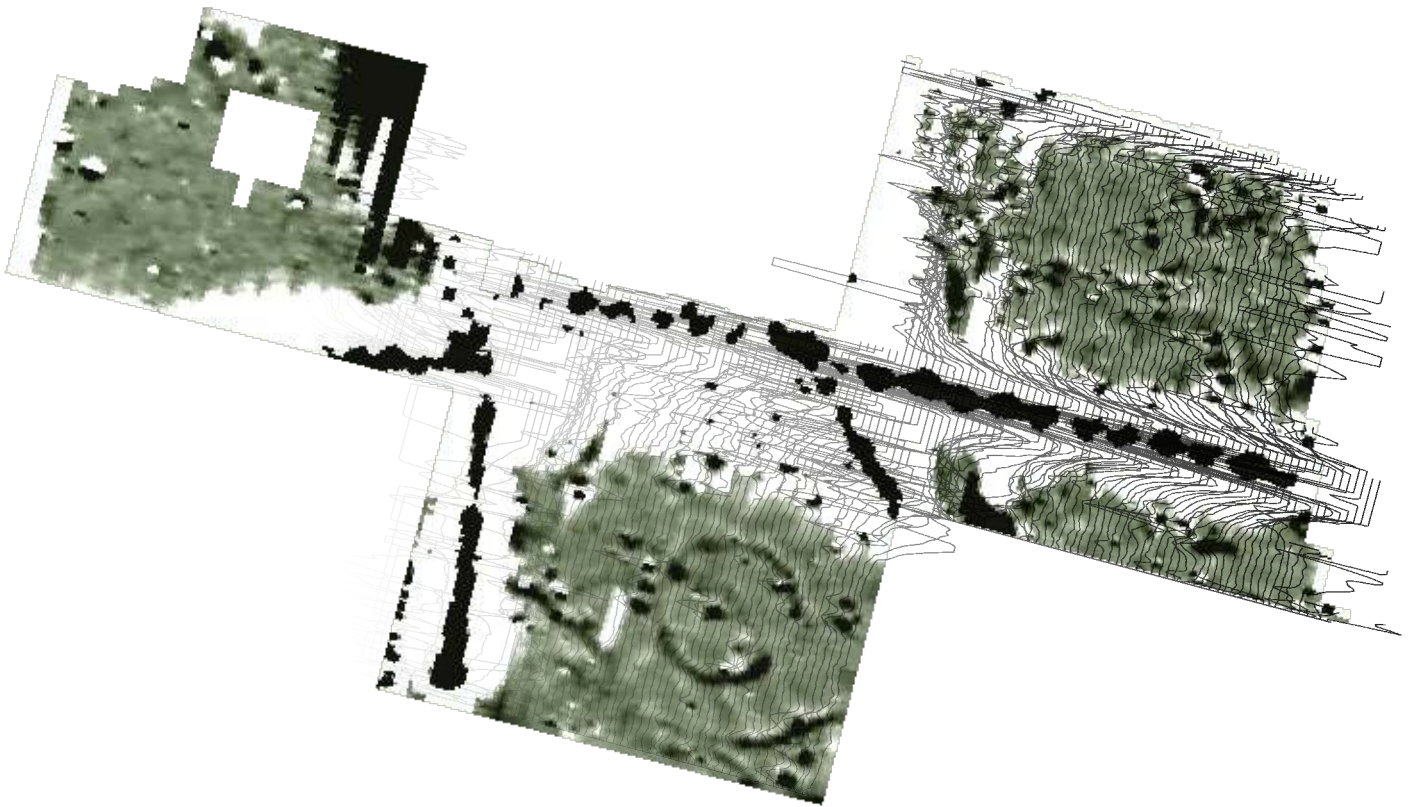




Land at Grimstone Reservoir Stratton, Dorset

Detailed Gradiometer Survey Report





**LAND AT GRIMSTONE RESERVOIR
STRATTON
DORSET**

Detailed Gradiometer Survey Report

Prepared for:

Wessex Water
Claverton Down Road
Claverton Down
BATH
BA2 7WW

By:

WA Heritage
Wessex Archaeology
Portway House
Old Sarum Park
Salisbury
SP4 6EB

Ref: 68501.01

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LAND AT GRIMSTONE RESERVOIR

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LAND AT GRIMSTONE RESERVOIR**STRATTON, DORSET****Detailed Gradiometer Survey Report****Summary**

WA Heritage was commissioned by Wessex Water to conduct detailed geophysical survey on land adjacent to Grimstone reservoir, near Stratton, Dorset, ahead of a proposed development. The Site is situated some 3km north of Stratton and is centred on NGR 364600 095315. The optioned development areas for the Site comprise approximately 0.4ha, although in total, 0.8ha was surveyed in a single block to put these areas into a wider context.

Wessex Water are proposing to construct an additional reservoir adjacent to the existing facility. Following consultations with Dorset County Council and English Heritage, it was agreed that three sites should be further investigated via geophysical survey to inform of their potential to contain archaeological remains

Geophysical survey has been successful in identifying a number of anomalies of probable archaeological provenance. The most significant of these is a sub-annular anomaly some 19m in diameter, which is likely to represent the remains of a round barrow.

Elsewhere, several linear and numerous discrete anomalies of probable archaeological significance have been identified. A number of weaker trends may be of archaeological interest, although their interpretation is limited by the extent of magnetic disturbance resulting from the construction of the existing reservoir and associated services.

LAND AT GRIMSTONE RESERVOIR**STRATTON, DORSET****Detailed Gradiometer Survey Report****Acknowledgements**

The detailed gradiometer survey was commissioned by Wessex Water. The fieldwork was directed by Ben Urmston, assisted by Rob Fry. Ben Urmston processed and interpreted the geophysical data and compiled this report. The geophysical survey was managed and quality controlled by Paul Baggaley. Illustrations were prepared by Ken Lyden. The project was managed on behalf of Wessex Archaeology by Rob Armour Chelu.

LAND AT GRIMSTONE RESERVOIR**STRATTON, DORSET****Detailed Gradiometer Survey Report****1 INTRODUCTION****1.1 Project background**

1.1.1 WA Heritage was commissioned by Wessex Water to conduct geophysical survey on land adjacent to the Grimstone reservoir, near Stratton, Dorset, ahead of proposed development. The Site is situated some 3km north of Stratton and is centred on NGR 364600 095315.

1.1.2 Wessex Water are proposing to construct an additional reservoir adjacent to the existing facility. Following consultations with Dorset County Council and English Heritage, it was agreed that three sites should be further investigated via geophysical survey to inform of their potential to contain archaeological remains.

1.1.3 The aim of the project was to conduct a geophysical survey to establish the presence/absence, extent, character and date of archaeological remains at the Site.

1.1.4 This report presents a brief description of the methodology followed, the detailed survey results and the archaeological interpretation of the geophysical data.

1.2 Archaeological and historical background

1.2.1 The Site lies in an area of high archaeological potential, adjacent to Grimstone Down Scheduled Monument, which comprises Iron Age and Romano-British settlement remains and four Bronze Age round barrows. Further round barrows lie to the south, east and north of the Site, all also protected as Scheduled Monuments.

1.3 Survey areas

1.3.1 The three optioned development areas for the Site comprise approximately 0.4ha, although in total, 0.8ha was surveyed in a single block to put these areas into a wider context.

1.3.2 Grimstone reservoir is located near the summit of a low plateau, at an elevation of 170m above Ordnance Datum (aOD), overlooking the valley of the River Frome to the south-west. The survey area was relatively flat topographically, with the adjacent land sloping gently downwards from north to south, and declining more steeply to the west. The site was under young crop and stubble at the time of survey.

- 1.3.3 The superficial drift geology underlying the Site largely comprises the brown rendzinas of the 343h Andover 1 association, and the typical brown alluvial soils of the 561d Lugwardine association (SSEW 1983). Such soils are likely to produce a magnetic contrast suitable for identification of archaeological remains through survey with the Bartington Grad 601-2 gradiometer.

2 METHODOLOGY

2.1 Introduction

- 2.1.1 The methodology employed for the Site comprised detailed gradiometer survey using a Bartington Grad 601-2 dual gradiometer system in accordance with English Heritage Guidelines for Geophysical Surveys (1995).

2.2 Detailed survey

- 2.2.1 The detailed survey was conducted by WA staff in accordance with English Heritage Guidelines and was undertaken on the 13th March 2008. Survey grids were established at 20m x 20m using a Leica 1200 RTK GPS system, which is able to provide locations in real-time, accurate to within 2cm, and therefore exceeds English Heritage recommendations (1995) for geophysical surveys.
- 2.2.2 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix I**.

3 RESULTS AND INTERPRETATION

3.1 Introduction

- 3.1.1 The detailed gradiometer survey was successful in revealing anomalies of anthropogenic origin and the results are presented as greyscale and XY trace plots (**Figure 2**). The greyscale has been plotted at -2nT (white) to +3nT (black) and the XY trace at $\pm 30\text{nT}$ at 30nT per cm at 1:1000.
- 3.1.2 The interpretation of the dataset highlights the presence of potential archaeological anomalies, trends, ferrous/burnt or fired objects and areas of general increased magnetic response (**Figure 3**). Full definitions of these terms are provided in **Appendix II**.
- 3.1.3 Numerous small-scale ferrous anomalies are visible throughout the detailed survey dataset. These are presumed to be modern in provenance and are not referred to in the interpretation, unless considered relevant to the archaeological interpretation.
- 3.1.4 Geotechnical work was being conducted on the existing reservoir at the time of survey. Two portable site offices and several vehicles were parked to the west of the reservoir, and the magnetic response from these has adversely affected a small portion of the data towards the western extent of the survey.

3.2 Detailed survey results and interpretation

- 3.2.1 A sub-annular anomaly **4001**, approximately 19m in diameter, is located towards the southern extent of the survey area. The response is broken to the east and west, and strong anomalies appear at the apparent termini of the ditch anomalies and at the approximate centre of the anomaly complex. Whilst it is possible that this anomaly represents a *hengiform* (a small henge-like feature), it is likely that this complex of anomalies represents the remains of a barrow, given the close proximity of other barrows of similar dimensions.
- 3.2.2 Linear and sub-linear anomalies are apparent to the south and west of **4001**, along with a number of smaller amorphous responses; there is no clear relationship between **4001** and these other anomalies, however.
- 3.2.3 Numbers of sub-linear and discrete anomalies appear towards the north-eastern extent of the survey area. There is no obvious coherence in their distribution, although it is probable that these responses are of archaeological origin. It is interesting to note that the linear earthworks recorded to the north do not correspond with clear geophysical anomalies in this dataset.
- 3.2.4 Weak linear and sub-linear trends appear throughout the dataset, and it is possible that some of these may be of archaeological significance. Further interpretation is hampered by the extent of the magnetic disturbance within the survey area, however.
- 3.2.5 Strong ferrous-type responses dominate the data around the existing reservoir, which are likely to be associated with its construction. Several modern services **4002** are evident within the data, and are coincident with known water mains.

4 CONCLUSION & RECOMMENDATIONS

4.1 Conclusion

- 4.1.1 Geophysical survey has been successful in identifying many anomalies of probable archaeological provenance. The most significant of these is a sub-annular anomaly some 19m in diameter, which is likely to represent the remains of a tumulus.
- 4.1.2 Elsewhere, several linear and numerous discrete anomalies are of probable archaeological significance. A profusion of weaker trends may be of archaeological interest, although their interpretation is limited by the extent of magnetic disturbance resulting from the construction of the existing reservoir and associated services.

4.2 Recommendations

- 4.2.1 Based upon the results of the geophysical survey and given the proximity of a number of Scheduled Monuments and previous consultations with English heritage, it is recommended that further formal consultation with both EH and the archaeological advisor to Dorset County Council is undertaken in

order to agree a strategy for further archaeological investigation across the Site.

5 REFERENCES

English Heritage, 1995. *Geophysical survey in archaeological field evaluation*. Research and Professional Service Guideline No 1.

Soil Survey of England and Wales, 1983. *Soils of South West England: Sheet 5*. Ordnance Survey, Southampton

6 APPENDIX I: 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 a resolution of 0.1nT over a ± 3000 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.

WA undertakes two types of magnetic surveys: scanning and detail. Both types depend upon the establishment of an accurate 20m site grid, which is achieved using a Leica 1200 RTK GPS system and then extended using tapes. The Leica 1200 RTK GPS system receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined to an accuracy of 1-2cm in real-time and therefore exceed the level of accuracy recommended by English Heritage (1995) 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 detail surveys consist of 20m x 20m grids, and data are collected at 0.25m intervals along traverses spaced 1m apart. This gives 1600 measurements per grid and is the recommended methodology for archaeological surveys of this type (English Heritage, 1995).

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 forward or backward by a number of readings. This corrects for operator errors and is used to enhance linear features;
- Clipping – Limiting the displayed range of the processed data to either $\pm 3nT$ or $\pm 3s.d.$ in order to enhance the appearance of smaller anomalies.
- Despike – Filtering any data points that exceed the mean by a specified amount to reduce the appearance of dominant anomalous readings caused by modern, small ferrous objects at the surface

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 image can include a hidden line algorithm to remove certain lines and enhance the image. This type of image is useful as it shows the full range and shape 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.

7 APPENDIX II: GEOPHYSICAL INTERPRETATION

The interpretation methodology used by WA separates the anomalies into two main categories: archaeological and unidentified responses.

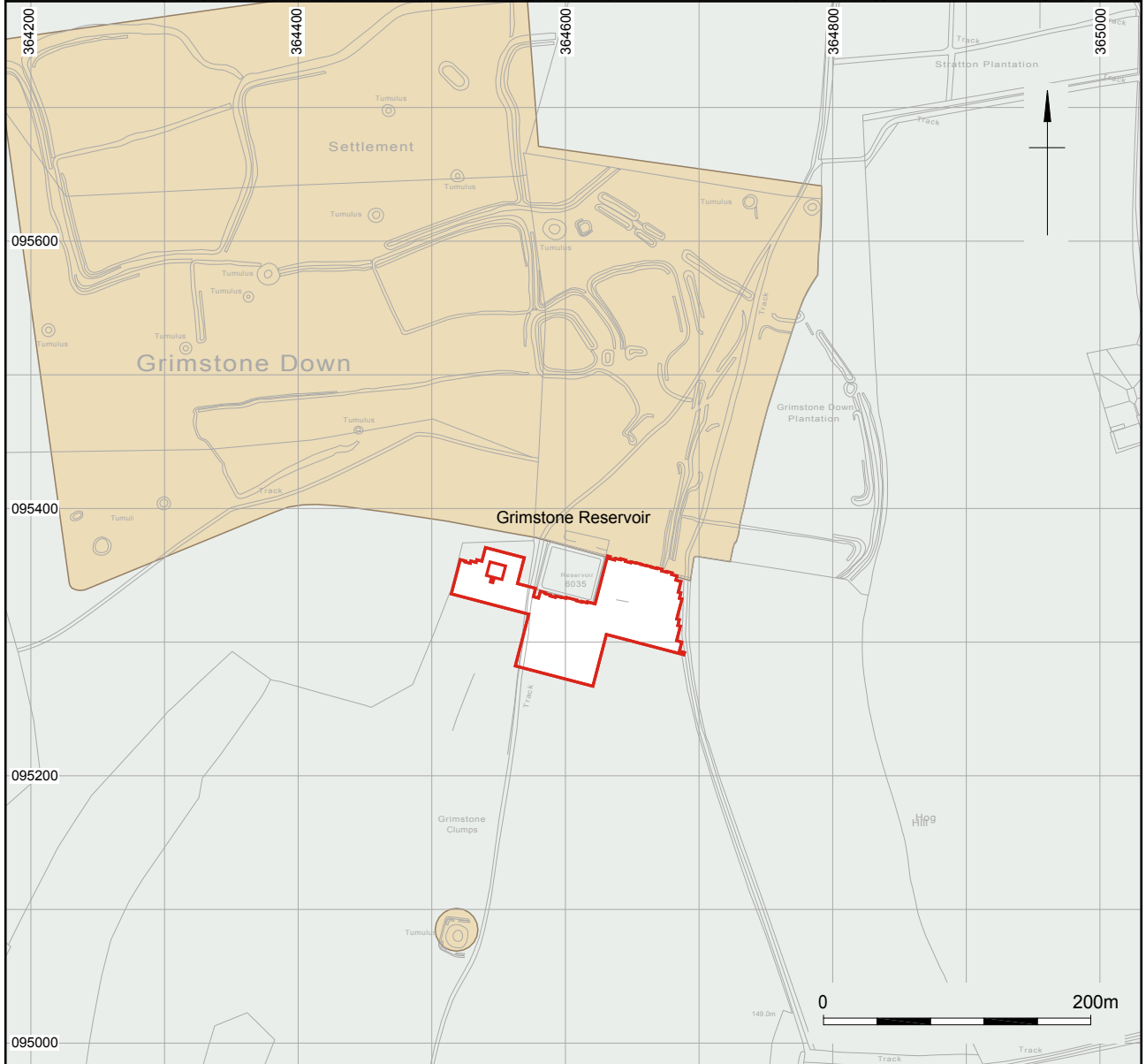
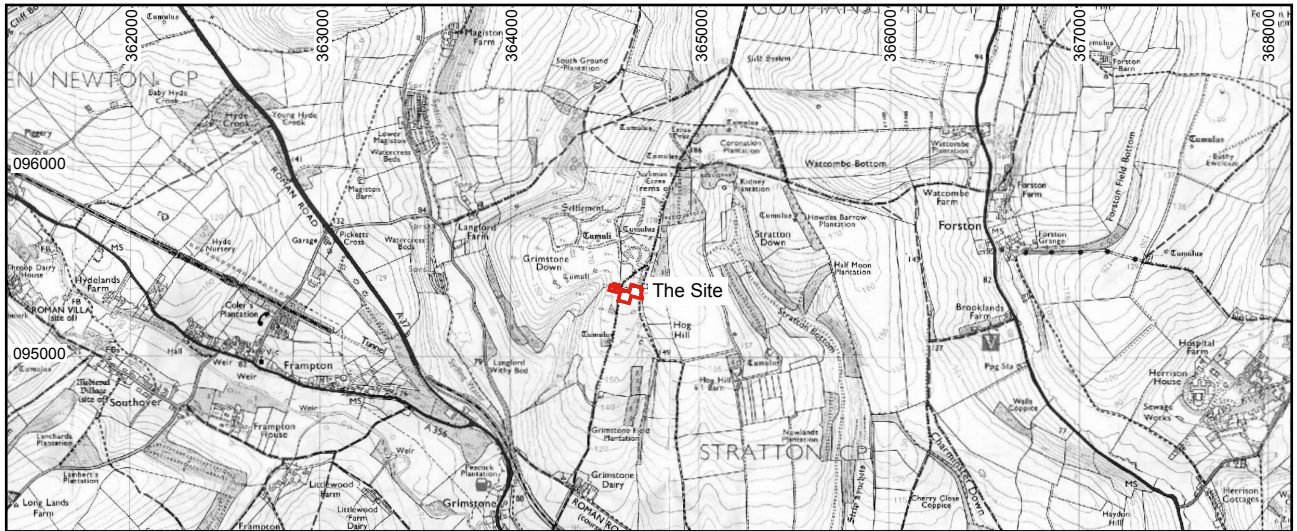
The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further sub-divided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

The unidentified 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:

- Possible archaeology – used for features which give a response but which form no discernable pattern or trend.
- 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.
- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.

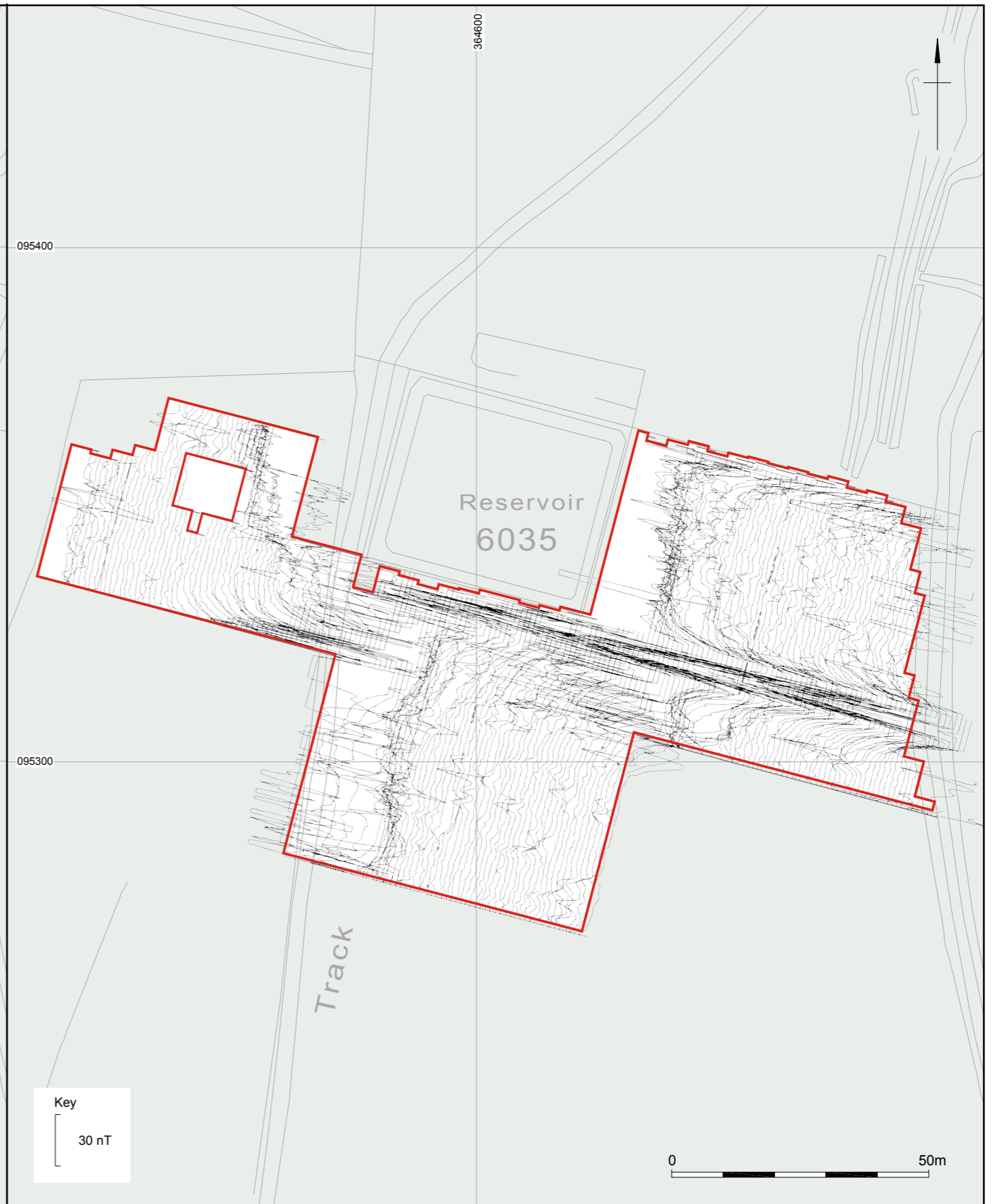
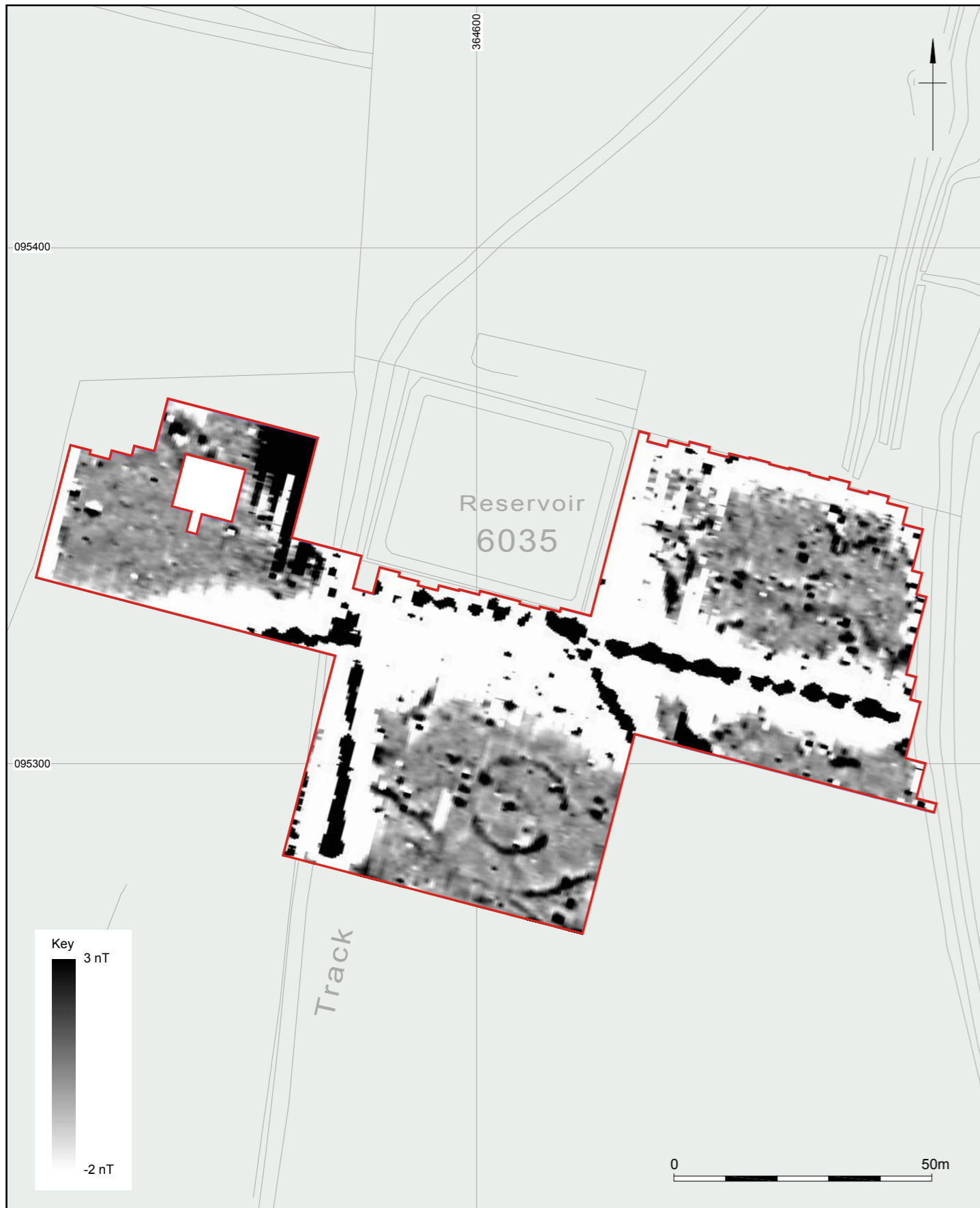
Finally, services such as water pipes are marked where they have been identified.



 Detailed survey area  Scheduled Monument	Reproduced from the 1998 Ordnance Survey 1:25000 Explorer® map with the permission of the controller of Her Majesty's Stationery Office © Crown copyright, Wessex Archaeology, Portway House, Old Sarum Park, Salisbury, Wiltshire. SP4 6EB. Licence Number: 100028190. Digital mapping reproduced from Client data. This material is for client report only © Wessex Archaeology. No unauthorised reproduction.			
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Site location and extents of detailed survey

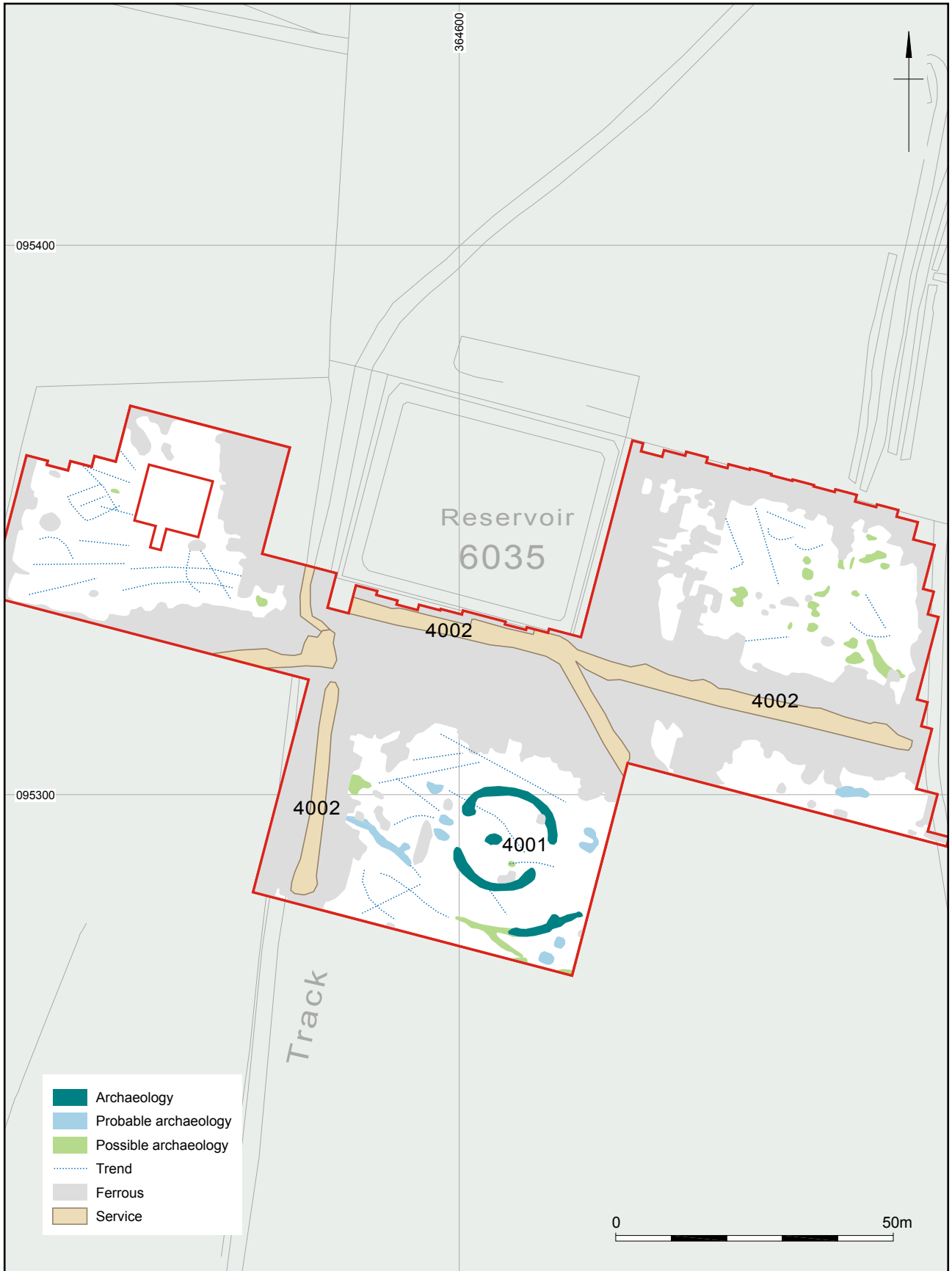
Figure 1



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Grayscale and XY trace plots

Figure 2



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Plate 1: Grimstone Reservoir looking west



Plate 2: General site conditions



Plate 3: Grimstone Reservoir looking northeast

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WESSEX ARCHAEOLOGY LIMITED.

Registered Head Office: Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB.

Tel: 01722 326867 Fax: 01722 337562 info@wessexarch.co.uk www.wessexarch.co.uk

London Office: Unit 113, The Chandlery, 50 Westminster Bridge Road, London SE1 7QY.

Tel: 020 7953 7494 Fax: 020 7953 7499 london-info@wessexarch.co.uk www.wessexarch.co.uk

