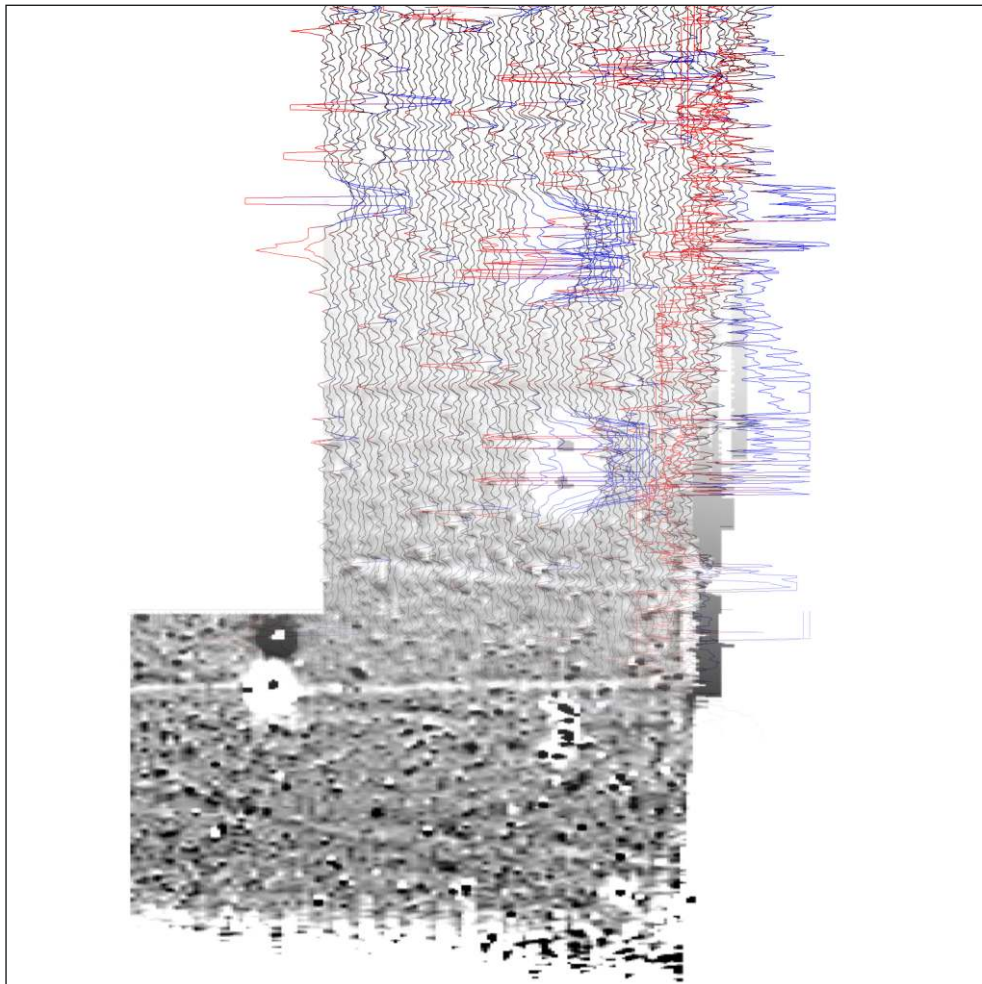




making sense of heritage

Queens Avenue and Maiden Castle Road Link, Dorchester, Dorset

Rapid Desk-Based Assessment and Detailed Gradiometer Survey Report



Ref: 106470.01
October 2014



**Queens Avenue and Maiden Castle Road Link,
Dorchester, Dorset**

**Rapid Desk-Based Assessment and Detailed Gradiometer Survey
Report**

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Rapid Desk-Based Assessment and Detailed Gradiometer Survey Report

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Queens Avenue and Maiden Castle Road Link, Dorchester, Dorset

Rapid Desk-Based Assessment and Detailed Gradiometer Survey Report

Summary

A detailed gradiometer survey was conducted over land between Queens Avenue and Maiden Castle Road on the southwest edge of Dorchester, Dorset. The project was commissioned by ZeroC Holdings Ltd. with the aim of establishing the presence, or otherwise, and nature of detectable archaeological features on the site ahead of a proposed development of a link road.

The site comprises the eastern edge of two playing fields adjacent to the Thomas Hardy School, approximately 1km southwest of the centre of Dorchester. A total of 1.92ha were surveyed with only a small area lost to an allotment and part of a tennis court. The site lies on a gentle south facing slope located between the Iron Age hillforts of Maiden Castle and Poundbury.

Also undertaken in conjunction with the geophysical survey were a rapid desk-based assessment and a review of available aerial photographs held at the English Heritage Archive in Swindon. Results from these assessments are summarised here and have been used to inform the conclusions of the geophysical survey.

The geophysical survey has demonstrated the presence of a few small anomalies of possible archaeological interest within the survey area, along with numerous agricultural features. The majority of detected anomalies appear to relate to agricultural activity with ploughing scars of at least two phases and other broad linear features interpreted as agricultural. The only anomalies of possible interest are a few small positive anomalies that may represent pits or postholes; it should be noted that a geological explanation for their formation is also possible.

The geophysical survey has demonstrated a low archaeological potential across the Site and it is considered that no further archaeological evaluation is required to inform the planning application. If any archaeological mitigation is deemed necessary, e.g. watching brief, it could be secured as a condition of any planning permission granted for the proposed development.

The geophysical survey was undertaken on 7th October 2014.



Queens Avenue and Maiden Castle Road Link, Dorchester, Dorset

Rapid Desk-Based Assessment and Detailed Gradiometer Survey Report

Acknowledgements

The detailed gradiometer survey was commissioned by ZeroC Holdings and Wessex Archaeology is grateful to Craig Bates in this regard. Wessex Archaeology would also like to thank Dorset County Council for supplying the Historic Environment Record data and Steve Wallis (Senior Archaeologist - Dorset County Council) for his advice.

The rapid desk-based assessment was undertaken by Naomi Brennan and the aerial photography assessment by Tom Wells. The fieldwork was directed by Laura Andrews assisted Patrick Dresch. Ross Lefort processed and interpreted the geophysical data in addition to writing this report. The geophysical work was quality controlled by Ben Urmston and Dr. Paul Baggaley. Illustrations were prepared by Ross Lefort, Naomi Brennan and Linda Coleman. The project was managed on behalf of Wessex Archaeology by Caroline Budd.



Queens Avenue and Maiden Castle Road Link, Dorchester, Dorset

Rapid Desk-Based Assessment and Detailed Gradiometer Survey Report

1 INTRODUCTION

1.1 Project background

- 1.1.1 Wessex Archaeology was commissioned by ZeroC Holdings to carry out a rapid desk-based assessment and geophysical survey of land linking Queens Avenue and Maiden Castle Road in Dorchester, Dorset (hereafter the 'Site') centred on National Grid Reference (NGR) 368109 089708 (**Figure 1**).
- 1.1.2 This assessment will inform proposals to construct a new link road between Queens Avenue and Maiden Castle Road along with a number of residential properties. The aim of the geophysical survey was to establish the presence/absence, extent and character of detectable archaeological remains within the survey area.
- 1.1.3 This report presents a brief description of the methodology followed, the detailed survey results and the archaeological interpretation of the geophysical data.

1.2 The Site

- 1.2.1 The Site is situated on the western edge of Dorchester in Dorset. It comprises a narrow strip of land some 1.7 hectares in size stretching between Queens Avenue to the north and Maiden Castle Road to the south (**Figure 1**). The Site is bounded to the east by properties along James Road and to the west by playing fields.
- 1.2.2 The survey area comprises the eastern part of two playing fields near the Thomas Hardy School with Queens Avenue running close to the northern end of the Site and Maiden Castle Road running past the south of the Site. Detailed gradiometer survey was undertaken over all accessible parts of the Site, a total of 1.92ha. Two small areas of the Site were not surveyed including part of a tennis court at the north and an allotment area at the south.
- 1.2.3 The Site lies on a south facing slope with the north of the Site at a height of over 80m above Ordnance Datum (aOD) and falls to less than 70m aOD at the south.
- 1.2.4 The underlying geology is mapped as the Portsdown Chalk (British Geological Survey). The soils underlying the Site are classed as unsurveyed due to it being an urban area. The nearest recorded soils to the Site are typical brown calcareous earths of the 511f (Coombe 1) association and the brown rendzinas of the 343i (Andover 2) association (SSEW 1983). Soils derived from such geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey.



2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Introduction

2.1.1 A 1km Study Area around the Site was considered in order to provide a sufficient archaeological background to the Site and its environs. This baseline was prepared using Historic Environment Record (HER) data sourced from Dorset County Council as well as nationally designated site and buildings in the National Heritage List for England (NHLE). The full dataset can be found in the project archive. A complete gazetteer is not presented here, instead selected sites, buildings and findspots have been used to illustrate the archaeological and historical development of the area and the Site in particular as well as to aid in the interpretation of the geophysical survey results. Broad areas of activity have been identified, based on the HER data and given **WA** prefixed numbers for ease of reference. These, along with any designated heritage assets which fall within the Study Area, are illustrated in **Figure 2**.

2.2 Planning background

2.2.1 The National Planning Policy Framework (NPPF) was published by the Department for Communities and Local Government (DCLG) in March 2012, replacing Planning Policy Statement 5.

2.2.2 NPPF Section 12: Conserving and enhancing the historic environment sets out the principal national guidance on the importance, management and safeguarding of heritage assets within the planning process.

2.2.3 The aim of NPPF Section 12 is to ensure that Regional Planning Bodies and Local Planning Authorities, developers and owners of heritage assets adopt a consistent and holistic approach to their conservation and to reduce complexity in planning policy relating to proposals that affect them.

2.2.4 To summarise, government guidance provides a framework which:

- *recognises that heritage assets are an irreplaceable resource;*
- *requires applicants to provide proportionate information on the significance of heritage assets affected by the proposals and an impact assessment of the proposed development on that significance;*
- *takes into account the desirability of sustaining and enhancing the significance of heritage assets and their setting;*
- *places weight on the conservation of designated heritage assets;*
- *requires developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and impact, and to make this evidence (and any archive generated) publicly accessible.*

2.2.5 Additionally local planning policy also recognises the significance of our archaeological and cultural heritage. The Site is situated within the administrative boundaries of West Dorset District Council. Together with Weymouth and Portland Borough Council, the council is currently in the process of preparing a joint Local Plan which will set out the long term planning strategy up to 2031. Until its finalisation, specific policies of the adopted West Dorset Local Plan 2006, including those concerning the historic environment, remain in force ('Saved Policies'). These policies (in particular **SA16**, **SA20**, **SA23** and **SA24**) reiterate the need to conserve and record our archaeological and



historical past as well as considering any potential affects to the setting of designated assets that may arise through development.

2.3 Statutory and local heritage designations

- 2.3.1 Within 1km (hereafter the 'Study Area') of the Site lie one Grade II* and 11 Grade II Listed Buildings (**WA01-WA12**), the majority of which lie within the eastern part of the Study Area. These reflect 19th and early 20th century development of the town within this area.
- 2.3.2 Three Scheduled Monuments (**WA13-WA15**) also lie within the Study Area and reflect evidence for activity in this area from the Neolithic to the Roman period, as well as the later Civil War history of the town. Two areas of park are also Grade II Listed (**WA16-17**) adjacent to the Roman walls.

2.4 Archaeological and historical context

Prehistoric

- 2.4.1 The early occupation of the Dorchester area is suggested by the concentration of prehistoric monuments and earthworks by which the modern town is surrounded. Maiden Castle, the largest and most visible of these, dominates the landscape to the south-west of Dorchester (list entry **1015775**). This earthwork was notably occupied and used during the Iron Age and Romano-British periods but also contains earlier Neolithic and Bronze Age monuments.
- 2.4.2 The smaller earthwork of Maumbury Rings which lies within the eastern part of the Study Area (**WA14**), comprises a Late Neolithic henge as well as a later Romano-British amphitheatre and 17th century Civil War earthworks. A number of smaller prehistoric monuments such as barrows, still survive in the surrounding countryside beyond the immediate Study Area.
- 2.4.3 Immediately to the north-west of the Site a number of previous investigations have been carried out within the grounds of Thomas Hardy School (**WA25**). A small evaluation in the area of the school buildings located a number of archaeological features thought to be of Middle to Late Bronze Age date (HER ref. **EDO4833**). Geophysical survey to the north-west, west and south of the school buildings located a Bronze Age barrow cemetery immediately to the west of the Site (HER ref. **EDO4203**). Subsequent excavation and monitoring works uncovered evidence for Neolithic and Bronze Age activity including a number of inhumation and cremation burials in association with the Bronze Age barrow group and pit activity indicating nearby Neolithic settlement (Gardiner *et al.* 2007) (HER ref. **EDO4207** and **EDO4208**).
- 2.4.4 An evaluation to the north-east of the Site located similar activity with a number of prehistoric features including a Beaker burial, an early Neolithic pit and a Late Neolithic hengiform monument with pits identified (**WA29**; HER ref. **EDO4806**).
- 2.4.5 To the north-west of the Site lie a number of areas of known Bronze Age activity (**WA19, WA20, WA22** and **WA23**) including evidence for settlement and field systems as well as a barrow cemetery to the west of Thomas Hardy School (HER ref. **EDO4013, EDO4078, EDO4094** and **EDO4225**). Earlier activity was also encountered to the north-west of the school comprising a number of Early Neolithic pits as well as some Palaeolithic and Late Mesolithic flintwork (HER ref. **EDO4225**).
- 2.4.6 Further Bronze Age activity lies within the south-western part of the Study Area where a number of probable barrows were investigated during works connected with the Dorchester bypass (**WA26**; HER ref **EDO3719**).



Iron Age and Romano-British

- 2.4.7 Maiden Castle (list entry **1015775**) is a large multivallate hillfort containing considerable evidence for Iron Age occupation and burials. Following the Roman Conquest occupation declined though a Romano-Celtic temple was constructed at the eastern end of the fort. A large area of associated Iron Age and Romano-British settlement, partly Scheduled, extends into the western part of the Study Area (**WA13**). This forms part of a much wider area of known Iron Age and Romano-British activity identifiable from aerial photographs (**WA18**; HER ref. **MDO24904**).
- 2.4.8 A short distance to the south-west of the Site an Iron Age enclosure has been identified and partially excavated at Maiden Castle First School (**WA24**; HER ref. **EDO3821**).
- 2.4.9 The fortified area of Roman Dorchester (*Durnovaria*) was located within the historic core of the town, but extensive finds to the west of the central core reveal an intensively occupied wider landscape in this period and the modern A35 (west) follows the route of the original Roman road to Exeter. The town was established during the 1st century AD and occupation appears to continue until the 5th century AD when Roman administration ceased.
- 2.4.10 Within the eastern part of the Study Area and closer to the historic core of the settlement a number of areas of Romano-British activity have been identified (**WA32**, **WA35**, **WA36**, **WA37** and **WA39**). In the Olga Road and Dagmar Road area evidence for a possible villa was uncovered at the end of the 19th century (**WA36**; HER ref. **MDO19057**, **MDO19058** and **MDO19059**). To the north of this in the Hawthorne Road area a number of burials have been identified thought to indicate a cemetery in this area (**WA32**; HER ref. **MDO18287**, **MDO18970**, **MDO18981**, **MDO19012**, **MDO19014**, **MDO19043**, **MDO19048**, **MDO19078**, **MDO19086** and **EDO4657**). Further burials were also discovered within the old Barracks parade ground just to the north-west of this (**WA35**; HER ref. **EDO4360**), at Fair Field (**WA37**; HER ref. **EDO5617**) and Dorchester Market (**WA39**, HER ref. **EDO3803**), where evidence for a Roman building was also found. Due to the practice of extra-mural burial the presence of the cemetery indicates that this area lay beyond the area of the Roman town.
- 2.4.11 The south-west corner of the Roman town walls at the north-eastern edge of the Study Area is a Scheduled Monument (**WA15**). A number of ditch sections and other activity recorded in the vicinity of the Dorchester Police Headquarters flank the Roman road leading into the south gate of the town (**WA38**, **WA40**; HER ref. **EDO4102**, **EDO4103**, **EDO4178** and **EDO4826**).

Medieval, post-medieval and modern

- 2.4.12 Known medieval remains in the Study Area are generally sparse, reflecting the thinly-populated heathland environment beyond the historic core of Dorchester, which at this time was a small market town. However an area of medieval or post-medieval field system identified from aerial photographs lies within the northern part of the Study Area (**WA21**; HER ref. **MDO20933**) and fragments of a medieval field system are also recorded adjacent to the Site within the school grounds (**WA25**; HER ref. **EDO4203**) and in James Road (**WA28**; HER ref. **EDO3769**). At Winterbourne Herringston the remains of a potential medieval field boundary have been identified from aerial photographs (**WA31**; HER ref. **MDO25151**).
- 2.4.13 During the English Civil War in the 17th century supported the Parliamentary cause and was captured and ransacked by Royalist troops in 1643. During this period attempts were



made to fortify the town including the redevelopment of the prehistoric Maumbury Rings (**WA14**).

- 2.4.14 In the late post-medieval period Dorchester was still a fairly small settlement, focused on the historic core however it grew and expanded considerably in the 19th and 20th centuries, extending around the area of the Site.
- 2.4.15 The area of the Roman town walls was adapted in the 18th century to form one of the Town Walks, a Grade II Listed park (**WA17**). In the late 19th century an area adjacent to this was laid out as a public pleasure garden, which is also Grade II Listed (**WA16**).
- 2.4.16 A large Second World War military depot was situated at the northern edge of the Study Area (**WA30**; HER ref. **MDO20960**) and immediately to the north-west of the existing 19th century infantry barracks, which is partially Grade II Listed (**WA02**).
- 2.4.17 An area within the southern part of the Study Area was the location in the mid 20th century for the Dorchester Show and the remains of two show rings were uncovered here in 1989 (**WA34**; HER ref. **EDO4096** and **EDO4097**).

Negative evidence

- 2.4.18 A number of investigations within the Study Area have not located any archaeological finds or features. Most notably an evaluation at the southern end of the Site only identified geological features (**WA27**; Wessex Archaeology 2008). A number of investigations in the area of Dorchester Hospital have also uncovered limited archaeological activity, in some part due to later disturbance (**WA33**; HER ref. **EDO3827**, **EDO3845** and **EDO4201**).

2.5 Aerial photography assessment

- 2.5.1 A full search of aerial photographs held by the NRHE was carried out for the Site (NRHE ref. 89788). This returned 172 oblique photographs and 126 vertical photographs, all of which were viewed for this report at English Heritage Archive in Swindon and notes made of the location and extent of any observed features. The results of the search are listed in **Appendix 1**.

Oblique photographs

- 2.5.2 Over 170 oblique prints were viewed, largely comprising a series of RAF pictures taken in 1950 as well as other photographs taken between 1925 and 2007. Apart from the single frame taken in 1925, the other images post-date the construction of the school and playing fields. Though other known features within the Study Area could be identified on a number of these images, including elements of the activity to the west of the school site (**WA23**), no archaeological features could be identified within the Site itself. This is thought to be partially a reflection of the land use of the Site. Its use as playing fields resulting both in grass cover unsuitable to produce visible cropmarks couple with the likely levelling of the Site removing any extant earthworks.

Vertical photographs

- 2.5.3 A total of 126 vertical photographs were viewed, representing 24 sorties undertaken between 1947 and 1998, all of the images were black and white. Even on the earliest images the school appears to have already been under construction. No potential archaeological features were observed, however this is likely a reflection of visibility as the known barrow group to the west of the Site (**WA25**) was also not observed.



3 METHODOLOGY

3.1 Introduction

- 3.1.1 The detailed magnetometer survey was conducted using a Bartington Grad601-2 dual fluxgate gradiometer system. The survey was conducted in accordance with English Heritage guidelines (2008b).
- 3.1.2 The geophysical survey was undertaken by Wessex Archaeology's in-house geophysics team on 7th October 2014. Field conditions within the main survey area at the time of the survey were good, though some areas around a tennis court and an allotment were not surveyable.

3.2 Method

- 3.2.1 Individual survey grid nodes were established at 30m x 30m intervals using a Leica Viva RTK GNSS instrument, which is precise to approximately 0.02m and therefore exceeds English Heritage recommendations (2008b).
- 3.2.2 The magnetometer survey was conducted using a Bartington Grad601-2 fluxgate gradiometer instrument, which has a vertical separation of 1m between sensors. Data were collected at 0.25m intervals along transects spaced 1m apart with an effective sensitivity of 0.03nT, in accordance with EH guidelines (2008b). Data were collected in the zigzag method.
- 3.2.3 Data from the survey was subject to minimal data correction processes. These comprise a zero mean traverse function (± 5 nT thresholds) applied to correct for any variation between the two Bartington sensors used, and a de-step function to account for variations in traverse position due to varying ground cover and topography. These two steps were applied to all survey areas, with no interpolation applied.
- 3.2.4 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 2**.

4 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION

4.1 Introduction

- 4.1.1 The gradiometer survey has been successful in identifying a few small anomalies of possible archaeological interest in addition to agricultural features. Results are presented as greyscale and XY trace plots along with an archaeological interpretation, at a scale of 1:1250 (**Figures 2 to 5**). The data are displayed at -2nT (white) to +3nT (black) for the greyscale image and ± 25 nT at 50nT per cm for the XY trace plots.
- 4.1.2 The interpretation of the dataset highlights the presence of potential trends, former field boundaries, modern services, ferrous/burnt objects, and magnetic trends (**Figure 5**). Full definitions of the interpretation terms used in this report are provided in **Appendix 3**.
- 4.1.3 Numerous ferrous anomalies are visible throughout the detailed survey dataset. These are presumed to be modern in provenance and are not referred to, unless considered relevant to the archaeological interpretation.

4.2 Gradiometer Survey Results and Interpretation

- 4.2.1 There are very few anomalies of archaeological interest within the survey area. The survey area is crossed by numerous broad positive and negative linear features such as



at **4000** and **4001**. They run parallel to one another at regular intervals of about 20m and there seems to be two phases visible at the south where similar anomalies exist on a slightly differing alignment. The exact function of these features is unclear but they do not seem to be archaeological and have instead been interpreted as agricultural.

- 4.2.2 There are several isolated sub-oval positive anomalies scattered across the dataset with the example north of **4002** marking one of the largest of these. These anomalies have positive values around +2.5nT and measure less than 2m across. It is possible that these anomalies could represent cut archaeological features such as small pits and postholes but it is equally possible that they are natural features such as tree throws. They have been classed as possible archaeology to reflect this uncertainty in the interpretation.
- 4.2.3 Several large ferrous anomalies are visible in the data at **4003** to **4006**; these look to be the positions of current or former goal posts.
- 4.2.4 There are high concentrations of ferrous anomalies scattered across the dataset with the area around **4007** forming the densest concentration. It is not thought that their distribution is dense enough to have significantly reduced the ability to detect large archaeological features but it is possible that small features such as pits could be obscured.
- 4.2.5 The remaining anomalies detected include ploughing scars and weak linear trends of uncertain origin. These weak trends could represent archaeological features but are considered as uncertain origin as they form no clear pattern in their layout and could conceivably be caused by agricultural activity.

4.3 Gradiometer Survey Results and Interpretation: Modern Services

- 4.3.1 No modern services have been observed in the geophysical data. It should be noted that gradiometer data will not be able to locate and identify all services present on site. This report and accompanying illustrations should not be used as the sole source for service locations and appropriate equipment (e.g. CAT and Genny) should be used to confirm the location of buried services before any trenches are opened on site.

5 CONCLUSION

- 5.1.1 The detailed gradiometer survey has been successful in detecting a few small anomalies of possible archaeological interest in addition to numerous agricultural features.
- 5.1.2 No significant archaeological features have been detected in this survey data despite the presence of significant heritage assets highlighted within the vicinity of the Site. As has been mentioned above there are a lot of ferrous responses visible in the data but it is not felt that their presence has reduced the ability to detect large scale archaeological features.
- 5.1.3 The only features of possible archaeological interest are small pit-like anomalies like **4002** although it should be noted that it is possible that these were created by natural formation processes. Previous surveys carried out by WA that have been followed up by excavation over similar geology have shown that pits and tree throws can produce identical responses in geophysical data. This makes the task of determining whether isolated pit-like responses are archaeological or natural in origin difficult.
- 5.1.4 It should be noted that small, weakly magnetised features may produce responses that are below the detection threshold of magnetometers. It may therefore be the case that



more archaeological features may be encountered than have been identified through geophysical survey.

- 5.1.5 The geophysical survey has demonstrated a low archaeological potential across the Site and it is considered that no further archaeological evaluation is required to inform the planning application. If any archaeological mitigation is deemed necessary, e.g. watching brief, it could be secured as a condition of any planning permission granted for the proposed development.

6 REFERENCES

6.1 Bibliography

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6.2 Cartographic and Documentary Sources

British Geological Survey <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>



APPENDIX 1: NRHE AERIAL PHOTOGRAPHY SEARCH

Obliques – specialist

Photo reference (NGR and Index number)	Film and frame number	Date	Film type	Map Reference
SY 6788 / 32	JRB 3085 / 3	22 JUN 1976	Black& white 70mm,120,220	SY 679887
SY 6789 / 2	NMR 65 / 084	26 MAR 1968	Black& white 5x5"	SY 673893
SY 6789 / 4	KXH 9802 / ORACLEF1	1960s	Black& white Unknown	SY 672894
SY 6789 / 5	NMR 169 / 101-102	04 MAR 1970	Black& white 70mm,120,220	SY 675899
SY 6789 / 6	NMR 169 / 96-100	04 MAR 1970	Black& white 70mm,120,220	SY 677893
SY 6789 / 7	NMR 169 / 95	04 MAR 1970	Black& white 70mm,120,220	SY 676894
SY 6789 / 8	NMR 169 / 93-94	04 MAR 1970	Black& white 70mm,120,220	SY 676894
SY 6789 / 9	NMR 169 / 92	04 MAR 1970	Black& white 70mm,120,220	SY 675893
SY 6789 / 10	NMR 169 / 88-91	04 MAR 1970	Black& white 70mm,120,220	SY 675894
SY 6789 / 11	JRB 9724 / ORACLEF44	25 MAR 1970	Black& white Unknown	SY 674894
SY 6789 / 12	JRB 9724 / ORACLEF45	25 MAR 1970	Black& white Unknown	SY 674894
SY 6789 / 13	JRB 9724 / ORACLEF46	25 MAR 1970	Black& white Unknown	SY 674894
SY 6789 / 14	JRB 9724 / ORACLEF47	25 MAR 1970	Black& white Unknown	SY 674894
SY 6789 / 15	JRB 379 / 5806	11 DEC 1971	Black& white 70mm,120,220	SY 676895
SY 6789 / 16	NMR 387 / 403-404	16 MAR 1972	Black& white 70mm,120,220	SY 671894
SY 6789 / 17	NMR 387 / 405-410	16 MAR 1972	Black& white 70mm,120,220	SY 671896
SY 6789 / 18	JRB 499 / 5013	23 FEB 1971	Black& white 70mm,120,220	SY 671895
SY 6789 / 19	RYP 11541 / 04	MAY 1970	Copy slide 35 mm	SY 673895
SY 6789 / 21	NMR 10866 / 4	12 APR 1984	Colour slide 35 mm	SY 672895
SY 6789 / 22	NMR 1743 / 307-308	10 APR 1980	Black& white 70mm,120,220	SY 671895
SY 6789 / 24	NMR 1743 / 316-317	10 APR 1980	Black& white 70mm,120,220	SY 679898
SY 6789 / 25	NMR 1743 / 318-319	10 APR 1980	Black& white 70mm,120,220	SY 675899
SY 6789 / 26	NMR 1749 / 139	23 APR 1980	Black& white 70mm,120,220	SY 671898
SY 6789 / 27	NMR 2110 / 1347	30 MAR 1982	Black& white 70mm,120,220	SY 672896
SY 6789 / 28	NMR 2110 / 1352	30 MAR 1982	Black& white 70mm,120,220	SY 671894
SY 6789 / 30	JRB 3085 / 1	22 JUN 1976	Black& white 70mm,120,220	SY 673895
SY 6789 / 31	JRB 3085 / 2	22 JUN 1976	Black& white 70mm,120,220	SY 673895



SY 6789 / 32	JRB 3085	/ 4	22 JUN 1976	Black& white	70mm,120,220	SY 675895
SY 6789 / 33	JRB 3085	/ 5	22 JUN 1976	Black& white	70mm,120,220	SY 675898
SY 6789 / 34	JRB 3085	/ 7	22 JUN 1976	Black& white	70mm,120,220	SY 672899
SY 6789 / 35	JRB 3085	/ 10	22 JUN 1976	Black& white	70mm,120,220	SY 675899
SY 6789 / 36	JRB 3085	/ 11	22 JUN 1976	Black& white	70mm,120,220	SY 671896
SY 6789 / 37	JRB 3085	/ 12	22 JUN 1976	Black& white	70mm,120,220	SY 676893
SY 6789 / 38	JRB 3085	/ 16	22 JUN 1976	Black& white	70mm,120,220	SY 672898
SY 6789 / 39	JRB 3085	/ 17	22 JUN 1976	Black& white	70mm,120,220	SY 672898
SY 6789 / 42	NMR 2134	/ 0190	12 APR 1983	Black& white	70mm,120,220	SY 677898
SY 6789 / 43	JRB 3303	/ 12	08 JUL 1976	Black& white	70mm,120,220	SY 677899
SY 6789 / 44	JRB 3303	/ 13	08 JUL 1976	Black& white	70mm,120,220	SY 675896
SY 6789 / 45	JRB 3303	/ 14	08 JUL 1976	Black& white	70mm,120,220	SY 675894
SY 6789 / 46	JRB 3303	/ 15	08 JUL 1976	Black& white	70mm,120,220	SY 675895
SY 6789 / 48	JRB 3303	/ 24	08 JUL 1976	Black& white	70mm,120,220	SY 675893
SY 6789 / 49	JRB 3425	/ 16	10 JUL 1987	Black& white	35 mm	SY 677896
SY 6789 / 50	JRB 3425	/ 17	10 JUL 1987	Black& white	35 mm	SY 678894
SY 6789 / 51	JRB 3425	/ 18	10 JUL 1987	Black& white	35 mm	SY 677896
SY 6789 / 52	JRB 3425	/ 19	10 JUL 1987	Black& white	35 mm	SY 677896
SY 6789 / 53	JRB 3425	/ 20	10 JUL 1987	Black& white	35 mm	SY 679893
SY 6789 / 54	JRB 3425	/ 21	10 JUL 1987	Black& white	35 mm	SY 679893
SY 6789 / 55	JRB 3425	/ 22	10 JUL 1987	Black& white	35 mm	SY 679893
SY 6789 / 56	JRB 3425	/ 23	10 JUL 1987	Black& white	35 mm	SY 679893
SY 6789 / 57	JRB 3425	/ 24	10 JUL 1987	Black& white	35 mm	SY 677896
SY 6789 / 58	JRB 3425	/ 25	10 JUL 1987	Black& white	35 mm	SY 677896
SY 6789 / 59	JRB 3425	/ 26	10 JUL 1987	Black& white	35 mm	SY 677896
SY 6789 / 60	JRB 3425	/ 27	10 JUL 1987	Black& white	35 mm	SY 677896
SY 6789 / 61	JRB 3425	/ 28	10 JUL 1987	Black& white	35 mm	SY 677896
SY 6789 / 62	JRB 3425	/ 29	10 JUL 1987	Black& white	35 mm	SY 679893
SY 6789 / 63	JRB 3425	/ 30	10 JUL 1987	Black& white	35 mm	SY 679893
SY 6789 / 64	JRB 3425	/ 34	10 JUL 1987	Black& white	35 mm	SY 677899
SY 6789 / 65	JRB 3425	/ 35	10 JUL 1987	Black& white	35 mm	SY 677894



SY 6789 / 66	JRB 3425	/ 36	10 JUL 1987	Black& white	35 mm	SY 679895
SY 6789 / 67	JRB 3421	/ 07	15 JUN 1987	Black& white	70mm,120,220	SY 677894
SY 6789 / 68	JRB 3421	/ 08	15 JUN 1987	Black& white	70mm,120,220	SY 677894
SY 6789 / 69	JRB 3421	/ 10	15 JUN 1987	Black& white	70mm,120,220	SY 677894
SY 6789 / 70	JRB 3421	/ 15	15 JUN 1987	Black& white	70mm,120,220	SY 678893
SY 6789 / 71	JRB 3421	/ 16	15 JUN 1987	Black& white	70mm,120,220	SY 678893
SY 6789 / 72	NMR 2134	/ 0191	12 APR 1983	Black& white	70mm,120,220	SY 677898
SY 6789 / 73	NMR 2134	/ 0192	12 APR 1983	Black& white	70mm,120,220	SY 677898
SY 6789 / 74	NMR 1749	/ 140	23 APR 1980	Black& white	70mm,120,220	SY 671898
SY 6789 / 75	NMR 1749	/ 141	23 APR 1980	Black& white	70mm,120,220	SY 671898
SY 6789 / 76	NMR 2110	/ 1348	30 MAR 1982	Black& white	70mm,120,220	SY 672896
SY 6789 / 77	NMR 2110	/ 1349	30 MAR 1982	Black& white	70mm,120,220	SY 672896
SY 6789 / 78	NMR 2110	/ 1350	30 MAR 1982	Black& white	70mm,120,220	SY 672896
SY 6789 / 79	NMR 2110	/ 1351	30 MAR 1982	Black& white	70mm,120,220	SY 672896
SY 6789 / 80	NMR 2110	/ 1353	30 MAR 1982	Black& white	70mm,120,220	SY 671894
SY 6789 / 89	NMR 23797	/ 01	15 FEB 2005	Black& white	70mm,120,220	SY 671895
SY 6789 / 91	NMR 23804	/ 13	15 FEB 2005	Digital colour	35 mm	SY 674896
SY 6790 / 1	NMR 169	/ 103-105	04 MAR 1970	Black& white	70mm,120,220	SY 675900
SY 6790 / 4	JRB 3085	/ 18	22 JUN 1976	Black& white	70mm,120,220	SY 672901
SY 6790 / 6	JRB 3303	/ 9	08 JUL 1976	Black& white	70mm,120,220	SY 673902
SY 6790 / 7	JRB 3303	/ 11	08 JUL 1976	Black& white	70mm,120,220	SY 678904
SY 6790 / 12	JRB 3421	/ 12	15 JUN 1987	Black& white	70mm,120,220	SY 675900
SY 6790 / 13	JRB 3421	/ 13	15 JUN 1987	Black& white	70mm,120,220	SY 677901
SY 6790 / 21	NMR 21682	/ 13	19 JUL 2002	Colour neg	35 mm	SY 677902
SY 6790 / 22	NMR 21682	/ 14	19 JUL 2002	Colour neg	35 mm	SY 677902
SY 6790 / 23	NMR 21682	/ 15	19 JUL 2002	Colour neg	35 mm	SY 675904
SY 6790 / 24	NMR 21682	/ 16	19 JUL 2002	Colour neg	35 mm	SY 677901
SY 6790 / 26	NMR 21682	/ 18	19 JUL 2002	Colour neg	35 mm	SY 677902
SY 6790 / 27	NMR 21682	/ 19	19 JUL 2002	Colour neg	35 mm	SY 675904
SY 6790 / 28	NMR 21682	/ 20	19 JUL 2002	Colour neg	35 mm	SY 677901
SY 6790 / 29	NMR 21682	/ 21	19 JUL 2002	Colour neg	35 mm	SY 677902



SY 6790 / 30	NMR 21682	/ 22	19 JUL 2002	Colour neg	35 mm	SY 675903
SY 6790 / 31	NMR 21682	/ 24	19 JUL 2002	Colour neg	35 mm	SY 677902
SY 6790 / 32	NMR 21682	/ 25	19 JUL 2002	Colour neg	35 mm	SY 675904
SY 6790 / 33	NMR 21710	/ 03	19 JUL 2002	Black& white	70mm,120,220	SY 676902
SY 6790 / 34	NMR 21710	/ 04	19 JUL 2002	Black& white	70mm,120,220	SY 675902
SY 6790 / 35	NMR 21710	/ 05	19 JUL 2002	Black& white	70mm,120,220	SY 677902
SY 6790 / 36	NMR 21710	/ 06	19 JUL 2002	Black& white	70mm,120,220	SY 676903
SY 6790 / 37	NMR 23814	/ 22	15 FEB 2005	Colour neg	70mm,120,220	SY 675902
SY 6790 / 38	NMR 23814	/ 23	15 FEB 2005	Colour neg	70mm,120,220	SY 675902
SY 6790 / 39	NMR 23814	/ 24	15 FEB 2005	Colour neg	70mm,120,220	SY 673903
SY 6790 / 54	NMR 24726	/ 23	18 SEP 2007	Digital colour	35 mm	SY 675904
SY 6790 / 63	NMR 24726	/ 34	18 SEP 2007	Digital colour	35 mm	SY 673903
SY 6790 / 64	NMR 24726	/ 35	18 SEP 2007	Digital colour	35 mm	SY 674903
SY 6790 / 66	NMR 24726	/ 37	18 SEP 2007	Digital colour	35 mm	SY 675904
SY 6790 / 67	NMR 24726	/ 38	18 SEP 2007	Digital colour	35 mm	SY 676902
SY 6790 / 68	NMR 24726	/ 39	18 SEP 2007	Digital colour	35 mm	SY 677902
SY 6790 / 69	NMR 24726	/ 40	18 SEP 2007	Digital colour	35 mm	SY 677901
SY 6790 / 70	NMR 24726	/ 41	18 SEP 2007	Digital colour	35 mm	SY 673903
SY 6790 / 71	NMR 24726	/ 42	18 SEP 2007	Digital colour	35 mm	SY 674904
SY 6888 / 1	CCC 11755	/ 5696	Unknown	Black& white	Unknown	SY 685888
SY 6889 / 3	JRB 3085	/ 8	22 JUN 1976	Black& white	70mm,120,220	SY 681899
SY 6889 / 6	JRB 3425	/ 33	10 JUL 1987	Black& white	35 mm	SY 681896
SY 6889 / 7	FXR 15919	/ 02	13 JUL 1989	Copy slide	35 mm	SY 689899
SY 6889 / 18	NMR 24727	/ 02	18 SEP 2007	Digital colour	35 mm	SY 689898
SY 6890 / 1	FXR 15919	/ 04	13 JUL 1989	Copy slide	35 mm	SY 686904
SY 6890 / 15	NMR 21682	/ 23	19 JUL 2002	Colour neg	35 mm	SY 684905
SY 6989 / 1	ACA 7090	/ ORACLEF16	Unknown	Black& white	Unknown	SY 690899
SY 6989 / 3	NMR 285	/ 319-322	02 FEB 1971	Black& white	70mm,120,220	SY 690899
SY 6989 / 4	NMR 285	/ 323	02 FEB 1971	Black& white	70mm,120,220	SY 690899
SY 6989 / 5	CAP 8039	/ 15	30 JUN 1951	Black& white	Unknown	SY 690899
SY 6989 / 6	CAP 8039	/ 16	30 JUN 1951	Black& white	Unknown	SY 690899



SY 6989 / 7	CAP 8039	/ 17	30 JUN 1951	Black& white	Unknown	SY 690899
SY 6989 / 8	CAP 8039	/ 18	30 JUN 1951	Black& white	Unknown	SY 690899
SY 6989 / 9	CAP 8039	/ 19	30 JUN 1951	Black& white	Unknown	SY 690899
SY 6989 / 13	CAP 8114	/ 73	02 MAY 1953	Black& white	Unknown	SY 690899
SY 6989 / 14	CAP 8114	/ 74	02 MAY 1953	Black& white	Unknown	SY 690899
SY 6989 / 15	CAP 8114	/ 75	02 MAY 1953	Black& white	Unknown	SY 690899
SY 6989 / 16	CAP 8114	/ 76	02 MAY 1953	Black& white	Unknown	SY 690899
SY 6989 / 25	FXR 15919	/ 03	13 JUL 1989	Copy slide	35 mm	SY 690896
SY 6989 / 46	NMR 23814	/ 09	15 FEB 2005	Colour neg	70mm,120,220	SY 690899
SY 6989 / 47	NMR 23814	/ 10	15 FEB 2005	Colour neg	70mm,120,220	SY 690899
SY 6989 / 48	NMR 24727	/ 01	18 SEP 2007	Digital colour	35 mm	SY 690899
SY 6989 / 49	NMR 24727	/ 03	18 SEP 2007	Digital colour	35 mm	SY 690899
SY 6989 / 50	NMR 24727	/ 04	18 SEP 2007	Digital colour	35 mm	SY 690899
SY 6989 / 51	NMR 24727	/ 05	18 SEP 2007	Digital colour	35 mm	SY 690899
SY 6989 / 52	NMR 24727	/ 06	18 SEP 2007	Digital colour	35 mm	SY 690899
SY 6989 / 53	JEH 22034	/ 04	19 APR 1970	Colour slide	35 mm	SY 690899
SY 6989 / 54	JEH 22034	/ 05	19 APR 1970	Colour slide	35 mm	SY 690899
SY 6989 / 55	JEH 22034	/ 06	19 APR 1970	Colour slide	35 mm	SY 690899
SY 6989 / 56	JEH 22034	/ 07	19 APR 1970	Colour slide	35 mm	SY 690899
SY 6989 / 57	AFL 60229	/ EPW013524	JUN 1925	BW Glass Plate	5"x4"	SY 690899

Obliques – military

Library and frame number	Photo reference (NGR and Index number)	Original number	Date	Film type	Map Reference
RAF 30231 / PFFO-0126	SY 6789 / 81	540/307	08 APR 1950	Black& white 8x7"	SY 672896
RAF 30231 / PFFO-0127	SY 6789 / 82	540/307	08 APR 1950	Black& white 8x7"	SY 673897
RAF 30231 / PFFO-0128	SY 6789 / 83	540/307	08 APR 1950	Black& white 8x7"	SY 676898
RAF 30231 / PFFO-0129	SY 6789 / 84	540/307	08 APR 1950	Black& white 8x7"	SY 678898
RAF 30231 / PFFO-0130	SY 6889 / 8	540/307	08 APR 1950	Black& white 8x7"	SY 681899
RAF 30231 / PFFO-0131	SY 6890 / 5	540/307	08 APR 1950	Black& white 8x7"	SY 683900



RAF 30231	/ PFFO-0132	SY 6890 / 6	540/307	08 APR 1950	Black& white	8x7"	SY 685900
RAF 30231	/ PFFO-0133	SY 6890 / 7	540/307	08 APR 1950	Black& white	8x7"	SY 688901
RAF 30231	/ PFFO-0147	SY 6989 / 29	540/307	08 APR 1950	Black& white	8x7"	SY 690895
RAF 30231	/ PFFO-0148	SY 6989 / 30	540/307	08 APR 1950	Black& white	8x7"	SY 690896
RAF 30231	/ PFFO-0149	SY 6889 / 13	540/307	08 APR 1950	Black& white	8x7"	SY 689899
RAF 30231	/ SFFO-0126	SY 6789 / 85	540/307	08 APR 1950	Black& white	8x7"	SY 671895
RAF 30231	/ SFFO-0127	SY 6789 / 86	540/307	08 APR 1950	Black& white	8x7"	SY 673895
RAF 30231	/ SFFO-0128	SY 6789 / 87	540/307	08 APR 1950	Black& white	8x7"	SY 675896
RAF 30231	/ SFFO-0129	SY 6789 / 88	540/307	08 APR 1950	Black& white	8x7"	SY 678897
RAF 30231	/ SFFO-0130	SY 6889 / 9	540/307	08 APR 1950	Black& white	8x7"	SY 680898
RAF 30231	/ SFFO-0131	SY 6889 / 10	540/307	08 APR 1950	Black& white	8x7"	SY 682898
RAF 30231	/ SFFO-0132	SY 6889 / 11	540/307	08 APR 1950	Black& white	8x7"	SY 684899
RAF 30231	/ SFFO-0133	SY 6889 / 12	540/307	08 APR 1950	Black& white	8x7"	SY 687899
RAF 30231	/ SFFO-0149	SY 6989 / 35	540/307	08 APR 1950	Black& white	8x7"	SY 690899
RAF 30351	/ PFFO-0131	SY 6889 / 14	540/307	08 APR 1950	Black& white	8x7"	SY 680899
RAF 30351	/ PFFO-0132	SY 6890 / 16	540/307	08 APR 1950	Black& white	8x7"	SY 683900
RAF 30351	/ PFFO-0133	SY 6890 / 17	540/307	08 APR 1950	Black& white	8x7"	SY 685900
RAF 30351	/ PFFO-0134	SY 6890 / 18	540/307	08 APR 1950	Black& white	8x7"	SY 687901
RAF 30351	/ PFFO-0149	SY 6989 / 39	540/307	08 APR 1950	Black& white	8x7"	SY 690896
RAF 30351	/ PFFO-0151	SY 6890 / 19	540/307	08 APR 1950	Black& white	8x7"	SY 689901
RAF 30351	/ SFFO-0132	SY 6889 / 15	540/307	08 APR 1950	Black& white	8x7"	SY 681898
RAF 30351	/ SFFO-0133	SY 6889 / 16	540/307	08 APR 1950	Black& white	8x7"	SY 683898
RAF 30351	/ SFFO-0134	SY 6889 / 17	540/307	08 APR 1950	Black& white	8x7"	SY 685899
RAF 30351	/ SFFO-0135	SY 6890 / 24	540/307	08 APR 1950	Black& white	8x7"	SY 687900



Verticals

Sortie number	Library number	Camera position	Frame number	Held	Centre point	Run	Date	Film details (in inches)
RAF/CPE/UK/1934	560	V	5085	P	SY 687 897	18	17 JAN 1947	Black and White 8.25 x 7.5
RAF/CPE/UK/1934	560	V	5086	P	SY 681 898	18	17 JAN 1947	Black and White 8.25 x 7.5
RAF/CPE/UK/2431	759	RS	4257	P	SY 689 896	23	JAN 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2431	759	RS	4258	P	SY 684 900	23	JAN 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2431	759	RS	4259	P	SY 680 904	23	JAN 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2475	779	RP	3015	P	SY 687 904	2	09 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2475	779	RP	3016	N	SY 681 906	2	09 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2475	779	RP	3017	N	SY 676 907	2	09 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2475	779	RS	4015	N	SY 683 885	10	09 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2475	779	RS	4016	N	SY 677 887	10	09 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2475	779	RS	4017	N	SY 672 888	10	09 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2475	779	RS	4077	P	SY 671 899	11	09 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2475	779	RS	4078	P	SY 677 897	11	09 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2475	779	RS	4079	P	SY 682 896	11	09 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2475	779	RS	4080	N	SY 689 896	11	09 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2491	785	RP	3015	P	SY 687 893	1	11 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2491	785	RP	3016	P	SY 681 896	1	11 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2491	785	RP	3017	P	SY 679 895	1	11 MAR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2621	837	RS	4044	P	SY 674 902	21	27 APR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2621	837	RS	4045	P	SY 682 901	21	27 APR 1948	Black and White 8.25 x 7.5
RAF/CPE/UK/2621	837	RS	4046	P	SY 689 901	21	27 APR 1948	Black and White 8.25 x 7.5
RAF/541/7	857	RP	3088	P	SY 686 902	8	07 MAY 1948	Black and White 8.25 x 7.5
RAF/541/7	857	RP	3089	P	SY 679 902	8	07 MAY 1948	Black and White 8.25 x 7.5
RAF/58/271	1006	V	5153	P	SY 678 902	11	28 JUN 1949	Black and White 8.25 x 7.5
RAF/58/271	1006	V	5154	P	SY 681 900	11	28 JUN 1949	Black and White 8.25 x 7.5
RAF/58/271	1006	V	5155	P	SY 683 898	11	28 JUN 1949	Black and White 8.25 x 7.5
RAF/58/271	1006	V	5156	P	SY 686 896	11	28 JUN 1949	Black and White 8.25 x 7.5
RAF/58/2687	1885	F21	58	P	SY 683 896	3	24 JAN 1959	Black and White 8.25 x 7.5



RAF/58/2687	1885	F21	59	P	SY 675 896	3	24 JAN 1959	Black and White 8.25 x 7.5
RAF/58/4652	2035	F21	285	P	SY 679 895	7	29 AUG 1961	Black and White 9 x 9
RAF/58/4652	2035	F21	286	N	SY 688 894	7	29 AUG 1961	Black and White 9 x 9
RAF/58/4733	2042	F21	209	N	SY 689 894	4	12 OCT 1961	Black and White 9 x 9
RAF/58/4733	2042	F21	210	N	SY 679 894	4	12 OCT 1961	Black and White 9 x 9
RAF/58/4733	2042	F21	211	N	SY 669 895	4	12 OCT 1961	Black and White 9 x 9
RAF/58/4733	2042	F22	140	N	SY 689 888	7	12 OCT 1961	Black and White 9 x 9
RAF/58/4733	2042	F22	141	N	SY 680 888	7	12 OCT 1961	Black and White 9 x 9
RAF/58/4733	2042	F22	142	N	SY 670 888	7	12 OCT 1961	Black and White 9 x 9
RCU/BKS/4724	9004	V	3842	N	SY 685 903	1	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3843	N	SY 683 903	1	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3844	N	SY 681 903	1	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3845	N	SY 678 903	1	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3846	N	SY 676 903	1	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3868	N	SY 673 896	2	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3869	N	SY 675 894	2	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3870	N	SY 677 893	2	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3871	N	SY 679 891	2	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3872	N	SY 681 890	2	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3880	N	SY 680 901	3	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3881	N	SY 680 903	3	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3882	N	SY 679 905	3	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3954	N	SY 684 889	6	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3955	N	SY 685 891	6	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3956	N	SY 686 893	6	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3957	N	SY 688 895	6	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3958	N	SY 689 898	6	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3993	N	SY 681 888	7	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3994	N	SY 683 889	7	17 SEP 1971	Black and White 9 x 9
RCU/BKS/4724	9004	V	3995	N	SY 686 889	7	17 SEP 1971	Black and White 9 x 9
RCU/FSL/7012	9012A	V	771	N	SY 674 897	3	19 MAR 1970	Black and White 9 x 9



RCU/FSL/7012	9012A	V	772	N	SY 684 899	3	19 MAR 1970	Black and White 9 x 9
RCU/FSL/7012	9012A	V	773	N	SY 693 901	3	19 MAR 1970	Black and White 9 x 9
OS/78080	12321	V	19	P	SY 689 897	1	11 JUN 1978	Black and White 9 x 9
OS/78080	12321	V	20	P	SY 683 897	1	11 JUN 1978	Black and White 9 x 9
OS/78080	12321	V	21	P	SY 676 897	1	11 JUN 1978	Black and White 9 x 9
OS/79060	12371	V	23	P	SY 686 901	1	05 JUL 1979	Black and White 9 x 9
OS/79060	12371	V	24	P	SY 680 900	1	05 JUL 1979	Black and White 9 x 9
OS/79060	12371	V	25	P	SY 674 900	1	05 JUL 1979	Black and White 9 x 9
OS/89079	13442	V	273	P	SY 686 893	2	07 MAR 1989	Black and White 9 x 9
OS/89079	13442	V	274	P	SY 679 895	2	07 MAR 1989	Black and White 9 x 9
OS/89079	13442	V	275	P	SY 673 896	2	07 MAR 1989	Black and White 9 x 9
OS/89137	13477	V	457	N	SY 689 905	1	05 MAY 1989	Black and White 9 x 9
OS/89137	13477	V	458	P	SY 682 906	1	05 MAY 1989	Black and White 9 x 9
OS/89137	13477	V	459	P	SY 675 906	1	05 MAY 1989	Black and White 9 x 9
MAL/70089	14285	V	175	P	SY 669 890	5	24 NOV 1970	Black and White 9 x 9
MAL/70089	14285	V	176	P	SY 671 890	6	24 NOV 1970	Black and White 9 x 9
OS/96662	15255	V	8814	N	SY 690 893	1	15 MAY 1996	Black and White 9 x 9
OS/96662	15255	V	8815	N	SY 683 893	1	15 MAY 1996	Black and White 9 x 9
MAL/62537	21177	V	102217	N	SY 687 894	11	24 JUL 1962	Black and White 9 x 9
MAL/62537	21177	V	102218	N	SY 687 896	11	24 JUL 1962	Black and White 9 x 9
MAL/62537	21177	V	102219	N	SY 687 898	11	24 JUL 1962	Black and White 9 x 9
MAL/62537	21177	V	102220	N	SY 687 900	11	24 JUL 1962	Black and White 9 x 9
MAL/62537	21177	V	102221	N	SY 687 903	11	24 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101551	N	SY 683 904	6	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101552	N	SY 683 902	6	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101553	N	SY 683 900	6	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101554	N	SY 683 898	6	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101555	N	SY 683 896	6	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101556	N	SY 683 894	6	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101557	N	SY 683 892	6	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101558	N	SY 683 890	6	09 JUL 1962	Black and White 9 x 9



MAL/62533	21182	V	101559	N	SY 682 888	6	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101577	N	SY 687 902	9	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101578	N	SY 687 900	9	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101579	N	SY 687 898	9	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V	101580	N	SY 687 896	9	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V1	101561	N	SY 688 901	11	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V1	101562	N	SY 688 899	11	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V1	101563	N	SY 688 897	11	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V1	101564	N	SY 687 895	11	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V1	101565	N	SY 687 893	11	09 JUL 1962	Black and White 9 x 9
MAL/62533	21182	V1	101566	N	SY 687 891	11	09 JUL 1962	Black and White 9 x 9
MAL/60410	21368	V	77730	P	SY 688 901	1	22 MAR 1960	Black and White 9 x 9
MAL/60410	21368	V	77731	P	SY 689 900	1	22 MAR 1960	Black and White 9 x 9
MAL/60410	21368	V	77742	P	SY 687 902	2	22 MAR 1960	Black and White 9 x 9
MAL/60410	21368	V	77743	P	SY 688 900	2	22 MAR 1960	Black and White 9 x 9
MAL/60410	21368	V	77744	P	SY 688 899	2	22 MAR 1960	Black and White 9 x 9
MAL/60410	21368	V	77745	P	SY 689 898	2	22 MAR 1960	Black and White 9 x 9
MAL/60410	21368	V	77746	P	SY 689 896	2	22 MAR 1960	Black and White 9 x 9
MAL/60410	21368	V	77753	P	SY 688 902	3	22 MAR 1960	Black and White 9 x 9
MAL/60410	21368	V	77754	P	SY 688 900	3	22 MAR 1960	Black and White 9 x 9
MAL/60410	21368	V	77755	P	SY 689 899	3	22 MAR 1960	Black and White 9 x 9
MAL/60410	21368	V	77756	P	SY 689 897	3	22 MAR 1960	Black and White 9 x 9
MAL/57283	21522	V	45284	N	SY 687 900	4	02 JUL 1957	Black and White 9 x 9
MAL/57281	21524	V	42844	N	SY 688 902	10	30 JUL 1957	Black and White 9 x 9
MAL/57281	21524	V	42845	N	SY 689 902	10	30 JUL 1957	Black and White 9 x 9
MAL/57281	21524	V	42855	N	SY 688 899	11	30 JUL 1957	Black and White 9 x 9
MAL/57281	21524	V	42856	N	SY 689 899	11	30 JUL 1957	Black and White 9 x 9
MAL/57281	21524	V	42861	N	SY 688 899	12	30 JUL 1957	Black and White 9 x 9
MAL/57281	21524	V	42862	N	SY 689 899	12	30 JUL 1957	Black and White 9 x 9
MAL/57281	21524	V	42868	N	SY 688 900	13	30 JUL 1957	Black and White 9 x 9
MAL/57281	21524	V	42869	N	SY 689 900	13	30 JUL 1957	Black and White 9 x 9



MAL/57281	21524	V	42883	N	SY 687 899	5	30 JUL 1957	Black and White 9 x 9
MAL/57281	21524	V	42897	N	SY 689 899	6	30 JUL 1957	Black and White 9 x 9
MAL/57281	21524	V	42898	N	SY 689 896	6	30 JUL 1957	Black and White 9 x 9
OS/98613	22747	V	26	N	SY 684 904	1	19 JUN 1998	Black and White 9 x 9
OS/98613	22747	V	27	N	SY 679 904	1	19 JUN 1998	Black and White 9 x 9



APPENDIX 2: SURVEY EQUIPMENT AND DATA PROCESSING

Survey Methods and Equipment

The magnetic data for this project was acquired using a Bartington 601-2 dual magnetic gradiometer system. This instrument has two sensor assemblies fixed horizontally 1m apart allowing two traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 1m separation, and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

The gradiometers have an effective resolution of 0.03nT over a ± 100 nT range, and measurements from each sensor are logged at intervals of 0.25m. All of the data are stored on an integrated data logger for subsequent post-processing and analysis.

Wessex Archaeology undertakes two types of magnetic surveys: scanning and detail. Both types depend upon the establishment of an accurate 20m or 30m site grid, which is achieved using a Leica Viva RTK GNSS instrument and then extended using tapes. The Leica Viva system receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined with a precision of 0.02m in real-time and therefore exceed the level of accuracy recommended by English Heritage (2008b) for geophysical surveys.

Scanning surveys consist of recording data at 0.25m intervals along transects spaced 10m apart, acquiring a minimum of 80 data points per transect. Due to the relatively coarse transect interval, scanning surveys should only be expected to detect extended regions of archaeological anomalies, when there is a greater likelihood of distinguishing such responses from the background magnetic field.

The detailed surveys consist of 20m x 20m or 30m x 30m grids, and data are collected at 0.25m intervals along traverses spaced 1m apart. These strategies give 1600 or 3600 measurements per 20m or 30m grid respectively, and are the recommended methodologies for archaeological surveys of this type (EH, 2008).

Data may be collected with a higher sample density where complex archaeological anomalies are encountered, to aid the detection and characterisation of small and ephemeral features. Data may be collected at up to 0.125m intervals along traverses spaced up to 0.25m apart, resulting in a maximum of 28800 readings per 30m grid, exceeding that recommended by English Heritage (2008b) for characterisation surveys.

Post-Processing

The magnetic data collected during the detail survey are downloaded from the Bartington system for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

As the scanning data are not as closely distributed as with detailed survey, they are georeferenced using the GPS information and interpolated to highlight similar anomalies in adjacent transects. Directional trends may be removed before interpolation to produce more easily understood images.



Typical data and image processing steps may include:

- Destripe – Applying a zero mean traverse in order to remove differences caused by directional effects inherent in the magnetometer;
- Destagger – Shifting each traverse longitudinally by a number of readings. This corrects for operator errors and is used to enhance linear features;
- Despike – Filtering isolated data points that exceed the mean by a specified amount to reduce the appearance of dominant anomalous readings (generally only used for earth resistance data)

Typical displays of the data used during processing and analysis:

- XY Plot – Presents the data as a trace or graph line for each traverse. Each traverse is displaced down the image to produce a stacked profile effect. This type of image is useful as it shows the full range of individual anomalies.
- Greyscale – Presents the data in plan view using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.



APPENDIX 3: GEOPHYSICAL INTERPRETATION

The interpretation methodology used by Wessex Archaeology separates the anomalies into four main categories: archaeological, modern, agricultural and uncertain origin/geological.

The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further sub-divided into three groups, implying a decreasing level of confidence:

- Archaeology – used when there is a clear geophysical response and anthropogenic pattern.
- Probable archaeology – used for features which give a clear response but which form incomplete patterns.
- Possible archaeology – used for features which give a response but which form no discernible pattern or trend.

The modern category is used for anomalies that are presumed to be relatively modern in date:

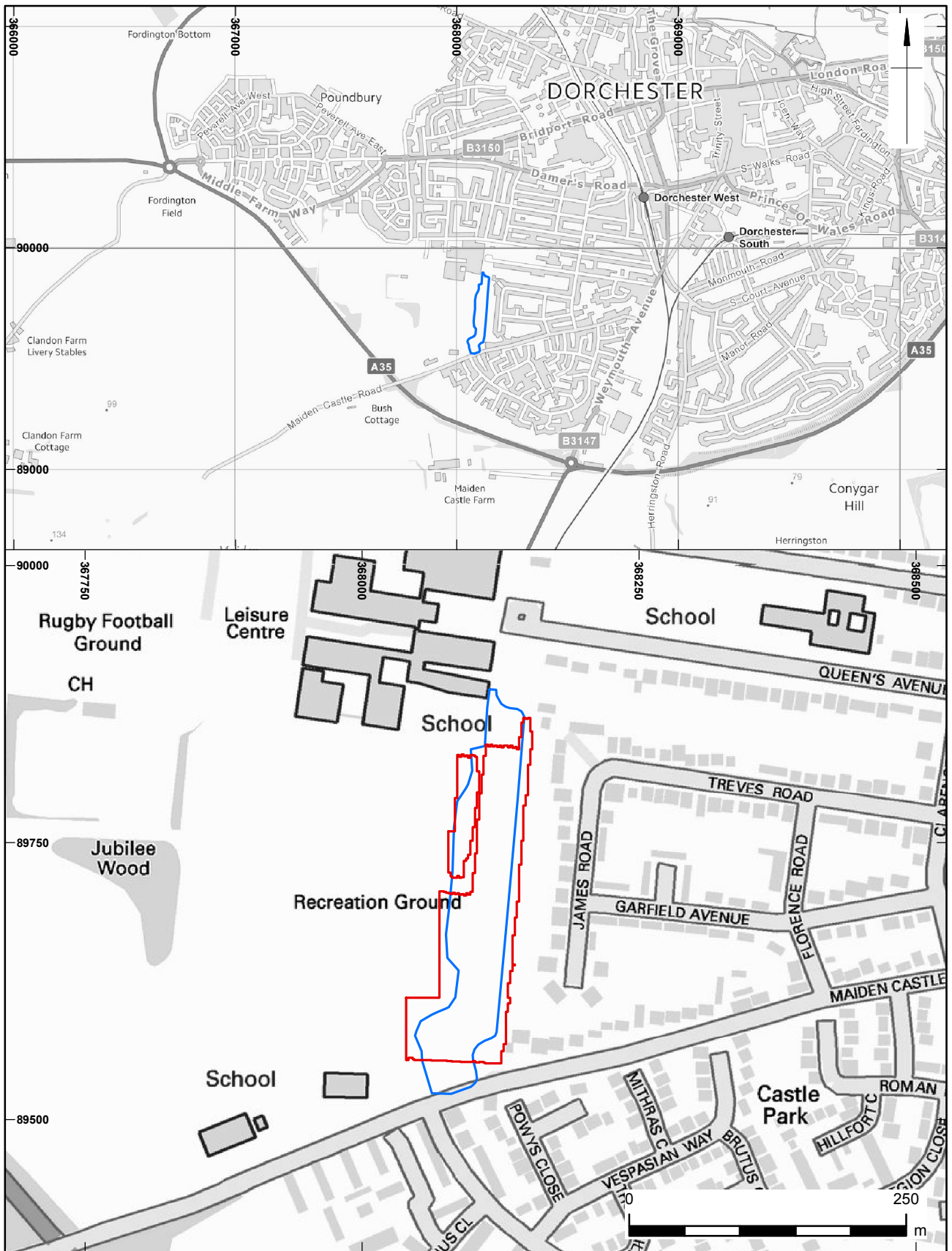
- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.
- Modern service – used for responses considered relating to cables and pipes; most are composed of ferrous/ceramic material although services made from non-magnetic material can sometimes be observed.

The agricultural category is used for the following:

- Former field boundaries – used for ditch sections that correspond to the position of boundaries marked on earlier mapping.
- Agricultural ditches – used for ditch sections that are aligned parallel to existing boundaries and former field boundaries that are not considered to be of archaeological significance.
- Ridge and furrow – used for broad and diffuse linear anomalies that are considered to indicate areas of former ridge and furrow.
- Ploughing – used for well-defined narrow linear responses, usually aligned parallel to existing field boundaries.
- Drainage – used to define the course of ceramic field drains that are visible in the data as a series of repeating bipolar (black and white) responses.

The uncertain origin/geological category is used for features when the form, nature and pattern of the anomaly are not sufficient to warrant a classification as an archaeological feature. This category is further sub-divided into:

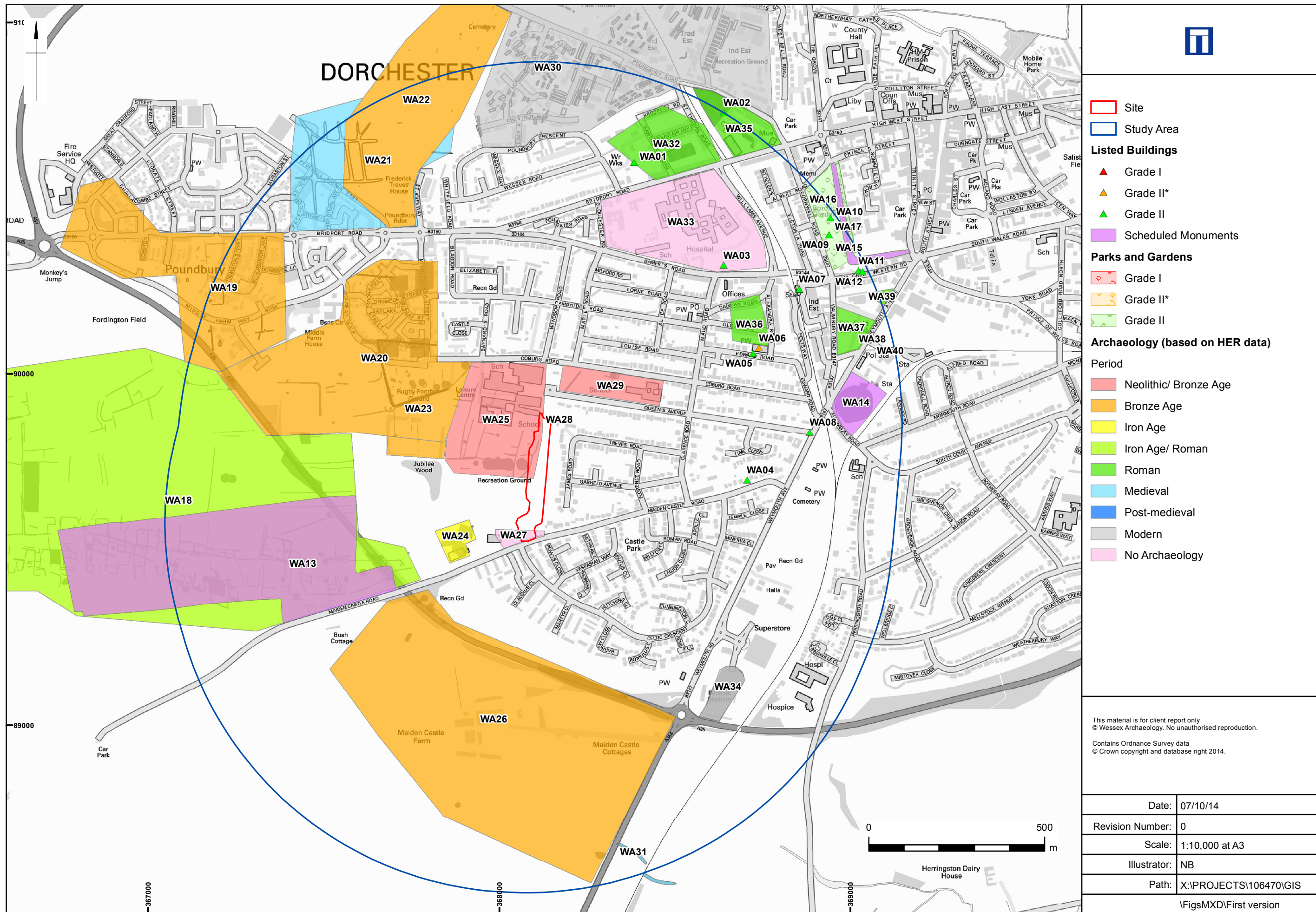
- Increased magnetic response – used for areas dominated by indistinct anomalies which may have some archaeological potential.
- Trend – used for low amplitude or indistinct linear anomalies.
- Superficial geology – used for diffuse edged spreads considered to relate to shallow geological deposits. They can be distinguished as areas of positive, negative or broad bipolar (positive and negative) anomalies.



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Site location and detailed survey extents

Figure 1



Archaeological and historical sites and monuments within the Study Area

Figure 2



Detailed Survey Extents

0 50 m

+3nT

-2nT


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Greyscale plot

Figure 3



 Detailed Survey Extents

 +25nT
-25nT



0 50
m

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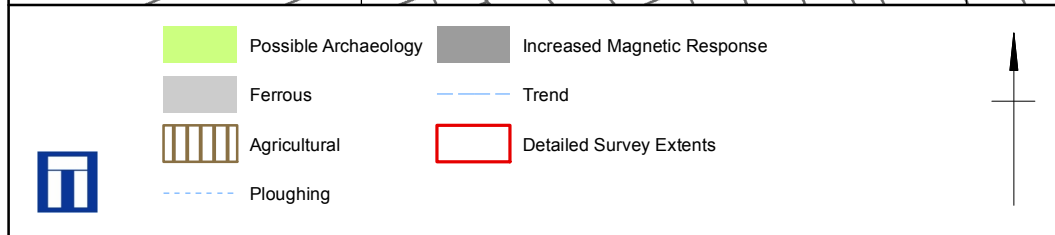
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XY trace plot

Figure 4



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Interpretation

Figure 5



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