STRATASCAN

Geophysical Survey Report

Harvington Hall, Kidderminster

for

Harvington Hall

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CONTENTS

LIST OF FIGURES

1 SUMMARY OF RESULTS

A geophysical survey undertaken at Harvington Hall has been successful in locating a number of anomalies that may represent former garden features and structures. The positions of a number of anomalies coincide with some of the buildings and garden positions as shown in the 1745/6 estate map.

2 INTRODUCTION

2.1 Background synopsis

Stratascan were commissioned by Harvington Hall to undertake a geophysical survey of an area outlined for proposed development. This survey forms part of an archaeological investigation being undertaken by the hall.

2.2 Site location

The site is located at Harvington Hall, Kidderminster at OS ref. SO 877 745.

2.3 Description of site

The survey area consists of 2160m^2 of lawn surrounding Harvington Hall. The underlying geology is Permian and Triassic undifferentiated sandstones (including Bunter and Keuper) (British Geological Survey South Sheet, Fourth Edition Solid, 2001). The overlying soils are known as Bromsgrove soils, which are a type of Permo-Triassic and Carboniferous sandstone and siltstone. These consist of well drained reddish course loamy soils mainly over soft sandstone, but deep in places. There may be associated fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging (Soil Survey of England and Wales, Sheet 3 Midland and Western England).

2.4 Site history and archaeological potential

The moated island was constructed circa 1260. Parts of Harvington Hall date to the middle ages, however most of the building dates to around 1580. Alterations were made to the Hall in the late seventeenth and early eighteenth centuries. To the far side of the south lawn are an Elizabethan Malt-house and a Georgian chapel. The long history and preservation of the hall contribute to the archaeological potential of the site (Hodgetts, 1998).

2.5 Survey objectives

The objective of the survey was to locate any footings of former buildings and any traces of the parterres garden known to have existed on the north lawn.

2.6 Survey methods

Resistivity was used as an effective method for targeting foundations and garden features. More information regarding these techniques is included in the Methodology section below.

3 METHODOLOGY

3.1 Date of fieldwork

The fieldwork was carried out over two days from 9th November when the weather was sunny.

3.2 Grid locations

The location and referencing of the survey grids has been plotted in Figure 2.

3.3 Description of techniques and equipment configurations

This method relies on the relative inability of soils (and objects within the soil) to conduct an electrical current which is passed through them. As resistivity is linked to moisture content, and therefore porosity, hard dense features such as rock will give a relatively high resistivity response, while features such as a ditch which retains moisture give a relatively low response.

The resistance meter used was an RM15 manufactured by Geoscan Research incorporating a mobile Twin Probe Array. The Twin Probes are separated by 0.5m and the associated remote probes were positioned approximately 15m outside the grid. The instrument uses an automatic data logger which permits the data to be recorded as the survey progresses for later downloading to a computer for processing and presentation.

Though the values being logged are actually resistances in ohms they are directly proportional to resistivity (ohm-metres) as the same probe configuration was used through-out.

3.4 Sampling interval, depth of scan, resolution and data capture

3.4.1 *Sampling interval*

Readings were taken at 0.5m centres along traverses 0.5m apart. This equates to 3600 sampling points in a full 30m x 30m grid. All traverses were surveyed in a "zigzag" mode.

3.4.2 *Depth of scan and resolution*

The 0.5m probe spacing of a twin probe array has a typical depth of penetration of 0.5m to 1.0m The collection of data at 1m centres with a 0.5m probe spacing provides an optimum resolution for the technique.

3.4.3 *Data capture*

The readings are logged consecutively into the data logger which in turn is daily down-loaded into a portable computer whilst on site. At the end of each job, data is transferred to the office for processing and presentation.

3.5 Processing, presentation of results and interpretation

3.5.1 *Processing*

The processing was carried out using specialist software known as *Geoplot 3* and involved the 'despiking' of high contact resistance readings and the passing of the data though a high pass filter. This has the effect of removing the larger variations in the data often associated with geological features. The nett effect is aimed at enhancing the archaeological or man-made anomalies contained in the data.

The following schedule shows the processing carried out on the processed resistance plots.

Despike	*X radius = 1*
	Y radius = 1
	Spike replacement
High pass filter	*X radius = 10*
	Y radius = 10
	Weighting = Gaussian

3.5.2 *Presentation of results and interpretation*

The presentation of the data for the site involves a print-out of the raw data as a grey scale plot (Figure 4), together with a grey scale plot of the processed data (Figure 5). Anomalies have been identified and plotted onto the ‘Abstraction and Interpretation of Anomalies’ drawing (Figure 6). A comparison between the resistivity results and the 1745-6 estate map is presented on Figure 7.

4 RESULTS

4.1 North Lawn

A large area of high resistance is evident within the southern edge of the north lawn. The estate map of 1745-6 shows the parterres gardens in this area. However, the data does not share the shape, size or outline of the gardens as they are shown in the map. The northern edge of this area has the greatest resistance, which may be caused by compacted ground from a footpath along the edge of the parterres. However, as this linear area of high resistance is rather wider than a footpath it is equally likely to represent subsurface rubble from a former wall or building.

The estate map also shows a building to the immediate north of the parterres gardens where the lawn starts to taper to a point. A patch of high resistance in the same area may represent the subsurface remains of this building.

4.2 South Lawn

A positive linear anomaly runs diagonally across the south lawn. This feature represents compacted ground caused by the presence of the footpath as shown in Plates 1 and 2.

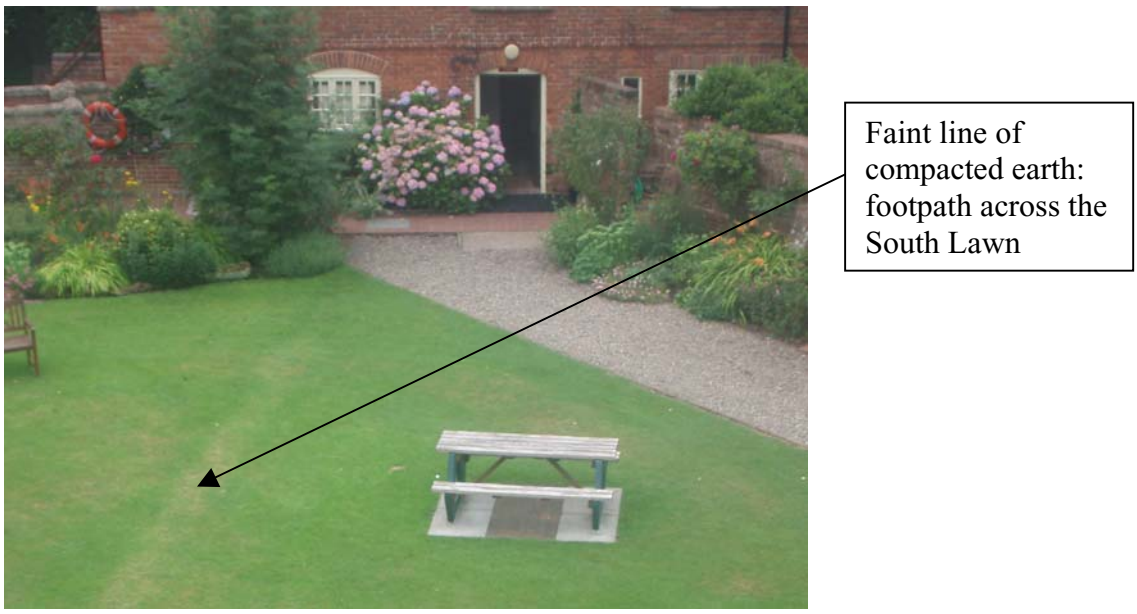

Plate 1- South Lawn looking northwest: Photo- Peter Barker

A low resistance curvilinear anomaly can be seen running along the southern boundary of the south lawn. This linear is related to the break of slope of the circular lawn still visible today. The break of slope can be seen in Plate 2.

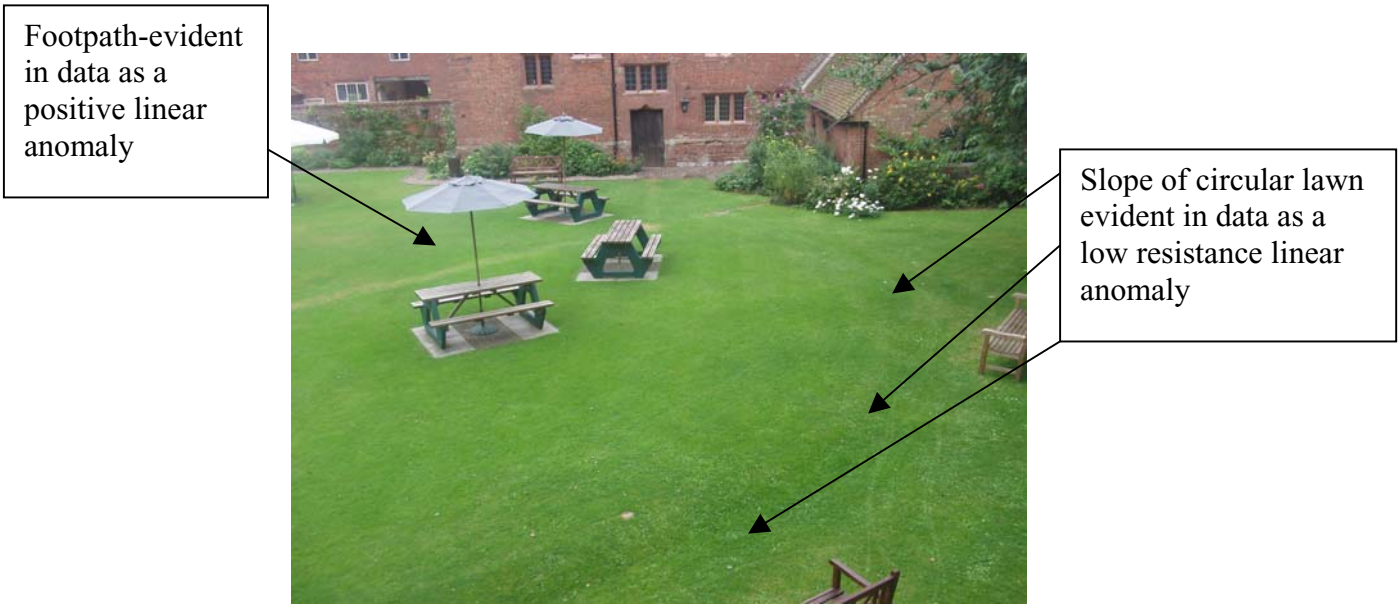

Plate 2- South Lawn. Break of slope: Photo- Peter Barker

The 1745/6 estate map shows a small building in the vicinity of the South Lawn to the north of the Elizabethan Malt-house. It is interesting to note that there is an area of high resistance in close proximity to where this building is shown on the map (See Figure 6). It is therefore possible that this area of high resistance is caused by subsurface rubble or compacted earth from this structure. Other areas of high resistance observed in the South Lawn may be caused by compacted earth. As there are no buildings shown on the estate map in these locations it is possible that these anomalies are a result of compacted ground and former paths rather than structural remains. However, they may represent subsurface rubble of buildings demolished before or built after the map was drawn. Further investigation is required in order to ascertain the nature of these features.

5 CONCLUSION

The geophysical survey undertaken at Harvington Hall has been successful in locating a number of features that may be related to the foundations of former buildings. A number of areas of high resistance coincide with the positions of buildings in the 1745-6 estate map and as a result may relate to their foundations or remains.

The survey has been less successful in locating the parterres gardens. An area of high resistance is evident where the 1745-6 estate map shows the gardens. None of these anomalies are the same shape or size as the parterres, suggesting that are related to separate garden features or structures.

A follow up survey of targeted Ground Penetrating Radar over the high resistance areas in both the North and South lawns may help us to understand the nature and state of preservation of these features.

Bibliography

Hodgetts, M. (1998) *Harvington Hall*, Upton-upon-Severn: Archdiocese of Birmingham Historical Commission.