ARCHAEOLOGICAL SERVICES WYAS

Castle Hill Motte and Bailey Castle
Mirfield
West Yorkshire

Geophysical Survey

Report no. 2660

October 2014

Client: John Wheelwright Archaeological Society

REGISTERED IA ORGANISATION

Castle Hall Hill Motte and Bailey Castle
Mirfield
West Yorkshire

Geophysical Survey and Map Regression

Summary

A small parcel of land immediately north of St Mary's Church and east of Castle Hall Hill in Mirfield was subject to a geophysical survey (magnetometer and earth resistance) in order to inform a National Heritage Open Weekend event and to aid future archaeological investigations on the site. The magnetic survey has identified a linear anomaly on the line of a boundary feature which is depicted on modern mapping but which may have earlier origins. The resistance survey has not identified this feature but has located a rectangular area of high resistance consistent with a rubble spread or the in situ remains of a structure. This may locate a building depicted on mid-19th century maps and plans.

ARCHAEOLOGICAL
SERVICES
WYAS

Report Information

Client:	John Wheelwright Archaeological Society
Address:	31 Black Hall Drive, Mirfield, West Yorkshire
Report Type:	Geophysical Survey
County:	West Yorkshire
Grid Reference:	SE 21113 20450
Period(s) of activity:	Medieval?/Post Medieval
Report Number:	2660
Project Number:	4266
Site Code:	MFC14
OASIS ID:	archaeol11-194539
Planning Application No.:	n/a
Museum Accession No.:	n/a
Date of fieldwork:	August 2014
Date of report:	October 2014
Project Management:	Sam Harrison BSc MSc MIfA
Fieldwork:	Christopher Sykes BA MSc
	Tom Fildes BA
	Megan Clement BA
Report:	David Harrison BA MSc MIfA
Illustrations:	David Harrison
Photography:	Site staff
Research:	n/a

Authorisation for distribution: --

PO Box 30, Nepshaw Lane South, Morley, Leeds
LS27 0UG
Telephone: 0113 383 7500.
Email: admin@aswyas.com

Contents

List of Figures

List of Plates

1 Introduction

Archaeological Services WYAS (ASWYAS) were commissioned by the John Wheelwright Archaeological Society, to undertake a geophysical (magnetometer and earth resistance) survey on land to the north of St. Marys Church, Mirfield and immediately east of Castle Hall Hill motte and bailey castle. The results of the survey will inform a National Heritage Open Weekend event. The work was undertaken in accordance with a Project Design (Harrison 2014) supplied to and approved by Stuart Wrathmell (Head of Heritage – Archives, Archaeology, Ecology at West Yorkshire Joint Services) and with guidance contained within the National Planning Policy Framework (NPPF 2012) and in line with current best practice (David *et al*. 2008). The survey was carried out on August 1st 2014 to provide additional information on the archaeological resource of the site.

Site location, topography and land-use

The town of Mirfield is located on the A644 road between Brighouse and Dewsbury in the Metropolitan Borough of Kirklees, West Yorkshire. Castle Hall Hill lies on the eastern edge of the town, centred at SE 21113 20450 (see Fig. 1). It is bound to the west by Dunbottle Lane, to the south by St Mary's Church and to the north and east by a cemetery. The motte at Mirfield is a 10 metre high mound which is surrounded by an 8 metre wide ditch. The survey area comprised a small lawn to the rear of the church and immediately east of the motte (see Fig. 2; Plate 1).

Soils and geology

The underlying geology comprises sandstone of the Falhouse Rock Formation. No superficial deposits are recorded (British Geological Survey 2014). The soils in this area are unclassified but are thought to comprise slowly permeable, seasonally wet loams and clays of the Dale Soil Association (Soil Survey of England and Wales 1983).

2 Archaeological Background and Map Regression

Castle Hall Hill is a motte and bailey castle which is protected as a scheduled monument (Ref. 1009929). The castle is thought to have been built between 1086 and 1159 by Swein, son of Alaric, one of the foremost knights in the honour of Pontefract. The motte is a 10 metre high mound which would have been topped by a wooden keep. It is surrounded by an 8 metre wide ditch. On the eastern side of the motte, the surrounding ditch is interrupted by a causeway which is thought to have allowed access to the bailey. The exact location of the bailey is unknown but is thought to be obscured by the present parish church of St Mary, a Victorian edifice, and the modern graveyard. The motte is thought to have been occupied until the late medieval period, when the castle was replaced by a timber-framed manor house, Castle Hall, and it is this building that is depicted on cartographic sources between 1720 and

1855 (see Figure 3 to Figure 8). A cluster of outbuildings are depicted to the south and east of Castle Hall with formal gardens to the west. The Whitley Beaumont estate map of 1720 shows a north-east/south-west orientated outlying structure to the north of Castle Hall, within the centre of the survey area. An outlying structure is also shown on the 1850 plan of Cote Wells estate (see Fig. 7) and on the 1855 first edition Ordnance Survey map (see Fig 8) although it is unclear whether these indicate the same structure. Two linear boundary features are also shown within the survey area on all but the earliest cartographic source. The southernmost of these appears on a north-east/south-west alignment and appears to be a continuation of a curving boundary feature forming an oval enclosure, perhaps demarcating the actual location of the bailey (see Fig. 8). Castle Hall was replaced by the current church in 1871 (see Fig. 2).

3 Aims, Methodology and Presentation

The aims and objectives of the programme of geophysical survey were to gather sufficient information to establish the presence/absence, character and extent of archaeological remains to the immediate east of the motte in order to inform the National Heritage Open Weekend event and aid future archaeological investigations on the site. Specifically, it was hoped that the survey may identify anomalies locating the bailey ditch.

Magnetometer survey

The site grid was laid out using a Trimble VRS differential Global Positioning System (Trimble 5800 model). Bartington Grad601 magnetic gradiometers were used during the survey, taking readings at 0.25m intervals on zig-zag traverses 1m apart within 20m by 20m grids, so that 1600 readings were recorded in each grid. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Geoplot 3 (Geoscan Research) software was used to process and present the data. Further details are given in Appendix 1.

Earth Resistance survey

A Geoscan RM15 resistance meter was used, with the instrument logging each reading automatically at 1m intervals on traverses 0.5m apart. The mobile probe spacing was 0.5m with the remote probes 15m apart and at least 15m away from the grid under survey. This mobile probe spacing of 0.5m gives an approximate depth penetration of 1m for most archaeological features. Further details are given in Appendix 2.

Reporting

A general site location plan, incorporating the 1:50000 Ordnance Survey (OS) mapping, is shown in Figure 1. Figure 2 is a large scale (1:1000) location plan displaying the processed earth resistance data. Figures 3 to 8 show historical mapping at an approximate scale of

1:2000. Detailed data plots ('raw' and processed) and full interpretative figures are presented at a scale of 1:500 in Figures 9 to 14 inclusive.

Further technical information on the equipment used, data processing and survey methodologies are given in Appendix 1, Appendix 2 and Appendix 3. Appendix 4 describes the composition and location of the site archive.

The survey methodology, report and any recommendations comply with the Project Design (Harrison 2014) and guidelines outlined by English Heritage (David *et al.* 2008) and by the Institute for Archaeologists (IfA 2013). All figures reproduced from Ordnance Survey (OS) mapping are with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The figures in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All figures are presented to most suitably display and interpret the data from this site based on the experience and knowledge of Archaeological Services staff.

4 Results and Discussion

Magnetometer Survey (see Figures 9, 10 and 11)

The magnetic background is extremely variable with a broad area of magnetic disturbance in the southern half of the survey area. This disturbance is likely to result from ground disturbance and episodes of landscaping. A high-magnitude linear anomaly, **A**, has, however, been identified aligned east/west and this corresponds closely to a boundary which is depicted on current Ordnance Survey mapping, but no longer extant. It is considered likely that this cartographic detail is the remnant of the boundary feature depicted on historical mapping. If so, it is possible that the anomaly is caused by magnetically enhanced material such as rubble and domestic debris contained within a back-filled ditch. To the north of the survey area, several areas of magnetic enhancement have been interpreted as being of archaeological potential, however, no clear archaeological patterns are visible and variations in the depth and composition of the topsoil due to modern landscaping may account for these anomalies.

Earth Resistance Survey (see Figures 12, 13 and 14)

The earth resistance survey has recorded a high resistance rectangular anomaly, **B**, towards the centre of the survey area. The anomaly measures at least 16 metres in diameter and it is likely that it is caused by the rubble and/or *in situ* remains of a former building. Elsewhere, variations in resistance have been identified creating amorphous high resistance anomalies. No clear archaeological pattern is visible and it is likely that the anomalies are caused by variations in the composition of the sub surface deposits. No anomalies have been identified in the earth resistance survey which correspond to the possible boundary feature, **A**, identified in the magnetometer survey

5 Conclusions

Although the surveys have covered a relatively small area both have identified anomalies consistent with the presence of sub-surface features. The magnetic survey has located a linear feature towards the southern end of the site that probably corresponds with a boundary feature recorded on modern mapping but which is also recorded on plans dating back to at least the early 19th century. The resistance survey has not identified this feature but has located an area of high resistance towards the southern end of the site that is probably caused by a spread of rubble or building remains. This anomaly probably also corresponds with the approximate location of a structure shown on 19th century maps and plans. Either or both anomalies could provide the focus of any future excavation at the site.

The results and subsequent interpretation of data from geophysical surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by direct investigation of sub-surface deposits.

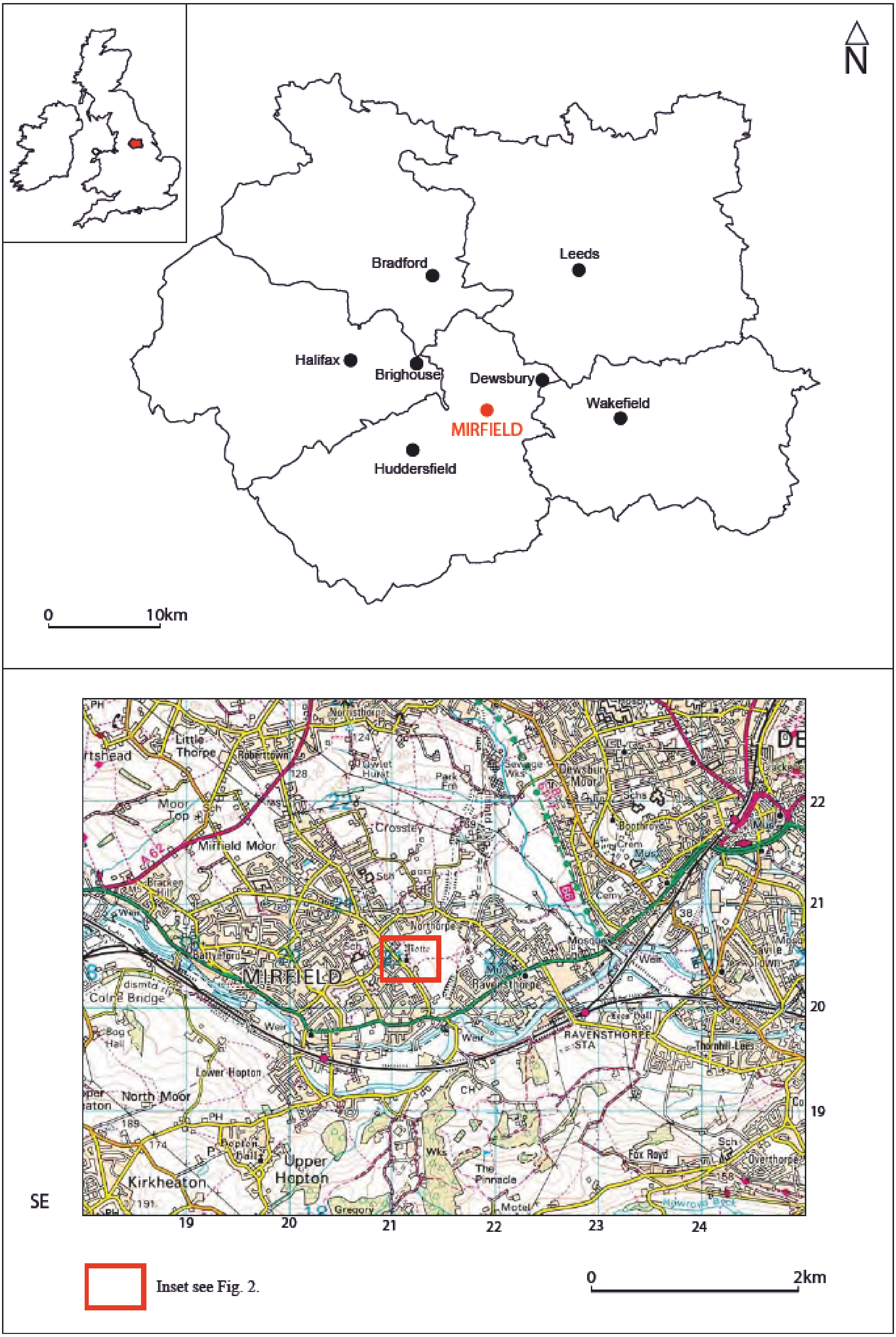

Fig. 1. Site location

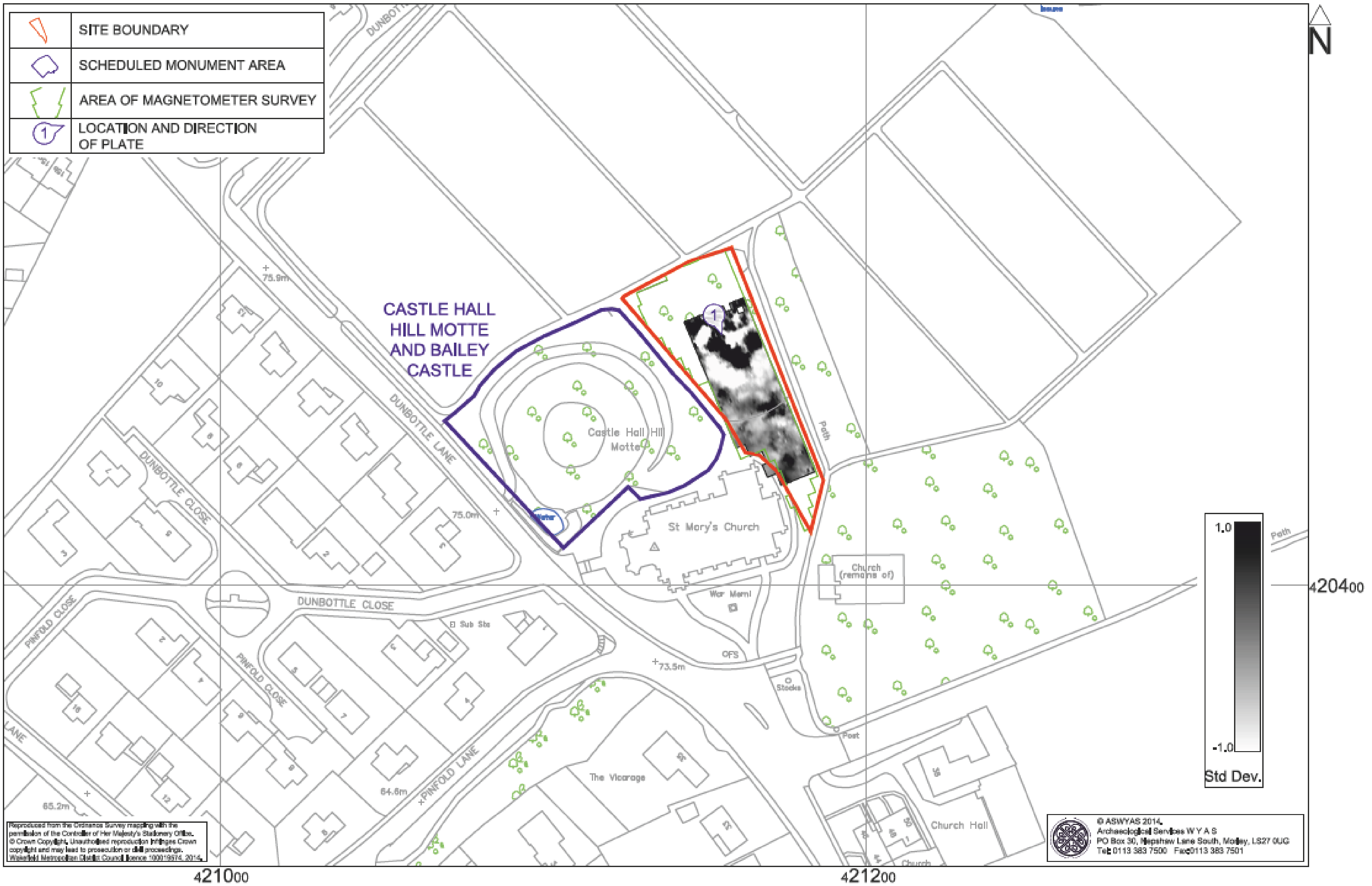

Fig. 2. Survey location showing processed earth resistance data (1:1000 @ A4)

Figure 3. Extract from map of Whitley Beaumont estate in Mirfield, Kirkheaton, Lepton and Whitley townships (1720) showing the old church, Castle Hall and a building within the survey area (1:2000)

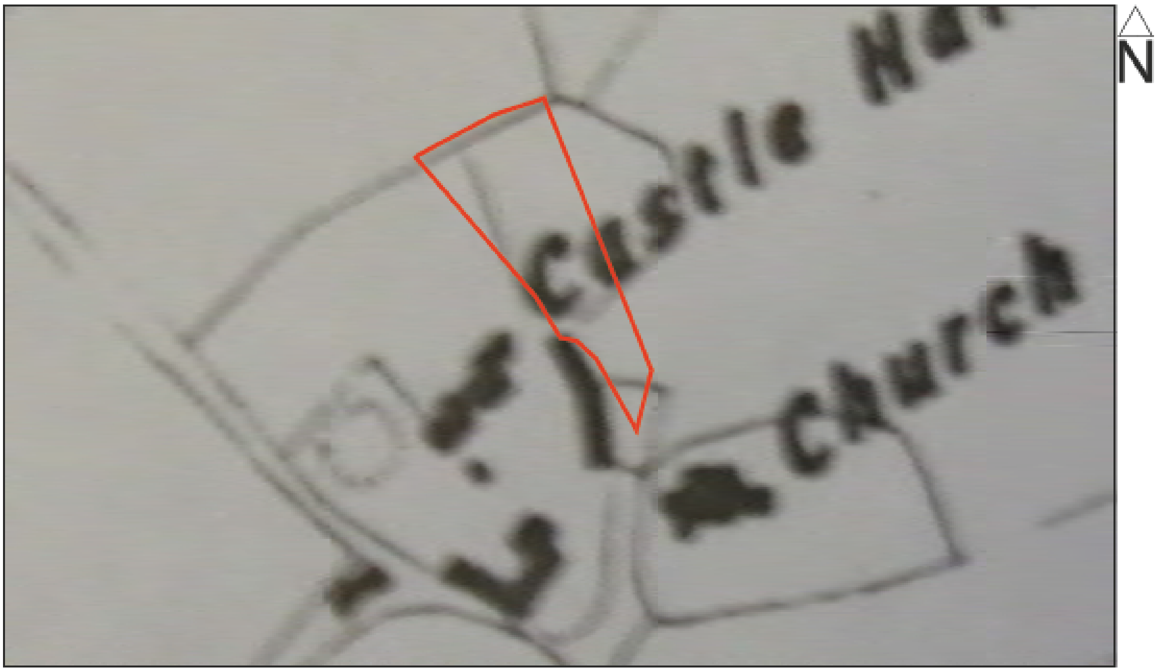

Figure 4. Extract from map of Mirfield township as it was in 1819 (1:2000)

Figure 5. Extract from plan of Whitley Beaumont estate in Mirfield township (1821) showing boundary features within the survey area (1:2000)

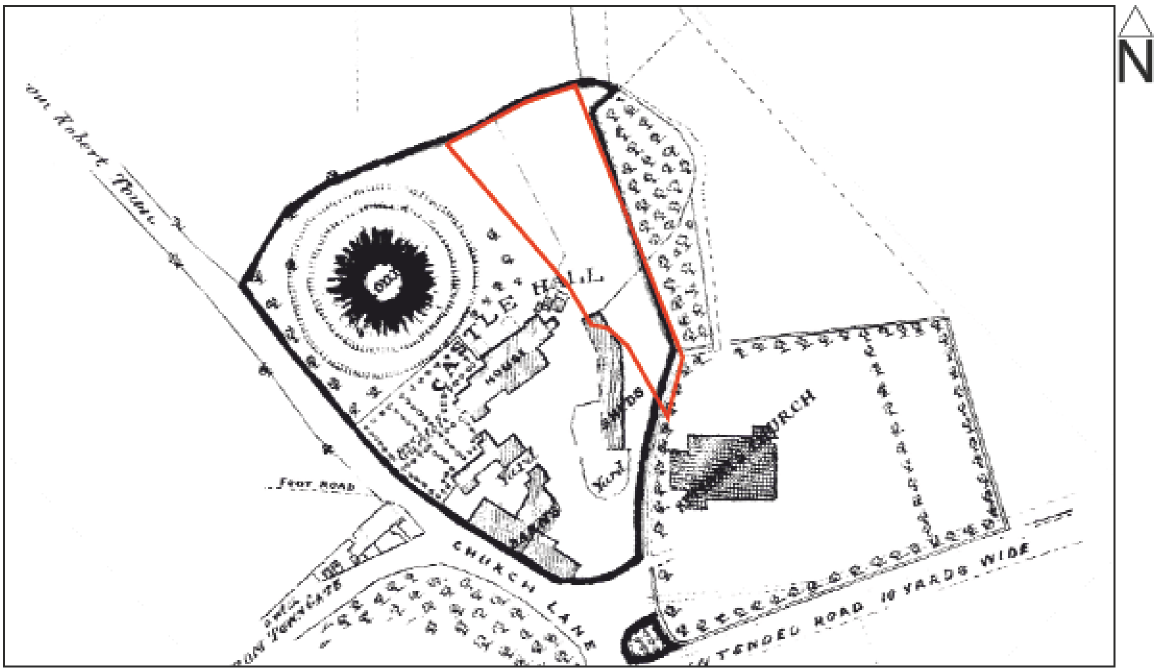

Figure 6. Extract from An unfinished history of St. Marys (date unknown) showing boundary features within the survey area (1:2000)

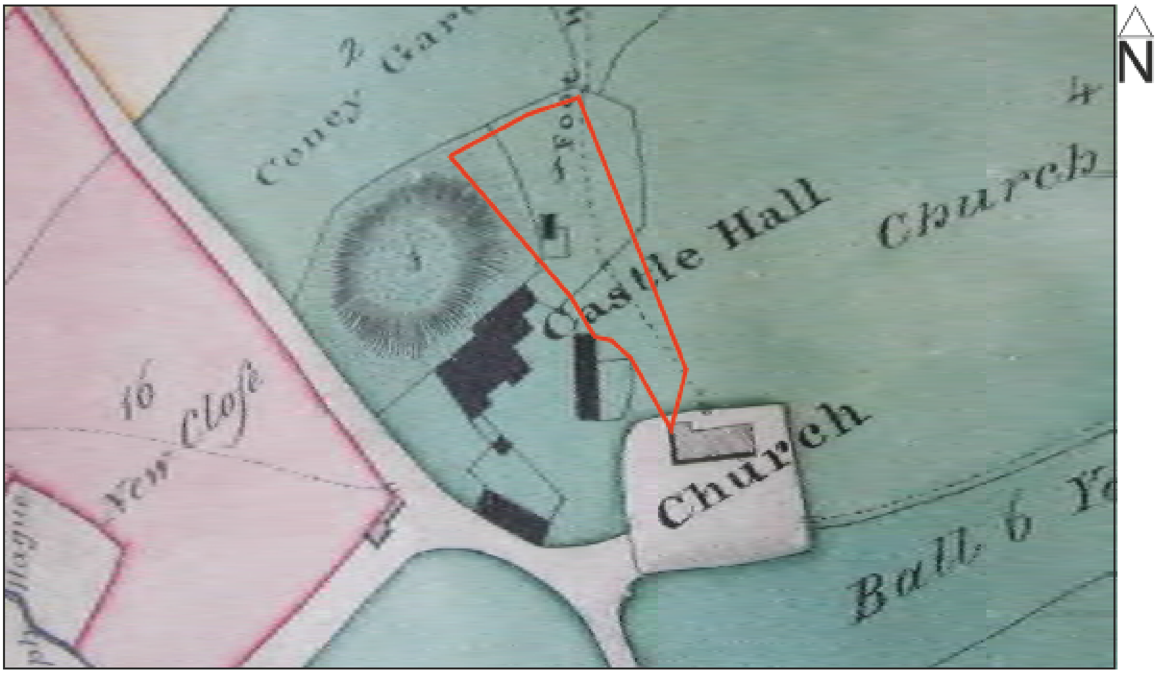

Figure 7. Extract from plan of Cote Wells estate in townships of Mirfield, Whitley Lower and Whitley Upper (1850) showing structure within west of survey area (1:2000)

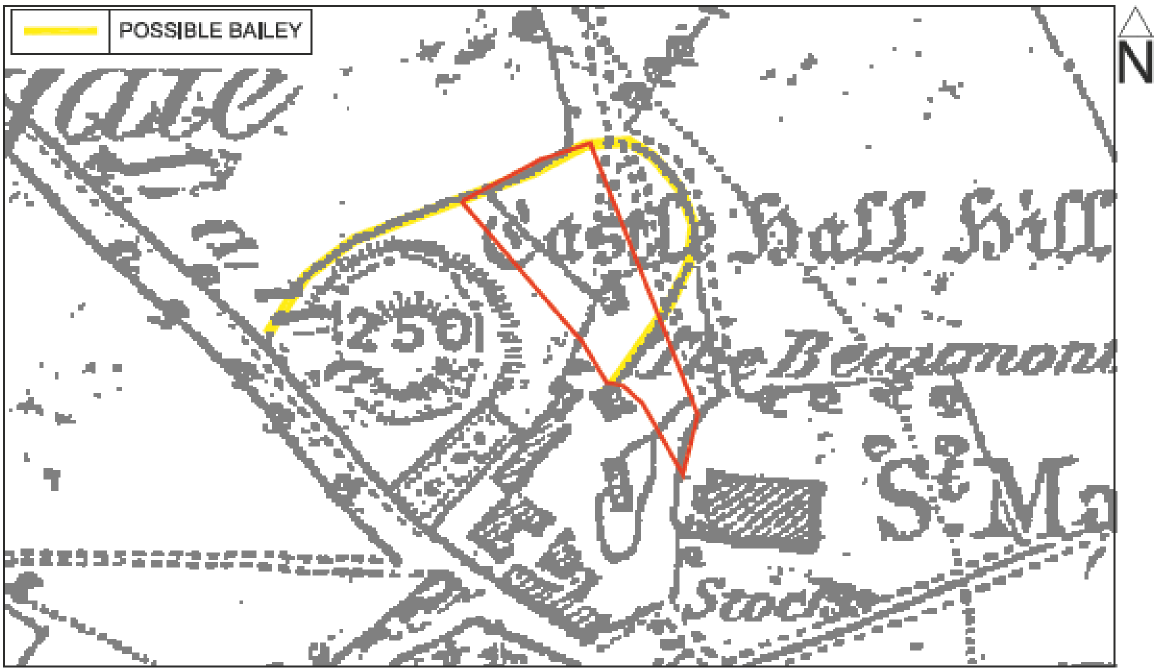

Figure 8. Extract from first edition Ordnance Survey map (1855) showing boundary features and a structure within the survey area (1:2000)

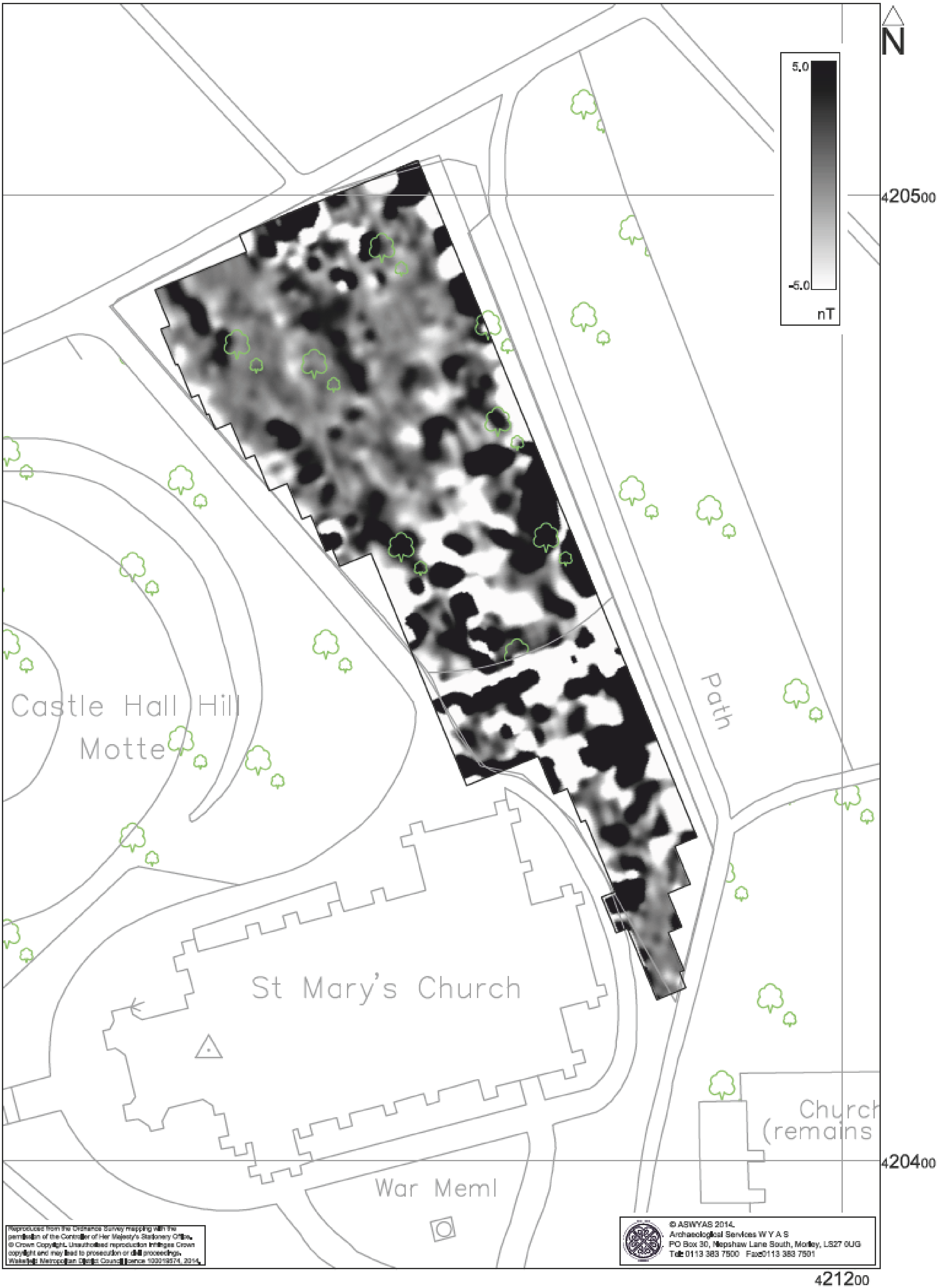

Fig. 9. Processed greyscale magnetometer data (1:500 @ A4)

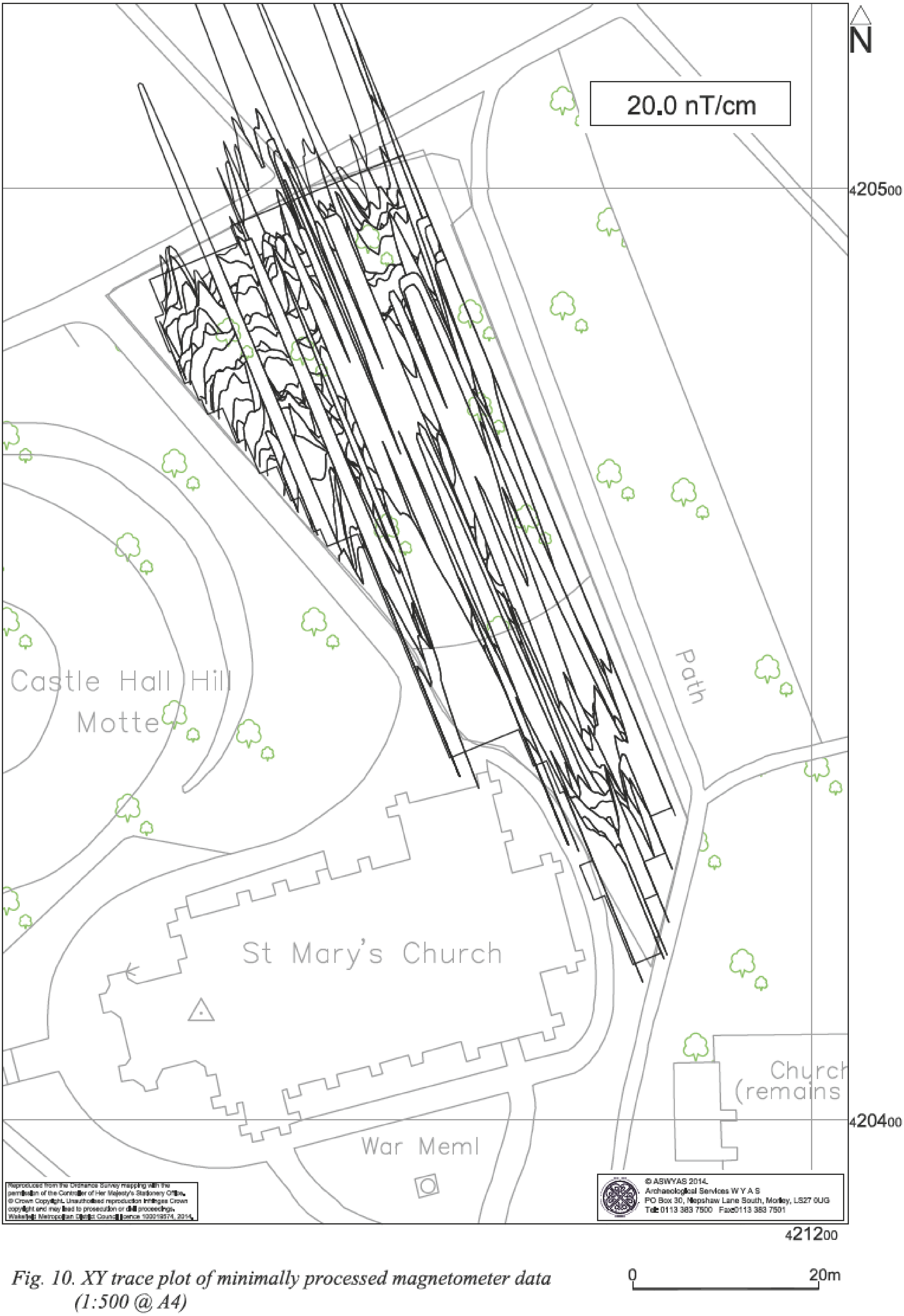

Fig. 10. XY trace plot of minimally processed magnetometer data (1:500 @ A4)

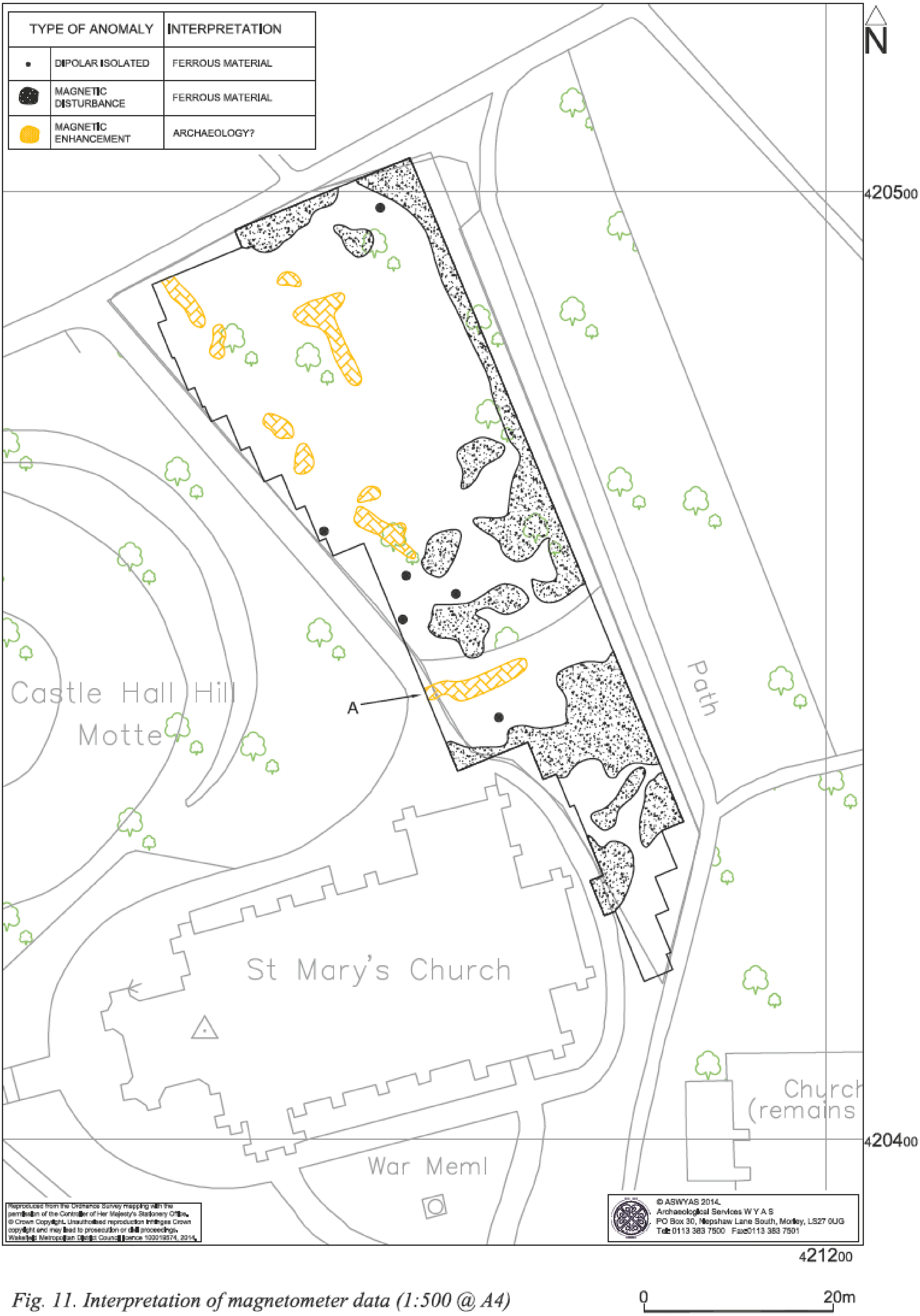

Fig. 11. Interpretation of magnetometer data (1:500 @ A4)

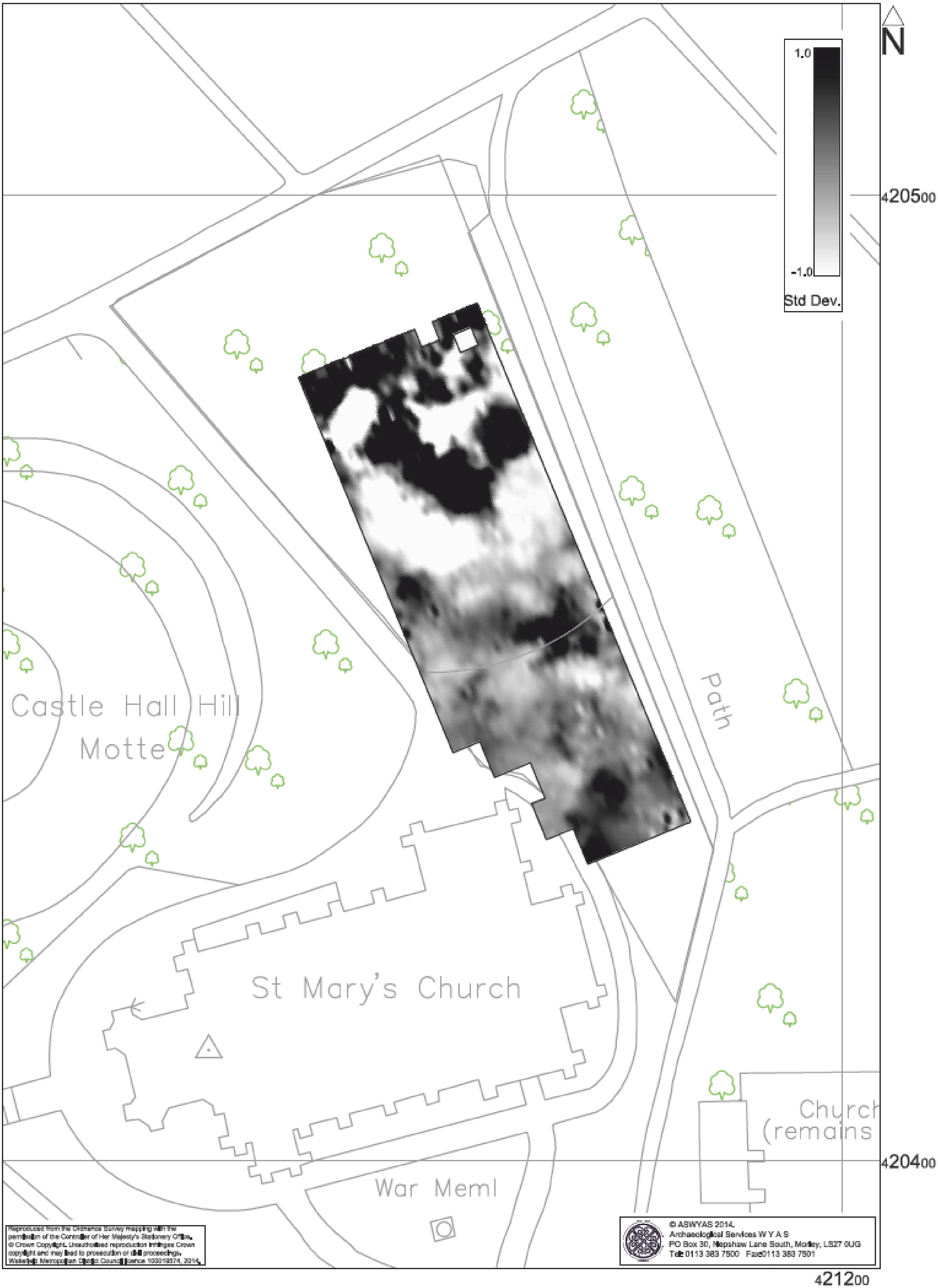

Fig. 12. Processed earth resistance data (1:500 @ A4)

0 20m

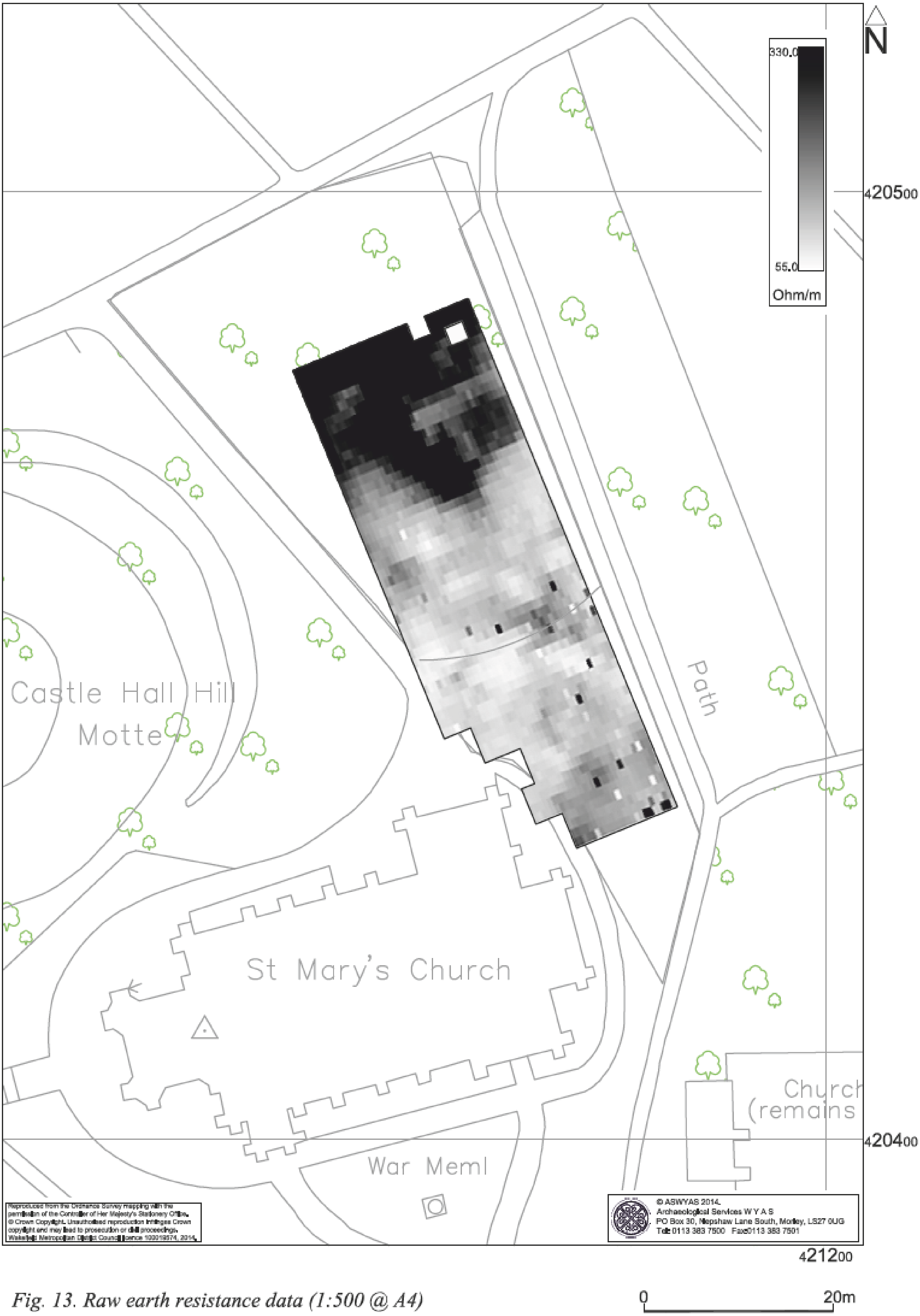

Fig. 13. Raw earth resistance data (1:500 @ A4)

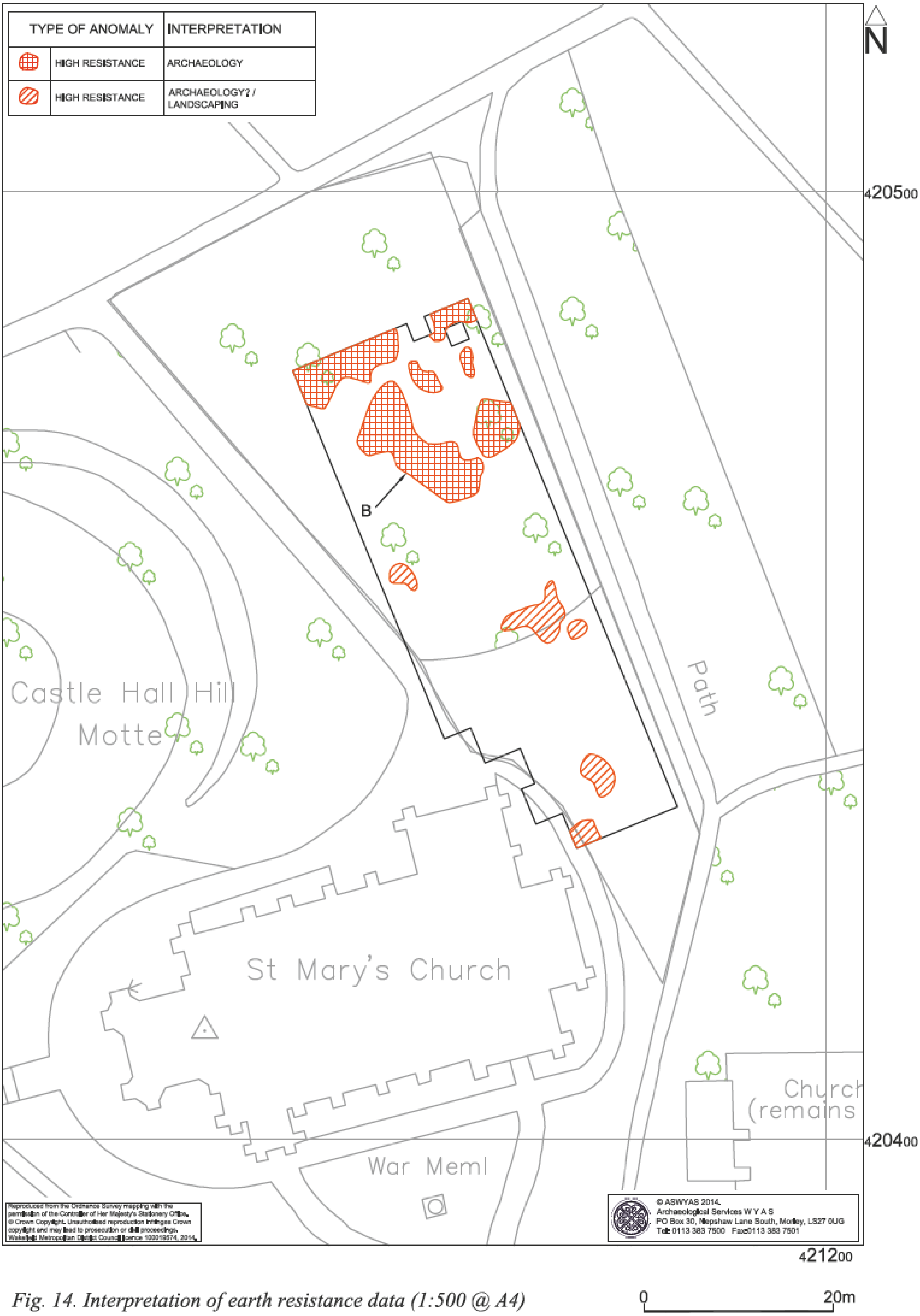

Fig. 14. Interpretation of earth resistance data (1:500 @ A4)

Plate 1. General view of survey area, looking south towards St. Mary's church

Appendix 1: Magnetic survey - technical information

Magnetic Susceptibility and Soil Magnetism

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haemetite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected. The magnetic susceptibility of a soil can also be enhanced by the application of heat and the fermentation and bacterial effects associated with rubbish decomposition. The area of enhancement is usually quite large, mainly due to the tendency of discard areas to extend beyond the limit of the occupation site itself, and spreading by the plough. An advantage of magnetic susceptibility over magnetometry is that a certain amount of occupational activity will cause the same proportional change in susceptibility, however weakly magnetic is the soil, and so does not depend on the magnetic contrast between the topsoil and deeper layers. Susceptibility survey is therefore able to detect areas of occupation even in the absence of cut features. On the other hand susceptibility survey is more vulnerable to the masking effects of layers of colluvium and alluvium as the technique, using the Bartington system, can generally only measure variation in the first 0.15m of ploughsoil.

Types of Magnetic Anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes)

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Linear trend

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

Methodology: Magnetic Susceptibility Survey

There are two methods of measuring the magnetic susceptibility of a soil sample. The first involves the measurement of a given volume of soil, which will include any air and moisture that lies within the sample, and is termed volume specific susceptibility. This method results in a bulk value that it not necessarily fully representative of the constituent components of the sample. For field surveys a Bartington MS2 meter with MS2D field loop is used due to its speed and simplicity. The second technique overcomes this potential problem by taking into account both the volume and mass of a sample and is termed mass specific susceptibility. However, mass specific readings cannot be taken in the field where the bulk properties of a soil are usually unknown and so volume specific readings must be taken. Whilst these values are not fully representative they do allow general comparisons across a site and give a broad indication of susceptibility changes. This is usually enough to assess the susceptibility of a site and evaluate whether enhancement has occurred.

Methodology: Gradiometer Survey

There are two main methods of using the fluxgate gradiometer for commercial evaluations. The first of these is referred to as ***magnetic scanning*** and requires the operator to visually identify anomalous responses on the instrument display panel whilst covering the site in widely spaced traverses, typically 10m apart. The instrument logger is not used and there is therefore no data collection. Once anomalous responses are identified they are marked in the field with bamboo canes and approximately located on a base plan. This method is usually employed as a means of selecting areas for detailed survey when only a percentage sample of the whole site is to be subject to detailed survey.

The disadvantages of magnetic scanning are that features that produce weak anomalies (less than 2nT) are unlikely to stand out from the magnetic background and so will be difficult to detect. The coarse sampling interval means that discrete features or linear features that are parallel or broadly oblique to the direction of traverse may not be detected. If linear features are suspected in a site then the traverse direction should be perpendicular (or as close as is possible within the physical constraints of the site) to the orientation of the suspected features. The possible drawbacks mentioned above mean that a 'negative' scanning result should be validated by sample detailed magnetic survey (see below).

The second method is referred to as ***detailed survey*** and employs the use of a sample trigger to automatically take readings at predetermined points, typically at 0.25m intervals, on zig-zag traverses 1m apart. These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation. Detailed survey allows the visualisation of weaker anomalies that may not have been detected by magnetic scanning.

During this survey a Bartington Grad601 magnetic gradiometer was used taking readings on the 0.1nT range, at 0.25m intervals on zig-zag traverses 1m apart within 30m by 30m square grids. The instrument was checked for electronic and mechanical drift at a common point and calibrated as necessary. The drift from zero was not logged.

Data Processing and Presentation

The detailed gradiometer data has been presented in this report in XY trace and greyscale formats. In the former format the data shown is 'raw' with no processing other than grid biasing having been done. The data in the greyscale images has been interpolated and selectively filtered to remove the effects of drift in instrument calibration and other artificial data constructs and to maximise the clarity and interpretability of the archaeological anomalies.

An XY plot presents the data logged on each traverse as a single line with each successive traverse incremented on the Y-axis to produce a 'stacked' plot. A hidden line algorithm has been employed to block out lines behind major 'spikes' and the data has been clipped. The main advantage of this display option is that the full range of data can be viewed, dependent on the clip, so that the 'shape' of individual anomalies can be discerned and potentially archaeological anomalies differentiated from 'iron spikes'. Geoplot 3 software was used to create the XY trace plots.

Geoplot 3 software was used to interpolate the data so that 3600 readings were obtained for each 30m by 30m grid. The same program was used to produce the greyscale images. All greyscale plots are displayed using a linear incremental scale.

The results and subsequent interpretation of data from geophysical surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by direct investigation of sub-surface deposits.

Appendix 2: Earth resistance survey - technical information

Soil Resistance

The electrical resistance of the upper soil horizons is predominantly dependant on the amount and distribution of water within the soil matrix. Buried archaeological features, such as walls or infilled ditches, by their differing capacity to retain moisture, will impact on the distribution of sub-surface moisture and hence affect electrical resistance. In this way there may be a measurable contrast between the resistance of archaeological features and that of the surrounding deposits. This contrast is needed in order for sub-surface features to be detected by a resistance survey.

The most striking contrast will usually occur between a solid structure, such as a wall, and water-retentive subsoil. This shows as a resistive high. A weak contrast can often be measured between the infill of a ditch feature and the subsoil. If the infill material is soil it is likely to be less compact and hence more water retentive than the subsoil and so the feature will show as a resistive low. If the infill is stone the feature may retain less water than the subsoil and so will show as a resistive high.

The method of measuring variations in ground resistance involves passing a small electric current (1mA) into the ground via a pair of electrodes (current electrodes) and then measuring changes in current flow (the potential gradient) using a second pair of electrodes (potential electrodes). In this way, if a structural feature, such as a wall, lies buried in a soil of uniform resistance much of the current will flow around the feature following the path of least resistance. This reduces the current density in the vicinity of the feature, which in turn increases the potential gradient. It is this potential gradient that is measured to determine the resistance. In this case, the gradient would be increased around the wall giving a positive or high resistance anomaly.

In contrast a feature such as an infilled ditch may have a moisture retentive fill that is comparatively less resistive to current flow. This will increase the current density and decrease the potential gradient over the feature giving a negative or low resistance anomaly.

Survey Methodology

The most widely used archaeological technique for earth resistance surveys uses a twin probe configuration. One current and one potential electrode (the remote or static probes) are fixed firmly in the ground a set distance away from the area being surveyed. The other current and potential electrodes (the mobile probes) are mounted on a frame and are moved from one survey point to the next. Each time the mobile probes make contact with the ground an electrical circuit is formed between the current electrodes and the potential gradient between the mobile and remote probes is measured and stored in the memory of the instrument.

A Geoscan RM15 resistance meter was used during this survey, with the instrument logging each reading automatically at 1m intervals on traverses 1m apart. The mobile probe spacing was 0.5m with the remote probes 15m apart and at least 15m away from the grid under survey. This mobile probe spacing of 0.5m gives an approximate depth of penetration of 1m for most archaeological features. Consequently a soil cover in excess of 1m may mask, or significantly attenuate, a geophysical response.

Data Processing and Presentation

All of the illustrations incorporating a digital map base were produced in AutoCAD 2008 (© Autodesk).

The resistance data is presented in this report in greyscale format with a linear gradation of values and was obtained by exporting a bitmap from the processing software (Geoplot v3.0; Geoscan Research) into AutoCAD 2008. The data has been processed and has also been interpolated by a value of 0.5 in both the X and Y axes using a sine wave (x)/x function to give a smoother, better defined plot.

Appendix 3: Survey location information

The site grid was laid out using a Trimble VRS differential Global Positioning System (Trimble 5800 model). The accuracy of this equipment is better then 0.01m. The survey grids were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if co-ordinates are measured off hard copies of the mapping rather than using the digital co-ordinates.

Archaeological Services WYAS cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

Appendix 4: Geophysical archive

The geophysical archive comprises:-

- an archive disk containing compressed (WinZip 8) files of the raw data, report text (Microsoft Word 2000), and graphics files (Adobe Illustrator CS2 and AutoCAD 2008) files; and
- a full copy of the report.

At present the archive is held by Archaeological Services WYAS although it is anticipated that it may eventually be lodged with the Archaeology Data Service (ADS). Brief details may also be forwarded for inclusion on the English Heritage Geophysical Survey Database after the contents of the report are deemed to be in the public domain (i.e. available for consultation in the West Yorkshire Historic Environment Record).

Appendix 5: OASIS Form

OASIS DATA COLLECTION FORM: England

List of Projects | Manage Projects | Search Projects | New project | Change your details | HER coverage | Change country | Log out

Printable version

OASIS ID: archaeol11-194539

Project details

Project name	Castle Hall Hill Motte and Bailey Castle Mirfield, Mirfield
Short description of the project	A small parcel of land immediately north of St Mary's Church and east of Castle Hall Hill in Mirfield was subject to a geophysical survey (magnetometer and earth resistance) in order to inform a National Heritage Open Weekend event and to aid future archaeological investigations on the site. The magnetic survey has identified a linear anomaly on the line of a boundary feature which is depicted on modern mapping but which may have earlier origins. The resistance survey has not identified this feature but has located a rectangular area of high resistance consistent with a rubble spread or the in situ remains of a structure. This may locate a building depicted on mid-19th century maps and plans.
Project dates	Start: 01-08-2014 End: 01-08-2014
Previous/future work	Not known / Not known
Any associated project reference codes	MFC14 - Sitecode
Any associated project reference codes	4266 - Contracting Unit No.
Type of project	Research project
Site status	None
Current Land use	Other 4 - Churchyard
Monument type	N/A None
Monument type	N/A None
Significant Finds	N/A None
Significant Finds	N/A None
Investigation type	"Geophysical Survey"
Prompt	Research
Solid geology (other)	Falhouse Rock Formation
Drift geology (other)	NONE
Techniques	Magnetometry

Techniques	Resistivity - area

Project location

Country	England
Site location	WEST YORKSHIRE KIRKLEES MIRFIELD Castle Hall Hill Motte and Bailey Castle, Mirfield
Study area	0.20 Hectares
Site coordinates	SE 21113 20450 53.6798571342 -1.68032391837 53 40 47 N 001 40 49 W Point

Project creators

Name of Organisation	Archaeological Services WYAS
Project brief originator	John Wheelwright Archaeological Society
Project design originator	Archaeological Services WYAS
Project director/manager	Harrison, S.
Project supervisor	Sykes, C.
Type of sponsor/funding body	Local Arch. Society/Amateur Archaeologist
Name of sponsor/funding body	John Wheelwright Archaeological Society

Project archives

Physical Archive Exists?	No
Digital Archive recipient	N/A
Digital Contents	"other"
Digital Media available	"Geophysics"
Paper Archive recipient	N/A
Paper Contents	"other"
Paper Media available	"Report"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	John Wheelwright Archaeological Society, Mirfield
Author(s)/Editor(s)	Harrison, D.
	Report Number 2660

Other bibliographic details	
Date	2014
Issuer or publisher	ASWYAS
Place of issue or publication	Morley
Description	A4 blue comb bound report
Entered by	Sam Harrison (sharrison@aswyas.com)
Entered on	7 November 2014

Bibliography

British Geological Survey, 2014. www.bgs.ac.uk/discoveringGeology/geology OfBritain/viewer.html . (Viewed October 3rd 2014)

David, A., N. Linford, P. Linford and L. Martin. 2008. *Geophysical Survey in Archaeological Field Evaluation: Research and Professional Services Guidelines (2nd edition)* English Heritage

Harrison, D. 2014. *Castle Hall Hill Motte and Bailey Castle, Mirfield, West Yorkshire: Geophysical Survey Project Design* Unpublished ASWYAS document

Institute for Archaeologists, 2013. *Standard and Guidance for archaeological geophysical survey.* IfA

Soil Survey of England and Wales, 1983. *Soil Survey of England and Wales: Soils of Northern England*, Sheet 1

Cartographic Sources

Joseph Dickinson, 1720, 'Map of Whitley Beaumont estate in Mirfield, Kirkheaton, Lepton and Whitley townships' DD/WBE/pe/1

William Rayner, 1821, 'Plan of Whitley Beaumont estate in Mirfield township' DD/WB/pe/12

Samuel Washington, 1850, 'Plan of Cote Walls estate in townships of Mirfield, Whitley Lower and Whitley Upper' coloured, with field numbers KC510/1

'Map of Mirfield Township as it was in 1819' KX269

'An Unfinished history of St. Mary's'