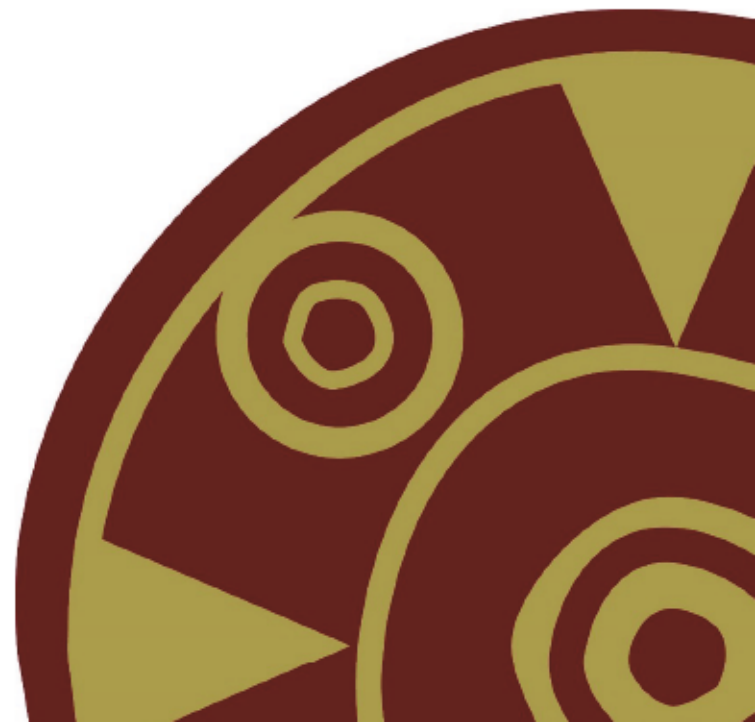


Abbey Farm, Earth Resistance Meter Survey Hoxne, Suffolk

Client:
Mr Wilf White

Date:
April 2017

HXN 004
Geophysical Survey Report
SACIC Report No. 2017/039
Author: Timothy Schofield HND BSc MCifA
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HER Information

Site Code: HXN 004
Event Number: ESF 25523
Site Name: Abbey Farm, Hoxne, Suffolk
Report Number 2017/039
Date of Fieldwork: April 11th to 13th 2017
Grid Reference: TM 7640 1830
Oasis Reference: suffolka1-283424
Project Officer: Timothy Schofield
Client/Funding Body: Mr Wilf White

Digital report submitted to Archaeological Data Service:
<http://ads.ahds.ac.uk/catalogue/library/greylit>

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Date: April 2017

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Date: April 2017

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Contents

Summary

1. Introduction	1
2. Geology and topography	1
3. Archaeology and historical background	3
3.1. Introduction	3
3.2. The medieval Priory	4
3.3. The post-medieval Abbey Farm	6
3.3.1. The farmhouse	6
3.3.2. The farm complex	6
3.4. Historic mapping	8
3.4.1. Estate map by Thomas Skynner	8
3.4.2. Hoxne Tithe map, 1843	9
3.4.3. Ordnance Surveys	10
3.5. Conclusion	12
4. Methodology	13
4.1. Aims	13
4.2. Objectives	13
4.3. Instrumentation	13
4.4. Instrument calibration and settings	13
4.1. Conditions	13
4.2. Reconnaissance Survey	13
4.3. Detailed Survey	14
4.4. Survey grid layout	14
4.5. Data capture	14
4.6. Data software, processing and presentation	14
4.7. Survey grid restoration	15
5. Results and discussion	16
6. Conclusion	22
7. Archive deposition	22
8. Acknowledgements	23
9. Bibliography	24

List of Appendices

Appendix 1.	Metadata Sheets	
Appendix 2.	Technical Data	
Appendix 3.	OASIS Form	

List of Figures

Figure 1.	Site location plan	2
Figure 2.	Extract from Skynner's estate map of 1757 depicting Abbey Farm. North is to bottom left	8
Figure 3.	Extract from Hoxne Tithe map of 1843 depicting Abbey Farm. North is to top left	10
Figure 4.	Extract from First Edition Ordnance Survey, 1885	11
Figure 5.	Extract from First Edition Ordnance Survey, 1904	11
Figure 6.	Site, survey grid and survey stations	25
Figure 7a.	Abbey Farm, raw earth resistance meter greyscale plot	27
Figure 7b.	Abbey Farm, processed earth resistance meter greyscale plot	28
Figure 7c.	Abbey Farm, processed earth resistance meter xy trace plot	29
Figure 7d.	Abbey Farm, interpretation plot of earth resistance anomalies	30
Figure 8a.	Moatfield, raw earth resistance meter greyscale plot	31
Figure 8b.	Moatfield, processed earth resistance meter greyscale plot	32
Figure 8c.	Moatfield, processed earth resistance meter xy trace plot	33
Figure 8d.	Moatfield, interpretation plot of earth resistance meter anomalies	34
Figure 9a.	Abbey Farm, detailed earth resistance meter survey, raw greyscale plot	35
Figure 9b.	Abbey Farm, detailed earth resistance meter survey, processed greyscale plot	36
Figure 9c.	Abbey Farm, detailed earth resistance meter survey, processed xy trace plot	37
Figure 9d.	Abbey Farm, detailed earth resistance meter survey, anomaly interpretation plot	38
Figure 10a.	Combined surveys, processed earth resistance meter greyscale plots, showing detailed earth resistance meter insert	39
Figure 10b.	Combined surveys, interpretation plot of earth resistance meter anomalies, showing detailed earth resistance meter insert	40

List of Plates

Plate 1.	View of Abbey Farm, facing east	4
Plate 2.	Surveying grid square 15 and 16, facing north towards the 16th century east wing of Abbey Farm	7
Plate 3.	Surveying grid square 05, facing east towards the 18th century wing of Abbey Farm	7
Plate 4.	Surveying grid squares 03 and 15 within the kitchen gardens, facing northeast	12
Plate 6.	Interior of the curtilage wall, facing south-west, at point where medieval flintwork terminates	17
Plate 7.	Exterior of the curtilage wall, facing east, at point where medieval flintwork terminates	17
Plate 8.	Surveying grid square 20, facing west towards Abbey Farm	19
Plate 9.	Surveying grid squares 24 and 25, facing north towards Moatfield	20

Summary

In March 2017 Suffolk Archaeology Community Interest Company (SACIC) undertook reconnaissance earth resistance meter survey followed by detailed earth resistance meter survey in the gardens of Abbey Farm and Moatfield, Hoxne, Suffolk, which both lie within the former boundary of the Benedictine Hoxne Priory, a Scheduled Monument.

The geophysical surveys successfully recorded the location of anomalies indicative of building structures related to the Priory and former wings of the 16th century farmhouse, as well as pits and ditches of possible archaeological derivation.



Plate 1. View of Abbey Farm, facing east

1. Introduction

In April 2017, a reconnaissance and detailed earth resistance meter survey covering c. 0.54 hectares of land was undertaken within the grounds of Abbey Farm, Hoxne, Suffolk (Fig. 1), and included a small additional area in the adjacent property, Moatfield. The fieldwork was carried out over three days by Suffolk Archaeology Community Interest Company (SACIC).

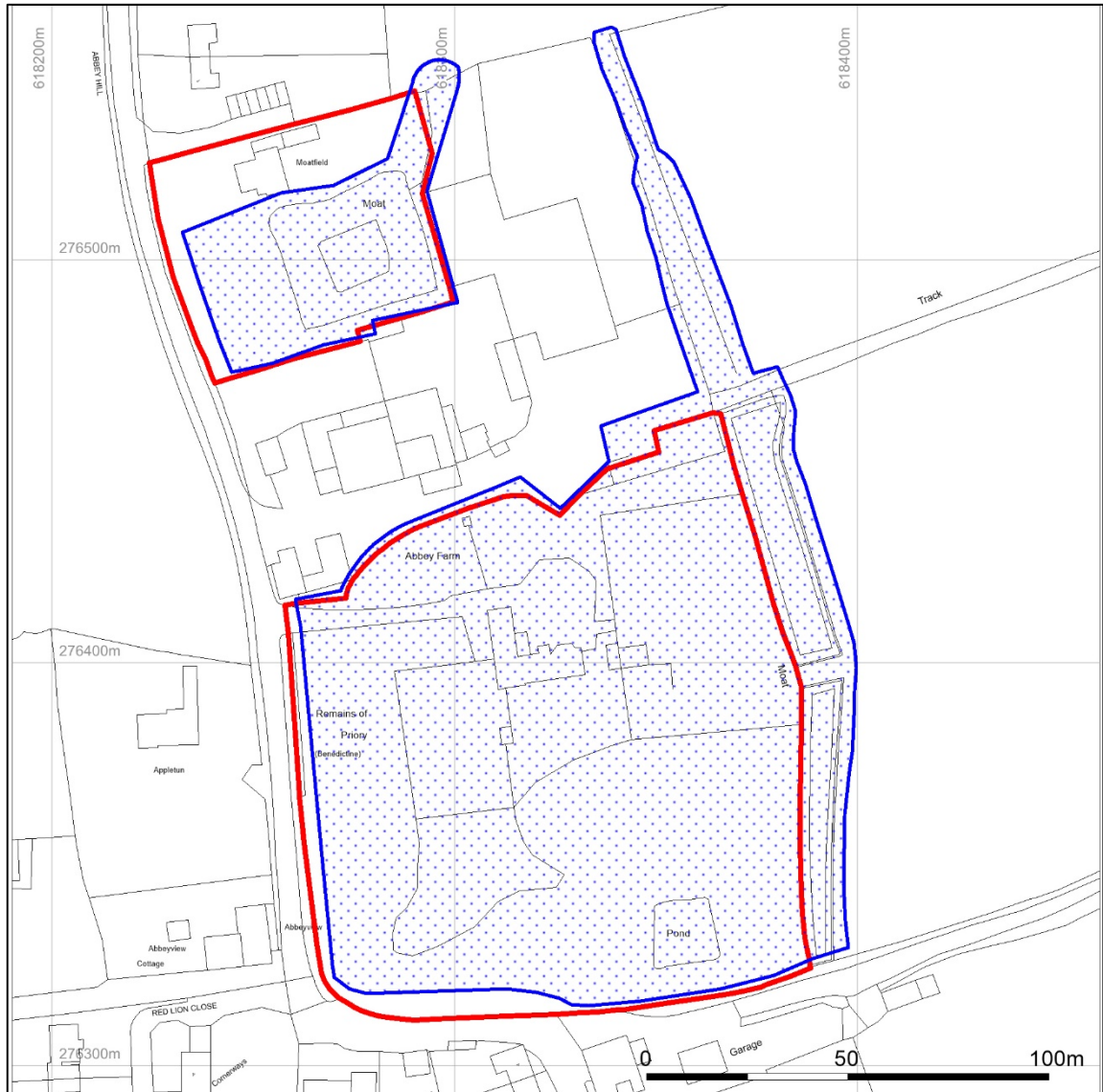
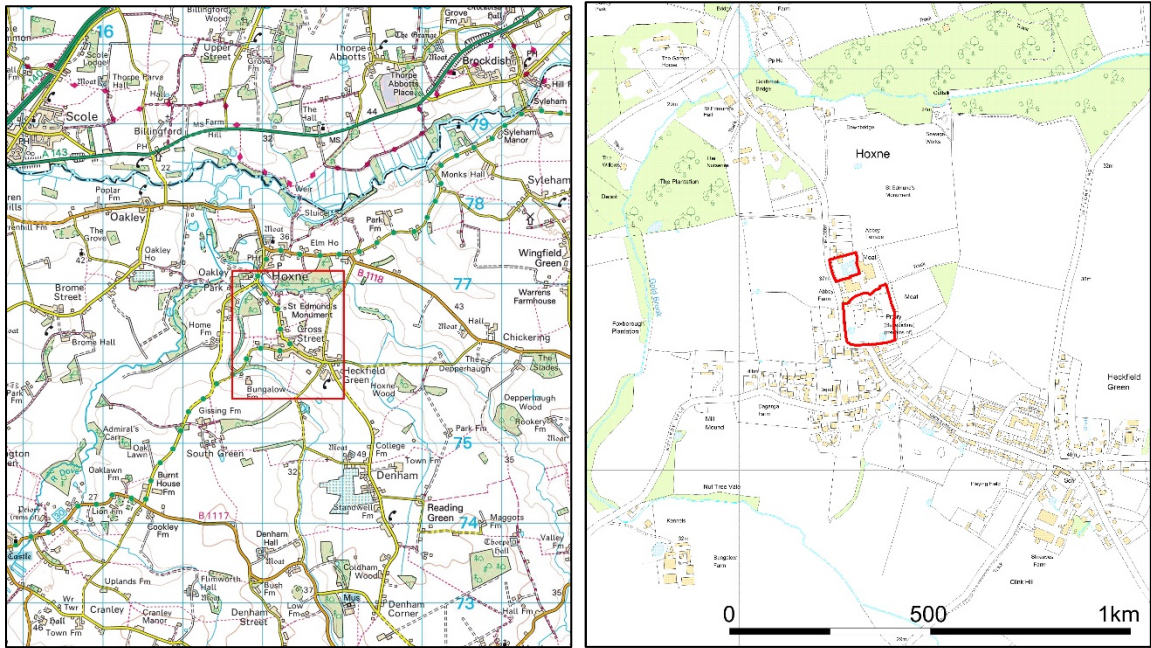
Abbey Farm and Moatfield together occupy the former site of Hoxne Priory, a monument recorded on the Suffolk Historic Environment (HER No. HXN 004) and designated in part as a Scheduled Monument (National Heritage List for England No. 1020447). SACIC were commissioned to undertake the work by the owner of Abbey Farm, Mr Wilf White, as part of his personal research into the history of the property.

The aims of the geophysical survey, which covered as much of the accessible areas of the gardens and lawns of the two properties as possible within the time available, were to define, delimit and record the location of any potential structural remains associated with the medieval priory and later farmhouse as well as any other surviving anomalies of potential archaeological derivation.

2. Geology and topography

Abbey Farm lies at the northern end of a plateau of high ground, c.40m above Ordnance Datum (AOD), which extends southeast through Cross Street to Heckfield Green. To the north the natural topography descends towards the confluence of the Goldbrook and Chickering Beck, and the settlement core of Low Street. Within the survey area, which was centred on NGR TM 7640 1830, the prevailing topography was seen to slope down from 42m AOD in the south, to 37m AOD in the north.

Bedrock geology is described as Norwich Crag Formation Sand, deposited 0 to 5 million years ago in the Quaternary and Neogene Periods in shallow seas as mud, silt, sand and gravel. Superficial deposits are described as Lowestoft Formation Diamicton, deposited below glaciers as moraines of till with outwash sand and gravel from seasonal and post glacial meltwaters up to 2 million years ago in the Quaternary Period (BGS, 2017).



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Figure 1. Site location plan
(Site boundaries depicted in red, Scheduled Monument Areas in blue)

3. Archaeology and historical background

John Craven

3.1. Introduction

Abbey Farm is situated immediately to the north of Cross Street, one of three principal cores of historic settlement within the parish, the others being Low Street and Heckfield Green, and occupies the former site of a Benedictine Priory which was established in the 12th/13th century.

The current farmhouse and its gardens form a rectangular enclosure of c.1.5ha, bordered by Abbey Hill to the west and south where it is bounded by a curtilage wall, an associated complex of largely 19th century farm buildings to the north and a series of linear ponds to the east. The farmhouse and gardens, ponds, farm complex and the 0.36ha property of Moatfield to the north, together occupy the western half of the former Priory grounds which is believed to have contained the various buildings of the monastic complex. Historic mapping suggests that the wider precinct likely extended east to incorporate paddocks or fields to form a larger, broadly square, site of c.5.5ha (see section 3.4 below).

The western half of the Priory site is, for the most part, a Scheduled Monument although it is divided into two separate areas. The larger southern area covers the entirety of the Abbey Farm gardens, the smaller second one to the north, much of the property of Moatfield. The two areas are separated by the complex of post-medieval farm buildings that, although within the Priory precinct, have been omitted from the designated Scheduled area.

Apart from two small monitoring projects during groundworks for development of the farm complex buildings (Everett, 2000 and Tester 1999) and a historic building survey of the farm complex and exterior of the farmhouse by Leigh Alston (2010), there has been no previous physical investigation of the Priory site, other than a single Test Pit in the gardens of Moatfield (Craven 2010). The following summary of the site history is largely derived from the relevant descriptions of Scheduled Monuments and Listed Buildings in the NHLE and the Suffolk HER entry, the reports by Alston and Craven, and a published article on Hoxne and the Cult of St Edmund by Margaret Carey Evans (Carey Evans 1987).

3.2. The medieval Priory

Hoxne was an important parish for the early Christian church in the Late Anglo-Saxon and early medieval periods, by the later Anglo-Saxon period being established as a Bishopric. The parish also has a long association with the legend of the martyrdom of St Edmund in 870 AD and the Priory was centred on a Chapel of St Edmund which may have had pre-conquest origins before being restored and rebuilt in the early 12th century. A second, later chapel to St Edmund, first recorded in 1326 (Carey Evans 1987, 187), is now thought to relate to an excavated example to the south of Cross Street near Bungalow Farm (HER No. HXN 017).

The documentary research by Carey Evans indicates that Hoxne Priory was founded by a charter in 1130, which gave ownership of the restored Chapel and its land to Norwich Cathedral Priory, with monks taking residence in the early 13th century and rebuilding and enlargement continuing into the 15th century.

The description of the Scheduled Monument in the NHLE states that *'Hoxne Priory was a small house of six or seven monks under a prior or warden who was appointed by the prior of Norwich. Shortly before the Dissolution of the Monasteries the last prior, William Castleton, conveyed the property of the cell to Sir Richard Gresham and the monks were recalled to Norwich.... Details of the priory buildings and precinct are recorded in account rolls of Norwich Priory dating chiefly from the 14th and 15th centuries. In addition to the chapel the buildings comprised a hall subdivided by a parclose (screen) where the monks would have taken their communal meals, a parlour, a dormitory with a chamber over it, and offices including a kitchen, bakehouse, dairy and brewery. In the surrounding precinct were a malthouse, dovecote and stables, closes for threshing and winnowing, fishponds, a garden in the southern part, and a cemetery enclosed by a wall. There was also a cistern, presumably to collect water for domestic use, and a well known as St Edmund's Well.'*

The position and layout of this priory complex is uncertain although the principal monastic buildings were probably located in the vicinity of Abbey Farm. Alston comments that with *'reported parch marks in the lawn to the south and south-east ... interpreted as evidence of the medieval monastic complex... the house may occupy the site of the prior's lodging in the north-western corner of a northern cloister. Given the reference to a southern*

garden in the 14th century, however, it may have formed part of the southern range of a cloister with the chapel on the site of the farm buildings to the north.'

Of the medieval buildings the only structure that still visibly survives is a length of flint wall incorporated into the Grade II listed curtilage wall (NHLE No. 1374922), which extends south for 90m from the modern driveway before cornering and running for 60m to the east along the southern edge of the former precinct. The majority of the curtilage wall is constructed of red brick and is 18th/19th century in date but the northern c.40m of the wall, ending at the driveway, is constructed of medieval flint rubble, with some coursed work and later brick repair, to a height of c.3m. This medieval walling, which is noted as containing two blocked windows or doors, is believed to be the surviving western wall of a building depicted on a pictorial map of 1757 (see section 3.4 below) that was demolished by the mid-19th century.

Other surviving elements at Abbey Farm which can be related to the medieval description of the Priory include the partially extant series of three linear fishponds running south to north along the eastern boundary of the Abbey Farm gardens and a further two ponds, one currently dry, which lie in the southern gardens and are interpreted by the NHLE as *'probably being constructed originally to supply and store water for domestic and agricultural use within the monastic precinct.'* A well, now within a post-medieval well house 20m to the north of the farmhouse, is also mentioned as possibly being the *'St Edmund's Well.'*

19th and early 20th century mapping (see section 3.4 below) shows the central eastern fishpond as 'L' shaped, with an arm extending to the west. It is possible that this arm may have once carried through to Abbey Hill, creating a smaller square enclosure in the south-west corner of the overall precinct which would likely have contained the main buildings of the monastic complex and is now more or less represented by the Abbey Farm gardens. This suggestion is supported by the results of two previous archaeological monitoring's in 1999 and 2000 (Tester and Everett respectively) during building extensions to the building sited north of the farmhouse driveway. The first report tentatively identified a possible ditch aligned north to south, parallel to Abbey Hill, while the second saw a substantial ditch aligned east to west which would broadly align to the fishponds western extension.

Moatfield, a modern property to the north of Abbey Farm and the current farm complex, occupies the north-west corner of the Priory precinct and contains the square medieval moat/fishpond, noted by Alston (2010, p2) as being *'unusually small but exceptionally well preserved.'* The central island likely contained the Priory dovecote. The moat was probably connected to the wider complex of fishponds to the east by a leat from its north-east corner, the last element of which was infilled in the mid/late 1980's (John Craven *pers. comm.*). The second designated area of the Scheduled Monument includes the moat and the western area of Moatfield's garden, which forms the Abbey Hill frontage, but excludes the substantial roadside ditch and the rear garden to the north. A Test Pit excavated in this non-designated area as part of the community Story of Hoxne project (HXN 069, Craven 2013) recovered sherds of 12th-14th and 15th/16th century pottery from a preserved buried soil layer but it was suggested that this part of the precinct was a peripheral area, separated by the moat from the main building complex.

3.3. The post-medieval Abbey Farm

3.3.1. The farmhouse

Abbey Farm itself is a Grade II* Listed Building (NHLE No. 1032502) with the east wing being described in the listing as the surviving part of a large house of c.1540, said to be for Sir Richard Gresham who acquired the Priory site after the Dissolution, and an early 17th century cross-wing on the west side which extends north to form an L-shape plan. The farmhouse has more recently been described by Alston (2010) as *'a fine timber-framed structure of the late-16th century...entirely inconsistent with a date of circa 1540 and was probably built by its next owners (possibly the Thruston family) in the final quarter of the 16th century.'*

Alston states that *'the orientation of the Elizabethan house is ambiguous, with a jettied facade to the south but evidence of ostentatious two-storied porches to both north and south'* and that the *'original parlour bay or cross-wing to the east has been demolished.'* Alston then dates the brick service wing extending to the north as being 18th century in date.

3.3.2. The farm complex

Alston's survey of the adjacent mid-19th century farm complex identified the barn

between the two site entrances from Abbey Hill (to farmhouse and the farm buildings) as being the surviving element of a larger building with ‘a substantial timber frame of late-medieval or 16th century appearance.’ Of particular interest was a structure identified as a rare example of a ‘sophisticated Elizabethan stable with two hay lofts.’



Plate 2. Surveying grid square 15 and 16, facing north towards the 16th century east wing of Abbey Farm



Plate 3. Surveying grid square 05, facing east towards the 18th century wing of Abbey Farm

3.4. Historic mapping

3.4.1. Estate map by Thomas Skynner

The earliest readily available map depicting the site of Abbey Farm (Fig. 2) dates to 1757. Drawn by Thomas Skynner it shows the estates of Lord Maynard in Hoxne, Chickering, Denham, Eye and Wetheringsett.

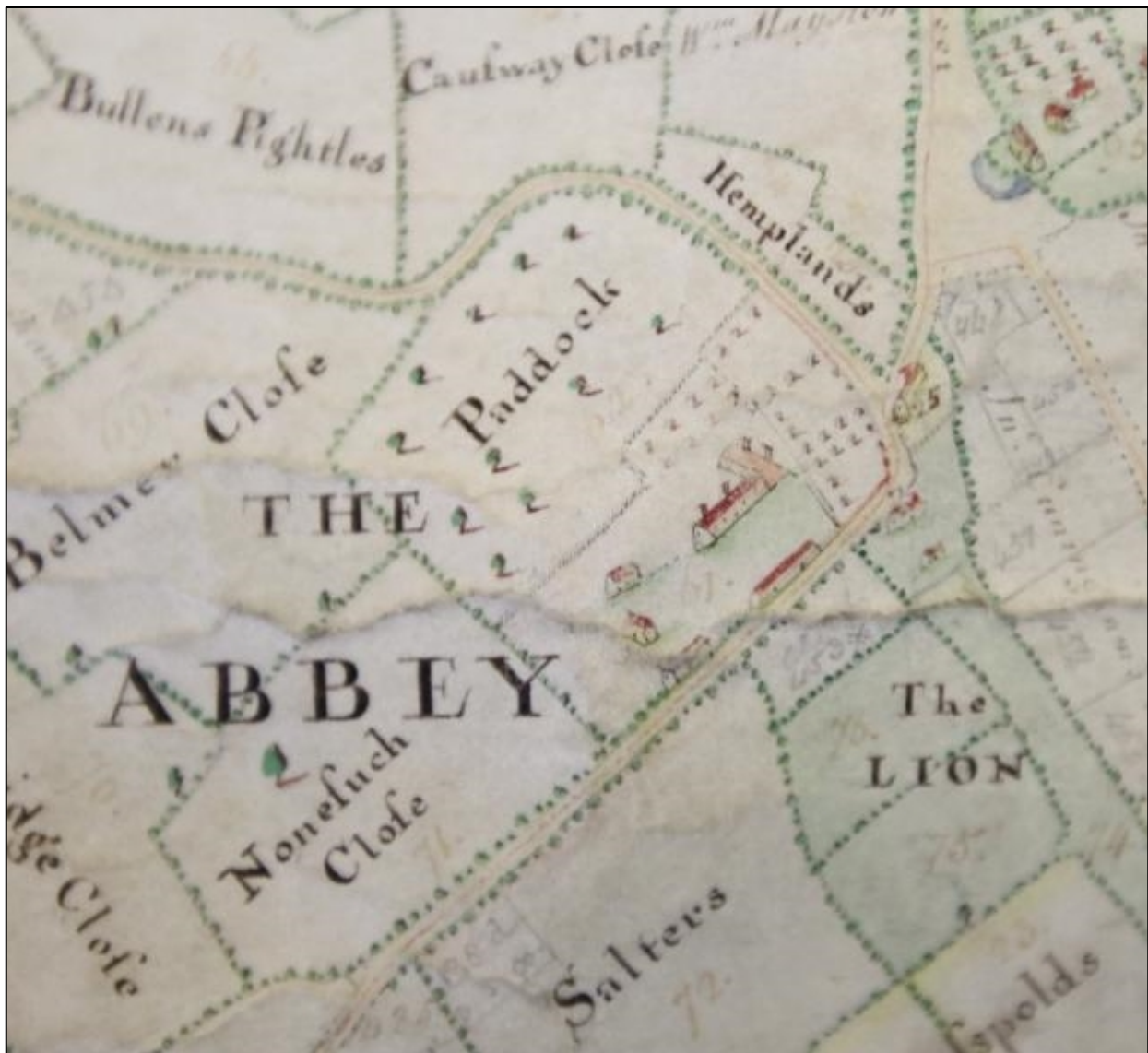


Figure 2. Extract from Skynner's estate map of 1757 depicting Abbey Farm. North is to bottom left

It is suggested that this map probably shows the full extent of the former Priory precinct, with the area labelled as paddock appearing to neatly form the eastern half of a wider square enclosure, bounded to south and east by a road which now survives only as a trackway and field boundaries. The area to the south of the farmhouse is shown as gardens or orchards but neither the two ponds, the linear fishponds to the east, or the

northern moat are shown.

Abbey Farm is broadly depicted as it appears now, although Alston notes that the *'rear (western) wing of the farmhouse appears much longer than today and lacks its integral gable chimney, suggesting it may represent a medieval predecessor of the existing structure'*.

To west and north of the farmhouse are four detached buildings, which Alston suggests may be reflecting the site's medieval monastic service courtyard or cloister with at least three of these structures relating to the surviving structures dating to the 16th century or earlier. Depicted on the western boundary is the presumably medieval building which now survives as the flintwork sections of the curtilage wall. Further north on the boundary is a second structure which is presumed to be the partially surviving 16th century barn. Within the site a third structure is presumed to represent the Elizabethan cartlodge.

3.4.2. Hoxne Tithe map, 1843

The tithe map of 1843 (Fig. 3) is broadly similar to the estate map of 1757, showing the large square precinct and 'L' shaped farmhouse. The main difference is that all of the known ponds are now shown and includes an arm extending west from the central linear fishpond which, as discussed above, may once have extended further west in the medieval period. There are several other notable differences however, the first being that the western wing of the farmhouse is shortened and more in keeping with the present structure and perhaps shows the replacement of an earlier (medieval?) wing in the latter part of the 18th century. Some delineation of boundaries within the gardens is shown around the farmhouse for the first time and includes one possible small outbuilding (shown unshaded). Finally the medieval building on the western boundary has now been demolished but the farm complex has developed considerably from the scattered buildings shown in 1757.



Figure 3. Extract from Hoxne Tithe map of 1843 depicting Abbey Farm. North is to top left

3.4.3. Ordnance Surveys

The First and Second Editions of the Ordnance Survey, of 1885 and 1904 respectively (Figs. 4 and 5), show relatively little change from the earlier Tithe map. An access track to the farmhouse, now the modern driveway, is shown from 1885 but boundaries within the farmhouse gardens broadly continue that seen in 1843 with two enclosed areas to south and southwest of the house. By 1904 the eastern of these enclosures is removed leaving only the one to the south-west which survives today as a brick wall enclosed kitchen garden.

Since 1904 the main changes to the site have been continued remodelling of the farm complex, including the insertion of a second road entrance, and the loss of the western extension from the central linear fishpond.

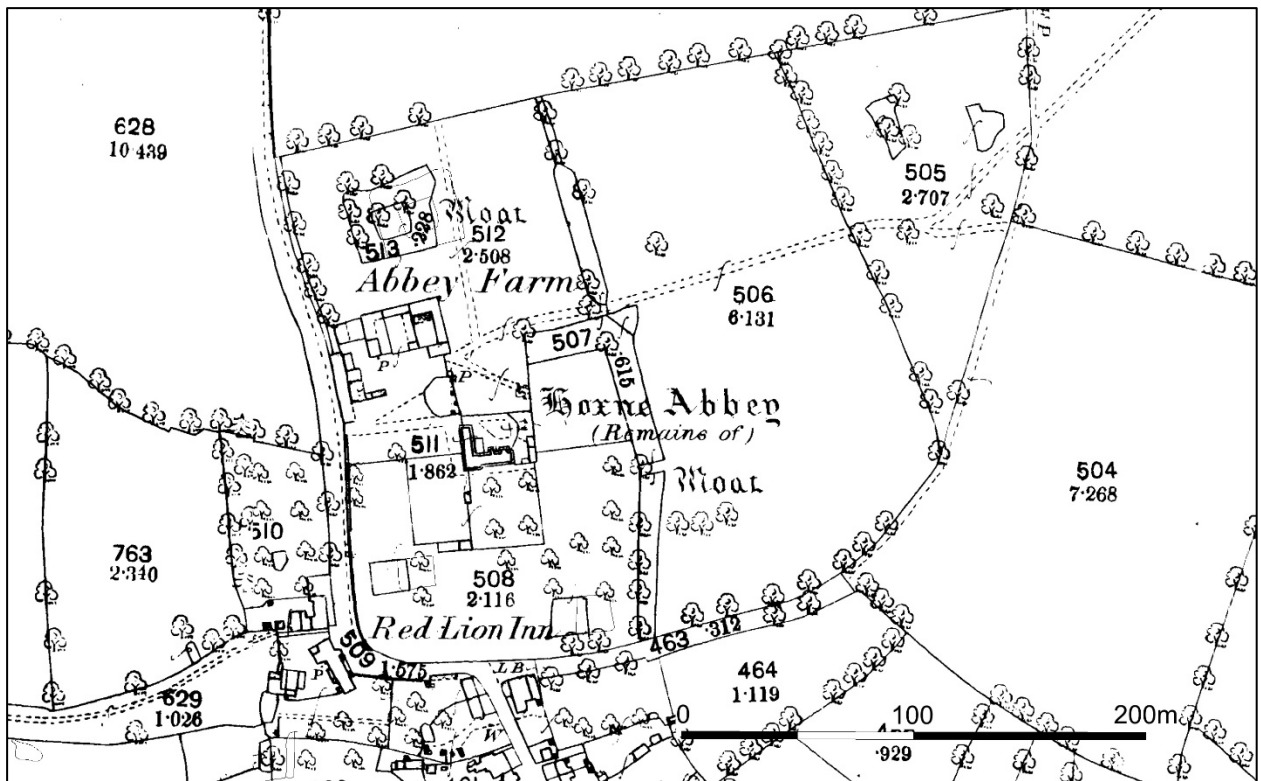


Figure 4. Extract from First Edition Ordnance Survey, 1885

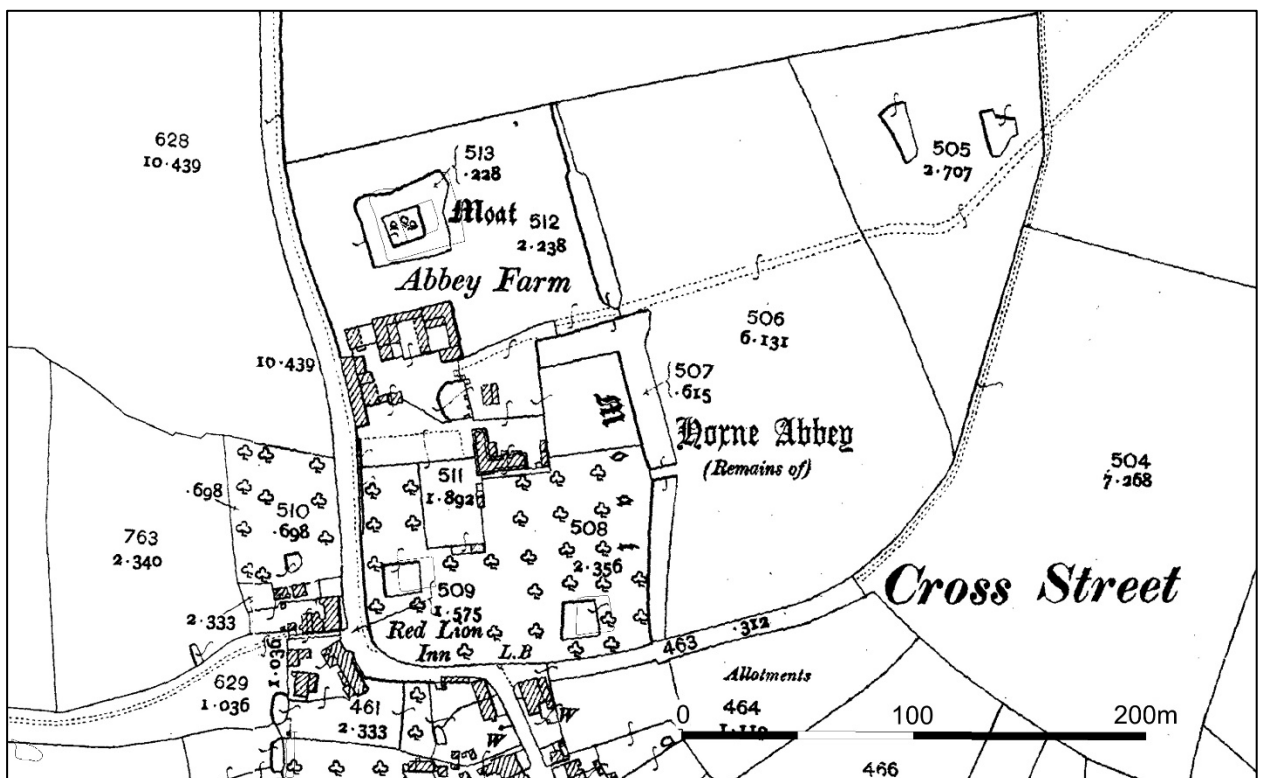


Figure 5. Extract from First Edition Ordnance Survey, 1904

3.5. Conclusion

Although the general size of the Priory precinct is known and has survived as a traceable feature in the modern landscape, and there is substantial survival of the variety of ponds and fishponds which further delineate the interior of the Priory grounds, there is still a general question as to whether the buildings forming the monastic complex are sited under the post-medieval farmhouse or adjacent farm complex and the actual location of any buildings are almost wholly unknown.

This uncertainty is in part due to and compounded by a lack of any previous physical investigation of the site. The opportunity and funding provided by Mr White to carry out an initial geophysical survey of the property was therefore an important chance to begin to address this question and potentially suggest further avenues of investigation.



Plate 4. Surveying grid squares 03 and 15 within the kitchen gardens, facing northeast

4. Methodology

4.1. Aims

The aim of the geophysical survey was to locate anomalies indicative of building structures relating to the former Priory and demolished wings associated with Abbey Farmhouse, and to prospect for any other archaeological remains that may survive beneath the lawns.

4.2. Objectives

It was deemed that the most appropriate technique for this site was an earth resistance meter survey undertaken within a 20m grid. This instrument was best suited to prospect for buried building structures, within a topography containing a high degree of garden furniture. It was decided that a primary reconnaissance survey across the entire area available, followed by detailed survey over anomalies of high archaeological potential would be most apposite.

4.3. Instrumentation

A Geoscan Research RM85 Advanced earth resistance meter in twin parallel mode was employed to undertake the reconnaissance survey, covering an area of c. 0.54 hectares. Detailed earth resistance meter survey also using an RM85 with parallel three probe array was subsequently deployed over an area deemed to have the highest potential for increased anomaly information, on the lawn immediately to the south of the farmhouse.

4.4. Instrument calibration and settings

4.1. Conditions

The weather was warm following a period of precipitation; the soil moisture content was found to be low due to the free draining nature of the underlying geology.

4.2. Reconnaissance Survey

A parallel twin (2 x twin pole-pole) array was chosen to undertake the survey. The sampling interval was set at 1m and the traverse interval also 1m. Gain was set to 10

after a preliminary site scan to keep the readings within instrument range, at a frequency of 122.5Hz, with an output voltage of 45v, the auto-log delay was set to 300ms and the high-pass filter was set to 0hz.

Station readings were equalised when moving the remote probes to allow consistent data matching between the survey grids.

4.3. Detailed Survey

A three twin (3 x twin pole-pole) array was chosen to undertake the detailed survey. The sampling interval was set at 0.5m and the traverse interval also 0.5m. Gain was set to 10, at a frequency of 122.5Hz, with an output voltage of 45v, the auto-log delay was set to 300ms and the high-pass filter was set to 0hz.

4.4. Survey grid layout

A 20m grid was employed (Fig. 6, blue grid), orientated south-southwest to north-northeast and geolocated employing a Leica Viva GS08+ Smart Rover RTK GLONASS/GPS, allowing an accuracy of +/- 0.03m. Data were converted to the horizontal National Grid Transformation OSTN15. Two grids were re-surveyed using the detailed survey method described above (Fig. 6, Grids 26 and 27, cyan font).

4.5. Data capture

Earth resistance meter survey points were recorded on an internal data logger that were downloaded and checked for quality at midday and in the evening, allowing grids to be re-surveyed if necessary. A pro-forma survey sheet was completed to allow data composites to be created. Data were filed in unique project folders and backed-up onto an external storage device and then a remote server in the evening.

4.6. Data software, processing and presentation

High contact resistance was kept to a minimum by retaking readings where they had been taken, despite this safeguard a few high resistance readings were collected where roots and large flint stones were present just below the ground surface, low contact resistance readings were also recorded where voids caused by mole and rabbit activity were

present. Datasets were composited and processed using DW Consulting's Terrasurveyor v.3.0.32.4; the raw grid files will be stored and archived in this format. Minimal processing algorithms were undertaken on the raw (Fig. 7a, 8a and 9a) and processed (Fig. 7b, 8b and 9b) datasets, schedules are presented in Appendix 1.

Data composites were exported as raster images into AutoCAD. An interpretation plan based on the combined interpretations of the raw, processed and xy trace plots has been produced (Figure 7d, 8d and 9d) along with combined larger map scale greyscale and anomaly interpretation figures (10a and 10b).

4.7. Survey grid restoration

Five virtual survey grid stations are recorded on grid nodes along the baselines (Fig. 6); these will allow the position of the grid and geophysical anomalies to be accurately relocated.

5. Results and discussion

5.1. Reconnaissance earth resistance meter survey

Reconnaissance earth resistance meter survey was undertaken within available areas on the gardens of Abbey Farm and Moatfield to identify potential abbey building structures and other surviving archaeological remains. The reconnaissance survey is described by area below, followed by the single area of detailed survey.

Lower amplitude areas of both high and low resistance (magenta and dark green hatching) indicative of geological features were recorded throughout the survey areas, however an archaeological origin cannot be ruled out.

5.2. Abbey Farm

(Figs. 7a – 7d)

High and low resistance anomalies were recorded within the garden areas of Abbey Farm, the most notable of which are indicative of structural remains (Figure 7d). Straddling the driveway in the northwest is a rectangular area of high amplitude resistance (red hatching, numbered 1) likely to be caused by building demolition rubble. An associated area of low resistance (blue hatching) located to the west, is interpreted as abutting moisture-rich material. Four small discrete areas of high resistance (orange hatching) located nearby, could indicate the presence of dried up moisture-poor pits containing compacted material. Two further areas of low resistance (cyan hatching) could reveal pits containing loose moisture-rich backfills, although a geological origin cannot be discounted.

High and low resistance anomalies (red and blue hatching, number 2) were further recorded adjacent to the only surviving extant priory remains within the survey area, the length of medieval flintwork within the curtilage wall, and extend up to the driveway that runs on a perpendicular course. The northeastern corner of the priory building represented by the flint surviving walling, was too overgrown to enable survey work to be undertaken, however recorded 11m to its east, are high and low resistance anomalies (red and cyan hatching) potentially associated with it. The southern wall of the priory building though is apparent as an area of high resistance running east-west and this

location ties-in well with the southern terminus of extant flintwork (Plates 6 - where the anomaly extends to the left broadly along the line between lawn and bare earth – and 7).



Plate 6. Interior of the curtilage wall, facing south-west, at point where medieval flintwork terminates



Plate 7. Exterior of the curtilage wall, facing east, at point where medieval flintwork terminates

Two further discrete high and low resistance anomalies (orange and cyan hatching) are indicative of associated pits. A single linear area of low resistance (cyan hatching,

number 5) orientated north to south is indicative of a ditch type anomaly. This could possibly be another element of an original moated enclosure, connecting to the ditches seen in previous archaeological monitorings, or an infilled feature similar to the extant ditch along the Moatfield road frontage. As this would underlie the priory building it is possible to speculate that it may be part of an earlier enclosure around the preceding Chapel of St Edmund.

The large area of low resistance (grey hatching) in the southwestern corner demarcates the location of the extant backfilled pond, first recorded on the Tithe map of 1843.

High and low resistance anomalies (red and blue hatching, number 3) indicative of buried wall remains and abutting moisture rich material were recorded to the south of the farmhouse. These are potentially the remains of one of the former wings believed to abut the southern side of the building (Alston, 2010) or earlier structures relating to the Priory and presumably the parch marks previously seen on the lawn. Due to the high potential of the anomalies here, this area was further chosen to undertake detailed earth resistance meter survey (see section 5.4 below).

Immediately to the west of number 3, in the walled kitchen garden area, were three areas of relatively low amplitude resistance readings that delineate the location of existing vacant flowerbeds (light green hatching). One discrete area of high resistance (orange hatching) is located where a dump of compacted material was witnessed. Of note within the walled garden are two relatively high amplitude linear anomalies (red hatching) both orientated north to south and abutting the garden wall. It is possible that they record the presence of the garden wall, however they are similarly aligned to the building structures recorded immediately to the east (number 3) and therefore may be associated.

One further area of high amplitude resistance (red hatching, number 4) recorded in the southeast of the dataset is further evidence of former buildings and potentially associated with those recorded to the north (number 3). This anomaly is of particular note as hitherto there has been nothing to suggest that any buildings are sited in the southern gardens. To the west of this lie two discrete areas of high resistance (orange hatching), one of which is linear and may be associated with remains of a demolished outbuilding witnessed by the surveyors and depicted on the historic mapping in 1843, 1885 and 1904. The second high resistance discrete is oval in plan and is more indicative of a pit

containing compacted material.

The large surveyed area to the east of the farmhouse consisted of an open lawn/pasture field, bounded by two of the linear fishponds located on the eastern boundary. Six high resistance discrete anomalies (orange hatching), indicative of dried out pits containing compacted material, were recorded. Two areas of low resistance (cyan hatching) recorded adjacent to the fishponds are likely to be remnants of moisture holding up-cast pond material. Eight low amplitude responses of probable geological derivation (magenta and dark green) were also recorded in this area.



Plate 8. Surveying grid square 20, facing west towards Abbey Farm

5.3. Moatfield

(Figs. 8a – 8d)

Three areas of high resistance (orange hatching) were recorded to the west of the moat, the most northern of which is located where the corner of the moat was present, caused by compacted low moisture holding material relating to the moat's bank. One discrete area of low resistance (cyan hatching) containing moisture-rich material, indicative of a pit type anomaly, was recorded immediately adjacent to the moat.

Weaker amplitude high (magenta) and low (dark green) resistance readings prospected in the centre of the plot, are more indicative of broad geological anomalies.



Plate 9. Surveying grid squares 24 and 25, facing north towards Moatfield

5.4. Abbey Farm detailed earth resistance meter survey

(Figs. 9a – 9d, 10a, 10b)

Following an appraisal of the reconnaissance survey it was decided that, in the remaining time available, detailed earth resistance meter survey would best be targeted on the lawn to the south of the farmhouse. The reconnaissance survey had hinted that anomalies of high and low resistance, indicative of building structure remains, were present and that detailed earth resistance meter survey could record them with greater contrast improving the original interpretation. Survey centres were increased to 0.5 x 0.5m and the instrument was re-set to take three parallel probe readings across the traverse.

The detailed survey did give greater detail than the reconnaissance survey, with narrow high resistance linear anomalies (red hatching) running parallel and perpendicular that are indicative of internal walls being recorded (see Fig. 10b). An east-west running high resistance anomaly was further prospected along the northern edge of the dataset.

The detailed survey revealed narrow linear, low resistance anomalies (narrow, dark blue hatching) that may delineate internal walls that have been removed and replaced with loose moisture rich backfill, interspersed within an area of low amplitude low resistance (cyan hatching) that appears to define the interior of the building structure. In contrast only a single rectangular area of low resistance (dark blue hatching) was recorded during the reconnaissance survey.

6. Conclusion

The site conditions were found to be challenging with garden furniture, trees and borders causing obstructions within the survey area. Despite these difficulties the earth resistance meter surveys recorded high and low resistance data indicative of a variety of potential archaeological anomalies. The most notable of which are those likely to be caused by building structures potentially associated with the Benedictine Priory or a former wing of the post-medieval farmhouse.

Of particular note was the identification of three possible sites of structures, straddling the driveway to the northwest of the farmhouse, in the lawn immediately to the south and in the southern part of the gardens between the two extant ponds. Against the western boundary the survey appears to have located the southern and eastern walls of the former known medieval structure and may have also identified a boundary ditch or former part of a moated enclosure.

The results suggest some potential for further geophysical survey work. Additional reconnaissance earth resistance meter survey could still be carried out in some areas not yet examined and could resurvey in higher detail, those areas already highlighted as being of particular interest in the reconnaissance survey dataset. A different technique, Ground Penetrating Radar (GPR), could also be of value, in firstly resurveying the potential building locations so far identified and secondly examining those areas that were unsuitable for earth resistance meter survey. In particular GPR could be deployed over the driveway (which is straddled by one potential structure and also cuts across the possible extended footprint of an earlier west wing) and gravel turning circle to the north and west of the farmhouse and other paved areas surrounding the farmhouse. The larger open fields to the east of the Abbey Farm gardens, which formed the eastern half of the wider precinct could be prospected by fluxgate gradiometer survey.

7. Archive deposition

The paper and digital archive will be held by SACIC in Needham Market, Suffolk. Digital and hard copies of the report and dataset will be deposited with the Suffolk Historic Environment Record in due course.

8. Acknowledgements

Suffolk Archaeology CIC would primarily like to thank Mr Wilf White for commissioning the project and, in keeping with our role as a Community Interest Company, are pleased to have been able to contribute by subsidising, in part, the costs of survey and reporting.

John Craven would also like to thank Mr White for allowing an opportunity to extend the survey to the neighbouring property of Moatfield, with the permission of Mrs Julie Craven.

The project was managed by John Craven. The survey was directed by Tim Schofield and the fieldwork was carried out by Ed Palka and Tim Schofield, with volunteer assistance from John Craven and Rory Coduri.

The report and illustrations were created by Tim Schofield, with contributions and editing by John Craven.

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- National Heritage List for England, 2017. <https://historicengland.org.uk/listing/the-list>

Survey Station	Easting	Northing
STN 01	618286.175	276329.124
STN 02	618326.044	276332.368
STN 03	618279.687	276408.861
STN 04	618247.033	276465.783
STN 05	618235.339	276504.035

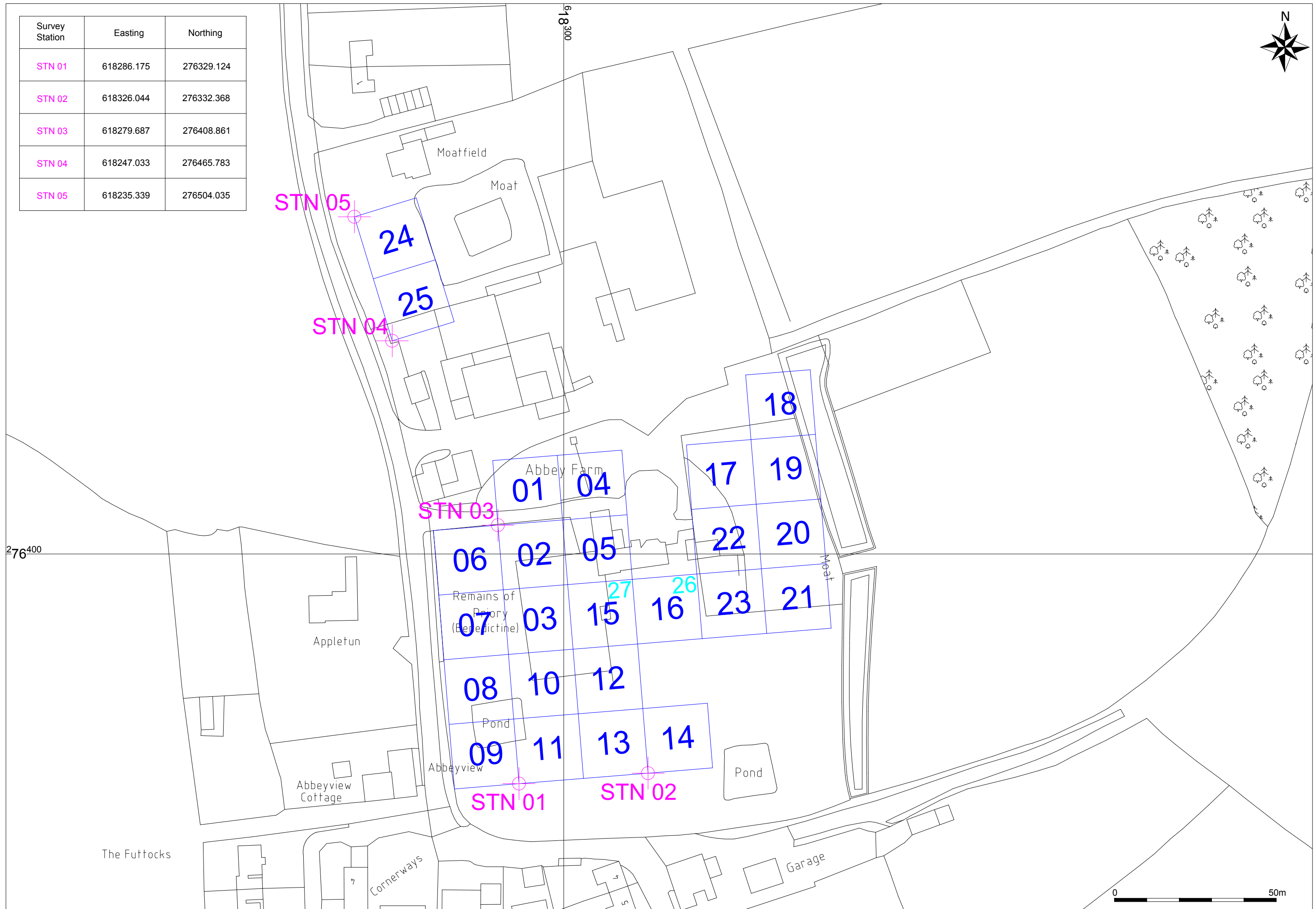


Fig. 6 Site, survey grid, survey station and scheduled monument (red hatching) location



Fig. 7a. Abbey Farm, raw earth resistance meter greyscale plot

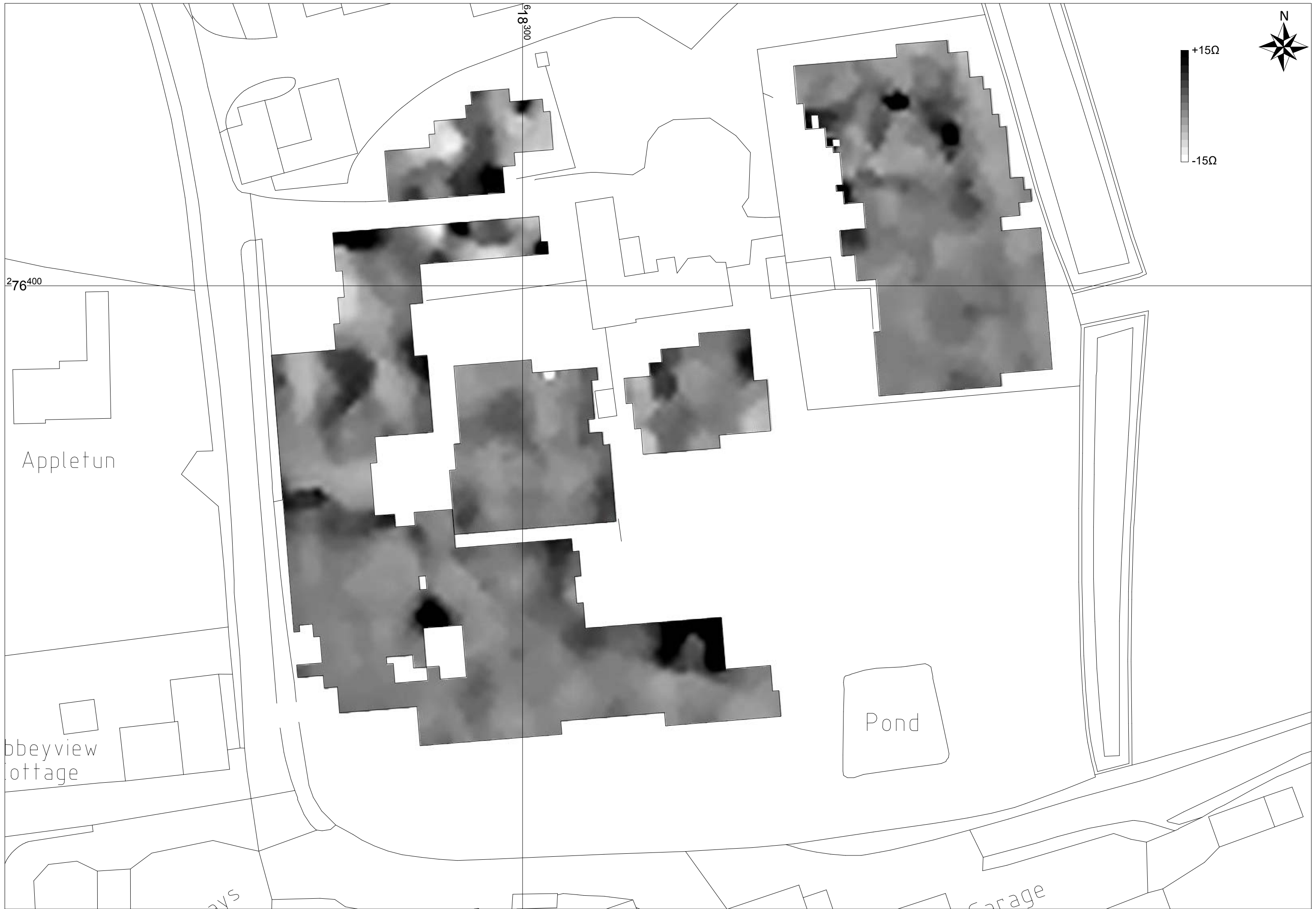


Fig. 7b. Abbey Farm, processed earth resistance meter greyscale plot

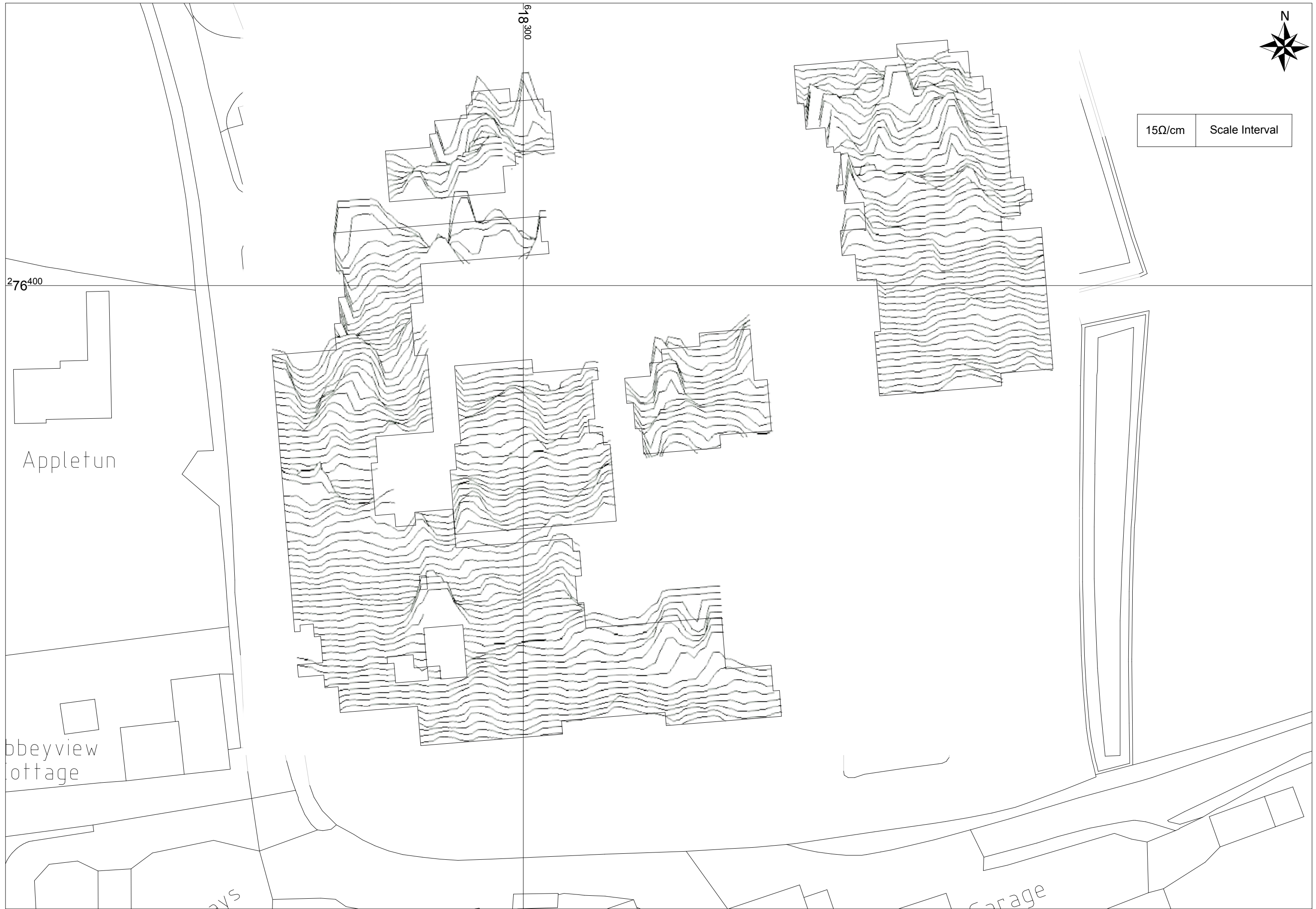


Fig. 7c. Abbey Farm, processed earth resistance meter xy trace plot

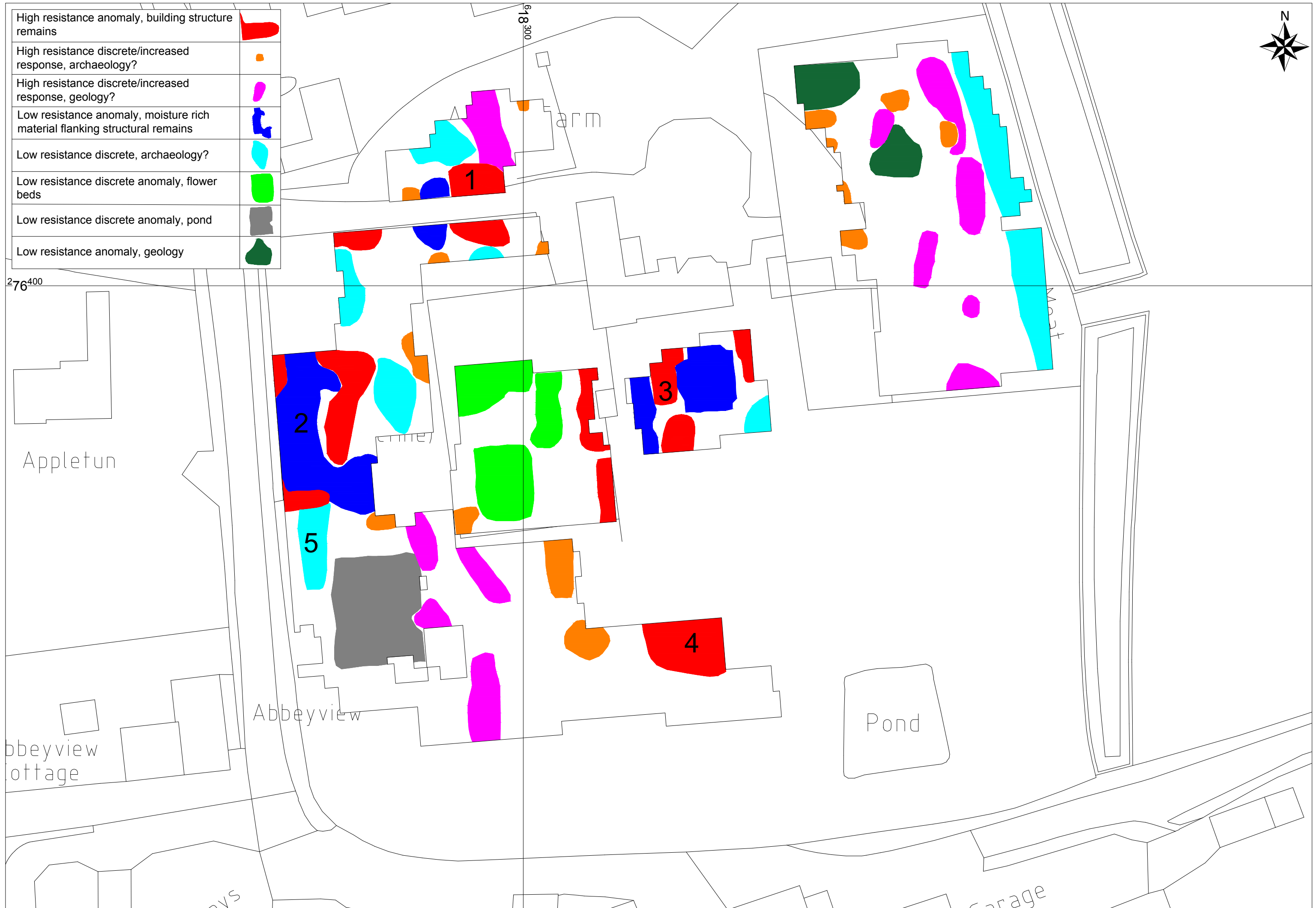


Fig. 7d. Abbey Farm, interpretation plot of earth resistance anomalies



Fig. 8a. Moatfield, raw earth resistance meter greyscale plot

0 25m



Fig. 8b. Moatfield, processed earth resistance meter greyscale plot

0 25m



Fig. 8c. Moatfield, processed earth resistance meter xy trace plot

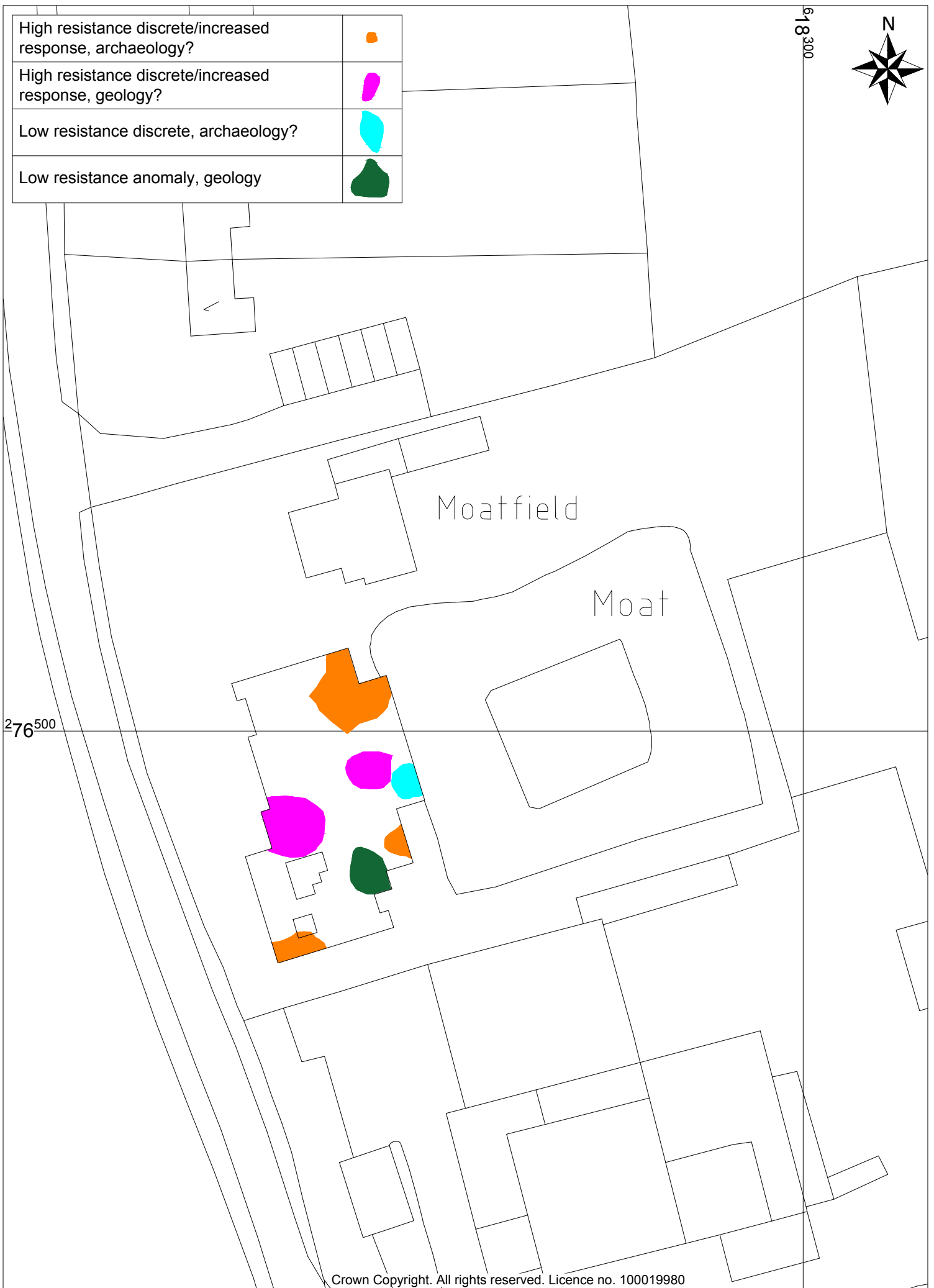


Fig. 8d. Moatfield, interpretation plot of earth resistance meter anomalies



Fig. 9a. Abbey Farm, raw earth resistance meter greyscale plot



Fig. 9b. Abbey Farm, processed earth resistance meter greyscale plot

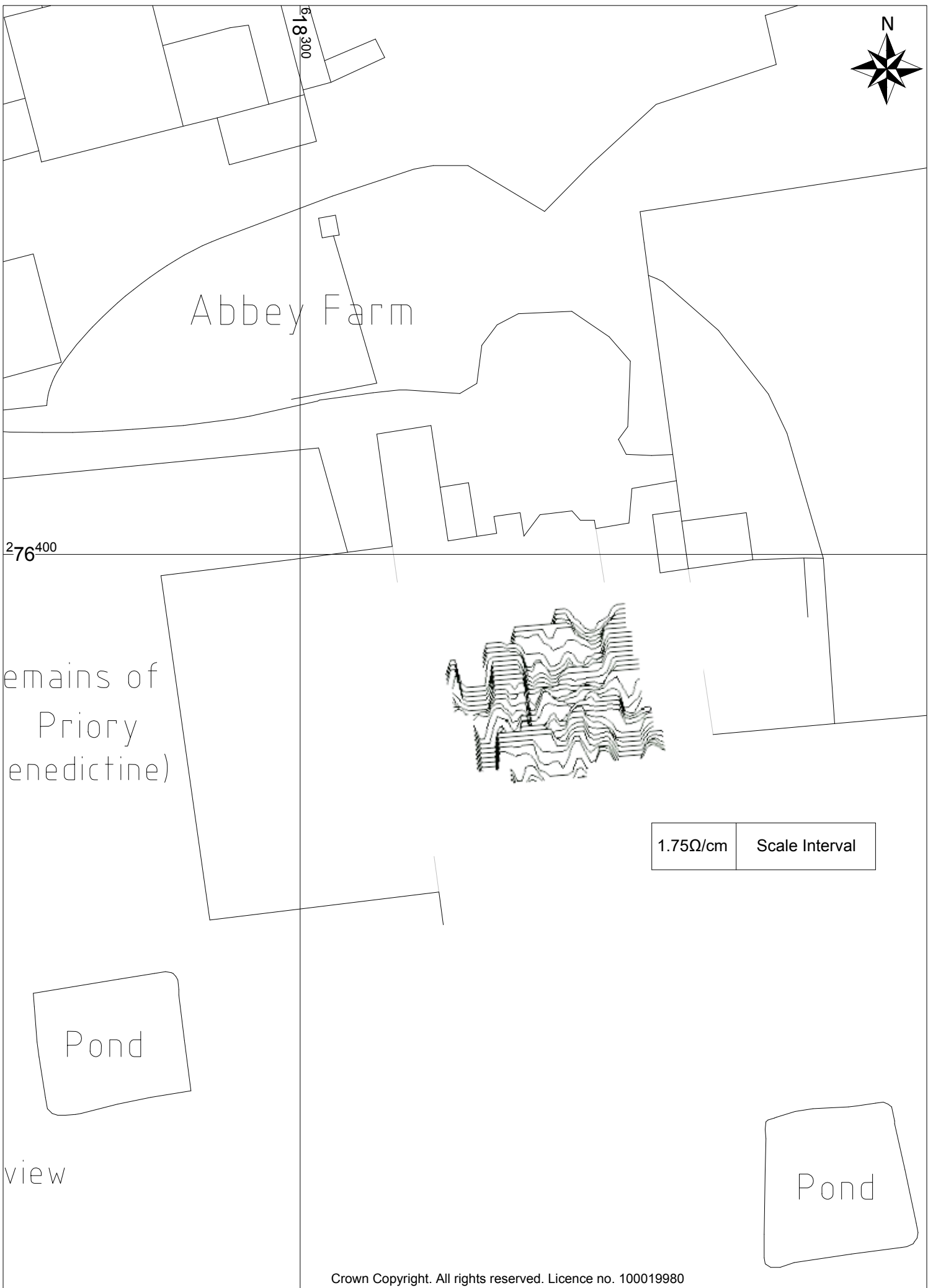
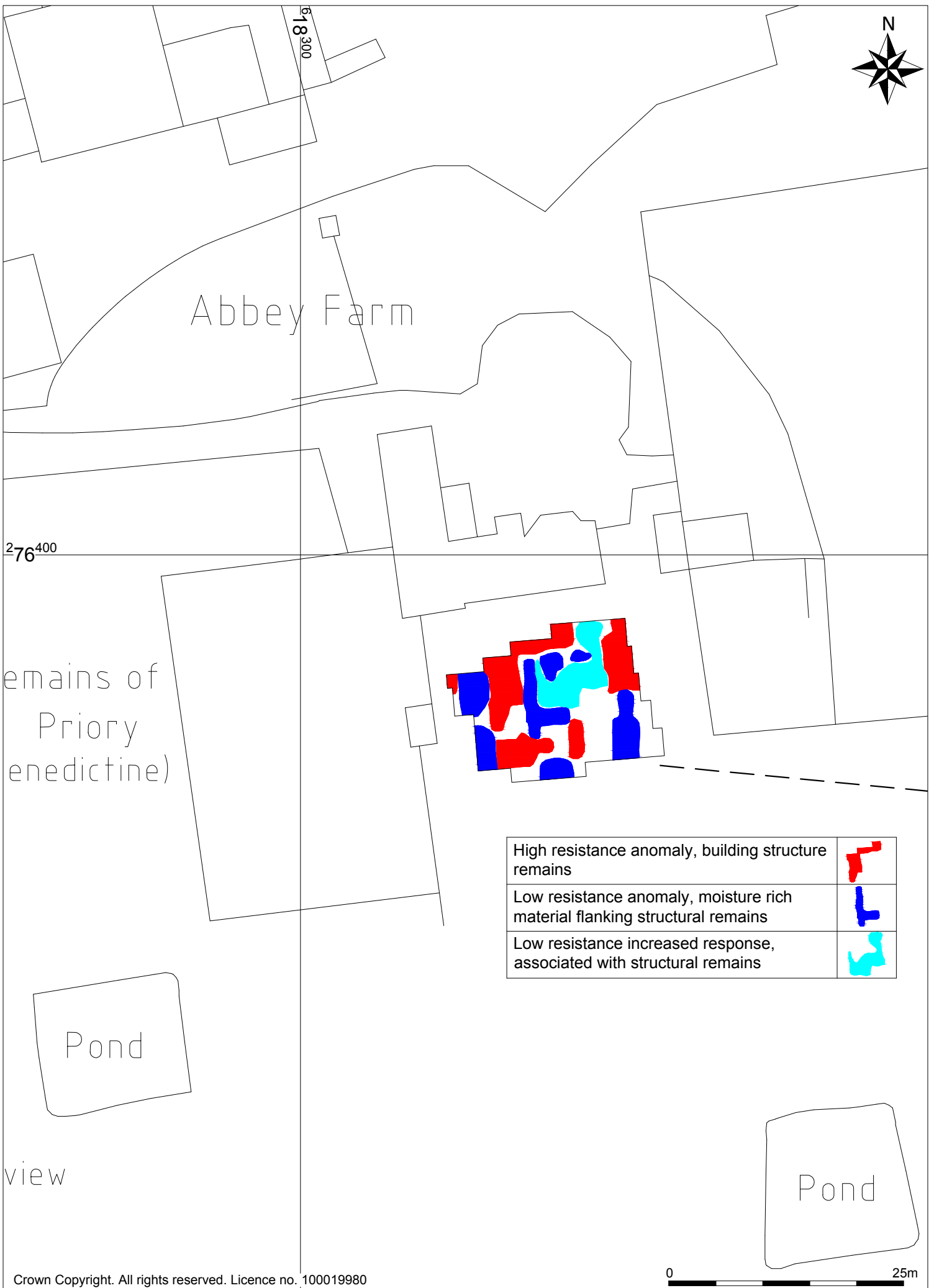


Fig. 9c. Abbey Farm, processed earth resistance meter xy trace plot



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Fig. 9d. Abbey Farm, detailed earth resistance meter survey, anomaly interpretation plot



Fig. 10a. Combined surveys, processed earth resistance meter greyscale plots, showing detailed earth resistance meter insert

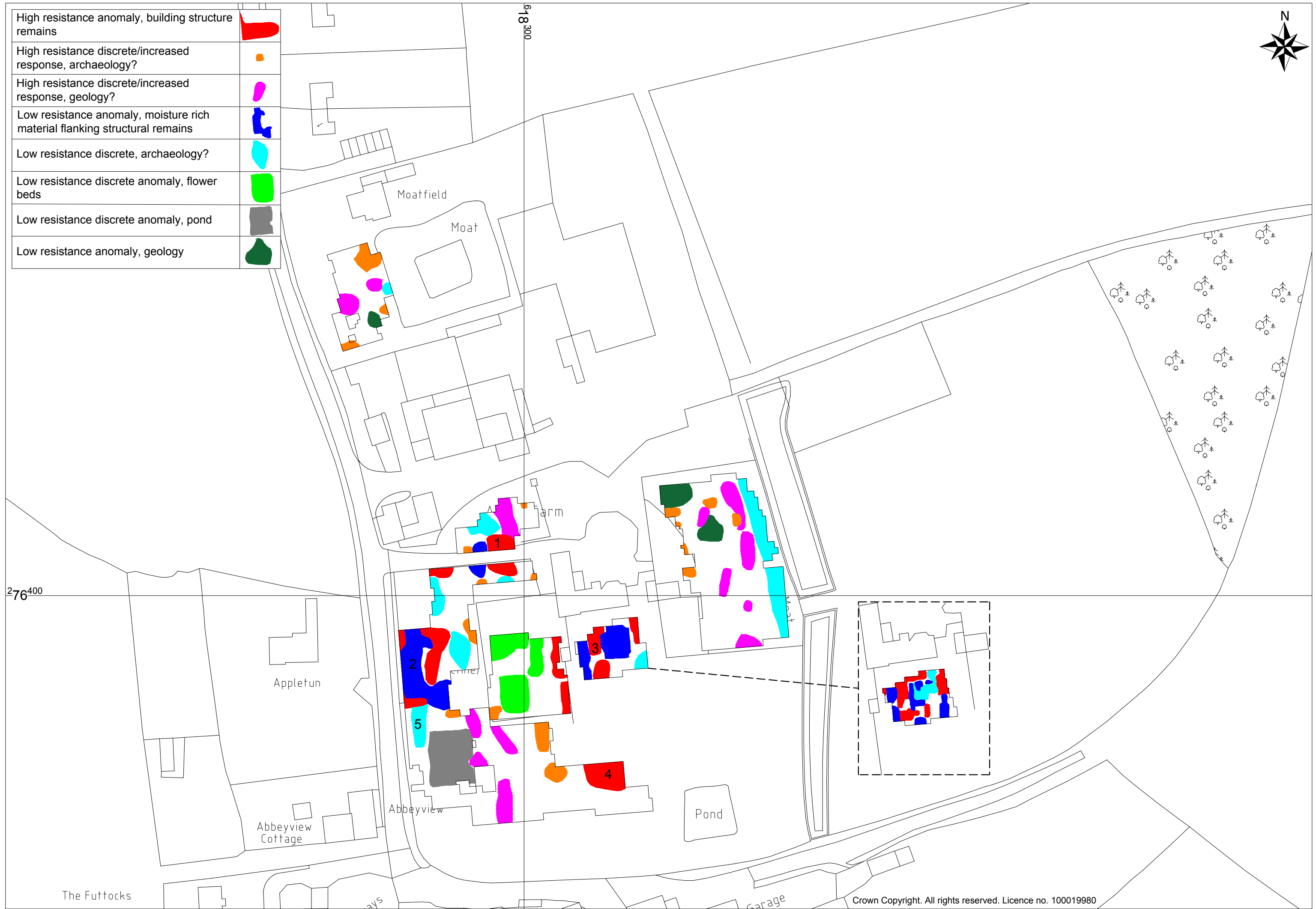


Fig. 10b. Combined surveys, interpretation plot of earth resistance meter anomalies, showing detailed earth resistance meter insert

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Appendix 1. Metadata Sheets

Abbey Farm Reconnaissance Survey

Survey Grids

Source Grids: 23		
1	Col:0	Row:2 grids\06.xgd
2	Col:0	Row:3 grids\07.xgd
3	Col:0	Row:4 grids\08.xgd
4	Col:0	Row:5 grids\09.xgd
5	Col:1	Row:1 grids\01.xgd
6	Col:1	Row:2 grids\02.xgd
7	Col:1	Row:3 grids\03.xgd
8	Col:1	Row:4 grids\10.xgd
9	Col:1	Row:5 grids\11.xgd
10	Col:2	Row:1 grids\04.xgd
11	Col:2	Row:2 grids\05.xgd
12	Col:2	Row:3 grids\15.xgd
13	Col:2	Row:4 grids\12.xgd
14	Col:2	Row:5 grids\13.xgd
15	Col:3	Row:3 grids\16.xgd
16	Col:3	Row:5 grids\14.xgd
17	Col:4	Row:1 grids\17.xgd
18	Col:4	Row:2 grids\22.xgd
19	Col:4	Row:3 grids\23.xgd
20	Col:5	Row:0 grids\18.xgd
21	Col:5	Row:1 grids\19.xgd
22	Col:5	Row:2 grids\20.xgd
23	Col:5	Row:3 grids\21.xgd

Raw Data

Filename	Hoxne Priory All Raw +2 +44.xcp
Description	
Instrument Type	GeoScan RM85 (Resistance)
Units	Ohm
Direction of 1st Traverse	0 deg
Collection Method	ZigZag
Sensors	2
Dummy Value	2047.5
Dimensions	
Composite Size (readings)	120 x 120
Survey Size (meters)	120 m x 120 m
Grid Size	20 m x 20 m
X Interval	1 m
Y Interval	1 m
Stats	
Max	204.70
Min	-204.70
Std Dev	30.13
Mean	23.56
Median	19.45
Composite Area	1.44 ha
Surveyed Area	0.5043 ha
Program	
Name	TerraSurveyor
Version	3.0.32.4

Raw data schedule

Display Clip: +2 +44

Processed Data

Filename	Hoxne Priory All Pro -15 +15.xcp
Description	
Instrument Type	GeoScan RM85 (Resistance)
Units	Ohm
Direction of 1st Traverse	0 deg
Collection Method	ZigZag
Sensors	2
Dummy Value	2047.5
Dimensions	
Composite Size (readings)	120 x 120
Survey Size (meters)	120 m x 120 m
Grid Size	20 m x 20 m
X Interval	1 m
Y Interval	1 m
Stats	
Max	43.76
Min	-30.75
Std Dev	4.82
Mean	0.78
Median	0.00
Composite Area	1.44 ha
Surveyed Area	0.5043 ha
Program	
Name	TerraSurveyor
Version	3.0.32.4

Processed Data Schedule

Despike Threshold: 0.5 Window size: 3x3
High pass Uniform (median) filter: Window: 18 x 18
Low pass Uniform (median) filter: Window: 3 x 3
Display Grad Shade
Display Clip: -15 +15

Moatfield Reconnaissance Survey

Survey Grids

Source Grids: 2
1 Col:0 Row:0 grids\24.xgd
2 Col:0 Row:1 grids\25.xgd

Raw Data

Filename	Hoxne Moatfield Raw.xcp
Description	
Instrument Type	GeoScan RM85 (Resistance)
Units	Ohm
Direction of 1st Traverse	0 deg
Collection Method	ZigZag
Sensors	2
Dummy Value	2047.5
Dimensions	
Composite Size (readings)	20 x 40
Survey Size (meters)	20 m x 40 m
Grid Size	20 m x 20 m
X Interval	1 m
Y Interval	1 m
Stats	
Max	204.70
Min	-204.70
Std Dev	40.53
Mean	18.11
Median	12.70
Composite Area	0.08 ha
Surveyed Area	0.0465 ha
Program	
Name	TerraSurveyor
Version	3.0.32.4

Raw Data Schedule

Display Clip: +8 +18

Processed Data

Filename	Hoxne Moatfield Pro -3 +3.xcp
Description	
Instrument Type	GeoScan RM85 (Resistance)
Units	Ohm
Direction of 1st Traverse	0 deg
Collection Method	ZigZag
Sensors	2
Dummy Value	2047.5
Dimensions	
Composite Size (readings)	20 x 40
Survey Size (meters)	20 m x 40 m
Grid Size	20 m x 20 m
X Interval	1 m
Y Interval	1 m
Stats	
Max	13.36
Min	-2.97
Std Dev	2.11
Mean	0.53
Median	0.00
Composite Area	0.08 ha
Surveyed Area	0.0439 ha
Program	
Name	TerraSurveyor
Version	3.0.32.4

Processed Data Schedule

Despike Threshold: 1 Window size: 3x3
High pass Uniform (median) filter: Window: 18 x 18
Low pass Uniform (median) filter: Window: 3 x 3
Display Grad Shade
Display Clip: -3 +3

Abbey Farm Southern Lawn, Detailed Resistance Meter Survey

Survey Grids

Source Grids: 2
1 Col:0 Row:0 grids\02.xgd
2 Col:1 Row:0 grids\01.xgd

Raw Data

Filename	Hoxne Res Det Raw.xcp
Description	
Instrument Type	GeoScan RM85 (Resistance)
Units	Ohm
Direction of 1st Traverse	0 deg
Collection Method	ZigZag
Sensors	3
Dummy Value	2047.5
Dimensions	
Composite Size (readings)	80 x 40
Survey Size (meters)	40 m x 20 m
Grid Size	20 m x 20 m
X Interval	0.5 m
Y Interval	0.5 m
Stats	
Max	204.70
Min	-204.70
Std Dev	18.96
Mean	25.05
Median	23.95
Composite Area	0.08 ha
Surveyed Area	0.027375 ha
Program	
Name	TerraSurveyor
Version	3.0.32.4

Raw Data Schedule

Display Clip: +10 +40

Processed Data

Filename	Hoxne Res Det Pro.xcp
Description	
Instrument Type	GeoScan RM85 (Resistance)
Units	Ohm
Direction of 1st Traverse	0 deg
Collection Method	ZigZag
Sensors	3
Dummy Value	2047.5
Dimensions	
Composite Size (readings)	80 x 40
Survey Size (meters)	40 m x 20 m
Grid Size	20 m x 20 m
X Interval	0.5 m
Y Interval	0.5 m
Stats	
Max	28.67
Min	-10.35
Std Dev	4.46
Mean	0.40
Median	0.00
Composite Area	0.08 ha
Surveyed Area	0.027375 ha
Program	
Name	TerraSurveyor
Version	3.0.32.4

Processed Data Schedule

Despike Threshold: 1 Window size: 3x3
High pass Uniform (median) filter: Window: 18 x 18
Low pass Uniform (median) filter: Window: 3 x 3
Display Grad Shade
Display Clip -3 +3

Appendix 2. Technical Data

Earth Resistance Meter

Soil resistance

The earth's soil has an electrical property known as conductivity or low resistance, that can be exploited by geophysical surveyors when prospecting for archaeological features. Naturally occurring minerals within the soil can be broken down by rainwater forming electrolytes, that further break down into positive and negative ions. When a current is inserted into the ground these ions will either attract or repel the current, driving it through the matrix along the path of least resistance.

Two sets of probes are employed to measure the relative resistance of the soil matrix; the first are the current probes which inject an electrical signal into the soil that is measured by a second set of potential probes recording the current's density. Archaeological features contain varying amounts of soil moisture, for example a loose moisture-rich pit or ditch will allow an injected electrical current to pass through it with relative ease, increasing the current density whilst decreasing the potential gradient and recording a low resistance anomaly within the dataset. Conversely a wall or road that is structurally dense, will repel the current, driving it above and below the feature on its journey through the matrix, decreasing the current density and increasing the potential gradient recording a high resistance anomaly.

Earth Resistance Meters

A single twin (pole-pole) probe array was employed to undertake this survey, using one set of mobile probes that along with the instrument box are mounted to the frame, recording individual data points within the survey grid, and remote probes that are located at least 15m beyond the edge of the grid to avoid feedback. The remote probes act as a static control station that the mobile probe readings are measured against. A 50m cable connects the remote probes to the instrument box; to progress the survey the static station will need to be moved. A control reading is taken before and after the remote probes are moved, to enable grid matching from one section to another. The mobile probes are mounted 0.5m apart on the frame, with the remote probes pushed into the ground approximately 3 – 4m apart. Once the mobile probes are placed onto the ground surface an electrical circuit is formed between the current electrodes of the remote and

mobile probes; the potential gradient between the remote and mobile probes is then automatically recorded by the instrument. Removing the mobile probes from contact with the ground resets the instrument ready for the next point, as soon as the probes touch the ground a circuit is once again formed; this point is then auto-logged by the instrument.

Resistance Anomalies

Discrete anomalies

Discrete anomalies can be recorded with both high and low resistance, those with low resistance are likely to be moisture-rich and those with high resistance are likely to have low moisture content compared with the surrounding matrix. Examples of low resistance anomalies include naturally occurring pockets of differing material within the geology, tree hollows or throws, glacial infilling of natural hollows, ponds, culturally excavated and backfilled storage or rubbish waste pits. High resistance anomalies are recorded where naturally occurring stone deposits, structural post pads, kilns, oven and hearth, furnace linings, rubble dumps and dried out hard or compacted fills are encountered.

Linear trends

Linear anomalies can also be either high or low resistance. Once again those with low resistance are likely to be moisture rich and conversely those with high resistance are likely have a low moisture content. Examples of low resistance linear trends include periglacial troughs, agricultural or settlement ditches, service run trenches. Examples of high resistance linear anomalies include geological rock formations, buried foundations, walls, metalled tracks or road surfaces, ditch banks.

Appendix 3. OASIS form

OASIS ID: suffolka1-283424

Project details

Project name	HXN 004, Abbey Farm, Hoxne, Suffolk, Earth Resistance Meter Survey
Short description of the project	In March 2017 Suffolk Archaeology Community Interest Company (SACIC) undertook reconnaissance earth resistance meter survey followed by detailed earth resistance meter survey in the gardens of Abbey Farm and Moatfield, Hoxne, Suffolk, which both lie within the former boundary of the Benedictine Hoxne Priory, a Scheduled Monument. The geophysical surveys successfully recorded the location of anomalies indicative of building structures related to the Priory and former wings of the 16th century farmhouse, as well as pits and ditches of possible archaeological derivation.
Project dates	Start: 04-04-2017 End: 06-04-2017
Previous/future work	No / Not known
Any associated project reference codes	HXN 004 - Sitecode
Any associated project reference codes	ESF 25523 - HER event no.
Any associated project reference codes	1020447 - NHLE No.
Any associated project reference codes	1374922 - NHLE No.
Any associated project reference codes	1032502 - NHLE No.
Type of project	Research project
Site status	Scheduled Monument (SM)
Current Land use	Other 5 - Garden
Monument type	ANOMALIES INDICATIVE OF BUILDING REMAINS Uncertain
Monument type	ANOMALIES INDICATIVE OF DITCHES Uncertain
Monument type	ANOMALIES INDICATIVE OF PITS Uncertain
Significant Finds	NONE None
Investigation type	"Geophysical Survey"
Prompt	Research
Solid geology (other)	Norwich Crag Formation Sand
Drift geology (other)	Lowestoft Formation Diamicton
Techniques	Resistivity - area

Project location

Country	England
Site location	SUFFOLK MID SUFFOLK HOXNE Abbey Farm, Hoxne, Suffolk
Study area	0.54 Hectares
Site coordinates	TM 7640 1830 51.794153463516 2.009017017335 51 47 38 N 002 00 32 E Point
Height OD / Depth	Min: 37m Max: 42m

Project creators

Name of Organisation	Suffolk Archaeology CIC
----------------------	-------------------------

Project brief originator	Contractor (design and execute)
Project design originator	Timothy Schofield
Project director/manager	John Craven
Project supervisor	Timothy Schofield
Type of sponsor/funding body	Landowner
Name of sponsor/funding body	Mr Wilf White

Project archives

Physical Archive Exists?	No
Digital Archive recipient	Suffolk HER
Digital Contents	"Survey"
Digital Media available	"Database","GIS","Geophysics","Images raster / digital photography","Images vector","Survey","Text"
Paper Archive recipient	Suffolk HER
Paper Contents	"Survey"
Paper Media available	"Plan","Report","Survey ","Unpublished Text"

Project bibliography

Publication type	Grey literature (unpublished document/manuscript)
Title	Abbey Farm, Earth Resistance Meter Survey, Hoxne, Suffolk
Author(s)/Editor(s)	Schofield, T, P.
Other bibliographic details	Report Number: 2017/039
Date	2017
Issuer or publisher	Suffolk Archaeology CIC
Place of issue or publication	Needham Market
Description	A4 bound report with A3 fold-out figures.

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