

T H A M E S V A L L E Y

ARCHAEOLOGICAL

S E R V I C E S

**Old Redingensians Sports Ground, Old Bath Road,
Sonning, Berkshire**

Geophysical Survey (Magnetic)

by Kyle Beaverstock

Site Code: BRS17/71

(SU 7653 7501)

Old Redingensians Sports Ground, Old Bath Road, Sonning, Berkshire

Geophysical Survey (Magnetic) Report

For the Rugby Football Union

by Kyle Beaverstock

Thames Valley Archaeological Services Ltd

Site Code BRS 17/71

May 2017

Summary

Site name: Old Redingensians Sports Ground, Old Bath Road, Sonning, Berkshire

Grid reference: SU 7653 7501

Site activity: Magnetometer survey

Date and duration of project: 19th May 2017

Project manager: Steve Ford

Site supervisor: Kyle Beaverstock

Site code: BRS 17/71

Area of site: c. 1ha

Summary of results: Several magnetic anomalies were recorded during the survey but these reflect the site's recent use as sports pitches and are unlikely to indicate the presence of buried archaeological deposits.

Location of archive: The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

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Report edited/checked by: Steve Ford✓ 01.06.17 Tim Dawson✓ 01.06.17
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Old Redingensians Sports Ground, Old Bath Road, Sonning, Berkshire A Geophysical Survey (Magnetic)

by Kyle Beaverstock

Report 17/71

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at the Old Redingensians Sports Ground, Old Bath Road, Sonning, Berkshire, RG4 6TQ (SU 76531 75016) (Fig. 1). The work was commissioned by Mr Tom Betts of Surfacing Standards Ltd, 1A Perth House, Corbygate Business Park, Priors Haw Road, Corby, Northamptonshire, NN17 5JG on behalf of the Rugby Football Union, Twickenham Stadium, 200 Whitton, Twickenham, TW2 7BA.

A planning application (170580) has been made to Wokingham Borough Council for the construction of a new artificial grass rugby pitch with associated technical areas, equipment store and artificial lighting at the Old Redingensians Sports Ground, Old Bath Road, Sonning, Berkshire (SU 7653 7501) (Fig. 1). The total area to be developed covers approximately 1ha of the current rugby pitches. This is in accordance with the Department for Communities and Local Government's National Planning Policy Framework (NPPF 2012, and the Borough's policies on archaeology. The field investigation was carried out to a specification approved by Ellie Leary, Archaeology Officer for Berkshire Archaeology. The fieldwork was undertaken by Kyle Beaverstock and Anna Ginger on the 19th May 2017 and the site code is BRS 17/71.

The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

Location, topography and geology

The site is located to the south of Old Bath Road on the eastern side of Sonning. The site is surrounded by open ground and is currently being used as rugby pitches. These flat fields are at an approximate height of 53.4m above Ordinance Datum and the underlying geology is mapped as Lambeth Group Fourth Terrace Deposits (BGS 2000). Conditions during the survey were overcast but dry.

Site history and archaeological background

The site lies within the archaeologically rich Thames Valley with important prehistoric and Roman remains visible from the air situated to the north of the site (Ford 1987; Gates 1975; Slade 1964). These include a Neolithic ceremonial complex with a cursus monument (processional way); a mortuary enclosure and ring ditches (levelled round barrows). A Roman enclosure is also recorded with a variety of undated but probably Roman field boundaries known. Sonning village, which lies some way to the north was an important administrative and ecclesiastical centre in Saxon and medieval times and includes the site of the Bishop's Palace, which dates from as early as the 13th century. These remains were partly excavated during the First World War and revealed a complex of medieval buildings (Brakspear 1916).

However, a small fieldwork project to the north east of the site and a watching brief on service trench digging on the site itself did not reveal any deposits of archaeological interest (Taylor 2004; Bray 2014).

Methodology

Sample interval

Data collection required a temporary grid to be established across the survey area using wooden pegs at 20m intervals with further subdivision where necessary. Readings were taken at 0.25m intervals along traverses 1m apart. This provides 1600 sampling points across a full 20m × 20m grid (English Heritage 2008), providing an appropriate methodology balancing cost and time with resolution. The majority of the site was unobstructed other than a dividing fence running north-west - south-east.

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects have been buried in the site. Under normal operating conditions it can be expected to identify buried features >0.5m in diameter. Features which can be detected include disturbed soil, such as the fill of a ditch, structures that have been heated to high temperatures (magnetic thermoremnance) and objects made from ferro-magnetic materials. The strength of the magnetic field is measured in nano Tesla (nT), equivalent to 10⁻⁹ Tesla, the SI unit of magnetic flux density.

Equipment

The purpose of the survey was to identify geophysical anomalies that may be archaeological in origin in order to inform a targeted archaeological investigation of the site prior to development. The survey and report generally

follow the recommendations and standards set out by both English Heritage (2008) and the Chartered Institute for Archaeologists (2002, 2011, 2014).

Magnetometry was chosen as a survey method as it offers the most rapid ground coverage and responds to a wide range of anomalies caused by past human activity. These properties make it ideal for the fast yet detailed surveying of an area.

The detailed magnetometry survey was carried out using a dual sensor Bartington Instruments Grad 601-2 fluxgate gradiometer. The instrument consists of two fluxgates mounted 1m vertically apart with a second set positioned at 1m horizontal distance. This enables readings to be taken of both the general background magnetic field and any localised anomalies with the difference being plotted as either positive or negative buried features. All sensors are calibrated to cancel out the local magnetic field and react only to anomalies above or below this base line. On this basis, strong magnetic anomalies such as burnt features (kilns and hearths) will give a high response as will buried ferrous objects. More subtle anomalies such as pits and ditches can be seen from their infilling soils containing higher proportions of humic material, rich in ferrous oxides, compared to the undisturbed subsoil. This will stand out in relation to the background magnetic readings and appear in plan following the course of a linear feature or within a discrete area.

A Trimble Geo7x handheld GPS system with sub-decimetre real-time accuracy was used to tie the site grid into the Ordnance Survey national grid. This unit offers both real-time correction and post-survey processing; enabling a high level of accuracy to be obtained both in the field and in the final post-processed data.

Data gathered in the field was processed using the TerraSurveyor software package. This allows the survey data to be collated and manipulated to enhance the visibility of anomalies, particularly those likely to be of archaeological origin. The table below lists the processes applied to this survey, full survey and data information is recorded in Appendix 1.

Process

Clip from -1.80 to 2.20 nT

Interpolate: y doubled

De-stripe: median, all sensors

De-spike: threshold 1, window size 3×3

De-stagger: all grids, both by -1 intervals

Effect

Enhance the contrast of the image to improve the appearance of possible archaeological anomalies.

Increases the resolution of the readings in the y axis, enhancing the shape of anomalies.

Removes the striping effect caused by differences in sensor calibration, enhancing the visibility of potential archaeological anomalies.

Compresses outlying magnetic points caused by interference of metal objects within the survey area.

Cancel out effects of site's topography on irregularities in the traverse speed.

The raw data plot is presented as a greyscale plot shown in relation to the site (Fig. 3) with the processed data then presented as a second figure (Fig. 4), followed by a third plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 5). Anomalies are shown as colour-coded lines, points and polygons. The grid layout and georeferencing information (Fig. 2) is prepared in EasyCAD v.7.58.00, producing a .FC7 file format, and printed as a .PDF for inclusion in the final report.

The greyscale plot of the processed data is exported from TerraSurveyor in a georeferenced portable network graphics (.PNG) format, a raster image format chosen for its lossless data compression and support for transparent pixels, enabling it to easily be overlaid onto an existing site plan. The data plot is combined with grid and site plans in QGIS 2.18.2 and exported again in .PNG format in order to present them in figure templates in Adobe InDesign CS5.5, creating .INDD file formats. Once the figures are finalised they are exported in .PDF format for inclusion within the finished report.

Results

Both halves of the survey area contained variations in the magnetic readings (Fig. 4). These primarily consisted of strong positive and negative readings caused by the fencing that divides the area, a generator associated with mobile floodlights and other fencing around the perimeter of the sports pitches. The only set of anomalies which indicate the presence of a feature that was not visible on the ground surface was located towards the centre of the eastern half of the survey area [**Fig. 5: 1**]. This constituted two strong dipolar anomalies *c.*20m apart with an area of enhanced magnetic readings in between. It corresponds to the size and location of the Old Redingians seasonal cricket wicket. Various strong magnetic spikes were also recorded across the survey area. These most likely indicate the presence of discrete ferrous objects buried in the soil.

Conclusion

The survey was successfully undertaken across the area of the proposed new pitch. Several magnetic anomalies were recorded but none are likely to represent any buried archaeological features. Strong magnetic disturbance was encountered around the edges of the survey area, caused by fencing and other equipment, which could have had a masking effect on any weaker anomalies in these locations. Other magnetic anomalies represented a seasonal cricket wicket and probable buried ferrous objects.

References

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Appendix 1. Survey and data information

Programme:

Name: TerraSurveyor
Version: 3.0.29.3

Raw data

Northwest corner: 476577.11, 175088.8 m
Southeast corner: 476677.11, 174928.8 m
Direction of 1st Traverse: 147.01635 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 2047.5

Dimensions

Composite Size (readings): 400 x 160
Survey Size (meters): 100 m x 160 m
Grid Size: 20 m x 20 m
X Interval: 0.25 m
Y Interval: 1 m

Stats

Max: 96.33
Min: -100.00
Std Dev: 9.37
Mean: -0.43
Median: 0.23
Composite Area: 1.6 ha
Surveyed Area: 1.0426 ha

Source Grids: 40

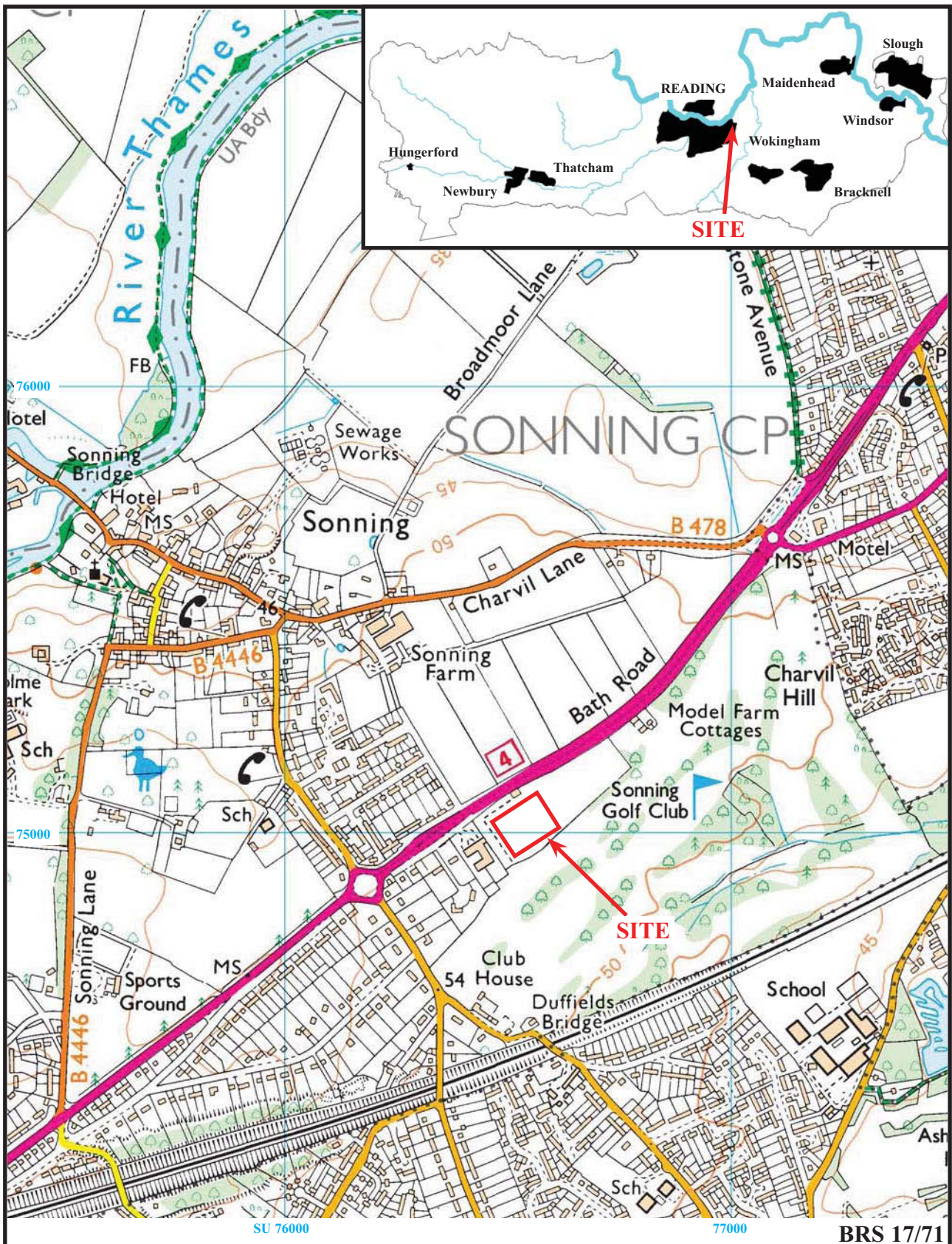
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6 Col:0 Row:5 grids\22.xgd
7 Col:0 Row:6 grids\23.xgd
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29 Col:3 Row:4 grids\33.xgd
30 Col:3 Row:5 grids\34.xgd
31 Col:3 Row:6 grids\35.xgd
32 Col:3 Row:7 grids\36.xgd
33 Col:4 Row:0 grids\17.xgd
34 Col:4 Row:1 grids\18.xgd
35 Col:4 Row:2 grids\19.xgd
36 Col:4 Row:3 grids\20.xgd
37 Col:4 Row:4 grids\37.xgd
38 Col:4 Row:5 grids\38.xgd
39 Col:4 Row:6 grids\39.xgd
40 Col:4 Row:7 grids\40.xgd

Processed data

Stats
Max: 2.20
Min: -1.80
Std Dev: 0.98
Mean: 0.01
Median: 0.01

Processes: 7

1 Base Layer
2 Move (Area: Top 80, Left 0, Bottom 159, Right 399) to X 0, Y -
20
3 DeStripe Median Sensors: Grids: All
4 De Stagger: Grids: All Mode: Both By: -1 intervals
5 Despike Threshold: 1 Window size: 3x3
6 Interpolate: Y Doubled.
7 Clip from -1.80 to 2.20 nT

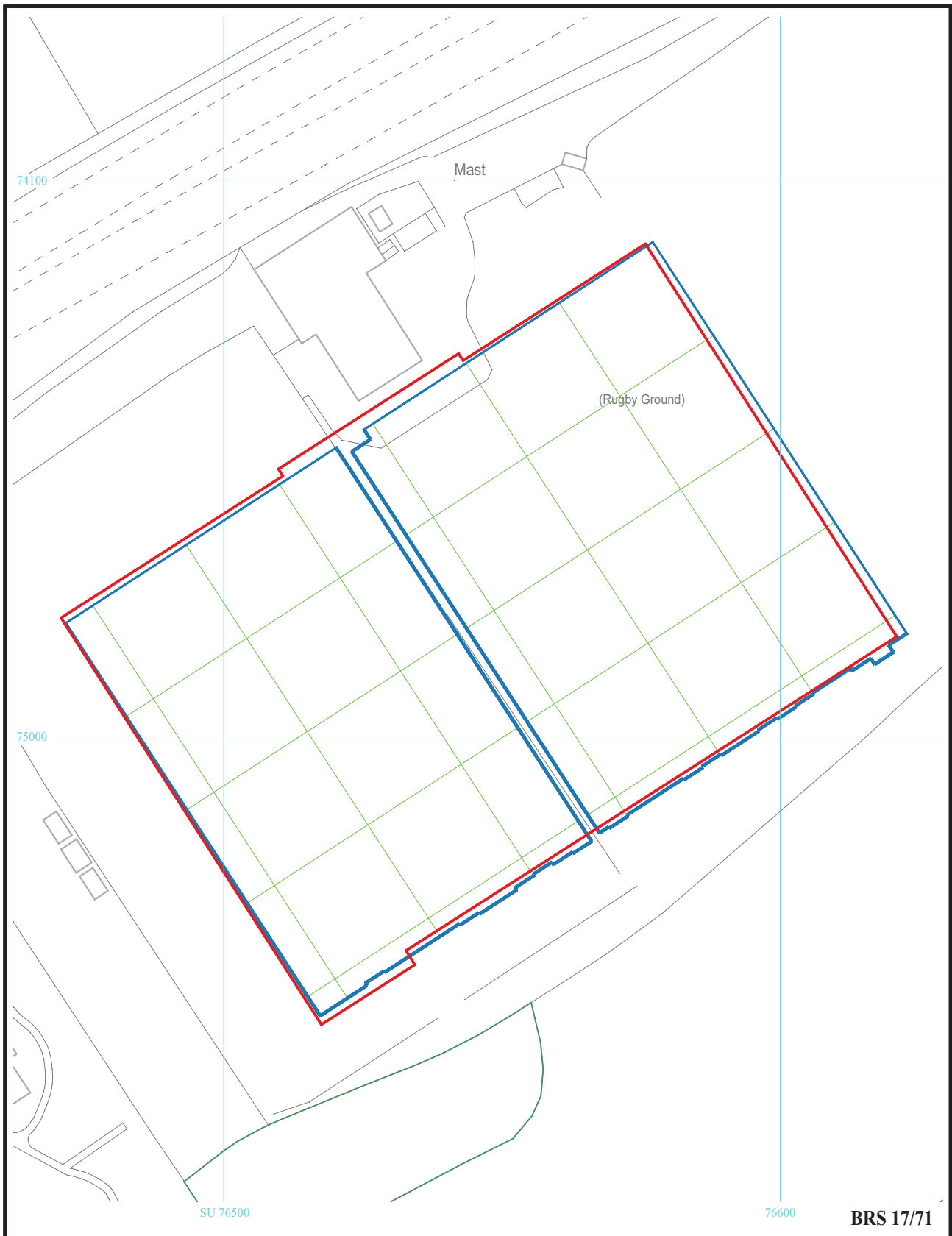


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Figure 1. Location of site within Sonning and Berkshire.

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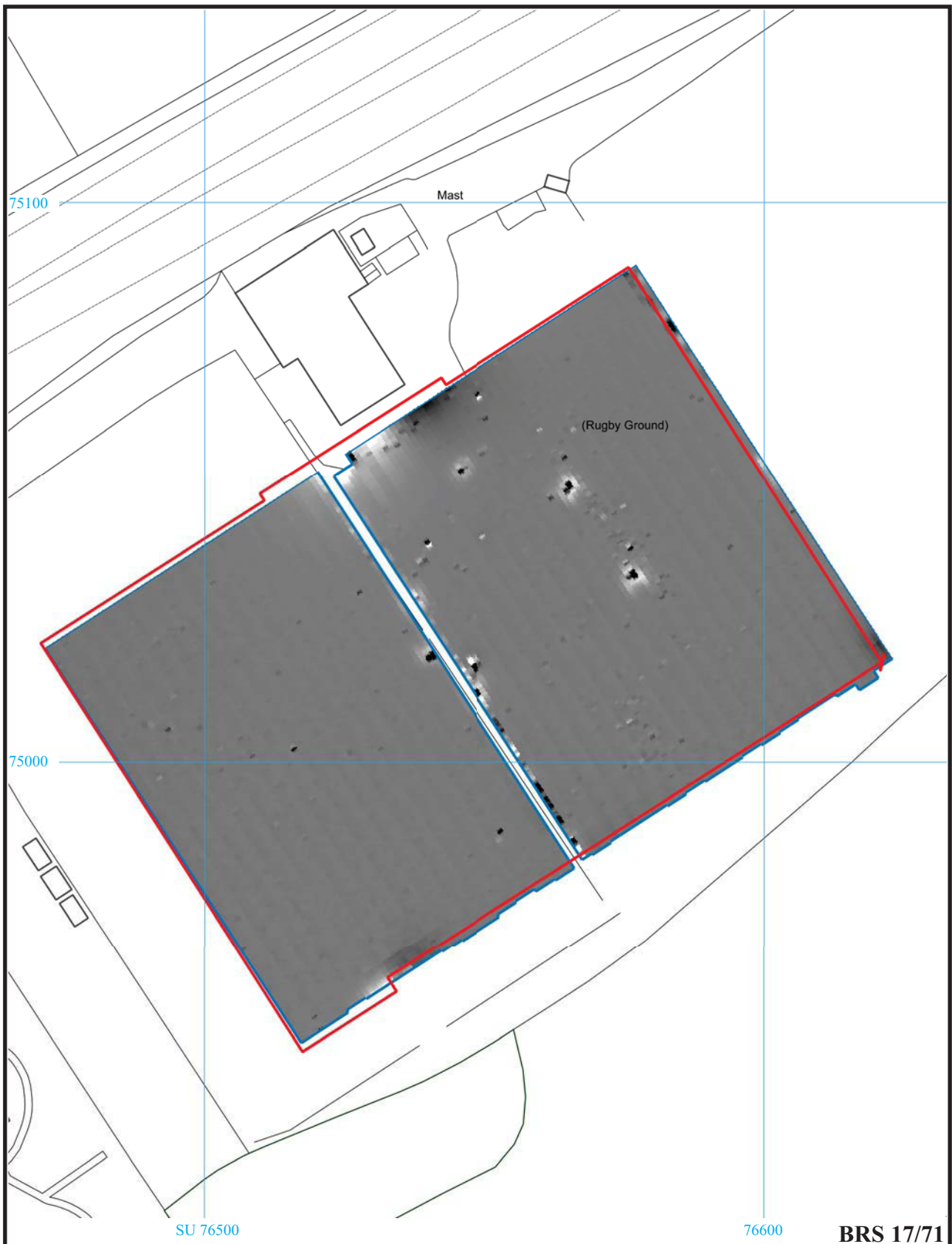
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Figure 2. Survey grid layout.



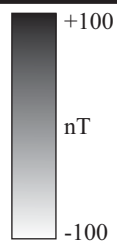
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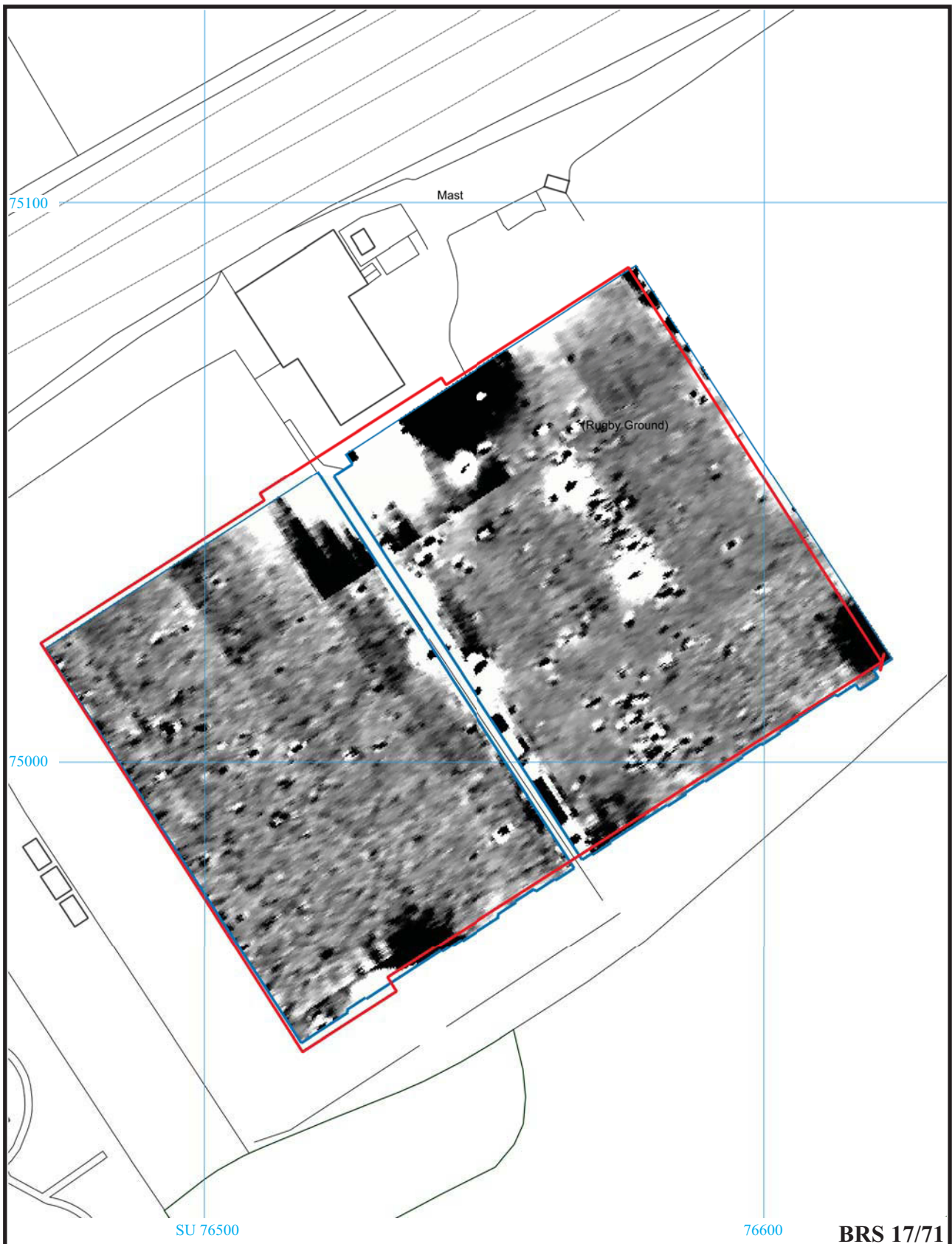


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Figure 3. Plot of raw gradiometer data.

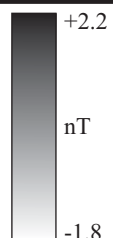


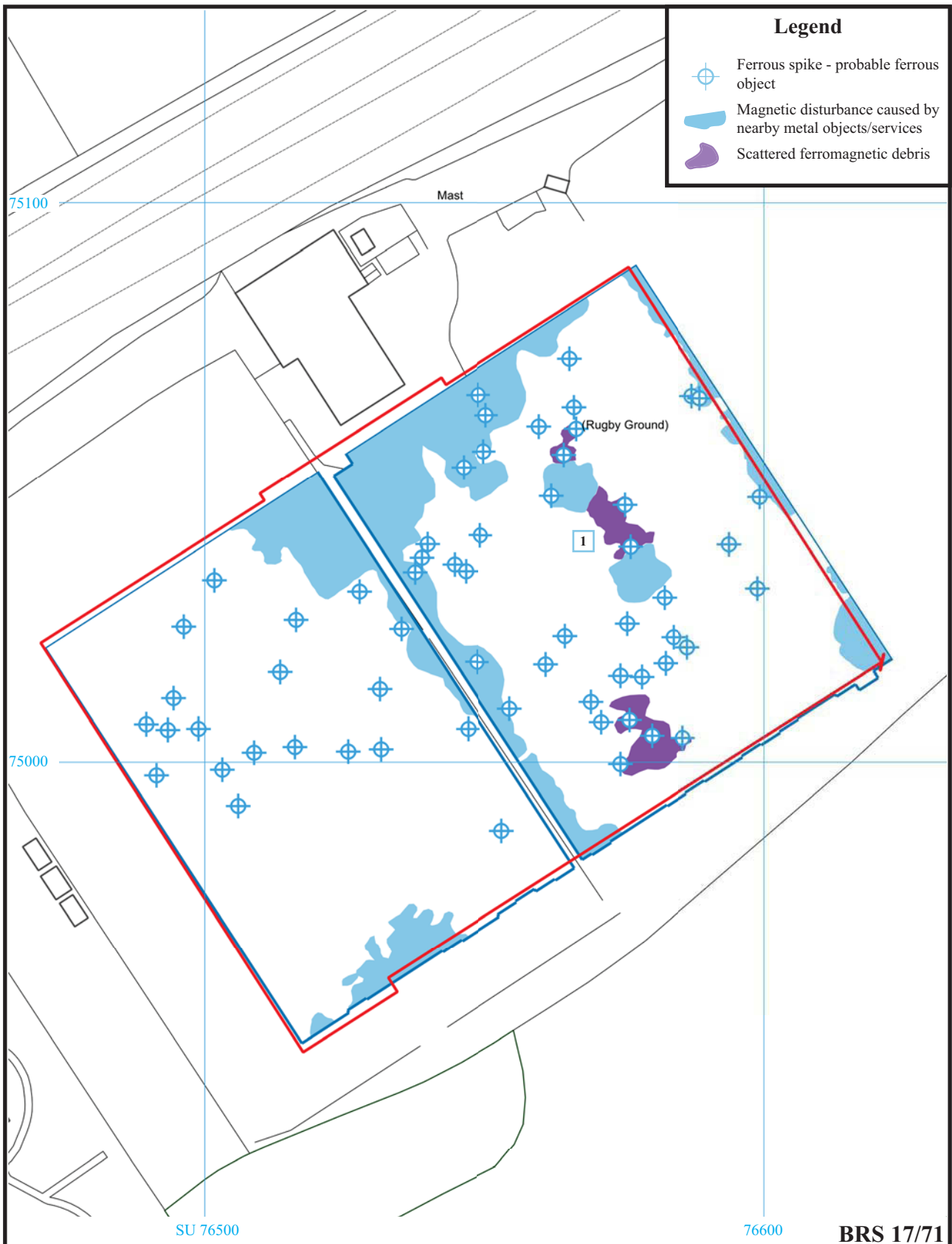


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Geophysical Survey (Magnetic)
 Figure 4. Plot of minimally processed gradiometer data.





Legend

-  Ferrous spike - probable ferrous object
-  Magnetic disturbance caused by nearby metal objects/services
-  Scattered ferromagnetic debris



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Figure 5. Interpretation plot.**



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Plate 1. The western half of the site, looking south-west.



Plate 2. The eastern half of the site, looking east.

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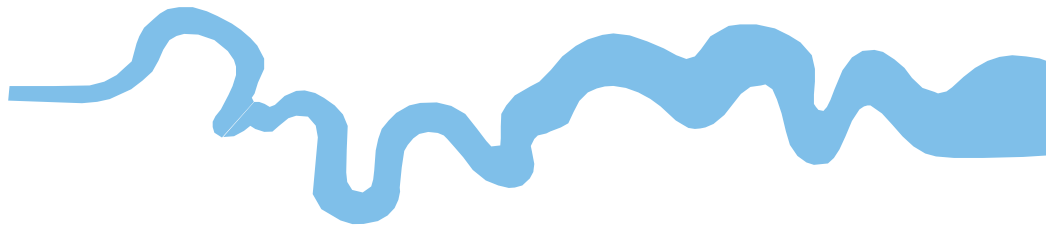
**Old Redingensians Sports Ground, Old Bath Road,
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Geophysical Survey (Magnetic)
Plates 1 and 2.**

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TIME CHART

	Calendar Years
Modern _____	AD 1901
Victorian _____	AD 1837
Post Medieval _____	AD 1500
Medieval _____	AD 1066
Saxon _____	AD 410
Roman _____	AD 43 AD 0 BC
Iron Age _____	750 BC
Bronze Age: Late _____	1300 BC
Bronze Age: Middle _____	1700 BC
Bronze Age: Early _____	2100 BC
Neolithic: Late	3300 BC
Neolithic: Early	4300 BC
Mesolithic: Late	6000 BC
Mesolithic: Early	10000 BC
Palaeolithic: Upper	30000 BC
Palaeolithic: Middle	70000 BC
Palaeolithic: Lower	2,000,000 BC





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