

**RESULTS FROM A GEOPHYSICAL SURVEY
AT WOKING PALACE, OLD WOKING, SURREY**

DRAFT

NGR: TQ 0294 5706 (centred)

ASE Project No: P83

ASE Report No. 2009099

OASIS ID: archaeol6-61278



By Chris Russel BA (Hons)

July 2009

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Abstract

Archaeology South East was commissioned by Surrey County Archaeological Unit to undertake a detailed resistance survey at Woking Palace, Old Woking, Surrey, as part of a community archaeology project and as part of the ongoing management scheme for the site. The survey area covered 1.53 hectares and took place between the 25th of May and the 5th of June 2009. The site consisted mainly of long undifferentiated grassland with some tree growth. The survey identified several groups of anomalies of a possible archaeological origin in south and south-east of the survey area as well as track ways and other possible archaeological features in the east. The northern part of the survey area showed fewer anomalies and these anomalies were less distinctly archaeological.

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1.0 INTRODUCTION

1.1 Site Background

1.1.1 Archaeology South-East was commissioned by Surrey County Archaeological Unit to conduct a resistivity survey over 1.53 hectares at Woking Palace, Old Woking, Surrey, hitherto referred to as 'the site' (NGR TQ 0294 5706; Figure 1). Woking Palace is designated as a Scheduled Ancient Monument (No 12752).

1.2 Geology and Topography

1.2.1 The geology of the site consists of alluvium (British Geological Survey: Sheet 285). The site is situated adjacent to the River Wey and is surrounded by a water filled moat.

1.3 Planning Background

The survey was undertaken as part of a community archaeology project and as part of the on going archaeological management of Woking Palace.

1.4 Aims of Geophysical Investigation

1.4.1 The purpose of the geophysical survey was to detect any buried archaeological anomalies that might provide a measurable resistance response in order to determine the extent and location of any possible features and so to inform the general management plan of the site.

1.5 Scope of Report

1.5.1 The scope of this report is to report on the findings of the survey with a view to contributing to the overall understanding and ongoing management of the archaeology of Woking Palace. The project was conducted by Chris Russel with the assistance of Richard Savage and members of the Surrey Archaeological Society and was project managed by Giles Dawkes.

2.0 ARCHAEOLOGICAL BACKGROUND

- 2.1** Woking Palace was the site of the Royal Manor of Woking from 1272 onwards and was the residence of Lady Margaret Beaufort, the mother of Henry VII and Henry himself further developed the property in 1503.
- 2.2** Excavations took place at the site in 1911 but only the plans from this investigation survive.
- 2.3** A programme of test pitting combined with a resistivity survey were undertaken in the 1990's (Poulton 2009)
- 2.4** There are architectural remains preserved at the site relating to several phases of development and preserved alongside these are remains of the enclosure moat (Poulton, 2009).

3.0 SURVEY METHODOLOGY

3.1 Summary of Methodology

3.1.1 The survey grid was set out using a differential GPS (Global Positioning Systems). A 30 metre grid was set out across the survey area and transects were walked every meter across these grids. Using this 30m grid a RM15 resistance meter attached to a PA1 twin probe frame with 0.5m probe separation was used to record sample readings every metre.

3.2 Geophysical Survey Methods Used

3.2.1 The primary survey method used by Archaeology South-East at Woking Palace used a twin probe resistance array. Further geophysical survey using a Fluxgate Gradiometer was conducted by Surrey Archaeological Society and is outside the scope of this report. The resistivity survey was undertaken in the areas depicted in Figure 2. The majority of the survey was carried out in fine weather although there were some heavy showers during the first two days.

3.3 Applied Geophysical Instrumentation

3.3.1 The resistance survey was carried out using a twin probe array fitted with a Geoscan RM15 data logger. The twin probe array is popular within archaeology and combines convenience with ease of use. The two probes of the array had 0.5m spacing and were connected to two remote probes placed at least thirty times this distance from the array (15m). This is done to lessen the effect on the results of probe separation and to improve depth penetration (Clark 1996: 44). The penetration of the survey will be dependant on the probe spacing, usually reaching a depth relative to half the probe space, in this case 0.25m.

3.3.2 The resistance survey uses an electric current to measure the relative water content of buried features. Features such as pits and ditches will generally contain looser material than the surrounding geology and will have an enhanced water bearing capacity allowing the current to pass through them more freely. These will be measured as low resistance anomalies on the results. Stone and brick wall foundations will prove a barrier to the electrical current and will be shown as higher resistance anomalies (Gaffney & Gater 2003: 26). Resistance survey relies on detecting differences in water content between archaeological features and the surrounding geology and will be ineffective in waterlogged or highly arid conditions. Resistance surveys are measured in ohms per metre.

3.4 Instrumentation Used for Setting out the Survey Grid

3.4.1 It is vitally important for the survey grid to be accurately set out. The English Heritage guidelines (David 1995) state that no one corner of any given survey grid square should have more than a few centimetres of error. The survey grid for the site was set out using a Leica TCRA 1205 total station. The grid points were then geo-referenced using a Leica System 1200 Differential Global Positioning System (DGPS). The GPS base station collects satellite position to determine its position. This data is processed in survey specific software to provide a sub centimetre Ordnance Survey position and height for the base station. The survey grid is then tied in to this known accurate position by using a roving satellite receiver that has its position corrected by the static base station. Each surveyed grid point has an Ordnance Survey position; therefore the geophysical survey can be directly referenced to the Ordnance Survey National Grid.

3.5 Data Processing

3.5.1 The resistance data was also processed using Geoplot V3 as described above. The first step was to EDGEMATCH the results to remove any inconsistencies between individual grid squares. The results were then DESPIKED to remove any spurious readings. The next step was to pass the results through a HIGH PASS FILTER which removed any low frequency spatial data and then a LOW PASS FILTER was applied removing high frequency spatial data and enhancing larger weak features. The data was then INTERPOLATED in both the X and Y axes improving the data presentation.

4.0 GEOPHYSICAL SURVEY RESULTS (Figures 2-7)

4.1 Description of Site

4.1.1 The area surveyed concentrated on the area within the moated enclosure. The brief of the resistance survey included the area of the inner enclosure to the east of the in-filled arm of the moat. Areas to the west of this feature were omitted.

4.1.2 The vegetation within the survey area consisted of undifferentiated grassland interspersed with patches of nettles. To the north of the extant structures were several mature Hawthorn trees and to the south west of the structures there were two or three other Hawthorn trees within the survey area. To the south east of the structures there was an area containing three mature trees and dense scrub vegetation.

4.2 Survey Limitations (Figure 2)

4.2.1 There were few barriers to the geophysical survey but those that existed are listed below and were omitted from the survey.

4.2.2 In the north and west of the survey area the land immediately adjacent to the enclosure moat was occupied by dense trees and long vegetation and could not be surveyed.

4.2.3 The north-western portion of the survey area was bounded by a metal fence which limited the survey.

4.2.4 The centre of the site contained extant structures. The areas immediately next to the structures were included in the survey although the structures themselves and the internal courtyard were omitted.

4.2.5 To the north and south-west of the structures there were areas containing mature hawthorn trees. Although most of the ground around these trees was surveyed some readings were omitted.

4.2.6 The area south-east of the structures contained two or three mature trees and an area of close growing scrub. These areas were omitted from the survey.

4.2.7 Areas to the east of the structures and in the area of the in filled moat produced very high resistance readings which the RM15 was unable to log. These were dummy logged and the readings omitted from the survey.

4.3 Introduction to results

4.3.1 The results should be read in conjunction with the figures at the end of this report. The types of features likely to be identified are discussed below.

4.3.2 Positive Resistance Anomalies

These are areas where the current from the array has passed less easily due to relative scarcity of water content. They may relate to stone or brick foundations or rubble in an archaeological context.

4.3.3 Negative Resistance Anomalies

These are areas where the current from the array has passed more easily due to relatively high water content. Low resistance anomalies may equate to pits or ditches in an archaeological context.

4.4 Interpretation of Resistance Survey Results (Figures 5-7)

4.4.1 The majority of the anomalies noted in the survey results were positive in signature although there were some negative anomalies which appeared regular in form. The highest concentration of anomalies appears in the south of the site.

High Resistance Results

4.4.2 In the east of the survey area it is possible to see two large areas of high resistance at HR1 and HR2. It is possible that HR1 and HR2 are actually part of the same area of high resistance and that the distinction between the two figures is the product data processing. It is hard to discern any regular patterns within these areas that might represent archaeology. It should be noted that this area is purported to contain an in-filled arm of the boundary moat. The high resistance seen here may relate to this in-filling possibly with building material. Alternatively the moat may be acting as a reservoir for the ground water in this area. The draining of ground water to the base of the in-filled moat would cause the soil around this feature to be relatively arid in comparison with the rest of the site leading to far higher resistance readings. This may explain why the high resistance is not confined to the moat but appears to spread to the west.

4.4.3 To the south of HR2 there is a group of apparently regular anomalies noted at HR3 (Figure 8). This group appears to consist of a linear anomaly running north-west to south-east respecting the river bank. From this linear anomaly there appear to be more irregular and slightly less distinct anomalies running towards the north-east. These are also visible in the trace plot (Figure 5). The regular nature of this group of anomalies suggests that they represent buried archaeology.

4.4.4 To the south-east of HR3 is another group of high resistance anomalies noted at HR4 (Figure 9). This group appears to be made up of linear anomalies forming a possible rectilinear enclosure. It is interesting to

note that the orientation of HR4 apparently mirrors that of HR3 suggesting that the two may be connected or are possibly part of the same feature. The regularity of the anomalies is again visible in the trace plot, (Figure 5). The regularity of these anomalies is strongly suggestive of buried archaeology.

- 4.4.5 In the area immediately surrounding the standing structures at Woking Palace there may be seen complex cluster of high resistance anomalies at HR5 (Figure 10). This group appears to be made up of a series of linear features with a regular configuration strongly suggestive of buried structural features. It may be noted that the orientation of these linear anomalies is at odds with the layout of the standing structures visible on the site today but appears to be in sympathy with the linear anomalies noted above at HR3 and HR4. It is possible that HR3, HR4 and HR5 closely associated and may even be part of one large feature. A trace plot detail of this group of anomalies is shown in Figure 10.
- 4.4.6 To the north of the standing structures may be seen a small localised group of high resistance anomalies shown as HR6. These are far from distinct but a degree of regularity may be detected and a possible connection with HR5 may be discerned at the south western extent of this group of anomalies.
- 4.4.7 A strong high resistance anomaly is visible running north east through HR7, HR8 and HR11. It is possible that this anomaly represents a buried boundary wall fronting the moat.
- 4.4.8 Close to the high resistance anomaly at HR8 there is an area of moderate high resistance anomalies shown at HR9. This area is localised and indistinct. It is hard to make out any regularity that might point to an archaeological origin for the anomalies seen here although the potential for such cannot be ruled out.
- 4.4.9 Lying to the north east of HR9 is a group of discreet high resistance anomalies at HR10. This group appears to form a rough 'L' shape with an arm running south east parallel with the moat before turning toward the south west. The regularity of this group of anomalies hints at an archaeological origin.
- 4.4.10 HR11 possibly represents part of a boundary wall as mentioned above although the anomaly here is more localised and discreet perhaps indicating a more substantial buried structure. A weak high resistance response is shown running to the south-east at HR12.
- 4.4.11 A linear anomaly consisting of two arms running east-west is shown at HR13. This almost certainly represents track-ways extant on site (Figure 13). The high resistance seen here may be the result of compaction of the soil and a roughly metallised surface which was evident. Incorporated into HR13 are concentrations of high resistance, HR16, 17 and 18. These concentrations are amorphous in character although HR18 may form an association with the linear anomaly HR19 immediately to the

south. There is also an exposed section of masonry in the region of HR18 (Figure 6). There is a strong possibility that these anomalies represent archaeological features.

- 4.4.12 Connecting the two arms of HR13 there may be discerned an anomaly running roughly north-south at HR14 with a possible association with HR16. The origin of this anomaly is uncertain though it may be another track linking the two arms of HR13 and avoiding the two areas of low ground seen at LR A and LR B (described below).
- 4.4.13 To the north of HR 14 and possibly closely associated with it is an indistinct feature vaguely rectilinear in form and shown at HR15 (figure 11). There is potential for HR 15 to represent a buried structure based on form although it should be stressed that the anomaly is far from distinct.
- 4.4.14 South of HR13 is a group of high resistance anomalies noted at HR20, 21 (Figure 12) and 22. This group displays a degree of linearity suggesting buried structures in this area.
- 4.4.15 Further south and fronting the Wey River is a linear anomaly noted at HR24. This appears to link two distinct areas of high resistance at HR23 and HR26. Whilst it is possible that the linearity seen here represents archaeology, the high resistance noted may be the result of topography in this area. The high resistance readings at HR23 and HR26 may be the result of moisture extraction caused by the trees present in this area. The presence of a buried structure fronting the river should not be ruled out however.
- 4.4.16 The final group of high resistance anomalies is noted at HR27 and may be associated with the linear HR24.

Low Resistance Results

- 4.4.17 In addition to the high resistance anomalies noted above there are several discreet areas of low resistance visible in the results from Woking Palace. There are three large areas of low resistance noted at LR A, B and C. These equate to low lying areas within the survey area (Figure 7). The low readings here are likely to be caused by a higher level of ground water being retained in these depressions which may have the affect of masking the presence of potential archaeological features in these areas.
- 4.4.18 Features LR1-LR4 represent low resistance areas within an area of disturbance in the survey results described above in section 4.4.2. It is probable that the low resistance features here are the result of complications encountered during data collection and the resultant effect on post processing. LR4 hints at the in-filled arm of the moat thought to be present in this area.
- 4.4.19 LR3 shows a regular low resistance anomaly forming a roughly

rectangular feature. LR3 is closely associated with high resistance feature HR 3 and may represent robbing activity within a possible structure or similar cut features.

- 4.4.20 LR5 and LR6 may be seen at the southern most extent of the survey area fronting the River Wey. These negative features appear regular in morphology and there is a strong possibility that they are archaeological in origin.
- 4.4.21 The group of negative features noted at LR7 are seen in close proximity to the extant structures at Woking Palace and appear to be incorporated into high resistance anomaly HR5. These also appear regular in nature and there is a strong possibility that these features represent buried archaeology, possibly robbed out walls.
- 4.4.22 To the west of the survey there is another low resistance anomaly seen at LR8. This also appears regular in nature and is present within high resistance anomaly HR20. The regular nature of this anomaly is suggestive of buried archaeology. It may also be significant that LR8 shows a very similar alignment to some of the high resistance anomalies mentioned above, particularly HR3, HR4 and HR5.
- 4.4.23 Just to the north-east of LR8 is another low resistance anomaly noted at LR9. As with LR8 this anomaly appears regular in nature, suggestive of an archaeological origin. The proximity of LR8 to LR9 hints at an association between the two anomalies though this is association not certain.

5.0 CONCLUSION

- 5.1 The resistance survey successfully revealed both positive and negative anomalies over most of the site. The survey of the area to the north-west of the standing structures failed to detect any anomalies in this area possibly due to the lack of detectable moisture differentiation in the soil here. The northern part of the survey may have been influenced in a similar way. There is a strong potential for the anomalies noted above to be archaeological in origin.
- 5.2 Several anomalies consistent with buried archaeology are seen in the southern part of the site. Anomalies HR3 and HR4 appear structural in form and potentially represent a range of buildings fronting the River Wey. Further river front structures may be present in the area of HR24.
- 5.2 There is the potential for another structure or group of structures at HR5 and on the site of the existing buildings. The anomalies here appear to be on a different alignment to the extant buildings and to be sympathetically aligned with HR3 and HR4.
- 5.3 Anomalies to the west of the present buildings hint at possible structures in this area of the site. It is possible HR20 represents a range of structures running roughly north-south from the river although results here are somewhat inconclusive. To the north of the extant buildings there is evidence for possible structures at HR15 and HR9.
- 5.4 In the northern part of the survey area anomalies possibly representing buried walls are evident although the rest of the results from this area are inconclusive.

Statement of Indemnity

- 5.5 Geophysical survey is the collection of data that relate to subtle variations in the form and nature of soil. Magnetic and resistance detail survey may not always detect sub-surface archaeological features. This is particularly true when considering earlier periods of human activity, for example those periods that are not characterised by sedentary social activity. These periods may include but are not necessarily restricted to the earlier Bronze Age, Neolithic, Mesolithic and Palaeolithic.

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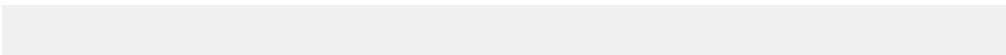
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Acknowledgements

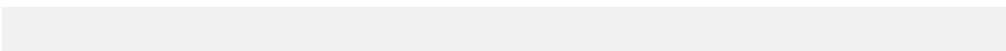
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OASIS DATA COLLECTION FORM: England

Printable version



OASIS ID: archaeol6-61279



Project details

Project name	Resistivity Survey at Woking Palace, Old Woking, Surrey
Short description of the project	Resistivity Survey at Woking Palace
Project dates	Start: 26-05-2009 End: 05-06-2009
Previous/future work	Yes / Yes
Any associated project reference codes	12752 - SM No.
Type of project	Research project
Site status	Scheduled Monument (SM)
Current Land use	Other 8 - Land dedicated to the display of a monument
Monument type	MOATED ENCLOSURE Medieval
Monument type	MOATED ENCLOSURE Post Medieval
Significant Finds	NONE
Investigation type	'Geophysical Survey'
Prompt	Research
Solid geology	Unknown
Drift geology	ALLUVIUM

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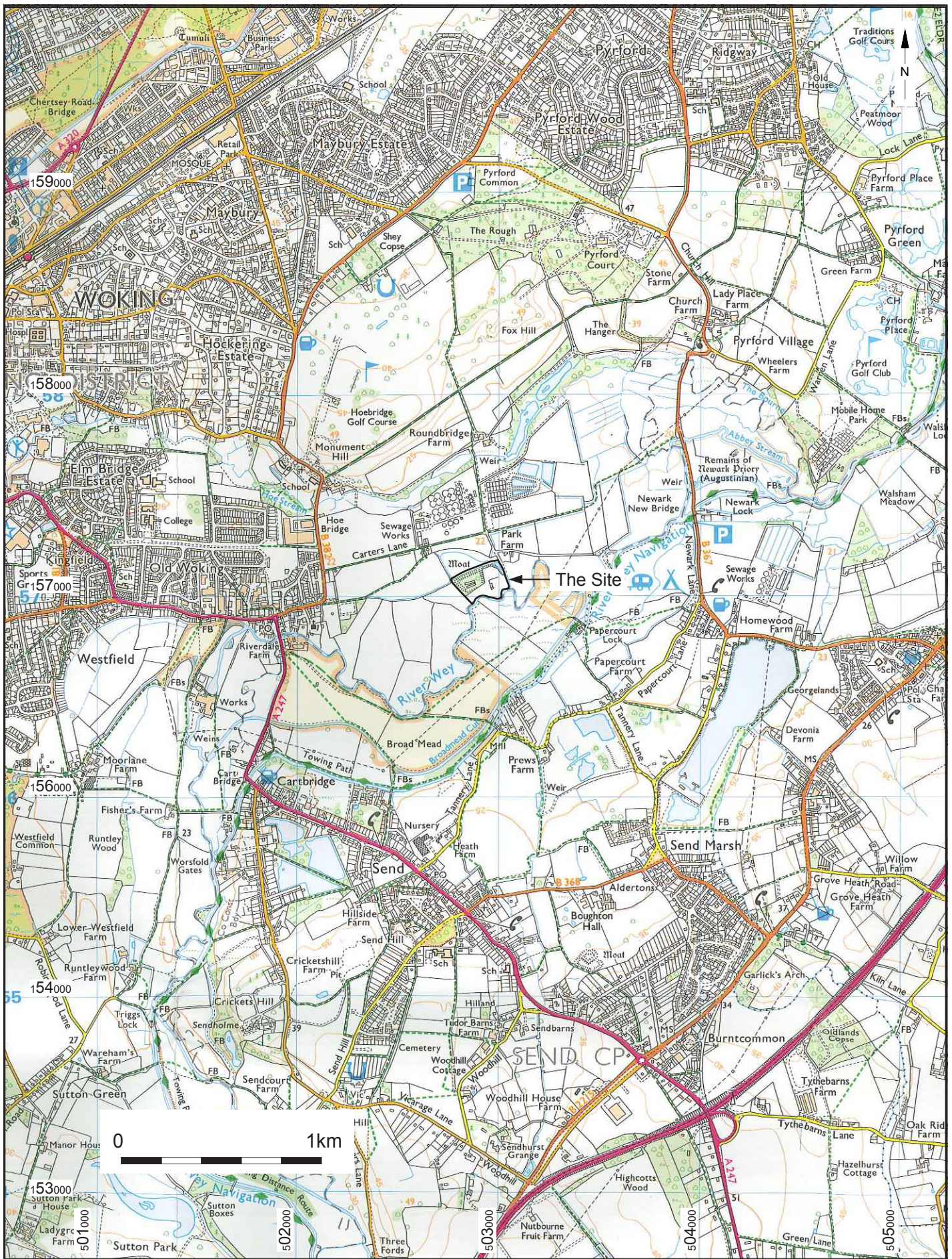
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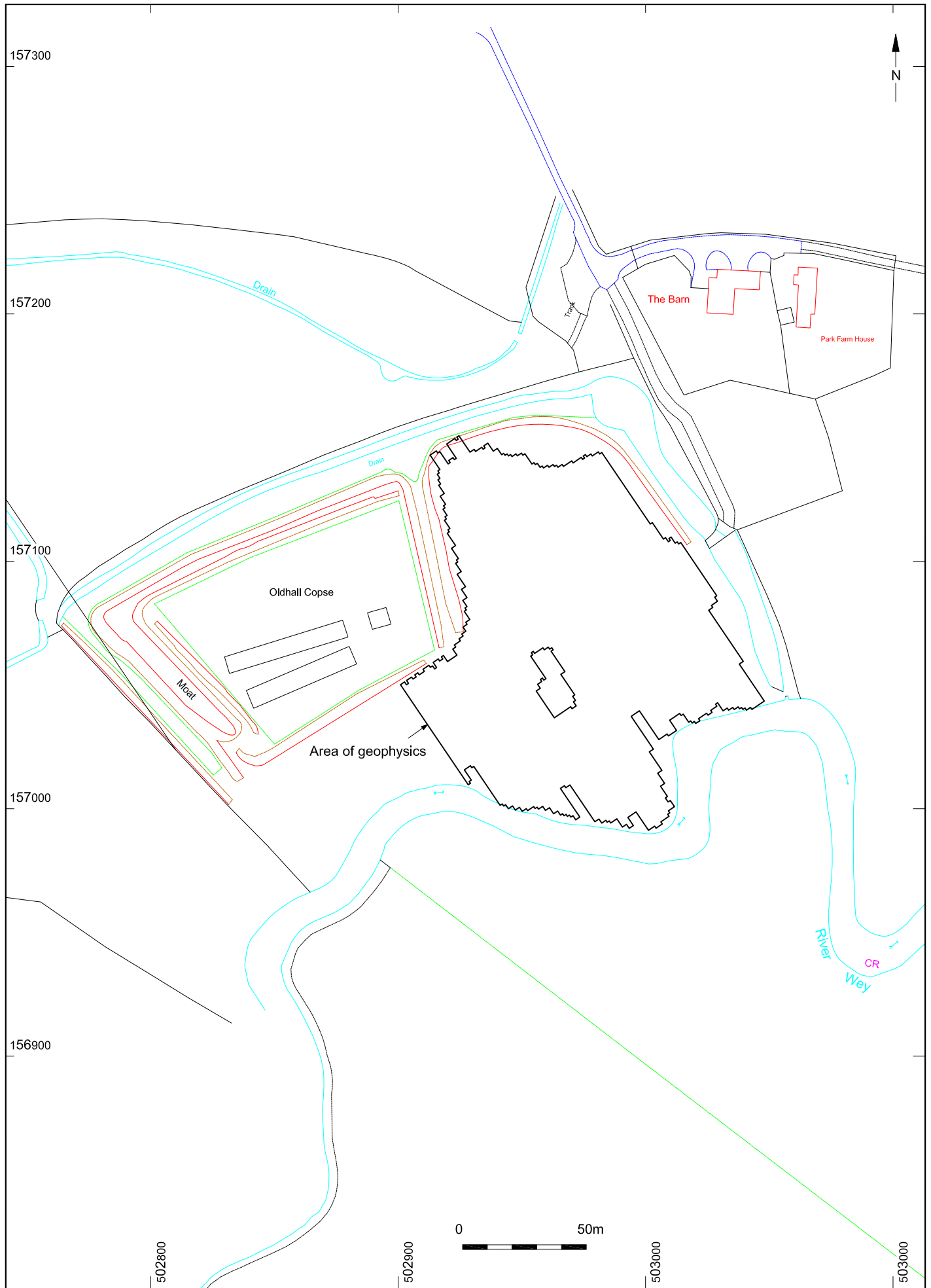
APPENDIX

Raw Data Files: Included on CD.



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Report Ref: 2009099	Drawn by: LD		

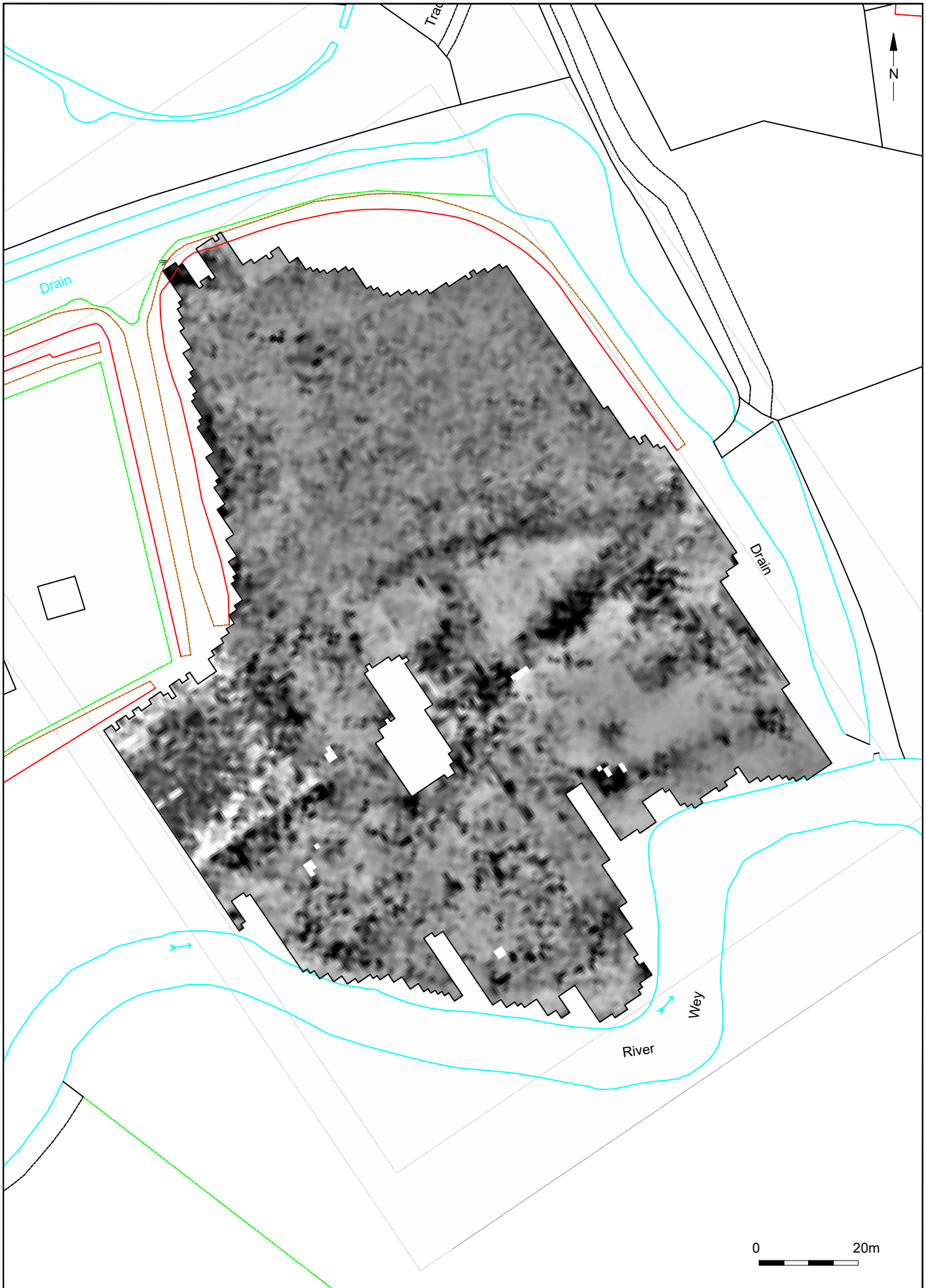
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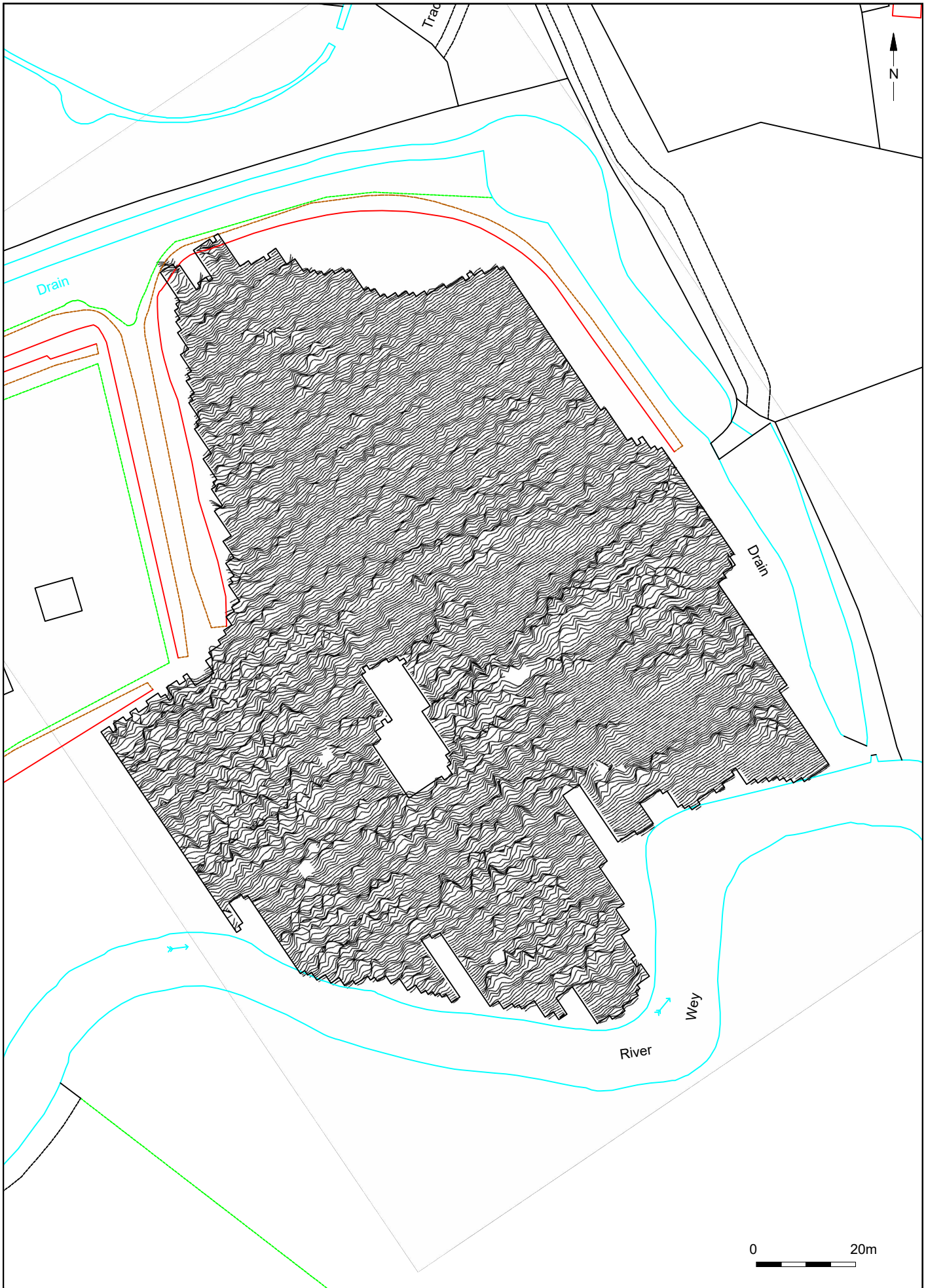
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Project Ref: P83	July 2009	Location of geophysics grid		
Report Ref: 2009099	Drawn by: JLR			



© Archaeology South-East		Woking Palace	Fig. 3
Project Ref: P83	July 2009	Raw data	
Report Ref: 2009099	Drawn by: JLR		



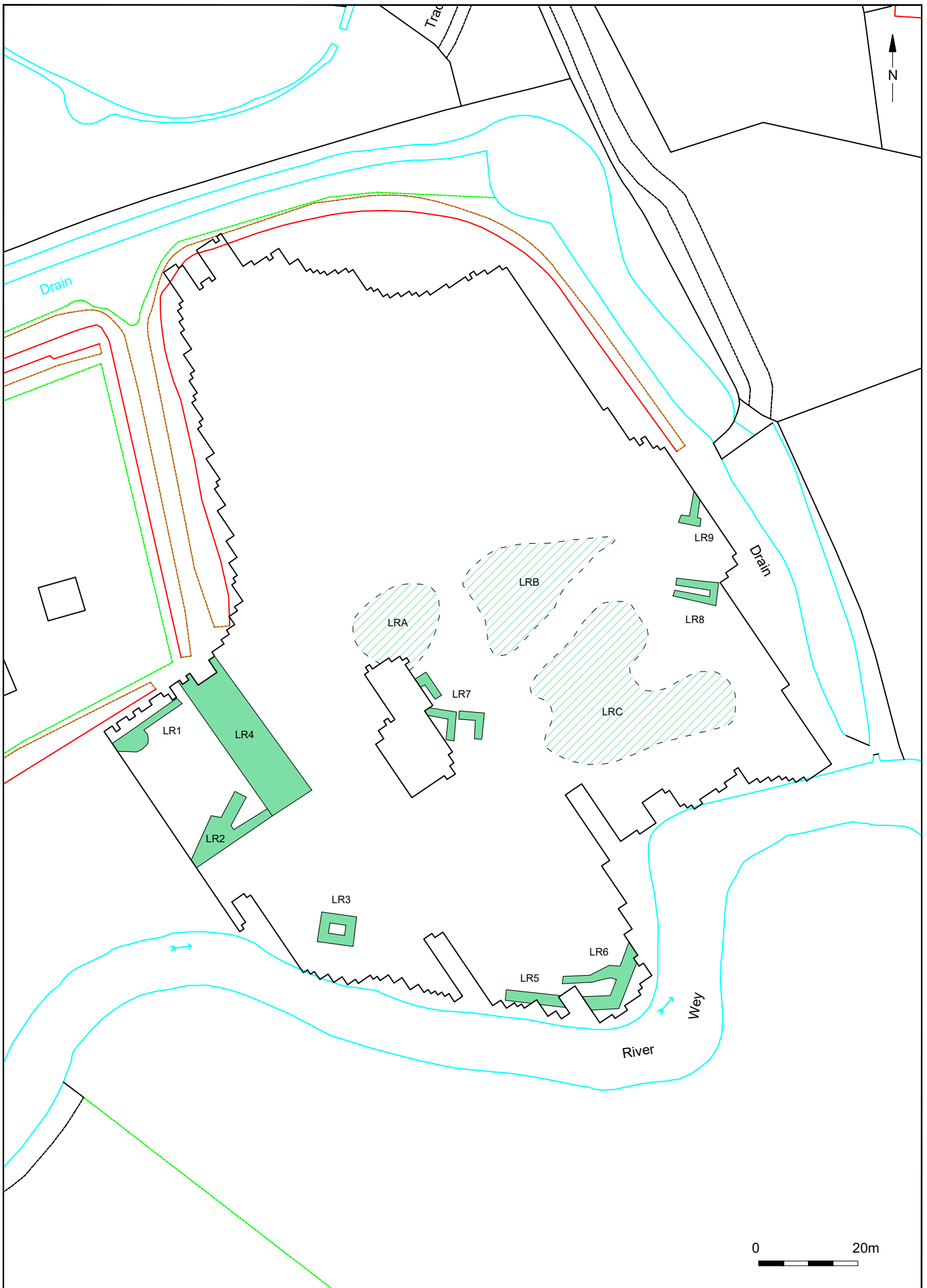
© Archaeology South-East		Woking Palace	Fig. 4
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Report Ref: 2009099	Drawn by: JLR		



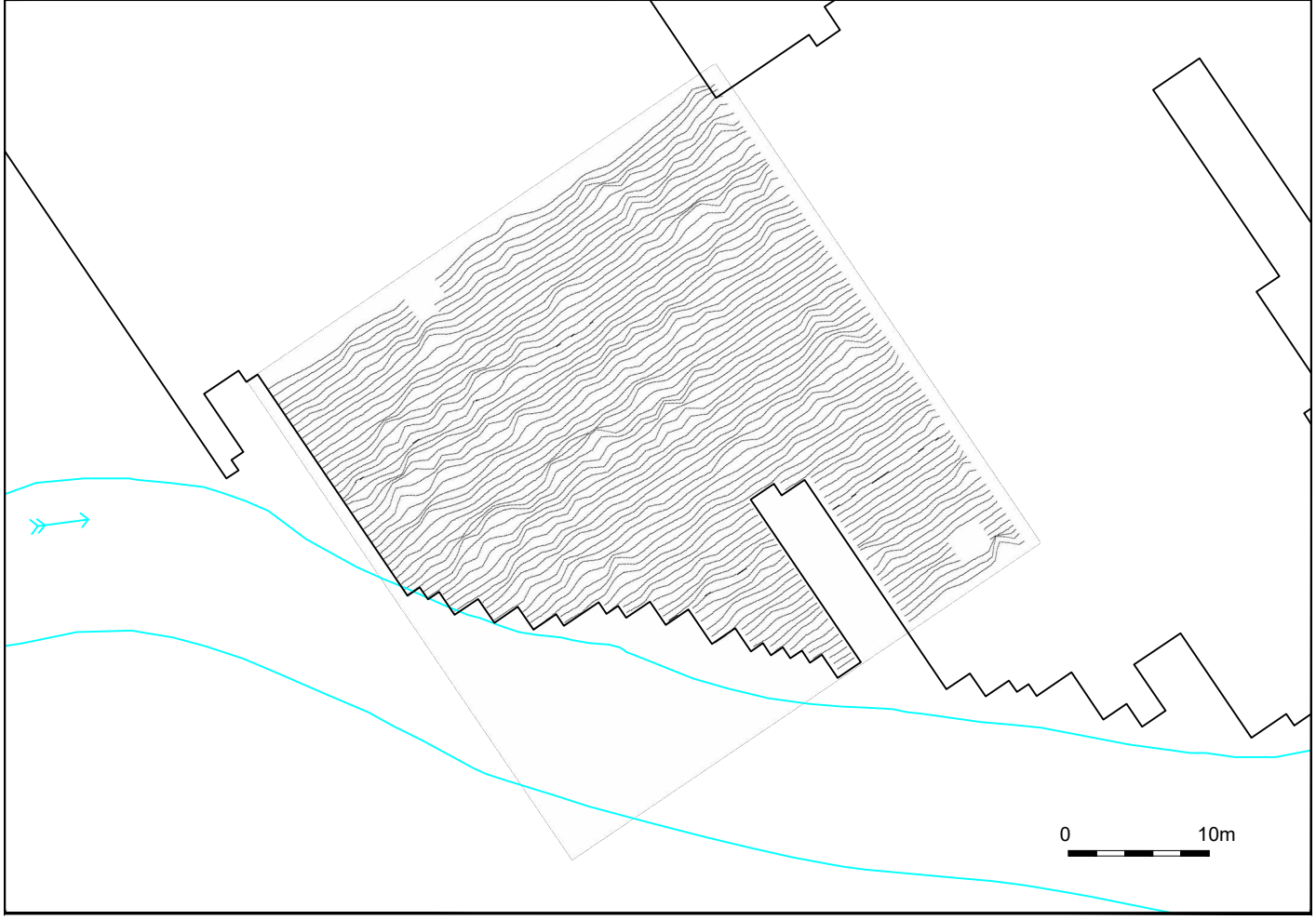
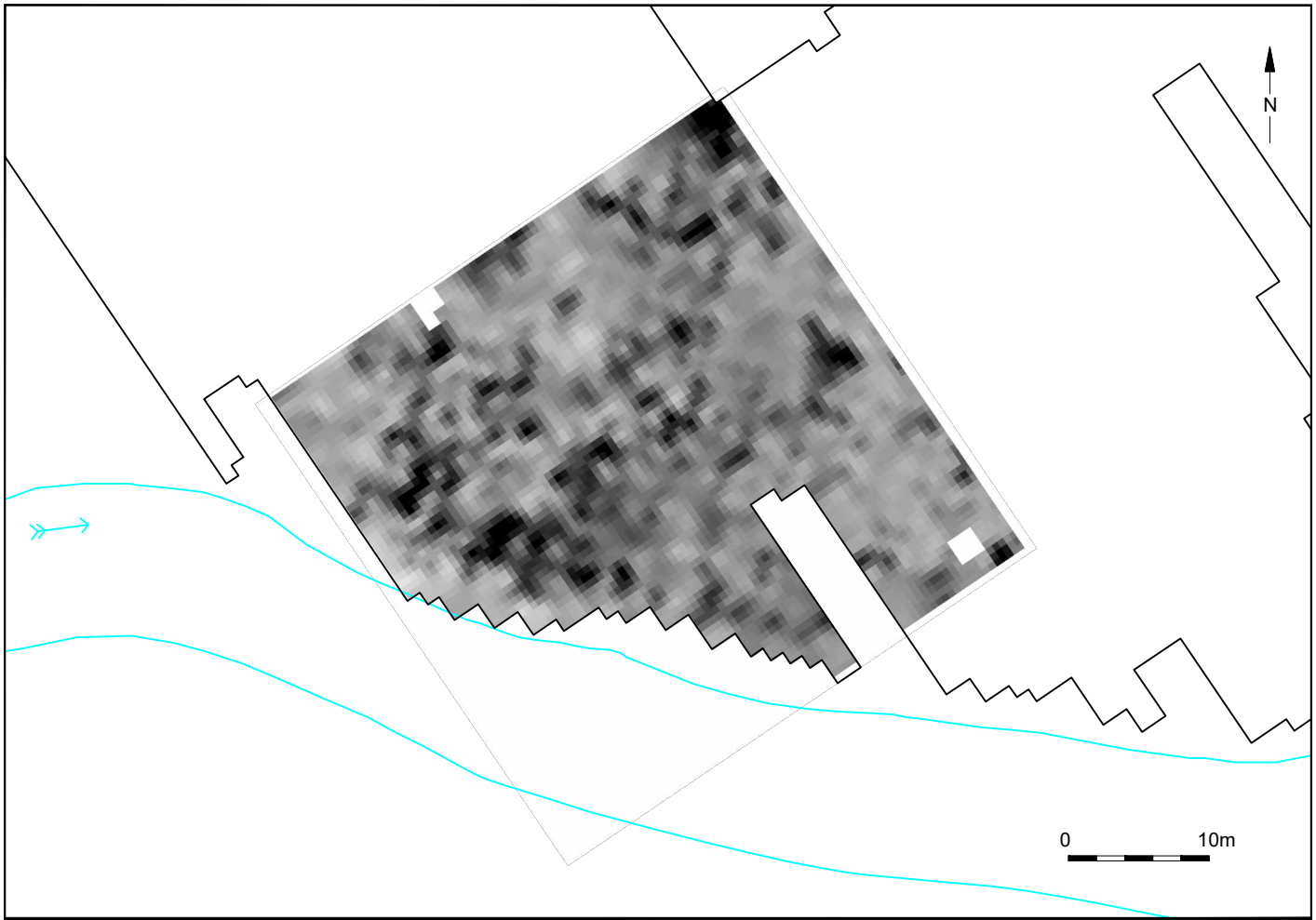
© Archaeology South-East		Woking Palace	Fig. 5
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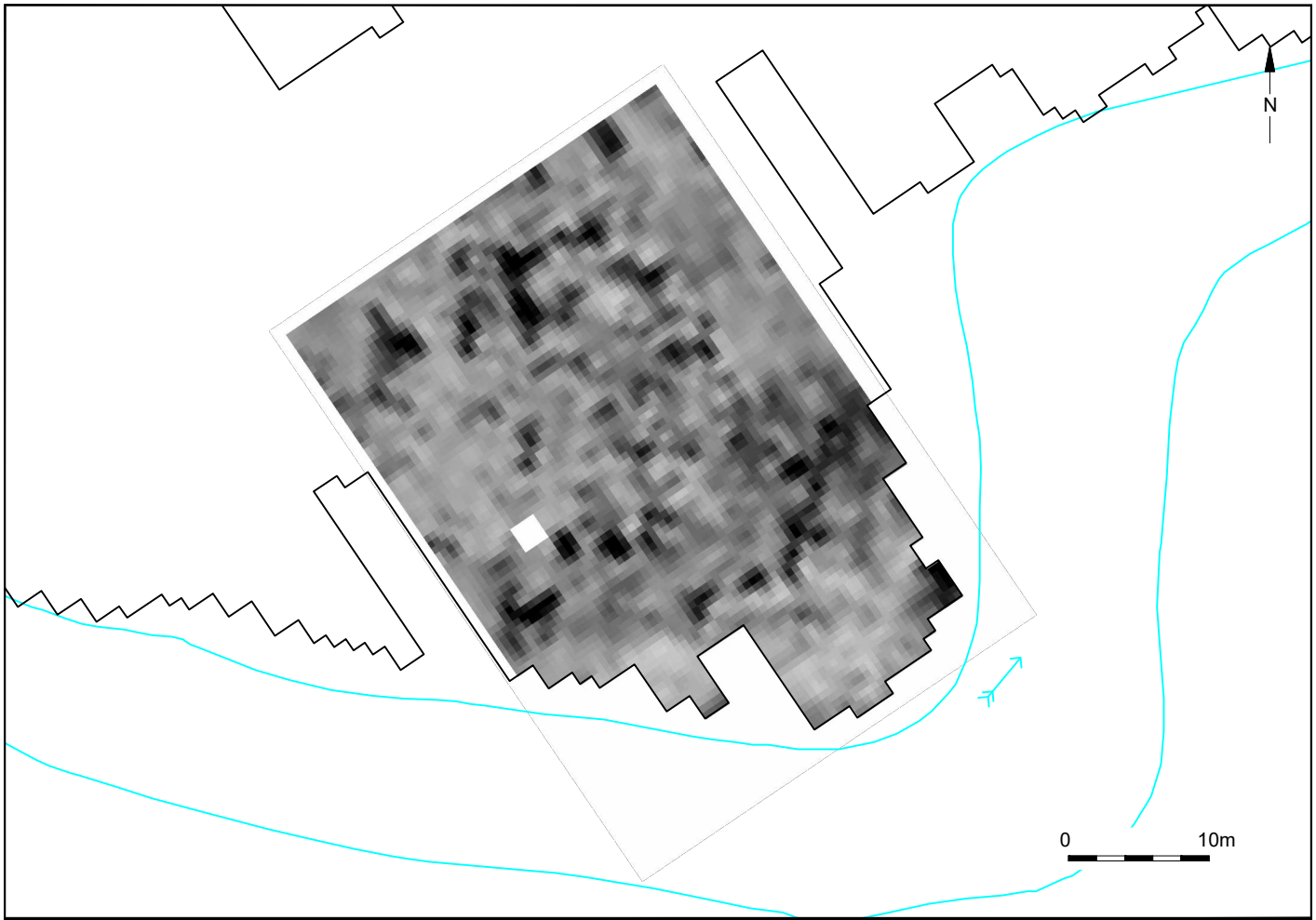
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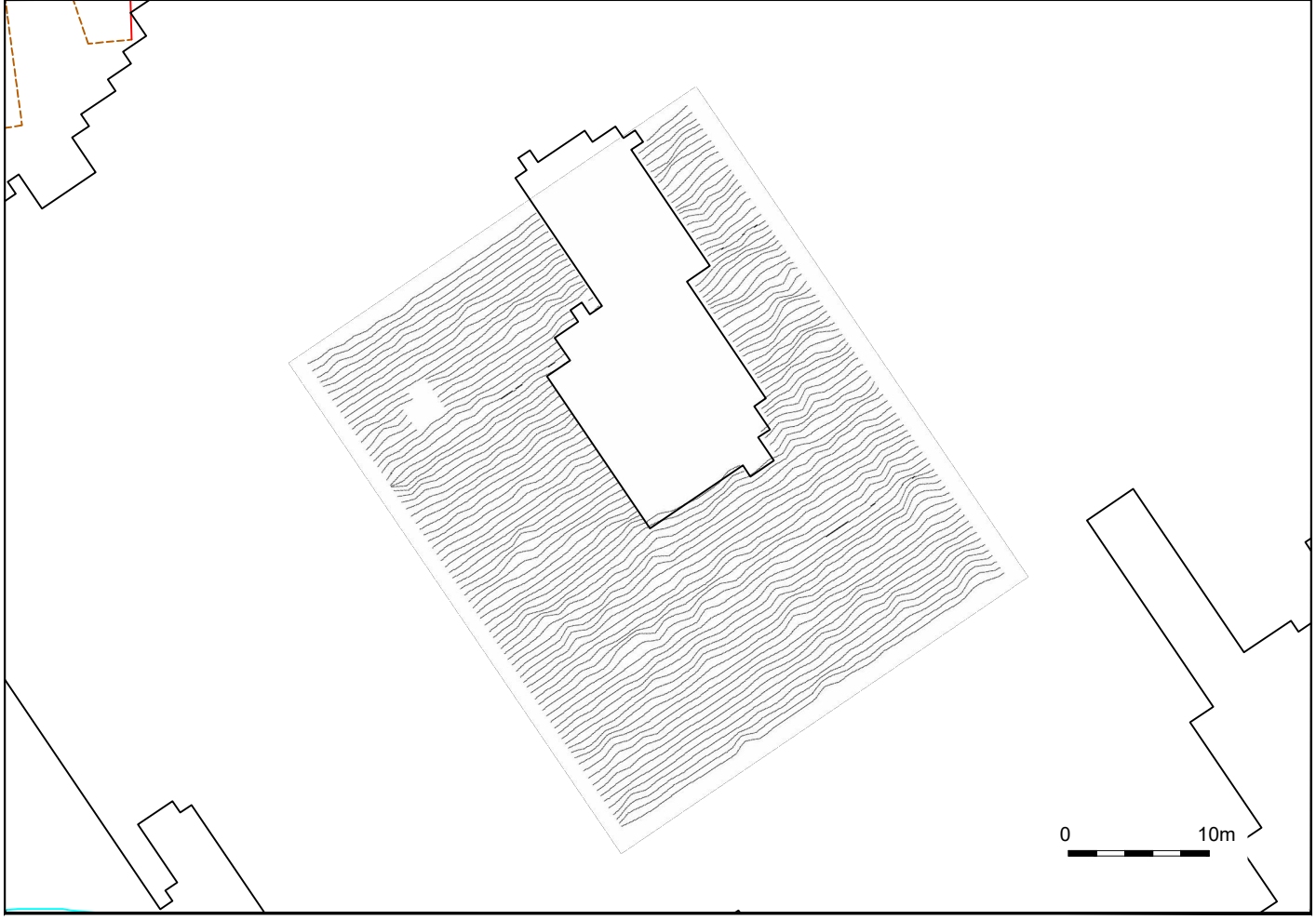
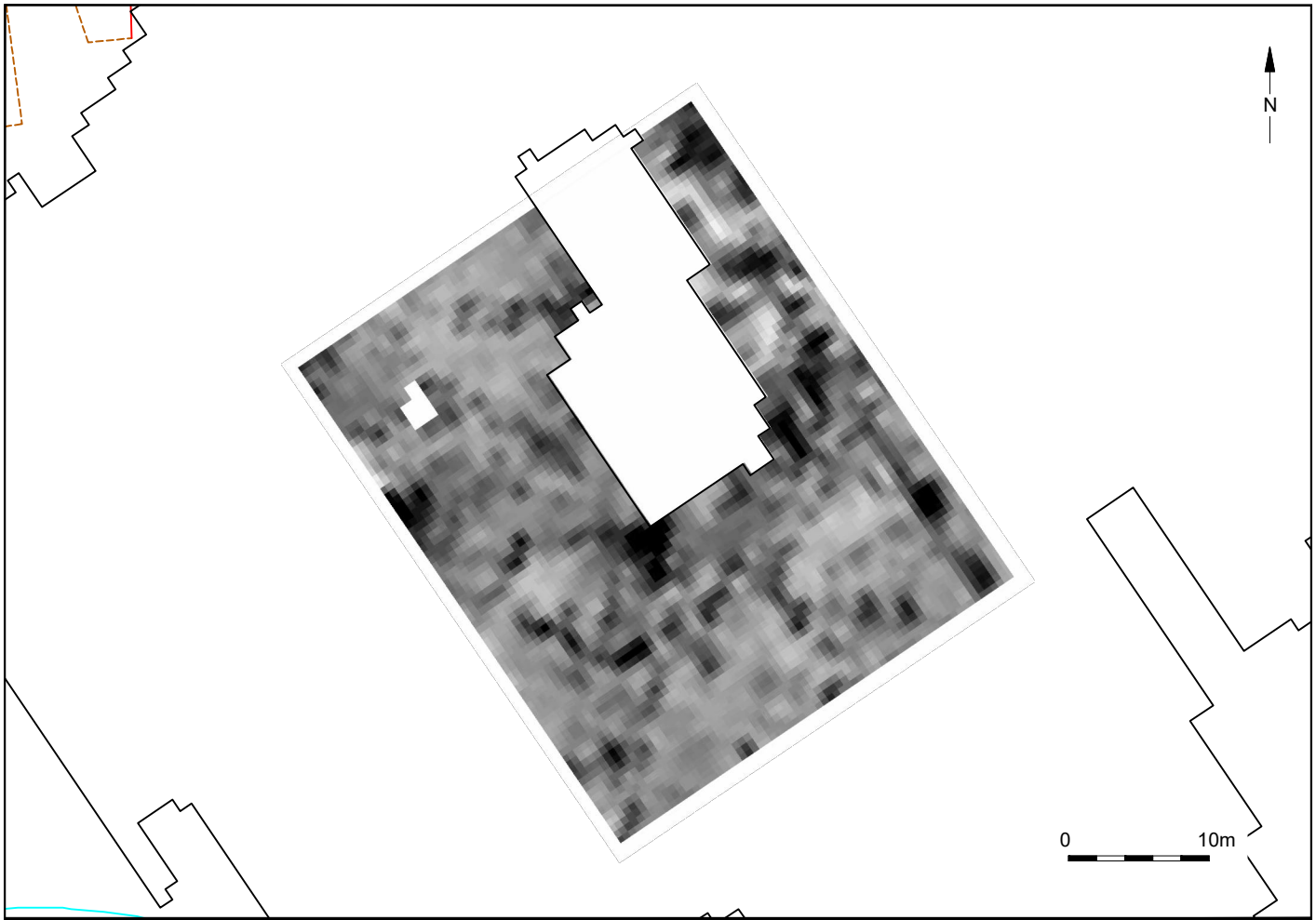
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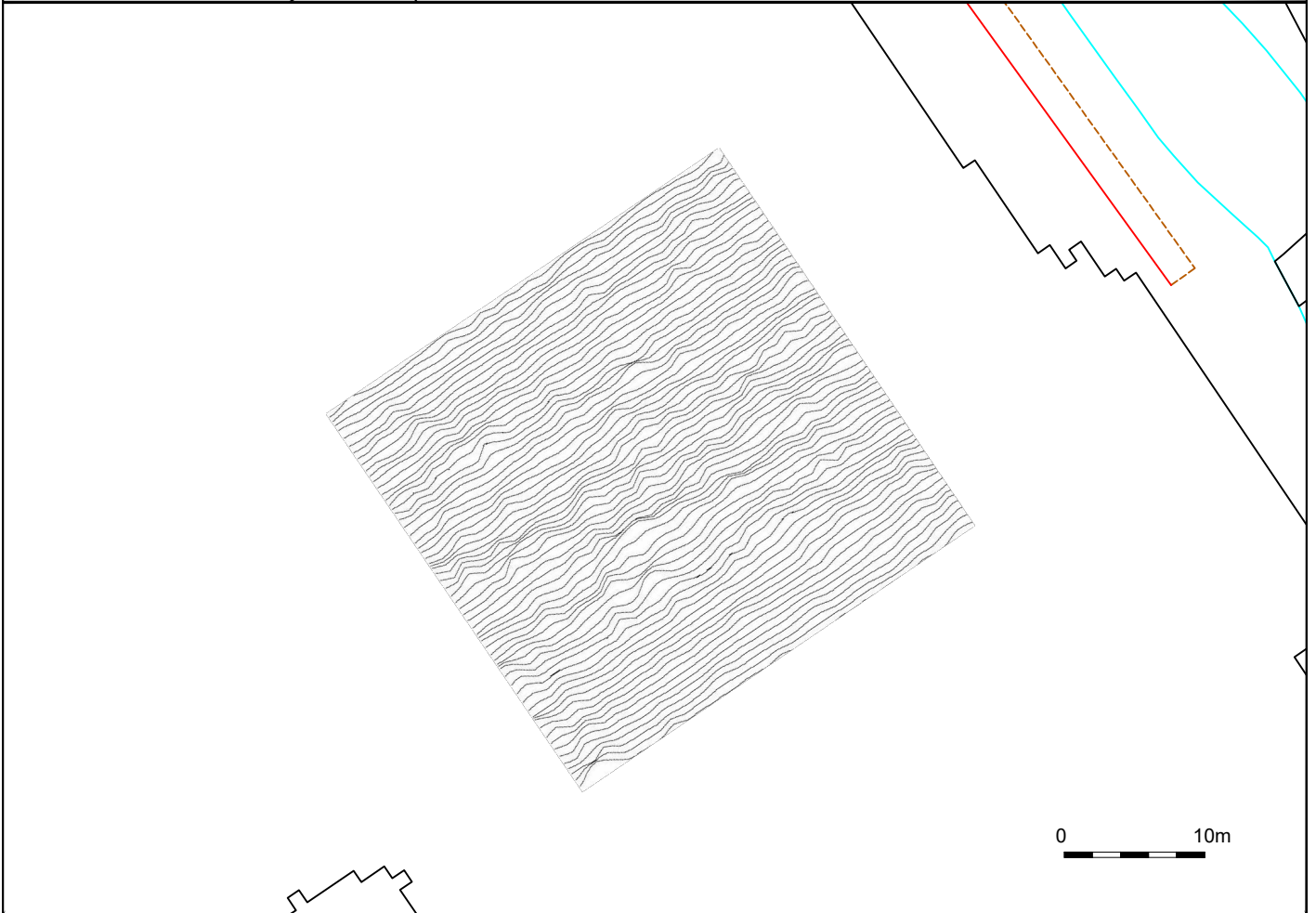
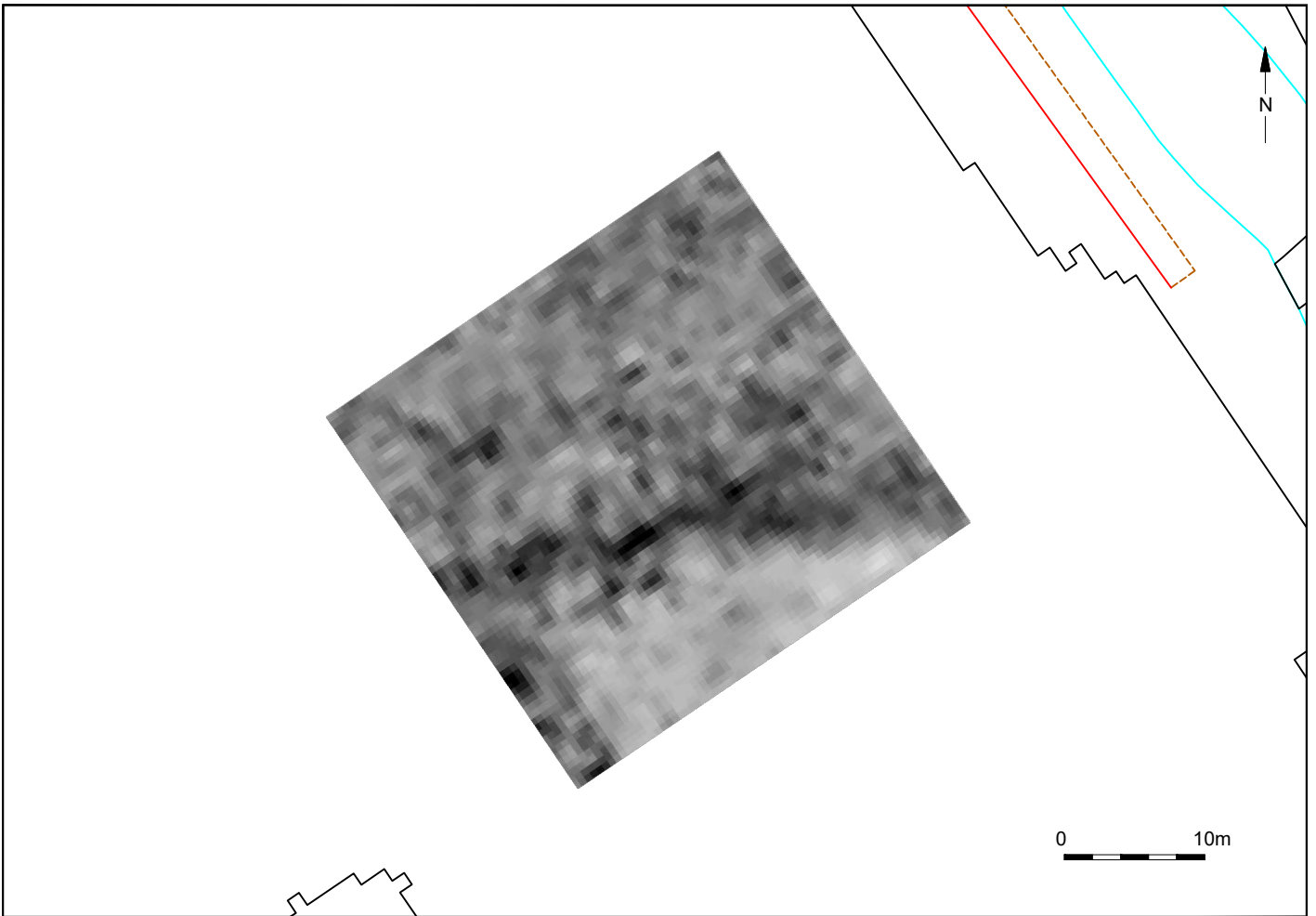
© Archaeology South-East		Woking Palace	Fig. 8
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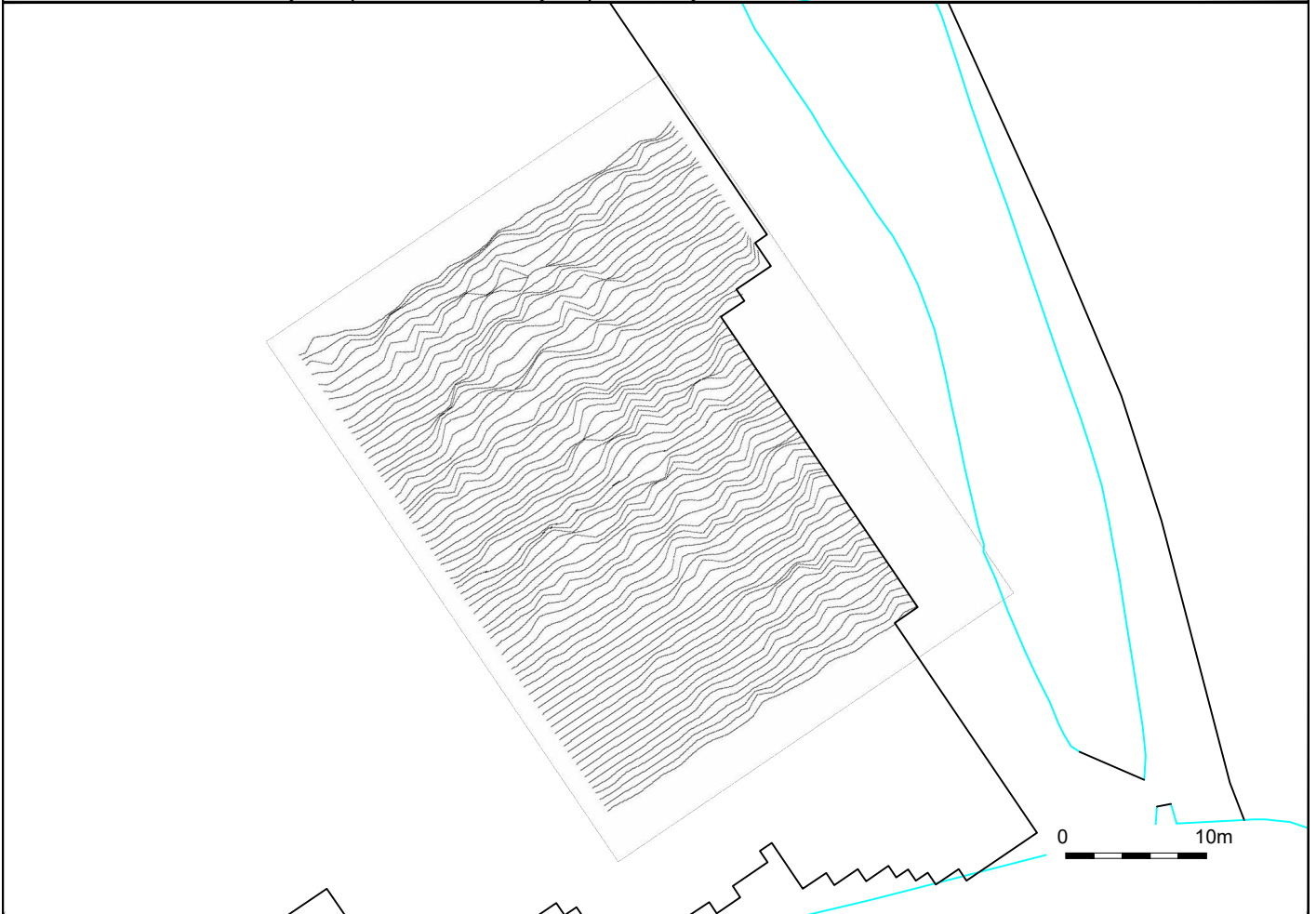
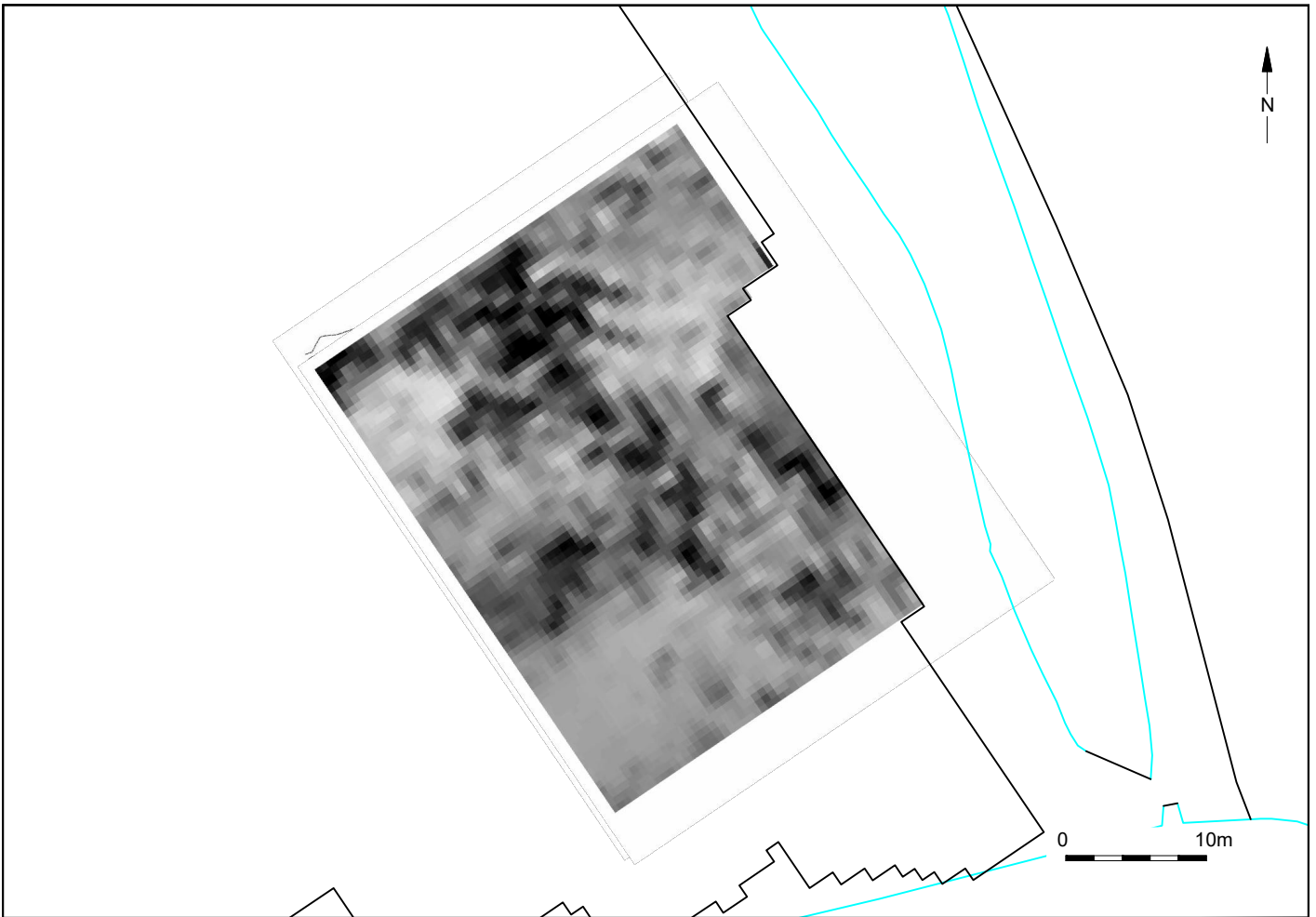
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