

GARDEN AND OTHER EARTHWORKS,
SOUTH OF WRESSLE CASTLE,
WRESSLE, EAST YORKSHIRE

GEOPHYSICAL SURVEY



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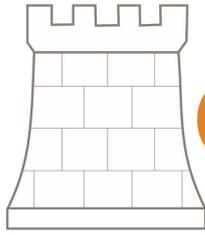
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**GEOPHYSICAL SURVEY,
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EXECUTIVE SUMMARY

In February 2019, Ed Dennison Archaeological Services Ltd (EDAS) were awarded a grant by the Castle Studies Trust (CST) to undertake a detailed geophysical survey of a field to the south of Wressle Castle, Wressle, East Yorkshire (NGR SE 7079 3146 centred). The survey area covered 5.5 hectares, and contained earthworks comprising the best surviving part of the gardens associated with the castle, as well as the remains of a shrunken medieval village. The area is included within a Scheduled Monument (National Heritage List for England entry 1005210) while the castle ruins are a Grade 1 Listed Building (National Heritage List for England entry 1083170). The extent of the project was defined in the grant application made to the CST by EDAS, and the project was predominantly funded by the CST. The geophysical survey was carried out by Archaeological Services WYAS in late March 2019.

The geophysical survey area had previously been the subject of a detailed measured earthwork survey undertaken by EDAS in 2014, also funded by a CST grant. As a result, a provisional interpretation of the surviving earthworks of the medieval settlement, the medieval and early post-medieval castle gardens, and other aspects of the local landscape was produced. The results of the new geophysical survey support several of the previous interpretations, and have also provided further information on the likely presence of the buried remains within the survey area. In particular, the identification of several key early 15th and 16th century garden buildings, such as the former School House and 'Laundrie' in the Old Garden and the former 'bayne' or bathing/banqueting house in the inside south-west corner of the moat, is significant.

1 INTRODUCTION

Reasons and Circumstances of the Project

- 1.1 In February 2019, Ed Dennison Archaeological Services Ltd (EDAS) were awarded a grant by the Castle Studies Trust (CST) to undertake a detailed geophysical survey of a field to the south of Wressle Castle, Wressle, East Yorkshire (NGR SE 7079 3146 centred) (see figure 1). The survey area covered 5.5 hectares, and contained earthworks comprising the best surviving part of the gardens associated with the castle, as well as the remains of a shrunken medieval village. The extent of the project was defined by the grant application made to the CST by EDAS, and the project was predominantly funded by the CST.
- 1.2 The geophysical survey was carried out by Archaeological Services WYAS in late March 2019, and comprised a combination of magnetic and resistance techniques (Sykes 2019). A full version of the ASWYAS survey report is included as an Appendix to this report.

Site Location and Description

- 1.3 The survey area covered most of the enclosed field to the south of the castle, apart from a small strip of land lying between a modern flood bund and the River Derwent which contains no earthworks (see figure 2). The area was bounded to the east by the unclassified north-south aligned Brighton Road running through this part of Wressle village, to the west by the River Derwent flood bund, to the south-east by modern housing, and to the south by the Selby to Hull railway line. At the time of the survey, the area was used as pasture for grazing cattle. The majority of the boundary was marked by either hedges or post and wire fencing.
- 1.4 The survey area therefore included the ground between the castle and the south moat, the south moat itself, the sites of a banqueting/bathing house and a laundry, the 'Old Garden', and part of the former extent of Wressle village and its associated open field system.

Site Designations and Permissions

- 1.5 The survey area is included within a Scheduled Monument (National Heritage List for England entry 1005210) while the castle ruins are a Grade 1 Listed Building (National Heritage List for England entry 1083170). Scheduled Monument Consent for the geophysical survey was given by Historic England on 20th February 2019 (ref AA/020201/5). Permission for the geophysical survey was also given by the landowner, Mr Robert Falkingham of Castle Farm.

Background Information to the Castle Complex

- 1.6 Wressle Castle is generally considered to have been constructed towards the end of the 14th century for Thomas Percy, later Earl of Worcester, and comparisons are often drawn with other contemporary castles of a similar form, for example Sheriff Hutton and Bolton castles, both in North Yorkshire. No licence to crenellate survives, but the castle is first documented in 1402.
- 1.7 In its original form, the castle had a quadrangular plan, with ranges running between four corner towers, and with a fifth gate tower in the centre of the east range. The castle was surrounded on all sides by a moat, and at a later date a base court was added to the east side. It is highly likely that the late 14th century

building was provided with gardens and pleasure grounds, and there was also an extensive park to the north, with the River Derwent running close by the west. The interior of the castle underwent extensive and very costly refurbishment under Henry Percy, 5th Earl of Northumberland, probably in two successive phases between 1498-1516 and 1524-1527. The two volumes of the contemporary *Northumberland Household Book* (Anon 1770), together with a detailed survey of c.1600 (see below), allow the magnificence and functioning of Percy's household at Wressle to be reconstructed in great detail (Brears 2010).

- 1.8 However, by the third-quarter of the 16th century, Wressle was in decay, like other regional Percy residences such as the nearby Leconfield Castle; in fact, it may have been in decay as early as 1537, when the Duke of Norfolk wrote to Thomas Cromwell that he had heard that the Earl of Northumberland "daily gives away houses and the brick of Wressle and other things, so that unless remedy be applied, it will be greatly decayed when it comes to the King's hands" (Bilson *et al* 1913, 184). Large sums of money were spent on repairing the building in the early 17th century, and it was found to be the only Yorkshire Percy residence to be in reasonable repair in 1630.
- 1.9 It was subsequently garrisoned for Parliament during the Civil War, and in 1646 the soldiery were said to have caused over £1000 worth of damage to the castle and its surroundings. Actual demolition of the castle started in June 1648, but in 1650 the decision was taken to demolish all but the south range, leaving it to serve as a manor house to administer the Earl of Northumberland's local estates. By the late 18th century, the lower level of the castle was a residence for a tenant farmer, although it is clear that several of the rooms retained their high-status 16th century woodwork. Unfortunately, a severe fire in February 1796 destroyed all of this material, and the castle has been derelict ever since (Fisher 1954 vol 2, 67; Pevsner & Neave 1995, 766-769; Emery 1996, 414-419).
- 1.10 The earliest account of the castle was given by Savage in 1805 (Savage 1805). However, given the richness of the surviving 16th century documentation, and the presence of a substantial part of the original building, with a few exceptions (e.g. Bilson *et al* 1913) Wressle remained relatively neglected in terms of academic studies until the mid 20th century. In 1954, the castle featured in an important two volume illustrated PhD thesis by Eric Fisher which studied the Percy family's Yorkshire estates, and which contains much useful unpublished material on the gardens and setting of the castle (Fisher 1954 vol 2). As part of this work, in 1937 Fisher made tracings of the set of plans of the castle drawn by T F Hampe in c.1600, and now kept as part of the Petworth House Archive at the West Sussex Record Office in Chichester, including the well-known and often reproduced 'upright' or perspective view of Wressle (WSA PHA 3538-47). However, of greater relevance to the garden survey, Fisher also copied the seldom-reproduced Hampe plans of the castle's base court and its wider landscape setting, which show elements not depicted on other 17th century maps and plans of the area (WSA PHA 3543 & 3547).
- 1.11 More recently, Wressle Castle has attracted more attention, and has been described by Pevsner and Neave (1995, 766-769), Emery (1996, 414-419) and Hislop (2007, 45-48 & 71-75), amongst others. However, the most informative and important recent work is by Brears (2010), who uses the information contained within the *Northumberland Household Book* and the Hampe c.1600 drawings to reconstruct the appearance and organisation of the interior of the castle in the early 16th century. Finally, and most recently, a Conservation Management Plan has been produced for the castle (Stone 2013).

- 1.12 Between June 2013 and February 2016, as part of a three year phased programme of repairs funded by Natural England and English Heritage (now Historic England), EDAS undertook a detailed architectural and archaeological survey of the castle (Dennison & Richardson 2015; Dennison & Richardson 2017); as well as recording the standing structure, this work also included an earthwork survey, a geophysical survey and a watching brief on limited below-ground works. In 2014, EDAS also carried out a detailed measured earthwork survey of the field to the south of Wressle Castle, producing a detailed interpretation of the surviving earthworks of the medieval settlement, the medieval and early post-medieval gardens and other aspects of the local landscape (Richardson & Dennison 2015). This earthwork survey was also undertaken with a grant awarded by the CST, and the current geophysical survey builds directly upon the results of the previous earthwork survey.

Geophysical Survey Methodology

Aims and Objectives

- 1.13 The aim of the geophysical survey was to gather sufficient information to establish the presence/absence, character, and extent, of below-ground archaeological remains within the survey area, and to inform further investigative strategies as necessary. The results of the geophysical survey would also be combined with the earlier earthwork survey to inform the understanding of the late medieval/early post-medieval development of the area around the castle.

Survey Methodologies

- 1.14 The geophysical survey was undertaken by Archaeological Services WYAS between 25th and 29th March 2019, in accordance with current best practice (ClfA 2014; David *et al* 2008). The survey area measured 5.5 ha, and all of this was covered by magnetometry, with a further 2 ha targeted by resistivity techniques. Further technical details of the equipment used, data processing and survey methodologies are provided in the full text of the geophysical survey report (Sykes 2019) which is reproduced as Appendix 1.

EDAS Survey Products

Archaeological Survey Report

- 1.15 This EDAS archive archaeological survey report summarises the results of the geophysical survey, and interprets the findings in relation to current knowledge of the site, including the results of the 2014 earthwork survey. It also comments on the quality and reliability of the evidence, and how it might need to be supplemented by further fieldwork or desk-based research. The report is illustrated using the plots of the geophysical survey results and various historic maps and plans, as appropriate.

Archaeological Survey Archive

- 1.16 The archive arising from the geophysical survey and the reporting will be combined with that produced from the historic building and other archaeological surveys, for eventual deposition with the East Riding of Yorkshire Museum Service (EDAS site code WCG 14).

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

Introduction

- 2.1 The history and development both of Wressle as a settlement and of the gardens around the castle was described in detail in the 2014 earthwork survey report (Richardson & Dennison 2015) and therefore only a summary is given below, drawing directly upon the previous report.
- 2.2 As might be expected, the castle's gardens underwent alteration, expansion and contraction during the 300 years that Wressle served as a high status residence for a large household. There were up to three different gardens present at one time. Two of these gardens are named in contemporary documentation; the garden to the south of the south moat was the 'Old Garden' while that to the north of the north moat was the 'New Garden'. These names have been retained in the following text. The third garden, within the moated enclosure on the south side of the castle, is referred to below as the 'Moat Garden', as it was in 2014.

The 15th and 16th Centuries

- 2.3 As noted above, Wressle Castle is generally considered to have been constructed towards the end of the 14th century for Thomas Percy, later Earl of Worcester; no licence to crenellate survives, but the castle is first documented in 1403 (Bilson *et al* 1913, 183). In its original form, the castle had a quadrangular plan, with ranges running between four corner towers, and with a fifth gate tower in the centre of the east range (see figure 3). The castle was surrounded on all sides by a moat, and at a later date a base court was created to the east side. It is highly likely that the late 14th century building was provided with gardens and pleasure grounds, and there was also an extensive park to the north, with the River Derwent running close by the west.
- 2.4 In 1403, Sir Thomas Percy was executed for his role in the Battle of Shrewsbury, and Wressle passed into an extended period of intermittent Crown ownership, during which it was successively granted to others but only for limited periods of time. The ownership was restored to Henry Percy, 4th Earl of Northumberland in 1471, and the interior underwent extensive and very costly refurbishment under Henry Percy, the 5th Earl, probably in two successive phases between 1498-1516 and 1524-1527. In 1537, following the Pilgrimage of Grace in 1536, during which the 6th Earl surrendered the castle to Robert Aske, Wressle again returned to the Crown, and the castle hosted the Privy Council, King Henry VIII and Queen Katherine Howard for at least three nights in September 1541 (Brears 2010; Stone 2013, 12-13).
- 2.5 Late medieval references to the gardens are less common than those dating to after c.1500, and the only one of the three gardens which is clearly referred during the 15th century is the 'Old Garden'. A building known as the 'School House', located in the Old Garden to the south of the castle's south moat was noted amongst decayed rents in 1472, when its old rent was 1s 6d (Fisher 1954 vol 2, 63). Records made between 1516 and 1523 itemised various verses painted within the chambers of this building. Wressle was not alone amongst the Percys' Yorkshire residences in having such a building in its gardens - the 1512 Northumberland Household Book describes a garden house at nearby Leconfield Castle as the "*Tour in the Gardyn*" and suggest that it had at least two storeys, both heated by fireplaces that required the provision of fuel, and that there was an inner and outer chamber to the upper floor (Anon 1770, 379-380 & 381). Another

interesting entry in the Household Book relating to Wressle details the Groom of the Chamber who was responsible for the keeping of the fire in the "*Houses in the Garden and outhere places where my Lorde shall syt aboute his Books*" (Anon 1770, 365). This infers that the garden houses were places used by the 5th Earl for reading and retirement, and may give some clue as to how the example in the Old Garden at Wressle acquired its name of the 'School House'.

- 2.6 In addition to the Old Garden, Fisher (1954 vol 2, 66) states that the Moat Garden was also present during the same period, and that the two gardens were kept in good order by one gardener - named as John Smeaton in 1472 - for a yearly wage of £3 8d. The 1512 Northumberland Household Book contains several references to the gardener, again always in the singular. Also of interest is the item relating to Wressle provisions - "*Item that from henseforth that there be no HERBYS bought seinge that the Cookes may have herbes anewe in my Lordys Gardyns*" (Anon 1770, 108 & 206) and the hint of some of the gardener's duties: "*Item. A Gardynner who attendis hourelly in the Garden for setting of Erbis and Clipping of Knottis and Sweping the said Garden clean hourelly*" (Anon 1770, 328). Taken together, these references suggest that knot gardens with paths that needed to be swept clean were present in one of the gardens at Wressle by 1512, and that herbs were an important component of the gardens, not only for pleasurable reasons but also to supply the kitchen. These need not have been in the Old or Moat Gardens. At some point between 1472 and 1517, the New Garden was created to the north of the north moat, enclosing an area formerly within the Little Park. Its special gardener received a fee of 26s 8d per year; the 'keeper of the New Garden' is first mentioned in an account roll for 1517, and payments continued to be made to him in the period between 1518 to 1523 (Fisher 1954 vol 2, 66).
- 2.7 The first known detailed description of the gardens was given by John Leland in 1538, as part of his wider description of the castle complex. Leland also addressed the wider landscape setting of the castle, noting that the most part of the eastern base court was of timber. The castle was described as being moated about on three parts, but the fourth part was dry on the side where the castle was entered (i.e. on the east side). He stated that much of the surrounding ground was very low, with the River Derwent running close to the castle, so that when there had been heavy rain, it overflowed much of the ground "*there aboute, beyng low Medowes*" (Toulmin Smith 1907, 52-54). Leland specifically referred to at least two gardens, one within the castle's moated enclosure and one or more 'Orchardes' without. His remarks, which have been reproduced many times previously (e.g. Fisher 1954 vol 2, 56; Woodward 1985, 12-13), note: "*And so wer the Gardeins withyn the mote and the Orchardes without. And yn the Orchardes were Mountes Opere topario, writhen about with degrees like Turninges of Cockelshilles, to cum to the Top without payn.*" (Toulmin Smith 1907, 53).
- 2.8 At about the same time as Leland made his visit, a Royal Surveyor in 1537 reported (regarding the gardens) that the moat was all around the castle except to the "*fore Frunte wt a fayer Garden verey well kepte and at the end of ye sd garden a propre banketyng howse havyng a bayne therin*" (Fisher 1954 vol 2, 57). Later maps (see below) indicate that the banqueting and/or bathing house was located at the inner south-west corner of the moated enclosure. In 1541, George Brown, a bricklayer, and two labourers working on the brick wall on the west of the Old Garden were paid the cost of four chalders of slaked lime and cartage (Fisher 1954 vol 2, 64). These repairs may have been occasioned by the visit of Henry VIII and his Queen to Wressle in September 1541, and implies that they used the Old Garden during their stay.

- 2.9 In 1570, a survey by Humberston noted that “...*The gardens aboute the Castell very well planted with arbors and open walkes and wellkept and preserved; and wyll soe contynue if the pore man may have his stipend allowed which ys yerely 4 li. 7s. 4d. for 3 large gardeynes*” (Fisher 1954 vol 2, 58). The reference to the three gardens at this date may be a late one as, although two keepers of the three gardens were still mentioned in 1542, by 1575 the New Garden was omitted and only the fee for the two earlier gardens was included. Fisher suggested that, by the later 16th century, the New Garden may already have been turned over to other uses, and it was certainly in decay by 1577, when it was described as a piece of ground ‘*ordeyned for a garden and bankettinge houses or houses of plesure*’ (Fisher 1954 vol 2, 26). The same 1577 survey recorded that the gardens and associated buildings to the south of the castle were also in decay (Fisher 1954 vol 2, 58-59). However, despite this decay, some maintenance was clearly still being undertaken to the area around the castle. Included amongst payments for repair works in 1579 was 21s 6d for a new boat, which was necessary both for easy communication across the moats and for the moat-cleaning operations that occurred every year (Fisher 1954 vol 2, 64-65).

The 17th Century

- 2.10 The various plans made by T F Hampe in c.1600 of the area around the castle and the base court (see Fisher 1954; Brears 2010, 62; Stone 2013, 13) provide some limited information on the setting which is useful for the interpretation of earlier surveys and surviving earthworks. For example, on one of the c.1600 plans (reproduced by Brears 2010, 62), the Old Garden is shown as still surrounded by a wall, the east side of which was approximately in line with the centre of the south range. The north side of the wall ran very close to the south moat. A sub-square ‘bayne’ stood at the south-west corner of the moated area, and there was a wall running west from the north-west (Kitchen) tower to the moat. There may also have been a wall along the inner south and west sides of the moat, but this is less certain.
- 2.11 A plan of Wressle village and park made in 1602 (WSA PHA 3547) is reproduced in Fisher’s 1954 PhD thesis (see figure 4). This is an important source for the gardens and the setting of the castle, although there are some reasons to believe that it is in fact less reliable than other of the surviving 17th century plans, and so it should be used with caution. The various features on the plan were assigned a letter code, with a corresponding list written down one side of the plan. The castle is shown, with the base court on the east side across the moat. The moat itself (‘C - The Mote’) is sub-square, but curiously there is a small sub-rectangular inlet at the north-west corner. To the north of the castle moat, there is the New Garden (‘G - The new Garden environed wth a quicksett hedge’) surrounded by a square moat (‘H - The Mote about the new Garden’); there is also an adjacent rectangular pond (‘N - Pondes’). To the south of the castle, within the area enclosed by the moat, at the south-west corner, there is a tower-like structure with a rather pointed roof (‘D - The Bayne’), i.e. the banqueting/bathing house noted in 16th century surveys. To the south of the south moat, there is a wooded sub-square enclosure (‘E - The ould Garden some tyme envyrened with a brick wall but now decayde’), with a north-south aligned building with a pitched roof at the north-west corner (‘F - The Laundrie’). To the south and west of the wooded enclosure, there is an open enclosure (‘W - The Marshe a meadow comon to the Towne’) and to the south of this, a smaller sub-triangular enclosure (‘X - A Close called Bonde Close’); a ‘Y’ marked on the west side of the latter, on the east bank of the River Derwent, indicates ‘The Fish Garthes’, with six presumably fish weirs or traps indicated in the watercourse. To the east of the wooded enclosure, there were two plots or crofts,

each with a house at the north-east corner. There was then a trackway, which communicated both with an east-west street to the north and an angled track to the south. Beyond the trackway, there were three further crofts within the EDAS survey area, extending for increasing distances to the south. On the south side of the crofts, there were two ponds, both sub-rectangular but one (M) approximately twice the length of the other (L).

- 2.12 There are other early 17th century maps, but it is difficult to tell to what extent they are derived from one another (or the 1602 plan), as all contain both contrasting and comparable detail. An undated but early 17th coloured plan of Wressle shows the moat around the castle, and the approach from the east through the base court (see figure 5). The Old Garden can be seen, but it is not named as such, and neither do the 'bayne' or the 'laundrie' buildings shown in 1602 appear. However, the two village house plots to the immediate east of the Old Garden are shown. The arrangement of tracks and the main street is also similar, although the two ponds shown in 1602 to the south of the house plots are not shown; this area may be divided from the adjacent area of 'Marsh', and there is also an 'M' next to a Maltese cross, which may signify a meadow although the significance of the cross is as yet uncertain.
- 2.13 A map of Wressle dating to c.1610 (Falkingham Collection; photographic copy held in WSA Garland N39261 & YAS MS1285/3) is broadly similar (see figure 6). Again, it shows the moat surrounding the castle, although the wide approach from the east through the base court either crosses or interrupts the moat. The Old Garden appears to the south of the moat (but does not border on it) and has gently curving west and south sides. To the south-west, there is an area of marsh, coloured blue; the area to the east shown as ponds in 1602 appears to have been dry and has the appearance of a village green. The two house plots to the immediate east of the Old Garden are shown, and they have a 'Hemp Garth' enclosure to their north; the western house plot is considerably wider than the eastern plot. The arrangement of tracks, main street and house plots is similar to the early 17th century plan noted above. To the south of these, south of the former pond/marsh area, there are a number of open strips, aligned north-west/south-east, and crossed by a track leading to the church.
- 2.14 Fisher (1954 vol 2, 67) opined that by 1613 all the gardens were abandoned, except for that part reserved for the keeper of the castle, which he suggested was probably the small plot to the immediate south of the castle but inside the moat. This view may be supported by a 1624 map of Wressle produced by Robert Norton (Falkingham Collection) which is essentially, a smaller scale, less detailed, version of the three earlier maps, and probably partly derived from them (see figure 7). The main differences are that the Old Garden is not specifically named, and although shown, a house appears in the top north-east corner - is this a confusion with the two house plots shown to the east on the earlier maps? The New Garden is also not named, but it is shown and, for the first time, there is some indication of the internal layout. What appears to be crudely depicted is a quartered arrangement, essentially cruciform pathways dividing the garden into four equal parts, with a quarter circle to each quadrant. If correct, this is the only known cartographic evidence for the internal layout that survives. The documentary evidence suggests that the bridge across the moat had been repaired between 1577 and 1613, perhaps indicating that some of the early 17th century expenditure did indeed encompass the gardens. The castle itself was the only Yorkshire Percy residence found to be still in a reasonable state of repair in 1630 (Fisher 1954 vol 2, 67).

- 2.15 It is quite possible that whatever remained of the three gardens in the early 17th century was further damaged by the events of the mid 17th century. Wressle was garrisoned for Parliament during the Civil War, and in 1646 the soldiery were said to have caused over £1000 worth of damage to the castle and its surroundings, including “*their havock of his [the Earl's] woods, Enclosures etc*” (Fisher 1954 vol 2, 68-69). Such damage to the former setting of a castle would not be unique during this period, and another example has been described at Kenilworth in Warwickshire (Rakoczy 2007, 123-126). In June 1648, a parliamentary committee in York sent a demolition team out to Wressle, and they also caused considerable damage before their work was stopped. However, in 1650, the Earl of Northumberland was ordered to demolish all but the south range of the castle, which was to serve as a manor house for his local estates (Anon 1770, 454-458; Brears 2010, 61).

The 18th Century

- 2.16 There is little known evidence for the appearance of the castle's environs during the early 18th century. The Percy estates were divided in the mid 18th century, with Wressle and Leconfield passing to the Wyndham family, the Earls of Egremont. The Northumberland earldom passed to Elizabeth Seymour and her husband Sir Hugh Smithson, and they were created first Duke and Duchess of Northumberland in 1766. The Duchess was particularly interested in her Percy ancestry, and visited Wressle before 1754 (Brears 2010, 61-63). She also sent her architect and agent, Mr John Bell, to Wressle in c.1765 to record details of the interior, and the information in his surviving sketchbook has proved invaluable in the light of the disastrous fire which occurred at the end of the 18th century (YAS MS349; Brears 2010, 63).
- 2.17 On a 1767 map of Wressle (Falkingham Collection; photographic copy in YAS MS1285/17-18), the water-filled moat is shown around the castle, but significantly it is interrupted in two places (see figure 8). The first is to the east, where the base court formerly led into the moat, and where it is shown as interrupted on the earlier maps. The second break is at the south-west corner, where the moat had presumably been infilled since the 17th century. The Old Garden no longer existed as a separate entity, but its area had been subsumed into an orchard, which also included the two house plots to the east of the Old Garden shown on the earlier maps; a small building on the east side of the orchard may have been one of the houses from the plots. The orchard also incorporated some of the land marked as ‘Hemp Garth’ in 1610. To the east of the orchard, some of the village crofts survived, but several had been amalgamated since the early 17th century. To the south of the crofts, the pond area of 1602 is marked as ‘Waste’, and is separated by a boundary from ‘The Marsh’ to the west. To the south of these areas, there are two enclosures (‘Pound Bank Roods?’); both have north-south aligned open strips or ridges marked within them, and they are crossed by the trackway leading to the church. To the north of the castle, the New Garden had completely gone, and the area had been redesigned as a ‘Little Park’.
- 2.18 A number of engravings of the castle appeared in the later 18th century, but they are of limited use for the landscape setting and gardens, as they mostly only show the south front and, when compared to other contemporary sources, can be seen to have been ‘tidied up’ for publication. A pair of pen, ink and watercolour drawings made by J Brown, perhaps in the 1770s, are more useful (<http://gottcollection.hepworthwakefield.org/item/610> & [611](http://gottcollection.hepworthwakefield.org/item/611)) (see figure 9). The drawing looking north shows that the area to the south of the castle was surrounded by a brick wall. This enclosed area seems rather bare, although a

wide gravel or sand path ran around the castle's external walls, with another path running towards an inserted doorway in the central part of the south range. The wall can also be seen on the drawing looking south-east. This latter view is most significant because it shows that the ground plan of the demolished east range was still discernable, the walls surviving to over five courses high in places. This confirms that the dotted depiction of the castle's east, north and west ranges shown on the 1767 map was marking remains which were still visible, and raises the possibility that the structures within these ranges, shaded on the map, were surviving medieval elements, such as the bakehouse. In turn, one can then question how comprehensive the demolition of 1650 actually was, and whether what remained to be drawn in the 1770s was the result of this demolition or an intervening 120 years of salvage dismantling, stealing and natural decay.

- 2.19 In 1796, the most disastrous event in the castle's history since 1650 occurred. On the 19th February, the tenant farmer who was then occupying the lower floor decided to clean his chimneys by deliberately setting fire to them. The fire subsequently ran out of control, destroying the surviving 16th century interiors (Brears 2010, 63). Estate surveys of 1797 and 1811 note the resulting ruination of the castle's south range, and give a useful description of the buildings of the adjacent farm complex. The existing Castle farmhouse is usually dated to c.1796, although the 1811 survey states that it had only just been erected, so perhaps placing it more accurately to 1810-11. The tenant of the farm in 1797 was William Richardson, and in 1798 it was let to Stephen Marram for 21 years for the sum of £244 per annum (Fisher 1954 vol 2, 76-77).

The 19th and 20th Centuries

- 2.20 The 1839 Wressle tithe map and award (BIHR) marks only the water-filled south moat in front of the castle, with the same angled approach of the base court as is apparent on early 17th century maps (see figure 10). To the south of the moat, plot 118 is marked, occupying the whole of the area formed by the Old Garden and the house plots to the east shown during the 17th century, as far as the main north-south route through the settlement. The southern boundary has an angled plan form, and is formed by another water-filled drain. The enclosure is described as a 'Garth', used for pasture, and, like the rest of the enclosures around the castle, it was owned by Colonel George Wyndham and occupied by Edward Latham. To the south of this enclosure, an east-west sinuous area (plot 122), occupying the marsh and ponds of the 17th century, was described as 'Marsh Bank and Foreshore' and used for oats. In the south-west corner of this area, there was a small rectangular brickyard (plot 122a), occupying only three roods in extent (c.0.3ha), on the north side of the land allocated to the Hull to Selby Railway. This seems to be the only occasion when the brickyard appears on a map, and so it must have been short-lived. The southern part of the geophysical survey area above the marsh comprised a single enclosure, named as 'Church Field Close', (plot 123) used as pasture, again with a drain defining its northern limit close to the lowest lying ground.
- 2.21 Some 15 years later, in 1854, the Ordnance Survey 1st edition 6" to 1 mile map was published (surveyed 1849-51) (see figure 11). The arrangement of fields and enclosures around the castle was very similar to that shown on the 1839 tithe map, although the brickyard was no longer present. The large field (plot 118 on the tithe map) to the south of the moat is now marked as 'The Old Orchard' and is shown with a sparse covering of trees. The 1854 map also shows the Hull to Selby Railway line, which had been constructed between 1834 and 1838, and opened in July 1840, some 500m to the south of the castle (Hoole 1978, 44). In 1957, Castle

Farm was sold as part of the larger Egremont Yorkshire Estates to Mr R H Falkingham, who was the sitting tenant, and it has remained with this family until the present day (Stone 2013, 19-21). Decaying trees, probably elements of the 'Old Orchard' shown in 1854, survived between the castle and the south moat as recently as 1996 (Emery 1996, 414-419) but have since fallen or been removed.

3 THE RESULTS OF THE 2014 EARTHWORK SURVEY

Introduction

- 3.1 The following chapter provides a summary description and interpretation of the earthworks relevant to the geophysical survey results, based on the 2014 earthwork survey (Richardson & Dennison 2015). To aid identification, individual or groups of earthworks were given site numbers (e.g. **Site 12**) in 2014, and the same numbers have been retained here; it should be noted that the site numbers should not be taken to infer any kind of chronological development or relationship. Figure 12 shows the identified earthworks, while figure 13 provides an interpretation.
- 3.2 The following text also follows the established convention of referring to the surviving west tower as the south-west tower, and the surviving east tower as the south-east tower, based on their original locations within the quadrangular layout of the castle's inner court. Finally, in the following text, 'modern' is taken to mean dating to after c.1945.

Earthworks within the Moat Garden (Sites 1a to 1c)

- 3.3 Fisher (1954 vol 2, 66) suggests that a garden within the moated enclosure was present by the later 15th century. Of course, it need not necessarily have been located just to the south of the castle, and it may well have continued around all three sides of the castle, but there is documentary evidence to suggest that it was present to the south at least. It contained a banqueting and/or bathing house, and was once linked to the Old Garden to the south by a wooden bridge. By 1577, the banqueting house was described as being in very great decay.
- 3.4 Within the area enclosed by the moat, the ground to the west of the castle (**Site 1a**) was, at the time of the 2014 survey, mainly occupied by post and rail cattle pens; these were subsequently removed in April 2015 (Dennison & Richardson 2015, 5-6). On the east side of this area, there is a right-angled length of wall constructed partly from re-used castle stone, which extends south from the south-west corner of the south-west tower. To the west of this is a trackway, which appears to have been in this position since at least the late 18th century, crossing the gap in the moat shown on the 1767 map. To the west of the trackway, there is a spread, north-south aligned, bank running for c.20m broadly parallel to the castle's west side. At the very south-west corner of this area, the east scarp of the west moat is unevenly stepped, and it is here that the banqueting house and/or bayne, shown on the c.1600 and 1602 plans, is located; the plans suggest a building perhaps c.7m square, tower-like in form and with a pointed roof. There is a flat-topped platform in this internal corner of the moat, which almost certainly represents its position (**Site 1d**). This structure probably belongs to the 16th century and, although banqueting houses are a common feature of 16th century gardens, the structure at Wressle was also associated with bathing. The above-mentioned right-angled length of wall marks the western boundary of the area between the castle and the south moat (**Site 1b**). It appears to coincide with the wall shown on Brown's c.1770s pen, ink and watercolour drawings (see figure 9 bottom), although arguably the wall on the drawing is somewhat further away from the tower.
- 3.5 The area between the castle and the south moat measures 14.0m wide in front of the south-west and south-east towers, and some 16.0m wide in front of the south range running between them. It appears that the section in front of the range was

defined by shallow scarps at either end. There is no clear above-ground trace of the wall shown running along the top of the north side of the moat as depicted on late 18th century engravings and drawings. The area within the moated enclosure on the east side of the castle (**Site 1c**) is now continuous with that to the south, and it is bounded to the east by the east moat. There is a spread bank, 3.5m wide, running parallel to the top of the east moat's west scarp, as far as the wall which forms the northern boundary of the survey area. A wall is marked here on the c.1600 plan of the base court, with adjacent text that reads "*this wall of brick rising V yearde [i.e. c.15 feet] heigh*" (see figure 3). However, the existing wall appears to be the same as that shown in this location on one of Brown's c.1770s drawings. The wall runs east as far as an earlier, brick structure, which it butts, and which is described in detail (**Site 2c**) below.

The Moat and Related Structures (Sites 2a to 2d)

The South Moat

- 3.6 The south moat (**Site 2b**) is set on a slight north-east/south-west alignment, although for the purposes of the following description, it is considered to be aligned east-west. Within the earthwork survey area, the south moat is 125m long, including the returns at either end; this is slightly shorter than the original measurement would have been, as the western scarp of the west moat has been removed. The south moat decreases in width from east to west; at the east end, measured across the top, it is 20.0m wide, but at the west end this decreases to between 12.0m to 14.0m. The north scarp stands a maximum of 0.8m high and is gently sloping. The south scarp stands up to 1.4m high and is slightly more steeply sloping; for much of its length, it is divided into an upper and lower scarp, with a narrow flattened area between. There may be a small rectangular structure c.7.0m long cut into the west end of the upper slope. The top of the south scarp is set on average 0.7m higher than the top of the north scarp. The flattened base of the south moat is relatively level, and also decreases in width from east to west. A modern drain runs along the base of the moat.
- 3.7 Towards the west end of the south moat, there is a 20.0m long section where the earthwork is both much shallower and more poorly defined. This coincides with the gap shown here in 1767, and is interpreted as a deliberate infilling done at some point between the mid 17th century and the later 18th century, perhaps to link the areas within and without the moat for agricultural purposes. The south moat still held water in 1839, if the latter depiction on the tithe map is to be believed.

The West and East Moats

- 3.8 Beyond the infilling, the south moat resumes, and returns north through a near right-angle to form the west moat (**Site 2a**); only the southern c.30.0m of this north-south alignment was surveyed in 2014, but the survey was subsequently extended at a later date after vegetation clearance. In this southern section, the western scarp of the west moat has been removed, and there is now little trace of it beyond the adjacent thorn hedge/post and wire fence boundary. The remaining portion has an average width of 8.0m across the top, with a relatively level flattened base.
- 3.9 At its east end, the south moat returns north through a near right-angle to form the east moat (**Site 2c**). Surveys from 1537 and 1577 both use similar phrases, indicating that the castle was moated on all but the east side (Fisher 1954 vol 2, 57-58). However, an east moat, interrupted by the entrance from the base court, is

clearly shown on all the early 17th century maps of Wressle, and so the 16th century phrasing should probably be understood as meaning that the east moat was dry rather than wet. It is possible that the moat was culverted under the base court, as any interruption would have prevented flow through the moat as a whole, leading to silt and vegetation build-up. The southern part of the east moat now lies completely within the garden of Castle Farm farmhouse, and has evidently been subject to some landscaping, although it is noticeable that the bottom is on average some 0.5m higher than the bottom of the south moat, supporting the idea that it may once have been dry. This section of the moat is 28.0m long, and has an average width of 18.5m across the top, narrowing to 14.0m at the very north end where it meets a ruined brick garden structure (**Site 2d**).

Garden Structure

- 3.10 This ruined brick structure (**Site 2d**) is shown, with a similar ground plan to that which now exists, on the c.1600 plan of the base court (figure 3). However, it is not clearly marked on any other maps or plans (for example, that dating to 1602) after this date. On the c.1600 plan, there is an additional sub-rectangular structure on the east side which no longer survives; the plan indicates that it measured '11 foot' east-west by '7 foot' north-south. In addition, the existing structure has the words "*This stare case rising som 7 yerds high of the syz?e [same?] fashion*" written below it. This structure can now be viewed either from within the garden of Castle Farm farmhouse or from the yard to the north, which follows the line of the base court's approach to the castle's gatehouse. However, the only surviving access to the interior is from the area enclosed by the moat i.e. from between the castle and the east moat. The structure was recorded in November 2014, as part of surveys and monitoring work carried out during repairs to the castle. A detailed description is given elsewhere (Dennison & Richardson 2017, 71-72), but the following provides a summary (see figure 14).
- 3.11 The surviving structure measures 6.75m east-west by 3.50m north-south, and it is built of red handmade bricks (average dimensions 250mm by 130mm by 50mm) generally laid in English bond (one stretcher to each header course) and set with a lime mortar. A doorway in the west elevation, shown as an internal opening in c.1600, it is now fitted with a wooden door frame of late 19th or early 20th century date. Above this, the brickwork begins to corbel out, with a socket in the higher courses; the upper part of the elevation has been rebuilt with late 19th or early 20th century brickwork. The doorway leads into a sub-circular space, 1.65m in diameter, which formerly housed the newel stair shown here in c.1600. This must have risen to the upper part of the structure, although the top is now capped with a later concrete and brickwork dome. In several places to the interior, scarring is visible which may mark the former position of the outer edge of stair treads.
- 3.12 The main feature of the south elevation, facing the east moat, is a large depressed or four-centred arch, 3.10m wide and standing 2.65m high above the existing ground level. Although sometimes characterised as a fireplace, the form of the arch and its juxtaposition with the east moat suggests that it is far more likely to have been associated with the moat. The north side of the structure, facing into the base court, is less prominent. The west end has a canted plan form, the lower part built of the same early brickwork as is visible to the south (garden) side, although it has been much repaired recently. Within the eastern section, the upper part of the blocked arch noted to the garden side is visible. As part of the repair works, the upper part of the structure was cleared of vegetation and soil, revealing a modern flat concrete slab roof with a low concrete dome over the point where the newel stair would formerly have emerged.

The Old Garden (Sites 3a to 3e)

- 3.13 The Old Garden was located to the immediate south of the south moat (**Site 2b**). It appears to have been in place by 1472, by which date it apparently contained a building known as the 'School House'. Records made between 1516 and 1523 suggest that this building had an inner and outer chamber above a ground floor, and that these chambers were decorated with painted verses. The Old Garden, and apparently also a garden within the castle's moat, were looked after by a single gardener in the later 15th century. The Old Garden appears to have been described as an 'orchard' by Leland in 1538, perhaps containing topiary and/or mounts. The garden was surrounded by a brick wall, repaired in 1541. In 1577 it was said to contain alleys for bowling and walking in, but by this date the surrounding brick wall was completely decayed, as was the School House. The Old Garden had formerly been linked to the garden within the castle's moat by a bridge; this too had collapsed by 1577, but had been rebuilt by 1613. In 1602, the Old Garden was shown as a wooded sub-square enclosure ('E'), with 'The Laundrie' at the north-west corner ('F') depicted as a two storey rectangular structures alined north-south (see figure 4); with the exception of the latter, which only appears in 1602, the garden is similarly depicted on the other 17th century maps. By the second half of the 18th century, the Old Garden had been subsumed into a larger orchard to the south of the south moat (see figure 8).
- 3.14 The 2014 earthwork survey found no clear above-ground evidence for the brick wall which formerly surrounded the garden throughout the 16th century although, by using a combination of cartographic and earthwork evidence, it was possible to establish the garden's former extent. Taken together, they suggest that the Old Garden (as indicated on early 17th century maps) had approximate dimensions of 90m north-south by somewhat less (perhaps c.50m) east-west; on the 1610 map, it is labelled as covering just over one acre (see figure 6). The construction of profiles through the Old Garden and surrounding area, demonstrated how little vertical variation there was across this part of the castle's setting (Richardson & Dennison 2015, figure 15). However, when the vertical scale was exaggerated, the raised plateau that the Old Garden occupies became very clear. These relatively small differences in height are important as, in a flat landscape close to the river, they would have ensured that the garden would have remained above water level during times of flood, and that it remained generally drier all year round; in 1538, Leland noted that the river frequently overflowed (Toulmin Smith 1907, 54).
- 3.15 The northern boundary of the garden as depicted in 1602, with the moat, is represented by a spread flat-topped bank, between 3.0m to 4.0m wide, which is best preserved along the central part of the moat (**Site 3a**). This bank has been disturbed at its east end by a tree guard, but east of this, a more prominent sub-rectangular bank is present, 20.0m long, 8.0m wide and up to 0.5m in height. Both of these features may have fallen within the narrow strip of ground, shown as separating the moat and garden in 1610, which may represent a former village street (see below), but could also form one of the alleys mentioned in 1577. The western boundary of the Old Garden survives as a south-west facing scarp (**Site 3b**), disturbed at the north end but visible further south, close to the modern flood bund. It curves around to the east, and is coincident with a shallow, curvilinear depression, itself almost certainly a later re-cutting of an earlier boundary (see Site 5a below). The eastern boundary of the garden is less certain. There is a further spread bank (**Site 3c**), on a north-west/south-east alignment, which appears to mirror the angle of the eastern boundary shown in 1602, or alternatively, some 10m to the east, another east-facing scarp which runs towards the prominent sub-

rectangular bank on the northern boundary. However, both of these earthworks appear to be placed to the east of the east wall of the garden as shown in c.1600 (Brears 2010, 62), which was apparently in line with the centre of the south range, and there is another flat-topped north-south bank in this approximate position which perhaps looks more convincing.

- 3.16 The 2014 survey also recorded some earthworks within this enclosure that might possibly relate to the former internal structure of the gardens. All of these earthworks are discrete, with very few being more than 0.5m in height or depth. In the north-west corner of the garden area, there are three sub-rectangular depressions, all aligned east-west and c.10.0m long, that probably represent the site of 'The Laundrie' building shown here in 1602 (**Site 3d**). To their immediate north, there is a flattened strip of ground c.5.0m wide. This strip has been ploughed out where it meets the western boundary of the 2014 survey area but interestingly, at this point, there are two mature oak trees, each trunk being between 1.0m and 1.2m in diameter, placed the same distance apart as the strip. It is possible that this strip represents a fragment of the narrow strip of ground shown as separating the moat and garden in 1610, and that the oak trees are a remnant of later planting which marked its course.
- 3.17 In terms of garden structures, the most convincing earthworks are located in the central part of the area defined as the 'Old Garden' on early 17th century maps, where there appears to be a pair of very slightly raised sub-rectangular platforms, each measuring c.20.0m north-south by 15.0m east-west (**Site 3e**). It is also possible that some of the very faint north-south aligned earthworks within the 'Old Garden' area represent the denuded remnants of other village plots which formerly extended into this area (see Site 4 below), and which were subsequently overlaid by the Old Garden.

The Former Extent of the Village (Sites 4a to 4e)

- 3.18 It is clear that the settlement of Wressle has a complex and long-lived history (Richardson & Dennison 2015, 40-42), but that part in the vicinity of the castle, as it then survived, is clearly shown on several of the early 17th century maps. In 1602, there were two plots or crofts, each with a house in the north-east corner, on the south side of a major east-west route and to the immediate east of the Old Garden (see figure 4). This east-west route formed the key element of a two- or double-row village which extended from a village green to the east to perhaps a river crossing point in the west (see figure 6 top). The western croft was wider, and apparently shared an angled boundary with the Old Garden. On the eastern side of the east croft, there was a short north-south trackway, which joined with the main east-west street, forming one arm of a crossroads. The north arm of the crossroads continued towards the castle gatehouse ('3'), while the west arm continued past the house in the aforementioned western plot. Opposite the west arm, there appears to have been a house in approximately the same location as the existing Castle Farm farmhouse. To the east, the main street had a number of house plots on its north and south sides; the former were considerably shorter than the latter, seemingly respecting the southern boundary of the Little Park ('K'). The south end of the north-south trackway angled to the south-east in 1602, running along the north bank of a pond ('M') and essentially forming a back lane to this side of the village.
- 3.19 That part of the village lying within the 2014 earthwork survey area is similarly depicted on the early 17th century plan of Wressle, but by 1610, a 'Hemp Garth' is shown occupying the plot in the north-west angle of the crossroads in 1602, which

corresponds to the site of the later Castle Farm farmhouse (see figure 6). The slightly later plan of 1624 marks one of the two houses shown immediately east of the Old Garden in 1602 as being within the garden, although this may simply be an oversimplified representation (see figure 7). By 1767 the houses and plots on the west side of the crossroads had gone, as had the western continuation of the trackway, although one possible small structure is depicted on the west side; as previously noted, the 'Orchard' now extended over this area (see figure 8). By the time of the 1839 tithe map, there had been a radical re-design of the village, with a new road (labelled as such in 1854) having been constructed on a north-south alignment to the east of the castle, allowing the 'Old Orchard' to be extended further to the east and separating the castle from the village entirely (see figure 10).

- 3.20 The earthworks representing those elements of the former village within the 2014 survey area are best described from west to east. The house formerly located in the westernmost plot on the south side of the road appears to correspond with a shallow but regularly formed rectangular depression, measuring c.15.0m north-south by 12.0m east-west (**Site 4a**). There is little or no above-ground trace of the plot to the east shown in 1602/1610, or indeed the house within it, although the area where it was located (**Site 4b**) is crossed by spread north-south aligned banks, resembling denuded ridge and furrow. However, this area is also located directly in front of Castle Farm farmhouse, built in c.1810-11 (Fisher 1954 vol 2, 76), and it might be that any upstanding features were removed to create an uninterrupted view to the south from the farmhouse. These two plots are shown to lie on the south side of the road, formerly running west to the river, an alignment probably represented by the flat-topped earthwork bank on the south side of the south moat (**Site 3a**). The north-south trackway shown in 1602/1610 survives well, as a linear depression, up to 11.0m wide and 0.7m deep (**Site 4c**). The north end fades before it meets the hedge forming the south boundary of Castle Farm farmhouse's existing garden. The south end curves slightly to the south-west, where it is cut by a curvilinear, generally east-west aligned, depression. Although this broadly follows the south-eastern route of the trackway as shown in 1602, it was almost certainly re-cut at a much later date (see Site 5a below).
- 3.21 To the east of the north-south trackway (**Site 4c**), there is a series of parallel linear earthworks, separated by a linear depression, which seems to represent two of the narrow plots or crofts depicted here in 1602/1610. The first plot (**Site 4d**) has a maximum north-south length of 70.0m and an east-west width of 30.0m within the survey area. Towards the north-west corner of the plot, there is a flattened area or platform, and to the south, a U-shaped depression which has a high proportion of fragments of brick rubble eroding out of its sides; either earthwork could represent the building shown here in 1602/1610. The plot contains linear earthworks resembling ridges. It is not clear whether these are former elements of the village's open field system which became isolated when the crofts were formed, whether they were created within the crofts, or whether they indicate that narrower plots were combined to form wider crofts. However, with regard to the latter, it is significant that these 'sub-divisions' are marked on the 1767 map, either as solid or dotted lines; if earlier, narrower crofts would have had an original width of c.15m. The second plot to the east (**Site 4e**) has a maximum north-south length of 90.0m and an east-west width of 30.0m (east-west) within the survey area, although the original width is almost certainly truncated by the 'New Road' to the east of the survey area. At the north end of the plot, where a house is shown in 1602/1610, there is an irregularly shaped sub-rectangular depression, 15.0m across and up to 0.5m deep.

The Marsh and Ponds (Sites 5a to 5d)

- 3.22 In 1577, a survey recorded that within the 'outer garden' there were "*certen ponds for fishe used for plesure*". The preceding text demonstrates that the term 'outer garden' refers either to the Old Garden itself or the area close to it (Fisher 1954 vol 2, 58-59). The 1602 map shows two 'pondes' to the south-east of the Old Garden, at the south end of the village plots extending south from the east-west street ('L' and 'M') (see figure 4). Both were sub-rectangular in plan, but that to the east was approximately twice the length of that to the west. On all subsequent maps, the same area appears simply as marsh or waste.
- 3.23 The positions of the ponds are separated from the garden and village earthworks to the north by a long curvilinear depression which has a sinuous east-west alignment (**Site 5a**). Although the southern boundaries of the Old Garden and the two plots to its east, as well as a trackway, followed or respected the line of this depression in 1602/1610, the existing earthwork is a later re-cutting along these earlier features. It has clearly disturbed some of them, and may have been re-cut in two separate phases. By 1767, the Old Garden (Site 3) and the two crofts to the east (Sites 4a and 4b) had been amalgamated into a larger orchard, with its southern boundary running along the existing earthwork and its eastern boundary along an earlier north-south trackway; both may have been re-cut when the larger orchard was created (see figure 8). By 1839, the area of the orchard had been extended east again (although it was then described as pasture), with the southern boundary depicted as an open water-filled drain (see figure 10). Given that there are no clear breaks within the existing earthwork, it was probably re-cut again between 1767 and 1839 along its whole length.
- 3.24 The west end of the linear earthwork (**Site 5a**) is overlain by the modern flood bund adjacent to the River Derwent, but it cuts through the former western boundary of the Old Garden. It is at its most prominent here, being 6.0m-7.0m wide and up to 0.6m deep, but as it moves east it becomes much fainter, and is often less than 0.4m deep. At the south end of the Old Garden, there is a sub-rectangular depression, aligned parallel to the main earthwork, c.13.0m long by c.6.0m wide. This is joined to the linear earthwork by a narrow channel, and they are possibly contemporary. If this is the case, it raises interesting questions about another similar but much fainter earthwork some 40m to the east, and the possible structures previously described at the south end of the crofts (Sites 4d and 4e) adjacent to the main earthwork; rather than being earlier features, are they perhaps associated in some way with the cutting of the main earthwork?
- 3.25 Although their remains are quite slight, both of the ponds shown in 1602 remain visible, occupying the lowest lying part of the 2014 earthwork survey area, which still floods after prolonged heavy rain. The larger eastern pond (**Site 5b**) measures a maximum of 90.0m east-west by 20.0m north-south; originally, it would have been longer but it has been truncated by the 'New Road' (now Beighton Road) to the east of the survey area. In the base of the pond, very denuded ridge and furrow is visible on the same orientation as that lying further upslope to the south. The smaller western pond (**Site 5c**) measures a maximum of 50.0m east-west by 40.0m north-south, and again has slightly more prominent ridge and furrow crossing the base, but on a slightly different orientation. There is a slight fall in the ground surface from east to west across the low-lying part of the survey area, and so water is assumed to have flowed from the eastern pond into the western pond; given that they are described in the late 16th century as fish ponds used for pleasure, a constant flow of water through them, as well as a bypass leat, would have been vital. It is also probable that there was an artificial barrier preventing

water from the adjacent marshes entering the ponds when the Derwent was in flood, stopping the ingress of silts and other materials and the egress of valuable fish. There are traces of a third pond or area of water to the west, set on a slight north-east/south-west alignment and with a roughly rectangular plan, measuring at least 65.0m long by 30.0m wide (**Site 5d**). As previously outlined, this area is labelled as 'the marshe, a meadow common to the Towne' in 1602 ('W') and 'Marsh' on the later plans.

The Former Village Field System (Site 6)

- 3.26 To the south of the ponds and other low-lying ground in the centre of the 2014 earthwork survey area, the land begins to rise again, reaching over 7.0m AOD at the southern boundary. In 1602, the western part of this area appears to coincide with a sub-triangular enclosure called 'Bonde Close' ('X') (see figure 4). The higher ground is shown as a number of open strips, set on a slight north-west/south-east alignment. These open strips also appear on the 1624 plan, with a north-east/south-west aligned trackway running across them (see figure 7). They still appear on the 1767 map as dotted features, the spacing of which indicates that individual ridges are being shown; the east end of this part of the survey area is named 'Church Close' at this date, with 'Pound Bank Roods' to the east (see figure 8). By 1839, this area formed a large single enclosure named as 'Church Field Close' (see figure 10).
- 3.27 In terms of surviving earthworks, this part of the 2014 survey area is the least well preserved, although areas of faint north-west/south-east aligned ridge and furrow were recorded. This is best preserved in a small fenced coppice, where it has been protected from 20th century agricultural improvements; it has a ridge to ridge width of between 6.0m-7.0m, and the ridges survive over 0.5m in height.

Former Brickyard (Site 7)

- 3.28 The small brickyard shown only on the 1839 tithe map (see figure 10) is defined by a spread, right-angled bank, mainly aligned north-east/south-west, enclosing an area measuring c.35.0m long by c.15.0m wide (see figure 11). Within this enclosed area, there is a spread curvilinear mound. The brickyard earthworks appear to be cut by a shallow gully on their southern side, measuring up to c.10.0m wide (see above). The brickyard is not shown on the 1854 Ordnance Survey map (see figure 11), suggesting it was relatively short-lived.

Modern Drainage and Other 20th Century Works

- 3.29 As part of the 2014 earthwork survey, Mr Graham Falkingham was consulted as to the known construction and placement of drainage across the area. A drainage channel runs almost the whole length of the eastern boundary of the survey area, punctuated by concrete and brick drain covers, the largest close to the east end of a former pond (Site 5b). Three other parallel drainage channels, set on shallow north-east/south-west alignments and spaced at 20.0m centres, cross two of the village plots (Sites 4d and 4e) in the north-east part of the survey area.
- 3.30 There are two further channels to the west, crossing two more of the house plots (Sites 4a and 4b) and running into the Old Garden. These cuts run into a north-west/south-east aligned buried drain, which itself runs to an inspection chamber with a concrete cover located at the south-west corner of the western pond (Site 5c); a right-angled scarp here is probably associated with the construction of the chamber. There is a similar drain running into the inspection chamber from the

south-east, and an east-west drainage cut is visible to the south of the eastern pond (Site 5b), also heading towards the chamber. From the inspection chamber, the main drain runs south-west, towards an outlet located close to the junction of the modern flood bund and the railway embankment. This would take it very close to the earthwork marking the northern side of the 19th century brickyard (Site 7), and it is possible that its construction may have affected the earthworks here. Finally, there is a small stone drain cover in the base of the south moat (Site 2b), suggesting that some drainage has been dug through here as well. These drainage channels are not shown on figure 12.

- 3.31 The only eroded trackway crossing the survey area has been worn by cattle. It enters the survey area through the post and rail fence forming part of the northern boundary, close to the north end of one of the building plots (Site 4d). It runs south-west as a narrow strip, generally less than 1.0m wide, across the Old Garden; where it leaves the western boundary of the Old Garden (Site 3b), there is a small embankment before the trackway rises up the modern flood bund.
- 3.32 A line of telegraph poles also run north-west/south-east across the north-east part of the survey area, and some of the poles have minor disturbance around their bases. A line of electricity poles runs in the opposite direction across the south-eastern part of the survey area. Again, there is some disturbance associated with some of the poles, most markedly around the pole terraced into the slope to the south of the eastern fish pond (Site 5b).

4 THE RESULTS OF THE 2019 GEOPHYSICAL SURVEY

Introduction

- 4.1 The following text summarises the results of the geophysical survey (Sykes 2019), which is reproduced in full and unedited as Appendix 1. As noted in Chapter 1, both magnetic and earth resistance techniques were used (see plates 1 and 2), and each identified anomaly is prefixed by a letter. The weather prior to undertaking the resistance survey had been dry with a prolonged period of sunshine, which had the effect of drawing sub-surface moisture towards the surface, meaning that the resistance readings were less differentiated - the contrast between the high and low readings was more subtle than if the weather prior to the survey had been damper. The interpretation of the magnetometer readings are shown in figure 15 while figure 16 shows the interpretation of the earth resistance data, both superimposed on the 2014 earthwork survey results.

Ferrous Anomalies and Magnetic Disturbance

- 4.2 Ferrous anomalies, recorded as individual 'spikes' or as large discrete areas, are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation. However, there is no obvious pattern or clustering to their distribution in the Wressle survey to suggest anything other than a random background scatter of ferrous debris. A number of sizable, isolated, magnetic responses were also detected, corresponding with the iron guards placed around the trees to protect them from livestock.
- 4.3 In the north-east corner of the survey area, two irregularly-shaped magnetic responses are likely to be evidence of ground disturbance, caused by either the demolition of earlier structures, as identified by the 2014 earthwork survey (**Sites 4d and 4e**), or through the removal of trees associated with the earlier orchard (see figure 15). A linear magnetic response also follows the line of the south moat, to the south of the castle, suggestive of some infilling. A buried service pipe was also detected on a north-west to south-east alignment, running from Brighton Road towards Castle Farm.

Agricultural Anomalies

- 4.4 Prominent magnetic anomalies characteristic of ridge and furrow cultivation were detected across the southern extent of the survey area, mirroring that identified by the 2014 earthwork survey (**Site 6**) (see figure 15). Similar responses were detected in the north-east corner of the survey area (**Sites 4b and 4c**), although these were partly obscured by the magnetic signature of the tree defences. The ridge and furrow was also detected by the earth resistance as having high readings, and these correspond closely with the earthworks recorded during the previous earthwork survey (see figure 16).
- 4.5 A curvilinear field drain was identified running through the area suggested to have formerly been the edge of a village green and then ponds (**Sites 5b to 5d**) (see figure 15). Surprisingly, the ponds were not clearly defined in the magnetic data, although they were picked up by the resistance data, suggesting retained moisture (**R3**; see figure 16). A series of thin, parallel, low resistance linear trends were also detected in the northern half of the survey area, orientated west to east; representing buried recent land drains (see figure 16).

Geological Anomalies

- 4.6 The geophysical survey detected a number of anomalies that have been interpreted as geological in origin, probably detected because of the variation in the composition and depth of the deposits of superficial material from which they derive. A linear alignment was detected within the area identified as a marsh and possible harbour/landing area and former village green, and later ponds (**Sites 5b to 5d**).

Possible Archaeological Anomalies (see figures 15 and 16)

- 4.7 To the immediate west of the castle, in the area where the banqueting house or 'bayne' was located at the internal angle of the south and west moats (**Site 1d**), a number of magnetic anomalies were identified (**P1**). They are likely to be associated with the structure, although later activity and the magnetic readings from the edge of the moat have obscured the clarity of the results. To the south of the 'bayne', beyond the corner of the moat, a further set of anomalies (**P2**) were recorded, which could possibly be associated with the former 'Laundrie' structure (**Site 3d**).
- 4.8 A disparate collection of anomalies (**P3**) were located centrally within the survey area, on the slightly raised ground to the immediate north of the marsh/dock/village green area (**Sites 5b to 5d**). It is possible that these may be geological responses, as they occur at a topographical horizon, but they may also be connected with the village earthworks in this general area (**Site 4**). However, some are located to the immediate north of a possible building platform identified as part of the 2014 earthwork survey on the north side of a linear ditch (**Site 5a**).
- 4.9 Further to the east, a collection of anomalies (**P4**) were identified around a rectangular earthwork, suggested by the 2014 earthwork survey to be a building platform (**Site 4a**), formerly part of the layout of the village here. However, magnetic disturbance from nearby features, and later drain insertions, have obscured the clarity of the anomaly. Just to the west of these anomalies is a collection of low resistance readings (**R2**), which may suggest an area of rubble or building material. Further to the east, high resistance results (**R5**) may suggest part of an inferred structure, correlating to a former house not visible as earthworks.
- 4.10 In the north-east corner of the survey area, fragmented anomalies (**P5**) may represent ridge and furrow, although the width between the magnetic responses could suggest a more clearly defined oblong-shaped feature, again possibly associated with the former village here (**Site 4**). A corresponding high resistance anomaly (**R4**) again suggests that this feature may be more substantial than ridge and furrow, for example building remains or yard surfaces.
- 4.11 Located to the immediate south and east of the castle, numerous smaller magnetic anomalies (**P6**) were identified which could be archaeological in nature. These could form features within the former Moat Garden (**Sites 1b and 1c**), or they may relate to the walled enclosure and perhaps even the pathway shown following the footprint of the castle on one of the c.1770 watercolour drawings. Alternatively, they may be the result of modern small-scale disturbance or activity, or represent geological anomalies associated with the break of the slope into the south moat (**Site 2b**).

Definite Archaeological Anomalies (see figures 15 and 16)

- 4.12 To the west of the castle, a magnetic anomaly coupled with a high resistance feature (**A1**) was detected, and is considered to be archaeological in origin. It lies close to the structure known as the banqueting house or 'Bayne' (**Site 1d**), and may represent its remains or a feature associated with it. This interpretation is reinforced by the resistance readings (**R1**).
- 4.13 A second definite archaeological anomaly was clearly defined by the earth resistance technique. A high resistance square core (**R6**) has been identified in the centre of the former Old Garden, possibly representing structural foundations, and it is associated with a pair of rectangular platforms (**Site 3e**) identified during the 2014 earthwork survey. This may represent a substantial building in the Old Garden, perhaps the former School House, noted in this area in the 15th and 16th centuries.

5 DISCUSSION AND CONCLUSIONS

- 5.1 The combination of the results from the 2019 geophysical survey and the previous 2014 earthwork survey has raised a number of issues relating to the remains of the village, the Moat Garden and the Old Garden which merit further discussion.

The Remains of the Village

- 5.2 The 2019 geophysical survey produced no clear or definite evidence for any features that significantly pre-date either the medieval settlement at Wressle or the castle, for example, from the prehistoric or Roman periods. However, it did identify a number of features which may relate to the form and development of the former village.
- 5.3 It has been suggested above that the core of the pre-castle village was formed by a major east-west route which linked a village green to the east to perhaps a river crossing point in the west. A number of houses are depicted on both sides of the street frontage on the early 17th century plans, with plots or crofts extending to the north and south (see figure 6 top). This arrangement forms a classic two- or double-row village plan, characteristic of the general area, which could relate to a specific period of planned development, perhaps dating to the 11th or 12th centuries, or perhaps slightly later (Richardson & Dennison 2015, 40-42).
- 5.4 A collection of magnetic anomalies (P4) were noted in the vicinity of a rectangular earthwork (Site 4a), suggested by the 2014 earthwork survey to be a building platform, and representing the westernmost building of the southern row of the village depicted on the 17th century plans; there was a particularly close correlation with the north and east sides of the earthwork, the magnetic anomalies perhaps representing the collapsed sides of the structure. Other low resistance anomalies just to the west (R2) might also be associated with this former structure. A short distance to the east, other high resistance anomalies (R5) were of a similar size and orientation to the rectangular earthwork, although it was not clearly visible on the surface. It is suggested that this is most likely to be the position of another structure, again correlating with one of the buildings shown on the early plans here. Other high resistance readings were noted further to the east (R4), together with some disparate magnetic anomalies (P5), which correlate with two other former crofts and possible house platforms (Sites 4c to 4e). On the basis of current evidence, it is considered most likely that these groups of anomalies do represent the remnants of the four plots or crofts extending south from the east-west aligned main street, two either side of a north-south aligned route.
- 5.5 In terms of the wider settlement, the geophysical survey again produced a strong correlation with the now generally denuded and furrow earthworks (Site 6) recorded by the 2014 earthwork survey, and confirmed their more widespread extent in the south part of the survey area. The strips are shown on the early 16th century plans, set on a slight north-west/south-east alignment, forming an area named as 'Pound Bank Roods' in 1767. Between the ridge and furrow and the village plots, a large area of low resistance (R3) corresponded with the northern side of the former marsh or ponds (Sites 5b to 5d).

The Moat Garden

- 5.6 A number of magnetic anomalies (P6) were identified to the immediate south of the castle which are likely to be archaeological in nature (Sites 1b and 1c). Unfortunately, no definite features were revealed, and so they could form elements

of the former Moat Garden, or perhaps even the pathway shown following the footprint of the castle on one of the c.1770 watercolours. Alternatively, and perhaps more likely, they may be the result of modern small-scale disturbance or activity, perhaps from debris remaining from the recent repairs and scaffolding to the castle, or the several post-repair events such as re-enactments which generally take place in this area.

- 5.7 Within the south-west internal corner of the moat, magnetic anomalies (P1 and A1) coupled with a high resistance feature (R1) were detected. These almost certainly represent the remains of the banqueting/bathing house or 'Bayne' (Site 1d). This structure was specifically mentioned in 1537, as "*a propre banketyng howse havyng a bayne therin*" (Fisher 1954 vol 2, 57), implying a banqueting house with bathing facilities, and the 1602 plan shows a building perhaps c.7m square, tower-like in form and with a pointed roof.

The Old Garden

- 5.8 In terms of the Old Garden, a collection of high resistance readings (R6) may indicate part of an inferred rectangular feature, cut by later drainage ditches, which appear to partly correlate with rectangular platforms (Site 3e) identified during the 2014 earthwork survey as lying at the approximate centre of the Old Garden. Comparison with the early maps suggest that the resistance anomalies actually lie on the eastern edge of the Old Garden, perhaps attached to the east wall. While it is possible that these anomalies could represent an earlier building platform from the medieval settlement which subsequently had the Old Garden laid out across it, it seems more likely that they form the remains of the former 'School House'. This garden structure is referenced in 1472 (Fisher 1954 vol 2, 63), records made between 1516 and 1523 itemised various verses painted within the chambers of this building, and is not mentioned after 1577. A similar building at the Percys' other East Yorkshire residence at Leconfield Castle seems to have been at least two storeys high, with an inner and outer chamber to the upper floor, and a reference in the Northumberland Household Book infers that this where 5th Earl was able to read or relax away from the main castle (Anon 1770, 365).
- 5.9 Finally, the geophysical survey recorded a collection of magnetic anomalies (P2) which correlates strongly with the position of the former 'Laundrie' building (Site 3d), located in the north-west corner of the Old Garden. This is depicted on the 1602 plan as a two storey rectangular structure aligned north-south.

Further Works

- 5.10 Following the completion of the earthwork and geophysical surveys in the area to the south of the castle, the next logical step for any further works would be targeted excavation to answer specific questions. As outlined above, the combined evidence suggests below-ground remains are likely to survive of both the banqueting/bathing house (Site 1d) and the 'Laundrie' building (Site 3d). Of these, based on current evidence, the former is considered to be the priority for sample or small-scale excavation. As was outlined in the 2014 earthwork survey, the banqueting house is likely to be associated with the works of Henry Percy, the 5th Earl, during the early 16th century. Given that it appears to also have been associated with bathing, any remains have the potential to inform about the bathing practices of the upper echelons of society during this period, and might shed light on the similar structure which is known to have existed at the nearby Percy residence at Leconfield in the mid 16th century.

- 5.11 In addition, sample or small-scale excavations would also be useful over the earthworks and geophysical anomalies identified towards the centre of the Old Garden, to confirm or otherwise the position of the 'School House' (Site 3e), over the position of the 'Laundrie' building (Site 3d), and also over the apparent building platform (Site 4a). All of these excavations would shed considerable light on the use and evolution of the castle's designed landscape, and also provide some much needed dating evidence relevant to the later medieval history of the village and also how it was affected by the construction of the castle in the late 14th century.

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ERAO = East Riding Archive Office, Beverley
WSA = West Sussex Archives (Petworth Collection), Chichester
YAS = Yorkshire Archaeological Society Archives, Leeds (now held in the Brotherton Archives, University of Leeds)

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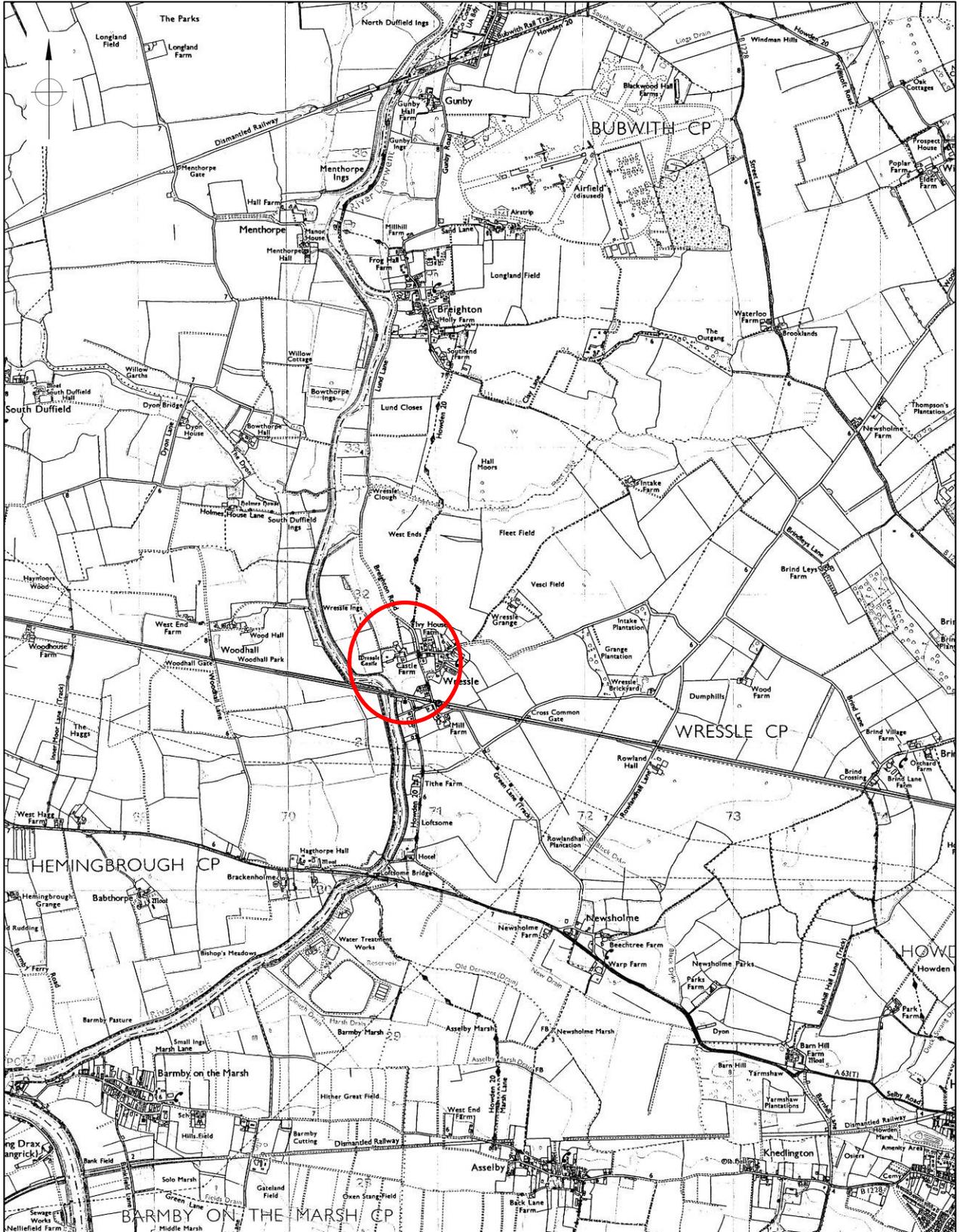
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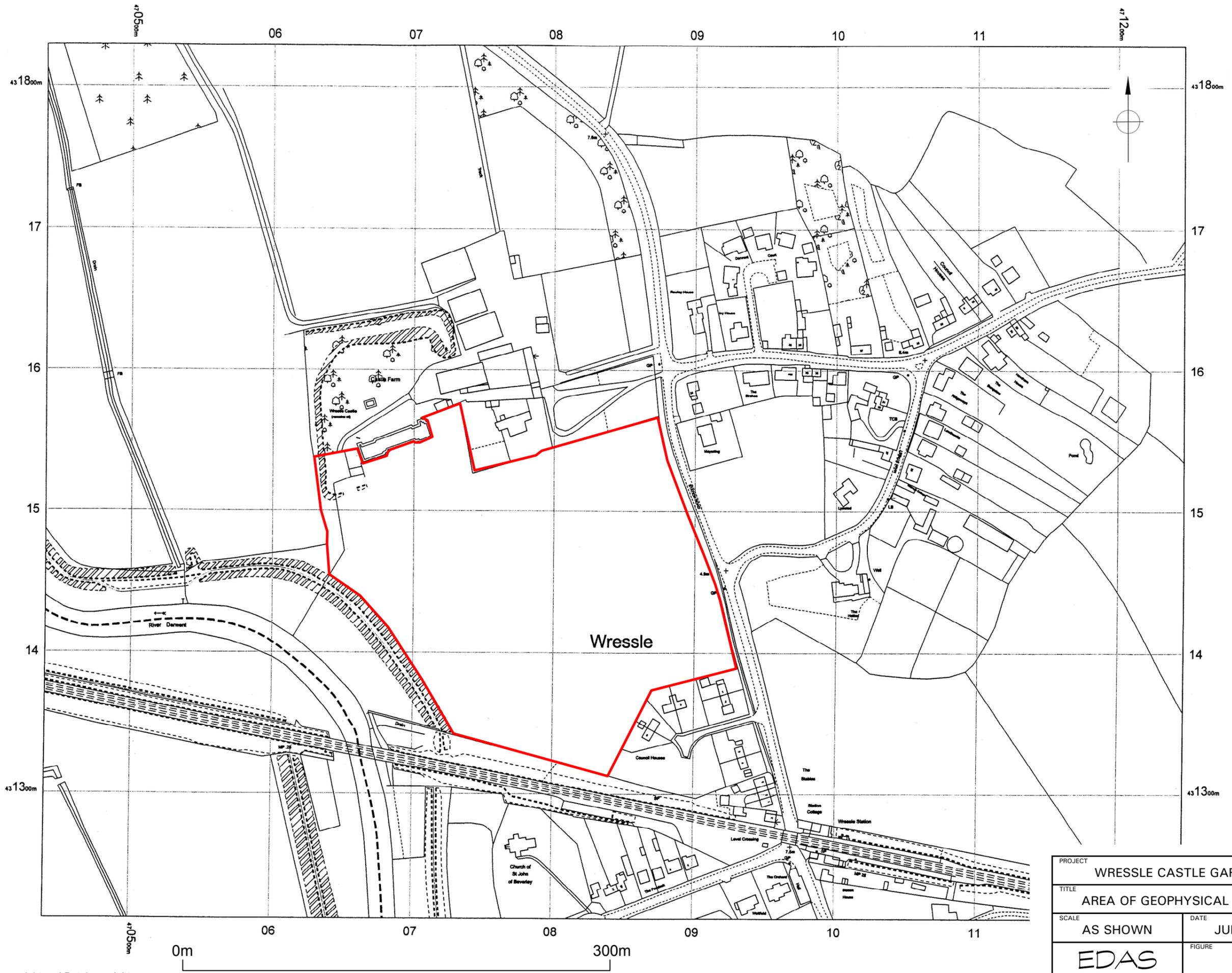
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- 7.2 The geophysical survey was undertaken by Archaeological Services WYAS, for EDAS, with fieldwork by David Ingels and Matt Worrall and reporting by Christopher Sykes. The documentary and other background material has been taken from previous EDAS reports. This report has been produced by Shaun Richardson and Ed Dennison, the latter taking responsibility for any errors or inconsistencies.
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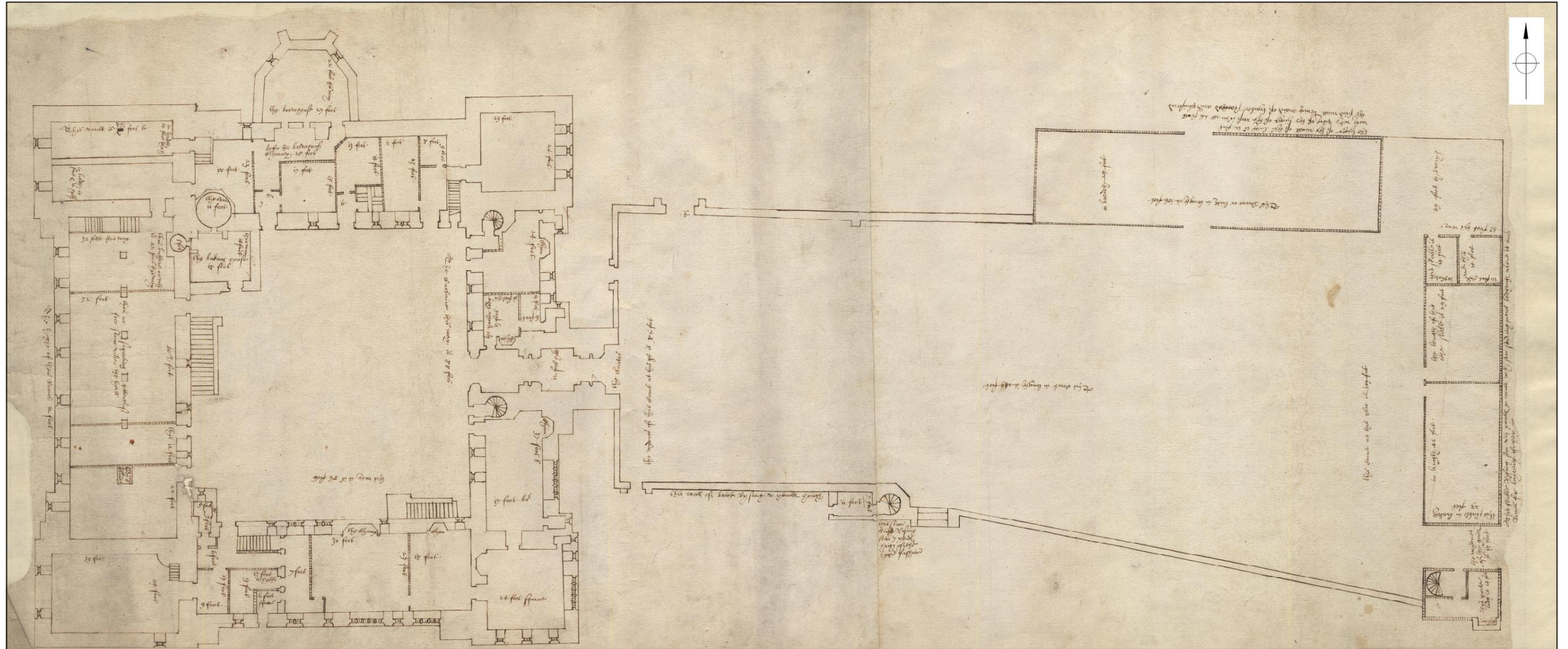


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PROJECT	WRESSLE CASTLE GARDENS	
TITLE	GENERAL LOCATION	
SCALE	NTS	DATE JULY 2019
	EDAS	FIGURE 1



PROJECT		WRESSLE CASTLE GARDENS	
TITLE		AREA OF GEOPHYSICAL SURVEY	
SCALE	AS SHOWN	DATE	JULY 2019
EDAS		FIGURE	2



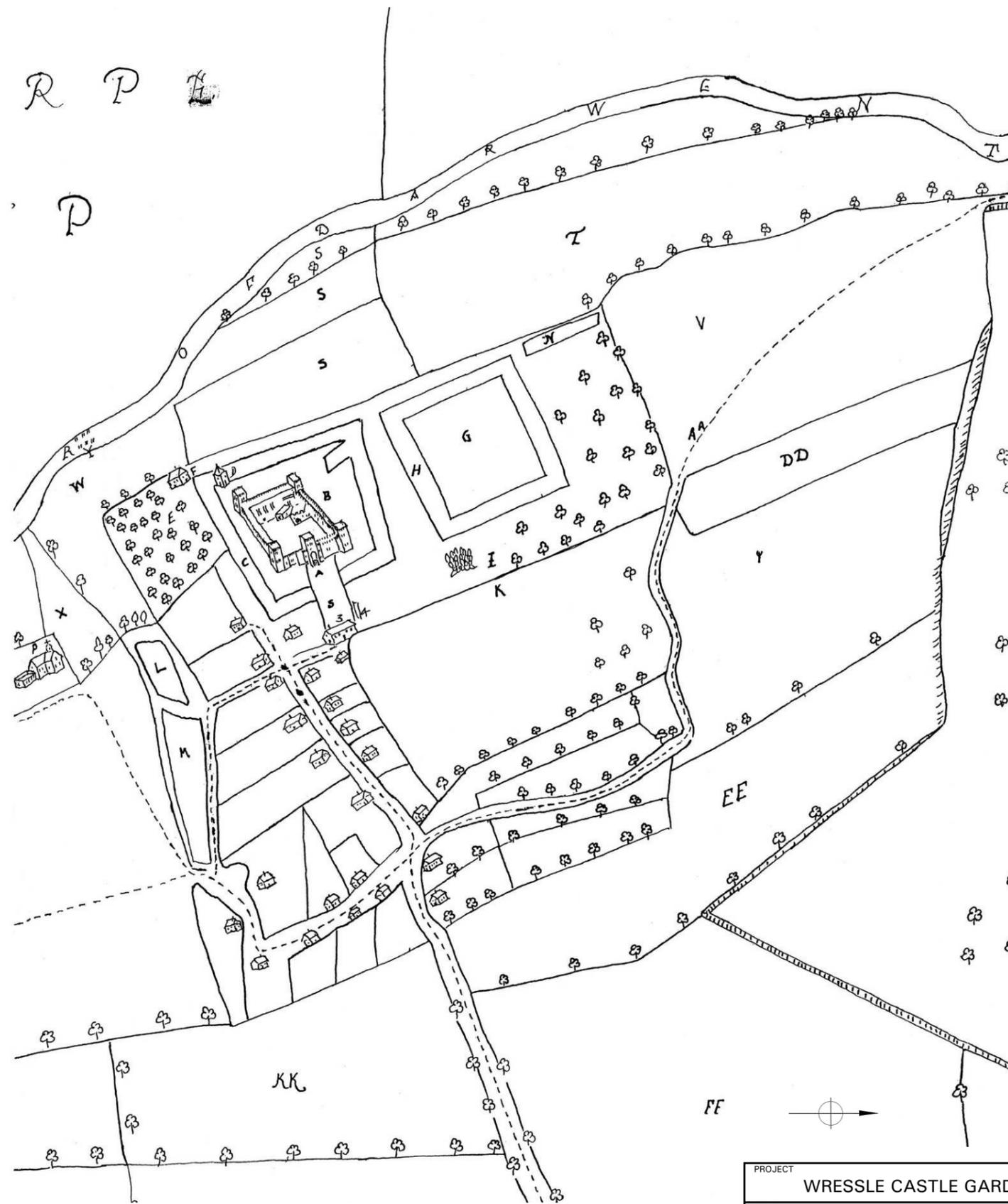
Plan of Wressle Castle and Base Court drawn by T F Hampe in c.1600. Source: WSA PHA 3543. (Reproduced with permission from Lord Egremont and West Sussex Archives).

PROJECT		WRESSLE CASTLE GARDENS	
TITLE			
SCALE		DATE	
NTS		JULY 2019	
EDAS		FIGURE	
		3	

- A The castle
- B The grounds wth in the castle mote
- C The mote
- D The Bayne
- E The ould Garden sometyme enuyrned with a brick wall but now decayde
- F The Laundrie
- G The new Garden environed wth a quicksett hedge
- H The Mote about the new Garden.
- K The Little Barke
- LMN Pondes
- o The Moore way and to Howden
- P The Churche
- Q The windmyn
- R The Churchefeld comon to the whole towne
- SSS Inges Close belonging to a farme called the whyte house
- T The mayne Inges meadow com on to the whole towne
- VIV Sand fields pasture
- W The Marthe a meadow com on to the Founte
- X A Close called Bonde Close
- Y The fish Garthes
- Z The Towne of Loftsome parcell of the Manor of Wressell
- AA The horseway to Brighton
- BB The Greate Parke
- BE The keepers Lodge
- DD The Conygarthe
- EE A close called Bilburrow close freshould
- FF vesowood fields comon to the whole towne.
- KK Tofte field comon to the whole towne.
- LL flete fields comon to the whole towne
- MM Rawlings Close
- NN Morgan close freshould
- LL fallow field Eastfielde
- HH To the Lathe and Garthe
- GG Loftsome flattes a comon field so called
- PP Newsham lordship pcell of the Manor of Wressell
- OO Newsham Moore
- 3 The Gatehouse parte of w^{ch} is a stable
- 4 A Barne
- 5 The base court

Memorand The Castle Garden Towne and the parke is platted by 132 foote in an ynche. The rest of the Lordship is but perspectively taken

Aug: 30 A^o 1602



Source: Fisher, E 1954 'The Lordship of Wressle'. Some Yorkshire Estates of the Percies 1450-1650 [Leconfield, Spofforth, Topcliffe and Wressle] (unpublished D. Phil. thesis, Department of History, University of Leeds). Original source WSA PHA 3547.

PROJECT		WRESSLE CASTLE GARDENS	
TITLE		TRACING FROM PLAN OF 1602	
SCALE	NTS	DATE	JULY 2019
EDAS		FIGURE	4



Source: Falkingham family, Castle Farm, Wressle.

PROJECT		WRESSLE CASTLE GARDENS	
TITLE		EARLY 17TH CENTURY PLAN	
SCALE	NTS	DATE	JULY 2019
EDAS		FIGURE	5



Source: Falkingham family, Castle Farm, Wressle.

PROJECT	WRESSLE CASTLE GARDENS	
TITLE	MAP OF 1610	
SCALE	NTS	DATE JULY 2019
EDAS	FIGURE 6	



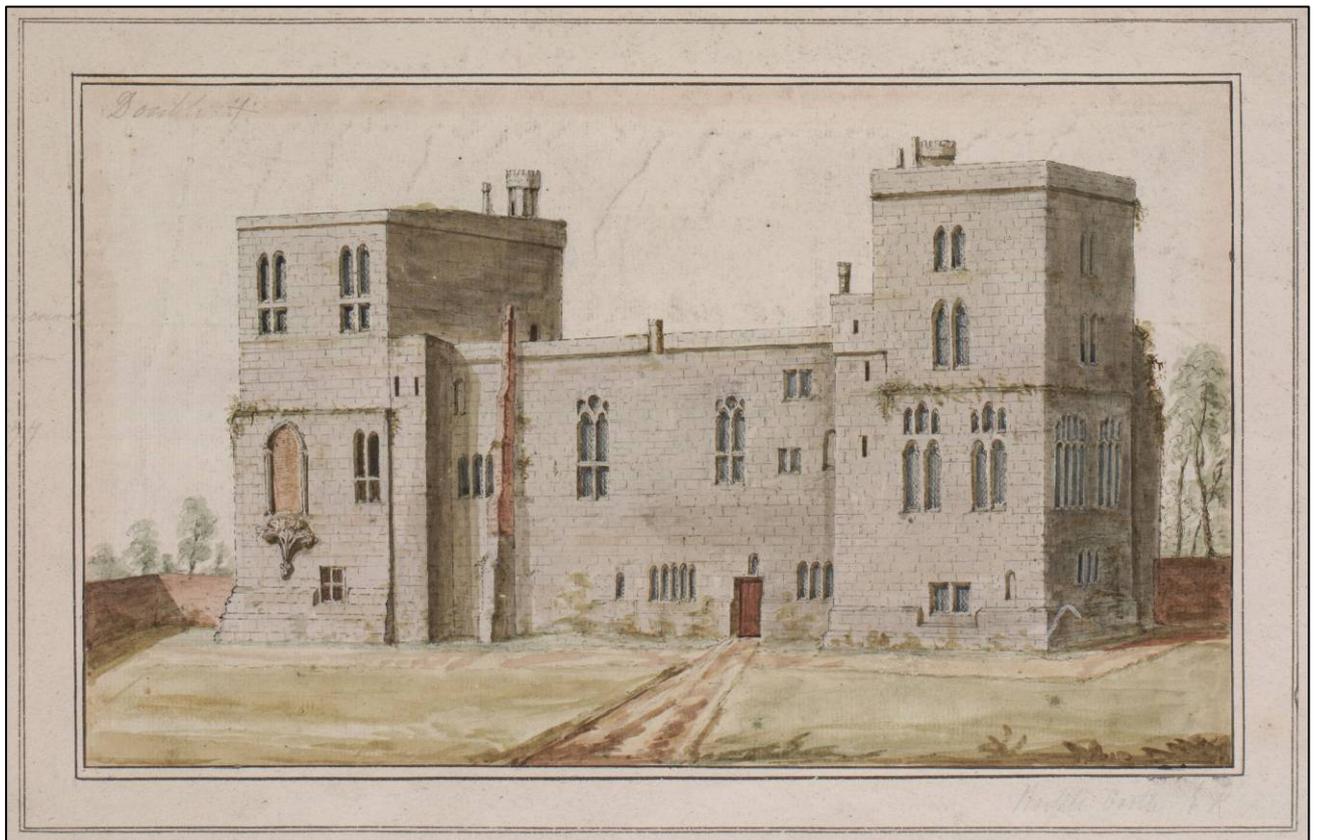
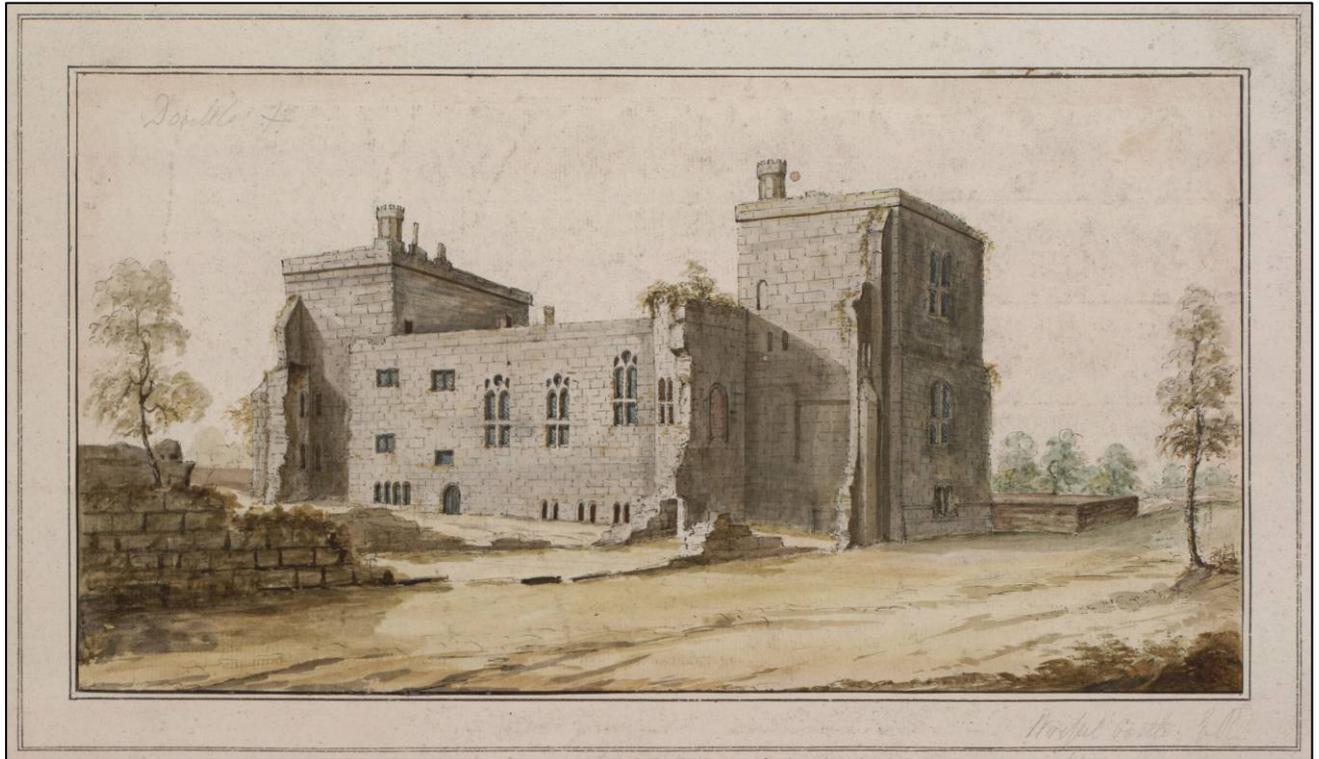
Source: Falkingham family,
Castle Farm, Wressle.

PROJECT		WRESSLE CASTLE GARDENS	
TITLE		PLAN OF 1624	
SCALE	NTS	DATE	JULY 2019
EDAS		FIGURE	7



Source: Falkingham family, Castle Farm, Wressle.

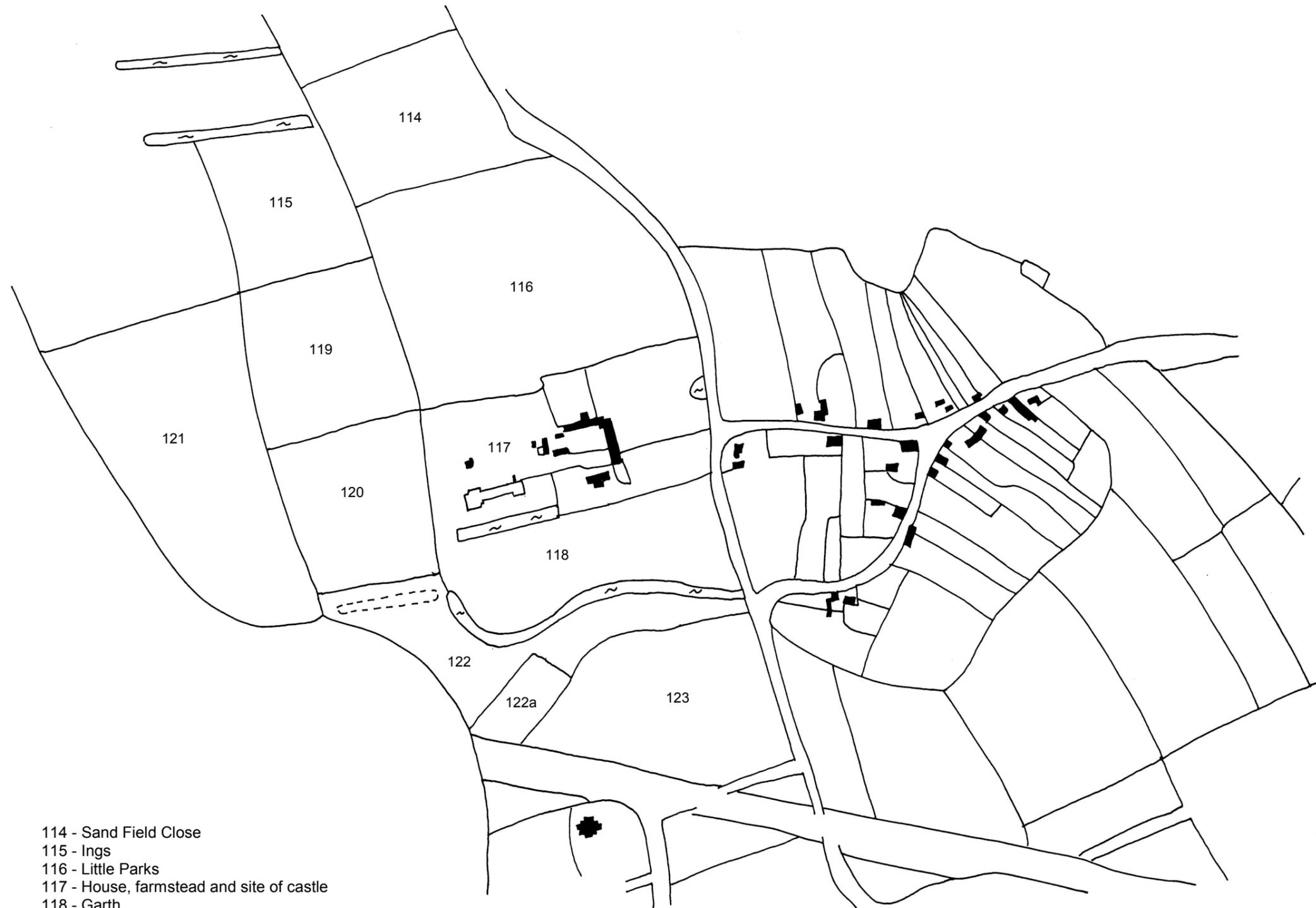
PROJECT		WRESSLE CASTLE GARDENS	
TITLE		PLAN OF 1767	
SCALE	NTS	DATE	JULY 2019
EDAS		FIGURE	8



Top: North side of south range, looking SE, painted c.1770 by J Brown (source: <http://gottcollection.hepworthwakefield.org/item/610>).

Bottom: South front of Wressle Castle, painted c.1770 by J Brown (source: <http://gottcollection.hepworthwakefield.org/item/611>).

PROJECT		WRESSLE CASTLE GARDENS	
TITLE		1770s WATERCOLOURS	
SCALE	NTS	DATE	JULY 2019
EDAS		FIGURE	9



- 114 - Sand Field Close
- 115 - Ings
- 116 - Little Parks
- 117 - House, farmstead and site of castle
- 118 - Garth
- 119 - Ings
- 120 - Ings
- 121 - Ings Bank and Foreshore
- 122 - Marsh Bank and Foreshore
- 122a - Brickyard
- 123 - Church Field Close

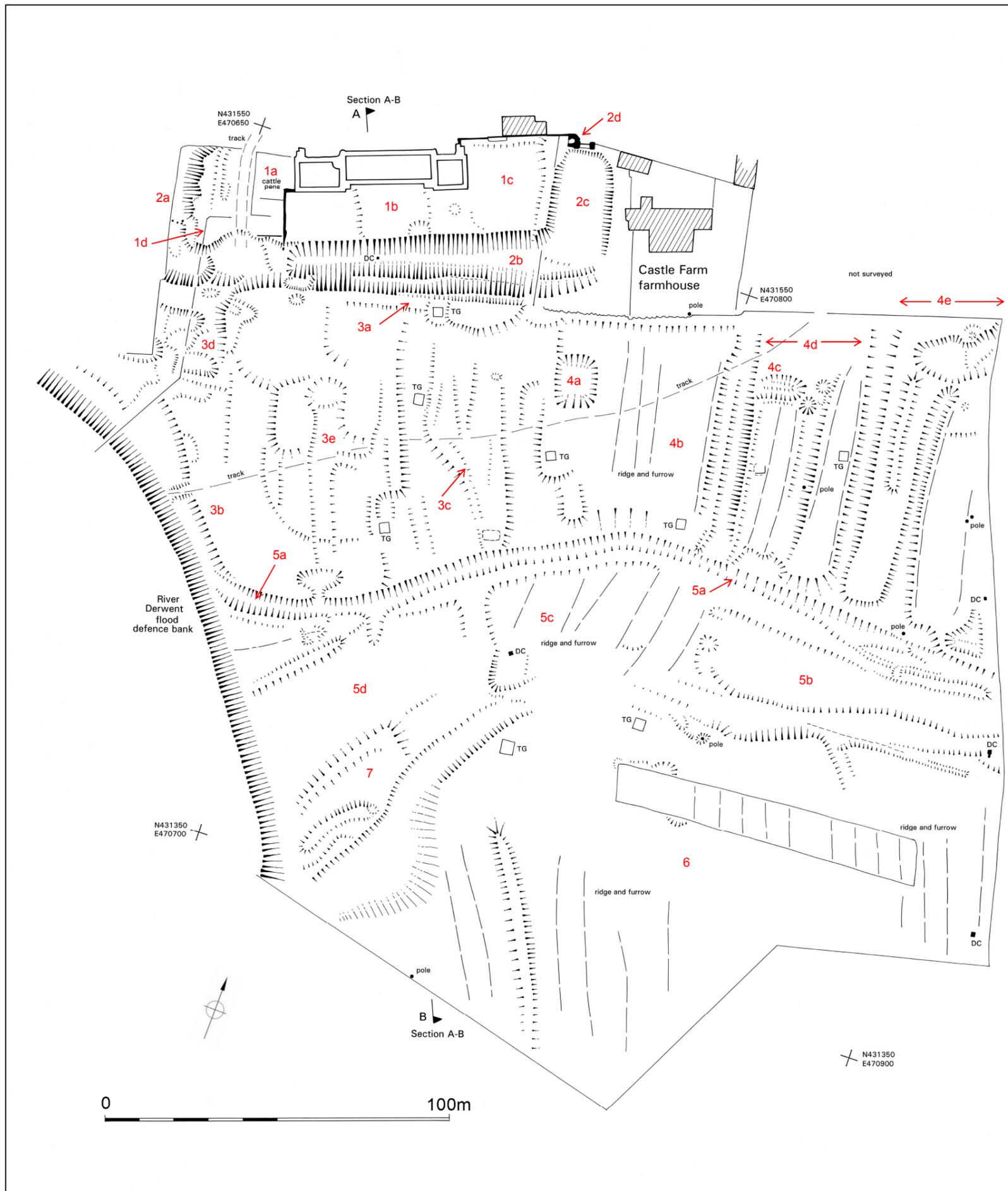
Source: 1839 tithe map - the Parish of Wressle in the East Riding of the County of York (BIHR).

PROJECT		WRESSLE CASTLE GARDENS	
TITLE		TRACING FROM 1839 TITHE MAP	
SCALE	NTS	DATE	JULY 2019
EDAS		FIGURE	10



Source: Ordnance Survey 1854 6" map Yorkshire sheet 222 (surveyed 1849-1851).

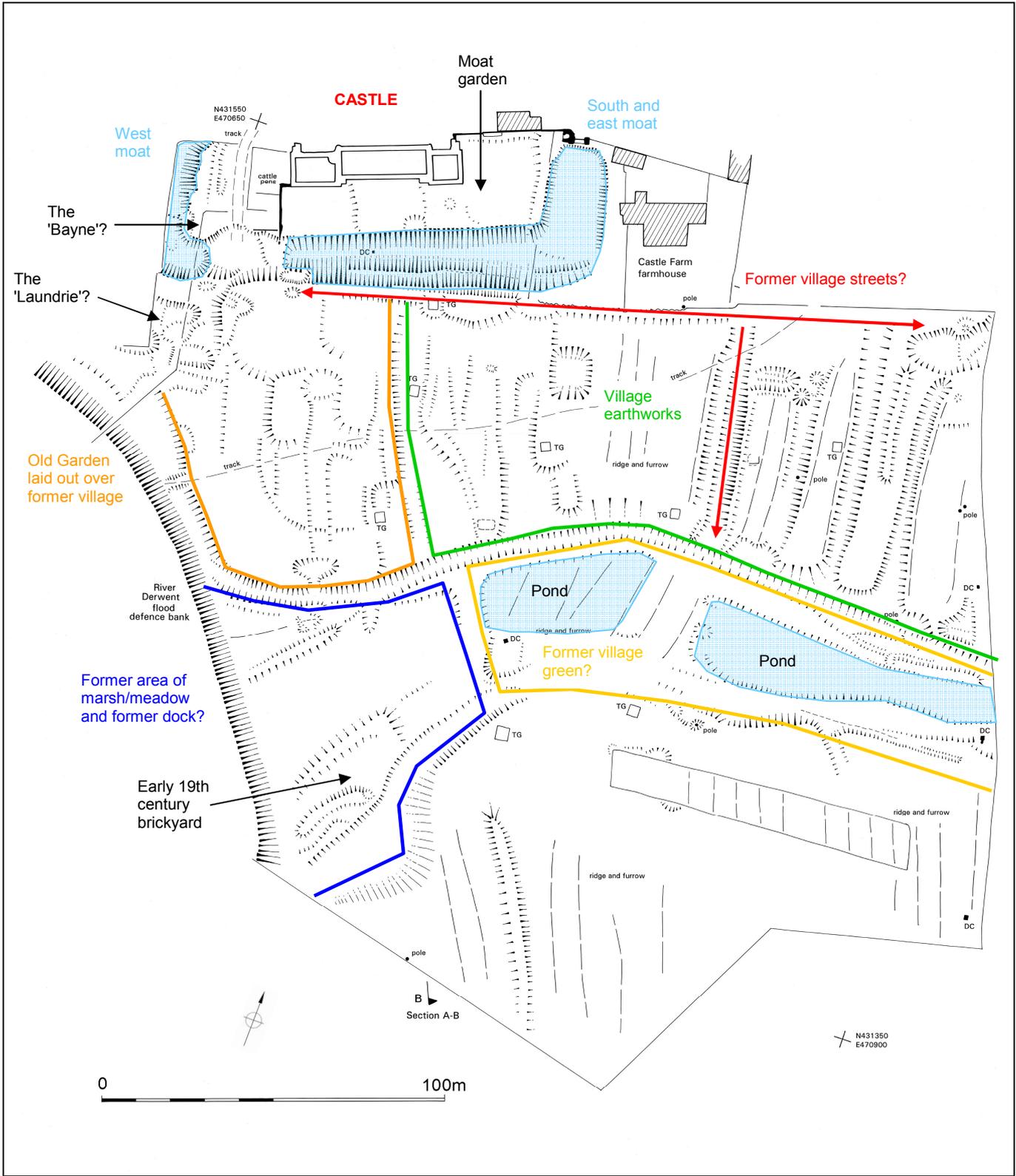
PROJECT		WRESSELE CASTLE GARDENS	
TITLE		ORNANCE SURVEY 1854 MAP	
SCALE	DATE	NTS	JULY 2019
EDAS	FIGURE		11



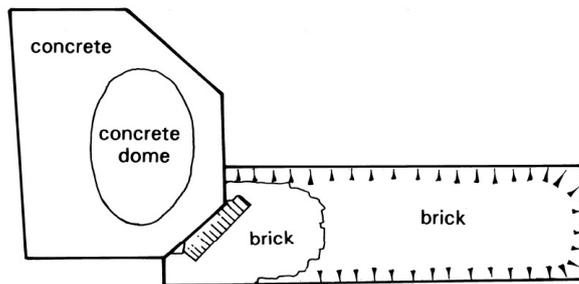
Modern drains omitted

TG - tree guard
DC - drain cover

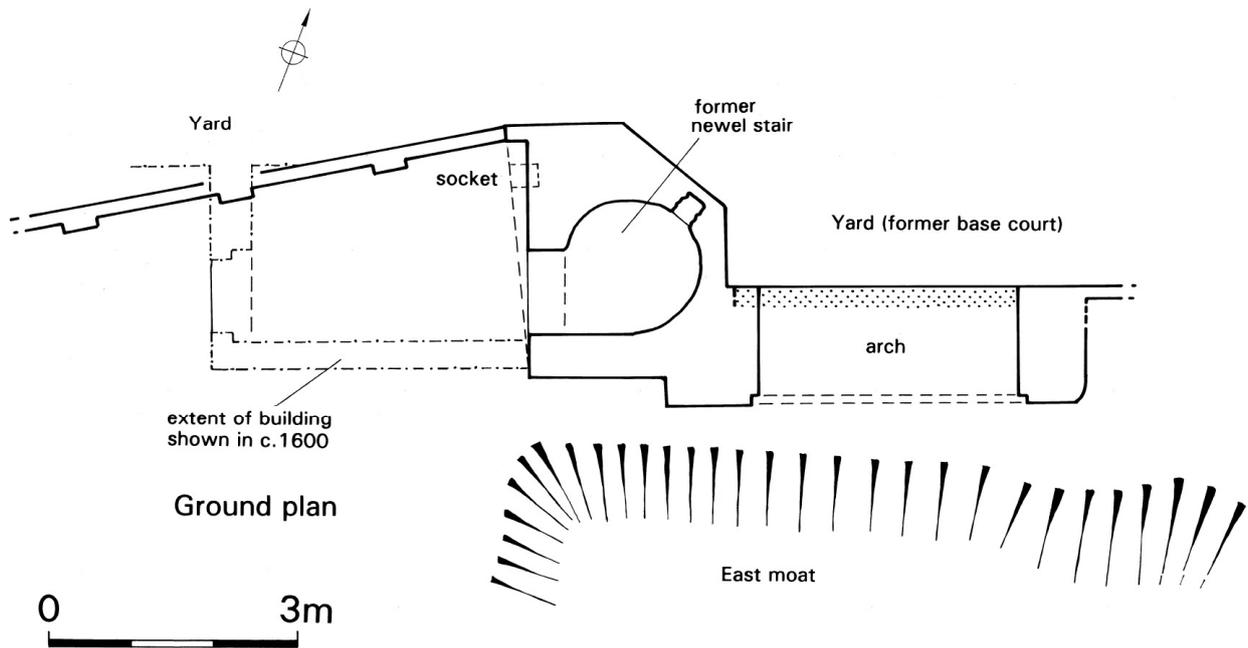
PROJECT		WRESSLE CASTLE GARDENS	
TITLE		2014 EARTHWORK SURVEY	
SCALE	AS SHOWN	DATE	JULY 2019
EDAS		FIGURE	12



PROJECT		WRESSLE CASTLE GARDENS	
TITLE		INITIAL INTERPRETATION	
SCALE	AS SHOWN	DATE	JULY 2019
EDAS		FIGURE	13



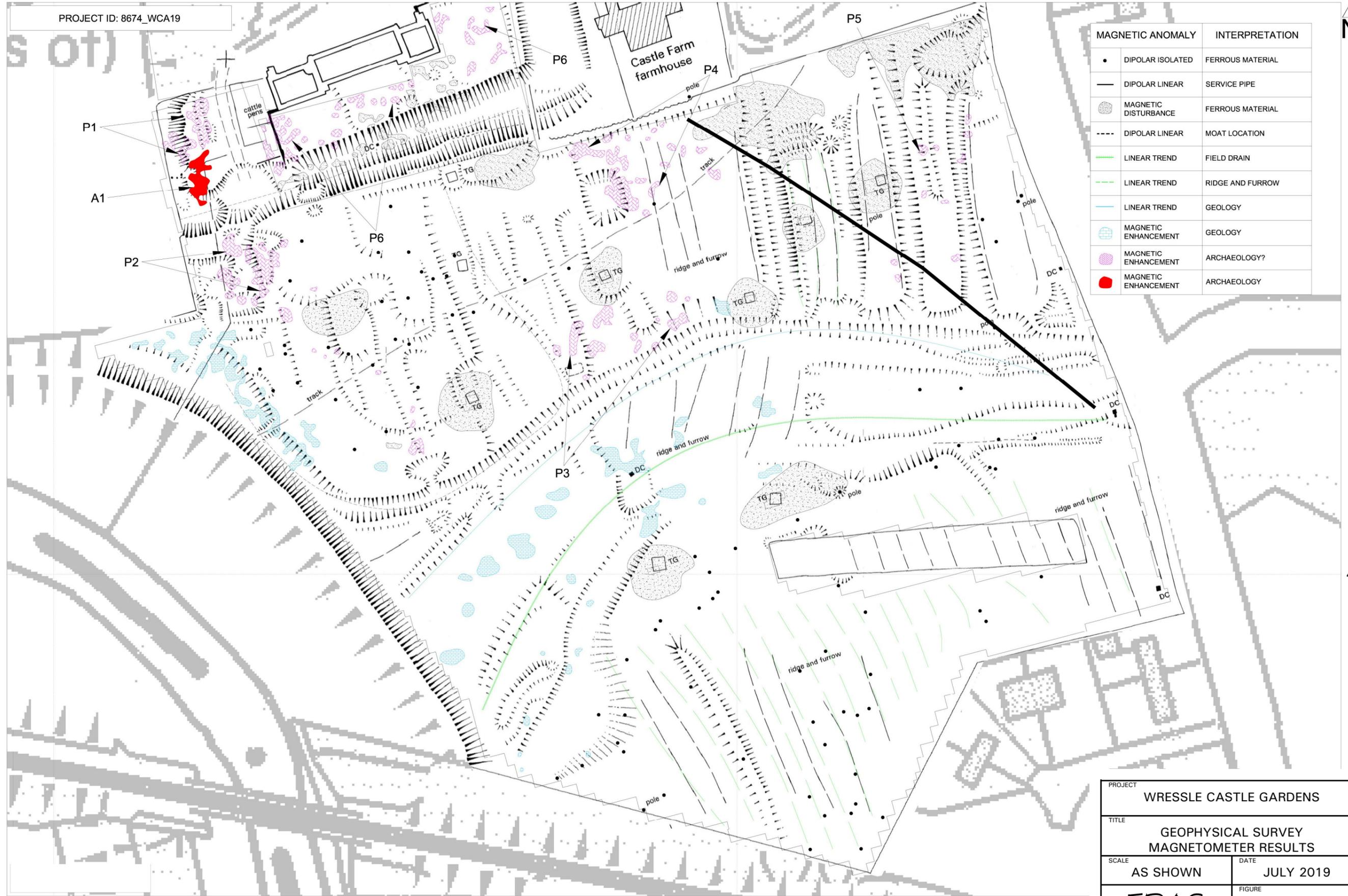
Upper level plan



Ground plan

PROJECT		WRESSLE CASTLE GARDENS	
TITLE		GARDEN STRUCTURE (SITE 2D)	
SCALE	AS SHOWN	DATE	JULY 2019
EDAS		FIGURE	14

PROJECT ID: 8674_WCA19



MAGNETIC ANOMALY	INTERPRETATION
•	DIPOLAR ISOLATED FERROUS MATERIAL
—	DIPOLAR LINEAR SERVICE PIPE
⊙	MAGNETIC DISTURBANCE FERROUS MATERIAL
- - -	DIPOLAR LINEAR MOAT LOCATION
—	LINEAR TREND FIELD DRAIN
—	LINEAR TREND RIDGE AND FURROW
—	LINEAR TREND GEOLOGY
⊕	MAGNETIC ENHANCEMENT GEOLOGY
⊗	MAGNETIC ENHANCEMENT ARCHAEOLOGY?
■	MAGNETIC ENHANCEMENT ARCHAEOLOGY

431400

470600

470800

PROJECT WRESSLE CASTLE GARDENS	
TITLE GEOPHYSICAL SURVEY MAGNETOMETER RESULTS	
SCALE AS SHOWN	DATE JULY 2019
EDAS	FIGURE 15



Source: Sykes, C 2019 *Land off Brighton Road, Wressle, Selby, East Riding of Yorkshire: Geophysical Survey*, figure 9 (unpublished ASWYAS report 3274 for EDAS Ltd).



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PROJECT		WRESSLE CASTLE GARDENS	
TITLE		GEOPHYSICAL SURVEY EARTH RESISTANCE RESULTS	
SCALE	AS SHOWN	DATE	JULY 2019
EDAS		FIGURE	16



470600

470800

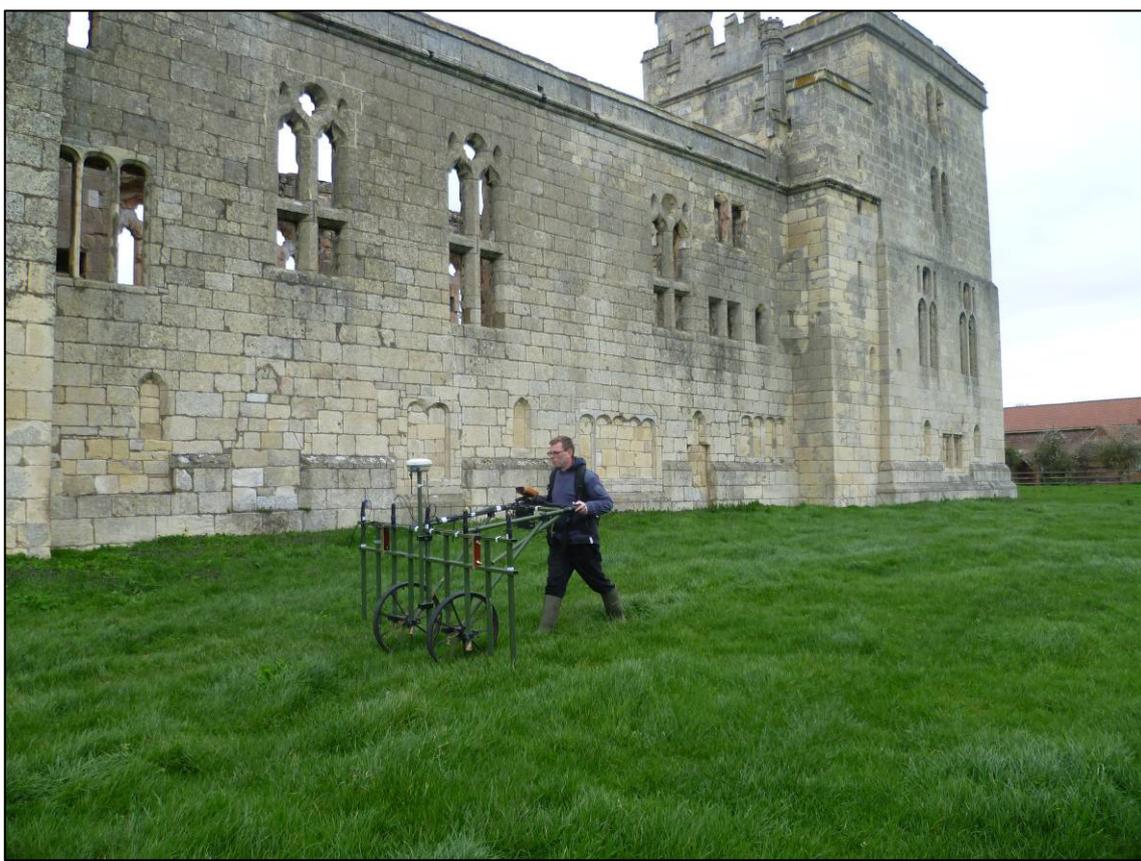


Plate 1: Magnetometer survey in progress, March 2019.



Plate 2: Resistance survey in progress, March 2019.

APPENDIX 1
ASWYAS GEOPHYSICAL SURVEY REPORT



WYAS
**Archaeological
Services**

**Land off Brighton Road
Wressle,
East Riding of Yorkshire**

Geophysical Survey

Report no. 3274
April 2019

Client: Ed Denison Archaeological
Services Ltd



**Land off Brighton Road,
Wressle,
East Riding of Yorkshire**

Geophysical Survey

Summary

A geophysical (magnetometer) survey, covering approximately 5 hectares was carried out on land off Brighton Road, Wressle, East Yorkshire, in order to determine the presence/absence of archaeological remains associated with Wressle Castle. A targeted 2 hectares of earth resistance survey was also undertaken. The resistance survey has identified regularly spaced, linear low resistance anomalies, which are likely to correspond with later drainage ditches. Some comparably higher resistance responses relate to ridge and furrow in the area and part of a former structure known as “the Bayne” along with a possible foundation base. A magnetometer survey has identified distinct ridge and furrow trends along the southern boundary, along with a drain, geological anomalies. Magnetic disturbance caused by tree guards and land developments was also noted. Possible archaeological and archaeological anomalies have also been identified. Overall the archaeological potential of the site is considered to be moderate to high.

Report Information

Client: Ed Dennison Archaeological Service Ltd
Address: 18 Springdale Way, Beverley, East Yorkshire, HU17 8NU
Report Type: Geophysical Survey
Location: Wressle
County: East Yorkshire
Grid Reference: SE 7079 3146
Period(s) of activity: Medieval/Post-medieval
Report Number: 3274
Project Number: 8674
Scheduled Monument No.: 1005210
Site Code: WCA19
OASIS ID: archaeol11-349934
Date of fieldwork: March 2019
Date of report: April 2019
Project Management: Christopher Sykes BA MSc MCifA
Fieldwork: David Ingles BA MA
Matt Worrall BA
Report: Christopher Sykes
Illustrations: Christopher Sykes

Authorisation for
distribution:





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1 Introduction

This report has been prepared by Archaeological Services WYAS (ASWYAS) for Ed Dennison Archaeological Services Limited (EDAS - the client) following a magnetometer survey and resistivity survey of land off Brighton Road, Wressle, Selby, as part of a research project. The work was undertaken in accordance with current best practice (CifA 2014; David *et al.* 2008). The survey was carried out from 25th March until the 29th March 2019 to provide additional information on the archaeological resource of the site. Scheduled Monument Consent for the survey was granted by Historic England on 20th February 2019.

Site location, topography and land-use

The survey boundary covers an area of *c.* 5.5ha of which all was subjected to a magnetometer survey. An area of *c.* 2ha was then targeted for an earth resistivity survey (resistance). The site lies to the immediate south of Wressle Castle, in Wressle, northwest of Howden (Fig. 1). It is centred on SE 7079 3146 and comprises one irregular shaped pasture field used for cattle grazing. The survey area is bounded to the south by the York to Beverley railway line, to the east by Brighton Road, the gardens of Castle Farm and Wressle Castle to the north, and the river Derwent to the west. The field is relatively flat, gently sloping from 6m above Ordnance Datum (aOD) at the peripheries to around 4m aOD centrally.

Soils and geology

The bedrock geology of the survey area predominantly belongs to the Sherwood Sandstone group - Sandstone Formation, a sedimentary bedrock formed approximately 237 to 272 million years ago in the Triassic and Permian Periods when the local environment was dominated by rivers. Superficial deposits of Brighton sand formation formed up to 2 million years ago in Quaternary Period, when the local environment was dominated by ice age conditions (British Geological Survey 2019). The soils in the area are classified in the Dale association (551d) characterised as deep well drained sandy and coarse loamy soils (Soil Survey of England and Wales 1983).

2 Archaeological Background

EDAS have been undertaking a wide-ranging and extensive survey of Wressle Castle and its designed landscape over recent years, and the following information has been summarised from their previous earthwork survey report (Richardson and Dennison 2015).

Wressle Castle is generally considered to have been constructed towards the end of the 14th century for Thomas Percy, later earl of Worcester. No licence to crenellate survives, but the castle is first documented in 1402. In its original form, the castle had a quadrangular plan, with ranges running between four corner towers, and with a fifth gate tower in the centre of

the east range. The castle was surrounded on all sides by a moat, and at a later date a base court was added to the east side. It is highly likely that the late 14th-century building was provided with gardens and pleasure grounds, and there was also an extensive park to the north, with the River Derwent running close by the west. The interior of the castle underwent extensive and very costly refurbishment under Henry Percy, 5th Earl of Northumberland, probably in two successive phases between 1498-1516 and 1524-1527.

By the third-quarter of the 16th century, the castle was in decay, but large sums of money were spent on renovations in the early 17th century, and it was found to be the only Yorkshire Percy residence to be in reasonable repair in 1630. It was subsequently garrisoned for Parliament during the Civil War, and in 1646 the soldiery were said to have caused over £1000 worth of damage to the building and its surroundings. Actual demolition of the castle started in June 1648, but in 1650 the decision was taken to demolish all but the south range, leaving it to serve as a manor house to administer the Earl of Northumberland's local estates. By the late 18th century, the lower level of the castle was a residence for a tenant farmer, although several of the rooms retained their high-status 16th-century woodwork. Unfortunately, a severe fire in February 1796 destroyed all of this material, and the castle has been derelict ever since.

Towards the north of the castle, ASWYAS undertook a geophysical survey in 2014 to determine the remains of any garden features. (ASWYAS 2014). This resistance survey identified low resistance anomalies, interpreted as being caused by the waterlogged deposits of a moated feature that correlated with a cropmark representing a late 15th/early 16th century 'New Garden'.

Of relevance to the current geophysical survey, EDAS undertook an earthwork survey of the area to the south of the castle, to determine and ascertain, the extent of castle's gardens and moat, and the remains of the former village (Richardson and Dennison 2015).

3 Aims, Methodology and Presentation

The aims and objectives of the programme of geophysical survey were to gather sufficient information to establish the presence/absence, character, and extent of any archaeological remains within the specific survey area, and to inform further strategies should they be necessary.

The aims of the survey are:

- to provide information about the nature and possible interpretation of any magnetic and resistance anomalies identified;
- to therefore determine the presence/absence and extent of any buried archaeological features;

- to produce a comprehensive site archive and report.

Magnetometer survey

The site grid was laid out using a Trimble VRS differential Global Positioning System (Trimble R6 model). The survey was undertaken using Bartington Grad601 magnetic gradiometers. These were employed taking readings at 0.25m intervals on zig-zag traverses 1.0m apart within 30m by 30m grids, so that 3600 readings were recorded in each grid. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Geoplot 3 (Geoscan Research) and in-house software was used to process and present the data. Further details are given in Appendix 1.

Resistance survey

The resistance survey was undertaken using Geoscan RM15 and MPX15 instruments set up as a Twin Probe array, to take readings at 1m intervals on traverses 1m apart within 30m by 30m grid squares, allowing 1800 readings to be recorded in each grid square. The mobile probe spacing was 0.5m with the remote probes 15m apart and at least 15m away from the grid under survey. This mobile probe spacing of 0.5m gives an approximate depth penetration of 1m for most archaeological features. The readings were stored in the memory of the instrument and later downloaded for processing and interpretation. Geoplot 3 (Geoscan Research) software was used to process and present the data. Further details are given in Appendix 2.

Reporting

A general site location plan, incorporating the 1:50000 Ordnance Survey (OS) mapping, is shown in Figure 1. A large scale (1:2000) plan showing the survey area and magnetometer data is presented as Figure 2. Figure 3 contextualises the resistance data at the same scale. Figure 4 shows a combined interpretation of both techniques at a scale of 1:2000. Figures 5 to 7 display a greyscale, XY trace plots and interpretation of the magnetometer data at a scale of 1:1000. The resistance data (processed), are presented in Figures 8 at a scale of 1:1000. Figures 9 and 10 incorporates the magnetometer and resistance interpretation with a map of the earthwork survey at a scale of 1:1000.

Survey location information is given in Appendix 3, Appendix 4 provides details of the geophysical archive, and Appendix 5 provides a completed OASIS form.

The survey methodology, report and any recommendations comply with guidelines outlined by English Heritage (now Historic England) (David *et al.* 2008) and by the Chartered Institute for Archaeologists (CIfA 2014). All figures reproduced from Ordnance Survey mapping are with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The figures in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All figures are presented to most suitably display and interpret the data from this site based on the experience and knowledge of Archaeological Services staff.

4 Results and Discussion (see Figures 5 to 10)

Results from the magnetic survey have been discussed first, followed by the findings from the resistance results. Where appropriate both the magnetometer and resistance are discussed together, under each sub-heading. Each identified anomaly is prefixed by a letter, which refers to the interpretation category **P** (Possible archaeology) or **A** (Archaeology), or in the case of resistance (**R**), refers to the technique. The majority of anomalies that have archaeological potential occur in the northern half of the survey area.

The conditions prior to undertaking the resistance survey had included a prolonged period of warm dry weather. This had the effect of drawing sub-surface moisture towards the surface. This impacted upon the resistance survey by reducing the difference between the maximum and minimum readings causing less contrast between the high and low readings than if the weather prior to the survey had been damper. A fuller explanation of the resistance survey technique can be found in Appendix 2.

Ferrous anomalies and magnetic disturbance

Ferrous anomalies are present within the magnetometer data and recorded as individual 'spikes' or as large discrete areas, typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris or material is common on rural sites, often being present as a consequence of manuring or tipping/infilling. There is no obvious pattern or clustering to their distribution in this survey to suggest anything other than a random background scatter of ferrous debris in the plough-soil.

Within the survey area, several sizable, isolated magnetic responses have been detected. They correspond with tree guards, used to protect the trees from livestock.

In the northeast corner of the survey area, close to the northern extent of the survey area, two irregularly-shaped responses are likely to be evidence of ground disturbance, caused by either the demolition of earlier structures or dumped material from Castle Farm farmhouse. Both responses correlate with hollows identified during the earthwork survey as being the position of buildings associated with the now deserted village (Richardson and Dennison 2015). A linear response in the northwest corner of the survey area has been interpreted as debris infilling the moat, to the south of the castle.

A service run has been detected projecting from the eastern boundary towards Castle Farm farmhouse along a northwest to southeast axis.

Agricultural anomalies

Prominent magnetic anomalies clearly defining ridge and furrow cultivation have been detected across the southern extent of the survey area and are oriented in a northwest to southeast direction (Fig. 9).

Similar responses have also been detected in the northeast corner of the site towards the south of Castle Farm farmhouse, although they are partly obscured by the magnetic signature of the tree defences. Superficially they may represent later ploughing, as they are situated within the area of the deserted settlement and so probably represent ploughing in the village crofts. These anomalies have also been detected by the resistance as having high readings. They correspond well with the ridge and furrow identified during the topographical survey.

A curvilinear field drain has been identified following the southern curve of an area previously identified as containing ponds, and an earlier former village green (Richardson and Dennison 2015). This also provided the boundary between the agricultural fields and the village area. Surprisingly the ponds themselves are not clearly defined within the magnetometer data.

Thin, parallel low resistance linear trends, have been detected in the northern half of the field, generally orientated west to east (Fig. 10). The regular spacing of these trends suggest that these are drainage ditches or land drains which have not been detected in the magnetometer data.

Geological anomalies

The survey has detected a number of anomalies that have been interpreted as geological in origin. It is thought that the responses have been detected because of the variation in the composition and depth of the deposits of superficial material in which they derive.

A collection of anomalies have been detected within a low-lying and flat area identified by the earthwork survey as being a former marsh and possible harbour/landing area with ponds and the village green. A similar number of responses have been detected along the western edge of the site, close to the modern protective flood bank of the river Derwent. These reading would be consistent with redeposited clay on the site to form part of the flood defences.

A large area of low resistance (**R3**) has been detected along the southern boundary of the resistance survey area. The low resistance of this area suggests it has retained higher levels of moisture which would be consistent with the former area of marsh and ponds identified in the earthwork survey, or it may have had links to the river. Perhaps a dock is represented here,

with the geological anomalies identified caused by inundation and silting up of the dock area by the river.

Possible archaeological anomalies

A number of magnetic anomalies have been categorised as having a possible archaeological origin. They have been grouped into areas and their interpretation has been based on the magnetic signature and resistance values, alongside the earthwork survey evidence.

To the immediate west of the castle, in an area identified as a 16th-century bathing or banqueting house (the “Bayne”), anomalies have been given the identification **P1** (Fig. 9). They are likely to be associated with the “Bayne”, however later activity and the magnetic readings from the edge of the moat have obscured the clarity of the results.

To the south of **P1**, a collection of anomalies (**P2**) have been recorded. They are considered to be associated with a former 17th-century structure, identified as the “Laundrie”. The level of magnetic disturbance and fragmented nature of the anomalies means that only a possible interpretation has been reached.

The collection of anomalies identified as **P3** are located centrally within the survey area. A geological origin for these anomalies cannot be ruled out, as they occur at a topographical horizon, but equally they are located close to village earthworks and as such may be archaeological in origin. Although fragmentary in nature, they may have been altered or damaged by later ploughing or landscaping within this area.

Located around an earthwork depression, representing one of the former houses of the village, are a collection of anomalies (**P4**) which are possibly related to this feature. Magnetic disturbance from nearby features, and later drain insertions, have partly obscured the clarity of this anomaly. The resistance results over this area indicate an area of low resistance readings close by (**R2**), which may suggest an area of rubble perhaps collapse from the structure (Fig. 10). To the immediate east of **P4** are a collection of high resistance readings (**R5**) which may suggest part of an inferred rectangular feature perhaps the site of another former house plots seen on 17th century plans but not evident as earthworks. This area has, however, has been truncated by later drainage ditches.

In the northeast corner of the survey area, fragmented anomalies (**P5**) have been identified. These may represent ridge and furrow in the area, but the width between the magnetic responses may suggest a more clearly defined oblong-shaped space (Fig. 5). An earth resistance anomaly (**R4**), with high resistance readings, suggests that this plateau may be more substantial than ridge and furrow and may have a possible archaeological origin. Taken together, these anomalies may be consistent with walling for either a house or boundary or conceivably yard surfaces.

Located to the immediate south and east of the castle, and on the north side of the moat, a number of magnetic anomalies (**P6**) have been identified could be archaeological in nature and may be part of a garden inside the moat. Conversely, they could represent geological anomalies associated with the break of the slope into the moat, or later small scale disturbance resulting from recent repairs to the castle.

Archaeological anomalies

A magnetic anomaly, coupled with a high resistance feature to the west of the castle, has been detected (**A1**) and is considered to be archaeological in origin. This may be the remnants of a wall associated with the “Bayne”. This interpretation is reinforced by the area of high resistance within the data set (**R1**).

An archaeological anomaly has been clearly defined by the results from the resistance technique. A high resistance square core around **R6** has been detected, and is defined by the low resistance readings that surround it. It may represent a footing for a structure or other defined space. It occurs in an area where a significant number of earthworks coexist. The area of high resistance also spreads westwards suggesting either another structure or a larger structure. Its function is not clear but it may have formed part of the former village associated with the castle or a later garden feature which superseded the village.

5 Conclusions

By employing both geophysical survey techniques, anomalies which would have been obscured or hidden if only one technique had been used, have been identified. The resistance technique is usually very good at identify either walls or spreads of rubble material. Here anomalies have been identified that would indicate structures associated with the former village and/or castle garden buildings.

Magnetic disturbance from tree guards have caused disturbance within the survey and are observed as discrete isolated anomalies, potentially masking archaeological anomalies. Ridge and furrow has been detected across the entire survey area, but particularly in the south, confirming that the site was used for agricultural purposes in the past. Low resistance trends across the site have identified drains, which were not detected by the magnetometer survey, further attesting to agriculture land use.

Geological anomalies have been detected where the soils are at their thinnest and in areas where the topography changes with other areas identified as a marsh and ponds that might have been used as a dock area.

Possible archaeological anomalies have been identified in areas where there is potential for former settlement and dwellings; some of these areas were identified in the previous earthwork survey, others were not. Archaeological anomalies have been detected to south and

west of the castle by earth resistance rather than magnetometry in the form of either house walls or boundary walls. Larger areas of higher resistance may also be the result of rubble collapse from buildings.

Based on this survey, the archaeological potential of the site is considered to be moderate to high.

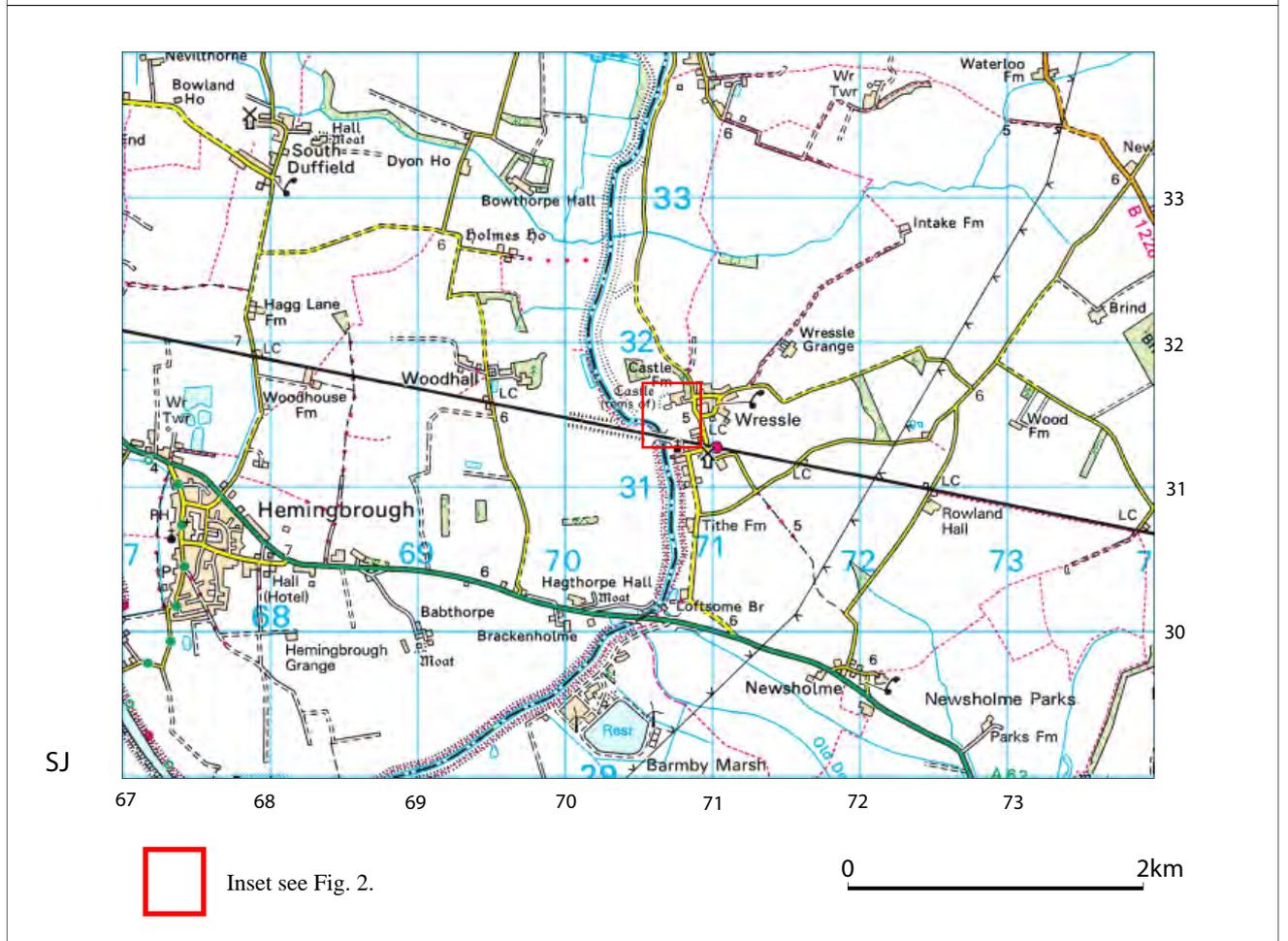
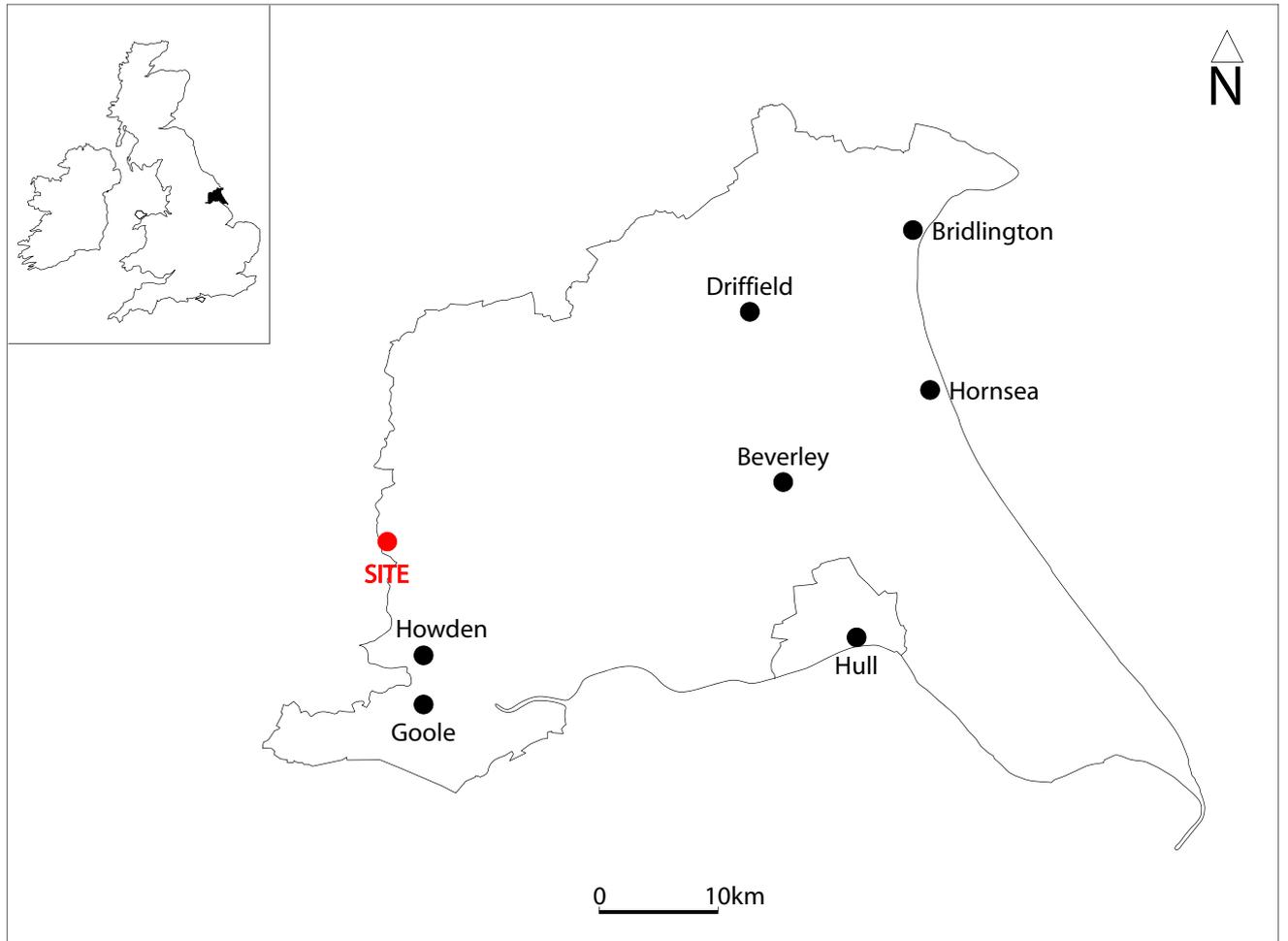


Fig. 1. Site location

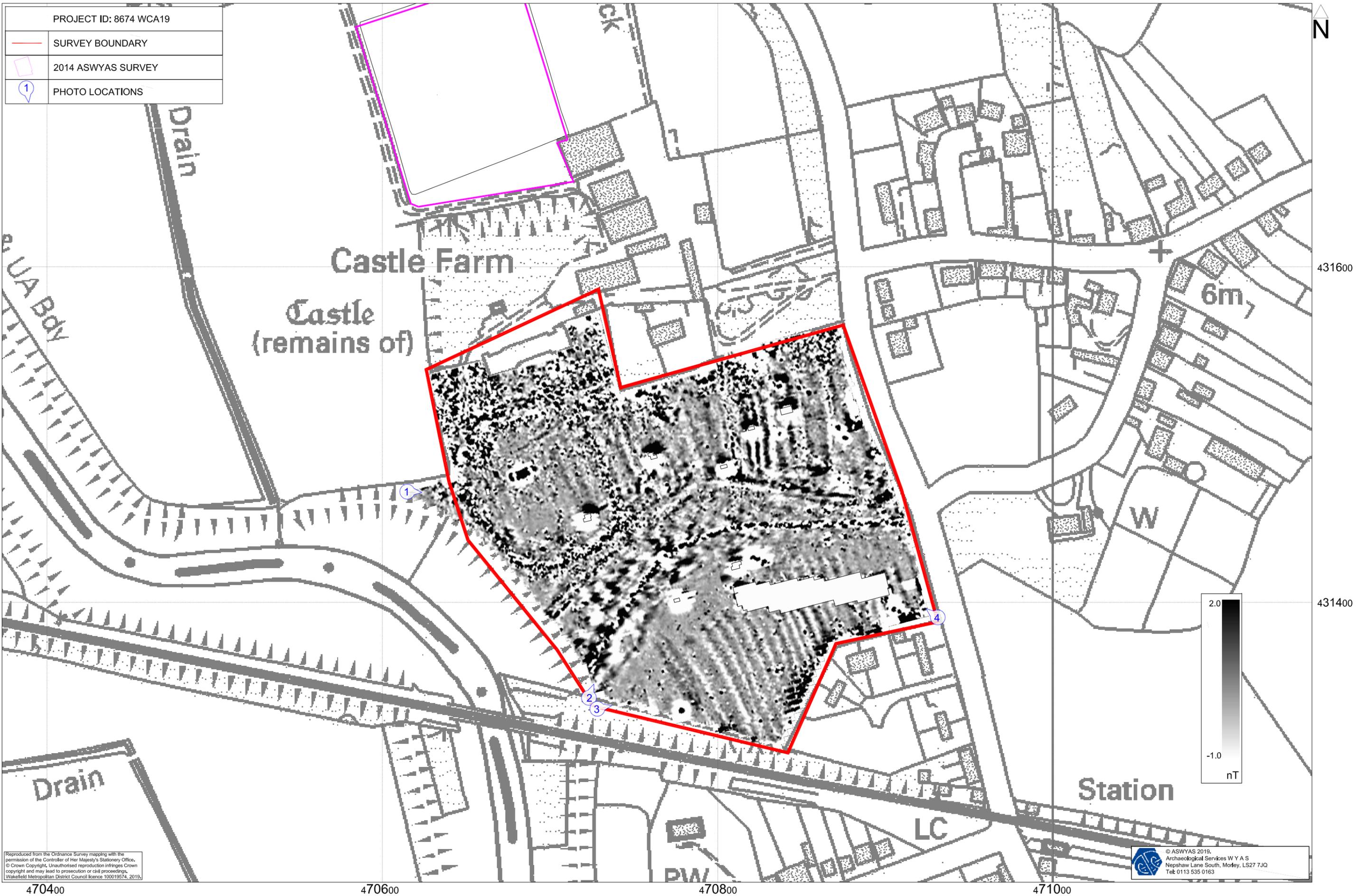
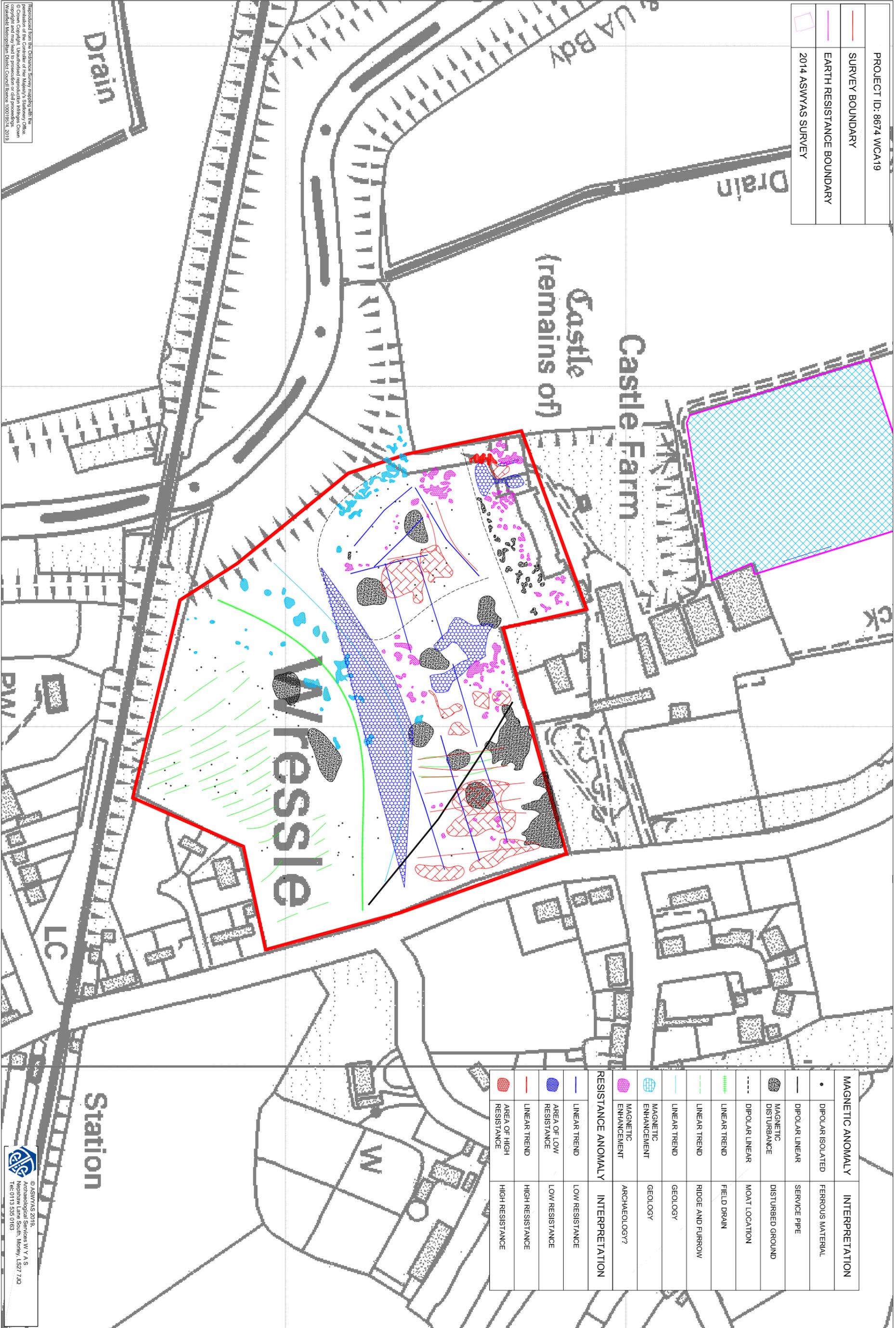


Fig. 2. Survey location showing greyscale magnetometer data (1:2000 @ A3)



Fig. 3. Survey location showing greyscale earth resistance data (1:2000 @ A3)

PROJECT ID: 8674 WCA19
SURVEY BOUNDARY
EARTH RESISTANCE BOUNDARY
2014 ASWYAS SURVEY



MAGNETIC ANOMALY	INTERPRETATION
• DIPOLAR ISOLATED	FERROUS MATERIAL
— DIPOLAR LINEAR	SERVICE PIPE
● MAGNETIC DISTURBANCE	DISTURBED GROUND
- - - DIPOLAR LINEAR	MOAT LOCATION
LINEAR TREND	FIELD DRAIN
— LINEAR TREND	RIDGE AND FURROW
— LINEAR TREND	GEOLOGY
⊕ MAGNETIC ENHANCEMENT	GEOLOGY
⊗ MAGNETIC ENHANCEMENT	ARCHAEOLOGY?
RESISTANCE ANOMALY	INTERPRETATION
— LINEAR TREND	LOW RESISTANCE
● AREA OF LOW RESISTANCE	LOW RESISTANCE
— LINEAR TREND	HIGH RESISTANCE
● AREA OF HIGH RESISTANCE	HIGH RESISTANCE

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Nephtaw Lane South, Merley, LS27 7JD
Tel: 0113 535 0183



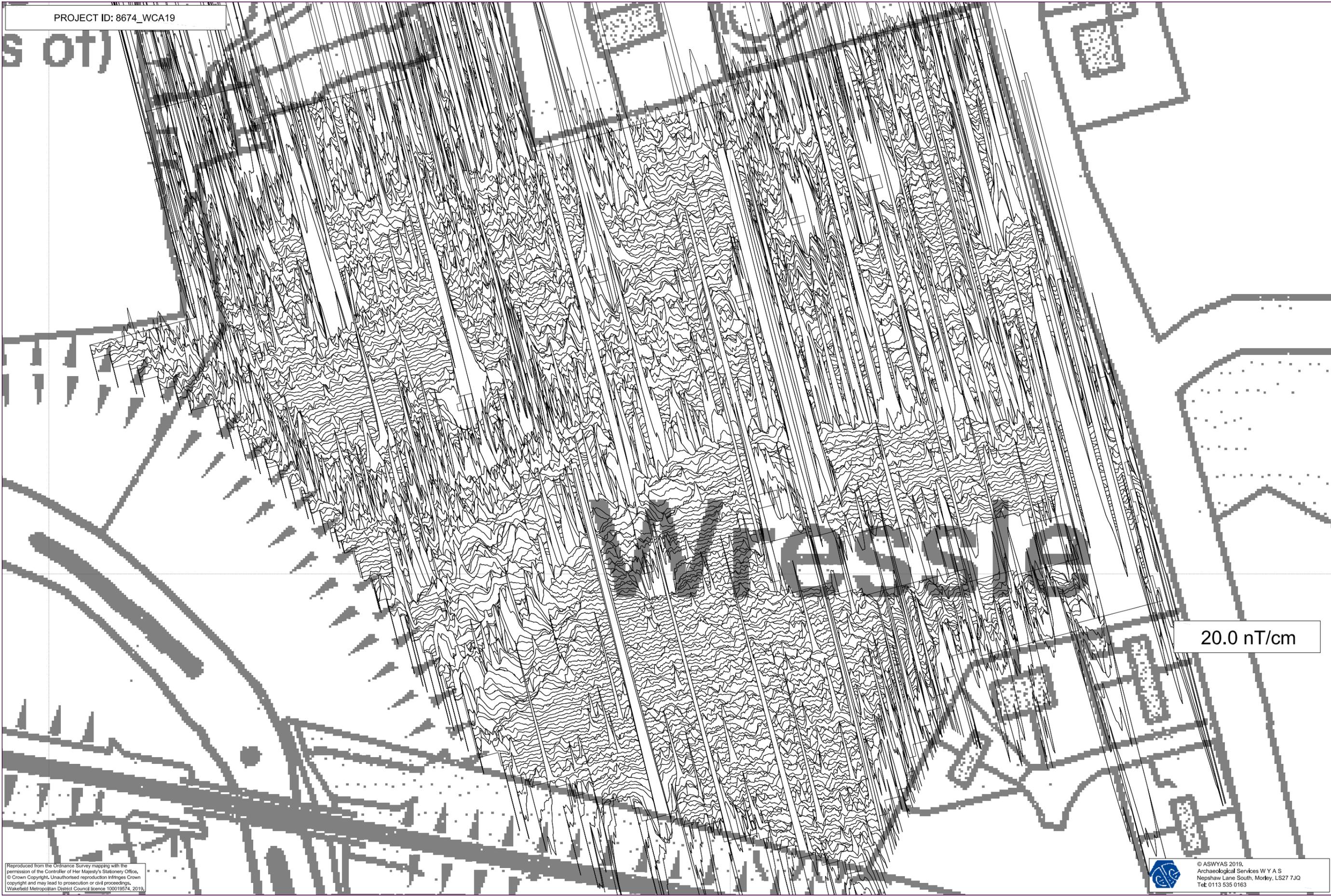
Fig. 4. Combined interpretation of magnetometer and earth resistance data (1:2000 @ A3)



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470600 470800 431400
0 50m
Fig. 5. Processed greyscale magnetometer data (1:1000 @ A3)



431400

20.0 nT/cm

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470600

470800

Fig. 6. XY trace plot of minimally processed magnetometer data (1:1000 @ A3)

0 50m

MAGNETIC ANOMALY	INTERPRETATION
•	DIPOLAR ISOLATED FERROUS MATERIAL
—	DIPOLAR LINEAR SERVICE PIPE
■	MAGNETIC DISTURBANCE DISTURBED GROUND
- - -	DIPOLAR LINEAR MOAT LOCATION
	LINEAR TREND FIELD DRAIN
—	LINEAR TREND RIDGE AND FURROW
—	LINEAR TREND GEOLOGY
⊕	MAGNETIC ENHANCEMENT GEOLOGY
⊗	MAGNETIC ENHANCEMENT ARCHAEOLOGY?
●	MAGNETIC ENHANCEMENT ARCHAEOLOGY



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470600

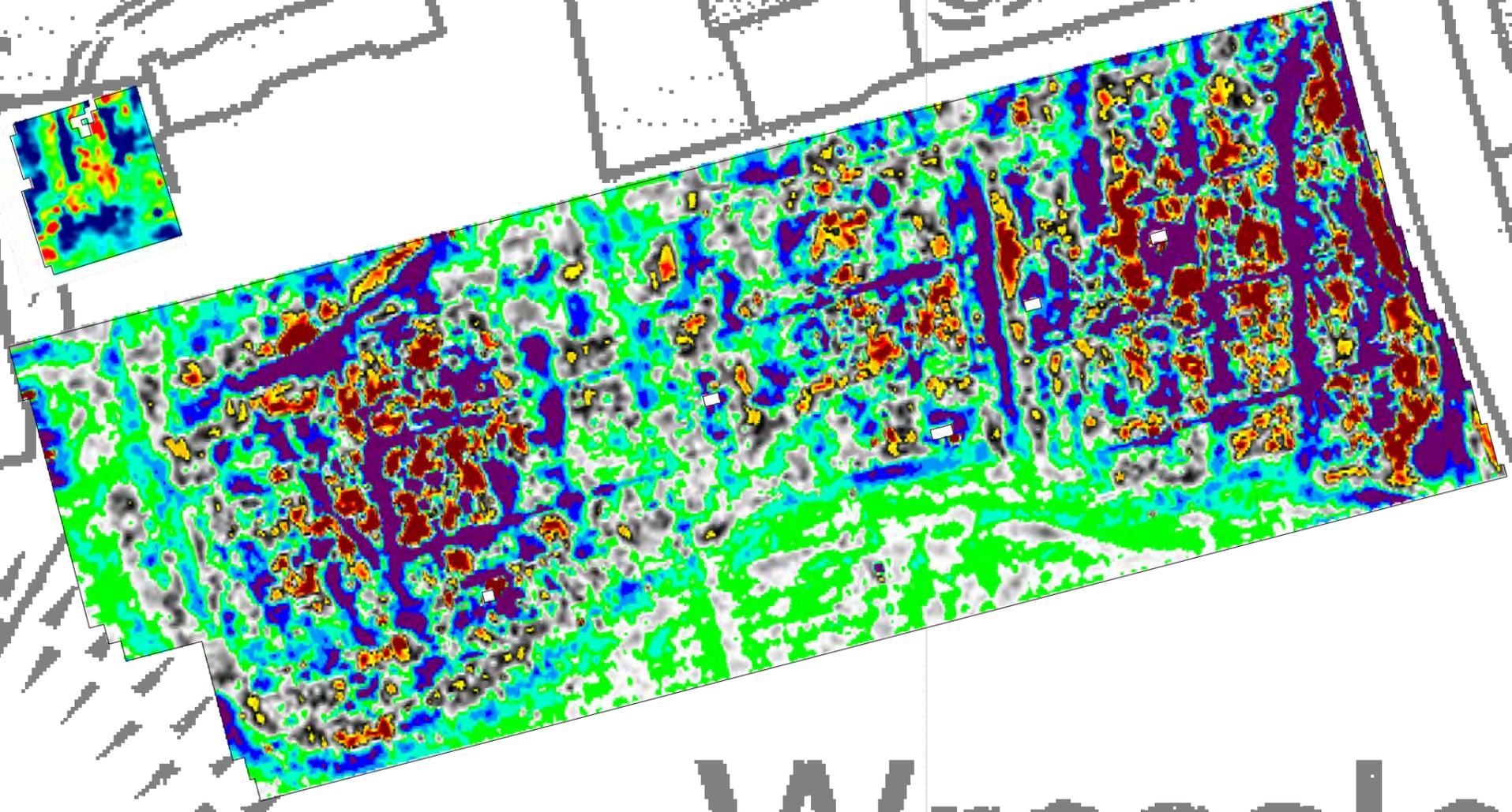
470800

431400

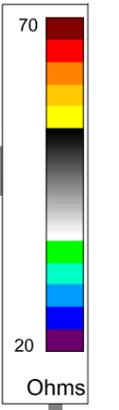
Fig. 7. Interpretation of magnetometer data (1:1000 @ A3)

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0 50m



Wressle



431400

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470600

470800

Fig. 8. Processed earth resistance data (1:1000 @ A3)

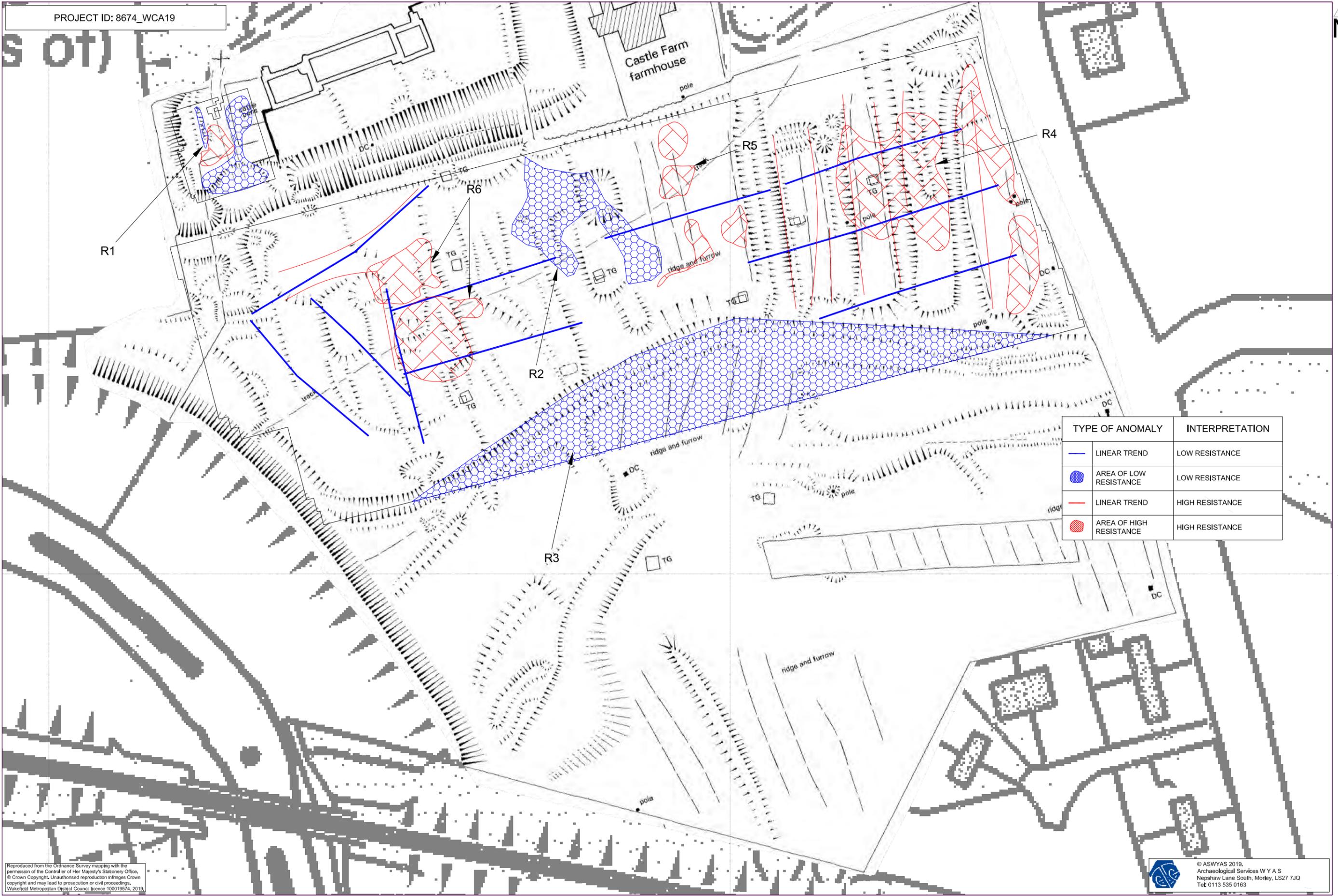




MAGNETIC ANOMALY	INTERPRETATION
•	DIPOLAR ISOLATED FERROUS MATERIAL
—	DIPOLAR LINEAR SERVICE PIPE
■	MAGNETIC DISTURBANCE FERROUS MATERIAL
- - -	DIPOLAR LINEAR MOAT LOCATION
	LINEAR TREND FIELD DRAIN
—	LINEAR TREND RIDGE AND FURROW
—	LINEAR TREND GEOLOGY
⊕	MAGNETIC ENHANCEMENT GEOLOGY
⊖	MAGNETIC ENHANCEMENT ARCHAEOLOGY?
●	MAGNETIC ENHANCEMENT ARCHAEOLOGY

Fig. 9. Interpretation of magnetometer data overlain earthwork survey (1:1000 @ A3)

0 50m



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470600 470800 431400
 Fig. 10. Interpretation of processed earth resistance data (1:1000 @ A3)
 0 50m



Plate 1. General overview of survey area, facing southeast.



Plate 2. General overview of survey area, facing northeast.



Plate 3. General overview of survey area, facing east.



Plate 4. General overview of survey area, facing northwest.

Appendix 1: Magnetic survey - technical information

Magnetic Susceptibility and Soil Magnetism

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haemetite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms. Areas of human occupation or settlement can then be identified by measuring the magnetic susceptibility of the topsoil because of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected. The magnetic susceptibility of a soil can also be enhanced by the application of heat and the fermentation and bacterial effects associated with rubbish decomposition. The area of enhancement is usually quite large, mainly due to the tendency of discard areas to extend beyond the limit of the occupation site itself, and spreading by the plough.

Types of Magnetic Anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes)

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Linear trend

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

Methodology: Gradiometer Survey

The main method of using the fluxgate gradiometer for commercial evaluations is referred to as *detailed survey* and requires the surveyor to walk at an even pace carrying the instrument within a grid system. A sample trigger automatically takes readings at predetermined points, typically at 0.25m intervals, on traverses 1m apart. These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation.

During this survey a Bartington Grad601 magnetic gradiometer was used taking readings on the 0.1nT range, at 0.25m intervals on zig-zag traverses 0.5m apart within 30m by 30m square grids. The instrument was checked for electronic and mechanical drift at a common point and calibrated as necessary. The drift from zero was not logged.

The gradiometer data have been presented in this report in processed greyscale format. The data in the greyscale images have been interpolated and selectively filtered to remove the effects of drift in instrument calibration and other artificial data constructs and to maximise the clarity and interpretability of the archaeological anomalies.

The results and subsequent interpretation of data from geophysical surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by direct investigation of sub-surface deposits

Appendix 2: Earth resistance survey - technical information

Soil Resistance

The electrical resistance of the upper soil horizons is predominantly dependant on the amount and distribution of water within the soil matrix. Buried archaeological features, such as walls or infilled ditches, by their differing capacity to retain moisture, will impact on the distribution of sub-surface moisture and hence affect electrical resistance. In this way there may be a measurable contrast between the resistance of archaeological features and that of the surrounding deposits. This contrast is needed in order for sub-surface features to be detected by a resistance survey.

The most striking contrast will usually occur between a solid structure, such as a wall, and water-retentive subsoil. This shows as a resistive high. A weak contrast can often be measured between the infill of a ditch feature and the subsoil. If the infill material is soil it is likely to be less compact and hence more water retentive than the subsoil and so the feature will show as a resistive low. If the infill is stone the feature may retain less water than the subsoil and so will show as a resistive high.

The method of measuring variations in ground resistance involves passing a small electric current (1mA) into the ground via a pair of electrodes (current electrodes) and then measuring changes in current flow (the potential gradient) using a second pair of electrodes (potential electrodes). In this way, if a structural feature, such as a wall, lies buried in a soil of uniform resistance much of the current will flow around the feature following the path of least resistance. This reduces the current density in the vicinity of the feature, which in turn increases the potential gradient. It is this potential gradient that is measured to determine the resistance. In this case, the gradient would be increased around the wall giving a positive or high resistance anomaly.

In contrast a feature such as an infilled ditch may have a moisture retentive fill that is comparatively less resistive to current flow. This will increase the current density and decrease the potential gradient over the feature giving a negative or low resistance anomaly.

Survey Methodology

The most widely used archaeological technique for earth resistance surveys uses a twin probe configuration. One current and one potential electrode (the remote or static probes) are fixed firmly in the ground a set distance away from the area being surveyed. The other current and potential electrodes (the mobile probes) are mounted on a frame and are moved from one survey point to the next. Each time the mobile probes make contact with the ground an electrical circuit is formed between the current electrodes and the potential gradient between the mobile and remote probes is measured and stored in the memory of the instrument.

A Geoscan RM15 resistance meter was used during this survey, with the instrument logging each reading automatically at 1m intervals on traverses 1m apart. The mobile probe spacing

was 0.5m with the remote probes 15m apart and at least 15m away from the grid under survey. This mobile probe spacing of 0.5m gives an approximate depth of penetration of 1m for most archaeological features. Consequently a soil cover in excess of 1m may mask, or significantly attenuate, a geophysical response.

Data Processing and Presentation

All of the illustrations incorporating a digital map base were produced in AutoCAD 2008 (© Autodesk).

The resistance data is presented in this report in greyscale format with a linear gradation of values and was obtained by exporting a bitmap from the processing software (Geoplot v3.0; Geoscan Research) into AutoCAD 2008. The data has been processed and has also been interpolated by a value of 0.5 in both the X and Y axes using a sine wave $(x)/x$ function to give a smoother, better defined plot.

Appendix 3: Survey location information

An initial survey station was established using a Trimble VRS differential Global Positioning System (Trimble R6 model). The data was geo-referenced using the geo-referenced survey station with a Trimble RTK differential Global Positioning System (Trimble R6 model). The accuracy of this equipment is better than 0.01m. The survey grids were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if co-ordinates are measured off hard copies of the mapping rather than using the digital co-ordinates.

Archaeological Services WYAS cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

Appendix 4: Geophysical archive

The geophysical archive comprises:-

- an archive disk containing compressed (WinZip 8) files of the raw data, report text (Microsoft Word 2000), and graphics files (Adobe Illustrator CS6 and AutoCAD 2008) files; and
- a full copy of the report.

At present the archive is held by Archaeological Services WYAS although it is anticipated that it may eventually be lodged with the Archaeology Data Service (ADS). Brief details may also be forwarded for inclusion on the Historic England Geophysical Survey Database after the contents of the report are deemed to be in the public domain (i.e. available for consultation in the Humber Archaeology Partnership Historic Environment Record).

Appendix 5: Oasis form

OASIS DATA COLLECTION FORM: England

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Printable version

OASIS ID: archaeol11-349934

Project details

Project name	Land off Brighton Road,
Short description of the project	A geophysical (magnetometer and resistance) survey covering approximately 5 hectares, with a targeted 2 hectare earth resistance survey was carried out on land off Brighton Road, Wressle, Selby in order to determine the presence/absence of archaeological remains associated with Wressle Castle, a scheduled monument. The resistance survey has identified regularly spaced, linear low resistance anomalies, which are likely to correspond with later drainage ditches. Some comparably higher resistance responses relate to ridge and furrow in the area and part of a former structure known as
Project dates	Start: 25-04-2019 End: 29-04-2019
Previous/future work	Yes / Not known
Any associated project reference codes	WCA19 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Grassland Heathland 2 - Undisturbed Grassland
Monument type	RIDGE AND FURROW Post Medieval
Monument type	N/A None
Significant Finds	N/A None
Significant Finds	N/A None
Methods & techniques	"Geophysical Survey"
Development type	Not recorded
Prompt	Research
Position in the planning process	Not known / Not recorded

Solid geology	PERMIAN MUDSTONES
Drift geology	RIVER TERRACE DEPOSITS
Techniques	Magnetometry
Techniques	Resistivity - area

Project location

Country	England
Site location	EAST RIDING OF YORKSHIRE EAST RIDING OF YORKSHIRE WRESSLE Wressle Castle
Postcode	YO8 6EX
Study area	5 Hectares
Site coordinates	SE 70769 31440 53.774262775047 -0.926052353776 53 46 27 N 000 55 33 W Point
Height OD / Depth	Min: 4m Max: 6m

Project creators

Name of Organisation	Archaeological Services WYAS
Project brief originator	Ed Dennison Archaeological Services Ltd
Project design originator	Ed Dennison Archaeological Services Ltd
Project director/manager	C. Sykes
Project supervisor	C. Sykes
Type of sponsor/funding body	Landowner

Project archives

Physical Archive Exists?	No
Digital Archive recipient	ASWYAS
Digital Contents	"none"
Digital Media available	"Geophysics","Images vector","Survey"
Paper Archive Exists?	No

**Project
bibliography 1**

Publication type	Grey literature (unpublished document/manuscript)
Title	Wressle Castle
Author(s)/Editor(s)	Sykes, C.
Date	2019
Issuer or publisher	ASWYAS
Place of issue or publication	LEEDS

Entered by	Christopher Sykes (christopher.sykes@aswyas.com)
Entered on	26 April 2019

OASIS:

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