Archaeological Services
University of Durham

Land at Langley Park, Buckinghamshire

geophysical survey

for

CgMs Consulting

Report 1687
July 2007

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on behalf of

CgMs Consulting

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Contents

1. Summary

The project

1.1 This report presents the results of geophysical surveys conducted in advance of proposed development on land at Langley Park House, Wexham, Buckinghamshire. The works comprised both geomagnetic and earth resistance surveys.

1.2 The works were commissioned by CgMs and conducted by Archaeological Services in accordance with a brief provided by Buckinghamshire County Archaeological Service and a written scheme of investigation (WSI) provided by Archaeological Services.

Results

1.3 The majority of anomalies detected by both survey techniques reflect recent activities or features visible on the surface.

1.4 The exceptions include a well and path evident on the OS map of 1924 and possible traces of a path depicted on the OS map of 1899. Probable former garden features were detected to the south and southwest of the house and additional anomalies of possible archaeological origin were detected in the north of the survey.

2. Project background

Location (Figure 1)

2.1 The study area consists of the privately owned grounds of Langley House, which lies within the larger County Council run Langley Park. The park is located in Wexham Parish, Buckinghamshire, (NGR: TQ 00850 81590) and lies on the northeast edge of Slough. The survey area comprises the lawn to the west and south of the existing house and covers approximately one hectare (Figure 2).

Development proposal

2.2 The geophysical survey was conducted in advance of proposed development of parts of the grounds in relation to the extension and conversion of Langley House to a hotel.

Objective

2.3 The remains of several phases of garden features, some by Capability Brown, as well as remains from an earlier house may be present on site. The principal aim of the survey was to assess the nature and extent of any sub-surface features of potential archaeological significance within the proposed development area, so that an informed decision may be made regarding the nature and scope of any further scheme of archaeological works that may be required in advance of development.

Methods statement

2.4 The surveys have been undertaken in accordance with a brief provided by the Buckinghamshire County Archaeological Service (Appendix I) and a written scheme of investigation (WSI) provided by Archaeological Services.

Dates

2.5 Fieldwork was undertaken between 18th and 21st June 2007. This report was prepared between 22nd June and 11th July 2007.

Personnel

2.6 Fieldwork was conducted by Lorne Elliott (Supervisor) and Richie Villis. This report was prepared by Lorne Elliott with illustrations by Ed Davies. The Project Manager was Duncan Hale.

Archive/OASIS

2.7 The site code is **LPB07**, for **L**angley **P**ark, **B**uckinghamshire 20**07**. The survey archive will be supplied on CD to the client. Archaeological Services is registered with the **O**nline **A**cces**S** to the **I**ndex of archaeological investigation**S** project (OASIS). The OASIS ID number for this project is **archaeol3-28077**.

3. Archaeological and historical background

3.1 Langley House is a grade II* 18th-century building which lies within a grade II 18th-century park landscaped by Lancelot Brown.

3.2 A deer park is first mentioned at Langley Marish in 1202, continuing in use throughout the Middle Ages. In 1603 Sir John Kederminster was appointed Chief Steward of the Manor of Langley Park, and shortly afterwards replaced the hunting lodge with a house, red brick stables and outbuildings. In 1626 the park and manor were granted to Sir John, ceasing to be crown property. The park was sold in 1738 to Charles Spencer, third Duke of Marlborough, who used it as a hunting lodge until 1756 when he commissioned Stiff Leadbetter to build the present house, which was finished in 1760. His son George, the fourth Duke, succeeded in 1758 and commissioned Lancelot Brown to landscape Langley Park.

3.3 In 2004 a watching brief was undertaken on a geotechnical test pit by Wessex Archaeology which identified a series of layers that may have been post medieval garden features (Wessex 2004). A subsequent archaeological evaluation was undertaken on the proposed site of the new spa wing by Archaeology South East Ltd (ASE 2007). This identified a possible cellar which appeared to be dated from the later 18th century and incorporated bricks from the earlier building.

4. Landuse, topography and geology

4.1 At the time of survey the proposed development area comprised a lawned garden to the west and south of the existing Langley Park House (Figure 2). This included two terraces of shrubs and grass banks approximately a metre in height, stone steps, cinder and gravel paths and a scatter of trees. Other objects noted included ground lights, two manhole covers and a large satellite dish.

4.2 The survey area was predominantly level at a mean elevation of *c*.35-37m OD.

4.3 The underlying solid geology of the area comprises London Clay, which is overlain by Lynch Hill gravels.

5. Geophysical survey

Standards

5.1 The surveys and reporting were conducted in accordance with English Heritage Research and Professional Services Guideline No.1, *Geophysical survey in archaeological field evaluation* (David 1995); the Institute of Field Archaeologists Technical Paper No.6, *The use of geophysical techniques in archaeological evaluations* (Gaffney, Gater & Ovenden 2002); and the Archaeology Data Service *Geophysical Data in Archaeology: A Guide to Good Practice* (Schmidt 2001).

Technique selection

5.2 Geophysical surveying enables the relatively rapid and non-invasive identification of potential archaeological features within landscapes and can involve a variety of complementary techniques such as magnetometry, electrical resistance, ground-penetrating radar and electromagnetic survey. Some techniques are more suitable than others in particular situations, depending on a variety of site-specific factors including the nature of likely targets; depth of likely targets; ground conditions; proximity of buildings, fences or services and the local geology and drift.

5.3 In this instance, based on previous work it was suggested that formal gardens may have been laid out in the survey area and that wall foundations from an earlier building might also be present. Given the anticipated shallowness of targets and the non-igneous geology of the study area both geomagnetic and earth electrical resistance survey techniques were specified. The resistance technique was expected to be particularly useful at detecting stone wall-footings.

5.4 The geomagnetic technique, fluxgate gradiometry, involves the use of hand-held magnetometers to detect and record minute anomalies in the vertical component of the Earth's magnetic field caused by variations in soil magnetic susceptibility or permanent magnetisation; such anomalies can reflect the presence of archaeological and garden features.

5.5 Earth electrical resistance is the most widely used electrical survey method and relies on the relative inability of materials to conduct an electrical current. When a small electrical current is injected through the earth it encounters sub-surface resistance which can be measured. Since resistance is linked to moisture content and porosity, rock or brick features such as wall foundations will give relatively high resistance values while soil-filled cut features, which retain more moisture, will provide relatively low resistance values. When measurements are taken over a regular grid, a map of sub-surface archaeological features can be produced. Although more time-consuming than magnetometry, this method can be used in a wider range of locations since it is not affected by the presence of buildings, wire fences, services or igneous geology.

Field methods

5.6 A 20m grid was established across the survey area and tied-in to known, mapped Ordnance Survey points using a Leica TR307 total survey station.

5.7 Measurements of vertical geomagnetic field gradient were determined using a Bartington Grad601-2 fluxgate gradiometer. A zig-zag traverse scheme was employed and data were logged in 20m grid units. The instrument sensitivity was set to 0.1nT, the sample interval to 0.25m and the traverse interval to 1.0m, thus providing 1600 sample measurements per 20m grid unit.

5.8 Measurements of electrical resistance were determined using a Geoscan RM15D resistance meter with a mobile twin probe separation of 0.5m. A zig-

zag traverse scheme was employed and data were logged in 20m grid units. The instrument sensitivity was set to 0.1ohm, the sample interval to 0.5m and the traverse interval to 1.0m, thus providing 800 sample measurements per 20m grid unit.

5.9 Data were downloaded on-site into a laptop computer for initial processing and storage and subsequently transferred to a desktop computer for processing, interpretation and archiving.

Data processing

5.10 Geoplot v.3 software was used to process the geophysical data and to produce both continuous tone greyscale images and trace plots of the raw (unfiltered) data. The greyscale images and interpretations are presented in Figures 3-7; the trace plots are provided in Appendix II. In the greyscale images, positive magnetic/high resistance anomalies are displayed as dark grey and negative magnetic/low resistance anomalies as light grey. A palette bar relates the greyscale intensities to anomaly values in nanoTesla/ohm.

5.11 The following basic processing functions have been applied to the geomagnetic dataset (Figure 3):

Clip	clips, or limits data to specified maximum or minimum values; to eliminate large noise spikes; also generally makes statistical calculations more realistic.
Zero mean traverse	sets the background mean of each traverse within a grid to zero; for removing striping effects in the traverse direction and removing grid edge discontinuities.
Destagger	corrects for displacement of geomagnetic anomalies anomalies caused by alternate zig-zag traverses.
Interpolate	increases the number of data points in a survey to match sample and traverse intervals. In this instance the gradiometer data have been interpolated to 0.25 x 0.25m intervals.

5.12 The following basic processing functions have been applied to the earth resistance dataset (Figure 5):

Despike	locates and suppresses spikes caused by very high probe contact resistance.
Interpolate	increases the number of data points in a survey to match sample and traverse intervals. In this instance the earth resistance data have been interpolated to 0.25 x 0.25m intervals.

Interpretation: anomaly types

5.13 Colour-coded geophysical interpretation plans are provided. Three types of geomagnetic anomaly have been distinguished in the data (Figure 4):

positive magnetic	regions of anomalously high or positive magnetic field gradient, which may be associated with high magnetic susceptibility soil-filled structures such as pits and ditches.
negative magnetic	regions of anomalously low or negative magnetic field gradient, which may correspond to features of low magnetic susceptibility such as wall footings and other concentrations of sedimentary rock or voids.
dipolar magnetic	paired positive-negative magnetic anomalies, which typically reflect ferrous or fired materials (including fences and service pipes) and/or fired structures such as kilns or hearths.

5.14 Two types of resistance anomaly have been identified in the data (Figure 6):

high resistance	regions of anomalously high resistance, which may reflect foundations, tracks, paths and other concentrations of stone or brick rubble.
low resistance	regions of anomalously low resistance, which may be associated with soil-filled features such as pits and ditches.

Interpretation: features

5.15 A colour-coded archaeological interpretation plan is provided in Figure 7.

5.16 The greyscale image for the earth resistance data (Figure 5a) broadly shows a distinction between the low resistance values of the upper terrace of the lawn and the high resistance values of the lower terrace. Due to the wide ranging values recorded, it was considered appropriate to subdivide the resistance data into two images in order to improve the definition of detected features (Figures 5b & 5c).

5.17 The curvilinear boundary between low and high resistance in Figure 5b represents the grass bank between the terraces. Adjacent to this boundary is a line of anomalously high resistance which possibly represents a revetment or retaining wall forming the terrace bank. A low resistance anomaly detected at the base of the bank corresponds to curvilinear chain of dipolar magnetic anomalies. This almost certainly reflects a service, probably covered cables relating to the lights positioned on the stone steps.

5.18 Several linear low resistance anomalies detected in the survey correspond to existing paths. Some of these are more clearly defined in Figure 5b.

5.19 An area of anomalously high resistance detected in the middle of an existing path, almost certainly corresponds to a well noted on the OS map of 1924. A linear area of anomalously low resistance detected to the east of this almost certainly corresponds to a path evident on the 1924 map and still present on the OS map of 1972.

5.20 An area of low resistance containing higher resistance values showing some form of symmetry was detected on the upper terrace to the south of the house. This may represent a former garden feature. A group of small dipolar magnetic anomalies detected in this area may reflect made ground containing fired or ferrous debris.

5.21 An area of anomalously low resistance near the southern edge of the survey corresponds to a rectilinear grass bank. Within this area a linear anomaly of low resistance aligned north-south was detected, almost certainly representing a former path depicted on the OS map of 1899.

5.22 A small circular high resistance anomaly detected a few metres to the northeast of the grass bank possibly represents a former garden feature.

5.23 A lineation of anomalously low resistance detected in the southwest corner of the survey with a northwest-southeast alignment corresponds to a chain of strong dipolar magnetic anomalies. This almost certainly reflects a service.

5.24 Three further chains of strong dipolar magnetic anomalies have been detected traversing the central part of the survey: one aligned northeast-southwest and two with a broadly east-west orientation. These almost certainly reflect services. The northernmost of these corresponds to a low resistance anomaly and the location of two manhole covers. The southernmost of these anomalies may be associated with a ground light located at the western edge of the survey.

5.25 A strong curvilinear dipolar magnetic anomaly was detected near the southeast edge of the survey. This appears to correspond to a boundary line or wall depicted on the OS maps of 1899 and 1924. The southwest end of this boundary is presently evident as a retaining wall and ditch.

5.26 Small, very weak curvilinear positive and negative magnetic anomalies detected in the southwest of the survey appear to correspond to an area of anomalously high resistance. These anomalies may represent a ditch, possibly associated with a former garden feature.

5.27 A weak discontinuous curvilinear positive and negative anomaly detected at the northern end of the survey may reflect a ditch feature. An additional weak curvilinear negative magnetic anomaly detected just to the west of this could reflect a wall footing or void. Both of these anomalies are possibly of archaeological origin.

5.28 A line of dipolar magnetic anomalies along the northern edge of the survey corresponds to an area of low resistance. This almost certainly reflects a ferrous service alongside a retaining brick wall noted on site.

5.29 Additional large dipolar magnetic anomalies detected in the survey represent a several ground lights, two manhole covers and a satellite dish.

6. Conclusions

6.1 Both geomagnetic and electrical resistance surveys have been carried out on land at Langley Park, Buckinghamshire.

6.2 The majority of anomalies detected reflect modern activities or features visible on the surface.

6.3 The exceptions include a well and path evident on the OS map of 1924 and possible traces of a path depicted on the OS map of 1899; all detected using the earth resistance technique.

6.4 The resistance survey also detected possible former garden features to the south and southwest of the house. A possible ditch feature was also detected in the southwest of the survey by the geomagnetic survey.

6.5 Additional anomalies detected in the north of the survey may also have an archaeological origin.

7. Sources

Archaeology South-East 2007 *An Archaeological Evaluation at Langley Park House, Buckinghamshire,* unpublished report.

David, A, 1995 *Geophysical survey in archaeological field evaluation,* Research and Professional Services Guideline **1**, English Heritage

Gaffney, C, Gater, J, & Ovenden, S, 2002 *The use of geophysical techniques in archaeological evaluations*, Technical Paper **6**, Institute of Field Archaeologists

Schmidt, A, 2001 *Geophysical Data in Archaeology: A Guide to Good Practice*, Archaeology Data Service, Arts and Humanities Data Service

Wessex Archaeology 2004 *An Archaeological Watching Brief Report on a Geotechnical Test Pit: Langley Park House, Buckinghamshire,* unpublished report.

Appendix I: Project brief

Buckinghamshire County Archaeological Service
Brief for an Archaeological Field Evaluation (Geophysical Survey)

Project: Langley Park House
Development: Conversion to hotel, new spa wing, accommodation wing, car parking and landscaping
Planning Application: Pre application
Local Planning Authority: South Bucks District Council
The case officer for this project is David Radford
Brief issued: 14/5/07

1. SUMMARY

This brief sets out the requirements for magnetometer and resistivity survey in the grounds of Langley Park house. The aim of the survey is to help establish the potential for archaeological deposits relating to the development of the historic house, park and garden and any earlier activity relating to the medieval manor and deer park.

2. DEFINITION

"The definition of archaeological field evaluation is a limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land … or underwater. If such archaeological remains are present Field Evaluation defines their character, extent, quality and preservation, and enables an assessment of their worth in a local, regional, national or international context as appropriate." (IFA, 1999)

3. SITE DESCRIPTION

The site consists of the privately owned grounds of Langley House which lies within a larger County Council run park. The house is located in Wexham Parish at NGR 00900 81560 and lies on Lynch Hill gravels.

4. PLANNING BACKGROUND

Planning Policy Guidance 16 (Archaeology and Planning) states that local planning authorities can expect developers to provide the results of archaeological desk-based assessments and field evaluations as part of their planning applications for sites where there is good reason to believe there are remains of archaeological importance. In this instance this geophysical work has been requested pre-application in response to consultations with the developer.

5. ARCHAEOLOGICAL BACKGROUND

This brief sets out the requirements for a geophysical survey which will form part of the field evaluation being conducted at this site. Geophysical survey is considered necessary because landscaping works are proposed in relation to the extension and refurbishment of Langley House as a Hotel. Langley House is a grade II* 18th century building which lies within a grade II 19th century landscaped park by Lancelot Brown. A deer park is first mentioned at Langley Marish (now in Wexham Parish) in the 12th century and the park continued in use throughout the Middle Ages. In 1603 Sir John Kederminster was appointed Chief Steward of the Manor of Langley Park and shortly afterwards replaced the existing hunting lodge with a house, red brick stables and outbuildings. In 1738 the park was sold to Charles Spencer, third Duke of Malborough who used it as a hunting lodge until in 1756 when he commissioned Stiff Leadbetter to build the present house, finished in 1760. His son George, the fourth Duke, commissioned Lancelot Brown (1716-83) to landscape Langley Park.

An archaeological desk based assessment was produced for this site by CgMs Ltd (2007b). In 2004 a watching brief was undertaken on a geotechnical test pit by Wessex Archaeology (Wessex 2004) which identified a series of layers that may have been post medieval garden features. A subsequent archaeological evaluation was undertaken on the proposed site of the new spa wing by ASE Ltd (ASE, 2007b), this identified a possible cellar which appeared to have dated from the later 18th century and have incorporated bricks from the earlier building. A conservation management plan has been produced for the site by Fielden and Mawson (2006; revised 2007).

6. PROCEDURE AND PROFESSIONAL STANDARDS

Geophysical surveys should be undertaken in accordance with the general *Standard and Guidance for archaeological field evaluations* published by the Institute of Field Archaeologists (IFA, 1999) and the specific standards for geophysical survey published by English Heritage: *Geophysical survey in archaeological field evaluation* (1995). Each project must be governed by a project design which has

been agreed in writing by the County Archaeological Service. The project design should be based on a thorough study of all relevant background information (especially any existing assessment or evaluation reports or, in their absence, data held or referenced in the SMR). It should conform to the guidelines set out in paragraph 3.2.17 of the IFA guidelines and should in particular specify:

- The project objectives
- The extent of the survey area
- The proposed methodology which must be justified with reference to the objectives and ground conditions (including the likely responsiveness of the underlying geology). This should detail the techniques to be employed, sampling intervals and contingency arrangements.
- The project manager should be a named Member of the Institute of Field Archaeologists (MIFA) who is adequately qualified to manage the required archaeological work in line with the guidance set out in the IFA code of conduct.
- Site staff should be suitably experienced in geophysical survey. Effective magnetometer scanning is recognised to require a particularly high level of experience. *Note: Specialists should be able to demonstrate a relevant qualification and track record of at least3 years continuous relevant work (or equivalent) and appropriate publication. In appropriate circumstances, less experienced staff may conduct work under the supervision of well established and widely recognised specialists.*
- Report and Archive format and arrangements.

7. OBJECTIVES

The project should aim to gather sufficient information to establish the presence/absence of potentially archaeologically significant anomalies and the character and extent of those anomalies within the survey area. It should also identify areas of land where geological or recent deposits (e.g. disturbed ground, alluvium or colluvium) or modern features (e.g. pipelines) could be masking the detection of anomalies. The work should be informed by, and subsequently considered in the context of, other studies of the area.

In this case, particular interest is attached to the potential for locating earlier structures relating to earlier hunting lodges, including the 17th century lodge and its out buildings. The survey should also seek to identify any traces of earlier gardening schemes (paths, beds, statue bases etc) that may be present.

8. GEOPHYSICAL SURVEY METHODOLOGY

The geophysical survey strategy should be based on the principles set out in *Geophysical survey in archaeological field evaluation* (English Heritage, 1995). It should take explicit account of the project's archaeological objectives including the size, date, nature and likely responsiveness of targets, site geology and topography, current and past land use and any constraints. For large sites and long linear projects it will often be appropriate to undertake a reconnaissance survey to be followed up by comprehensive detailed survey of "hot spots" and a sample of other areas. **However, the routine use of standardised methodologies will not always be acceptable and will only be approved where properly justified as required above.**

In this instance a detailed magnetometer survey and resistivity survey should be undertaken on the areas that are to be subject to landscaping in the current landscape Masterplan and their immediate context (e.g. the grassed lawn west and south of the house defined by the tree belt).

9. POST-EXCAVATION METHODOLOGY

Data should be processed and interpreted in accordance with the English Heritage guidelines (English Heritage, 1995).

10. REPORTING

Report format

The survey report should conform to the requirements defined by English Heritage (English Heritage 1995, 30-33). In addition:

- All plans should be clearly related to the national grid and to the local topography (e.g. field boundaries).

- As far as possible, the results should be related to other significant archaeological features in the vicinity (e.g. adjacent earthworks).

Submission of the report

- **Two** copies of the final report should be supplied to the Buckinghamshire County Archaeological Service. A digital PDF copy of all text should also be supplied. A copy of any specialist papers relating to the project should also be supplied to the County Archaeological Service.

- One copy of the report should also be supplied to the local planning authority.

- Reports submitted in support of planning applications are automatically considered to be public documents and will be made available for public consultation through the Sites and Monuments Record. Other reports will also be treated as a public document unless specifically identified as being confidential. Where a report is so identified then confidentiality should apply for an agreed period not normally exceeding 12 months from its submission to the County Archaeological Service.

11. PUBLICATION

A summary report (including illustrations where appropriate) should be sent to the editors of ***South Midlands Archaeology*** and ***Records of Buckinghamshire*** not later than three months after the end of the calendar year in which the work is undertaken. A publication grant should be provided to the publishers in accordance with their requirements.

12. OASIS

Once the final report has been accepted by the County Archaeological Service, contractors taking part in the OASIS scheme should complete an OASIS fieldwork summary form and submit it to the Archaeology Data Service. Contributors not yet formally participating are also encouraged to submit data. The form and guidance for its completion can be found at http://ads.ahds.ac.uk/project/oasis/first.html.

13. ARCHIVING

The archaeological contractor should arrange for the report to be copied on microfiche to the standard required by the National Monuments Record. One copy should be deposited with the National Monuments Record and a second copy with the County Sites & Monuments Record.

Digital archiving ….UNDER REVIEW.

14. MONITORING

Monitoring is carried out by the County Archaeological Service, normally acting on behalf of the local planning authority, to ensure that projects are being carried out in accordance with the brief and approved project design, to enable the need for modifications to the project to be independently considered and validated and to control and validate the use of available contingencies.

A programme of monitoring should be agreed with the County Archaeological Service prior to the commencement of fieldwork. The archaeological contractor should keep the County Archaeological Service regularly informed of the project's progress and facilitate the monitoring of the project at each stage. In particular, there should be no substantial modification of the approved brief and project design without the prior consent of the County Archaeological Service and no fieldwork should be carried out without the Service's knowledge and approval.
All monitoring visits will be documented by the County Archaeological Service and the archaeological contractor will be informed of any perceived deficiencies.

The County Archaeological Service should be informed at the earliest opportunity of any unexpected discoveries, especially where there may be a need to vary the project design. The archaeological

contractor should carry out such reasonable contingency works as requested by the County Archaeological Service within the resources defined in the project design.

15. HEALTH AND SAFETY

Health and Safety must take priority over archaeological requirements. It is essential that all projects are carried out in accordance with safe working practices and under a defined Health and Safety Policy. **Risk Assessments must be carried out for every field project**. If the risk assessment indicates it is necessary, the requirements of the brief can be varied in the interests of health and safety. The County Archaeological Service must be consulted and the proposed changes agreed in such cases.

16. ENFORCEMENT POLICY

In the event that the County Archaeological Service considers that the approved project design is not being complied with without reasonable justification then action will be taken in accordance with Buckinghamshire County Councils archaeological enforcement policy (http://www.buckscc.gov.uk/archaeology/index.htm).

17. BIBLIOGRAPHY

Archaeology South-East *An Archaeological Evaluation at Langley Park House, Bucks* 2007

DoE, 1990 *Planning Policy Guidance: Archaeology and Planning.* (PPG16)

English Heritage, 1995 *Geophysical survey in archaeological field evaluation.*

Fielden and Mawson *Langley Park Mansion Conservation Plan* 2007

IFA, 1999 *Standard and Guidance for archaeological field evaluations.*

Wessex Archaeology *Archaeological Watching Brief Report on a Geotechnical Test Pit: Langley Park House, Bucks* 2004

18. CONTACTS

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Please note that the SMR operates an appointment system and there is a charge for commercial enquiries.

Buckinghamshire Archaeology Society (Records of Buckinghamshire)

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Council For British Archaeology South Midlands Group (South Midlands Archaeology)

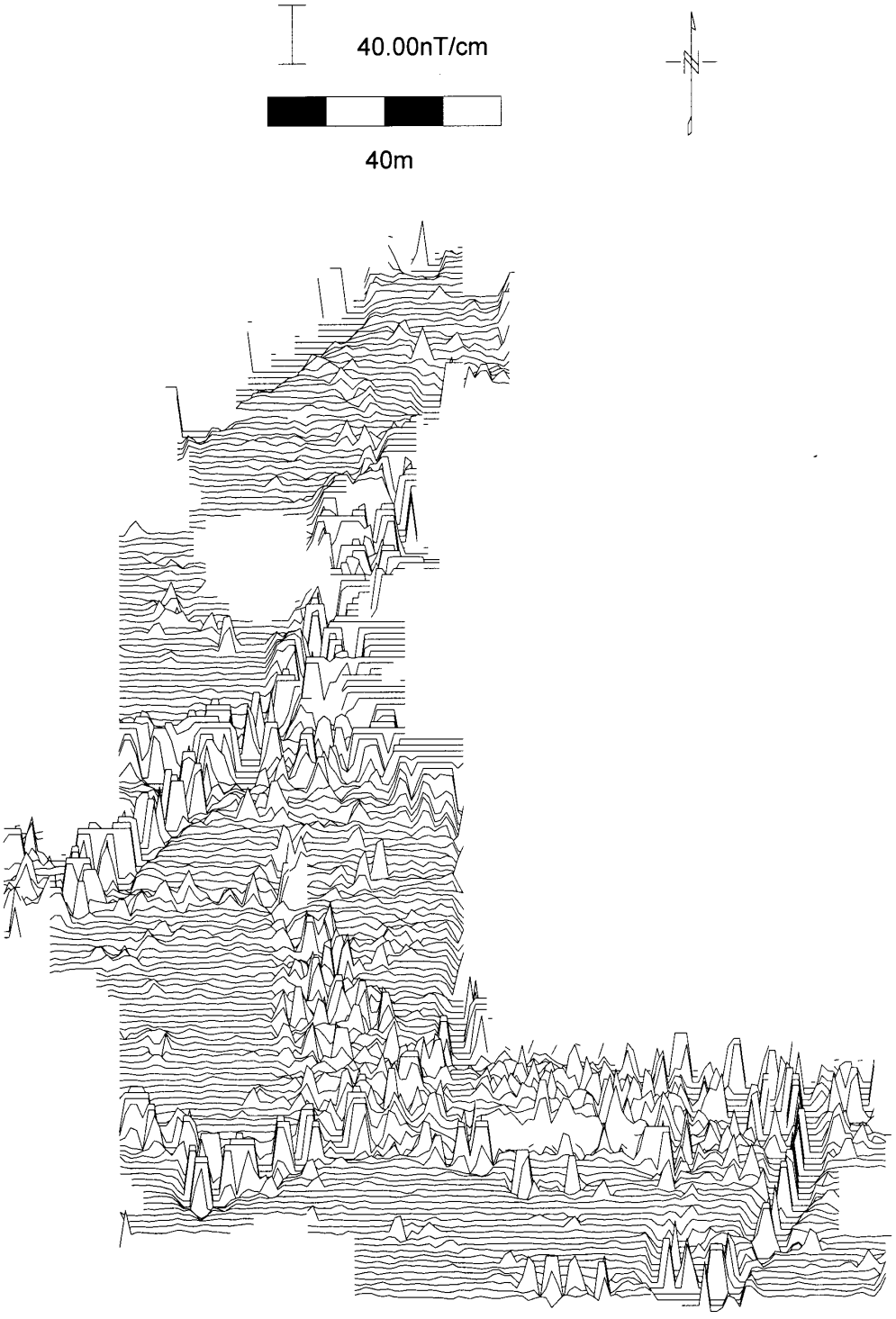
Mr Barry Horne, Hon.Editor, "Beaumont", Church End, Edlesborough, Dunstable, Beds, LU6 2EP.

English Heritage Regional Adviser in Archaeological Science (South East Region)

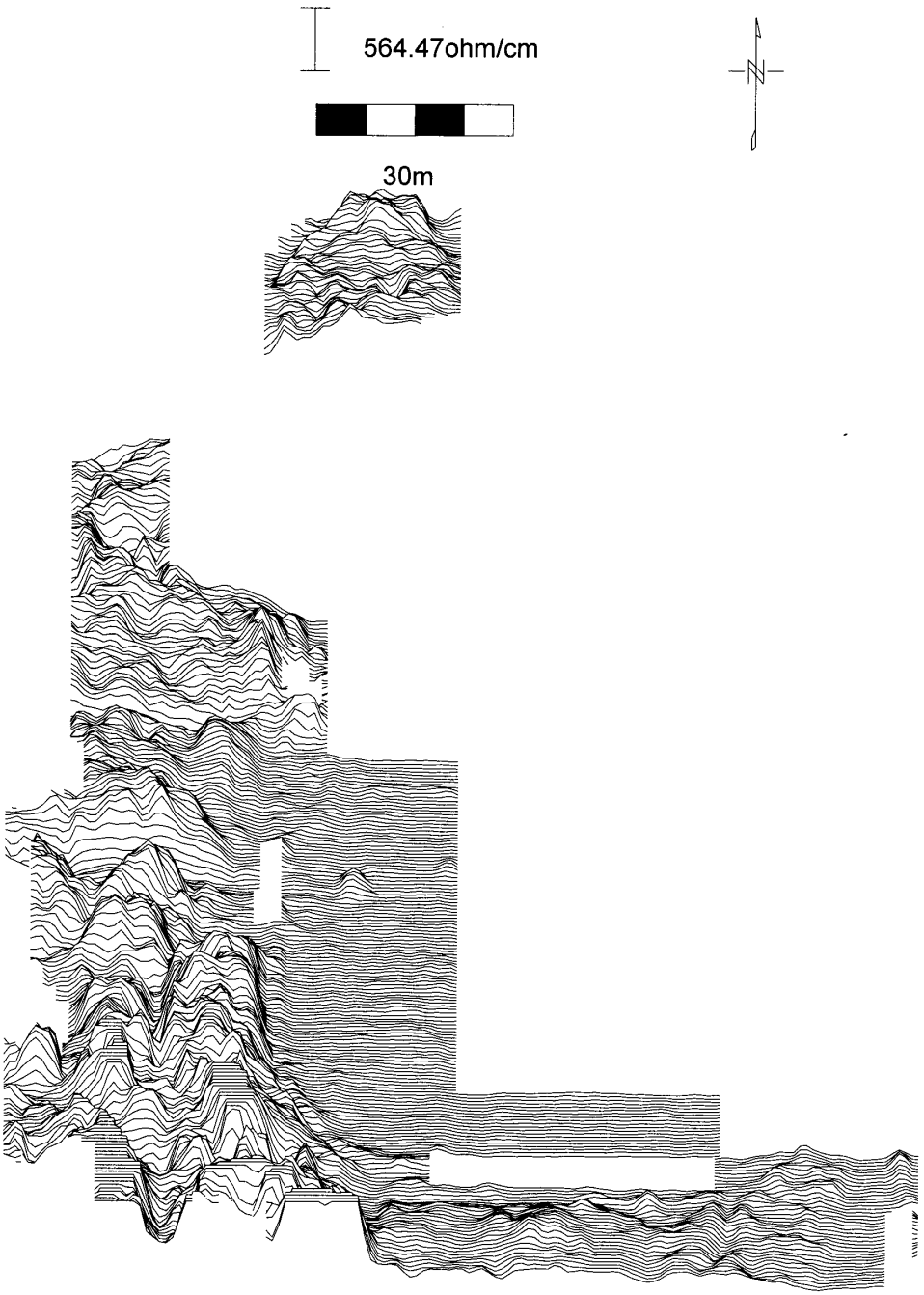
Dr Dominique de Moulins, Institute of Archaeology, University College London, 31-34 Gordon Square, London WC1H 0PY. Tel: 0171-3911539; Fax: 0171-3832572; e-mail:d.moulins@ucl.ac.uk

Appendix II: Trace plots of geophysical data

Magnetic data



Resistance data



Archaeological Services
University of Durham

Langley Park, Buckinghamshire

geophysical surveys

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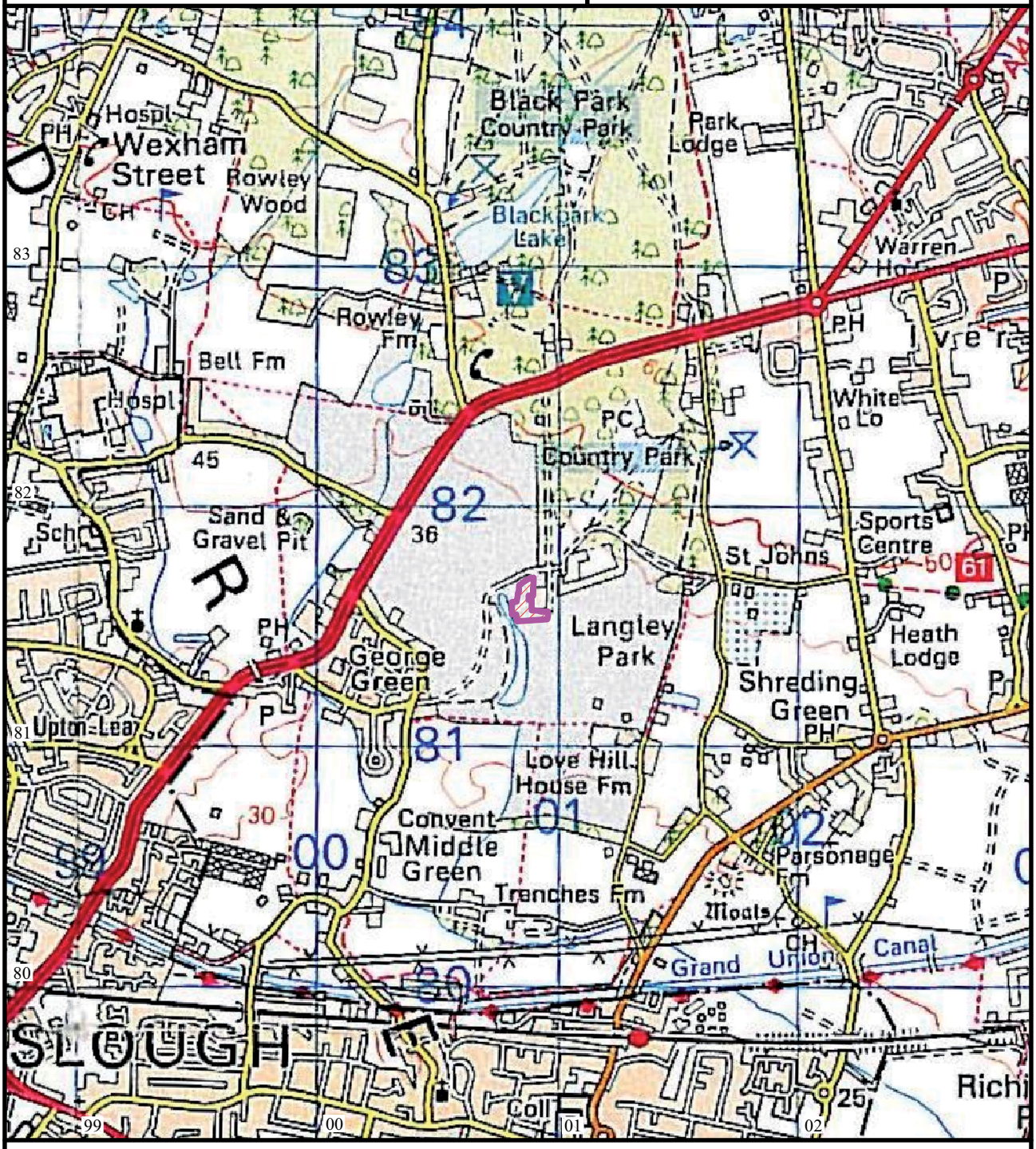
Figure 1
Location of study area

on behalf of
CgMs Consulting



study area

0 1km

scale 1:25 000 - for A4 plot

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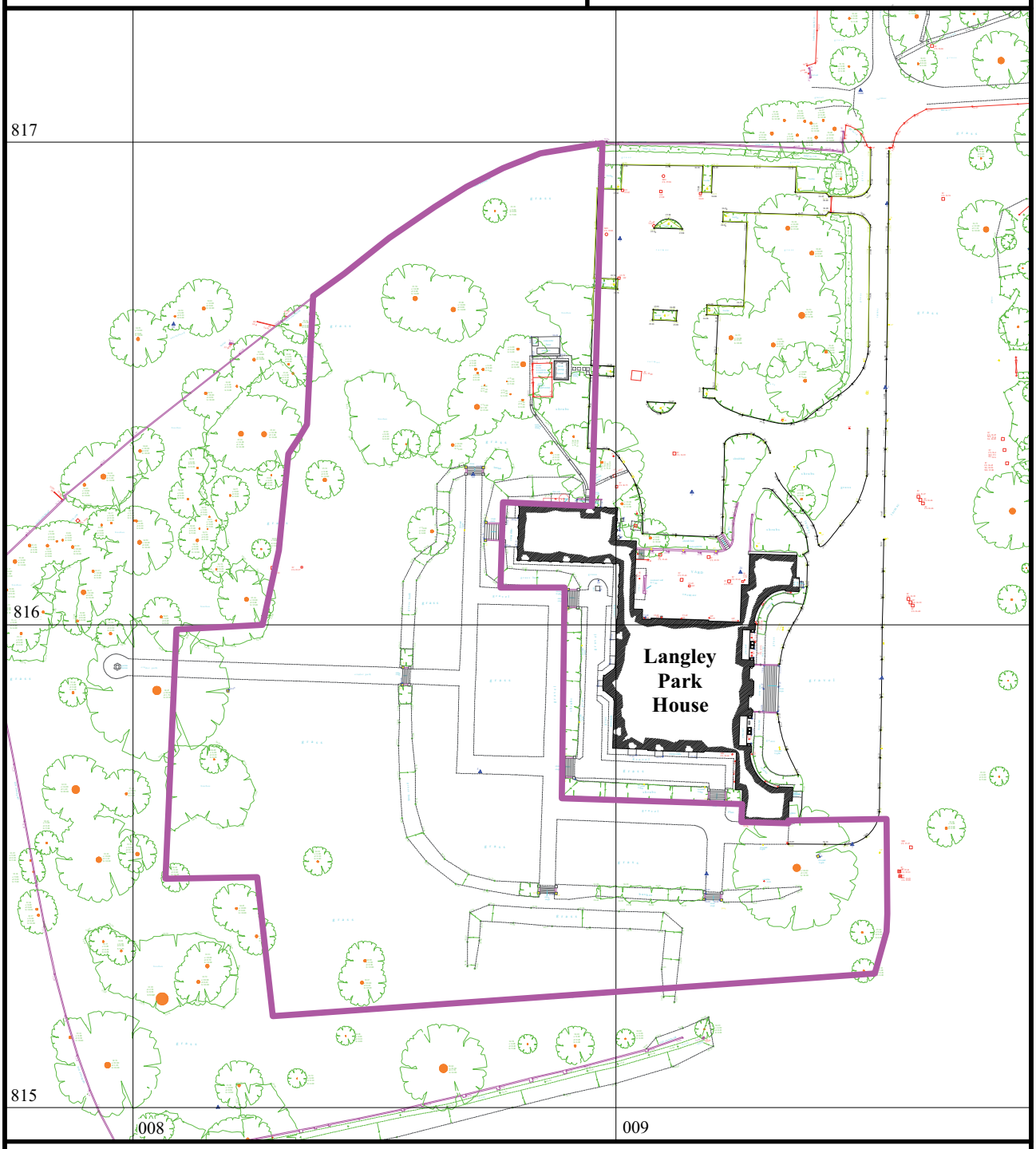
Figure 2
Extent of study area

0 50m
scale 1:1250 - for A4 plot



study area

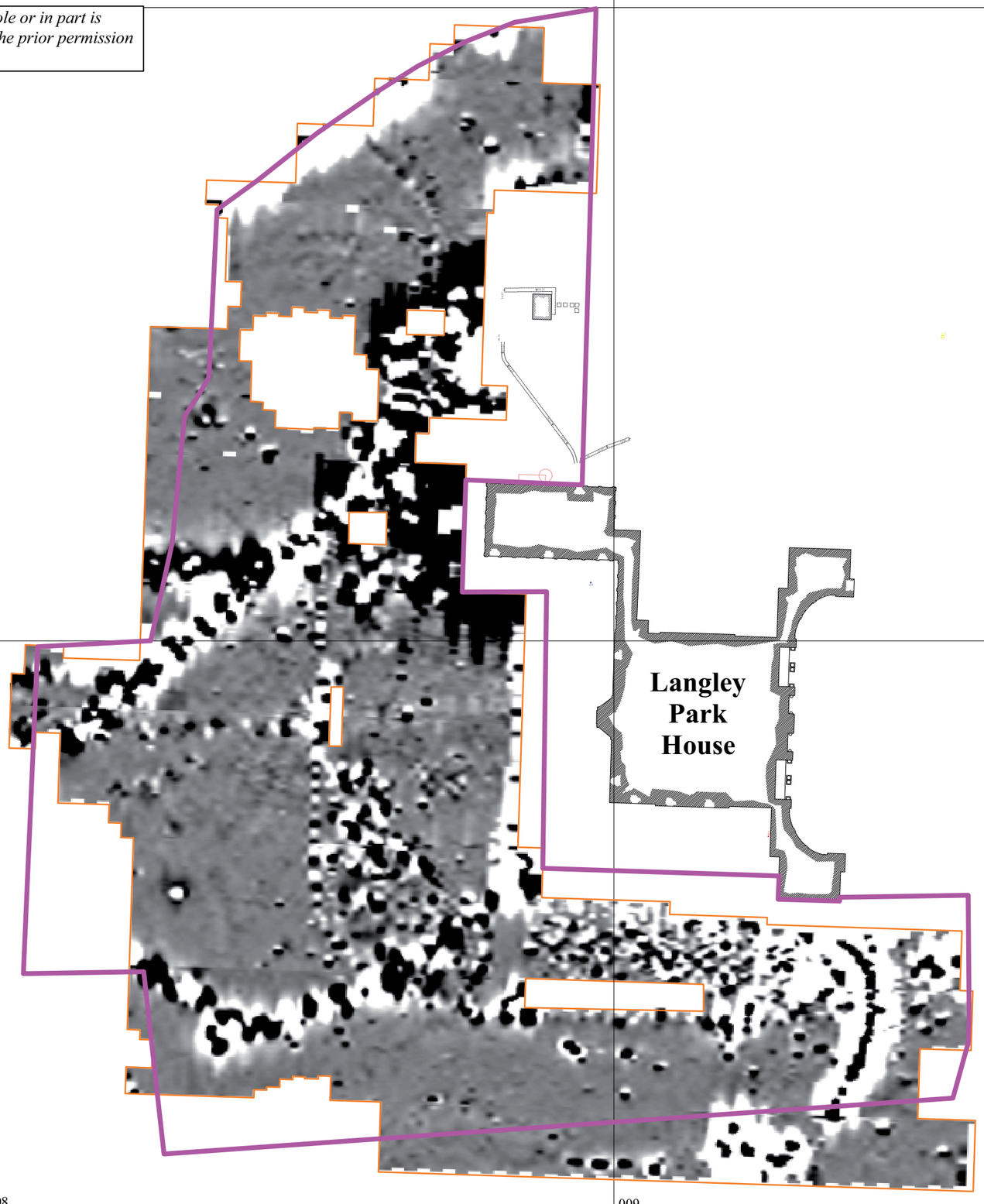


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Figure 3

Geomagnetic survey

on behalf of
CgMs Consulting

0 30m

scale 1:750 - for A3 plot

outline of study area

outline of survey area

6.00
5.00
4.00
3.00
2.00
1.00
0
-1.00
-2.00
-3.00
-4.00
-5.00
-6.00 nT

816

Langley Park House

008

009

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Figure 4

Geophysical interpretation of geomagnetic survey

on behalf of
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0 30m

scale 1:750 - for A3 plot

- outline of study area
- outline of survey area
- positive magnetic anomalies
- negative magnetic anomalies
- dipolar magnetic anomalies

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on behalf of
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outline of study area

outline of survey area

0 50m

scale 1:1250 - for A3 plot

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Figure 5

Resistance survey

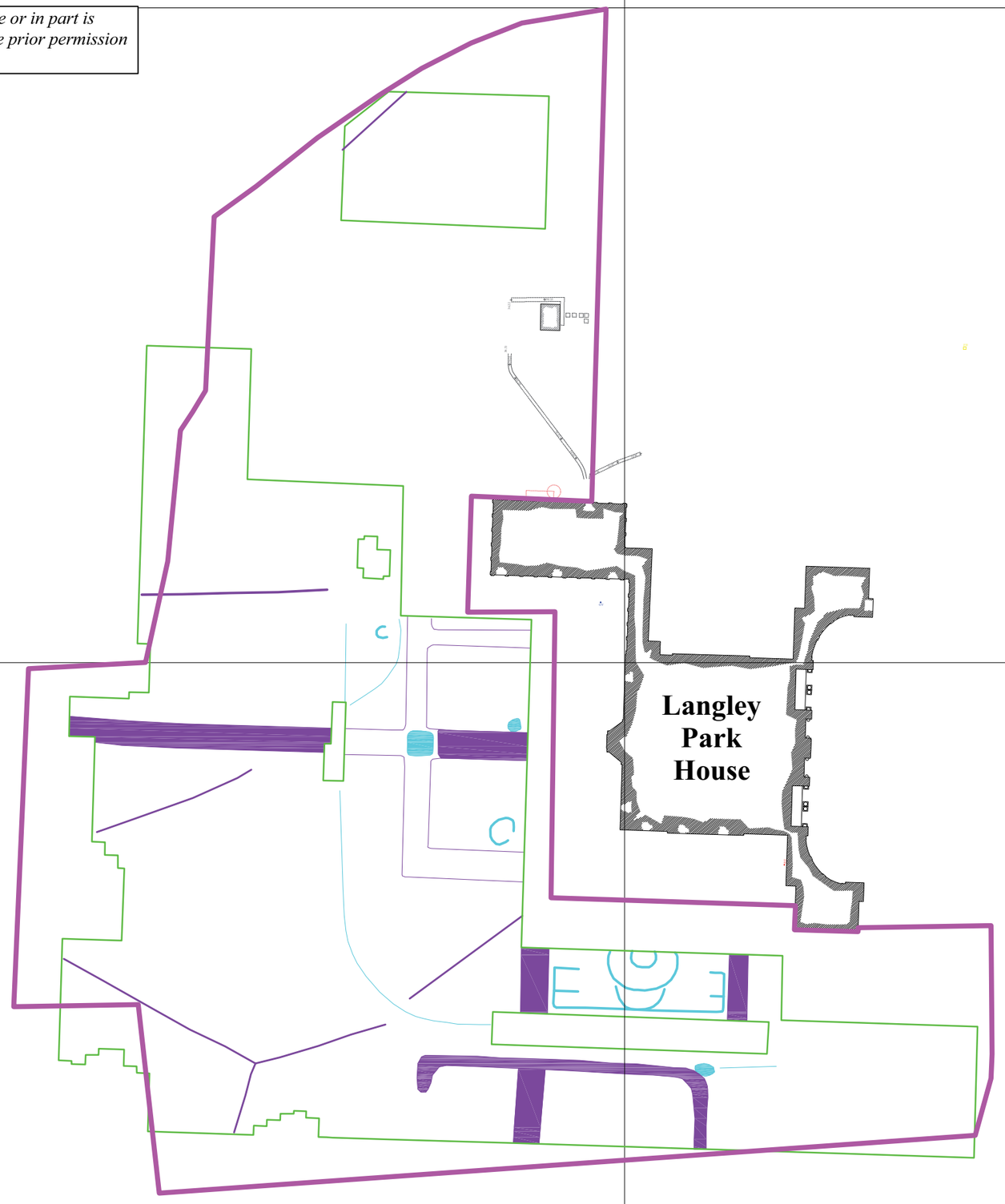

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Figure 6

Geophysical interpretation of resistance survey

on behalf of
CgMs Consulting

0 30m

scale 1:750 - for A3 plot

- outline of study area
- outline of survey area
- high resistance anomalies
- low resistance anomalies

816

Langley Park House

008

009

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geophysical survey

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Figure 7

Archaeological interpretation

on behalf of
CgMs Consulting

0 30m

scale 1:750 - for A3 plot

- outline of study area
- outline of geomagnetic survey area
- outline of resistance survey area
- soil-filled features
- service pipes
- course of services unclear
- stone/rubble
- paths