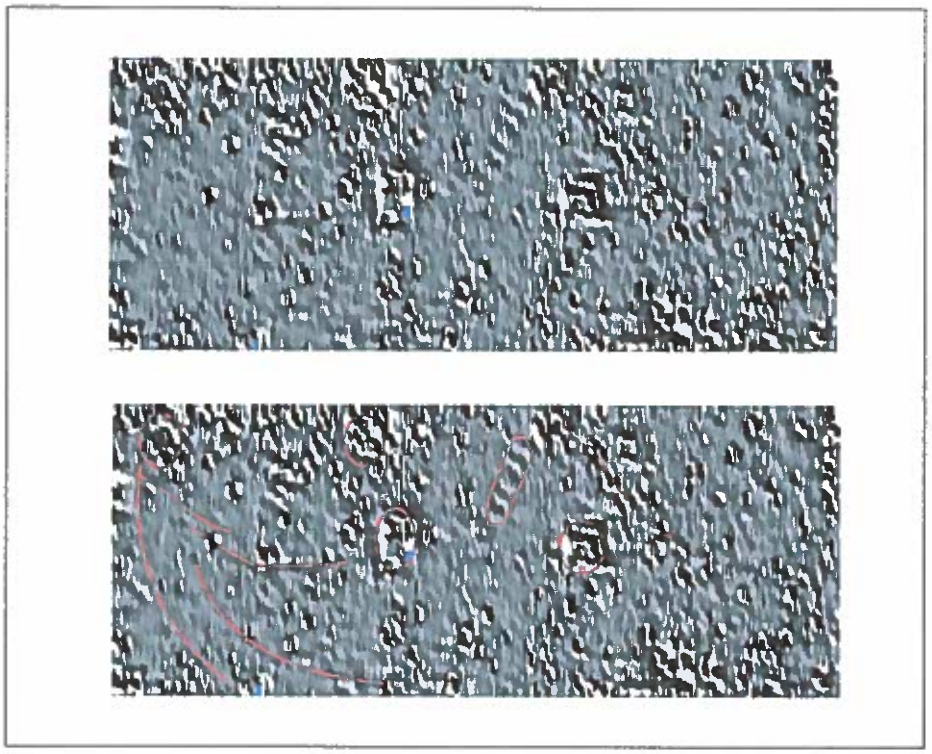
EVENT PRN 65019

CAMBRIAN ARCHAEOLOGICAL PROJECTS

Glebelands, Milford Haven Pembrokeshire

Geophysical Survey



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Report No. 561

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Glebelands, Milford Haven Pembrokeshire

Geophysical Survey

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CONTENTS

List of Figures

Non Technical Summary

This report results from work undertaken by Cambrian Archaeological Projects Ltd (CAP) for Pembrokeshire Housing Association on land adjacent to Glebelands, Milford Haven, Pembrokeshire. The work involved the undertaking of a Geophysical Survey.
The assessment area is a field to the east of St. David's church, Hubberston. The geophysical survey assessed the presence or absence of below ground features. A total of ten features were located. These were made up of areas of obvious magnetic disturbance and several faint linear features.

1 Introduction

1.1 Location and scope of work

1.1.1 In April 2009 Cambrian Archaeological Projects (CAP) carried out a geophysical survey on land to the east of St. David's church near Glebelands, Milford Haven (NGR SM 89185 06255 – Fig 1) in advance of a proposed housing development project. Work was carried out on behalf of Pembrokeshire Housing Association.

1.1.2 Geotechnical test pits were excavated across the site by Roger Casey Associates on behalf of Pembrokeshire Housing Association. The locations of these pits were evident as mounds of backfilled earth within the assessment area.

1.1.3 An archaeological specification for the work was drawn up by Mark Houliston of Cambrian Archaeological Projects Ltd.

1.2 Geology and topography

1.2.1 The assessment area is located approximately 1km to the west of the centre of Milford Haven on land sloping to the north east. The site is located at approximately 40m OD.

1.2.2 The underlying solid geology of the assessment area is comprised of Lower Devonian Red Sandstone (British Geological Survey Map, 1994).

2 Aims and Objectives

2.1 Geophysical Survey

2.1.1 The main aims of the geophysical survey were to assess the presence/absence of subterranean archaeological remains within the assessment area.

2.1.2 To determine the extent and location of any archaeological remains present.

2.1.3 To inform the approach to any possible trench locations should an evaluation phase be deemed necessary.

3 Geophysical Survey Methodology

3.1 Scope of Fieldwork

3.1.2 Two Fluxgate Gradiometers were used to undertake the survey. Previous research has shown that fired, or cut and backfilled archaeological features such as kilns and hearths, ditches and pits often have an anomalously higher magnetic susceptibility than the surrounding subsoil due to burning and biological processes. Differences in magnetic susceptibility within the subsoil and archaeological features can be detected as changing magnetic flux by an instrument such as a fluxgate gradiometer. Data from this may be mapped at closely spaced regular intervals, to produce an image that may be interpreted to locate buried archaeological features (Clarke 1990).

3.1.3 The machines used for the survey were Geoscan Research FM256 fluxgate gradiometers using the double speed dual gradiometer survey mode. Detailed surveys were carried out in grids of 50m x 50m along parallel traverses spaced at 2m intervals, recording data points spaced at 0.5m intervals to a maximum instrument sensitivity of 0.1nT in accordance with English Heritage Guidelines (EH 2008). The grids were surveyed in the 'zigzag' style (traverses walked alternately south-north/north-south). At regular intervals the data was downloaded to a laptop computer for storage and assessment.

3.1.4 The location of the survey area was then surveyed using a Topcon GTS 725 total station.

3.1.5 **Data Processing and Presentation**

Following the completion of the detailed surveys, processing and analysis took place using Geoscan Research's Geoplot v.3.00k software. The most typical method of visualising the data is as a greyscale image. In a greyscale, each data point is represented as a shade of grey, from black to white at either extreme of the data range. A number of standard operations were carried out to process the data. The gradiometer data was mathematically adjusted to account for instrument drift over time. The mean level of each traverse of data was reduced to zero and all grids matched so that there were no differences between background levels. The data was then analysed using a variety of parameters and styles and the most useful of these were saved as a *JPEG image and manipulated using Adobe Illustrator software. The results of the survey were then overlaid onto a digital map of the study area. This was then used to produce the interpretation figures.

3.1.6 All works were undertaken in accordance with both the IFA's *Standards and Guidance: for a geophysical survey* and current Health and Safety legislation.

3.1.7 Project Manager Chris E Smith and project assistant Irma Bernardus undertook the geophysical survey.

4 Geophysical Survey Results

4.1 Ground conditions

4.1.1 Generally the weather conditions whilst on site were mainly sunny and dry. The ground and grass underfoot however was wet from the previous nights rainfall.

4.1.2 It would appear that geotechnical trial pits have been excavated prior to the geophysical survey being undertaken. These remain visible in the field as large mounds of earth were the pits have been backfilled.

4.2 Survey Location and Summary

4.2.1 The assessment area was surveyed using a total of 10 grids, each measuring 20x20m (Fig 2). Features affecting the results of the survey included a metal fence running the entire length of the north western assessment area edge, beer cans and other discarded domestic debris over the whole survey area and metal in property boundaries to the south east. Large tufts of grass were prevalent over the survey area which hindered walking in places. Large bushes were located along the northern edge of the survey area.

4.2.2 To mitigate against these hindrances the survey area was located so as to not be in close proximity to the metal fences on the north west and south east edges of the assessment area. Beer cans and other metallic litter was removed from the survey area whenever possible. Areas of thick vegetation were deemed unsuitable for survey.

4.3 Results of the Survey

4.3.1 The geophysical survey shows ten separate features (Figs 3-8).

4.3.2 Features A, B, C & D show as large areas of magnetic disturbance. The results appear to be bi-polar in nature and giving off a strong magnetic response. This may indicate the presence of metallic objects. Iron Slag was noted within the topsoil near Feature A. Features B and D are close to the reported locations of a trial pit and a bore hole according to data supplied by Roger Casey Associates.

4.3.3 Feature E shows as a series of reasonably faint oblong features arranged in a linear formation. This may be a linear feature or a series of smaller features arranged in a linear formation.

4.3.4 Feature F shows as a rough alignment of smaller bipolar, most likely metallic responses.

4.3.5 Features G, H, I and J all appear as faint thin curvilinear features. All are extremely ephemeral and are only visible after extensive data processing. If genuine features rather than results of natural geological variations then they would appear to represent thin gullies or ditches.

4.4 Interpretation

4.4.1 Features A, B, C and D appear as large areas of magnetic disturbance. As previously mentioned these may coincide with the locations of geotechnical trial pits excavated prior to the geophysical survey being undertaken. However, the magnetic signal given off by features C and D are relatively large, seemingly larger than would be expected of a single trial pit. It is not impossible that they represent features of archaeological significance.

4.4.2 Feature E appears on the survey to be a linear formation of smaller oblong features. The magnetic signal given off by the features does not appear to indicate either metal or burning and may therefore represent a cut feature or features.

4.4.3 Feature F appears as a rough alignment of smaller, possibly metallic, responses. This may represent coincidental alignment of metal peaks or a short linear feature. The magnetic response indicates this is unlikely to be a cut feature.

4.4.4 Features G, H I and J all appear as very faint curvilinears after extensive processing of the survey data. The magnetic signal given off by each would appear to indicate a small cut feature rather than a feature containing burnt or metallic material. Whilst these may indicate archaeological features they may also indicate small geological variations.

5 Conclusions of the Geophysical Survey

5.1.1 The geophysical survey undertaken within the assessment area has shown that the area appears to contain ten distinct features. Each curvilinear feature has only a very weak magnetic response which may be indicative or small ditches/gullies. The larger features (A, B, C, D) appear to be very magnetic. Whilst they may represent archaeological features or spreads of material, features B and D appear to coincide with the locations of geotechnical trial investigations.

5.1.2 The locations of the geotechnical trial investigations as provided by Roger Casey Associates would appear to suggest that a trial pit has been excavated across linear features I and J (Fig 9).

6 Discussion and Interpretation

6.1 Reliability of field investigation

6.1.1 The survey was hampered slightly by the presence of metallic objects in close proximity to the survey area.

6.1.2 The overall findings of the geophysical survey were, to a certain degree, consistent with those suggested by the desk based assessment. If the area has been used as an allotment type area then the frequent metal spikes on the survey are likely related to this activity.

6.2 Overall interpretation

6.2.1 The survey highlighted the possible presence of archaeological features within the assessment area.

6.2.2 It is recommended that these be subject to further archaeological investigation prior to development.

6.3 Significance

6.3.1 The geophysical survey has revealed that the assessment area may contain features of archaeological significance.

7 Acknowledgements

7.1.1 Thanks are due to Irma Bernardus for her assistance during the geophysical survey.

8 Bibliography and references

British Geological Survey, 1979. 3rd Edition. *Geological Survey Ten Mile Map. South Sheet 1:625000.* BGS, London

CLARKE, A. 1990. *Seeing Beneath the Soil: Prospecting Methods in Archaeology.* B T Batsford Ltd

English Heritage, 2008. *Geophysical Survey in Archaeological Field Evaluation.* English Heritage Publications, Swindon

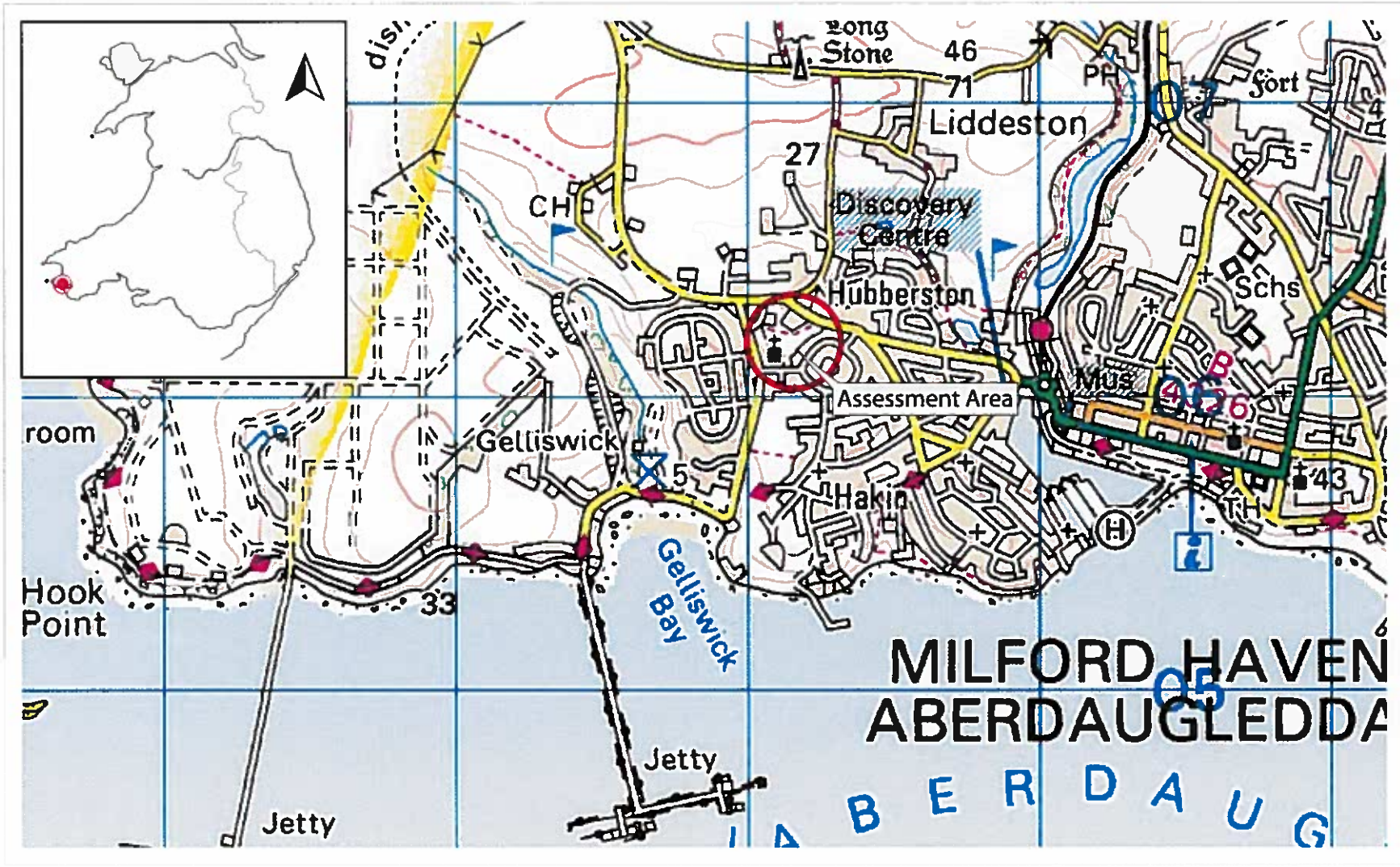

Fig 01: Map showing general location of assessment area

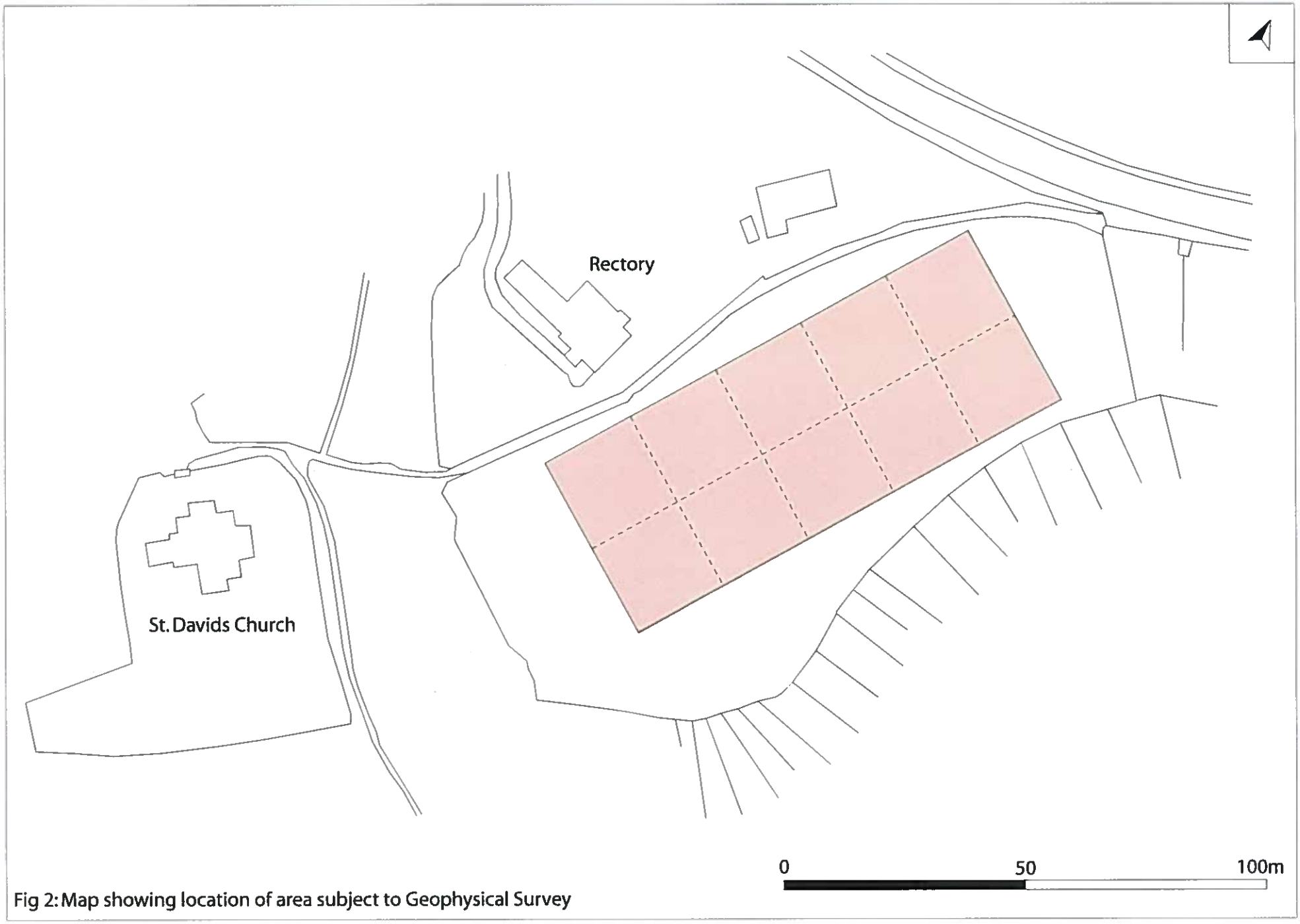

Fig 2: Map showing location of area subject to Geophysical Survey

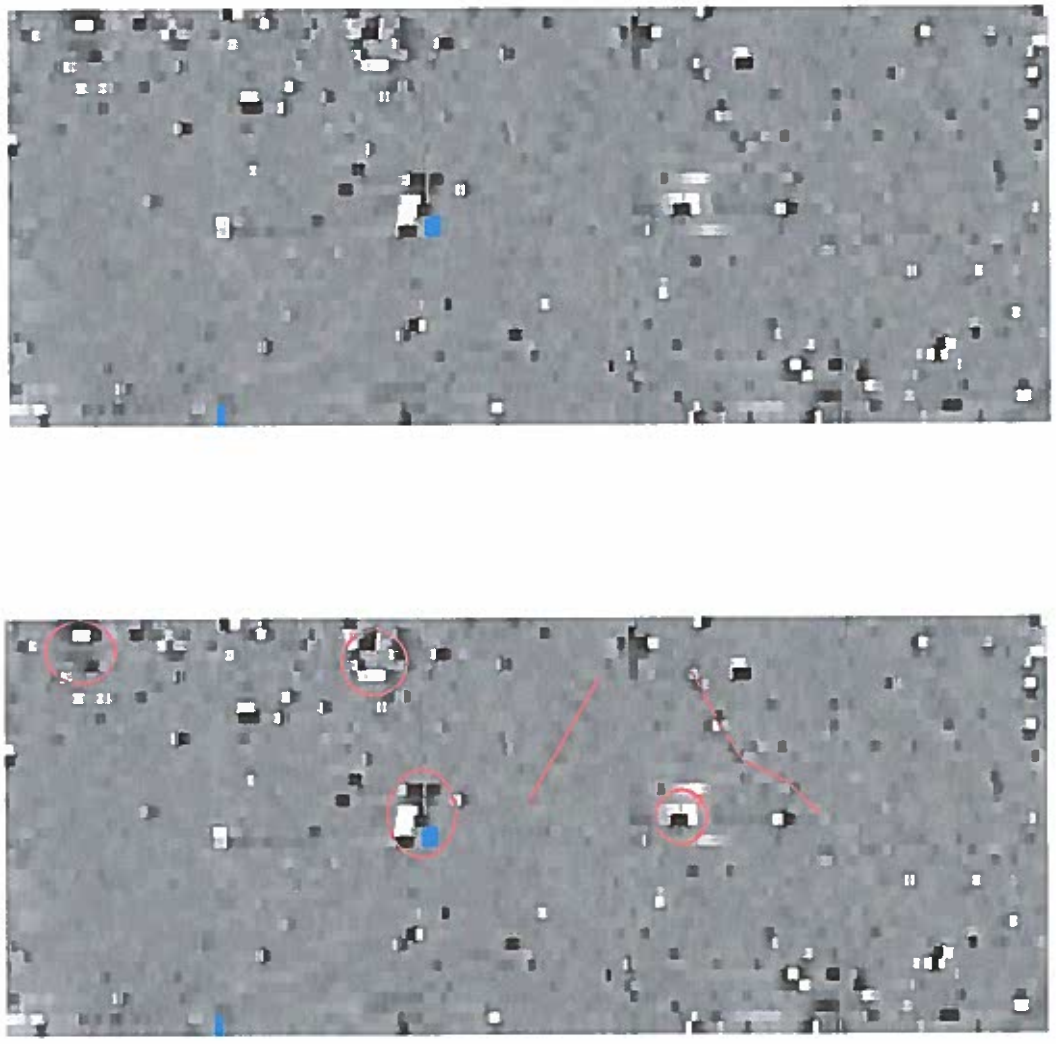

Fig 3: Survey results and traced interpretation of possible features.
Survey results shown are pre-processing

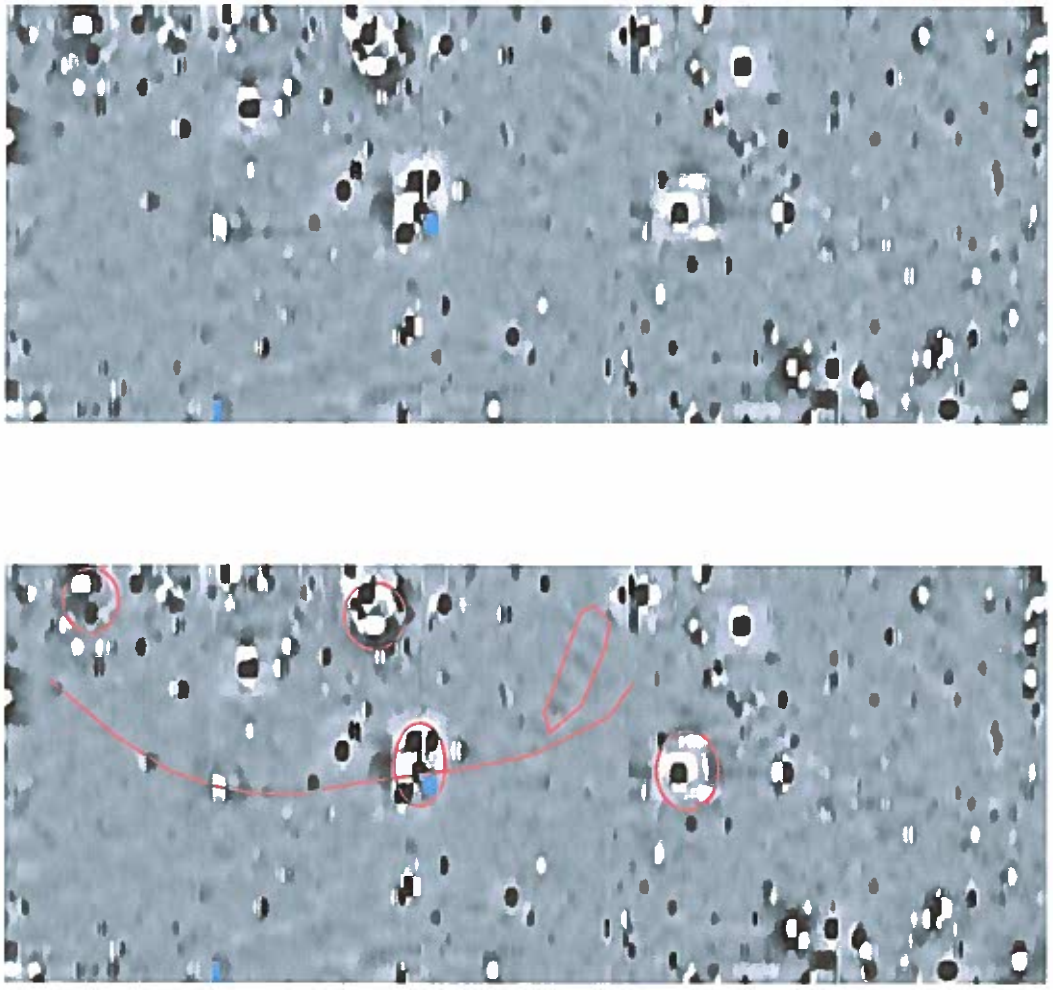

Fig 4: Survey results and traced interpretation of possible features.
Survey results shown after processing using interpolation and low pass filters

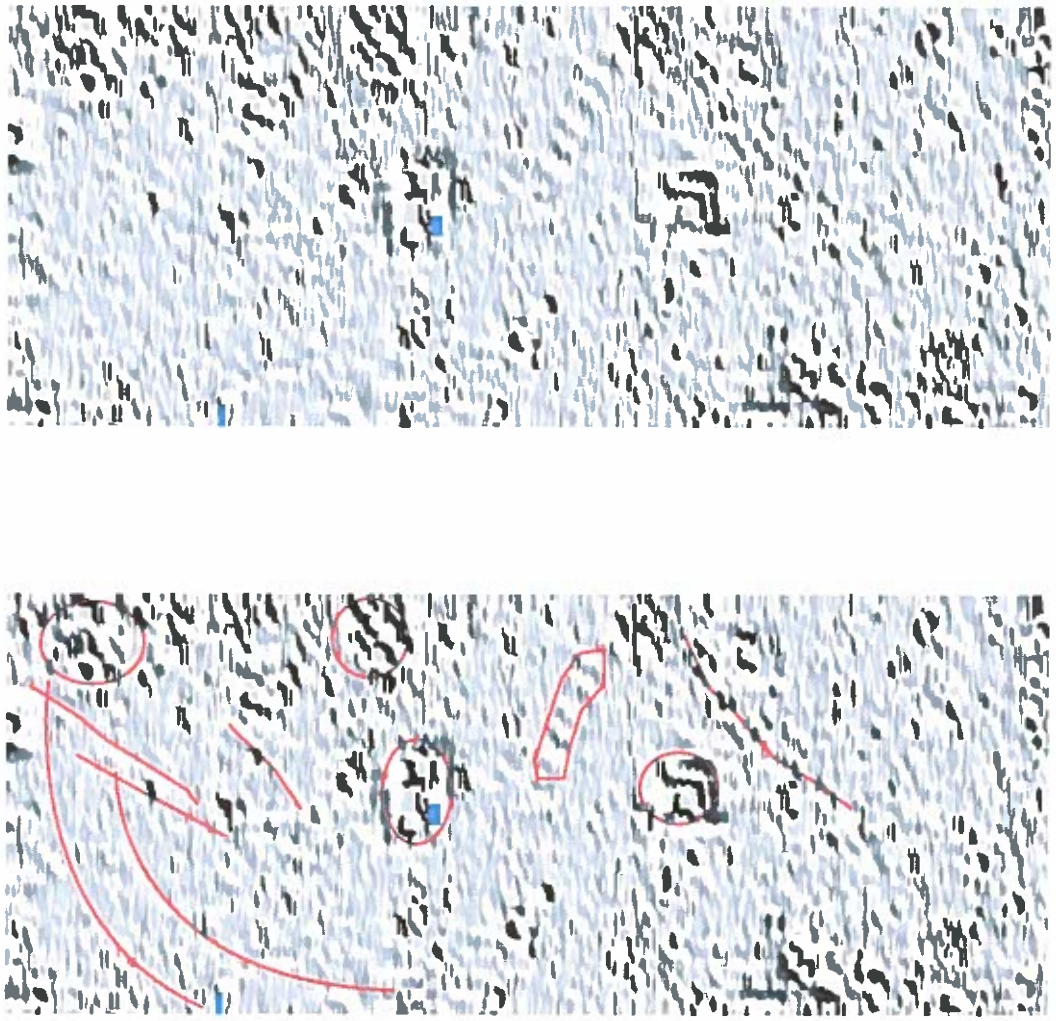

Fig 5: Survey results and traced interpretation of possible features.
Survey results shown in relief with sun at only 5 degrees elevation

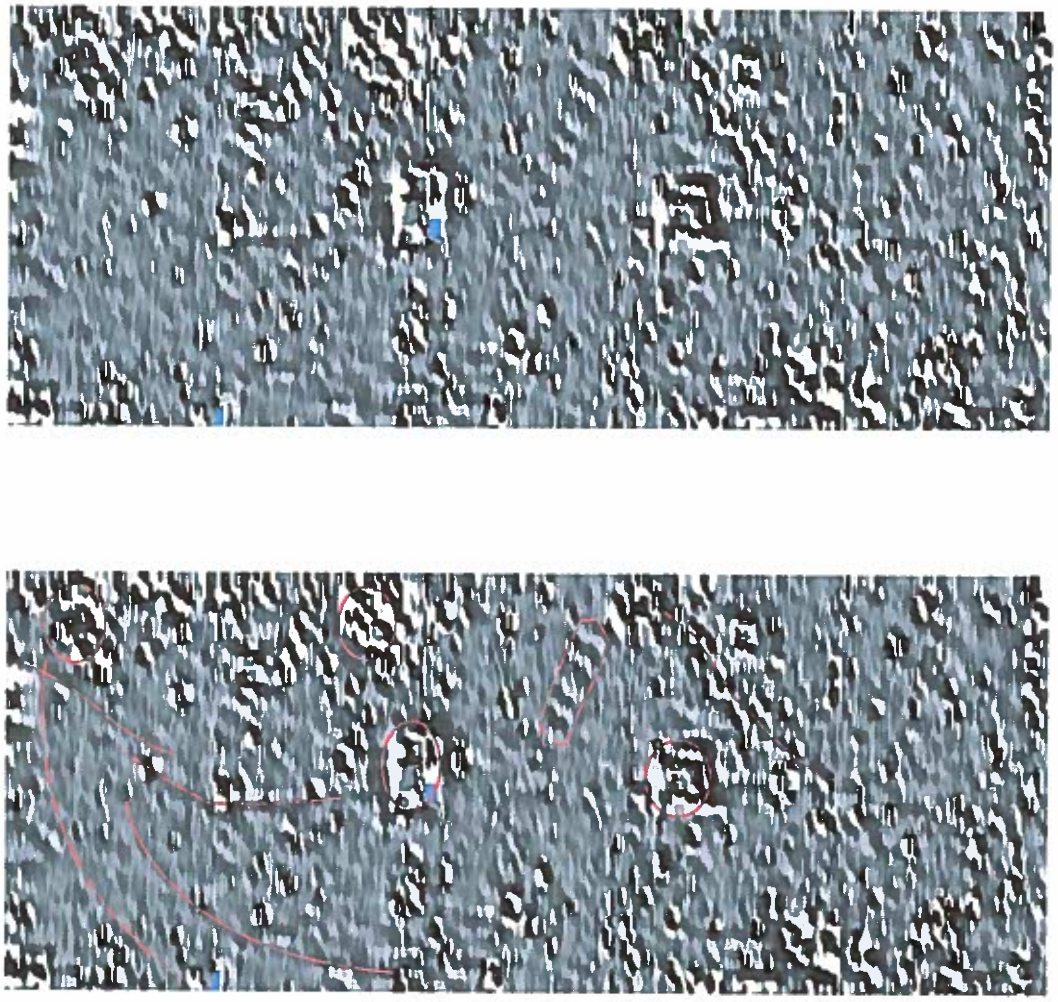

Fig 6: Survey results and traced interpretation of possible features.
Survey results shown in relief with sun at 35 degrees elevation

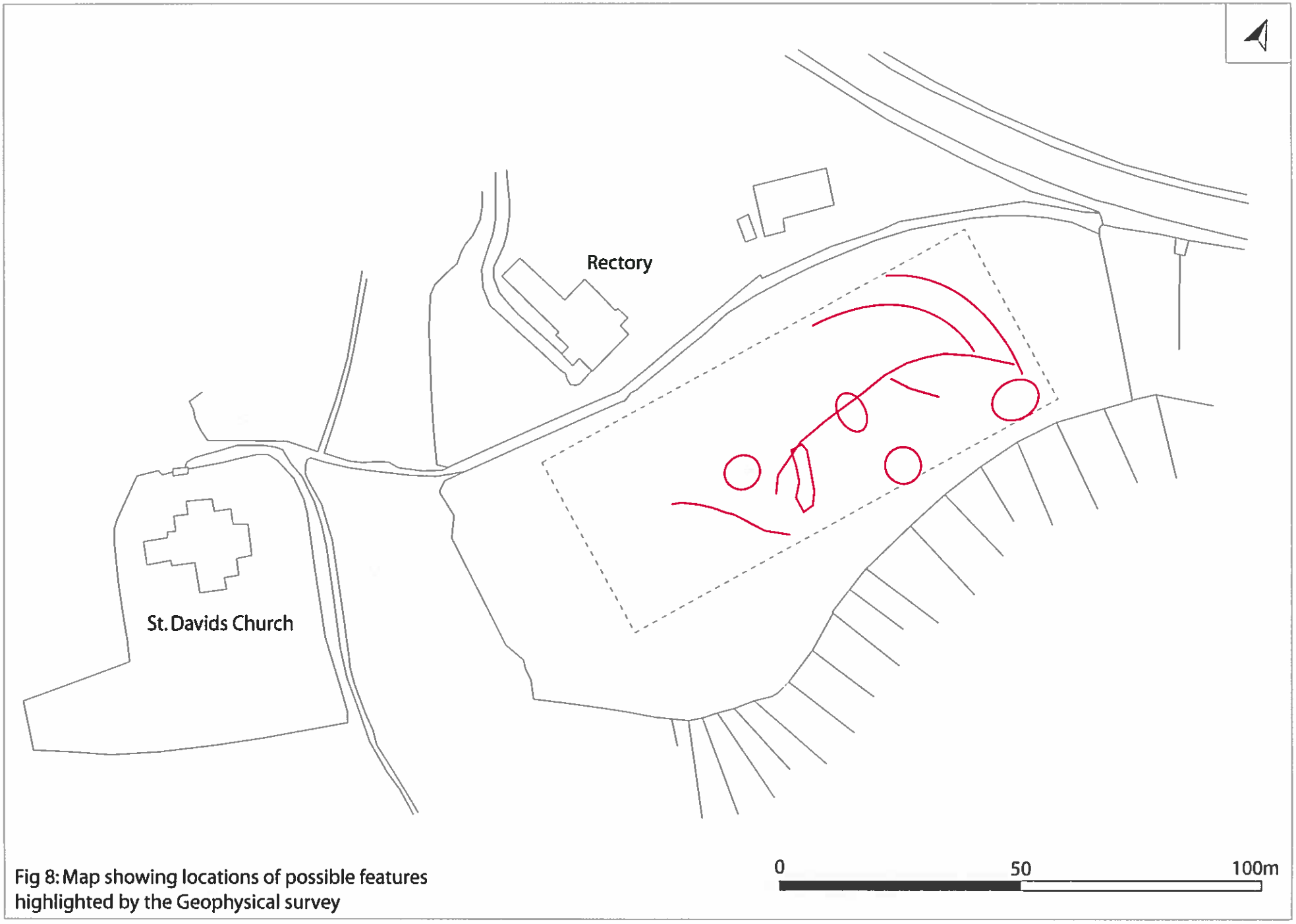

Fig 8: Map showing locations of possible features highlighted by the Geophysical survey

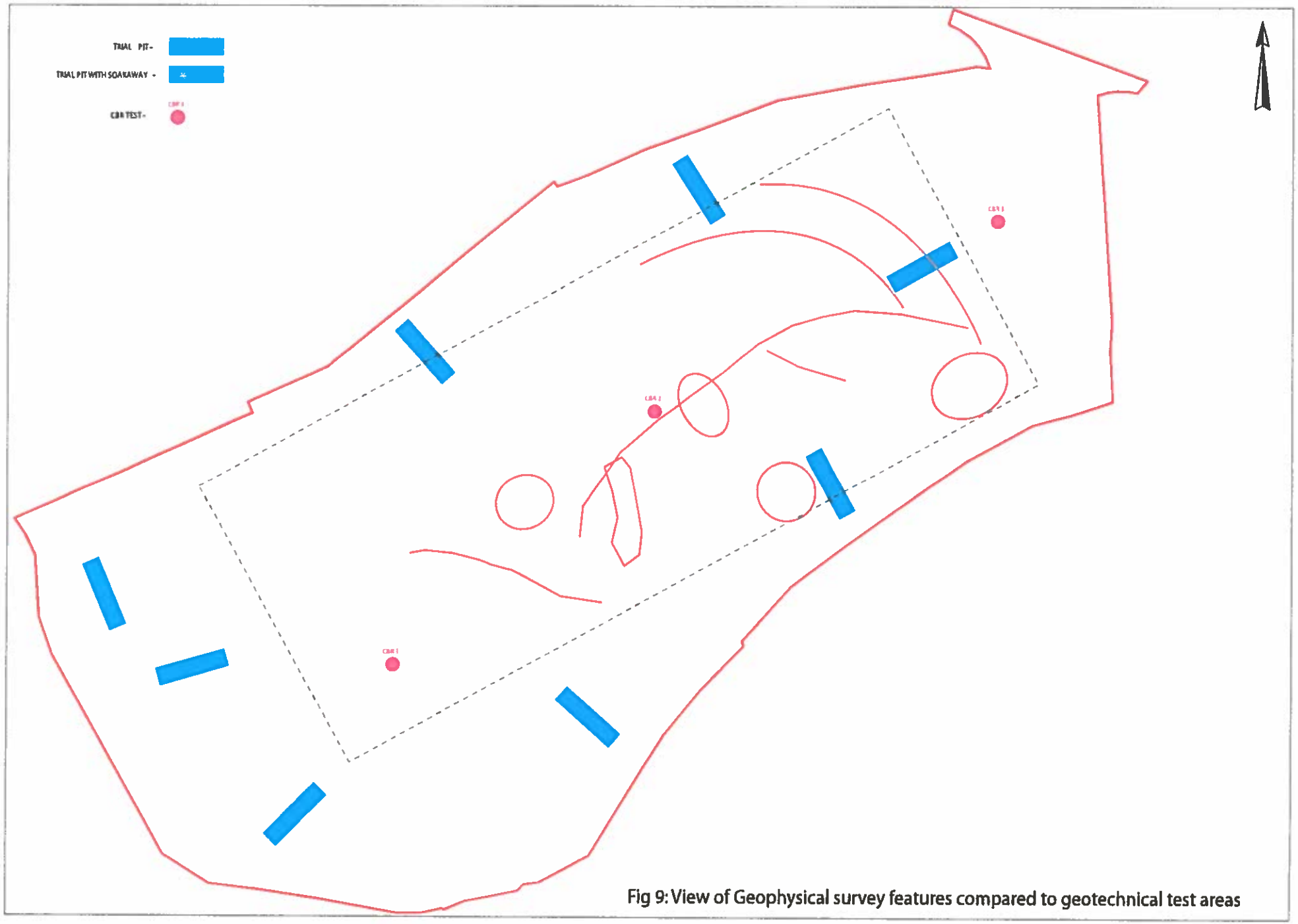

Fig 9: View of Geophysical survey features compared to geotechnical test areas

ARCHIVE COVER SHEET

Site Name:	Glebelands, Milford Haven
Site Code:	GMH/09/GEO
PRN:	-
NPRN:	-
SAM:	-
Other Ref No:	Report No. 561
NGR:	SM 89185 06255
Site Type:	Waste ground
Project Type:	Geophysical Survey
Project Manager:	Chris E Smith MA MIFA
Project Dates:	April 2009
Categories Present:	-
Location of Original Archive:	CAP Office
Location of duplicate Archives:	-
Number of Finds Boxes:	-
Location of Finds:	-
Museum Reference:	-
Copyright:	-
Restrictions to access:	None