BOURNE CASTLE
BOURNE, LINCOLNSHIRE

COUNTY MONUMENT LI 95

GEOPHYSICAL SURVEY

David Charles Hibbitt PIFA

CONTENTS

Acknowledgments

Thanks to:

Bill Manners

Bourne United Charities.

Dr. Glyn Coppack, Inspector of Ancient Monuments, English Heritage.

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DCH/BC001

Bourne Castle, Bourne, Lincolnshire
National Monument No: LI 95

1 **Project Title:** Bourne Castle
Dates of survey: 11th~12th March 2006

County: Lincolnshire
Parish:
Grid Reference: TF 094199
O.S Map: LR 130 (1:50 000)
Site Type: Probable castle with associated buildings

1.1 **Survey undertaken for:** Bill Manners
EH Inspector: Dr. Glyn Coppack
Surveyor: David Charles Hibbitt

1.2 **Solid Geology:** Middle Oolite: Corallian, Oxford Clays and Kellaways Beds
Drift Geology:

2 Purpose of Survey

To search for evidence through geophysical means for areas of 'potential archaeological interest' and to confirm the existence of any buried structural remains that may be associated with the documented but disputed existence of Bourne Castle.

3 Report Details

Title: Bourne Castle, Bourne, Lincolnshire
Author: David Charles Hibbitt
Date: March 2006
Number: DCH/BC001
Held by: Bill Manners/David Charles Hibbitt

3.1 Summary of report findings:

The resistance survey and subsequent interpretation of the results suggests that several anomalies of 'potential archaeological interest' have been located within the surveyed area.
After consultation with Dr. Glyn Coppack, Regional Inspector for English Heritage,
there is little doubt that the strong, curving anomaly to the south west is highly likely to be
the remains of a curtain wall with clear evidence for external square towers. Such distinct features date to C. 14th century. There are other anomalies within the surveyed area which are highly likely to be structural remains.
All the anomalies detected have the potential to be geological in origin. but given the clarity of the results this is unlikely.

3.2 Archaeological Feature Classifications Covered

Medieval castle site. *Evidence located by survey.*

3.3 Geophysical Techniques Used

Survey type: Resistance. Recorded grid
Area surveyed: 6525 sq. metres
Traverse separation: 1m
Reading interval: 1m
Instrument type: Resistance meter.
Instrument make: TR Systems
Electrode configuration: Twin probe
Electrode separation: 0.5m
Range setting: 200 Ohms.
Acquisition time: 1.5 seconds
Land use: Maintained parkland/short grass
Weather: Cool. Damp underfoot.

3.4 Principles of resistance surveying

The basis for this method is that electric currents are fed into the ground and the resistance to the flow of these currents is measured. Where they 'meet' buried wall foundations high resistance readings are recorded, while if silted-up ditches (which tend to be wetter than the surroundings) are encountered, low resistance readings ensue. By mapping zones of high and low resistance it is possible to identify, for example, the layout of buildings or the size and orientation of a ditched enclosure.
(Gaffney, C. & Gater, J. *'Revealing The Buried Past'* Tempus Publishing, 2003).

3.5 Known limitations of the survey technique

Resistivity surveying measures only high and low contact resistance in the soil, which can vary considerably, depending on the moisture present in the ground. The instruments used *do not* distinguish between archaeology and geology. Post-survey interpretation of the results is vital in the understanding of what the survey shows.

4 The geophysical (resistance) survey of Bourne Castle, Bourne, Lincolnshire

4.1 The survey

A geophysical (resistance) survey was carried out within part of the site where several years ago well defined, clear parch marks had been seen and photographed(Figs.7 and 8). Previous work in this area included a watching brief by Archaeological Project Services (APS) for a narrow water pipe, which uncovered some structural remains believed to be from a gatehouse and there is an account of an excavation in 1860 which uncovered some stonework believed to be contemporary with the castle.
The geophysical survey was carried out over two days and almost immediately it became apparent that there were anomalies being detected. The ground conditions were almost perfect for resistance surveying, as the moist ground would give good contrast against any drier stonework or rubble deposits. The survey was hampered slightly by areas of standing water, causing many 'null' readings (small white areas in the data), however, it was possible to survey through some of the shallower areas without compromising the data collected. There were slight concerns that later landscaping or consolidation of the grounds may cause difficulties with the survey.
The survey has been tied-in to local features. It is re-locateable and repeatable.

4.2 Data collection and processing

All the surveys were carried out using a TR Systems resistance meter using the standard remote twin-probe array. Fixed and mobile electrode spacing was set to 0.5m. Reading acquisition time was set to 1.5 seconds at 200 Ohms.
The data was logged in the meter and downloaded back at base onto a laptop PC running TR Systems software for handling the raw data information. Further processing of the data was carried out using Snuffler and Adobe Photoshop 7.
The finished plots and report were printed using a Xerox DC2060 colour digital press. The plots are displayed in their original raw data form and as several processed plots.

5 Interpretation of the results

The interpretation of the data (Fig.6) indicates that there are several high resistance anomalies which are likely to be substantial structural remains present within the surveyed area.

The distinctive shape of the curving anomaly to the south (Fig.6 A) is in a classic curtain wall style. Around the northern end of 'A' there are vestiges of possibly a secondary wall, or part of a curtain wall, close to and parallel with it. Stone curtain walls were usually made with a clay or rubble core with an ashlar facing laid in horizontal courses. The distance between the east and west wall of 'A' is approximately 30 metres. There appears to be several gaps in 'A' which although look like entrances are more likely to have been caused by tree root responses around the anomaly.

The square anomaly (Fig.6 B) is probably one of several external towers contemporary with anomaly 'A'. This anomaly, and part of the curving anomaly is without doubt the cause of the parch marks photographed several years ago (Fig.8).

There are several other strong anomalies (Fig.6 C, D & E) which all are likely to be structural remains. The excavation for the water pipe found the structural remains 'E', which at the time was interpreted as part of a gate house.

The apparent unevenness of edges to several of the anomalies is not expected to represent their exact shape in the ground. The unevenness is likely to be caused by demolition deposits or rubble spreads over the features. In extreme cases these deposits can mask of the true form of the features and show just as an area of high resistance with no form.

6. Conclusions

The purpose of the survey was to search for evidence using non-intrusive geophysical techniques for areas of any buried structural remains that may be associated with Bourne Castle.

The resistance survey has shown that there are many high resistance anomalies which have been well defined, suggesting a fair state of preservation. There are other similar responses within the surveyed areas which are less distinct, and therefore may suggest a poorer state of preservation.

Given the documentary evidence for the site, the many earthworks and parch-marks, previous excavations and the clear geophysics, it can therefore be concluded that there are substantial, well preserved and distinctly shaped structural remains on the site that could be associated with castle structures.

Figure 1 Location of Bourne, Lincolnshire

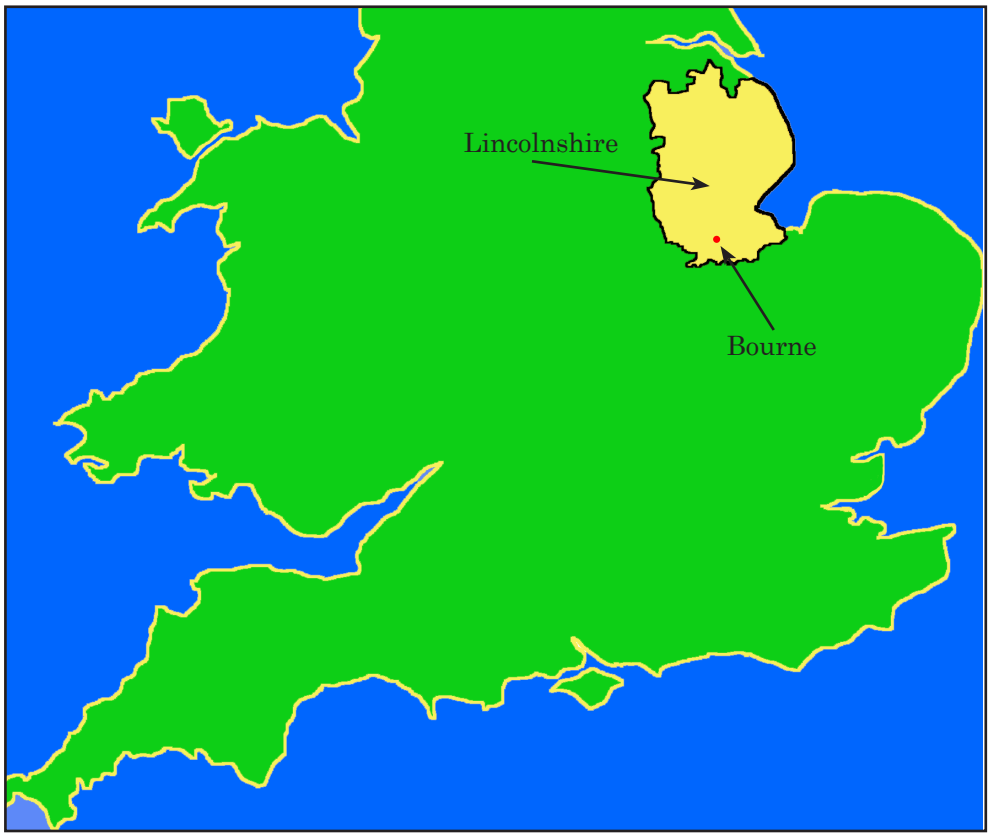
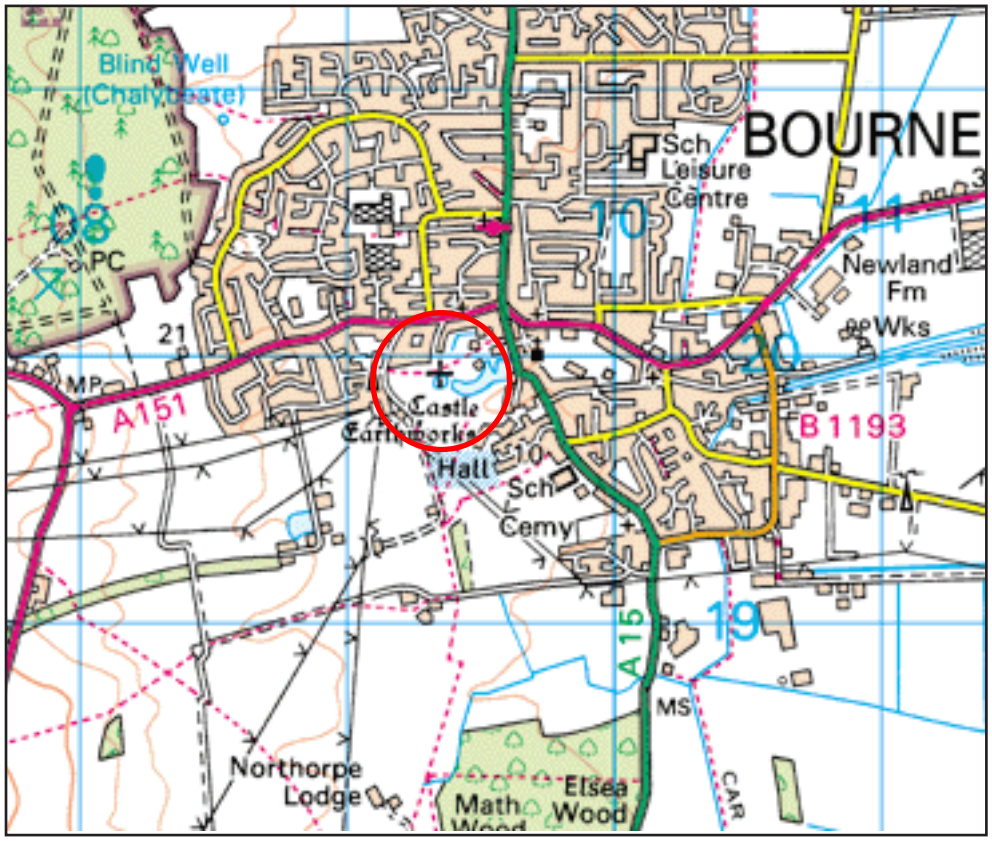


Figure 2 Location of site (circled in red)



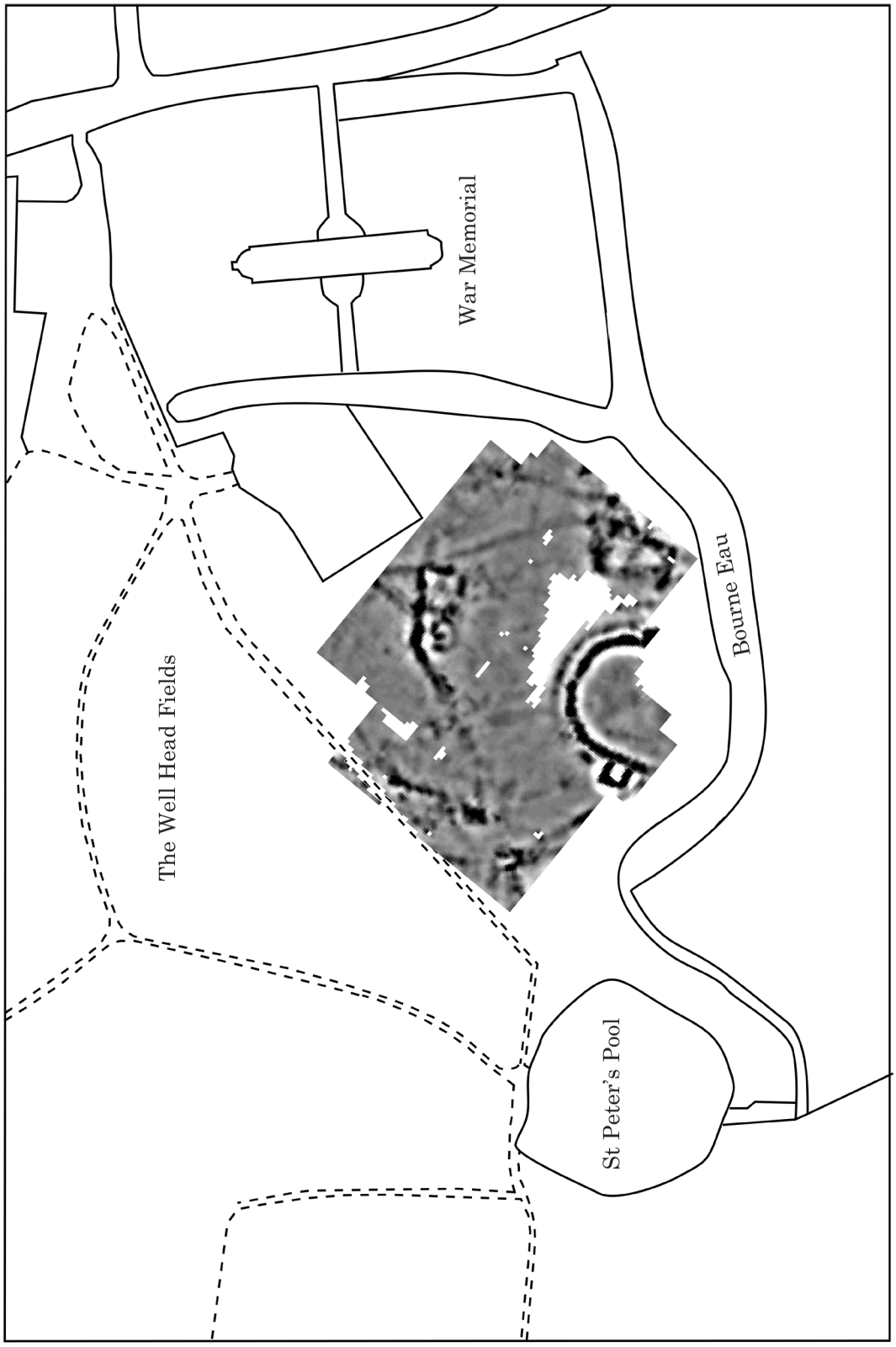


Figure 3 *Approximate* location of survey in relation to park features

Figure 3 Raw resistance data

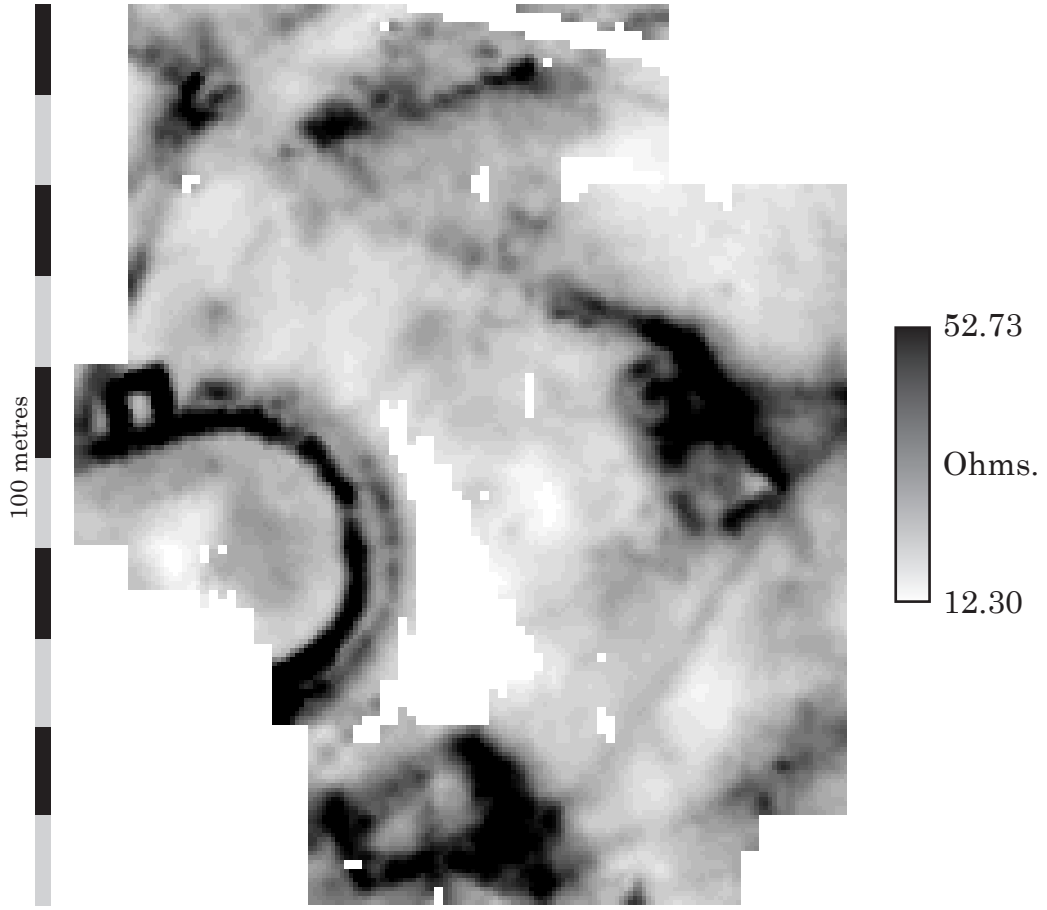


Figure 4 High pass filtered and interpolated data

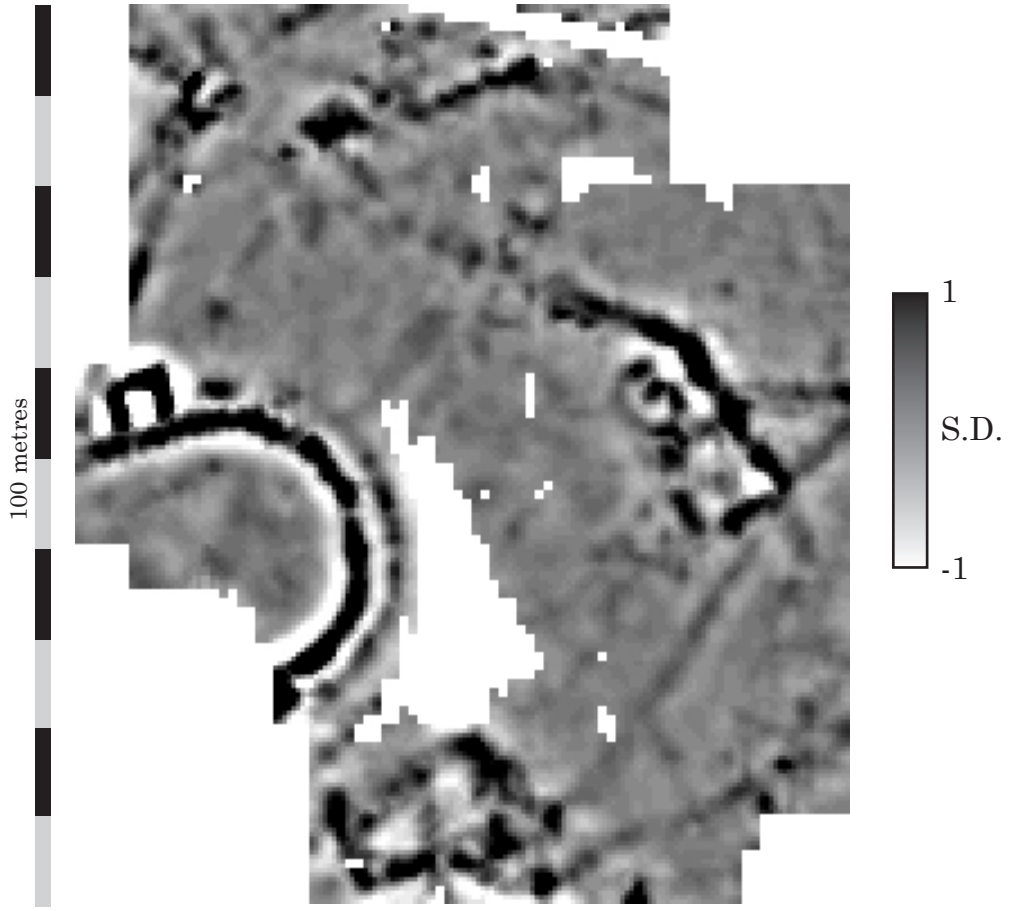


Figure 5 Relief plot

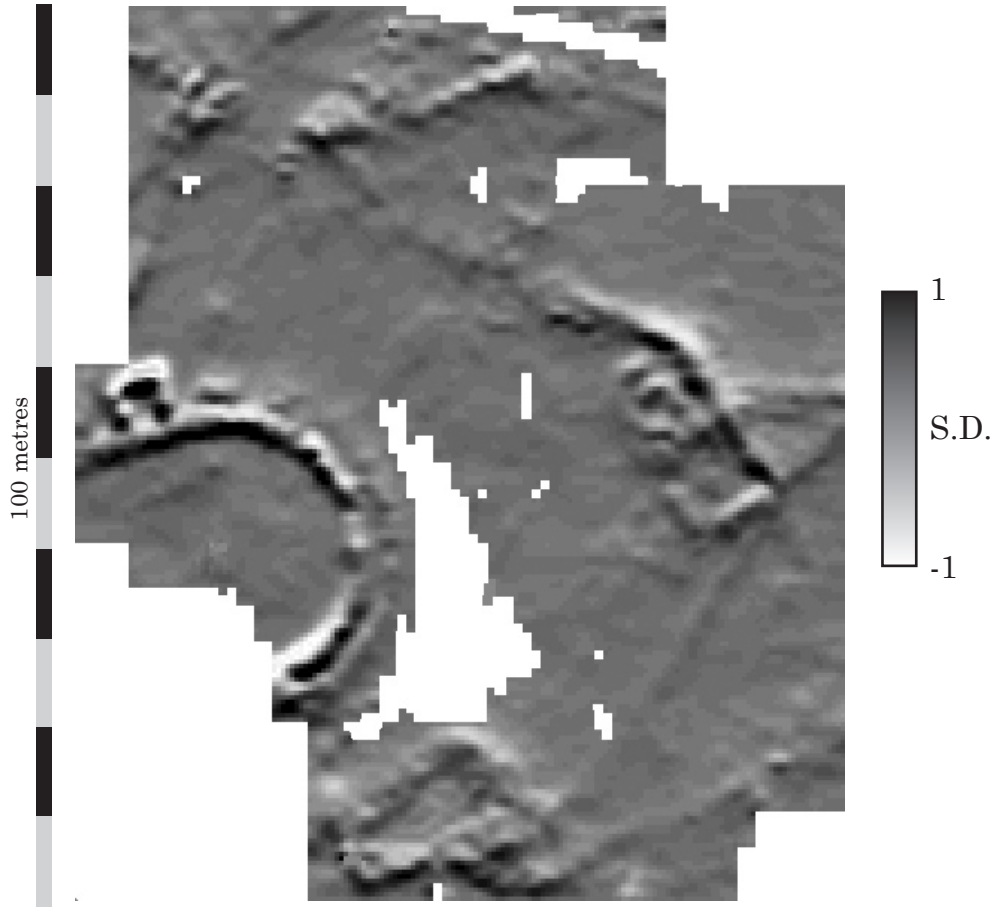


Figure 6 Interpretation (see text section 5)

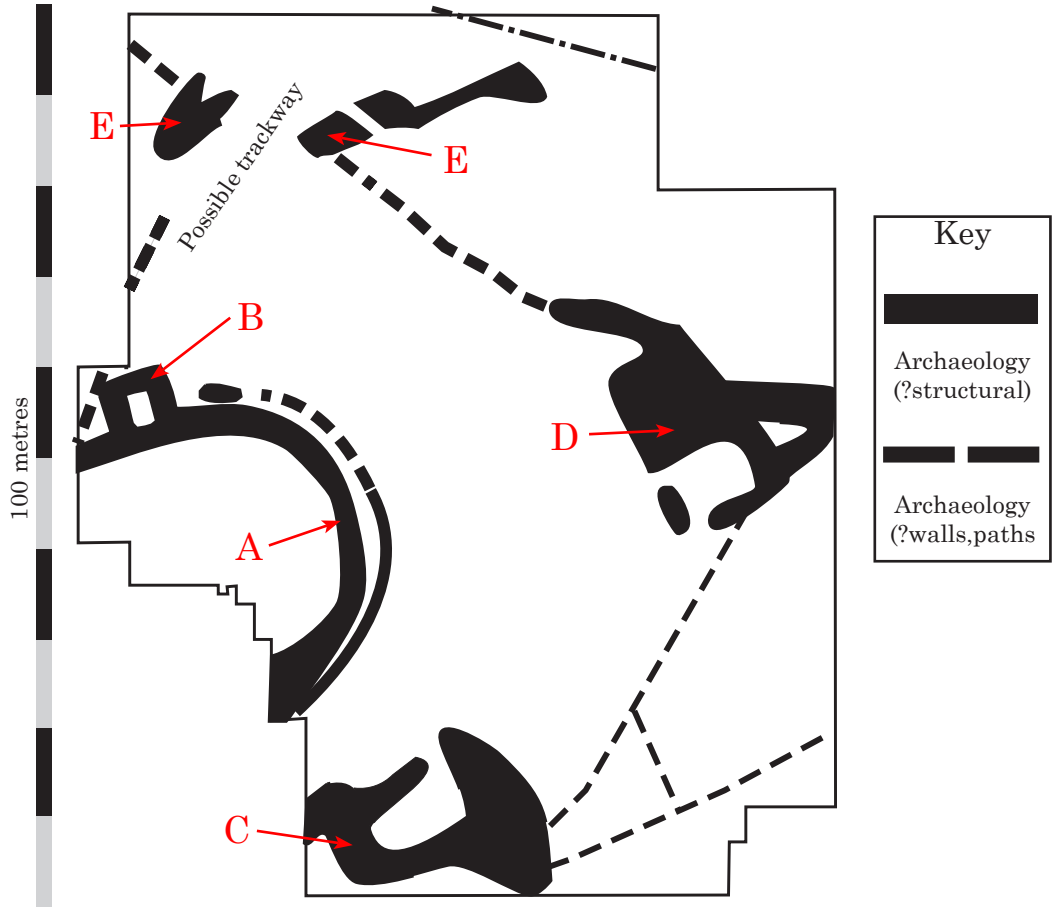


Figure 7 Parch mark close to the pipeline.

Figure 8 Parch mark from likely curtain wall and external tower.

Data statistics

All statistics based on raw data.

Area surveyed:	6525 Sq.metres
Readings:	6525
Max. reading:	52.732
Min. reading:	12.306
Mean:	18.877
Std. Dev.:	4.972

References

Gaffney, C. & Gater, J. 2003 *'Revealing The Buried Past'* Tempus Publishing.

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