South Oxfordshire Archaeological Group

In association with the
Oxfordshire Buildings Trust

ASCOTT PARK
Stadhampton, Oxfordshire

Ground Resistance Survey Report

ABSTRACT

A ground resistance geophysical survey at Ascott Park, Stadhampton, was completed in 2013 to extend an earlier one carried out in 2007 by Abingdon Archaeological Geophysics. The combined data enabled assessment of four competing hypotheses for the location of William Dormer's new house, burnt down in 1662 when nearing completion. A critical examination of the data concludes on a balance of probability that three of the proposed locations can be rejected, leaving the 'traditional' location at the central 'hollow and bank' as the preferred choice, and this not simply by default but because it is the only one for which there is convincing geophysical and archaeological evidence. The analysis and conclusions provide firm support for the findings of the Analytical Earthwork Survey of Ascott Park carried out by English Heritage in 2007. A detached survey reveals geophysical evidence for the site of the estate chapel, demolished in 1823.

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1 INTRODUCTION

Ascott Park is centred at SU 611 981, close to the village of Stadhampton and about 12 km south-east of Oxford. The park is owned by Oxfordshire County Council (OCC) who commissioned Oxfordshire Buildings Trust (OBT) to carry out extensive historical and archaeological research preparatory to improving public access and the opening of an Historical Trail in 2010. The history of the post-medieval occupants of Ascott Park, the Dormers and their successors, and the problems surrounding where they lived, has been ably summarised by John Sykes of OBT (Sykes 2008/2012a/b). William Dormer commissioned a new house c.1660, complete with formal avenues and gardens laid out in the latest fashion, but the house accidentally burnt down in 1662 when close to completion and was never rebuilt. Despite much recent research, the precise location of this house remains uncertain.

The South Oxfordshire Archaeological Group (SOAG) accepted an invitation from John Sykes of OBT to consider further fieldwork at Ascott Park, with the primary aim of confirming the location of the 1662 house. This report covers a preliminary geophysical survey carried out in 2013 to assist with the formulation of a proposal for further archaeological work within an agreed research framework**.** The survey was an extension of a ground resistance (resistivity) survey carried out in 2007 by Abingdon Archaeological Geophysics (AAG), extending it by approximately 30m to the north and south, and 60m to the west and east. The primary purpose of the new survey was to see whether there were any rectilinear anomalies suggesting a substantial building in these peripheral areas, but it would also aid interpretation of the important 'courtyard' area of AAG's results (see 2 below) by placing it in a wider context. A secondary (detached) survey in the north-east corner of the park was carried out to attempt to locate the site/ground plan of the lost medieval chapel. The survey was covered by a SOAG Project Specification (Clarke 2013) and was completed by a team of volunteers led by Gerard Latham.

The first two sections of this report have appeared earlier in the project specification (Clarke 2013) and in published interim reports (Clarke 2014a/b) but are reproduced in full here with minimal changes, both for convenience and for those readers who may not have seen the interim reports. The report is prepared in accordance with the general standards for geophysical survey of English Heritage (2008) and the Chartered Institute for Archaeologists (2011). Of the authors: Gerard Latham was responsible for geophysics consultancy, for survey methodology and logistics, and for merging and storing the data from the AAG and SOAG surveys; Ian Clarke was responsible for analysis and interpretation and for compiling the report. Monitoring of the work has been with the helpful assistance of the archaeological curator Richard Oram, OCC Planning Archaeologist.

2 EARLIER WORK

In 2007, Mark Bowden of English Heritage (EH) led an archaeological survey and investigation of Ascott Park on behalf of OBT (Bowden & Rardin 2007). The survey elucidated the post-medieval history of the park, of particular interest here being those features relating to the extensive remodelling of the site at the time of the building of the new house by William Dormer. Bowden confidently locates the house on an axial alignment with the main avenue and gateway, at a rectangular hollow (or cellar) (21) fronting a linear earth bank (or terrace) (22) and overlooking formal gardens to the south. *Note: The numbers in brackets are identifiers from the EH report, included here for cross-referencing.*

Also in 2007, a geophysical survey was carried out by Abingdon Archaeological Geophysics (AAG). Earth resistance and magnetometer techniques were used to survey much of the area of the 17th century gardens, including the earth bank (22) and hollow (21) thought by EH and OBT to be the location of the 1662 house. Both methods detected important archaeological features: the magnetometry showed linear features relating to the garden layout and possible rubble spreads; the resistivity gave better results for both garden and possible building remains (Ainslie *et al* 2007; Ainslie 2008). In their report, Anslie *et al* propose that "…areas of probable rubble and linear features…north of the earth bank" (22) indicate a large house arranged around a rectangular courtyard, perhaps open to the east. This is thought unlikely by Mark Bowden who interprets the area as an 'entrance courtyard' for the house (Bowden & Rardin 2007, p16).

In 2009, an excavation was organised by OBT and directed by independent archaeologist Brian Dix. A number of trenches were opened to examine remains of the 17th century formal gardens, the terrace (22) and hollow (potential house site) (21). Dix's report summarises the results and findings, but he is unable to offer any firm conclusion regarding the location of the 1662 house (Dix 2012). His long Trench 7 that sectioned the bank (22) and western end of the hollow (21), revealed clear evidence for a robbed-out surrounding wall in the hollow and possible flagstone floor, but Dix records that the deposits in the hollow were notably clean and that: "There was

no evidence for burning or demolition nor of a quantity of remains consistent with the demolition of a substantial and largely complete building…". The limited finds of pottery and glass from the terrace bank: "… suggest an 18th century *terminus ante quem*." He proposes that the archaeological evidence: "… is consistent with the creation of a former basement or cellar in the early 18th century … [but] that the project was unfinished, and possibly abandoned at an early stage". Dix suggests that the 1662 house was perhaps located elsewhere and that the hollow may represent a second attempt to build a new house sometime in the early 18th century. An area of "building rubble" east of the hollow (21) and towards the 'granary' (34) is suggested as worth investigating as a possible site (Dix 2009).

The results of the 2009 excavation may be usefully compared with those of an earlier excavation in 1969 by Susanna Everett (now Dr Susanna Wade-Martins) and R D Hodgkins, when a long trench also sectioned the bank (22) and hollow (21) but at the eastern end. Here significant quantities of rubble, mortar, burnt tile, ash, charred wood and melted lead were found within the bank. Rubble, brick, tile and mortar were also found in the hollow immediately north of the bank but the rest of the hollow was relatively clean. On the south side of the hollow a coursed limestone and mortar wall 0.9m thick was revealed surviving to a height of c.2m, but no evidence was found for a wall on the north side of the hollow. Everett concluded that: "It is certain … there were no buildings in the hollow to the north of the bank". (Everett 1969).

One other possibility, put forward in response to Dix's findings, is that the house might have been located at the southern end of the main avenue, looking across a formal garden towards the terrace; in which case the hollow could be the site of a grotto/pavilion (Clarke 2011).

3 DESIGNATIONS

Ascott Park is owned by OCC. Management of the smallholding estate is the responsibility of Carillion Capita Symonds (CCS), Property and Facilities, Oxford. Local conservation of the archaeology is the responsibility of the Historic and Natural Environment Team, Speedwell House, Oxford.

The park is on the EH Register of Historic Parks and Gardens registered Grade II, list number 1001086, and various buildings and structures are also listed Grade II or II* (for the full list see Bowden & Rardin 2007 or the EH website). The regional archaeological curator is English Heritage (South East), Guildford, Surrey. [Note: EH (South East) confirmed that the geophysical survey did not require Scheduled Monument Consent (Section 42 Licence).]

Ascott Park Cottage is Grade II listed and is now in private ownership. It is a much altered remnant of the c.16th century manor house (Bowden & Rardin 2007; Sykes 2008/2012a/b).

4 SURVEY LOCATION

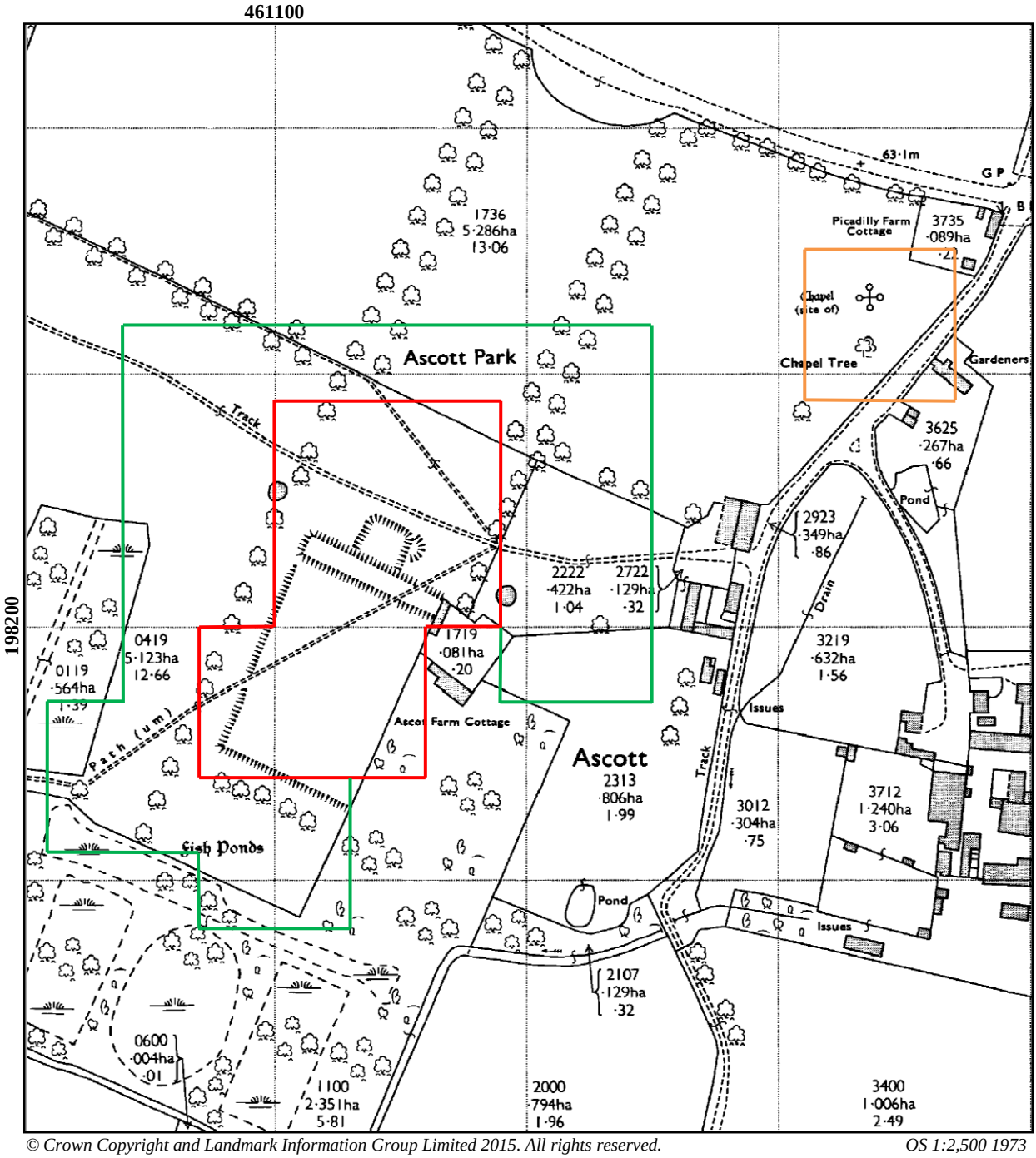
The survey areas are outlined in Fig 1 overlaid on the OS 1:2500 map. The 1973 version of this map is used because it shows the earthworks of the hollow, bank and upper garden terrace, these features being the focus of the main survey. For comparison, Fig 2 shows the combined data from the resistivity surveys superimposed on a *Google Earth* satellite image of Ascott Park and identifies key features mentioned in the introduction.

For the main survey, the area covered by AAG in 2007 is outlined in red with the SOAG extension in green. Several of the outer grid squares making up this area were partial, being truncated by the curtilage of Ascott Park Cottage (shown here as Ascott Farm Cottage) and by fence lines to the south and west, as can be seen in Fig 2.

The detached survey area (orange outline) is in the north east corner of the park, enclosing the OS markers: *Chapel* (site of) and Chapel Tree. It is located an integer number of 30m grid squares from the primary survey. The grid squares here were truncated by the boundary of Piccadilly Cottage and by the wall along Ascott Lane, as can be seen in Fig 2.

The survey grids are aligned with the British National Grid (BNG) with co-ordinates as shown on the Master Grid layouts in Figs 3 & 4.

Fig 1 Location of survey on Ordnance Survey 1:2,500 map
(100m British National Grid squares)



 OS 1:2,500 1973

Fig 2 Combined survey data superimposed on a *Google Earth* satellite image of Ascott Park
(resistivity greyscale images are as per Figs 6 and 9b below)

Background image: © Google Earth 2006

Fig 3 Main Survey Master Grid

- Grid squares are 30m x 30m
- RED outline: area surveyed by AAG in 2007
- BLUE outline: extended area surveyed by SOAG in June 2013
- GREEN outline: further extension surveyed by SOAG in Sep 2013
- Grid 30 (= AAG Grid 10) was used as a control grid
- Black dots indicate control points established with GNSS/GPS
- SW corner of Grid 21 (= AAG Grid 1) is at BNG: SU 61100 98200 (or 461100 198200)

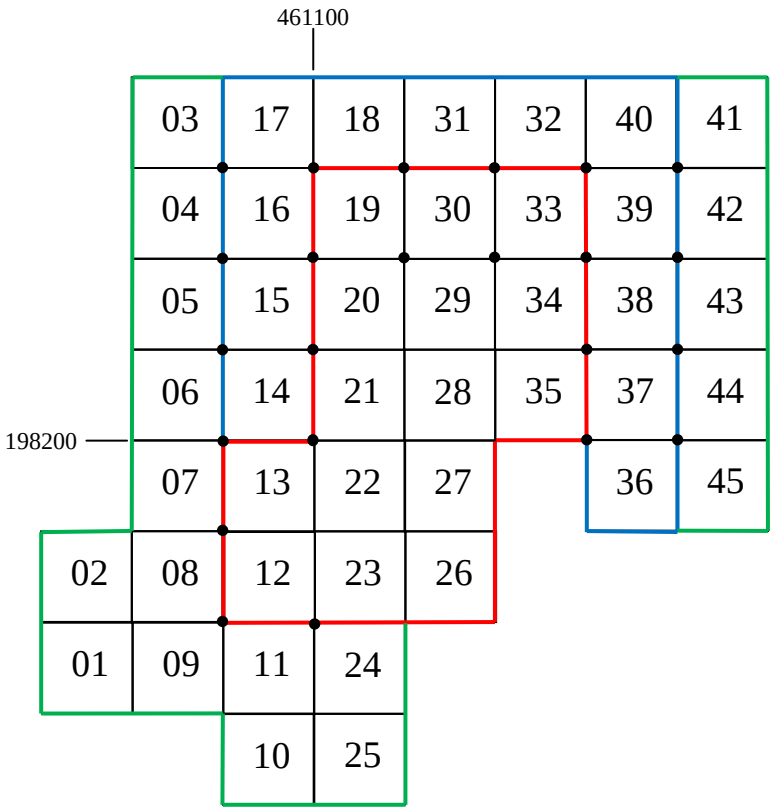
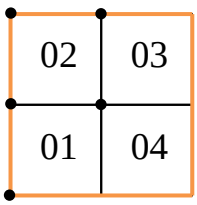


Fig 4 Detached Survey Master Grid

- Grid squares are 30m x 30m
- ORANGE outline: area surveyed in June 2013
- Black dots indicate control points established with GNSS/GPS
- South-west corner of Grid 01 is at BNG: SU 61310 98290 (or 461310 198290)
  [Note: Grid 01 is 90m due east of Grid 41 of the main survey]



5 METHODOLOGY

AAG used both magnetometry and resistivity techniques in 2007 but the clearest results were obtained with the latter (Ainslie 2007/2008). Since the new survey was an extension of the AAG one and was primarily a search for possible building remains, or rectilinear features representing robbed-out walls and foundations, resistivity was selected for the extended survey.

A TR/CIA resistance meter was used to ensure complete compatibility with AAG's data, although any make of resistance meter should produce comparable results. The meter was matched to raw or minimally processed data from the AAG 2007 survey. In view of recent weather patterns, it was considered that there was a risk that the new survey would encounter ground moisture conditions sufficiently different as to negate the overall result; to guard against this, AAG's resistivity survey Grid 10 (= Grid 30 in Fig 3) was rescanned and analysed first as a control. The fifteen grids of the AAG survey were renumbered and incorporated into the enlarged master grid, as shown in Fig 3. The data from the extended survey was merged with that from the AAG survey and (apart from the control grid) no part of the AAG survey area was rescanned.

Geophysics metadata and georeferencing summary	
Survey type	Earth resistance
Instrument	TR/CIA Resistance Meter (1st series)
Probe configuration	Twin probe array
Probe spacing	0.5m
Meter settings	Range: 200Ω; Filter: Rural 0.5s
Traverse mode	Zigzag
Direction of 1st traverse	North/C'wise
Sample interval	1m
Traverse separation	1m
Line separation	2m (north/out along line, south/return between lines)
Sampling position	SW corner of each 1m x 1m square
Grid size	30m x 30m
Geophysics coordinate system	Cartesian: North +ve y direction; East +ve x direction.
Positional accuracy (estimated)	The location of each data measurement is estimated accurate to 0.1m with respect to the geophysics grid over 95% of the survey area, increasing to 0.15m in fringe areas beneath trees and/or in nettles.
Survey methodology	All data grids have the same size and resolution. The master grid layouts are shown above in Figs 3 & 4. First traverse starts at (x0, y0) progressing to (x0, y29) with second traverse starting at (x1, y29) and ending at (x1, y0), with survey then continuing in zigzag mode to finish at (x29, y0).
Data processing	The raw data from the AAG 2007 survey was copied in xyz format, renumbered to match the revised master grid and merged with the new data from the SOAG 2013 survey. The Freeware *Snuffler* and DW Consulting's *TerraSurveyor* were used for initial assessment. The combined raw data was then imported in xyz format and fully processed using Geoscan's *Geoplot3* Rev.v.
Georeferencing	Survey baselines are aligned to the British National Grid. A Leica Viva GS08 GNSS/GPS system was used to establish control points for a number of grid squares to an estimated accuracy of better than 50mm. These control points are indicated by black dots on the master grid layouts in Fig 3 & 4. They were marked with survey stakes and the grid squares completed by triangulation from these using nylon tapes. [Note: AAG used a Trimble Pro XR GNSS/GPS system to position their main axes with a stated estimated error of c.20cm; the grid squares were then set out from these using tapes (Ainslie *et al* 2007).]
Geology	Flinty gravels and sands overlying Gault clay.
Ground conditions	Grass parkland with free-draining silty-clay soil.

6 SURVEY RESULTS

6.1 Main survey - data (Figs 5, 6 and 7)

The resistivity results are shown as greyscale images in Figs 5 – 7 following. In all cases, white is high resistance and black low resistance, matching the convention used by Ainslie *et al* (2007). The scale of the plots is 2cm ≡ 30m (1:1500); this is less than the recommended minimum of 1:1000 but is the maximum sensible scale to fit the page. Note that this means that 1m on the ground is represented by just 0.66mm (⅔ millimetre) on the page.

Fig 5 shows the combined AAG/SOAG raw data, despiked and edge matched. Despiking removes any random, spurious high readings which may be present in the resistance data. Edge matching removes or reduces grid edge discontinuities due either to imperfect balancing of the Twin Probe Array remote electrodes or to ground moisture conditions changing over time. Satisfactory edge matching between the AAG and SOAG survey data was difficult to achieve and took many steps, but even so is far from perfect. The AAG data has a noticeably smoother appearance in comparison with the SOAG data, with the latter having a more speckled appearance, i.e. containing more high-frequency content, or 'noise'. The likely explanation for this is a difference in the soil moisture content with SOAG encountering drier conditions than AAG, although the ground conditions for the SOAG survey were not exceptionally dry.

A smoother appearance can be achieved by applying a low-pass Gaussian weighted filter (LPF) to the SOAG data but leaving the AAG data unchanged. Fig 6a shows the result of three passes of the LPF using a small (1x1m) window. This has effectively removed the excess noise from the SOAG data and improved the visual matching of the two surveys. However, it is important to understand that we are now no longer looking at raw data but filtered data and there is a risk that this will have degraded some data that may be of archaeological significance. A subjective assessment of this can be made by visually comparing Figs 5 and 6a but a more effective method is to digitally subtract one data set from the other (the 'Cut and Combine' process in Geoplot3). This is illustrated by Fig 11 in Appendix 1 at the end of the report. Fig 6b is the same as Fig 6a but with the 30m grids superimposed for reference.

Fig 7 shows the effect of applying a high-pass uniform weighted filter (HPF) to the low-pass filtered data of Fig 6, in this case a single pass with a large (10x10m) window, followed by a single interpolation in x and y. The HPF removes much of the low-frequency background variation due to geological factors and sharpens the image. Interpolation is used to smooth the data and reduce the apparent pixilation; it is purely cosmetic and does not add any more data. Fig 8 is not a better image than Figs 5 or 6 but it does help to highlight certain features, as will become apparent in the interpretation and discussion section below. Once again, it is important to remember that filtering can degrade data of interest and a HPF can introduce false anomalies that might be misinterpreted as archaeological features, so it is important to refer back to the raw or minimally processed data for confirmation when carrying out analysis and making interpretations.

[Continued on page 13]

Fig 5 Main survey – combined AAG/SOAG raw data with minimal processing
(Data clipped at ± 3SD; Black low resistance, white high; Range -30 – +195 Ohms)
(Central area with dashed outline is the AAG survey data)

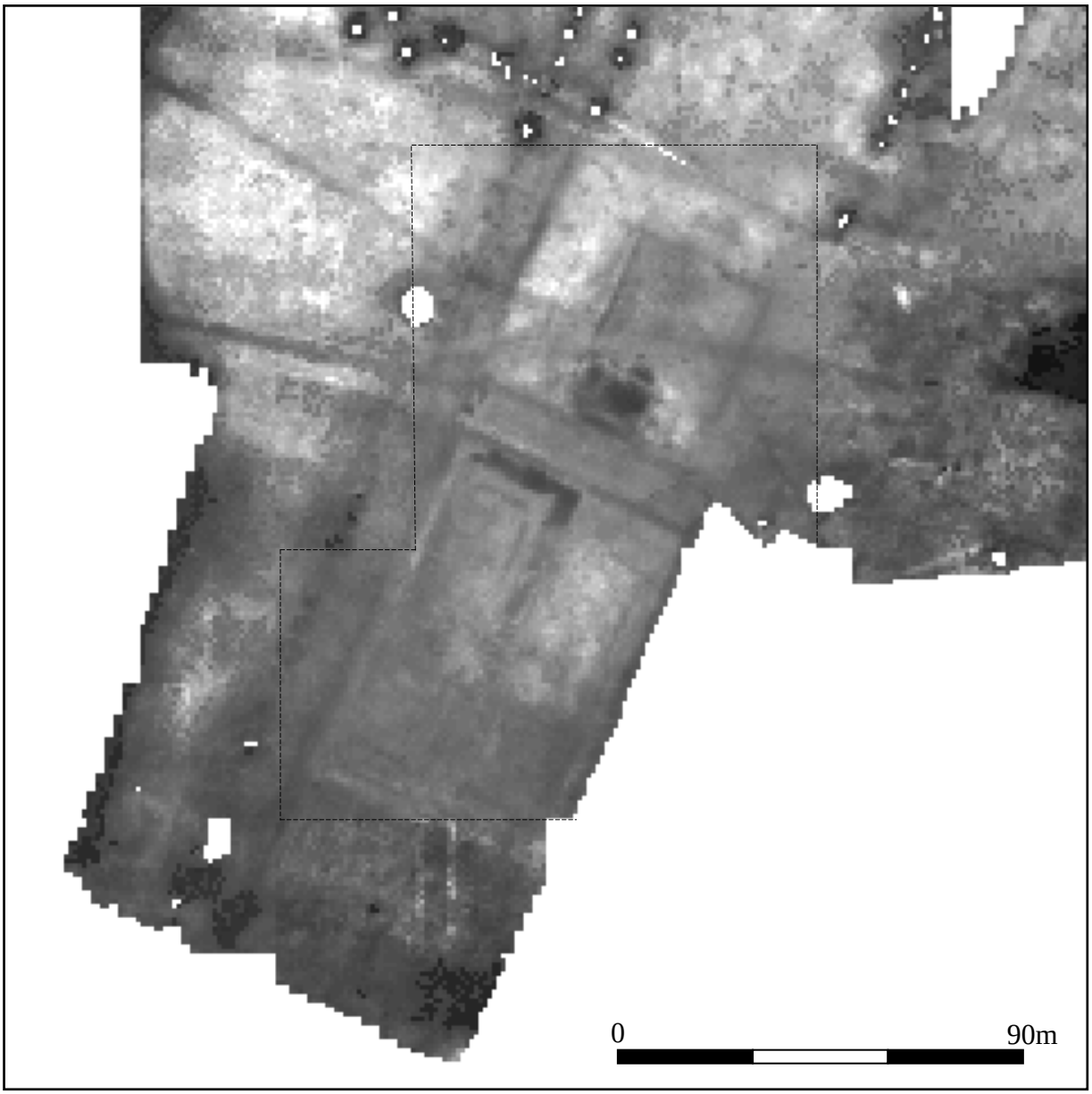


Fig 6a Main survey – combined data with low-pass filtering of extended area
(Graphics clipped at -2/+2.6SD)

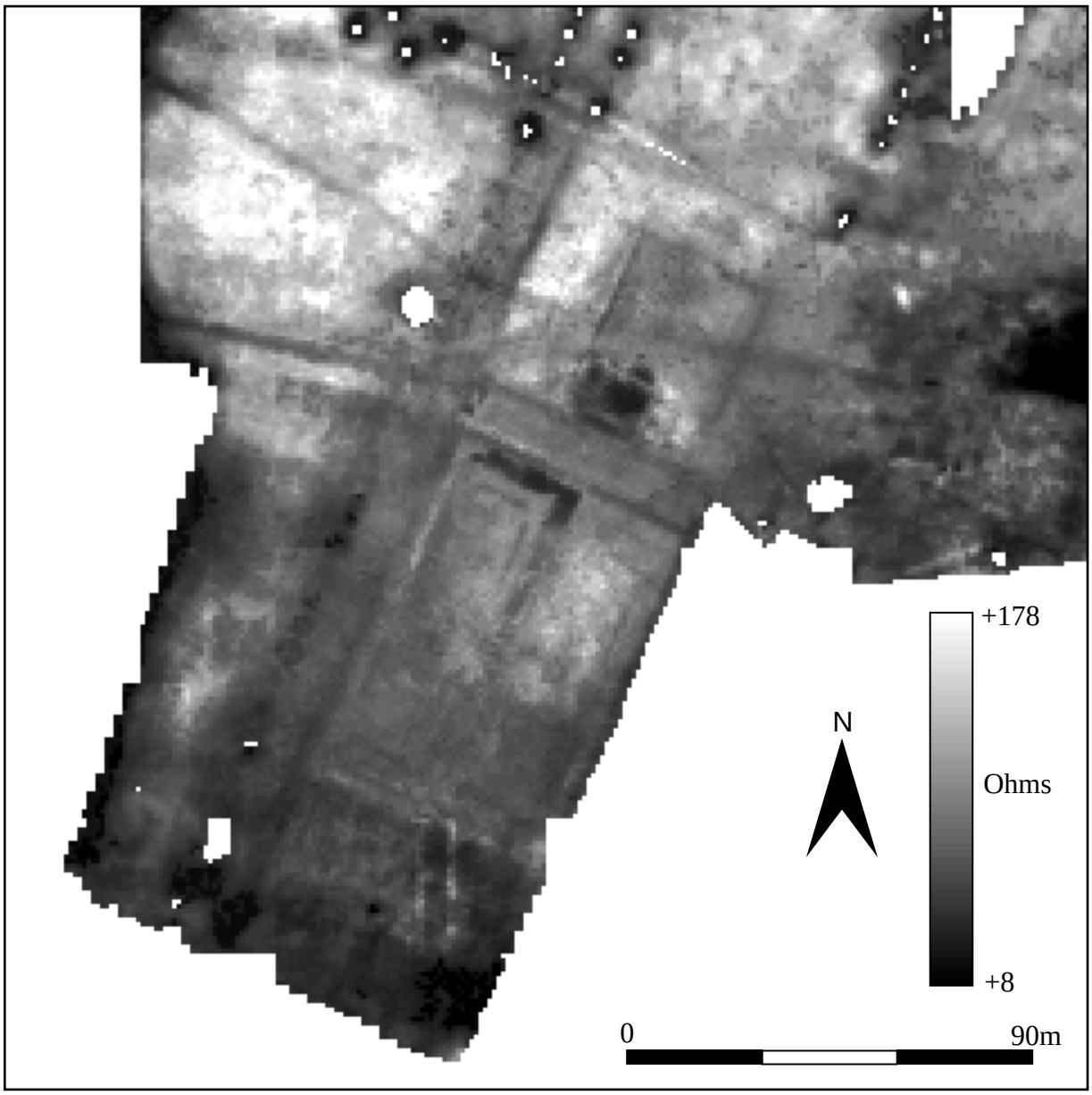


Fig 6b Main survey – combined data with low-pass filtering of extended area – with grids
(Graphics clipped at -2/+2.6SD)

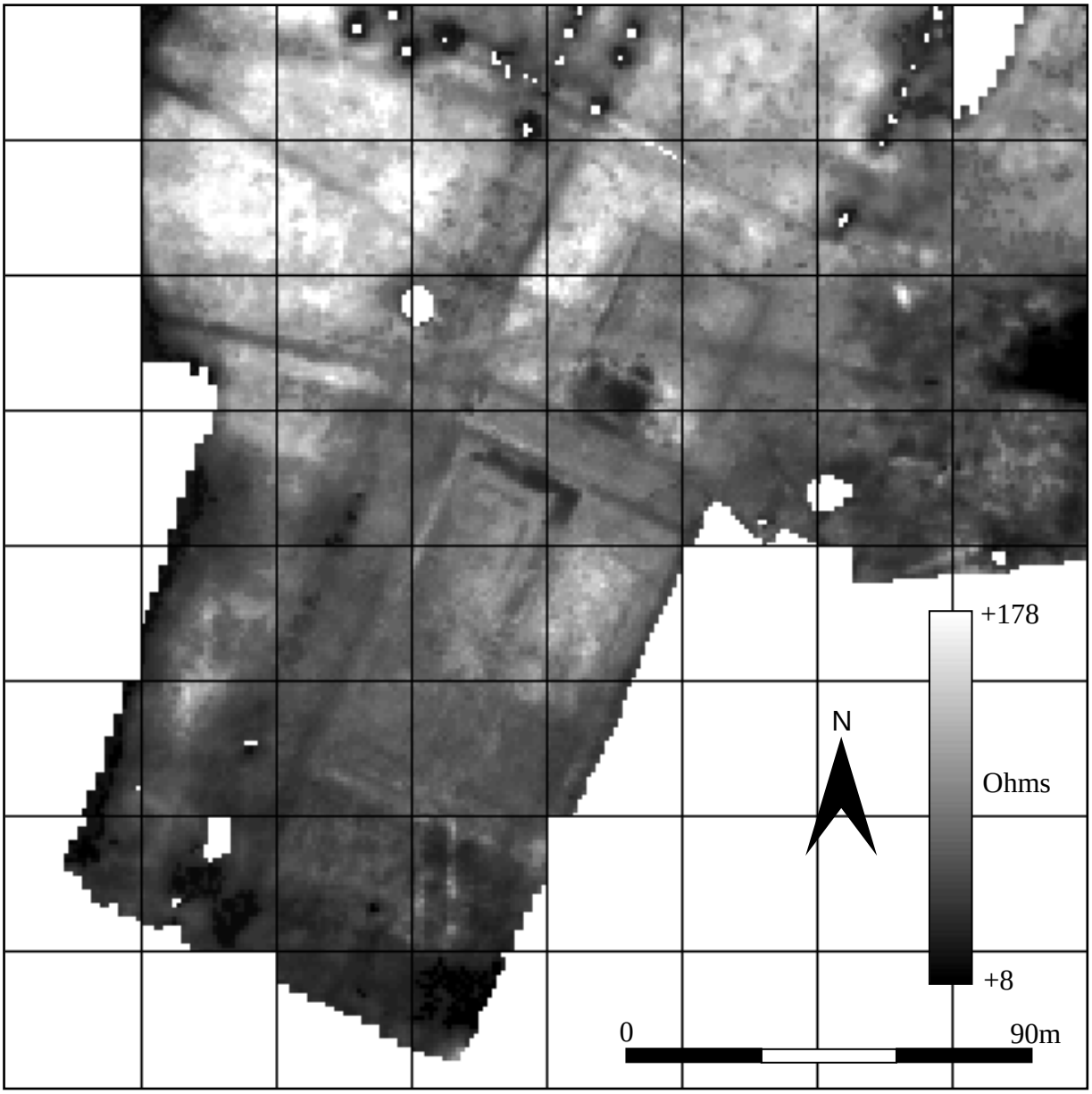


Fig 7 Main survey – combined data with high-pass filtering and interpolation
(Graphics clipped at ± 3SD)

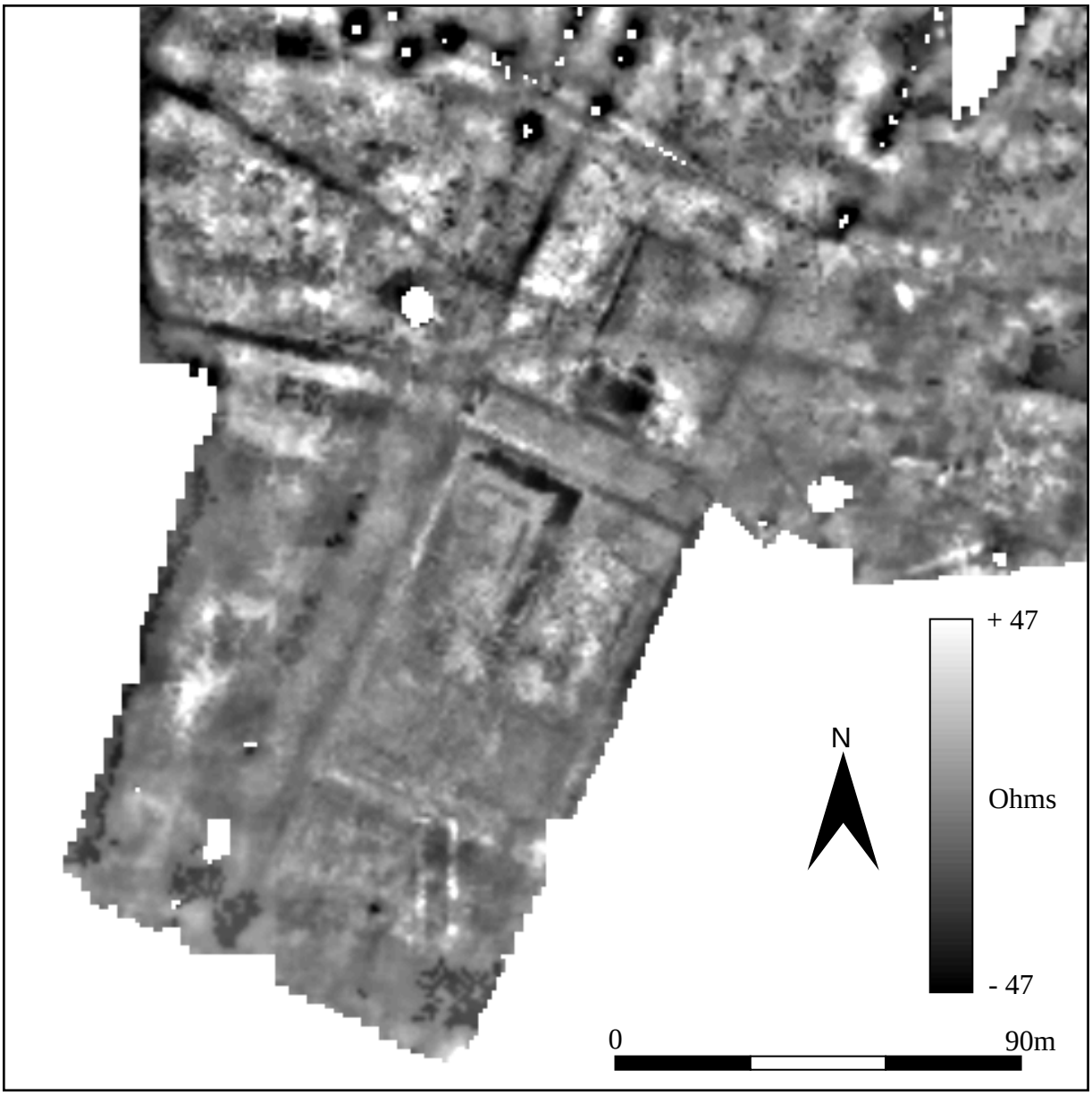
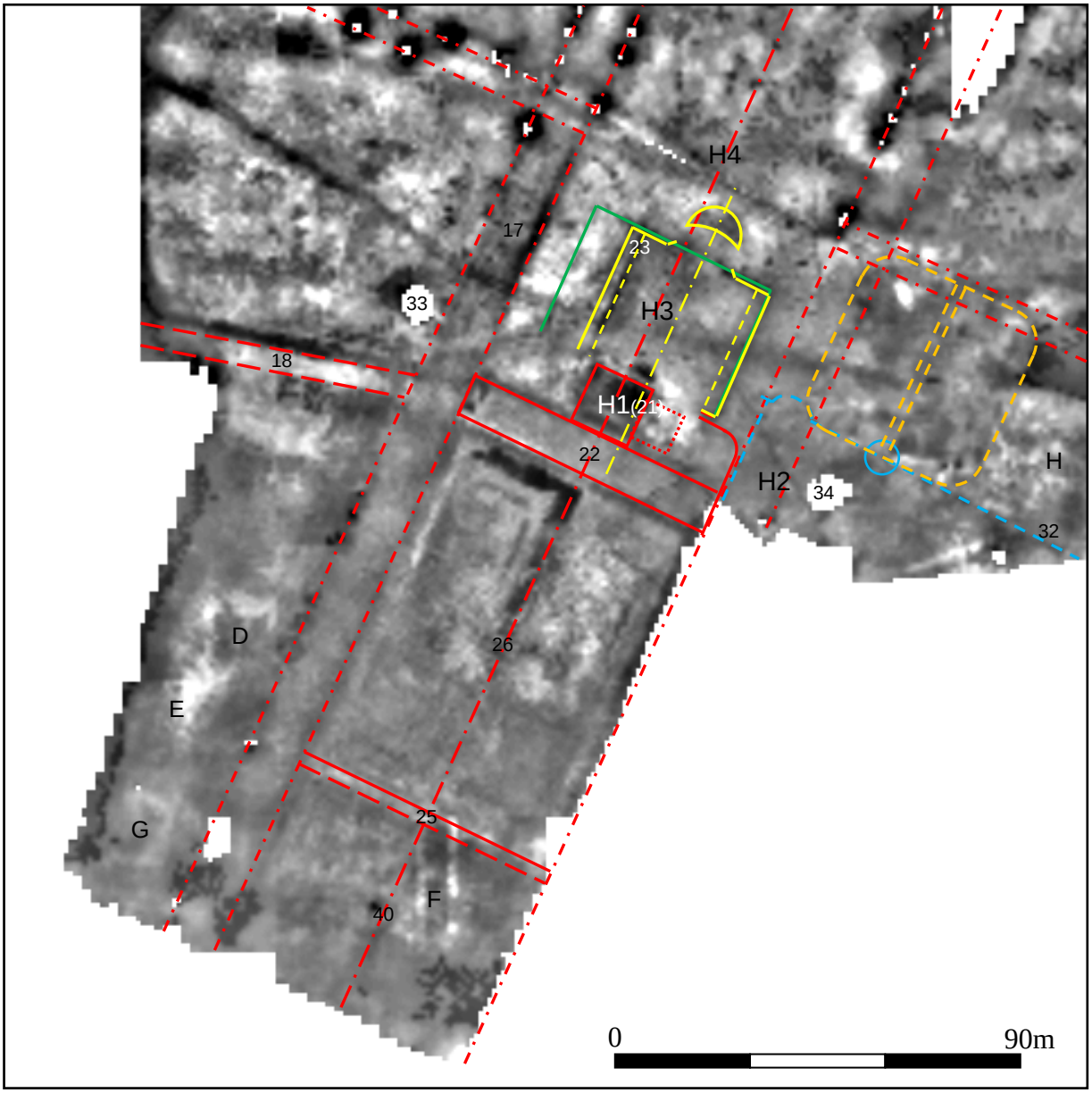


Fig 8 Main survey – interpretation



6.2 Main survey - interpretation and discussion (Fig 8)

The interpretation and discussion will refer to Fig 8, which is a marked up copy of Fig 7. The addition of lines and other markings to a data plot often obscures the very anomalies or features being discussed and interpreted, so frequent reference should be made back to Fig 7 and to Figs 5 & 6 if necessary, for comparison. *Note: The numbers in brackets are identifiers from the EH report, included here for cross-referencing. For convenience these numbers are also shown in Fig 8.*

The axial symmetry and principal features of the 17th century garden layout are self-evident and are highlighted in red. The axial centreline of the layout is marked with a long-dashed red line and symmetrically placed to each side of this are pairs of short-dashed red lines which mark the inner and outer tree-lines of the main avenue. When projected southwards (as shown) the inner tree lines are precisely aligned: (a) on the east side with the surviving ancient brick wall of the formal terraced gardens (26, 25, 40) and (b) on the west side with a linear low-resistance feature, which we know from Dix's 2009 excavations (Trench 10) is a foundation trench for what was probably a matching brick wall on that side. Also marked is the cross-avenue which runs at right angles to the main avenue. Although much of the eastern arm of the cross-avenue is now missing, it is aligned with the entrance gate from Ascott Lane into the modern farmyard, which suggests this is an ancient entrance. There are clear signs of ornamental planting evident in the upper garden terrace (26) which might be further enhanced by a survey at 0.5m resolution. There is a recreational path (18) which runs from the bank/terrace (22) towards the north end of the fish ponds and beyond to ornamental features in the outer park. Although there is more that could be said about this formal garden layout, in the following analysis we will confine ourselves to those features that have a direct bearing on the main aim of the survey: the location of William Dormer's new house.

Before continuing with the analysis, we must emphasise that no conclusion based purely on geophysical data can be definitive, particularly when it relies on negative evidence: the fact that nothing obvious shows up does not prove there is no archaeology there. But conclusions can be drawn directly from the survey results based on a 'balance of probability', the latter being a reasoned judgement based on experience, an understanding of the site (especially geology and soil conditions) and taking into account what kinds of features are showing up and with what clarity they are revealed. In our analysis we are much aided by the availability of results from earlier fieldwork, especially the EH survey by Bowden & Rardin in 2007 and the OBT excavations led by Dix in 2009, an advantage not available to Ainslie *et al* in 2007.

The specification for this survey outlined four separate hypotheses for the location of William Dormer's 1662 house arising from the earlier archaeological work. For convenience, these are indicated in Fig 8 and can be briefly summarised as:

H1	A compact, four-square or rectangular 'double-pile' house with cellar occupying the hollow and fronting a terrace.	Mark Bowden (EH) 2007, John Sykes 2008, also the traditional location.
H2	A house 'elsewhere', perhaps towards the granary, with the remains in the hollow representing a second attempt to build in the early C18.	Brian Dix 2009/2010/2012
H3	A large courtyard house north of the terrace, perhaps open to the east. (In Fig 8, the H3 is placed in the supposed central courtyard.)	Roger Ainslie 2007
H4	A compact, four-square or rectangular 'double-pile' house at the south end of the main avenue.	Ian Clarke 2011

The combined survey data provides new evidence to assist in ranking these hypotheses in order of probability and this, when taken together with other available archaeological and historical evidence, enables us to determine which is the most likely. Based on this balance of probability and addressing them in reverse order, the results of the combined survey are as follows.

<u>Hypothesis H4</u>
The combined survey data reveals no rectilinear anomalies in this area suggesting foundations, or foundation trenches, or any other obvious signs of disturbance that might represent the construction and subsequent removal of a substantial building. Given the good geophysical evidence revealed elsewhere for constructional activity, the probability for a house at H4 is considered very low and we can confidently reject hypothesis H4.

Hypothesis H3

The combined survey data shows that the rectilinear high-resistance areas north of the bank/terrace (22) interpreted by Ainslie *et al* (2007) as 'probable rubble', are not significantly different in response from the surrounding areas to the north within the main avenue, to the west beyond the linear earthwork (17) and to the south of the bank/terrace (22), i.e. they are not significantly different from the local 'background' response. We may therefore consider it more likely that the high-resistance over this general area is merely indicative of the near-surface geology and pedology. We know from excavations in the hollow (21) by Everett in 1969 and Dix in 2009 that the near-surface structure contains sand and gravel layers, and the tenant farmer Mr John Osbourne confirmed (pers. comm.) that the soil over this general area is free-draining, so we might reasonably expect a high-resistance background. However, we may also expect some of the observable variations in background response on such a type-site to be evidence for landscaping, i.e. for the general levelling and terracing of the site in the 17th century preparatory to the laying out of the gardens and construction of the house. A clear example of this is the distinct change from high to low resistance about two thirds of the way along the formal garden terrace (26). The distribution of high-resistance responses noted by Ainslie north of the terrace may therefore, in part, fall into this category of landscaping and we will return to this shortly.

If there is no significant rubble spread to mask other features, then the low-resistance linear features that Ainslie thought might delineate a central courtyard are insufficient in themselves to suggest a surrounding building without additional evidence, but they are clearly archaeology of some kind. On closer examination, these linear features are more extensive and reveal possible evidence for two separate 'garden layouts'. The first (green outline in Fig 8) is symmetrical about the formal centreline and so is likely to be an integral part of the 17th century layout. Although the western arm of this is slight and incomplete it is clearly there. A reasonable interpretation for this layout may be that it marks an intended green forecourt for a house at H1. The second (yellow outline in Fig 8) is parallel to the formal alignment and in part coincident with the first on the eastern and northern sides, but its centreline is offset some 5m (16ft) to the east. It has a curious crescent shaped feature to the north with an obvious entrance leading to it, which shows clearly in Fig 7. This second layout is recorded by Bowden & Rardin (2007, p10) as a 'series of small scarps' (23) enclosing the north-west corner. Noting the offset to the east, Bowden suggests an interpretation as either 'an earlier feature or perhaps, more probably, a later yard utilizing the general orientation of the burnt-out house and its associated gardens'. From the relative strength of the geophysical response and the existence of the scarps, the latter interpretation does seem more likely. The crescent feature suggests that its creation was as what we would call a garden rather than a yard, although the etymology of these terms is essentially the same. The high-resistance areas noted by Ainslie can be seen to enclose this 'yellow garden' to the west and to the north either side of the crescent feature, thus their distribution is in part a consequence of landscaping as proposed above. The possibility that this could be an earlier garden should not be ruled out and we will refer to this again later.

The low-resistance linear features themselves are likely to be shallow cuts and are perhaps foundation trenches for low walls, or possibly for ornamental hedging. The existence of a parallel inner feature on the east side mirroring the obvious one on the west side (dotted yellow lines) is speculative but may be indicated by a subtle change in resistance (see Fig 7). Excavation would be necessary to confirm the true nature of all of these features, as it would be to test the chronology of the two layouts.

In summary, the extension of the geophysical survey confirms that the rectilinear areas of high-resistance noted by AAG are primarily a background response but modified in part by landscaping, rather than being indicative of rubble spread; a re-examination of the detailed evidence supports the interpretation of EH that this is a forecourt/garden area. This renders the probability for a large courtyard house very low and we can confidently reject hypothesis H3.

Hypothesis H2

The proposed location H2 for the house towards the granary (34) is based on the AAG magnetometry survey data, where a high magnetic response in the area surrounding the granary was interpreted as 'probable brick rubble … [that] … could indicate an earlier building in that vicinity' (Anslie *et al* 2007). Dix relates this to the discovery in his Trench 5 of a 'spread of mortar and broken bricks which covered the ground surface around the outside of the walls' at the eastern end of the terrace (22) (Dix 2012, p6). He proposed investigating this area as a possible site and comparing it to the 'similar spread' identified north-west of the terrace (Dix 2009), i.e. to the high-resistance areas discussed under Hypothesis H3 above. But in a geophysical sense these two areas are not similar because H3 shows high-resistance but low magnetic response and H2 the complete opposite; yet both were interpreted as possible rubble spread, which must seem counter-intuitive to readers unfamiliar with geophysics. Essentially, it means that one area was interpreted as having a high-density spread of stone rubble

with weak magnetic susceptibility (e.g. the local limestone) and the other as a low-density spread of brick rubble. As a consequence of the kiln firing, brick acquires a permanent and directional magnetisation, known as thermo-remanance, the strength of which depends on the amount of iron oxide in the clay. The density of the rubble within a soil matrix will influence drainage and hence the relative resistivity.

Turning now to Fig 8 (and comparing this with Figs 7 and 6) it will be seen that the area containing H2 and the 'granary' is bounded to the north and west by linear features, marked here with blue dashed lines. These features show as narrow, incomplete and indistinct lines of lower resistance. They are quite subtle and easy to miss, being more visible on the computer screen than on the page. Given their location and the rectilinear shape delineated by them, it is reasonable to suppose that they mark the outline of a larger enclosure on the north side of the old manor house (a remnant of which is now Ascott Park Cottage) in which case the linear features are possibly foundation trenches for walls. There is a distinct change in the level and distribution of the resistivity response from lower and smoother inside the enclosure to higher and more variable outside. It seems likely that this is either a working area or, perhaps more probably, a part of the earlier gardens that we might reasonably expect to have surrounded the old house in the 16th and early 17th centuries. The lower resistivity can then be attributed to a build-up of organic rich (i.e. water retaining) soils. If this is correct, then the enclosure coexisted with and contained the 'granary'. That it may also have become incorporated into the changes of the later 17th century is suggested by a possible semi-elliptical feature at the western end that is precisely aligned with the eastern avenue of the later design; perhaps there was a gate here, or simply an opening, linking the old and new areas. Whether the enclosure wall extends to the eastern edge of the survey area (as shown) is unclear; it may stop at, or the line may be cut by, the 'elongated mound' (32) which Bowden (2007, pp11 & 15) suggests might be a path (drive may be a better description) curving round to the front of the manor house. But there is more going on here than can be determined from the geophysics alone. Finally, we should note that there are no rectilinear anomalies within the enclosure suggestive of a substantial building.

Examination of the AAG magnetometry data in the 'granary' area shows that this has sharp cut-offs that are roughly coincident with this rectilinear enclosure, i.e. it shows approximately the same area distribution, changing from a high magnetic response inside to a low magnetic response outside the boundary, although in this case with a more dramatic change in magnitude (Ainslie *et al* 2007). Magnetometry was not used for the extended survey so it is not possible to confirm how far the high magnetic response continues eastwards but certainly it must go beyond the edge of the 2007 survey. If we are correct in interpreting this area as an enclosure for the old manor house then we can attribute much of this magnetic response to the long-term and intensive activities that would inevitably have taken place around the house, for example to create and maintain formal gardens, which would have enhanced the magnetic susceptibility of the soil. Indeed this seems a more likely interpretation for such a large area than brick rubble spread, although we might reasonably expect magnetic remanance to also play a part since garden soils often contain a proportion of ceramic material and brick was popular from the Tudor period onwards for paths and other hard features. However, if there is brick rubble here the low resistivity suggests it is of low density, i.e. sparsely distributed.

Returning to the resistivity evidence for the above enclosure, there are indications of a personal gate through its northern boundary (within the blue circle in Fig 8) close to the 'granary'. This gate is centred on a possible second large enclosure to the north (outlined with dashed orange lines) on the same general alignment as other garden features. The geophysical evidence for this enclosure is difficult to see, being marked only by an area of generally lower resistivity approximately 42m (140ft) square but with distinctive rounded corners, the latter being clearly evident on the north side but much less certain on the south side. A possible path, marked by a very faint, linear high-resistance feature about 1.8m (6ft) wide, runs northwards from the gate and divides this enclosure into two halves, as shown. Immediately to the south of the gate a similar feature suggests that the path kinks sharply to the west to run close to the 'granary' doorway and on towards the north wing of the old manor house. Note that the 'granary' doorway faces due east. The combination of location, size, shape and central dividing path strongly suggests a small, walled kitchen garden. If this should be proved by future fieldwork it would be a major discovery. However, the geophysical anomalies that suggest this is an enclosure are all very faint – indeed they were missed altogether for a long time, being spotted only as this report was nearing completion – moreover, we can see no evidence to suggest foundation trenches for the essential enclosing walls. The shape also overlies the lines of the eastern side of the main avenue and the eastern cross-avenue, so it could not have survived the changes of the later 17th or early 18th century, depending on when these avenues were planted. The mere existence of this enclosure and its interpretation as a 'walled garden' must remain tentative for the present. An extension of the Ainslie magnetometry survey over this whole area is strongly recommended.

With regard to the brick rubble observed by Dix, this is more likely to result from the robbing out of the above-ground parts of the brick terrace walls or to alterations to the adjacent garden wall. The eastern terrace end wall

is of particular interest here as Dix showed that it continues northwards beyond the line of the terrace and is on a slightly different alignment to that of the adjacent garden wall, the two diverging northwards. The geophysics reveals it as a low resistance linear feature that continues northwards for a distance before apparently curving round through 90° towards the house site, as shown in red in Fig 8. The area enclosed by it has a slightly higher average resistance suggesting this may perhaps have been a paved area.

In summary, it seems likely that the high magnetic response in the area around the granary is a consequence of long term anthropogenic activities confined within an earlier and larger enclosure for the old manor house. This probably contained gardens which appear to have been incorporated into the changes of the later 17th century. The existence of these gardens and their possible continuation into the 18th century, does lend some weight to the possibility that the 'yellow garden' of H3 above was also an early garden that continued in use. On balance, the probability for a house towards the granary is considered low and we can rule it out. But before we can finally reject hypothesis H2 we must consider any case for a house 'elsewhere', that is any geophysical evidence for a building in the outlying areas of the extended survey that might be a candidate for the 1662 house.

There is a sub-rectangular anomaly (G) in the south-west corner that may be archaeological, but based on shape and location it is not considered a candidate. There is a confusion of anomalies (H) on the extreme eastern side of the survey but these are more likely to be associated with the multiplicity of earthwork 'garden' features in this area noted by Bowden (2007), or possibly with farming activity, rather than any indication of a house.

Of greater interest are a number of rectilinear anomalies (such as D, E and F) in the south-west area that are potentially evidence for enclosures or buildings. Some doubt as to whether they are archaeological features arises from the fact that they are all aligned to the survey grid (itself aligned to the National Grid) and so might simply be artefacts of the SOAG surveying operation. However, in the case of the most prominent anomaly (F) there is clear evidence that it extends northwards and shows up in the adjacent AAG grid (see Figs 5 and 6), so confirming that it is real. It also shows internal structure and so is very likely to be the remains of a long, narrow building. This increases the probability that other anomalies in this area on a similar alignment are related features. These rectilinear anomalies certainly cannot be ignored and justify another resistance survey (at 45 degrees to the present grid) to examine them further.

What we can confidently say about the potential building (F) is that because it extends beneath the upper garden terrace (26) it and so by association any other features on a similar alignment, must predate the formal terraced gardens. The date of the gardens is therefore important: not the date that any particular part was constructed or planted but rather the date that the overall plan was decided and laid out. If the formal, terraced gardens are an integral part of a mid-17th century 'Grand Design' by William Dormer then these anomalies (D, E and F) cannot be candidates for William Dormer's new house. Their location and distribution suggests they may be ancillary buildings to do with the running of the old estate.

Hypothesis H1

It should be clear to the reader by now that the weight of evidence from the geophysics is pointing inexorably towards the house being in the 'traditional' location, at H1. Dix's 2009 excavation confirmed that there was a building in the hollow (albeit in Dix's view a later and uncompleted one) so overturning Everett's conclusion in 1969. The geophysical data in Fig 7 reveals clear indications of linear features surrounding the hollow/cellar (21) and bank/terrace (22) and these have been shown by both Everett and Dix to be the remains of walls or their foundation trenches. Unfortunately, the steep sides of the earthworks will have resulted in distortion of the physical grid and errors in positioning of the probes, which renders locations projected onto the horizontal plane and extraction of precise dimensions from the geophysics somewhat unreliable.

In Fig 8, the outline of a house 13.7m (45ft) square and fronting a terrace 9m (30ft) deep is shown in red. The figure of 13.7m has been extracted from Dix's 2009 excavation archive (OXCMS 2013.61, Large Drawing Sheet 3) and that of 9m from Everett (1969, Section through Earthwork). Dix excavated the depth of the house but not the width so the square plan is speculative; it has been assumed here on the basis of the early 18th century estate survey drawing by William Burgess known as 'Mrs Dighton's Plan' (Sykes 2008/2012a/b). Bowden (2007, p10) suggests it may be rectangular. Fig 7 reveals some high-resistance linear features around the floor of the hollow which may be evidence for robbed out structures within the cellar. To the east of the hollow/cellar is a disturbed area that also shows linear features (see Fig 7), indicated in Fig 8 as a dotted red square, although the precise size and shape is uncertain. It may represent some kind of annexe to the main building. If we take the house and possible annexe together, they make some sense of the offset alignment of the 'yellow' garden and suggest that the remains of the house may have continued to play a part in Ascott life in the decades following the fire.

In summary: from the combined survey, it is only in the area of the hollow/cellar (21) and bank/terrace (22) that we have any clear geophysical evidence that can reasonably be interpreted as a substantial building of appropriate scale – appropriate that is to the wealth and status of the owner and the era in which it was conceived and built. Moreover, H1 is on the axial alignment of the formal gardens which strongly suggests that their layout was intended to complement the house and that they were indeed part of a unified 'Grand Design'.

6.3 Main survey - summary and recommendations

The SOAG 2013 earth resistance survey places the important central area covered by the AAG 2007 survey in a wider context. A detailed examination of the combined data enables us to analyse and reject hypotheses H4 – H2 on a balance of probability, leaving hypothesis H1 as the first choice, and this not simply by default but because it is the only one for which there is convincing geophysical and archaeological evidence. In arriving at our conclusions, we are much aided by the availability of published evidence from the EH 2007 survey and the OBT 2009 excavations led by Brian Dix.

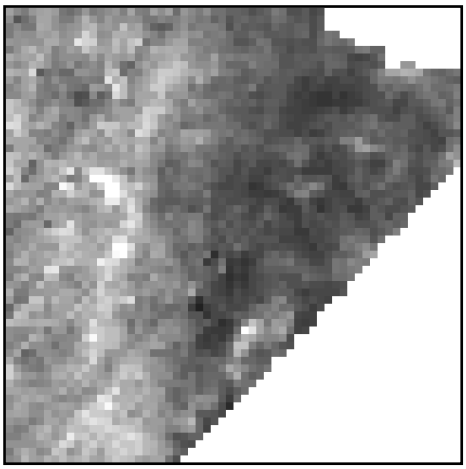
In summary:

- H4 is rejected because there is no geophysical evidence whatsoever to support it (i.e. a negative result).
- H3 is rejected because the geophysical evidence shows that the high-resistance areas interpreted by AAG as possible rubble spread are essentially no different from the surrounding background areas. The evidence rather supports interpretation of the area as a forecourt/garden area, as per the EH report, with the low-resistance linear features revealing two different garden layouts: one a probable forecourt on the formal axial alignment and the second a probable garden on a parallel axis offset some 5m to the east. The latter is thought most likely to post-date the 1662 fire but this cannot be proved from the geophysics alone; indeed the analysis of H2 provides some evidence to support an earlier date.
- H2 is rejected because the high magnetic disturbance on which it is based is shown to be confined to a rectilinear area that appears to be a larger enclosure for the old manor house (of which Ascott Park Cottage is a remnant). It is proposed that this area contained gardens that pre-dated the formal changes of the later 17th century but were perhaps incorporated into them. The increased magnetic susceptibility is then attributable to long-term anthropogenic activity taking place within that enclosure rather than to widespread brick rubble, although ceramic materials are likely to be found within a garden area. The discovery of a possible 'kitchen garden' immediately to the north of this enclosure is potentially very significant but remains tentative at this stage. Brick rubble detected outside the eastern end of the terrace (22) by Dix can be attributed to the partial robbing out of the terrace walls and/or to alterations to the adjacent boundary wall. There is no convincing geophysical evidence for the 1662 house 'elsewhere' in the outlying areas of the survey but certain rectilinear anomalies (potential archaeological features) in the south-west area beneath the 17th century formal gardens should be subjected to further investigation.
- H1 is the remaining hypothesis and the only one supported by convincing geophysical and archaeological evidence.

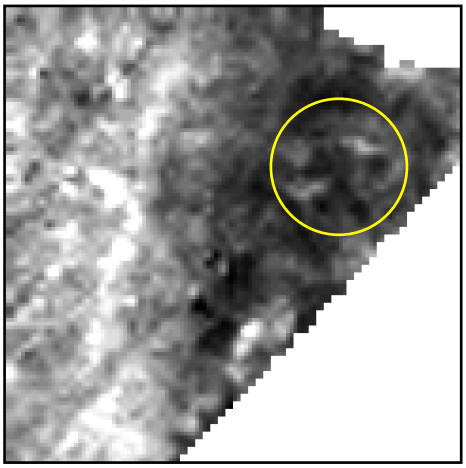
It is recommended that:

- An additional small resistivity survey should be carried out of the rectilinear anomalies (D, E and F) in the south-west area to finally prove whether or not they are genuine features.
- The AAG magnetometry survey should be extended eastwards to cover the whole area surveyed by SOAG to investigate the possible early gardens.
- H1 (and only H1) should be the working hypothesis for future SOAG investigations into the location of William Dormer's 1662 house.

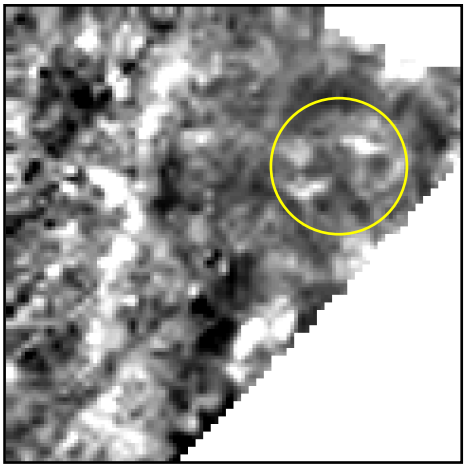
Fig 9 Detached survey - data



(a) Raw data with minimal processing
- Data clipped at ± 3SD
- Black low resistance, white high
- Range 25 – 165 Ohms

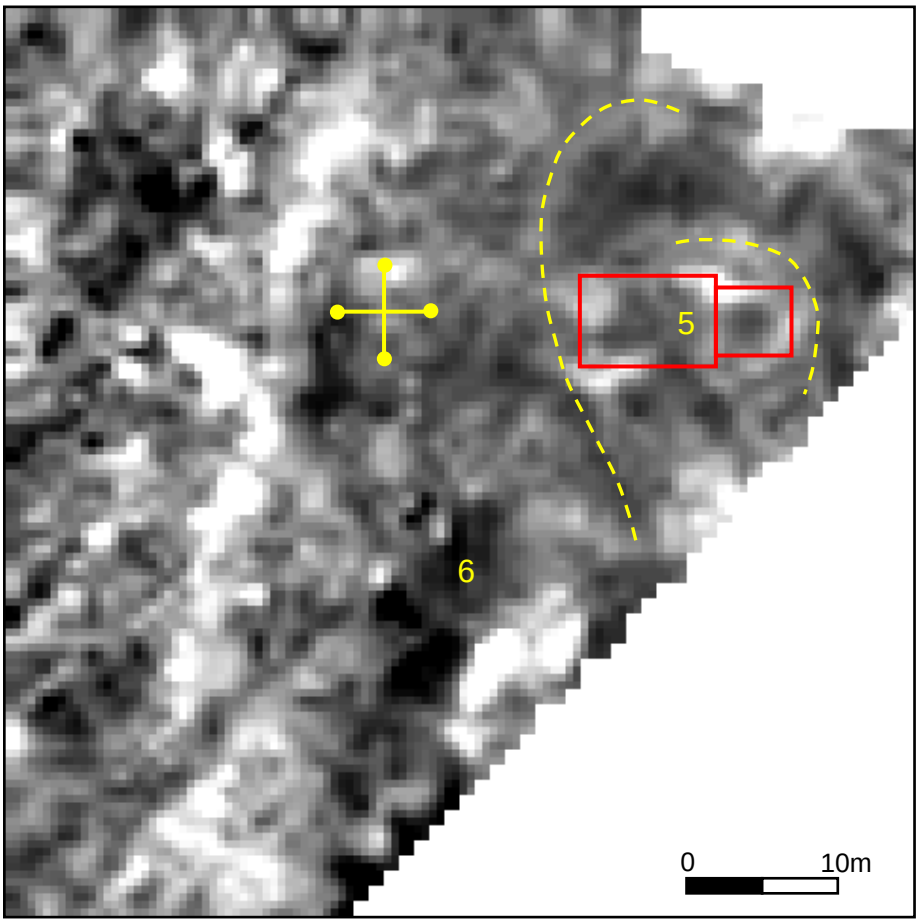


(b) Raw data with interpolation
- Data clipped at ± 2SD
- Black low resistance, white high
- Range 50 – 140 Ohms



(c) With HPF and interpolation
- Data clipped at ± 2SD
- Black low resistance, white high
- Range ±28 Ohms

Fig 10 Detached survey - interpretation



6.4 Detached survey - data (Fig 9)

The resistivity results are shown as a series of greyscale images in Fig 9. In all cases, white is high resistance and black low resistance. Fig 9 is to a scale of 3cm ≡ 30m (1:1000).

Fig 9a shows the raw data despiked and clipped at ±3 Standard Deviations, no edge matching being required. Fig 9b shows the same data clipped to ±2 SD (Range reduced by 50 Ohms) to sharpen the image and with a single interpolation in x and y to reduce pixilation. Fig 9c shows the effect of applying a high-pass uniform weighted filter (HPF) to the raw data of Fig 9a, in this case a single pass with a large (10x10m) window, followed by a single interpolation in x and y. Again the data is clipped at ±2 SD.

6.5 Detached survey - interpretation and discussion (Fig 10)

Fig 10 is a marked up copy of Fig 9c to a larger scale of 2cm ≡ 10m (1:500). The large yellow cross in Fig 10 shows the location of the Chapel site marker on the 1973 OS 1:2,500 map (see Fig 1). This marker is in the same location on the OS 1st Edition map of 1881, some 63m SWbyW of the Bench Mark on the corner of the 17th century Banqueting House, now part of Piccadilly Cottage.

The area of prime archaeological interest from the geophysical data is in the north-east quadrant, where a group of high resistance anomalies form a distinct rectilinear pattern. This grouping shows up well in Figs 9b and 9c where it is circled in yellow. The EH survey records two irregularly shaped earthworks (5) in this area, the approximate location of these being indicated by dotted yellow lines in Fig 10, together with a tree hole (6) some 20m to the south-west. From the position of the amorphous earthworks between Piccadilly Cottage and the tree hole, Bowden concludes that this is what remains of the chapel site, noting that significant degradation by 20th

century ploughing will have blurred the outlines. The tree hole is proposed as the probable location of the Chapel Tree. (Bowden & Rardin 2007, p7). The rectilinear anomalies can be seen to be centred within these earthworks.

Bowden makes reference to a 19th century illustration of the chapel as a ruin (Judge 2001, p126) which clearly places it a little south-west of the Banqueting House and close to Ascott Park Lane. The chapel was intact in 1811 but demolished in 1823 (Sykes 2008/2012a/b) so this drawing must date from c.1820, after the roof was removed and before Piccadilly Cottage was built. The EH report reproduces an illustration of the chapel drawn by Charles Ellis in 1811 (Bowden & Rardin 2007, p4). From these two illustrations we know that the chapel had a nave and chancel and that it was oriented east-west.

Although the Ellis drawing is in perspective, we can use simple projection to make an estimate from it of the likely size of the chapel floor-plan: we need only make the reasonable assumption that the nave is rectangular with typical proportions of (say) 1.5:1 and use an estimated height of the door apex to provide a scale, there being little vertical distortion at eye level. Choosing a door apex height of 2.1m (7ft) we arrive at a nave of around 9.1 x 6.1m (30 x 20ft); the likely size of the chancel can be estimated from that. This is a realistic and workable size for a small estate chapel. The outline of a chapel of these dimensions is shown in red in Fig 10, overlaid on the group of rectilinear anomalies. The fit is sufficiently good to suggest that the anomalies are a reflection of the remaining buried archaeology of the chapel; indeed, when taken together with the antiquarian evidence for the location and orientation of the chapel, the probability is high. The OS Chapel site marker can be seen to be in line with this proposed location but displaced some 20m to the west.

Whether the grouping of high-resistance features reflects the remains of actual walls or floors, or simply robbed out foundation trenches, only excavation can determine. Excavation would also be needed to determine precise dimensions for the chapel, although a second survey of the north-east square at 0.5m resolution would provide useful additional data and is recommended.

7 COPYRIGHT

8 ACKNOWLEDGEMENTS

My sincere thanks are due to Jerry Anderson for setting out the control points and to the enthusiastic SOAG volunteers who completed the 2013 survey in record time under the excellent leadership of Gerard Latham. I am most grateful to Oxfordshire County Council for granting permission to carry out the survey, for the support and guidance of Richard Oram the OCC Planning Archaeologist and for the continuing encouragement and interest of John Sykes and the Board of the Oxfordshire Buildings Trust. Thanks are also due to John Osbourne, tenant farmer at Ascott Park and to the many other residents of Ascott and Stadhampton who continue to show such a lively interest in this project. The responsibility for the analysis and interpretation, and hence any possible over-interpretation, is entirely mine. I confide that future fieldwork at Ascott Park will resolve any errors and doubts.

Ian Clarke
Ascott Park Project Leader,
South Oxfordshire Archaeological Group

GENERAL STANDARDS & GUIDES

English Heritage 2008: *Geophysical survey in archaeological field evaluation*, 2nd Edition, http://www.english-heritage.org.uk/publications/geophysical-survey-in-archaeological-field-evaluation/geophysics-guidelines.pdf

Schmidt A, 2011 *Geophysical Data in Archaeology: A Guide to Good Practice, 2nd Edition*, Archaeology Data Service & Digital Antiquity, Oxbow Books, Oxford. Equivalent to online version in October 2011; see latest version at http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_Toc

Chartered Institute for Archaeologists 2011: *Standard and Guidance for archaeological geophysical survey*, http://www.archaeologists.net/sites/default/files/node-files/Geophysics2010.pdf

REFERENCES

Ainslie R, Ainslie S & Oatley C, 2007 *Ascott Park: survey using magnetometry and resistivity*, June 2007, Abingdon Archaeological Geophysics, unpubl. report for OBT

Ainslie R, 2008 Abingdon Archaeological Geophysics: Stadhampton, Ascott Park, *South Midlands Archaeology No 38 2008*, CBA South Midlands Group

Bowden M & Rardin A, 2007 *Ascott Park, Stadhampton, Oxfordshire: analytical earthwork survey of a 17th century park and garden*, Archaeological Survey and Investigation Report, English Heritage Research Department Report, Series 93/2007, http://services.english-heritage.org.uk/ResearchReportsPdfs/093_2007WEB.pdf

Clarke I, 2011 *A new theory on the location of William Dormer's 'new' house at Ascott Park*, unpubl. note for OBT, dated 1 March 2011

Clarke I, 2013 *Specification for a geophysical field evaluation at Ascott Park, Stadhampton, Oxfordshire*, Issue 3.2 of 5 Sept 2013, unpubl. SOAG Project Specification

Clarke I, 2014a Stadhampton, Ascott Park, *South Midlands Archaeology No 44 (2014)*, CBA South Midlands Group

Clarke I, 2014b Ascott Park Research Project – an overview and interim report, *SOAG Bulletin No 68 (2014)*, South Oxfordshire Archaeological Group

Dix B, 2009 Letter to J Griffin Esq, Hon. Sec. OBT, dated 7 October 2009, regarding Ascott Park, Stadhampton: archaeological investigation

Dix B, 2010 Gone but not forgotten, *Historic Gardens Review Issue 24, Dec 2010 – Jan* 2011, The Historic Gardens Foundation, London

Dix B, 2012 *Archaeological excavation at Ascott Park, Stadhampton, Oxfordshire, August 2009*, upubl. report for OBT

Everett S, 1969 Trial excavation at Ascott Park, OCC HER record: PRN1797

Judge C (comp.), 2001 *The Parish of Stadhampton, Oxfordshire, incorporating the villages of Ascott, Brookhampton, Chiselhampton & Stadhamton*, Stadhampton History Society

OXCMS 2013.61 Archive of Oxfordshire Buildings Trust/Dix B 2009 excavation, Oxfordshire Museums Resource Centre, Standlake

Sykes J, 2008 *The mystery of where the Dormers and their successors lived in Ascott Park*, unpubl. OBT report, March 2008

Sykes J, 2012a *The mysterious later history of Ascott* Park, unpubl. OBT report, February 2012. Copy deposited in the Oxfordshire History Centre, Ref. D11/483

Sykes J, 2012b 'The mysterious later history of Ascott Park', *Oxfordshire Local History Vol.9 No. 3 Summer 2012*, Oxfordshire Local History Association

DOCUMENT HISTORY

Issue	Date	Change
1.0	02/06/2015	1st draft for comment.
1.1	02/07/2015	Refs. to *TerraSurveyor* added on pp6 & 23. Approved and issued.

APPENDIX 1

LOSS AND DEGRADATION OF DATA FROM LOW-PASS FILTERING

Fig 11 Digital subtraction of the data sets from Figs 5 & 6 (Cut and Combine process in Geoplot3)

The Cut and Combine result in Fig 11 shows that most of the data loss is random noise but that there is some degradation of archaeologically significant data. That relating to modern linear features such as fence lines and footpaths (A and B) is unimportant. That affecting the linear feature (C) on the west side (feature 18 in Bowden *et al* 2007) and the rectilinear anomalies (such as D, E and F) in the south-west area is important and should be taken into account when studying these specific features. (In relation to D, E and F see Section 6.2, p16 Hypothesis H2 closing paragraphs). There is also some degradation of a sub-rectangular anomaly (G) in the extreme south-west corner and of a group of anomalies around area (H) on the east side.

In summary, there is some loss of archaeological data from the low-pass filtering but all the features affected remain clearly visible in the processed images. The loss is not considered significant with regard to the specific aims of the survey and the visually improved images provided by low-pass filtering (LPF) have been used as the basis for subsequent processing and analysis in this report.

APPENDIX 2

CONTENTS OF THE DIGITAL ARCHIVE

Ascott Park – Geophysics
- Ascott Park 2013 – Resistivity survey report .pdf
- Ascott Park 2013 – Resistivity survey report .doc
- Ascott Park 2013 – Resistivity specification – Iss3.2.pdf
- Ascott Park 2013 – Resistivity specification – Iss3.2.doc
- > Geophysics data AAG 2007
  - >Mag asg grids
  - >Mag pngs
  - >Mag xyz grids
  - >Res asg grids
  - >Res pngs
  - >Res xyz grids
  - Mag processed comp.cmp
  - Res process comp.cmp
  - Stad Rep4.doc
- > Geophysics data GL 2013
  - >APChapel
    - >Images – detached survey
    - >XYZ Chapel
    - Snuffler files
  - >Ascott Park
    - >AP2013 – test square
      - Snuffler files
    - >Images – main survey
    - >XYZ All S1 WithoutNulls [TerraSurveyor files]
      - Grid positions.jpg
      - >WithoutNulls
    - >XYZ All WithNulls [TerraSurveyor files]
      - Grid positions.jpg
      - >WithNulls
    - >XYZ All WithoutNulls [TerraSurveyor files]
      - Grid positions.jpg
      - >WithoutNulls
    - Snuffler files
  - >Geoplot3
    - >RAPChap
      - >Comp
      - >Grid
      - >Mesh
    - >RASPK2
      - >Comp
      - >Grid
      - >Mesh