highways england

A303 Stonehenge
Amesbury to Berwick Down

Geophysical Survey Report:

Amesbury Road Diversion

April 2019

Table of contents

Table of Figures

Executive Summary

This report presents the results of geophysical survey of land off Equinox Drive, Solstice Park, Amesbury, as part of the A303 Amesbury to Berwick Down road improvement scheme (hereafter referred to as the Scheme). The survey area lies 2.3 km east of the Stonehenge part of the Stonehenge, Avebury and Associated Sites World Heritage Site (WHS) and is proposed for diversion of Amesbury Road (byway AMES1). The land had previously been included in a programme of non-intrusive archaeological geophysical survey and trial trenching in connection with the Solstice Park development (see the Environmental Statement submitted with the Application for Development Consent dated October 2018 (ES) paragraph 6.6.109). The conclusions of the ES were informed by the results of that geophysical survey and trial trenching, allowing a robust assessment of baseline, (see ES paragraphs 6.6.15 and 6.6.109), approach to mitigation (see ES section 6.8) and likely significant effects (see ES paragraph 6.4.1 (f) and section 6.9 and tables 6.10 to 6.12). The purpose of the fieldwork described in this report was to confirm the results of the previous survey and trenching and therefore the conclusions of the Environmental Statement.

The geophysical survey has not identified any anomalies that can be confidently interpreted as archaeology. A possible ditch feature may represent an extension of a Bronze Age – Romano-British field system recorded across the area. However, this could equally relate to more recent activity on the site, evident on satellite imagery.

The survey also identified several possible pit features. Whilst these may relate to archaeological activity, they are equally likely to be natural pitting in the underlying chalk bedrock. The remaining anomalies are modern in origin. These relate to a service and ferrous debris likely associated with the construction activity to the north of the site.

Based on the results of the geophysical survey and consultation with Wiltshire County Archaeology Service, it was concluded that the archaeological evaluation trenching proposed in the Site Specific Written Scheme of Investigation (SSWSI) was not required.

The survey evaluated in this report confirms the results of the previous survey and trenching and therefore confirms the conclusions of the Environmental Statement.

1 Introduction

1.1 Project background

1.1.1 Wessex Archaeology Ltd has been appointed as Archaeological Contractor by AECOM Mace WSP Joint Venture (AmW, the Technical Partner) on behalf of Highways England (the Employer) to undertake a programme of archaeological evaluation for the A303 Stonehenge project ('the Scheme').

1.1.2 An Archaeological Evaluation Strategy Report (AESR) [1] sets out the general and specific principles guiding the strategies for field-based investigations. An Overarching Written Scheme of Investigation (OWSI) [2] accompanying the AESR details the methods and techniques employed during the archaeological evaluation. The AESR and OWSI were approved by the Heritage Monitoring and Advisory Group (HMAG: comprising representatives of Wiltshire Council Archaeology Service, the National Trust and Historic England).

1.1.3 A Site Specific Written Scheme of Investigation (SSWSI) [3] for archaeological evaluation of land off Equinox Drive, Amesbury, detailed the aims and methodologies to be used. This guiding document was approved by Wiltshire Council Archaeology Service (WCAS) on behalf of the Local Planning Authority (LPA), as the land lies outside the Stonehenge, Avebury and Associated Sites World Heritage Site (WHS). The land is proposed for diversion of Amesbury Road (byway AMES1) ('the site').

1.2 Scope of the document

1.2.1 The site had previously been included in a programme of non-intrusive archaeological geophysical survey and trial trenching in connection with the Solstice Park development [4] [5]. The conclusions of the Environmental Statement (ES) were informed by the results of this geophysical survey and trial trenching, allowing a robust assessment of baseline (see ES paragraph 6.6.15), approach to mitigation (see ES paragraphs 6.8.6 and 6.8.7) and likely significant effects (see ES paragraph 6.4.1 (f) and section 6 and tables 6.10 to 6.12). The purpose of the fieldwork described in this report was to confirm the results of the previous survey and trenching and therefore the conclusions of the Environmental Statement.

1.2.2 This document details the results of the geophysical survey of the site, in accordance with the approved SSWSI. Where relevant, the report notes the limitations of the survey, the data collected, and the interpretation put forward: these limitations do not affect the confirmation presented by this document of the baseline conditions, assessment of effects and mitigation approach identified in the ES.

1.2.3 Based on the results of the geophysical survey and consultation with Wiltshire County Archaeology Service, it was concluded that the archaeological evaluation trenching proposed in the Site Specific Written Scheme of Investigation (SSWSI) was not required.

2 Site Description

2.1 Location, topography and geology

2.1.1 The part of the Scheme covered by this geophysical survey covers an area located within the provisional Development Consent Order (DCO) limits ('the Red Line Boundary', or RLB). The area lies approximately 450m southwest of the A303, at the eastern end of the scheme centred on NGR 417663, 141803 (**Figure 1**), and is required for construction of a diversion of Amesbury Road (byway AMES1).

2.1.2 The area lies outside, and to the east of, the Stonehenge, Avebury and Associated Sites World Heritage Site (WHS).

2.1.3 The area comprises 1.1 ha of grassland across one field. The field is bounded by wooded boundaries to the north, west, and south, with industrial buildings beyond these. The east of the site is bounded by Amesbury Road (byway AMES1).

2.1.4 The area lies on a slight south-west facing slope, dropping from 96 m above Ordnance Datum (aOD) in the north-east to 92 m aOD along the south-western boundary.

2.1.5 The solid geology comprises Cretaceous Chalk of the Seaford Formation. There are no recorded superficial deposits across most of the site, although accumulations of alluvial head deposits, comprising clay, silt, sand, and gravel, are mapped to the north, west, and south [6].

2.1.6 The soils underlying the area are likely to consist of brown rendzinas of the 343h (Andover 1) association [7]. Soils derived from such geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey.

2.2 Archaeological background

Introduction

2.2.1 A Historic Environment Baseline Assessment [8] (ES Appendix 6.2) has presented the known and potential archaeological baseline for the proposed A303 Amesbury to Berwick Down road improvement scheme. The study area for this covered a 500 m wide corridor either side of the DCO limits and considered all heritage assets up to and including the 20th century. The SSWSI [3] addresses the archaeological background for the site, relevant parts of which are summarised below.

Summary of the archaeological resource

2.2.2 The site is located within a relatively dense concentration of Early Bronze Age round barrows, of which the barrow groups at Earl's Farm Down, New Barn Down, and Bulford are perhaps the most notable. A group of two Bronze Age disc barrows and a bell barrow is located on the eastern extent of the survey area (NHLE 1009566), noted as being 400 m east of the Pennings and part of the Earl's Farm Down group. The westernmost of the two disc barrows extends into the surveyed field but was not covered by this survey, since the proposed

realignment of Amesbury Road avoids the scheduled area, which in consequence would not be affected by any of the proposed works.

2.2.3 Several scheduled monuments are recorded near the site, with a further six designated bell barrows and one scheduled bowl barrow within 750 m of the site (NHLE 1009560, 1009563, 1009572, 1009871, 1009872). These all lie to the north and east of the site (**Figure 1**).

2.2.4 The Wiltshire and Swindon Historic Environment Record (WSHER) also records numerous non-designated funerary monuments dating from the Neolithic and Bronze Age in the surrounding area. This includes seven barrows excavated during development of Solstice Park business park to the immediate west of the site, as well as a further three possible ring ditches identified by geophysical survey in the same area [4] [5]. A faint curvilinear anomaly identified by the geophysical survey is also recorded in the south-west of the current survey area. This is noted as a possible ring ditch, although it is not clear whether subsequent excavations found anything at this location.

2.2.5 The excavations at Solstice Park also identified part of a Bronze Age – Romano-British field system that has been mapped from aerial photography (MWI12268). The field system extends across the site but is more clearly visible in aerial photography to the east. A likely associated trackway runs to the north and west of the site. This appears to form a boundary to the field system and continues towards a scheduled area of trackways further east (NHLE 1009613).

2.2.6 Undated possible pit features are recorded to the north-east of the site. These were identified by a previous geophysical survey.

3 Methodology

3.1 Introduction

3.1.1 The Geophysical survey of the site adhered to the methodology set out below, prepared in accordance with guidelines and recommendations published by Historic England [9], Europae Archaeologiae Consilium [10], and by the Chartered Institute for Archaeologists [11].

3.2 Aims and objectives

3.2.1 The aims of the geophysical survey were:

- To provide information about the nature and interpretation of any anomalies identified;
- To determine the presence, absence and extent of buried archaeological features;
- To contribute to the next stage of the iterative archaeological evaluation strategy and assist in defining suitable targets for the archaeological trial trenching;
- To establish the extent and character of potential archaeological anomalies and provide an interpretation of the results in their local, regional, national or international context; and
- To produce this interpretive report on the findings of the fieldwork and to inform the development of an archaeological mitigation strategy for the Scheme[1].

3.3 Fieldwork methodology

3.3.1 Following cutting of long grass (as practicable on site), detailed gradiometer survey was undertaken across the entirety of the site. A brief description of the survey technique is provided below. Further details of the specific geophysical and survey equipment, methods, and processing are described in **Appendix A**.

3.4 Survey specification

3.4.1 Individual survey grid nodes were established at 30 m x 30 m intervals using a Leica Viva RTK GNSS instrument, which is precise to approximately 0.02 m and therefore exceeds European Archaeologiae Consilium recommendations [10].

3.4.2 The detailed gradiometer survey was conducted using a Bartington Grad601-2 fluxgate gradiometer instrument, which has a vertical separation of 1 m between sensors. Data were collected at 0.25 m intervals along transects spaced 1 m apart with an effective sensitivity of 0.03 nT). Data were collected in the zigzag method.

3.5 Data processing

3.5.1 Data from the survey were subjected to minimal correction processes. These comprise a zero-mean traverse function (±5 nT thresholds) applied to correct for

[1] The approach to archaeological mitigation for the Scheme is set out in section 6.8 of the ES

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 throughout the survey area, with no interpolation applied.

4 Geophysical survey results and interpretation

4.1 Introduction

4.1.1 The detailed gradiometer survey was undertaken on 17 August 2018. The conditions at the time of survey were generally good, being dry and over short grass. An area in the south-western part of the site adjacent to Equinox Drive was not available for survey due to overgrown vegetation, reducing the surveyed area to 0.8 ha.

4.1.2 The results are presented as a series of greyscale plots and archaeological interpretations at a scale of 1:1000 (**Figures 2** – **3**). The data are displayed at -2 nT (white) to +3 nT (black) for the greyscale images. The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous responses, burnt or fired objects, and magnetic trends (**Figure 3**). Full definitions of the interpretation terms used in this report are provided in **Appendix B**.

4.1.3 Numerous ferrous anomalies are visible throughout the datasets. These are presumed to be modern in provenance and are not referred to further, unless considered relevant to the archaeological interpretation.

4.1.4 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 are present than have been identified through geophysical survey.

4.1.5 Gradiometer survey may not detect all services present on site. This report and accompanying illustrations should not be used as the sole source for service identification and appropriate equipment (e.g. CAT and Genny) should be used.

4.2 Survey results and interpretation

4.2.1 In the north of the site, a weak positive linear anomaly has been identified at **4000**. This extends 40 m on a north-east to south-west orientation and is 4 m wide. This is indicative of a ditch feature, and it is possible that this is an extension of the Bronze Age – Romano-British field system recorded across the area on a similar orientation. However, the weak nature of the anomaly makes confident interpretation difficult. It is equally likely that this anomaly is associated with construction of the adjacent boundary (first seen on 2005 satellite imagery).

4.2.2 Weak linear trends have been identified across the south-west of the site at **4001**. These are aligned north-west to south-east and are between 11 and 45 m long. The perpendicular alignment with the anomaly at **4000** suggests that these have some potential to be related to the same field system. However, these anomalies are very weak, and it is considered more likely that they are related to modern activity in the area, such as construction of the south-western boundary of the field or other landscaping activity.

4.2.3 Six small discrete positive anomalies have been identified across the area. Three of these can be seen at **4002**. These anomalies are 1.5 – 2 m in diameter and are indicative of pit features. While it is possible these represent archaeological pits,

they do not form any clear alignment or pattern, suggesting that they are more likely natural pitting in the underlying chalk bedrock.

4.2.4 In the north of the site, a strongly magnetic positive linear anomaly with associated negative responses has been identified at **4003**. This extends 32 m across the site and is indicative of a modern service.

4.2.5 There are numerous ferrous responses across the site. It is likely that the majority of these are related to the construction activity to the north.

5 Discussion

5.1 Summary

5.1.1 The detailed gradiometer survey has not identified any anomalies that can confidently be interpreted as archaeology. A possible ditch feature may represent an extension of the Bronze Age – Romano-British field system recorded across the area. However, this could equally relate to more recent activity on the site evident on satellite imagery.

5.1.2 There is no evidence for the ring ditch, or associated activity, identified by a previous geophysical survey. However, the exact location of this was not suitable for survey.

5.1.3 The survey also identified several possible pit features. Whilst these may relate to archaeological activity, they are equally likely to be natural pitting in the underlying chalk bedrock.

5.1.4 The remaining anomalies are modern in origin. These relate to a service and ferrous debris likely associated with the construction activity to the north of the site. Aerial imagery from 2003-2005 appears to show soil stockpiles on the site, although it is not clear whether the site was stripped of topsoil beforehand.

5.2 Conclusion

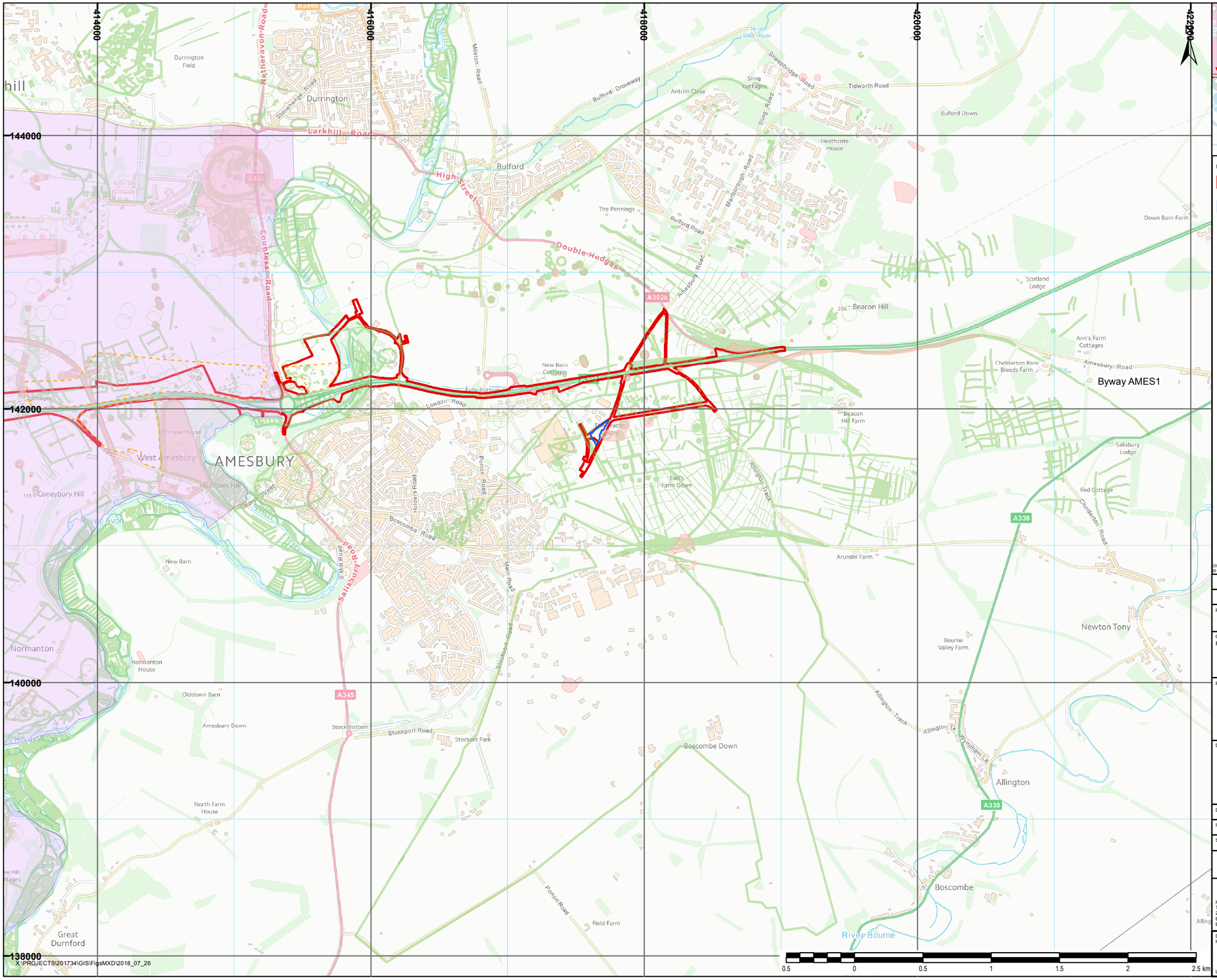
5.2.1 In conclusion, the geophysical survey has been successful in fulfilling the overarching aims for the evaluation programme. It has helped confirm the extent, or lack thereof, of archaeological features within the site and therefore the archaeological mitigation strategy for the Scheme set out in the ES.

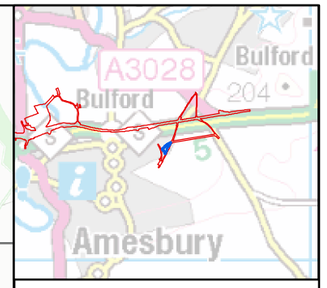
5.2.2 Although the survey was not able to identify any anomalies thought to relate to archaeological features, the success of earlier surveys in the surrounding area suggest gradiometry is an appropriate technique for the site. It is likely that, other than the possible ditch feature, no archaeological features extend within the site.

5.2.3 In summary, then, the survey evaluated in this report confirms the results of the previous survey and trenching and therefore confirms the conclusions of the Environmental Statement.

5.2.4 Based on the results of the geophysical survey and consultation with Wiltshire County Archaeology Service, it was concluded that the archaeological evaluation trenching proposed in the Site Specific Written Scheme of Investigation (SSWSI) was not required.

6 Figures





NOTES / LEGEND

- DCO boundary
- Detailed survey extent
- Previous Survey Area
- World Heritage Site
- Scheduled Monument
- Non-Designated Heritage Assets

Revision Details	By / Check	Date	Suffix

Purpose of issue

Client
Highways England

Working on behalf of
highways england

Project Title

A303 AMESBURY TO BERWICK DOWN

Drawing Title

GEOPHYSICAL SURVEY AMESBURY ROAD DIVERSION

FIGURE 1

SITE LOCATION AND DETAILED SURVEY EXTENTS

Designed	Drawn	Checked	Approved	Date
RM	TR			18/03/2019

Internal Project No.

Scale @ A3 1:25,000

Zone

Highways England
Temple Quay House
2 Temple Quay
Bristol
BS1 6PN

AmW
AECOM + mace + WSP

Drawing Number
Highways England PIN | Originator | Volume | Location | Type | Role | Number | Rev

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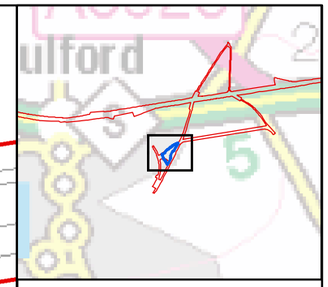
417500
417600
417700
417800
141900
141800
141700

SOLAR WAY
The Beacon
10
11
14
15
13
Ancestor House
ESS
Tumuli
Slone
Balancing Pond

N



NOTES / LEGEND

DCO boundary

Detailed survey extent

+3nT

-2nT

25 0 25 50 75 100 125 m

X:\PROJECTS\201734\GIS\FigsMXD\2018_07_26

Revision Details	By / Check	Date	Suffix

Purpose of issue

Client
Highways England

Working on behalf of
highways england

Project Title

A303 AMESBURY TO BERWICK DOWN

Drawing Title

GEOPHYSICAL SURVEY AMESBURY ROAD DIVERSION

FIGURE 2

GREYSCALE

Designed	Drawn	Checked	Approved	Date
RM	TR			18/03/2019

Internal Project No.

Scale @ A3 1:1,000

Zone

Highways England
Temple Quay House
2 Temple Quay
Bristol
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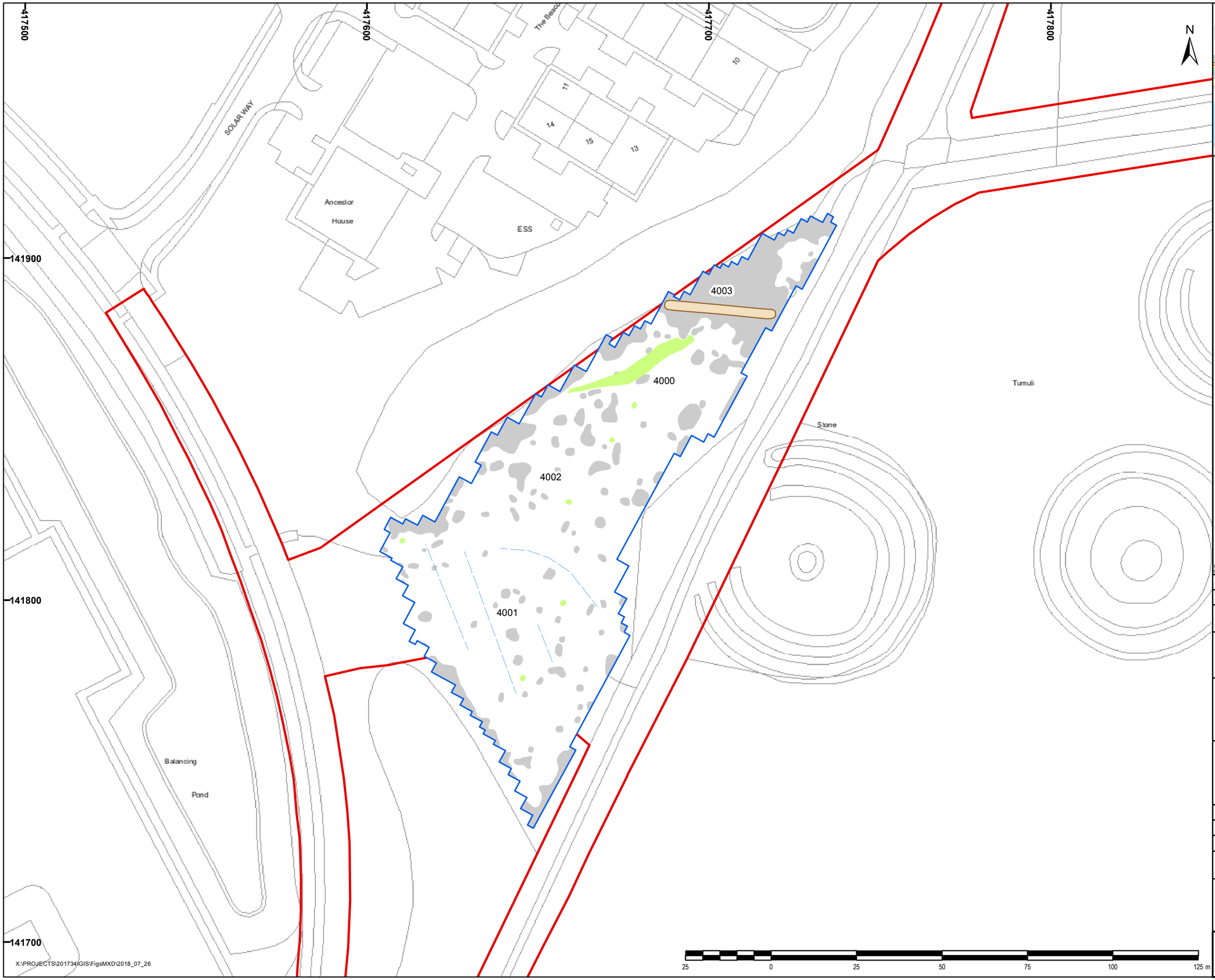
AmW
AECOM + mace + WSP

Drawing Number
Highways England PIN | Originator | Volume | Location | Type | Role | Number

Rev



NOTES / LEGEND

- DCO boundary
- Detailed survey extent
- Possible archaeology
- Modern service
- Trend
- Ferrous

Revision Details	By / Check	Date	Suffix

Purpose of issue

Client
Highways England

Working on behalf of
highways england

Project Title

A303 AMESBURY TO BERWICK DOWN

Drawing Title

GEOPHYSICAL SURVEY AMESBURY ROAD DIVERSION

FIGURE 3

INTERPRETATION

Designed	Drawn	Checked	Approved	Date
RM	TR			18/03/2019

Internal Project No.

Scale @ A3 1:1,000

Zone

Highways England
Temple Quay House
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AECOM + mace + WSP

Drawing Number
Highways England PIN | Originator | Volume | Location | Type | Role | Number

Rev

Abbreviations List

AESR	Archaeological Evaluation Strategy Report
AmW	AECOM, Mace, WSP Joint Venture
CIfA	Chartered Institute for Archaeologists
DCO	Development Consent Order
EIA	Environmental Impact Assessment
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HIA	Historic Impact Assessment
HMAG	Heritage Monitoring and Advisory Group
NGR	National Grid Reference
NHLE	National Heritage List for England
nT	Nanotesla
OS	Ordnance Survey
OWSI	Overarching Written Scheme of Investigation
RTK	Real-Time Kinematic
WCAS	Wiltshire County Archaeology Service
WHS	World Heritage Site
WSHER	Wiltshire and Swindon Historic Environment Record

References

[1] AmW, “Archaeological Evaluation Strategy Report (HE551506-AMW-EHR-SW_GN_000_Z-MS-0001),” 2018a.

[2] AmW, “An Overarching Written Scheme of Investigation (OWSI),” unpublished report ref. HE551506-AMW- EHR-SW_GN_000_Z-SP-LH-001, 2018.

[3] AmW, “WSI for Geophysical Survey and Trial Trenching: Amesbury Road Link (HE551506-AMW-EHR-Z4_GN_000_Z-SP-LH-0003),” 2018c.

[4] AC Archaeology, “The excavation of seven ring ditches and other prehistoric features at Earl's Farm Down and New Barn Down, Amesbury, Wiltshire,” AC Archaeology, 2012.

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[9] English Heritage, Geophysical Survey in Archaeological Field Evaluation. Research and Professional Service Guideline No 1, 2nd edition, 2008.

[10] Schmidt, A., Linford, P., Linford, N., David, A., Gaffney, C., Sarris, A. and Fassbinder, J., Guidelines for the use of geophysics in archaeology: questions to ask and points to consider. EAC Guidelines 2, Belgium: European Archaeological Council, 2015.

[11] Chartered Institute for Archaeologists, “Standard and guidance for archaeological geophysical survey,” Reading, 2014.

Appendices

Appendix A Gradiometer Survey: Equipment and Data Processing

A.1 Survey methods and equipment

A.1.1.1 The magnetic data for this project was largely acquired using a non-magnetic cart fitted with 4x Bartington Grad-01-1000L magnetic gradiometers. The instrument has four sensor assemblies fixed horizontally 1 m apart allowing four 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.

A.1.1.2 The gradiometers have an effective resolution of 0.03 nT over a ±100 nT range, and measurements from each sensor are logged at a rate of 10 Hz (intervals of c. 0.13 m). All the data are stored on a Leica Viva CS35 tablet controller using the data acquisition program MLGrad 601. This also collects readings streamed by a Leica GS14 GNSS receiver, which is fixed to the cart at a measured distance from the sensors.

A.1.1.3 The use of the non-magnetic cart has several advantages over the use of the Bartington Grad 601-2 fluxgate gradiometer instrument. Perhaps chief amongst these is that it has a higher sample rate resulting in higher resolution dataset. The addition of the GPS receiver also negates the need to establish a survey grid prior to the survey and therefore increases efficiency. Mounting the instrument on the cart also reduces the occurrence of operator error caused by inconsistent walking speeds and variation in traverse position due to varying ground cover and topography.

A.1.1.4 Wessex Archaeology undertakes two types of magnetic surveys: scanning and detail. When not using the handheld Bartington 601-2 dual magnetic gradiometer, both types depend upon the establishment of an accurate 20 m or 30 m 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 0.02 m in real-time and therefore exceed the level of accuracy recommended by Historic England [9] for geophysical surveys.

A.1.1.5 Scanning surveys consist of recording data at 0.25 m 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.

A.1.1.6 The detailed surveys consist of 20 m x 20 m or 30 m x 30 m grids, and data are collected at 0.25 m intervals along traverses spaced 1m apart. These strategies give 1600 or 3600 measurements per 20 m or 30 m grid respectively, and are the recommended methodologies for archaeological surveys of this type [9].

A.1.1.7 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 0.125 m intervals along traverses spaced up to 0.25 m apart, resulting in a maximum of 28800 readings per 30 m grid, exceeding that recommended by Historic England [9] for characterisation surveys.

A.2 Post-Processing

A.2.1.1 The magnetic data collected during the detailed 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 to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

A.2.1.2 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.

A.2.1.3 Typical data and image processing steps for the non-magnetic cart fitted system may include:

- Destripe – Removes striping effects caused by directional variation, drift, and operational habits. This is achieved by determining the median of each transect and subtracting that value from each data point.
- Discard Overlap – Eliminates portions of the tracks that have been collected too close one another. Without this, the results of the interpolation process can be distorted as very close points with potentially differing values.
- Interpolation – Sets the X and Y interval of the data and the track radius around each data point that is included in the interpolated result.

A.2.1.4 Typical displays of the data used during processing and analysis:

- Greyscale – Presents the data in plan 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.
- 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 and can be provided upon request.

Appendix B Geophysical interpretation

B.1.1.1 The interpretation methodology used by Wessex Archaeology separates the anomalies into four main categories: archaeological, modern, agricultural, and uncertain origin/geological.

B.1.1.2 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.
- Possible archaeology – used for features which give a response, but which form no discernible pattern or trend.

B.1.1.3 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.
- Coherent ferrous – used for anomalies caused by ferrous material that can be directly linked to a specific or known 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.

B.1.1.4 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.
- 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.

B.1.1.5 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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