Hatchlands Park, Surrey

Archaeological and Historical Landscape Survey

Oxford Archaeology North

August 2009

Landscape Agency and The National Trust
Issue No: 2008-2009/974
OA North Job No: L10105
NGR: TQ 0688 5248

Document Title: **HATCHLANDS PARK, SURREY**

Document Type: **Archaeological and Historical Landscape Survey**

Client Name: **Landscape Agency and The National Trust**

Issue Number: **2009-10/974**
OA Job Number: L10105
National Grid Reference: TQ 0688 5248

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ARCHAEOLOGICAL AND HISTORIC LANDSCAPE SURVEY

FOR THE LANDSCAPE AGENCY AND THE NATIONAL TRUST

Summary

Oxford Archaeology North was commissioned by The Landscape Agency (on behalf of The National Trust) to conduct an archaeological and historical landscape survey of Hatchlands Park, Surrey (centred on TQ 0688 5248). This was intended to record and evaluate the archaeological and historical features within the park and to inform the management of the park. The survey was undertaken between April and June 2009.

The project has successfully achieved the key objectives, which were to undertake a landscape study (including the identification and recording of archaeological remains within the park), to undertake a detailed measured survey of the most significant features identified during the project, and to implement a geophysical survey with the specific aims of identifying a former service trench, and to investigate the possibility of tracing the site of the Tudor house.

The desk-based and topographic surveys have identified a wide range of archaeological features in the park, the majority of which can clearly be linked to the early use of the land within the park as farmland prior to the early nineteenth century, or to the development of the designed landscape since the eighteenth century. These features include ponds, former buildings and enclosures, various boundaries, extant and former quarries, and various features of the relict designed landscape. A selection of these features were chosen for detailed measured survey, which focussed on features that either did not appear on historic maps or were influential on the evolution of the historic landscape. Amongst these are the earthworks scattered over Fullers Hill, which proved to be mainly of eighteenth and nineteenth century origin, although the former Grotto Pond may be earlier. A complex of boundaries was noted running east/west through the park, and which join the historic parish boundary running north from the old Epsom road. These boundaries may mark the northern and eastern edges of the manor in the sixteenth or seventeenth century.

The geophysical survey located what appears to be the partial plan of a sixteenth or seventeenth century farm complex just to the east of the present eighteenth century house. This is very likely to be the first significant structure in the park, and was recorded in some detail in documents of the late sixteenth and early seventeenth century, prior to demolition in the mid-eighteenth century. The geophysical survey also successfully demonstrated that the Fullers Hill pasture contains archaeological deposits related to the relict designed and agricultural landscape features visible as earthworks or grassmarks, and has identified that a previous largely unrecorded excavation probably located a structure or structures of possible eighteenth or nineteenth century origin.

Two Archaeological Constraint Areas have been proposed, extending out from the groups of archaeological features detected in the geophysical survey. It is possible that the complex of features identified to the east of the present house and provisionally interpreted as a sixteenth or seventeenth century farm complex may meet the criteria to be designated as a Scheduled Monument, protected under the provisions of the Ancient Monuments and Archaeological Areas Act of 1979.

1 INTRODUCTION

1.1 CONTEXT OF THE PROJECT

1.1.1 Oxford Archaeology North (OA North) was commissioned by The Landscape Agency (on behalf of The National Trust) to conduct an archaeological and historical landscape survey of Hatchlands Park, Surrey (centred on TQ 0688 5248; Figure 1). This was intended to record and evaluate the archaeological and historical features within the park and to inform the management of the park.

1.2 AIMS AND OBJECTIVES

1.2.1 The primary aim of the project is to inform the future management of the estate. The specific objectives of the project were set out in the brief prepared by The National Trust and re-iterated in the OA North project design (*Appendix 2*, this report). These comprise:

- ***Landscape Study:*** to identify, record and understand the character of the remains within the estate, which would include any designed elements of the estate, communication routes and any parkland features. The was to be achieved by means of an archival study and an archaeological walk-over survey. It was to examine only the extent of the registered park, but to draw on documentary material from the whole property. It was to examine the development of the landscape through documentary and archaeological data;
- ***Detailed Topographic Survey:*** a detailed measured survey was to be undertaken of any new features identified during the survey;
- ***Geophysical Survey:*** to implement a geophysical survey in the south-west corner of the park to identify a former service trench, and to investigate the possibility of tracing the site of the Tudor house by geophysics.

1.2.2 The project does not encompass the extant, built heritage but does include possible archaeological deposits on the recorded location of former buildings.

2 METHODOLOGY

2.1 PROJECT DESIGN

2.1.1 A project design (*Appendix 2*) was submitted in October 2008 by OA North in response to a brief by The National Trust for a programme of survey of the archaeological and historical features within Hatchlands Park, to inform the management of the park. The work was carried out in accordance with the project design.

2.2 DESK-BASED ASSESSMENT

2.2.1 ***Historic Environment Record:*** an assessment was undertaken of data held in Surrey County Council's Heritage Environment Record (SHER), the English Heritage National Monument Record (NMR) and the National Trust Historic Buildings and Sites and Monuments Record (NTHBSMR). A full digital record was obtained of the sites within the study area, including grid reference and description. OA North also received various personal communications from National Trust staff and a member of the Surrey Archaeological Society referring to archaeological activities within the park that were not recorded in either the SHER or NMR.

2.2.2 ***Aerial Photographs:*** no aerial photographs are held for the study area by the SHER or by the *Cambridge University Collection of Air Photos* (CUCAP); however, aerial photography from the NMR was consulted. The NMR collection comprised 181 vertical and oblique aerial photographs taken between 1946 and 1997.

2.2.3 ***Surrey History Centre:*** the Surrey Historic Centre (SHC) in Woking was visited to consult documents and maps relevant to the survey.

2.2.4 ***Rubber Sheeting of Historic Maps:*** the scans or photographs of the most significant historic maps were spatially georeferenced within ArcGIS and AutoCAD and then transferred into ArcGIS digital mapping. Once transformed the historic mapping was overlain with a digitised plan of all features identified during the topographic survey. These features were compared to those shown on the historic mapping to identify their first depiction date.

2.2.5 Close cooperation was maintained between OA North and The Landscape Agency to exchange data and to maximise the efficiency of the research.

2.3 TOPOGRAPHIC SURVEY - IDENTIFICATION AND RECONNAISSANCE

2.3.1 A general identification survey was undertaken extending across the full extent of the park and the results were superimposed onto the base OS map. The survey examined the full extent of the park, where access was available, and was undertaken in three stages: reconnaissance, GPS mapping, and description. The survey was intended to examine and record all landscape elements and any archaeological monuments within the landscape and used differential GPS to map features identified.

2.3.2 ***Reconnaissance:*** the first stage of reconnaissance was undertaken by close field walking, which varied from 15m - 20m line intervals depending on visibility (as affected by tree density), terrain and safety considerations. All sites noted were

recorded. The survey aimed to identify, locate and record archaeological sites and features on the ground. Those sites already identified by the desk-based assessment were checked against their entry, which was enhanced, where appropriate.

2.3.3 ***GPS Survey:*** the identified sites were recorded by Satellite Global Positioning System (GPS) survey and the data was digitally superimposed with the OS mapping. The hand-held GPS used achieved accuracies varying between +/- 3m. The location, extent and, in places, detail of the identified features.

2.3.4 ***Description:*** a descriptive record of all park features was created from the notes, GPS survey data and photographs. The description incorporated a provisional interpretation of each feature's function and a provisional interpretation of the site's chronology. In conjunction with the descriptive recording, a photographic archive was generated, which recorded significant features, as well as aspects of the general landscape. This part of the photographic archive was maintained using a digital camera with 8 megapixel resolution.

2.4 TOPOGRAPHIC SURVEY - DETAILED MEASURED SURVEY

2.4.1 The second phase of the topographic survey consisted of a Detailed Measured Survey, and used a GPS device to enable the measured survey recording of the significant monuments discovered during the identification and reconnaissance survey. The differential GPS used was a Leica 1200 differential system which utilised Ordnance Survey base stations in conjunction with a roving station to correct the raw data, with corrections transmitted by mobile phone. The accuracy of the OA North GPS system used during the detailed measured survey was is +/- 0.04m.

2.4.2 In conjunction with the descriptive recording, a photographic archive was generated, which recorded significant features, as well as aspects of the general landscape. This part of the photographic archive was maintained using black and white 35mm film and also digital photography using an 8 megapixel camera

2.5 GEOPHYSICAL SURVEY

2.5.1 A geophysical survey was undertaken on three areas of the park in order to (1) identify the location of reported finds of building rubble; and (2) to investigate the possibility of tracing the site of the Tudor house by geophysics. The geophysical survey used two complimentary survey techniques: magnetometry and electrical resistance. Full technical details of the survey methodology are included in *Appendix 4*, and the results are incorporated in this text where appropriate.

2.6 GAZETTEER

2.6.1 All of the information concerning archaeological sites within the park has been collated into a gazetteer (*Appendix 1*), which provides details of their location, period, character and significance. Locations are given as ten-figure National Grid References where possible, and the position of each site is indicated on a map of the park (Fig 2).

2.6.2 The gazetteer attached here as *Appendix 1* is a text version of the Access 97 database generated by OA North within a template supplied by The National Trust, and which is linked to GIS (Geographical Information System) digital mapping (ArcMap 9.3). This enables the results of the project to be rapidly assimilated into the NTHBSMR.

2.6.3 The SHER, NMR and NTHBSMR are the primary repositories of archaeological data for the park. Each were contacted and supplied digital records of known cultural heritage sites and events within the park and its immediate environs.

2.6.4 Archaeological features discussed in this report have been numbered according to the schedule set out below and as detailed in *Appendix 1*. This has been used in order to permit identification of the data origin of each feature and consistent cross-referencing between text and figures etc.

- **OA 100 - 199**: features identified from the SHER, the NMR, the NTHBSMR, and from various personal communications from NT staff and a member of the Surrey Archaeological Society;
- **OA 200 - 299**: features identified from aerial photography;
- **OA 300 - 399**: features identified from documentary and map sources;
- **OA 400 - 499**: features identified during the topographic survey;
- **OA 500 +**: features identified during the geophysical survey.

3 THE ARCHAEOLOGICAL AND HISTORICAL CONTEXT OF THE PARK

3.1 LOCATION

3.1.1 The park is centred on NGR TQ 0688 5248 and is located in the Borough of Guildford, in the County of Surrey (Fig 1). The majority of the park lies within the historic parish of East Clandon, with the south-eastern part of the park in the historic parish of West Horsley.

3.2 TOPOGRAPHY

3.2.1 The park is located on the north slope of the Clandon Downs, above the valley of the River Wey. The valley sides and north slope of the downs are cut by re-entrants (or side-valleys) with smaller rivers and streams. The park straddles a slight ridge between two of these re-entrants, with most of the park lying on the west side of one re-entrant on a slope facing north-east, whilst a small portion on the east side of the park faces downhill to the north-west. The house is located on a slight plateau between the two re-entrants, with open vistas to the north.

3.2.2 The highest point within the park is on the southern edge beside the A246 at about 100m OD, and the lowest point is on the northern edge at about 55m OD.

3.3 GEOLOGY

3.3.1 The geology of the park is closely related to the topography. The lowest parts (below *c* 65m OD) overlie gravels of the First Terrace (BGS Sheet 285, Solid and Drift 1:50,000, 1976) whilst the central portion of the park (*eg* Great Wix Wood) is underlain by London Clay. The area around the house is split between Reading Beds on the north side and Upper Chalk on the southern and highest part of the park.

3.4 DESIGNATED SITES

3.4.1 There are no Scheduled Monuments or Historic Battlefields within the park or within the broader Study Area.

3.4.2 The park itself is an English Heritage Grade II Registered Park and Garden (English Heritage ref. 5311).

3.4.3 Within the park are four Listed Buildings:

- Hatchlands House (Grade I);
- Stable block to Hatchlands (Grade II);
- Temple 100 yards south of Hatchlands (Grade II);
- Ice house 200 yards south east of Hatchlands (Grade II).

3.5 THE HISTORICAL CONTEXT OF THE PARK

3.5.1 The history of the park, house and gardens is set out in great detail in The Landscape Agency report; however, a condensed history of the landscape is included here. This summary also includes a review of the historic mapping relevant to the history of the landscape and parkland.

3.5.2 The first reliable documentary reference to the manor of East Clandon is dated to the eighth century (Maldon 1911), and notes that the Priory of Chertsey held the manor, although it is possible that the Priory had held the manor from the late seventh century, and the holding at this time consisted of land rented to tenants.

3.5.3 The manor was granted in the early thirteenth century to John Chaper and at that time consisted of five acres of land, half a virgate, and one hide. A reference late in the thirteenth century notes that the Prior of Newark had a chalk-pit on land that was accessed through land belonging to the Abbot of Chertsey, who had reclaimed the manor from John Chaper's heirs (Brayley 1878-81). The core area of the manorial holding at that time thus appears to have been in the area of the present house.

3.5.4 Very little is recorded of the manor between the thirteenth century and the mid sixteenth century. The manor was acquired by Sir Anthony Browne in 1544, following the Dissolution, and, via a number of other owners, eventually passed into the ownership of Edward Carleton by 1562 (Manning and Bray 1814). There are references to pieces of land as part of the manor (or leased to the manor) in the 1570s, which were named as Ninlands, Barveylands, Hield, Gasons Wood, Pitcroft alias Conypit (3a), West Gaston alias East Gaston (20a) and Chalkhawe (2a).

3.5.5 The first evidence for a significant structure within the site is an account of 1581 which describes the 'Mansion house newly erected in Hatchlands', and which included gardens, orchards, stables, barns, and outbuildings, and 35 acres of land besides called Hatchlands (SHC G165/72/1). This include coppices known as Gastons and Wykes Wood and a coneypit or rabbit-warren. Other documents of the 1580s describe the house in terms of some of the rooms and facilities, and suggest it was probably of symmetrical form. The documents clearly refer to what is basically a medium-sized farm unit, with stables, brew-house, kitchen, dairy and all the expected facilities of such a property.

3.5.6 A document of 1609 (SHC G165/72/4) refers to the capital messuage with 'garden orchards pigeon house brewhouse stable gateroom barn and other the outbuildings… and all of those grounds called the Hether and the further warren being stored with Coney' of 16 acres; 'fields of arable pasture and woodgrounds' of 76 acres, 'being all together and within one pale or fence and adjoining to the said messuage', all in East Clandon'. There was also a 'Lodge situate and being within the Warren'. There is no clear indication that the land within the manorial holding included or formed a deer-park, despite the reference to the lodge, and it is possible, therefore, that the lodge was a modest structure used by the keeper of the warren. Neither the lodge or warren are described in detail.

3.5.7 There are references later in the seventeenth century to the various residents at Hatchlands but the documentation becomes increasingly obtuse and appears to suggest that Hatchlands was no longer considered the manor house.

3.5.8 Although Surrey was mapped as a county by early cartographers such as Norden (1594) and Speed (1612), Hatchlands is not shown on any map prior to that by Sellar, surveyed between *c* 1679 and 1693. The park is annotated as 'Hatchlands Park', and is shown as enclosed by a pale, with two buildings within. The western building almost certainly represents what is now known as Fullers Farm, and the eastern building probably shows the sixteenth century house. No details are shown of either building.

3.5.9 From 1642-1692 the estate was periodically mortgaged by demise from Francis Lord Aungier to Sir Richard Heath, until it was finally sold to Sir Richard Heath in 1692. It is possible that the first designed landscape was created at Hatchlands in the late seventeenth century (between *c* 1670 and 1695), by Sir Richard Heath and did not then include land in West Horsley parish. The northern part of the present park was

still coppice woods, outside the park boundary. The property was referred to in some documents of this period as 'Hatchlands Park'. John Senex's map of 1729 depicts 'Hatchlands Place', and apparently shows an avenue running between the house and the Epsom road.

3.5.10 John Raymond purchased the Hatchlands estate from the Heath family in 1739 (Manning and Bray 1814). The parkland was apparently enlarged in 1741, when John Raymond rented 4.5 acres of Wykes Wood. The Boscawens bought the Hatchlands estate in 1750 and moved into the old house in 1751. Frances Boscawen had arranged for alterations to the existing gardens and a new walk by 1754, which appears to have ran to the south of the house. The chalk-pit was planted as a dell. Her letters suggest that the area of the park, around the house, was increasingly devoted to gardens and that the outer parts of the park were still essentially productive farmland. The Grotto Clump appears to be of mid-eighteenth century origin but in it's earlier form may have comprised an earthwork mound with grotto, which was later over-grown and mapped as the Grotto Clump on Reptons Red Book (1800). Farm buildings and stables were built to the north of the house.

3.5.11 The old house was demolished in 1757, and the new house was completed externally the following year, but was still not internally complete in 1759. Frances suggests in a letter of 1754 that the new house was to be built on the lawn close to the old house (Fretwell 1990, 9). John Rocque's map of *c* 1760 (Fig 4) shows the new house with outbuildings to the north, the Grotto Pond, Fullers Farm to the west, and park pales to the west, north and east. A similar arrangement is shown on the Lindley and Crossley map of *c* 1789-90, although a new drive is shown the west of the house, from the Epsom road.

3.5.12 The park was bought in 1770 by William Brightwell Sumner, who removed the coppiced woodland on Lower, Middle, and Upper Gason, which were shown on the Rocque, Lindley and Crossley maps. George Holme Sumner commissioned Humphrey Repton to prepare proposals for the landscape at Hatchlands, which were compiled in a 'Red Book' dated to February 1800. The description of the estate given by Repton confirms that, apart from the immediate environs of the house, the estate was principally farmland. Most of Repton's proposals close to the house were enacted. The conversion of the farming estate to a designed, parkland landscape thus appears to date to the early nineteenth century. The plan in the Red Book shows the Grotto Clump (or mound) for the first time. The eastern edge of the park follows the historic parish boundary north, encompassing Louisburg Grove, which is also mapped here for the first time; the boundary is shown as a fence. The area of the later Sheepwash pond appears to be depicted as woodland.

3.5.13 The estate was expanded in the early nineteenth century by purchasing or exchanging land to the east and north-west of the core area; the West Horsley Enclosure Map of 1803 shows Louisburg Grove as contiguous with Wix Wood. The OS two inch drawing of 1806 shows a new drive to the east of the house, and Louisburg Grove /Wix Wood as a single block of woodland extending farther east than that shown on the Repton plan. The woodland was divided by clear felling at some point early in the nineteenth century, but not before the survey was undertaken for the Newland and Smith plan (*c* 1814-22).

3.5.14 The Newland and Smith plan (Fig 5) is undated but is usually referred to as of *c* 1814 to 1822; however, it clearly shows the land in West Horsley parish as part of the park, together with the former Gaston coppices to the north. These fields were obtained between 1803 and 1821, suggesting that the Newland and Smith plan was prepared in 1821 or 1822. This plan is probably the most useful guide to the historic landscape as it had evolved by the early nineteenth century within the park. It records in some detail features of the Boscawen period and earlier, such as the

Grotto Pond and Clump, which were to be removed in the late nineteenth century. By this date Sheepwash pond is now depicted as a water feature.

3.5.15 The Tithe Maps for East Clandon (1843) and West Horsley (1842), and the First Edition OS maps of 1870 (25 inch scale) and 1873 (6 inch scale, Fig 6) show no significant change to the parkland landscape and suggest a period of relative stability between *c* 1820 and 1888, when the estate was bought by Stuart Rendel.

3.5.16 Rendel saw through a wide-ranging programme of works on the estate, which were shown in place on the OS 25 inch Second Edition maps of 1897. The principle works comprised:

- replacing the farm and stables north of the house;
- refurbishing the east lodge;
- various works around the house including laying paving;
- replacing the drive and turning circle from the west side of the house with a fountain and paths;
- re-aligning the east drive close to the house to form a new principal entrance;
- extending the drive to the west over the former glebe land;
- building a new west lodge;
- draining and removing the Grotto Pond;
- removing the Grotto Clump.

3.5.17 During the twentieth century a series of relatively minor and incremental changes were undertaken on the house and its immediate environs; in particular, Gertrude Jekyll was commissioned in 1900 by Lord Rendel to design new gardens around the house.

3.5.18 More substantial changes occurred further from the house between *c* 1909 and 1913. A new access was created on the east side of the park from West Horsley, and linked to the house by a new drive through Wix Wood and Louisbourg Plantation. To the south of the house, the former main Epsom road was re-aligned further south to its present course, bringing in more land to the south-west of the park. These changes, including the Jekyll garden, are shown in place on the OS six inch map of 1919.

3.5.19 Further changes to the gardens to the west of the house are shown on the OS six inch map of 1934. Later OS maps of the second half of the twentieth century depict a series of minor changes including the erection of the circular Doric temple in 1953, a new plantation of beeches to the south of the house, and another redesign of the garden to the west of the house. An inventory, taken in 1958, indicates that many of the features in and around the kitchen garden (*eg* storehouses, greenhouses, lean-tos and cold-frames) have been removed in the second half of the twentieth century. The current car-park and access road from the A246 was built in 1989.

3.6 THE ARCHAEOLOGICAL CONTEXT OF THE PARK

3.6.1 ***Introduction:*** before the field survey was undertaken, OA North closely examined a range of sources in order to collate and clarify the recorded archaeological resource for the park, and to make preliminary identifications of potential archaeological features that could be discerned from the study of historic maps and aerial photographs. This section describes that process and briefly notes the results.

3.6.2 ***The recorded archaeological resource (Figures 2 and 3):*** the SHER, the NMR and the NTHBSMR are the primary repositories of archaeological data for the park. Each

were contacted and they supplied copies digital records of known cultural heritage sites and events within the park and its immediate environs.

3.6.3 Unsurprisingly, the recorded resource is dominated by records referring to the extant Listed and non-Listed historic buildings within, and in close proximity to, the park, including clusters of buildings at Fullers Farm, in East Clandon, and in West Horsley. There are no records in the NTHBSMR recording archaeological sites or features within the park.

3.6.4 Both the SHER and the NMR included records referring to the park, including its status as a Grade II Registered Park and Garden, but these records primarily focussed on the extant parkland.

3.6.5 The SHER includes one archaeological record within the park (**OA 100**) but the location is almost certainly incorrect and it should be located outside of the park. This records refers to finds of early medieval pottery during fieldwalking in 1990; however, the map reference given in the SHER is purely nominal as it is only accurate to plus or minus 1km. The park is a very unlikely location for such finds as it has not been ploughed in the recent past. No finds or structures were identified at the given location during the field survey.

3.6.6 The Surrey County Archaeology Unit kindly supplied OA North with a copy of a watching-brief report relating to a British Telecom cable trench that was dug across part of the lawn to the west of the house in 2006 (**OA 101**). The stratigraphy revealed consisted of heavily disturbed topsoils overlying subsoils and natural sandy clay, with modern debris present in the top and subsoils. This was interpreted as material resulting from the use of this area as a garden in the twentieth century, and its removal in the 1980s. No archaeological features or finds were identified during the watching-brief.

3.6.7 The area surrounding the park has a generally low-level of recorded archaeological site or features. Finds of later medieval pottery were recovered from a possible kiln site located *c* 360m west of the park in the area known as Cannocks Wood (SHER ref. 3261). A Roman site, very probably part of a settlement, was located *c* 550m west of the park (SHER 537), on the north edge of the village of East Clandon. The record notes the findspot of late second century AD date; the material comprised a large quantity of coarse pottery, and a roof tile.

3.6.8 Ms. Sue Streeter (Head Gardener, Hatchlands Park) has several photos and a very brief hand-written note referring to an archaeological watching-brief that was undertaken during works to replace a water main and insert new access hatches across the field to the west of the house and south of the access drive (**OA 102**) in 1993. The watching-brief was undertaken by members of the Surrey Archaeological Society, under Stephen Dyer. The results of the watching-brief were not published nor collated; however, OA North were able to contact Mr Dyer who was very helpful in being able to describe the investigation. OA North were also supplied with additional photos held by The National Trust at Polesdon Lacey; unfortunately, no accurate plan survives of the watching-brief.

3.6.9 During the cutting of the service trench two brick-built features were noted at separate locations about 15m apart (**OA102A** and **102B**; Fig 3, Plates 1 and 2). These were interpreted at the time of the watching-brief as possibly indicating the site of the sixteenth century house. They appear to comprise brick foundations *c* 0.60m high, buried at a depth of *c* 0.50m below the present ground surface. Each feature lies in an angular, narrow construction trench, intercepted by the modern service trench at an angle of about 45 degrees. The bricks do not appear to be early examples (*eg* sixteenth century) but appear to date between the seventeenth and nineteenth centuries, and were bonded with a pale, creamy mortar. The soils around,

and above, each of the walls have been heavily disturbed and include scattered brick debris. Finds of iron nails, nineteenth or twentieth century pottery, ceramic drain pipes and lumps of a slag-like or vitreous material were recovered from this general area. Close examination of the watching-brief photos, aerial photographs, historic and current maps and the results of the geophysical survey of the area (*Section 4.4* below) indicates that the western brick-feature (**OA102A**) is likely to have been located beside or close to geophysical survey feature **OA 501**, and the eastern brick-feature (**OA102B**) spatially coincided with geophysical survey feature **OA 503**.

3.6.10 A geophysical survey of the area of the two brick-structures was undertaken by the Surrey Archaeological Society at the time of the watching-brief in 1993, however it failed to produce clear results (Stephen Dyer pers comm). The results of the Surrey Archaeological Society investigation in the area of **OA 102A** and **102B** support the results of the ground observation and the 2009 geophysical survey as representing a group of features within and around the former Grotto Clump, and the results are discussed further in *Sections 4.4* and *4.5*.

3.6.11 ***Historic Map Sources (Figs 2 and 3):*** as noted above, there is a very useful, if somewhat patchy, assemblage of historic maps and associated documents covering the park. Close examination of these sources resulted in the identification of 25 features, numbered **OA 300** to **OA 325**. These comprise:

- The former locations of ponds (**OA 300**, **304**, **305** and **308**);
- Former buildings and a milestone (**OA 301, 302, 303, 306, 309**, **319, 321, 322, 323** and **324**);
- Former small enclosures or buildings (**OA 307**, **310** and **315**);
- Former or new boundaries or roads (**OA 311, 312, 313, 316** and **320**);
- Two quarries (**OA 317, OA 325**);
- The kitchen garden (**OA 318**).

3.6.12 The park includes a complex web of active, unused and former paths, tracks, rides, drives and roads. These have been compiled and collated from the historic mapping and are shown on Figure 8. The nature of the historic maps is such that it is frequently impossible to distinguish between a path and a drive, for instance, and so this distinction has not been made on Figure 8.

3.6.13 ***Aerial Photography (Figs 2 and 3):*** two collections of aerial photographs were checked by OA North for this assessment:

- The Cambridge University Collection of Aerial Photographs (CUCAP);
- Aerial photographs held in the National Monuments Record by English Heritage.

3.6.14 No detailed aerial photographs covering the park are held in the CUCAP. The aerial photograph collection held in the National Monuments Record comprises 111 vertical aerial photographs taken between 1946 and 1995, and 70 oblique aerial photographs taken between 1969 and 1997. These aerial photographs were examined at the NMR premises in Swindon. Nine potential archaeological features were noted and comprise:

- The course of the former Epsom road (**OA 200**);
- Faint parallel, narrow grass-marks apparently pre-dating the Grotto Clump (**OA 202**);
- Former field boundaries (**OA 210**);

- A large circular feature, possibly the former location of a mature tree (**OA 204**);
- A dark-grassmark, possibly a former tree (**OA 205**);
- A large, sub-rectangular grass-mark, possibly the result of livestock movement (**OA 207**);
- A group of soilmarks in arable fields that appear to be the result of modern cultivation (**OA 209** and **212**);
- A long, curvilinear grassmark, possibly an animal trail (**OA 213**).

4 RESULTS OF THE TOPOGRAPHIC AND GEOPHYSICAL SURVEYS

4.1 INTRODUCTION

4.1.1 Once the basic data sets noted above had been examined and collated (*Section 3.5*), then a provisional features gazetteer and GIS mapping were prepared. The features were then checked on the ground during the Identification and Reconnaissance phase of the topographic survey, and any new features identified were added to the mapping and gazetteer. The results were closely reviewed to determine which features would be most appropriate to survey in more detail in the second phase of survey, the Detailed Measured Survey. Finally, the results of all work to date was reviewed and three areas were selected for the Geophysical Survey, which was carried out by ArchaeoPhysica Ltd on behalf of OA North. The rationale for locating the geophysical survey areas is discussed in detail in *Section 4.4* below.

4.2 TOPOGRAPHIC SURVEY - IDENTIFICATION AND RECONNAISSANCE

4.2.1 Thirty-four features were identified during this phase of the topographic survey (Figs 2 and 3). These consist almost entirely of earthworks visible as either positive features (banks or mounds) or negative features (ditches or pits), or combinations of each form, such as boundaries formed of a bank and ditch.

4.2.2 The features comprise:

- Possible woodland boundaries (**OA 402, 458, 479, 483** and **485**);
- Former or possible quarries (**OA 403, 406, 413, 461, 462** and **477**);
- Tree-bowls or the former location of mature trees (**OA 451** and **476**);
- Holloways or former routes through the park (**OA 409, 412** and **455**);
- Various boundaries (**OA 450, 459, 463, 474, 478, 481** and **486**);
- Various earthworks forming part of the former Grotto Clump and Pond complex (**OA 470 - 473**);
- Other features (**OA 401, 410, 456, 460, 475, 482** and **487**).

4.3 TOPOGRAPHIC SURVEY - DETAILED MEASURED SURVEY

4.3.1 Of all the features identified at this stage of the project, some were identified as targets for the Detailed Measured Survey (Figs 2 and 3); those features that were already mapped by the OS mapping were generally excluded. The exception to this is the complex of earthworks forming the former Grotto Clump and Pond, and the associated former paths, as these were important former designed landscape features, and were influential on the later layout of the parkland landscape and gardens. The features subject to the detailed measured survey comprised:

- The earthworks forming part of the former Grotto Clump and Pond complex (**OA 304, 470 - 473**);
- A boundary shown on the Newland and Smith map (Fig 5) of the early nineteenth century (**OA 311**);
- A possible former woodland boundary to the west of Wix Wood (**OA 458**);

- A slight earthwork bank seen to the east of the house (**OA 460**);
- Two possible former quarries (**OA 462** and **477**);
- A previously unrecorded bank boundary (**OA 463**);
- The former southern edge to the western Jekyll garden (**OA 474**);
- A slight earthwork bank seen on the lawn to the east of the house (**OA 475**);
- A probable tree-bowl (**OA 476**);
- Two ditches to the east of Great Wix Wood (**OA 481** and **486**).

4.4 GEOPHYSICAL SURVEY (FIGS 2, 3 AND 7)

4.4.1 The geophysical survey was intended to achieve two aims:

- to investigate the reported finds of potential building remains (**OA 102**);
- to determine the location of the sixteenth century house.

4.4.2 It rapidly became clear in the initial phases of the project that to achieve the first task would require all of the allocated survey resources, which comprised the survey of an area of up to 0.5ha. Information reviewed during the course of the project suggested that the actual location of the sixteenth century house probably lay to the east of the extant house. Accordingly, the area subject to survey (0.5 ha) was split into three areas (A, B and C; each 30m by 50m), located so as to offer the greatest potential to achieve the aims noted above.

4.4.3 Survey Area A was located *c* 200m west of the house, and adjacent to the former Grotto Pond. This location was chosen as it covers both the reported location of the potential building remains (**OA 102**) and the former location of the Grotto Clump, that was mapped in the nineteenth century as including several unidentified features.

4.4.4 Survey Areas B and C were located on the lawns and maintained grassland, *c* 40m and *c* 130m respectively to the east of the house. These areas were chosen as they lay on grassland close to the eighteenth century house, from where the old house was noted in the eighteenth century as being visible on the lawns. Each of these locations included subtle, eroded earthworks that could not be matched to any mapped features or otherwise explained otherwise. Survey Area B lies over the eroded bank (**OA 475**, Plate 3) and slight mound or tree-bowl (**OA 476**), whilst Survey Area C included an earthwork bank (**OA 464**).

4.4.5 Six features or groups of features were detected in Survey Area A:

- Three short stretches of probable paths within the former Grotto Clump (**OA 501, 502** and **503**);
- A continuation underground (**OA 504**) of the visible earthworks of a path which can be seen on the surface to the west (**OA 472**), running south-west to the north edge of the Fullers Farm complex;
- A manhole for the rising main running north-west across Fullers Hill, together with a general scatter of brick debris (**OA 505**);
- A series of parallel, linear features (**OA 506**), possibly representing the underground expression of the grass-marks (**OA 202**), that were seen on aerial photographs. Collectively, these may be the very eroded remains of ridge and furrow cultivation.

4.4.6 Feature **OA 503** appears to be in the same location as the eastern brick-feature noted in a service trench in 1993 (**OA 102B**), whilst feature **OA 505** and the associated scatter of brick debris are also in the approximate location of the western brick-feature (**OA102A**). At the present level of knowledge, however, it cannot be categorically stated that the features detected in the 2009 geophysical survey as **OA 503** and **505** are those previously noted in 1993 as features **OA102A** and **OA102B**. It is possible that features **OA102A** and **OA102B** are distinct features that were not clearly detected by the 2009 geophysical survey due to the presence of brick debris and other brick structures in the survey area, which has obscured their detection from the surface.

4.4.7 Eight features or groups of features were detected in Survey Area B:

- An area of crushed-brick (**OA 507**) associated with the former drive and ha-ha to the east;
- A possible surface or spread of rubble (**OA 508**);
- Two possible services (**OA 509** and **510**);
- A group of linear features (**OA 511** to **514**), forming a rectangular and apparently structural complex.

4.4.8 Eight features or groups of features were detected in Survey Area C:

- A possible surface or spread of rubble (**OA 520** and **521**);
- A complex of linear features (**OA 515** to **519, 522**) probably representing back-filled ditches and or robber-trenches.

5 SYNTHESIS AND DISCUSSION OF RESULTS

5.1 INTRODUCTION (FIGS 2, 3 AND 7)

5.1.1 An attempt has been made to construct a broad chronological structure that encompasses the features discussed in this report. It should be noted however, that it is difficult, at this level of information, to securely date features that are not mapped or which appear and disappear from the mapping evidence, and for which no other chronological indicators are available. Four basic chronological periods are proposed here, and under which the results of the project are discussed:

- Medieval and early post-medieval, including the sixteenth and seventeenth centuries;
- Eighteenth century;
- Nineteenth century;
- Twentieth century.

5.1.2 ***Medieval and early post-medieval, including the sixteenth and seventeenth centuries:*** the modern park is effectively cut in two by a series of earthworks aligned east/west, comprised of **OA 311, 320, 483** and **481**. Feature **OA 311** joins a group of three, segmented wet ditches to the east (**OA 320**), which in turn join the northern boundary of Wix Wood (**OA 483**). A further boundary can be traced in open grassland between Great and Little Wix Woods as an eroded ditch (**OA 481**), terminating in an amorphous depression. Feature **OA 311**, a broad ditch, is shown as a boundary on the *c* 1800 Repton plan and the *c* 1821 Newland and Smith plan (Fig 5), but it is very likely to be considerably older. Together with features **OA 320** and **OA 483**, it perhaps defines the northern edge of the manorial holding during the sixteenth century, or even earlier (Plate 4). This manorial holding may also have been defined to the east by a boundary feature (since lost) along the historic parish boundary, which runs north from the old Epsom road to a point within Great Wix Wood, before turning east. The fence, dividing two areas of pasture in the park, is close to this former boundary but is not on the exact alignment. The complex of boundary features formed by **OA 311**, **320**, and **483,** however, does not include any surviving elements of a classic deer-park pale, which would typically comprise a substantial ditch with an external bank.

5.1.3 The complex of features detected by geophysical survey *c* 40m to the east of the present house (Geophysical Survey Area B) includes a series of structural elements. Features **OA 512** and **OA 514** appear to represent stone walls or foundations, and are spaced between *c* 11 and 6m apart. Parallel stone walls or foundations lie to the north (**OA 511**) and east (**OA 513**), although the latter may also include some ceramic building material, perhaps in the form of a hearth or chimney. A slight earthwork bank (**OA 475**, Plate 3) is just visible on the surface and exactly overlies the southern wall **OA 514**. Collectively, this group of structures may be interpreted as the partial plan of a large farmhouse of the sixteenth or early seventeenth century, built in a open 'U' shape, and facing south-south-east (*eg* Brunskill 1987, 105, type e or f). The principal part of the structure would thus be on the same orientation as the former grotto pond (**OA 304**), and it is also aligned almost exactly with the southern elevation of the eighteenth century house. It is possible that the Grotto Pond (**OA 304**) was extant or constructed at the same time as the sixteenth century house, and may originally have been a fishpond or ponds. Features **OA 511** and **OA 513** may indicate later rebuilds of the core structure formed by **OA 512** and **OA 514**. Such

farmhouses were often modified in later years by building wings that extended further and further away from the core structure, and may have been enclosed in a courtyard with an entrance feature, possibly a gate-house. A source of 1609 (SHC G165/72/4) refers to a 'gate-room' at Hatchlands, strongly suggesting an enclosed complex. The Hextalls manor house at Blechingley (Turner 2004, 131), had a central hall which had very similar dimensions to the suggested structure formed here by **OA 512** and **OA 514**. The Hextalls manor house was, however, on a moated site and of early Tudor origin.

5.1.4 The exact nature of the possible surface or rubble spread in Area B (**OA 507**) is uncertain; it could be a yard surface associated with the sixteenth or seventeenth century house, a spread of rubble associated with the demolition of the earlier house, or evidence of a later activity, such as landscape gardening. Feature **OA 507** may of course be associated with the former drive and ha-ha to the east; the drive is shown on the Newland and Smith plan of *c* 1821 (Fig 5), and was removed in the second half of the twentieth century.

5.1.5 The complex of features seen further to the east (Area C) are perhaps less easy to interpret. Most of the features are linear and on broadly perpendicular alignments (**OA 515** to **519**, **522**). The survey results suggest that these may have been either ditches or robber trenches, and would support the thesis that these features form part of the garden, orchard, and perhaps correspond with barn, stable and pigeon house that were recorded in 1609 (SHC G165/72/4). Certainly, these features do not appear on any historic mapping and are on the same orientation as the structure that has been noted *c* 60m to the west (*Section 5.1.3*). The possible rubble spreads **OA 520** and **521** are enigmatic and may, as above, have been deposited for several reasons.

5.1.6 The slight earthwork bank noted on the surface (**OA 460**), and which runs between, and within, Geophysical Survey Areas B and C, may be a surface expression of the complex of linear features in Area C. It aligns with the north edge of the possible sixteenth century building in Area B (**OA 511**), and is approximately parallel with **OA 522** in Area C. This underlines the fact that the linear features in both Areas B and C are similarly orientated, suggesting a common origin, and may be components of a single inter-related complex. While this would appear to relate to the sixteenth century house and associated gardens, no evidence has been discovered for the existence of the warren or lodge that was referred to in documents of the sixteenth century.

5.1.7 There is a second and less likely explanation for the complex of features detected in Survey Areas B and C: that these features represent the sub-surface remains of a previously unrecorded formal garden. If so, then the garden may have part of the late seventeenth century designed landscape set out under Sir Richard Heath between *c* 1670 and 1695.

5.1.8 With the exception of the Gaston fields to the north (**OA 209**, **212**) and the former fields owner by Lord King to the south (**OA 210**), there is little evidence for the use of the core of the park as farmland prior to the early nineteenth century. The linear features noted on the aerial photographs (**OA 202**) appear to match features noted in the geophysical survey (**OA 506**), and there is a possibility that these features are the eroded remnants of ridge and furrow cultivation. It is likely that at least some of the former ponds within the park were livestock ponds, or were used as such at some time (**OA 300**, **304**, **305** and **308**).

5.1.9 ***The eighteenth century:*** Great Wix Wood, whilst undoubtedly including some veteran trees (*eg* **OA 487**), does not include the range of features characteristic of 'ancient woodland', such as grown-out coppices, internal boundaries, or external woodland boundaries (ditch with internal bank). The mapping history suggests that the present form of Wix Wood/Louisberg Grove is of late eighteenth century origin,

although references in the late sixteenth century do record eight acres of coppiced woodland called 'Wykes Wood'. The western, southern and eastern edges are not defined by woodland boundaries, and there are no signs of any internal subdivisions. The northern edge is defined by a ditch with an internal bank, although the bank may be fairly recent upcast from regular ditch clearance. This boundary might be seen more as part of the east/west boundary complex formed by **OA 311**, **320**, **483** and **481** (*Section 5.1.2*). Between *c* 10 and 15m west of the current edge of Great Wix Wood is a shallow, meandering ditch (**OA 458**), which appears to mark the former extent of the wood as shown on the OS map of 1870.

5.1.10 The large quarry to the west of the walled garden (**OA 317**) appears to be shown on the OS drawing of 1806, just to the south of the Epsom Road. It may have been opened during the construction of the present house in the mid-eighteenth century, although there are references to a quarry presumably south of the Hatchlands holding in the late thirteenth century (Brayley1878-81). There are a number of other hollows around the park that may have been quarries and which are not shown on historic maps (**OA 403**, **406**, **413**, **461**, **462** and **477**, Plate 5).

5.1.11 The grassland to the west of the house contains a complex of relict features dating to between the sixteenth or seventeenth century and the twentieth century. However the majority appear to be of eighteenth or nineteenth century origin.

5.1.12 The Grotto Pond (**OA 304**) is first shown on the Rocque map of the mid-eighteenth century, but may pre-date this as a landscape feature associated with the original sixteenth century house. The earthworks are prominent at the west end and along the northern edge, but the southern edge is difficult to discern and the eastern end has been lost. Some of this material may have gone to make up the mound **OA 470**, which is not shown on any map pre- or post-dating the removal of the pond in the late nineteenth century.

5.1.13 Geophysical survey feature **OA 503** appears to be in the same location as the eastern brick-feature noted in a service trench in 1993 (**OA 102B**), whilst feature **OA 505** and the associated scatter of brick debris are also in the approximate location of the western brick-feature (**OA102A**). However, it is quite possible that **OA102A** and **OA102B** are distinct features that were not clearly detected by the 2009 geophysical survey. The information available is sketchy at best, but, on balance, this seems to be the most likely explanation for features **OA102A** and **OA102B**. These features can, therefore, tentatively be described as probably of eighteenth or nineteenth century date, and to represent an unmapped and unrecorded structure or structures of uncertain purpose and form. It is equally possible that these structures were built in the mid-eighteenth century as temporary structures perhaps associated with brick-kilns, or are internal features of the nineteenth century Grotto Clump. It is, though, less likely that they were part of the first designed landscape of the late seventeenth century.

5.1.14 Extending south from the former pond is a holloway *c* 10m wide (**OA 473**), which terminates on the southern edge of the Fullers Hill pasture. This feature is visible as an apparently fenced boundary on the Newland and Smith plan of *c* 1821, and possibly also on the Rocque map of the mid-eighteenth century. It was used as a boundary in the mid-nineteenth century (OS First Edition map of 1873, Fig 6) but the northern part of this boundary was re-aligned by the late nineteenth century, and was removed entirely by the mid-twentieth century.

5.1.15 On the south side of the park, and running south from the quarry **OA 317** to the modern A246, is an eroded bank and ditch boundary (**OA 402**, Plate 6). This is shown on the Newland and Smith map (*c* 1821) as marking the boundary between the Sumner estate and the lands of Lord King to the west. It may have originated as a boundary in the early or mid eighteenth century, associated with the construction of

the walled garden (**OA 318**), and was first depicted on the Rocque map of the mid-eighteenth century.

5.1.16 ***The nineteenth century:*** to the west of the former Grotto clump and pond is another rather slight holloway (**OA 472**), running west and south to the boundary with the Fullers Farm complex. It is shown for the first time on the Newland and Smith plan of *c* 1821 (form uncertain), but the eastern arm falls out of use as a boundary in the late nineteenth century. The feature was also detected below-ground during the geophysical survey (Area A, feature **OA 504**). The continuation of this path to the north-east of the former pond is not visible on the ground as an earthwork but a section of eroded ditch (**OA 462**), slightly further to the north, may mark what appears to be a minor avenue or alignment of trees to the north of the pond, that is visible on the OS First Edition map of 1870.

5.1.17 The Grotto Clump is shown on the OS First Edition map of 1870 as defined by a roughly circular path. This can still be discerned as an earthwork arc on the ground (**OA 471**). The same map also shows internal paths within the Clump, and are the likely origin of the geophysical survey features **OA 501**, **502** and **503.**

5.1.18 To the east of Great Wix Wood (and roughly parallel to **OA 481**) is another eroded ditch (**OA 486**, Plate 7). This feature is on the exact location of a ride or path shown on the Newland and Smith plan as running along the north edge of Great Wix Wood, and continuing east to join the drive around Gastons.

5.1.19 Feature **OA 507** (Geophysical survey Area C) is associated with the former drive and ha-ha to the east, the former is shown on the Newland and Smith plan of *c* 1821, and was removed in the second half of the twentieth century.

5.1.20 Little Wix Wood contains two internal boundaries: Feature **OA 479** is a bank/ditch woodland boundary, possibly that shown on the 1803 West Horsley enclosure map as defining the east edge of parcel 137, whilst **OA 485** appears to be a twentieth century feature.

5.1.21 ***The twentieth century:*** immediately to the south-west of the house is a gentle bank (**OA 474**), that is shown on historic mapping and as an aerial photograph at the southern edge of the Jekyll garden of the mid-twentieth century.

5.1.22 The hollow noted as **OA 477** is on the upper west slope of a hill that is a prominent feature of the skyline from the east side of the house. Although it has the appearance of a quarry, this is an odd location for a quarry, and it is possible that this is an unrecognised designed landscape feature from the early nineteenth century.

5.1.23 The ditches **OA 486** and the former boundary **OA 481** (east of Great Wix Wood, Plate 7), are overlaid by the earthwork causeway of the ride through Great Wix Wood to the new east entrance, that was created between *c* 1909 and 1913 (Fig 8). Feature **OA 316** is a slight, linear earthwork crossing the east entrance drive, and represents a trackway that served Dean Farm. This farm was relocated as part of the works to create the new east entrance, which also resulted in the construction of the extant lodges in West Horsely.

6 RECOMMENDATIONS

6.1 ISSUES AND CONSTRAINTS

6.1.1 The surveys undertaken as part of this project have identified a wide range of cultural heritage features in the park, in two principal forms: above ground earthworks and below ground archaeological features and deposits. The conservation of both the identified resource and the currently unidentified, but potential, resource must form a key component of any Conservation Management Plan.

6.1.2 The Issues and Constraints section of the main Landscape Agency text accordingly refers to identified constraints in relation to, for example, the re-planting of trees. The Access database version of the detailed project gazetteer (submitted as a digital resource with GIS shapefiles) includes entries under the following headings which will help inform their management:

- Significance;
- Condition;
- Survival;
- Stability;
- Vulnerability;
- Threats to Site.

6.2 ARCHAEOLOGICAL CONSTRAINT AREAS

6.2.1 The geophysical survey results show the presence of groups of below ground archaeological features and deposits in Areas A, B and C. This raises three critical issues:

- These identified features and deposits are almost certainly only a portion of a much larger complex;
- The potential archaeological resource will extend some distance outward from Areas B and C, and, to a lesser degree from Area A;
- The significance of both the identified and potential archaeological resource for the complex of features within and extending out from geophysical survey Areas A, B and C is not certain at present.

6.2.2 Accordingly, it is strongly recommended that the management of the archaeological resource within the park takes account of two proposed Archaeological Constraint Areas surrounding the geophysical survey Areas A, B and C (Fig 3). The proposed Archaeological Constraint Area around geophysical survey Areas B and C is based upon the potential extent of the core of a sixteenth or seventeenth farm complex. The proposed Archaeological Constraint Area around geophysical survey Area A is placed to include all of the area of the former Grotto Clump, which may be of mid-eighteenth century origin.

6.3 OTHER MANAGEMENT RECOMMENDATIONS

6.3.1 A number of potential threats have been identified to the archaeological features detected during the survey. These are listed individually for each feature in the

Access 97 database, together with an assessment of the significance, condition, survival, stability and vulnerability of each feature.

6.3.2 As noted above (6.1.1), the archaeological resource consists primarily of above ground earthworks and below ground archaeological features and deposits. The archaeological resource may be impacted by the following primary potential threats:

- Accidental damage by tenant/occupier;
- Disturbance/intrusion (*eg* the insertion of services or the use of temporary facilities);
- Cultivation (*eg* the ploughing or sub-soiling of areas under arable cultivation);
- Neglect;
- Erosion from foot traffic, from livestock or from vehicle access;
- Tree planting, tree-removal, the unrestricted growth of vegetation, or the clearance of vegetation.

6.3.3 The below ground archaeological resource is more vulnerable to accidental damage, as it is essentially invisible.

6.3.4 Accordingly, six principal Management Recommendations are made here for the archaeological resource within the Park:

(1) No significant disturbance of the ground surface should be permitted within the defined extent of the proposed Archaeological Constraint Areas without seeking guidance from the NT Regional Archaeologist.

(2) Any programme of proposed works within the Park that may impact upon archaeological features identified in this survey (*eg* new paths or services, tree-planting or removal) should be informed by guidance from the NT Regional Archaeologist at an early stage in the process of planning such works.

(3) Consideration should be given to monitoring erosion to earthworks caused by foot traffic, livestock, or temporary facilities for special events (*eg* marquees) and to the use of practical measures for reducing or removing such erosion by means such as re-locating feeding troughs, using alternative means of access or the erection of temporary barriers to re-direct traffic.

(4) The dissemination of information on the location and nature of the archaeological resource to NT staff and NT tenants/occupiers to better inform day to day decisions and working-practises, and to encourage the reporting of damage, potential threats or new discoveries that may come to light.

(5) The results of this survey (in the form of the Access 97 database and the GIS shapefiles) should be incorporated into the NTHBSMR as soon as possible, in order to inform the future management of the resource.

(6) Further research is undertaken in order to clarify the extent, form and potential significance of the complexes of features identified in geophysical survey Areas B and C (this is discussed in detail below).

6.4 RECOMMENDATIONS FOR FURTHER RESEARCH

6.4.1 The complexes of features identified in geophysical survey Areas B and C appear to represent the partial plan of a sixteenth or seventeenth century farm complex, probably that which was first built in 1581 and which is recorded in various documentary sources until its removal in the late eighteenth century. There is an element of doubt over this interpretation, however, (as with all geophysical survey

results), and the extent of this complex also remains uncertain. It is recommended, therefore, that further archaeological investigation is undertaken in order to:

1. Determine and record the extent in plan of the larger complex of features detected in geophysical survey Areas B and C;
2. Characterise and date the larger complex of features;
3. Assess the sensitivity and significance of the complex.

6.4.2 This could be undertaken in a two-phase operation, combining further geophysical survey with limited and targeted trial excavation. Phase 1 would require further geophysical survey of the environs of geophysical survey Areas B and C and would be aimed at determining and recording the extent and plan of the complex (Objective 1, above). The extent of the survey would depend on two factors: the resources available and the survey results as they develop.

6.4.3 Phase 2 (and Objectives 2 and 3 above) would be best achieved by a tightly-controlled, limited and targeted trial excavation aimed at testing critical areas or features to determine the nature, form and chronology of the complex. The scope, aims and methodology of any trial excavation should be defined in a project design document or written scheme of investigation. The trial excavation would inform the assessment of the sensitivity and significance of the complex.

6.4.4 Whilst the features detected in geophysical survey Area A are undoubtedly of interest (especially the enigmatic structures **OA 102 A** and **B**), they do not appear to be as potentially significant as those of the sixteenth or seventeenth century farm complex noted in geophysical survey Areas B and C. It is suggested, therefore, that the latter are given priority if any resources become available for further archaeological work.

6.5 SCHEDULED MONUMENT STATUS

6.5.1 It is possible that the complex of features identified in geophysical survey Areas B and C may meet the criteria to be designated as a Scheduled Monument, protected under the provisions of the Ancient Monuments and Archaeological Areas Act of 1979. The latest guidance from the Department for Culture, Media and Sport (DCMS 2009) suggests that the complex meets the basic criteria, outlined in *Section 1.1*. The more detailed criteria applied by English Heritage, who take the lead in identifying sites in England for scheduling, do not appear to exclude the complex but it should be borne in mind that only sites of national importance are scheduled and that this is only enacted if it is the best means of protection available. This is outlined on the English Heritage website (http://www.english-heritage.org.uk/server/show/nav.00100200400d004).

6.5.2 If it were proposed to English Heritage that the complex be considered as a candidate for scheduling, then its status as a candidate could be enhanced if the recommendations for further work noted above had been undertaken and the extent, nature, form, chronology and significance of the complex are clarified as far as possible. Ultimately, however, the advice given to the Department for Culture, Media and Sport by English Heritage would be the deciding factor in this matter.

7 CONCLUSION

7.1 CONCLUSION

7.1.1 The project has successfully achieved the key objectives, which were to undertake a landscape study (including the recording and identification of archaeological remains within the park), to undertake a detailed measured survey of the most significant features identified during the project, and to implement a geophysical survey with the specific aims of identifying a former service trench, and to investigate the possibility of tracing the site of the Tudor house.

7.1.2 The desk-based and topographic surveys have identified a wide range of archaeological features in the park, the majority of which can clearly be linked to the early use of the land within the park as farmland prior to the expansion of the early nineteenth century, or to the development of the designed landscape since the eighteenth century.

7.1.3 These features include ponds**,** former buildings and enclosures, various boundaries, extant and former quarries, and various features of the relict designed landscape. A selection of these features were chosen for detailed measured survey, which focussed on features that either did not appear on historic maps or were influential on the evolution of the historic landscape. Amongst these are the earthworks scattered over Fullers Hill, which proved to be mainly of eighteenth and nineteenth century origin, although the former Grotto Pond may be earlier. A complex of boundaries was noted running east/west through the park, and which join the historic parish boundary running north from the old Epsom road. These boundaries may mark the northern and eastern edges of the manor in the sixteenth or seventeenth century, and possibly even earlier.

7.1.4 The geophysical survey located what appears to be the partial plan of a sixteenth or seventeenth century farm complex just to the east of the present eighteenth century house. This is very likely to be the first significant structure in the park, and was recorded in some detail in documents of the late sixteenth and early seventeenth century, prior to demolition in the mid-eighteenth century. The geophysical survey also successfully demonstrated that the Fullers Hill pasture contains archaeological deposits related to the relict designed and agricultural landscape and visible as earthworks or grassmarks, and has identified that a previous, and largely unrecorded, excavation probably located a structure or structures of possible eighteenth or nineteenth century origin.

7.1.5 Two Archaeological Constraint Areas have been proposed, extending out from the groups of archaeological features detected in the geophysical survey. There is one centred on Geophysics Area A and another to the east of the house which includes Geophysics Areas B and C. It is possible that the complex of features identified to the east of the present house and provisionally interpreted as a sixteenth or seventeenth century farm complex may meet the criteria to be designated as a Scheduled Monument, protected under the provisions of the Ancient Monuments and Archaeological Areas Act of 1979. The detailed project gazetteer (submitted as an Access database and GIS shapefiles) forms a key resource in the future management of the park.

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8.2 OTHER SOURCES

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8.3 CARTOGRAPHIC SOURCES

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Speed's map of Surrey (1612)

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John Senex's map of Surrey (1729)

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Enclosure map of the parish of West Horsley (1803)

Ordnance Survey Two Inch Drawing (1806; Thomas Budgen)

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8.4 NON-CARTOGRAPHIC PRIMARY SOURCES

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APPENDIX 1
ARCHAEOLOGICAL FEATURES GAZETTEER

NB. Features discussed in this report have been numbered according to the schedule set out below. Note that some features have two numbers as they have two identities: as visible earthworks and as geophysical survey anomalies, for instance.

- **OA 100 - 199**: Features identified from the SHER, the NMR, the NTHBSMR and from various personal communications from NT staff and a member of the Surrey Archaeological Society; **OA 100 - 199**;
- **OA 200 - 299**: Features identified from aerial photography;
- **OA300 - 399**: Features identified from documentary and map sources;
- **OA 400 - 499**: Features identified during the topographic survey;
- **OA 500 +**: Features identified during the geophysical survey.

OA Number	***Type of Feature***	***Description***
100	Archaeological Findspot	SHER record 4277 refers to finds of early medieval/Anglo-Saxon pottery at this location during surface artefact collection (fieldwalking in 1990). However, the map reference given is purely nominal as it is only accurate to plus or minus 1km. This is a very unlikely location for such finds as it has not been ploughed in the recent past. Nothing was seen at this location during the field survey.
101	Archaeological Watching-Brief (2006)	Archaeological Watching-Brief undertaken by the Surrey County Archaeology Unit in 2006 on a British Telecom cable trench. The trench ran from a box junction at the west end to a terminus near the east edge of the lawns. The stratigraphy that was revealed consisted of heavily disturbed topsoils overlying subsoils and natural sandy clay. Modern debris was present in the top and subsoils resulting from the gardens that were formerly laid out over this area and which were removed in the 1980s. No archaeological features or finds were identified during the watching-brief.
102	Archaeological Watching-	A watching-brief undertaken by members of the Surrey Archaeological Society, under Stephen Dyer. The results

OA Number	***Type of Feature***	***Description***
	Brief (1993)	of the watching-brief were not published nor were they collated. Two brick-built features were noted at separate locations about 15m apart (**OA102A** and **102B**), during the cutting of a service-trench. The features appear to comprise brick foundations *c* 0.60m high, buried at a depth of *c* 0.50m below the present ground surface. The bricks appear to date to between the seventeenth and nineteenth centuries, and were bonded with a pale, creamy mortar. The soils around and above each of the walls have been heavily disturbed and included scattered brick debris. Finds of iron nails, nineteenth or twentieth century pottery, ceramic drain pipes and lumps of a slag-like or vitreous material were recovered from this general area. The western brick-feature (**OA102A**) is likely to have been located beside or close to geophysical survey feature **OA 501**, and the eastern brick-feature (**OA102B**) co-located with geophysical survey feature **OA 503**. A geophysical survey of the area of the two brick-structures was undertaken by the Surrey Archaeological Society at the time of the watching-brief in 1993; however, it failed to produce clear results (pers com Stephen Dyer).
200	Former road	Soilmarks of former road are visible on various aerial photographs. They were visible as a slight earthwork embankment in the field south of Fuller's Farm at NGR 06268 51665. It may extend slightly further east but this is unclear on the ground.
202	Linear grassmarks	Faint parallel, but regularly-spaced, narrow grass-marks apparently pre-dating the Grotto Clump features. This was possible eroded former ridge and furrow cultivation. They were detected as regular features in the geophysics survey (Area A, Feature OA 506).
204	Earthwork or grassmark	An earthwork or grassmark, sub-circular feature, possibly the former location of a mature tree. Nothing was seen at this location during the field survey.
205	Small grassmark	A dark grassmark in pasture to the east of house, which was possibly a former tree. Nothing was seen at this location during the field survey.
207	Large grassmark	A large rounded, sub-rectangular grassmark. Nothing was seen at this location during the field survey. The grassmark was apparently the result of livestock movement.
209	Pair of soilmarks	Pair of diffuse, parallel soilmarks in a ploughed field; it is very likely the result of recent cultivation. Nothing was seen at this location during the field survey.
210	Linear soilmarks	Linear soilmarks of former field boundaries shown on the Newland and Smith Plan of the Hatchlands Estate (*c* 1821). Nothing was seen at this location during the field survey.
212	Large soilmark	A large roughly semi-circular soilmark in arable field; it was very likely the result of recent cultivation. Nothing was seen at this location during the field survey.
213	Linear grassmark	A long, curvilinear grassmark seen on aerial photographs. It was very likely an animal track. Nothing was seen at this location during the field survey.

OA Number	***Type of Feature***	***Description***
300	Former Pond	The site of a pond shown on the OS 1st Edition map of 1870; it was removed by 1946. A roughly circular depression was noted at this location during the field survey, approximately 4m in diameter and 0.20m deep.
301	Former building	The site of a possible former building shown on the OS 1st Edition map of 1870; it was removed by 1896. Nothing was observed at this location during the field survey.
302	Former building	The site of a possible former building shown on the OS 1st Edition map of 1870, it was removed by 1896. Nothing was observed at this location during the field survey.
303	Former building	The site of a possible former building shown on the OS 1st Edition map of 1870; it was removed by 1896. Nothing was observed at this location during the field survey.
304	Former Pond	A former Grotto pond first shown on the Repton map of *c* 1800; it was removed between 1870 and 1896 (OS mapping). It survives as an earthwork. The northern edge is relatively sharply defined, the eastern edge much less so, as it has been removed. Mound 470 is located at the north-west corner and connects to a lower mound along a low bank forming the west edge of the pond. It measures *c* 97m long by up to *c* 42m wide. It was possibly laid out late in the seventeenth century as a feature of the parkland landscape, although it is also possible (but less likely) that it was dug at about the same time as the construction of the sixteenth century house and may have originally been a fishpond.
305	Former Pond	The site of a small pond shown on the OS 2nd Edition map of 1897; it was removed by 1977. It is an irregular hollow approximately 10m long and 5m wide which was visible at this location during the field survey.
306	Milestone	The site of a milestone with bench-mark shown on OS 1st Edition map of 1870; it was possibly relocated further south when road realigned. It is not seen at this location during the field survey.
307	Former enclosure	The site of a small enclosure shown on the OS 2nd Edition map of 1896; it was removed by 1915. Nothing was seen at this location during the field survey.
308	Former Pond	The site of a small pond shown on OS 1st Edition map of 1870, removed by 1897. Nothing was seen at this location during the field survey.
309	Former buildings	The site of a complex of former buildings - some of which may be shown on the Greenland and Smith, and Repton plans of the early nineteenth century; it was removed by 1896. These appear to be the former farm buildings built by the Boscawens in the mid eighteenth century.
310	Small enclosure	A small enclosure shown on the OS map of 1961; it was denoted as a 'sheep dip' on the 1977 map, and was removed by 2009. Rubble is present at this location.
311	Former boundary	A former boundary shown on the Rocque map of mid eighteenth century, and also on the OS 1st Edition map of 1870; it was realigned by 1897. It was visible as a 'V' profile ditch that was up to 4m wide and 0.60m deep; itv was shallower at the west end. It joins a segmented wet ditch to the east.

OA Number	***Type of Feature***	***Description***
312	Boundary	A boundary inserted between 1870 and 1897.
313	Former boundary	A former boundary shown on OS map of 1934, and removed by 1977. Nothing was seen at this location during the field survey.
315	Site of enclosure or small building	The site of an enclosure or small building shown on AP of 1947 and OS map of 1961, and removed after 1977. Nothing was seen at this location during walkover survey.
316	Former track/road	A former track/road to Dean Farm, realigned between 1897 and 1919 at same time as construction of lodges. Slight earthworks were just visible south of the path during the field survey.
317	Quarry	A quarry west of the kitchen garden, shown for the first time on the OS 2 inch drawing of 1806. A quarry is mentioned in a document of 1259 referring to access through land at Hatchlands. The eastern half of the open quarry has recently been partly backfilled. It possibly has medieval origins.
318	Kitchen garden	Walled kitchen garden, shown on Rocque map of 1768.
319	Former building and compound	Building shown on the OS 2nd edition 25" 1896, and removed by 1977, when it was replaced by a modern structure.
320	Boundary	A segmented wet ditch. A boundary first shown on the Newland and Smith map of the early nineteenth century, segments clearly shown on the OS First Edition map of 1870.
321	Former buildings	A complex of greenhouses and other horticultural buildings first depicted on the Newland and Smith plan of the early nineteenth century, and removed late in the twentieth century.
322	Former building	A possible building shown on the Newland and Smith plan of the early nineteenth century, removed by 1870 and not shown on the OS First Edition map.
323	Former building	A building to the east of the house; it was shown on the OS First Edition map of 1870, and removed by 1896.
324	Site of enclosure or building	A building or enclosure shown on the Repton plan of 1800 to east of the house, beside the drive. It is uncertain if it represents a proposed or a contemporary feature and what form it might have taken. It was not depicted on any other map or plan. It is in the approximate location of a currently fenced area to the east of the house.
325	Quarry	A large quarry or chalk pit located *c* 80m south of the house. It is uncertain when it was first dug but it is possibly the chalk pit mentioned in a document of 1259. The quarry is almost certainly that which is referred to in documents from the late sixteenth century onwards. It is shown clearly for the first time on the OS 2 inch map of 1806 but thereafter is generally shown as an area of woodland. The Grade II Listed ice-house is located on the north side. The quarry is also known as 'the Dell' and formed part of the designed landscape in the late eighteenth century under the Boscawens.

OA Number	***Type of Feature***	***Description***
401	Earthwork	A circular earthwork in the field south of Fuller's Farm. It is approximately 6m in diameter and 0.5m high. A mature tree is in the centre. It was possibly created by selective cultivation around the base of the tree.
402	Earthwork	A ditch and bank on the edge of woodland to the west of the kitchen garden. The ditch is approximately 1.5m wide and 0.2m deep, bank of similar dimensions with mature trees on top. It was cut by the modern access road. *t was s*hown as a boundary on the Newland and Smith map of early nineteenth century but may be earlier than this.
403	Quarry	A former quarry on the southern edge of Fuller's Farm. The Well House is built right up to the quarry face.
406	Quarry	A possible former quarry in the south-west corner of Gardiner's Cottage garden.
409	Earthwork	A substantial ditch or holloway, running south-west from the Great Quarry. It was approximately 5m wide and up to 1.5m deep, it runs for a distance of *c* 70m, gradually shallowing as it approaches the north-east corner of the kitchen garden. It was shown on the OS First Edition map of 1870.
410	Earthwork	A circular earthwork in an area of new saplings south of the old road. It is approximately 7m in diameter and 0.3m high, it is topped by mature trees and grown-out coppices.
412	Earthwork	The course of a former road through park between the kitchen garden and the south-east entrance. It occasionally forms a substantial holloway or embankment (eg NGR 07142 51972). It was possibly of medieval origin.
413	Earthwork	A possible former quarry hollow, roughly triangular, *c* 20m long, 12m wide and up to 0.40m deep.
450	Earthwork	An earthwork of former field boundary shown on the Newland and Smith map of the early nineteenth century, it was removed between 1870 and 1896.
451	Earthwork	A slight mound approximately 3.5m in diameter and 0.5m high. It was possibly a former tree location.
455	Earthwork	A track and holloway (up to *c* 7m wide) on the west edge of the park between lane off Ripley Road and the south-western terminus of Long Walk. Mature oaks set on the bank within the park.
456	Earthwork	A pair of parallel shallow ditches or ruts *c* 3.5m apart, running north from the modern road. It is approximately 100m long. There is a series of shallow pits on the west side, one of which is covered by an ashlar slab *c* 0.60m x 0.50m. It was possibly a former designed landscape feature.
458	Earthwork	A sinuous, irregular hollow roughly parallel to the west edge of Great Wix Wood. It was possibly a former woodland boundary as shown on the OS 1st Edition map of 1870.
459	Earthwork	A boundary bank *c* 1.2m wide and 0.15m high, but is not shown on any mapping. It was apparently formed by recent cultivation to the north in the 1960s.
460	Earthwork	A slight bank, *c* 7m wide and 0.2m high. It is aligned roughly east/west, it is about 76m long but the terminals are hard to define. It was probably part of the complex of linear features detected in Geophysical Survey Area C.
461	Earthwork	A slight hollow in the corner of field, it is 'D' shaped, *c* 18m long, 10m wide and 0.3m deep. It was possibly livestock soil-poaching or a quarry.

OA Number	***Type of Feature***	***Description***
462	Earthwork	An irregular hollow, *c* 10m long, 4m wide and 0.5m deep. It is a possible quarry.
463	Earthwork	A bank up to 1.2m wide, 0.15m high and *c* 90m long. It is a possible former boundary.
470	Mound	A mound at the north-west corner of the former Grotto Pond. It connects to a small mound to the south-west by a low bank, forming the west edge of the pond. It is abutted by ditch 471, and defines the former Grotto Clump. It is not shown on any mapping.
471	Grotto Clump Ditch	A sub-circular ditch partly defining the former Grotto Clump, immediately west of the Grotto Pond. It was removed between 1870 and 1896 (OS mapping). It is about 1.5m wide and 0.3m deep. It connects to ditch 472 to the west.
472	Grotto Clump Ditch West	A broad, shallow ditch or holloway, running north and north-east from Fuller's Farm to the Grotto Clump, and turns through 90 degrees. It was shown for the first time on the Newland and Smith map of the early nineteenth century; it was removed by 1896 (OS mapping). It joins Grotto Clump ditch at the east end.
473	Grotto Pond South Ditch	A broad, shallow ditch running south-south-east from the former Grotto Pond and then turns south-west. It was shown for the first time on the Newland and Smith map of the early nineteenth century, and was removed by 1896 (OS mapping).
474	Earthwork	A curving bank on lawn to the southwest of the house; it is c 0.6m high on the south side. It appears to represent a southern boundary to the Jekyll garden, to the west of the house as shown on an aerial photograph dated 1978.
475	Earthwork	A slight bank or scarp in slope, *c* 0.60m high on southern edge and c 15m long, eastern end very diffuse. It appears to be the surface expression of the southern wall of the sixteenth/seventeenth century house OA 514.
476	Earthwork	A very slight mound with a shallow, irregular depression at the centre. It is about 6m in diameter and 0.25m high. It was a possible tree location as shown on the Newland and Smith map of the early nineteenth century but also overlies an area of disturbance detected in the geophysical survey Area B (Feature OA 507).
477	Earthwork	A roughly oval hollow c 20m long and 15m wide. It was located on the west face of a hillock opposite the main entrance to the house. It was possible a quarry or former designed landscape feature.
478	Earthwork	A bank up to 0.80m high, parallel to east boundary of park (c 4m from fence) and *c* 80m long. It was shown as a boundary on the OS 1st Edition map of 1870, but not shown as a defined boundary on the 2nd Edition map of 1896.
479	Earthwork	A ditch and bank woodland boundary within Little Wicks Wood. Bank c 1.5m wide and 0.2m high, ditch up to 3m wide and 0.75m deep. Mature trees and grown-out coppices are on top and along the bank. It was shown as boundary on the OS 1st Edition map of 1870 and possibly on the 1803 West Horsley enclosure map as defining the east edge of parcel 137.
481	Earthwork	An eroded ditch terminating in an amorphous depression. It appears to represent a continuation of OA 483 to the west.

OA Number	***Type of Feature***	***Description***
482	Earthwork	A pond to the north-east of Great Wix Wood. It was shown for the first time on the OS 1st Edition map of 1870 but may pre-date this. The current form is that of a stock-pond. An historic parish boundary runs along the south side of the pond.
483	Earthwork	A ditch and bank woodland boundary on the north side of Great Wix Wood. The bank is *c* 0.25m high.
485	Earthwork	A very slight bank and ditch boundary within Little Wix Wood. It was only shown on recent OS mapping.
486	Earthwork	An eroded ditch on the exact location of a ride or path shown on the Newland and Smith plan as running along the north edge of Great Wix Wood, and continuing east to join the drive around Gastons.
487	Tree	A veteran oak tree in Great Wix Wood; it was located *c* 15m west of the historic parish boundary.
501	Geophysical survey feature (Area A)	A short stretch of probable former path within Grotto Clump; it was possibly shown on the OS First Edition map of 1870.
502	Geophysical survey feature (Area A)	A short stretch of probable former path within Grotto Clump, possibly shown on the OS First Edition map of 1870.
503	Geophysical survey feature (Area A)	A short stretch of probable former path within Grotto Clump, possibly shown on the OS First Edition map of 1870.
504	Geophysical survey feature (Area A)	A continuation underground (**OA 504**) of a path which can be seen on the surface to the west as **OA 472**, running south-west to the north edge of the Fullers Farm complex.
505	Geophysical survey feature (Area A)	A manhole for the rising main running north west across Fullers Hill.
506	Geophysical survey feature (Area A)	A series of parallel, linear features, possibly representing the underground expression of the grass-marks (**OA 202**), seen on aerial photographs. Collectively, these may be the very eroded remains of ridge and furrow cultivation.
507	Geophysical survey feature (Area B)	An area of crushed-brick or similar material associated with the former drive and ha-ha to the east.
508	Geophysical survey feature (Area B)	A possible surface or spread of rubble.
509	Geophysical survey feature (Area B)	A possible service trench.
510	Geophysical survey feature (Area B)	A possible service trench.
511	Geophysical survey feature (Area B)	A linear feature probably representing a stone wall or the foundations of a stone wall.

OA Number	***Type of Feature***	***Description***
512	Geophysical survey feature (Area B)	A linear feature probably representing a stone wall or the foundations of a stone wall.
513	Geophysical survey feature (Area B)	A linear feature probably representing a stone wall or the foundations of a stone wall and which may also include some components in brick or tile (eg hearth or chimney).
514	Geophysical survey feature (Area B)	A linear feature probably representing a stone wall or the foundations of a stone wall.
515	Geophysical survey feature (Area C)	A linear feature probably representing a back-filled ditch or a robber-trench.
516	Geophysical survey feature (Area C)	A linear feature probably representing a back-filled ditch or a robber-trench.
517	Geophysical survey feature (Area C)	A linear feature probably representing a back-filled ditch or a robber-trench.
518	Geophysical survey feature (Area C)	A linear feature probably representing a back-filled ditch or a robber-trench.
519	Geophysical survey feature (Area C)	A linear feature probably representing a back-filled ditch or a robber-trench.
520	Geophysical survey feature (Area C)	A possible surface or spread of rubble.
521	Geophysical survey feature (Area C)	A possible surface or spread of rubble, a continuation of feature OA 520.
522	Geophysical survey feature (Area C)	A linear feature probably representing a back-filled ditch or a robber-trench, although there is a slight possibility this might be a service trench.

APPENDIX 2
PROJECT DESIGN

1. INTRODUCTION

1.1 CONTRACT BACKGROUND

1.1.1 The Landscape Agency has invited Oxford Archaeology North to submit proposals for an historic landscape survey of the 422 acre estate at Hatchlands Park, Surrey, to inform a proposed Management Plan for the property owners The National Trust. Hatchlands Park lies to the east of the village of East Clandon, and 7km east of Guildford in Surrey. The parkland on the property is of national importance as *c*115ha of the land is designated Grade II on the Register of Parks and Gardens of Special Historic Interest kept by English Heritage (Ref No. 5311). This project is intended to record and evaluate the archaeological and historical features within the estate lands of the property, which will inform the management of the estate. The aim of the survey is to identify the landscape character and significance of the landscape. It will examine the archaeological history of the landscape as part of this process and will present the results of the survey. The following project design sets out the objectives of the project, provides a method statement demonstrating how these can be met and defines the resource implications of the method statement.

1.1.2 The project will be managed by the OA North office in Lancaster, but the field survey and analysis will be undertaken members of the OA South office in Oxford. The geophysics will be undertaken by Archaeophysica.

1.2 HISTORICAL BACKGROUND

1.2.1 The land at Hatchlands Park has been occupied since at least the Middle Ages, with a moated capital messuage recorded in 1307 that belonged to Chertsey Abbey. The land passed to Sir Anthony Browne at the Dissolution and remained in his family until *c*1700. The property was acquired by the English naval hero Admiral the Hon Edward Bocawen in 1749, and he lived at the Tudor residence with his wife Frances (Fanny) from 1751. The landscaping of Hatchlands Park was initiated almost immediately and a new red brick house was built between 1756 and *c*1760. The Bocawen's ownership of the estate was to be brief, with Edward dying in 1761 and his widow selling to William Brightwell Sumner in 1770. Sumner who had made his fortune and reputation with the East India Company and his familial descendants made minor alterations to the house over the years and commissioned the famous landscape designer Humprhy Repton to lay out designs for modest improvements to the house and 200 acres of parkland landscape on the estate. His designs survive in one of his famous red books of February 1800.

1.2.2 Hatchlands was passed through the Sumner family until 1888 when it was sold to the wealthy industrialist and Liberal MP Stuart Rendel (later to be Lord Rendel of Hatchlands). Some changes were made to the house and gardens over the years, the most important being the commissioning of a small formal garden located to the south of the house designed by Gertrude Jekyll. Hatchlands passed to Lord Rendel's grandson the writer and architect Harry Stuart Goodhart-Rendel in 1913 and it was he who gave the estate over to The National Trust in 1945.

1.3 OXFORD ARCHAEOLOGY NORTH

1.3.1 Oxford Archaeology North (OA North), formerly Lancaster University Archaeological Unit, has considerable experience of the archaeological survey of sites and monuments of all periods, having undertaken a great number of small and large projects during the past 20 years. OA North employs a qualified archaeological and landscape surveyor (Jamie Quartermaine BA DipSurv MIFA) who has over 23 years experience of surveying buildings and landscapes, having worked closely with the Royal Commission on the Historical Monuments of England and the Lake District National Park Authority on numerous projects. OA North has particular experience in the recording and analysis of park landscapes and

formal gardens. Garden surveys of most relevance include an extensive archaeological study was undertaken of the formal and nursery gardens of Lyme Park, Cheshire, for the National Trust (LUAU 1996a and 1997), in 1996 a survey and evaluation was undertaken of the walled garden at Bostock Hall, in Cheshire (LUAU 1996b) and in 1999 an evaluation and survey was undertaken of the Astley Hall Gardens (LUAU 2001). OA North has also undertaken detailed surveys of complex gardens at Rectory Wood Gardens, Heysham Head and St Catherine's Estate, Cumbria, again for the National Trust (LUAU 1999, OA North 2005), further detailed survey, and map regression analysis of Lowther Castle gardens in Cumbria as part of proposals to restore the gardens (OA North 2007), and has undertaken the survey and excavation of both a fernery at Eller How gardens in Ambleside, Cumbria, for Channel 4 Television (Lost Gardens Series, broadcast 25/11/99), and on the parterres surviving beneath Salisbury Lawn at Chatsworth House, Derbyshire in advance of a proposed Anthony Gormley art installation on the lawn (OA North 2008d).

1.3.2 Archaeological surveys and archaeological studies of parklands include those at Lyme Park, Cheshire, Lowther Park, Cumbria, Lathom Park and Rufford Park, both Lancashire and the parkland at East Riddlesden Hall, West Yorkshire. Recent work has also been undertaken to identify the development and surviving parkland features of two municipal parks at Acton Park, Wrexham, North Wales and Memorial Park, Padiham, Lancashire. The Lyme Park programme involved a comprehensive documentary and archaeological survey of all elements of the large (6 sqkm) parkland, looking at the formative processes of the park and its buildings which was intended to provide the basis for the restoration and management of this extremely important site. Lowther Park involved a detailed documentary and surface survey of one of the more significant and sizeable parks in Cumbria, and examined both the development of the park and its associated deer park, but also recorded the extensive Roman and prehistoric pre-park remains. Lathom Park, was the seat of the Stanley family, and was at one time the most powerful seat in the North-West. OA North is involved in an on-going programme of excavation, survey, documentary study, and fabric survey intended to identify the evidence for the fourteenth century palace and investigate the development of the park.

1.3.3 Projects have been undertaken to fulfil the different requirements of various clients and planning authorities, and to very rigorous timetables. OA North is accustomed to undertaking projects to strict timetables, and to fulfil a wide variety of requirements. OA North is one of the bodies endorsed by the IFA (Institute of Field Archaeologists) (No. 17) and has both the expertise and resources to undertake this project to the highest standards

2. AIMS AND OBJECTIVES

2.1 NATIONAL TRUST BRIEF

2.2.1 The primary purpose of the project is to inform the future management of the estate. The requirements of the project are set out in the brief prepared by The National Trust and are as follows:

- ***Landscape Study:*** to record, identify and understand the character of the remains within the estate, which would include any designed elements of the estate, communication routes and any parkland features. The work will by means of an archival study and an archaeological walk-over survey. It will examine only the extent of the registered park, but will draw on documentary material from the whole property. It will examine the development of the landscape through documentary and archaeological data.
- ***Detailed Topographic Survey:*** a detailed measured survey is to be undertaken of any new features identified during the survey.
- ***Geophysical Survey:*** to implement a geophysical survey in the south-west corner of the park to identify a former service trench, and to investigate the possibility of tracing the site of the Tudor house by geophysics.

3. METHODS STATEMENT

3.1 The following work programme is submitted in line with the objectives of the archaeological work summarised above.

3.2 ARCHIVAL STUDY

3.2.1 The archival study will operate in conjunction with that undertaken as part of the conservation management plan by the Landscape Agency, and will draw upon their results. This work will provide for all the main sources as defined within the project brief, and will include a search on aerial photographic sources from the National Monuments Record (NMR), the Cambridge University Collection and the Historic Environment Record (HER). However, it is also proposed to incorporate and rubber sheet the historic mapping within a GIS to enable correlation between these and the archaeological data.

3.2.2 ***Processing Historic Mapping:*** an extensive documentary study of the park will be undertaken by The Landscape Agency and it is not intended to repeat this work. However, in order to facilitate the analysis it is intended to incorporate the historic cartographic mapping into a GIS, to georeference the maps to a consistent scale and where possible correct any original distortions in the original survey so that all surveys can be reliably superimposed and therefore enable the analysis of the parks development.

3.2.3 The base mapping will be the current ordnance survey vector mapping, it is the most accurate modern mapping available and will provide the base to which the historic mapping will be transformed (*Section 3.2.4*). The modern mapping will also provide the base for the field survey.

3.2.4 ***Rubber Sheeting Historic Maps:*** the scans of the historic maps will be spatially adjusted using a process called 'Rubber Sheeting' in ArcMap. This method of transformation is most suitable when the area in question is smaller and local accuracy is required (as opposed to georeferrencing where local is sacrificed for global accuracy). This is achieved by identifying multiple control points extant on both the historic scans and current mapping. Buildings and field boundary junctions have proved the most reliable reference points. ArcMap allows experimentation with a number of different transformation methods to achieve an optimal fit with minimal distortion.

3.2.5 Once transformed the historic mapping can be overlain with the survey data provided by GPS survey, and a direct comparison of surveyed features and those depicted on the historic mapping can be made. The output of the GIS can be transferred into Mapinfo for incorporation with the NT SMR.

3.3 TOPOGRAPHIC SURVEY

3.3.1 It is proposed that the park be surveyed at two levels. The first would be a general GPS identification survey extending across the full extent of the study area (0.16sqkm) and the results would be superimposed onto the 1:2500 base OS map. The second would be a detailed survey of selected individual features that are discovered during the survey. The results of both surveys will be combined and superimposed with the historic mapping within a CAD system (AutoCAD map).

3.3.2 ***Identification Survey:*** the survey will examine the full extent of the registered park, and will be undertaken in three stages: reconnaissance, mapping and description. The survey would be intended to examine and record all designed elements and any archaeological monuments within the landscape and would use differential GPS to map features identified.

3.3.3 ***Reconnaissance:*** the reconnaissance will consist of close field walking, varying from 15m - 20m line intervals dependant on visibility (as affected by tree density), terrain and safety considerations. All sites noted will be recorded. The survey will aim to identify, locate and record archaeological sites and features on the ground. Those sites already identified by the archival study will be checked against their entry and this will be enhanced, if appropriate.

3.3.4 ***Mapping:*** the parkland will be recorded by differential GPS survey and the data will be digitally superimposed with the OS 1:2,500 mapping. This particular hand held GPS can achieve accuracies of +- 0.5m. The method will record the location, extent and in places detail of the identified monuments.

3.3.5 In conjunction with the archaeological survey a photographic archive will be generated, which will record significant features as well as aspects of the general landscapes. It will record all principal vistas. This photographic archive will be maintained using black and white 35mm film and also using a digital camera with 8.0mega pixel resolution. The use of a

digital camera provides very effective manipulation of photographic images, which can seamlessly be incorporated within reports and also be inserted against the individual entries within the database form if required.

3.3.6 ***Site Description and Assessment:*** the key to economy of survey is being able to compile a descriptive record for each site in a fast and accurate manner, which can be implemented in all weather conditions. It is proposed that the data be directly input on site into a Psion palm computer. The data will be incorporated into an Access 97 compatible database. The data will be backed up daily onto a portable computer running Access 97. The proposed system has the advantage that it can be input in adverse weather conditions, unlike conventional pro-forma sheets, and saves on the subsequent transcription of the data into the database; however, it is slightly slower to create the entry in the field by comparison with a conventional pro-forma.

3.3.7 The input into the system will be guided by a proforma to ensure uniformity and consistency of input. The recording of the archaeological sites will incorporate a written description, including an accurate ten figure National Grid Reference. The description will assess and interpret the monuments and will include the following mandatory fields:

- NTSMR number
- Site Name
- NGR
- Site Description
- Monument Type
- Period
- Condition
- Management Recommendation

3.3.8 The description will incorporate a provisional interpretation of the function and purpose of a site, where possible, and similarly will provide a provisional interpretation of the site's chronology where possible. The descriptions will be linked in with the historical records for individual features obtained as part of the archive review.

3.3.9 ***Measured Survey:*** a Satellite Global Positioning System (GPS) will be utilised to enable the measured survey recording of the monuments discovered during the survey. GPS uses electronic distance measurement along radio frequencies to satellites to enable a positional fix in latitude and longitude which can be converted mathematically to Ordnance Survey national grid. The differential GPS is a Leica 1200 differential system and uses Ordnance Survey base stations in conjunction with a roving station to correct the raw data with corrections transmitted by mobile phone The accuracy of the OA North GPS system is capable of +- 0.03m and provides for a quick and effective means of recording the detail of the features. It is proposed that this technique be used to record the new features discovered during the survey.

3.4 GEOPHYSICAL SURVEY

3.4.1 ***Introduction:*** it is required that a geophysical survey be used to identify a service trench in the south-west corner of the park. In addition a trial will be undertaken to find out the susceptibility of the land and establish if there is the potential for searching for the Tudor house. It is proposed to undertake a single day of geophysical survey, which will be able to examine the area of the proposed service trench and will also be able to trial for further potential.

3.4.2 The two most commonly used techniques to undertake an effective geophysical survey in the location of archaeological remains are magnetic and electrical resistance. The two techniques are often applied to the same site as the differing means of locating below-ground remains produce complementary results. The choice as to which is most pertinent reflects local conditions and the nature of the archaeological resource. It is proposed to do a short trial between the two techniques at the outset of the survey to determine which is most effective for the local conditions and then continue using the successful technique for the rest of the survey. The disadvantage of the resistivity survey is that it is slower and can not cover the

same area as magnetometry within a given time. It is proposed to do a single day of survey, and therefore the use of Resistivity will result in a survey of probably only 0.5ha. It is proposed that the survey be undertaken by Archaeophysica.

3.4.2 ***Magnetic Survey:*** a magnetic survey is usually the first choice for a geophysical survey owing to its ability to be carried out relatively quickly (due to recent improvements in commercially available instruments), and is therefore more cost effective. The requirements for the survey in this instance is to use a vertical gradiometer with a sensor separation of 1m-1.2m. The aim of the magnetic survey is to detect cut features, such as ditches or cultivation features. However, the main drawback to magnetic surveys is that non-thermoremnant features, such as stone foundations, or those features with magnetic susceptibility levels similar to those of the background (particularly in areas where the parent material of the topsoil has very low magnetic susceptibility levels) will fail to be seen in the magnetic survey results. Therefore, a complementary or more suitable technique, such as resistivity, will be employed.

3.4.3 ***Methodology:*** a caesium vapour magnetometer will be employed, with a sensor separation of 1.0m. The data are captured in the internal memory and then downloaded to a portable computer for processing. The survey area will be divided into a 20m or 30m grid system dependant on the suitability to the site conditions. Within this grid system, sampling will be at a minimum of 0.25m intervals on a 1.0m traverse separation.

3.4.4 ***Electrical Resistance Survey:*** non-magnetic masonry features cannot be easily identified during a magnetic survey. Therefore, stone structures or platforms may be difficult to interpret without the use of electrical resistance. Cut features that have been subsequently infilled tend to be more moisture retentive and thereby less resistant to the current. These features manifest as low resistance anomalies. Structural remains or buried megaliths are more resistant to the current flow and are seen as high resistance features.

3.4.5 ***Methodology:*** a Geoscan Research RM15 resistivity meter will be employed. The standard methodology for an electrical resistance survey is to have the two mobile probes mounted horizontally on a frame at a distance of 0.5m apart. This will produce a depth of penetration of approximately 0.5m-1.0m. The data are captured in the internal memory of the RM15 and then downloaded to a portable computer. The survey area will be divided into the same 20m or 30m grid system also used for the magnetic survey, and which ever size is deemed more suitable to the site conditions. Within this grid system, sampling will be at 1.0m intervals on a 1.0m traverse separation.

3.5 LANDSCAPE ASSESSMENT

3.5.1 Following completion of the surveys, a programme of landscape assessment will be undertaken, drawing together the results of the survey work. The assessment will examine the chronological development of the parkland and gardens, it will describe the evidence for the pre-parkland history of the site, and also the character of the eighteenth/nineteenth century park and gardens, and the chronological changes that have been made to them. It will identify the extant elements of the park, including the residual elements of the historic planting schemes. The character of the original park elements will be presented in conjunction with their present form to identify the changing landscape and to inform the future management proposals. The report will identify areas of archaeological importance, and will examine their level of preservation and fragility.

3.5.2 ***Digital Mapping****:* Once the survey has been completed the survey data, historic mapping and site database will be combined into the GIS system to facilitate the spatial analysis; this will be ArcMap 9.2. Using historic plans and documentary evidence a draft layout plan of the early eighteenth/nineteenth century landscape design will be generated as an overlay to the site survey in the GIS system.

3.5.3 ***Analysis:*** a programme of landscape assessment will be undertaken, drawing together the results of the survey work and the earlier cartographic sources. The assessment will examine the chronological development of the gardens, and will identify on which historic map specific elements of the designed landscape first appear, and will included the residual elements of the historic planting schemes. The extant garden/parkland designed features will be categorised against period, and a series of phased maps of the parkland and gardens will be produced. The character of the original elements will be presented in conjunction with

their present form to identify the changing landscape and to inform the future restoration proposals.

3.6 PROJECT ARCHIVE

3.6.1 ***Archive:*** the results of the fieldwork will form the basis of a full archive to professional standards, in accordance with current English Heritage guidelines (Management of Archaeological Projects, 2nd edition, 1991). The project archive represents the collation and indexing of all the data and material gathered during the course of the project. This archive will be provided in the English Heritage Centre for Archaeology format, both as a printed document and digitally.

3.6.2 ***Digital Presentation:*** the digital data will be collated in a GIS, using Esri's ArcGIS 9.2. This powerful system provides full integration with standard database packages, and can output in a variety of formats compatible will all major GIS and CAD software packages. The database will be compiled in Access 97 format, as this provides good backwards and forwards compatibility with other versions of the software, and integrates smoothly with ArcGIS 9.2. Data can easily be imported into Access 97 from a variety of formats, and similarly can be easily exported back into other formats afterwards. Primarily point data (shapefiles) will be generated for each of the archaeological sites or parkland/garden features identified. Where sites are of an extensive nature these will be also created as line and/or polygon shapefiles and referenced to the Access 97 database.

3.6.3 ***Site Gazetteer:*** the site descriptions and characterisations input in the field to the site PDA will be processed and combined with the records from the NTSMR. Once the digital gazetteer has been collated and edited, it will be output as an Access Report and then input directly into a Microsoft Word format document. This data will then be formatted and topped and tailed within word to produce the gazetteer volume for the survey project.

3.6.4 ***Recommendations:*** a series of recommendations will be compiled for all the sites within appropriate fields within the Access database. This will define the most appropriate conservation strategy for the individual sites and will be prepared subject to detailed discussions with the National Trust Territory Archaeologist. As with site gazetteer the recommendations will be output as a separate Access report, incorporating only those fields pertinent to the conservation management. The data will then be edited within Microsoft Word to produce a separate volume of management recommendations.

3.6.5 ***Photographic Presentation:*** the primary access database will have fields defining the photograph number, type and orientation against the individual site. This will then be output as a database report, in order of photograph number, showing the site number, NGR, orientation and photo type. This will then be output as a word file to form the photographic catalogue.

3.7 REPORT

3.7.1 The report will present, summarise, and interpret the results of the programme detailed in Stages 3.1-3.5 above, and will include a full index of archaeological features identified in the course of the project. The reports will consist of an acknowledgements statement, lists of contents, summary, introduction summarising the brief and project design and any agreed departures from them. The report will identify the significance of the archaeological and architectural evidence and will include the following:

- An historical background to the estate, outlining its development.
- Results of the topographic survey, presented in conjunction with survey mapping
- Results of the geophysical survey presented in conjunction with survey mapping
- The report will examine the character and extent of the archaeological resource within the estate based upon the documentary sources, and survey evidence.

3.7.2 The report will also include a complete bibliography of sources from which the data has been derived, and a list of further sources identified during the programme of work. An appendix gazetteer of sites and designed elements which will be based directly upon the project database (which will be compatible with the NTSMR).

3.7.3 The report will incorporate appropriate illustrations, including copies of the site plans, landscape survey mapping, all reduced to an appropriate scale. The site mapping will be based upon the GIS and CAD base. The report will be accompanied by photographs and historic illustrations illustrating the principal elements of the landscape.

3.7.4 The report will make recommendations for the management of the identified archaeological resource.

3.7.5 ***Editing and submission:*** the report will be subject to the OA North's stringent editing procedure and then a draft will be submitted to the National Trust for consultation. The number of reports to be submitted will be subject to discussions with the client. In addition to the paper copies of the report digital copies of the report and drawings will be submitted.

4. OTHER MATTERS

4.1 ACCESS

4.1.1 It is assumed that the client will enable access to the full extent of the study area.

4.2 HEALTH AND SAFETY

4.2.1 Full regard will, of course, be given to all constraints (services) during the survey, as well as to all Health and Safety considerations. The OA North Health and Safety Statement conforms to all the provisions of the SCAUM (Standing Conference of Unit Managers) Health and Safety manual. Risk assessments are undertaken as a matter of course for all projects, and will anticipate the potential hazards arising from the project. In particular action will be taken to protect against eye injury from working in low, dense woodland undergrowth.

4.3 INSURANCE

4.3.1 The insurance in respect of claims for personal injury to or the death of any person under a contract of service with the Unit and arising in the course of such person's employment shall comply with the employers' liability (Compulsory Insurance) Act 1969 and any statutory orders made there under. For all other claims to cover the liability of OA North in respect of personal injury or damage to property by negligence of OA North or any of its employees there applies the insurance cover of £10m for any one occurrence or series of occurrences arising out of one event. The insurance will provide cover for volunteers working under the direct supervision of OA North staff.

4.4 CONFIDENTIALITY

4.4.1 The report is designed as a document for the specific use of The National Trust and the Landscape Agency, for the particular purpose as defined in this project design, and should be treated as such. Any requirement to revise or reorder the material for submission or presentation to third parties or for any other explicit purpose can be fulfilled, but will require separate discussion and funding.

5. WORK TIMETABLE

5.1 The phases of work will comprise the following elements. The days quoted are the duration for each individual task

i) Processing Historic Maps
4 days

ii) Topographic Survey
3 days - field work
3 days - Office

iii) Geophysics Survey

iv) Landscape Assessment
7 days

v) Report Production
14 days

5.2 TIMETABLE

5.2.2 The processing of cartographic sources can be implemented as soon as the project is commissioned and the copies of the mapping are provided by the Landscape Agency..

6. RESOURCES

6.1 PROJECT TEAM

6.1.1 The survey will be undertaken by Hugh Beamish (Project Manager). The report writing and analysis will be by Hugh and edited by Jamie Quartermaine (Senior Project Manager).

6.1.2 ***Project Management:*** the project will be under the project management of **Jamie Quartermaine, BA Surv Dip MIFA** (OA North Senior Project Manager) to whom all correspondence should be addressed. Jamie is a very experienced landscape surveyor, who has undertaken or managed literally hundreds of surveys throughout Northern England since 1984, and has considerable experience of working on similar projects to that proposed. He has managed a major recording programme of Lyme Park, Cheshire, and also a survey of the Rectory Wood Gardens, Heysham Head, both for the National Trust. He has also undertaken surveys of Lowther Park, Cumbria, Rufford Park, Lancashire and also a structural survey of Rufford Old Hall, he has also managed the recording programme of Lathom Hall and Park, Lancashire. He has been a project manager since 1995 and has managed over 250 very diverse projects since then, which are predominantly survey orientated, but of all periods from Palaeolithic to twentieth century.

6.1.3 ***Survey and Analysis:*** the survey and analysis will be undertaken by **Hugh Beamish BA Cert. AIFA** (OA South Senior Project Manager). Hugh has been working for Oxford Archaeology since 2002 and specialises in the preparation of Environmental Impact Assessments, historic landscape surveys and archaeological desk-based assessments. He has considerable experience gained over the last 23 years of the study of historic landscapes, and in particular the detection and analysis of historic landscape features through aerial photography, LIDAR survey, field survey, historical documentary analysis, and the use of historic mapping. Hugh has responsibility within OA's specialist Heritage Management Services department for training in heritage management and consultancy, and regularly teaches professional development courses in heritage management at Oxford University's Department for Continuing Education and at other venues for the Institute of Field Archaeologists. Hugh currently functions as Archaeological Consultant to the States of Jersey Planning and Environment Department, advising on technical and planning issues relating to archaeology.

APPENDIX 3

ARCHAEOPHYSICA LTD: HATCHLANDS PARK, SURREY - GEOPHYSICAL SURVEY REPORT

Hatchlands Park, Surrey

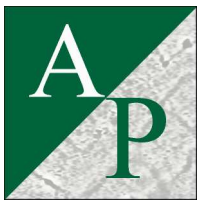
Geophysical Survey Report

Produced for Oxford Archaeology North

HNT091

27th May 2009

MJ & ACK Roseveare



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Mapping Our Heritage

Non-Technical Summary

Oxford Archaeology North in conjunction with Oxford Archaeology commissioned ArchaeoPhysica on behalf of The National Trust to investigate possible sites of an earlier dwelling at Hatchlands in Surrey. Three small trial areas were investigated with twin probe electrical resistance survey and caesium vapour magnetic gradiometry.

All three areas revealed substantial evidence for former structures including to the west of the house perhaps the surroundings of a former water feature known as Grotto Pond. To the east of the house a large area of structures including probably masonry from buildings or garden structures was sampled, none of which were previously known about.

June 2009

Digital Data

Data	Included?	Format
Survey outlines	Yes	Vector: AutoCAD R12 DXF "AP HNT081 CAD.dxf"
Interpretation	Yes	Vector: AutoCAD R12 DXF "AP HNT081 CAD.dxf"
XY Traces	No	Vector:
Contours	Partial	Vector: AutoCAD R12 DXF "AP HNT081 CAD.dxf"
Images	Yes	Georeferenced raster: GeoTIFF "AP HNT081 ER A 3x3av hp20m i black -2 white +2 Ohm.tif" "AP HNT081 ER B 3x3av hp20m i black -2 white +2 Ohm.tif" "AP HNT081 ER C 3x3av hp20m i black -7 white +7 Ohm.tif" "AP HNT081 MTFVG A black -5 white +3 nTpm.tif " "AP HNT081 MTFVG B black -5 white +3 nTpm.tif" "AP HNT081 MTFVG C black -5 white +3 nTpm.tif"
Catalogue	Yes	Database: MS Access 2003 "AP HNT081 Catalogue Table.mdb"

Media	Sent to	Date
E-mail	Hugh Beamish [hugh.beamish@oxfordarch.co.uk]	03.06.09

Audit

Version	Author	Checked	Date
Draft Final	MJR ACKR	MJR	03.06.09

Table of Contents

1 Introduction

Objective

1.1 Jamie Quartermaine at Oxford Archaeology North has commissioned ArchaeoPhysica on behalf of The National Trust to provide geophysical survey as part of a wider scheme of investigation.

1.2 A project brief has been set by The National Trust which states the objective of the geophysical survey is to "*identify a former service trench, and to investigate the possibility of tracing the site of the Tudor house by geophysics*". Electrical resistance and magnetic survey were specified in the Survey Project Design (OAN, 2008). Three separate small areas of survey by both methods were designated as a trial.

Location

Country	England
County	Surrey
Nearest Town	East Clandon
Landholding	The National Trust
Central Co-ordinates	506745, 151980

Summary of methodology

1.3 The following instrumentation and procedures were used:

Magnetic field survey

Measured Variable	Total magnetic field strength, nT
Instrument	Geometrics G858 Magmapper caesium magnetometer
Configuration	70cm vertical gradiometer
Sensitivity	0.03nT
QA Procedure	Static test
Resolution	0.25m along lines 1.0m apart

Electrical resistance survey

Measured Variable	Ground electrical resistance, Ohms
Instrument	Geoscan Research RM15 0.5m twin probe
Configuration	Multiplexed probe array
Sensitivity	0.1 Ohm
QA Procedure	Repeated traverses/readings
Resolution	1.0m x 0.5m grid

Set out

1.4 Set out used a total station working off temporary stations established with DGPS to create a common survey grid for the two methods. Local reference points were surveyed in as correlation.

1.5 Set out precision was within 0.05m internally.

Constraints & variations

1.6 There were no constraints experienced or variation from the specification.

2 Context

Archaeology

2.1 Early medieval settlement has been identified close by (Crockery Lane); the church in East Clandon dates from the eleventh century; monastic ownership of the park land (Chertsey Abbey) is recorded from 1307 and medieval dates have been attributed to nearby buildings (Lower Hammonds Farm) (Thackray, 2008).

2.2 Private ownership followed the dissolution and the mid-eighteenth century saw demolition of the old house, construction of a fine new house on a different site and landscaping works, with further landscaping by Humphrey Repton from 1800.

2.3 Later alterations to the house and gardens include the switching of the main entrance to the east after 1895 and a small formal garden by Gertrude Jekyll.

2.4 A reported discovery of building materials during works on a service trench that runs through survey area A (westernmost) raised the possibility that remains of the medieval house had been found, though this is not certain (Beamish, *pers. comm.*). This lies in the vicinity of the former "Clump", containing structural and planted garden features.

Environment

NRSI Soil Description	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils; lower ground = loamy soils with naturally high groundwater; higher ground = freely draining slightly acid but base-rich soils
Quaternary Drift	None
Bedrock	Boundary of (N) Lambeth Group (Upnor, Woolwich and Reading fms) sand and clay, pebbly, shelly & (S) White chalk (chalk with flints)
Topography	Gently sloping towards the north
Hydrology	Presumed assisted drainage
Current Land Use	Parkland
Historic Land Use	Parkland
Vegetation Cover	Grazed grass
Sources of Interference	None significant

3 Catalogue

3.1 The table below is the catalogue of anomalies found during survey for this project. The labels refer to DWG 05 and also those in green in the text of this report.

Label	Description	Easting	Northing
1	One of three high resistance features about 3.5m wide. Along with [2], either this one or [3] could be the corner of the Grotto Pond, however, their width suggests something like a path rather than the pond edge itself	506491.1	151983.3
2	One of three high resistance features about 3.5m wide - see [1]	506500.1	151976.6
3	One of three high resistance features about 3.5m wide - see [1]. Unlike [1] this example is not perpendicular to [2] and is perhaps not directly related to the Grotto Pond	506498.8	151965.0
4	A series of curving weak magnetic disturbances broadly coincide with a path depicted on the OS 1st ed. within Grotto Clump. However, if this is the case their juxtaposition with the possible pond-edge structures [1] - [3] is awkward	506479.7	151983.0
5	One of several strong magnetic disturbances indicating buried ferrous or brick debris within the site of Grotto Clump. This may reflect post-clearance land reclamation rather than anything ancient	506482.6	151967.1
6	Several weak low resistance linear anomalies are slightly enigmatic and may relate to drainage or perhaps cultivation although neither can be definitely assigned	506479.5	151947.3
7	Strong magnetic disturbances are associated with the former line of a drive against the SW side of the fence	506807.0	152042.3
8	An extensive area of strong variation of electrical resistance, on the whole rather elevated above 'background', suggests abnormally dry ground or perhaps a spread of rubble or a former surface	506793.0	152042.8
9	Probable service trench	506781.6	152039.6
10	Buried ferrous service	506791.1	152005.5
11	One of a series of non-magnetic resistive structures typical of buried culverts or more likely walls with anomalies up to 1m wide. The group form a rectangular structure comprising two 'walls' spaced between 1.5m and 3.5m apart, surrounding at 6.5m to 10.5m distance a much less well defined but still resistive 'enclosure' [14]. Either a substantial stone-built garden feature or elements of a large building seem the most likely interpretation	506784.8	152032.9
12	See [11]. This wall is the only one seen (approximately) to be continuous around two sides of the structure	506781.6	152027.4
13	See [11]. At this location there is a strong magnetic anomaly that seems to coincide with both walls and which would suggest a brick-built element absent elsewhere. If so, the closer separation of the two walls may also be significant	506805.2	152011.3
14	A weak increase in electrical resistance borders an area measuring 11m wide by at least 23m long (extends S beyond survey)	506787.7	152016.6
15	Most of the anomalies in this area are of resistance with little significant variation in the magnetic field. This sinuous low resistance anomaly is ephemeral and has no obvious explanation other than being the fill of a narrow trench	506872.4	152085.4
16	A probable ditch fill no more than 1m wide passes into the survey from the N before turning E through slightly more than a right angle. It is possible that this was an element of an ornamental feature though this is not self-evident	506879.5	152074.0
17	Probable ditch fill no more than 1m wide	506852.8	152078.5
18	Possible ditch fill or band of trapped moisture	506858.1	152055.2

Label	Description	Easting	Northing
19	Possible ditch fill or band of trapped moisture	506870.8	152055.2
20	In a similar fashion to [8] in area B, there appears to be a substantial area of dry ground to the S and it may have a fairly geometric edge typical of buried structure. It could therefore be an expanse of rubble or a former surface	506853.9	152042.8
21	See [20] of which this is presumably part	506878.5	152046.5
22	See [17] - [19]. This could however be a service trench	506853.1	152067.9

4 Discussion

Introduction

4.1 For an explanation of the data processing see the section entitled "Process Documentation" in the appendices.

4.2 The sections below first discuss the geophysical context within which the results need to be considered and then specific features or anomalies of particular interest. Not all will be discussed here and the reader is advised to consult the catalogue (*ibid*) in conjunction with the graphical elements of this report.

Geophysical character & environment

4.3 Overall the electrical resistance data exhibits fairly low values but not exceptionally so. Long wavelength variations are present across all three areas but whether these are entirely artificial or due in part to natural changes (e.g., [20] and [21]) is not clear. A larger area of survey would better answer this question.

4.4 Where buried structures apparently exist resistance anomalies are generally well defined and probably caused by structures quite close to the surface, however, their amplitude is similar to the broader trends observed in the data. These have had to be reduced to permit greater clarity of result.

4.5 The magnetic data is fairly uniform across the site with little in the way of major variations but a scatter of magnetic debris which lessens towards the east, further away from known structures. Of this only [13] directly correlates with buried structure and in this case indicates the likely presence of brickwork. Anomaly amplitudes are low, typical of long-term pastoral settings.

4.6 Within landscapes soil tends to accumulate in negative features like pits and ditches and will include particles with thermo-remanent magnetization (TRM) through exposure to heat if there is settlement or industry nearby. In addition, particles slowly settling out of stationary water will attempt to align with the ambient magnetic field at the time, creating a deposit with depositional remanent magnetization (DRM). At Hatchlands the strongest sources are clearly ferrous or brick-derived and there are few magnetic signs of ditch fills, however, these could still exist.

Interpretive framework

Magnetic

4.7 The primary interpretative logic is based on structural class and examples are given below. For example a linear field or gradient enhancement defining an enclosed or semi-enclosed shape is likely to be a ditch fill, if there is no evidence for accumulation of susceptible material against a non-magnetic structure. Weakly dipolar discrete anomalies of small size are likely to have shallow non-ferrous sources and are therefore likely to be pits. Larger ones of the same class could also be pits or locally-deeper topsoil but if strongly magnetic could also be hearths. Strongly dipolar discrete anomalies are in all cases likely to be ferrous or similarly magnetic debris, although small repeatedly heated and *in-situ* hearths can produce similar anomalies. Reduced field strength (or gradient) linear anomalies without pronounced dipolar form are likely to be caused by relatively low susceptibility materials, e.g. masonry walls, stony banks or stony or sandy ditch fills, none of which, apart from drains, are apparent here.

Electrical resistance

4.8 In general, significantly reduced electrical resistance can be associated with fills and wetter ground, although there are exceptions to this. Enhanced resistance is in general terms the converse situation, i.e., drier materials. These, however, are both relative terms and within small areas or complex archaeology the definition of 'background' may not be possible. In addition, the presence of shallow but variable geology can impart strong trends of equal or greater anomaly strength and a linear feature can produce an anomaly with strongly variable character along its

length. An exact interpretation of electrical resistance data is therefore not a trivial exercise and is usually best guided by information from other sources.

4.9 Within formal landscapes it can be difficult to distinguish stone culverts from walls as both produce similar anomalies and this can be a problem within gardens where both features are likely to exist. Stone or brick edging, however, tends to be distinguishable due to its narrower character but can easily remain invisible if survey resolution is too low. 'Background' variation is often quite marked due to the differences between soil cultivated to different depths, but also due to the transitory nature of garden layouts.

4.10 At Hatchlands it is difficult at this stage to be sure exactly what all the features may be, for the reasons stated above. Larger areas of survey would help and would be recommended if a more detailed interpretation was required. In addition, all the structures are of a scale greater than the area surveyed.

General

4.11 The use of more than more method at a site is always recommended and usually brings significant benefits. In the context of historic parks and gardens the combination of magnetic survey and electrical resistance is capable of distinguishing brick from stone and hence in some cases differences in structural phase. The use of brick and other thermo-remanent materials in path and drive construction becomes commonplace in the 1800s, often as crushed rubble at foundation level. Foundries and iron works sometimes provided a cheap source of hardcore ideal for the construction of the invisible parts of new paths and drives and the continuous processes of renewal and alteration within many country estates often resulted in surpluses of building rubble.

4.12 There are other benefits, e.g. in area C where the electrical resistance data shows clear low resistance anomalies typical of ditch fills but with few corresponding magnetic anomalies. They are present but are extremely weak, 0.5nT/m or less. This demonstrates that if these features are ditch fills their content is essentially as (non-) magnetic as the surrounding material, something often associated with excavations that are rapidly filled with the same material dug from them.

4.13 In this case that is interesting; it is perhaps unlikely that we have detected bedding trenches (though not impossible) but we could have detected robber trenches. If so, the implication is that this enigmatic set of low resistance features could mark the sites of walls and therefore could be associated with the probable walls of area B.

Chronology

4.14 It is not possible to attach dates to features through geophysical means alone, however, some attempt at recognition of broad phases of activity is sometimes possible.

4.15 In this case insufficient area was examined to permit the relationships between the features apparent within areas B and C to be studied. However, we do have the benefit of the first edition OS mapping from the 1870s and later editions. None of the features in areas B and C east of the house have been seen before and therefore must have become disused prior to the 1870s. Area A, to the west, is within the site of a grove called Grotto Clump, adjacent to which was Grotto Pool. It is assumed that both these features, depicted in the 1870s, are artificial, though whether there was a grotto is unknown to ArchaeoPhysica.

4.16 Neither feature now exists and the survey suggests that reuse of the site has been limited although the presence of magnetic debris [5] could imply the introduction of materials during land reclamation. There are no signs of any structures pre-dating the grove.

Archaeology

Area A (westernmost)

4.17 This area (like the others) measures 30m x 50m north – south and overlays the site of a grove known as Grotto Clump, a presumably artificial landscape feature. Immediately to the east is the site of Grotto Pond, a water feature depicted on the 1st editions of the OS map. It was

positioned to investigate reports of building materials exposed in the sides of a service trench excavated by the National Trust and was not expected to overlay the pond. Both these features have long been absent from the landscape.

4.18 As would be expected, the grove has left little geophysical trace apart from signs of later reclamation of the ground (e.g., debris [5] and perhaps linear features [6]). In spite of this, faint magnetic anomalies at [4] mirror the shape of a walk depicted within the northern margin of the grove and it is possible therefore that this had a metalled surface or was bounded in some way and that some traces survive.

4.19 If this is the case then there is an interpretive problem because within the northeast corner of the survey are three substantial resistive structures up to 3.5m wide, unlikely to be walls but perhaps the remains of paths. If so, the perpendicular angle between [1] and [2] suggests these surrounded the western end of Grotto Pond, however, that doesn't explain the third feature [3] which is angled relative to these. Not only are these features some 10m or more further west and north than the pond as depicted by the OS, they themselves are not known from any mapping and nor would the pond fit with possible walk [4] at this location.

4.20 If these features are not the pond and its immediate environment, it seems likely the structures depicted by the OS in the 1870s represent a contraction from an earlier unknown layout.

Area B (central)

4.21 Although areas B and C lay only 40m apart the great disparity between their results means they warrant separate discussion.

4.22 Both these areas are dominated by areas [8], [20] and [21] that seem likely to be caused by relatively impervious material in the soil, e.g., rubble or possible surfaces or perhaps simply more air. The possibility of a natural origin due to variations in deeper parts of the soil structure also cannot be discounted at this stage. Leaving these aside, discrete linear anomalies predominate.

4.23 At the northeast corner strong magnetic fields [7] mark the line of a former drive and could be an example of crushed brick or other magnetic material used within the foundation of this structure.

4.24 Two services, one [10] more certain than the other [9], are visible. The southern one [10] is strongly magnetic and is likely to be a water pipe or cable. The other, [9], is not magnetic and although a trench does seem to exist, might not actually be a service.

4.25 Of greatest interest is a group of linear structures [11 – 14], all bar [14] visible as high resistance structures typical of walls or culverts. Features [12] and [13] define a right-angled structure with a further parallel element [11] to the north. There is no magnetic expression and therefore we have to assume these are stone built and the absence of reduced magnetic field means no magnetic contrast and potentially therefore no void, i.e., perhaps not culverts. This suggests that all these features could be stone walls but there are no known structures at this location. At [13], some magnetic disturbance associated with an irregular anomaly typical of brickwork, suggests the eastern side to again be double and to incorporate brickwork.

4.26 Enclosed by this structure is a further rectangular structure [14], again apparently of stone though producing less of a resistive anomaly than the others, perhaps due to it penetrating less far into the ground and hence distorting the current flow less.

4.27 Interpretation of these is currently difficult, if not impossible. They share an uneasy association with the present house and its surroundings and do not appear on any known map. Logically they probably predate the rebuild of the house and could represent part of the previous dwelling or perhaps elements of a formal garden.

Area C (easternmost)

4.28 This area is immediately east of area B and the features share a similar alignment to those in area B, however, not exactly so.

4.29 Linear features again predominate but unlike in area B here they are all apparent as low resistance anomalies and magnetic disturbance is limited to a number of extremely weak linear anomalies that share the same alignment but are otherwise un-diagnostic.

4.30 It is one or two of these magnetic anomalies that mitigate against high resistance area [20] in particular being natural as they seem to coincide with the edge of the area. Bearing in mind this is a gradiometric survey the implication is that the resistive structure is rather shallow.

4.31 All the rest of the anomalies are apparently caused by low resistance linear structures, most likely ditch fills and too complex to be just drains. It has been difficult to generate a clear impression of the relationships between them and indeed whether or not there may be some resistive linear structures amongst them. This does seem possible but without a larger area to study (and to stabilise the data during processing) it is not possible to be sure.

4.32 Again there is no map showing these features and they seem unlikely to be just drains or bedding trenches. It is also tempting to associate them with those of area B, however, there are no grounds for doing so other than proximity. One possibility is that they are robber trenches, removing stone (hence the relative lack of magnetic debris) walls and if this is the case then a more definite association between the two areas can be postulated. However, if this is the case, these features are part of a complex extending substantially more than 100m in any direction.

General comments

4.33 Further survey could usefully be brought to bear in all three areas, especially to explore the relationship and function of structures east of the house but also to better inform what structures [1], [2] and [3] at Grotto Clump might be.

4.34 It seems clear that areas B and C reveal features that probably predate the existing house and therefore have provided the best indication yet of the likely location of the earlier building. However, the extent of anomalies suggests that rather more than just a house lies buried beneath the park.

Caveats

4.35 Geophysical survey is literally that, a systematic measurement of some physical property related to the earth. There are numerous sources of disturbance of this property, some due to archaeological features, some due to the measuring method, and others that relate to the environment in which the measurement is made. No disturbance, or 'anomaly', is capable of providing an unambiguous and comprehensive description of a feature, in particular in archaeological contexts where there are a myriad of factors involved.

4.36 The measured anomaly is generated by the presence or absence of certain materials within a feature, not by the feature itself. Not all archaeological features produce disturbances that can be detected by a particular instrument or methodology. For this reason, the absence of an anomaly must never be taken to mean the absence of an archaeological feature. The best surveys are those which use a variety of techniques over the same ground at resolutions adequate for the detection of a range of different features.

4.37 Where the specification is by a third party ArchaeoPhysica will always endeavour to produce the best possible result within any imposed constraints and any perceived failure of the specification remains the responsibility of that third party.

4.38 Where third party sources are used in interpretation or analysis ArchaeoPhysica will endeavour to verify their accuracy within reasonable limits but responsibility for any errors or omissions remains with the originator.

4.39 Any recommendations are made based upon the skills and experience of staff at ArchaeoPhysica and the information available to them at the time. ArchaeoPhysica is not responsible for the manner in which these may or may not be carried out, nor for any matters arising from the same.

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Thackray, C., 2008. "*Hatchlands Park Management Plan*" The National Trust, unpublished

Map copies (via a secondary source): Repton, H., c.1800 and Newland & Smith, 1814-22

http://www.nationaltrust.org.uk:80/main/w-vh/w-visits/w-findaplace/w-hatchlandspark/w-hatchlandspark-history.htm

Appendices

Survey metadata

Project information

Project Name	Hatchlands Park, Surrey
Project Code	HNT091
Client	Oxford Archaeology North
Fieldwork Dates	5-6 May 2009
Field Personnel	Thomas Desalle, Neil Paveley
Processing Personnel	Thomas Desalle, Anne Roseveare
Reporting Personnel	Anne Roseveare, Martin Roseveare
Draft Report Date	
Final Report Date	

Data geolocation

Projection	Orthographic
Co-ordinate System	British National Grid
Bearing	Zero
Precision	0.05m internally
Instrument Used	Total station
Reference Points	Resection off points located by GPS
References Definition	ArchaeoPhysica

Process documentation

4.40 General information on processes commonly applied to data can be found in standard text books and also in the 2008 English Heritage Guidelines "*Geophysical Survey in Archaeological Field Evaluation*" at http://www.helm.org.uk/upload/pdf/Geophysical_LoRes.pdf.

4.41 ArchaeoPhysica uses more advanced processing for magnetic data using potential field techniques standard to near-surface geophysics. Details of these can be found in Blakely, 1996, "*Potential Theory in Gravity and Magnetic Applications*", Cambridge University Press.

4.42 All archived data includes process metadata.

Magnetic field survey

Measured Variable	Total magnetic field strength, nT
Instrument	Geometrics G858 Magmapper caesium magnetometer
Configuration	70cm vertical gradiometer
Sensitivity	0.03nT
QA Procedure	Static test and repeated observation
QA Result	Normal
Resolution	0.25m along lines 1.0m apart
Original Data Format	Geometrics .bin, .stn & base station .dat

Process

4.43 Overall processing follows correct procedure for potential field data using industry standard routines. The sequence is as follows:

- Removal of temporal component by subtraction of base station magnetometer data, creating a total field model specific to that location
- Suppression of missing or individual outlying data (single-datum spike reduction)

- Reduction of heading offsets (constant) due to rotation of instrument in use
- Along-line interpolation to a constant 0.25m interval and creation of a regular grid of data
- Cross-line interpolation to 0.25m partly for cosmetic purposes and partly to stabilise subsequent processes

Electrical resistance survey

Measured Variable	Apparent electrical resistance, Ohms
Instrument	Geoscan Research RM15A
Configuration	Multiplexed probe array 0.5m twin, x10 gain, 1 mA current
Sensitivity	0.1 Ohm
QA Procedure	Repeated traverses/readings
QA Result	Normal
Resolution	1.0m x 0.5m grid
Original Data Format	ASCII Instrument dump decoded to Surfer 6 ASCII grid

Process

4.44 Processing of electrical resistance data is minimised to avoid the introduction of errors and the loss of narrow anomalies. In this case processing was limited to a 1.5m diameter smoothing filter for presentation after limited removal by hand of 'spikes'.

Archive data

Introduction

4.45 ArchaeoPhysica maintains an archive for all its projects, access to which is permitted for research purposes. Copyright and intellectual property rights are retained by ArchaeoPhysica on all material it has produced, the client having full licence to use such material as benefits their project.

4.46 Access is by appointment only. Some content is restricted and not available to third parties. There is no automatic right of access to this archive by members of the public. Some material retains commercial value and a charge may be made for its use. An administrative charge may be made for some enquiries, depending upon the exact nature of the request.

General description

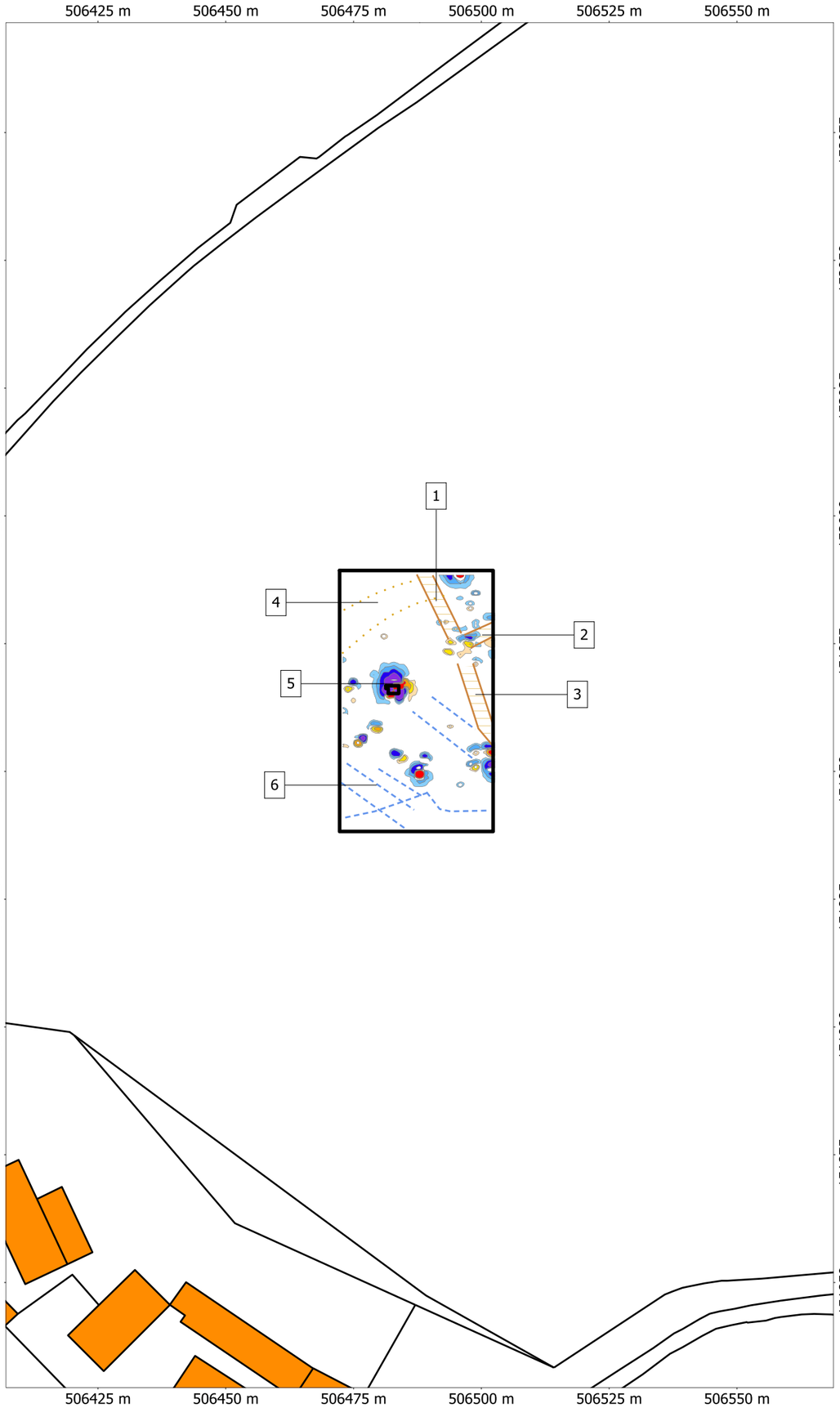
4.47 The archive contains all survey and project data, communications, field notes, reports and other related material including copies of third party data (e.g. CAD mapping, etc) in digital form. Many are in proprietary formats while report components are available in PDF format.

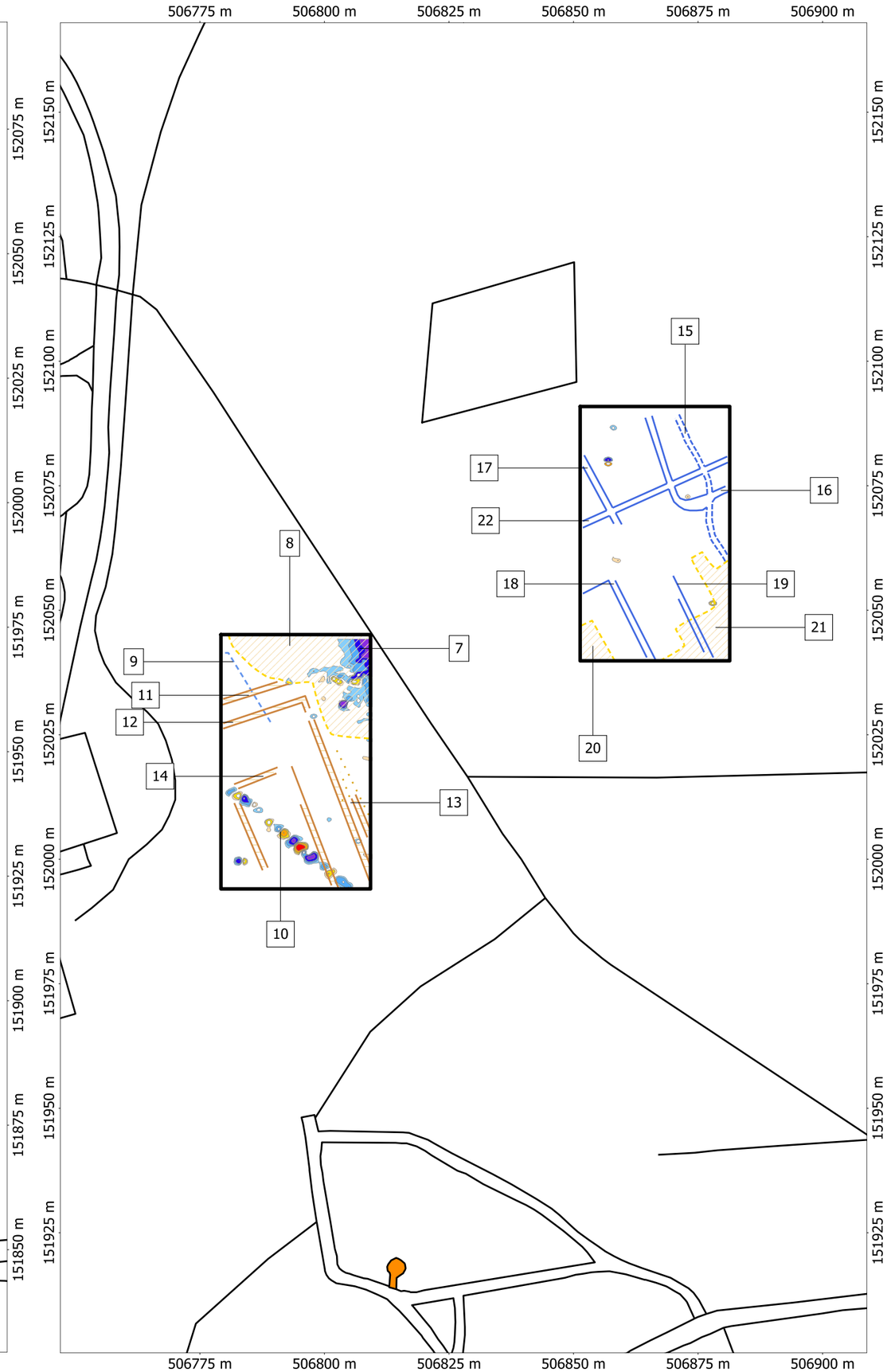
4.48 In addition, there are paper elements to some project archives, usually provided by the client. Nearly all elements of the archive that are generated by ArchaeoPhysica are digital.

Dissemination

4.49 It is the client's responsibility to ensure that reports are distributed to all parties with a necessary interest in the project, e.g. local government offices, including the HER where present. ArchaeoPhysica reserves the right to display data from projects on its website and in other marketing or research publications, usually with the consent of the client. Information that might locate the project is normally removed unless otherwise authorised by the client.

4.50 ArchaeoPhysica are subscribed to the OASIS system and can initiate records within this if required.





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working for

Oxford Archaeology

on behalf of

The National Trust

Features

- Resistive structure
- High resistance spreads
- Edges of resistive areas
- Low resistance feature edges
- Weakly-defined low resistances
- Possible service trenches
- Magnetic texture changes

Magnetic Data

Anomaly strength /nT

- < -50.00
- -50.00 - -20.00
- -20.00 - -10.00
- -10.00 - -5.00
- 5.00 - 10.00
- 10.00 - 20.00
- 20.00 - 50.00
- > 50.00

Hatchlands
Surrey

HNT081

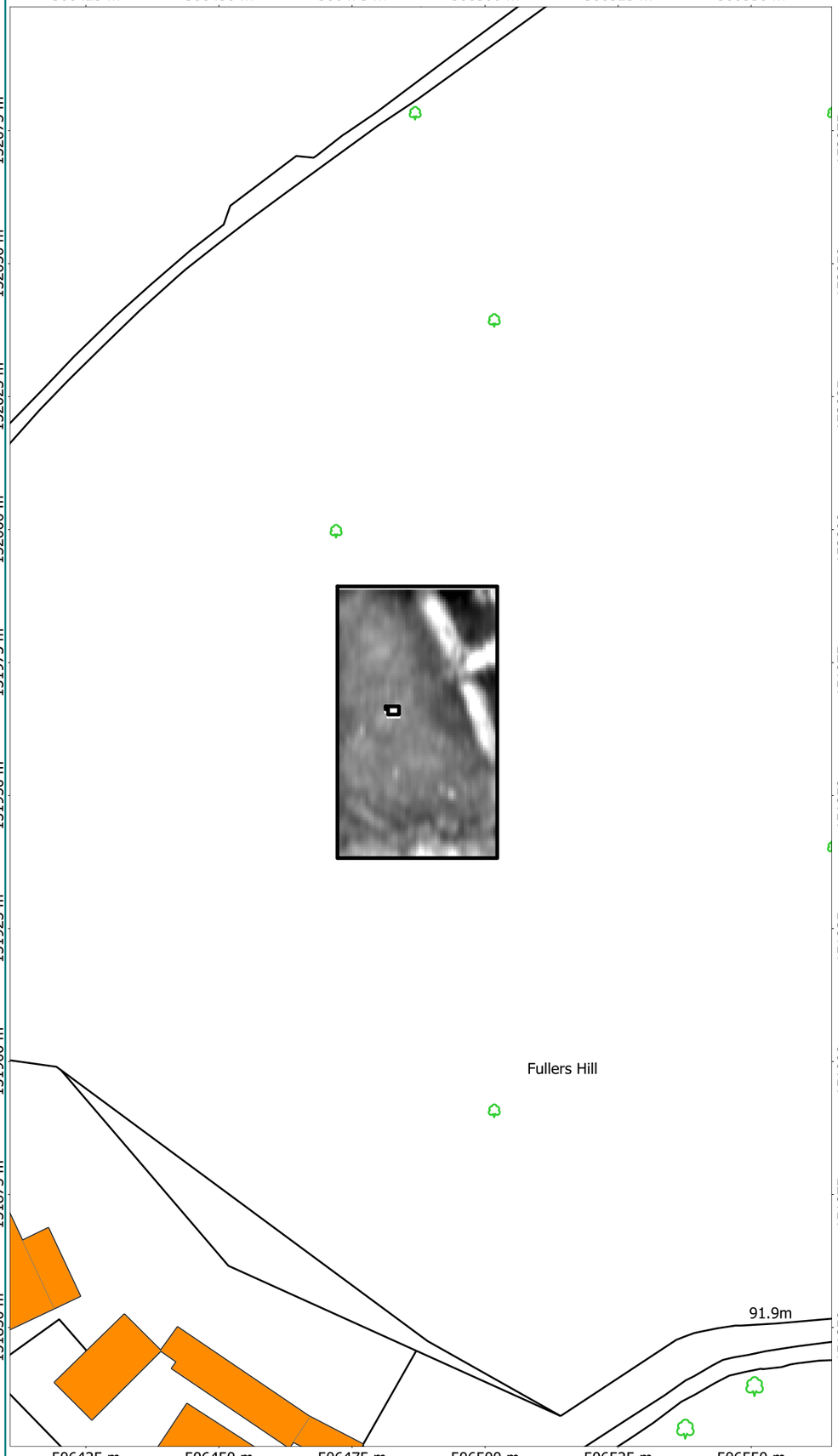
DWG 05

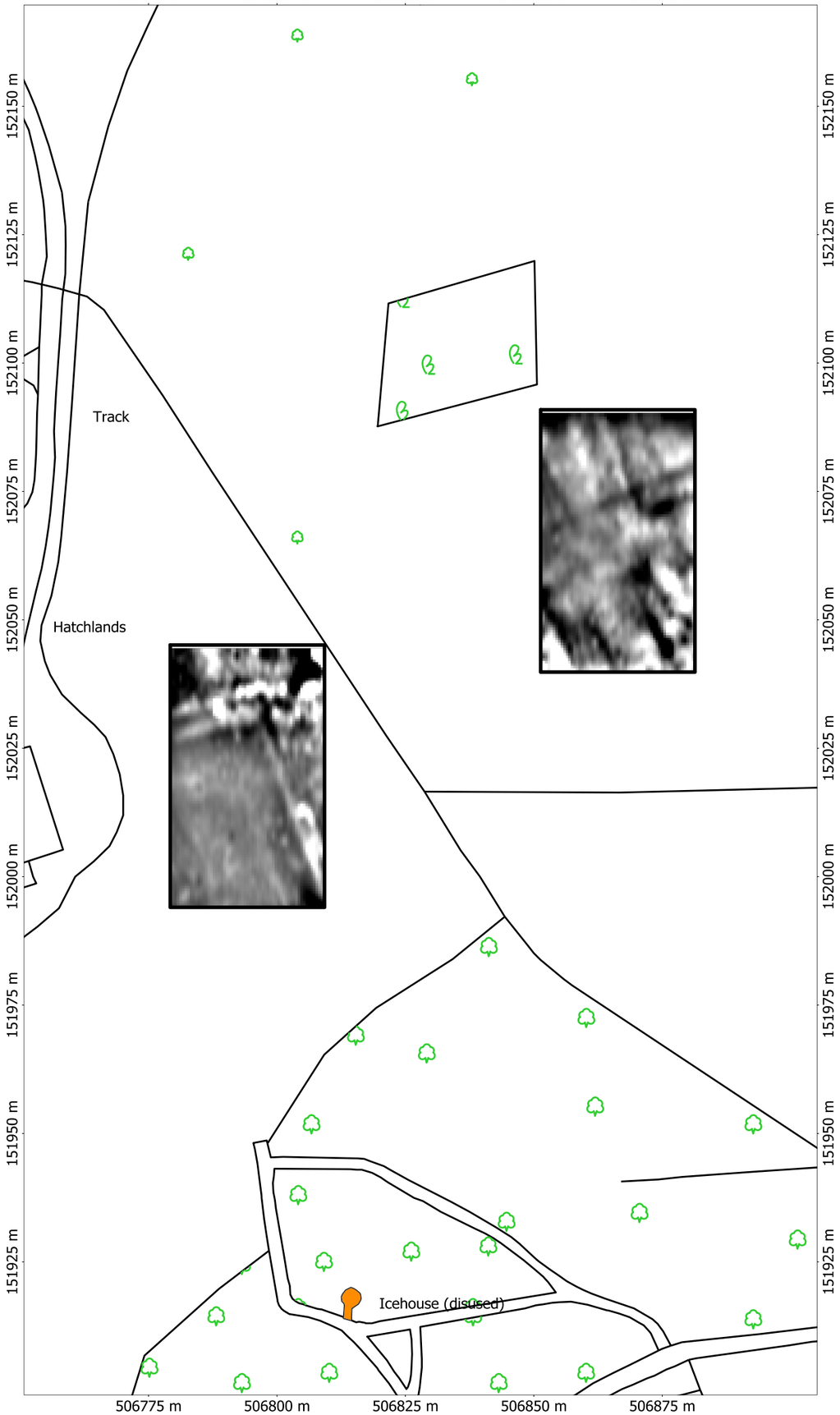
Catalogue

British Grid

Scale: 1:1000 @ A3
Spatial Units: Meter

File: HNT081 Primary.map from PERSEPOLIS 2/6/2009





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Electrical Resistance

Area A (left) / Ohm
2
0
-2

Area B (middle) / Ohm
2
0
-2

Area C (right) / Ohm
7
0
-7

Data 3x3 point smoothed and then highpass filtered above 20m

Hatchlands
Surrey

HNT081

DWG 04

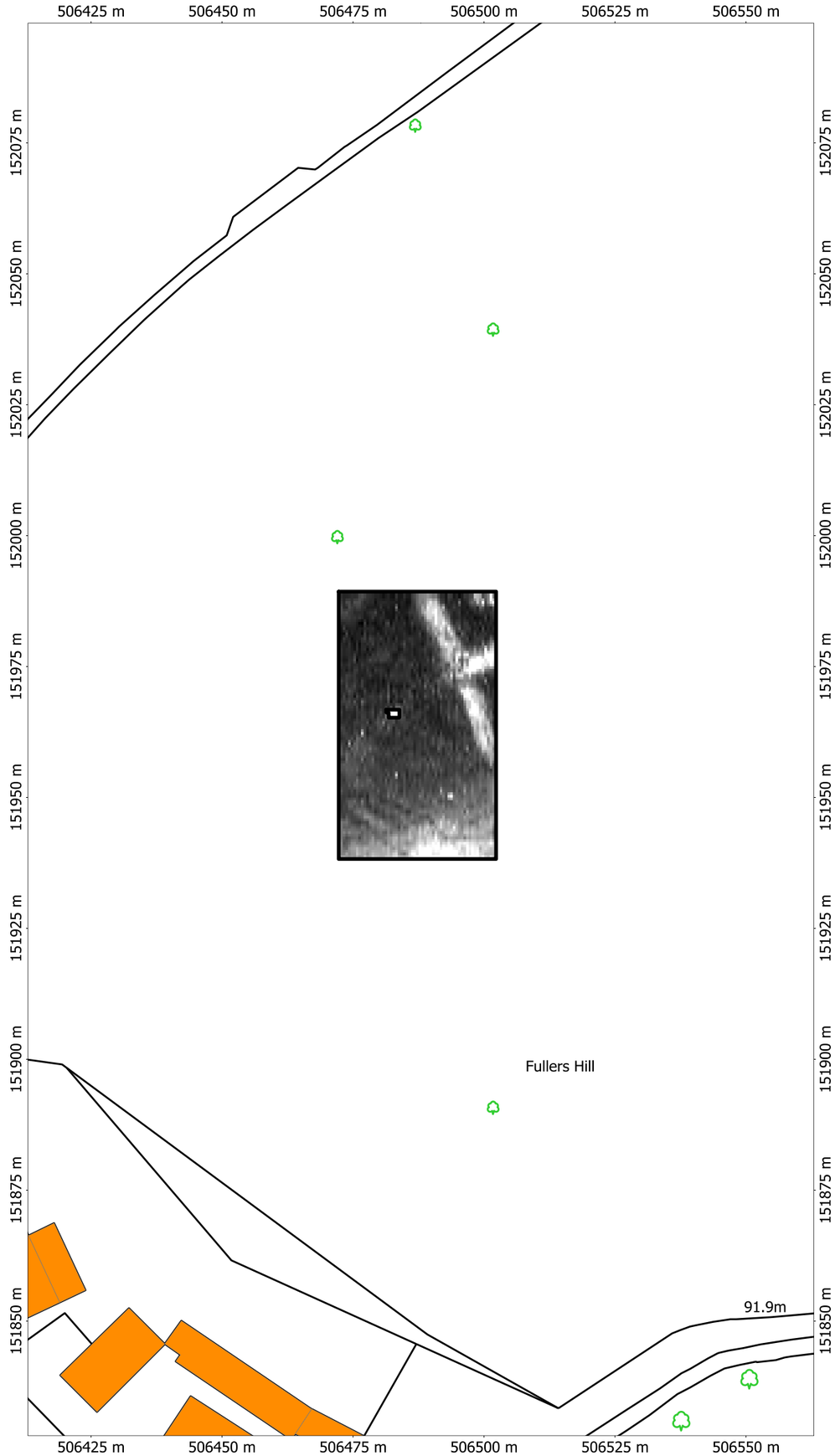
Electrical Resistance
Processed

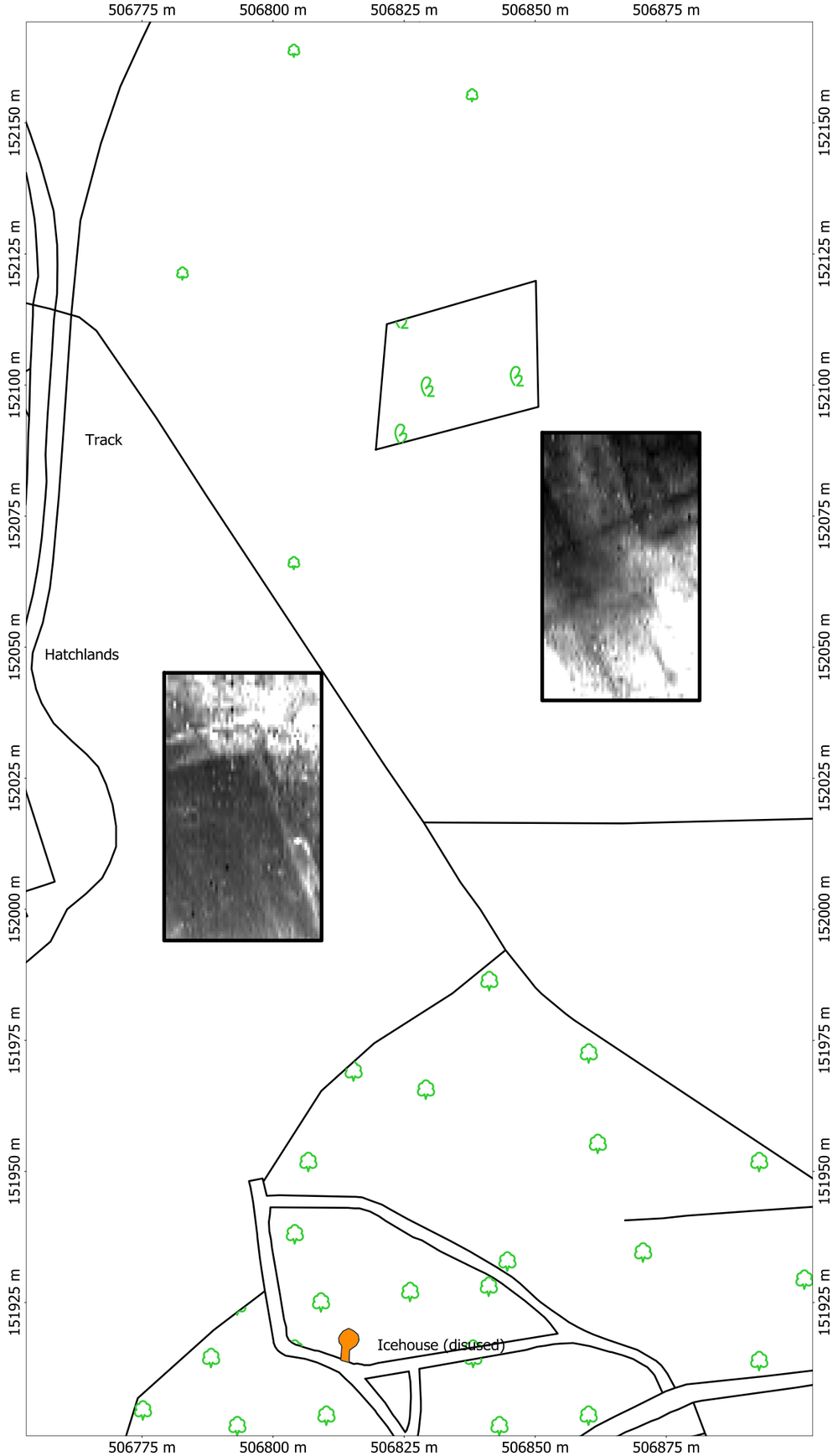
British Grid

Scale: 1:1000 @ A3
Spatial Units: Meter

File: HNT081 Primary.map from PERSEPOLIS 2/6/2009

Map base provided by client





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Electrical Resistance

Area A (left) / Ohm
12.75
10
7.25

Area B (middle) / Ohm
20
16
11.3

Area C (right) / Ohm
50
37
15.95

Hatchlands
Surrey

HNT081

DWG 03

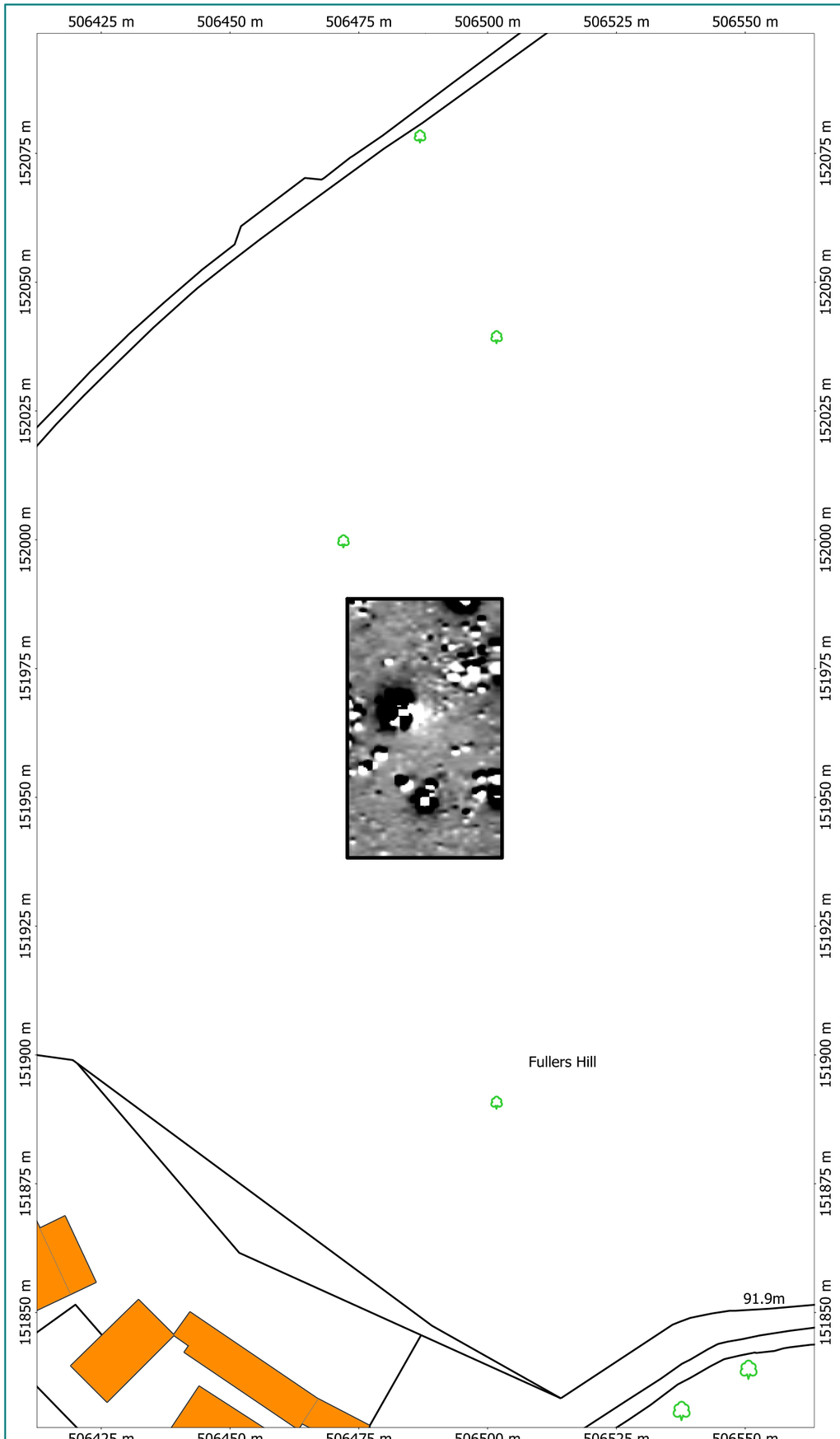
Electrical Resistance Data Raw

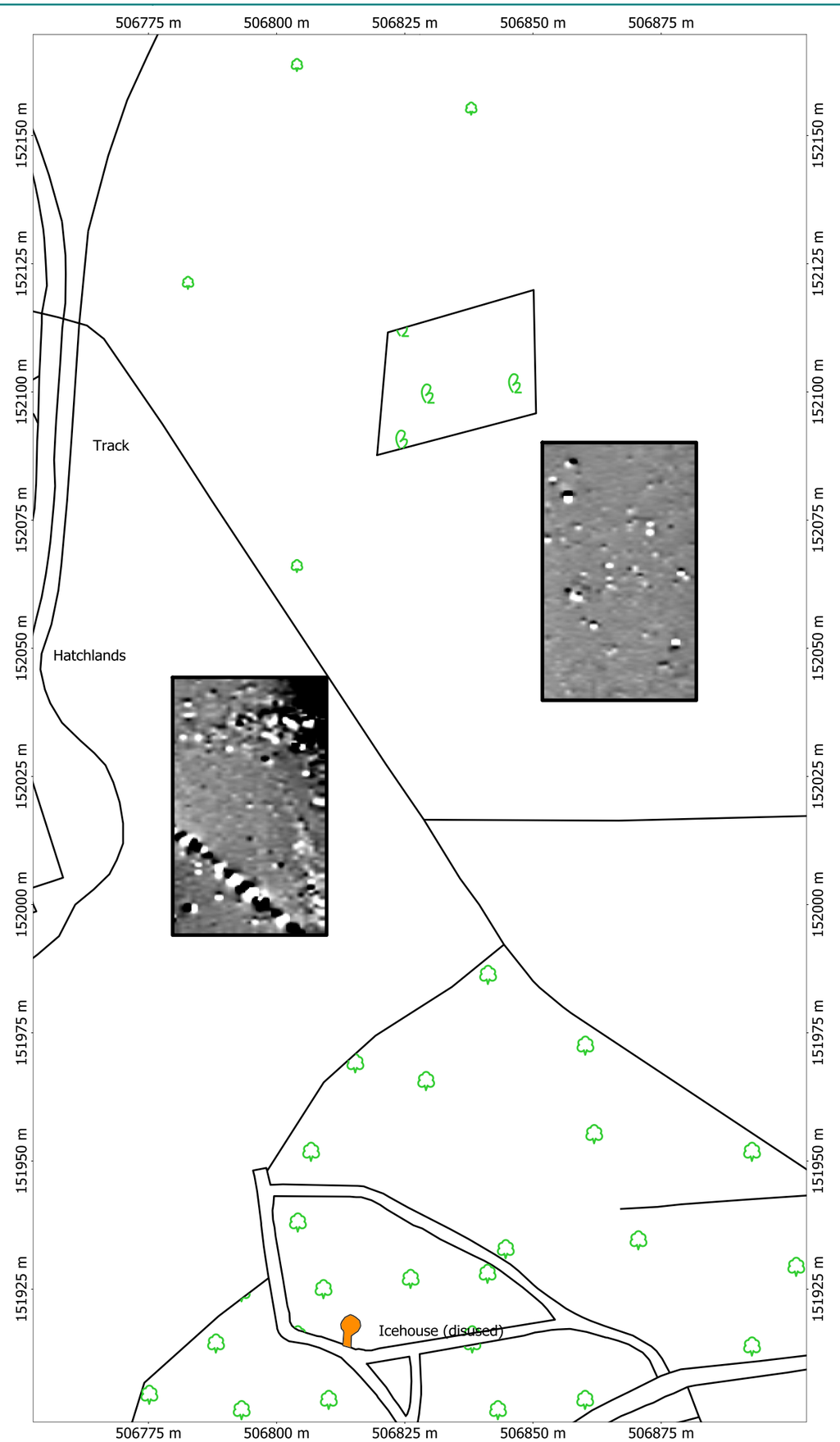
British Grid

Scale: 1:1000 @ A3
Spatial Units: Meter

File: HNT081 Primary.map from PERSEPOLIS 2/6/2009

Map base provided by client





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Magnetic Field
Vertical gradient nT/m
3
-1
-5

Hatchlands
Surrey

HNT081

DWG 02

Magnetic data
0.7m vertical gradient

British Grid

Scale: 1:1000 @ A3
Spatial Units: Meter

File: HNT081 Primary.map from PERSEPOLIS 2/6/2009

506400 m 506450 m 506500 m 506550 m 506600 m 506650 m 506700 m 506750 m 506800 m 506850 m 506900 m 506950 m 507000 m

152300 m 152250 m 152200 m 152150 m 152100 m 152050 m 152000 m 151950 m 151900 m 151850 m 151800 m

Track
Track
Courtyard Cottages
1
2
3
Hatchlands
Hatchlands
Pond
Fountain
Statue
Icehouse (disused)
Fullers Hill
Temple
Def
93.8m
91.9m
BM 89.78m
Track
Cattle Grid
BM 92.66m
Track
Clare Cottage
Path
A 246

506400 m 506450 m 506500 m 506550 m 506600 m 506650 m 506700 m 506750 m 506800 m 506850 m 506900 m 506950 m 507000 m

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Survey Extent
Magnetic
Electrical resistance

Hatchlands
Surrey

HNT081

DWG 01

Survey Locations

British Grid
Centre X: 506683.51 m
Centre Y: 152044.17 m

Scale: 1:2000 @ A3
Spatial Units: Meter

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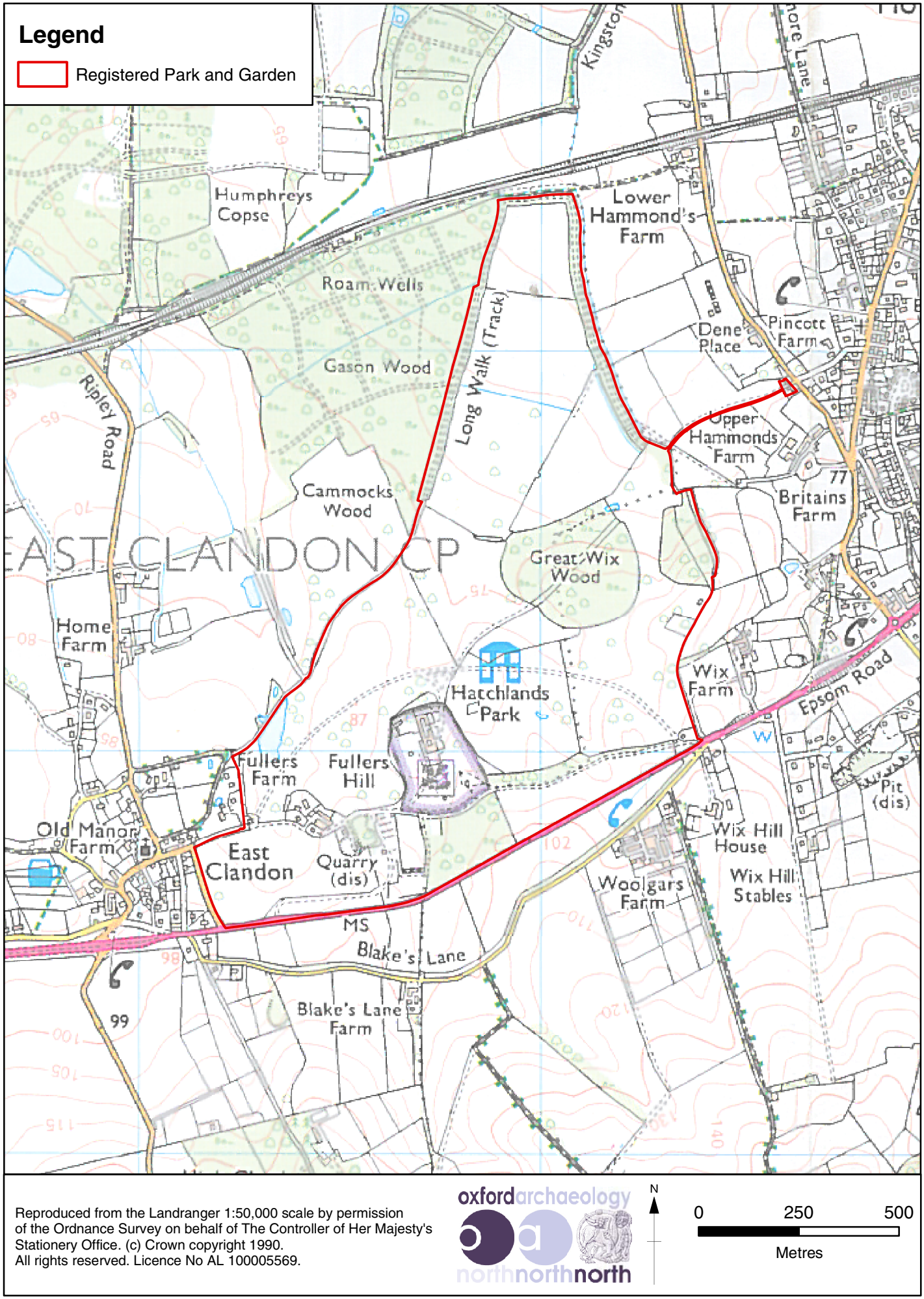

Figure 1: Site Location, Hatchlands Park, Surrey

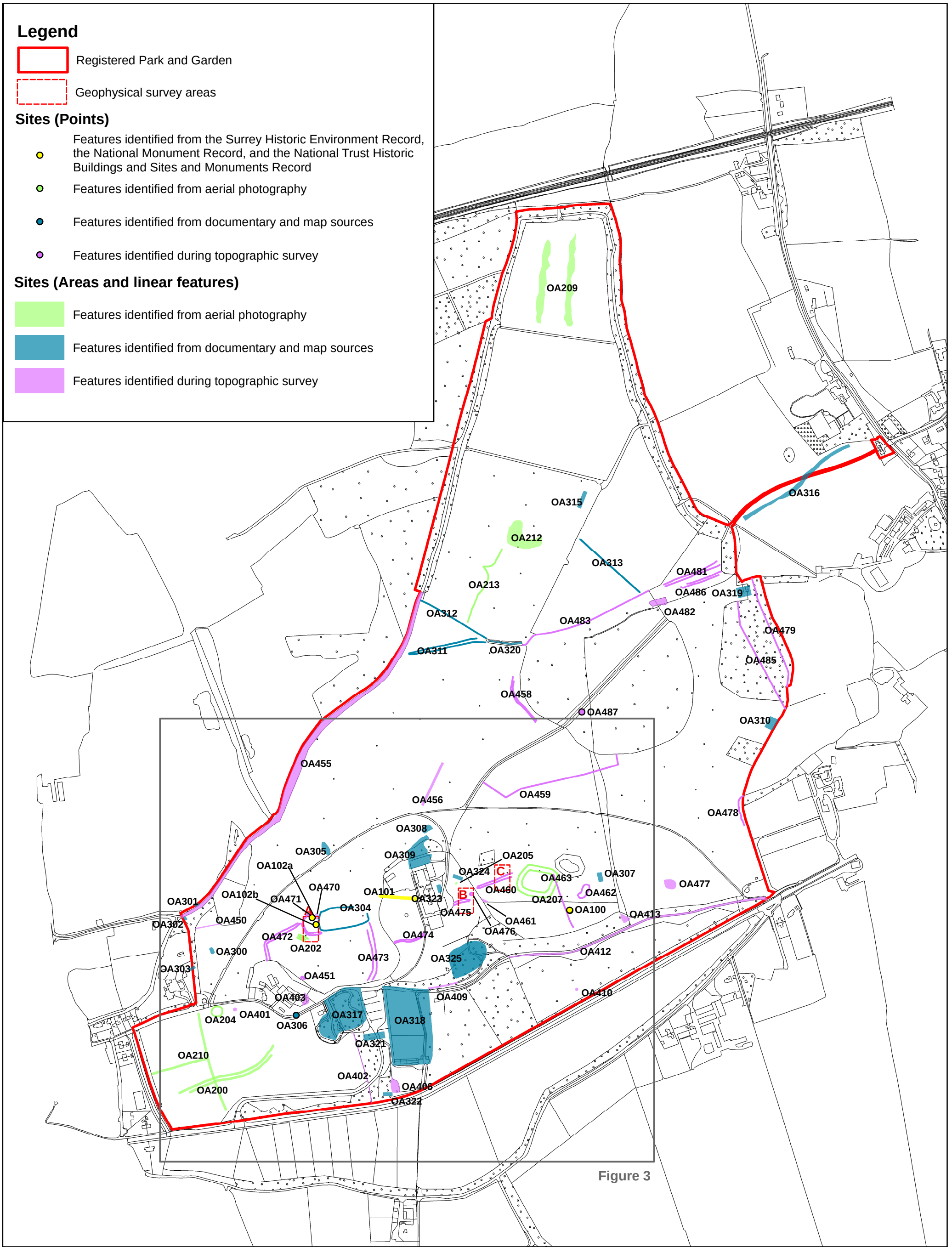

Figure 2: Archaeological features in the Hatchlands Park area

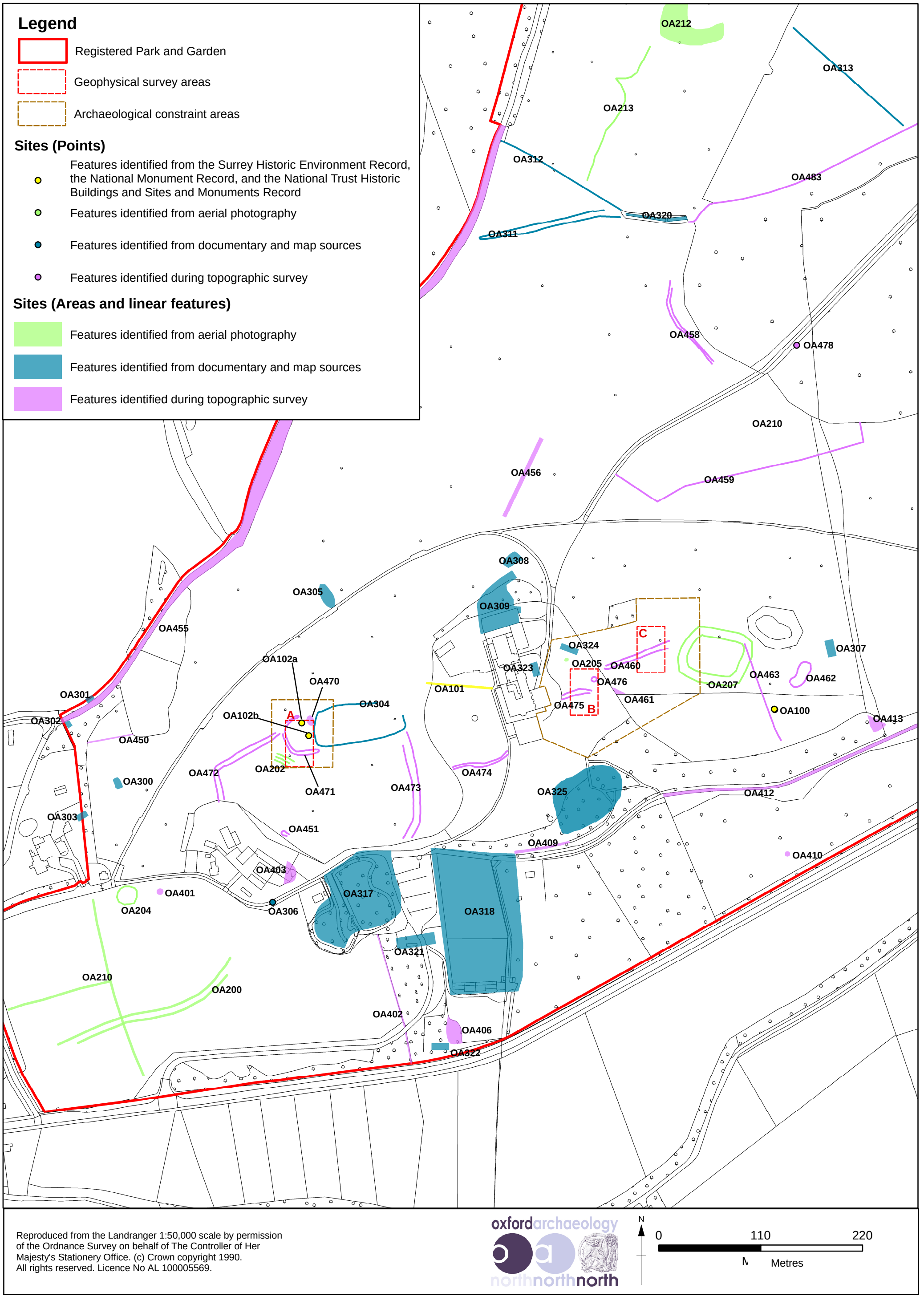

Figure 3: Detail of Figure 2, archaeological features in the Hatchlands Park area

Figure 4: John Roque's map of Surrey, showing the Hatchlands Park area in 1760

Figure 5: Newland and Smith c1821 map in relation to modern OS mapping

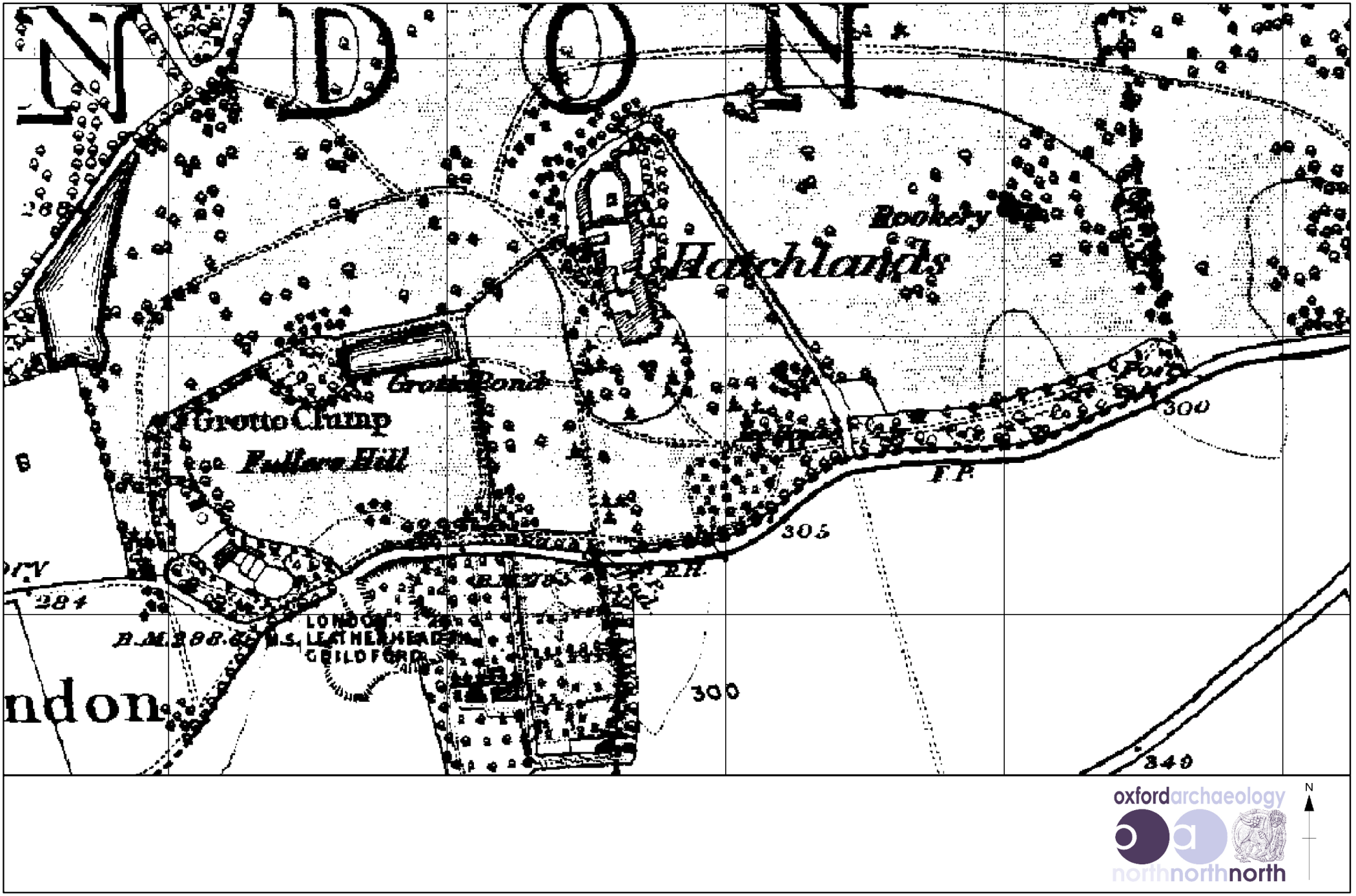

Figure 6: OS 6 inch map, showing the Hatchlands Park area in 1873

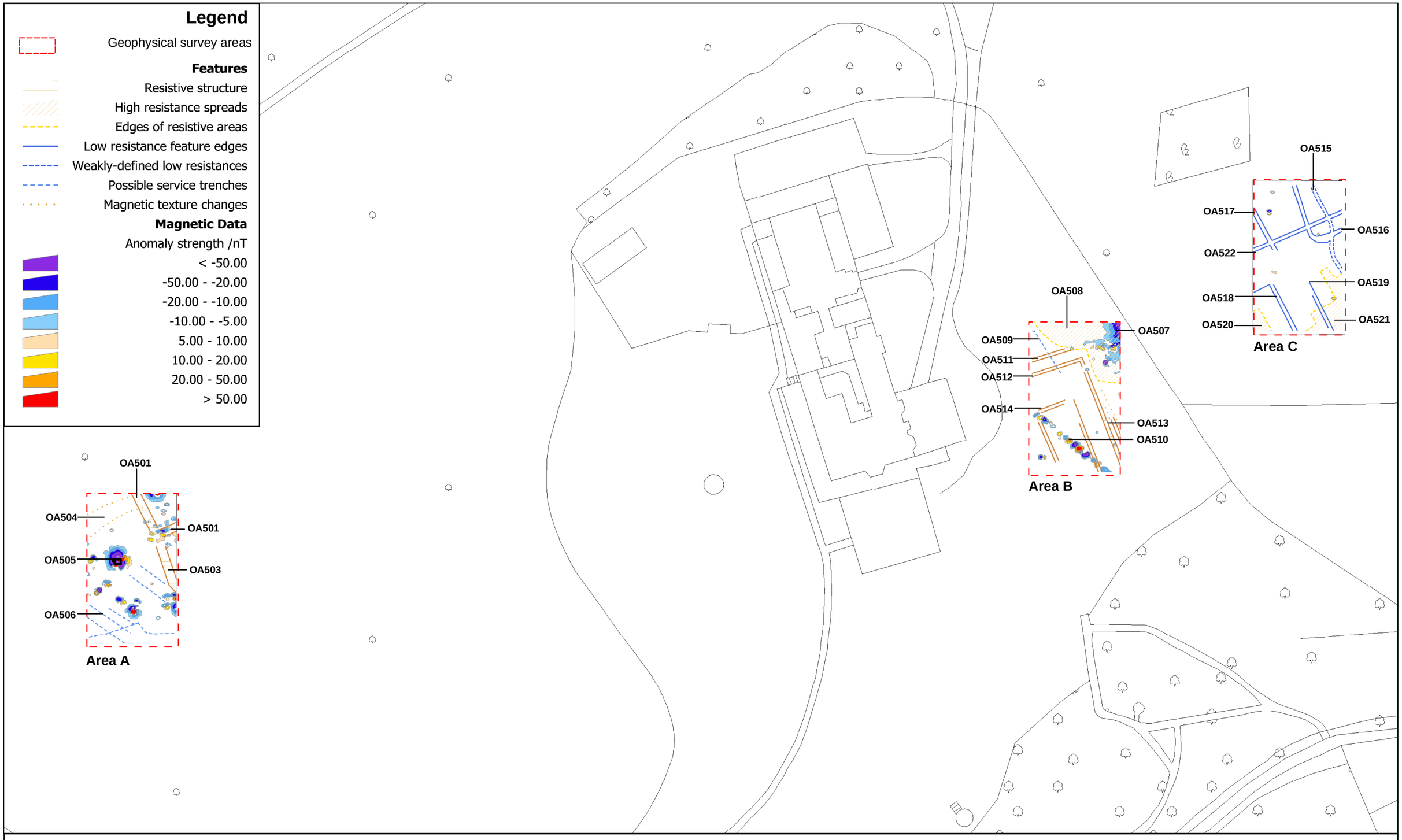

Figure 7: Geophysical survey results

Legend

All dates refer to adoption dates

Registered Park and Garden

Pathways

1800-1850

1850-1900

1900-1950

1950-modern

Tracks

pre1700

1700-1800

1800-1850

1850-1900

1900-1950

1950-modern

oxfordarchaeology northnorthnorth

N

0 250 500

Metres

Figure 8: Access routes throughout the Hatchlands Park area, according to phase based on map regression

Plate 1: Feature **OA102A**, part of a probable eighteenth or nineteenth century structure

Plate 2: Feature **OA102B**, part of a probable eighteenth or nineteenth century structure

Plate 3: Feature **OA475**, Geophysics Area B, showing a slight earthwork or an eroded bank east of the house

Plate 4: Feature **OA483**, ditch representing the northern boundary of Wix Wood

Plate 5: View west towards the house from feature **OA477**, a possible former quarry

Plate 6: Feature **OA402**, possible woodland boundary in the south-west part of the park

Plate 7: Features **OA481** and **OA486**, eroded former boundary ditches east of Great Wix Wood

Plate 8: Feature **OA409**, holloway or former route through the south of the park