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archaeological surveys

GEOPHYSICAL (GRADIOMETER) SURVEY

LAND TO THE WEST OF STATION ROAD, LINGFIELD

CENTRED AT NGR TQ 39197 43615

REPORT PREPARED BY DAVID BUNN

ON BEHALF OF

HCUK GROUP AND WOOLBRO GROUP & MORRIS INVESTMENT

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Contents

Illustrations

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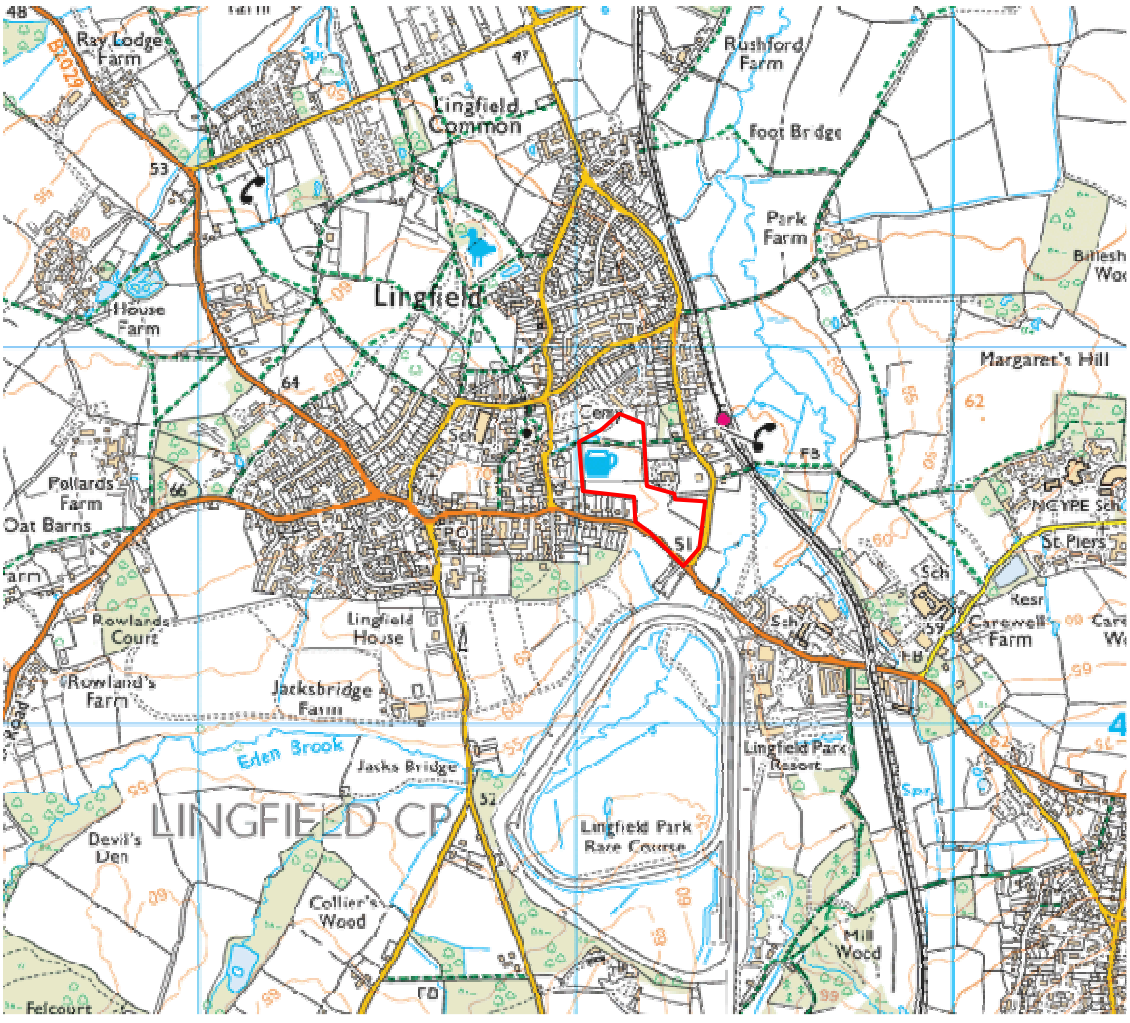
Non technical summary

- *A geophysical survey was undertaken on land to the west of Station Road, Lingfield.*
- *For the most part, the geophysical survey has not identified magnetic variation that can be attributed to archaeological remains with any level of confidence. A possible exception is an isolated linear anomaly that exhibits some potential as a buried ditch though alternative interpretations as a recently removed boundary or a land drain are also feasible.*
- *The majority of stronger responses clearly signify modern features or materials, including at least two buried services and boundary ferrous.*
- *It is concluded that the proposed development area has low archaeological potential.*



Location of site
(1:25000)

1.0 Introduction

Acting for Woolbro Group and Morris Investment, HCUK Group commissioned a fluxgate gradiometer survey of land to the west of Station Road, Lingfield (centred at NGR TQ 39197 43615).

The objective of the geophysical survey is to provide information relating to potential archaeological resources within the site, forming part of a heritage assessment designed to inform a planning application for the construction of c.99 residential dwellings, with associated access roads and landscaping.

This report references information contained within an Archaeological Desk Based Assessment prepared by HCUK Group (Cooper, 2022).

The proposed development site comprises approximately 6.2ha of agricultural land located in the village of Lingfield, Surrey.

The site is bounded to the north, north-east and west by residential properties; to the south-east by Station Road; to the south by the B2028; to the north-west by Peter and St Pauls Church. An east-west aligned public footpath extends across the northern extent of the site.

3.0 Geology and topography

The solid geology comprises Tunbridge Wells Sand - Interbedded Sandstone and Siltstone, sedimentary bedrock formed approximately 134 to 139 million years ago during the Cretaceous Period (BGS, 2023).

No superficial geological deposits have been identified within the site.

The northern region is situated c.58m AOD, the ground level to c.51m at the southern boundary.

4.0 Archaeological Context

An Archaeological Desk-Based Assessment has been prepared by HCUK, which includes a detailed review of the recorded archaeological resource (Cooper, 2022).

The assessment has confirmed that the Site contains no designated archaeological assets such as scheduled monuments or registered battlefields. However, there is one Scheduled Monument within the 1km Study Area, the Linfield Village Cage and St Peter's Cross (NHLE1005942) which sits within the village of Lingfield, this is also designated as a County Site of Archaeological Importance. The assessment identified sixty-two archaeological monument records on the Surrey Historic Environment Record (SHER) within the 1km study area. None of these entries are within the Site itself but there are five assets directly adjacent to the Site boundary. Four of these assets relate to New Place Farm, which sits to the north-east of the Site, and the fifth relates to undated deposits identified during a previous archaeological investigation. The SHER records two Areas of High Archaeological Potential within the 1km Study Area, the St Peter and St Paul's 14 th century church and church area that sits immediately adjacent to the north-western boundary of the Site and the Plaistow Street, Lingfield- Historic Town Core that lies 300m to the west of the Site.

During the site walkover an area of ridge and furrow was identified in the south-east and north of the Site. LIDAR coverage of the Site did confirm the presence of ridge and furrow at this location and therefore further investigations within the Site may be needed to ascertain the form and function of the earthworks.

This assessment has indicated that there is a high potential for archaeological remains to be identified within the Site, probably relating to the Medieval, Post Medieval and Modern periods.

5.0 Methodology

5.1 The survey methodology is based on relevant heritage industry guidance and best practice advice, including the *EAC Guidelines for the use of Geophysics in Archaeology* (Schmidt et al. 2016), and the '*Standard and Guidance for Archaeological Geophysical Survey'* (Chartered Institute for Archaeologists, 2014).

5.2 Fluxgate Gradiometry is a non-intrusive scientific prospecting tool that is used to determine the presence/absence of some classes of sub-surface archaeological features (e.g. pits, ditches, kilns, and occasionally stone walls).
The use of magnetic surveys to locate sub-surface ceramic materials and areas of burning, as well as magnetically weaker features, is well established, particularly on large green field sites. The detection of anomalies requires the use of highly sensitive instruments; in this instance the Bartington 601 Dual Fluxgate Gradiometer. This is accurately calibrated to the mean magnetic value of each survey area. Two sensors mounted vertically and separated by 1m measure slight, localised distortions of the earth's magnetic field, which are recorded via a data logger.

This technique only records magnetic variation in relation to natural background levels, established by careful selection of magnetically 'quiet' zones where instrument sensors are calibrated to 0nT. As such, the magnetic response of archaeological remains will vary according to geology/pedology, with a possibility that buried features could remain undetected should their magnetic susceptibility closely match that of the surrounding soils. Additionally, some remains may be buried beyond the effective 1m - 2m range of the instrumentation; for example beneath alluvium. Back-filled shallow pits or ditches might also exhibit minimal variation.

5.3 The fieldwork was undertaken on the 8th and 9th of May, 2023. The zigzag traverse methodology was employed, with readings taken at 0.25m intervals along 1.0m wide traverses.

The survey grid was established by Global Positioning Satellite using a Leica GS015 RTX, to an accuracy of +/- 0.1m.

The data were processed by using *Terrasurveyor V3*.

The raw data set is presented as a greyscale image on Fig. 2 (data clipped to +/-20nT).

The trace plot image is presented on Fig. 3 (processed unclipped data).

A 'Despike' function was applied to reduce the effect of extreme readings induced by metal objects, and 'Destripe' to eliminate striping introduced by zigzag traversing. The data were clipped to +/-3nT on the greyscale images of the processed data (Fig. 4).

Anomalies in excess of +/-10nT are highlighted pink and blue on the interpretive figure (Fig.5). These are characterised magnetically as dipolar 'iron spikes', often displaying strong positive and/or negative responses, which reflect ferrous-rich objects. Examples include those forming/deposited along current or former boundaries (e.g. wire fencing), services and random scatters of horseshoes, ploughshares etc across open areas. Fired (ferro-enhanced) material, such as brick/tile fragments (often where the latter are introduced during manuring or land drain construction) usually induce a similar though predominately weaker response, closer to c+/-5nT (highlighted in pink/blue on the interpretive image). Collectively, concentrations of such anomalies typically indicate probable rubble spreads, such as backfilled ponds/ditches and demolished buildings. On a cautionary note, fired clay associated with early activity has the same magnetic characteristics as modern brick/tile rubble. As such, the interpretation of such variation must consider the context in which it occurs.

It should be noted that the strong responses of modern features can mask those of underlying archaeological remains.

This technique only records magnetic variation (relative to natural background levels). As such, the magnetic response of archaeological remains will vary according to geology/pedology. Additionally, remains may be buried beyond the effective 1 - 2m range of the instrumentation.

A digital archive of the geophysical data and report will be retained by PCG.

6.0 Results and discussion (Figs. 2 – 5)

The survey recorded a magnetically weak isolated linear anomaly in the mid-northern part of F3 (Fig. 5: **1**, red line). This extends approximately north-east to south-west toward the northern edge of a magnetically strong buried service (**2**: pink and blue/blue line), with no geophysical indications of any continuation beyond into the southern side of the field. This has been primarily interpreted as a buried ditch of potential archaeological origin, though it is also speculated that it might reflect a relatively recent field boundary. However, no such feature is depicted on historic maps (Cooper, 2022). This hypothesis references a possible association with the service that extends along the extent of a known former boundary. Similarly, a further north-south aligned service that conjoins with it in the central part of the field also corresponds to a recent boundary (**3**).

An enigmatic east-west aligned, partially fragmented, array of strong discrete anomalies was registered in F2 (**4**: dashed blue line). Clearly of modern origin, these extend from the eastern boundary and terminate in the western side of the field. However, it has not been possible to establish a specific origin by non-intrusive investigation (e.g. as remnants of a buried service or a linear array of *in situ* remains of metal posts).

Strong readings (pink and blue) were also recorded in close proximity to existing field boundaries, with more isolated examples (typically) indicators of miscellaneous ferrous-rich objects contained within the plough soil.

The discussed anomalies were recorded against a backdrop of minimal natural variation (greenscale). Slighter stronger responses are more likely to reflect either near surface natural inconsistencies or magnetically weak objects in the plough soil rather than pits, though an archaeological origin for such anomalies cannot be entirely discounted (e.g. green dots).

7.0 Conclusions

For the most part, the geophysical survey has not identified magnetic variation that can be attributed to archaeological remains with any level of confidence. A possible exception is an isolated linear anomaly that exhibits some potential as a buried ditch though alternative interpretations as a recently removed boundary or a land drain are also feasible.

The majority of stronger responses clearly signify modern features or materials, including at least two buried services and boundary ferrous.

The survey has not recorded clearly-defined traces of relict ridge and furrow cultivation, the lack of magnetic contrast suggesting that it might have been almost completely levelled by subsequent ploughing.

With reference to the geophysical survey results, it is concluded that the proposed development area has low archaeological potential. This concurs with the findings of the Archaeological Desk Based Assessment,

8.0 Acknowledgements

Pre-Construct Geophysics thanks HCUK Group for this commission.

9.0 References

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Fig.2: Greyscale images of unprocessed data

Fig.3: Trace plot images

Fig.4: Greyscale images of processed data

50m

>10nT
>10nT
Predominately modern 'ferrous'

Predominately natural

Ditch type response/recent boundary
Service
Uncertain – potential service

Fig.5: Interpretation