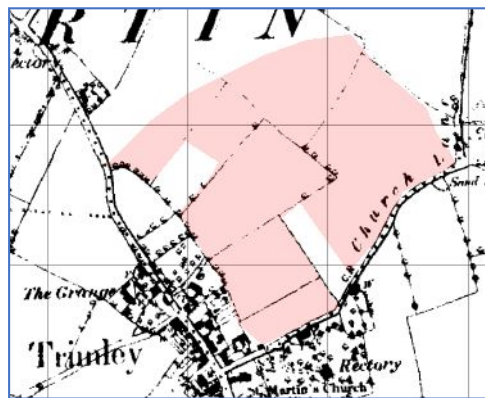




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Howlett Way, Trimley St Martin

Proposed Development



OS 1890

Archaeological Impact Assessment

January 2020

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1. Introduction

1.1 SCOPE OF THIS REPORT

1.1.1 Description of the proposed development

This report, commissioned by Bidwells on behalf of Trinity College Cambridge, presents the findings of an archaeological impact assessment for proposed development on land at Trimley St. Martin, Suffolk. The Proposed Development Area (PDA) is centred on NGR TM 2777 3733 (**Figure 1**) and shown on **Figure 2**.

The report shall accompany a Planning Application for a residential development on land located along Howlett Way on the southern edge and bounded by the A14 on the eastern boundary. The site is allocated for housing within the Felixstowe Peninsula Area Action Plan (adopted in January 2017) under Policy FPP7 and is located to the south of the existing Trimley St. Martin Village. The allocation is carried forward in the emerging Local Plan (Policy 12.65), published in January 2019 and submitted for examination in March 2019.

The application shall seek outline planning permission for the construction of up to 340 dwellings, new public open space and an Early Years Centre. All matters are reserved except access.



Figure 1 Location of Proposed Development Area (PDA)

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Figure 2 The proposed development masterplan

1.1.2 Scope of archaeology and this assessment

Archaeology is represented by a wide range of features that result from past human use of the landscape. These include historic structures, many still in use, above ground and buried archaeological monuments and remains of all periods, artefacts of anthropological origin and evidence that can help reconstruct past human environments.

This assessment considers potential direct effects upon archaeology based upon archival and database research, map regression and aerial photography. Work was carried out Ian Meadows and Andrew Josephs of Andrew Josephs Associates.

Field-based evaluation by geophysical survey and trial-trenching was carried out by Tigergeo and PCAS respectively.

Potential offsite effects upon the setting of built heritage assets, such as listed buildings and Conservation Areas, has been undertaken by Bidwells and is reported separately.

1.2 RELEVANT LEGISLATION, POLICY AND GUIDANCE

1.2.1 Legislation

The importance of cultural heritage is clearly recognised at both national and local levels. Certain features that are deemed to be of particular importance are given legal protection through the *Ancient Monuments and Archaeological Areas Act 1979* (Scheduled Monuments), the *Town and Country Planning Act 1990* (Listed Buildings and Conservation Areas) and the *Hedgerows Regulations 1997* (Hedgerows of Historic Importance).

1.2.2 National Policy and Guidance

Relevant policy and guidance include:

- National Planning Policy Framework 2019. Department for Communities and Local Government.
- Planning Practice Guidance: *Conserving and Enhancing the Historic Environment* <http://planningguidance.planningportal.gov.uk>
- Historic England 2017. *The Setting of Heritage Assets (GPA3): Historic England guidance.*
- Historic England 2008. *Conservation Principles: Policies and Guidance for the Sustainable Management of the Historic Environment.* London.

1.2.3 National Planning Policy Framework

National planning policy on how cultural heritage should be assessed is given in the National Planning Policy Framework, revised in 2019. This covers all aspects of heritage and the historic environment, including listed buildings, conservation areas, registered parks and gardens, battlefields and archaeology. The most relevant policies to this proposal are reproduced below.

189. 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.

197. 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 directly or indirectly affect 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.

1.2.4 Local Planning Policy

The PDA is situated within the administrative area of Suffolk Coastal Council. The current development plan is the Local Plan 2013 and within it the following reference is made to archaeology and the historic environment:

The importance of buildings and places is recognised as contributing to peoples' general quality of life. The district contains a rich historic legacy. Its historic market towns and villages together with their landscape settings, archaeology, individual buildings and groups of buildings, and historic street patterns all add to the social and cultural history of the area.

In relation to the built environment, the designation of conservation areas, scheduled ancient monuments, historic parklands and the listing of buildings are all issues that can be addressed outside of the Local Plan process. The role of the Core Strategy in relation to these topics will be to provide general advice supporting their retention and enhancement whilst minimising any significant adverse impacts upon them. Section 12 of the NPPF supports this aim and will be applied rigorously. More generally, decisions on development proposals affecting heritage assets will be informed as appropriate by Conservation Area Appraisals, information from the Historic Environment Record and Archaeological Assessments.

The emerging Local Plan is also relevant as Suffolk Coastal Council has confirmed it will seek to apply emerging policy.

Archaeological advice is provided by the local planning authority archaeologists at Suffolk County Council.

1.3 AUTHORSHIP

This report has been written by Andrew Josephs and Ian Meadows of Andrew Josephs Associates, a consultancy specialising in archaeology and cultural heritage founded in 2002.

Andrew is Managing Director of AJA and has extensive experience of all periods and facets of cultural heritage, including the authorship of over 800 Heritage Statements. He was previously Principal Consultant (Director of Heritage and Archaeology) at AMEC and Wardell Armstrong, where he started in 1992, becoming one of the UK's first consultants in the post-PPG16 era of developer-funded archaeology. Prior to 1992, he worked as a field-based archaeologist and researcher for universities and units in the UK, Europe and the USA. He graduated with a BA (Honours) in Archaeology and Environmental Studies in 1985. He has previously been a tutor in archaeology to the WEA and Visiting Lecturer in EIA at Nottingham University.

The site walkover was carried out by Ian Meadows. Ian is an archaeologist with 40 years' experience in archaeology and heritage. He was a Senior Project Officer with Northamptonshire Archaeology between 1992 and 2014 directing numerous projects, in particular excavations of large landscapes in quarries throughout England and Wales. Since joining AJA in 2014 he has carried out a variety of projects including desk-based research and scheduled monument management plans. His expertise and pragmatism in the project management of archaeological excavations has been well received by clients and county

Howlett Way, Trimley St Martin: Archaeological Assessment. January 2020.

archaeologists alike. Ian also teaches archaeology and landscape history, previously being engaged as a tutor by Cambridge University, Anglia Ruskin University, Bath University and the WEA.

2. Baseline Conditions

2.1 DESIGNATED HERITAGE ASSETS

There are no scheduled monuments within 500m of the PDA. The nearest scheduled monument is an anti-aircraft battery site at Searson's Farm (NHLE 1420538) about 950m south of the PDA. This site was constructed in 1946 and retains most of the key components of a Cold War emplacement with subsequent modifications and is rare because of its completeness.

There is no intervisibility with the PDA due to intervening development and the monument has therefore been scoped out of detailed assessment.

The setting of the listed buildings is addressed by Bidwells in a Heritage Statement.

2.2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.2.1 *Previous Archaeological Work within the PDA*

There have been no archaeological events within the PDA prior to this work associated with this planning application.

2.2.2 *Suffolk Historic Environment Record (SHER)*

The Suffolk Historic Environment Record (SHER) was consulted and the assistance of Grace Campbell is gratefully acknowledged. Details of sites, monuments, find spots and buildings within 1km of the PDA was obtained in order to place the PDA within its archaeological context and allow an assessment of the potential of the PDA to be made. The locations of the monuments and events are shown on **Figures 3A and B**. Summary lists of events and monuments are included at **Appendix A**.

One site is recorded within the PDA, a rectangular WWII pillbox (SHER no. TYN124), based on a design known as 'Suffolk square' and constructed of reinforced concrete.

Prehistoric

There is evidence of several periods of prehistoric activity ranging from the Neolithic onwards around the PDA although none from within it. The evidence is both from stray finds and from excavations and aerial photographs. The stray finds include a Neolithic polished flint axe recovered during building works (TYN076) and a circular flint scraper on the surface (TYN052), both south of the PDA. A complete socketed Bronze Age axe (TYN023) was recovered to the north of the PDA by metal detection.

Two crop mark ring ditches, perhaps the remains of ploughed out Bronze Age burial mounds, have been identified from aerial photographs. They are between 25-30m diameter with one (TYN016) at the northern limit of the 1km study area and the other about 500m south of the PDA. Other crop mark evidence points to a more extensive use of the landscape in the Iron Age with evidence for a trackway defined by ditches (TYN118) to the north of the PDA and an area of elements of a co-axial field system, including tracks, to the northwest (TYN122). Additionally, a crop mark of a sub-rectangular enclosure (TYN012) to the south of the PDA may also be of late prehistoric date, as may the undated crop mark complex (TYN013) to the north of Trimley St Mary, now built upon.

Excavations at Mushroom Farm by Pre-Construct in 2015, to the northwest of the PDA, revealed evidence for a north-west to south-east aligned Iron Age ditched trackway, which was presumably part of the

broader landscape indicated by the crop marks. In addition, several small pits and nine post holes (perhaps a fence or structure) were aligned parallel to the trackway. Flint and late Neolithic pottery were also recovered from this work reflecting earlier activity.

Romano-British

There is little evidence of Roman activity within the study area beyond stray finds of pottery and coins (TYM 019, 059 & 068) all of which lie to the east of the A14 and two sherds of greyware found on the surface (TYY052) south of the PDA. A large fragment of a tegula was found (TYN059) with some of the pottery. It is however possible that some elements of the later prehistoric track and enclosure system could have continued into this period.

Anglo-Saxon

There is little evidence of activity from this period within the study area apart from a single abraded sherd of Ipswich ware recovered along with some medieval pottery in a pipeline (TYN060) to the north-east of a PDA and a silver sceat (TYN109) about 350m to the west. In addition, two pieces of Anglo-Saxon metalwork have been recorded as part of the Portable Antiquities Scheme to the south-west of the PDA.

Medieval

The historic core of Trimley (TYY060), which probably has its origins in the Saxon period, lies to the southwest of the PDA. There are two medieval churches that are mentioned in the Domesday Book, St Martins (TYN020) and St Marys (TYY017), that lie within the historic core to the southwest of the PDA. Medieval pottery was recovered from what are described as scatters along the line of a pipeline to the north east of the PDA (TYN059, 060, 061 & 062), at least one of which comprised 21 pieces. It is unclear what these scatters related to but 21 pieces might suggest they are not the result of manuring activity. Three further pottery scatters were recorded to the south-east of the PDA (TYY005, 007 & 016). A shallow possible medieval ditch was identified in an archaeological evaluation to the rear of Three Mariners in 2016 along with a post medieval ditch or pit that aligns with a boundary shown on the late nineteenth century Ordnance Survey mapping.

Post Medieval

A number of post medieval features are recorded within the SHER including two brick kilns to the north of the study area (TYN049 & 057) and the course of a route called Guncorner Lane (TYN085) surviving as a bank. This route once ran between Trimley St Martin and Grimston Hall. The site of a water mill (TYY020) depicted on the 1783 map is also noted.

Miscellaneous

In addition to the above sites several undated crop marks are recorded towards the eastern edge of the study area (TYN070, 121 & TYY023, 067). Some of these remains might relate to recent activity, for example TYY023 may be a series of drainage channels connected to the adjacent mill (TYY020). Two finds of stray human bone are also recorded one (TYN131) was a piece of parietal bone found adjacent to the A14 in what is now the tree belt. The other is a possible recent clavicle (TYN MISC) found adjacent to a footpath to the north of Grimston Hall.

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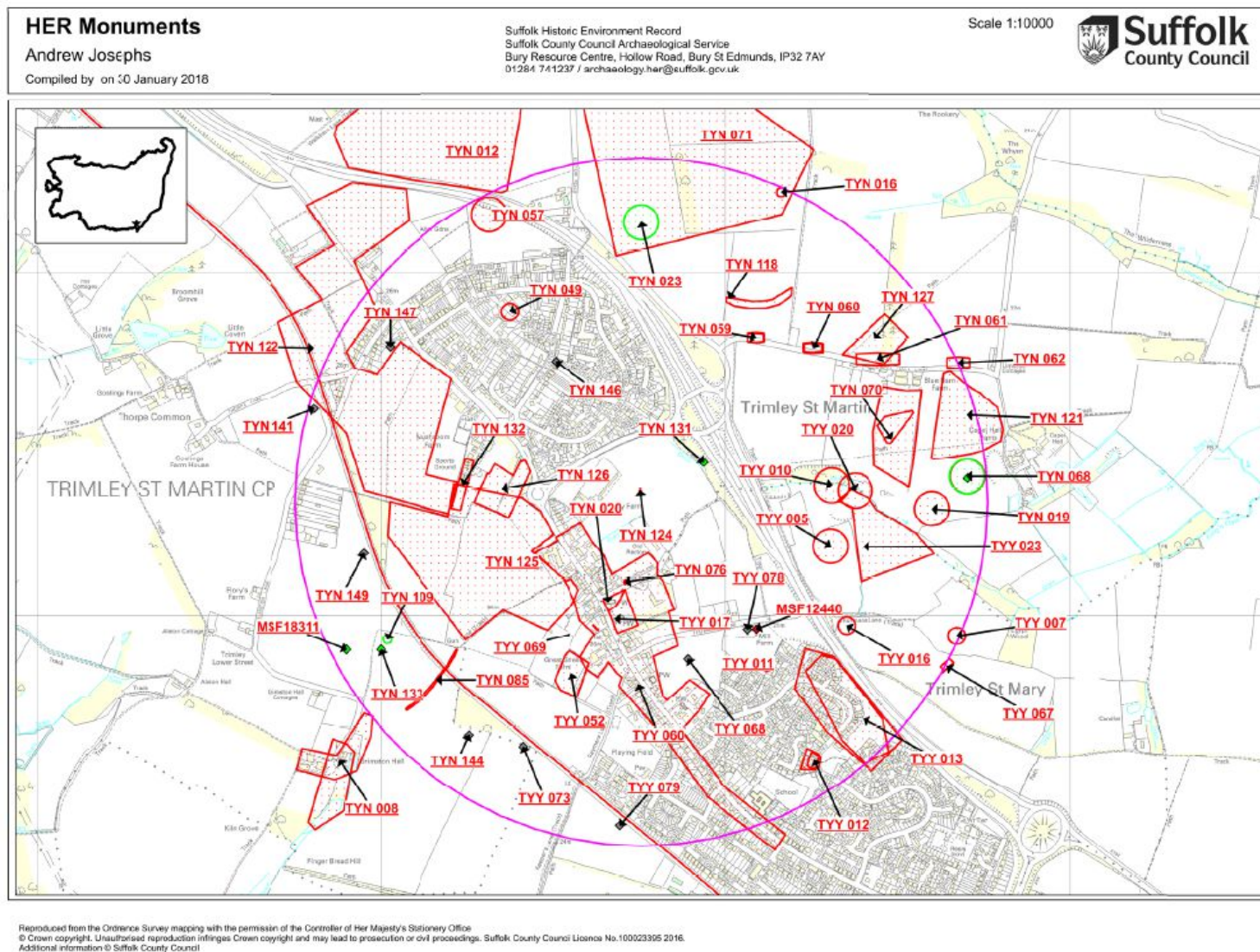
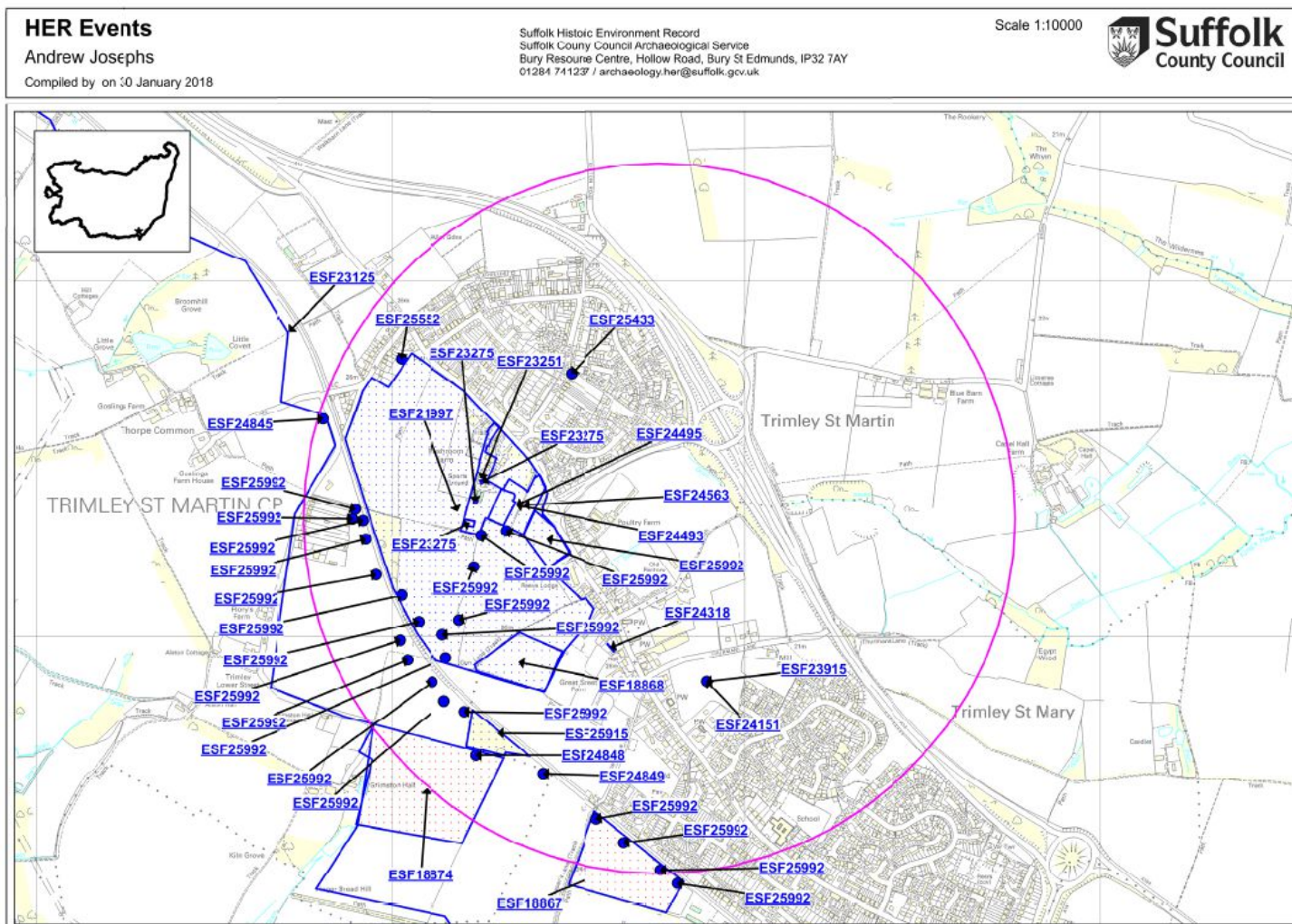


Figure 3A Suffolk HER Monuments within 1km of the PDA (reproduced with kind permission of Suffolk CC; copyright as shown)

andrew josephs associates

Archaeological and Cultural Heritage Consultancy



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Figure 3B Suffolk HER Events within 1km of the PDA (reproduced with kind permission of Suffolk CC; copyright as shown)

2.2.3 Historic Maps and Aerial Photography

The readily available historic maps for the PDA and its environs were consulted. The PDA was subdivided into several smaller rectilinear fields on the 1890 Ordnance Survey map and all the boundaries were still present when the area was resurveyed in 1938. However, by 1966 most of the boundaries had been removed leaving only those that are still present today. This change is almost certainly a reflection of increasing mechanisation of agriculture and as a result the desire for larger land parcels.

Ordnance Survey editions are reproduced at **Figures 4 and 5**

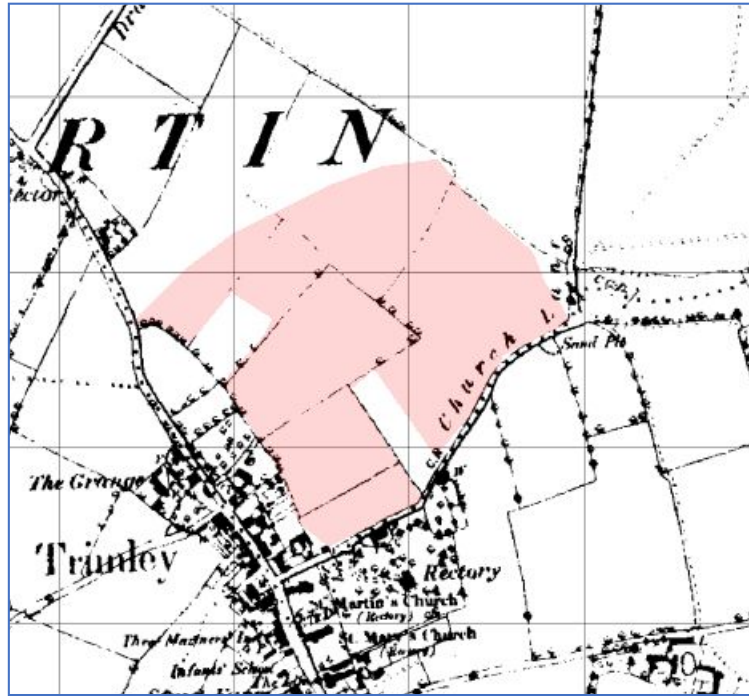


Figure 4 Ordnance Survey 1890

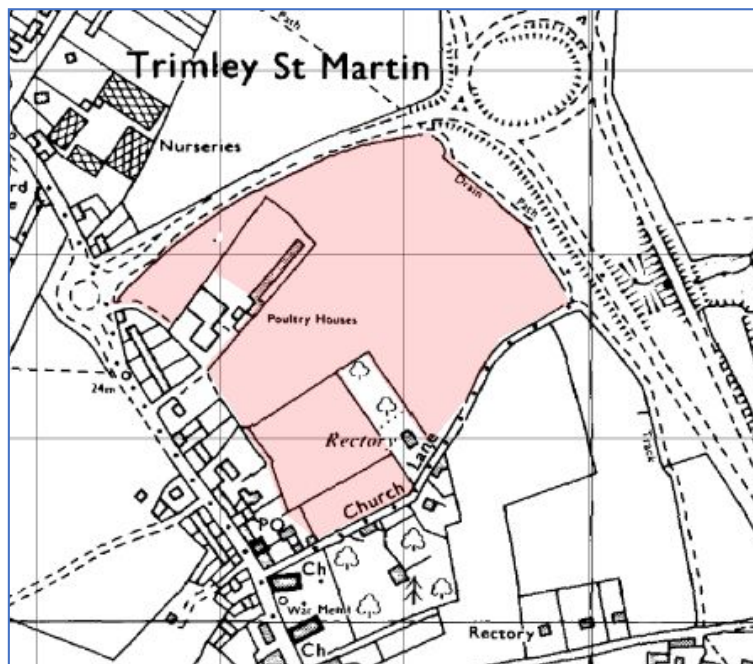


Figure 5 Ordnance Survey 1975 © Crown copyright. All rights reserved. Licence number 100043831

2.2.4 Historic Landscape

The PDA lies in an area described as Type 2 in the Suffolk Historic Landscape Characterisation, that is a planned enclosure landscape. The area is part of the sub-type 2.1 which is described as:

Sub-type 2.1. 18th-century and later enclosure – former common arable or heathland.

Fields formed from land that was previously farmed as individually owned strips in large common or 'open' fields. Field shapes are frequently rectangular with straight boundaries, as a result of having been laid out to measured plans by surveyors. In the Breckland region of north-west Suffolk there temporary intakes from the heaths (called 'brecks'), which were cultivated for a short time and then abandoned to slowly recover their fertility.

This classification covers not only the PDA but also much of the undeveloped land to its west.

To the east, beyond the A14, the landscape is characterised as Type 1, pre-18th-century enclosure – i.e. and that was enclosed into fields for agriculture before 1700. The identification of these earlier landscapes, which date back to medieval and in some cases even earlier, was a priority behind the development of the HLC mapping. These earlier landscapes are of great historic significance and have different management needs to later field systems.

2.3 GEOPHYSICAL SURVEY

2.3.1 Introduction

Detailed geophysical survey of the whole PDA was undertaken by TigerGeo in April and August 2018.

The processed data is shown on **Figures 6-7**. Numbers in [n] refer to **Table 1** and the interpretation on **Figure 8-9**. The interpretation was made in advance of the trenching.

The data was distorted close to the northern boundary with the road but quality was otherwise good.

The report¹ has been submitted to the Development Control Archaeologist, Suffolk County Council, advisor to Suffolk Coastal Council. It is included at **Appendix B**.

2.3.2 Land-use

The 1890 OS mapping (**Figure 4**) shows a fairly regular system of small rectangular fields across the wider area, although much has since been removed by agriculture residential and other development. However, the survey has revealed elements of another system across the southern parts of the survey, likely derived from the original medieval pattern. This has strips extending perpendicular to the road through the village; anomalies [3], [4], [8] and [11] all seem to be former field boundaries and of these, [3] and [11] along with cultivation [12] and a likely former alignment of Church Lane [10] reveal the former layout.

Former cultivation is less evident, however, although area [7] implies ridge and furrow cultivation aligned with the field boundaries of the northern part of the site and extending away from the core of the settlement. Less obvious traces exist at [12] and possibly [2] although the latter is unlikely to be medieval. At [5] is a group of strong discrete anomalies that likely relate to debris or land use and represent a concentration in one location of a number of similar anomalies observed across the site. Their relevance is uncertain.

2.3.3 Archaeology

At [13] is a small ring ditch of about 15m diameter and lacking diagnostic character. Although the complete circuit is not well resolved, there is no obvious sign of an entrance nor are there associated

¹ *Land off Howlett Lane, Trimley St Martin, Suffolk: Archaeological Geophysical Survey*. TigerGeo Ltd Report TSM171 (2018).

enclosure ditches that might suggest settlement. It might be that this is the remains of a burial-related structure instead.

Linear anomalies [9] and [10] appear to be the remains of a former course of Church lane, extending eastwards perpendicular to the settlement between contemporary fields. The lane appears to have been diverted southwards prior to the 1880 OS map edition before being eventually cut by the railway line east of the site.

At [6] is the remains of a military structure (HER MSF26360) that seems originally to have been built at the intersection of two field boundaries, since removed. It does not appear to be associated with other anomalies, i.e. there is no evidence for connected services, and therefore appears to have been a self-contained complex.

Table 1 Geophysical Survey Catalogue

Label	Anomaly Type	Feature Type	Description
1	Weak linear enhanced	Fill? - Ditch?	Tentative and < 1 m wide, the impression is here of a linear anomaly poorly resolved against the irregular background
2	Weak linear enhanced (group)	Fills – Ditches? / Cultivation?	Two linear anomalies approximately 3.6 m apart, parallel to [4]
3	Weak linear enhanced	Fill - Ditch?	About 1m wide, this could be a ditch fill and is better resolved than [1] and [2]
4	Linear enhanced	Fill – Ditch	Probable old field boundary parallel to a known field boundary to the east and possible cultivation [2]
5	Strong discrete enhanced (group)	Debris / objects?	A group of similar anomalies, suggesting a common origin or purpose
6	Strong variable (group)	Structures	Extant military structure, HER MSF26360
7	Weak texture	Fills - Cultivation	An area (1.2 ha) of texture with a linear grain suggestive of cultivation. The grain is parallel to a known field boundary and crosses a probable field boundary [8]
8	Variable enhanced linear	Fill – Ditch	Probable old field boundary roughly parallel to a known old field boundary to the west
9	Linear enhanced	Fill – Ditch / Path?	A fill approximately 2 m wide extending westwards tangentially from the course of Church Lane
10	Linear enhanced	Fill – Ditch / Path?	A probable continuation of [9]
11	Linear enhanced	Fill - Ditch	A probable field boundary, parallel to other boundaries and the possible path [10]
12	Weak linear enhanced (group)	Fills - Cultivation	Parallel anomalies typical of cultivation running parallel to a known and a probable field boundary [11]
13	Linear enhanced	Fill - Ditch	A 1.6m wide anomaly of sub-circular form with a diameter of approximately 15 m and weakly defined northern arc

2.3.4 Conclusion

The only evidence for prehistory is a ring ditch which does not seem to be associated with any settlement and is perhaps funerary-related.

The survey has revealed a medieval landscape that developed into strip fields perpendicular to the settlement and within which a former course of Church Lane appears to have been integral. This was later diverted southwards to cross the northwest corner of an existing field and before the 1880s OS map editions.

Overall the evidence for features of archaeological interest seems to be fairly sparse.



TSM171 Land off Howlett Lane, Trimley St Martin, Suffolk
 DWG 03a Magnetic Data - 1m Vertical Pseudogradient - North

Orthographic Scale: 1:1500 @ A3 Spatial Units: Meter. Do not scale off this drawing
 File: TSM171.map Copyright TigerGeo Limited 2018 OS OpenData Crown Copyright & Database Right 2018



Figure 6 Geophysical Survey Magnetic Data – northern part of PDA



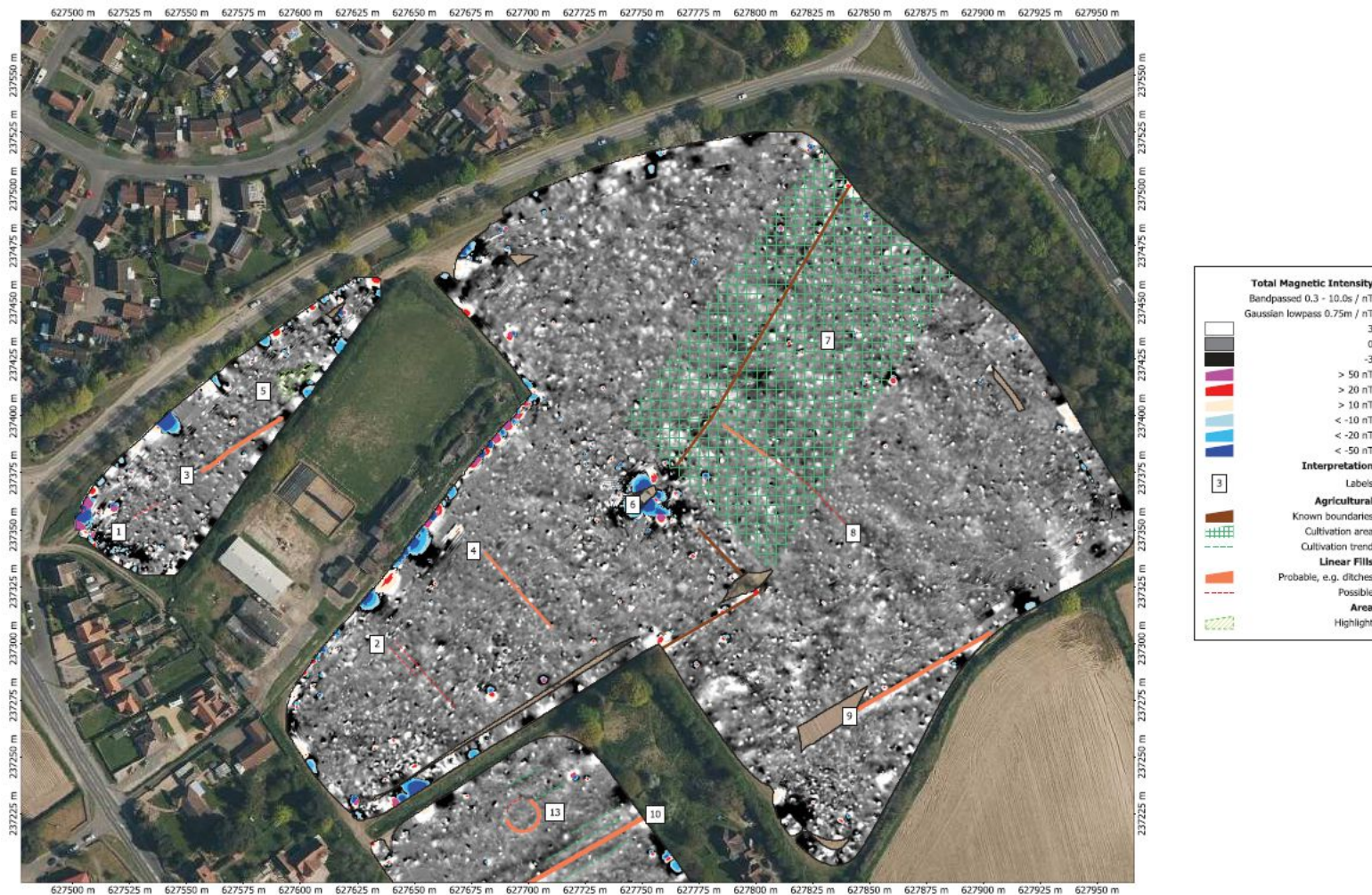
TSM171 Land off Howlett Lane, Trimley St Martin, Suffolk
 DWG 03b Magnetic Data - 1m Vertical Pseudogradient - South

Orthographic Scale: 1:1500 @ A3 Spatial Units: Meter. Do not scale off this drawing
 File: TSM171.mxd Copyright TigerGeo Limited 2018 OS OpenData Crown Copyright & Database Right 2018



Figure 7 Geophysical Survey Magnetic Data – southern part of PDA

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TSM171 Land off Howlett Lane, Trimley St Martin, Suffolk
 DWG 04a Interpretation - North

Orthographic Scale: 1:1500 @ A3 Spatial Units: Meter. Do not scale off this drawing
 File: TSM171.map Copyright TigerGeo Limited 2018



Figure 8 Geophysical Survey Interpretation – northern part of PDA



TSM171 Land off Howlett Lane, Trimley St Martin, Suffolk
 DWG 04b Interpretation - South

Orthographic Scale: 1:1500 @ A3 Spatial Units: Meter. Do not scale off this drawing
 File: TSM171.mxd Copyright TigerGeo Limited 2018



Figure 9 Geophysical Survey Interpretation – southern part of PDA

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2.4 TRIAL-TRENCHING

2.4.1 Introduction

PCAS Archaeology Ltd carried out archaeological evaluation to investigate the results of a geophysical survey as well as check areas apparently free of archaeology, as a control. A 4% sample of the PDA comprising seventy-five evaluation trenches measuring 30m x 1.8m were excavated in September 2018.

The report² has been submitted to the Development Control Archaeologist, Suffolk County Council, advisor to Suffolk Coastal Council. It is included at **Appendix C**.

2.4.2 Results

No remains of archaeological interest were located in 45 of the 75 trenches (Trenches 1, 4–16, 19 & 20, 22, 25 & 27, 29–35, 38 & 39, 42–47, 50 & 51, 53 & 54, 65 & 66, 71-73 & 75).

The results are shown on **Figure 10**.

The earliest activity identified during the evaluation trenching was late Neolithic/early Bronze Age flint working and use, identified across the PDA, but in no particular concentration and/or features. The only features that may date to this period were pit [1703] at the northern end of the site, pit [7403] in the southeast corner of the site, and ditch [4107] on the western side of the site. Pit [1703] consisted of a single shallow pit from which a single sherd of late Neolithic/early Bronze Age pottery and flint flakes were retrieved and pit [7403] contained two small flint flakes, alongside oyster shells and animal bones that would suggest the flints are residual in a later feature. A single sherd of early Bronze Age pottery was retrieved from ditch [4107], though again this may be intrusive and the function of the ditch was unclear.

The later Neolithic/early Bronze Age pottery represents small scale activity at the site in the later third millennium, consistent with the stray finds from the immediate area (TYN076, TYY052 etc), the burnt and worked flints, and pot-boilers from the Clickett Hill Road area of neighbouring Felixstowe, and also comparable with that found fairly commonly locally in spreads and pit groups such as those excavated at Sutton Hoo (Hummler 2005). The majority of the remaining flint was either unstratified or recovered from later features, but does demonstrate the working and use of flint in the vicinity of the PDA.

Evidence for later Prehistoric activity was located in the southwest and northeast corners of the PDA, with four pits in Trench 64 in the southwest corner of the site. Three of the pits produced assemblages of Early Iron Age pottery, all in fine to medium flint-tempered fabrics, with the largest assemblage coming from the two fills of pit [6409b]. Early Iron Age pottery is not found regularly in this part of Suffolk though is present locally at Little Bealings (Martin 1993) and across Suffolk has been recovered recently at sites at Exning and Gravel Hill, Harwich (Brudenell 2012). The fine tripartite decorated bowl from pit [6409b] helps date the assemblage c.850/800-600/500 BC (Brudenell 2012).

The geophysical survey had identified a potential ring ditch to the north of these pits, targeted by Trenches 62 and 63. However, no ditch was identified in Trench 62, although a cow burial alongside a single sherd of late medieval pottery was found in the centre of the trench, and an undated linear ditch feature, rather than the curvilinear of a ring ditch, was identified in Trench 63. Trench 63 was extended 15m to the east to try and locate the other side of the potential ring ditch, but nothing was found.

Sixty sherds of Later Iron Age pottery were retrieved from isolated pit [2103] in the northeast corner of the PDA. The sherds include rims from two vessels, a shouldered jar with flat, upright rim and a pointed rim from a vessel of unknown form. The assemblage compares well with pottery found locally at Great Bealings and Barham (Martin 1999). The excavations at Mushroom Farm to the west of the PDA revealed

² *Howlett Way, Trimley St Martin, Suffolk, IP1 0SW: Archaeological Evaluation Report*. PCAS Report 2089 (2018).

several post-holes and pits of a similar date, although the scarcity of later Iron Age features within the PDA suggests the focus of this activity of this date lies to the west.

There was no evidence for Roman activity anywhere within the PDA and the only evidence of Saxon activity was a single sherd of late Anglo-Saxon pottery recovered from the fill of large ditch [5203] at the southern end of Trench 52, which also contained pottery and other artefacts of post-medieval and modern date; this ditch was likely the former roadside ditch (to an extension to Gun Lane from the west) also revealed in Trenches 48, 49, 60, 61 and 64. The only evidence for medieval activity came from a single sherd of 15th – 16th century pottery recorded in a cow burial pit [6203], though the burial may date to a later period and the sherd of pot intrusive. These results are consistent with the known archaeological monuments in the area, where there are very few Roman, Saxon or medieval dated features or artefacts recorded on the Suffolk HER.

The majority of the remaining features identified during the evaluation are former post-medieval field boundaries identified during the geophysical survey (**Figure 11**). In addition, trenches located the post-medieval/Modern former roadside ditches on the former line of Gun Lane/Church Lane. A study of available historic mapping (early OS mapping and the 1839 enclosure map) has not identified any road or track crossing the southern part of the PDA, however the line of these ditches corresponds with the line of Gun Lane on the west side of High Road, and with the eastern end of Church Lane on either side of the site, suggesting a road or track may have extended through this area pre-1839.

The remaining features consisted of post-medieval/undated pits and linear features (of uncertain function). Available historic mapping shows that this area was farmland, and the features revealed in the evaluation relate to this landuse.

Although the trenches were targeted on the geophysical anomalies, there were some discrepancies in the results. Although the majority of the trenches that were anticipated to reveal buried features did so, those features were not positioned as the anomalies had suggested, an occurrence which was noted on site during the early stages of the fieldwork.

The most likely reason for this is human; errors with scaling, geo-referencing, machining and manual planning of the trenches may have all contributed to the differences. For most of the trenches, an adjustment to the north would mean the revealed features would more closely correspond with the geophysical anomalies, however it is not possible at this stage of the project to identify definitively where errors were made and rectify them, therefore the plan of the results remains unchanged.

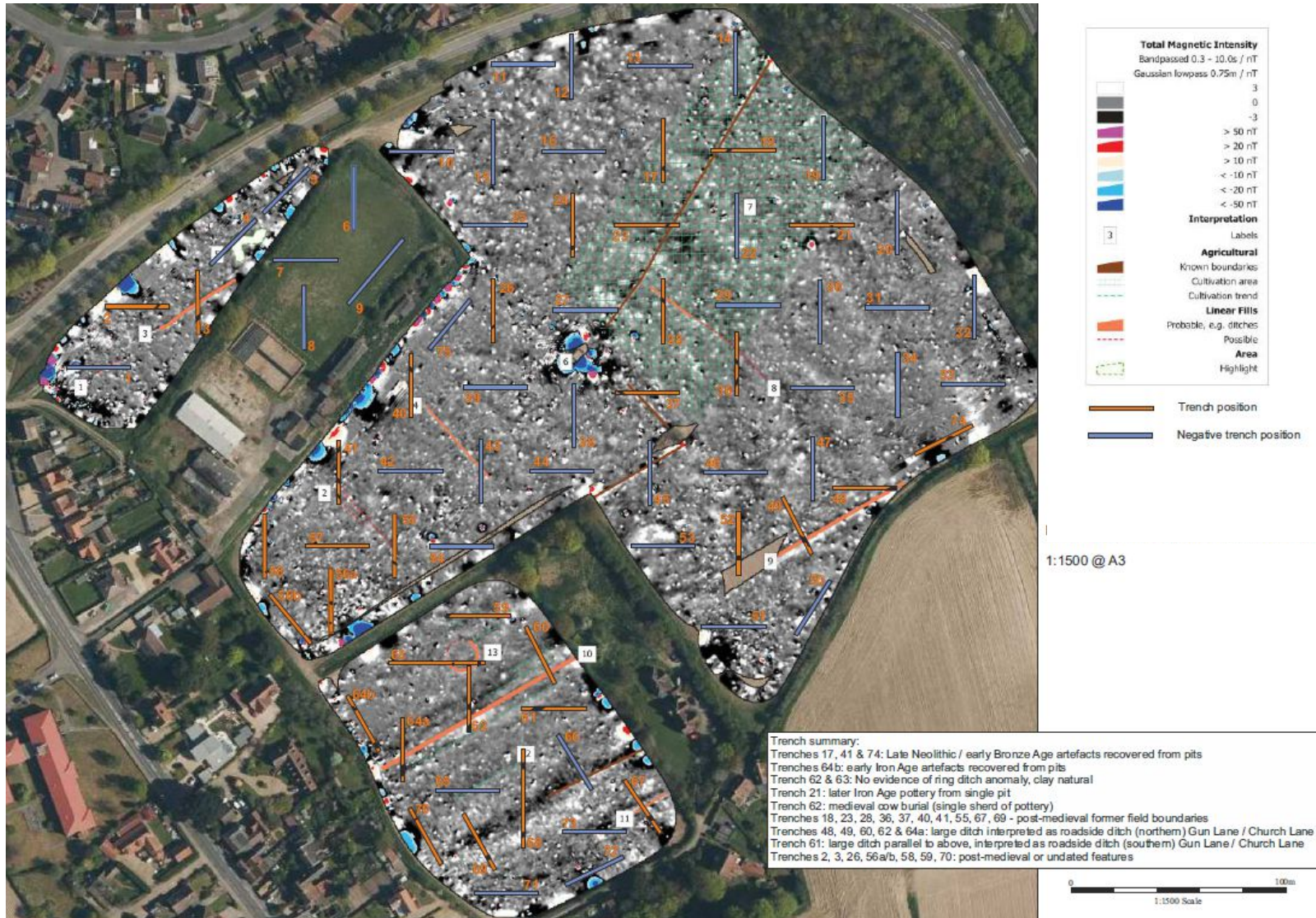


Figure 10 Trenching results over Geophysical Survey Interpretation

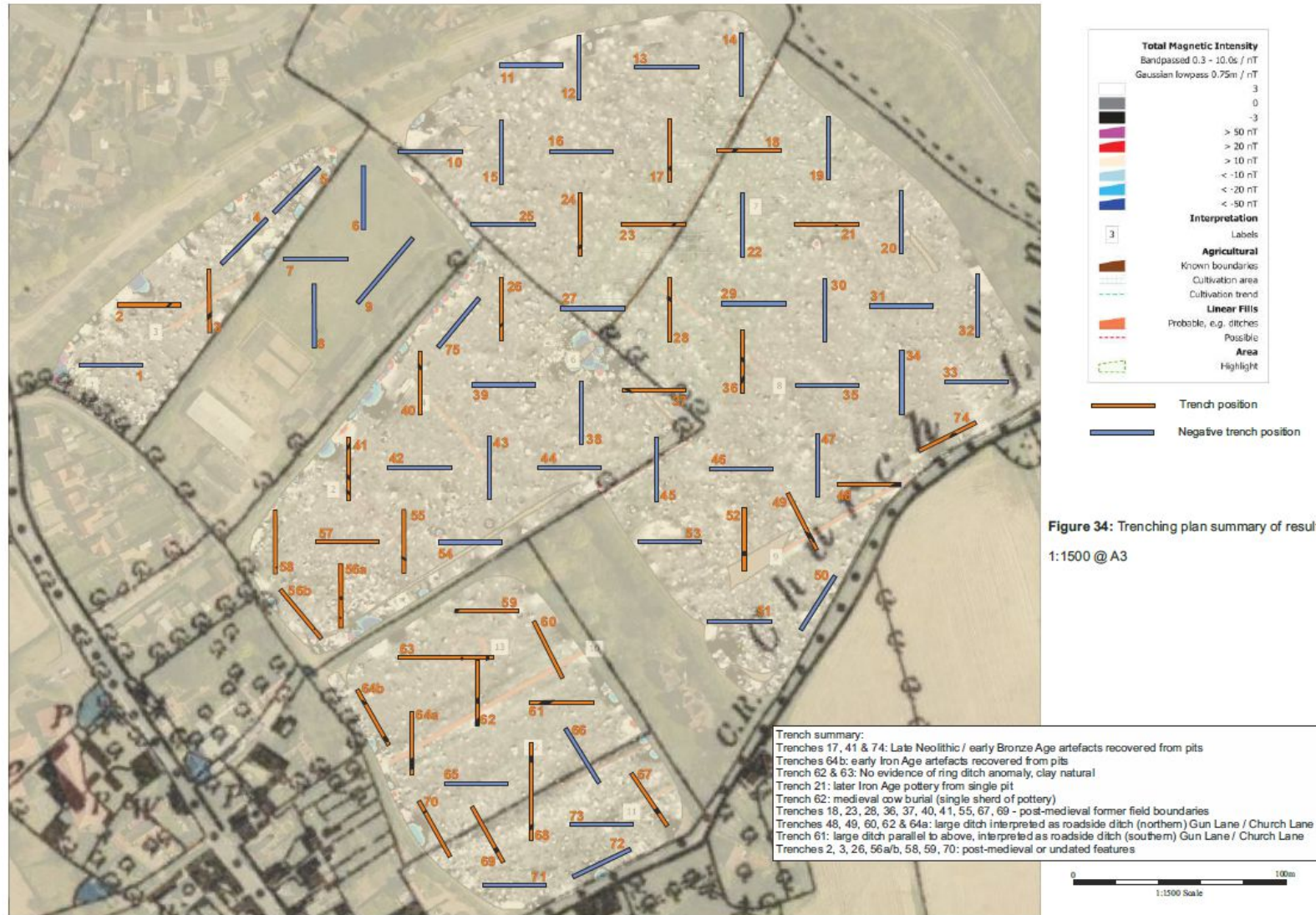


Figure 11 Trenching results over OS 1890

3. Impacts and Mitigation

3.1 DIRECT IMPACTS

Development and redevelopment can result in the loss of the archaeological resource wherever ground disturbance for construction takes place, and the potential loss or damage in other areas associated with infrastructure, services and landscaping.

The results of the geophysical survey and trenching evaluation carried out as part of this planning application would indicate that overall the PDA has only very limited activity prior to the post-medieval period.

The majority of the earlier artefacts recovered are probably residual in later features, with just five confirmed prehistoric pits which may relate to peripheral activity to the Iron Age Mushroom Farm site to the west. No Roman dated material and a single sherd each of Saxon and medieval pottery were found.

The Iron Age features may prove on further examination to give a more rounded interpretation to the activity at Mushroom Farm, while in other periods it seems unlikely that this site is going to prove a valuable resource in terms of the research priorities set out in the regional research framework (Medlycott, 2011). The results are too dispersed and too scattered to identify a new area of historic activity or occupation to add to the understanding of chronological maps, patterns in trade, migration etc.

The pill box will be preserved and enhanced within the design of the development.

3.2 CUMULATIVE IMPACTS

There would be no impacts or effects upon offsite archaeological assets either within other consented developments or in the broader landscape.

3.3 MITIGATION

In accordance with planning policy, loss of archaeology needs to be offset by a programme of mitigation. Although the evaluation located only a handful of archaeological features, it is recognised that archaeology is likely to be found in the vicinity of the trenches and a precautionary approach should therefore be adopted. NPPF 2019 proposes that an appropriate approach to mitigation is to ensure preservation by record through archaeological excavation, recording, analysis and publication appropriate to significance of the archaeological resource.

Two areas of set piece excavation are proposed, centred on known archaeology, and three areas of watching brief, as shown on **Figure 12**.

This approach should be agreed with the Development Control Archaeologist, Suffolk County Council, as advisor to Suffolk Coastal Council.

These works would be undertaken by suitably qualified archaeologists. As work progresses, areas may be completed and signed off with the agreement of the Development Control Archaeologist or their nominee to allow development to continue.

Details of methodologies, in the form of a Written Scheme of Investigation, would be agreed with Suffolk Coastal. The work would be secured via a planning condition.

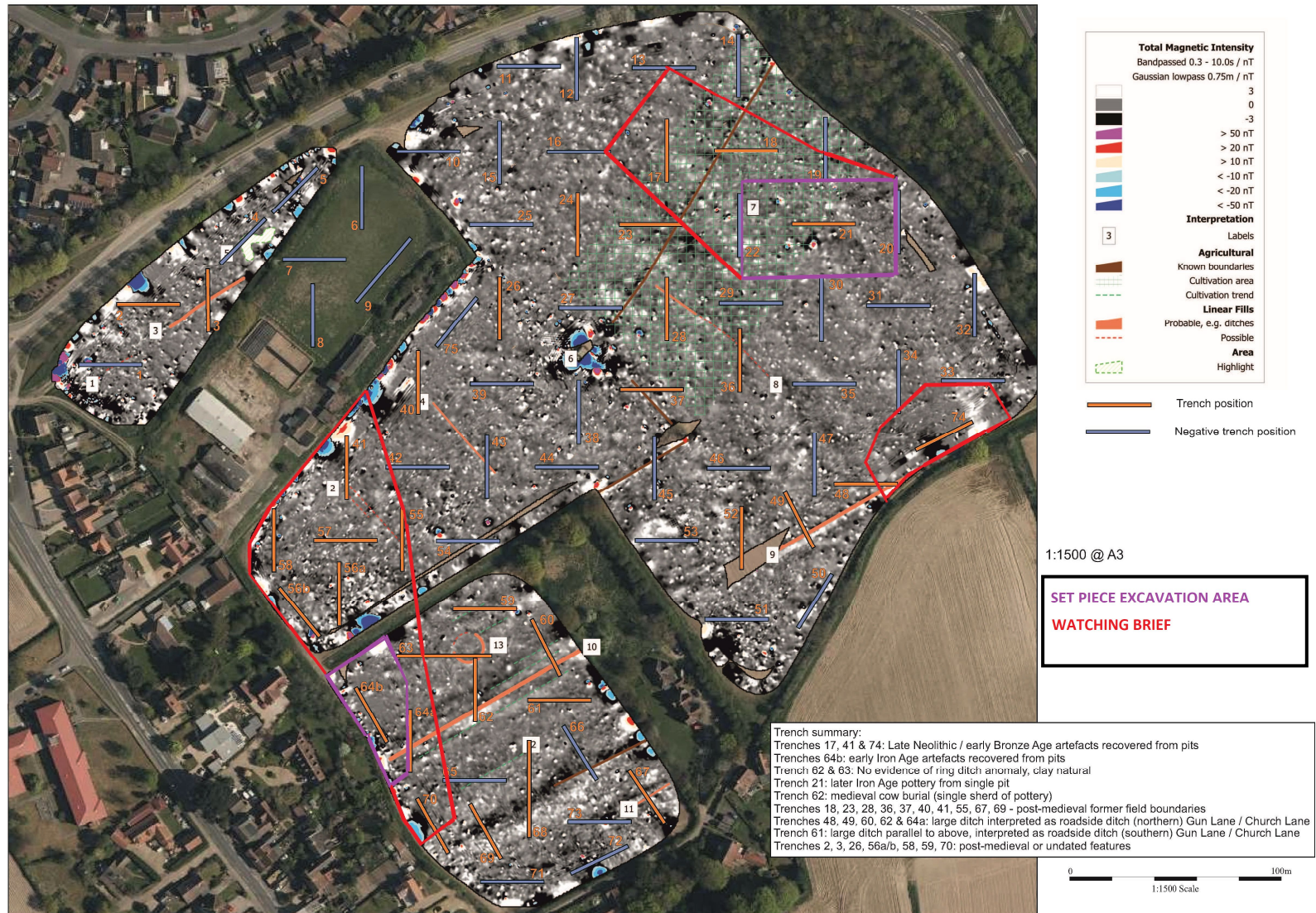


Figure 12 Proposed post-consent areas of archaeological mitigation

4. Conclusion

On the basis of currently available information, overall, the site has low archaeological potential.

The National Planning Policy Framework 2019 (paragraph 196) states Local Planning Authorities:

‘Should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible.’

The archaeological remains within two defined areas of the PDA will be excavated, recorded and disseminated. Three areas would be subject to a watching brief followed by further mitigation in accordance with the significance of archaeological remains identified. This could help answer questions relating to Iron Age settlement and material culture, as set out in the revised Archaeological Research Framework for the East of England. The Written Scheme of Investigation that would form the basis for the work, subject to planning consent, would be agreed with Suffolk Coastal. The work would be secured via a planning condition.

Having regard to the baseline conditions, the nature of the proposed development and the proposed measures that would be effective in mitigating the impacts of the scheme, there would be no residual effects upon known archaeological assets. The proposed development therefore fully accords with both local and national cultural heritage policy.

Appendix A: Suffolk HER Summary of Entries

Suffolk County Council Event/Activity Summary Report

30/01/2018

Number of records: 20

Event Ref, Type	Name	Dates	Organisation
(ESF18867) Event - Survey	Metal detecting, 2002	01/01/2002 - 31/12/2002	
(ESF18868) Event - Survey	Metal detecting	01/01/2000 - 31/12/2000	
(ESF18874) Event - Survey	Metal detecting, Trimley St Martin		
(ESF21997) Event - Survey	Aerial Photographic Assessment , Land adjacent to Mushroom Farm, Trimley St Martin Aerial Photographic Assessment identified field systems, trackways, enclosures and numerous pits, some of the ditches are aligned on historical maps.	01/12/2012 - 31/12/2012	
(ESF25992) Event - Intervention	Test Pit Survey - Felixstowe Branch Line, Trimley St Martin + St Mary		Suffolk Archaeology CIC
OASIS-albionar1-215862 (ESF23125) Event - Intervention	Evaluation - Ipswich to Felixstowe, Shotley and Harwich 132kV and 33kV Cable route		Albion Archaeology
OASIS-albionar1-258134 (ESF24845) Event - Intervention	Evaluation - Trench 110-118 M2, Ipswich to Felixstowe Cable Route		Albion Archaeology
OASIS-albionar1-258134 (ESF24848) Event - Intervention	Evaluation - Trench 125-137 M2, Ipswich to Felixstowe Cable Route		Albion Archaeology
OASIS-albionar1-258134 (ESF24849) Event - Intervention	Evaluation - Trench 139-140 M2, Ipswich to Felixstowe Cable Route		Albion Archaeology

Event Ref, Type	Name	Dates	Organisation
OASIS-britanni1-146218 (ESF24495) Event - Survey	Magnetometry Survey - Mushroom Farm, Trimley St Martin A geophysical magnetometry survey was carried out on a plot of c.1.5 hectares. The survey was successful in recording potential archaeological anomalies despite a fairly high magnetic background. A total of five potential archaeological anomalies were identified by the survey.	31/03/2013 - 31/03/2013	Britannia Archaeology
OASIS-dennispa1-284862 (ESF25552) Event - Intervention	Evaluation - Land rear of 349 High Road, Trimley St Martin		Dennis Payne Archaeological Services
OASIS-preconst1-225522 (ESF23251) Event - Intervention	Evaluation - Land at and adjacent to Mushroom Farm, High Road, Trimley St Martin The second phase of an evaluation was carried out at Mushroom Farm in advance of a proposed residential development. The prior evaluation was undertaken by Suffolk County Council Archaeological Service on the plot to the east in 2013 (see ESF 24493). A total of five trenches were excavated, although four were relocated from their original positions due to contaminated ground. The trenches all measured between 18m and 30m long and 1.8m wide. The trenches were excavated to a maximum depth of 0.84m before encountering the natural. Ditches and pits were identified.	12/10/2015 - 16/10/2015, between	Pre-Construct Archaeology
OASIS-preconst1-230253 (ESF23275) Event - Intervention	Excavation - Land at and adjacent to Mushroom Farm, High Road, Trimley St Martin An archaeological excavation was carried out following the identification of possible prehistoric features during an archaeological trial trench evaluation on the site. The excavation comprised of three rectangular areas in the east of the site measuring 350m squared in total. Topsoil and other overburden of low archaeological value were removed in spits down to the level of the undisturbed natural geology where potential archaeological features could be observed. A series of prehistoric features were identified.	31/10/2015 - 05/11/2015	Pre-Construct Archaeology
OASIS-preconst1-230253 (ESF24563) Event - Intervention	Monitoring - Land at and adjacent to Mushroom Farm, High Road, Trimley St Martin Archaeological monitoring was carried out following archaeological evaluation trenching across the site. This focused on the eastern part of the site where the topsoil was stripped, drains excavated and an area reduced in order to build a road. No finds or features were identified during the monitoring, although this is possibly because the works did not reach a depth sufficient to reveal features.	24/11/2015 - 14/12/2015, between	Pre-Construct Archaeology
OASIS-preconst1-249966 (ESF23915) Event - Intervention	Evaluation - Thurmans Lane, Trimley St Martin		Pre-Construct Archaeology
OASIS-preconst1-254943 (ESF24151) Event - Intervention	Excavation - Land South of Thurmans Lane, Trimley St Mary		Pre-Construct Archaeology
OASIS-suffolka1-257779 (ESF24318) Event - Intervention	Evaluation - Land to the Rear of Three Mariners, Trimley St Mary An archaeological evaluation was carried out prior to the construction of six dwellings. A single trench was excavated across the development area measuring 29.5m long by 1.6m wide. The topsoil measured between 0.2m and 0.45m and subsoil measured 0.35m. Medieval and post medieval finds and features were identified.	23/08/2016 - 24/08/2016, between	Suffolk Archaeology CIC

Event Ref, Type	Name	Dates	Organisation
OASIS-suffolka1-277022 (ESF25433) Event - Intervention	Evaluation - 28 Old Kirton Road, Trimley St Martin		Suffolk Archaeology CIC
OASIS-suffolka1-298040 (ESF25915) Event - Intervention	Monitoring - Felixstowe Branch Capacity Enhancement (Badger setts), Trimley St Martin Monitoring of works groundworks associated with the construction of an artificial badger set. No archaeological features or finds were recorded.	16/10/2017	Suffolk Archaeology CIC
OASIS-suffolkc1-164709 (ESF24493) Event - Intervention	Evaluation - Land at and adjacent to Mushroom Farm, High Road, Trimley St Martin An archaeological evaluation was carried out in advance of a residential development. A total of nine trenches were excavated measuring 31m long, although one of the trenches was lengthened to 56m. A further eight trenches were planned but were located under buildings or concrete roadways within the area of the active farm. The trenches revealed similar natural subsoil at between 0.65m and 0.81m. A number of linear features were identified although no artefacts were recovered.	02/12/2013 - 04/12/2013, between	Suffolk County Council Archaeological Service

Suffolk County Council Archaeological Service Sites and Monuments Record

30/01/2018

Parish IPSWICH, IPSWICH, SUFFOLK, FELIXSTOWE, SUFFOLK COASTAL, SUFFOLK, FOXHALL, SUFFOLK COASTAL, SUFFOLK, LEVINGTON, SUFFOLK COASTAL, SUFFOLK, NACTON, SUFFOLK COASTAL, SUFFOLK, PURDIS FARM, SUFFOLK COASTAL, SUFFOLK, STRATTON HALL, SUFFOLK COASTAL, SUFFOLK, TRIMLEY ST MARTIN, SUFFOLK COASTAL, SUFFOLK, TRIMLEY ST MARY, SUFFOLK COASTAL, SUFFOLK

Ref	Site Name	Period	Summary Description	NGR
SUF 072	Felixstowe Branch railway line MSF34997		Felixstowe Branch railway line. Opened in 1877	Centred TM 2107 4178 (12411m by 14408m)
TYN 008	Grimston Hall; Trimley Park MSF8093	Med	The site of Medieval Grimston Hall, Trimley St Martin parish listed building	Centred TM 2686 3654 (219m by 338m)
TYN 012	Interconnecting ditched tracks of unknown date are visible as cropmarks on Trimley Heath to the north of the A14 in Trimley St Martin parish, partial... MSF8097	Un	Interconnecting ditched tracks of unknown date are visible as cropmarks on Trimley Heath to the north of the A14 in Trimley St Martin parish, partially defining and connecting two rectilinear ditched enclosures or fields.	Centred TM 2715 3849 (569m by 522m)
TYN 016	A ring ditch of unknown date, circa 25 metres in diameter can be seen as a cropmark on aerial photographs in Trimley St Martin parish. MSF8101	BA	A ring ditch of unknown date, circa 25 metres in diameter can be seen as a cropmark on aerial photographs in Trimley St Martin parish.	Centred TM 2816 3823 (26m by 26m)
TYN 019	Three C4 coins found with a metal detector. MSF8104	Rom	Three C4 coins found with a metal detector.	Centred TM 2859 3731 (101m by 100m)
TYN 020	St Martin's Church (Rectory) MSF8105	Med	St Martin's Church (Rectory).	Centred TM 2766 3704 (63m by 63m)
TYN 023	Complete socketed axe, 102mm long, found metal detecting. MSF1837	BA	Complete socketed axe, 102mm long, found metal detecting.	Centred TM 2775 3814 (100m by 100m)
TYN 049	C19 brick kiln to rear of Mill Lane. MSF11286	PMed	C19 brick kiln to rear of Mill Lane.	Centred TM 2737 3788 (50m by 50m)
TYN 057	A brick kiln which probably was abandoned for the kiln to S (TYN 049). MSF16344	PMed	A brick kiln which probably was abandoned for the kiln to S (TYN 049).	Centred TM 2731 3816 (100m by 100m)

Ref	Site Name	Period	Summary Description	NGR
TYN 059	Pipeline; Capel Hall Lane (Rom) MSF16757	Rom	July 1996: Two sherds greyware and large fragment tegula found during pipeline monitoring - details in (S1).	Centred TM 2808 3780 (47m by 30m)
TYN 059	Pipeline; Capel Hall Lane (Med) MSF16758	Med	July 1996: Pottery scatter (21 sherds) found during pipeline monitoring - details in (S1).	Centred TM 2808 3780 (49m by 27m)
TYN 060	Pipeline; Capel Hall Lane (Med) MSF16759	Med	July 1996: Pottery scatter found during pipeline monitoring - details to follow (S1).	Centred TM 2825 3778 (55m by 29m)
TYN 060	Pipeline; Capel Hall Lane (Sax) MSF17506	Sax	Single sherd of Ipswich ware (unabraded) located amidst Med scatter during pipeline monitoring - details in (S1).	Centred TM 2825 3777 (55m by 29m)
TYN 061	Pipeline; Capel Hall Lane MSF16760	Med	July 1996: Pottery scatter found during pipeline monitoring - details to follow (S1).	Centred TM 2844 3774 (127m by 36m)
TYN 062	Pipeline; Capel Hall Lane MSF16761	Med	July 1996: Pottery scatter found during pipeline monitoring - details to follow (S1).	Centred TM 2867 3773 (65m by 33m)
TYN 068	Capel Hall Farm (Rom) MSF17500	Rom	1992: Scatter of Rom finds found metal detecting.	Centred TM 2870 3740 (100m by 100m)
TYN 068	1993: metal detector find of silver seal, variant of 'chess piece' type (S1). (PMed) MSF18630	PMed	1993: metal detector find of silver seal, variant of 'chess piece' type (S1).	Centred TM 2869 3740 (100m by 100m)
TYN 070	Blue Barn MSF17896	Un	A possible rectilinear enclosure or field and trackway can be seen as a cropmark on aerial photographs to the south of Blue Boar Farm, Trimley St Martin parish.	Centred TM 2849 3752 (141m by 291m)
TYN 071	Blue Barn MSF17897	Un	Extensive field boundaries of possible medieval or earlier date are visible as cropmarks on aerial photographs to the east of Trimley St Martin Primary School, Trimley St Martin parish.	Centred TM 2791 3840 (671m by 705m)
TYN 076	6 Sioux Close, behind Post Office MSF20374	Neo	Neolithic polished flint axehead found during building works.	Centred TM 2770 3709 (6m by 14m)
TYN 085	A Post Medieval road, the former route of Guncorner Lane, from Trimley St Martin to Grimston Hall MXS19876	PMed	A Post Medieval road, the former route of Guncorner Lane, from Trimley St Martin to Grimston Hall	Centred TM 2716 3681 (152m by 177m)
TYN 109	Silver sax sceat found in 1998. MSF22404	Sax	Silver sax sceat found in 1998.	Centred TM 2701 3693 (25m by 25m)

Ref	Site Name	Period	Summary Description	NGR
TYN 118	A length of ditched track of probable late prehistoric date is visible on aerial photographs to the east of Trimley St Martin. MXS22462	IA	A length of ditched track of probable late prehistoric date is visible on aerial photographs to the east of Trimley St Martin.	Centred TM 2801 3792 (189m by 60m)
TYN 121	Probable trackways and field boundaries of unknown date are visible as cropmarks on aerial photographs in Trimley St Martin parish, in a field to the... MXS22465	Un	Probable trackways and field boundaries of unknown date are visible as cropmarks on aerial photographs in Trimley St Martin parish, in a field to the north-west of Capel Hall	Centred TM 2870 3758 (206m by 255m)
TYN 122	A coaxial field system and trackways of possible late prehistoric date are visible as cropmarks on aerial photographs to the west of Trimley, Trimley... MXS22469	Un	A coaxial field system and trackways of possible late prehistoric date are visible as cropmarks on aerial photographs to the west of Trimley, Trimley St Martin parish.	Centred TM 2680 3777 (519m by 962m)
TYN 124	Rectangular pillbox based on the 'Suffolk square' design. MSF26360	WW2	Rectangular pillbox based on the 'Suffolk square' design.	Centred TM 2775 3736 (6m by 5m)
TYN 125	Mushroom Farm MSF26868		Cropmarks visible on aerial photographs show field systems, trackways and numerous pits, some of the ditches are aligned on historical maps.	Centred TM 2729 3715 (553m by 454m)
TYN 126	Undated ditches at Mushroom Farm MSF30819		Undated ditches identified during archaeological evaluation trenching at Mushroom Farm	Centred TM 2735 3736 (162m by 166m)
TYN 127	Capel Hall Lane MSF27386	Un	Cropmarks of two adjoining enclosures or field boundaries and part of possible trackway.	Centred TM 2843 3780 (192m by 144m)
TYN 131	Stray find of human parietal bone MSF31443		Stray find of human parietal bone.	TM 2793 3744 (point)
TYN 132	Iron Age trackway, post holes and Neolithic, Bronze Age and Iron Age pits and ditches at Mushroom Farm. MSF34049		Iron Age trackway, post holes and Neolithic, Bronze Age and Iron Age pits and ditches identified during evaluation trenching and excavation at Mushroom Farm.	Centred TM 2723 3738 (65m by 148m)
TYN 133	Findspot of a late 13th or 14th century pendant MSF34058		Findspot of a late 13th or 14th century pendant found during metal detecting.	TM 2700 3690 (point)
TYN 141	OUTLINE RECORD: Trench 110-118 Ipswich to Felixstowe cable route MSF35415			TM 2680 3760 (point)

Ref	Site Name	Period	Summary Description	NGR
TYN 144	OUTLINE RECORD: Trench 125-137 Ipswich to Felixstowe cable route MSF35418			TM 2725 3665 (point)
TYN 146	OUTLINE RECORD: 28 Old Kirton Road (SA) EVAL MSF35762			TM 2750 3774 (point)
TYN 147	OUTLINE RECORD: land rear of 349 High Road Trimley St Martin (DPAS) EVL MSF36172			TM 2702 3778 (point)
TYN 149	OUTLINE RECORD: Felixstowe Branch Line Phase 1 (SA) TPS MSF37198			TM 2695 3718 (point)
TYN Misc	Feb/Mar 1997: Adult human clavicle, probably recent, on ploughed field surface (close to footpath). (PMed) MSF18311	PMed	Feb/Mar 1997: Adult human clavicle, probably recent, on ploughed field surface (close to footpath).	TM 2690 3690 (point)
TYY 005	Med pottery scatter recovered in 1960 (S1). MSF8130	Med	Med pottery scatter recovered in 1960 (S1).	Centred TM 2830 3720 (101m by 100m)
TYY 007	Egypt Wood MSF8132	Med	Pottery scatter, W of Egypt Wood, includes one C13 with thumbbed decoration (same as 'chain patterned pot' ? in S2).	Centred TM 2867 3694 (50m by 50m)
TYY 010	Small lava millstone, 8 inches diameter, found in stream bed. MSF8135	Med	Small lava millstone, 8 inches diameter, found in stream bed.	Centred TM 2830 3737 (100m by 100m)
TYY 011	Ring ditch seen on air photographs. MSF8136	BA	Ring ditch, circa 30m diameter (S1), seen on air photographs.	Centred TM 2812 3685 (25m by 25m)
TYY 012	A sub-rectangular enclosure of possible late prehistoric date is visible on aerial photographs as a cropmark on the north- eastern side of Trimley St ... MSF8137	Un	A sub-rectangular enclosure of possible late prehistoric date is visible on aerial photographs as a cropmark on the north- eastern side of Trimley St Mary, Felixstowe.	Centred TM 2824 3658 (58m by 63m)
TYY 013	Probable field boundaries, rectangular enclosures and a possible trackway of unknown date can be seen on aerial photographs to the north of Trimley S... MSF8138	Un	Probable field boundaries, rectangular enclosures and a possible trackway of unknown date can be seen on aerial photographs to the north of Trimley St Mary, Felixstowe.	Centred TM 2835 3672 (314m by 356m)

Ref	Site Name	Period	Summary Description	NGR
TYY 016	Pottery scatter, C11-C12. Area circa 20m square, coarse ware and some Thetford ware. MSF8141	Med	Pottery scatter, C11-C12. Area circa 20m square, coarse ware and some Thetford ware.	Centred TM 2835 3697 (50m by 50m)
TYY 017	St Mary's Church MSF8142	Med	St Mary's Church (Rectory).	Centred TM 2768 3699 (85m by 128m)
TYY 020	Water mill shown between Capel Hall & church on Hodskinson's 1783 map (S1). MSF14848	PMed	Water mill shown between Capel Hall & church on Hodskinson's 1783 map (S1).	Centred TM 2837 3736 (100m by 100m)
TYY 023	Aerial photograph showing sunken earthworks in meadow, possible shrunken way and a group of four small enclosures to NW (S1). MSF16906	Un	Aerial photograph showing sunken earthworks in meadow, possible shrunken way and a group of four small enclosures to NW (S1).	Centred TM 2840 3720 (280m by 269m)
TYY 052	8 sherds med pottery. 2 sherds Roman and a circular flint scraper found on the surface in 2002. MSF22390	Med	8 sherds med pottery. 2 sherds Roman and a circular flint scraper found on the surface in 2002.	Centred TM 2755 3683 (101m by 135m)
TYY 060	Trimley historic settlement core MSF25751	Sax-	Indicative area of the historic settlement core of Trimley	Centred TM 2774 3679 (727m by 952m)
TYY 067	SW of Egypt Wood. MSF27385	Un	September 2013: cropmarks (S1) of rectilinear enclosure of field boundaries SW of Egypt Wood.	Centred TM 2864 3685 (37m by 44m)
TYY 068	OUTLINE RECORD: Land South of Thurmans Lane (PCA Central) EXC MSF35034		Evaluation was misnumbered under TYN 136	TM 2789 3687 (point)
TYY 069	Medieval and post medieval features at the Land to the rear of Three Mariners MSF35241		Medieval and post medieval features identified during evaluation trenching at the Land to the rear of Three Mariners	Centred TM 2762 3696 (14m by 15m)
TYY 073	OUTLINE RECORD: Trench 139-140 Ipswich to Felixstowe cable route MSF35419			TM 2741 3661 (point)
TYY 078	OUTLINE RECORD: Mill Farmhouse (LA) HAA MSF35531			TM 2806 3695 (point)
TYY 079	OUTLINE RECORD: Felixstowe Branch Line Phase 1 (SA) TPS MSF37199			TM 2769 3639 (point)

Ref	Site Name	Period	Summary Description	NGR
TYY Misc	Mill Farm (Un) MSF12440	Un	During underpinning following fire in Grade II listed early C16, 3 bay timber framed former dairy, "large tablets of stone" were encountered.	TM 2809 3696 (point)

Appendix B: Geophysical Survey Report



Land off Howlett Lane, Trimley St Martin, Suffolk

Geophysical Survey Report
(Caesium Vapour Magnetic – Archaeology)
Version 2.0

Project code: TSM171

HER Event: HAD TYN151

OASIS: tigergeo1-313948

Produced for:

Andrew Josephs Associates

Authors:

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23rd August 2018





Land off Howlett Lane, Trimley St Martin, Suffolk

Digital data

Item and version	Sent to	Sent date
CAD – Vector Elements 1.0	Andrew Josephs	23rd August 2018

Audit

Version	Author	Checked	Date
Interim			
1.0_	ACK Roseveare, MJ Roseveare, D Lewis	MJ Roseveare	27th April 2018
2.0	MJ Roseveare, L Gilling	ACK Roseveare	23rd August 2018

Project metadata

Project Code	TSM171
Client	Andrew Josephs Associates
Fieldwork Dates	17 th April 2018, 14 th - 15 th August 2018
Field Personnel	J Wild, L Gilling, G Britton
Data Processing Personnel	ACK Roseveare, J Smith, L Gilling
Reporting Personnel	MJ Roseveare, L Gilling, ACK Roseveare, D Lewis
Report Date	23 rd August 2018
Report Version	2.0

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Non-Technical Summary

A magnetic survey was commissioned by Andrew Josephs Associates to prospect land off Howlett Lane, Trimley St Martin for buried structures of archaeological interest. Survey was undertaken using a GNSS-tracked non-gradiometric array of caesium vapour magnetometers on a non-magnetic platform.

Survey was undertaken across two visits to accommodate harvest of an Oil Seed Rape crop that occupied much of the area and this version of the report replaces an earlier one for just the area initially accessible.

Within the data there is evidence for a medieval landscape east of the settlement, including a former course of Church Lane. Earlier periods are represented by a sole ring ditch that in the absence of obvious settlement-related features perhaps had a funerary purpose.

WWII Pillbox (MSF26360)





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DWG 01	Site Location
DWG 02a, b	Magnetic Data – Total Magnetic Intensity
DWG 03a, b	Magnetic Data – 1m Vertical Pseudogradient
DWG 04a, b	Interpretation



Drawing	Title
DWG 05	Interpretation - Vector

1 Introduction

TigerGeo was commissioned by Andrew Josephs Associates to undertake a geophysical survey on land off Howlett Lane, Trimley St Martin, Suffolk. Survey was undertaken using an array of caesium vapour magnetometers to prospect for buried features possibly of archaeological interest. A small area that was available before harvest was surveyed using a hand cart but the rest, the majority of the site, was surveyed using a GNSS-tracked sledge towed by ATV.

Country	England
County	Suffolk
Nearest Settlement	Trimley St Martin
Central Co-ordinates	627740, 237350
Survey Area	Approximately 9 ha

2 Context

2.1 Environment

Soilscapes Classification	Freely draining slightly acid loamy soils (6)
Superficial 1:50000 BGS	Glaciolacustrine Deposits, Mid Pleistocene – Clay and Silt (GLLMP) (W part) Kesgrave Catchment Subgroup – Sand and Gravel (KGCA) (main area)
Bedrock 1:50000 BGS	Red Crag Formation – Sand (RCG)
Topography	Fairly flat
Hydrology	Enhanced for agricultural purposes, drainage ditches along boundaries
Current Land Use	Agricultural - rough pasture (W), arable (main)
Historic Land Use	Agricultural - mixed
Vegetation Cover	Grass and weedy vegetation (W), stubble following OSR harvest (main)
Sources of Interference	Possible interference from adjacent road and poultry farm structures

2.2 Heritage

A desk-based assessment has yet to be prepared for the proposed survey area, but a search of the Heritage Gateway website, which contains data from the Suffolk Historic Environment Record, revealed that the only previously recorded heritage asset within the area is a WWII Pillbox (MSF26360). This was photographed by the field team while on site.

In the wider environs, a Neolithic polished stone axe is recorded immediately to the south of the survey area and medieval pottery scatters and cropmarks depicting possible enclosures and field systems of likely archaeological interest are recorded to the east.

Old Ordnance Survey mapping shows a steady reorganisation of the local landscape in the 20th century, with field boundaries being removed, then the A14 and connecting road constructed by 1975. The boundary of the poultry farm is a survival of the earliest field boundaries mapped by the Ordnance Survey.

3 Discussion

3.1 Character & Principal Results

3.1.1 Introduction

The following paragraphs represent an interpretive summary of the survey. The numbers in square brackets refer to individual anomalies described in detail in the catalogue below and shown on DWG 04 onwards.

3.1.2 Data

The data is inevitably distorted close to the northern boundary with the road but this will be most marked within this field and less of an issue elsewhere on site. Quality is otherwise good. Magnetic contrast is rather low and anomalies are not particularly well defined against the background. Background textural variation is within 0.05 nT in some locations although is overlaid by a wide scatter of discrete anomalies stronger than 5 nT.

3.1.3 Geology

The soil may be naturally weakly magnetic, with the British Geological Survey 5km G-Base data recording 1.5% soil iron but the presence of weak yet detectable linear anomalies would suggest that cut features with perhaps deeper or former topsoil within them can be mapped.

The inhomogeneity of the superficial deposits attribute to banded variations of contrast and texture across the site, possibly the result of changes between sands and gravels in the Kesgrave Catchment Subgroup. As the amplitude of the geological texture is similar to that seen for linear fills it may mask other weak anomalies from anthropogenic sources.

Other features with broader anomalies would be typical of past waterlogging from known drained areas seen in previous OS map editions.

3.1.4 Land use

The 1881 OS mapping shows a fairly regular system of small rectangular fields across the wider area, although much has since been removed by residential and other development. However, the survey has revealed elements of another system across the southern parts of the survey, likely derived from the original medieval pattern. This has strips extending perpendicular to the road through the village; anomalies [3], [4], [8] and [11] all seem to be former field boundaries and of these, [3] and [11] along with cultivation [12] and a likely former alignment of Church Lane [10] reveal the former layout.

Former cultivation is less evident, however, although area [7] implies ridge and furrow cultivation aligned with the field boundaries of the northern part of the site and extending away from the core of the settlement. Less obvious traces exist at [12] and possibly [2] although the latter is unlikely to be medieval.

At [5] is a group of strong discrete anomalies that likely relate to debris or land use and represent a concentration in one location of a number of similar anomalies observed across the site. Their relevance is uncertain.

3.1.5 Archaeology

At [13] is a small ring ditch of about 15m diameter and lacking diagnostic character. Although the complete circuit is not well resolved, there is no obvious sign of an entrance nor are there associated enclosure ditches that might suggest settlement. It might be that this is the remains of a burial-related structure instead.

Linear anomalies [9] and [10] appear to be the remains of a former course of Church lane, extending eastwards perpendicular to the settlement between contemporary fields. The lane appears to have been diverted southwards prior to the 1880 OS map edition before being eventually cut by the railway line east of

the site.

At [6] is the remains of a military structure (HER MSF26360) that seems originally to have been built at the intersection of two field boundaries, since removed. It does not appear to be associated with other anomalies, i.e. there is no evidence for connected services, and therefore appears to have been a self-contained complex.

3.2 Catalogue

Label	Anomaly Type	Feature Type	Description
1	Weak linear enhanced	Fill? - Ditch?	Tentative and < 1 m wide, the impression is here of a linear anomaly poorly resolved against the irregular background
2	Weak linear enhanced (group)	Fills – Ditches? / Cultivation?	Two linear anomalies approximately 3.6 m apart, parallel to [4]
3	Weak linear enhanced	Fill - Ditch?	About 1m wide, this could be a ditch fill and is better resolved than [1] and [2]
4	Linear enhanced	Fill – Ditch	Probable old field boundary parallel to a known field boundary to the east and possible cultivation [2]
5	Strong discrete enhanced (group)	Debris / objects?	A group of similar anomalies, suggesting a common origin or purpose
6	Strong variable (group)	Structures	Extant military structure, HER MSF26360
7	Weak texture	Fills - Cultivation	An area (1.2 ha) of texture with a linear grain suggestive of cultivation. The grain is parallel to a known field boundary and crosses a probable field boundary [8]
8	Variable enhanced linear	Fill – Ditch	Probable old field boundary roughly parallel to a known old field boundary to the west
9	Linear enhanced	Fill – Ditch / Path?	A fill approximately 2 m wide extending westwards tangentially from the course of Church Lane
10	Linear enhanced	Fill – Ditch / Path?	A probable continuation of [9]
11	Linear enhanced	Fill - Ditch	A probable field boundary, parallel to other boundaries and the possible path [10]
12	Weak linear enhanced (group)	Fills - Cultivation	Parallel anomalies typical of cultivation running parallel to a known and a probable field boundary [11]
13	Linear enhanced	Fill - Ditch	A 1.6m wide anomaly of sub-circular form with a diameter of approximately 15 m and weakly defined northern arc

3.3 Conclusions

The only evidence for prehistory at this site is the ring ditch which does not seem to be associated with any settlement and is perhaps funerary-related.

The survey has revealed a medieval landscape that developed into strip fields perpendicular to the settlement and within which a former course of Church Lane appears to have been integral. This was later diverted southwards to cross the northwest corner of an existing field and before the 1880s OS map editions.

Overall the evidence for features of archaeological interest seems to be fairly sparse.

3.4 Caveats

Geophysical survey is reliant upon the detection of anomalous values and patterns in physical properties of the ground, e.g. magnetic, electromagnetic, electrical, elastic, density and others. It does not directly detect underground features and structures and therefore the presence or absence of these within a geophysical interpretation is not a direct indicator of presence or absence in the ground. Specific points to consider are:

- some physical properties are time variant or mutually interdependent with others;
- for a buried feature to be detectable it must produce anomalous values of the physical property being measured;
- any anomaly is only as good as its contrast against background textures and noise within the data.

TigerGeo will always attempt to verify the accuracy and integrity of data it uses within a project but at all times its liability is by necessity limited to its own work and does not extend to third party data and information. Where work is undertaken to another party's specification any perceived failure of that specification to attain its objective remains the responsibility of the originator, TigerGeo meanwhile ensuring any possible shortcomings are addressed within the normal constraints upon resources.

4 Methodology

4.1 Magnetic Principles

4.1.1 Physical concepts

Magnetic survey for any purpose relies upon the generation of a clear magnetic anomaly at the surface, i.e. strong enough to be detected by instrumentation and exhibiting sufficient contrast against background variation to permit diagnostic interpretation. The anomaly itself is dependent upon the chemical properties of a particular volume of ground, its magnetic susceptibility and hence induced magnetic field, the strength of any remanent magnetisation, the shape and orientation of the volume of interest and its depth of burial. Finally the choice and configuration of measurement instrumentation will affect anomaly size and shape.

Sites present a complex mixture of these factors and for some the causative affects are not known. However, depth of burial and size are usually fairly constrained and background susceptibility can be estimated (or measured). The degree of remanent magnetisation is harder to predict and depends on both the natural magnetic properties of the soil and any chemical processes to which it has been subjected. Fortunately heat will raise the susceptibility of most soils and topsoil tends to be more magnetic than subsoil, by volume.

It is hard to draw reliable conclusions about what sort of geology is supportive of magnetic survey as there are many factors involved and in any case magnetic response can vary across geological units as well as being dependent upon post-deposition and erosional processes. In general a relatively non-magnetic parent material contrasting with a magnetisable erosion product, i.e. one which contains iron in the form of oxides and hydroxides, will allow archaeological structures to exhibit strong magnetic contrast against their surroundings and especially if the soil has been heated or subjected to certain processes of fermentation. In the absence of either, magnetic enhancement becomes entirely reliant upon the geochemistry of the soil and enhancement will often be weaker and more variable.

Analysis of the British Geological Survey (BGS) Geochemical Atlas (G-Base) for total soil iron reveals that for England and Wales 50% of the samples (the interquartile range) lie between 1.9% and 3.6% percentage iron with the median at 2.7%.

The principal magnetic iron mineral is the oxide magnetite which sometimes occurs naturally but is more often formed during the heating of soil. Subsequent cooling yields a mixture of this, non-magnetic oxide haematite and another magnetic oxide, maghaemite. Away from sources of heat, other magnetic iron minerals include the sulphides pyrite and greigite while in damp soils complex chemistry involving the hydroxides goethite and lepidocrocite can create strong magnetic anomalies. There are thus a number of different geochemical reaction pathways that can both augment and reduce the magnetic susceptibility of a soil. In addition, this susceptibility may exhibit depositional patterns unrelated to visible stratigraphy.

Most structures of archaeological interest detected by magnetic survey are fills within negative or cut features. Not all fills are magnetic and they can be more magnetic or less magnetic than the surrounding ground. In addition, it is common for fills to exhibit variable magnetic properties through their volume, basal primary silt often being more magnetic than the material above it due to the increased proportion of topsoil within it. However, a fill containing burnt soil may be much more magnetic than this primary silt and sometimes a feature that has contained standing water can produce highly magnetic silts through mechanical depositional processes (depositional remanent magnetisation, DRM).

A third structural factor in the detection of buried structures is the depth of topsoil over the feature. As fills sink, the hollow above accumulates topsoil and hence a structure can be detected not through its own magnetisation but through the locally deeper topsoil above it. The volume of soil required depends upon the magnetic susceptibility of the soil but just a few centimetres are often sufficient. Such a thin deposit can, however, easily be lost through subsequent erosion by natural factors or ploughing.

4.1.2 Instrumentation

The use of the magnetic sensors in non-gradiometric (vertical) configuration avoids measurement

sensitisation to the shallowest region of the soil, allowing deeper structures, whether natural or otherwise to be imaged within the sensitivity of the instrumentation. This also allows the detection of shallow broad variations in magnetic susceptibility that might have archaeological significance. Suppression of ambient noise and temporal trends is reduced and therefore need reduction during processing.

The theoretical slightly reduced lateral resolution inherent to using non-gradiometric sensor arrays is practically not an issue and especially if processing includes a vertical pseudo-gradient conversion. The non-gradiometric system is thus overall a more capable configuration than the short gradiometers often used for archaeological studies.

Caesium instrumentation has a greater sensitivity than fluxgate instruments, however, at the 10 Hz sampling rate used here this increase in sensitivity is limited to about one order of magnitude. Greater benefit is obtained from a better signal-to-noise ratio meaning that sub-nanoTesla measurement is more practically achieved.

The array system is designed to be non-magnetic and to contribute virtually nothing to the magnetic measurement, whether through direct interference or through motion noise.

4.2 Magnetic Survey

4.2.1 Technical equipment

Measured variable	Magnetic flux density / nT (Total Magnetic Intensity / nT after removal of regional trend)
Instrument	Array of Geometrics G858 Magmapper caesium magnetometers
Configuration	Non-gradiometric transverse array (4 sensors - handcart, 6 sensors - ATV towed sledge system)
Sensitivity	0.03 nT @ 10 Hz (manufacturer's specification)
QA Procedure	Continuous observation
Spatial resolution	1.0m between lines, 0.25m mean along line interval

4.2.2 Monitoring & quality assessment

The system continuously displays all incoming data as well as line speed and spatial data resolution per acquisition channel during survey. Rest mode system noise is therefore easy to inspect simply by pausing during survey, and the continuous display makes monitoring for quality intrinsic to the process of undertaking a survey. Rest mode test results (static test) are available from the system.

4.3 Magnetic Data Processing

4.3.1 Procedure

All data processing is minimised and limited to what is essential for the class of data being collected, e.g. reduction of orientation effects, suppression of single point defects (drop-outs or spikes) etc. The processing stream for this data is as follows:

Process	Software	Parameters
Measurement & GNSS receiver data alignment	Proprietary	
Temporal reduction, regional field suppression	Proprietary	Bandpassed 0.3 – 10.0 s
Gridding	Surfer	Kriging, 0.25 m x 0.25 m
Smoothing	Surfer	Gaussian lowpass 3x3 data (0.75 m)
Pseudo-gradient transformation	Proprietary	1 m vertical gradient

Potential field processing procedures are used where possible on gridded data from the above processing, allowing simulation of vertical gradient data, separation of deep and shallow magnetic sources, etc. The initial processing uses proprietary software developed in conjunction with the multisensor acquisition system. Gridded data is ported as data surfaces (not images) into Manifold GIS for final imaging, contouring and

detailed analysis. Specialist analysis is undertaken using proprietary software.

4.4 Magnetic Interpretation

4.4.1 Introduction

Numerous sources are used in the interpretive process, which takes into account shallow geological conditions, past and present land use, drainage, weather before and during survey, topography and any previous knowledge about the site and the surrounding area. Old Ordnance Survey mapping is consulted and also older sources if available. Geological information (for the UK) is sourced only from British Geological Survey resources and aerial imagery from online sources. LiDAR data is usually sourced from the Environment Agency or other national equivalents, SAR from NASA and other topographic data from original survey.

Information from nearby surveys is consulted to inform upon local data character, variations across soils and near-surface geological contexts. Published data from other surveys may also be used if accompanied by adequate metadata.

Interpretation of magnetic data is undertaken using total intensity data, vertical pseudo-gradient and where relevant, shallow field, component models in parallel although for clarity only a subset of these may be presented in the report.

4.4.2 The contribution from geology and soils

On some sites, e.g. some gravels and alluvial contexts, there will be anomalies that can obscure those potentially of archaeological interest. They may have a strength equal to or greater than that associated with more relevant sources, e.g. ditch fills, but can normally be differentiated on the basis of anomaly form coupled with geological understanding. Where there is ambiguity, or relevance to the study, these anomalies will be included in this category.

Not all changes in geological context can be detected at the surface, directly or indirectly, but sometimes there will be a difference evident in the geophysical data that can be attributed to a change, e.g. from alluvium to tidal flat deposits, or bedrock to alluvium. In some cases the geophysical difference will not exactly coincide with the geological contact and this is especially the case across transitions in soil type.

Geophysical data varies in character across areas, due to a range of factors including soil chemistry, near surface geology, hydrology and land use past and present. These all contribute to the texture of the data, i.e. a background character against which all other anomalies are measured.

4.4.3 Agricultural inputs

Coherent linear dipolar enhancement of magnetic field strength marking ditch fills, narrow bands of more variable magnetic field or changes in apparent magnetic susceptibility, are all included within the category of former field boundaries if they correlate with those depicted on the Tithe Map or early Ordnance Survey maps. If there is no correlation then these anomaly types are not categorised as a field boundaries.

Banded variations in apparent magnetic susceptibility caused by a variable thickness of topsoil, depositional remanent magnetisation of sediments in furrows or susceptibility enhancement through heating (a by product of burning organic matter like seaweed) tend to indicate past cultivation, whether ridge-based techniques, medieval ridge and furrow or post medieval 'lazy beds'. Modern cultivation, e.g. recent ploughing, is not included.

In some cases it is possible to identify drainage networks either as ditch-fill type anomalies (typically 'Roman' drains), noisy or repeating dipolar anomalies from terracotta pipes or reduced magnetic field strength anomalies from culverts, plastic or non-reinforced concrete pipes. In all cases identification of a herring bone pattern to these is sufficient for inclusion within this category.

4.4.4 Features of archaeological interest

Any linear or discrete enhancement of magnetic field strength, usually with a dipolar character of variable strength, that cannot be categorised as a field boundary, cultivation or as having a geological origin, is classified as a fill potentially being of archaeological interest. Fills are normally earthen and include an often invisible proportion of heated soil or topsoil that augments local magnetic field strength. Inverted anomalies are possible over non-earthen fills, e.g. those that comprise peat, sand or gravel within soil. This category is subject to the 'habitation effect' where, in the absence of other sources of magnetic material, anomaly strength will decrease away from sources of heated soil and sometimes to the extent of non-detectability.

Former enclosure ditches that contained standing water can promote enhanced volumetric magnetic susceptibility through depositional remanence and remain detectable regardless of the absence of other sources of magnetic enhancement.

Anything that cannot be interpreted as a fill tends to be a structure, or in archaeological terms, a feature. This category is secondary to fills and includes anomalies that by virtue of their character are likely to be of archaeological interest but cannot be adequately described as fills. Examples include strongly magnetic bodies lacking ferrous character that might indicate hearths or kilns. In some cases anomalies of ferrous character may be included.

On some sites the combination of plan form and anomaly character, e.g. rectilinear reduced magnetic field strength anomalies, might indicate the likely presence of masonry, robber trenches or rubble foundations. Other types of structure are only included if the evidence is unequivocal, e.g. small ring ditches with doorways and hearths. In some circumstances a less definite category may be assigned to the individual anomalies instead.

It is sometimes possible to define different areas of activity on the basis of magnetic character, e.g. texture and anomaly strength. These might indicate the presence of middens or foci within larger complexes. This category does not indicate a presence or absence of discrete anomalies of archaeological interest.

4.5 Glossary

Acronym / term	Type	Definition
A	Physical quantity	SI unit Amp of electric current
BGS	Organisation	British Geological Survey
CIfA	Organisation	Chartered Institute for Archaeologists
dB	Physical quantity	Decibel, unit of amplification / attenuation
DRM	Process	Depositional Remanent Magnetisation
EAGE	Organisation	European Association of Geoscientists and Engineers
EGNOS	Technology	European Geostationary Navigation Overlay Service
ERT	Technology	Electrical resistivity tomography
ETRS89	Technology	European Terrestrial Reference System (defined 1989)
ETSI	Organisation	European Telecommunications Standards Institute
EuroGPR	Organisation	European Ground Penetrating Radar Association, the trade body for GPR professionals
G-BASE	Data	British Geological Survey Geochemical Atlas
GeoSoc	Organisation	Geological Society of London, the chartered body for the geological profession
GNSS	Technology	Global Navigation Satellite System
GPR	Technology	Ground penetrating radar
GPS	Technology	Global Positioning System (US)
inversion	process	A combination of forward and backward modelling intended to construct a 2D or 3D model of the physical distribution of a variable from data measured on a 1D or 2D surface. It is fundamental to ERT survey
IP	Physical quantity	Induced polarisation (or chargeability) units mV/V or ms

Acronym / term	Type	Definition
m	Physical quantity	SI unit metres of distance
mbgl	Physical quantity	Metres below ground level
MHz	Physical quantity	SI unit mega-Hertz of frequency
MS	Physical quantity	Magnetic susceptibility, unitless
mS	Physical quantity	SI unit milli-Siemens of electrical conductivity
nT	Physical quantity	SI unit nano-Tesla of magnetic flux density
OFCOM	Organisation	The Office of Communications, the UK radio spectrum regulator
Ohm	Physical quantity	SI unit Ohm of electrical resistance
OS	Organisation	Ordnance Survey of Great Britain
OSGB36	Data	The OS national grid (Great Britain)
OSTN15	Technology	Current coordinate transformation from ETRS89 to OSGB36 co-ordinates
RDP	Physical quantity	Relative Dielectric Permittivity, unitless
RTK	Technology	Real Time Kinematic (correction of GNSS position from a base station)
s	Physical quantity	SI unit seconds of time
TMI	Physical quantity	Total magnetic intensity (measured flux density minus regional flux density)
TRM	Process	Thermo-Remanent Magnetisation
V	Physical quantity	SI unit Volt of electric potential
WGS84	Data	World Geodetic System (defined 1984)

4.6 Selected reference

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4.7 Archiving and dissemination

An archive is maintained for all projects, access to which is permitted for research purposes. Copyright and intellectual property rights are retained by TigerGeo on all material it has produced, the client having full licence to use such material as benefits their project. Where required, digital data and a copy of the report can be archived in a suitable repository, e.g. the Archaeology Data Service, in addition to our own archive.

The archive contains all survey and project data, communications, field notes, reports and other related material including copies of third party data (e.g. CAD mapping, etc.) in digital form. Many are in proprietary formats while report components are available in PDF format.

The client will determine the distribution path for reporting, including to the end client, other contractors, local authority etc., and will determine the timetable for upload of the project report to the OASIS Grey Literature library or supply of report or data to other archiving services, taking into account end client confidentiality.

TigerGeo reserves the right to display data rendered anonymous and un-locatable on its website and in other marketing or research publications.

5 Supporting information

5.1 Standards and quality (archaeology)

TigerGeo is developing an Integrated Management System (IMS) towards ISO certification for ISO9001, ISO14001 and OHSAS18001/ISO45001 and has appointed Alan Ward of Bigfoot Services Limited as our ISO/HSE Technical Advisor. For work within the archaeological sector TigerGeo has been awarded CIfA (Chartered Institute for Archaeologists) Registered Organisation status.

A high standard of client-centred professionalism is maintained in accordance with the requirements of relevant professional bodies including the Geological Society of London (GeoSoc) and the Chartered Institute for Archaeologists (CIfA). Senior members of TigerGeo are professional members of the GeoSoc (FGS), CIfA (MCIfA & ACIfA grades) and other appropriate bodies, including the European Association of Geoscientists and Engineers (EAGE) Near Surface Division (MEAGE) and the Institute of Professional Soil Scientists (MISoilSci).

In addition TigerGeo is a member of EuroGPR and all ground penetrating and other radar work is in accordance with ETSI EG 202 730.

The management team at TigerGeo have over 30 years of combined experience of near surface geophysical project design, survey, interpretation and reporting, based across a wide range of shallow geological contexts. Added to this is the considerable experience of our lead geophysicists in a variety of commercial and academic roles. All geophysical staff have graduate and in many cases also post-graduate relevant qualifications pertaining to environmental geophysics from recognised centres of academic excellence.

During fieldwork there is always a fully qualified (to graduate or post-graduate level) supervisory geophysicist leading a team of other geophysicists and geophysical technicians, all of whom are trained and competent with the equipment they are working with. Data processing and interpretation is carried out by a suitably qualified and experienced geophysicist under the direct supervision and guidance of the Senior Geophysicist. All work is monitored and reviewed throughout by the Senior Geophysicist who will appraise all stages of a project as it progresses.

Data processing and interpretation adheres to the scientific principles of objectiveness and logical consistency. A standard set of approved external sources of information, e.g. from the British Geological Survey, the Ordnance Survey and similar sources of data, in addition to previous TigerGeo projects, guide the interpretive process. Due attention is paid to the technical constraints of method, resolution, contrast and other geophysical factors.

There is a strong culture of internal peer-review within TigerGeo, for example, all reports pass through a process of authorship, technical review and finally proof-reading before release to the client. Technical queries resulting from TigerGeo's work are reviewed by the Senior Geophysicist to ensure uniformity of response prior to implementing any edits, etc.

Work is 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.

All work for archaeological projects is also conducted in accordance with the following standards and guidance:

- David et al, "Geophysical Survey in Archaeological Field Evaluation", English Heritage, 2008;
- "Standard and guidance for Archaeological Geophysical survey", Chartered Institute for Archaeologists, 2014 (Updated 2016);

and TigerGeo meets with ease the requirements of English Heritage in their 2008 Guidance "Geophysical Survey in Archaeological Field Evaluation" section 2.8 entitled "Competence of survey personnel".

5.2 Key personnel

Martin Roseveare, MSc BSc(Hons) MEAGE FGS MCIfA	Senior Geophysicist, Director
<p>Martin specialised (MSc) in geophysical prospection for shallow applications and since 1997 has worked in commercial geophysics. Elected a GeoSoc Fellow in 2009 he is now working towards achieving CSci. A member of the European Association of Geoscientists & Engineers, he has served on the EuroGPR and CifA GeoSIG committees and on the scientific committees of the 10th and 11th Archaeological Prospection conferences. He has reviewed papers for the EAGE Near Surface conference, was a technical reviewer of the Irish NRA geophysical guidance and is a founding member of the ISSGAP soils group. Professional interests include the application of geophysics to agriculture and the environment, e.g. groundwater and geohazards. He is also a software writer and equipment integrator with significant experience of embedded systems.</p>	
Anne Roseveare, BEng(Hons) DIS MISoSci	Operations Manager, Environmental Geophysicist - Data Analyst
<p>On looking beyond engineering, Anne turned her attention to environmental monitoring and geophysics. She is a Member of the British Society of Soil Science (BSSS) and has specific areas of interest in soil physics & hydrology, agricultural applications and industrial sites. Amongst other contributions to the archaeological geophysics sector over the last 18 years, Anne was the founding Editor of the International Society for Archaeological Prospection (ISAP) and is a founding member of the ISSGAP soils group. Specifications, logistics, safety, data handling & analysis are integral parts of her work, though she is happily distracted by the possibilities of discovering lost cities, hillwalking and good food.</p>	
Daniel Lewis, MA BA(Hons) ACIfA	Consultant Archaeologist
<p>Daniel studied archaeology at the University of Nottingham and worked in field archaeology for many years, managing urban and rural fieldwork projects in and around Herefordshire. When the desk became more appealing he jumped into the world of consulting, working on small and large multi-discipline projects throughout England and Wales. At the same time, he returned to University, gaining an MA in Historic Environment Conservation. With over 15 years' experience in the heritage sector, Daniel has a diverse portfolio of skills. Here he ensures that geophysical work within the heritage sector is well grounded in the archaeology. His spare time includes much running up mountains</p>	
Luigi Benente, MSc	Consultant Environmental Geophysicist
<p>Luigi is an experienced geologist specialized in geophysics, who gained a blend of practical and technical experience within explorations carried out in Italy, Peru, Colombia, Ecuador, Mexico, Uzbekistan, Thailand and Nigeria. Resourceful and hardworking with a positive attitude in problem solving, he has the ability to lead a team through challenging tasks, organizing people and equipment in order to hit the goal in safety and with time conscious professionalism. He is attracted to discover hidden things within the earth and after celebrating with friends, good wine, good beer and lots of food he is able to repair most broken things...</p>	
Kathryn Cunningham, BSc(Hons) FGS	Environmental Geophysicist
<p>Kathryn has been with TigerGeo since its inception and has undertaken over 100 surveys comprising total field magnetometry, twin probe resistivity, electrical resistance tomography, ground penetrating radar and laser-scanning. In addition she has increasing responsibilities in data processing and interpretation. She graduated with a BSc (Hons) in Applied Geology in 2015 from the University of Plymouth, is a Fellow of the Geological Society and enjoys acrobatics and sunny days.</p>	
Jennifer Smith, MSc	Environmental Geophysicist
<p>Jen developed an interest in all aspects of topographical and geophysical survey whilst studying for a MSc in Archaeological Science at the University of Bristol. During her studies she obtained valuable experience in the use of and data analysis for various terrestrial geophysical techniques as well as develop her interest</p>	

further by adding marine geophysical techniques to her working theoretical knowledge. She has worked as a near-surface geophysicist within archaeology for several years and has developed a good knowledge of UK geology. Outside of work, Jen is currently learning Java code but is easily distracted by keeping fit, exploring the world or some other hobby.

Alexandra Gereca, MSc, BSc, PhD Candidate

Geophysical Processor & Analyst

Alexandra has a BSc in Geophysics and an MSc in Applied Geo-biology and started a PhD in the UK after living in Portugal for six months working on her master's degree. Since 2008 she has used most mainstream processing applications across electrical, magnetic and radar methods. She combines a love of nature and science and is currently studying plant roots in agricultural environments using geophysical methods. When not doing that she enjoys travelling, hiking, nature, yoga, books, foreign languages and cats. Two years ago she found a passion for electronics and started building different devices including intelligent gardening systems and coding in Python.

Laura Gilling, MSc

Environmental Geophysicist

Laura studied Geophysics at the University of Southampton. From there she went on to travel the world embracing her love of nature and the outdoors. Intrigued by the variety of uses geophysics can have she has since used many geophysical techniques completing surveys for both archaeological and engineering purposes. She has a keen interest in renewable energy and environment. In her spare time she loves to head back to the Dorset coastline for a spot of hiking and photography.

6 Appendices

6.1 Appendix 1 – OASIS summary page

OASIS DATA COLLECTION FORM: England

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Printable version

OASIS ID: tigergeo1-313948

Project details

Project name	Land off Howlett Lane, Trimley St Martin, Suffolk
Short description of the project	A magnetic survey was commissioned by Andrew Josephs Associates to prospect land off Howlett Lane, Trimley St Martin for buried structures of archaeological interest. Survey was undertaken using a GNSS-tracked non-gradiometric array of caesium vapour magnetometers on a non-magnetic platform. Survey was undertaken across two visits to accommodate harvest of an Oil Seed Rape crop that occupied much of the area and this version of the report replaces an earlier one for just the area initially accessible. Within the data there is evidence for a medieval landscape east of the settlement, including a former course of Church Lane. Earlier periods are represented by a sole ring ditch that in the absence of obvious settlement-related features perhaps had a funerary purpose.
Project dates	Start: 13-12-2017 End: 25-09-2018
Previous/future work	Not known / Not known
Any associated project reference codes	HAD TYN151 - HER event no.
Any associated project reference codes	tigergeo1-313948 - OASIS form ID
Type of project	Field evaluation
Site status	None
Current Land use	Cultivated Land 4 - Character Undetermined
Monument type	NONE Uncertain
Monument type	NONE Uncertain
Significant Finds	NONE None
Significant Finds	NONE None
Methods & techniques	""Geophysical Survey""
Development type	Not recorded
Prompt	National Planning Policy Framework - NPPF
Position in the planning process	Pre-application
Solid geology (other)	Red Crag Formation - Sand
Drift geology (other)	Kesgrave Catchment Subgroup - Sand And Gravel (most of area)Kesgrave Catchment Subgroup - Sand And Gravel
Techniques	Magnetometry

Project location

Country	England
Site location	SUFFOLK SUFFOLK COASTAL TRIMLEY ST MARTIN Land off Howlett Lane, Trimley St Martin, Suffolk
Postcode	IP11 0YA
Study area	10.64 Hectares
Site coordinates	TM 627740 237350 51.849538697035 1.815987740439 51 50 58 N 001 48 57 E Point

Project creators

Name of Organisation	TigerGeo Ltd
Project brief originator	Consultant
Project design originator	TigerGeo Ltd
Project director/manager	MJ Roseveare
Project supervisor	A Roseveare
Type of sponsor/funding body	Developer

Project archives

Physical Archive Exists?	No
Digital Archive recipient	TigerGeo Ltd
Digital Contents	"none"
Digital Media available	"GIS","Geophysics","Text"
Paper Archive Exists?	No

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Land off Howlett Lane, Trimley St Martin, Suffolk
Author(s)/Editor(s)	Roseveare, M, Gilling, L
Date	2018
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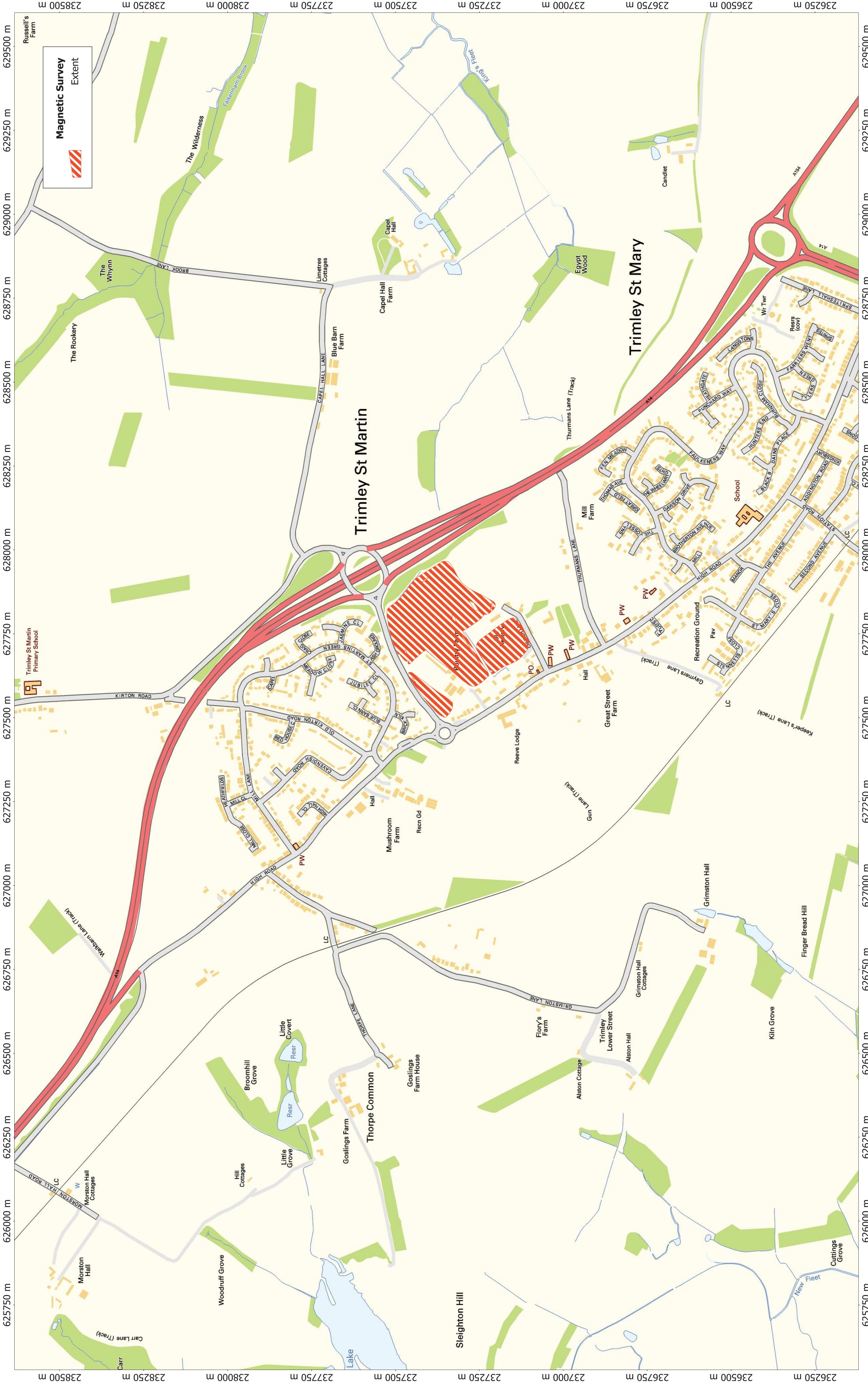
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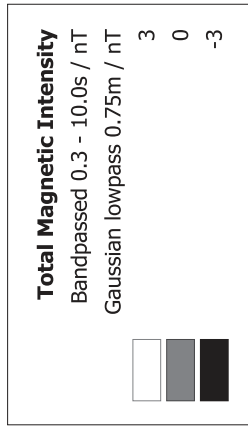


TSM171 Land off Howlett Lane, Trimley St Martin, Suffolk
DWG 01 Site Location

Orthographic Scale: 1:10000 @ A3 Spatial Units: Meter. Do not scale off this drawing
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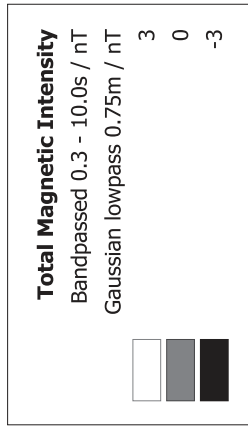
**TSM171 Land off Howlett Lane, Trimley St Martin, Suffolk
DWG 02a Magnetic Data - Total Magnetic Intensity - North**

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TSM171 Land off Howlett Lane, Trimley St Martin, Suffolk
 DWG 02b Magnetic Data - Total Magnetic Intensity - South

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237090 m 237120 m 237150 m 237180 m 237210 m 237240 m 237270 m 237300 m 237330 m 237360 m 237390 m 237420 m

627490 m 627520 m 627550 m 627580 m 627610 m 627640 m 627670 m 627700 m 627730 m 627760 m 627790 m 627820 m 627850 m 627880 m 627910 m 627940 m

627490 m 627520 m 627550 m 627580 m 627610 m 627640 m 627670 m 627700 m 627730 m 627760 m 627790 m 627820 m 627850 m 627880 m 627910 m 627940 m



627500 m 627525 m 627550 m 627575 m 627600 m 627625 m 627650 m 627675 m 627700 m 627725 m 627750 m 627775 m 627800 m 627825 m 627850 m 627875 m 627900 m 627925 m 627950 m

1m Vertical Pseudogradient
 Bandpassed 0.3 - 10.0s / nT
 Gaussian lowpass 0.75m / nT
 Pseudogradient conversion / nT/m

2
0
-2

TSM171 Land off Howlett Lane, Trimley St Martin, Suffolk
DWG 03a Magnetic Data - 1m Vertical Pseudogradient - North

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1m Vertical Pseudogradient
 Bandpassed 0.3 - 10.0s / nT
 Gaussian lowpass 0.75m / nT
 Pseudogradient conversion / nT/m

2
0
-2

TSM171 Land off Howlett Lane, Trimley St Martin, Suffolk
DWG 03b Magnetic Data - 1m Vertical Pseudogradient - South

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