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ARCHAEOLOGICAL REPORT

KINGSWAY, FISHTOFT

PRE-CONSTRUCT ARCHAEOLOGY (LINCOLN)

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# KINGSWAY, FISHTOFT

AN ARCHAEOLOGICAL REPORT

FOR

MR D NEWTON  
(CHESTNUT HOMES LTD.)

BY

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## 1.0 Non-technical summary

*Chestnut Homes Ltd, in response to a brief set by the Community Archaeologist for Boston, requested that a programme of assessment/evaluation be undertaken on c. 2.5 hectares of land situated to the south of Kingsway, Boston, Lincolnshire. The request follows an assessment and evaluation of an adjacent site (Palmer-Brown, 1995 unpublished) and may form the basis for a future watching brief during residential development.*

*The present study is a combined field walking and geophysical survey report.*

*The site central National Grid Reference is TF 343 431*

## 2.0. Introduction

This report was commissioned by Chestnut Homes Ltd. in advance of a housing development on c. 2.5 hectares of land situated on the south side of Kingsway, Boston, Lincolnshire (Fig. 1). As part of the overall recording strategy, arrangements were made for preliminary field investigations to take place: namely, gridded field walking followed by a selective geophysical (magnetometer) survey. The results of these independent surveys are presented at the back of this report (Appendix 1, Appendix 2).

The report was researched and written intermittently between November 6th and November 30th, 1995. Gridded field walking was undertaken on November 6th, and a selective programme of magnetometry took place on November 20th.

## 3.0. Location and description

Fishtoft lies in the silt fens of Lincolnshire, immediately east of Boston, c. 46km south-east of Lincoln. It is one in a series of thin parishes which skirts the west side of The Wash: to the north lie Frithville and Sibsey; to the east is Freiston, and to the south-west is Wyberton.

The development site is located immediately south of the rears of properties which front Kingsway, an east-west route which joins Fishtoft Road to the west and meets White House Lane to the east. The unit of land is broadly L-shaped in plan and is defined on its east and south sides by a series of drainage ditches.

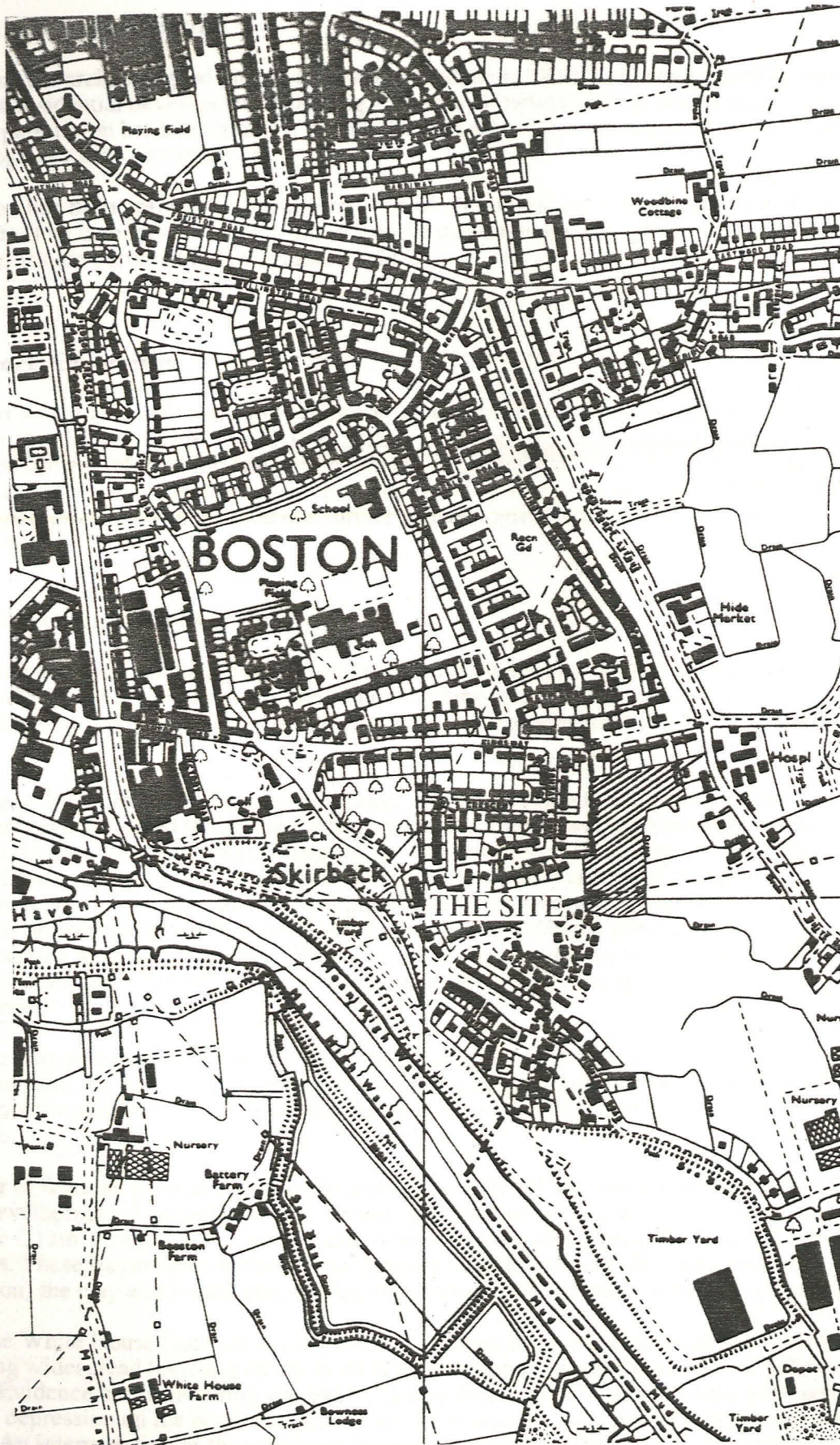
When the site was field walked on November 6th, 1995, most of the area was covered with a moderately dense blanket of stubble and weed vegetation. The site is predominantly flat, though there is a wide, shallow but noticeable, depression on the extreme east side (Fig. 2)

## 4.0 Geology and topography

The site lies in a predominantly flat environment, where the height above sea level is approximately 3.0m OD. The modern landscape, which overlies deep silt deposits, conceals an earlier landscape, aspects of which were exploited in earlier periods. This buried landscape is not flat, and this explains the intermittent occurrence of surface or near-surface, as well as deeply-buried, archaeological sites dating within the Roman or prehistoric periods. Fishtoft lies in a slightly elevated position - on a moraine which marks the limit of the Devensian ice sheet (Lane, 1993, 30).

At the adjacent site off White House Lane, archaeological and natural deposits were exposed beneath 30 - 35cm of humic silty clay topsoil.

Fig. 1 1:10,000 site location



## 5.0. Planning background

At the time the archaeological project brief was issued, permission had been granted in outline for a scheme of residential development (planning reference BO9/0445/95). It is now understood that full planning permission has been granted, though the consent is subject to a condition that a scheme of archaeological works be carried out.

Permission has been granted for the construction of 18 houses and 6 bungalows, as well as roads and sewers. The latter describes only phase 1 of the development, though the archaeological investigations are pertinent to both phases 1 and 2.

## 6.0 Report Objectives

The report aims to identify and assess archaeological deposits, without the use of intrusive means, which may be threatened by construction works associated with development. It seeks, in essence, to gather sufficient information and present interested parties with a set of data from which a reasoned and informed judgement may be made regarding any future archaeological requirement. If deemed appropriate, it is understood that further archaeological management will take the form of a watching brief.

## 7.0 Archaeological background

A programme of trial trenching was conducted on land sited immediately south-east of the present development (the White House Lane site). The trenching followed a magnetometer survey and field walking. Both techniques produced data indicative of buried remains of late Saxon and medieval date.

Trenching at White House Lane exposed a range of well-preserved settlement features, most of which were securely dated to the late C9th/early C10th; a period synonymous with the first Scandinavian incursions into eastern England (ie Viking raids). Within many of the excavated features (for the most part, extensive linear ditch-like features) were significant quantities of settlement debris, including charred cereal grains and well-preserved animal bones. The widespread occurrence of fired silt mixed with vegetable inclusion suggested the possibility that the fragments were associated with salt processing. However, when examined against the backdrop of what is a principally domestic assemblage, it now seems more likely these fragments were the fragile remains of structures.

These late Saxon features appeared to lie within a restricted zone on the south-east side of the White House Lane site: on the west and north sides, neither magnetometry or 'blind' trenching was able to demonstrate the continuation of the settlement, though remains of a later date were exposed on the north side.

A number of features were sampled on the north side of the White House Lane site, closer to the present development. A potentially large natural pool/channel appeared to be a focus of activity during the C13th: a series of pits were found in association with a widespread layer of fired clay fragments. These fragments could not be diagnosed, though it is possible (in the absence of further information) the clay was *briquetage*, a rather loose term applied to early salt making equipment.

During the White House Lane site investigation, a number of the local residents relayed information concerning widespread levelling on the north side of the site: apparently, a series of hollows were filled in. Evidence of this levelling was established archaeologically, and it would seem possible that an extant depression on the north-east side of the Kingsway site was part of this same group of hollows. An interpretation of these features has not been established.

## 8.0 Survey methodology

It was a requirement of the project brief that the investigation be based on two independent survey techniques, which could be examined against each other, and against data gathered at the White House Lane site. The combined sets of data will be used as a basis for determining the requirement/non-requirement and/or intensity of further archaeological management.

### 8.1 Gridded field walking

On November 6th, the entire site area was divided into 20.0m grid squares and was then walked-over in 5.0m transects. The conditions for field walking were not good as there was a considerable density of stubble and weed vegetation which, in places, concealed up to 75% of the soil surface.

A small collection of artefacts were picked-up, and the results of the survey are presented in Fig. 2. Finds were washed, marked, bagged and boxed, prior to their examination by J Young (City of Lincoln Archaeology Unit).

It will be noted that, of the small assemblage collected, most of the finds, which date broadly between the medieval and modern periods, were picked up on the north-east side of the development area. Most of the pottery sherds were from local medieval types, which could not be diagnosed (for the most part, the sherds were in a worn state, suggesting long-term exposure to ploughing)

On balance, even considered against the constraints outlined above, the size and character of the assemblage cannot be taken alone as a reliable indicator of buried *in situ* archaeological deposits: at least not in isolation

### 8.2 Geophysical Survey

On November 20th, 1995, a magnetometer survey was undertaken by GeoQuest Associates. The area selected was based on the field walking result, and on the proximity of medieval remains located on the north side of the White House Lane site: it was designed also to incorporate the depression seen on the east side of the Knigsway site.

The full magnetometer report may be read in Appendix 1 below, though a summary of the main points is presented thus:-

There is a strong magnetic anomaly in the southern part of the survey area, thought to reflect the proximity of a buried service pipe

There are dipolar anomalies over much of the site, indicative of ferrous litter: an apparent cluster, orientated broadly north-south, has been interpreted as a concentration of ferrous debris

Diffuse, lobate, positive and negative anomalies seen on the extreme east side were interpreted as geological rather than archaeological anomalies: a reflection, possibly of sub-surface topographical variation.

In consideration of this data, the following comments may be added, in the same order of presentation:

The service pipe detected in the present survey was located during a similar survey on the north-west side of the White House Lane site: it was also indicated on an architect's drawing

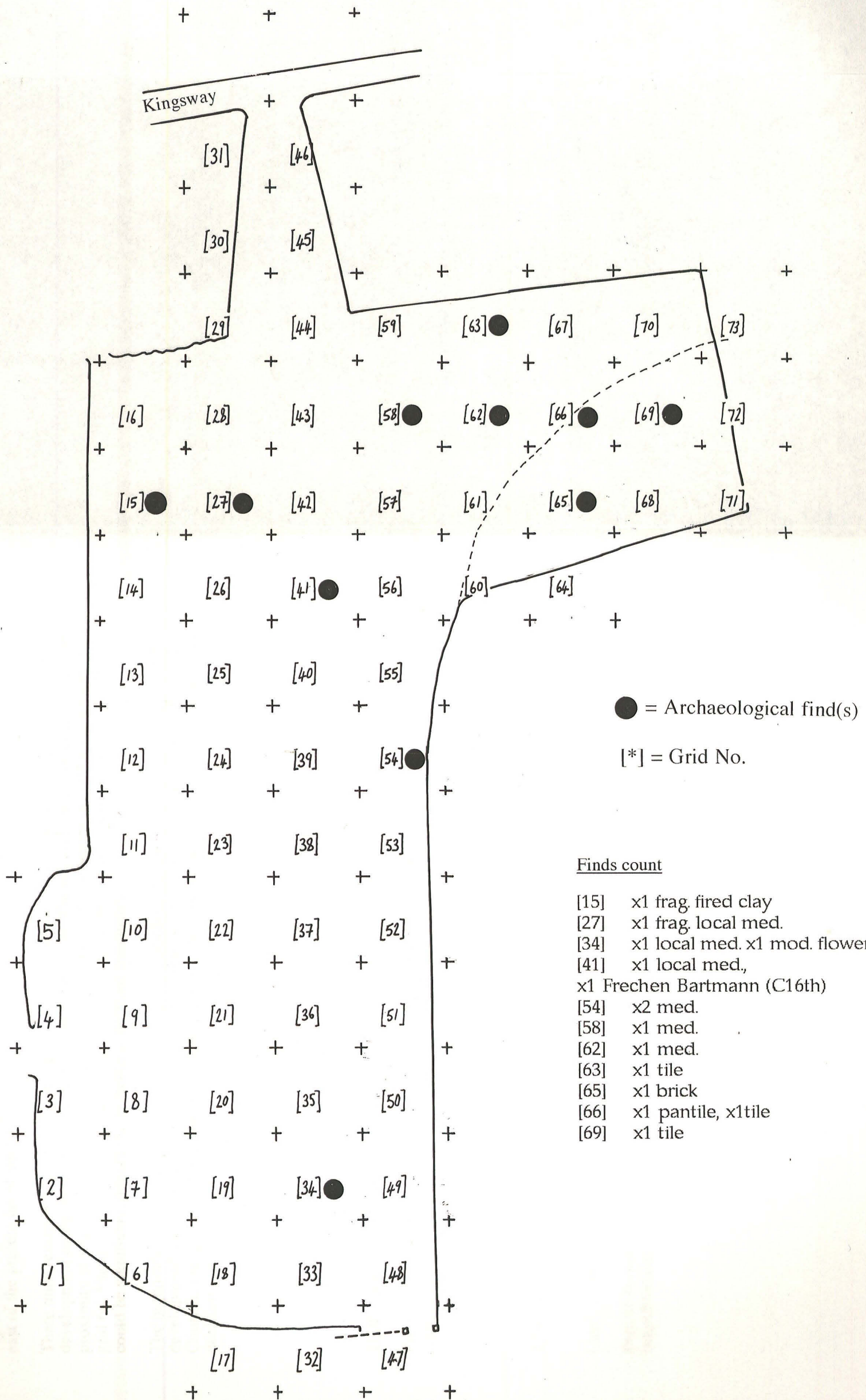
It has not been possible to suggest an interpretation for the so-named linear concentration of dipoles

The principal concentration of diffuse positive and negative anomalies seen on the east side of the site would appear to correspond broadly with the surface depression which has been noted in this area.

The geophysical survey has not produced any clear evidence of significant settlement features on the site.



Fig. 2 1:1000 plan of development site, incorporating field walking results



**9.0 Conclusions**

Data gathered during the compilation of this report suggests, on balance, that the archaeological potential of the site is low. The recovery of low concentrations of abraded medieval pottery and tile could be taken to reflect little more than incorporation via manuring (no freshly broken sherds were recovered). Similarly, the interpretation of the geometrical data presented by GeoQuest Associates does not appear to contradict the former survey.

Random trenching on the west side of the White House lane site (three trenches) failed to identify any archaeological remains, suggested that the important late Saxon settlement is confined to an area east of the present development.

There must remain a slight possibility that some medieval features will be disturbed as a result of development on the north-east side of the development site. The inference is drawn mainly from the proximity of known C13th deposits, which were exposed c. 50.0m south of field walking survey grid 64. Viewed in this context, the medieval pottery scatter on the north side of the present site could be significant, though the evidence is far from conclusive.

The requirement or non-requirement for further archaeological requirement on the site of proposed development must now rest on a judgement by the Community Archaeologist for Boston Borough Council. The purpose of this report has been to present an unbiased set of data from which any such decision may be drawn.

**10.0 Acknowledgements**

Pre-Construct Archaeology (Lincoln) would like to thank Mr D Newton of Chestnut Homes for commissioning this report.

**11.0 References**

Lane, T 1993 *East Anglian Archaeology* 66  
Palmer-Brown, CPH 1995 *Archaeological Field Evaluation Report: White House Lane, Fishtoft* (unpublished)

Appendix 1 Geophysical survey report (by GeoQuest Associates)

**GEOPHYSICAL SURVEYS AT  
FISHTOFT, BOSTON,  
LINCOLNSHIRE**

A programme of research carried out  
on behalf of

**PRE-CONSTRUCT ARCHAEOLOGY,  
LINCOLN**

and

**CHESTNUT HOMES**

by

**GeoQuest Associates**

## INTRODUCTION

This report presents the results of a geophysical survey on an area of land at Fishtoft, Boston. The aim of the study was to test for the presence of archaeological features beneath the present field prior to a proposed housing development.

The research was carried out on behalf of Pre-Construct Archaeology, Lincoln in accordance with a Brief supplied by Colin Palmer-Brown. The surveyed area is shown yellow in Figure 1.

## GEOLOGY, TOPOGRAPHY AND LANDUSE

The study site comprises part of a stubble field off Kingsway in Fishtoft, Boston and encompasses a level area of approximately 1 hectare. A 20-30 cm deep depression exists in the eastern corner of the study area.

Information provided by the Geological Survey indicates that the area is underlain by Ampthill and Kimmeridge Clays of the Upper Jurassic.

## THE GEOPHYSICAL SURVEY

Geophysical surveying provides a rapid method for the detection of subsoil features within archaeological landscapes. Two methods are most frequently used. *Geomagnetic* surveying employs a portable magnetometer to detect small perturbations in the Earth's magnetic field caused by changes in soil magnetic susceptibility or permanent magnetisation. The *resistivity* method, on the other hand, maps differences in soil electrical resistance which mainly reflect variations in water content.

Prior to the geophysical survey a programme of structured field walking had detected a low concentration of Medieval pottery and later artifacts suggesting that the site is situated close to a focus of Medieval settlement. Hence the aim of the survey at Fishtoft was to locate associated archaeological features such as stone and timber buildings, trackways, rubbish pits and ditches. Such features should be characterised by significant contrasts in magnetic susceptibility and so geomagnetic surveying was chosen as an appropriate technique for this investigation.

Measurements of vertical geomagnetic field gradient were made using an enhanced Geoscan FM36 fluxgate gradiometer with ST1 sample trigger. A zig-zag traverse scheme was employed and data were logged in units of 20 x 20m at 1.0 x 0.5m intervals. Appendix A provides further information about the techniques employed.

The GeoQuest *InSite* Windows program has been used to process the geophysical data and produce a grey-scale image at a scale of 1:750 (Figure 2) showing the residual geomagnetic anomalies. A convention is used that shows positive magnetic anomalies as dark grey and negative magnetic anomalies as light grey.

## RESULTS AND DISCUSSION

The first stage in the interpretation has been to extract significant anomalies in the geomagnetic data and present them on a map using coded colours and patterns (Figure 3). This drawing is based on a digitised version of a 1:500 site layout plan supplied by Chestnut Homes.

The three classes of anomalies which have been distinguished are as follows:

- 1 **Green:** Significant regions of anomalously high magnetic field gradient which might be associated with high susceptibility soil-filled structures such as pits or ditches.
- 2 **Blue:** Areas of anomalously low magnetic field gradient, corresponding to material with low magnetic susceptibility, such as stone drains or layers of limestone gravel.
- 3 **Red:** Strong dipolar anomalies (paired positive-negative) which, in this context, mostly reflect ferrous surface litter such as horseshoes and chain links.

The survey area is characterised by a low concentration of small dipolar anomalies which probably reflect ferrous litter. The following features have been identified (Figure 4):

- 1 The geomagnetic survey has detected a linear alignment of intense magnetic dipoles, oriented NW-SE, which extends across the southern part of the survey area. This geophysical feature probably reflects a metal service pipe.
- 2 A second chain of intense magnetic dipoles can be seen extending southwards from the northern edge of the study area. Since this feature is discontinuous, it seems unlikely to be due to a metal pipe and instead is thought to reflect a linear concentration of ferrous debris.
- 3 The results from the eastern side of the survey area are characterised by a pattern of diffuse, lobate, positive and negative magnetic anomalies. The geophysical nature of these anomalies suggest that they are geological, rather than archaeological in origin and may, for example, reflect the topography of more shallow bedrock in this part of the study area.

## SUMMARY AND CONCLUSIONS

The results of this research are summarised below:

- 1 Geomagnetic surveys have been carried out at Fishtoft in Boston, Lincolnshire in order to locate buried archaeological features prior to housing development.
- 2 A chain of intense magnetic dipoles was detected at the southern end of the study area and is thought to reflect the presence of a metal pipe.
- 3 The results from the eastern part of the survey area were found to contain an irregular pattern of amorphous magnetic anomalies. These geomagnetic features are probably due to the geology of the area.
- 4 No geophysical anomalies of archaeological interest were detected in the study area.

## CREDITS

Field survey: D.N. Hale, R. Grove

Graphics and report: R. Grove

Date: 28th November 1995

**Note:** Whilst every effort has been taken in the preparation and submission of this report in order to provide as complete an assessment as possible within the terms of the brief, GeoQuest Associates cannot accept any responsibility for consequences arising as a result of unknown and undiscovered sites or artifacts.

Kingsway



KINGSWAY, FISHTOFT  
SURVEY LOCATION

0 scale 1:750 50m

survey by



for



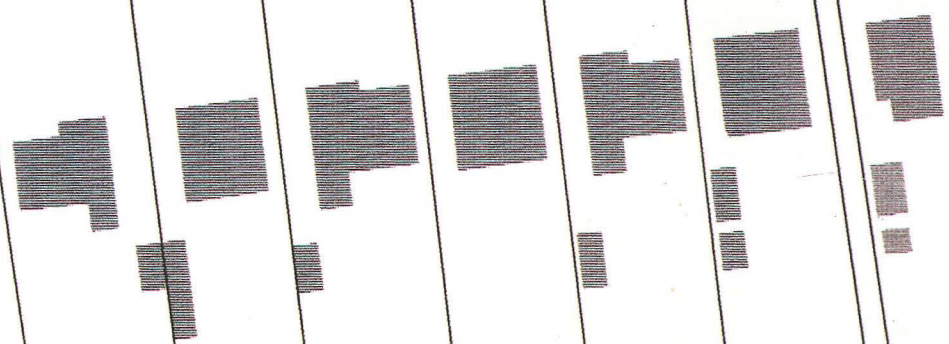
and



FIGURE I



Kingsway



**KINGSWAY, FISHTOFT  
SURVEY LOCATION**

0 scale 1:750 50m

survey by



for



and



**FIGURE 1**

Kingsway



KINGSWAY, FISHTOFT  
SURVEY RESULTS

0 scale 1:750 50m

survey by

**GeoQuest**  
ASSOCIATES

for

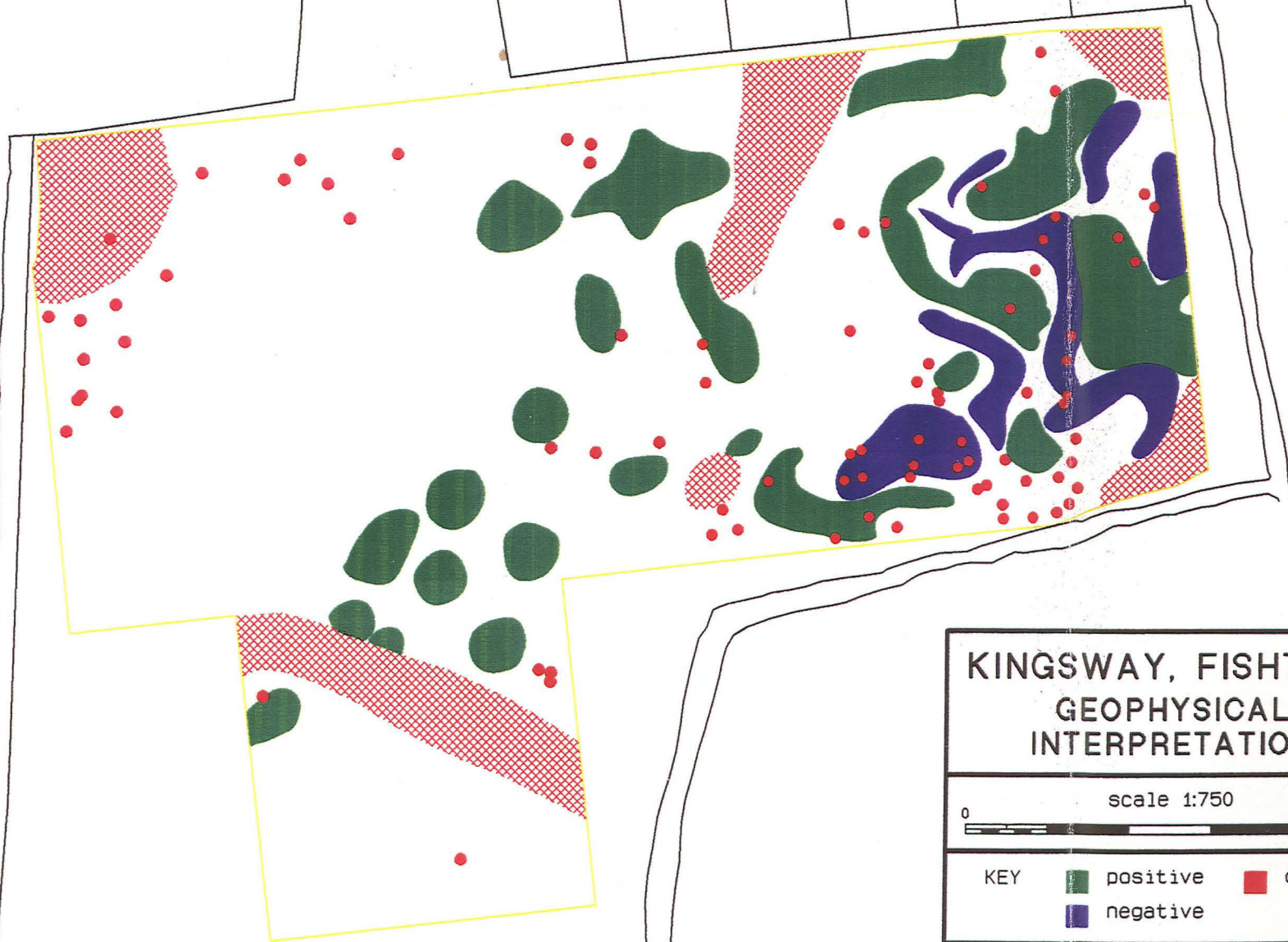
  
**chestnut**  
HOMES

and

**PCA**  
PRE-CONSTRUCT ARCHAEOLOGY




FIGURE 2

Kingsway



**KINGSWAY, FISHTOFT  
GEOPHYSICAL  
INTERPRETATION**

0 scale 1:750 50m

KEY     positive     dipolar  
          negative

survey by

**GeoQuest**  
ASSOCIATES

for

  
**chestnut**  
HOMES

and

**PCA**  
PRE-CONSTRUCT ARCHAEOLOGY

**FIGURE 3**

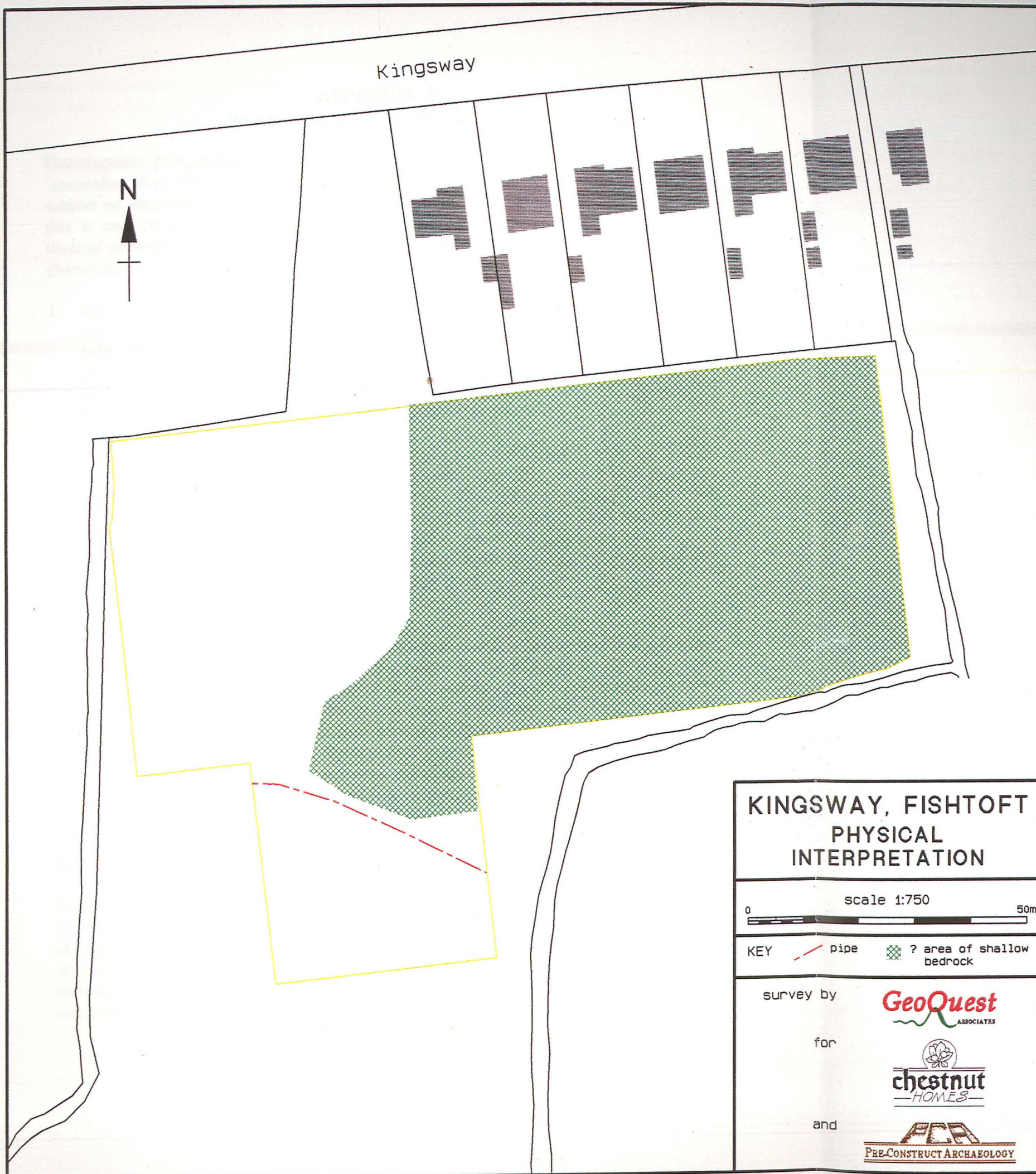


FIGURE 4

## APPENDIX A

### *Principles of Geomagnetic Surveying*

Geomagnetic prospecting detects subsurface features in terms of the perturbations or 'anomalies' that they induce in the Earth's magnetic field. In contrast to resistivity, seismic or electromagnetic surveying, no energy is injected into the subsoil and hence this is one of a class of *passive* geophysical techniques that includes gravity and thermal surveying. In an archaeological setting two types of magnetic anomalies can be distinguished:

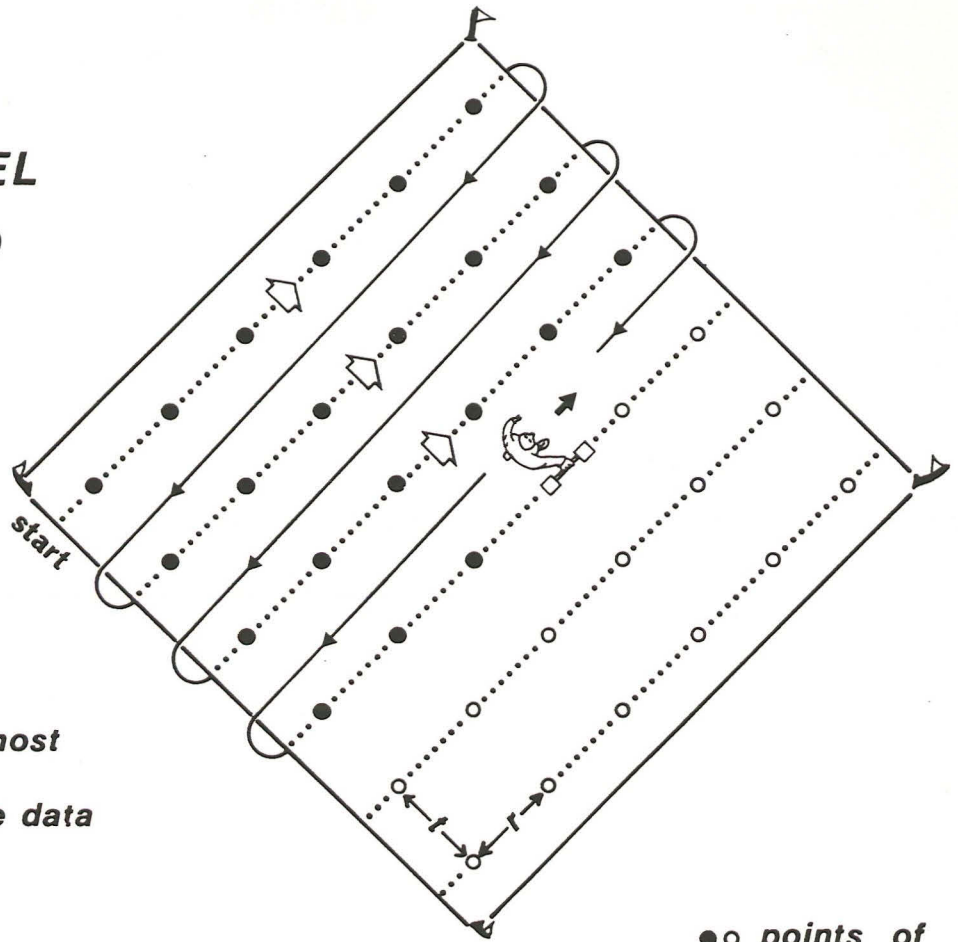
- 1 Anomalies arising from variations in *magnetic susceptibility* which will modulate the component of magnetisation *induced* in the subsurface by the Earth's magnetic field. For most archaeological sites, this is the dominant factor giving rise to geomagnetic anomalies. In general, susceptibility is relatively weak in sediments, such as sandstones and enhanced in igneous rocks and soils, especially those which have been burnt or stratified with organic material.
- 2 Anomalies due to large, *permanently magnetised* structures. Such permanent magnetisation or 'remanence' arises when earth materials are heated to above  $\sim 600^{\circ}\text{C}$  and cooled in the geomagnetic field. Thus kilns and hearths are often detected as strong permanent magnets causing highly localised anomalies that dominate effects due to background susceptibility variations. Remanence can result from other physical and chemical processes but these give rise to anomalies that are usually unimportant for geophysical prospecting.

There are several approaches towards the practical measurement of geomagnetic anomalies. In this study measurements were made using a Geoscan FM36 fluxgate gradiometer which records the change with height in the vertical component of the Earth's magnetic field, as shown overleaf. This method has the advantage of being insensitive to diurnal variations while the Geoscan instrument also benefits from an integrated data logger. Note that in mid northern latitudes the magnetic anomaly will be asymmetric with the main peak displaced to the south of the archaeological feature. Thus, a ditch filled with a soil of enhanced susceptibility, for example, will generate a positive anomaly to the south, mirrored by a weak negative anomaly north of the feature. When portrayed as an area map of grey tones this gives rise to a 'shadowing' or pseudo relief effect which must be borne in mind when making an archaeological interpretation.

Two techniques can be used to survey gridded areas using the fluxgate magnetometer. In the parallel method the instrument is used to scan the area along traverses which are always in the same direction. This method minimises 'heading errors' due to operator and instrument magnetisation but is time consuming. The alternative zig-zag method is significantly faster and suitable for areas where anomalies are large compared to these and other sources of error.

# SURVEY SCHEMES

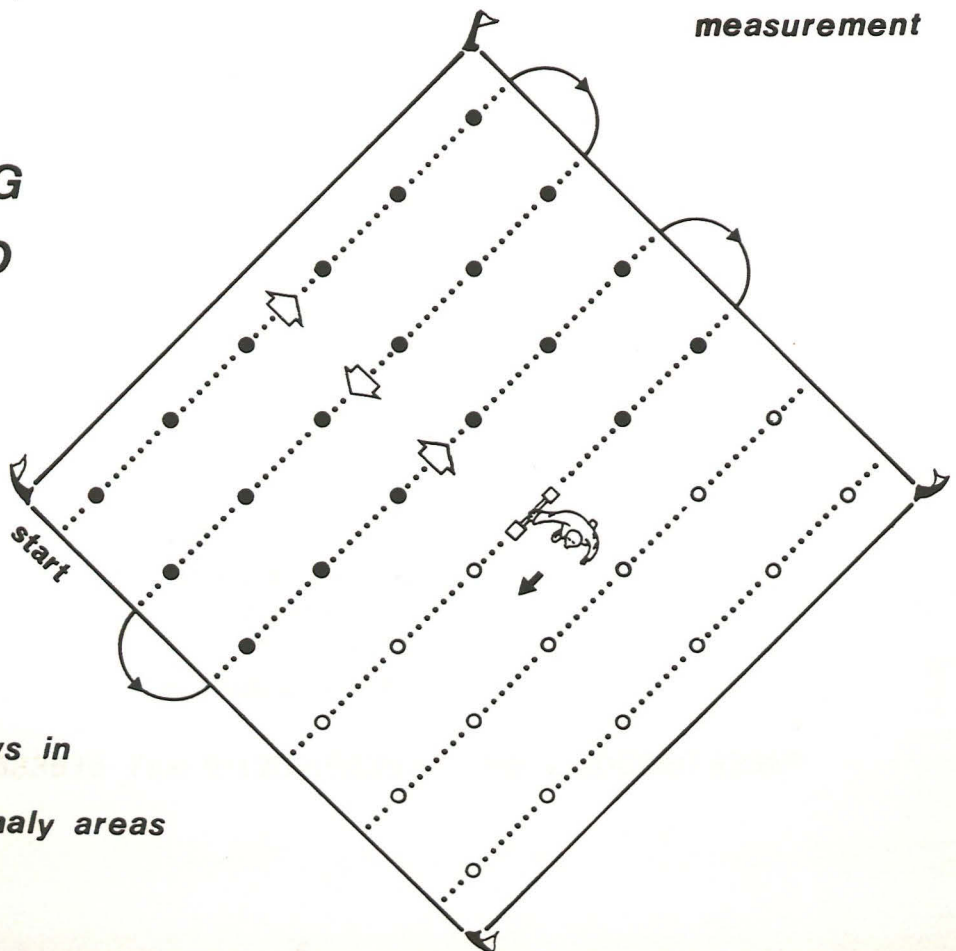
## PARALLEL METHOD



*slower but  
minimises most  
errors in the data*

●● points of  
measurement

## ZIG-ZAG METHOD



*suitable for  
rapid surveys in  
strong anomaly areas*

## NOTES

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