Geophysical Survey Report
Bothwell Castle

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Commissioned by:

Kirkdale Archaeology

On Behalf of:

HISTORIC SCOTLAND

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Executive Summary

A programme of geophysical survey at Bothwell Castle has been undertaken as part of wider archaeological investigations of the site with the aim of answering outstanding research questions. Gradiometer survey was undertaken over the Outer Park area and over all available areas within the Properties in Care (PIC) boundary. Resistance survey was carried out over all available areas within the PIC boundary and within four sample blocks in the outer park. GPR survey was undertaken within the Inner Courtyard and flat areas to the north of the Castle.

Although the gradiometer survey was severely affected by magnetic disturbance due to modern paths, fences etc., the gradiometer data from the PIC area to the north of the Castle suggests areas of possible 'settlement'. The resistance survey has detected a wealth of anomalies across the site. The outer park area is dominated by extensive drainage with numerous alignments and phases of drainage having been detected. Within the PIC area the resistance data suggest the potential for extensive buried remains associated with the Outer Courtyard of the Castle. Although anomalies possibly indicating the extent of the South Range within the Inner Courtyard have been detected, interpretation is cautious due to numerous drains within the area. The GPR survey within the Inner Courtyard is dominated by responses from drains although anomalies potentially associated with the South Range, complimenting the resistance survey results, have also been detected. Although the GPR survey to the north of the Castle is dominated by responses from modern paths, several anomalies and areas of increased response have been detected which correlate well with the resistance survey thereby supporting interpretation of the potential for extensive buried archaeological remains in the area.

Survey:	Bothwell Castle, Uddingston
Client:	Kirkdale Archaeology on behalf of Historic Scotland
Date of Survey:	3rd – 12th April 2015
Survey Personnel:	Dr S M Ovenden and A S Wilson
Report Author:	Dr S M Ovenden
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1 Introduction

1.1 A programme of geophysical survey at Bothwell Castle has been undertaken as part of wider archaeological investigations of the site with the aim of answering outstanding research questions with excavation due to take place in June. A combination of Gradiometer, Resistance and Ground Penetrating Radar (GPR) surveys were undertaken.

1.2 Gradiometer survey was undertaken over the Outer Park area and over all available areas within the Properties in Care (PIC) boundary. Data were collected at 1m by 0.25m intervals throughout. Resistance survey was carried out over all available areas within the Properties in Care (PIC) boundary and within four sample blocks in the outer park. With the exception of two areas in the Outer Park, all data were collected at 0.5m by 0.5m intervals. These two blocks (Areas R1 & R2; see Figure 19) in the park area were collected at 1m by 1m intervals. GPR survey was undertaken within the Inner Courtyard and flat areas to the north of the Castle. Data was collected at 0.02m intervals along parallel traverses 0.5m apart. Figure 1 shows the location of all the various survey areas.

1.3 Figures 2 - 7 display summary plots and interpretations of the gradiometer and resistance survey data, with a combined interpretation plot provided in Figure 8. These are all produced at a scale of 1:1250.

1.4 The results from the GPR survey are displayed as a series of depth slices maps, with accompanying interpretations, in Figures 9 – 24. These are at a scale of 1:1000.

1.5 Figures 25 – 50 form the Archive Section with the gradiometer and resistance data and interpretations displayed at 1:625.

2. Methodology

2.1 Prior to data collection a series of 20m grids were established across the site. The survey grid was tied-in to hard features depicted on plans provided by Historic Scotland using a Trimble Total Station and has been lodged with the client.

Gradiometer Survey

2.2 Gradiometer survey is ideally suited to locating ditches, pits, areas of settlement, midden, and kilns/fired areas.

2.3 Gradiometer survey was undertaken using a Bartington Grad601-2 gradiometer. This gradiometer comprises two fluxgate sensors mounted 1m apart on a vertical axis. Each sensor measures the earth's magnetic field, in nanoTesla (nT), and the instrument records the difference between the observed readings for each sensor. As a result the instrument is able to record subtle changes or anomalies in the earth's magnetic field caused by material in the top metre or so of the earth's surface. Data was collected at 0.25m intervals along traverses 1m apart within the series of 20m grids, which were later merged together.

2.4 The data were processed with Geoscan Research Geoplot 3.00 software, using a standard range of corrections and processing algorithms. These include setting the data mean to zero and the application of destagger of the data. The edited data are displayed as XY traces and grey-scale images. Interpolated data are displayed as grey-scale images. In these images the data have been interpolated in the Y direction to create a 'square dataset' which has the overall effect of smoothing the data.

Resistance Survey

2.5 Resistance survey is ideally suited to locating walls, foundations and rubble spreads. It can also identify ditches and pits in areas with little magnetic enhancement. It is particularly useful when underlying geology or modern ferrous contamination reduces the efficacy of gradiometer survey.

2.6 Earth resistance surveys measure variations in the moisture content of the earth's subsurface by passing a small electrical current through the subsurface. Features such as walls and paths will show as high resistance anomalies, while features such as ditches, robber trenches and planting beds with their humic fill will usually result in a low resistance response.

2.7 Resistance survey was carried out using a Geoscan RM85 resistance meter. For this survey a standard twin probe configuration was used with a mobile probe separation of 0.5m providing a depth resolution of approximately 0.75m. Data was collected at 0.5m by 0.5m and 1m by 1m intervals.

2.8 The data was processed with Geoscan Research Geoplot 3.00 software, using a standard range of corrections and processing algorithms. Raw, interpolated and high pass filtered data have been included in the report. Interpolating data has the effect of smoothing the data image by interpolating the data in the X and Y direction resulting in the appearance of a 0.25m by 0.25m sample interval. Running a high pass filter on the data effectively removes background trends within the data thereby enhancing more discrete anomalies.

2.9 The data have been displayed at a variety of levels, in an attempt to pull out more subtle anomalies. In area resistance survey the data values themselves are not significant but rather the changes relative to the background level of response are. In some of the figures the data are plotted at absolute values in ohms (Ω) to try to pull out different anomalies. In other plots the statistics of the full data range are used and the data are plotted at plus/minus one or two standard deviations (SD).

Ground Penetrating Radar Survey

2.10 GPR survey is the best technique for providing information of the depth and stratigraphy of a site and is required if archaeological deposits may extend to a depth greater than *circa* 0.75m. Unlike gradiometry and resistance surveys it can also be used on paved/tarmac areas.

2.11 In a GPR survey pulses of electromagnetic energy are directed downwards into the earth. The transmitted wave is affected by variations in the electrical properties of the subsurface, specifically the dielectric constant and the conductivity of the subsurface. Contrasts in these properties cause differential reflection of the energy wave creating an anomaly. The subsurface is mapped by recording the amplitude of this reflected energy and its travel time. The travel times are converted to depth using a calculated velocity.

2.12 The data were collected with a Mala X3M GPR system with a 500MHz antenna and processed using the GPRSlice software package. The data was collected as individual traverses with data being collected at 0.02m intervals along transects 0.5m apart. All the traverses were then assembled into a block of data and processed and displayed as a series of time slice or depth maps. This type of data processing and visualisation can allow more subtle features and relationships between features to be analysed more readily.

3. General Considerations / Complicating Factors

3.1 Geophysical data can be ambiguous and while every effort has been made to ensure that the interpretations contained within this report represent an accurate record of potential surviving archaeological deposits, it is a subjective analysis of the data.

Gradiometer Survey

3.2 Gradiometers are extremely sensitive to ferrous material and areas of magnetic disturbance are to be expected close to fences and other ferrous material, and certain modern materials e.g. tarmac.

3.3 Throughout the survey areas numerous isolated 'iron spikes' have been noted. These indicate isolated ferrous or fired material within the topsoil/subsoil. Only the most prominent of these are noted on the interpretation and are only discussed when relevant. Similarly, numerous isolated 'pit-type' anomalies are also evident across the site. The differentiation between an 'iron-spike' and a 'pit-type' response is based on the strength and form of the anomaly, and the wider context. However, more deeply buried fired/ferrous material will give an anomaly comparable to that produced by a pit.

Resistance Survey

3.4 The distinction between natural/modern/archaeological responses is based on the nature of the anomalies, their strength and form, and their wider context within the survey data.

3.5 The differentiation between 'Possible Archaeology' and 'Possible Structure' anomalies is based on the form of the response. However, it is possible that an anomaly noted as potentially indicating a structure may be a rubble spread, and vice versa.

Ground Penetrating Radar Survey

3.6 GPR is very sensitive to marked variations in surface/near surface material e.g. metal inspection hatch, voids. This may result in 'ringing' of the signal. This can result in near surface anomalies re-appearing in deeper depth slices due to the signal bouncing back and forth between the antenna and the feature.

3.7 The velocity value used to convert the recorded two-way-time to depth has been established using software analysis. While the depths provided should be a reasonable estimation of the depth of features, there may be some variation as a constant value has been applied and the velocity can vary vertically and laterally within the subsurface

4. Results of Gradiometer Survey (Figures 2 – 3, 8, 25 - 50)

Anomaly letters referred to below are shown on the accompanying interpretation diagrams.

4.1 There is a wide range in the level of magnetic response across the site and a generally high level of background noise.

4.2 Clear areas of strong magnetic disturbance (A) are associated with existing roads and parking bays. This noise extends beyond the existing road and is most likely due to earlier layouts or 'migration' of magnetic material from earlier roads/tracks.

4.3 The data to the south of the Castle and within the Inner Courtyard are dominated by magnetic disturbance (B) from the metal fencing as part of the ongoing conservation work and metal signs, grills etc.

4.4 In the east of the Outer Park two well-defined areas of magnetic disturbance (C) have been noted. The disturbance immediately to the east of the PIC boundary is thought to potentially be due to an earlier parking area etc. The disturbance along the eastern limits of the survey area coincides with slight 'lumps and bumps' and may simply be due to a dump of material associated with the modern housing forming the eastern limit of the survey area. However, the responses within these areas were so strong that definitive interpretation was not possible, and as a result both areas were targeted with resistance survey. However, the result from the resistance survey suggests that these anomalies are most likely due to dumps of modern material.

4.5 The strong linear anomaly (D) running NW-SE across the outer park coincides with a boundary shown on early maps. Remnants of this boundary (remains of an iron railing embedded in stone) is visible in some areas. The linear trend (E) to the south of (D) is thought to be related to the earlier path in the area and coincides with a slight earthwork. Similarly, the two parallel linear anomalies (F) coincide, in part, with a slight earthwork and are thought to have a modern origin.

4.6 In the north of the survey area several ephemeral, amorphous anomalies have been detected. These are consistent with natural pedological variations e.g. palaeo-channels. A cluster of stronger, more coherent, responses (G) are apparent. While it is believed that these are natural in origin and they have been interpreted as such, an archaeological origin cannot be dismissed. This area was targeted with resistance survey and the results support such an interpretation, see Section 5.5 below.

4.7 In the south of the outer park the responses are noticeably different with numerous pit-like responses (H) being detected. While these may have a natural origin, their different nature suggests that they may be archaeologically significant. Weaker linear trends have also been noted in this area. This area was targeted with resistance survey. However, the results were not conclusive and as such an archaeological interpretation for these pit-like anomalies remains tentative. The linear trends are believed to be due to drainage features, see Section 5.3 below.

4.8 A well-defined curvilinear positive anomaly (I) has been detected immediately to the north of the castle earthworks and follows the line of an earlier footpath.

4.9 A ditch type anomaly (J) has been detected 'within' the defensive ditch. The anomaly shows some correlation with the resistance data (See Section 5.12 below). No path is indicated in this area and it does not appear to be associated with drainage so may be archaeologically significant. However, a modern origin cannot be dismissed.

4.10 There is a well-defined area of increased magnetic response (K) within the outer courtyard, between the extant Castle and the Castle earthworks, which is possibly to be expected if this part of the Castle was inhabited. However, the technique can not differentiate between magnetic enhancement due to activity contemporary with the Castle and later enhancement due to excavations, restorations, public use of the park, etc. Several discrete anomalies are apparent within this general area of increased response. Although they are not especially coherent, they show clear correlation with the resistance data, see Figure 8, and as such may be archaeologically significant.

4.11 Numerous ephemeral linear trends and isolated pit type anomalies have been noted throughout the survey and are thought to be modern/natural in origin.

5. Results of Resistance Survey (Figures 4 - 8, 25, 40 – 50)

Anomaly numbers referred to below are shown on the accompanying interpretation diagrams.

5.1 The results from the resistance survey within the Outer Park and the north-eastern limits of the PIC area are dominated by parallel linear responses indicative of drainage. Several alignments and different spacing are evident suggesting different phases of drainage.

5.2 The most striking are the closely spaced (*circa* 3m - 4m) parallel linear trends (1) on a NNE-SSW alignment within the PIC area. These occupy the NE side of the ditch and terminate at a presumed drain (2) running NW-SE through the bottom of the ditch. Given the close spacing (c. 3m-4m), ridge and furrow cultivation rather than drainage is possible but the topography of the site supports an interpretation of intensive drainage. In addition, conditions underfoot are consistent with this drainage pattern with the north-eastern flank of the ditch being noticeably drier than the south-western side.

5.3 Comparable trends are seen throughout the Outer Park. Two alignments of these closely spaced linear responses are evident; to the south of the former field division (Gradiometer anomaly (D)) they are aligned approximately north-south (3) while to the north they are aligned NE-SW approximately (4). Wider spaced parallel linear trends (5), approximately 12m apart, on an NW-SW alignment have also been detected throughout the outer park area. It is assumed that these are also drainage features. It is not clear from the data if these respect (3) indicating one phase of drainage or if they relate to a different drainage system. The data is most confused in the south of the Outer Park (Area R4) where in addition to anomalies (3) and (5) anomalies on the same alignment as (4), are also apparent. Also additional linear trends (6) on differing alignments have been detected which appear to respect (3). Again these are thought to indicate different phases of drainage, although some may indicate former field divisions. Very few, if any of these have been detected by the gradiometer survey. This suggests that the postulated drainage features comprise stone/gravel rather than terracotta pipe. However, it is possible that if the latter exist their signal maybe being masked by the generally high level of magnetic response across the site.

5.4 Several amorphous areas of high resistance have been noted within the Outer Park and these are believed to have a natural origin. Given their apparent association with postulated drainage features, one possibility is they indicate gravel spreads associated with the drainage features, although they may just indicate localised pedological/geological variations.

5.5 More discrete anomalies (7) have been detected in the north of the Outer Park. These show good correlation with the gradiometer data (anomaly G) and are also thought to have a natural origin. The combination of a positive magnetic anomaly and a high resistance response supports an interpretation of material associated with palaeochannels or drainage features (e.g. magnetic gravels), although an archaeological origin cannot be dismissed.

5.6 To the north of the castle, and associated with the outer courtyard, numerous well-defined, rectilinear high resistance anomalies have been detected. The linear high resistance response (8) is due to a former path. The curving trends (9) are also thought to indicate remnants of a former path, although they are not as well-defined and may be archaeologically significant.

5.7 Three narrow linear anomalies (10) suggesting walls leading south-westwards from the extant latrine have been detected which lead into a larger area of high resistance which may indicate a rubble spread or *in-situ* foundations. Rectilinear anomalies (11) have also been noted to the north of the extant latrine block. While these (11) may be archaeologically significant, the former footpath in this area may be confusing the results.

5.8 Well-defined anomalies (12) and (13) have been detected to the south of the gate house and suggest further buried structural remains. Suggestions of possible wall foundations are also evident in this area. The anomaly (14) to the north of the gatehouse coincides with stonework visible on the surface. However, the extent of ground disturbance associated with the original excavation and consolidation of the site is not known and some of the anomalies detected may be associated with these later activities rather than indicating *in-situ* archaeological remains.

5.9 Weak low resistance trends (15) have been noted which may be associated with the curtain wall although such a response would suggest a robber trench rather than foundations. Similarly, well-defined low resistance anomalies (16) have been noted. These may indicate the location of former excavation trenches or robbed foundations, although the former seems more likely.

5.10 The amorphous area of high resistance (17) is thought to be associated with possible landscaping/in-filling of the ditch. However, given the micro-topography of the area an archaeological origin cannot be dismissed. Similarly the origin of (18) is unclear. This may be related to the gatehouse to the Inner Court, or could simply be due to modern layouts of the area (See GPR results Section X.X below)

5.11 The linear anomalies (19) in the west of the area coincide with former paths and the change in slope. It is unclear whether the data is just indicating preferential drainage or possible revetments.

5.12 The rectilinear anomaly (20) is likely to have an archaeological origin, given its wider context. The more general area of high resistance (21) adjacent to the *donjon* is difficult to interpret given the redistricted area available for survey. While it may indicate a rubble spread, it could simply be due to compaction from footfall.

5.13 The origin of the cluster linear anomalies (22) in the west of the survey area is unclear; they could indicate paths or drainage features although an archaeological origin associated with gate house cannot be excluded.

5.14 Unfortunately the area available for survey to the south of the castle was restricted due to ongoing conservation work. Most of the linear trends detected are thought to relate to the former path.

5.15 A cluster of high resistance responses (23), in the area of the postern gate, may indicate structural remains but they are not very well-defined. More ephemeral anomalies and trends (24) have also been noted which may relate to possible garden features. However, interpretation is extremely cautious given the limited area available for survey.

5.16 The broad area of high resistance (25) is difficult to interpret. Although it may indicate structure remains, its amorphous nature suggests it could be due to natural bedrock or a spread/dump of modern material.

5.17 Several anomalies have been detected within the southern half of the inner courtyard, although the results are confusing. A strong, broad, curving high resistance anomaly (26) has been detected. This is associated with a well-defined area of low resistance and may have a natural origin (e.g. poor drainage) which may be confusing the data.

5.18 A slightly better defined linear response (27) has also been detected which may be associated with the south range although interpretation is cautious. Several discrete anomalies (28) have also been noted in the east of the inner courtyard which may be significant. A linear trend on a NW-SE alignment is also apparent and is due to drains/buried services (see GPR Results section X.X below).

5.19 The area of high resistance (29) in the west of the Inner Courtyard is thought to be modern in origin, relating to excavation and consolidation of the site.

6. Results of Ground Penetrating Radar Survey (Figures 9 – 24)

Anomaly letters referred to below are shown on the accompanying interpretation diagrams.

0.00m – 0.25m Depth Slice (Figures 9 &10)

6.1 This near surface slice is dominated by strong reflections due to surface changes (a) e.g. grass to paving. The earlier paths (b) are also clear within this slice. This will partly be due to the fact that even though no 'path' currently exists leading west from the drive, there is still a 'natural' path leading round the side/back of the castle. However, the data suggest that remnants of these paths survive beneath the surface.

6.2 The rectilinear response (c) is thought to be due to an earlier (but modern) layout at the entrance to the castle, based on some drawings of the site. However, it is understood that the current area of hardstanding does overlie the footprint of an original tower. As such (c) may be archaeologically significant, but it is very shallow and does extend beyond this depth slice.

6.3 Coherent reflections (d) are apparent in the east of the area. These coincide with micro-topographic changes and resistance anomaly (17) suggesting near surface material which may be archaeologically significant although a modern origin seems more likely given its shallow depth.

0.25m – 0.50m Depth Slice (Figures 10 &11)

6.4 Responses from the existing (a) and former paths (b) are still apparent within this depth slice with the former path surrounding the outer courtyard being very clear within this depth slice.

6.5 Rectilinear anomalies (e) at the entrance to the castle are still clear in this slice. These (e) appear to have a slightly different orientation and location to the very shallow reflections (c) seen in the previous slice. While the possibility that these anomalies indicate surviving footings associated with the castle entrance, interpretation is extremely cautious given the existing paved area and earlier layouts at the entrance to the Castle.

6.6 The well-defined anomaly (d) seen in east of the previous slice is not present at this depth although a clear response is visible to the south. The apparent association of this to the existing road suggests a likely modern origin, although an archaeological one cannot be dismissed.

6.7 A cluster of coherent anomalies (f) have been detected immediately to the southwest of the latrine block and show good correlation with linear resistance anomalies associated with (10).

6.8 Within the Inner Courtyard very weak parallel low amplitude responses (g) are just discernible in the data. These are thought to be related to trenches associated with drainage features. Other trends have been also been noted which are more coherent in the deeper depth slices.

6.9 Several discrete high amplitude reflections (h) have been noted within the courtyard. While these may be significant they have no coherent form and are most likely due to subtle variations in the subsoil. Those in the centre, in particular, are clearly 'cut' by the postulated drainage trenches.

0.50m – 0.75m Depth Slice (Figures 13 &14)

6.10 The more coherent anomalies within this depth slice are within the Inner Courtyard with several linear responses (i) being detected which are believed to indicate drainage features and/or buried services.

6.11 In the south of the Inner Courtyard a broader linear anomaly (j) has been detected which shows strong correlation with high resistance anomaly (26) and suggests a ‘hard’ feature such as a drain or foundations. However, it is not clear if this response is due to a possible drain or if it may be associated with the South Range, or indeed a composite of the two.

6.12 A cluster of discrete high amplitude anomalies (k), containing some rectilinear elements, in the east of the Inner Courtyard may be of archaeological interest although a modern origin cannot be dismissed. The more ephemeral areas of increased response (l) are thought to be due to modern ground disturbance.

6.13 Outwith the Castle the results are not especially coherent although a general area of increased response (m) is apparent within the data. This coincides with the concentration of resistance anomalies thought to be archeologically significant and there is particular correlation with resistance anomalies (10) and (13).

6.14 Discrete anomaly (n) suggests the probable presence of buried footings associated with the tower.

6.15 The broad areas of high amplitude reflections adjacent to the entrance of the Castle (o) may be of archaeological interest although interpretation is cautious given modern activity in the area.

0.75m – 1.00m Depth Slice (Figures15 &16)

6.16 Anomalies (m) and (n) are still clear within this depth slice with the north-eastern limit of (m) being very well-defined with a linear edge running between the towers, consistent with the location of the curtain wall.

6.17 The broad areas of increased response to the south of the drive are thought to be due to modern disturbance and ringing of the signal, although a partial archaeological origin cannot be ruled out.

6.18 The data from within the courtyard is dominated by the strong linear anomalies (i) indicative of drainage features and possible buried services. These presumed drains are not visible in the resistance data as they are beyond the depth resolution of that technique.

6.19 Although the anomaly (j) seen in the previous depth slice is still just discernible within this depth slice, a more coherent anomy (p) has been detected at this depth and shows good correlation with resistance anomaly (27). While it is tempting to consider this response (p) to potentially be associated with the South Range, the extensive drainage in the areas makes such an interpretation tentative.

1.00m – 1.25m Depth Slice (Figures 17 &18)

6.20 The presumed drains (i) within the Inner Courtyard are still evident within this slice.

6.21 The broad area of increased response immediately to the north of the Castle (q) is thought to be due to modern activity and ringing of the signal given its correlation with the existing and former drive. However, an archaeological origin for all of the anomalies cannot be dismissed.

6.22 Discrete anomalies (r) are apparent in the north of the area. While an archaeological origin for these cannot be dissmissed, some are due to ringing of the signal.

1.25m – 1.50m, 1.50m – 1.75m & 1.75m – 2.00m Depth Slices (Figures 19 - 24)

6.23 The majority of the 'anomalies' within these depth slices are due to 'ringing' of the signal, i.e. strong surface and near surface responses re-appearing at a greater depth due to the signal bouncing back and forth at a strong interface. Anomalies not due to ringing are most likely to be natural, geological, variations in the subsurface.

6.24 One perplexing response is the suggesting of ephemeral parallel linear trends (s) in the west of the area, on a SW-NE alignment. These are not apparent at any other depth so are not due to ringing of the signal. However, their depth (1.75m – 2.00m) makes an archaeological interpretation cautious; they may be due to variations in the underlying geology.

7. Conclusions

7.1 The application of Gradiometer, Resistance and Ground Penetrating Radar survey to the site has provided complimentary data sets suggesting a high level of archaeological activity across the site.

7.2 Although the gradiometer survey was severely affected by magnetic disturbance due to modern paths, fences etc., the survey has identified some potential areas of archaeological interest within the outer park. In addition, the gradiometer data from the PIC area to the north of the Castle suggests areas of possible 'settlement'.

7.3 The resistance survey has detected a wealth of anomalies. The outer Park area is dominated by extensive drainage with numerous alignments and phases of drainage having been detected.

7.4 Within the PIC area the resistance data suggest the potential for extensive buried remains associated with the Outer Courtyard of the Castle. Although anomalies possibly indicating the extent of the South Range within the Inner Courtyard have been detected, interpretation is cautious due to numerous drains within the area.

7.5 The GPR survey within the Inner Courtyard has located numerous drains within the area. It has also detected anomalies potentially associated with the South Range, complimenting the resistance survey results.

7.6 Although the GPR survey to the north of the Castle is dominated by responses from modern paths, several anomalies and areas of increased response have been detected which correlate well with the resistance survey thereby supporting interpretation of the potential for extensive buried archaeological remains in the area.

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