Northamptonshire County Council

Northamptonshire Archaeology

A Geophysical Survey

of the North Lawn at

Apethorpe Hall,

Northamptonshire

November 2005

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November 2005

Report 05/137

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NORTHAMPTONSHIRE COUNTY COUNCIL

NOVEMBER 2005

A GEOPHYSICAL SURVEY OF THE NORTH LAWN AT APETHORPE HALL, NORTHAMPTONSHIRE

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ABSTRACT

Northamptonshire Archaeology conducted an earth resistance survey, on behalf of English Heritage, on approximately 1.3ha of the North Lawn at Apethorpe Hall. A putative group of small structures were detected in the north of the Lawn, near the site of the medieval village. Possible remains of brick constructions may have been present towards the centre of the Lawn. A pipeline was confirmed as crossing the site.

1 INTRODUCTION

Northamptonshire Archaeology conducted geophysical survey on behalf of English Heritage, between 1st-3rd November 2005 on a single area of approximately 1.3ha of the North Lawn of Apethorpe Hall, Northamptonshire (NGR TL 023, 955, Fig 1). The Hall, a Grade I listed country house is currently under renovation. The planting of a screen of trees is proposed to the north of the North Lawn, a development which may have impact upon unknown subsurface archaeology.

2 ARCHAEOLOGICAL BACKGROUND

Apethorpe Hall was constructed in the late 15th century and the buildings and grounds continually remodelled up until the present day (Pevsner 1973, 85). The proposed development is in an area of archaeological interest. As the Hall may have been imposed upon the medieval village of Apethorpe, the North Lawn may extend over village remains possibly including the manor house (Linford 2005, 6). A magnetometer survey was carried out over the North Lawn by Engineering Archaeological Services Ltd. in 2002, identifying the likely line of a ferrous pipe and possible 'post-medieval' archaeology (Brooks & Laws 2002 fig 14; Linford 2005, 6). A Roman villa was excavated in 1859, within Apethorpe Park, approximately 600m south-east of the present survey area (RCHME 1975, 8).

3 TOPOGRAPHY AND GEOLOGY

The North Lawn is an area laid to grass with only the very slightest topographic changes observable. The survey area is bounded by Hunting Way road on the west, the Hall's rear driveway on the south and a curtain wall to the north. The eastern edge of the Lawn is bounded (north-south)

by a fenced path, low wall and curving low-walled shrubbery. Several trees are located on the south, west and northern perimeter of the lawn (see Fig 4).

The solid geology of the area comprises inferior oolite covered by a drift of boulder clay and morainic drift (www.bgs.ac.uk/geoindex/index.htm accessed 31/10/05).

The site suffered from heavy rain on 31 October and again on the nights of 1 and 2 November. Survey on 2 November was hampered by day-long drizzle, although 1 and 3 November were relatively dry.

4 METHODOLOGY

Earth Resistance Survey

Survey was conducted utilising a pair of Geoscan Research RM15 resistance meters. Instrument 'A' was a standard twin electrode configuration with a 0.5m mobile electrode separation. The second instrument, 'B', was coupled with a MPX15/PA5 unitin 0.5m electrode separation 4-probe Parallel Twin mode, allowing two adjacent readings to be recorded in tandem. Unfortunately the remote electrodes supplied as part of the instrument 'B' (hired from Allied Associates Geophysical Ltd.) were found to be of non-standard type. This required the author to make an in-the-field repair, attaching bare wire to probes in place of the usual connectors, perhaps slightly effecting the efficiency of instrument 'B'.

The site area was divided into 20m x 20m grid-squares, totalling *c* 1.3ha, each was surveyed in detail. Data was recorded at intervals of 1.0m x 1.0m from a starting position 0.5m along each 1.0m traverse, resulting in a total 400 points per full grid. All efforts were made to match the background readings of both instruments between grids, as per the Brief (Linford 2005, 6), although this proved ultimately impossible due to the distance between units and changes in topsoil moisture levels. Fieldwork was carried out in accordance with English Heritage and the Institute of Field Archaeologists Guidelines (EH 1995 & Gaffney, Gater and Ovendon 2002).

Data was downloaded into a portable notebook computer at the end of each survey day, ready for processing using desktop workstations at Northamptonshire Archaeology.

On initial checking of the data, a degree of striping was noted along several of the traverses in grids surveyed by instrument 'B'. The RM15/MPX15 setup and wiring of the parallel twin frame were checked for errors, but none were apparent. It was later noted in the software manual (Geoscan

2003, 6-164) that "striping defects can sometimes occur when the MPX15 / PA5 / RM15 system is used in the Parallel Twin mode, usually in wet conditions… after a short period of working in rainy conditions or in long damp grass striping can start to occur." The weather around the time of survey (see para. 3 above) would appear to match this situation, as did the relatively low level of defect.

Processing

The data was analysed using Geoplot 3.00s software. Processing involved two stages. Initially an attempt was made to rectify the striped data and then the entire dataset was assembled. Low resistance is shown as white and high resistance as black in the resultant greyscale plots.

Stage 1:
The grids surveyed in Twin Parallel mode ('B' above) were assembled into a data composite which was then *Despiked* using a 1x1 reading window, threshold of 3SD with mean value replacement. A *Low Pass Filter (LPF)* was then applied using a 3x3 reading window and Gaussian weighting, the data saved at this point. To remove the striping the data was subjected to a *High Pass Filter (HPF)* of window radii x=10, y=0 with Gaussian weighting. The results of this operation were then combined with the previously saved data.

Stage 2:
The pre-processed Twin Parallel 'B' data was then combined with the Single Twin 'A' results. A series of *Edge Matching* and area *Addition* operations were then conducted on the 'A' grids in order to obtain a flat, even background level between the two datasets (Figs 2.1 & 2.2). Finally the 'A' grids were subject to a 2x2 reading Gaussian *LPF* as a cosmetic exercise to make them visually match the 'B' grids in a greyscale plot (Figs 2.3 & 2.4).

The processed data is presented here in the form of greyscale plot of resistance anomalies registered onto digital mapping supplied by the client (5-60Ω scale, Fig 3) and an interpretive plot (fig 4) and are referred to directly in the following Survey Results section.

5 SURVEY RESULTS

A number of resistance anomalies were identified through survey of the North Lawn (Figs 2-3), those of interest have been highlighted on Figure 4 and labelled **A**-**F**. Some comparison has been made with the earlier magnetic survey (Brooks & Laws 2002) although only a summary plot of the North Lawn was available (ibid. fig 14).

High resistance orthogonal anomalies have been located at **A** and **B** adjacent to the northern wall of the Lawn, possibly indicating buried masonry foundations. However, as can be seen in Figure 4, both sets of anomalies neatly surround existing trees which may have effected the local hydrology through the joint effects of root growth and canopy cover. The same may be true of the high resistance area east of **B**, although a rubble spread is a possible explanation. A third possible rectangular anomaly has been detected to the south of **B**, measuring *c* 37Ω in a local background of *c* 32Ω and therefore only tentatively identified. The Lawn has been divided into two by a low resistance linear anomaly **E**, orientated south-west from the north-eastern corner of the site. This feature almost certainly reflects a buried iron pipeline, as it matches a previously located ferromagnetic linear anomaly (Brooks & Laws 2002).

A series of high resistance rectilinear and area anomalies were detected at **C**. These could, as a group, represent several east-west orientated wall foundations and possible packed floor or rubble areas. As the southern half of this group matches areas of magnetic disturbance and possible archaeology from the previous survey, it is encouraging to consider the possibility of a range of demolished brick buildings at **C**. Further sub-rectangular high resistance area anomalies, **D**, continue south-west from **C** and another rectangular area orientated south-east south of that to which a low resistance area was detected parallel to the south. That both of the high areas are of similar dimensions, approximately 5m x 25m, may indicate an anthropogenic source to them.

High resistance area and curvilinear anomalies were identified along a generally north-eastern trend at **F**. If these are building remains or garden features then they share a similar alignment to those at **D**. The south-west corner of the lawn was found to contain a high resistance area that corresponds well with an area of magnetic disturbance, suggesting possibly a deposit of brick or stone rubble, perhaps connected with the construction of Hunting Way or the Hall's rear driveway.

6 CONCLUSION

Area earth resistance survey was carried out over the North Lawn at Apethorpe Hall. Three small structures have been cautiously identified to the north of the Lawn. More centrally at **C**, (Fig 4) the combined results of this and earlier magnetic survey have suggested a zone of brick structures. A suspected pipeline, **E**, has been confirmed, crossing the lawn orientated south-west. In the south-eastern quarter of the site high and low resistance anomalies (**D** & **F**) may represent building remains or large scale garden features.

Data quality from the survey was reduced by factors including faulty equipment and wet weather.

Although no highly obvious evidence of remains the shrunken medieval village (Linford 2005, 7) were located, a group of possible structures may have been present in the north of the Lawn, towards the centre of Apethorpe. Such structures may date from the late medieval period onwards (Buckley & Butler 2001, 129).

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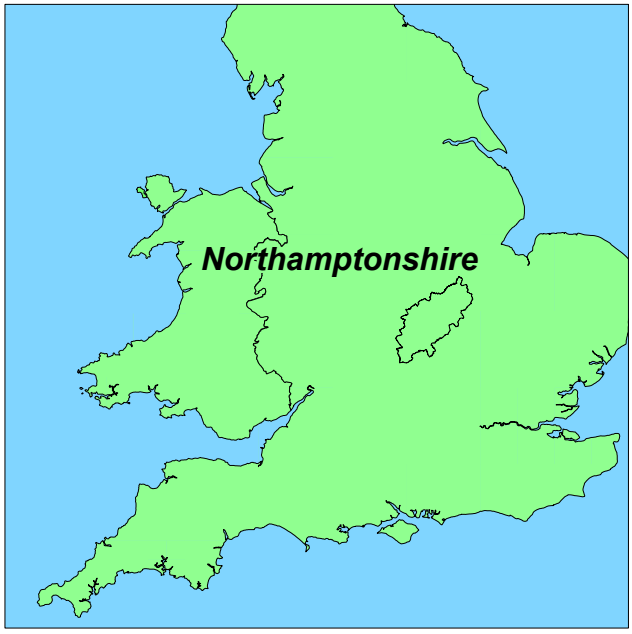
Northamptonshire Archaeology
A service of Northamptonshire County Council 17 November 2005



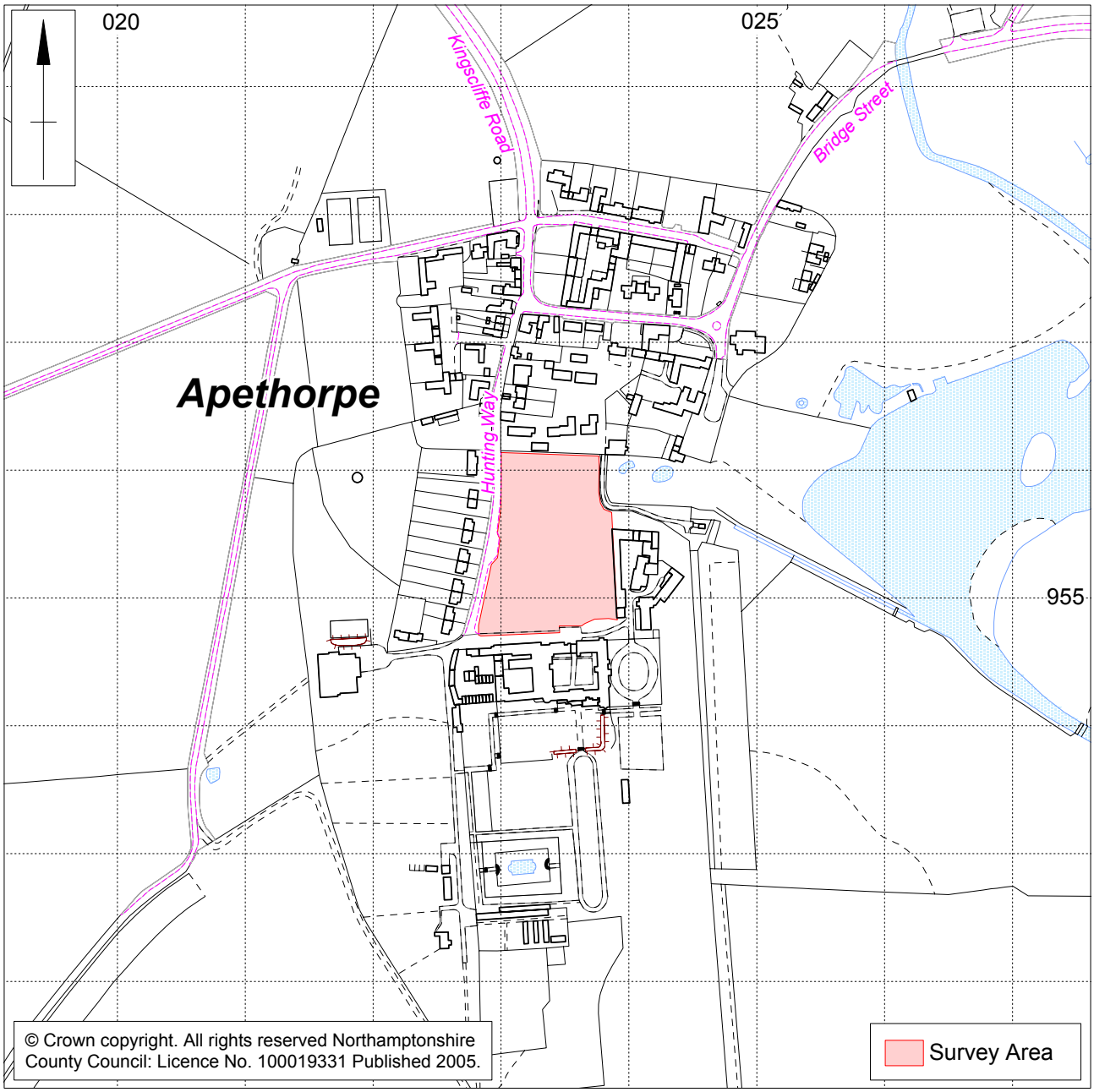


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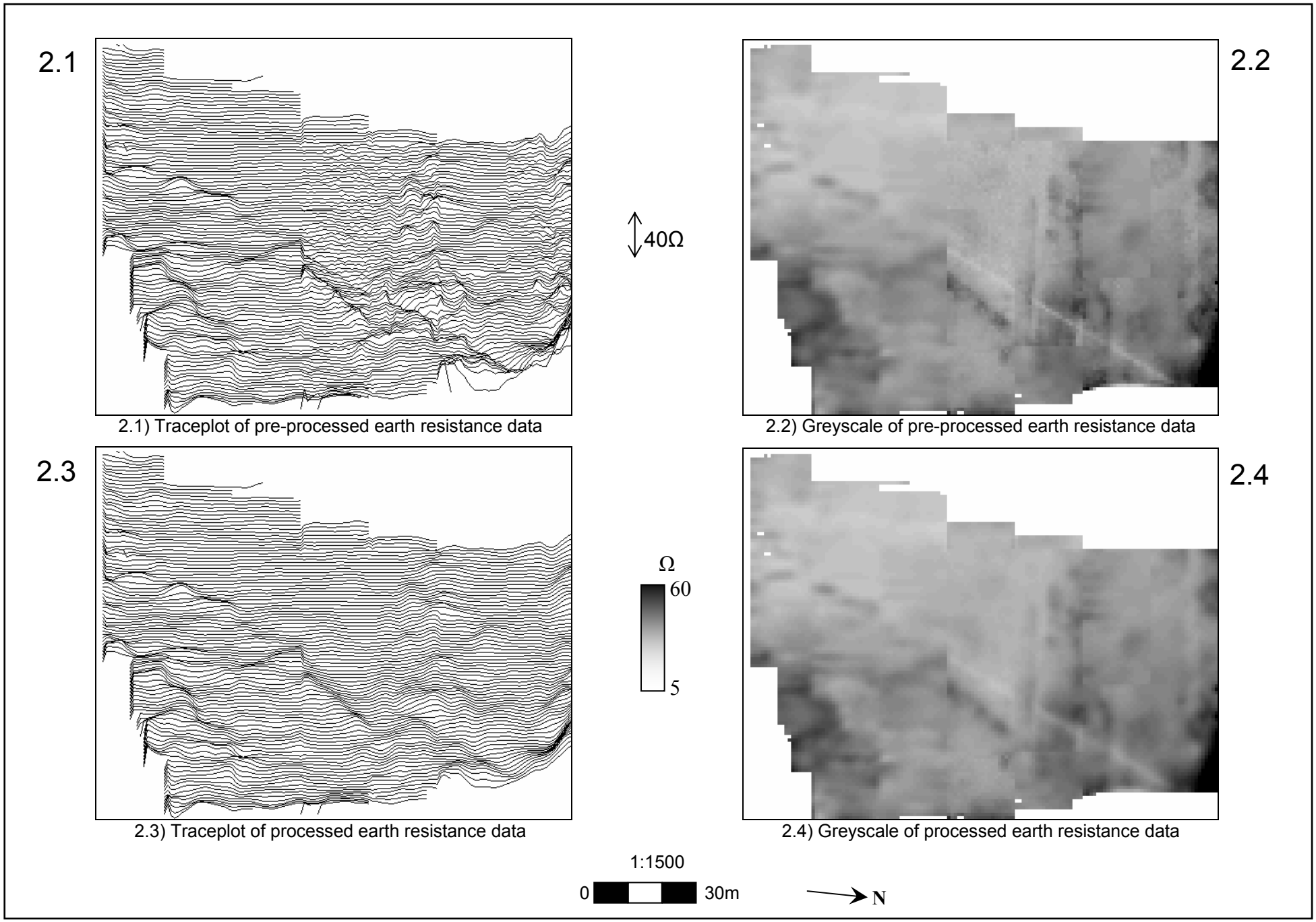
Figure 1.



2.1) Traceplot of pre-processed earth resistance data

2.2) Greyscale of pre-processed earth resistance data

2.3) Traceplot of processed earth resistance data

2.4) Greyscale of processed earth resistance data

Figure 2

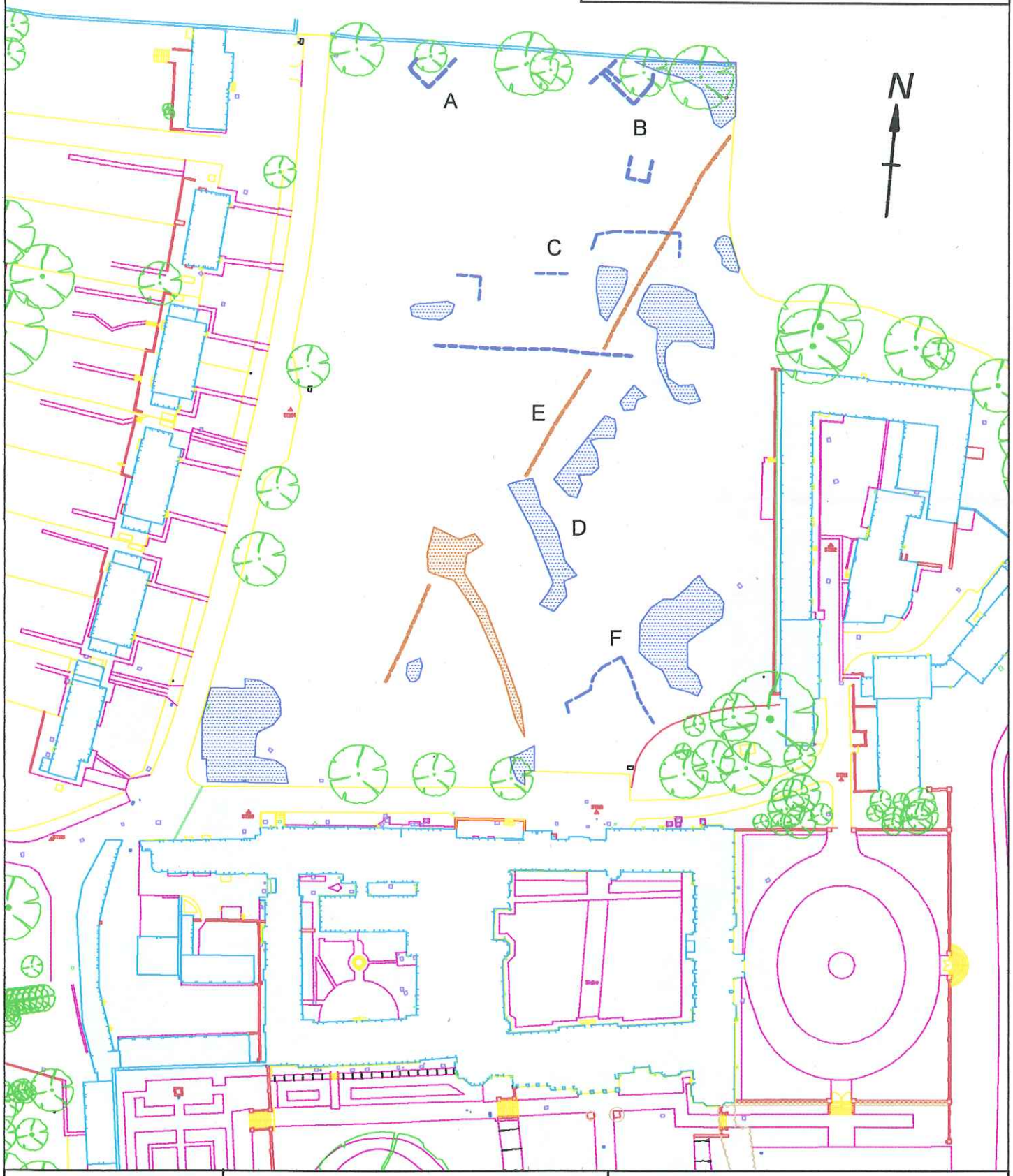
Anomalies

60
Ohms
5

Scale 1:1000

0 20 40 60m

Figure 3:
Earth Resistance Survey



–High Res' Linear
–High Res' Area
–Low Res' Linear
–Low Res' Area

Scale 1:1000

0 20 40 60m

Figure 4: Survey Interpretation