



Tresavean Estate, Lanner, Cornwall

Geophysical survey and Archaeological reporting



Historic Environment Projects

Tresavean Estate, Lanner, Cornwall

Geophysical survey and Archaeological reporting

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Report author	Anna Lawson-Jones
Checked by	Adam Sharpe BA MIfA
Approved by	Andy Jones

Historic Environment, Cornwall Council
Kennall Building, Old County Hall, Station Road, Truro, Cornwall, TR1 3AY
tel (01872) 323603 fax (01872) 323811 E-mail hes@cornwall.gov.uk
www.cornwall.gov.uk

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This study was commissioned by Matthew Gray of Halsall Construction and carried out by Historic Environment Projects, Cornwall Council.

The Project Manager was Adam Sharpe.

The views and recommendations expressed in this report are those of Historic Environment Projects and are presented in good faith on the basis of professional judgement and on information currently available.

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Cover illustration

A 2005 aerial photograph showing the vicinity and character of the site.

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Contents

1	Summary	1
2	Introduction	3
2.1	Project background	3
2.2	Aims	3
2.3	Methods	3
3	Location and setting	4
4	Designations, policies and guidance	5
4.1	National designation	5
4.2	Regional / County designation	5
4.3	Local designation	5
4.4	Hedgerow Regulations	5
4.5	Cornwall Structure Plan 2004	5
4.6	National Planning Policy Framework 2012	6
5	Site history and survey results	7
6	Significance	7
7	Recommendations	9
8	Site inventory	10
8.1	Geophysical survey identified sites	10
8.2	Desk top assessment identified sites	11
	References	13
8.3	Primary sources	13
8.4	Publications	13
9	Project archive	13
	Appendix 1: Planning brief	18
	Appendix 2: Written Scheme of Investigation	21

List of Figures

- Fig 1 Map showing the location of the site.
- Fig 2 Site extent and landscape characterisation map.
- Fig 3 Extract from the OS First Edition One Inch Map c1809.
- Fig 4 Gwennap parish Tithe Map extract, c1840, showing site area in red and the Tithe Apportionment field names for plots 3229 and 3230.
- Fig 5 First Edition of the Ordnance Survey 25 Inch Map, c1880, showing the site.
- Fig 6 Second Edition of the Ordnance Survey 25 Inch Map, c1907, showing the site.
- Fig 7 Geophysical survey identified sites as presented by ArchaeoPhysica Ltd. Top shows grey scale raw data, bottom shows identified sites.
- Fig 8 Ordnance Survey digital mapping showing the site location, and all known HBSMR and NMP sites.

Abbreviations

HER	Cornwall and the Isles of Scilly Historic Environment Record
HE	Historic Environment, Cornwall Council
MCO	Monument number in Cornwall HER
NGR	National Grid Reference
NMP	National Mapping Programme
OD	Ordnance Datum – height above mean sea level at Newlyn
OS	Ordnance Survey

1 Summary

This report presents the results of a rapid desk-based archaeological assessment and geophysical survey of a site proposed for housing development located to the immediate south of the Tresavean Estate on the southern edge of Lanner. The project was carried out by Historic Environment, Projects for Cornwall Council and the geophysical survey was carried out by ArchaeoPhysica Ltd. This report identifies and evaluates the archaeological resource within the area of the site, provides guidance on potential impact of the proposed development and recommends further appropriate archaeological work.

The assessment and survey has identified sixteen sites of varying significance. Within the immediate area of the site these include a probable shaft, a removed boundary, potential mining or other linear features, a track, two extant boundaries (**Sites 1 to 9**). Beyond the immediate development area, but of potential relevance to it are a number of sites (**Sites 11 to 13 and 15 to 16**), including mines, an engine house and dense mining related earthworks identified via historic maps and aerial photographs to the south and east of the site, plus a potential medieval ridge and furrow site and an undated field system located to the east of the site (**Sites 10 and 14**). Agricultural land extends west from the site, whilst to the north the area has already seen housing development.

Historic Landscape Character analysis indicates additional archaeological potential for the survival of unknown prehistoric and medieval sites in land identified as being of Anciently Enclosed 'Medieval Farmland' Type.

It is recommended that an archaeological watching brief should be undertaken during groundworks associated with the site development in order to record the remains of known sites within the area of the development, and to record any additional sites uncovered during the topsoil strip. Field boundaries should be retained where possible, given their pre-1850 dates of construction (as evidenced by historic mapping), but where breached their sections should be recorded. Archiving of results and (dependant on significance) analysis and publication would be a requirement of such follow up work.

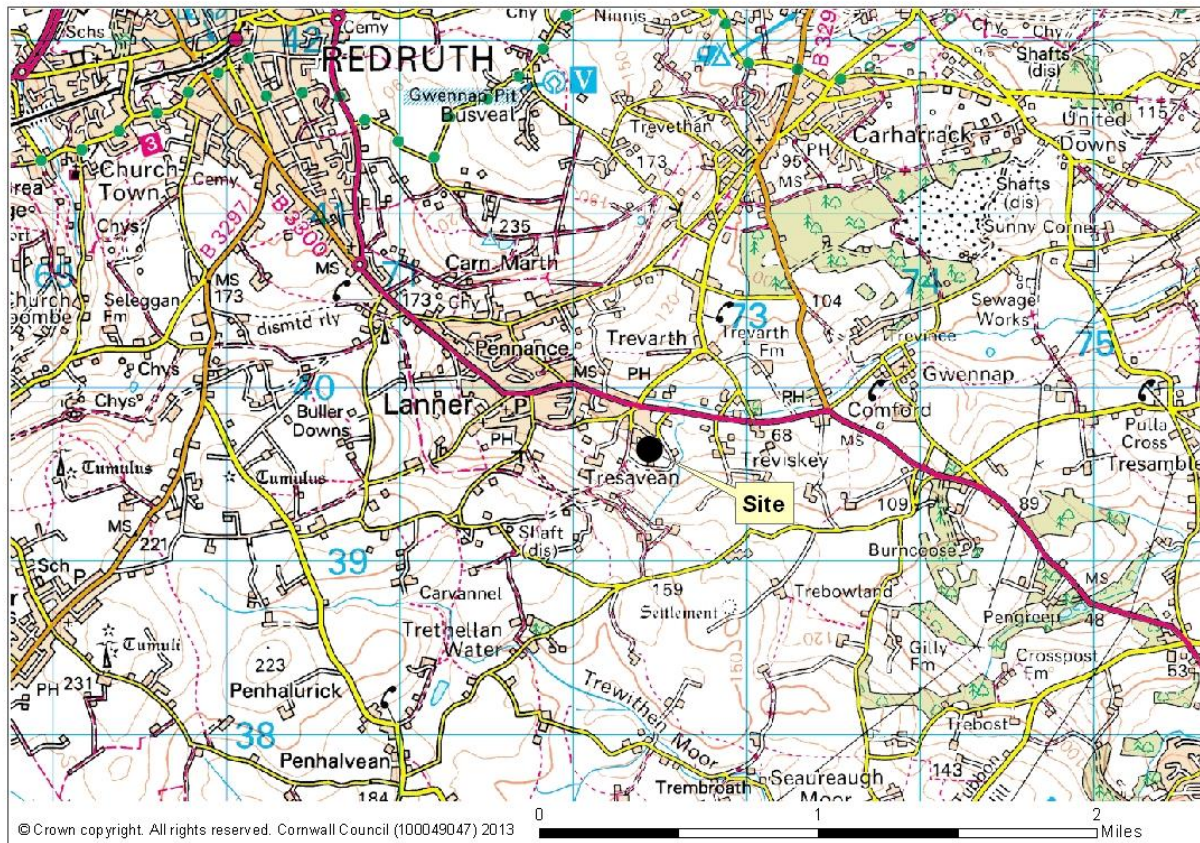


Fig 1 Map showing the location of the site.

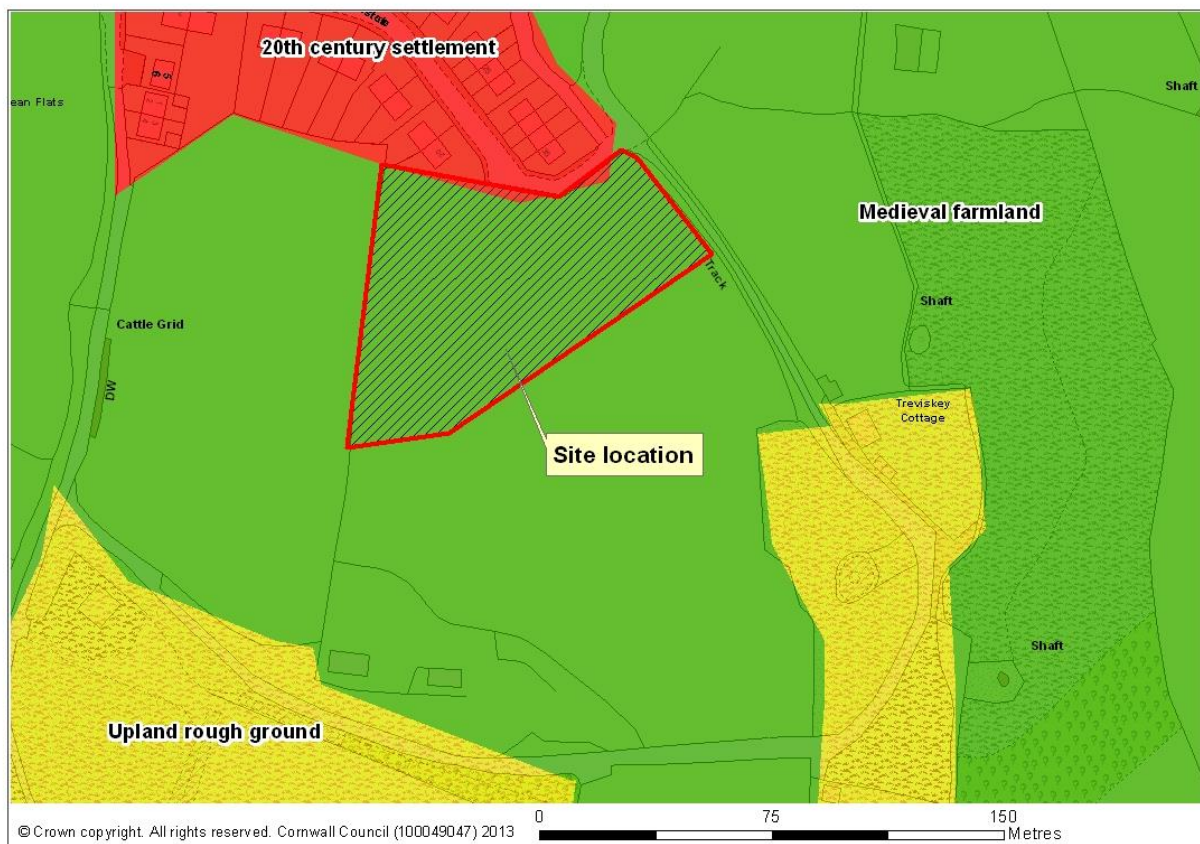


Fig 2 Site extent and landscape characterisation map.

2 Introduction

2.1 Project background

A field adjacent to the Tresavean Estate, Lanner is to be developed by Halsall Construction on behalf of Coastline Housing Association. The project area is located on the south-eastern edge of Lanner centred at OS grid reference SW 7244 3968. This is a greenfield site on the development boundary of the village, set within what is currently agricultural land fringed by evidence for mining.

Planning application PA09/01042/F was submitted on the 3rd August 2009 and was for the erection of 25 affordable dwellings for rent and shared ownership. It is understood that this application has been approved with a number of conditions. The proposed condition 14 states:

No development shall take place within the area to be developed until the applicant has secured the implementation of a programme of archaeological recording based on a written scheme of investigation submitted to and approved by the Local Planning Authority.

Reason: To ensure that provision is made to record finds of archaeological interest in accordance with the requirements of PPS5 'Planning for the Historic Environment'.

A brief to guide archaeological work in advance of construction work (see Appendix 1) was prepared by Phil Markham, Historic Environment Planning Advice Officer, Cornwall Council on 29th September 2011, and this was used as the basis for the WSI (see Appendix 2) by Adam Sharpe 15th November 2011.

The Planning Authority Officer is Chantel McLennen.

2.2 Aims

As stated in the brief and the WSI (see Appendices 1 and 2), the ground works associated with the planned development may disturb buried archaeological remains. In order to understand the site and the potential for recording any significant below ground remains, a geophysical survey was recommended. This was to provide the background data on which recommendations for further archaeological recording might be based.

The site specific aims were to:

- Undertake an archaeological magnetometer survey
- Produce a report containing the geophysical data and the data in interpreted form
- Inform whether an archaeological evaluation or further archaeological recording of any potential buried remains is recommended.

The project objectives were to undertake a magnetometer survey of the site and to produce a summary report on its results.

2.3 Methods

All recording work has been undertaken according to the Institute for Archaeologists *Standards and Guidance for Archaeological Investigation and Recording*. The IfA *Code of Conduct* and *Code of Approved Practice for the Regulation of Contractual Arrangements in Archaeology* has been followed. The Institute for Archaeologists is the professional body for archaeologists working in the UK.

The geophysical survey was undertaken in line with English Heritage guidelines, using the following:

- *Geophysical Survey in Archaeological Field Evaluation*, English Heritage 2008

- *Standards and Guidance for Archaeological Field Evaluation*, Institute for Archaeologists 2008.

All work has been undertaken in accordance with the high professional standards and technical competence expected by the Geological Society of London and the European Association of Geoscientists and Engineers.

Desk-based assessment

A brief desk-based assessment has been carried out to inform the fieldwork stage and to set the context for the results of the geophysical survey within this report. This comprised:

- Published sources
- Historic maps
- Modern maps
- GIS layers held by HE CC and Cornwall Council.

Fieldwork: geophysical survey

A Geometrics MagMapper G858 caesium vapour magnetometer was used to carry out the survey by ArchaeoPhysica Ltd. The sensors were set approximately 0.3m above the ground surface to maximise sensitivity whilst decreasing the effects of surface anomalies.

(Further detail can be found within the WSI – Appendix 2 and the geophysical survey report).

The resultant data was presented as a report (ArchaeoPhysica 2011) with a series of greyscale images overlaid onto map data geo-referenced to the OS grid; a separate map highlighting the most significant anomalies (regardless of their origin) and an anomaly catalogue. The survey report also includes a detailed methodological description, justification and analysis of the geophysical environment and its impact upon or presence within the data.

Creation of site archive

- An entry has been made to the English Heritage/ADS OASIS online archive index.

Archive report

This archive report summarises the results of the geophysical survey. It sets the survey results within their archaeological/historical context using information and mapping gathered during the desk-based survey. The report discusses significance of all sites identified.

A paper copy and a digital (PDF) copy of this report, illustrations and any other files will be held in the Cornwall HER. Paper copies of the report will be distributed to the client, to local archives and relevant national archaeological record centres.

3 Location and setting

The site is located within a large field to the immediate south of Tresavean Estate, Lanner (Fig 1). It is positioned on a north-west facing slope at an approximate height of 90m above Ordnance Datum. The soil is recorded as being Manod (Loam over Shale) overlying a bedrock geology recorded as being Mylor Slates.

The proposed site is on land recorded by the Cornwall and Scilly Historic Environment Record as being 'Anciently Enclosed Land' (AEL), and of Medieval Farmland type (Fig 2). The Cornwall Landscape Assessment describes AEL as typically containing below ground archaeological material and features of variable date, including that from

Bronze Age, Iron Age and Romano-British settlements and fields dating to when the land was originally cleared for use (1994, 142). Since at least the 1840s (Fig 4) mining activity came to dominate the site setting, eventually impinging on the site itself (Site 7). More recently following the decline of mining, associated features have been lost as surface features through landscaping etc., and the field has reverted to a greenfield site.

4 Designations, policies and guidance

4.1 National designation

The site is not directly affected by any statutory national designations. It does not fall within an area of the Cornish Mining World Heritage Site and is not within a Conservation Area. There are no Listed Buildings or Scheduled Monuments or Areas within the immediate vicinity.

4.2 Regional / County designation

No regional or county designations apply to the site proposed for development.

4.3 Local designation

No local designations apply to the site, and no rights of way will be affected by the proposed development.

4.4 Hedgerow Regulations

Under the current 1997 Hedgerow Regulations (part of the Environment Act 1995), owners wishing to remove all or part a hedgerow considered to be historically important must notify the Local Planning Authority (LPA). Criteria determining importance include whether the hedge marks a pre-1850 boundary, and whether it incorporates an archaeological feature. The LPA may issue a hedgerow retention notice prohibiting removal.

NOTE: Boundary features are the most abundant archaeological feature to be found in Cornwall. Whilst some may be of recent origin, many have older origins and are thus of considerable importance in telling the story of the development of agriculture in the rural landscape, their layout, inter-relationships and phasing allowing sequences of land clearance and enclosure for agriculture to be read. They are thus important visually as landscape features, but also archaeologically.

4.5 Cornwall Structure Plan 2004

The Cornwall Structure Plan (Policy 2: Character Areas, Design and Environmental Protection) produced by Cornwall County Council (now Cornwall Council), provides an overview and framework for environmental policy in Cornwall.

Paragraph 29 states *'Development must be compatible with the conservation of Cornwall's historic and natural heritage. This is not just confined to designated areas. Local features are an important part of local character and all too often these elements are lost by gradual attrition. The protection, conservation, interpretation and stewardship of the environment for future generations is an important element in sustainable development and one in which local authorities must play a vital role through example and encouragement.'*

Local Plans should define Character Areas to inform planning decisions taking into account Regional and County-wide landscape assessments. The conservation and enhancement of sites, areas, or interests, of recognised international or national importance for their landscape, nature conservation, archaeological or historic

importance, including the proposed World Heritage Site, should be given priority in the consideration of development proposals.

4.6 National Planning Policy Framework 2012

The following paragraphs within the above document (Department for Communities and Local Government 2012) frame planning policy relating to the historic environment and are germane to this assessment:

128. In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

129. Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset's conservation and any aspect of the proposal.

132. When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting. As heritage assets are irreplaceable, any harm or loss should require clear and convincing justification. Substantial harm to or loss of a grade II listed building, park or garden should be exceptional. Substantial harm to or loss of designated heritage assets of the highest significance, notably scheduled monuments, protected wreck sites, battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.

133. Where a proposed development will lead to substantial harm to or total loss of significance of a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:

- the nature of the heritage asset prevents all reasonable uses of the site; and
- no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and
- conservation by grant-funding or some form of charitable or public ownership is demonstrably not possible; and
- the harm or loss is outweighed by the benefit of bringing the site back into use.

134. Where a development will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal, including securing its optimum viable use.

135. The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that affect directly or indirectly non designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.

139. Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.

5 Site history and survey results

All sites identified from the geophysical survey and the desk-based assessment are shown on Figs 7 and 8 and briefly described in the site inventory (section 8).

The site lies within Anciently Enclosed Land of Medieval Farmland type, which forms part of Cornwall's agricultural heartland, with settlements documented before the 17th century AD. Farming settlements linked by sinuous tracks and lanes, flanked by interconnected, often curvilinear field boundaries characterise this type of landscape. Sites likely to be associated with this phase of the site's past include extant lane **Site 9**, former field boundary **Sites 4 and 10** and remnant probable ridge and furrow **Site 14**, while extant boundary **Site 8** has been shown on all mapping since 1840. **Site 4** was identified by geophysical survey and desk-based survey. It is shown as a gently curvilinear field boundary separating two fields (numbered 3229 and 3230) and was listed in the Tithe Apportions as being arable and owned by the local vicar/church.

Buried archaeological features of prehistoric, medieval and post medieval date can be expected virtually anywhere (Cornwall Landscape Assessment 1994, 143).

During the nineteenth century mining activity came to increasingly dominate the area. The 1840s Gwennap Tithe map (Fig 4) shows the gradual impingement of mining activity extending from the south, east and north. The Tithe Apportionment accordingly names adjacent fields 3238 and 3235 Wheel (probably *Wheal*) Field and Stamps Meadow, both names indicating mining activity within or close to these fields at some point in the past.

Thomas's map of 1819 shows East Tresavean (later Treviskey) Mine as active to the south of the site – **Site 11**, with associated **Site 15** workings partly identified by NMP and Site 16 (a partially extant engine house). These sites fall within the Tresavean sett, as does the geophysically-identified probable shaft **Site 7**.

Symons's map of 1845 shows continuing activity at Site 11, but also the mine at East Tresavean **Site 13**, with associated **Site 12** partially identified by the NMP. Both sites are within the West Treviskey sett, with the western side of Site 12 extending in to Tresavean sett.

Sites 2 and 3, both linear features were located by geophysical survey running approximately from north to south. These, given the location of the site and the proximity of mining activity over at least a century may well represent mining features, though are of uncertain depth and character. Their presence might imply additional, probably shallow mining related activity in the site such as pits and spreads of mine waste. Track **Site 1** may have had either a mining or an agricultural origin.

In addition **Sites 5 and 6** were highlighted by the geophysical survey. Site 5 is not an archaeological site, whilst site 6 was recorded by the survey as likely to be modern and probably superficial since it was visible as recent surface disturbance during the survey.

6 Significance

The proposed residential development of the study area will have a significant affect upon the character of the site, and more specifically will result in marked physical effects on the sites contained within it, ranging from disturbance to complete loss. A detailed plan of the proposals was supplied to HE Projects – Trewin Design Partnership drawing number 6044 S1F. Given the detail on this plan, all-over disturbance and landscaping works have been assumed.

As buried archaeological sites are a non-renewable resource, most potential negative impacts are likely to occur during the construction phase of this development rather than during its operation. The potential impact on archaeological remains during construction is assessed through definitions of impact significance as set out below.

- **Major positive** – Site continues in, or is restored to, its original design and use.
- **Moderate positive** – Site restored as far as possible respecting its original function, but its use is altered.
- **Minor positive** – Site partially restored; interpretation introduced.
- **Negligible positive** – Stabilisation and/or maintenance of site.
- **Negligible negative** – Benign neglect – losses of fabric over a long period of time.
- **Minor negative** – Site suffers areas of alteration or damage, which contribute to loss of meaning.
- **Moderate negative** – Significant loss of fabric or alteration, leading to erosion of original character.
- **Major negative** – Complete demolition and/or removal.

Impacts upon identified archaeological sites

In summary the proposed development is considered likely to have the following impacts on identified sites within the study area. (Note: Site 5 is not an archaeological site and does not feature in the following text).

- Boundary **Sites 8 and 9** are considered to be important under the Hedgerow Regulations. If removed the impact would be considered **major negative**. If the boundaries were breached, but recorded (in section) this would be deemed **moderate negative**. If the boundaries were retained, this would be seen as **moderate positive**, and if they were both retained and maintained in character this would be **major positive**.
- Removed boundary **Site 4**, associated with extant boundary Sites 8 (associated and 9) is liable to be completely removed as a subsurface feature. Because it is no longer a visible landscape component the impact is considered to be **minor negative**.
- Track **Site 1** is associated with boundary Site 8, but may not be contemporary. If it is recorded during groundwork operations the impact would be **negligible positive**.
- Probable mine shaft **Site 7** will be affected by the development since it lies very close to the southern part of the proposed new buildings. This feature is not visible on the ground, and may be choked. If so then its recording and treatment to render it safe would be viewed as **minor positive**. If it was choked and did retain some original features, but was not recorded this would be seen as **major negative** impact.
- **Sites 2, 3** and possibly **Site 6** may all relate to mining activity or more recent culverts or service-associated trenching. Recording of any lost mining remains would be seen as a **negligible positive**.
- Partially extant field system **Site 10** is potentially of medieval date, but as identified in the HBSMR lies outside the site. It is debatable whether removed boundary Site 4 has any association with it. Since **Site 10** will not be directly affected and is likely to be shrouded from view from the proposed development the impact is considered to be **negligible negative**.

- Areas of mining activity identified by the NMP and on historic mapping – **Sites 12 and 15** – both have the potential to extend into the site. Potential extensions from these areas of mining activity have already been identified in the case of Site 7 and are hinted at by Sites 2, 3 and 6. The potential for further mining remains of various forms – shallow pits, culverts, surfaces or mine waste dumps – may all exist within the area and as such the impact without recording would be seen as a **major negative**, but with recording this would be viewed as a **minor negative**. If the sites are not of significance when recorded the impact would be viewed as neutral.
- Mining **Sites 11, 13 and 16** all fall outside the development area. Any impacts caused by the development would be seen in terms of effects on their visual settings, and as such would be seen as **minor negative**.
- Possible ridge and furrow **Site 14** lies 250m to the southeast of the site. The development will not negatively impact on this site.

Impacts upon Historic Landscape Character

The proposed development will change the character of the study area from an 'Anciently Enclosed Landscape' consisting of 'Medieval Farmland' with an industrial fringe to an 'Urban and Residential' characterisation. The impact of the proposed development will be significant but limited in extent, and can therefore be viewed as **minor negative**. Anciently Enclosed Land is characterised by pre-17th century farming settlements and irregular field systems, some of which (in this study area) may have medieval (or earlier) origins. It is a landscape type known to contain a predictably rich range of archaeological remains, spanning the prehistoric and medieval period through to the modern day.

7 Recommendations

The following recommendations are made for the site, with provision to fully archive and publish results where applicable.

NOTE:

- Where possible preservation *in situ* of archaeological deposits, following adequate recording, should be considered through a controlled soil strip within specific areas and an archaeological watching brief over the remainder of the site during groundworks.
- All mechanical topsoil removal should at all times involve the use of a toothless bucket.
- No vehicles should move across the topsoil stripped area until it has been seen/recorded by an archaeologist.

Watching brief

It is recommended that an archaeological watching brief is carried out during topsoil stripping of the site in order to record the character and date of known **Sites 1 to 4**, and **Sites 6 to 9**, plus any unknown subsurface remains.

This would involve the presence of an archaeologist on site during topsoil removal for the route of the new road and the houses/carpark areas. It is assumed that the non-built up areas/gardens will not see major ground disturbance. Unless significant, unexpected features appear after the topsoil strip, the archaeologist on site would be able to rapidly record any remains by annotating a base map, and by taking notes, measurements and photographs as features appear during the topsoil strip.

It is considered most unlikely that any significant Medieval or earlier features or deposits will exist on this site given the likely previous disturbance caused by mining or agricultural / ploughing activity.

8 Site inventory

8.1 Geophysical survey identified sites

(All sites shown on fig 7).

Site no.	Feature type	Form	Description (<i>ArchaeoPhysica Ltd description in italics</i>)	Easting (centred)	Northing (centred)
1	Track	Below ground/surface	<i>Probable track along the edge of the field.</i> This may represent either an agricultural or an industrially-related access way, potentially composed of mining waste.	72413.8	396927.7
2	Mine working? (culvert or service?)	Below ground	<i>An approximately linear alignment of strong anomalies typical of a buried non-magnetic structure e.g. a service, perhaps a non-ferrous pipe or culvert, function unknown.</i> This may well represent an industrial mine-related feature with an uncertain depth and character, or may be a relatively modern feature.	72429.7	39688.0
3	Mine working? (culvert or service?)	Below ground	<i>An approximately linear alignment of strong anomalies typical of a buried non-magnetic structure e.g. a service, perhaps a non-ferrous pipe or culvert, function unknown.</i> As above, potentially an industrially - related feature or a modern feature.	72465.4	39688.0
4	Former boundary – shown on 1840, 1880 and 1907 mapping.	Below ground	<i>Probable ditches of a former Cornish hedge.</i> Parallel running, curvilinear double ditched feature running along the line of a boundary shown on Figs 4, 5 and 6. Potentially Medieval, otherwise post-medieval in date	72441.2	39677.3
5–not a true site	Modern distortion	-	<i>Distortion of magnetic field caused by nearby steel security fencing.</i> (Not an archaeological site)	72469.0	39663.4
6	?Modern disturbance	Below ground	<i>Recent ground disturbance.</i> Uncertain. Possibly modern disturbance, or modern disturbance overlying an earlier mine-related feature?	72445.9	39653.8
7	?Shaft – part of Tresavean sett.	Below ground	<i>A massive anomaly with a peak area measuring approximately 2m x 4m has no obvious surface cause. Whether it relates directly to [2] is unknown, however, this is a large item of buried steel in a corresponding large opening.</i>	72420.1	39642.3

			<p><i>The possibility of a choked or capped mine shaft cannot be discounted in this location.</i></p> <p>Given the relatively dense historic industrial use of the surrounding areas, and the presence of mines and associated features to the immediate east and south, it is very likely that this feature is a choked/capped shaft which may or may not have associated archaeological/structural detail surviving within or around the periphery. It does not feature on any of the maps or GIS layers consulted for the desk study.</p>		
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NOTE: It was noted during the geophysical survey that the site contains made ground, and that as such there may be further structures and features sealed beneath it which are not detectable through geophysical survey.

8.2 Desk top assessment identified sites

(All sites shown on fig 8).

Site no.	Feature type	Form	Description	Easting (centred)	Northing (centred)
8	Boundary	Extant	Boundary defining the western edge of the site. This runs along the line of a pre-1840 field boundary and as such has the potential to be partly Medieval in date, perhaps with mine related alterations and additions.	72407	39676
9	Lane / boundary	Extant	Lane shown as present on the 1809 First Edition OS map, and as such is likely to be Medieval in date, linking medieval farmsteads/settlements (for example see ridge and furrow field system– MCO35446, shown on Fig 8, and Site 10).	72504	39714
10	Field system / boundary - MCO35449	Extant and below ground	The partially extant field system in the vicinity of Treviskey is considered to be of medieval origin (HBSMR). There may be additional elements extending beyond the known site.	72618	39701
11	Mine – MCO12709	Document evidence & below ground	Treviskey mine produced copper and is recorded on Thomas's map of 1819 as East Tresavean. The mine itself is shown some 250m to the east of the development area (Fig 5, 6 and 8). Associated workings extended out towards the west from the core area	72400	39501

			and have been partially identified by NMP as Site 12.		
12	Mine workings	Surface and below ground	Shown on Symons's 1845 map and the 1880 OS map as a dense area of mine workings associated with the West Treviskey Sett. Features marked in red partly identified by NMP. These only represent those features identified on historic maps and from aerial photographs, and as such there is the potential for features to extend further west towards the site – see Fig 5, 6 and 8.	72595	39595
13	Mine – MCO39018	Extant and below ground	A small and unsuccessful copper mine also known as East Tresavean. It was absorbed into the Tresavean sett in the late C19th. The mine itself is shown as some 125m to the south of the development site, but as suggested by the 1880 and 1907 OS maps associated activity did extend further north towards the site.	72698	39601
14	?Ridge and furrow – MCO35446	Crop mark / below ground	The extant field system in the vicinity of Treviskey Farm is considered to be of medieval origin.	72699	39588
15	Mine workings	Surface & below ground	Shown on Symons's 1845 map and the 1880 OS map as a dense area of mine workings associated with the Tresavean Sett. Features marked in red have been partly identified by NMP using mapped detail and aerial photographs, (see above).	72398	39525
16	Engine House – MCO52596	Extant structure	Dressing floor engine house situated on the site of Tresavean, which had a stamps engine. Located within the Tresavean sett, part of Site 13 and within the area defined as Site 15.	72367	39448

NOTE: The site was not subjected to a walk-over survey, and as such all site identification and commentary is based on a combination of geophysical survey and HBSMR held detail.

References

8.3 Primary sources

Ordnance Survey, c1880. *25 Inch Map* First Edition (licensed digital copy at HE)

Ordnance Survey, c1907. *25 Inch Map* Second Edition (licensed digital copy at HE)

Ordnance Survey, 2007. *Mastermap Digital Mapping*

Tithe Map and Apportionment, c1840. *Parish of Gwennap* (microfiche copy at HE and online)

Ordnance Survey, c1809, 1 Inch Map First Edition (licensed digital copy at HE)

8.4 Publications

Buck, C., 2004. *Mineral Tramways Conservation Management Plan*. HES, Truro **2004R066**

Cornwall County Council, 1996. *Cornwall Landscape Assessment 1994*, Cornwall County Council: Truro

Roseveare, M.J., 2013. *Tresavean, Lanner, Cornwall – Geophysical Survey Report*, **TLC111**. ArchaeoPhysica Ltd

9 Project archive

The HE project number is **HEXPB1102**

The project's documentary, photographic and drawn archive is housed at the offices of Historic Environment, Cornwall Council, Kennall Building, Old County Hall, Station Road, Truro, TR1 3AY. The contents of this archive are as listed below:

1. A project file containing site records and notes, project correspondence and administration.
2. English Heritage/ADS OASIS online reference: cornwall2-145333

This report text is held in digital form as: G:\TWE\Waste & Env\Strat Waste & Land\Historic Environment\Projects\Sites\Sites T\Tresavean geophysics\Tresavean Estate arch-report.doc

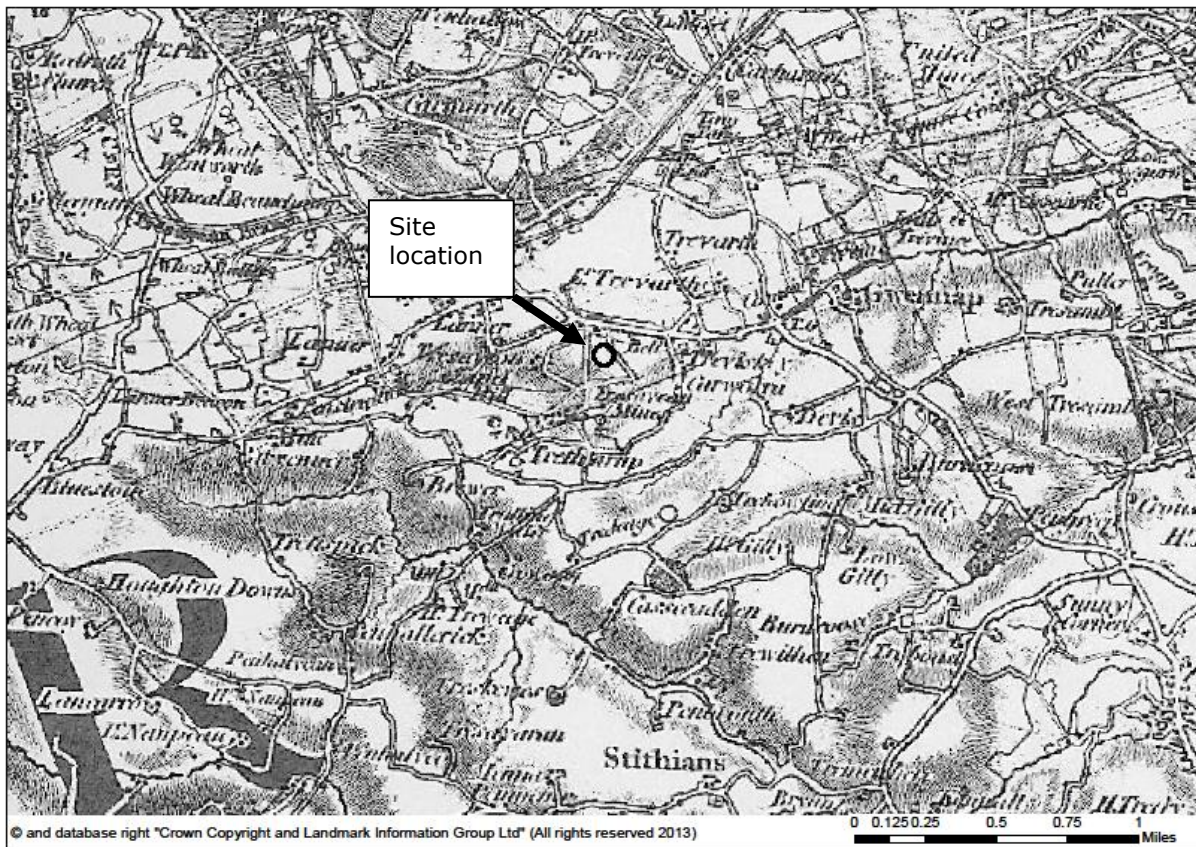


Fig 3 Extract from the OS First Edition One Inch Map c1809.

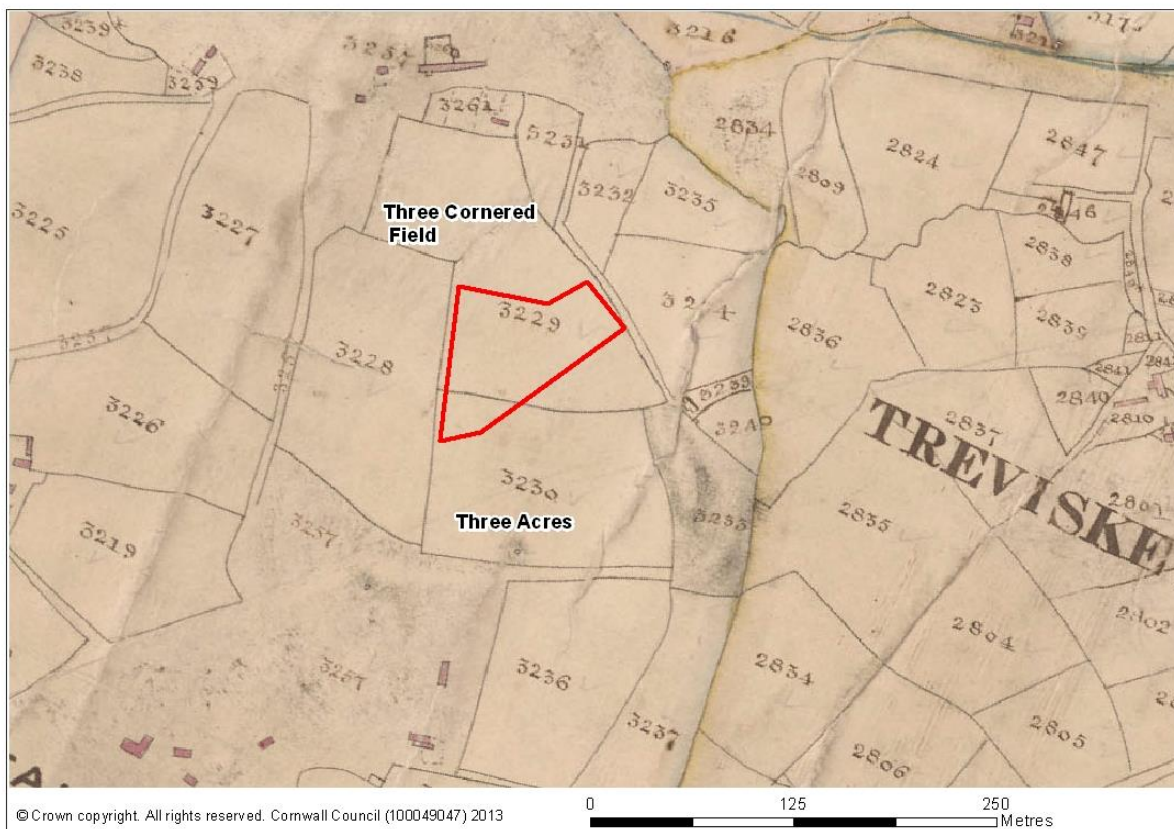


Fig 4 Gwennap parish Tithe Map extract, c1840, showing site area in red and the Tithe Apportionment field names for plots 3229 and 3230.

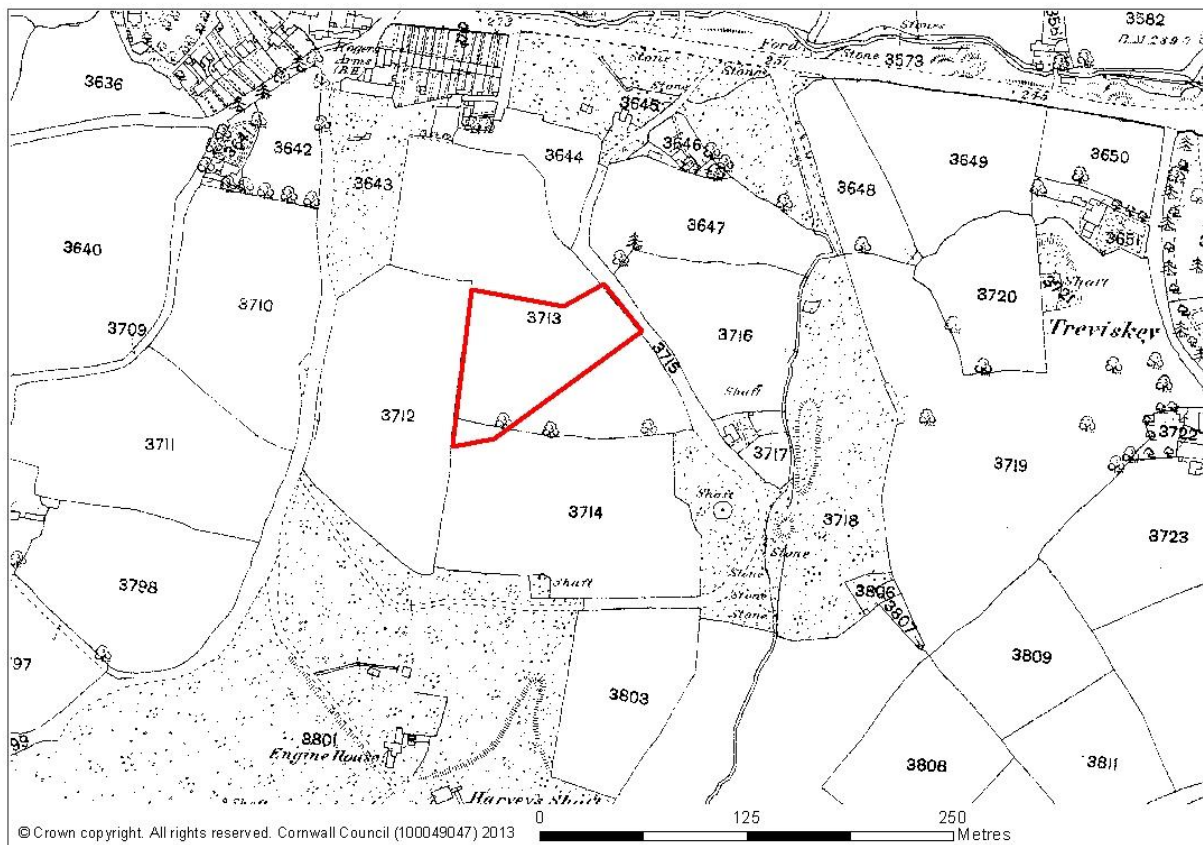


Fig 5 First Edition of the Ordnance Survey 25 Inch Map, c1880, showing the site.

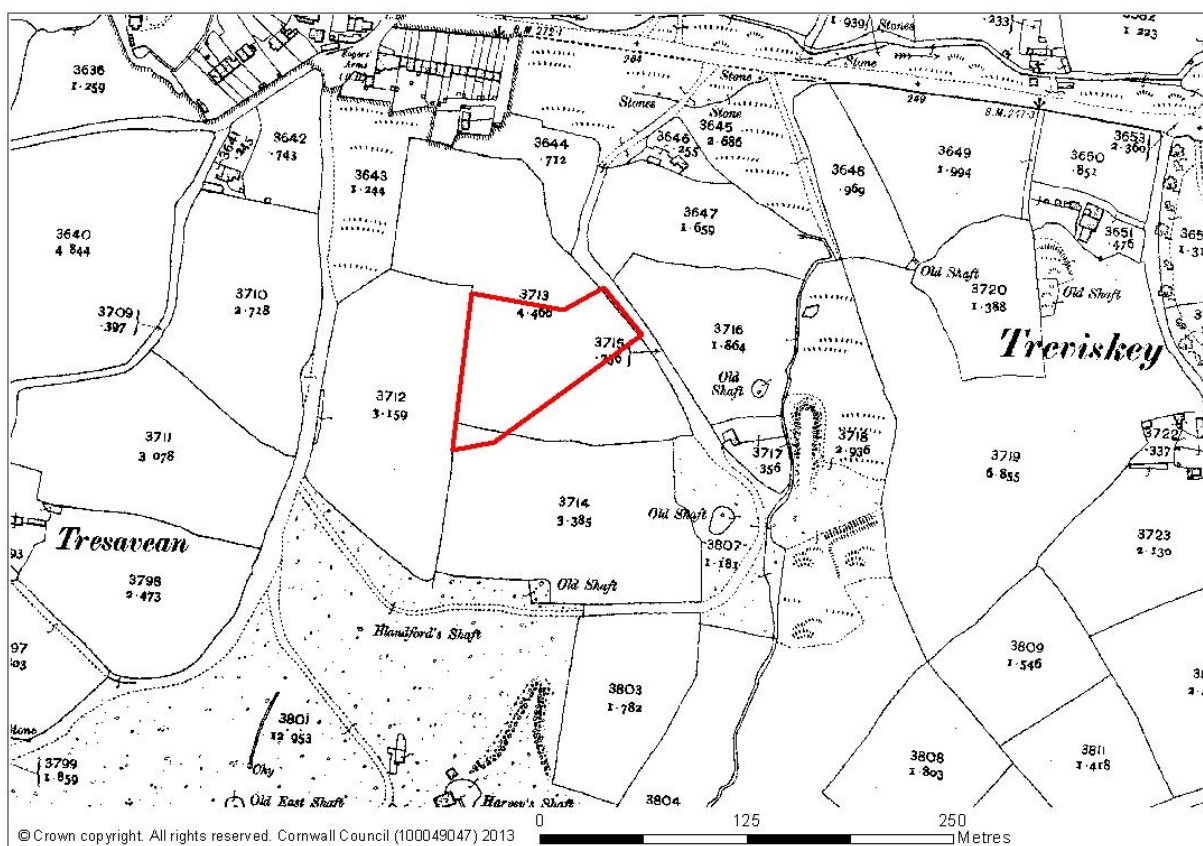


Fig 6 Second Edition of the Ordnance Survey 25 Inch Map, c1907, showing the site.



Fig 7 Geophysical survey identified sites as presented by ArchaeoPhysica Ltd. Top shows grey scale raw data, bottom shows identified sites.

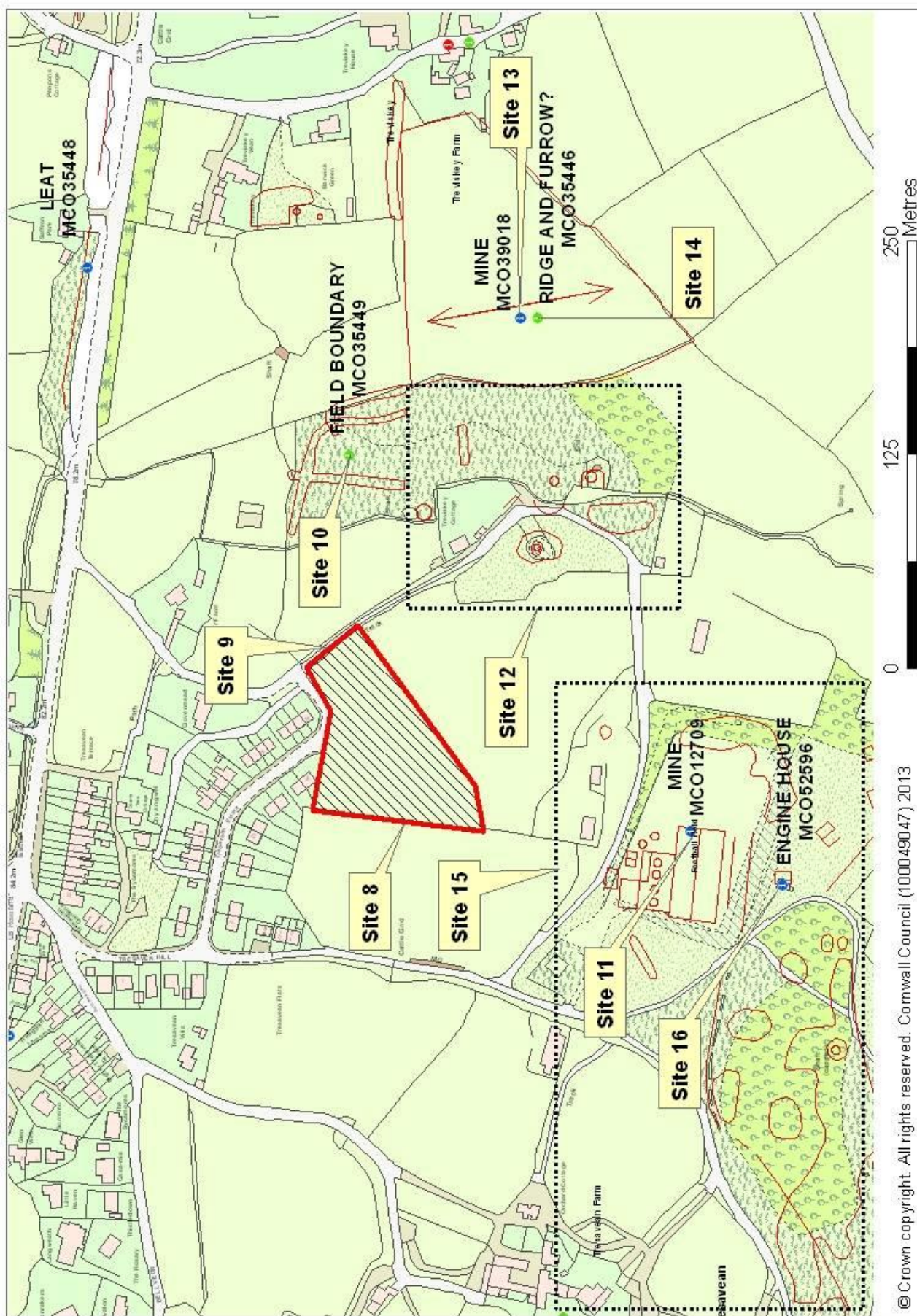


Fig 8 Ordnance Survey digital mapping showing the site location, and all known HBSMR and NMP sites.

Appendix 1: Planning brief

BRIEF FOR ARCHAEOLOGICAL GEOPHYSICAL SURVEY

Date: 29th September 2011

Site: Tresavean Estate, Lanner, Redruth

Application: PA09/01042/F

HBSMR Ref: CCO3400

Applicant: Coastline Housing Association

Agent: Iain Thayne, Halsall Construction

Historic Environment Planning Advice Officer: Phil Markham

Planning Authority Officer: Chantal McLennan

This brief is only valid for six months. After this period the Historic Environment Planning Advice Officer (HEPAO) should be contacted. The contractor is strongly advised to visit the site as there may be implications for accurately costing the project.

Contractors Written Scheme of Investigation (WSI)

No ground works are to be undertaken until the HEPAO and the Local Planning Authority (LPA) have approved the archaeological contractor's WSI.

1 Introduction

This brief has been written by the HEPAO and sets out the minimum requirements for an archaeological evaluation of the above site. This approach will reduce the risk of unnecessary excavation of significant archaeological deposits - if these are indicated by the geophysical survey the HEPAO will work with the planning authority and the developer to ensure these remain *in situ* where feasible.

2 Site Location and Description

The site is located on the south-eastern edge of Lanner at OS grid reference SW 7244 3968 and is at an approximate height of 90m ordnance datum on a north-west facing slope. The soil is recorded as being Manod (Loam over Shale) overlying a geology recorded as being Mylor Slates. This is a Greenfield site on the development boundary of the village.

3 Planning Background

Planning application PA09/01042/F was submitted on the 3rd August 2009 and was for the erection of 25 affordable dwellings for rent and shared ownership. It is understood that this application has been approved with a number of conditions. The proposed condition 14 states:

No development shall take place within the area to be developed until the applicant has secured the implementation of a programme of archaeological recording based on a written scheme of investigation submitted to and approved by the Local Planning Authority.

Reason: To ensure that provision is made to record finds of archaeological interest in accordance with the requirements of PPS5 'Planning for the Historic Environment'.

The applicant, their agents and any subcontractors should note that where there are other conditions requiring satisfaction in advance of the commencement of works on site; it is the responsibility of the applicant to liaise with the planning officer concerned to ensure that the timetabling of these works is managed.

4 Archaeological Background

The proposed application is on land recorded by the Cornwall and Scilly Historic Environment Record as being 'Anciently Enclosed Land' (AEL). The Cornwall Landscape Assessment 1994 describes AEL as:

Typical Historical/Archaeological Components

Much important archaeological material will survive below the surface, including the Bronze Age, Iron Age and Romano-British settlements and fields of the farmers who originally cleared this zone. (Page 142)

Potential for historical and archaeological research

Considerable. Each farming settlement will contain a wealth of historical, architectural and archaeological information. Surveys of field systems yield considerable agricultural, social, and tenurial information. Buried archaeological features can be expected virtually anywhere in this zone. (Page 143)

5 Requirement for Work

Ground works may disturb buried archaeological remains. In order to understand the site and its potential for recording archaeological remains a geophysical survey is recommended. This would provide evidence for any recommendations for further archaeological recording.

The site specific aims are to:

- Undertake an archaeological magnetometer survey
- Produce a report containing the geophysical data and the data in interpreted form
- Inform whether an archaeological evaluation or further archaeological recording of any potential buried remains is recommended.

General Guidance

The archaeological contractor is expected to follow the code of the Institute for Archaeologists (IfA).

6.2 All of the latest Health and Safety guidelines shall be followed on site.

6.3 Terminology will be consistent with the English Heritage Thesaurus.

7 Results

7.1 The full report shall be submitted within a length of time (but not exceeding six months) to be agreed between the applicant and the archaeological contractor, Cornwall County Council Historic Environment Service and the Cornwall Record Office or Royal Cornwall Museum. A further digital copy shall be supplied on CD-ROM preferably in 'Adobe Acrobat' PDF format.

7.2 The archaeological contractor will undertake the English Heritage/ads online access to the index of archaeological investigations (OASIS).

7.3 This report will be held by the Cornwall and Scilly Historic Environment Record (HER) and made available for public consultation.

7.4 The report must contain:

- A concise non-technical summary of the project results.
- The aims and methods adopted in the course of the investigation.
- A discussion of the archaeological findings in terms of both the site specific aims and the desk based research.
- A location map, a drawing showing those areas examined as part of the archaeological recording.

8 Archive Deposition

- 8.1 An ordered and integrated site archive will be prepared in accordance with: *Management of Research Projects in the Historic Environment (MoRPHE) English Heritage 2006* upon completion of the project. The requirements for archive storage shall be agreed with the Royal Cornwall Museum. Please check the accessioning and deposition information on the Royal Cornwall Museum website and fill in the 'Notification of Fieldwork' form. Once this has been accepted an accession number will be provided by the museum.

<http://www.royalcornwallmuseum.org.uk/policies/>

- 8.2 Where there is only a documentary archive this will be deposited with the Cornwall Record Office.
- 8.3 A copy of the report will be supplied to the National Monuments Record (NMR) Swindon.
- 8.4 A summary of the contents of the archive shall be supplied to the HEPAO.

9 Monitoring

- 9.1 The HEPAO will monitor the work and should be kept regularly informed of progress.
- 9.2 Notification of the start of work shall be given preferably in writing to the HEPAO at least one week in advance of its commencement.
- 9.3 Any variations to the WSI shall be agreed with the HEPAO, preferably in writing, prior to them being carried out.

Appendix 2: Written Scheme of Investigation

Tresavean Estate, Lanner: Written Scheme of Investigation for geophysical survey and reporting

Client: Halsall Construction

Client contact: Craig Willis



Project background

A field adjacent to the Tresavean Estate, Lanner is to be developed by Halsall Construction on behalf of Coastline Housing Association. The project area is located on the south-eastern edge of Lanner at OS grid reference SW 7244 3968 and is at an approximate height of 90m above Ordnance Datum on a north-west facing slope. The soil is recorded as being Manod (Loam over Shale) overlying a geology recorded as being Mylor Slates. This is a Greenfield site on the development boundary of the village, set within what is currently agricultural land fringed by evidence for mining.

Planning application PA09/01042/F was submitted on the 3rd August 2009 and was for the erection of 25 affordable dwellings for rent and shared ownership. It is understood that this application has been approved with a number of conditions. The proposed condition 14 states:

No development shall take place within the area to be developed until the applicant has secured the implementation of a programme of archaeological recording based on a written scheme of investigation submitted to and approved by the Local Planning Authority.

Reason: To ensure that provision is made to record finds of archaeological interest in accordance with the requirements of PPS5 'Planning for the Historic Environment'.

A brief to guide archaeological work in advance of construction work was prepared by Phil Markham, Historic Environment Planning Advice Officer, Cornwall Council on 29th September 2011, and has been used as the basis for this WSI.

The Planning Authority Officer is Chantel McLennen.

Site history

The proposed application is on land recorded by the Cornwall and Scilly Historic Environment Record as being 'Anciently Enclosed Land' (AEL). The Cornwall Landscape Assessment 1994 describes AEL as:

Typical Historical/Archaeological Components

Much important archaeological material will survive below the surface, including the Bronze Age, Iron Age and Romano-British settlements and fields of the farmers who originally cleared this zone. (Page 142)

Potential for historical and archaeological research

Considerable. Each farming settlement will contain a wealth of historical, architectural and archaeological information. Surveys of field systems yield considerable agricultural, social, and tenurial information. Buried archaeological features can be expected virtually anywhere in this zone. (Page 143)

Project extent

The project area consists of the northern part of an agricultural field immediately adjacent to the Tresavean housing estate at Lanner, Redruth, Cornwall.

Aims and objectives

As stated in the brief, the ground works associated with the planned development may disturb buried archaeological remains. In order to understand the site and the potential for recording any significant archaeological remains located under its surface, a geophysical survey has been recommended. This is intended to provide the background data based on which any recommendations for further archaeological recording will be made.

The site specific aims are to:

- Undertake an archaeological magnetometer survey
- Produce a report containing the geophysical data and the data in interpreted form
- Inform whether an archaeological evaluation or further archaeological recording of any potential buried remains is recommended.

The project objectives are to undertake a magnetometer survey of the site and to produce a summary report on its results.

Working methods

All recording work will be undertaken according to the Institute for Archaeologists *Standards and Guidance for Archaeological Investigation and Recording*. Staff will follow the IfA *Code of Conduct* and *Code of Approved Practice for the Regulation of Contractual Arrangements in Archaeology*. The Institute for Archaeologists is the professional body for archaeologists working in the UK.

The geophysical survey will be undertaken in line with English Heritage guidelines, using the following:

- *Geophysical Survey in Archaeological Field Evaluation*, English Heritage 2008
- *Standards and Guidance for Archaeological Field Evaluation*, Institute for Archaeologists 2008.

In addition, all work will be undertaken in accordance with the high professional standards and technical competence expected by the Geological Society of London and the European Association of Geoscientists and Engineers.

Desk-based assessment

A desk-based assessment will be carried out to inform the fieldwork stage. This will comprise:

- Published sources
- Historic maps
- Modern maps
- GIS layers held by HE CC and Cornwall Council.

Fieldwork: geophysical survey

A Geometrics MagMapper G858 caesium vapour magnetometer will be used to carry out the survey, either utilising its own inbuilt data logger or a separate acquisition system if the magnetometer is sledge mounted. The sensors will be set approximately 0.3m above the ground surface to maximise sensitivity whilst decreasing the effects of surface anomalies. Line separation will either be 1.0m to achieve a compromise between speed of coverage and lateral resolution, or 0.5m where better quality data is required. The along-line interval will be 0.25m in line with English Heritage guidance. Where hand held instruments are used the average along-line separation will be in the order of 0.16m at average walking speeds.

The sledge mounted system will be used wherever possible as this provides a faster rate of coverage, less ground contact and imparts less ground pressure than a walking surveyor; it also provides a more stable measurement platform. Real-time tracking will be provided by a GNSS receiver or robotic total station, obviating the need to set out temporary grids. The driver of the quad bike towing the sledge can also track information in real time, monitor data quality, positional accuracy and survey resolution.

Caesium vapour magnetic data collected in this fashion usually requires very little levelling to achieve a seamless sheet of data, an elementary corrections are usually limited to heading reduction and a little light smoothing. Heading reduction is a statistical process designed to reduce normal constant offsets between the zero or DC measurement from each sensor generated by slight rotational differences due to their manufacture. The sheet or mosaic can then be subjected to normal potential field processing techniques including reduction of the background regional field and splitting of the resultant residual field into different depth models through analysis in the frequency domain. This yields the shallow data set, a model of anomalies within the upper 3m of ground and also a pseudo-gradient data set which models the response of a 1m vertical gradiometer, which can sometimes better reveal the edges of weakly magnetic structures.

The data will be presented as a series of greyscale images overlaid onto map data geo-referenced to the OS grid. A separate catalogue map will graphically highlight the most significant anomalies regardless of their origin and also the numerical key to a detailed anomaly catalogue included within report text.

Alongside the catalogue the report text will include a detailed methodological description and justification and analysis of the geophysical environment and its impact upon or presence within the data. Significant aspects of the results will be discussed within the specialist report.

Creation of site archive

- An entry will be made to the English Heritage/ADS OASIS online archive index.

Archive report

A written report will summarise the results of the geophysical survey and will include:

- Summary
- Project background
- Aims and objectives
- Methodology
- Location and setting
- Designations
- Site history
- Survey results
- Significance
- Recommendation
- References
- Project archive index
- Supporting illustrations: location map, historic maps, plans, survey results

A paper copy and a digital (PDF) copy of the report, illustrations and any other files will be held in the Cornwall HER. Paper copies of the report will be distributed to the client, to local archives and national archaeological record centres.

Archive deposition

An index to the site archive will be created and the archive contents prepared for long term storage, in accordance with HE standards.

The archiving will comprise the following:

1. All correspondence relating to the project, the WSI, a single paper copy of the report together with an electronic copy on CD, stored in an archive standard (acid-free) documentation box
2. The project archive will be deposited initially at ReStore PLC, Liskeard and in due course (when space permits) at Cornwall Record Office.

Timetable

The study is anticipated to be commenced during November 2011. HE will require notice before commencement of work, in order to allocate field staff time and arrange other logistics.

The archive report will be completed within 3 months of the end of the fieldwork. The deposition of the archive will be completed within 3 months of the completion of the archive report.

Monitoring and Signing Off Condition

Monitoring of the project will be carried out by Phil Markham, Historic Environment Planning Advice Officer. Where the Historic Environment Planning Advice Officer is satisfied with the archive report and the deposition of the archive written discharge of the planning condition will be expected from the local planning authority (LPA).

Monitoring points during the study will include:

- Approval of the WSI
- Completion of fieldwork
- Completion of archive report
- Deposition of the archive

Historic Environment Projects

Historic Environment Projects is the contracting arm of Historic Environment, Cornwall Council (HE). HE employs some 20 project staff with a broad range of expertise, undertaking around 100 projects each year.

HE is committed to conserving and enhancing the distinctiveness of the historic environment and heritage of Cornwall and the Isles of Scilly by providing clients with a number of services including:

- Conservation works to sites and monuments
- Conservation surveys and management plans
- Historic landscape characterisation
- Town surveys for conservation and regeneration
- Historic building surveys and analysis
- Maritime and coastal zone assessments
- Air photo mapping
- Excavations and watching briefs
- Assessments and evaluations
- Post-excavation analysis and publication

- Outreach: exhibitions, publication, presentations

Standards



HE is a Registered Organisation with the Institute for Archaeologists and follows their Standards and Code of Conduct.

As part of Cornwall Council, HE has certification in BS9001 (Quality Management), BS14001 (Environmental Management), OHSAS18001 (Health, Safety and Welfare), Investors in People and Charter Mark.

Terms and conditions

Contract

The HE projects team is part of Historic Environment, Cornwall Council. If accepted, the contract for this work will be between the client and Cornwall Council.

The views and recommendations expressed will be those of the HE projects team and will be presented in good faith on the basis of professional judgement and on information currently available.

Project staff

The project will be managed by a nominated Senior Archaeologist who will:

- Discuss and agree the detailed objectives and programme of each stage of the project with the client and the field officers, including arrangements for health and safety.
- Monitor progress and results for each stage.
- Edit the project report.
- Liaise with the client regarding the budget and related issues.

Work will be carried out by HE field staff, with assistance from qualified specialists and sub-contractors where appropriate.

Report distribution

Paper copies of the report will be distributed to the client, to local archives and national archaeological record centres.

A digital copy of the report, illustrations and any other files will be held in the Cornwall HER and also supplied to the client on CD or other suitable media.

Copyright

Copyright of all material gathered as a result of the project will be reserved to the Historic Environment, Cornwall Council. Existing copyrights of external sources will be acknowledged where required.

Use of the material will be granted to the client.

Freedom of Information Act

As Cornwall Council is a public authority it is subject to the terms of the Freedom of Information Act 2000, which came into effect from 1st January 2005.

HE will ensure that all information arising from the project shall be held in strict confidence to the extent permitted under the Act. However, the Act permits information to be released under a public right of access (a "Request"). If such a Request is received

HE may need to disclose any information it holds, unless it is excluded from disclosure under the Act.

Health and safety statement

HE follows the Council's *Statement of Safety Policy*. For more specific policy and guidelines HE uses the manual *Health and Safety in Field Archaeology* (2002) endorsed by the Standing Conference of Archaeological Unit Managers.

The quality manager for the project will be Senior Geophysicist Martin Roseveare, whilst site safety will be managed by Safety Co-ordinator Anne Roseveare in accordance with established practice and guidance as laid down by the Health and Safety Executive and the International Association of Geophysical Contractors.

A risk assessment will be drawn up for the site. Local welfare facilities will be utilised.

Insurance

As part of Cornwall Council, HE is covered by Public and Employers Liability Insurance.

Adam Sharpe BA MIfA