

POLURRIAN VILLAS MULLION CORNWALL

Results of a Geophysical Survey



South West Archaeology Ltd. Report no 170420



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Polurrian Villas, Mullion, Cornwall Results of a Geophysical Survey

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Work undertaken by SWARCH for Darren Healey of 3MS Construction (the Client)

SUMMARY

South West Archaeology Ltd. (SWARCH) was commissioned to undertake a geophysical (Resistivity) survey, and for related off-site analysis and reporting on land at Polurrian Villas, Mullion, Cornwall to attempt to locate former building footing trenches believed to have been excavated approximately ten years ago.

The results of the geophysical survey showed areas of made-ground and natural geology with six possible linear anomalies that may be associated with buried groundworks. However, other than the made-up ground at the north end of the site, interpretations as to the meanings of the resistivity survey data are speculative at best and suspected footing trenches cannot be conclusively identified.

Any future proposed development of the site is unlikely to disturb any potential archaeological deposits.

Intrusive survey (excavation) of the site is needed to accurately identify and locate any potential existing groundworks on the site.



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CONTENTS

<i>SUMMARY</i>	2
<i>CONTENTS</i>	3
<i>LIST OF FIGURES</i>	3
<i>LIST OF TABLES</i>	3
<i>LIST OF APPENDICES</i>	4
<i>ACKNOWLEDGEMENTS</i>	4
<i>PROJECT CREDITS</i>	4
1.0 INTRODUCTION	5
1.1 PROJECT BACKGROUND	5
1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND	5
1.3 HISTORICAL BACKGROUND	5
1.4 ARCHAEOLOGICAL BACKGROUND	6
1.5 METHODOLOGY	7
2.0 RESISTIVITY SURVEY	9
2.1 INTRODUCTION	9
2.2 SITE INSPECTION	9
2.3 METHODOLOGY	9
2.4 RESULTS	10
2.5 DISCUSSION	13
3.0 CONCLUSION	14
4.0 BIBLIOGRAPHY	15

LIST OF FIGURES

COVER PLATE: THE SITE FROM ITS SOUTH-EAST CORNER; LOOKING NORTH-WEST (NO SCALE).

FIGURE 1: SITE LOCATION (THE SITE IS INDICATED).	8
FIGURE 2: SHADE PLOT OF RESISTIVITY SURVEY DATA; RED-GREEN-BLUE(2), BAND WEIGHT EQUALISED.	11
FIGURE 3: INTERPRETATION OF RESISTIVITY SURVEY DATA.	12
FIGURE 4: THE SITE FROM ITS SOUTH-WEST CORNER; LOOKING NORTH.	16
FIGURE 5: THE SITE FROM ITS SOUTH-WEST CORNER; LOOKING EAST.	16
FIGURE 6: THE SITE FROM ITS SOUTH-EAST CORNER; LOOKING WEST.	16
FIGURE 7: SITE GRID LOCATION AND NUMBERS; GREY-SCALE IMAGE OF RESISTIVITY SURVEY DATA.	17
FIGURE 8: RESISTIVITY SURVEY PROCESSING AND INTERPRETATION SUMMARY.	18
FIGURE 9: ORDNANCE SURVEY SURVEYOR'S DRAFT MAP FOR THE HELSTON AREA, 1811 (BL).	19
FIGURE 10: MULLION TITHE MAP, 1841 (CRO).	19
FIGURE 11: HARVEYS MAP, 1875 (HARVEY 1875).	20
FIGURE 12: ORDNANCE SURVEY 1 ST EDITION, 25 INCH SERIES, SURVEYED 1877, PUBLISHED 1879.	20
FIGURE 13: ORDNANCE SURVEY 2ND EDITION, 25 INCH SERIES, SURVEYED 1906, PUBLISHED 1907.	21

LIST OF TABLES

TABLE 1: INTERPRETATION OF RESISTIVITY SURVEY DATA.	10
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LIST OF APPENDICES

APPENDIX 1: SUPPORTING PHOTOGRAPHS: SITE INSPECTION	16
APPENDIX 2: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY	17
APPENDIX 3: CARTOGRAPHIC SOURCES	19

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1.0 INTRODUCTION

LOCATION:	POLURRIAN VILLAS (LAND ADJACENT TO HOTEL POLURRIAN)
PARISH:	MULLION
COUNTY:	CORNWALL
NGR:	SW 67087 18760
SWARCH REF:	MPV17

1.1 PROJECT BACKGROUND

South West Archaeology Ltd. (SWARCH) was commissioned by Darren Healey of 3MS Construction (the Clients) to undertake a geophysical survey, and for related off-site analysis and reporting on land at Polurrian Villas, Mullion, Cornwall to attempt to locate former footing trenches believed to have been excavated approximately ten years prior. This work was carried out in accordance with ClfA guidelines.

1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND

The site is a sub-rectangular field (c.2,750m²) immediately east of Hotel Polurrian, towards the south-west of Mullion, atop the cliffs that over look Polurrian Bay (Figure 1) at a height of approximately 65m AOD.

The soils of the site are the well-drained fine loamy soils over deeply weathered rock of the Trusham Association (SSEW 1983), overlying the schist, hornblende of the Traboe Hornblende-schist (lizard Complex) Formation (BGS 2014).

1.3 HISTORICAL BACKGROUND

Mullion is a parish and village approximately 7km south of Helston. It is in the deanery and west division of the hundred of Kirrier (Lysons 1814). During the times of the Domesday Book (c.1086) Mullion was within the Hundred of Winnianton, which covered the Lizard peninsular and areas north-west of Helston and north of Penryn and the manors were held between Earl Harold, seventeen thanes and three other nobles. Within the modern parish of Mullion were two Domesday manors; Garah (Garuerot), which was held by Godwine; and closer to the site, Trenance (Trenant), which was held by Blechu (Williams and Martin 2002). Trenance still exists today, although had at some point been subsumed by other/later estates.

Approximately 2km south of the site was the manor of Pradannack; which had belonged to the Serjeaux family from whom it passed by a co-heiress to the Veres family, the Earls of Oxford and then the Robartes family until c.1600. In 1814 the manor (Pradannack-Wartha and Predannack-Wollas) belonged to Mrs. Agar, as a representative of the Robartes family and Rev. Sir Carew Vyvyan, Bart. Approximately 1.9km north-east of the site was the manor of Clahar, which in 1814 belonged to Lord Viscount Falmouth (Lysons 1814).

A detailed history and description of Mullion was recorded in 1875 by the Vicar E.G. Harvey in "Mullyon: its history, scenery and antiquities; narratives of shipwrecks on its coast; its agriculture, fisheries and mining; tales of the days of wrecking and smuggling; longevity of its inhabitants; names of places, their true Cornish renderings and significations".

Shipwrecks frequently occurred along the coast line adjacent to Mullion until the construction of the Wolf Rock lighthouse in 1871 and such events probably contributed to smuggling in this part of Cornwall (genuki 2017 – source; Harvey 1875 and Polsue 1873). In 1873 the Vicar of the parish church wrote, "*In six years and a quarter there have been nine wrecks, with a loss of 69 lives, under Mullion Cliffs, on a bit of coast line not more than a mile and a half in length.*" (Polsue 1867-1873). Poldhu, slightly north of the site and on the western edge of Mullion received the first morse telegraph signal across the Atlantic in 1901 at the Marconi Wireless Telegraphy Station (genuki 2017). The population rose from 529 in 1801 to 808 in 1841 and then fell to 607 in 1881 before beginning to rise again to over 2000 inhabitants today. The slight decline in the second half of the 19th century may reflect the fortunes of the copper mine now on the site of Hotel Polurrian.

The place name *Polurrian* is derived from the Cornish *pol* meaning 'cove' (Padel 1985) and an unknown element that may be associated with the Saints name Ruan, which can be found in place-names to the south-east of the site on the Lizard.

According to the 1844 tithe apportionment and 1841 tithe map the site was part of Great Trenance, for which the Honourable A.M. Ager held the freehold and five individuals held the lease; William Thomas, Joseph Thomas, Thomas Foxwell, William Jose and Jeremiah Jose. It had a coparcenary ownership and was called 'Morrops', which comes from the Cornish *mōr ryp* for 'beside the sea' (Harvey 1875).

1.4 ARCHAEOLOGICAL BACKGROUND

No archaeological work has been conducted previously on the site.

The site lies within land recorded on the Cornwall and Scilly Historic Environment Record as 'Farmland: Medieval' - *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, by the Cornwall Council Historic Landscape Characterisation (HLC).*

The Cornwall Historic Environment Record (HER) records several heritage assets within 1km of the proposed development site. Prehistoric assets include: flint flakes, cores, scappers and nodules indicative of a flint working site in the fields near Polurrian cliff castle (HER No.10548); a stone axe found at Polurrian beach (10678); Fragments of Bronze Age cinerary urns were found near Mullion, north of the site and given to Truro museum in 1927 (10666); a Bronze Age barrow was demolished at Angrouse, north-west of the site (10542); a possible barrow (10661), the cropmark of a possible 'round' (169924) and enclosures and boundaries (15415, 51417 and 51418) have been located predominantly via aerial photography near to Trembel; and field name evidence near Polurrian cove, 'Park Kistall' and 'Crigger' may indicate the location of an Iron Age 'round' (10547) and to the east of the site 'Crick Mangan' may indicate the site of a barrow. Early medieval assets include: the settlement at Trenance, first recorded in 1086 (10532); earthworks of parallel field boundaries visible on aerial photography to the south-east of the site near Croft Corner (51405); the possible pre-conquest church at Mullion (10693.10). Medieval assets include: to the north, settlements at Angrouse first recorded in 1317 (10520), which now has a Grade II Listed 18th century cottage; and Meres first recorded in 1327 (10526); and documentary evidence for crosses at Angrouse (10541 and 10520.10) and a cider press (10692); to the north-east, settlements at Lafrowder first recorded in 1314 (10524) and Mullion first recorded in the 13th century (10527); Mullion contains five Grade II Listed Buildings and the mostly 15th century, although first recorded in 1262, Grade I Listed church, dedicated to St Melaine/Melan from which the settlement takes its name (10693); the church yard contains crosses (106048 and 169695), one of which is Grade II Listed; to the east, settlements at Trembel first recorded in 1525 (10531), Trenance Veian first recorded in 1289 (10533), near to which

is the Grade II* Listed Parc Venton 19th century house and Garah first recorded in 1201 (10523); and to the south, a chaple, possibly licensed in 1386, on a 1694 Trenance Vean Estate Map (10550); and field systems evident on the 1841 tithe map (4101-4101.40). Various post-medieval and modern structures are located in Mullion and along the coast-line, however of significance are the World War II beach defences to the north of the site, at Polurrian Beach that include an anti-tank invasion wall (51409 and 166566) and the Wheal Fenwick mine that supplied copper, tin and arsenic and was labelled as 'disused' on the 1879 1st edition Ordnance Survey map (178237). A shaft of Fenwick mine would be located at the south end of Hotel Polurrian, possibly beneath the existing tennis courts.

1.5 METHODOLOGY

The resistivity survey follows the guidance outlined in *Geophysical Survey in Archaeological Field Evaluation* (English Heritage 2008) and *Standard and Guidance for Archaeological Geophysical Survey* (ClfA 2014b).

'Archaeological geophysical survey uses non-intrusive and non-destructive techniques to determine the presence or absence of anomalies likely to be caused by archaeological features, structures or deposits, as far as reasonably possible, within a specified area or site on land, in the inter-tidal zone or underwater. Geophysical survey determines the presence of anomalies of archaeological potential through measurement of one or more physical properties of the subsurface.' (Standard and Guidance for Archaeological Geophysical Survey 2014).

The results of the survey will as far as possible inform on the presence or absence, character, extent and in some cases, apparent relative phasing of buried archaeology to inform a strategy to mitigate any threat to the archaeological resource.



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

2.0 RESISTIVITY SURVEY

2.1 INTRODUCTION

The purpose of this survey was to identify and record anomalies of relative resistance within the proposed site. While the anomalies may relate to archaeological deposits and structures, the dimensions of recorded anomalies may not directly correspond with any associated archaeological features. The following discussion attempts to clarify and characterise identified anomalies. The survey was undertaken on the 10th of April 2017 by J. Bampton and L. Lichtenstein in sunny conditions. The survey data was processed by J. Bampton. An area of approximately 0.24ha was surveyed.

The survey identified five groups of anomalies. These included probable in-filled cut features associated with an earlier proposed development, linear anomalies associated with drainage or geological striations, made-ground and an area of natural geology. Group 1 represents three linear anomalies; probable in-filled cut features associated with an earlier proposed development. Group 2 represents three linear anomalies set at right-angles associated with drainage or geological striations. Groups 3 and 4 represent made-grounds; Group 3 consisting of more stony or compacted natural deposits and Group 4 consisting of a more loose or soil based deposit. Group 5 represents an area of high resistance indicative of relatively solid natural geology that has been exposed and buried during terracing of the site for earlier development. The south west corner of the site appeared to have been disturbed and perhaps buried over. The typical response of the underlying geology when the array probes were placed within c.1m of each other was c.43-63 Ohms, which could be corrected based on the distance between the probes.

2.2 SITE INSPECTION

The site was comprised of a field that had been made level and used as a playing field. The ground on the site appeared to have been cut-away/terraced into the south-east corner of the site and made-up along the northern end and western half of the site. It had a modern fence line along its southern boundary, beyond which was a house and garden; it had a stone faced hedgebank along its eastern boundary, beyond which were fields and the southern half of the eastern boundary had a bank up to the hedgebank and the north end had scrub and dived down slightly to the hedgebank; its northern boundary was defined by a slope of made-ground that fell away to a natural slope that ran down to a water course and valley and contained scrub; its western boundary consisted of a battered grass slope that met the top of a c.1m high retaining wall along which a tarmac drive associated with Hotel Polurrian was instated. The top of this wall may represent the original ground level along this part of the site. The south-east corner of the site appeared to have more scrub underfoot than most of the playing field and it was accessed via a gap in the retaining wall in the south-west corner of the site. No earthworks were visible on the ground. A compliment of supporting photographs of the site can be seen in Appendix 1.

2.3 METHODOLOGY

The resistivity survey follows the general guidance as outlined in: *Geophysical Survey in Archaeological Field Evaluation* (English Heritage 2008) and *Standard and Guidance for Archaeological Geophysical Survey* (CIfA 2014b).

The 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 system and using the Wenner method to calculate soil resistivity.

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 20x20m. The survey grid was tied into the Ordnance Survey National Grid. The data was downloaded onto- and processed using *TerraSurveyor Version 3.0.25.0*. The primary data plots and analytical tools used in this analysis were *Shade* and *Metadata*. The details of the data processing are as follows:

Processes: Edge match to bottom edge (bottom 19, right 59); DeSpike threshold 1 window size 3x3, twice; Clip from 10.00 to 109.00 Ohm.

Details: 0.2347ha surveyed; Max. 100.92 Ohm, Min. 40.00 Ohm; Standard Deviation 8.78nT, mean 50.44 Ohm, median 48.15 Ohm.

2.4 RESULTS

Table 1 with the accompanying Figures 2 and 3 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 2.

*note on 'Class':

- Negative responses refer to readings of lesser relative resistance and represent in-filled cut features or relatively soft deposits.
- Positive responses refer to readings of higher relative resistance and represent built/compact stony features or relatively hard deposits.

In this instance readings of below c.50Ohms are considered negative responses; and above c.50Ohms, positive responses.

Anomaly group	Class and Certainty	Form	Archaeological Characterisation	Comments
1	Negative, probable	Linear	Man-made trenches, footings or drainage	Probably associated with an earlier proposed development. Approximately aligns with earlier proposed footing trenches. Responses vary between +400hm and +40hm (representative).
2	Negative, possible	Linear	Man-made trenches, drainage	Possibly associated with the same earlier proposed development as Group 1 or drainage associated with the site as a playing ground. Responses vary between +430hm and +470hm (representative).
3	Positive, probable	Amorphous	Made-ground	Made-ground of probable stony or compacted rocky natural material. Responses vary between +490hm and +570hm (representative).
4	Negative, probable	Amorphous	Made-ground	Made-ground of probable soft or loose, probably soil based material. Responses vary between +400hm and +44hm (representative).
5	Positive, possible	Amorphous	Natural geology	Visible as the result of terracing the south-east corner of the site for an earlier development. Responses vary between +620hm and +100hm (representative).

TABLE 1: INTERPRETATION OF RESISTIVITY SURVEY DATA.

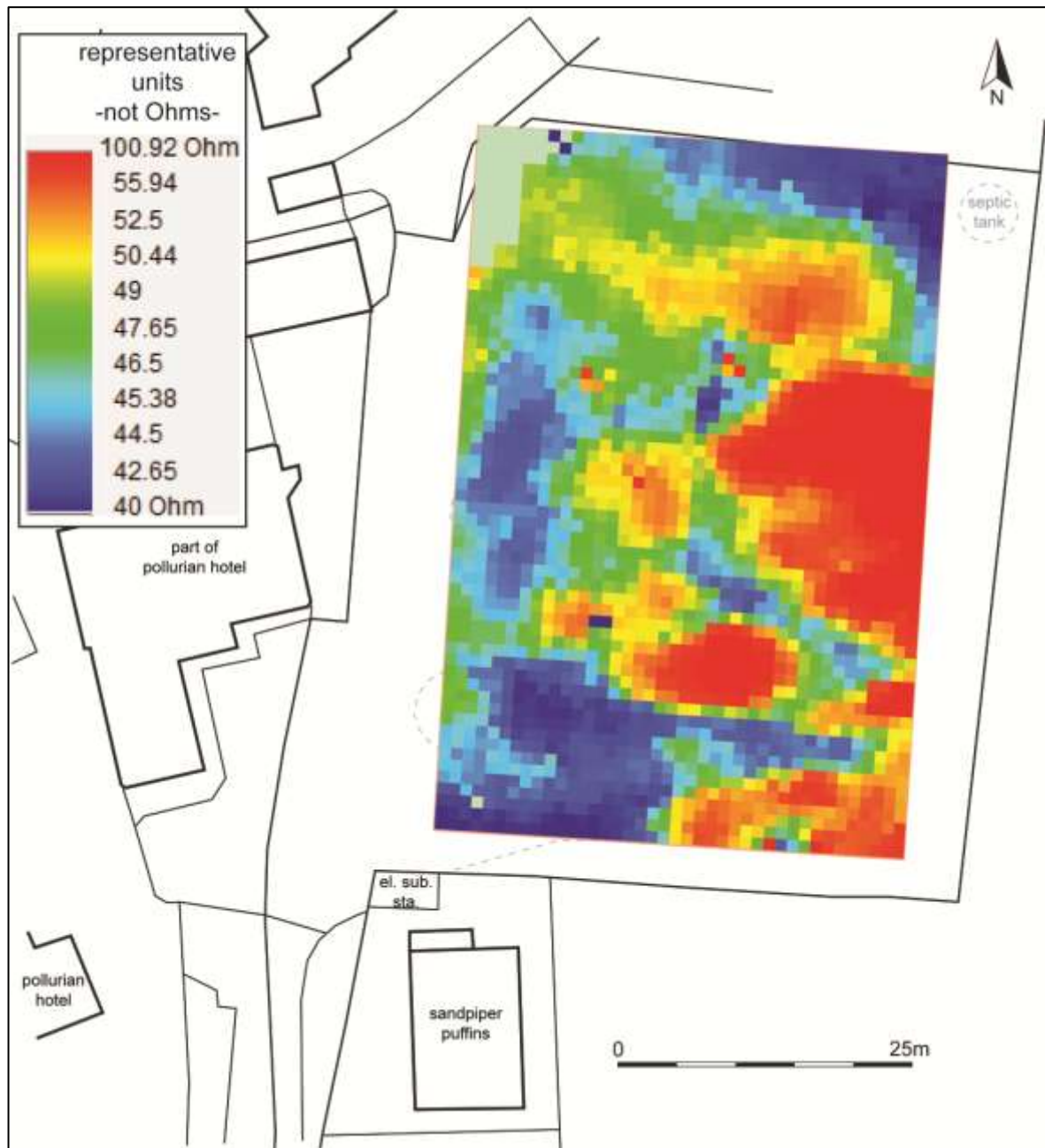


FIGURE 2: SHADE PLOT OF RESISTIVITY SURVEY DATA; RED-GREEN-BLUE(2), BAND WEIGHT EQUALISED.

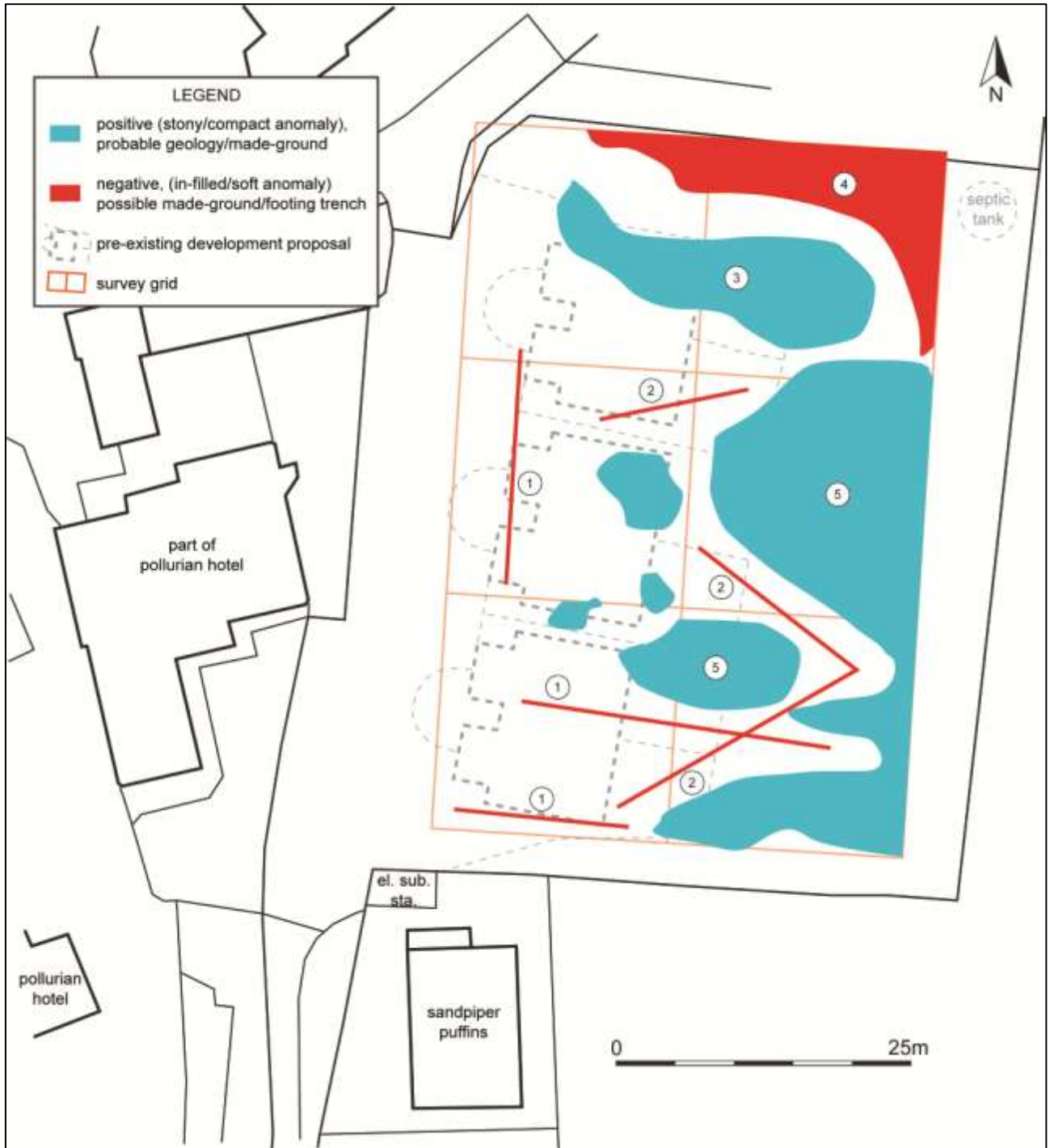


FIGURE 3: INTERPRETATION OF RESISTIVITY SURVEY DATA.

2.5 DISCUSSION

The survey identified five groups of anomalies. These were generally undated linear anomalies, and spreads of made-ground and natural geology. None of the groups are represented on the cartographic record. Cartographic and visual sources supporting the discussion and comments can be seen in Appendices 1 and 3.

Group 1 are three (+40 to +44Ohms) negative linear anomalies indicative of cut features such as ditches or possibly drains. These may represent the in-filled trenches of footings or drains associated with an earlier building proposal, the layout of which can be seen in Figure 3.

Group 2 are three (+43 to +47Ohms) negative linear anomalies indicative of cut features such as ditches or possibly drains. These may represent trenches or drains associated with Group 1 or drainage of the site as a playing field; aligned north-east to south-west and north-west to south-east.

Group 3 is an (+43 to +57Ohms) amorphous positive anomaly indicative of a spread of compact and/or stony material, which may include redeposited natural rock. This made-ground was used to make the site level towards its northern end.

Group 4 is an (+40 to +44Ohms) amorphous negative anomaly indicative of a spread of loose or soil based material. This made-ground was used to make the site level at its northern end.

Group 5 is an (+62 to +100Ohms) amorphous positive anomaly indicative of relatively solid natural geology, which has been cut into during terracing of the south-east and east edge of the site. The removed material was then probably used to make-up and level the rest of the site and may account for the Group 3 response.

The south west corner of the site appeared to have been disturbed and perhaps buried over.

The majority of the site appears to have been disturbed during groundworks associated with its terracing and levelling for an earlier development that resulted in a playing field. Any made-ground beyond a depth of c.1m will have obscured any archaeological deposits, unless they cut this modern made ground, which according to cartographic evidence can only have occurred in the last century. Photographs show a small, c.1m high, retaining wall along the western edge of the site, which may represent the original ground level with a road cut to its west and a battered c.1m high slope of made-ground to its east, across the site. The levelling of the site most probably occurred during ground works associated with an earlier development proposal, which may have had footings laid prior to being abandoned. Anecdotal evidence suggests that a housing plot was begun in the south-west corner of the site, which may account for the southern examples of Group 1 and the generally negative response spread across this area.

3.0 CONCLUSION

The results of the geophysical survey show areas of made-ground and natural geology with six possible linear anomalies that may be associated with buried groundworks. However, other than the made-up ground at the north end of the site, interpretations as to the meanings of the resistivity survey data are speculative at best and suspected footing trenches cannot be conclusively identified.

Validation of the geophysical survey results could be achieved through intrusive archaeological works or during later groundworks.

Any proposed development of the site is unlikely to disturb archaeological deposits, as if formerly present on the site these are likely to have been completely destroyed in earlier phases of groundworks and levelling.

Intrusive survey (excavation) of the site is needed to accurately identify and locate any potential existing groundworks on the site.

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Heritage Gateway 2017: Cornwall and Scilly HER

<http://www.heritagegateway.org.uk> [accessed 12.04.2017]

APPENDIX 1: SUPPORTING PHOTOGRAPHS: SITE INSPECTION



FIGURE 4: THE SITE FROM ITS SOUTH-WEST CORNER; LOOKING NORTH.



FIGURE 5: THE SITE FROM ITS SOUTH-WEST CORNER; LOOKING EAST.



FIGURE 6: THE SITE FROM ITS SOUTH-EAST CORNER; LOOKING WEST.

APPENDIX 2: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY

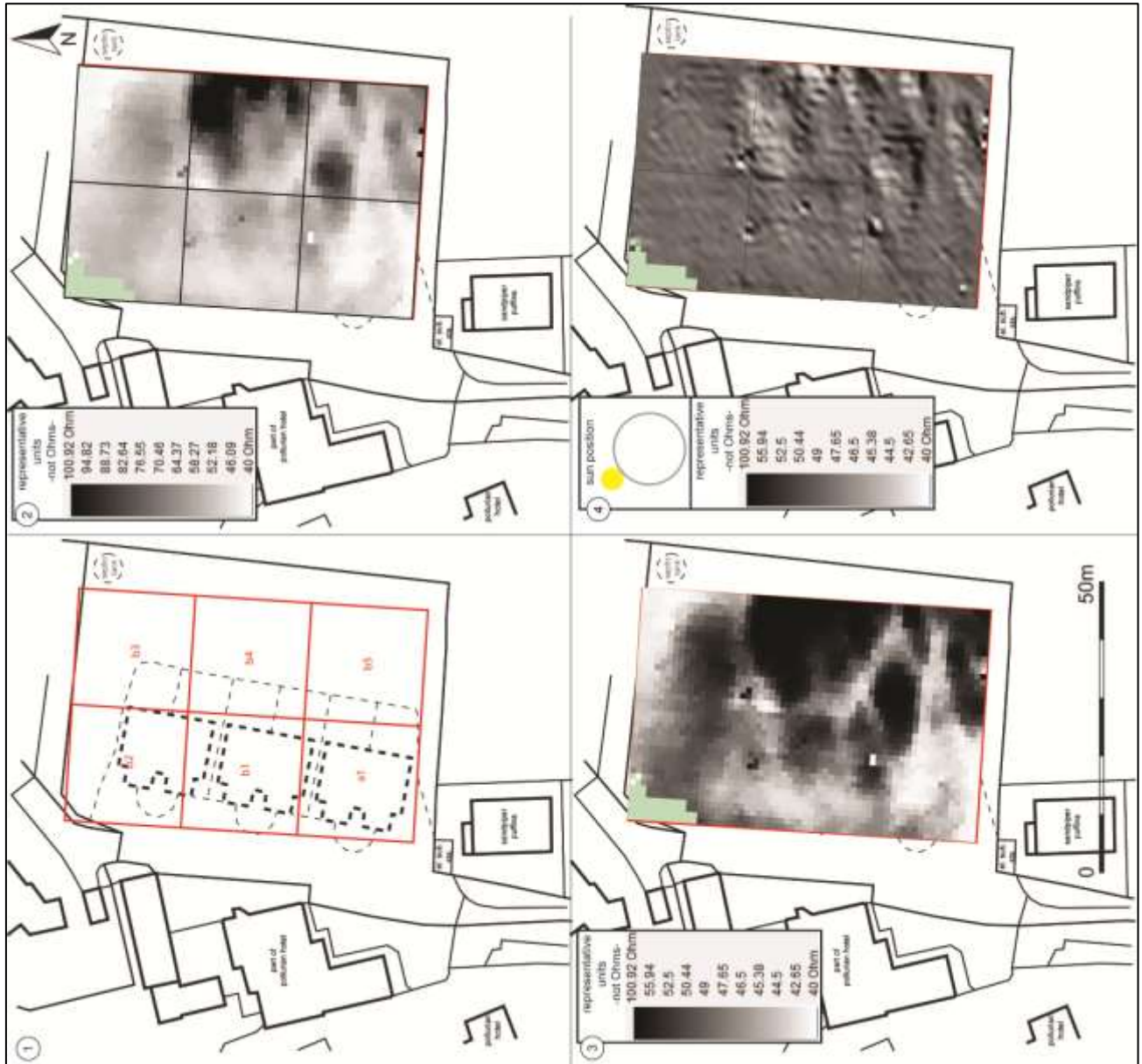
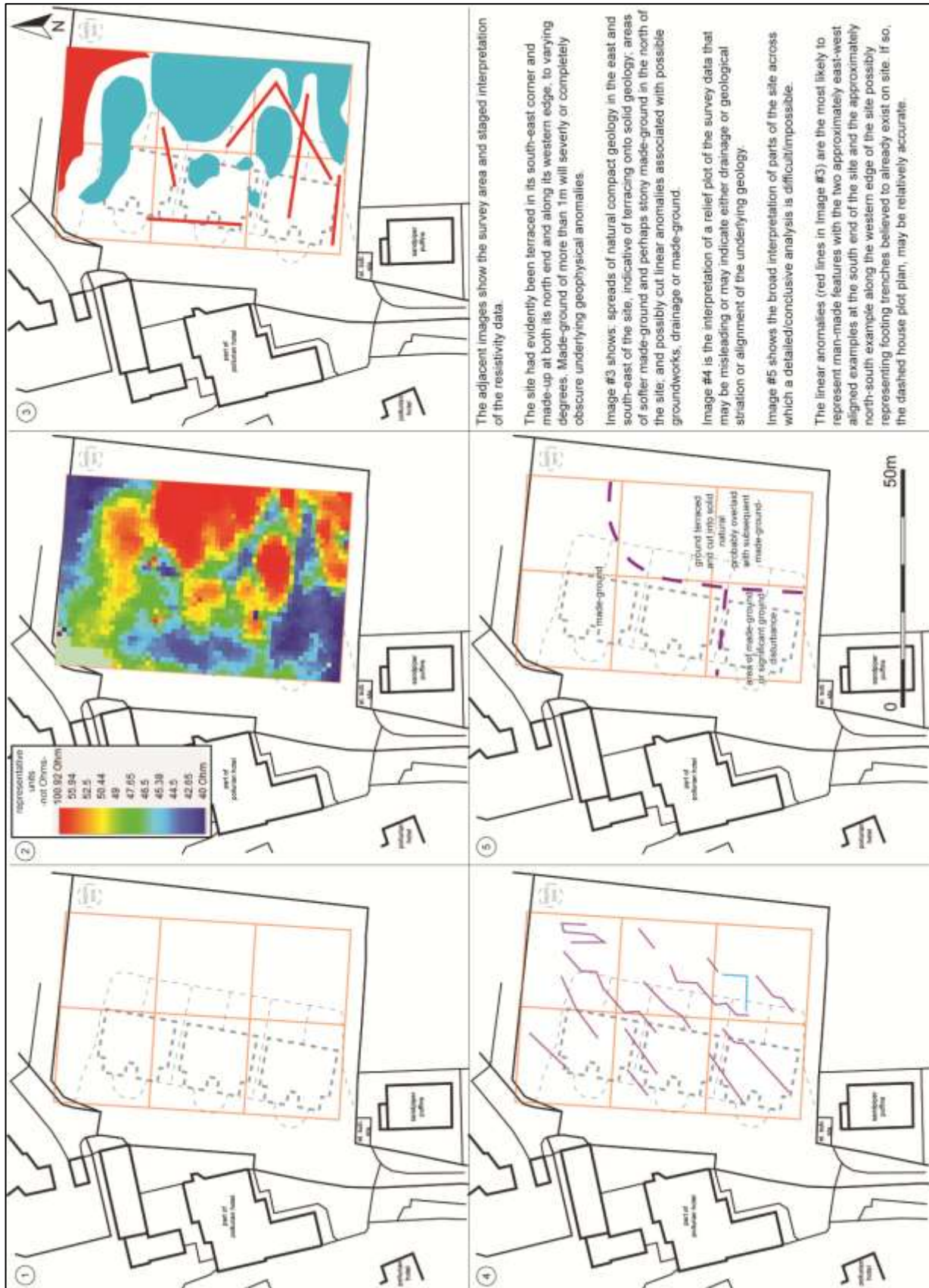


FIGURE 7: (1) SITE GRID LOCATION AND NUMBERS; (2) GREY-SCALE IMAGE OF RESISTIVITY SURVEY DATA; (3) GREY-SCALE IMAGE OF RESISTIVITY SURVEY DATA, BAND WEIGHT EQUALISED; (4) GREY-SCALE IMAGE OF RESISTIVITY SURVEY DATA, RELIEF PLOT.



The adjacent images show the survey area and staged interpretation of the resistivity data.

The site had evidently been terraced in its south-east corner and made-up at both its north end and along its western edge, to varying degrees. Made-ground of more than 1m will severly or completely obscure underlying geophysical anomalies.

Image #3 shows: spreads of natural compact geology in the east and south-east of the site, indicative of terracing onto solid geology, areas of softer made-ground and perhaps stony made-ground in the north of the site, and possibly cut linear anomalies associated with possible groundworks, drainage or made-ground.

Image #4 is the interpretation of a relief plot of the survey data that may be misleading or may indicate either drainage or geological stratiation or alignment of the underlying geology.

Image #5 shows the broad interpretation of parts of the site across which a detailed/conclusive analysis is difficult/impossible.

The linear anomalies (red lines in Image #3) are the most likely to represent man-made features with the two approximately east-west aligned examples at the south end of the site and the approximately north-south example along the western edge of the site possibly representing footing trenches believed to already exist on site. If so, the dashed house plot plan, may be relatively accurate.

FIGURE 8: RESISTIVITY SURVEY PROCESSING AND INTERPRETATION SUMMARY; (1) GRID LOCATION; (2) RED-GREEN-BLUE(2) SHADE PLOT OF RESISTIVITY SURVEY DATA, BAND WEIGHT EQUALISED; (3) INTERPRETIVE REPRESENTATION OF SURVEY DATA; (4) INTERPRETIVE REPRESENTATION OF RELIEF PLOT OF SURVEY DATA; (5) BROAD INTERPRETATION OF SITE DEPOSITS/STRATIGRAPHY; (6) INTERPRETIVE SUMMARY.

APPENDIX 3: CARTOGRAPHIC SOURCES



FIGURE 9: ORDNANCE SURVEY SURVEYOR'S DRAFT MAP FOR THE HELSTON AREA, 1811 (BL); THE APPROXIMATE LOCATION OF THE SITE IS INDICATED.



FIGURE 10: MULLION TITHE MAP, 1841 (CRO); THE APPROXIMATE LOCATION OF THE SITE IS INDICATED.



FIGURE 11: HARVEYS MAP, 1875 (HARVEY 1875); THE APPROXIMATE LOCATION OF THE SITE IS INDICATED.

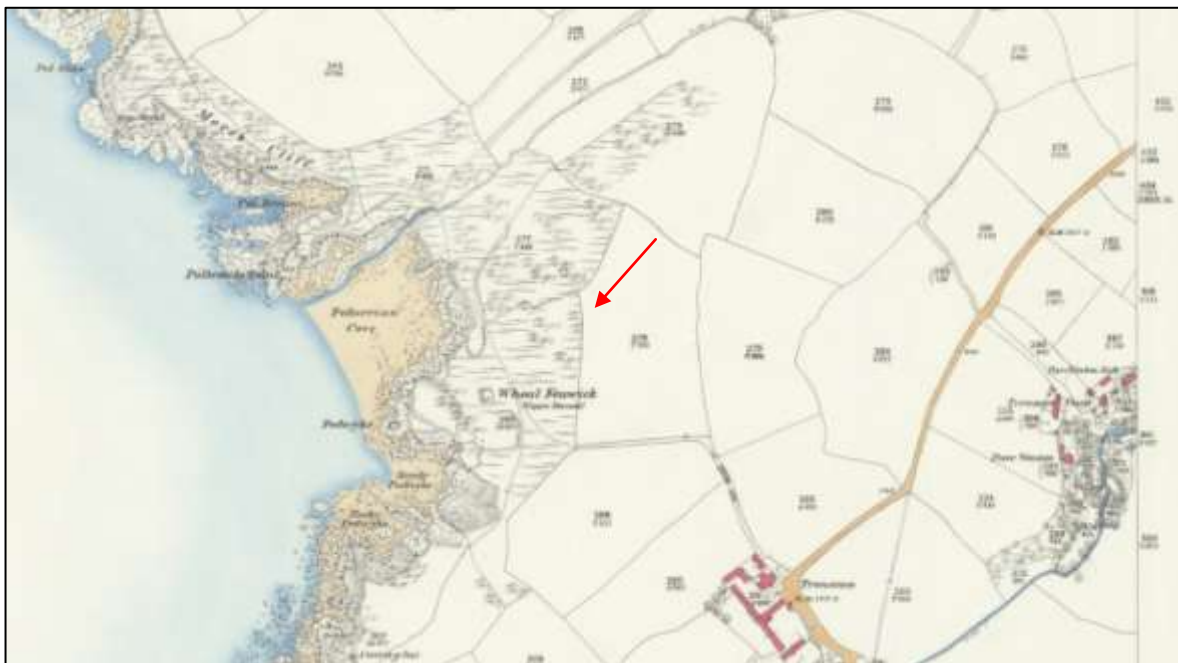


FIGURE 12: ORDNANCE SURVEY 1ST EDITION, 25 INCH SERIES, SURVEYED 1877, PUBLISHED 1879 (CRO); THE APPROXIMATE LOCATION OF THE SITE IS INDICATED.

POLURRIAN VILLAS, MULLION, CORNWALL



FIGURE 13: ORDNANCE SURVEY 2ND EDITION, 25 INCH SERIES, SURVEYED 1906, PUBLISHED 1907 (CRO);
THE APPROXIMATE LOCATION OF THE SITE IS INDICATED.



The Old Dairy
Hacche Lane Business Park
Pathfields Business Park
South Molton
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Email: mail@swarch.net