Land at Fulwood Drive Bare, Morecambe Lancashire

Oakmere Homes (Northwest) Ltd



MAY 2022

Geophysical Survey Report EH139/02





Land at Fulwood Drive Bare, Morecambe Lancashire

Geophysical Survey Report for Oakmere Homes (Northwest) Ltd

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PREPARED BY:

Martin Railton

edenheri1-506732

Managing Director

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Heritage Impact Assessment Archaeological Desk-Based Assessment Historic Landscape Survey Written Scheme of Investigation Geophysical Survey Trial Trench Evaluation Archaeological Excavation Archaeological Watching Briefs



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Summary

In 2022 Eden Heritage Ltd was commissioned by Oakmere Homes (Northwest) Limited to undertake an archaeological geophysical survey on land at Fulwood Drive, Bare, Morcambe in Lancashire. The geophysical survey was undertaken) in order to help inform an outline planning application for a proposed residential development at the site (Planning Reference 21/01341/OUT).

The proposed development area is believed to have archaeological potential. There is one non-designated heritage asset is recorded at the site, which extends into part of the proposed development area, this being a field called 'Standing Stone' (HER 26420). Torrisholme Barrow (HER 429/2935) is also located 325m to the southwest of the proposed development area. Further evidence of Bronze Age activity has been recovered by metal detecting from the area to the north of Torrisholme Barrow and possibly within the site boundary.

The purpose of the geophysical survey was therefore to help determine the archaeological potential of the site. Geomagnetic survey was undertaken covering the proposed development area, which was under rough pasture at the time of the survey. The geophysical survey has confirmed the presence of post-medieval activity in the form of the remains of a field system which is recorded on the 1846 Plan of the Township of Slyne with Hest. The survey has also confirmed the presence of an associated trackway and the remains of ridge and furrow cultivation, which appears to respect the post-medieval field system and is likely contemporary. Another field boundary ditch and two possible drainage ditches have been detected.

The geophysical survey has detected a small number of possible soil-filled features but no definite evidence for prehistoric activity. It is recommended the results of the survey be tested through the excavation of a limited number of trenches located to sample the geophysical anomalies detected by the geophysical survey.



1 Introduction

1.1 **Project Circumstances**

- 1.1.1 In 2022 Eden Heritage Ltd was commissioned by Oakmere Homes (Northwest) Ltd (the Client) to undertake an archaeological geophysical survey on land at Fulwood Drive, Bare, Morcambe, Lancashire. The geophysical survey was undertaken) in order to help inform an outline planning application for a proposed residential development at the site (Planning Reference 21/01341/OUT).
- 1.1.2 The proposed development area comprised 5ha of land on the east side of Bare, located 1.75km to the east of Morecambe town centre, The site was to the north of Slyne Road, bounded to the east and north by the railway between Lancaster and Carnforth and Morecambe branch line (Figure 2).
- 1.1.3 The proposed development area is believed to have archaeological potential. A previous desk-based assessment has revealed that there is one non-designated heritage asset is recorded at the site, which extends into part of the proposed development area, this being a field called 'Standing Stone' (HER 26420). Torrisholme Barrow (HER 429/2935) is also located 325m to the southwest of the proposed development area. The barrow, believed to be a possible Bronze Age burial site, is designated a scheduled monument and takes the form of a bowl barrow (Historic England List Entry 1008912). Further evidence of Bronze Age activity has been recovered by metal detecting from the area to the north of Torrisholme Barrow and possibly within the site (Eden Heritage Ltd 2021).
- 1.1.4 As a result, Doug Moir, Planning Officer (Archaeology), Historic Environment Team, at Lancashire County Council (HETLCC) has advised that an archaeological field evaluation of the proposed development area is required to help determine the planning application. This is in line with government advice as set out in the National Planning Policy Framework (MHCLG 2021).
- 1.1.5 This report presents the results of the geophysical survey which was undertaken to help determine the archaeological potential of the proposed development area. The scope of the subsequent trial trench evaluation will need to be agreed with Doug Moir by submitting a Written Scheme of Investigation (WSI) to HETLCC for approval, prior to the fieldwork taking place.



2 Methodology

2.1 Standards

2.1.1 The geophysical survey fieldwork and reporting was undertaken following Historic England guidelines (English Heritage 2008) and in accordance with the standard and guidance of the Chartered Institute for Archaeologists (CIFA 2020).

2.2 Geophysical Survey

- 2.2.1 **Technique Selection:** geomagnetic survey was selected as the most appropriate technique, given the non-igneous geology (mudstone), and the expected presence of archaeological features at depths of no more than 1.5m. Magnetic survey over sandstone can produce variable results, but previous surveys have shown magnetic susceptibility exists, which can produce moderate anomaly strengths. This response will also depend on local variations in drainage and overlying soils.
- 2.2.2 This technique involves the use of hand-held gradiometers, which measure variations in the vertical component of the earth's magnetic field. These variations can be due to the presence of sub-surface archaeological features.
- 2.2.3 *Field Methods:* the geophysical survey area measured *c*.5ha in total and was subdivided into three areas by field boundaries and ditches (Areas 1-3). A 30m grid was established in each area and tied-in to known Ordnance Survey points using a Trimble M3 Total Station (Figure 2).
- 2.2.4 Geomagnetic measurements were determined using a Bartington Grad601-2 dual gradiometer system, with twin sensors set 1m apart. It was expected that significant archaeological features at a depth of up to 1.5m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 30m grid units. A sample interval of 0.25m was used, with a traverse interval of 1m, providing 3600 sample measurements per grid unit, with measurements being recorded at the centre of each grid cell. The data were downloaded on site into a laptop computer for processing and storage.
- 2.2.5 **Data Processing:** geophysical survey data were processed using Terra Surveyor software, which was used to produce 'grey-scale' images of the raw data. Positive magnetic anomalies are displayed as dark grey, and negative magnetic anomalies are displayed as light grey. A palette bar shows the relationship between the grey shades and geomagnetic values in nT.
- 2.2.6 Raw data were processed in order to attempt to further define and highlight the archaeological features detected. The following basic data processing functions were used:
 - *Despike:* to locate and suppress random iron spikes in the gradiometer data (despike was performed on all survey grids using a window of 3x6 and threshold of 1.5);



- *Destagger:* to reduce errors in the x direction, sometimes caused by topography or operator error, (destagger was performed on selected survey grids using an offset of 1.0 m);
- *Destripe:* to reduce the effect of striping in the gradiometer data, sometimes caused by misalignment of the twin sensors (zero mean traverse was performed on all survey grids using a threshold of 1 standard deviation);
- *Clip*: to clip data to specified maximum and minimum values, in order to limit large noise spikes in the geophysical data (data were clipped from -3nT to 3nT);
- *Interpolate*: to match the resolution of the sample intervals in the x and y directions.
- 2.2.7 *Interpretation:* four types of geophysical anomaly were detected in the gradiometer data:
 - *positive magnetic*: regions of anomalously high or positive magnetic data, associated with the presence of high magnetic susceptibility soil-filled features, such as pits or ditches;
 - *negative magnetic:* regions of anomalously low or negative magnetic data, which may be associated with features of low magnetic susceptibility, such as stone-built features, geological features, land-drains or sub-surface voids;
 - *dipolar magnetic*: regions of paired positive and negative magnetic anomalies, which typically reflect ferrous or fired materials, including fired/ferrous debris in the topsoil, or fired structures, such as kilns or hearths;
 - *magnetic disturbance*: areas of high amplitude magnetic disturbance or interference, which may be associated with the presence of modern structures, such as services, fences or buildings.
- 2.2.8 **Presentation:** the grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey figures. A geophysical survey interpretation diagram shows the location and extent of dipolar, positive and negative geophysical anomalies, and areas of magnetic disturbance. An archaeological interpretation diagram is also provided, which is based on the interpretation of the geophysical survey results in light of the historical context of the site.

2.3 **Project Archive**

- 2.3.1 The data archive for the geophysical survey has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2013) and is held at the company offices. A PDF version of the final report will be deposited with the Lancashire Historic Environment Record within 3 months of completion of the project, once approved by the client.
- 2.3.2 The project is also registered with the **O**nline **A**cces**S** to the Index of archaeological investigation**S** (OASIS Project). The OASIS reference for this project is: **edenheri1-506732.**



Background

3.1 Location and Geological Context

- 3.1.1 Morcambe is situated on the southern coast of Morcambe Bay, located 5km to the northwest of Lancaster, in Lancashire (Figure 1). Bare is located 1.75km to the east of Morecambe town centre on the outskirts of the town, with Torrisholme located approximately 1km to the south.
- 3.1.2 The proposed development encompasses 5ha of land on the east side of Bare, to the north of Slyne Road, and west of the Lancaster Canal. It is bounded to the east and north by the railway between Lancaster and Carnforth and Morecambe branch line with Williamlands Farm to the south (Figure 2).
- 3.1.3 The site comprises undulating farmland, with elevations of approximately 8m aOD (above Ordnance Datum) at the centre of the site rising to 10m on the east and west sides of the site. There is a lack of substantial tree cover, but mature trees are present along the site boundaries (see Figure 7).
- 3.1.4 The solid geology of the site comprises mudstone known as Cumbrian Coast Group. This sedimentary bedrock formed approximately 252 to 299 million years ago in the Permian Period. This is overlain by glaciofluvial deposits of sand and gravel formed up to 2 million years ago in the Quaternary Period (BGS 2021).

3.2 Archaeological and Historic Background

- 3.2.1 The historical and archaeological background of the site was compiled as part of the desk-based assessment, a summary of which is provided below. For full details readers are directed to this report (Eden Heritage Ltd 2021) and to the Lancashire Historic Environment Record (HER) database.
- 3.2.2 Torrisholme Barrow (HER 429/2935) is believed to be Bronze Age in date and is located 325m to the southwest of the proposed development area on top of a glacial drumlin. The barrow, believed to be a burial site, is designated a scheduled monument and takes the form of a bowl barrow. The mound is 2.5m high on the east side and 1.2m high on the north side. On the west and south sides, the mound merges with the natural slope of the hill, there being no trace of an encircling ditch.
- 3.2.3 The 1845 tithe map identifies a group of four fields split by the railway line, but originally comprising one large field called 'Standing Stone' (HER 26420). This included three fields within the southeast part of the proposed development area. The field name is tentative evidence for the presence of a prehistoric standing stone at the site, possibly associated with the Torrisholme Barrow landscape.
- 3.2.4 Two fragments of cast bronze, possibly Bronze Age founder's waste were found by a metal detectorist on land to the north of Torrisholme Barrow (HER 26411). A possible Late Bronze Age axehead or spearhead (Asset 66) and a fragment of possible casting waste (HER 31564) were also recovered in the vicinity of Williamsland Farm to the south of the site indicating Bronze Age activity.



- 3.2.5 Previous field survey, conducted approximately 750m to the south of proposed development area in 2005 in association with the proposed Heysham to M6 link road, revealed a large number of features which were believed to be associated with medieval and/or post-medieval agricultural activity. These mostly comprised field boundary banks, cultivation lynchets and ridge and furrow earthworks and evidence of quarrying was also recorded. Aerial photographs, maps, LiDAR survey and local reports also indicate the presence of a medieval and/or post-medieval field system to the south and east of the site. This includes pronounced lynchets or cultivation terraces on the sides of the drumlin topped by Torrisholme Barrow (Eden Heritage Ltd, 13). There is no evidence for medieval settlement in the immediate vicinity of the proposed development area, but agricultural features are likely to be present within the site.
- 3.2.6 The earliest map to show the proposed development area in detail is the 1846 Plan of the Township of Slyne with Hest in the Parish of Bolton le Sands, which accompanied the 1845 Tithe apportionment. This map shows the route of the LNWR line to the east of the site and the subdivision of the proposed development area into seven fields (see Figure 3). As noted previously the three fields on the east side of the site (numbered 44, 48 and 49) were all part of an area known as 'Standing Stone' (HER 26420). Fields on the west side of the site (numbers 41, 45, 46 and 47) were known as either 'White Mires Pasture' or 'White Mire Meadow'. The majority of the land was owned by Thomas Green Esquire and occupied by Richard and John Gilloe, with one field (number 46) owned by William Sparling Esquire and occupied by John Parker. This land appears to have been meadow or mire, and a drainage ditch apparently bisected the west side of the site.
- 3.2.7 The proposed development area was largely unchanged at the end of the 19th century the, apart from the introduction of a further drainage ditch in the northwest portion of the site and the loss of some internal field boundaries (Figure 4a). A trackway also crossed the site, aligned northwest to southeast, providing access to Slyne Road to the south of the proposed development area.
- 3.2.8 Post-medieval activity within the proposed development area is considered likely to be limited to agricultural activity and associated with former field boundaries, drainage ditches and a trackway. However, there is also the possibility of sub-surface remains associated with the construction of the adjacent LNWR railway line and the Hest Bank and Morecambe Branch Railway. No development is known to have taken place within the proposed development area in the 20th century, apart from the gradual removal of field boundaries and the trackway (see Figures 4a-4d) and a new field boundary added to the south of the site (Eden Heritage Ltd 2021, 16).
- 3.2.9 Google Earth imagery has revealed several earthworks of possible archaeological interest within the site boundary. However, these appear to primarily relate to the post-medieval field boundaries, ditches and trackways identified through historic mapping. LiDAR imagery from 2017 also shows the presence of ridge and furrow cultivation on the east side of the site of possible medieval or post-medieval date, and possible hollows relating to small-sale quarrying (Eden Heritage Ltd 2021, 16).



3.3 **Previous Archaeological Work**

- 3.3.1 Information obtained from the Lancashire Historic Environment Record indicates that there has been no previous archaeological work undertaken within the site boundary. However, there have been several archaeological interventions undertaken within 1km of the site. Those investigations which are considered to be of relevance to the proposed development are summarised below.
- 3.3.2 As noted previously, several phases of archaeological investigation were undertaken to the south of the proposed development area in association with the proposed Heysham to M6 Link Road. An archaeological desk-based assessment, rapid identification walkover survey and built heritage appraisal was undertaken over two possible routes in 2003, which identified mainly earthworks associated with post-medieval field systems, as discussed in the section above (OAN 2003).
- 1.1.1 In 2009 an archaeological geophysical survey was undertaken of the proposed route which confirmed the presence of former field boundaries and ridge and furrow ploughing. Anomalies caused by ferrous utility pipes, former field boundaries, modern activity associated with the construction of the M6 motorway and modern and ridge and furrow ploughing were also identified. Anomalies due to archaeological activity were identified at two locations although both sites were previously known to have archaeological potential due to the presence of earthworks (WYAS 2009).
- 1.1.2 In 2013 an earthwork survey was also undertaken to record the identified earthworks (Rubicon Heritage Services Ltd 2014a). The same year an archaeological trial trench evaluation was undertaken. Three potential archaeological sites were identified, containing prehistoric features. One site had been previously interpreted as a Romano-British settlement adjacent to the believed route of a Roman road. The remaining site was indicative of a medieval farming landscape (Ibid).
- 1.1.3 Following the evaluation fieldwork four areas were subject to archaeological mitigation excavation in 2014. All of the excavation areas found archaeological remains, the two most important sites being a multi-period prehistoric settlement site and a medieval settlement area which were located outside of the 1km search area to the east of the current site. The first appeared to have been utilised in the Mesolithic period (8,000-4,000 BC) with a significant scatter of microliths but was subsequently occupied by a structure of early Neolithic date (3,500 BC), probably a rectangular longhouse. Other pits and pottery indicate that the site continued to be used into the Bronze Age (c.1,800 BC). At the second site extensive complex of buildings and kilns of medieval date were excavated, which were believed to be associated with the monastic grange at Beaumont (OAN 2018).
- 1.1.4 The site located *c*.900m to the south of the proposed development area adjacent to Torrisholme Road and was excavated to target possible evidence for prehistoric activity. This site revealed late medieval/early post-medieval activity in the form of three large kilns which were believed to be used for processing iron ore (OAN 2018, 115).



Geophysical Survey

4.1 Introduction

- 4.1.1 The geophysical survey was undertaken on 10th and 11th May 2022. The survey area comprised two fields of pasture, subdivided by a hedgerow (Area 1 and Area 2). The field to the west was further subdivided by a ditch which required the further subdivision of this field (Area 2 and Area 3). The ground in this area was waterlogged, and deeply rutted by cattle, so some parts had to be excluded.
- 4.1.2 The survey area was bounded by field boundaries consisting of hedges and ditches with post and wire fences and garden fences. Modern metal fences separated the fields from the railway to the east. These fences produced strong magnetic disturbance around the periphery of the survey areas.
- 4.1.3 Small discrete dipolar magnetic anomalies were detected across the whole of the study area. These are almost certainly caused by fired/ferrous litter in the topsoil, which is typical for modern agricultural land. These anomalies are indicated on the geophysical interpretation drawing (Figure 7) but are not referred to again in the subsequent archaeological interpretation (Figure 8).

4.2 Area 1

- 4.2.1 Area 1 was located within a field on the east side of the proposed development area, adjacent to the railway, part of which is recorded as containing an earlier field called 'Standing Stone'. As noted previously this field contained a prominent earthwork bank, which relates to a former field boundary which is recorded on the 1845 tithe map. The field was also crossed by raised trackway, which was located within a deep cutting on the south side of Area 1. The steepest earthwork banks and the cutting had to be excluded from the geophysical survey due to the severe topography.
- 4.2.2 A strong positive linear magnetic anomaly with a negative 'halo' was detected in the vicinity of the trackway, indicating that the trackway probably incorporated a metaled surface. A positive linear magnetic anomaly and negative magnetic anomaly was also detected in the vicinity of the earthwork bank. These anomalies are believed to relate to a stone bank and a corresponding soil-filled ditch.
- 4.2.3 Several very strong dipolar magnetic anomalies were detected on the alignment of the field boundary, which probably relate to ferrous materials which once formed part of the field boundary. Two strong dipolar magnetic anomalies were also detected in the vicinity of two round hollows in on the southwest side of Area 1, which have been interpreted as possible ponds or marl pits. These may have been backfilled with fired/ferrous debris, which could induce the two geophysical anomalies.
- 4.2.4 A series of weak linear positive and linear negative magnetic anomalies was detected crossing the east side of Area 1, which are typical of ridge and furrow cultivation. These anomalies were defined to the west by the field boundary bank, suggesting the former ploughing is post-medieval in date.



4.2.5 A linear positive magnetic anomaly was located crossing the west side of Area 1, aligned northwest to southeast, which may represent a ditch or drain, as it appeared to join the existing boundary ditch.

4.3 Area 2

- 4.3.1 Area 2 was located within a separate field to the west of Area 1, which was subdivided by a 19th century drainage ditch. The field was also crossed by the raised trackway identified in Area 1. In Area 2 the trackway was represented by two parallel positive linear magnetic anomalies (Figure 7).
- 4.3.2 A series of linear positive and linear negative magnetic anomalies was detected crossing the south side of Area 2, located on higher ground within the field aligned approximately north to south, which were indicative of further ridge and furrow cultivation. These anomalies were delineated to the west side by a linear positive magnetic anomaly, which was interpreted as a soil-filled field boundary ditch.
- 4.3.3 A discrete positive magnetic anomaly was detected on the southeast side of Area 2 (also located on the higher ground within the field), which may represent a soil-filled feature, such as a possible pit.

4.4 Area 3

- 4.4.1 Area 3 was located within the same field as Area 2 on the west side of the site but was separated from Area 1 by the 19th century drainage ditch. The field was also very waterlogged and boggy in places, meaning parts of this area had to be excluded from the geophysical survey (Figure 7). Strong magnetic disturbance was also detected on the west side of Area 3 due to the presence of modern houses and gardens, and what appeared to be modern debris resulting from house construction.
- 4.4.2 A broad linear positive magnetic anomaly was detected crossing the north side of Area 3, which corresponded to the location of the trackway as identified in Area 1 and Area 2 to the east.
- 4.4.3 A weak linear positive magnetic anomaly was also detected crossing the northwest corner of Area 3, which may represent a land drain as this aligned with a drain on the north side of the railway.

4.5 Discussion

- 4.5.1 The geophysical survey has detected the remains of post-medieval features relating to a former field system, which is first depicted on the 1846 Plan of the Township of Slyne with Hest, along with an associated trackway (Figure 8). These features were identified within the site boundary as earthworks on the previous site visit. In addition, the survey has identified the remains of ridge and furrow cultivation (in Area 1 and Area 2) which appears to respect this field system and is therefore interpreted as being post-medieval in date. Another possible field boundary has also been detected on the west side of the site in Area 2, along with two possible land drains or drainage ditches.
- 4.5.2 The geophysical survey has detected a possible soil-filled feature which is located on the higher



ground on the south side of Area 2. A number of strongly magnetic deposits have also been detected in association with the field boundary earthworks and two notable hollows recorded in Area 1.



5 Conclusions

5.1 Survey Conclusions

- 5.1.1 Geomagnetic survey has been conducted on land at Fulwood Drive, Bare, to provide information in relation to a proposed residential development. The proposed development area is believed to have archaeological potential due to the close proximity of Bronze Age activity, including Torrisholme Barrow (HER 429/2935) to the south. There is one non-designated heritage asset recorded on the east side of the proposed development area, this being a field called 'Standing Stone' (HER 26420).
- 5.1.2 The geophysical survey has confirmed the presence of post-medieval activity in the form of the remains of a field system which is recorded on the 1846 Plan of the Township of Slyne with Hest. The survey has also confirmed the presence of an associated trackway and the remains of ridge and furrow cultivation, which appears to respect the post-medieval field system and is likely contemporary. Another field boundary ditch and two possible drainage ditches have been detected.
- 5.1.3 A small number of possible soil-filled features have been detected at the site, which may possibly be pits. However, the survey has not identified any definite evidence for prehistoric activity at the site.

5.2 Research Potential

- 5.2.1 Overall, the results of the geophysical survey suggest that potential archaeological activity relates to post-medieval cultivation practices, including a number of prominent earthworks, which form part of a former field system bisected by a raised and metaled trackway. This was probably necessary due to the waterlogged nature of the ground on the west side of the site, which was formerly marsh.
- 5.2.2 It has already been determined by HETLCC that an evaluation of the site is required in order help to determine the planning application for the proposed residential development. It is therefore recommended that a targeted trial trench evaluation is undertaken, with a small number of linear trenches located to sample the geophysical anomalies detected by the geophysical survey.
- 5.2.3 The scope of this further work will need to be agreed in advance with Doug Moir, Planning officer (Archaeology), Historic Environment Team at Lancashire County Council.



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APPENDIX 1: Figures

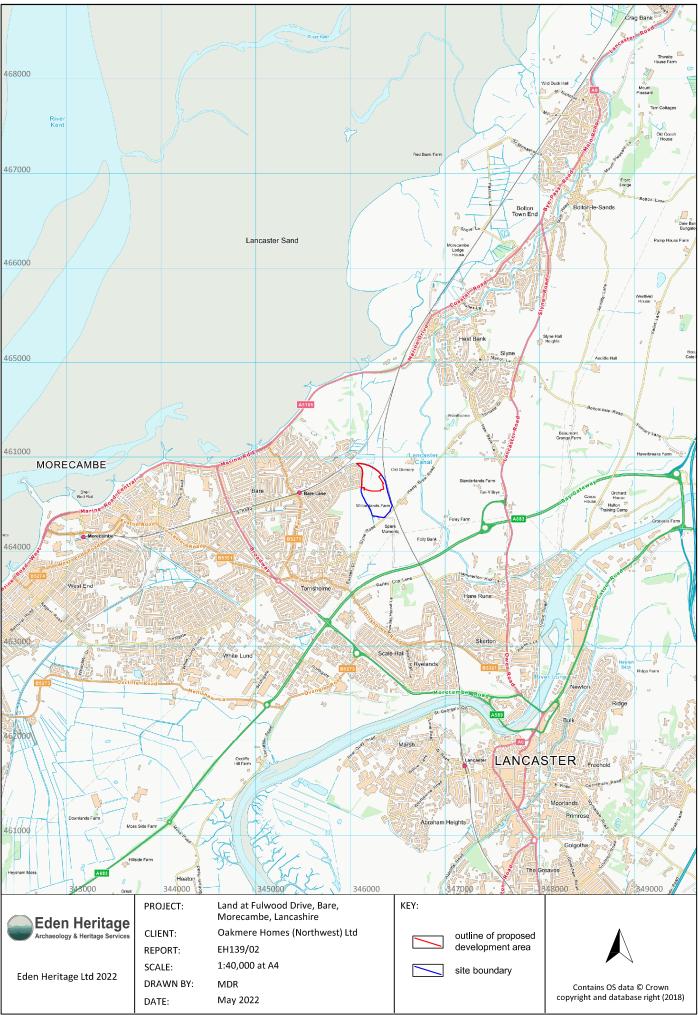


Figure 1: Site Location.

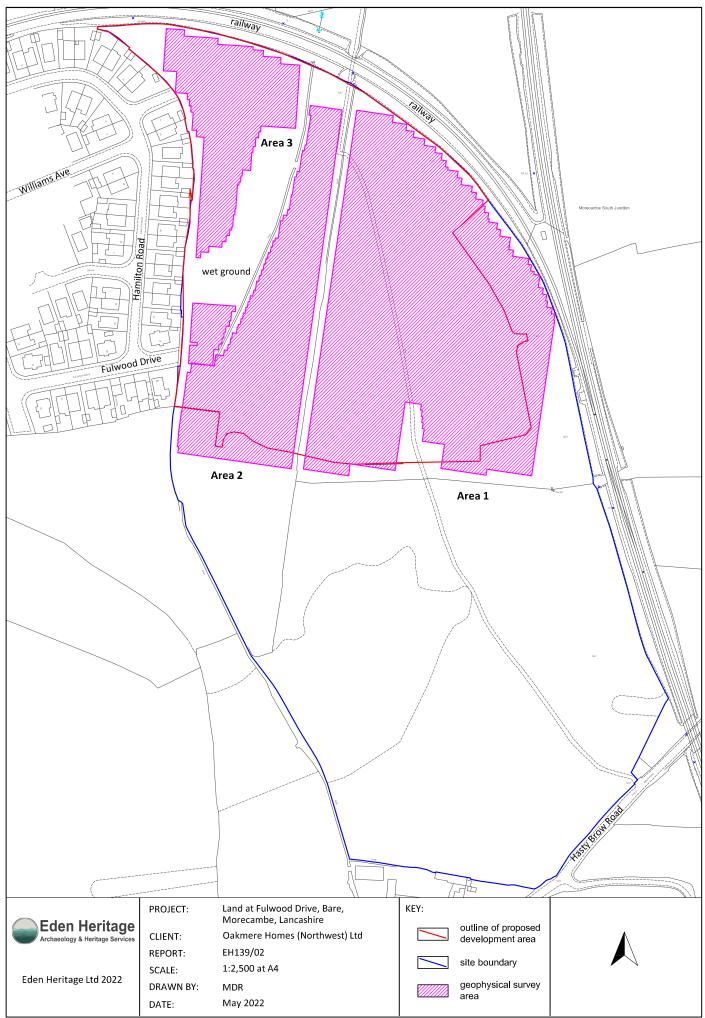


Figure 2: Location of the geophysical survey areas (Areas 1-3).

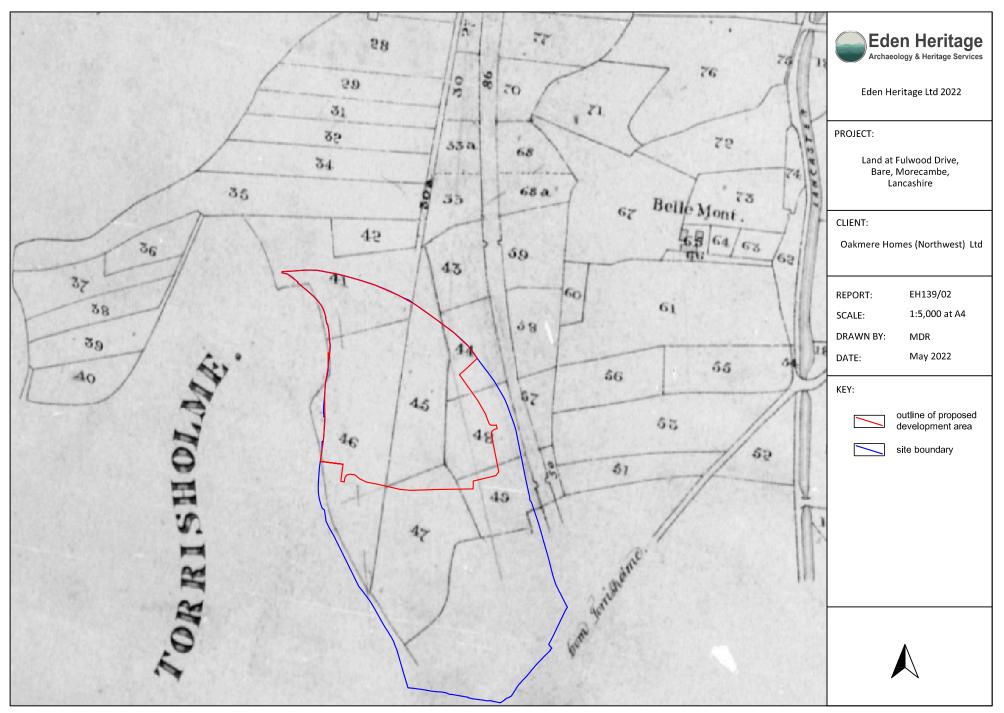


Figure 3: Extract from the 1846 Plan of the Township of Slyne with Hest in the Parish of Bolton le Sands.

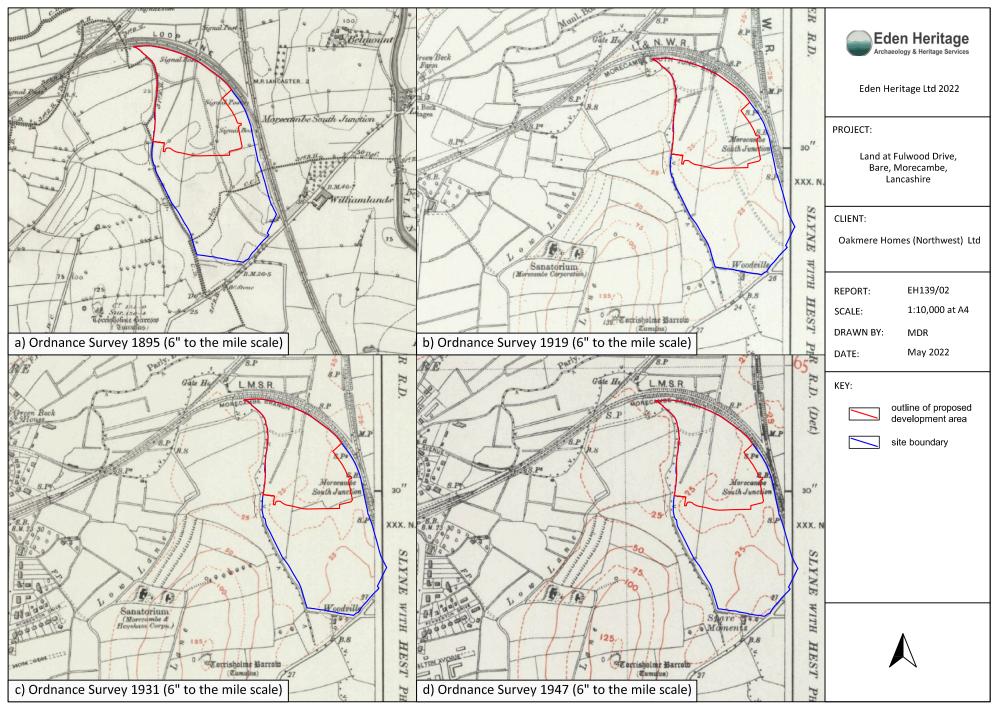


Figure 4: Extracts from the 1895-1947 Ordnance Survey maps.



Are	ea 2		Ar	rea 1		
						II Troug
		at Fulwood Drive, Bare cambe, Lancashire	KEY:	outline of proposed development area		
Eden Heritage Archaeology & Heritage Services	CLIENT: Oakm	ere Homes Limited		site boundary		
Archaeology & Heritage Services	REPORT: EH139)/02		outline of geophysica	I	
Eden Heritage Ltd 2022	SCALE: 1:1,00	0 at A3		survey area		
Eden Hentage Ltd 2022	DRAWN BY: MDR					
	DATE: May 2					

Figure 5: Geophysical surveys (minimally-processed data) showing survey grids.



Are	ea 2	Area 1	
			L Troug
	PROJECT: Land at Fulwood Drive, Bare Morecambe, Lancashire	KEY: outline of proposed development area	
Eden Heritage Archaeology & Heritage Services	CLIENT: Oakmere Homes Limited	site boundary	
Archaeology & Heritage Services	REPORT: EH139/02	outline of geophysical survey area	
Eden Heritage Ltd 2022	SCALE: 1:1,000 at A3		
	DRAWN BY: MDR		
	DATE: May 2022		

Figure 6: Geophysical surveys (processed data).

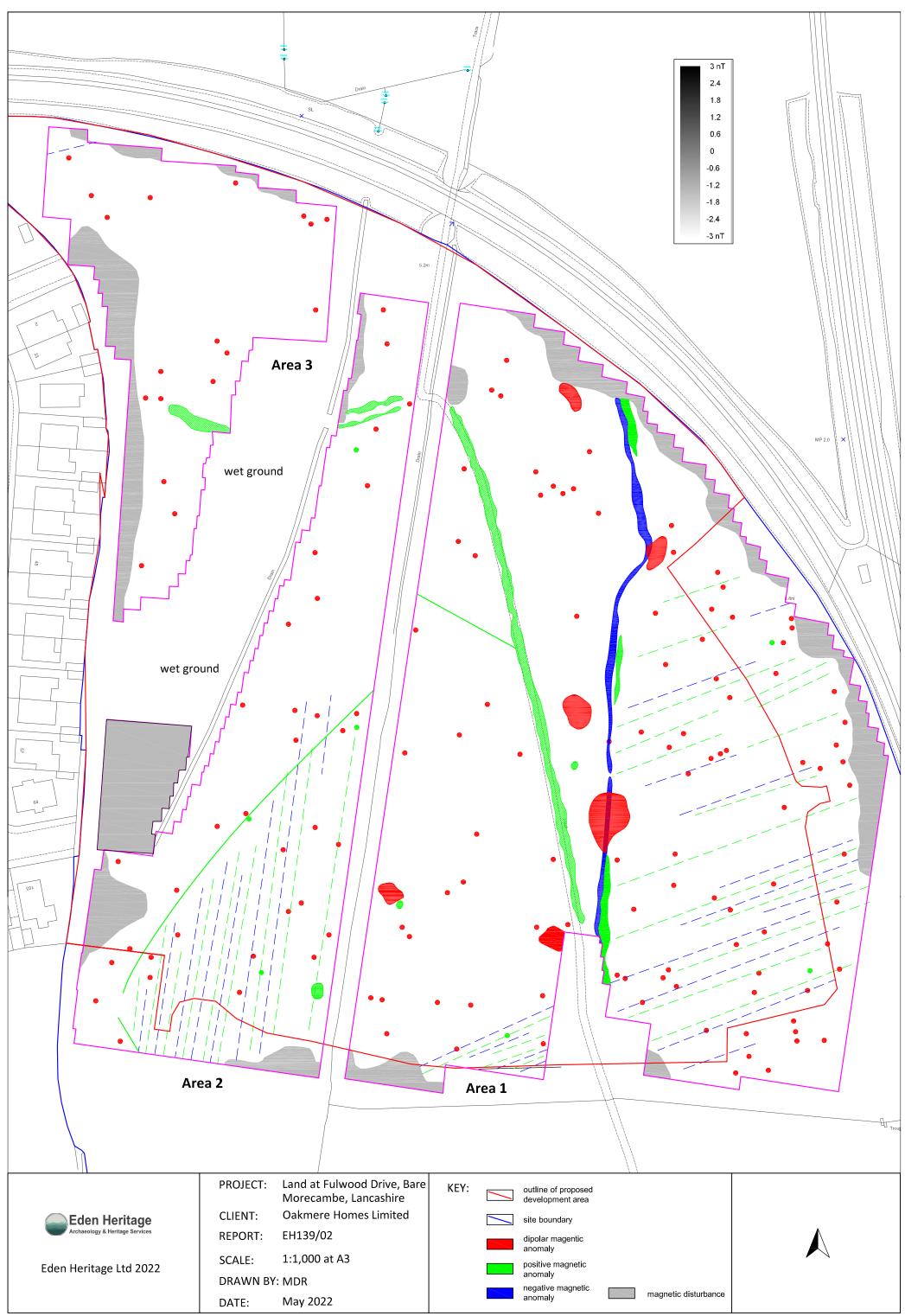


Figure 7: Geophysical interpretation.

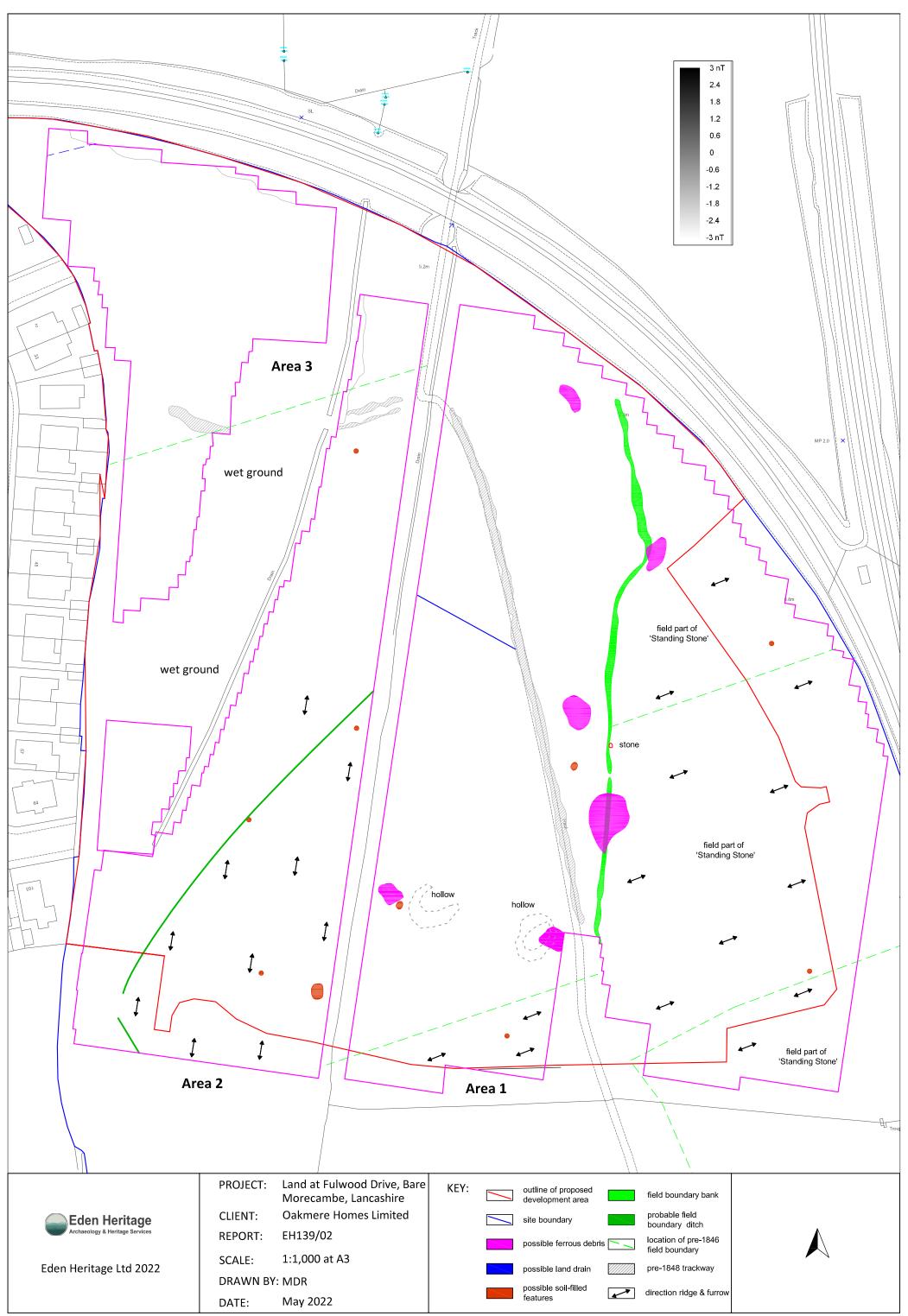


Figure 8: Archaeological interpretation.

Heritage Impact Assessment Archaeological Desk-Based Assessment Historic Landscape Survey Written Scheme of Investigation Geophysical Survey Trial Trench Evaluation Archaeological Excavation Archaeological Watching Briefs

