BOTTREAUX CASTLE
DUNN STREET
BOSCASTLE
CORNWALL

Results of a Geophysical Survey

South West Archaeology Ltd. report no. 230404

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BOTTREAUX CASTLE, DUNN STREET, BOSCASTLE, CORNWALL

RESULTS OF A GEOPHYSICAL SURVEY

By J. Bampton
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Work undertaken by SWARCH for the Cornwall AONB

SUMMARY

This report presents the results of a magnetometry survey and resistivity survey carried out by South West Archaeology Ltd. (SWARCH) on land at Bottreaux Castle, Dunn Street, Boscastle, Cornwall. The site is located at the Scheduled Bottreaux Castle (DCO1671; 1005455; MCO126; HER no.705), which is currently maintained as a green space and picnic area. The castle was recorded in the late 13th century and from the later 15th century passed through various ownerships, was used as a court and fell into disrepair until the 19th century when only the approximate north half of the motte remained. This phase of geophysical survey was requested as part of the AONBs Monumental Improvement project.

The surveys identified 12 groups of anomalies, comprised of c.29+ anomalies across the survey area. From these, one could infer that: the lower crescent-shaped plateaux was probably a planned terrace and platform rather than an in-filled ditch; areas of disturbed and made-ground as well as ditches along the southern boundary of the site could be associated with 19th-20th century alterations to the boundary, these boundaries could possibly respect earlier boundaries, such as a building; geological variation and anomalies correspond to the topography of the site and that local stone or boulders were used in topographic features on the west of the site; on the east side of the site ephemeral remains of a ditch could mirror a ridge on the west slope, and possible wall segments may survive on the east side of the top plateaux indicative of a retaining- or boundary wall; possible post settings that may represent a modern disturbance or feature were located on the top plateaux of the site. Some of the anomalies associated with probable stony areas combined with mixed magnetic responses could be geological. Extant earthworks on the site and aspects of its topography were also evident in the survey data.

The surveys have ostensibly worked in producing identifiable anomalies and possible archaeological deposits/features. Intrusive archaeological works would test the efficacy and validity of the results of the geophysical survey and aid to confirm the presence or absence of any archaeology resource on the site.

The current use and maintained condition of the site seems appropriate for its continued preservation and future understanding and enjoyment.

April 2023

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ACKNOWLEDGEMENTS

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THE AONB TEAM FROM THE MONUMENTAL IMPROVEMENT PROJECT (MI): JEANETTE RATCLIFFE, NATALIE HALY, JAMES RICHARDS, LINUS FIRTH
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1.0 INTRODUCTION

LOCATION: BOTTREAUX CASTLE, DUNN STREET, BOSCASTLE
PARISH: FORRABURY & MINSTER
COUNTY: CORNWALL
NGR: SW 09953 90847
SWARCH REF. CANB22 (BOTTREAUX)

1.1 PROJECT BACKGROUND

South West Archaeology Ltd. (SWARCH) was commissioned by the Cornwall Area of Outstanding Natural Beauty (AONB) to undertake a geophysical survey on land at Bottreaux Castle, Dunn Street, Boscastle, Cornwall. This work was requested as part of the Monumental Improvement (MI) project at a number of Scheduled Monuments within the AONB. This work was undertaken in accordance with best practice and CIfA guidance.

1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND

Bottreaux Castle is a partially surviving medieval motte and bailey castle on the east side of Boscastle. It is at the summit of a steep natural spur of land at the confluence of- and between the Treforda Water stream and River Jordan, which affords principle views to the north and north-west, across the Jordan Valley to the River Valency and Boscastle Harbour. The site is in a landscape of steep sided river valleys associated with the catchment area of the River Valency. The site equates to the upper parts- and approximate northern half of a former motte that is used as a picnic area. It has a grassy plateaux at its summit with a very steep slope leading to a rough crescent shaped, slightly sloped and bumpy grass areas, which in turn lead to wooded and scrubby slopes leading to the watercourses at the base of the motte/spur. The southern edge of the site borders housing and a 20th century memorial along Dunn Street, Boscastle. The monument is at a height of between *c.*45m and *c.*65m AOD; with the site across plateauxs at *c.*56m and 64m AOD.

The soils on the site are the well drained loamy and fine silty soils over rock of the Denbigh 1 Association (SSEW 1983), which overlie an area where underlaying geologies meet and partially account for the site topography: principally the igneous bedrock of tuff and agglomerate Tintagel Volcanic Formation across the top of the site and the slate of the Tramberley Cove Formations and possible slates from the Barras Nose- and Yeolmbridge Formations between the top of the site and silt- and mudstones of the Boscastle Formation beside the water courses below the site (BGS 2023).

1.3 METHODOLOGY

This work was undertaken in accordance with current best practice and CIfA guidance.

Any desk-based assessment aspect of this report follows the guidance as outlined in: Standard and Guidance for Archaeological Desk-Based Assessment (CIfA 2014a) and Understanding Place: historic area assessments in a planning and development context (English Heritage 2012).

The geophysical survey follows the general guidance as outlined in: EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider (Europae Archaeologiae Consilium/European Archaeological Council 2016) and Standard and Guidance for Archaeological Geophysical Survey (CIfA 2014b).

FIGURE 1: SITE LOCATION (THE SITE IS INDICATED).

2.0 DOCUMENTARY HISTORY

2.1 HISTORICAL BACKGROUND

The site is in the parish of Forrabury and Minster; historically separate parishes within the hundred of Lesnewth and deanery of Trigg-Minor. In the 16th-17th century John Norden describes Forrabury as a poor parish, whose former historical importance could be inferred from relict castles at Bottreaux and Tintagel (Lysons 1814). The majority of Boscastle was historically within the parish of Minster, which was named for a Benedictine cell to Tywardreth priory established there by the Botterell/Bottreaux family. Forraburry fell within the Manor of Worthyvale, which along with that of Boscastle/Bottreaux Castle was held by the Botterell/Bottreaux family (Lysons 1814). The castle was first recorded in 1284 as *Castello Boterel* (MCO21990). The last direct line of the Bottreaux family holding the manor died in 1462 and it was probably decastellated sometime after that, as *William of Worcestre* describes it as a manor house in 1678; and 16th century antiquarian John Leland describes the castle as not being worth that title and that it was locally referred to as 'the court' (Lysons 1814; MCO21990). In Richard Carew's survey of Cornwall, published in 1603, it is said to have been used as a prison. In 1812 stonework was ostensibly recovered from the 'mound' and inner and outer walls were 'distinguishable'. In 1814 Lysons states that only the mount of the castle remains; although remains were examined and surveyed in 1849/1852 by H.McLauchlan. The town of Boscastle is named by a corruption of Bottreaux Castle (MCO21990). After the Bottreaux's the ownership of the manor passed through the Hastings and Hender families to the Cottons through the whole of the 17th century then via a sister to a Mr Amy, whose daughter married a Phillipps from whome it was inherited by a Winslow, whose family held the manor in 1814 (Lysons 1814). By the time of the 1839 Minster tithe apportionment it was held by a Thomas Avery.

2.2 CARTOGRAPHIC DEVELOMENT

The 1805 Surveyor's draft map (Figure 19) for the Camelford area depicts the castle as a semi-circle, but with a subtle plot that would complete an approximately circular earthwork beside Dunn Street. Plot 128 on the 1839 Minster tithe map (Figure 20) defines the site. The approximate semi-circle of fields north of a line defined by plots 142 143 and 144 ostensibly represented what remained at the time of a definable medieval motte down to the curving boundaries of watercourses meeting between ploys 124 and 125.

A property and garden are shown occupying the faint semi-circular aspect across the southern half of the motte visible on the 1805 map. At the time of the tithe map and apportionment the site was owned by a Thomas Rickard Avery, occupied by a Henry James, called Higher Jordans and under pasture. The field names in the immediate vicinity of the site were generally prosaic (see Table 1) The 1880's Ordnance Survey (OS) mapping (Figure 21) more clearly defines the site. The boundary between the tithes plot 128 and 127 is depicted as an earthwork slope with an entrance in its north-east segment. Part of the boundary in the south-west of the site aligned north-west by south-east is also shown partially as an earthwork slope. On the 1905-7 OS revision (Figure 22) the southern boundary of the site is depicted as a built wall that curved around the western and northern part of the monument. At the time of this survey the site was largely as depicted on these 19th and early 20th maps; although a 20th century war memorial had been inserted beyond the southern wall to the south-west of the site, and picnic benches were located on the more level upper and middle sections of the site. LiDAR imagery from 2019 and 2022 (Figures 15 and 18) shows the site much as its is depicted on the 19th and 20th century mapping and shows extant topographic features on the site indicative of linear and curvi-linear ridges, bumps and slopes; as well as picnic benches. Supporting cartographic sources and LiDAR imagery for this section can be seen in Appendices 1 and 2.

TABLE 1: TRANSCRIPT EXTRACT FROM THE MINSTER TITHE APPORTIONMENT, *C.*1839 (KK).

Plot	Owner	Occupier	Field Name	Field Use
124	Thomas Rickard Avery	Henry James	Pond and Waste	-
125			Part of Jordans	-
126			Garden	-
127			Lower Jordans	Pasture
128			Higher Jordans	Pasture
128a		Thomas Rickard Avery	Cold Frame Hill	Arable
142		James Hewett	Orchard	Orchard
143		William Rawle	Higher Jordans	Arable
144			House and Garden	-

2.3 SITE DESIGNATIONS AND BACKGROUND

Bottreaux Castle is a Scheduled Monument (DCO1671; 1005455; MCO126; HER no.705). Its Scheduling text reads as follows -

'*Reasons for Designation*

Motte and bailey castles are medieval fortifications introduced into Britain by the Normans. They comprised a large conical mound of earth or rubble, the motte, surmounted by a palisade and a stone or timber tower. In a majority of examples an embanked enclosure containing additional buildings, the bailey, adjoined the motte. Motte castles and motte-and-bailey castles acted as garrison forts during offensive military operations, as strongholds, and, in many cases, as aristocratic residences and as centres of local or royal administration. Built in towns, villages and open countryside, motte and bailey castles generally occupied strategic positions dominating their immediate locality and, as a result, are the most visually impressive monuments of the early post-Conquest period surviving in the modern landscape. Over 600 motte castles or motte-and-bailey castles are recorded nationally, with examples known from most regions. As one of a restricted range of recognised early post-Conquest monuments, they are particularly important for the study of Norman Britain and the development of the feudal system. Although many were occupied for only a short period of time, motte castles continued to be built and occupied from the 11th to the 13th centuries, after which they were superseded by other types of castle. The motte and bailey castle at Boscastle survives comparatively well and will contain archaeological and environmental evidence relating to its construction, development, social, political, economic and territorial significance, abandonment, function and overall landscape context.

Details

The monument includes part of a motte and bailey castle, situated at the summit of a steep natural spur, overlooking River Jordan at the head of the impressive Jordan Valley and with wide views to the coast. The castle survives as a circular mound or motte with a small bank at the summit representing a possible building. Part of a steeply embanked bailey wall with a terrace, representing a silted ditch, is located to the north, with further small terraces and platforms within.

Known locally as 'Bottreaux Castle', this was the principal residence of the Bottreaux family, one of the most important in medieval Cornwall, who settled here in the reign of Henry II (1154-1189). The castle may date from this time, although one is not actually documented until the 13th century. The last member of the family died in 1462, and the castle soon fell into decay. William Worcester (c. 1478) mentioned the castle, as did Leland in the mid-16th century. Carew, in about 1600, suggested the rooms and prisons of tradition were no longer discernible in the mound. By Maclaughlan's survey in 1852, although some walls were found, he noted only about half of the castle motte was still visible. The settlement of Boscastle was named after Bottreaux Castle.

A war memorial lies within the scheduled area and is excluded although the ground beneath is included.'

2.4 ARCHAEOLOGICAL BACKGROUND

Other than antiquarian examination of the site in the 19th century (MCO21990), the site has not been subject to direct or intrusive archaeological works; however, it has been included within broad historical and archaeological assessments of the area (see section 1.6.4).

Cornwall's Historic Landscape Characterisation (HLC) describes the site as an area of *Farmland: Medieval* (HCO4) – *'The agricultural heartland, with farming settlements documented before the 17th century AD and whose field patterns are morphologically distinct from the generally straight-sided fields of later enclosure. Either medieval or prehistoric origins'*.

Below is a summary of noteworthy archaeological/HER assets and events near to the site.

2.4.1 PREHISTORIC

An Iron Age cemetery excavated in 2009 (MCO54622; ECO3569) was located within 500m west of the site. Beyond 500m from the site the HER lists: a Neolithic pit to the west (MCO61600); and an Iron Age promontory settlement (MCO6586; MCO46085) and possible Bronze Age barrows (MCO36278; MCO36291) to the north-west; although these barrows may be associated with medieval clearance and mounds in the same location.

2.4.2 MEDIEVAL

An area of medieval strip fields is within 200m north-west of the site, just beyond the confluence of the River Jordan and Treforda Water (MCO21993). The HER text for these strip fields states - '*Forrabury Common is an area of 20ha containing the best preserved example of a medieval strip field system in Cornwall, and one of only five actively farmed open strip plots in Britain*'. The HER also includes documentary evidence for Boscastle itself as a medieval town (MCO21990) and as a market town from 1204 (MCO21991). Within 350m west of the site is the Grade II * Listed Forrabury parish church (St Symphonian's), which was documented in 1278 (MCO6315; 1143467)

2.4.3 POST-MEDIEVAL TO MODERN

The majority of assets listed on Cornwall's HER near to the site are associated with the post-medieval development of the settlement at Boscastle, and are represented within the designated assets of the towns Conservation Area (CA). Of note in relation to the site is the 20th century war memorial on the south-west side of the Scheduled Bottreaux Castle (MCO56284, MCO56285).

2.4.4 EVENT RECORDS

HER events pertinent to the site include various broad assessments and appraisals of Boscastle and the wider area; some of which include detailed historical and archaeological backgrounds to Boscastle, e.g. a management assessment following flooding in 2004 (ECO2492; Kirkham 2005); a conservation area appraisal (ECO2600); and 'The Historic Towns of Cornwall: An Archaeological Survey (ECO3110; Sheppard 1980). Environmental sampling has also been taken from the village hall on the other side of Dunn Street, just south-west of the site (ECO604).

3.0 GEOPHYSICAL SURVEY

3.1 INTRODUCTION

An area *c.*0.23ha, comprising the grass picnic area of the monument, excluding a particularly steep slope, was subject to a magnetometry- and resistivity survey. The purpose of the magnetometry survey was to identify and record magnetic anomalies within the survey: and the purpose of the resistivity survey was to identify and record anomalies of relative resistance within the proposed site. While identified anomalies may relate to archaeological deposits and structures the dimensions of recorded anomalies may not correspond directly with any associated features. The following discussion attempts to clarify and characterise the identified anomalies. The survey was undertaken on the 31st of January 2023 by J. Bampton, P. Bonvoisin of SWARCH, local volunteers, and members of the AONB; the survey data was processed by J. Bampton.

3.2 SITE INSPECTION

The site was across the north end of a spur of land with steep sides running from its west, in a rounded curve to its north and then east. The site was under short grass with a small approximately semi-circular area and a crescent shaped area separated by a mostly very steep slope. The lower slopes beyond the targeted site were wooded and scrub covered, although had been recently cleared to some extent and led down to water courses at the foot of the spur. The western end of the south boundary of the site was defined by a retaining wall with a memorial set lower than the site. The rest of the southern boundary defined a property boundary with a garden beyond its east end. The majority of the slope, in particular its northern portion, between the top and middle 'terraces'/level survey areas was too steep to survey. The eastern slope between the level areas was appropriate for access and walking and had some possible stone-work protruding from its turf near to/adjoining the extant southern boundary. The western slope between the two level areas was evidently the natural/easiest route between them; although contained slopes and earthworks indicative of internal features and boundaries.

The area immediately north of the war memorial, to the south-west of the site, on the south side of an ostensible retaining wall was relatively level and may have contained made-up ground. A telegraph pole on the southern edge of the site had ostensibly been replaced and possibly slightly relocated in recent history based. A possible re-usable post-hole/concrete patch, such as for a temporary beacon was visible at the top of the site and a picnic bench was present on both level areas of the survey area. The top level of the site was extremely flat and level; the lower level area had more undulations and a slight slope. Supporting photographs for the site inspection can be seen in Appendix 3.

FIGURE 2: SITE SHOT FROM ITS WESTERN EDGE, SHOWING WESTERN EARTHWORKS ON THE MONUMENT; VIEWED FROM THE WEST (NO SCALE).

3.3 METHODOLOGY

The magnetometry and resistivity survey follow the general guidance as outlined in: *EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider* (Europae Archaeologiae Consilium/European Archaeological Council 2016) and *Standard and Guidance for Archaeological Geophysical Survey* (CIfA 2014b).

3.3.1 MAGNETOMETRY METHODOLOGY

The magnetometry survey was carried out using a twin-sensor fluxgate gradiometer (Bartington Grad601). These machines are sensitive to depths of up to *c.*1.50m. The survey parameters were: sample intervals of 0.25m, traverse intervals of 1m, a zigzag traverse pattern, traverse orientation was circumstantial, grid squares of 30×30m. The gradiometer was adjusted ('zeroed') every 0.5-1ha. The survey grid was tied into the Ordnance Survey National Grid- and set out using a Leica CS15 GNSS Rover GPS. The data was downloaded onto Grad601 Version 3.16 and processed using TerraSurveyor Version 3.0.36.0. The primary data plots and analytical tools used in this analysis were Shade and Metadata. A technical summary of the survey method, and data details and processing can be seen in Appendix 4.

3.3.2 RESISTIVITY METHODOLOGY

The resistivity survey was carried out using a RM15-D Resistivity Meter with an MPX15 Multiplexer module allowing for four terminal sensing using a PA20 multiprobe array with parallel twin log mode 2. These machines are sensitive to depths of up to *c.*1m. The survey parameters were: sample intervals of 1m, traverse intervals of 1m, a zigzag traverse pattern, traverse orientation was circumstantial, grid squares of 30×30m. . The survey grid was tied into the Ordnance Survey National Grid- and set out using a Leica CS15 GNSS Rover GPS. The data was downloaded onto- and processed using TerraSurveyor Version 3.0.36.0. The primary data plots and analytical tools used in this analysis were Shade and Metadata. A technical summary of the survey method, and data details and processing can be seen in Appendix 4.

3.3.3 ASSESSMENT OF METHODOLOGY

Both types of geophysical survey produced a usable range of results, demonstrating the potential for them to work and provide meaningful results. The magnetometry survey provided data that corresponded to discernible potential archaeological- and topographical features. The resistivity survey provided data that corresponded to probable geological features and possible archaeological deposits. Archaeological evaluation/excavation would test the efficacy and validity of the results of the geophysical survey and aid to confirm the presence or absence of any buried archaeology resource on the site. A higher resolution resistivity survey across the breaks of the upper slope and western slope, or Ground Penetrating Radar (GPR) across the top of the site and its breaks of slope may clarify potential features associated with the construction of the motte, such as retaining walls where cut and fill and scarping may have needed consolidation. However, one may argue that this survey has demonstrated that excavation would be the more informative investigation of the monument and that significant archaeological features may not obviously forthcoming by way of geophysical survey.

3.4 RESULTS

Tables 2 and 3 with the accompanying Figures 3-6 show the analyses and interpretation of the geophysical survey data. Additional graphic images of the survey data and numbered grid locations can be found in Appendix 1.

*note on 'Class' when interpreting the resistivity survey data:
• High responses refer to readings of higher relative resistance and represent built/compact stony features or relatively hard deposits. Simplistically, these are comparable to negative responses in the magnetometry data and both are represent in the interpretive Figures 4 and 6 in shades of blue.

• Low responses refer to readings of lower relative resistance and represent in-filled cut features or relatively soft deposits. Simplistically, these are comparable to positive responses in the magnetometry data and both are represent in the interpretive Figures 4 and 6 in shades of red.

In this instance readings of above 471.00 Ohm are considered high responses and readings below 471.00 Ohm are considered low responses. Readings above *c.*650 ohm are considered strong high; and readings below *c.*200 Ohm are considered strong low. Responses ranging between, but exclusively limit to- *c.*300 OHm and 600 Ohm could be considered as probable natural variation.

TABLE 2: INTERPRETATION OF MAGNETOMETRY SURVEY DATA.

Anomaly Group	Class and Certainty	Form	Archaeological Characterisation	Comments
1	Moderate positive, probable	Linear	Ditch, boundary	Located at the southern edge of the upper plateaux of the site. Aligned approximately north-east by south-west, parallel to the site boundary. Indicative of a cut and in-filled feature such as a ditch. Probably associated with the extant southern site boundary. Response strength of <*c.*+30nT.
2	Moderate negative, probable	Linear	Boundary, wall, drain, made-ground	Located in the south-west part of the site. Aligned approximately north-west by south-east. Indicative of a compact or stony deposit or feature set north of-, but roughly parallel to the site boundary near to a 20th century war memorial. Possibly associated with a retaining wall and boundary that may have been moved/modified. Possibly associated with Group A. Response strength of *c.*-46nT.
3	Moderate negative and positive, possible	Linear, amorphous spread	Made-ground, retaining wall	Located in the south-east of the site, near to the southern boundary. Aligned partially parallel to the slope and boundary. Indicative of a spread or deposit of made-ground containing mixed material of a probable geological nature. The western edge of this anomaly may containing a deposit indicative of a wall; some stone work was visible on site in this approximate location within the turf running north west from the site boundary, parallel to the slope of the motte. It may possibley indicate the edge of the top of the motte with a

				spread of material on the slope beneath it that may include in-filled features associated with the extant boundary, such as a ditch or pits/tree-throws. Possibly associated with Group A. Response strength of *c.*-34nT near the possible wall-type feature and up to +39nT near the southern boundary; the majority of the 'spread' had a response strength of *c.*+/-10nT.
4	Weak positive, possible	Sub-rectangular / amorphous spread	Made-ground, pit, hollow	Two examples. One located on the western slopes of the site between the upper and lower plateauxs. Indicative of made-ground on the edge of the slopes of the motte or of cut and in-filled feature such as a pit, hollow or similar feature. Possibly associated with a construction on this side of the monument, such as a cut and fill construction or consolidated scarping. Possibley a less stony/compacted deposit than other parts of the site. A second area of possibly less stony made-ground on the east side of the motte slope. Possibly associated with Group E. Response strength of <*c.*+14nT.
5	Very weak positive, possible	Linear	ditch	Located on the eastern side of the site. Aligned approximately north-east by south-west. Indicative of a cut and in-filled feature such as a ditch or an alignment of disturbed ground. Extremely ephemeral and intermittent response that may be indicative of poor survival or a shallow ground disturbance. Response strength of *c.*+7nT.
6	Very weak positive and negative, possible	Linear spreads	Geological variation / topographic	Numerous anomalies across the site associated with geological variation on the site that correspond to topographic changes on the site. this probable geological variation partially explain topographic variation and subsequent differentiation in thickness/condition of surface/topsoil deposits. Typically such anomalies would not be included as a numbered group, however, in this instance they depict probable features relevant to the topography of a site whose natural and modified topography are significant to its existence and understanding. Possibly associated with Group D. Response strengths of between <+/-1nT to +/-10nT.
Other Anomalies				
-	Moderate-strong dipolar, probable	Point/ ovoid	Geology/ Ferrous objects/debris	The site has a handful of dipolar responses. Black crosses in Figure 4. The strongest examples are indicative of ferrous objects that are typically presumed to be modern, such as farm machinery fragments. Such examples are present near to picnic benches on the site and near to the southern site boundary. Similar and weaker responses can be indicative of geological features/anomalies. In this case these may include igneous deposits/boulders and outcrops and can account for green waste or shallow ground disturbance. These are highly probable to be non-archaeological in nature. Responses of < +/-100nT.

TABLE 3: INTERPRETATION OF RESISTIVITY SURVEY DATA.

Anomaly Group	Class and Certainty	Form	Archaeological Characterisation	Comments
A	Strong low, possible	Linear spread	Made-ground	Located on the southern edge of the site, specifically along the east end of the southern boundary and against the south-west boundary of the site adjacent to a 20th century war memorial. Possibly associated with Groups 2 and 3. Response strength of between <*c.*200 Ohm.
B	Low, possible	Amorphous spread	Made-ground	Located on the east side of the site; against the east end of the southern boundary and on the upper edge of the lower terrace above the lower wooded/scrub slopes. Possibly indicative of built up material at the edge of slopes, and possibly indicating softer ground along the east end of the southern boundary. Response strengths of *c.*471 to 350 Ohm.
C	Strong high, possible	Linear, point	Stony deposit, wall, path	Located near the middle of the southern boundary at the entrance to the site. Possibly indicative of an underlaying stretch of path or section of wall crossing the threshold of the site and access footpath. Response strength of *c.*697 Ohm.
D	Very strong high, possible	Oval	Stony or compacted deposit, boulder, geology	Approximately five areas across the lower half of the site indicative of stony deposits or comparatively rocky geological variation. Possibly indicative transition between varying underlaying geologies and areas of igneous boulders or intrusions. Possibly associated with Group 6. Response strengths of between 750 Ohm and 778 Ohm.

E	High to strong high, Possible	Oval	Stony deposit, boulder, geology	Approximately six anomalies in two areas of the site; the western side and the top plateaux. On the top plateaux three of these anomalies form three corners of a rough square and could be indicative of post-sockets, either in-filled or of modern construction. At the western side of the site these responses approximately line an ostensibly geological transition and topographic feature of a sloped ridge/boundary on the site and where this boundary meets the steep slope of the motte. This western group may indicate made-ground or geological variation associated with these features and may indicate boulders or in-filled post-settings within it. Possibly associated with Group 4. Response strength of *c.*650 Ohm to 720 Ohm.
F	Very weak mixed response, possible	Amorphous spread	Made-ground, natural geology	Located in the north part of the site. Although indicative of a natural variation in the underlaying geology it is a definable area that corresponds to a group of weak magnetic dipolar geophysical responses and may equate to natural variation, made-ground or shallow ground disturbance. Response strengths of between *c.*440 Ohm and 650 Ohm.

3.5 DISCUSSION

The geophysical survey identified 12 groups of anomalies (1-6 on the magnetometry survey; and A-F on the resistivity survey) comprised of *c.*29+ anomalies, depending on where one chooses to define /discrete anomalies, across the survey area. These included: a linear anomaly of a probable ditch beside an extant boundary (Group 1); a possible wall line or drain (Group 2), although this is not concurrent in both surveys; areas of probable made-ground or shallow ground disturbance (Groups 3, 4, A, B, F); a possible ephemeral ditch-type anomaly (Group 5); an anomaly indicative of a possible former boundary wall or the site access path (Group C); probable areas of geological variation indicative of rocky outcrops or deposits and breaks in slope/topographic features (Groups 6, D); and areas of small anomalies of high resistance that may have indicated geological features or deposits within made-ground, or stone/concrete post settings, both on top of the monument and on the western slope and a boundary ridge line on the western slope (Group E).

Instances of magnetic debris associated with ferrous debris or weak geological variation were also evident in the survey data. Other than metallic debris/objects, some of these examples on this site may correspond to igneous boulders or intrusions that approximately correspond to resistivity anomalies associated with rocky/igneous geology (Group D). Patches of weaker debris may be associated with shallow ground disturbance or made-ground such as the area of resistivity anomaly Group F. Additional visual interpretations of the data and cartographic sources supporting the discussion and comments can be seen in Appendices 1 and 2.

Regarding the magnetometry survey, the general 'noise' (inherent geological variation) of the site was low across the site, <*c.*+/-1nT, with occasionally higher fluctuations/spikes into the low teens. Anomalies of a comparable strength are probably/possibly natural and geological in nature. Occasional banding/striations in the geological variation are ostensibly associated with changes in the slope of the site. This will be associated with soils accumulating differentially on the site and the scarping and landscaping of the site as a defensible motte or modified spur tip. A band/outcrop of igneous geology recorded on the site could account for some broad variation in responses and ostensible dipolar anomalies. In terms of the resistivity survey, responses of between *c.*300 Ohm and *c.*600 Ohm are of possible natural/geological origins or variation; although similarly to the magnetometry survey, the wide range of responses may be indicative of a varying geologies on site (igneous and sedimentary), or made-grounds.

No clearly definitive evidence of a castle wall or structure on top of the motte was evident in the survey data. It is likely that the castle (manor house/court) was south of the site, perhaps in the location of the adjacent property on the outside corner of Dunn Street. This property is on high

ground and does not conform to the terraced properties running down the slope of Fore- and Dunn Street. Additional defensive features may have crossed the spur to the south, crossing Fore Street.

Anomalies on the top of the motte equated to modern features and disturbance associated with a telegraph pole and modern disturbance on its west side, and a ditch (Group 1) parallel to the adjacent southern property boundary on its east side. It is possible that this boundary and this probable ditch respect some earlier structure atop the motte. Three points of high resistance on the top plateaux could correspond to post settings for a temporary re-erectable structure, such as a beacon. The nature of these anomalies can not be clearly understood from this survey.

Just beyond the break of slope of the top plateaux, on its east side was a visible patch of stonework seemingly running out from the southern site boundary. This approximately corresponded to a negative aspect of anomaly Group 3, which otherwise defined disturbed or made-ground in the south-east of the site along with parts of Groups A and B. The negative anomaly could be associated with former walls at the edge of the motte or a retaining construction within the motte; while the aspects of disturbed or made-ground accumulated beside the boundary could also in-fill ditch/boundary type features.

Further down the eastern slope of the site an ephemeral linear anomaly (Group 5) could be argued to approximately mirror the extant ridge type boundary half way down the slope on the west side of the site. These could have been contemporary features if the anomaly were proven to equate to a genuine feature.

The undulations on the west slope of the site, on either side of the ridge type boundary, included anomalies associated with probable made-grounds (Group 4) and deposits associated with the extant topographic features (Group E). Group 2 and parts of Group A in the south-west of the site probably correspond to an area of made-ground and a possible drain or retaining wall associated with an altered boundary. Based on historic mapping, this part of the site boundary was probably altered in the 19th century, between 1839 and 1883 (see Figures 20 and 21; Appendix 2). Perhaps oddly, the resistivity data does not corroborate the magnetometry regarding Group 2, unless it is simply part of a spread of disturbed or made-ground behind the extant wall between the site and the 20th century war memorial. Although probably indicative of disturbed and made-ground, this material in the south-west of the site may seal underlaying material associated with earlier phases of the castle.

The terrace forming the lower crescent-shaped plateaux contained few to no significant anomalous responses, generally only probable geological responses and magnetic debris. The evident terracing and scarping of this slope may account for the encountered responses; although the theory of the plateaux containing an in-filled ditch could account for some magnetic debris and variation in resistivity (Group F). Based on the survey data this crescent plateau appears to be a terrace cut into the slope without a ditch.

The path allowing access to the lower crescent-shaped plateaux from the wooded scrub and streams on the north side of the monument is not better understood from this survey. If this were an original or later feature of the castle to allow access to the streams or lower slopes and later ‘gardens’, the crescent-shaped plateaux would afford a path around the motte. Possible outer defensive works on the east and west side of the site, possibly represented by extant features or ephemeral anomalies may help to mitigate the risk of some planned access on this side of the monument.

FIGURE 3: GREYSCALE SHADE PLOT OF MAGNETOMETRY SURVEY DATA; MINIMAL PROCESSING.

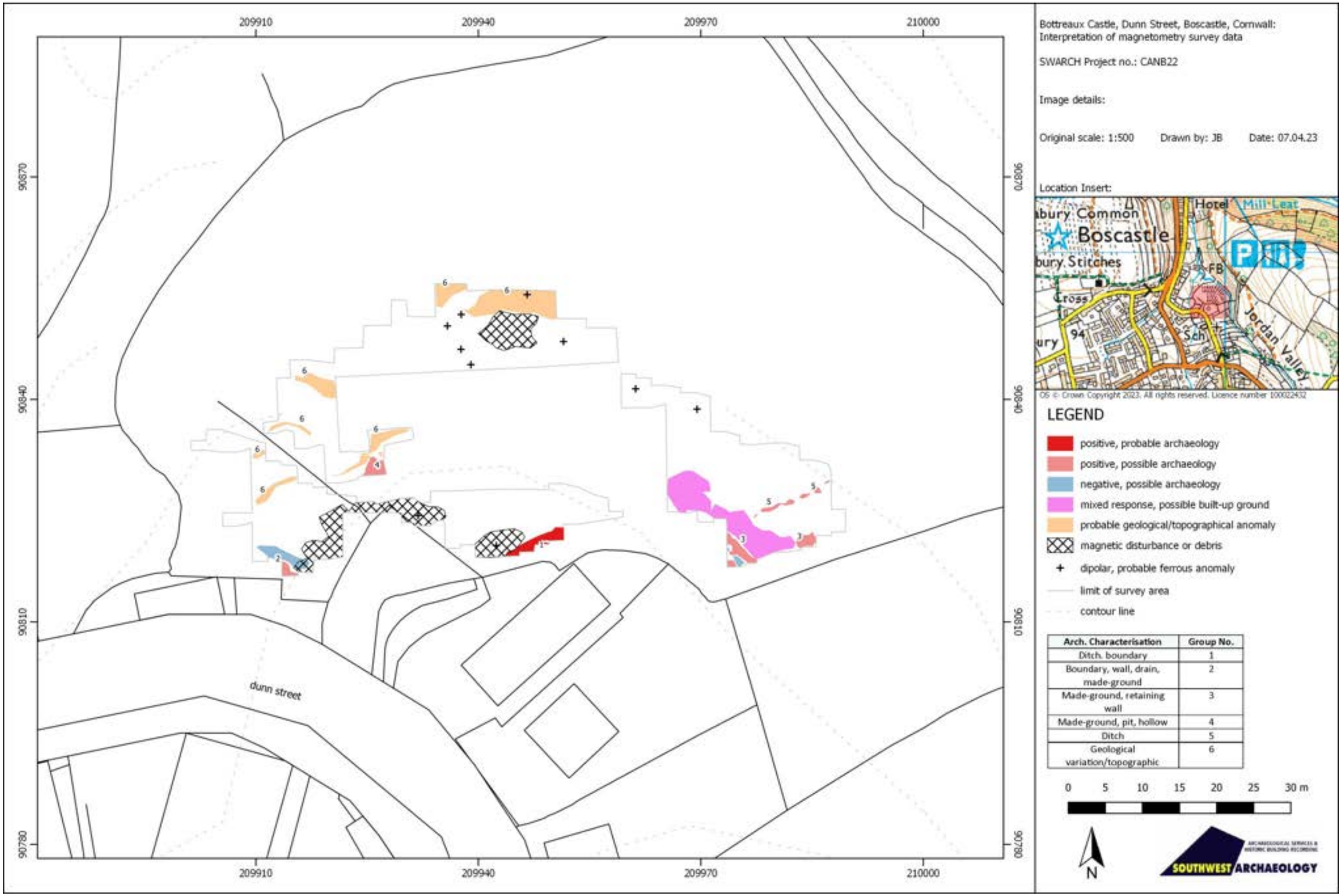

FIGURE 4: INTERPRETATION OF MAGNETOMETRY SURVEY DATA.

FIGURE 5: GREYSCALE SHADE PLOT OF RESISTIVITY SURVEY DATA; MINIMAL PROCESSING.

FIGURE 6: INTERPRETATION OF RESISTIVITY SURVEY DATA.

4.0 CONCLUSION

The site is located at the Scheduled Bottreaux Castle (DCO1671; 1005455; MCO126; HER no.705); a partially surviving medieval motte and bailey castle on the east side of Boscastle. It occupies the northern tip of a spur of land between Treforda Water and the River Jordan. The castle was recorded in the late 13th century and from the later 15th century passed through various ownerships, was used as a court and fell into disrepair until the 19th century when only the approximate north half of the motte remained. Boscastle is within a Cornwall area of the AONB. The site is used as a picnic area that is accessed via a footpath from Dunn Street. This phase of geophysical survey was requested as part of the AONBs Monumental Improvement project.

The geophysical survey identified 12 groups of anomalies (1-6 on the magnetometry survey; and A-F on the resistivity survey) comprised of *c.*29+ anomalies, depending on where one chooses to define discrete anomalies, across the survey area. From these, one could infer that: the lower crescent-shaped plateaux was probably a planned terrace and platform rather than an in-filled ditch; areas of disturbed and made-ground as well as ditches along the southern boundary of the site could be associated with 19th-20th century alterations to the boundary, and these boundaries could possibly respect earlier boundaries, such as a building; geological variation and anomalies correspond to the topography of the site and that local stone or boulders were used in topographic features on the west of the site; on the east side of the site ephemeral remains of a ditch could mirror a ridge on the west slope, and possible wall segments may survive on the east side of the top plateaux indicative of a retaining- or boundary wall; possible post settings that may represent a modern disturbance or feature were located on the top plateaux of the site. Some of the anomalies associated with probable stony areas combined with mixed magnetic responses could be geological. Extant earthworks on the site and aspects of its topography were also evident in the survey data. It was not possible to survey the steepest slope of the motte/site between the top plateaux and lower crescent-shaped plateaux.

The survey shows that probable archaeological activity has survived in the geophysical record but that the nature of the geology and construction of terraces and a motte will have accounted for anomalous spreads and points in the data. The post-medieval modifications to the original castle that culminated in the current residential and 20th century features immediately south of the southern site boundary could have included modifications to the site itself; removing outer works or instating access to the lowest northern slopes of the spur.

Intrusive archaeological works would test the efficacy and validity of the results of the geophysical survey and aid to confirm the presence or absence of any archaeology resource on the site.

4.1 RECOMMENDATIONS ON MONUMENT MANAGEMENT AND FURTHER WORKS

Maintenance of the monument in its current condition and use seems like the most reasonable and effective management of the monument. It retains a community purpose and retains a relative equilibrium preventing bioturbation and erosion.

The surveys used in this work may indicate that any further geophysical investigation, by either more intensive and focused resistivity or GPR could, but probably won't, yield further significant results in identifying walls and structures.

A very small amount of community excavation (four to five targeted shallow test pits; targeting Anomaly Groups 2, 3, 5, E and the lower plateau), could clarify the results of this phase of work with limited impact to the integrity of the monument.

5.0 BIBLIOGRAPHY & REFERENCES

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https://map.cornwall.gov.uk/website/ccmap/ and http://www.heritagegateway.org.uk

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https://environment.data.gov.uk/DefraDataDownload/?Mode=survey

Kresen Kernow (KK):

Surveyors draft map for the Camelford area, *c.*1805
Minster Tithe Apportionment, *c.*1839
Minster Tithe Map, *c.*1839

National Library of Scotland (NLS):

Ordnance Survey 1st edition, 25 inch map, Sheet: Cornwall X.7, surveyed 1883, published 1884
Ordnance Survey 2nd edition, 25 inch map, Sheet: Cornwall X.7, revised 1905, published 1907

APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY

FIGURE 7: MAGNETOMETRY SURVEY GRID LOCATION AND NUMBERING.

FIGURE 8: RED-GREY-BLUE SHADE PLOT OF MAGNETOMETRY SURVEY DATA; BAND WEIGHT EQUALISED; GRADIATED SHADING.

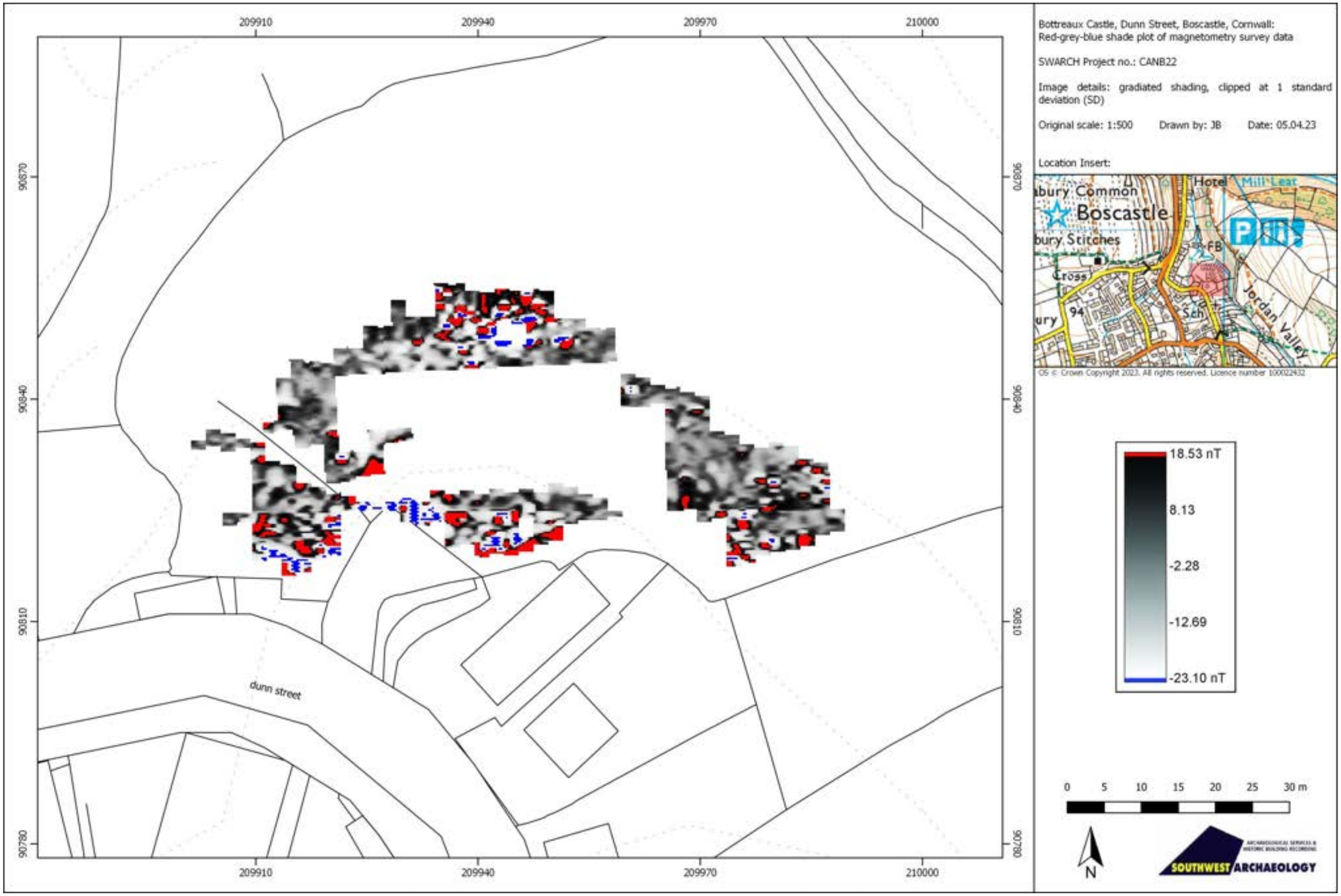


FIGURE 9: RED-GREY-BLUE SHADE PLOT OF MAGNETOMETRY SURVEY DATA; CLIPPED AT 1 STANDARD DEVIATION (SD).

FIGURE 10: RESISTIVITY SURVEY GRID LOCATION AND NUMBERING.

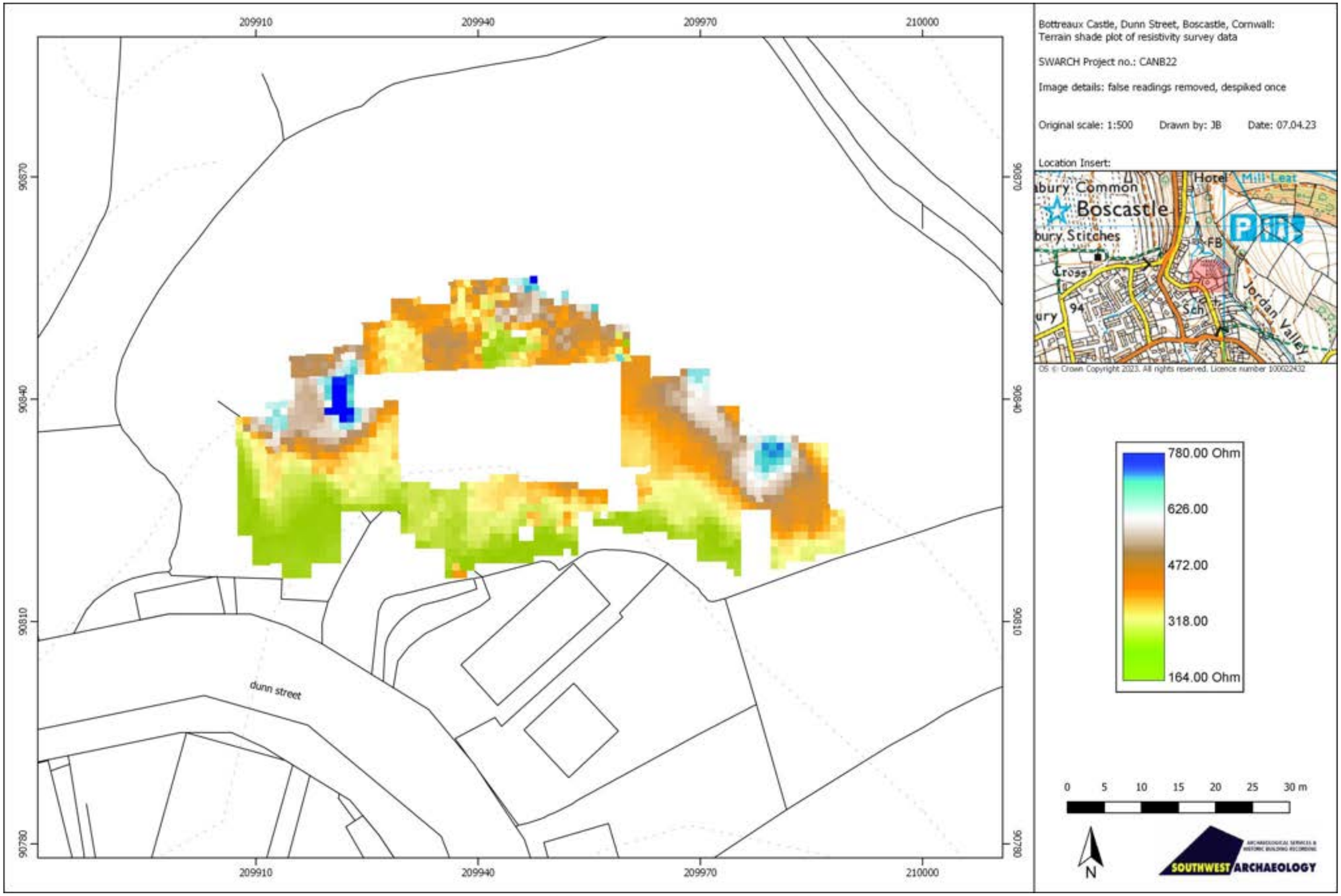


FIGURE 11: TERRAIN SHADE PLOT OF RESISTIVITY SURVEY DATA; DESPIKED ONCE.

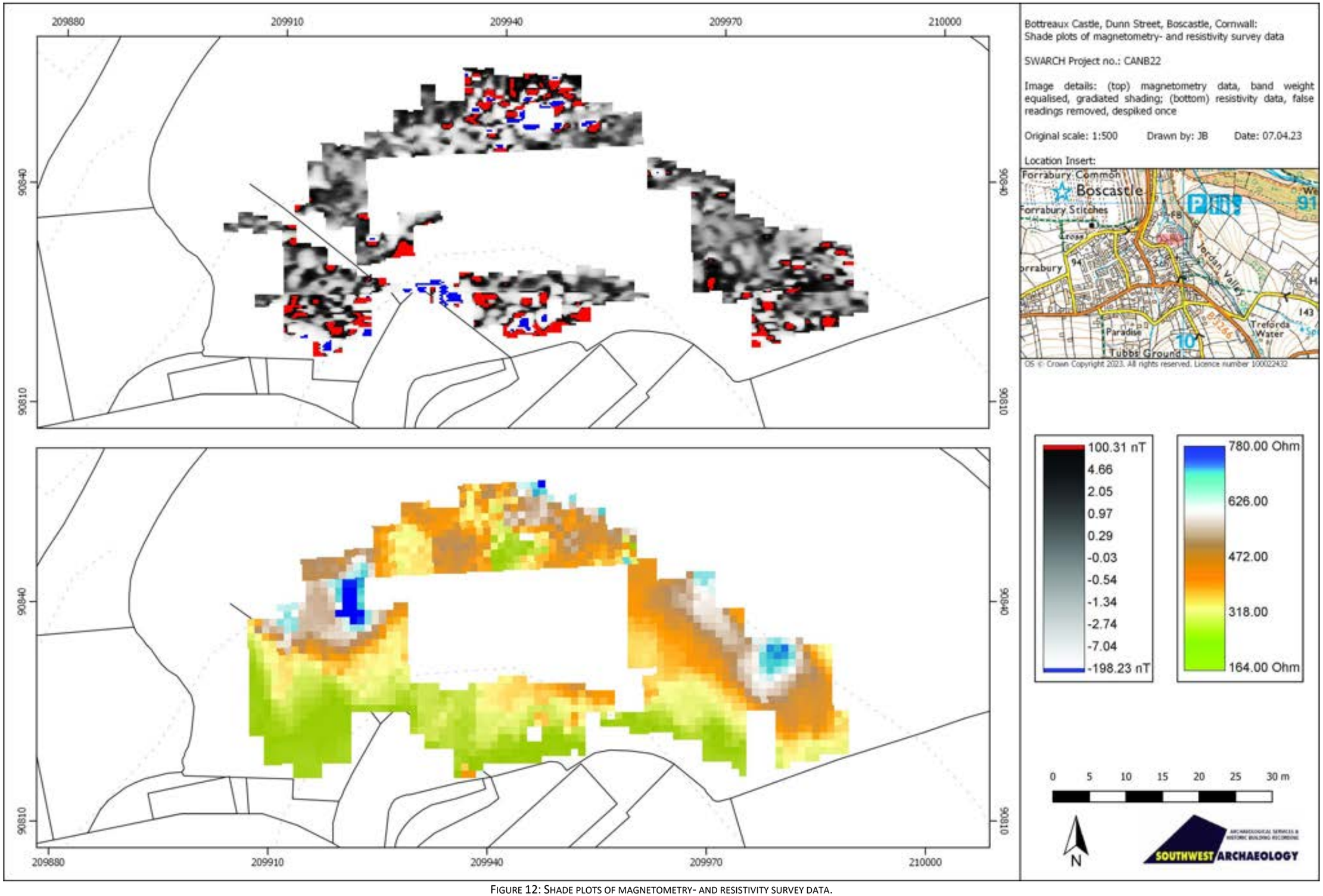


FIGURE 12: SHADE PLOTS OF MAGNETOMETRY- AND RESISTIVITY SURVEY DATA.

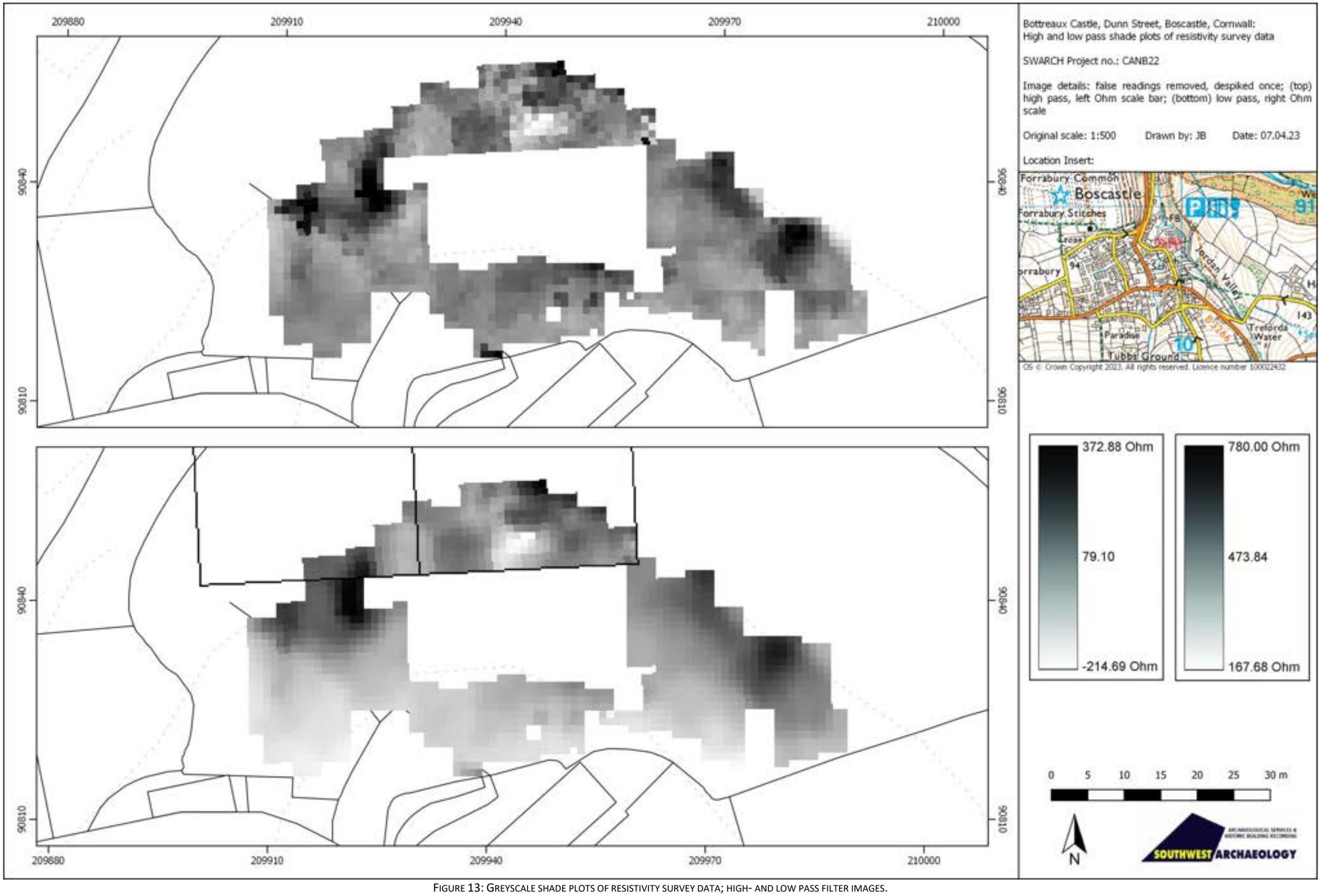


FIGURE 13: GREYSCALE SHADE PLOTS OF RESISTIVITY SURVEY DATA; HIGH- AND LOW PASS FILTER IMAGES.

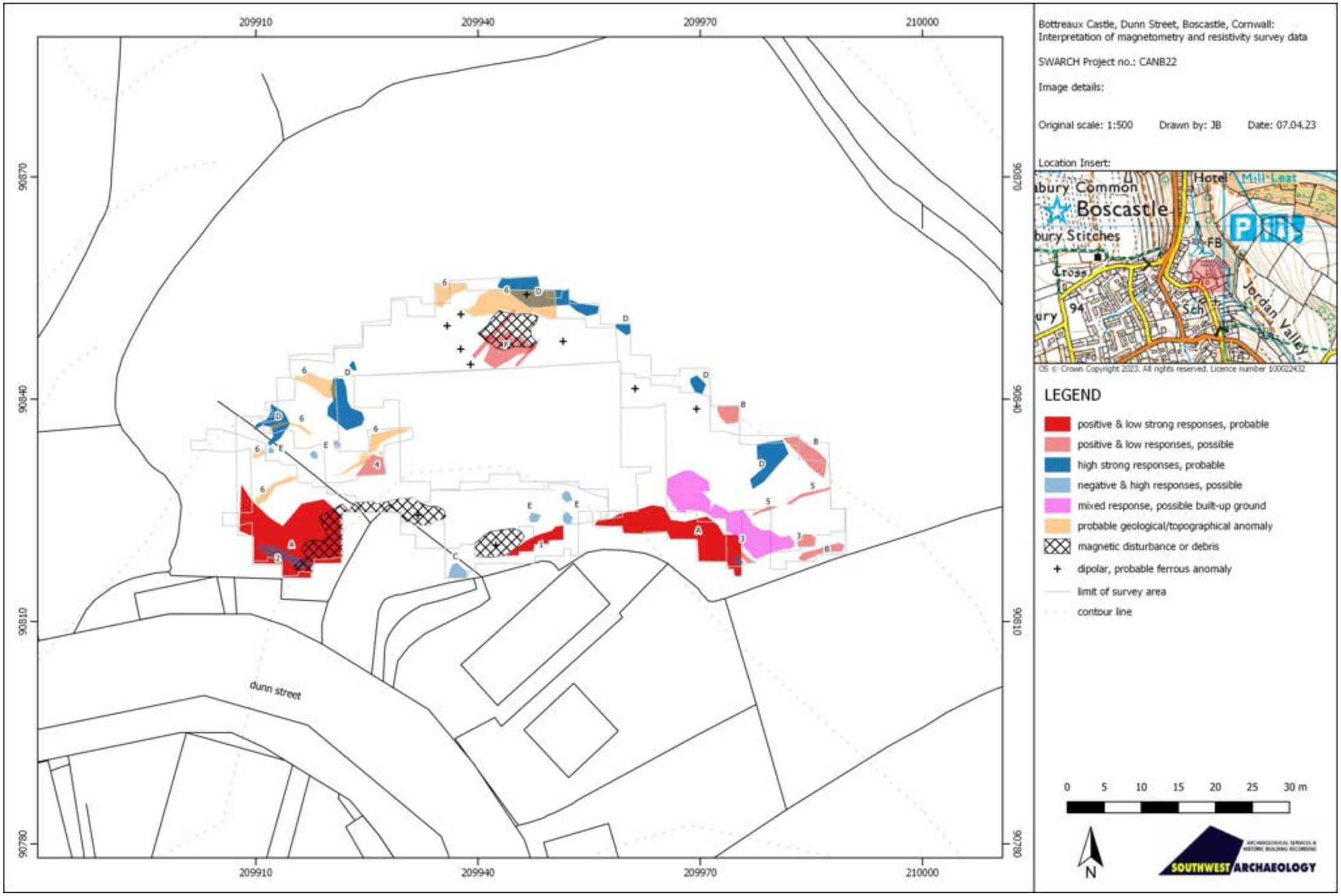


FIGURE 14: INTERPRETATION OF MAGNETOMETRY AND RESISTIVITY SURVEY DATA.

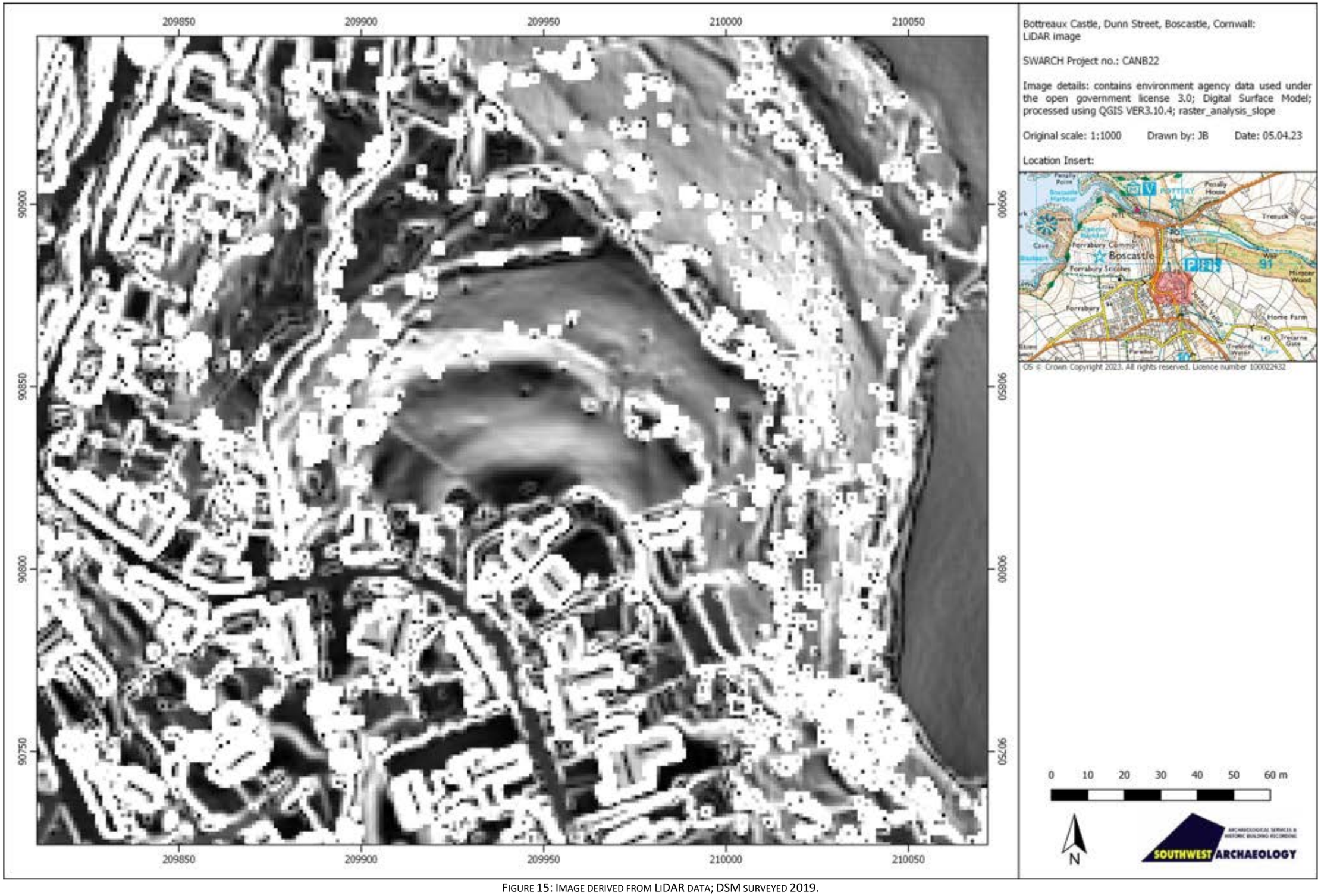


FIGURE 15: IMAGE DERIVED FROM LIDAR DATA; DSM SURVEYED 2019.

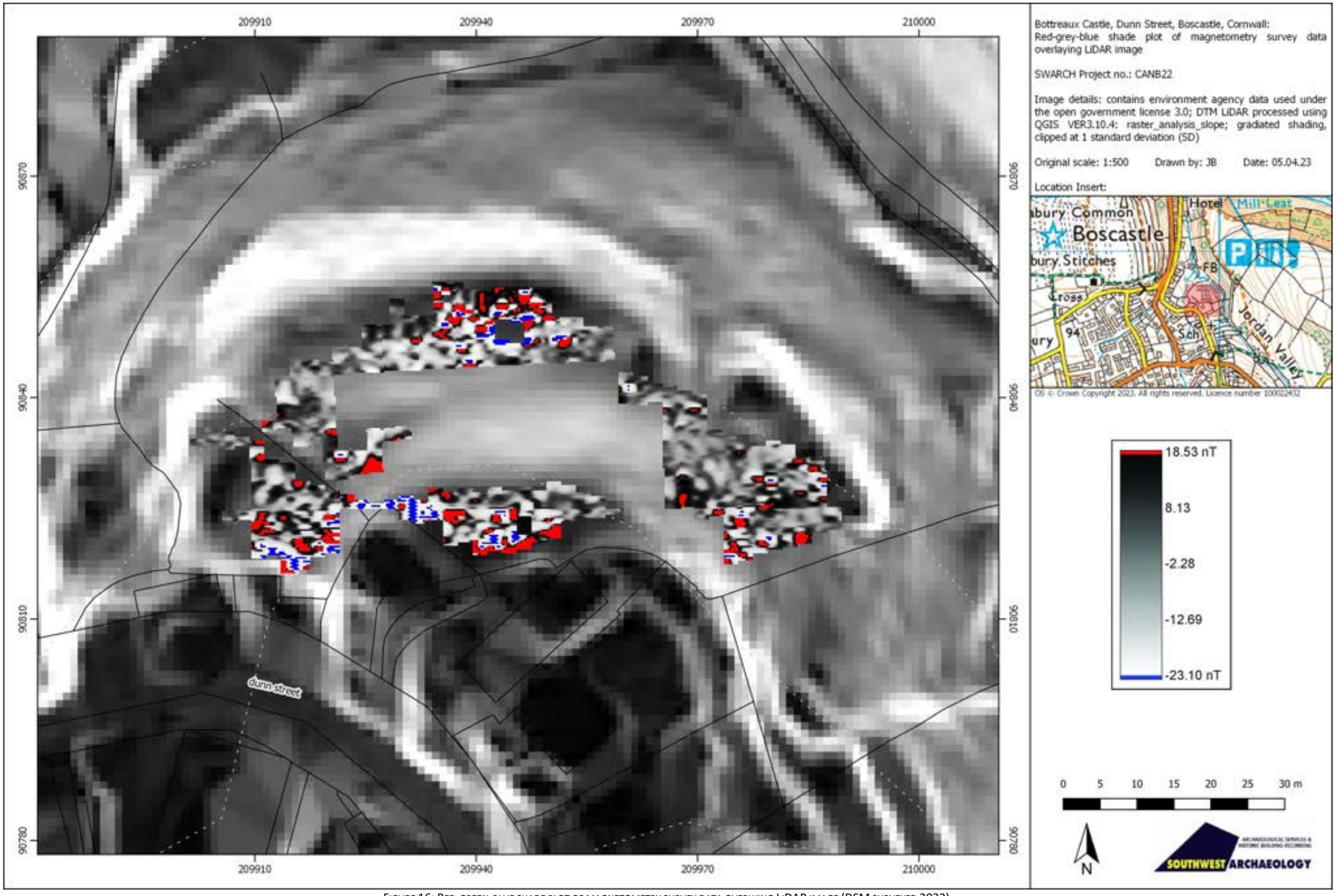


FIGURE 16: RED-GREEN-BLUE SHADE PLOT OF MAGNETOMETRY SURVEY DATA OVERLYING LIDAR IMAGE (DSM SURVEYED 2022).

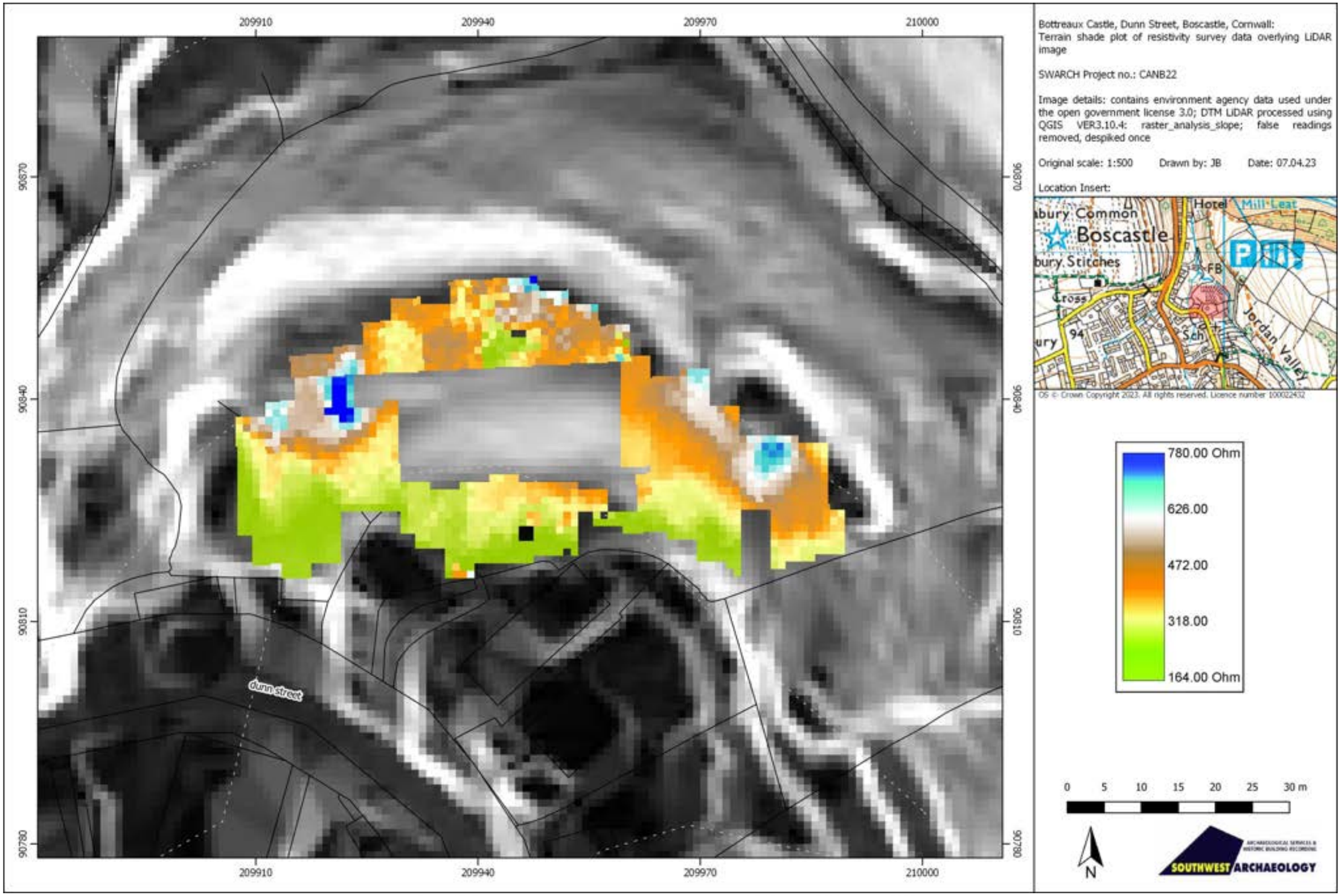


FIGURE 17: TERRAIN SHADE PLOT OF RESISTIVITY SURVEY DATA OVERLYING LIDAR IMAGE (DSM SURVEYED 2022).

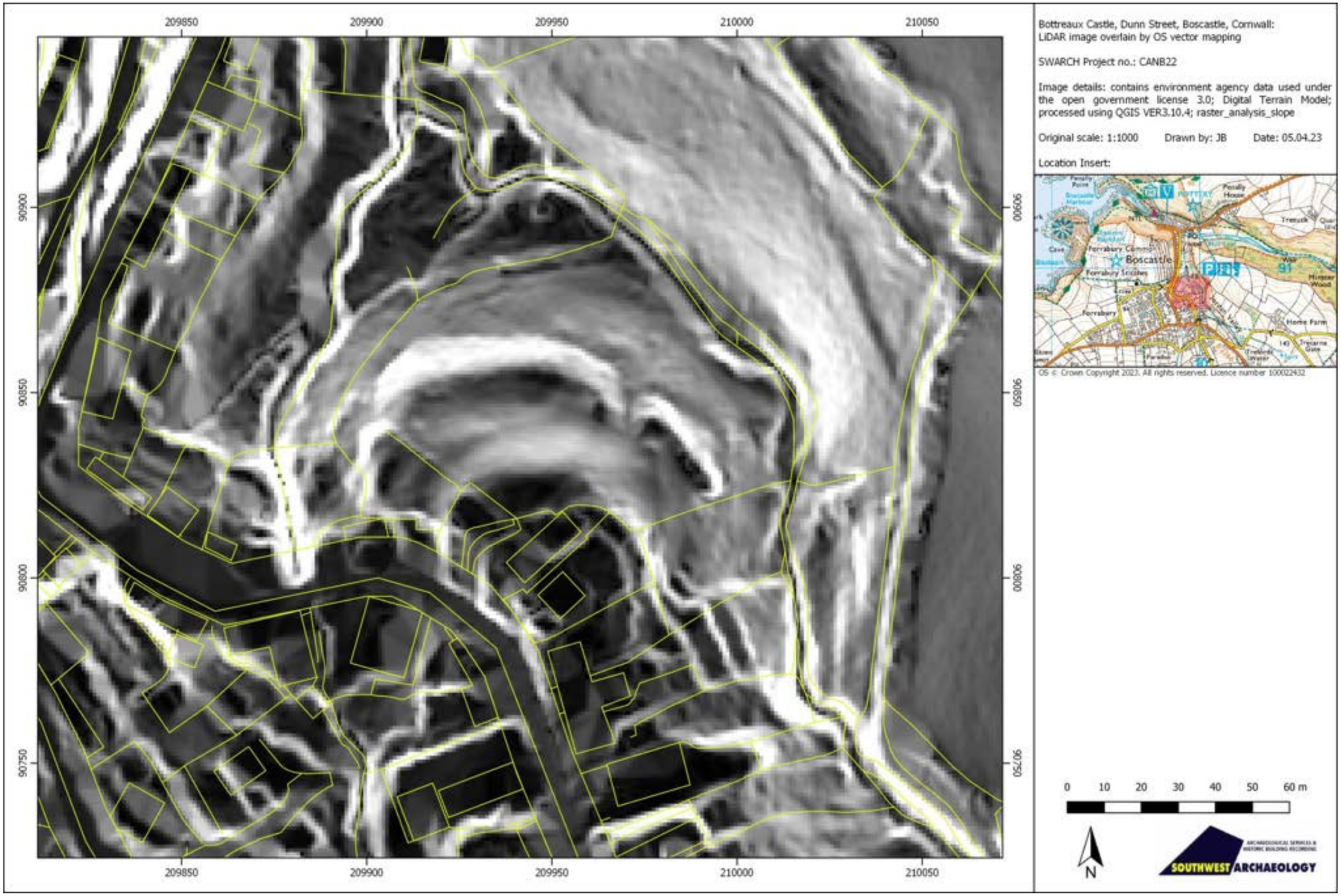


FIGURE 18: OS VECTOR MAPPING OVERLYING LIDAR IMAGE; ILLUSTRATES THE FIELD OF THE SITE AND ITS INTERNAL SLOPES AND PLATEAUS.

APPENDIX 2: SUPPORTING SOURCES

FIGURE 19: EXTRACT FROM THE SURVEYOR'S DRAFT MAP, *C.*1805; THE APPROXIMATE LOCATION OF THE SITE IS INDICATED (KK).

FIGURE 20: EXTRACT FROM THE *C.*1839 MINSTER PARISH TITHE MAP; THE APPROXIMATE LOCATION OF THE SITE IS OUTLINED IN RED (KK).

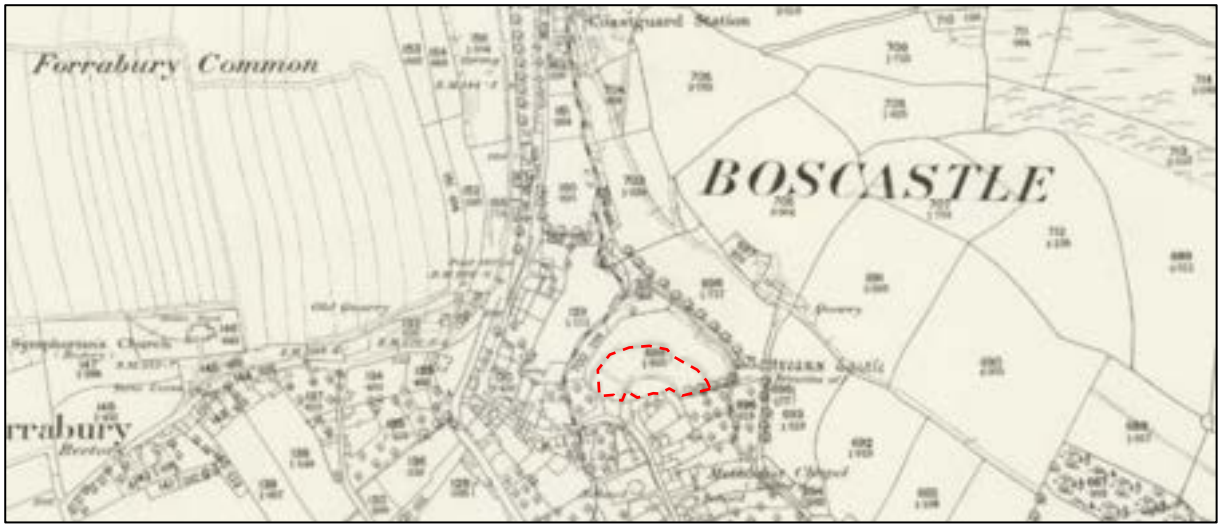


FIGURE 21: EXTRACT FROM THE ORDNANCE SURVEY 1ST EDITION, 25 INCH SERIES, PUBLISHED 1884; THE SITE IS OUTLINED IN RED (NLS).

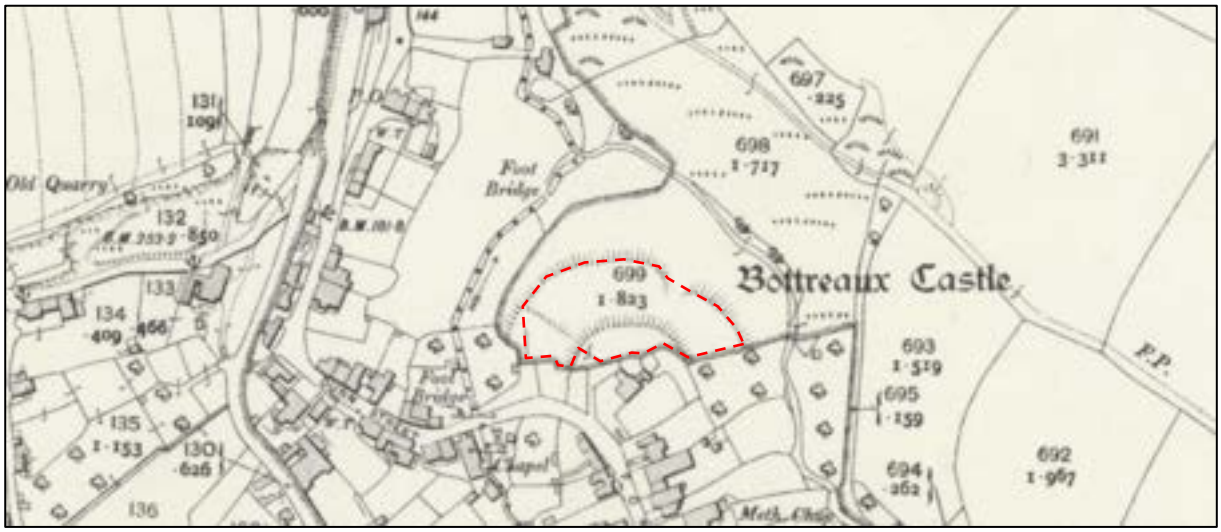


FIGURE 22: EXTRACT FROM THE ORDNANCE SURVEY 2ND EDITION, 25 INCH SERIES, PUBLISHED 1907; THE SITE IS OUTLINED IN RED (NLS).

Appendix 3: Supporting Photographs

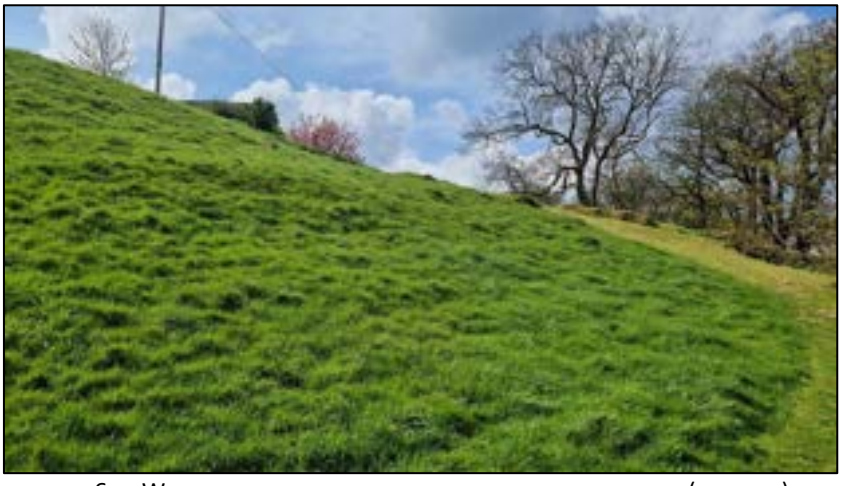
1. SOUTHERN BOUNDARY ON THE EASTERN SIDE OF THE SITE, SHOWING STONE WORK PROTRUDING FROM THE BOUNDARY; VIEWED FROM THE NORTH (NO SCALE).

2. WORN PATH IN THE SOUTH-EAST CORNER OF THE SITE, BESIDE THE SOUTHERN BOUNDARY; VIEWED FROM THE WEST (NO SCALE).

3. ACCESS IN THE NORTH-EAST PART OF THE SITE TO LOWER, WOODED PARTS OF THE MONUMENT; VIEWED FROM THE SOUTH-WEST (NO SCALE).

4. VIEW FROM THE EASTERN SLOPE OF THE SITE ACROSS THE LOWER PLATEAU; VIEWED FROM THE EAST (NO SCALE).

5. LOWER PLATEAU OF THE SITE; VIEWED FROM THE WEST (NO SCALE).



6. WESTERN SIDE OF THE SITE; VIEWED FROM THE NORTH-EAST (NO SCALE).

7. WEST SIDE OF THE SITE, SHOWING EARTHWORKS; VIEWED FROM THE NORTH (NO SCALE).

8. EARTHWORKS AND SOUTH-WEST PART OF THE SITE; VIEWED FROM THE NORTH (NO SCALE).

9. WAR MEMORIAL AND AREA IN THE SOUTH-WEST OF THE SITE; VIEWED FROM THE NORTH (NO SCALE).

10. DEVELOPED AREA AT THE TOP OF THE MOTTE; VIEWED FROM THE WEST (NO SCALE).

11. TELEGRAPH POLE AND SOUTHERN BOUNDARY WEST OF THE SITE ENTRANCE FROM DUNN STREET; VIEWED FROM THE NORTH (NO SCALE).

12. ACCESS FROM DUNN STREET IN THE SOUTHERN BOUNDARY OF THE SITE; VIEWED FROM THE NORTH (NO SCALE).

13. SITE ACCESS FROM DUNN STREET; VIEWED FROM THE SOUTH (NO SCALE).

14. VIEW OF PROPERTIES SOUTH OF THE SITE ON DUNN STREET DEMONSTRATING THE FALL OF THE SLOPE ON THE SPUR SOUTH OF THE SITE; VIEWED FROM THE NORTH-WEST).

15. VIEW OF PROPERTIES SOUTH OF THE SITE ON DUNN STREET DEMONSTRATING A PLATEAU OR RISE AT THE NORTH END OF THE SPUR AS OCCUPIED BY THE MOTTE AND PROPERTIES IMMEDIATELY SOUTH/ADJACENT TO THE SITE; VIEWED FROM THE SOUTH (NO SCALE).

APPENDIX 4: TECHNICAL SUMMARY TABLES OF SURVEY METHOD AND METADATA

TABLE 4: TECHNICAL SUMMARY OF MAGNETOMETRY SURVEY METHOD AND METADATA.

Site no.	Site Name	Site Type	Period	AONB Section
29	Bottreaux Castle	Motte and bailey Castle	Medieval	2. Pentire Point to Widemouth
Survey Type:	Magnetometry			
Equipment:	Twin sensor fluxgate gradiometer (Bartington Grad601) Leica CS15 GNSS Rover GPS			
Software:	Grad 601 - Version 3.16 TerraSurveyor - Version 3.0.36.0			
Instrument Settings / Parameters:	Survey Mode:	Grid Mode		
	Range:	100nT		
	Threshold:	2nT		
	Sensors:	2		
	Reject:	50 Hz		
Collection parameters:	Sample Intervals:	0.25m		
	Traverse Intervals:	1m		
	Traverse Pattern:	Zigzag		
	Traverse Direction:	South / 180°		
	Adjustment frequency:	0.5-1ha		
Lower Survey Area:				
Survey Size Metadata:	Individual Grid Size	30m x 30m		
	Composite Area:	0.36ha / 60m x 60m		
	Area Surveyed:	0.0452ha		
Raw Response Metadata:	Max.:	68.00nT		
	Min.:	-82.47nT		
	Standard Deviation:	7.46nT		
	Mean:	1.41nT		
	Median:	1.85nT		
Processed Response Metadata: pre-clipping	Max.:	66.24nT		
	Min.:	-81.35nT		
	Standard Deviation:	6.79nT		
	Mean:	0.03nT		
	Median:	0.00nT		
Processes:	DeStripe all traverses, median			
	DeStagger all traverses out- and inbound by 0.25m			
	Clip at +/- 2SD (Standard Deviation)			
Upper Survey Area:				
Survey Size Metadata:	Individual Grid Size	30m x 30m		
	Composite Area:	0.54ha / 60m x 90m		
	Area Surveyed:	0.0737ha		
Raw Response Metadata:	Max.:	98.42nT		
	Min.:	-100.00nT		
	Standard Deviation:	27.93nT		
	Mean:	-0.56nT		
	Median:	1.74nT		
Processed Response Metadata: pre-clipping	Max.:	100.31nT		
	Min.:	-198.23nT		
	Standard Deviation:	25.51nT		
	Mean:	-3.72nT		
	Median:	-0.01nT		
Processes:	DeStripe all traverses, median			
	DeStagger all traverses out- and inbound by 0.50m			

	Clip at +/- 1SD (Standard Deviation)	
Total Area Combined:		
Survey Size Metadata:	Individual Grid Size	30m x 30m
	Composite Area:	0.90ha
	Area Surveyed:	0.1189ha
Raw Response Metadata:	Max.:	98.42nT
	Min.:	-100.00nT
	Standard Deviation:	22.48nT
	Mean:	0.19nT
	Median:	1.81nT
Processed Response Metadata: pre-clipping	Max.:	100.31nT
	Min.:	-198.23nT
	Standard Deviation:	20.82nT
	Mean:	-2.28nT
	Median:	-0.00nT
Processes:	DeStripe all traverses, median	
	DeStagger all traverses out- and inbound by 0.25m (Grids a2-a4); 0.50m (Grids a5-a7, a10-a11)	
	Clip at +/- 1SD (Standard Deviation)	

TABLE 5: TECHNICAL SUMMARY OF RESISTIVITY SURVEY METHOD AND METADATA.

Site no.	**Site Name**	**Site Type**	**Period**	**AONB Section**
29	Bottreaux Castle	Motte and bailey Castle	Medieval	2. Pentire Point to Widemouth
Survey Type:	Resistivity			
Equipment:	Geoscan Research RM15-D Resistivity Meter with MPX15 multiplexer module Four sensor PA20 mulitprobe array system at 0.5m probe spacing Leica CS15 GNSS Rover GPS			
Software:	TerraSurveyor - Version 3.0.36.0			
Instrument Settings:	Survey / Log Mode:	Parallel Twin Log Mode 2		
	Gain:	x1		
	Current:	1 mA		
	Frequency:	137 Hz		
	Output Voltage:	40 V		
	Auto-log Speed:	Medium		
	High Pass Filter:	13 Hz		
	Mains Frequency:	50 Hz		
	Hardware:	PA5		
	Interface:	MPX15		
	Log Mode:	Parallel Twin		
	# Parallel Reads:	2 (4P)		
	Baud Rate:	9600		
Collection parameters:	Sample Intervals:	1m		
	Traverse Intervals:	1m		
	Traverse Pattern:	Zigzag		
	Traverse Direction:	South / Grid North / 0°		
	Remote Probe Spacing:	Between 0.5m and *c.*1.5m		
Lower Survey Area:				
Survey Size Metadata:	Individual Grid Size	30m x 30m		
	Composite Area:	0.18ha / 30m x 60m		
	Area Surveyed:	0.0372ha		
	Max.:	1023.50 Ohm		
	Min.:	430.00 Ohm		

Response Metadata: post replace	Standard Deviation:	71.66 Ohm
	Mean:	609.49 Ohm
	Median:	610.00 Ohm
Processed Response Metadata: post-clipping	Max.:	817.00 Ohm
	Min.:	441.00 Ohm
	Standard Deviation:	60.96 Ohm
	Mean:	607.90 Ohm
	Median:	610.75 Ohm
Processes:	DeSpike threshold 1 window size 3×3, once	
	High Pass filter with Gaussian weighted window 21x21 intervals	
	Low Pass filter with Gaussian weighted window 3x3 intervals	
Upper Survey Area:		
Survey Size Metadata:	Individual Grid Size	30m x 30m
	Composite Area:	0.54ha / 60m x 90m
	Area Surveyed:	0.1394ha
Response Metadata: post replace	Max.:	1958.00 Ohm
	Min.:	16.50 Ohm
	Standard Deviation:	192.42 Ohm
	Mean:	426.87 Ohm
	Median:	0.00 Ohm
Processed Response Metadata: post-clipping	Max.:	882.00 Ohm
	Min.:	164.00 Ohm
	Standard Deviation:	152.19 Ohm
	Mean:	416.16 Ohm
	Median:	375.22 Ohm
Processes:	Search and Replace -2047.5 and 1920 with Dummy	
	DeSpike threshold 1 window size 3×3, twice	
	Clip from 164.00 to 882.00 Ohm	
	Mask for all layers	
	High Pass filter with Gaussian weighted window 21x21 intervals	
	Low Pass filter with Gaussian weighted window 3x3 intervals	
Total Area Combined:		
Survey Size Metadata:	Individual Grid Size	30m x 30m
	Composite Area:	0.81ha / 90m x 90m
	Area Surveyed:	0.1766ha
Response Metadata: post replace	Max.:	1958.00 Ohm
	Min.:	16.50.00 Ohm
	Standard Deviation:	188.94 Ohm
	Mean:	467.45 Ohm
	Median:	450.50 Ohm
Processed Response Metadata: post-clipping	Max.:	780.00 Ohm
	Min.:	164.00 Ohm
	Standard Deviation:	155.90 Ohm
	Mean:	459.02 Ohm
	Median:	452.00 Ohm
Processes:	Search and Replace -2047.5 and 1920 with Dummy	
	DeSpike threshold 1 window size 3×3, twice	
	Clip from 163.00 to 780.00 Ohm	
	Mask for all layers	
	High Pass filter with Gaussian weighted window 21x21 intervals	
	Low Pass filter with Gaussian weighted window 3x3 intervals	

THE OLD DAIRY
HACCHE LANE BUSINESS PARK
PATHFIELDS BUSINESS PARK
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