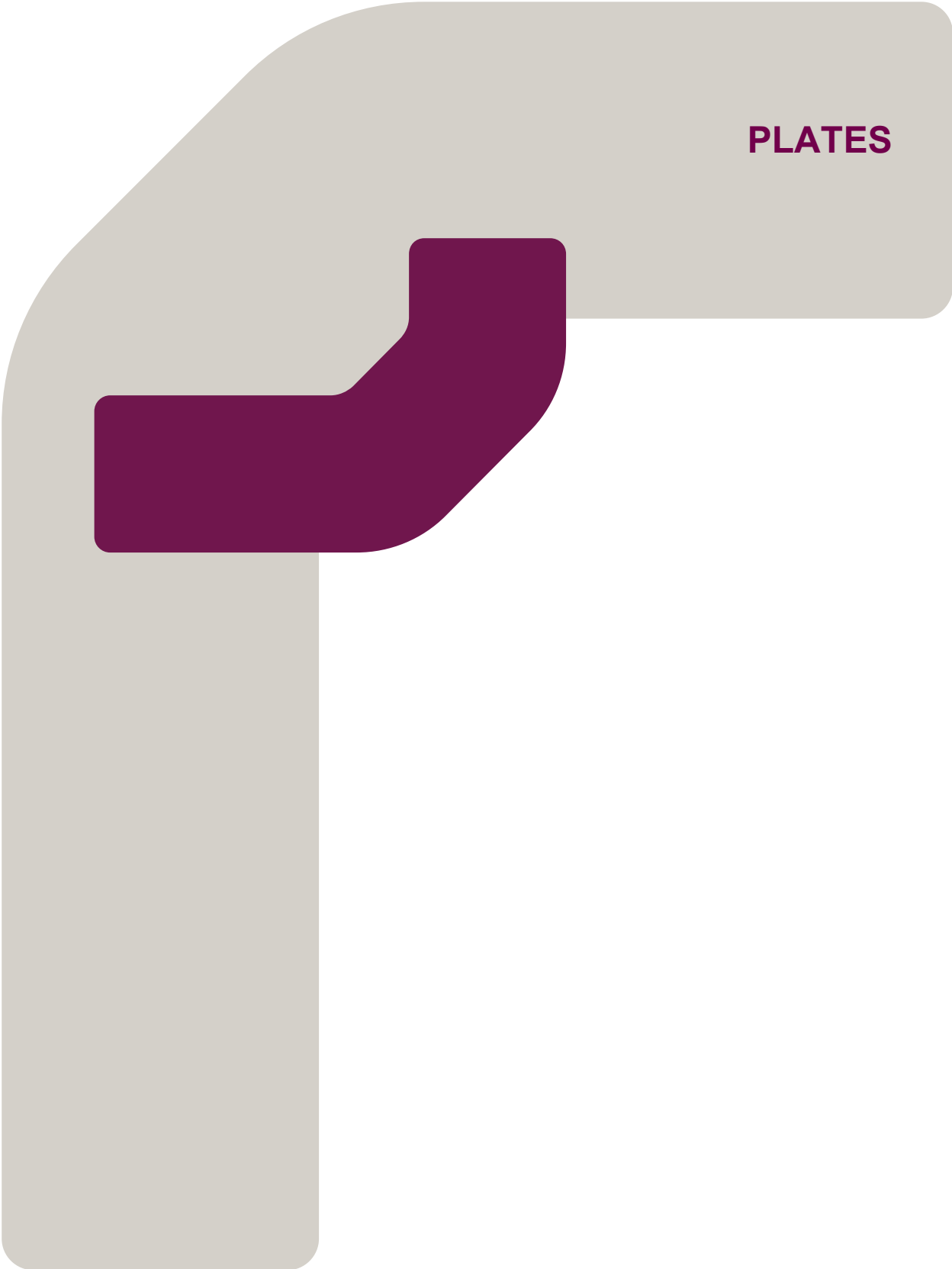




Plate 1: View looking ENE from west side of the southern field



Plate 2: View facing north from central-western area of the Site



Plate 3: View looking north-east across Site from below the power line east of Alexandra Drive



Plate 4: View looking east from central area of the Site east of Alexandra Drive



Plate 5: View looking south from under power line in central area of the Site east of Alexandra Drive



APPENDICES

Appendix 1
HER Gazetteer

JAC26990 Gazetteer

Registered Park or Garden

List Entry	Name	Grade
1000371	WIVENHOE PARK	II

Listed Buildings

List Entry	Name	Grade
1111474	KEELARS FARMHOUSE	II
1111475	KELLARS FARMSTEAD TO SOUTH OF KEELARS FARMHOUSE	II
1225211	20, 22 AND 24, THE CROSS	II
1225230	14, 15 AND 16, COLCHESTER ROAD	II
1225341	88 AND 88A, RECTORY ROAD	II
1266468	16 AND 18, THE CROSS	II
1268336	WIVENHOE WATER TOWER	II

Locally Listed Buildings

DesigUID	Name
DCC25988	Lodge Farm, Boundary Road, Colchester Road, Wivenhoe (Field number 2)
DCC25991	3 Elmstead Road, Wivenhoe (3 Chimney Cottage)
DCC25992	5 and 6 Colchester Road, Wivenhoe
DCC25992	5 and 6 Colchester Road, Wivenhoe
DCC25993	18 Elmstead Road, Wivenhoe (Abbots Cottage)
DCC25994	20 and 22 Elmstead Road, Wivenhoe
DCC25994	20 and 22 Elmstead Road, Wivenhoe
DCC25995	Cross Farm, Colchester Road, Wivenhoe
DCC25996	The Flag Inn, Colchester Road, Wivenhoe
DCC25997	Vine Farm House, Colchester Road, Wivenhoe
DCC26003	43-51 The Cross, Wivenhoe (odd numbers)
DCC26003	43-51 The Cross, Wivenhoe (odd numbers)
DCC26003	43-51 The Cross, Wivenhoe (odd numbers)
DCC26003	43-51 The Cross, Wivenhoe (odd numbers)
DCC26003	43-51 The Cross, Wivenhoe (odd numbers)
DCC26004	Horse and Groom, 55 The Cross, Wivenhoe
DCC26011	73 Rectory Road, Wivenhoe (Red House)
DCC26014	Wivenhoe Cricket Club, Rectory Road, Wivenhoe

HER Features

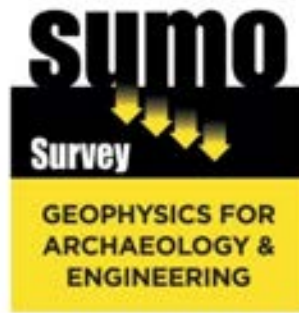
MonUID	Name	RecordType	Period
MCC10348	Wivenhoe (known as)	Portable Antiquities Scheme	Late Iron Age
MCC10382		Portable Antiquities Scheme	Unknown
MCC4681	Beehive Cottage, Rectory Road, Wivenhoe	Building	Post Medieval Colchester 1 to Post Medieval Colchester 2
MCC4683	16 The Avenue, Wivenhoe	Building	Post Medieval Colchester 1 to Post Medieval Colchester 2
MCC4684	20 The Cross, Wivenhoe	Building	Post Medieval Colchester 1 to Post Medieval Colchester 2
MCC4691	14, 15 and 16 Colchester Road, Wivenhoe	Building	Post Medieval Colchester 1 to Post Medieval Colchester 2
MCC4842	Wivenhoe Water Tower	Building	Edwardian to 21st Century
MCC5209	Tower Road Water Tower, Tower Road, Wivenhoe	Industrial	Early 20th Century
MCC5533	WWII Spigot Mortar Emplacement (destroyed), Colchester Road, Wivenhoe	Monument	World War 2
MCC5534	WWII Ammunition Shelter (destroyed), Tower Road, Wivenhoe	Monument	World War 2
MCC5794	A Portable Antiquities Scheme findspot of Post Medieval to Unknown date.	Portable Antiquities Scheme	Post Medieval Colchester 1 to Unknown
MCC5795	A Portable Antiquities Scheme findspot of Medieval date.	Portable Antiquities Scheme	Medieval Colchester I. to Medieval Colchester II.
MCC5796	A Portable Antiquities Scheme findspot of Post Medieval date.	Portable Antiquities Scheme	Post Medieval Colchester 1
MCC6086	A Portable Antiquities Scheme findspot of Medieval date.	Portable Antiquities Scheme	Medieval Colchester II.
MCC6170	A Portable Antiquities Scheme findspot of Medieval date.	Portable Antiquities Scheme	Medieval Colchester I.
MCC6227	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Portable Antiquities Scheme	Medieval Colchester II. to Post Medieval Colchester 2
MCC6229	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Portable Antiquities Scheme	Medieval Colchester II. to Post Medieval Colchester 1
MCC6230	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Portable Antiquities Scheme	Medieval Colchester I. to Post Medieval Colchester 1
MCC6466	A Portable Antiquities Scheme findspot of Post Medieval date.	Portable Antiquities Scheme	Post Medieval Colchester 1
MCC6467	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Portable Antiquities Scheme	Medieval Colchester II. to Post Medieval Colchester 2
MCC6468	A Portable Antiquities Scheme findspot of Post Medieval date.	Portable Antiquities Scheme	Post Medieval Colchester 1
MCC6472	A Portable Antiquities Scheme findspot of Post Medieval to Unknown date.	Portable Antiquities Scheme	Post Medieval Colchester 1 to Unknown
MCC6537	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Portable Antiquities Scheme	Medieval Colchester II. to Post Medieval Colchester 1
MCC6538	A Portable Antiquities Scheme findspot of Post Medieval date.	Portable Antiquities Scheme	Post Medieval Colchester 1
MCC6539	A Portable Antiquities Scheme findspot of Post Medieval date.	Portable Antiquities Scheme	Post Medieval Colchester 1
MCC6540	A Portable Antiquities Scheme findspot of Post Medieval date.	Portable Antiquities Scheme	Post Medieval Colchester 1

MCC6796	A Portable Antiquities Scheme findspot of Late Iron Age to Roman date.	Portable Antiquities Scheme	Late Iron Age to Early Roman Colonia
MCC6937	Near Broad Lanes	Find Spot	Palaeolithic
MCC7095	Probable Iron Age burial, southwest of Keelars Farm, Wivenhoe	Monument	Early Iron Age to Late Iron Age
MCC7116	West of Keelars Farm	Monument	Modern
MCC7117	West of Keelars Farm	Monument	Post Medieval Colchester 1 to Modern
MCC7118	West of Keelars Farm	Find Spot	Early Iron Age to Late Iron Age
MCC7119	West of Keelars Farm	Find Spot	Roman
MCC7120	West of Keelars Farm	Find Spot	Prehistoric
MCC7121	West of Keelars Farm	Find Spot	Undated
MCC8658	Wivenhoe Park	Monument	Medieval
MCC8659	Wivenhoe House	Monument	Post Medieval Colchester 1 to Post Medieval Colchester 2
MCC8719	Cropmarks N of cross farm	Monument	Undated
MCC8978	Near Wivenhoe Lodge	Monument	Undated
MCC9013	North edge of Wivenhoe	Monument	Undated
MCC9022	East of Wivenhoe	Monument	Undated
MCC9167	Wivenhoe Heath	Monument	Medieval Colchester I. to Post Medieval Colchester 2
MCC9486		Portable Antiquities Scheme	Early Roman Colonia to Late Roman Colonia
MCC9932	Wivenhoe CP (known as)	Portable Antiquities Scheme	Medieval Colchester I. to Post Medieval Colchester 1
2595	Keeler's Farm, South of Keelars Tye, Wivenhoe	MON	Iron Age
2597	Fen Farm	MON	Early Medieval to Post Medieval
2641	South of Park Farm	MON	Unknown
2642	Near Birds Farm	MON	Unknown
2671	Near Blossomwood Farm	MON	Unknown
16724	Cropmarks along Elmstead Road	MON	Unknown
16725	Cropmarks of field boundaries at Park Farm	MON	Medieval
16727	Cropmarks N of cross farm	MON	Unknown
17559	North of Keelars Farm	MON	Post Medieval to Modern
17561	Prospect House	MON	Unknown
45983	Elmstead, Fen Farm	MON	Lower Palaeolithic to Modern
48737	Wivenhoe Park Corner	MON	Unknown
48935	Broad Lanes	MON	Unknown
54616	A Portable Antiquities Scheme findspot of Post Medieval date.	PAS	Post Medieval
57283	A Portable Antiquities Scheme findspot of Roman date.	PAS	Roman

HER Events

EvUID	Name
ECC2910	Archaeological monitoring along Colchester Road, Wivenhoe, 2015
ECC3552	SALV EXCAV by Priddy, DA, 1979
ECC4068	Heritage statement of 20 The Cross, Wivenhoe, 2017
ECC4411	Geophysical survey on land to the east of Richard Avenue, Wivenhoe
EEX55823	Keeler's Farm (Site1), Wivenhoe
EEX54409	Fen Farm, Elmstead market
EEX55424	Fen Farm excavation

Appendix 2
Geophysical Survey



GEOPHYSICAL SURVEY REPORT

Land behind Broadfields, Wivenhoe

Client

RPS Group

Survey Report

16554

Date

December 2019



Survey Report: 16554 Land behind Broadfields, Wivenhoe

Survey dates	2-3 December 2019
Field co-ordinator	Elizabeth Topping BSc MSc
Field Team	Connor Rumble MSc Natalie Holt BSc
Report Date	11 December 2019
CAD Illustrations	Elizabeth Topping BSc MSc Thomas Cockcroft MSc
Report Author	Thomas Cockcroft MSc
Project Manager	Thomas Cockcroft MSc
Report approved	Dr John Gater BSc DSc(Hon) MCIfA FSA

SUMO Geophysics Ltd
Cowburn Farm
Market Street
Thornton
Bradford
BD13 3HW

T: 01274 835016

www.sumoservices.com
geophysics@sumoservices.com

SUMO Geophysics Ltd
Vineyard House
Upper Hook Road
Upton upon Severn
Worcestershire
WR8 0SA

T: 01684 592266

TABLE OF CONTENTS

1	LIST OF FIGURES	1
2	SURVEY TECHNIQUE	1
3	SUMMARY OF RESULTS	2
4	INTRODUCTION	2
5	RESULTS	3
6	DATA APPRAISAL & CONFIDENCE ASSESSMENT	3
7	CONCLUSION	4
8	REFERENCES	4

Appendix A Technical Information: Magnetometer Survey Methods, Processing and Presentation

Appendix B Technical Information: Magnetic Theory

Appendix C OASIS Data Collection Form

1. LIST OF FIGURES

Figure 01	NTS	Site Location
Figure 02	1:1200	Magnetometer Survey Greyscale Plot
Figure 03	1:1200	Magnetometer Survey Interpretation
Figure 04	1:1800	Magnetometer Survey Greyscale Plot / Aerial Imagery 2019
Figure 05	1:1200	Magnetometer Survey [Minimally Processed] Greyscale Plot
Figure 06	1:1200	XY Trace Plots
Figure 07	1:1500	Magnetometer Survey - Repeated Grids

2. SURVEY TECHNIQUE

Detailed magnetic survey (magnetometry) was chosen as the most efficient and effective method of locating the type of archaeological anomalies which might be expected at this site.

Bartington Grad 601-2 Traverse Interval 1.0m Sample Interval 0.25m

One 30m Grid was re-collected, on each day of survey, in order to check the calibration and demonstrate the repeatability of the results as per the Standards for Development-Led Archaeological Projects in Essex.

3 SUMMARY OF RESULTS

- 3.1 A magnetometer survey carried out on land at Wivenhoe, Colchester has detected no responses that could be interpreted as being of archaeological interest. Uncertain responses likely due to modern farming practices and natural processes have been recorded.

4 INTRODUCTION

- 4.1 **SUMO Geophysics Ltd** were commissioned to undertake a geophysical survey of an area outlined for development. This survey forms part of an archaeological investigation being undertaken by **RPS Group**.

4.2 Site details

NGR / Postcode	TM 04552 23207 / CO7 9SF		
Location	The site is located 5.5km south-east of Colchester and on the northern outskirts of Wivenhoe. The survey area is bounded to the west by houses off Richard Avenue and Henrietta Close and by houses off Alexandra Road to the north. The survey area is surrounded by farmland to the east and south.		
HER	Colchester Borough Council		
HER Event Code	ECC4411	OASIS Ref.	sumogeop1-377369
District	Colchester		
Parish	Wivenhoe CP		
Topography	Flat		
Current Land Use	Arable agriculture		
Geology (BGS 2019)	Bedrock: Thames Group - clay, silt and sand Superficial: Kesgrave Catchment Subgroup - sand and gravel Cover Sand - clay, silt and sand		
Soils (CU 2019)	Soilscape 8: Slightly acid loamy and clayey soils with impeded drainage.		
Archaeology (CHE 2019)	A number of monuments are recorded in the Colchester HER, in and around the survey area. An irregular shaped enclosure (partially surrounded by a ditched trackway) has been identified as an indistinct feature on aerial photography located within the survey area (MCC9022). A possible sub-rectangular enclosure and other linear features (MCC9013) have also been identified in aerial photography in the field due south; however, these have been destroyed by gravel extraction. In the field to the east of the survey area a large sub-rectangular enclosure with associated pits (MCC7116) has been recorded in the HER. Iron Age and Roman pottery (MCC7117) has also been found in the field.		
Survey Methods	Magnetometer survey (fluxgate gradiometer)		
Study Area	4 ha		

4.3 Aims and Objectives

To locate and characterise any anomalies of possible archaeological interest within the study area.

5 RESULTS

Specific anomalies have been given numerical labels [1] which appear in the text below, as well as on the Interpretation Figure(s).

5.1 **Probable / Possible Archaeology**

5.1.1 No magnetic responses have been recorded that could be interpreted as being of archaeological interest.

5.2 **Uncertain**

5.2.1 A weak linear trend recorded in the magnetic data [1] appears to correspond to a cropmark feature visible on aerial mapping (see figure 04). It is possible this response has an archaeological provenance, but it could also have modern origins. The response has therefore been categorised as *Uncertain*.

5.2.2 A number of linear and discrete anomalies and trends across the survey area have been classified as *Uncertain*. They lack the defined morphology of anomalies that would normally be interpreted as being archaeological in origin. A small area of increased response has also been detected in close association to one of the discrete anomalies; this too has been classified as *Uncertain*. None of these uncertain responses correlate to the cropmarks that can be seen on aerial imagery (see Figure 04). These anomalies are likely to be due to natural or modern agricultural processes.

5.3 **Ferrous / Magnetic Disturbance**

5.3.1 Strong ferrous anomalies in the north-east and north-west of the dataset are due to two pylons being located in and adjacent to the survey area.

5.3.2 Ferrous responses close to boundaries are due to adjacent fences and gates. Smaller scale ferrous anomalies ("iron spikes") are present throughout the data and are characteristic of small pieces of ferrous debris (or brick / tile) in the topsoil; they are commonly assigned a modern origin. Only the most prominent of these are highlighted on the interpretation diagram.

6 DATA APPRAISAL & CONFIDENCE ASSESSMENT

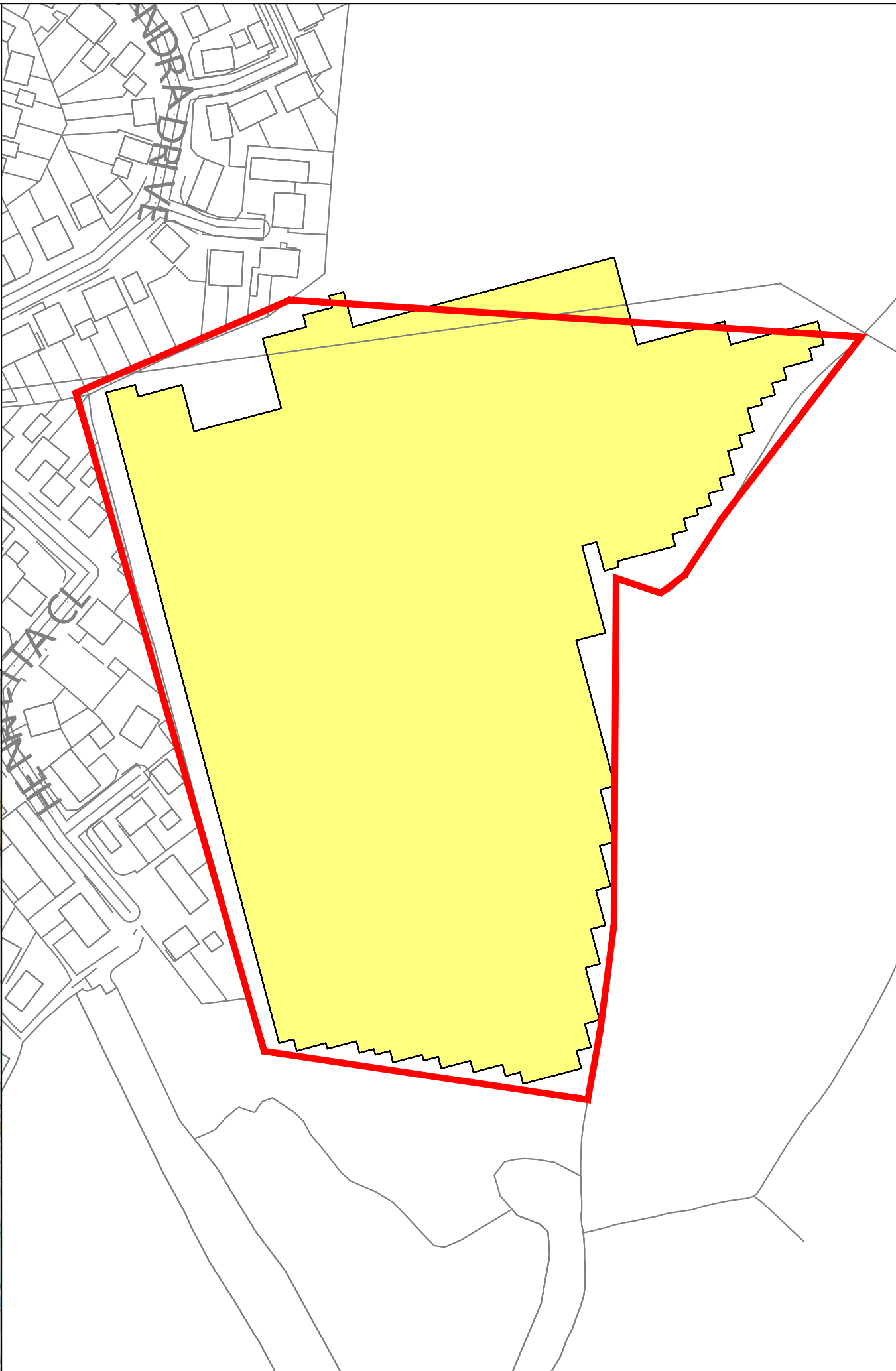
6.1 Historic England guidelines (EH 2008) Table 4 states that the typical magnetic response on the local soils / geology is generally poor. The results from this survey indicate the presence of uncertain responses; therefore, it would suggest the magnetic fill of the features recorded in the HER and visible on aerial imagery do not have a strong enough contrast with the natural geologies to be detected.

7 CONCLUSION



- 7.1 No anomalies have been detected that could be interpreted as being of archaeological origin. A number of responses of uncertain origin have been detected, one of which corresponds to a cropmark visible on aerial mapping. The other uncertain responses are likely to be due to modern agricultural practices or natural causes. The majority of features which are visible in the aerial imagery and that are recorded in the HER are not visible in the magnetic data; therefore, it is possible that these features are related to agricultural or funerary practices rather than settlement activity. This could explain the lack of magnetic differentiation between the natural and fill of the features.

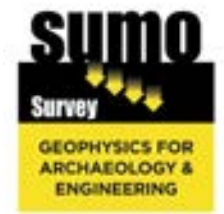
8 REFERENCES

- BGS 2019 British Geological Survey, Geology of Britain viewer [accessed 11/12/2019] *website:* (<http://www.bgs.ac.uk/opengeoscience/home.html?Accordion1=1#maps>)
- CIfA 2014 *Standard and Guidance for Archaeological Geophysical Survey*. Amended 2016. CIfA Guidance note. Chartered Institute for Archaeologists, Reading
http://www.archaeologists.net/sites/default/files/CIfAS%26GGeophysics_2.pdf
- CHE 2019 *Colchester Heritage Explorer* [accessed 11/12/2019] Website: <https://colchesterheritage.co.uk/Monument/>
- CU 2019 The Soils Guide. Available: www.landis.org.uk. Cranfield University, UK. [accessed 11/12/2019] *website:* <http://mapapps2.bgs.ac.uk/ukso/home.html>
- EAC 2016 *EAC Guidelines for the Use of Geophysics in Archaeology*, European Archaeological Council, Guidelines 2.
- EH 2008 *Geophysical Survey in Archaeological Field Evaluation*. English Heritage, Swindon
<https://content.historicengland.org.uk/images-books/publications/geophysical-survey-in-archaeological-field-evaluation/geophysics-guidelines.pdf>



Reproduced from Ordnance Survey's 1:25 000 map of 1998 with the permission of the controller of Her Majesty's Stationery Office. Crown Copyright reserved. Licence No: 100018665

	Site Location
	Magnetometer Survey

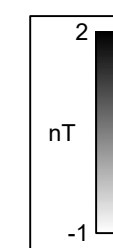


Title: Site Location

Client: RPS Group

Project: 16554 Land behind Broadfields, Wivenhoe

not to scale	Fig No: 01
--------------	------------



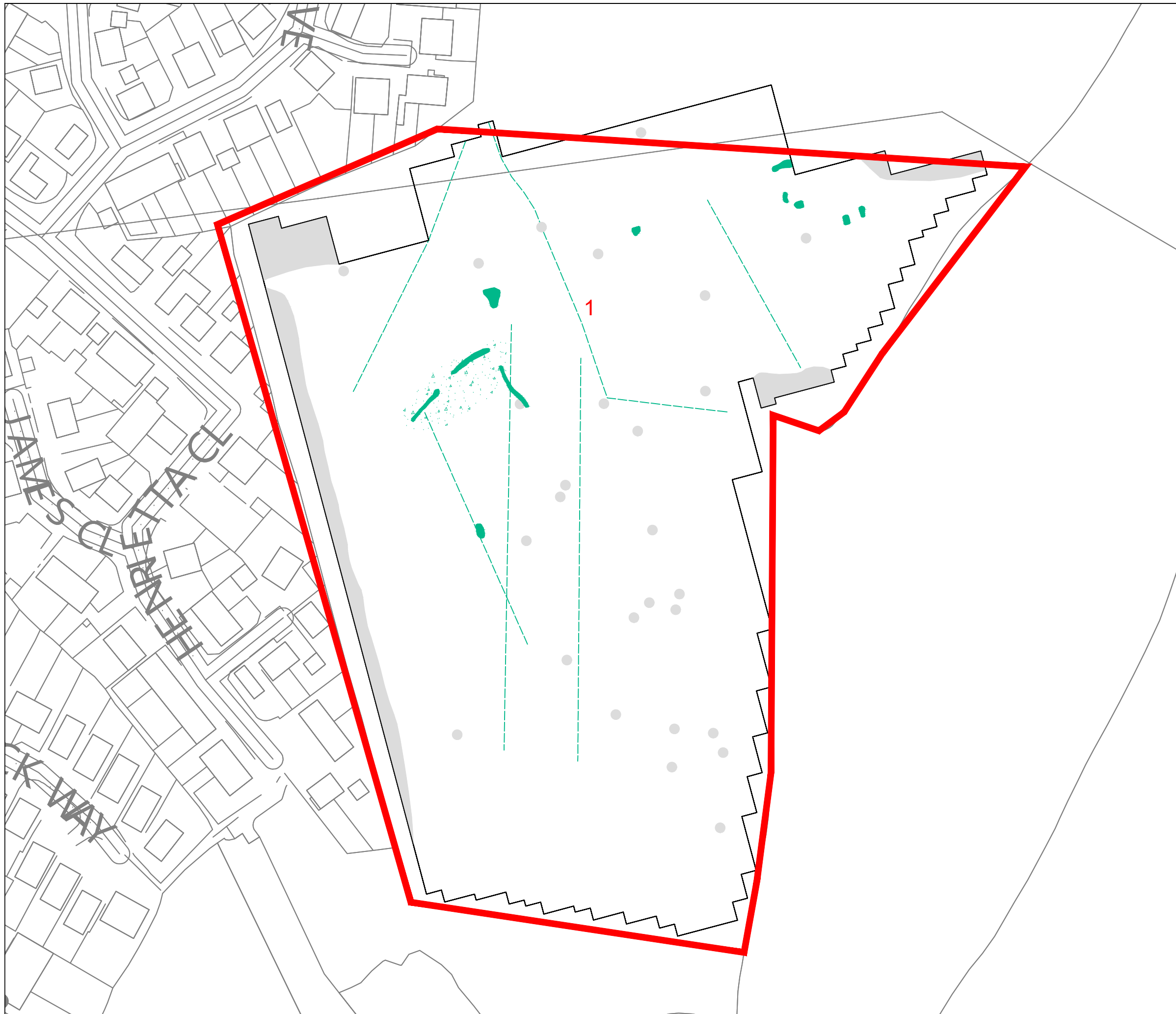
Title: Magnetometer Survey Greyscale Plot

Client: RPS Group


Project: 16554 Land behind Broadfields, Wivenhoe

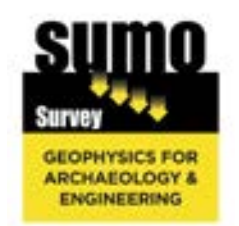
Scale: 0 metres 60
1:1200 @ A3

Fig No: 02



KEY

	Uncertain (Trend / Discrete / Zone)
	Ferrous



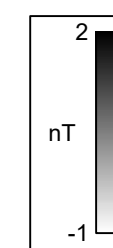
Title: Magnetometer Survey Interpretation

Client: RPS Group

Project: 16554 Land behind Broadfields, Wivenhoe

Scale: 0 metres 60
1:1200 @ A3

Fig No: 03



Title: Magnetometer Survey Greyscale Plot / Aerial Imagery 2019

Client: RPS Group

Project: 16554 Land behind Broadfields, Wivenhoe

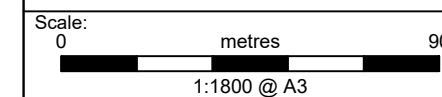
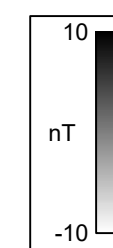


Fig No: 04

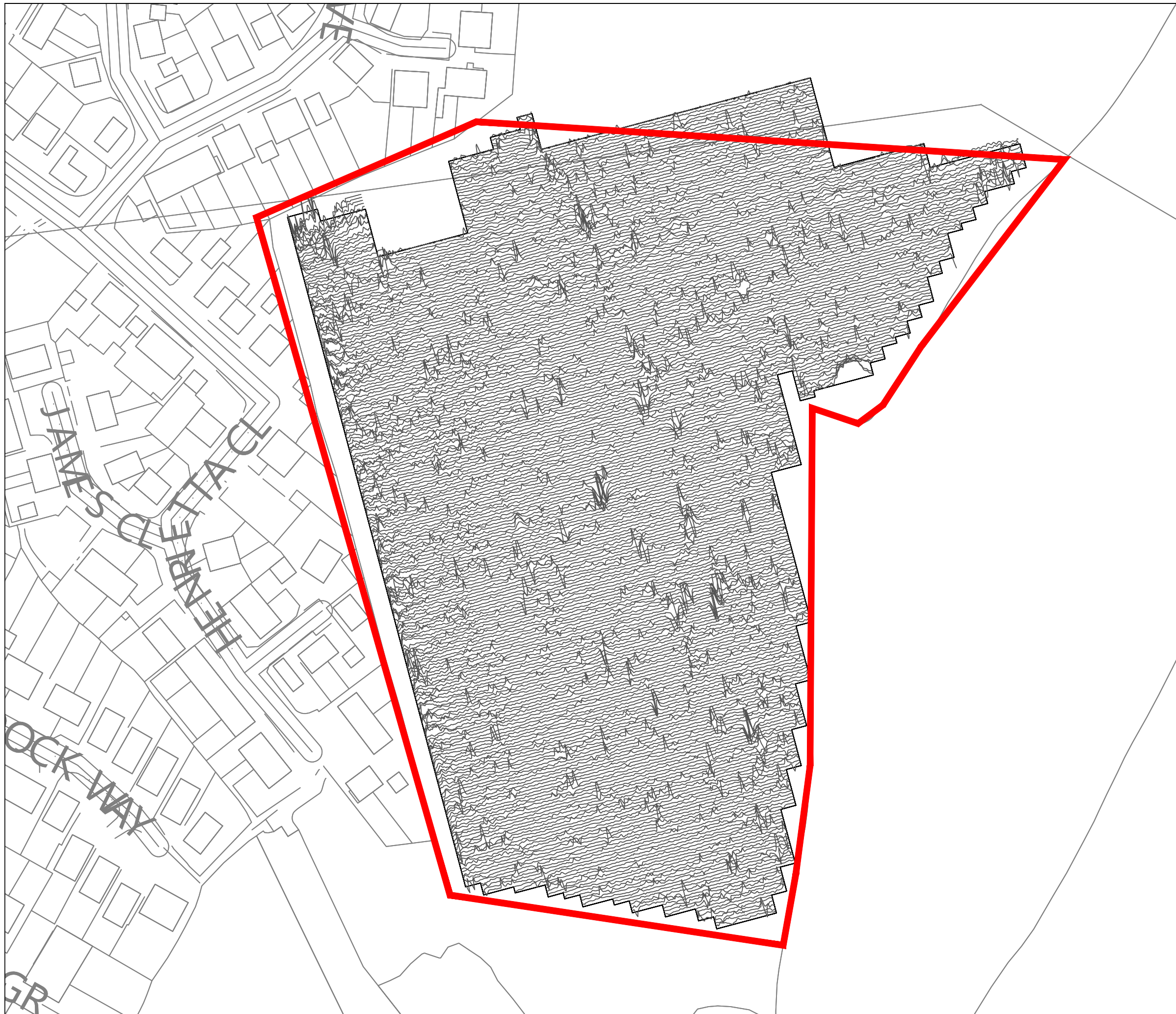


Title: Magnetometer Survey [Minimally Processed]
Greyscale Plot

Client: RPS Group

Project: 16554 Land behind Broadfields, Wivenhoe

Scale: 0 metres 60
1:1200 @ A3 Fig No: 05



15 nT



Title: XY Trace Plots

Client: RPS Group

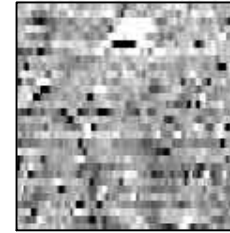
Project: 16554 Land behind Broadfields, Wivenhoe

Scale: 0 metres 60
1:1200 @ A3

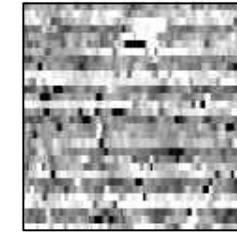
Fig No: 06



Grid 1



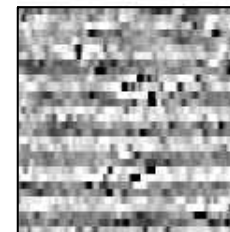
Grid Identifier:
32



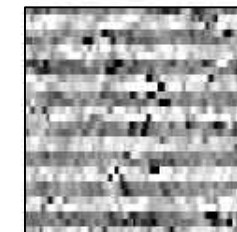
Grid Identifier:
40



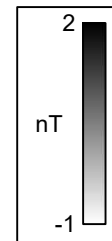
Grid 2



Grid Identifier:
13



Grid Identifier:
14



Title: Magnetometer Survey - Repeated Grids

Client: RPS Group

Project: 16554 Land behind Broadfields, Wivenhoe

Scale: 0 metres 75
1:1500 @ A3

Fig No: 07

Standards & Guidance

This report and all fieldwork have been conducted in accordance with the latest guidance documents issued by Historic England (EH 2008) (then English Heritage), the Chartered Institute for Archaeologists (CIfA 2014) and the European Archaeological Council (EAC 2016).

Grid Positioning

For hand held gradiometers the location of the survey grids has been plotted together with the referencing information. Grids were set out using a Trimble R8 Real Time Kinematic (RTK) VRS Now GNSS GPS system.

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to a far greater accuracy than a standard GPS unit. A standard GPS suffers from errors created by satellite orbit errors, clock errors and atmospheric interference, resulting in an accuracy of 5m-10m. An RTK system uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier it measured, and the mobile units compare their own phase measurements with those they received from the base station. This results in an accuracy of around 0.01m.

Technique	Instrument	Traverse Interval	Sample Interval
Magnetometer	Bartington Grad 601-2	1m	0.25m

Instrumentation: **Bartington Grad 601-2**

Bartington instruments operate in a gradiometer configuration which comprises fluxgate sensors mounted vertically, set 1.0m apart. The fluxgate gradiometer suppresses any diurnal or regional effects. The instruments are carried, or cart mounted, with the bottom sensor approximately 0.1-0.3m from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is measured in nanoTesla (nT). The sensitivity of the instrument can be adjusted; for most archaeological surveys the most sensitive range (0.1nT) is used. Generally, features up to 1m deep may be detected by this method, though strongly magnetic objects may be visible at greater depths. The Bartington instrument can collect two lines of data per traverse with gradiometer units mounted laterally with a separation of 1.0m. The readings are logged consecutively into the data logger which in turn is daily down-loaded into a portable computer whilst on site. At the end of each site survey, data is transferred to the office for processing and presentation.

Data Processing

Zero Mean	This process sets the background mean of each traverse within each grid to zero.
Traverse	The operation removes striping effects and edge discontinuities over the whole of the data set.
Step Correction (De-stagger)	When gradiometer data are collected in 'zig-zag' fashion, stepping errors can sometimes arise. These occur because of a slight difference in the speed of walking on the forward and reverse traverses. The result is a staggered effect in the data, which is particularly noticeable on linear anomalies. This process corrects these errors.

Display

Greyscale/ Colourscale Plot	This format divides a given range of readings into a set number of classes. Each class is represented by a specific shade of grey, the intensity increasing with value. All values above the given range are allocated the same shade (maximum intensity); similarly, all values below the given range are represented by the minimum intensity shade. Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. The assigned range (plotting levels) can be adjusted to emphasise different anomalies in the data-set.
--------------------------------	---

Presentation of results and interpretation

The presentation of the results includes a 'minimally processed data' and a 'processed data' greyscale plot. Magnetic anomalies are identified, interpreted and plotted onto the 'Interpretation' drawings.

When interpreting the results, several factors are taken into consideration, including the nature of archaeological features being investigated and the local conditions at the site (geology, pedology, topography etc.). Anomalies are categorised by their potential origin. Where responses can be related to other existing evidence, the anomalies will be given specific categories, such as: Abbey Wall or Roman Road. Where the interpretation is based largely on the geophysical data, levels of confidence are implied, for example: Probable, or Possible Archaeology. The former is used for a confident interpretation, based on anomaly definition and/or other corroborative data such as cropmarks. Poor anomaly definition, a lack of clear patterns to the responses and an absence of other supporting data reduces confidence, hence the classification Possible.

Interpretation Categories

In certain circumstances (usually when there is corroborative evidence from desk-based or excavation data) very specific interpretations can be assigned to magnetic anomalies (for example, *Roman Road, Wall, etc.*) and where appropriate, such interpretations will be applied. The list below outlines the generic categories commonly used in the interpretation of the results.

<i>Archaeology / Probable Archaeology</i>	This term is used when the form, nature and pattern of the responses are clearly or very probably archaeological and /or if corroborative evidence is available. These anomalies, whilst considered anthropogenic, could be of any age.
<i>Possible Archaeology</i>	These anomalies exhibit either weak signal strength and / or poor definition, or form incomplete archaeological patterns, thereby reducing the level of confidence in the interpretation. Although the archaeological interpretation is favoured, they may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.
<i>Industrial / Burnt-Fired</i>	Strong magnetic anomalies that, due to their shape and form or the context in which they are found, suggest the presence of kilns, ovens, corn dryers, metal-working areas or hearths. It should be noted that in many instances modern ferrous material can produce similar magnetic anomalies.
<i>Former Field Boundary (probable & possible)</i>	Anomalies that correspond to former boundaries indicated on historic mapping, or which are clearly a continuation of existing land divisions. Possible denotes less confidence where the anomaly may not be shown on historic mapping but nevertheless the anomaly displays all the characteristics of a field boundary.
<i>Ridge & Furrow</i>	Parallel linear anomalies whose broad spacing suggests ridge and furrow cultivation. In some cases, the response may be the result of more recent agricultural activity.
<i>Agriculture (ploughing)</i>	Parallel linear anomalies or trends with a narrower spacing, sometimes aligned with existing boundaries, indicating more recent cultivation regimes.
<i>Land Drain</i>	Weakly magnetic linear anomalies, quite often appearing in series forming parallel and herringbone patterns. Smaller drains may lead and empty into larger diameter pipes, which in turn usually lead to local streams and ponds. These are indicative of clay fired land drains.
<i>Natural</i>	These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions.
<i>Magnetic Disturbance</i>	Broad zones of strong dipolar anomalies, commonly found in places where modern ferrous or fired materials (e.g. brick rubble) are present.
<i>Service</i>	Magnetically strong anomalies, usually forming linear features are indicative of ferrous pipes/cables. Sometimes other materials (e.g. pvc) or the fill of the trench can cause weaker magnetic responses which can be identified from their uniform linearity.
<i>Ferrous</i>	This type of response is associated with ferrous material and may result from small items in the topsoil, larger buried objects such as pipes, or above ground features such as fence lines or pylons. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.
<i>Uncertain Origin</i>	Anomalies which stand out from the background magnetic variation, yet whose form and lack of patterning gives little clue as to their origin. Often the characteristics and distribution of the responses straddle the categories of <i>Possible Archaeology / Natural</i> or (in the case of linear responses) <i>Possible Archaeology / Agriculture</i> ; occasionally they are simply of an unusual form.

Where appropriate some anomalies will be further classified according to their form (positive or negative) and relative strength and coherence (trend: weak and poorly defined).

Appendix B - Technical Information: Magnetic Theory

Detailed magnetic survey can be used to effectively define areas of past human activity by mapping spatial variation and contrast in the magnetic properties of soil, subsoil and bedrock. Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.1 nanoTeslas (nT) in an overall field strength of 48,000 (nT), can be accurately detected.

Weakly magnetic iron minerals are always present within the soil and areas of enhancement relate to increases in *magnetic susceptibility* and permanently magnetised *thermoremanent* material.

Magnetic susceptibility relates to the induced magnetism of a material when in the presence of a magnetic field. This magnetism can be considered as effectively permanent as it exists within the Earth's magnetic field. Magnetic susceptibility can become enhanced due to burning and complex biological or fermentation processes.

Thermoremanence is a permanent magnetism acquired by iron minerals that, after heating to a specific temperature known as the Curie Point, are effectively demagnetised followed by re-magnetisation by the Earth's magnetic field on cooling. Thermoremanent archaeological features can include hearths and kilns; material such as brick and tile may be magnetised through the same process.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil creates a relative contrast against the much lower levels of magnetism within the subsoil into which the feature is cut. Systematic mapping of magnetic anomalies will produce linear and discrete areas of enhancement allowing assessment and characterisation of subsurface features. Material such as subsoil and non-magnetic bedrock used to create former earthworks and walls may be mapped as areas of lower enhancement compared to surrounding soils.

Magnetic survey is carried out using a fluxgate gradiometer which is a passive instrument consisting of two sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the top sensor measures the Earth's magnetic field whilst the lower sensor measures the same field but is also more affected by any localised buried feature. The difference between the two sensors will relate to the strength of a magnetic field created by this feature, if no field is present the difference will be close to zero as the magnetic field measured by both sensors will be the same.

Factors affecting the magnetic survey may include soil type, local geology, previous human activity and disturbance from modern services.

OASIS DATA COLLECTION FORM: England

[List of Projects](#) | [Manage Projects](#) | [Search Projects](#) | [New project](#) | [Change your details](#) | [HER coverage](#) | [Change country](#) | [Log out](#)

Printable version

OASIS ID: sumogeop1-377369

Project details

Project name	Land at Wivenhoe, Colchester, Essex
Short description of the project	A magnetometer survey carried out on land at Wivenhoe, Colchester has detected no responses that could be interpreted as being of archaeological interest. Uncertain responses likely due to modern farming practices and natural processes have been recorded.
Project dates	Start: 02-12-2019 End: 03-12-2019
Previous/future work	Not known / Not known
Any associated project reference codes	ECC4411 - HER event no.
Any associated project reference codes	16554 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Cultivated Land 4 - Character Undetermined
Monument type	NONE None
Significant Finds	NONE None
Methods & techniques	"Geophysical Survey"
Development type	Not recorded
Prompt	National Planning Policy Framework - NPPF
Position in the planning process	Not known / Not recorded
Solid geology (other)	Thames Group - Clay, Silt and Sand
Drift geology (other)	Kesgrave Catchment - sand and gravel
Techniques	Magnetometry

Project location

Country	England
Site location	ESSEX COLCHESTER WIVENHOE Land at Wivenhoe, Colchester, Essex
Postcode	CO7 9SF
Study area	4 Hectares

Site coordinates TM 04552 23207 51.86933676609 0.971579473111 51 52 09 N 000 58 17 E Point

Project creators

Name of Organisation Sumo Geophysics

Project brief originator RPS

Project design originator Dr Jon Gator

Project director/manager Thomas Cockcroft

Project supervisor Elizabeth Topping

Type of sponsor/funding body Clients Business

Name of sponsor/funding body RPS

Project archives

Physical Archive Exists? No

Digital Archive recipient Colchester HER

Digital Archive ID 16554 Land East of Richard Avenue, Wivenhoe, Essex

Digital Contents "Survey"

Digital Media available "Geophysics","Images raster / digital photography","Survey","Text"

Paper Archive Exists? No

Project bibliography 1

Publication type Grey literature (unpublished document/manuscript)

Title Land East of Richard Avenue, Wivenhoe, Essex

Author(s)/Editor(s) Cockcroft, T

Date 2019

Issuer or publisher SUMO

Place of issue or publication Bradford

Description 6 pages of A4 descriptive text 9 A3 pages of figures.

Entered by thomas cockcroft (tom.cockcroft@sumoservices.com)

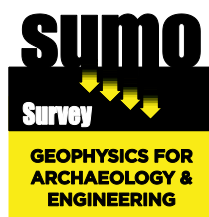
Entered on 12 December 2019

Please e-mail [Historic England](#) for OASIS help and advice

© ADS 1996-2012 Created by [Jo Gilham and Jen Mitcham](#), [email](#) Last modified Wednesday 9 May 2012

Cite only: <http://www.oasis.ac.uk/form/print.cfm> for this page

[Cookies](#) [Privacy Policy](#)



- Archaeological
- Geophysical
- Laser Scanning
- Measured Building
- Topographic
- Utility Mapping

SUMO Services Ltd, incorporated under the laws of England and Wales,
Company Registration No.4275993.
Registered Office Unit 8 Hayward Business Centre, New Lane, Havant, Hampshire, PO9 2NL



rpsgroup.com