ARCHAEOLOGICAL
SERVICES
DURHAM UNIVERSITY

on behalf of

Professor Chris Scarre
Durham University

Broadsands chambered tomb
Paignton
Devon

geophysical and borehole surveys

report 3031
January 2013

Durham
University

Contents

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1. Summary

The project

1.1 This report presents the results of geophysical and borehole surveys conducted as part of a research project at a chambered tomb at Broadsands, Paignton, Devon. The works comprised detailed geomagnetic and earth electrical resistance survey of areas to the north and south of the tomb and 23 hand-augered boreholes.

1.2 The works were commissioned by Professor Chris Scarre of the Department of Archaeology, Durham University, and conducted by Archaeological Services Durham University.

Results

1.3 A possible ditch has been identified in the geomagnetic survey around the southern side of the tomb. The surveys and augering have not detected any evidence for a stone cairn or artificial platform associated with the tomb.

1.4 Many of the geophysical anomalies detected are considered likely to reflect varying depths of soil and bedrock, and former quarrying activities to both the north and south of the tomb.

1.5 Two courses of a former track have been identified in the northern field, heading to the limekiln and former quarry there. An existing track has also been identified in both fields.

1.6 The borehole profiles, combined with the geophysical anomalies, suggest that the tomb was constructed on a rock terrace, with subsequent hillwash giving rise to deeper soils to both the north and south of the monument.

1.7 The bedrock terrace is likely to be a natural feature, though it could have been modified in the past. The homogenous sediment stratigraphy at the site has prevented the interpretation of possible anthropogenic landscaping

2. Project background

Location (Figures 1 & 2)

2.1 The study area comprised land surrounding a chambered tomb at Broadsands, Paignton, Devon (NGR centre: SX 8929 5732). Approximately 1.5ha of geomagnetic survey and 1.1ha of earth electrical resistance survey were conducted to the north and south of the tomb. Three transects of six boreholes to the north and one transect of five boreholes to the south of the tomb were also undertaken.

Objectives

2.2 The principal aims of the surveys were to detect and map any sub-surface features of potential archaeological significance within 60-70m of the tomb and to establish the nature and depth of the sedimentary sequence in the vicinity of the tomb, in order to broaden the understanding of the monument and to inform any further research, heritage management and conservation issues at the site.

Methods statement

2.3 The surveys have been undertaken in accordance with a methods statement provided by Archaeological Services Durham University (ref. DH11.446).

2.4 Since the study area included a Scheduled Monument the geophysical surveys and palaeoenvironmental borehole surveys were undertaken in accordance with full Scheduled Monument Consent granted by English Heritage under the Ancient Monuments and Areas Act 1979 (as amended by the National Heritage Act 1983).

Dates

2.5 Fieldwork was undertaken between 15th and 17th October 2012. This report was prepared for 7th January 2013.

Personnel

2.6 The geophysical surveys were undertaken by Nathan Thomas and Richie Villis (Supervisor). The borehole survey was undertaken by Lorne Elliott assisted by Kate Sharpe. The geophysical data were processed by Richie Villis. This report was prepared by Richie Villis, Lorne Elliott and Duncan Hale (the Project Manager), with illustrations by David Graham.

Archive/OASIS

2.7 The site code is **DPB12**, for **D**evon **P**aignton **B**roadsands 20**12**. The survey archive will be supplied on CD to Professor Chris Scarre for deposition with the project archive in due course. Archaeological Services Durham University is registered with the **O**nline **A**cces**S** to the **I**ndex of archaeological investigation**S** project (**OASIS**). The OASIS ID number for this project is **archaeol3-137631**.

3. Historical and archaeological background

3.1 Excavation of the site in the 1950s found three primary burials and one secondary burial, all associated with Neolithic pottery (Ralegh Radford 1958). The excavation also determined that the passage and tomb were originally within a circular mound of approximately 12m in diameter, which was subsequently reduced to a mound of approximately 7m by 9m. The monument is believed to have been disturbed as early as the medieval period.

3.2 More recently radiocarbon age determination of human and animal bone has demonstrated funeral activity at the site from the early 4th millennium BC (Sheridan, Schulting, Quinnell & Taylor 2008). These dated samples may relate to pre-monument activity at the site rather than the tomb itself. Fragments of carinated bowls found in the cairn may also relate to an earlier phase of activity.

4. Landuse, topography and geology

4.1 At the time of survey the study area comprised two fields of ungrazed pasture. It was not possible to collect data in the north-east part of Area 2 due to former quarry works.

4.2 The study area occupied a south-facing slope, with gentle undulations and former quarry works. Elevations ranged from approximately 40mOD in the north of Area 2 to approximately 25m OD in the south of Area 1.

4.3 The underlying solid geology of the area comprises late Devonian interbedded strata of mudstones and limestone of the Saltern Cove Formation in Area 1 and mid to late Devonian strata of the Brixham Limestone Formation in Area 2, both of which are overlain by a reddish-brown clayey silt topsoil.

5. Geophysical survey

Standards

5.1 The surveys and reporting were conducted in accordance with English Heritage guidelines, *Geophysical survey in archaeological field evaluation* (David, Linford & Linford 2008); the Institute for Archaeologists (IfA) *Standard and Guidance for archaeological geophysical survey* (2011); the IfA Technical Paper No.6, *The use of geophysical techniques in archaeological evaluations* (Gaffney, Gater & Ovenden 2002); and the Archaeology Data Service *Guide to Good Practice: Geophysical Data in Archaeology* (Schmidt & Ernenwein 2011).

Technique selection

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

5.3 In this instance, based on previous work, it was considered likely that cut features such as ditches and pits would be present on the site, and that other types of feature such as trackways, wall foundations and fired structures (for example kilns and hearths) might also be present.

5.4 Given the anticipated shallowness of targets and the non-igneous geological environment of the study area a geomagnetic technique, fluxgate gradiometry, was considered appropriate for detecting the types of feature mentioned above. This technique involves the use of hand-held magnetometers to detect and record anomalies in the vertical component of the Earth's magnetic field caused by variations in soil magnetic susceptibility or permanent magnetisation; such anomalies can reflect archaeological features.

5.5 Given the likely presence of stone-built features around the tomb itself an electrical resistance survey was also considered appropriate. Earth electrical resistance survey can be particularly useful for mapping stone and brick features. When a small electrical current is injected through the earth it encounters resistance which can be measured. Since resistance is linked to moisture content and porosity, stone and brick features will give relatively high resistance values while soil-filled features, which retain more moisture, will provide relatively low resistance values.

Field methods

5.6 A 20m grid was established across each survey area and related to known, mapped Ordnance Survey points and the National Grid using a Leica GS15 global navigation satellite system (GNSS) with real-time kinematic (RTK) corrections typically providing 10mm accuracy.

5.7 Area 1 (0.75ha mag; 0.62ha res) was surveyed to the south of the tomb. Area 2 (0.71ha mag; 0.52ha res) was surveyed to the north of the tomb (Figure 2).

5.8 Measurements of vertical geomagnetic field gradient were determined using Bartington Grad601-2 dual fluxgate gradiometers. A zig-zag traverse scheme was employed and data were logged in 20m grid units. The instrument sensitivity was nominally 0.03nT, the sample interval was 0.25m and the traverse interval was 1m, thus providing 1,600 sample measurements per 20m grid unit.

5.9 Measurements of earth electrical resistance were determined using Geoscan RM15D Advanced resistance meters and MPX15 multiplexers with a mobile twin probe separation of 0.5m. A zig-zag traverse scheme was employed and data were logged in 20m grid units. The instrument sensitivity was 0.1ohm, the sample interval was 1m and the traverse interval was 1m, thus providing 400 sample measurements per 20m grid unit.

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

Data processing

5.11 Geoplot v.3 software was used to process the geophysical data and to produce both continuous tone greyscale images and trace plots of the raw (minimally processed) data. The greyscale images and interpretations are presented in Figures 3-7; the trace plots are provided in Figure 9. In the greyscale images, positive magnetic and high resistance anomalies are displayed as dark grey while negative magnetic and low resistance anomalies are displayed as light grey. Palette bars relate the greyscale intensities to anomaly values in nanoTesla/ohm.

5.12 The following basic processing functions have been applied to the geomagnetic data:

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

5.13 The following basic processing functions have been applied to the resistance data:

add	adds or subtracts a positive or negative constant value to defined blocks of data; used to reduce discontinuity at grid edges
despike	locates and suppresses spikes in data due to poor contact resistance
interpolate	increases the number of data points in a survey to match sample and traverse intervals; in this instance the data have been interpolated to 0.25m x 0.25m intervals

Interpretation: anomaly types

5.14 Colour-coded geophysical interpretation plans are provided. Three types of geomagnetic anomaly have been distinguished in the data:

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

5.15 Two types of resistance anomaly have been distinguished in the data:

high resistance	regions of anomalously high resistance, which may reflect foundations, tracks, paths and other concentrations of stone or brick rubble

low resistance regions of anomalously low resistance, which may be associated with soil-filled features such as pits and ditches

Interpretation: features

General comments

5.16 A colour-coded archaeological interpretation plan is provided.

5.17 Small, discrete dipolar magnetic anomalies have been detected in both survey areas. These almost certainly reflect items of near-surface ferrous and/or fired debris, such as horseshoes and brick fragments, and in most cases have little or no archaeological significance. A sample of these is shown on the geophysical interpretation plan, however, they have been omitted from the archaeological interpretation plan and the following discussion.

5.18 A number of possible soil-filled features have been detected, some of which could be archaeological in origin. Since the soils are typically quite shallow, with near-surface bedrock in many areas, it is likely that some of the geomagnetic variation across the area simply reflects greater or lesser depths of soil, which typically has a higher magnetic susceptibility than the limestone bedrock.

Area 1

5.19 A weak, short, curvilinear positive magnetic anomaly has been detected near the north-central edge of the survey area, just south-east of the tomb. This type of anomaly typically reflects a soil-filled feature, which in this case could possibly be the remains of a ditch around the tomb. The electrical resistance data are uniformly low in this area, probably due to the amount of rainwater retained in the soil, consequently it has not been possible to identify a corresponding ditch anomaly in the resistance data.

5.20 Several broad and diffuse positive magnetic anomalies have been detected across this area. These may reflect either anthropogenic or geomorphological features, such as greater depths of soil over the rockhead. Low earth resistance values broadly correspond to these locations. The closest borehole (T1S 15m) also confirms a greater depth to bedrock here than elsewhere in Area 1.

5.21 A large concentration of small, intense dipolar magnetic anomalies has been detected in the south-east quarter of this area. This corresponds to a region of anomalously high resistance data and a scooped hollow on the ground. Boreholes in this region (T1S 25m, 35m and 45m) record a shallow depth to bedrock (between 0.2-0.5m). This scoop and the geophysical anomalies are almost certainly the result of quarrying here, probably short-lived as it is not shown on any OS editions.

5.22 A narrow north-east/south-west aligned band of positive and negative magnetic anomalies detected across the west of this field corresponds to a narrow curvilinear resistance anomaly and an existing track through the field. The various anomalies along the course of the track are caused by a combination of wheel ruts, hardcore and standing water. The track continues north-eastwards into Area 2.

5.23 The large and strong dipolar magnetic anomaly detected in the north-west of the area reflects an adjacent farm building.

5.24 Small patches of high and low electrical resistance near a field entrance in the north-west corner of the area reflect both hardcore and an adjacent waterlogged patch of ground respectively.

Area 2

5.25 A large number of dipolar magnetic anomalies have been detected in the central and eastern parts of this area. These anomalies broadly correspond to regions of high earth resistance and topographic features on the ground. Boreholes in this region have recorded shallow depths to bedrock. It is considered likely that these anomalies and the topographic features are related to known former quarry workings in this area.

5.26 Two sets of strong curvilinear magnetic anomalies have been detected in the eastern half of the area. In each case a negative magnetic anomaly is flanked by positive magnetic anomalies. These anomalies typically reflect tracks with associated drainage ditches to either side. Both features are evident on the ground as slight topographic ridges traversing up the slope. Two former courses of the western track have been identified, both of which are shown on the first edition Ordnance Survey (1865) leading to the limekiln adjacent to the former quarry. The eastern track is a continuation of that which crosses Area 1 to the south.

5.27 With the exception of the post-medieval features mentioned above, no probable archaeological features have been identified in this area.

6. Palaeoenvironmental borehole survey

Field methods

6.1 A total of 23 boreholes were undertaken using an open-chambered, narrow gouge hand auger. The survey comprised three transects of six boreholes to the north, and one transect of five boreholes to the south of the tomb, aligned approximately north/south (Figure 2).

6.2 The boreholes were placed at 5m intervals to the north of the tomb and at 10m intervals to the south. The borehole locations and elevations were recorded using a Leica GS15 global navigation satellite system (GNSS) with real-time kinematic (RTK) correction typically providing accuracy of approximately 10mm in horizontal plane and 15mm in elevation.

6.3 Boreholes were labelled according to the transect number and their distance north or south of the hedgerow incorporating the tomb. Transect 1 is the central transect which continues north and south of the tomb, whilst Transect 2 (eastern) and Transect 3 (western) are confined to the north of the tomb. Borehole T1S4 was offset by 1m to avoid an existing track.

6.4 The stratigraphy within the boreholes is described in the results below and presented in Figure 8 and Appendix 1. Due to the homogenous nature of the stratigraphy only Transect 1 is shown in Figure 8, in order to provide a profile of the elevation and depth of the boreholes. Classification and descriptions of sediment follow the modified Troels-Smith system (Kershaw 1997).

Results

6.5 The boreholes ranged from 0.18m to 1.36m in depth, with the shallowest depths occurring at the northern and southern limits of the survey, as shown in the profile of Transect 1 (Figure 8). These shallow depths to bedrock correspond to the large areas of high earth electrical resistance shown in Figure 4.

6.6 Ralegh Radford (1958) suggested the site lies on the limestone bedrock hidden beneath hill-slope soil wash from the hillock to the north. The stratigraphy of the site proved to be homogenous in nature and essentially comprised a single unit of sticky reddish-brown clayey silt, as also recorded by Ralegh Radford (*ibid*.), who stated the old surface soil is indistinguishable from the modern accumulations of soil. This has been confirmed by the present investigations. No former soil horizon or ground surface was identified in any of the boreholes, however, depth to the weathered top of the bedrock was established in most cases; this comprised tiny flakes of shale and small fragments of limestone throughout the lower levels of the boreholes.

6.7 The depth of soil immediately outside the tomb area on both sides appears to be greater than elsewhere, as noted by Ralegh Radford, who also suggested that there was extensive disturbance subsequent to the tomb's period of use.

6.8 The profile recorded along Transect 1 does indicate that the tomb is sited on a slight rock terrace, probably natural but possibly modified.

7. Conclusions

7.1 A scheme of works comprising geomagnetic survey, earth electrical resistance survey and augering was undertaken at Broadsands chambered tomb, Paignton, Devon, as part of ongoing research at the site.

7.2 A possible ditch has been identified in the geomagnetic survey around the southern side of the tomb. The surveys and augering have not detected any evidence for a stone cairn or artificial platform associated with the tomb.

7.3 Many of the geophysical anomalies detected are considered likely to reflect varying depths of soil and bedrock, and former quarrying activities to both the north and south of the tomb.

7.4 Two courses of a former track have been identified in the northern field, heading to the limekiln and former quarry there. An existing track has been identified crossing both fields.

7.5 The borehole profiles, combined with the geophysical anomalies, suggest that the tomb was constructed on a rock terrace, with subsequent hillwash giving rise to deeper soils to both the north and south of the monument.

7.6 The bedrock terrace is likely to be a natural feature, though it could have been modified in the past. The homogenous sediment stratigraphy at the site has prevented the interpretation of possible anthropogenic landscaping.

8. Sources

David, A, Linford, N, & Linford, P, 2008 *Geophysical Survey in Archaeological Field Evaluation*. English Heritage

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

IfA 2011 *Standard and Guidance for archaeological geophysical survey*. Institute for Archaeologists

Kershaw, AP, 1997 A modification of the Troels-Smith system of sediment description and portrayal. *Quat Australasia* **15/2**, 63-68

Ralegh Radford, CA, 1958 The chambered tomb at Broadsands, Paignton. *Proc Devon Archaeol Explor Soc* **5**, 147-167

Schmidt, A, & Ernenwein, E, 2011 *Guide to Good Practice: Geophysical Data in Archaeology*. Archaeology Data Service

Sheridan, A, Schulting, R, Quinnell, H, & Taylor, R, 2008 Revisiting a small passage tomb at Broadsands, Devon. *Proc Devon Archaeol Soc* **66**, 1-26

Appendix 1: Borehole logs

Borehole T1N30 (central transect – north)

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Fragments of shale below 35.835 (Stopped on gravel at base)	35.955	35.615

Borehole T1N25

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Fragments of shale below 34.852	34.982	34.672

Borehole T1N20

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Fragments of shale below 33.987	34.157	33.757

Borehole T1N15

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Fragments of shale below 33.245	33.485	32.785

Borehole T1N10

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Fragments of shale below 32.602	33.022	31.992

Borehole T1N5

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Small stones (grit) below 32.170	32.680	31.480

Borehole T1S4 (central transect – south)

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Impenetrable at 31.007	31.257	31.007

Borehole T1S15

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Small stones below 30.329	30.599	29.559
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag2, As2, nig1, strf0, sicc3, lim1, elas0, (softness-1) Gmaj+ (more clay-like)	29.559	29.269

Borehole T1S25

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Bedrock at 29.778	30.028	29.778

Borehole T1S35

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Fragments of shale below 29.048	29.168	28.968
Reddish brown gravelly silt (Munsell 5YR 4/4) sticky Gmaj3, Ag1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gravelly at base	28.968	28.958

Borehole T1S45

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Small stones below 27.312	27.582	27.122

Borehole T2N30 (eastern transect)

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Fragments of shale below 36.766. Bedrock at 36.756	36.956	36.756

Borehole T2N25

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Bedrock at 35.835	35.989	35.809

Borehole T2N20

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Bedrock at 34.736	34.886	34.736

Borehole T2N15

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Bedrock at 33.757	33.957	33.757

Borehole T2N10

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Fragments of shale below 33.139	33.259	32.599

Borehole T2N5

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Small stones below 32.317	32.717	32.317
Reddish brown gravelly silt (Munsell 5YR 4/4) sticky Gmaj3, Ag1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gravelly at base	32.317	32.287

Borehole T3N30 (western transect)

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Small stones below 34.815. Bedrock at base	34.955	34.675

Borehole T3N25

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Small stones below 34.082. Bedrock at base	34.302	33.832

Borehole T3N20

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Small stones below 33.600. Bedrock at base	33.770	33.150

Borehole T3N15

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Small stones below 33.039. Bedrock at base	33.349	32.419

Borehole T3N10

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Small stones below 32.623. Bedrock at base	32.913	32.063

Borehole T3N5

Description	Height (m OD)	
	Top	Base
Reddish brown clayey silt (Munsell 5YR 4/4) sticky Ag3, As1, nig1, strf0, sicc3, lim0, elas0, (softness-1) Gmaj+ Small stones below 32.259	32.549	31.189

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Figure 1: Site location

site location

0 1km
scale 1:25 000 for A4 plot

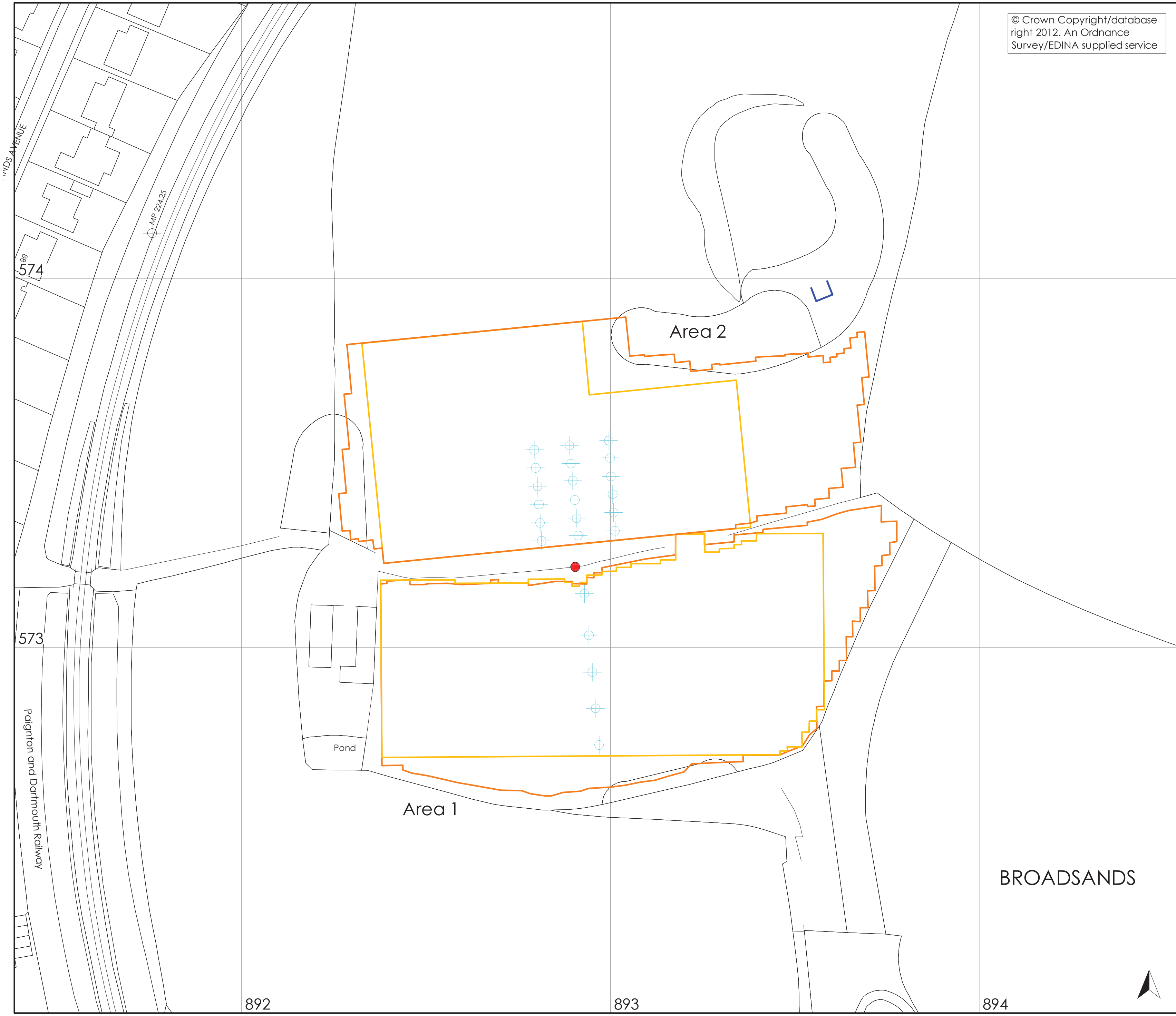

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Figure 2: Geophysical surveys and borehole locations

0 — 50m
scale 1:1000 for A3 plot

- chambered tomb
- geomagnetic survey
- resistance survey
- borehole

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Figure 3: Geomagnetic survey

0 50m
scale 1:1000 for A3 plot

chambered tomb

geomagnetic survey

-5 nT 5

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Figure 4: Earth electrical resistance survey

0 50m
scale 1:1000 for A3 plot

chambered tomb

resistance survey

30 ohm 100

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Figure 5: Geophysical interpretation of geomagnetic data

0 50m
scale 1:1000 for A3 plot

- chambered tomb
- geomagnetic survey
- dipolar magnetic anomaly
- positive magnetic anomaly
- negative magnetic anomaly

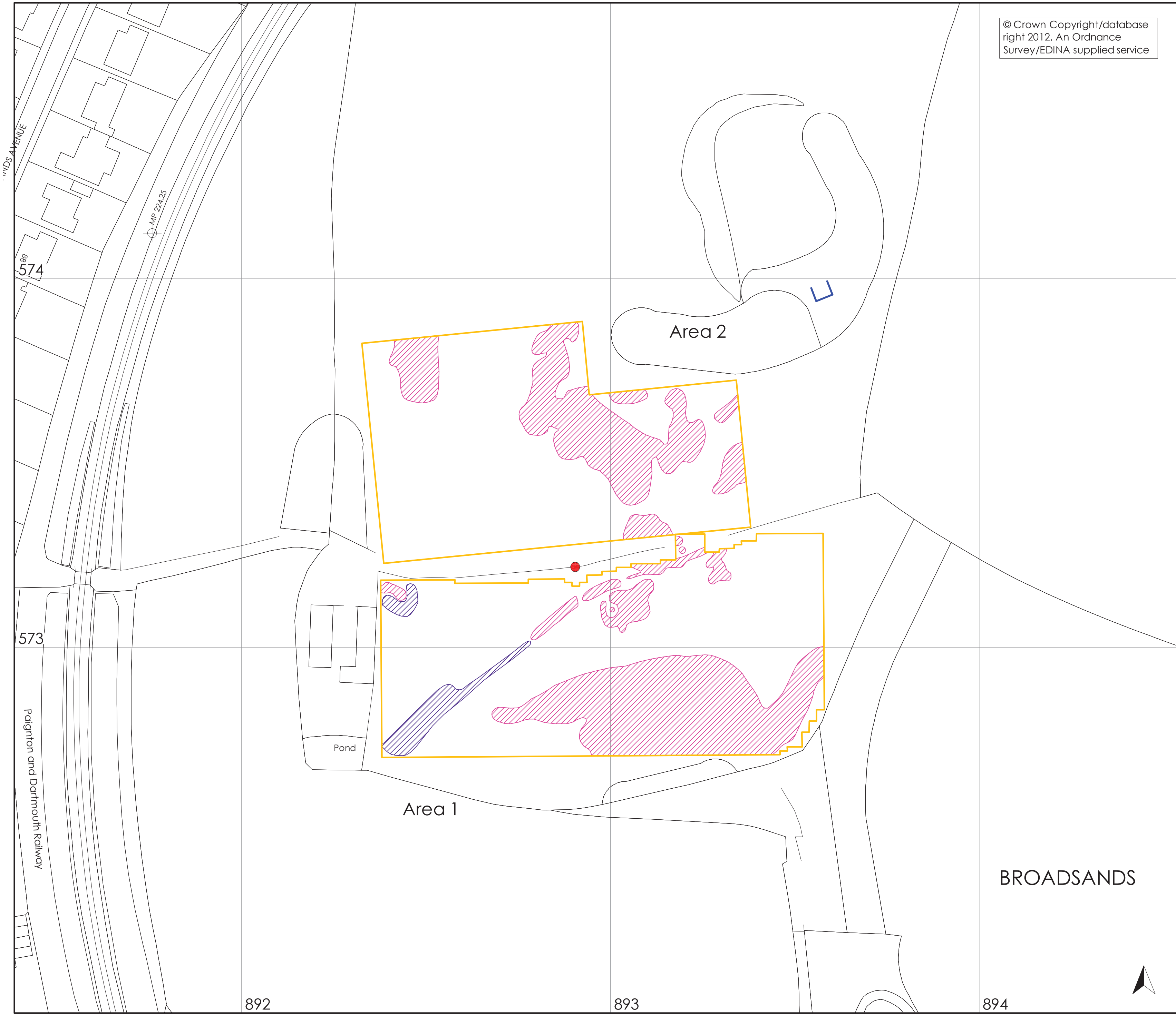

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Figure 6: Geophysical interpretation of resistance data

0 50m
scale 1:1000 for A3 plot

chambered tomb
resistance survey
high resistance anomaly
low resistance anomaly

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Broadsands chambered tomb
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Figure 7: Archaeological interpretation

0 — 50m
scale 1:1000 for A3 plot

- chambered tomb
- geomagnetic survey
- resistance survey
- soil-filled feature
- disturbed area
- track
- lime kiln (from 1865 Ordnance Survey map)
- building (from 1865 Ordnance Survey map)
- track (from 1865 Ordnance Survey map)

reddish brown clayey silt

ground level

suggested depth of bedrock

0 7.5m
scale 1:150 for A2 plot

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Figure 8: Borehole transect 1 profile

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0 50m
scale 1:1000 for A3 plot

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Figure 9: Trace plots of geophysical data