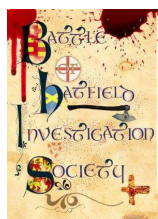


**Geophysical Magnetometer and Topographic Survey
of Cuckney
Churchyard, Castle, and surroundings.
Cuckney, Nottinghamshire, 2016.
(SK 565713).**

**Geophysical Magnetometer and Topographic
Survey Report**

Andy Gaunt
Mercian Archaeological Services CIC
31/032016
Ref: Gaucuck1301
Report MAS020



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1. Project location, topography and geology

1.1. **Site Location:** The site is located (SK565713), in the parish of Cuckney, Nottinghamshire, Cuckney Church yard is to the north of the village of Cuckney. Cuckney village is located approximately half way between Mansfield and Worksop.



Figure 1: Site Location regional map.
Contains OS data © Crown copyright [and database right] 2016.

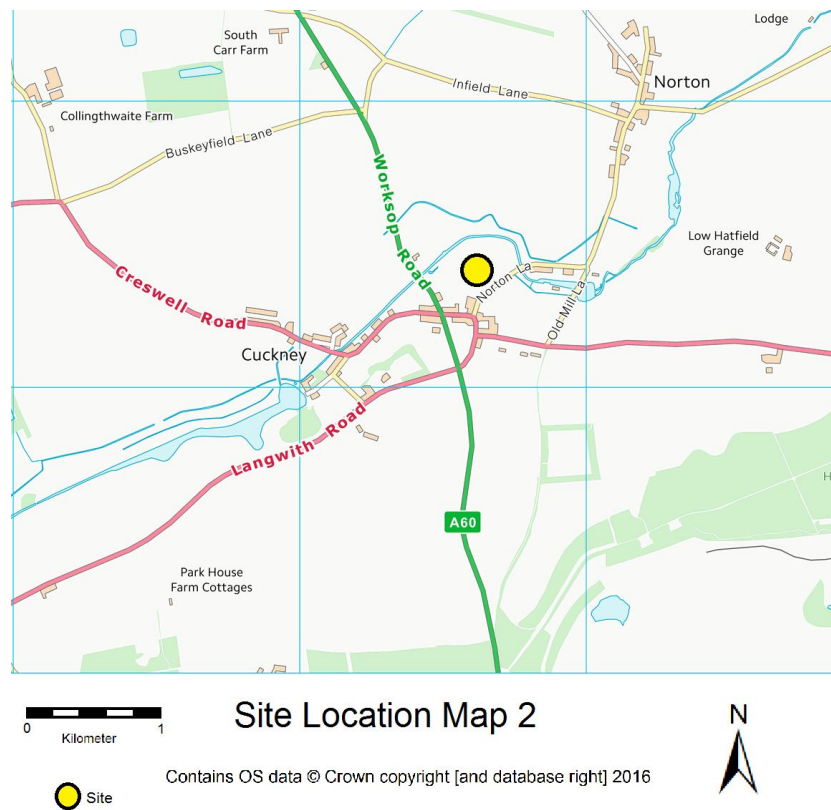


Figure 2: Site location from local map.
Contains OS data © Crown copyright [and database right] 2016.

1.2 Topography: The site is located in the valley of the River Poulter. The Church of Cuckney sits on a raised location at the northern end of the village of Cuckney above the flood plain of the river. The River Poulter forms the northern extent of the site, which is enclosed to the east north and west by a meander. The river's course has been canalized as part of a historic water meadow system. A number of earthworks occupy the lower ground between the churchyard and the river on this northern side. The site sits to the west side of a historic north-south routeway from Mansfield to Worksop. Earthworks protected as a Scheduled Monument are extant in the western part of the churchyard, and to the north.

1.3 Geology: The 1:50,000 scale bedrock geology description for the site is as follows: Lenton Sandstone Formation - Sandstone. Sedimentary Bedrock formed approximately 246 to 271 million years ago in the Triassic and Permian Periods. Local environment previously dominated by rivers. These rocks were

formed from rivers depositing mainly sand and gravel detrital material in channels to form river terrace deposits, with fine silt and clay from overbank floods forming floodplain alluvium, and some bogs depositing peat; includes estuarine and coastal plain deposits mapped as alluvium. The site is enclosed to the north by the river channel of the River Poulter where the 1:50,000 scale superficial deposits description is as follows: Alluvium - Clay, Silt, Sand And Gravel. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by rivers. These rocks were formed from rivers depositing mainly sand and gravel detrital material in channels to form river terrace deposits, with fine silt and clay from overbank floods forming floodplain alluvium, and some bogs depositing peat; includes estuarine and coastal plain deposits mapped as alluvium.(www.BGS.ac.co.uk-accessed 29/03/2016).

2. Archaeological and Historical Background

2.1. **Place name:** The English Place Names Society volume for Nottinghamshire published in 1940 gives the derivation of Cuckney as “The second element is eg. ‘island of marshy land.’ The first is probably... The personal name *Cuca* or *Cwica*, a pet form of such a name as [old english] *Cwichealm* (Glover et al 1940 p75). It lists the earliest appearances in the forms: Cuchenai 1086 Domesday Book, Cucheneia c 1150, , Cuckeneya 1159-81, Cuckeneie c 1179, “and frequently in Inquisitions Post Mortem to 1295 with variant spellings *Kuk-* and *-eye, eia, -aie, -aye, -ee.*” *Chugeneia* 1185, *Chugeneia* 1187, *Quikenea* 1195, *Kuyekeney* c 1245, *Cokeneye* 1221, *Cokkene* 1393, *Cokkenaye* 1548, *Coknay* 1510, *Cookney* 1542, *Cowkenay* 1548, *Cuckney* 1684 (ibid).

2.2 The Domesday Book of 1086:

“The Land of Roger de Bully.

Bassetlaw Wapentake

In CUCKNEY Alric and Wulfsige had 1 carucate of lands to geld. [There is] land

for 2 ploughs. There Geoffrey, Roger's man, has 1 plough, and 9 villains having 3 ploughs. [There is] woodland pasture 2 furlongs long and 2 broad. TRE* worth 20s; now 2s less." (Williams & Martin Eds. 2003. Pp 764-766)

"The Land of Hugh fitzBaldric.

In Cuckney Swein had 2 carucates of land to the geld. [There is] land for 4 ploughs. Richard holds it of Hugh, and has there 2 ploughs in demense; and 3 sokeman on 2 bovates of land and 10 villains and 5 bordars having 2 ploughs. There is a priest and a church, and 2 mills [rendering] 8s [and] woodland pasture 4 furlongs long and 4 furlongs broad. TRE, as now, worth 30s." (Williams & Martin Eds. 2003. P779).

*TRE - Tempore Regis Edwardi (Time of King Edward the Confessor). Refers to the value of the holdings at the time of the Norman Conquest, 1066. The second value relates to the value at the time of the Domesday survey 1086.

2.3 Prehistoric and Roman

2.3.1. The Historic Environment Record (HER) is the repository for archaeological knowledge and information for the county. A 2km wide search of the database, centered on Cuckney church brings up a list of 54 Monuments and Elements.

The records listed on the HER include a number of undated linear earthworks, an undated cropmark enclosures; one in both Norton and Cuckney, an undated banked enclosure, and undated irregular earthworks.

The earliest dateable object is a Roman coin dating from 268- 273AD.

2.3.2. This Roman coin is the only artefact registered on the HER for Cuckney with a confirmed date prior to the medieval period (see Appendix V).

2.4. Medieval

2.4.1. Church.

2.4.1.1. The earliest reference to a church in Cuckney comes from the Domesday entry listed above, where a church and priest are recorded in 1086.

2.4.1.2. Nikolaus Pevsner describes the church in Cuckney in the following entry: "St, Mary. An unusually long nave of c. 1200 with a N aisle, in the W with circular piers, then two of quatrefoil plan, finally the others octagonal... The arches are all semi-circular and double chamfered. In date the arcade seems to stand between the lower stages of the broad short W tower and the S door (two orders without columns, one zig-zag, the other a thick angular rope motif) on the one hand and the upper stage of the tower (ashlar with mid-C13 two-light windows) and the S porch on the other. The S porch in any case seems EE [Early English] throughout (see its door with stiff-leaf capitals and its corbel table). The Piscina has dog-tooth and nailhead ornament, - SCREEN now in the tower arch: only very small remains of Perp [Perpendicular] panel tracery" (Pevsner. 1951. p58).

2.4.2. Motte and Bailey Castle.

2.4.2.1. The Motte and Bailey Castle at Cuckney has been a Scheduled Monument since 28-Apr-1953. Scheduled Monument Number 1010909, Legacy Scheduled Monument Number 13393 (<https://historicengland.org.uk/listing/the-list/list-entry/1010909>, accessed 31/03/2016).

2.4.2.2. According to the Historic England website "Cuckney Motte and bailey castle is a reasonably well-preserved example of an adulterine fort built to command a river valley. Although the Motte and inner bailey are partially disturbed by modern burials, a sufficient amount remains intact for the structure of the Motte to be preserved and also the relationship between these areas and

the outer bailey. The outer bailey itself has suffered little disturbance and so will retain the archaeological remains of ancillary features such as garrison buildings and corrals for stock and horses. The defensive earthworks associated with both the inner and outer baileys also survive well” (<https://historicengland.org.uk/listing/the-list/list-entry/1010909>, accessed 31/03/2016).

2.4.2.3. The Historic England website contains the following detailed entry about the Scheduled area of the Motte and Bailey Castle:

“The monument includes the Motte, outer bailey and part of the inner bailey of the twelfth century Motte and bailey castle at Cuckney. Originally, the inner bailey extended further east into the area now occupied by the parish church of St Mary and the churchyard to the south. Although archaeological remains will survive here, these areas are not included in the scheduling as they are in current ecclesiastical use. The outer bailey may also have extended further south into the built-up area south-west of the church. This area is not included in the scheduling as the extent and state of preservation of the remains is not sufficiently understood. The inner bailey is a sub-rectangular platform orientated east to west. It measures 90m from north to south and 150m east to west. Only the western 80m are included in the scheduling. The Motte occupies the north-west corner of the inner bailey and consists of a flat-topped oval mound, 4m high and measuring 45m from north to south by 20m east to west. Both the Motte and the scheduled part of the inner bailey are occupied by the now disused graveyard associated with the church. The perimeter wall of the graveyard occupies the inner edge of a 10m wide ditch that encircles the west side of the Motte and encloses the inner bailey on the north side. Originally, it would also have enclosed the south side of the bailey but has been filled-in to the south of the church so that, on this side, only the area south of the Motte remains open. The remainder will survive as a buried feature in the unscheduled part of the inner bailey. The ditch does not appear to have extended along the east side of the inner bailey, which also lies in the unscheduled area. This indicates that the original entrance would have

occupied this side. Encircling the inner bailey on the north and west sides is a 40m wide ribbon of open ground which functioned as an outer bailey. This is partially encircled by a double bank and ditch which lies roughly parallel with the River Poulter and is approximately 15m wide. The river would have formed another line of defence on this side and, in addition, could be commanded from the castle. The castle was built by Thomas de Cuckney during the reign of King Stephen (1135-54), which was a time of civil strife between Stephen's supporters and those of the Empress Matilda (Maud), daughter of his predecessor Henry I. The castle may therefore have been an adulterine fort; that is, one built without the king's permission. During the underpinning of the church in 1951, up to 200 burials were found which antedate the building of the church in c.1200. They occupied three or four communal graves; that is, trenches dug north to south so that the bodies could be laid with their feet to the east. No associated finds have been recorded, neither have the remains undergone scientific analysis. However, it is assumed that the bodies were casualties from a skirmish associated with the Maudian rebellion. After their discovery, the skeletons were reinterred in a fresh communal grave. Excluded from the scheduling are the boundary walls crossing the monument and the graves on the Motte and within the scheduled part of the inner bailey, although the ground beneath these exclusions is included" (<https://historicengland.org.uk/listing/the-list/list-entry/1010909>, accessed 31/03/2016).

2.5. Post Medieval

2.5.1 The HER search (see Appendix V) shows large amounts of building in the parish in the post medieval period, including a series of mills and workers cottages. The list also includes a number of sluices. These survive in the fields to the north of the River Poulter.

2.5.2. **Water Meadows system.** The River Poulter was the subject of a water meadow improvement scheme by the Duke of Portland during the 18th and 19th century (Gaunt 2009: 2010) this presumably resulted in canalization of

the water channel of the meander surrounding the site to the East, North and West.

2.6 Mass Burials under the Church.

2.6.1. As stated on the Historic England website, in relation to the entry for the Motte and Bailey Castle Scheduling, During underpinning works, undertaken in 1951 in advance of potential coal mining operations in the area, builders discovered a large number of skeletons. Maurice Barley reported the find in the transactions of the Thoroton Society, but his interpretations and descriptions were not based on first hand evidence, but on the testimonies of the workmen and others. It was estimated that burial pits under the church could hold up to 200 burials. These burials were believed to have pre-dated the building of the church in the later 12th century and early 13th century (Barley 1951).

2.6.2. The burials occupied three or four trenches dug north to south so that the bodies could be laid with their feet to the east.

2.6.3. No finds were recorded to date the bones, no photographs survive, if they were taken, no drawings were made, and no scientific analysis was undertaken. No primary evidence of the burials is known.

2.6.4. Professor Barley assumed that the bodies were casualties from a skirmish or battle dating from the period of the Anarchy of Stephen and Matilda in the middle part of the 12th century.

2.6.5. This suggestion ties in with the building of the possible adulterine Motte and Bailey Castle, and is the preferred date for the origin of the burials according to Historic England.

2.6.6. The skeletons that were dug up in the 1951 works were reinterred in a new location in the graveyard.

2.7. The Battle of Hatfield

2.7.1. In 1975 Stanley Revill reassessed the evidence for the burials, and using place name evidence among other arguments, he suggested that the burials may have dated from the 633AD Battle of Hatfield, where Edwin of Northumbria was defeated and killed by the combined forces of Penda of Mercia and Cadwallon of Gwynedd. Revill referenced the existence of Hatfield Grange, High Hatfield Farm, the location of Cuckney in the District of Hatfield, the western part of the Wapentake of Bassetlaw, Edwinstowe, and St Edwin's chapel in Clipstone, all as indicators of the possible memory of the battle and death of King Edwin in the area (Revill, 1975).

2.7.2. Revill was not the first to suggest the Battle of Hatfield was fought local to Cuckney. In 1890 Stapleton in his: *History of the Lordship of King's Clipstone or Clipstone in Sherwood, Nottinghamshire*, speculated that St Edwin's Chapel in Clipstone parish was likely named after King Edwin and the Battle.

2.7.3. John Chapman's map of Nottinghamshire from 1774 depicts Hatfield District covering the western half of Bassetlaw Wapentake.

3. Methodology

3.1. **Geophysical Survey** enables the non-invasive identification of buried or sub-surface features. These may include features of potential archaeological significance. Geophysical survey as employed in archaeology usually comes from one of three techniques; Magnetometry, Earth Electrical Resistance, or Ground Penetrating Radar (GPR). Techniques are chosen depending on site-specific factors including the nature of likely targets; depth of likely targets; ground conditions; proximity of buildings, fences or services and the

local geology and drift, but also more often than not choices are based on time, and therefore financial reasons. Best results are gained from an integrated survey where more than one technique is employed. For this integrated survey, two forms of Geophysical survey were chosen. Magnetometer survey was employed to cover as large an area as possible, and to search for anomalies such as ditches and pits associated with earthworks from the Castle and surrounding landscape. The methods of the geophysical surveys are outlined below.

3.1.1. Standards

3.1.1.1. The Magnetometer survey and reporting were conducted in accordance with Historic England guidelines, *Geophysical survey in archaeological field evaluation* (David, Linford & Linford 2008); the Institute for Archaeologists (IfA) *Draft Standard and Guidance for archaeological geophysical survey* (2010); the IfA Technical Paper No.6, *The use of geophysical techniques in archaeological evaluations* (Gaffney, Gater & Ovenden 2002); and the Archaeology Data Service Guide to Good Practice: *Geophysical Data in Archaeology* (draft 2nd edition, Schmidt & Ernenwein 2010).

3.1.2.2 The survey was undertaken using a Bartington Grag6012 fluxgate gradiometer. This technique involves the use of hand-held magnetometers to detect and record anomalies in the vertical component of the Earth's magnetic field caused by variations in soil magnetic susceptibility or permanent magnetisation; such anomalies can be caused by archaeological features. The gradiometer works by measuring the earth magnetic field at two separate sensors; one positioned 1 metre above the other. The lower of the two sensors is placed nearer to the ground surface and so is affected by magnetic variations in the soil. The signal is either higher or lower than the top sensors. This 'gradient' is recorded.

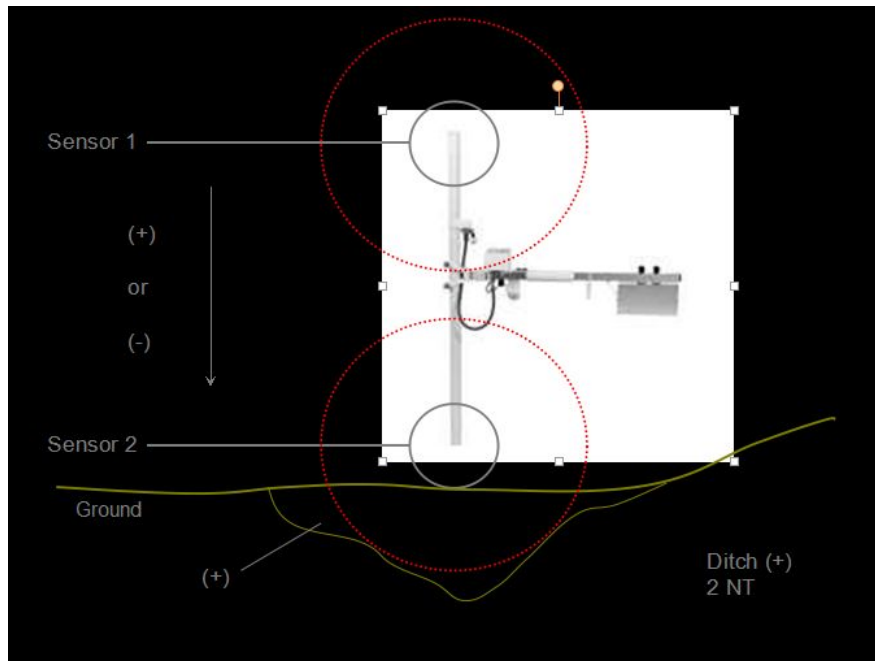


Figure 3: Theory of Fluxgate Gradiometer recording anomaly. A. Gaunt © Mercian Archaeological Services CIC, 2015.

3.1.2.4 Fieldwork Methods

3.1.2.4.1. A 20m grid was established across the survey area using tape measures and pegs. This grid was then recorded using the total stations to give accurate Ordnance Survey data locations for the grid. Three separate areas were surveyed (see figure 5).

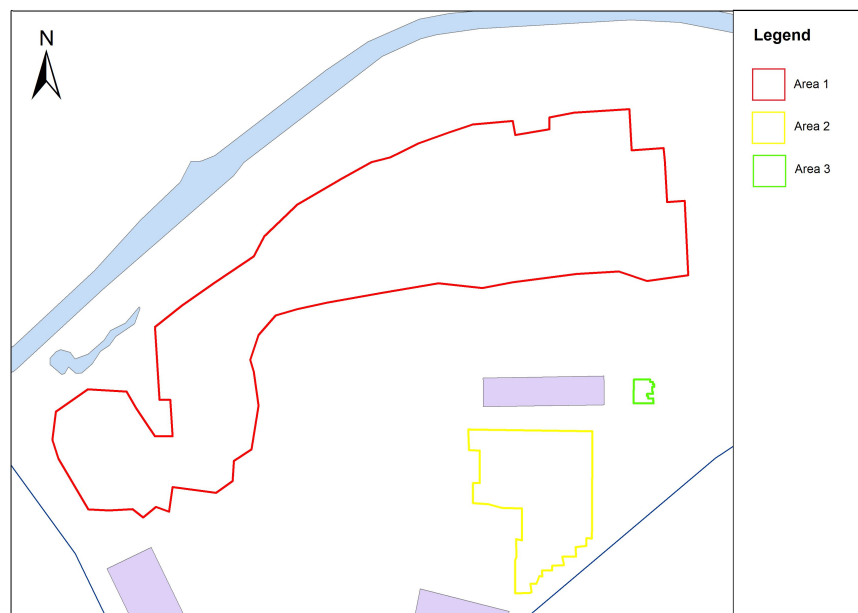
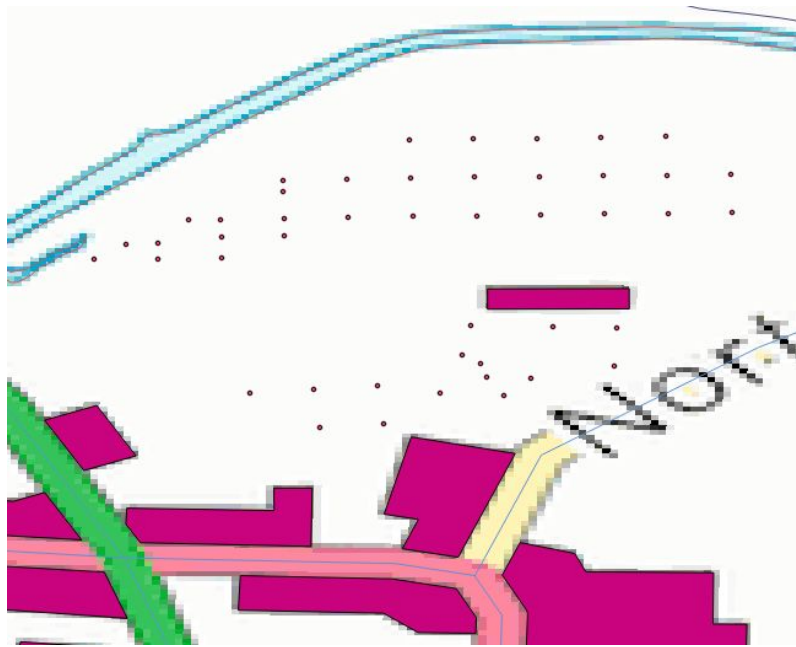


Figure 5: Magnetometer Survey Areas

3.1.2.4.2. Measurements of vertical geomagnetic field gradient were determined using Bartington Grad601-2 dual fluxgate gradiometers. A zig-zag traverse scheme was employed and data were logged in 20m grid units. The instrument sensitivity was nominally 0.03nT, the sample interval was 0.25m and the traverse interval was 1m.

3.1.2.4.3 Data were downloaded on site onto a laptop for initial processing and storage. The data was backed up onto Mercian's data network, with copies made of the data for processing.

3.1.2.5. Interpretation and Archiving.

3.1.2.5.1. Data processing

3.1.2.5.1.1. Grids collected in the field were downloaded and processed in a combination of Snuffler version 1.14, and Geoplot v.3 software. Grids were meshed together into a composite map of the survey. Snuffler 1.14 and Geoplot v.3 were used to process the geophysical data and to produce both a continuous tone greyscale image and a trace plot of the raw (minimally processed) data. A plot of filtered data is also provided. The greyscale images are presented in Figures 11, 12, 13, 15, 16, 18, and 19. Trace plots provided in Figures 14, 17, and 20. An interpretation plot is provided in Figure 21. In the greyscale images, positive magnetic anomalies are displayed as light grey and negative magnetic anomalies as dark grey. A key bar relates the greyscale intensities to anomaly values in NanoTesla.

3.1.2.5.1.2. The following basic processing functions have been applied to the geomagnetic data:

3.1.2.5.1.3 **Clip:** This clips data to specified maximum or minimum values; to eliminate large noise spikes; also generally makes statistical calculations more realistic.

3.1.2.5.1.4. **Zero Mean Traverse:** sets the background mean of each traverse within a grid to zero; for removing striping

effects in the traverse direction and removing grid edge discontinuities.

3.1.2.5.1.5. **Interpolate:** increases the number of data points in a survey to match sample and traverse intervals; in this instance the data have been interpolated to 0.25m x 0.25m intervals

3.1.2.1.5. **Destripe:** used to remove error caused during data collection.

3.1.2.1.2. **Anomaly types:**

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

3.1.2.1.2.2. **Positive magnetic** regions of anomalously high or positive magnetic field gradient, which may be associated with high magnetic susceptibility soil-filled structures such as pits and ditches (in Purple in Figure 21).

3.1.2.1.2.3. **Negative magnetic** regions of anomalously low or negative magnetic field gradient, which may correspond to features of low magnetic susceptibility such as wall footings (Blue in Figure 21).

4.1.2.1.2.4. **Dipolar magnetic** paired positive-negative magnetic anomalies, which typically reflect ferrous or fired materials (including fences and service pipes) and/or fired structures such as kilns or hearths (pink in Figure 21).

3.1.2.1.3. **Interpretation: features**

3.1.2.1.3.1. A colour-coded archaeological interpretation plan is provided. Except where stated otherwise in the text below, positive magnetic anomalies are taken to reflect relatively high magnetic susceptibility materials, typically sediments in cut archaeological features (such as ditches or pits) The fill of ditches is often magnetically enhanced by decomposed

organic matter or by burning.

3.2. Topographic Survey Methodology

The Topographic earthwork survey was undertaken to record and interpret the earthworks in and around Cuckney churchyard, including those that are designated as the Scheduled monument of Cuckney Castle. The survey was also designed to provide a 3 dimensional and 2 dimensional framework for the Geophysical radar and Magnetometer surveys. The survey was undertaken to produce a 2D hachure plan of the earthworks using subjective survey techniques, and to produce 3D Digital terrain models (DTM) of the earthworks by combining the data from subjective survey with data from objective surveys.

3.2.1. Equipment

3.2.1.1. The survey was undertaken using survey grade Global Positioning System (GPS), Electronic Distance Measuring (EDM) Total Station, and Robotic EDM Total Station with 360° prism. The GPS system used was a Leica GPS Viva; enabled to use Smartnet technology. This GPS system operates using Differential GPS (DGPS), where corrections are given to improve the information received from satellite location data. A rover station controlled by the operator recorded points operating in Real-time Kinematic mode, receiving data from a remote system of control stations. This Smartnet system, corrects the rover station, allowing points to be recorded 'on the fly' to subcentimetre accuracy levels, via a mobile SIMM card connection. The GPS rover was set to record either continuously or to take static points, depending on requirements as recommended in Ainsworth, S. & Thomason, B. 2003. The GPS was used to set up accurate control points which could form the 'Control of Survey' for the optical survey techniques (see below).

3.2.1.2 EDM Total Station combines a Theodolite to record vertical and horizontal angles, and an Electronic distance measurement device, to enable the acquisition of 3-Dimensional coordinate data. Total stations reflect infrared laser beams against a reflective prism. Two different Total Stations were utilised during the Cuckney survey to provide the different aspect of the

survey. The first Total Station; a Leica TS06, requires two operators, one to operate the device and the other to position the prism pole in the required location for surveying. The second Total Station was a Leica TS15 Robotic 360° prism station. This device enables an operator to gather points automatically at a set increment while the total station 'locks on' and automatically follow the user around the site. This method allows a large volume of data points to be recorded quickly.

3.2.1.3. EDM Total Stations also provide subcentimetre relative accuracy for recordings (<http://totalstation.org/total-stationfunctionality.php>). The stations are orientated by coordinate or re-sectioning from known coordinates which are taken from control points (see below) provided by the Differential GPS. All points recorded are therefore accurate to, and recorded in Ordnance Survey Datum.

3.2.2 Control of survey

3.2.2.1 Control of survey is the accurate framework of carefully measured points within which the rest of the survey is fitted' (Ainsworth, et al. 2007). Section 2.1 *Control of Survey in Metric Survey Specifications for English Heritage* states that metric survey 'must provide reliable and repeatable control capable of generating the required coordinates within the tolerances stated' (Lutton.2003).

3.2.2.2 The prescribed tolerance level is to a precision of $\pm 10\text{mm}$ (Lutton. 2003). This level of control was achieved by using the Differential GPS Leica Viva system mentioned above. The GPS device was set to take readings within $\pm 10\text{mm}$ accuracy levels, and then used to stake-out station points using 99 epochs per location. The points were chosen to provide inter-visibility across the site for optical survey using Total Stations. Total stations were set up above these station points when required and orientated by the other survey control points to provide control between GPS and optical survey. The control points were also used to configure the Total Stations by re-sectioning techniques. Further control points and Temporary Bench Marks (TBM) were set up around the site using the GPS as required. As well as falling within the accepted

tolerance levels, this technique also fulfills the requirement that the control must be repeatable. The site can easily be re-occupied using GPS devices in the future without the need to leave permanent site pegs on a Scheduled Site.

3.2.3. Objective and Subjective survey methodology

The survey was undertaken using a combination of objective and subjective survey techniques.

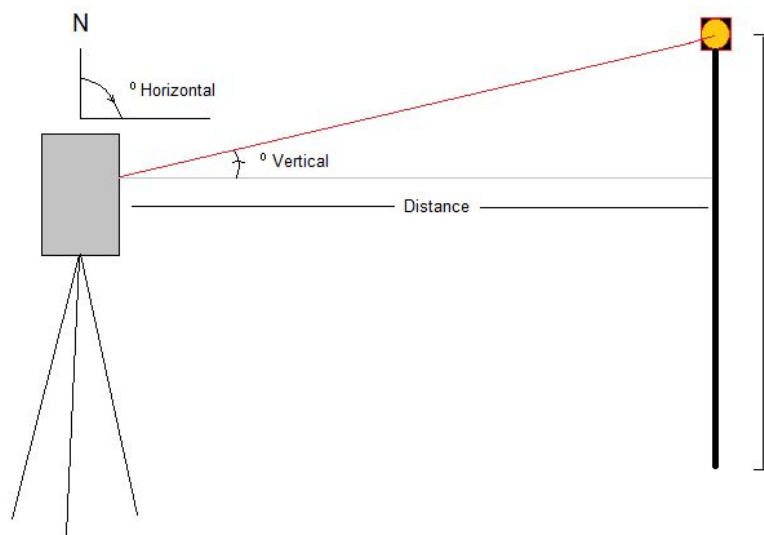


Figure 6: Using a Total Station and prism pole to record points, showing how device records angles and distance (infrared light beam shown in red). © Mercian Archaeological Services 2016.

3.2.3.1 Objective Survey

3.2.3.1.1. The objective, systematic part of the survey was carried out using the GPS Viva system described above, but due to tree cover a robotic TS15 Total Station was also used. 1m transects were surveyed across the site walked at right angles to give regular and objective coverage. Transect increments were controlled by volunteers at the ends of the transects acting as markers for the surveyor carrying the robotic total station 360° prism pole. Surveyors walked these transects, and recordings were automatically taken every 0.25 metres.



Figure 7: Screen grab from working data combining subjective and objective surveys. To show coverage. Collected during survey (not all data points displayed).



Figure 8: Screen grab from working data combining subjective and objective surveys. To show coverage. Collected during survey (not all data points displayed).

3.2.3.2 Subjective Survey

3.2.3.2.1 Subjective survey was used as a means to record features in more detail. It relies on the expertise of the surveyor to analyse the earthworks and to record them. For this procedure, EDM Total Stations were used to record the tops and bottoms of slopes. These recordings were highlighted in the survey data using different point Identification codes. The tops

and bottoms of slopes were mapped and joined together in Geographic Information Systems software, and then the subjective survey data was employed to produce a hachure plan of the site as recommended by Historic England (Bowden 2006).

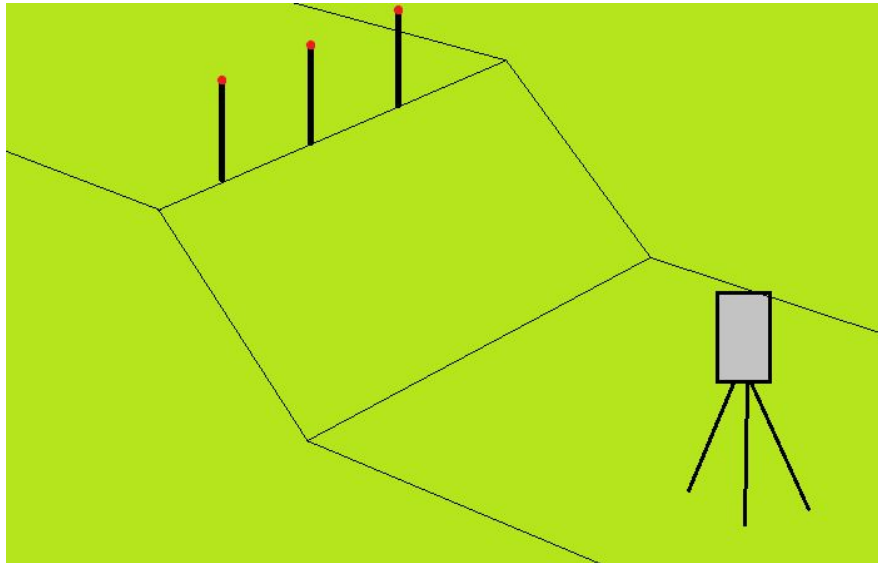


Figure 9: Total Station measuring tops of slope.

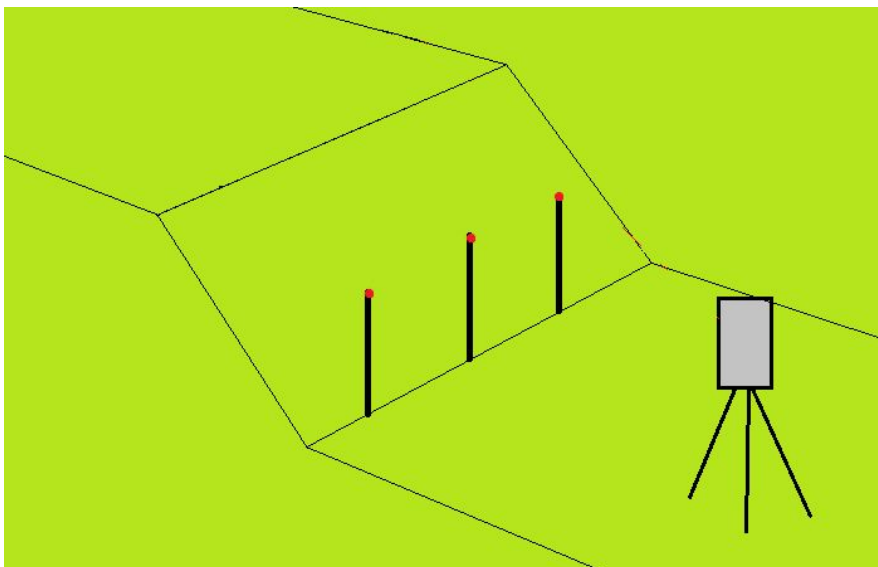
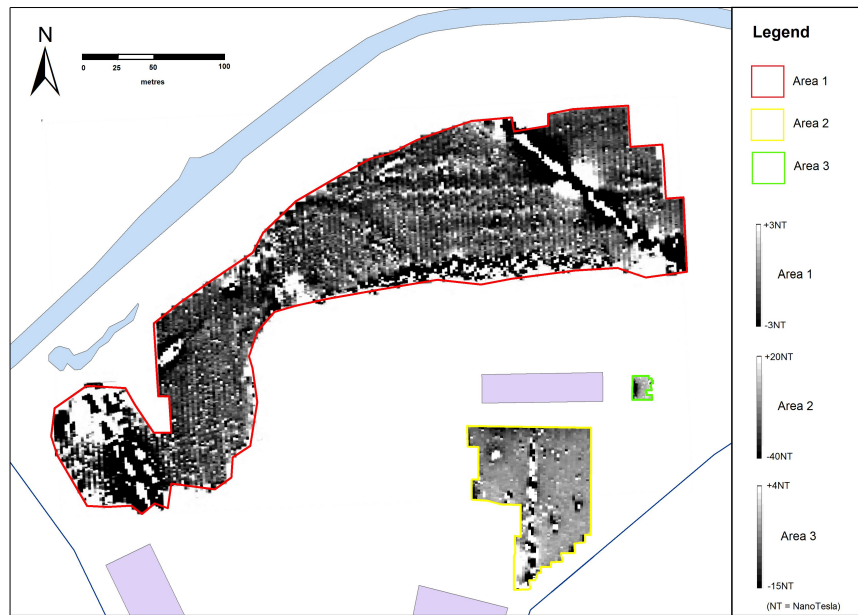


Figure 10: Total Station measuring bottom of slope.

4. Results

4.1. Magnetometer Survey

4.1.1. Survey Results Map



Geophysical Magnetometer Survey Results, Cuckney Churyard and Castle, 2016



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Figure 11: Geophysical Magnetometer Survey Results, 2016.

4.1.2. Area 1 Plots

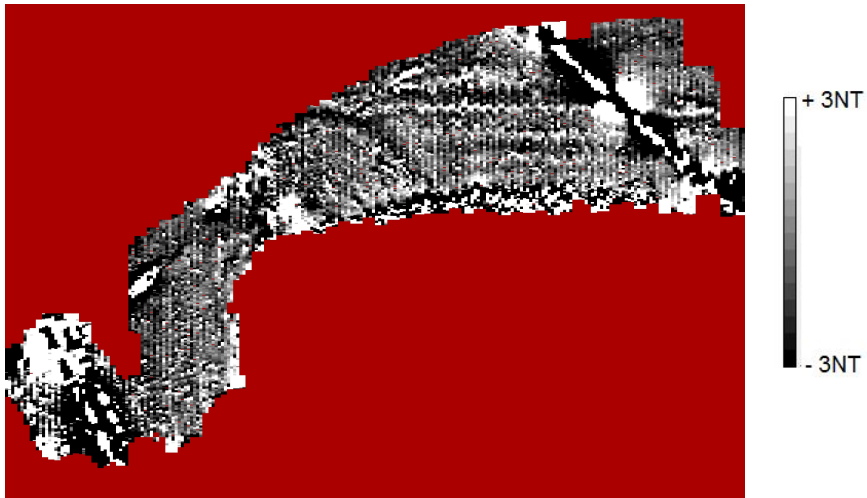


Figure 12: Unprocessed Magnetometer data greyscale image area 1.

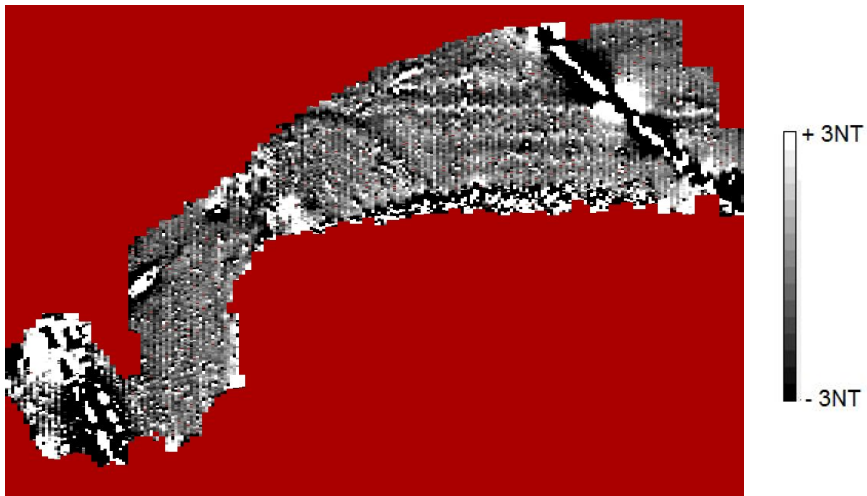


Figure 13: Magnetometer data greyscale image area 1, Clipped +/- 3NT, Destriped, De-Spiked (Threshold 1.0), Interpolated Vertical.



Figure 14: Trace plot area 1, produced in TerraSurveyor

4.1.3. Area 2 Plots

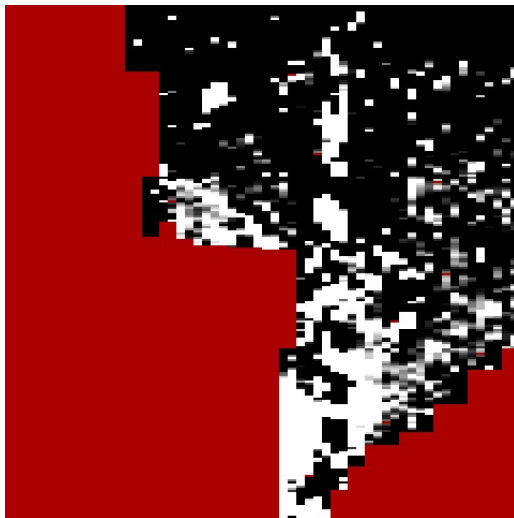


Figure 15: Unprocessed Magnetometer data greyscale image area 2.

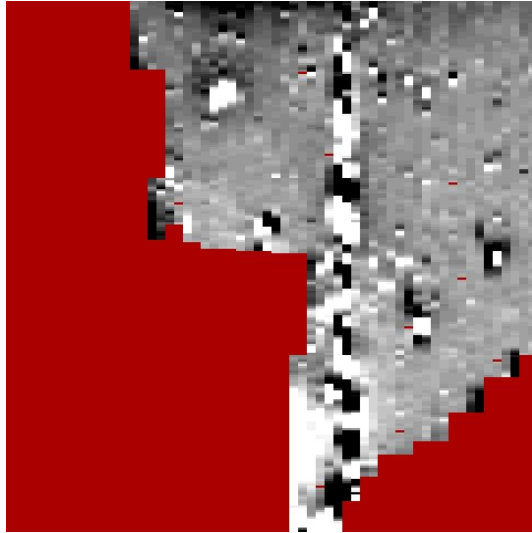


Figure 16: Magnetometer data greyscale image area 2, Clipped +20NT/ - 40NT, Destriped, De-Spiked (Threshold 1.0), Interpolated Vertical.

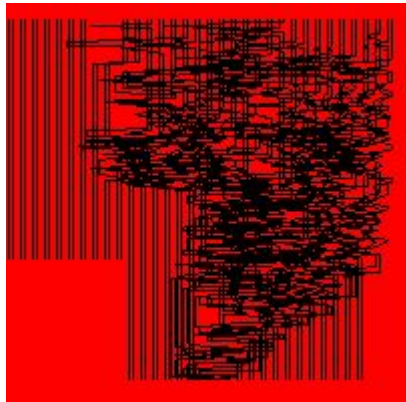


Figure 17: Trace plot Area 2, produced in TerraSurveyor

4.1.4. Area 3 Plots



Figure 18: Unprocessed Magnetometer data greyscale image area 3.



Figure 19: Magnetometer data greyscale image area 3, Clipped +4NT/ - 15NT, Destriped, De-Spiked (Threshold 1.0), Interpolated Vertical

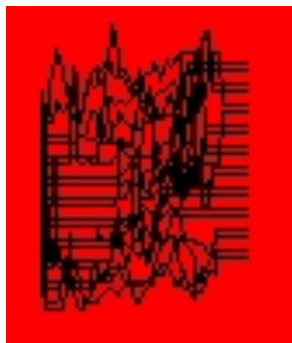
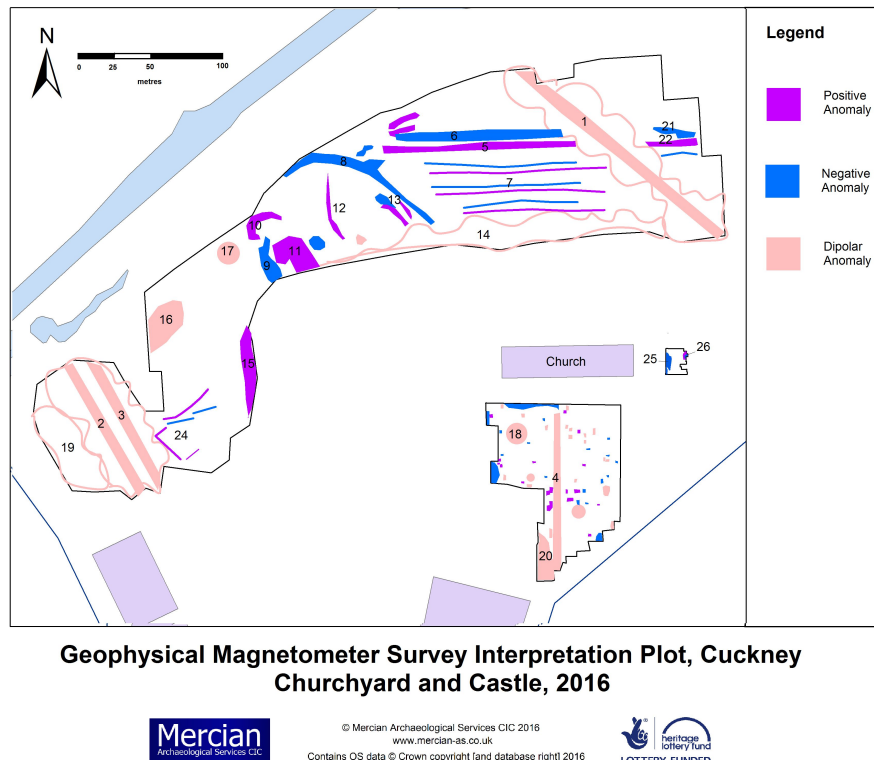


Figure 20: Trace plot Area 3, produced in TerraSurveyor

4.1.5. Interpretation Plot



Geophysical Magnetometer Survey Interpretation Plot, Cuckney Churchyard and Castle, 2016

Figure 21: Geophysical Magnetometer Survey Interpretation Plot.

4.1.6. The above plots and figures 11 to 21 are the processed and unprocessed results and trace plots of the Geophysical Magnetometer survey undertaken at Cuckney in November 2015. Figure 21 is an interpretation plot of the survey data.

4.1.7. Area 1 contains a number of high and low magnetic anomalies, collection was affected in the field by the varying topography, which resulted in some striping of the data. However a good number of anomalies have been recorded.

4.1.8. Within the churchyard, large amounts of historic disturbance and metalwork affected the quality of the survey data. In order to display the results for

area two the data was clipped at very high values, this means that any small variations caused by archaeological remains may be difficult to discern. Area 3 was also clipped at high values, but feature 25 and particularly 26 may be of interest.

4.1.9. A number of linear dipolar anomalies run across the surveyed area. In area 1 a linear dipolar anomaly cuts across the eastern end of the survey running northwest to southeast; marked 1 on interpretation plot in figure 21. Area 1 is also crossed in the western end by two further linear dipolar anomalies labeled 2 and 3. Area 2 is crossed north to south by a linear dipolar anomaly labeled 4. There are large areas of dipolar signals to the north of the churchyard labeled 14, and on the far western edge of area 1 labeled 19. Large individual dipolar signals were detected labeled 16, 17 and 18.

4.1.10. A large linear high magnetic anomaly labeled 5 runs approximately 120 metres east to west across the northern part of area 1. It is truncated at the eastern end by the dipolar linear feature 1. To the east of feature 1 a high magnetic linear feature 22 (possibly a continuation of feature 5); runs to the eastern edge of the survey. To the north of feature 5 a low magnetic linear feature runs parallel to 5; labeled 6. It may continue to the eastern edge of the survey where feature 21 continues on the same alignment.

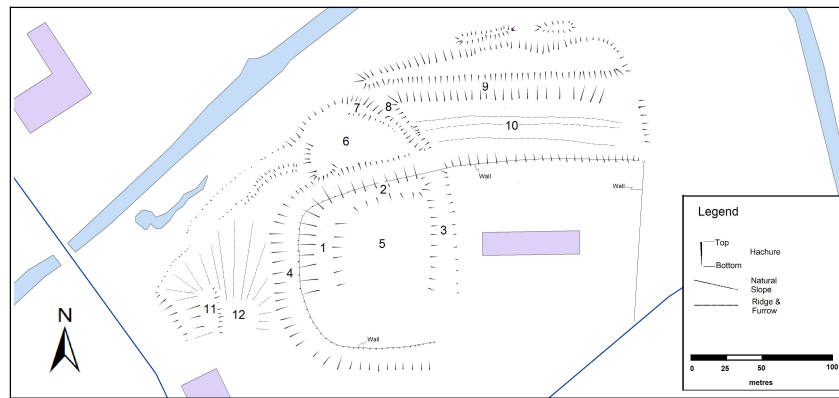
4.1.11. To the south of feature 5 a series of alternating low, high, low, high, low, high linear anomalies run east to west in the ground between feature 5 and the area of dipolar anomalous readings labeled 14; close to the northern churchyard wall.

4.1.12. A curvilinear negative anomaly labeled 8 was detected in the central part of area 1, where there are a number of positive and negative anomalies.

4.1.13. In the western part of the survey an area of positive magnetic signal forms a reasonably wide linear orientated north to south, labeled 15. To the west of this a small number of discrete thin linear positive and negative anomalies can be discerned in the various plots. These are labeled 24.

4.2 Topographic Survey

4.2.1 Hachure Plan



Hachure plan of earthworks, Cuckney Churchyard and Castle, 2016



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Figure 22: Hachure plan of earthworks

4.2.2. Topographic Survey Results

4.2.2.1. The Topographic earthwork survey recorded a number of features which have been mapped on the Hachure plan in figure 22 above. These features can also be seen in the Digital Terrain Models (DTM) in figures 23- 27. To the west end of the churchyard the ground rises to a linear bank running 30 metres north to south by 10 metres east to west, labeled 1 in figure 22. The DTM models below show this raised area continues to the south and curves around to the east. Here it forms a raised bank 50 metres east to west by 20 metres north to south. This area forms a discreet section of the churchyard with burials from the 20th century. To the north the bank forming feature 1 drops to form a lower east to west orientated ridge on the north side of the churchyard; feature 2 on figure 22. The features so far described enclose to the west north and south an area of lower flatter ground marked 5 on the plot in figure 22. To the east feature 2 drops in to a shallow ditch running 45 metres north to south, and up to 20 metres wide; labeled 3 on the plot. Together these earthworks form the western half of Cuckney churchyard. The combined curved bank of features 1 and 2 are surrounded to the north, west and south by a large ditch which falls away steeply. The Hachure plan depicts with a line

and triangle (tops of hachures) where the bank to ditch profile is vertical due to the insertion of a stone wall. This forms a Ha Ha on the southern and western sides with the wall forming one whole side of the ditch (the internal side) and being entirely below the surrounding ground levels to the south and west of the ditch. To the north of the churchyard the ditch levels out to form a wide semi-circular plateau; feature 6, with a low bank; 7 forming its northeastern edge. Feature 6 is terminated on the eastern side by a metre deep ditch or hollow; marked 8 on the plot. Ditch or hollow 8 curves towards the southeast and lines up with the ditch inside the churchyard; feature 3. Feature 9 is a large linear east to west orientated ditch or hollow that runs 200m in length by 10 metres in width. Feature 9 is flanked to the north and south by higher flatter ground. To the north this drops into the river flood plain, but to the south is cut by a number of linear banks and ditches running east to west; marked as 10 on the plot in figure 37. To the west of the Churchyard the land rises out of ditch 4 to an area of high ground to the west marked 12 on the hachure plan. This high ground is equal in height to feature 1, and the area to the south of feature 1 in the DTMs. To the west of the summit of the hill marked 12, is a pronounced linear bank running north to south; marked 11 on the plot. The earthworks recorded fall both inside and outside of the area Scheduled as a Motte and Bailey Castle. The DTM's displayed below help to display the 3 Dimensional shape of the earthworks and their relationship to each other.

4.2.3. 3D models

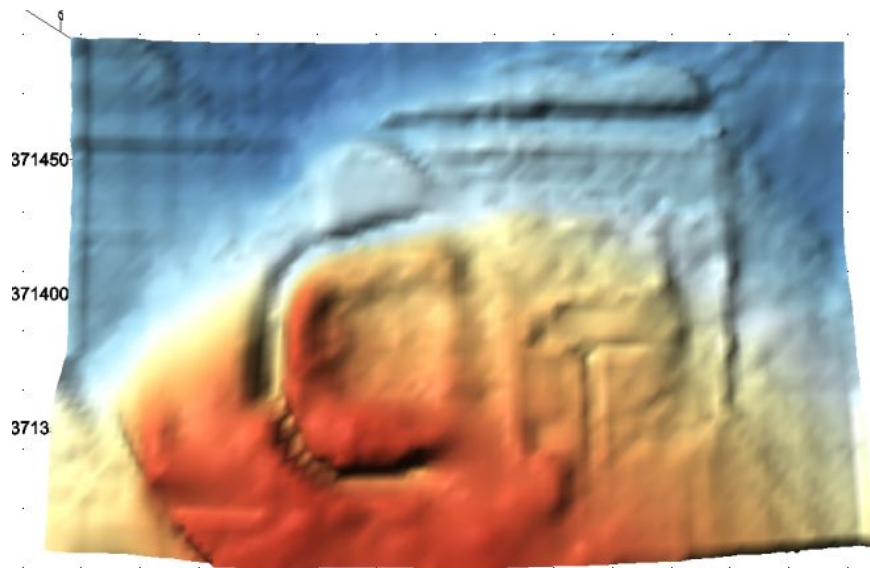


Figure 23: Digital Terrain Model (DTM) of earthwork survey data, North to top of image.

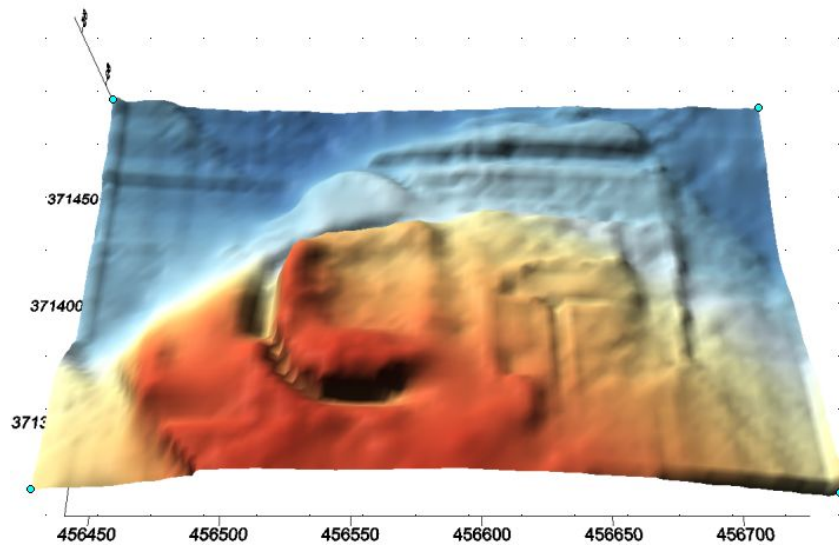


Figure 24: Digital Terrain Model (DTM) of earthwork survey data, oblique view. North to top of image.

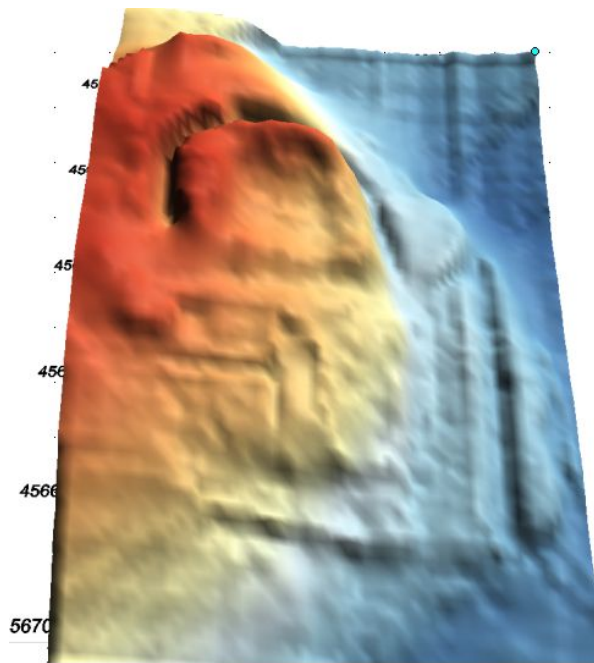


Figure 25: Digital Terrain Model (DTM) of earthwork survey data, oblique view. West to top of image.

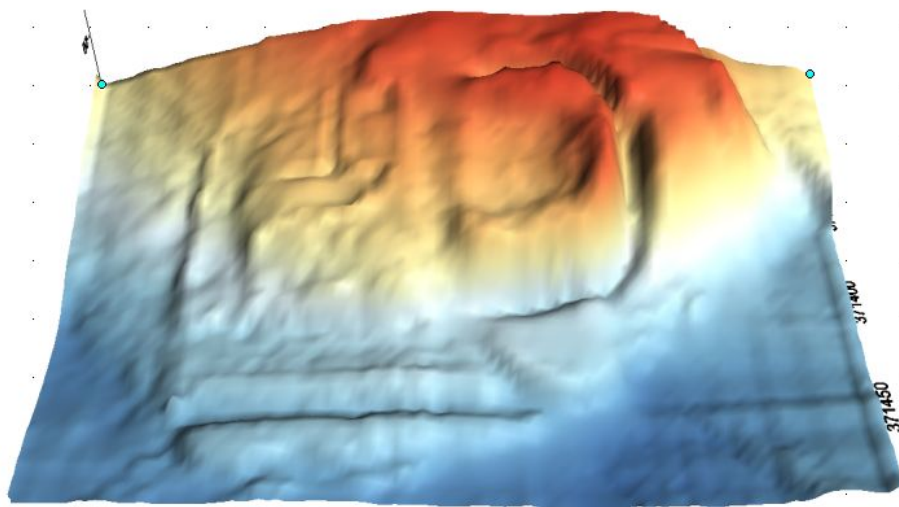


Figure 26: Digital Terrain Model (DTM) of earthwork survey data, oblique view. East to top of image.

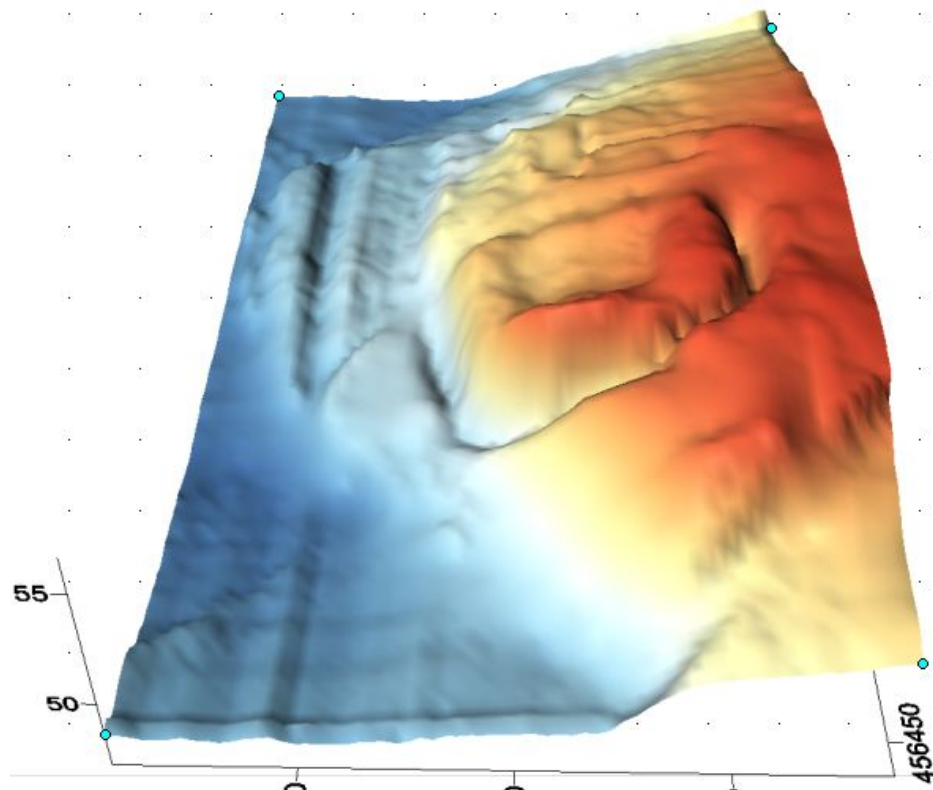


Figure 27: Digital Terrain Model (DTM) of earthwork survey data, low angle oblique view. East to top of image.

5. Interpretations, conclusions, and discussions

5.1 The integrated surveys revealed a large number of anomalies and features listed in the results above. The Magnetometer survey picked up a number of dipolar linear anomalies 1, 2, 3 and 4 which represent buried services, with features 2 and 3 running parallel to the line of the road. Feature 1 is perhaps a buried metal water pipe, as a series of manholes are present in the river flood plain. Feature 4 is the detection of services entering the church underneath a pathway forming the southern approach to the church.

5.2. The large areas of dipolar anomalies 14 and 19 are close to site boundaries where metal wire fencing has been dumped along with other material (19 is probably associated with material from the building of the road, and from dumped material, 14 is adjacent to the boundary wall of the churchyard, and probably also reflects dumped material and remnants of metal fencing). Dipolar anomalies 16 and 17 are caused by manhole covers perhaps for brick or stone lined drains. The bipolar anomaly 18 may represent a buried metal object, the large number of weaker dipolar anomalies in area 2 along with similar sized and shaped positive and negative anomalies (unnumbered) probably represent human burials in the churchyard, where grave markers have been removed presumably in the later 20th century.

5.4. The alternating negative, positive, negative, positive, negative, positive, magnetic linear anomalies in feature 7 in figure 21 correspond with feature 10 in the hachure plan for the topographic survey, where they have been interpreted as ridge and furrow agricultural remains (figure 22).

5.5. To the north of these features is a long linear ditch marked 9 on the hachure plan, and detected as a positive anomaly in figure 21 marked 5. The bank to the north corresponds with a negative linear anomaly 6 on figure 21. This long linear channel cuts the shortest route across the meander of the river, and may be a former 'leet' or water channel utilising the potential energy gradient of the water caused by the meander, perhaps to power a mill at the eastern, downstream end (beyond the survey area). The Historic England Scheduled Monument entry suggests that this

feature is a double bank and ditch enclosing an outer bailey to the north, running parallel to the river which would have formed a further line of defence. This could also be a possibility. Although no ditch is seen to the east or west of the church (see below) to complete the outer bailey enclosure.

5.6. To the west of this long linear ditch is a large flat semi-circular feature 5 on hachure plan, with a bank; 7 on the northeastern edge and a meter deep ditch; 8 on the north eastern and eastern sides. This may be an enclosure between the suggested Motte to the south, and the river to the north. The Magnetometer survey shows positive and negative anomalies in line with the bank and ditches of this feature (9, 10, 11, 12, 13 on figure 22). The ditch in feature 8 corresponds with a ditch running north to south (feature 3 on figure 21) further to the south.

5.7. Feature 3 seem to form part of the remains of a series of banks (features 1 and 2 in figure 21, and seen to the south in the DTMs above) that enclose a circular area (feature 5 on the hachure plan). This area is interpreted as a possible Motte in the Scheduling.

5.8. The western and southern part of the graveyard is enclosed by a deep ditch to the west and south of feature 3 (shown on the western side as positive anomaly 15 in the magnetometer interpretation plot in figure 21). It is depicted as feature 4 on the hachure plan and the vertical line of the wall is also show. According to the Scheduling for the Castle by Historic England: "The perimeter wall of the graveyard occupies the inner edge of a 10m wide ditch that encircles the west side of the Motte and encloses the inner bailey on the north side. Originally, it would also have enclosed the south side of the bailey but has been filled-in to the south of the church so that, on this side, only the area south of the Motte remains open. The remainder will survive as a buried feature in the unscheduled part of the inner bailey".

5.9. Although a slight depression can be discerned in the western part of the southern churchyard, there is no evidence in the magnetometer survey data in area 2 for a ditch extending through the churchyard to the south".

5.10. The Scheduling also suggests that having encircled the church to the south, the inner bailey ditch should continue to the east of the church, however: “The ditch does not appear to have extended along the east side of the inner bailey, which also lies in the unscheduled area. This indicates that the original entrance would have occupied this side”. No ditch was seen in area 3 of the magnetic survey.

5.11. To the west of the Scheduled site is a large area of high ground with a flattish summit (feature 12 on the hachure plan in figure 22). A wide linear bank runs along the western edge of this summit marked 13 on the hachure plan.

5.12. Within feature 12 (on the hachure plan) are a number of discreet linear positive and negative magnetic anomalies that may represent occupation, possibly small trenches or building foundations.

6. Future work:

6.1. The surveys have detected many features and anomalies that can only be understood better through targeted excavation, features outside the scheduled area may benefit from further invasive investigations, particularly in the area of the mound to the west of the current scheduling where there may prove to be evidence of occupation.

This area in particular, along with the semi-circular platform north (feature 6 on hachure plane) would benefit from further geophysical survey. Resistance survey may help to determine if trenches or foundations are indeed present.

7. Bibliography

A Short Guide to GPS. 2004. British Archaeological Jobs Resource.

Ainsworth, S., Bowden, M., McOmish, D. & Pearson, T. 2007. *Understanding the Archaeology of Landscape*. English Heritage.

Ainsworth, S. & Thomason, B. 2003. *Where on Earth are We? The Global Positioning System (GPS) in archaeological field survey*. English Heritage.

Bannister, A., Raymond, S. and Baker, R. 1998. *Surveying*. Longman, Essex.

Barley, M. 1951. *Cuckney church and castle*. Transactions of the Thoroton Society of Nottinghamshire Vol. 55 p. 26-29

Bettess, F. 1990. *Surveying for Archaeologists*. Penshaw Press: University of Durham.

Bowden, M. 1999. *Unravelling the landscape. An inquisitive Approach to Archaeology*. Tempus, Stroud.

Brown, A. 1987. *Fieldwork for Archaeologists and Historians*. Batsford, London.

Chapman, H. 2006. *Landscape Archaeology and GIS*. Tempus.

David, Linford & Linford. 2008. *Geophysical survey in archaeological field evaluation*. Historic England guidelines.

English Heritage, 2011 *Introductions to Heritage Assets – Animal Management*

English Heritage, 1997 *Sustaining the historic environment: new perspectives on the future*

English Heritage, 1991 *Exploring our Past. Strategies for the Archaeology of England*

English Heritage, 1991 *Management of Archaeological Projects (MAP2)*

Gaffney, C. & Gater J. 2006. *Revealing the Buried Past: Geophysics for Archaeologists*. Tempus Publishing.

Gaffney, Gater & Ovenden 2002. *The use of geophysical techniques in archaeological evaluations*. IfA Technical Paper No.6,

Gaunt, A. 2009. *Carburton Water Meadows 1, Level 1 Archaeological Survey*.

NCA-012. Nottinghamshire County Council Community Archaeology. Unpublished Grey Report.

Gaunt, A. 2010. *Carburton Water Meadows 2, Level 1 Archaeological Survey*.

- NCA-013. Nottinghamshire County Council Community Archaeology. Unpublished Grey Report.
- Glover, J. E. B., Mawer, A. & Stenton, F. M. 1940. *Placenames of Nottinghamshire*. English Placenames Society. Vol. XVII
- Hawker, J M, 2001, *A Manual of Archaeological Field Drawing* (new edition), RESCUE.
- Howard, P. 2007. *Archaeological Surveying and Mapping*. Routledge, Oxford.
- IFA, 2012, By-laws. *Code of Conduct*, Institute of Field Archaeologists, Reading.
- IFA 1994 (updated) 2008. *Standards and Guidance: for Archaeological Excavation*. Institute of Field Archaeologists.
- IFA .2010. *Draft Standard and Guidance for archaeological geophysical survey*. Institute for Archaeologists.
- Knight, D and Howard, A J, 2004, Trent Valley Landscapes
- Knight, D, Vyner, B and Allen C. 2012. *Research Agenda and Strategy for the Historic Environment of the East Midlands*.
- Lutton, S. 2003. *Metric Survey Specifications for English Heritage*. English Heritage.
- Mastoris, S. and Groves, S. 1997. *Sherwood Forest in 1609. A crown survey by Richard Bankes*. Thoroton Record Series XL.
- Medieval Pottery Research Group, 2011, *A Research Framework for Post-Roman Ceramic Studies in Britain*, MPRG occasional paper no. 6
- MoLAS, 1994, *Archaeological Site Manual*, Museum of London, London.
- Muir, R. 2004. *Landscape Encyclopaedia: A reference guide to the Historic Landscape* Windgather Press.
- Nailor, V and Young, J, 2001, A Fabric Type Series for Post Roman Pottery from Nottingham City (5th – 16th Centuries), Unpublished Report for Nottingham City Museum.
- National Monuments Record Thesauri*. © English Heritage 1999 National Monuments Record Centre
- Pevsner, N. 1951. *The Buildings of England: Nottinghamshire*. Penguin Books.
- Revill, S. 1975. *King Edwin and the Battle of Heathfield*. Transactions of the Thoroton Society. Vol. LXXIX.
- Ripper, S A, 2004. Bodies, Burnt Mounds and Bridges: A Riverine Landscape at Watermead Country Park, Birstall, Unpublished ULAS Document.

Schmidt & Ernenwein. 2010. *Geophysical Data in Archaeology*. Archaeology Data Service Guide to Good Practice (draft 2nd edition).

Speight, S. 1994. *Early Medieval Castles in Nottinghamshire* Transactions of the Thoroton Society of Nottinghamshire Vol. 98 p. 66-7.

Survey Basics – *Laying out a Trench and Levelling*. 2005. British Archaeological Jobs & Resources.

Watkinson, D E and Neale, V, 1998, First Aid for Finds. Rescue / UKIC third edition
Wright, J. 2008. *Castles of Nottinghamshire*. Nottinghamshire County Council. p. 62

Websites:

<http://www.bajr.org>

<http://www.bgs.ac.uk>

<http://www.english-heritage.org.uk>

<http://www.leica-geosystems.com>

<http://smartnet.leica-geosystems.co.uk>

<http://www.thingproject.eu>

<http://totalstation.org/total-stations-functionality.php>

8. Disclaimer:

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Geophysical techniques are not a map of the ground and are instead a direct measurement of subsurface properties. Detecting and mapping features requires that said features have properties that can be measured by the chosen technique(s) and that these properties have sufficient contrast with the background to be identifiable. The interpretation of any identified anomalies is always subjective. While the scrutiny of the results is undertaken by qualified, experienced individuals and rigorously checked for quality and consistency it is often not possible to classify all anomaly sources; while there will be degrees of certainty for others. Where possible an anomaly source will be identified along with the certainty of the interpretation. The only way to improve the interpretation of results is through a process of comparing excavated results with the geophysical reports.

The results of the GPR survey can only provide locations of anomalies, which were identified based on changes from surrounding ground conditions. This includes areas with hyperbolic reflections, amplitude variations, and distinct planar reflections. It should be noted that these signals are not exclusive to

archaeological features, and may represent other natural or contemporary features. Further, not all features of archaeological interest will produce a recognisable signal, in particular small-scale isolated remains (such as discrete bones) which are not in a formal burial context, and those features which do not vary significantly in physical and chemical characteristics from surrounding deposits.

The size of objects detected is limited by the antenna frequency to objects with dimensions larger than ~10 cm (with the 800MHz in the upper 0-1m) and ~20 cm (with the 300MHz in the depth range 1-3m). As such, this GPR survey is not expected to have identified all locations where human remains may be present.

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Ursilla Spence, County Archaeologist, Nottinghamshire County Council for supporting the project.

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10. Publication, archiving, reporting, and Dissemination

10.1. An OASIS entry pertaining to the work has been created. The OASIS identifier for the project is OASIS ID: merciana2-246688.

10.2. All reports including those in the appendices are available for download from the Mercian website: <http://www.mercian-as.co.uk>.

10.3. A summary of the work will be published in the Archaeological Short Reports section of the Transactions of the Thoroton Society.

11. Bibliography

A Short Guide to GPS. 2004. British Archaeological Jobs Resource.

Ainsworth, S., Bowden, M., McOmish, D. & Pearson, T. 2007. *Understanding the Archaeology of Landscape*. English Heritage.

Ainsworth, S. & Thomason, B. 2003. *Where on Earth are We? The Global Positioning System (GPS) in archaeological field survey*. English Heritage.

Bannister, A., Raymond, S. and Baker, R. 1998. *Surveying*. Longman, Essex.

Barley, M. 1951. *Cuckney church and castle*. Transactions of the Thoroton Society of Nottinghamshire Vol. 55 p. 26-29

Bettess, F. 1990. *Surveying for Archaeologists*. Penshaw Press: University of Durham.

Bowden, M. 1999. *Unravelling the landscape. An inquisitive Approach to Archaeology*. Tempus, Stroud.

Brown, A. 1987. *Fieldwork for Archaeologists and Historians*. Batsford, London.

Chapman, H. 2006. *Landscape Archaeology and GIS*. Tempus.

David, Linford & Linford. 2008. *Geophysical survey in archaeological field evaluation*. Historic England guidelines.

English Heritage, 2011 *Introductions to Heritage Assets – Animal Management*

English Heritage, 1997 *Sustaining the historic environment: new perspectives on the future*

English Heritage, 1991 *Exploring our Past. Strategies for the Archaeology of England*

English Heritage, 1991 *Management of Archaeological Projects (MAP2)*

Gaffney, C. & Gater J. 2006. *Revealing the Buried Past: Geophysics for Archaeologists*. Tempus Publishing.

Gaffney, Gater & Ovenden 2002. *The use of geophysical techniques in archaeological evaluations*. IfA Technical Paper No.6,

Garton et al, in press (2016), *Ice Age Journeys: Research by a Community*

Archaeology Group at Farndon Fields, Nottinghamshire. Transactions of the Thoroton Society of Nottinghamshire, Vol 119.

Gaunt, A. 2009. *Carburton Water Meadows 1, Level 1 Archaeological Survey*.

NCA-012. Nottinghamshire County Council Community Archaeology. Unpublished Grey Report.

Gaunt, A. 2010. *Carburton Water Meadows 2, Level 1 Archaeological Survey*.

NCA-013. Nottinghamshire County Council Community Archaeology. Unpublished Grey Report.

Gibson, A. and Woods, A. 1997. *Prehistoric Pottery for the Archaeologist*, Second Edition, Leicester University Press.

Glover, J. E. B., Mawer, A. & Stenton, F. M. 1940. *Placenames of Nottinghamshire*. English Placenames Society. Vol. XVII

Hawker, J M, 2001, *A Manual of Archaeological Field Drawing* (new edition), RESCUE.

Howard, P. 2007. *Archaeological Surveying and Mapping*. Routledge, Oxford.

IFA, 2012, By-laws. *Code of Conduct*, Institute of Field Archaeologists, Reading.

IFA 1994 (updated) 2008. *Standards and Guidance: for Archaeological Excavation*. Institute of Field Archaeologists.

IFA .2010. *Draft Standard and Guidance for archaeological geophysical survey*. Institute for Archaeologists.

Jeffrey, S. 1991. Burnt Mounds, Fulling and Early Textiles? in *Burnt Mounds and Hot Stone Technology*.

Knight, D and Howard, A J, 2004, *Trent Valley Landscapes*

Knight, D, Vyner, B and Allen C. 2012. *Research Agenda and Strategy for the Historic Environment of the East Midlands*.

Lutton, S. 2003. *Metric Survey Specifications for English Heritage*. English Heritage.

Mastoris, S. and Groves, S. 1997. *Sherwood Forest in 1609. A crown survey by Richard Bankes*. Thoroton Record Series XL.

Medieval Pottery Research Group, 2001, *Minimum Standards for the Processing, Recording, Analysis and Publication of Post-Roman Ceramics*, MPRG Occasional Paper no. 2

Medieval Pottery Research Group, 2001, *Minimum Standards for the Processing, Recording, Analysis and Publication of Post-Roman Ceramics*.

Medieval Pottery Research Group, 2011, *A Research Framework for Post-Roman Ceramic Studies in Britain*, MPRG occasional paper no. 6

MoLAS, 1994, *Archaeological Site Manual*, Museum of London, London.

Muir, R. 2004. *Landscape Encyclopaedia: A reference guide to the Historic Landscape* Windgather Press.

Nailor, V and Young, J, 2001, A Fabric Type Series for Post Roman Pottery from Nottingham City (5th – 16th Centuries), Unpublished Report for Nottingham City Museum.

National Monuments Record Thesauri. © English Heritage 1999 National Monuments Record Centre

Pevsner, N. 1951. *The Buildings of England: Nottinghamshire*. Penguin Books.

Revill, S. 1975. *King Edwin and the Battle of Heathfield*. Transactions of the Thoroton Society. Vol. LXXIX.

Ripper, S A, 2004. Bodies, Burnt Mounds and Bridges: A Riverine Landscape at Watermead Country Park, Birstall, Unpublished ULAS Document.

Schmidt & Ernenwein. 2010. *Geophysical Data in Archaeology*. Archaeology Data Service Guide to Good Practice (draft 2nd edition).

Speight, S. 1994. *Early Medieval Castles in Nottinghamshire* Transactions of the Thoroton Society of Nottinghamshire Vol. 98 p. 66-7.

Survey Basics – *Laying out a Trench and Levelling*. 2005. British Archaeological Jobs & Resources.

Watkinson, D E and Neale, V, 1998, First Aid for Finds. Rescue / UKIC third edition
Wright, J. 2008. *Castles of Nottinghamshire*. Nottinghamshire County Council. p. 62

Young, J, Vince, A, and Nailor, V, 2005, A Corpus of Anglo-Saxon and Medieval Pottery from Lincoln, Lincoln Archaeological Studies.

Websites:

<http://www.bajr.org>

<http://www.bgs.ac.uk>

<http://www.english-heritage.org.uk>

<http://www.leica-geosystems.com>

<http://smartnet.leica-geosystems.co.uk>

<http://totalstation.org/total-stations-functionality.php>

Appendix I
Historic Environment Record Search

Edited table of results of Historic Environment Record (HER) search for 1km radius (2km diameter) centered on SK565714 Easting 456593, Northing 371408.

Ref	Title	DateGeneral	PartOfMon	Type01
M4376	Castle Hill, Cuckney	Med		MOTTE AND BAILEY
M4396	Cotton mill, Cuckney	1723		COTTON MILL
M4397	Ten Row, Cuckney	from late C18		WORKERS COTTAGE
M4409	Old Mill, Cuckney	by 1774		FLOUR MILL
M4411	Blacksmiths, Norton	pre 1800		BLACKSMITHS WORKSHOP
M4415	Church of St Mary, Cuckney	from Norman		CHURCH
M5369	Mill Hill, Cuckney	P Med-Mod		WINDMILL
M5378	Gorton's Mill, Cuckney	P Med		TEXTILE MILL
M5379	Sitwell's Forge, Cuckney	P Med		FOUNDRY
M6109	Mill Hill Sand Pit, Cuckney	by 1918		SAND PIT
M6110	Quarries, Cuckney	U		QUARRY
M6111	Building, Bar Lane, Cuckney	U		BUILDING
M6840	Well, Cuckney	U		WELL
M6854	Fish houses, Norton	by 1918		FISH HOUSE
M6864	Boat house, Cuckney	from C18		BOAT HOUSE
M8707	Burial pit, Cuckney Church	pre C13		BURIAL PIT
L4376	Earthworks at Castle Hill, Cuckney	Med	4376	bailey
L4396	Cotton mill, Cuckney		4396	
L4397	Ten Row, Cuckney	late C18	4397	Building
L4409	Old Mill, Cuckney	pre 1774	4409	Building
L4411	Blacksmiths, Norton	pre 1800	4411	Building
L4415	Church of St Mary, Cuckney - C13 Phase	C13	4415	Church tower
L4425	Cropmark enclosure, Norton	U		Enclosure
L4426	Cropmark enclosures, Cuckney	U		Enclosure
L5369	Mill Hill, Cuckney	pre 1972	5369	Place name
L5373	Roman coins from Cuckney 268-273			Finds spot
L5378	Gorton's Mill, Cuckney		5378	Architectural Fragment
L5379	Sitwell's Forge, Cuckney		5379	Documentary reference
L5381	Harvest Dam, Cuckney	Med-P Med		Dam
L6108	Mound, Cottage Lane, Cuckney	U		Mound
L6109	Mill Hill Sand Pit, Cuckney	pre 1918	6109	Hollow
L6110	Quarry hollows, Cuckney	U	6110	Hollow
L6111	Remains of Building, Bar Lane, Cuckney	U	6111	TERRACED GROUND

L6112	Banked enclosure, Cuckney	U		Bank
L6113	Irregular earthworks, Norton	U		Hollow
L6114	Building platform and earthworks, Norton	U		Building platform
L6840	Map depiction of Well, Cuckney	U	6840	Map Depiction
L6841	Sluice, Norton	pre 1918		Sluice
L6842	Sluice, Cuckney	pre 1918		Sluice
L6843	Sluices, Cuckney	pre 1918		Sluice
L6844	Sluice, Cuckney	pre 1918		Sluice
L6845	Sluices, Cuckney	pre 1918		Sluice
L6854	Map depiction of Fish houses, Norton	pre 1918	6854	Map Depiction
L6861	Embankment, Norton	U		Bank
L6864	Map depiction of Boat house, Cuckney	pre 1918	6864	Map Depiction
L8707	Burials under Cuckney Church	pre C13	8707	Inhumation
L9173	Documentary reference to Castle, Cuckney	1135-1154	4376	Documentary reference
L9176	Mill pond and dam, Cotton Mill, Cuckney		4396	Dam
L9179	Old Mill, Cuckney - Dam and Sluice	pre 1774	4409	Dam
L9181	Church of St Mary, Cuckney - C12 Phase	C12	4415	Doorway
L9182	Church of St Mary, Cuckney - C15 Phase	C15	4415	Window
L9183	Church of St Mary, Cuckney - C20 Phase	1907 and 1936	4415	Roof
L10855	Linear earthworks, Cuckney	P Med		Drain
L10857	Linear feature, Cuckney	U		Linear feature

Appendix II
Section 42 License for Geophysical Survey



Historic England

EAST MIDLANDS OFFICE

Mr Andy Gaunt
Mercian Archaeological Services CIC
Staffordshire House
Beechdale Road
Nottingham
NG8 3FH

Direct Dial: 01604 735460

Our ref: AA/030549/5

28 October 2015

Dear Mr Gaunt

Ancient Monuments and Archaeological Areas Act 1979 (as amended) section 42 - licence to carry out a geophysical survey

CUCKNEY MOTTE AND BAILEY CASTLE, CUCKNEY, NOTTINGHAMSHIRE

Case No: SL00116567

Monument no: SM 13393

I refer to your application dated 26 October 2015, to carry out a geophysical survey at the above site.

Historic England is empowered to grant licences for such activity and I can confirm that we are prepared to do so as set out below.

By virtue of powers contained in section 42 of the 1979 Ancient Monuments and Archaeological Areas Act (as amended by the National Heritage Act 1983) Historic England hereby grants permission for geophysical survey of CUCKNEY MOTTE AND BAILEY CASTLE, for the areas shown on the map that accompanied your application (copy attached). This permission is subject to the following conditions.

1. The permission shall only be exercised by Andy Gaunt of Mercian Archaeological Services CIC and his nominated subcontractors at RSK Archaeology and by no other person. It is not transferable to another individual.
2. The permission shall commence on 2 November 2015 and shall cease to have effect on 16 November 2015.
3. A full report summarising the results of the geophysical survey and their interpretation shall be sent in hard copy to Erin Lewis at the address below and electronic (pdf) format to tim.allen@HistoricEngland.org.uk, copied to Paul.Linford@HistoricEngland.org.uk no later than 6 months after the completion of the survey.
4. The enclosed questionnaire shall be completed and appended to the survey report. For convenience an electronic version of this questionnaire can be downloaded from <http://HistoricEngland.org.uk/advice/technical->



2nd Floor, WINDSOR HOUSE, CLIFTONVILLE, NORTHAMPTON, NN1 5BE

Telephone 01604 735460
HistoricEngland.org.uk



Historic England is subject to the Freedom of Information Act, 2000 (FOIA) and Environmental Information Regulations 2004 (EIR). All information held by the organisation will be accessible in response to an information request, unless one of the exemptions in the FOIA or EIR applies.



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advice/archaeological-science/geophysics.

5. A copy of the report shall also be sent (in their preferred format) to the local Historic Environment Record (HER). The local HER's contact details can be found at <http://www.heritagegateway.org.uk/gateway/chr/default.aspx>.
6. A record signposting your investigation shall be made with the Archaeology Data Service using their online OASIS Data Collection form no later than 8 months after completion of the survey. Please see <http://oasis.ac.uk/> for details or contact oasis@HistoricEngland.org.uk for information and training.
7. An interim image of the processed survey results shall be provided to Tim.Allen@HistoricEngland.org.uk at the first available opportunity following the completion of the survey.
8. The final report shall be produced with reference to published guidelines in English Heritage (2008) *Geophysical Survey in Archaeological Field Evaluation*

It is the responsibility of the surveyor and landowner to clarify whether a derogation is required from Natural England to conduct any survey on land held within an environmental stewardship agreement prior to commencing work on site.

This letter does not carry any consent or approval required under any enactment, by-law, order or regulation other than section 42 of the 1979 Act (as amended).

You are advised that the person nominated under this licence to carry out the activity should keep a copy of this licence in their possession in case they should be challenged whilst on site.

Yours sincerely

Tim Allen

Inspector of Ancient Monuments

E-mail: tim.allen@HistoricEngland.org.uk

cc Ursula Spence, Nottinghamshire County Council

Virginia Baddeley, Nottinghamshire County Council



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Purpose of Survey:

Location of:

a) Primary archive, i.e. raw data, electronic archive etc:

Nottinghamshire Historic Environment Record,

Mercian Archaeological Services CIC

OASIS ID: merciana2-246688.

b) Full Report:

Nottinghamshire Historic Environment Record, including
electronic data from project.

Electronic copy Mercian Archaeological Services CIC website:
<http://www.mercian-as.co.uk/publications.html>

OASIS ID: merciana2-246688.

Hardcopy: Mercian Archaeological Services CIC

Hard Copy with clients

Hard Copy Historic England



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HistoricEngland.org.uk



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Enclosure:

Historic England Geophysical Survey Database Questionnaire

Survey Details

Name of Site: CUCKNEY MOTTE AND BAILEY CASTLE

County: NOTTINGHAMSHIRE

NGR Grid Reference (Centre of survey to nearest 100m):

SK565714 Easting 456593, Northing 371408

Start Date: 2/11/2015 **End Date:** 13/11/2015

Geology at site (Drift and Solid):

Lenton Sandstone Formation - Sandstone.

Known archaeological Sites/Monuments covered by the survey
(Scheduled Monument No. or National Archaeological Record No. if known)

Name: Cuckney motte and bailey castle. List entry Number: 1010909

Archaeological Sites/Monument types detected by survey
(Type and Period if known. "?" where any doubt).

Ditches, Banks, Ridge and Furrow. Date: ?

Surveyor (Organisation, if applicable, otherwise individual responsible for the survey):

Andy Gaunt of Mercian Archaeological Services CIC, and his nominated subcontractor RSK

Name of Client, if any:

Battle of Hatfield Investigation Society
Heritage Lottery Fund



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