STRATASCAN

Geophysical Survey Report

‘Lost’ Mansion of Nydfwch, Penllergare, Swansea

for

Penllergare Trust

January 2008

J2449

John Cook BSc. (Hons)

REGISTERED • IFA • ORGANISATION

Document Title: **Geophysical Survey Report**
'Lost' Mansion of Nydfwch, Penllergare, Swansea

Client: **Penllergare Trust**

Stratascan Job No: **J2449**

Techniques: **Detailed resistance survey**

National Grid Ref: **SS 623 979**

Field Team: **Richard Flemming, Philippa Mills BSc. (Hons)**

Project Manager: **Simon Stowe BSc. (Hons)**

Report written by: **John Cook BSc. (Hons)**

CAD illustration by: **John Cook BSc. (Hons)**

Checked by: **Peter Barker C.Eng MICE MCIWEM MIFA**

Stratascan Ltd.

Vineyard House
Upper Hook Road
Upton upon Severn
WR8 0SA

Tel: 01684 592266
Fax: 01684 594142
Email: ppb@stratascan.co.uk
www.stratascan.co.uk

CONTENTS

LIST OF FIGURES

1 SUMMARY OF RESULTS

A detailed resistance survey was carried out over an area of approximately 2500m² at Penllergare, Swansea.

The resistance data was successful in indicated the location of several linear features as well as area anomalies that may be the result of structural remains at Penllergare.

2 INTRODUCTION

2.1 Background synopsis

Stratascan were commissioned by Penllergare Trust to undertake a geophysical survey of an area of interest to the Penllergare Trust as the possible location of a former building.

2.2 Site location

The site is located at Penllergare nr Swansea at OS ref. SS 622 980

2.3 Description of site

The survey area is 0.5ha of steep wooded and cleared hillside. The underlying geology is Upper Westphalian (British Geological Survey South Sheet, Third Edition Solid, 1979). The overlying soils are known as Neath soils which are typical brown earths. These consist of well drained fine loamy soils over rock (Soil Survey of England and Wales, Sheet 5 South West England).

2.4 Site history and archaeological potential

The site is thought to be the location of a former medieval mansion demolished in the early 19th Century with potential remains suggested by topographic survey.

2.5 Survey objectives

The objective of the survey was to locate any anomalies that may be of archaeological significance so that they may be assessed prior to further archaeological investigation.

2.6 Survey methods

A detailed resistance survey was used for its ability to locate structural remains. More information regarding this technique is included in the Methodology section below.

3 METHODOLOGY

3.1 Date of fieldwork

The fieldwork was carried out over 2 days from 17th January to 18th January 2008 when the weather was overcast and raining.

3.2 Grid locations

The location of the survey grids has been plotted in Figure 2 together with the referencing information.

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 net 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 3), together with a grey scale plot of the processed data (Figure 4). Anomalies have been identified and plotted onto the 'Abstraction and Interpretation of Anomalies' drawing (Figure 5).

4 RESULTS

A high resistance rectilinear anomaly is observed in the north of the survey area (1) and is likely to be the result of structural remains. Further high resistance linear anomalies can be seen in the central section of the area (2). These anomalies are similar in character to the rectilinear anomaly in the north and may be evidence for an enclosure.

High resistance area anomalies are visible across the survey although the largest area of high resistance is found towards the south the survey. These high resistance anomalies may relate to building debris or stone outcrops.

Moderately high resistance anomalies are also widespread within the survey area and are areas of possible structural debris.

Low resistance anomalies are found across the survey area and may be related to cut features or greater depth of soil.

5 CONCLUSION

The resistance survey has been successful in identifying linear and area anomalies within the survey area (shown in figure 5) these may relate to a buried objects such as walls or structural debris although further work would be required to identify the exact nature of these features.