

ARCHAEOLOGICAL
SERVICES
DURHAM UNIVERSITY

on behalf of
Snowdon Coaches

Snowdon Coaches
Seaside Lane, Easington
County Durham

geophysical survey

report 5589
July 2021

Contents

1.	Summary	1
2.	Project background	2
3.	Historical and archaeological background	3
4.	Landuse, topography and geology	4
5.	Geophysical survey	5
6.	Conclusions	7
7.	Sources	8

Figures

Figure 1:	Site location and Historic Environment Record
Figure 2:	Magnetometer survey
Figure 3:	Geophysical interpretation
Figure 4:	Archaeological interpretation

1. Summary

The project

- 1.1 This report presents the results of a geophysical survey conducted in advance of proposed development at Snowdon Coaches, Seaside Lane, Easington, County Durham. The works comprised approximately 1.1ha of magnetometer survey.
- 1.2 The works were commissioned by Snowdon Coaches and conducted by Archaeological Services Durham University.

Results

- 1.3 The partial remains of a possible soil-filled ditch of uncertain age and origin have been identified in the northern part of the survey area, along with several possible pits.
- 1.4 Traces of former ridge and furrow cultivation have been detected.
- 1.5 Former field boundaries, as shown on Ordnance Survey maps, have been detected.
- 1.6 Probable areas of disturbed ground have been detected.

2. Project background

Location (Figure 1)

- 2.1 The proposed development area (PDA) is located at Snowdon Coaches, Seaside Lane, Easington, County Durham (NGR centre: NZ 41868 43685). It is irregular in plan and covers an area of approximately 1.8ha. To the south is Seaside Lane, with housing beyond; to the north are allotment gardens; to the west is a pasture field with more housing beyond; to the east is a former field currently under development.
- 2.2 One survey of approximately 1.1ha was conducted across all practicable parts of the PDA, comprising the grassy area north of the main coach yard.

Development proposal

- 2.3 The area is proposed for residential development.

Objective

- 2.4 The aim of the survey was to assess the nature and extent of any sub-surface features of potential archaeological significance within the survey area, so that an informed decision may be made regarding the nature and scope of any further scheme of archaeological works that may be required in relation to the development.
- 2.5 The regional research framework *Shared Visions: The North-East Regional Research Framework for the Historic Environment* (Petts & Gerrard 2006) contains an agenda for archaeological research in the region, which is incorporated into regional planning policy implementation. In this instance, the scheme of works was designed to address the following research priorities: Early Medieval EMi. Landscape and EMii. Settlement; Later Medieval MDi. Settlement and MDii. Landscape.

Methods statement

- 2.6 The survey has been undertaken in accordance with instructions from the client and national standards and guidance (see para. 5.1 below).

Dates

- 2.7 Fieldwork was undertaken on 19th July 2021. This report was prepared for July 2021.

Personnel

- 2.8 Fieldwork and geophysical data processing was conducted by Mark Woolston-Houshold. This report was prepared by Richie Villis, with illustrations by Dr Helen Drinkall.

Archive/OASIS

- 2.9 The site code is **ESC21**, for **Easington Snowdon Coaches 2021**. The survey archive will be retained at Archaeological Services Durham University and a copy supplied on CD to the client for deposition with the project archive in due course. Archaeological Services Durham University is registered with the **Online Access to the Index of archaeological investigationS project (OASIS)**. The OASIS ID number for this project is **archaeol3-426799**.

3. Historical and archaeological background

- 3.1 The following information is taken from a search of the County Durham Historic Environment Record within a 1km radius of the PDA. Primary Reference Numbers (PRN) are shown in brackets below.
- 3.2 There are no historic or statutorily protected buildings on the PDA. The structures within the PDA are of 20th-century date and of no significant heritage value. There are no Scheduled Ancient Monuments or other designated heritage assets on or in the near vicinity of the site. The PDA is outside the Easington Conservation Area, which lies to the west and south-west.

Previous archaeological works

- 3.3 No previous archaeological works have been identified within the PDA. Easington has been subject to numerous archaeological projects over the years, with over 40 events listed by the HER within 1km of the PDA. The majority of these are concentrated in the historic core of the village to the west of the PDA.
- 3.4 Most recently the field to the east of the PDA, currently under development, has been subject to archaeological evaluation through geophysical survey (E60797) and subsequent trial trenching (E63656; E67155). The geophysical survey identified former ridge and furrow cultivation (H60798) and the possible remains of linear archaeological features; subsequent trial trenching found evidence of post-medieval furrows but no significant archaeological remains (McKelvey 2017).
- 3.5 Geophysical survey at Fennel Grove (E61234), approximately 300m west of the PDA, identified the remains of soil-filled ditches and traces of former ridge and furrow cultivation (Archaeological Services 2016). Subsequent archaeological works identified the remains of a medieval enclosure and several medieval rubbish pits (Horsley 2018). No evidence was recorded of possible Iron Age ring-ditches (H8592) previously interpreted from aerial photography.
- 3.6 A detailed archaeological desk-based assessment (E61933) and subsequent archaeological watching brief (E60992) were conducted prior to and during development of the former council offices on Seaside Lane, directly opposite the PDA. The watching brief recorded a layer of demolition rubble and stone wall foundations of two phases of buildings associated with the former Easington Union Workhouse and subsequent hospital (H60994/H15999) built between 1848 and 1850 and subsequently demolished in 1971 (Archaeological Services 2013; 2015).

The prehistoric and Roman periods (up to 5th century AD)

- 3.7 There is no direct evidence of prehistoric or Roman activity in the PDA. There is, however, evidence that the surrounding area was exploited in prehistory and this activity may have extended onto the site. Most notably a rectilinear enclosure of probable prehistoric date has been identified from aerial photography at Holm Hill (H3061), approximately 500m north-east of the PDA. Possible Iron Age ring-ditches (H8592) are recorded on the HER at Fennel Grove, although no such features were identified in subsequent works there (above, para. 3.5).

The medieval period (5th century to 1540)

- 3.8 The name of Easington comes from *Essyn – tun*, the Old English for farm/settlement of Essa's (Essyn/Essingas) people. Remains of an Anglo-Saxon cemetery dating from

the 6th and 7th centuries were found on Andrew's Hill, to the south of the village (H51) in 1991. The remains of late Anglo-Saxon buildings were found during excavations at Seaton Holme (H3866; H60514), approximately 450m west of the PDA.

- 3.9 The Church of St Mary (H248/H35467, Grade I Listed Building: 1231813) dates from the 12th century (Mackenzie & Ross 1834, 386) but was probably built on the site of an earlier church. An 8th to 10th-century stone slab carved with an Anglo-Saxon cross has been built into the fabric of the church (H747). The village is set out around the large village green and is overlooked by the church, which is approximately 400m west-south-west of the PDA. Seaton Holme, to the north of the church, contains 13th or early 14th-century elements (H35466, Grade I Listed Building: 1231692) as does a nearby farmhouse and barn (H36129, Grade II* Listed Building: 1277424). The Boldon Book of 1183 records that land in Easington was under the control of the Bishops of Durham.
- 3.10 During excavations in Low Road, 200m south of the PDA, a small area of 15th to 16th-century settlement was found (as well as foundations of an early 18th-century cottage; H249).

The post-medieval period (1541 to 1899)

- 3.11 In the 16th to 18th centuries the village remained the focus of activity for the surrounding rural population. Between 1656 and 1672 much of the surrounding common land was enclosed. The PDA was sufficiently close to the village to have been used as agricultural land throughout the medieval and early post-medieval periods. Speed's (17th century), Armstrong's (1768) and Greenwood's (1820) maps of the area show Easington to the west of the PDA as one of the larger settlements in the area standing on the main Sunderland to Stockton road. The 1840 tithe map and subsequent Ordnance Survey editions show a series of north/south fields after enclosure. The first appearance of the buildings which now constitute Snowdon Coaches offices and depot is on the 1939 OS edition.
- 3.12 The PDA was probably in use as agricultural land throughout the medieval and post-medieval periods, evidence of this, in the form of ridge and furrow cultivation, has been recorded in the fields east of the PDA (H60798) (above, para. 3.4).
- 3.13 There are numerous post-medieval entries in the HER in the vicinity of the PDA, most notably the former Easington Union Workhouse and subsequent hospital (H60994/H15999) on the south side of Seaside Lane, opposite the PDA (above, para 3.6).

4. Landuse, topography and geology

- 4.1 At the time of survey the PDA comprised the offices and depot for Snowdon Coaches and a recently mown grass field to the north. Magnetometer survey was restricted to the northern grass field, which was bounded by hedges and post and wire fences to the north and west. The survey area was separated from the coach yard by overgrown patches of waste ground and trees. To the east Heras fencing separated the survey area from the adjacent field, which was under development. A telegraph pole stood in the south of the survey area.

- 4.2 The topography undulated whilst generally sloping downwards from approximately 116m OD in the south-west of the PDA to approximately 106m OD in the north-east.
- 4.3 The underlying solid geology of the area comprises Late Permian dolostone of the Roker Formation, which is overlain in the main by Devensian till with glaciofluvial sand and gravel in the south-eastern corner of the survey area.

5. Geophysical survey Standards

- 5.1 The surveys and reporting were conducted in accordance with the Chartered Institute for Archaeologists (CIfA) *Standard and Guidance for archaeological geophysical survey* (2014, updated 2020); the *EAC Guidelines for the Use of Geophysics in Archaeology* (Schmidt *et al.* 2015); and the Archaeology Data Service & Digital Antiquity *Geophysical Data in Archaeology: A Guide to Good Practice* (Schmidt 2013).

Technique selection

- 5.2 Geophysical survey enables the relatively rapid and non-invasive identification of sub-surface features of potential archaeological significance and can involve a suite of complementary techniques such as magnetometry, earth electrical resistance, ground-penetrating radar, electromagnetic survey and topsoil magnetic susceptibility survey. Some techniques are more suitable than others in particular situations, depending on site-specific factors including the nature of likely targets; depth of likely targets; ground conditions; proximity of buildings, fences or services and the local geology and drift.
- 5.3 In this instance, based on the HER evidence, it was considered possible that cut features such as ditches and pits might be present on the site, and that other types of feature such as trackways, wall foundations and fired structures (for example kilns and hearths) could also be present.
- 5.4 Given the anticipated nature and depth of targets, and the non-igneous geological environment of the study area, a magnetic technique, fluxgate gradiometry, was considered appropriate for detecting the types of feature mentioned above. This technique involves the use of magnetometers to detect and record anomalies in the vertical component of the Earth's magnetic field caused by variations in soil magnetic susceptibility or permanent magnetisation; such anomalies can reflect archaeological features.

Field methods

- 5.5 A 30m grid was established across the survey area and related to the Ordnance Survey (OS) National Grid using a Leica GS15 global navigation satellite system (GNSS) with real-time kinematic (RTK) corrections typically providing 10mm accuracy.
- 5.6 Magnetic gradient measurements were determined using Bartington Grad601-2 dual fluxgate gradiometers. A zig-zag traverse scheme was employed and data were logged in 30m grid units. The instrument sensitivity was effectively 0.03nT, the sample interval was 0.25m and the traverse interval was 1m, thus providing 3,600 sample measurements per 30m grid unit.

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

Data processing

- 5.8 Geoplot v.4 software was used to process the geophysical data and to produce a continuous tone greyscale image of the raw (minimally processed) data. Trace plots of the data were also prepared and examined but are not presented in this report. The greyscale image is presented in Figure 2; geophysical and archaeological interpretations are presented in Figures 3 and 4. In the greyscale image, positive magnetic anomalies are displayed as dark grey and negative magnetic anomalies as light grey. A palette bar relates the greyscale intensities to anomaly values in nanoTesla.

- 5.9 The following basic processing functions have been applied to the magnetometer data:

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

Interpretation: anomaly types

- 5.10 A colour-coded geophysical interpretation plan is provided. Three types of magnetic anomaly have been distinguished in the data:

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

Interpretation: features

- 5.11 A colour-coded archaeological interpretation plan is provided. For ease of reference, anomaly labels shown bold in the text below (eg **a**, **b**, etc) are also shown on the archaeological interpretation plan.
- 5.12 Weak and diffuse positive magnetic anomalies have been detected in the northern part of the area (**a**). Linear elements could possibly reflect the truncated remains of a soil-filled ditch of uncertain age and origin. Several discrete positive magnetic anomalies have also been detected in this vicinity (**b**), which could reflect the remains of pits. Similar anomalies identified at Fennel Grove, approximately 300m to the west of the survey area, proved to represent the remains of a medieval enclosure and associated features. The features identified here, and at Fennel Grove, both appear to pre-date subsequent ridge and furrow cultivation.
- 5.13 A series of parallel, weak, north-west/south-east aligned positive magnetic anomalies (**c**) has been detected across the survey area, which almost certainly reflects former ploughing regimes, possibly representing traces of former ridge and furrow cultivation. This former cultivation appears to cut the possible ditch and pit features (above, para 5.12).
- 5.14 Sporadic weak positive magnetic anomalies and associated dipolar magnetic anomalies (**d**) have been detected, forming a loose chain parallel to the eastern edge of the area. These correspond to the location of a former field boundary as shown on historic OS editions. A second, broadly perpendicular chain of dipolar magnetic anomalies has been detected in the centre of the area (**e**); this also corresponds to a former field boundary shown on OS editions.
- 5.15 Two linear negative magnetic anomalies have been detected (**f**), which correspond to desire paths visible on Google Earth aerial photographs of the area.
- 5.16 The only other anomalies detected here are small, discrete dipolar magnetic anomalies. These almost certainly reflect near-surface items of ferrous and/or fired debris, such as horseshoes and brick fragments. Greater concentrations of dipolar magnetic anomalies along the northern and south-western edges of the area almost certainly reflect areas of disturbed ground, burnt areas (eg bonfires) and other debris (**g**). A large and strong dipolar magnetic anomaly in the south of the survey area reflects telegraph pole (**h**).

6. Conclusions

- 6.1 Approximately 1.1ha of magnetometer survey was undertaken on land at Snowdon Coaches, Seaside Lane, Easington, County Durham prior to proposed residential development.
- 6.2 The partial remains of a possible soil-filled ditch of uncertain age and origin have been identified in the northern part of the survey area, along with several possible pits.
- 6.3 Traces of former ridge and furrow cultivation have been detected.
- 6.4 Former field boundaries, as shown on OS maps, have been detected.

6.5 Probable areas of disturbed ground have been detected.

7. Sources

- Archaeological Services 2013 *Seaside Lane, Easington, County Durham: archaeological desk-based assessment*. Report **3264**, Archaeological Services Durham University
- Archaeological Services 2015 *Former Council Offices, Easington, County Durham: archaeological monitoring*. Report **3652**, Archaeological Services Durham University
- Archaeological Services 2016 *Fennel Grove, Easington, County Durham: geophysical survey*. Report **4156**, Archaeological Services Durham University
- CIfA 2014 *Standard and Guidance for archaeological geophysical survey*. Chartered Institute for Archaeologists
- Horsley, K, 2018 *Land at Fennel Grove, Easington, County Durham: archaeological strip, map and sample report*. Report **LE13753**, Wardell Armstrong
- McKelvey, J, 2017 *Land at Seaside Lane, Easington, County Durham: archaeological evaluation*. Report **AD228**, AD Archaeology
- Petts, D, & Gerrard, C, 2006 *Shared Visions: The North-East Regional Research Framework for the Historic Environment*. Durham
- Schmidt, A, 2013 *Geophysical Data in Archaeology: A Guide to Good Practice*. Archaeology Data Service & Digital Antiquity, Oxbow
- Schmidt, A, Linford, P, Linford, N, David, A, Gaffney, C, Sarris, A & Fassbinder, J, 2015 *EAC Guidelines for the Use of Geophysics in Archaeology: Questions to Ask and Points to Consider*. EAC Guidelines **2**, Namur

Reproduced from Explorer 308 1:25 000 by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright 2015. All rights reserved. Licence number AL100002176

ARCHAEOLOGICAL SERVICES

DURHAM UNIVERSITY

Snowdon Coaches
Seaside Lane, Easington
County Durham

geophysical survey
report 5589

Figure 1: Site location and Historic Environment Record

0 500m
scale 1:10 000 for A3 plot

-  site boundary
-  HER site
-  event
-  listed building
-  conservation area

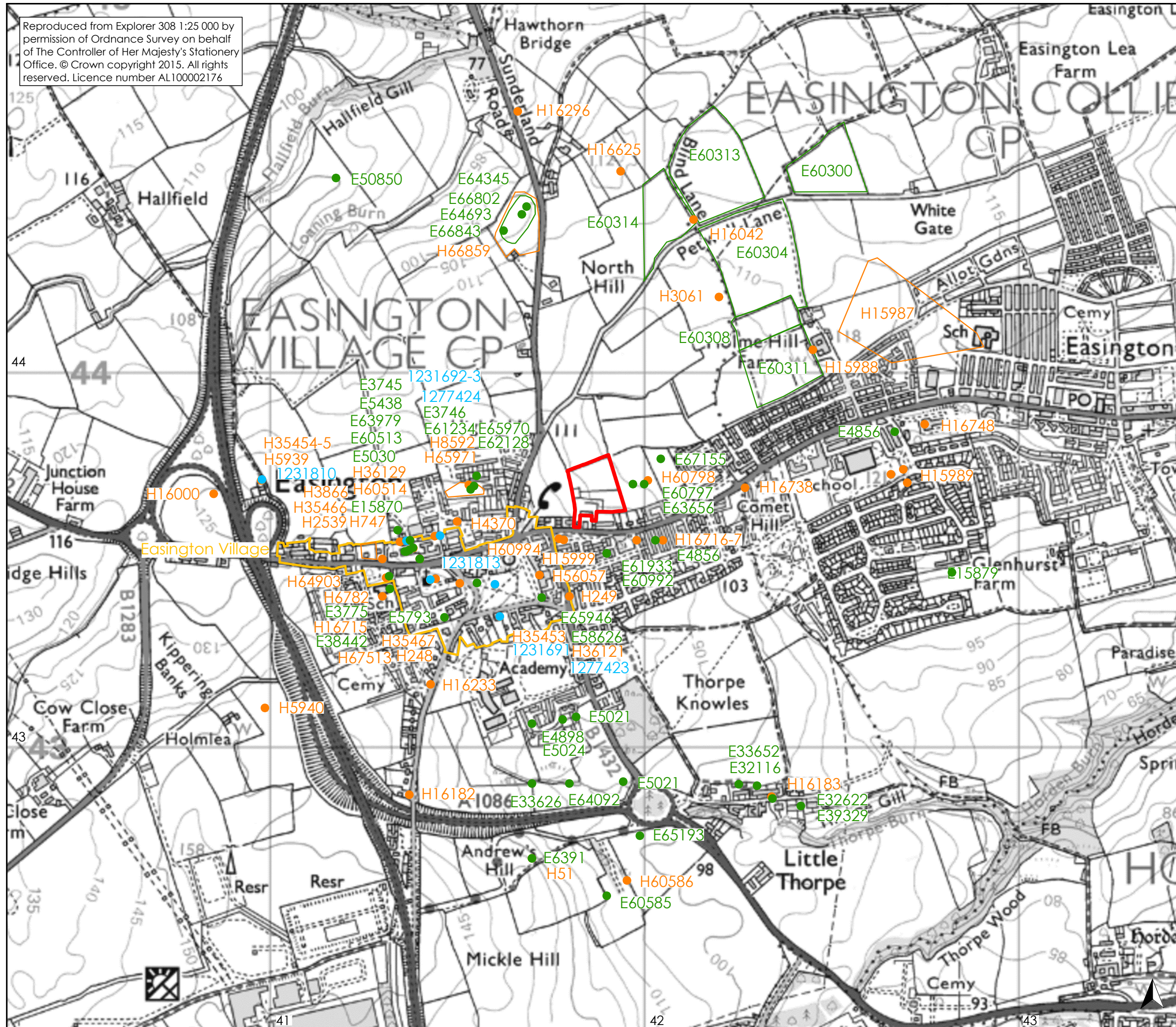
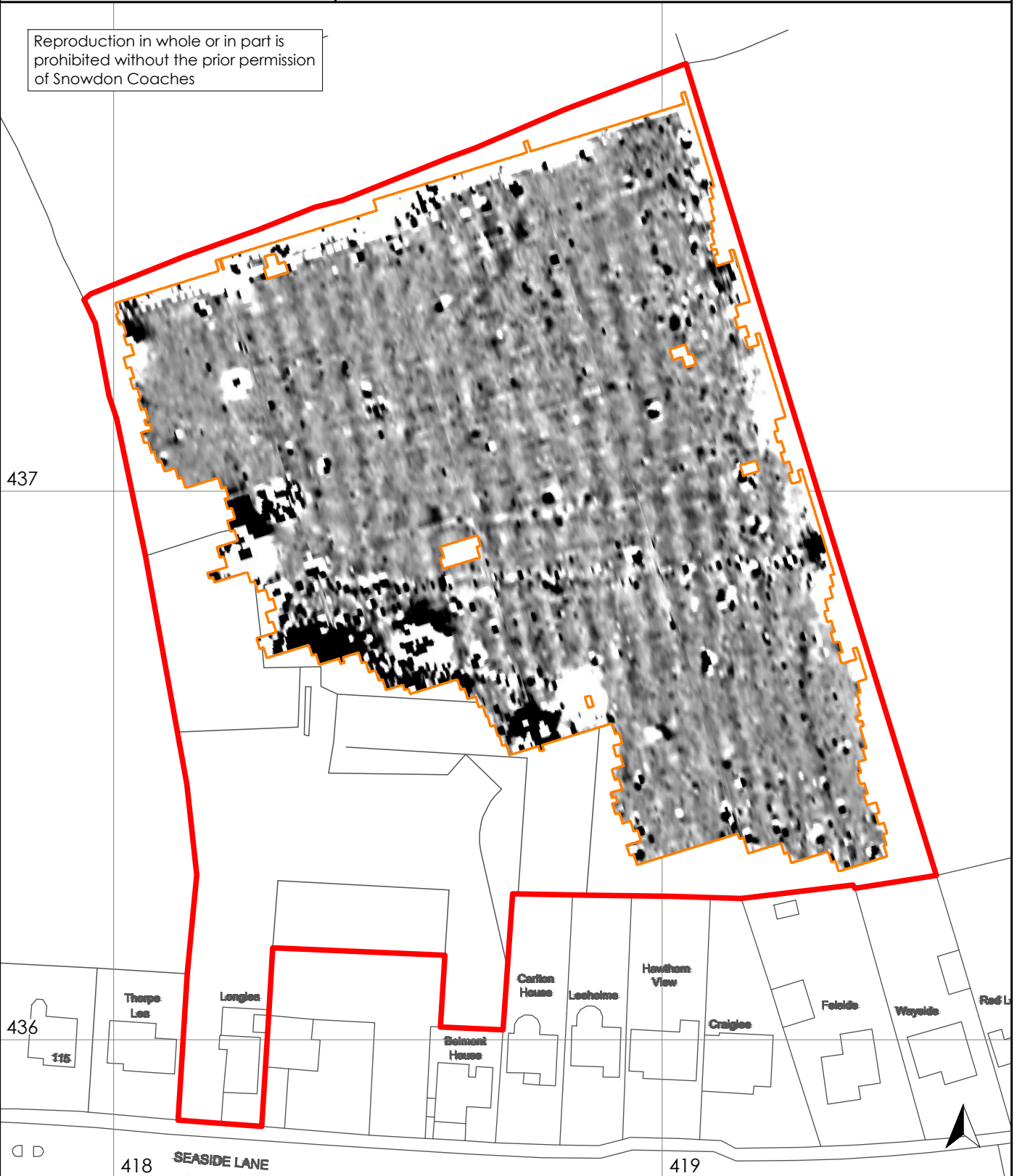


Figure 2: Magnetometer survey

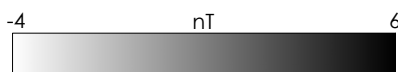
Reproduction in whole or in part is prohibited without the prior permission of Snowdon Coaches



site boundary



magnetometer survey



scale 1:1000 for A4 plot

Figure 3: Geophysical interpretation

Reproduction in whole or in part is prohibited without the prior permission of Snowdon Coaches

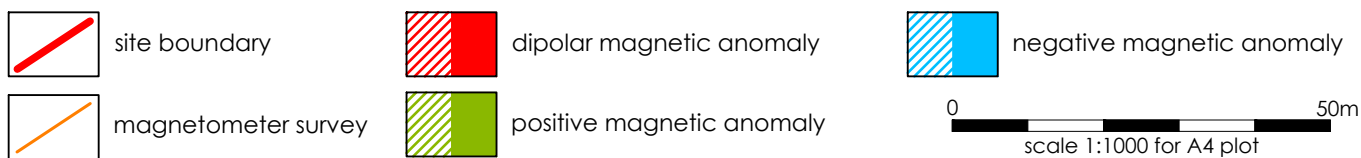
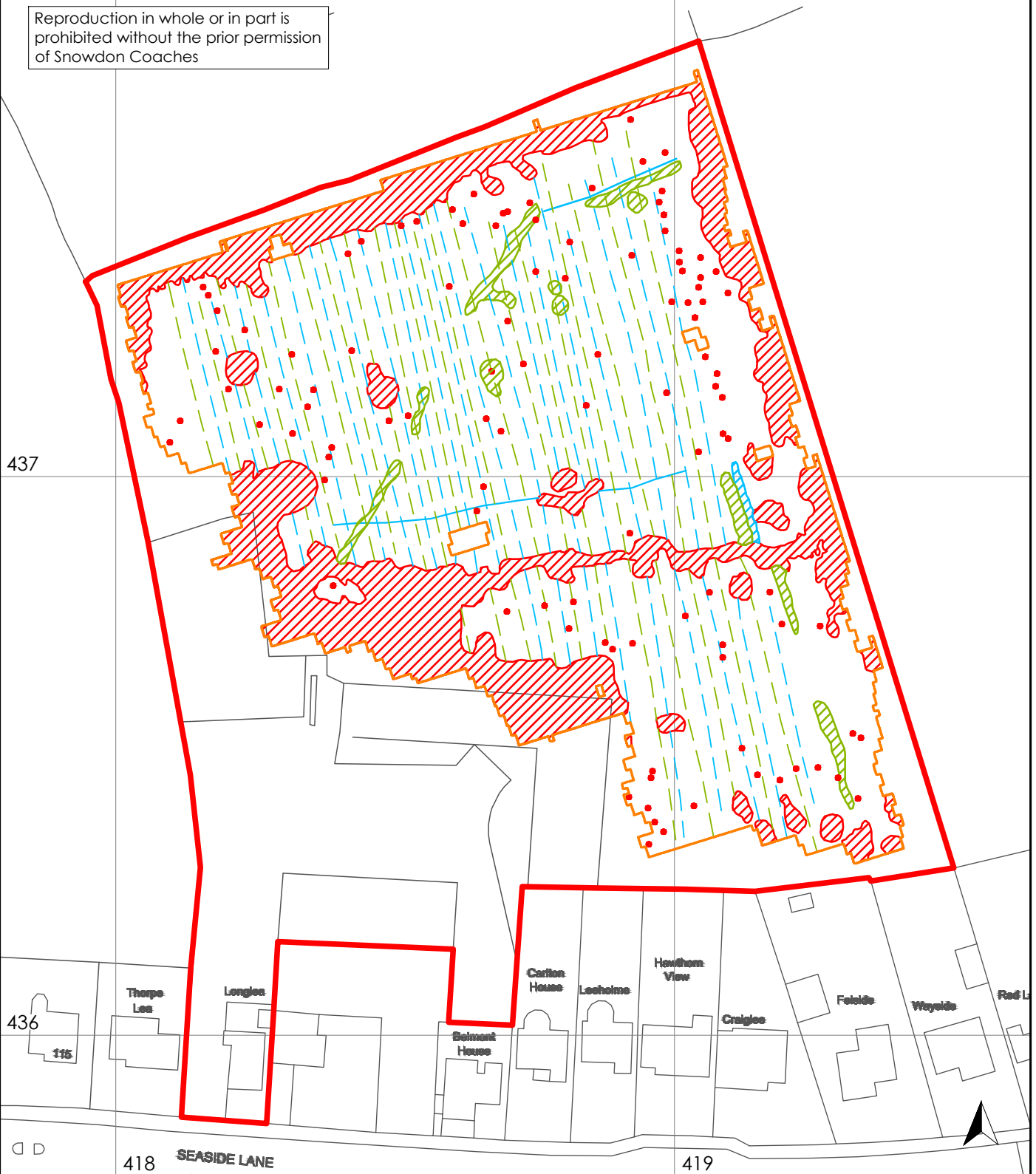
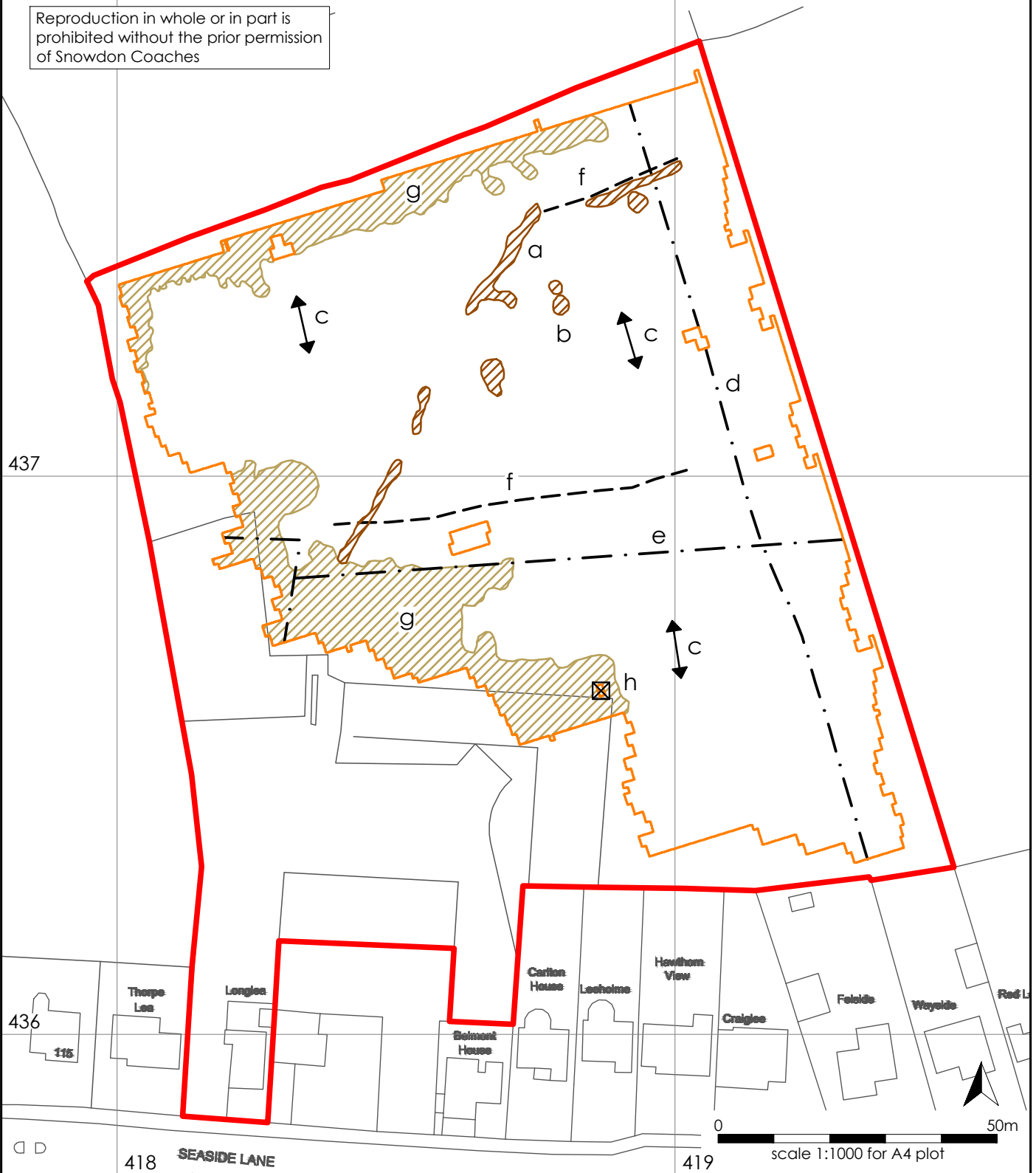










Figure 4: Archaeological interpretation

Reproduction in whole or in part is prohibited without the prior permission of Snowdon Coaches



- | | | | |
|--|--|--|---|
|  site boundary |  possible soil-filled feature |  ridge and furrow |  former field boundary |
|  magnetometer survey |  disturbed area |  footpath |  telegraph pole |