Archaeological geophysical survey of land east of Foxholes Care Home, Pirton Road, Hitchin, Hertfordshire
April 2017

Report No: 17/60

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Site Code: HIT FGH 17
NGR: TL 174 291

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OASIS REPORT

PROJECT DETAILS	**Oasis No. molanort1-285711**	
Project name	Archaeological geophysical survey of land east of Foxholes Care Home, Pirton Road, Hitchin, Hertfordshire	
Short description	MOLA (Museum of London Archaeology) was commissioned to undertake magnetometer and earth resistance surveys across the site of a proposed development east of Foxholes Care Home, Pirton Road, Hitchin, Hertfordshire. The survey covered *c* 2ha of land and detected sets of magnetic anomalies which relate to possible Roman enclosure ditches and post-medieval field boundaries. The earth resistance survey was largely uninformative.	
Project type	Geophysical survey	
Site status	None	
Previous work	None known	
Current land use	Improved grassland	
Future work	Trial trenching	
Monument type/ period	Roman enclosures, post-medieval field boundaries	
Significant finds	None	
PROJECT LOCATION		
County	Hertfordshire	
Site address	Pirton Road	
Study area	*c* 2ha	
OS Easting & Northing	TL 174 291	
Height OD	*c* 90m - 95m aOD	
PROJECT CREATORS		
Organisation	MOLA	
Project brief originator	Simon Wood, Hertfordshire County Council Historic Environment Team	
Project design originator	MOLA	
Director/Supervisor	Graham Arkley	
Project Manager	John Walford	
Sponsor or funding body	Manor Oak Homes	
PROJECT DATE		
Start date	19th April 2017	
End date	20th April 2017	
ARCHIVES	Location	Content
Physical	N/A	
Paper	MOLA Northampton	Site survey records
Digital		Geophysical survey & GIS data
BIBLIOGRAPHY	Journal/monograph, published or forthcoming, or unpublished client report	
Title	Archaeological geophysical survey of land east of Foxholes Care Home, Pirton Road, Hitchin, Hertfordshire, April 2017	
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ABSTRACT

MOLA (Museum of London Archaeology) was commissioned to undertake magnetometer and earth resistance surveys across the site of a proposed development east of Foxholes Care Home, Pirton Road, Hitchin, Hertfordshire. The survey covered c 2ha of land and detected sets of magnetic anomalies which relate to possible Roman enclosure ditches and post-medieval field boundaries. The earth resistance survey was largely uninformative.

1 INTRODUCTION

MOLA (Museum of London Archaeology) was commissioned by Manor Oak Homes to undertake an archaeological geophysical survey across a proposed development site east of Foxholes Care Home, Pirton Road, Hitchin, Hertfordshire (NGR TL 174 291; Fig 1). This work was intended to identify and map any archaeological remains which may be affected by the development of the land.

The survey was prompted by a requirement from Simon Wood of the Hertfordshire County Council Historic Environment Advisory Team (HCCEAT). Because of the particular archaeological interest of the site he stipulated that an initial magnetometer survey of all accessible areas should be followed up by an earth resistance survey of a 25% sample area. Both surveys were to be conducted back to back, with the location of the resistance survey area to be determined following completion of the magnetometer survey.

The survey fieldwork was conducted on 19th to 20th April 2017, and was allocated site code HIT FGH 17.

2 BACKGROUND

2.1 Topography and geology

The proposed development site is located on the western fringe of Hitchin, approximately one mile east of the Barton Hills national nature reserve. It comprises an nearly rectangular block of land bounded by Pirton Road to the south, Crow Furlong to the east and Gray's Lane to the north. The western boundary is irregular but follows the current access road to Foxholes Care Home and Gainsford House. The survey area comprises the northern half of this site and is mainly improved grassland, *c* 2ha in extent, with the south-eastern corner left to nettles and brambles. A small wedge in the east of this area, as well as the southern half of the overall development site, were inaccessible under dense woodland. A further obstruction was presented by a dog agility training course in the north-west of the site (see back cover photo). Here the fencing and other equipment presented too many sources of magnetic interference for a magnetometer survey in this area to be worthwhile.

The site is located slightly to the north-west of a low hilltop, and stands largely at 94m aOD with a gentle slope down to approximately 90m aOD in the south west. The solid geology of the area comprises West Melbury formation marly chalk concealed beneath superficial geology of chalky Lowestoft formation glacial till (BGS 2017).

2.2 Historical and archaeological background

The survey area lies to the east of the 19th-century Foxholes House (HHERs 13218 & 10203), on the western fringe of the medieval market town of Hitchin. The present Foxholes care home is a modern building, the former 19th-century house havaing been demolished sometime between 2009 and 2011.

Several inhumations of Romano-British date were recovered from one of the kitchen gardens of the 19th-century Foxholes House in 1880, although their precise location is unknown. It is thought that these may comprise part of a more extensive cemetery, possibly extending into the present survey area (HHER 1184, Wood 2017). A pit containing late Iron Age to Roman pottery has also been found during an archaeological watching brief in the gardens of Foxholes House (HHER 10912).

Immediately north of the survey area, on the northern side of Gray's Lane, is the site of a 19th-century windmill which was relocated some 450m from an earlier site on Lucas Lane prior to 1844 (HHER 5990). Allotments to the immediate east along Crow Furlong are recorded on the Ordnance Survey (OS) map of 1881, at which date the survey area appears to have been open grassland.

3 METHODOLOGY

The survey fieldwork was conducted according to the HCCEAT brief (Wood 2017) and in line with CIfA and Historic England guidelines (CIfA 2014, EH2008). All suitable parts of the survey area were covered by magnetometer survey, following which a strategy for the earth resistance survey was devised in consultation with Simon Wood. It was decided that the resistance survey area should be on the western side of the development site, as close as possible to the previously recorded Roman burials, and not survey areas where the magnetic data already indicated archaeology was present.

3.1 Magnetometer survey

This survey was conducted with the MOLA magnetometer cart, which is a two-wheeled, lightweight structure designed to be pushed by hand. It incorporates a bank of six vertically-mounted Bartington Grad601 magnetic sensor tubes, spaced at half-meter intervals along a bar aligned crossways to the direction of travel, and also incorporates a Leica Geosystems Viva GPS antenna mounted on the central axis, 0.5m astern of the sensors. The magnetic sensors each output data at a rate of six readings per second and the GPS antenna outputs NMEA format data (GGA messages) at a rate of one position every second. These data streams are fed into a laptop computer where they are compiled into a single raw data file by MultiGrad601 logging software specifically designed for that purpose.

The cart was pushed along straight and parallel traverses across the survey area, with data logging being manually toggled on and off at the start and end of each traverse to avoid the collection of spurious data whilst turning. Traverse ends were marked with ranging poles to aid even coverage, and the evenness of coverage was further checked by monitoring the positional trace plotted in real time by the MultiGrad601 logging software. The average speed of coverage was *c* 1.5m/s and the effective data resolution thus approximated to 0.25m x 0.50m.

A single survey traverse was resurveyed at the end of the survey in accordance with the survey brief (Wood 2017). The purpose of this was to demonstrate the repeatability of the survey results.

The raw survey data was initially processed with MLGrad601 software, which calculated an actual UTM co-ordinate for each data point by interpolating the GPS readings and applying offset corrections based on the array geometry and calculated heading direction. This produced an output file in XYZ format which could be imported into TerraSurveyor software for data visualisation and further processing.

The raw XYZ data exhibited striping caused by slight mismatches in the calibration of the individual magnetic sensors. This was removed in TerraSurveyor by applying the median de-stripe function to runs of data from each sensor.

3.2 Earth resistance survey

The earth resistance survey was conducted with a Geoscan Research RM15 resistance meter. This was deployed in twin probe configuration with a mobile probe spacing of 0.5m, and a variable remote probe spacing adjusted to ensure reading consistency each time the remote probes were relocated during the survey. Measurements of earth resistance were recorded to a precision of 0.1Ω at 1m intervals across contiguous network of 20m survey grids.

The weather and ground conditions were favourable for the earth resistance survey, being neither excessively wet nor dry for the majority of the survey area. However, the northern trio of grids encompassed an area used for car parking parking, with sparse grass cover and significant surface compaction. Here the probes were frequently unable to penetrate the ground surface, and the data shows particularly high resistance as a result (*cf* Schmidt 2013, 21-23).

The earth resistance data was visualised and processed using Geoplot 3.00v software. Biases in the mean value of adjacent grids arising from the re-locating of the remote probes were balanced out using the “Edge Match” function. Following this a targeted “Despike” function was used to reduce the impact of discrete results with values greater than three standard deviations above or below the mean.

3.3 Data presentation

The magnetometer data collected during the survey has been processed to produce greyscale raster plots (range +5nT to -5nT / black to white) which have been rotated and scaled for display against OS Master Map base mapping (Figs 2, 4, 6 & 8).

The two sets of earth resistance data have been processed to produce a greyscale raster plots (range +12 Ω to +65 Ω), which have also been rotated and rectified to be displayed against OS Master Map base mapping (Figs 3, 5, & 7)

Interpretative overlays for the two techniques are presented in Figures 4 & 5. Plots of the unprocessed survey data are presented in Figures 6 & 7. The repeated transect of magnetometer data is presented in Figure 8.

4 SURVEY RESULTS

4.1 Magnetometer survey results

The survey has detected a group of magnetically positive linear anomalies extending across the central two thirds of the survey area, representing ditches. These appear to define two adjacent enclosures. The possible enclosure on the eastern side has a roughly rhomboidal shape, measuring *c* 35m x 25m, and has a possible entrance along its south-western edge. The other enclosure lies *c* 10m to the west, on much the same alignment. It has only been detected in part, with evidence for a short north-eastern edge and a longer, curving north-western edge meeting at a right angle. Part of the north-eastern edge is disrupted, with a possible entrance gap and outwork, and there are also traces of internal features although these are not distinct enough to interpret in detail. Ditched enclosures like these are typically Iron Age or Roman in date and in this case the proximity of Roman burials means that a Roman date is most likely.

To the north-west of the probable enclosures there are two subtle curving anomalies, each with a diameter of *c* 6m. Although anomalies as slight as this cannot be confidently interpreted there is a possibility that they could indicate the remains of small Iron Age or Roman roundhouses, but the small size may suggest they are not domestic in origin

The survey has also detected a set of parallel, magnetically negative, linear anomalies aligned east-west across the south of the survey area. Their clarity, spacing and correlation with former allotments along Crow Furlong to the east of site (shown on the First Edition Ordnance Survey map of 1881) suggest that these are possibly the boundaries of small-scale post-medieval field plots.

Weak, magnetically positive, linear anomalies aligned north-south have been detected crossing the western ends of the above field boundaries. Their less distinct appearance and apparent relationship with the above linear features suggest possible ditches or gullies of post-medieval date.

A strong, magnetically alternating positive / negative linear anomaly is apparent in the north-east of the survey area, running parallel with Gray's Lane. Such anomalies typically represent metal pipelines.

The series of magnetically negative anomalies in the middle of the field in line north to south arises from the extant, modern, low metal fence across the site separating the east and west halves of the field. Similarly, a magnetically negative halo around the dog agility course is the result of the metal fencing pins supporting its fence.

The large magnetically dipolar anomalies along the eastern boundary indicate the location of a metal gate and a water trough. The northern-most dipolar anomaly along the central fence is a result of miscellaneous metal upon the surface. The largest dipolar anomaly, straddling the centre fence approximately 50m from the northern end, had no obvious surface explanation. This is clearly a response from ferrous material, either representing a single massive object or a cluster of smaller metal objects.

Small dipolar anomalies are scattered across the site, though with a higher concentration in the north. These likely represent insignificant ferrous debris near the surface of the top-soil, such as horseshoes or other modern litter.

4.2 Earth resistance survey results

The earth resistance survey data show nothing of archaeological interest. Two small patches of particularly high resistance in the northern grids coincide with areas of surface compaction caused by parked vehicles, where the ground was drier and harder than elsewhere and it was more difficult for the instrument probes to penetrate and make a good electrical contact.

A swathe of slightly enhanced resistance in the south of the area corresponds to a subtle topographical ridge at the point where the ground begins to slope down to the south-west. This anomaly seems most likely to be natural in origin.

5 CONCLUSION

The magnetometer survey has revealed a set of enclosure ditches and a few other features of probable Iron Age / Roman date lying across the centre of the survey area, and has also revealed some features which are thought to be post-medieval field boundaries and ditches/gullies. The earth resistance survey has revealed no features of archaeological interest. Neither survey provided any evidence for further burials to those previously found to the west of the survey area, but it should be noted that burials are difficult targets for geophysical survey and frequently impossible to detect.

As well as archaeological features, the survey has also identified a few non-archaeological features, the most notable being a pipe along the northern edge of the survey area and a large ferrous object buried beneath the fence which crosses the centre of the site

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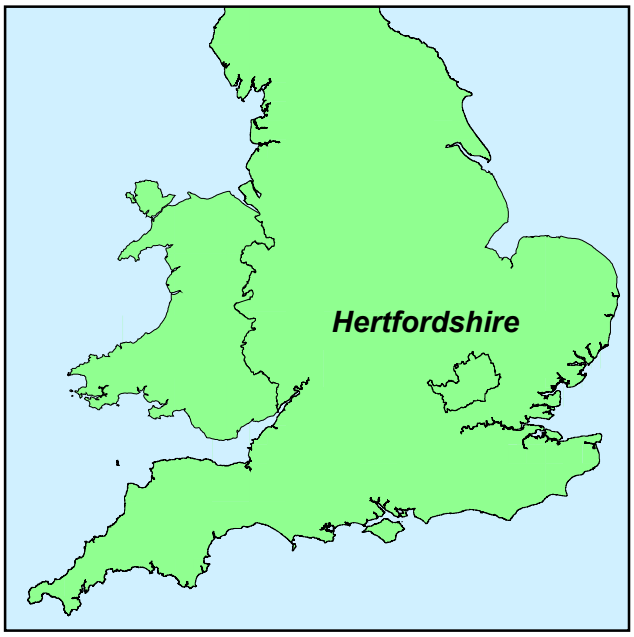
Historic maps consulted

Ordnance Survey 1881 *County Series: Hertfordshire 1:2500*

MOLA
06th June 2017



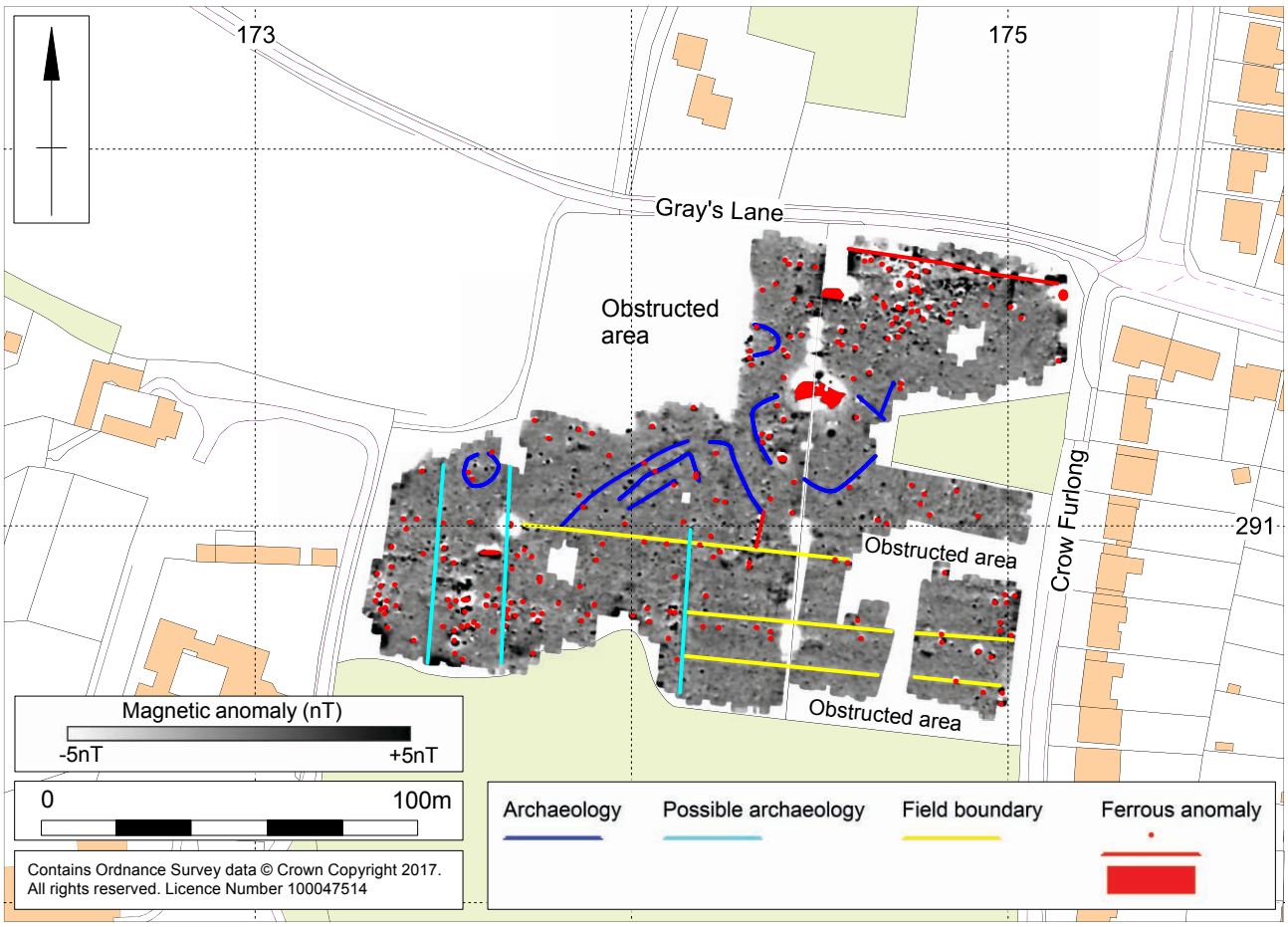
Scale 1:25,000

Site location Fig 1

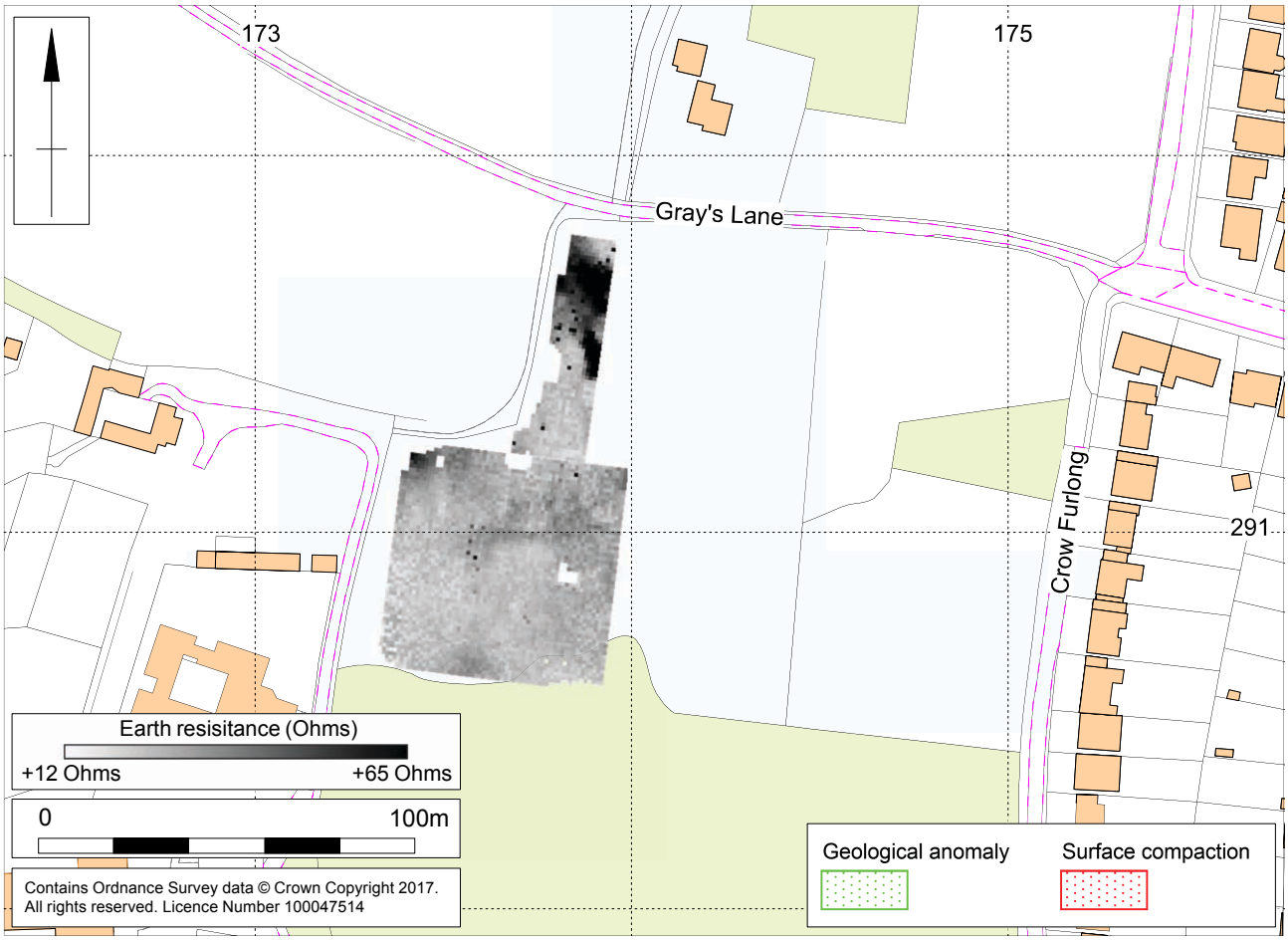
Magnetometer survey results Fig 2

1:2000

Earth resistance survey results Fig 3



Magnetometer survey interpretation Fig 4



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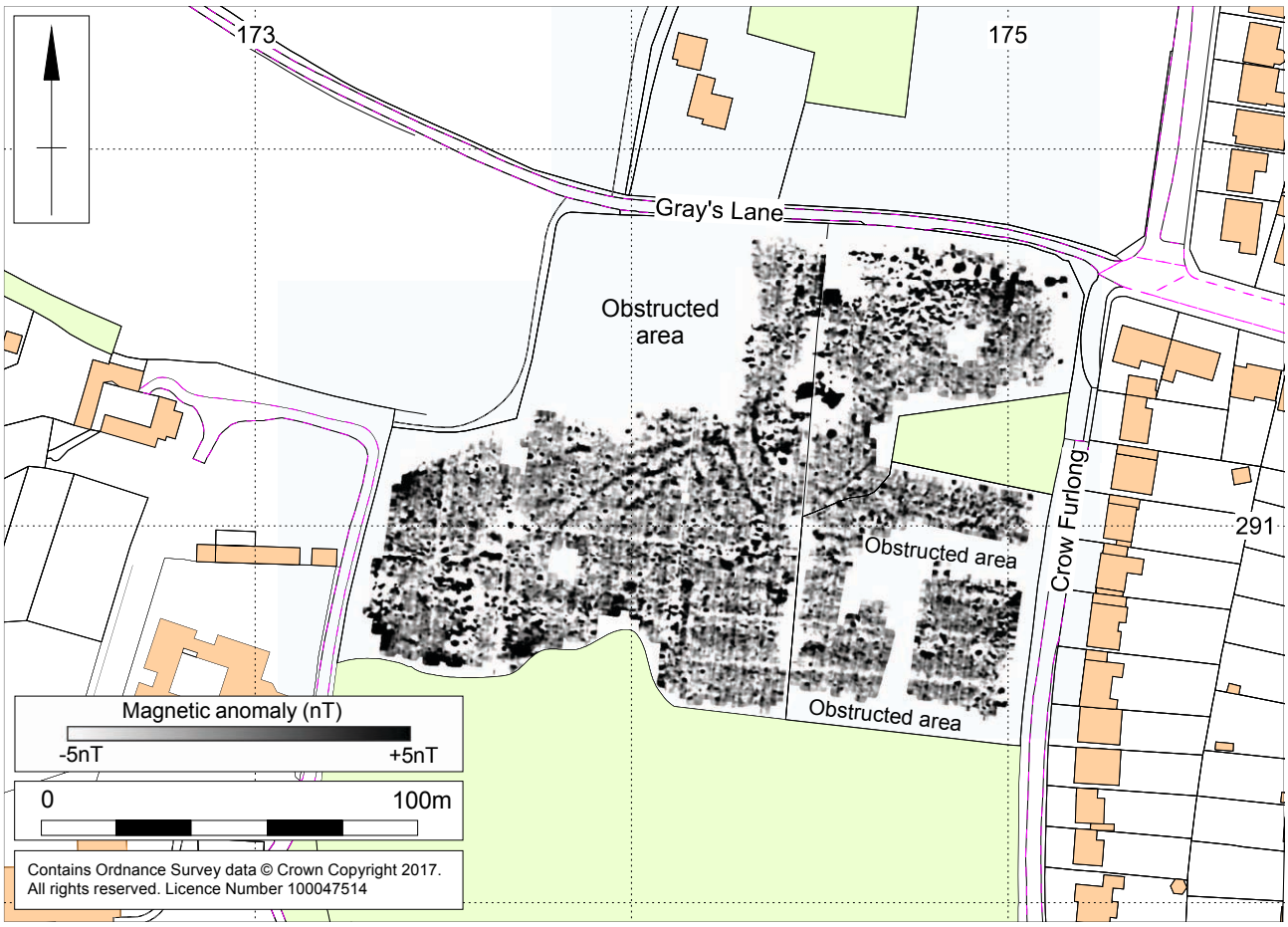
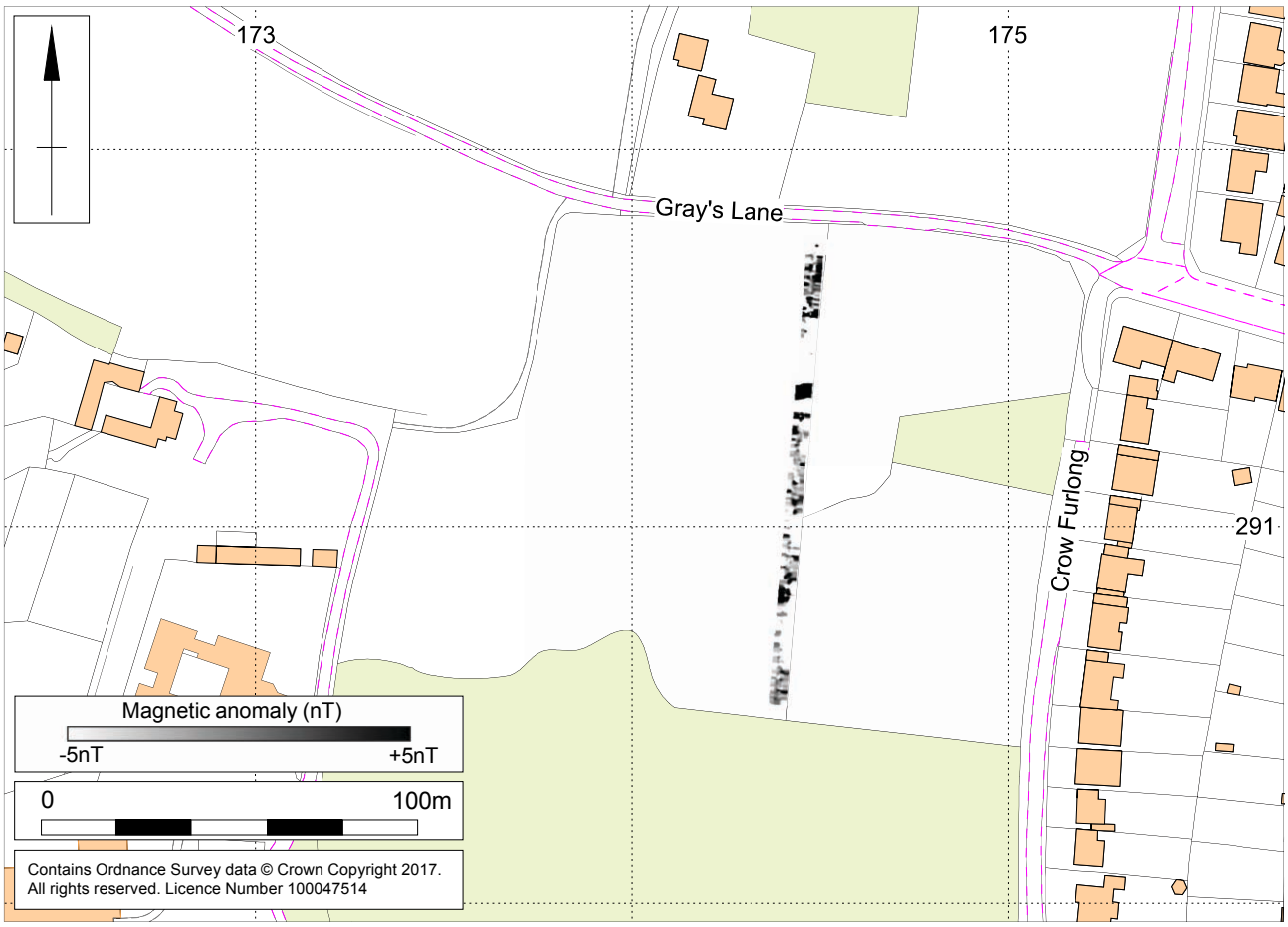
Earth resistance survey interpretation Fig 5



Magnetometer survey results - unprocessed Fig 6

1:2000

Earth resistance survey results - unprocessed Fig 7



Magnetometer survey - repeated traverse - unprocessed Fig 8

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