

Community Archaeology on the Mendip Plateau

Results of Pseudosection Resistivity Surveying in the 'Precinct' Field, Chewton Mendip, Somerset May 2013



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June 2013

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1.0 Summary

This short report details the results of a trial survey using resistivity pseudosectioning, undertaken by members of CAMP and volunteers on an established excavation site in Chewton Mendip (Somerset HER no. PRN31670). The exercise targeted 4 areas with 18 grids or lines being surveyed. These were positioned to answer specific questions posed as a result of excavations. They were used to assess both the extent of the archaeology so far uncovered and also to assess the depth of the bedrock beneath the site.

2.0 Background

The site, under investigation by members of Community Archaeology on the Mendip Plateau (CAMP), is situated in the centre of the village of Chewton Mendip and to the immediate north of the churchyard of St. Mary Magdalene Church. The field is centred on NGR ST 5965 5320.

Excavations by members of CAMP have been taking place over the last 2 years following both resistivity and magnetometry surveys undertaken in December 2010, which showed a rectilinear anomaly orientated roughly SW/NE and on a parallel with the north wall of the churchyard.

Over the following 2 years significant remains of a medieval building have been uncovered. Unfortunately much of the east end of the field has not provided meaningful magnetometry readings. The reasons for this could be contamination from past field use, such as dumping of rubbish and bonfires. Likewise the resistivity readings in this area, and other areas produce blanket low levels, which appear to be related to layers of reddish brown compacted clay which has been dumped in the field in the past. The opportunity arose to use equipment belonging to Bob Smisson in order to do some pseudosections across the field. Careful consideration was given to where to place each grid or line of readings as each one takes about 40 minutes to complete.

It was decided to concentrate on answering the following questions.

1. What lies beyond the east end of the building as uncovered through excavation in April 2013?
2. What lies on the downhill slope in the region of the northwest corner of the building?
3. What lies between trench 1 and trench 7, an area as yet not excavated?
4. Is there any geophysics evidence to suggest a routeway between the thresholds uncovered in trenches 6 and 10 and the chancel of the church?
5. How deep is the bedrock beneath the excavation?

3.0 About resistivity pseudosectioning

Resistivity pseudosectioning has applications in both geological and archaeological investigation building a profile of the electrical resistance of a vertical slice of the ground in any chosen area.

The resistance meter is that used in conventional resistivity surveying. However, instead of a frame and meter with probes being walked across a measured 20 or 30 m sq grid, with readings taken at 1m intervals, a line of 30 probes at 1m intervals is placed in the ground, with the meter remaining static. Conventionally, only 4 of the probes have a wire attached at any one time. These wires are moved manually along the line of probes in a specific order with 5 lines of readings being taken. This takes time and energy to

execute. In the case of the modified equipment used by CAMP, every probe has a wire attached and all run to an array box. The readings are taken using pegs moved in a specific order on the array, again totaling 5 lines of readings. This greatly speeds up the process.

The results, once downloaded and manipulated, produce a vertical slice of measuring 27m wide and a maximum 3.46 m deep. The varying colours correspond to a sliding scale of electrical resistance, with dark brown being the highest through to dark blue, the lowest reading. Typically, geological features such as bedrock and voids show as high resistance, while water and boggy areas show as low. It must be noted that differing features sharing a similar resistance value may show as one colour and therefore care must be taken in their interpretation.

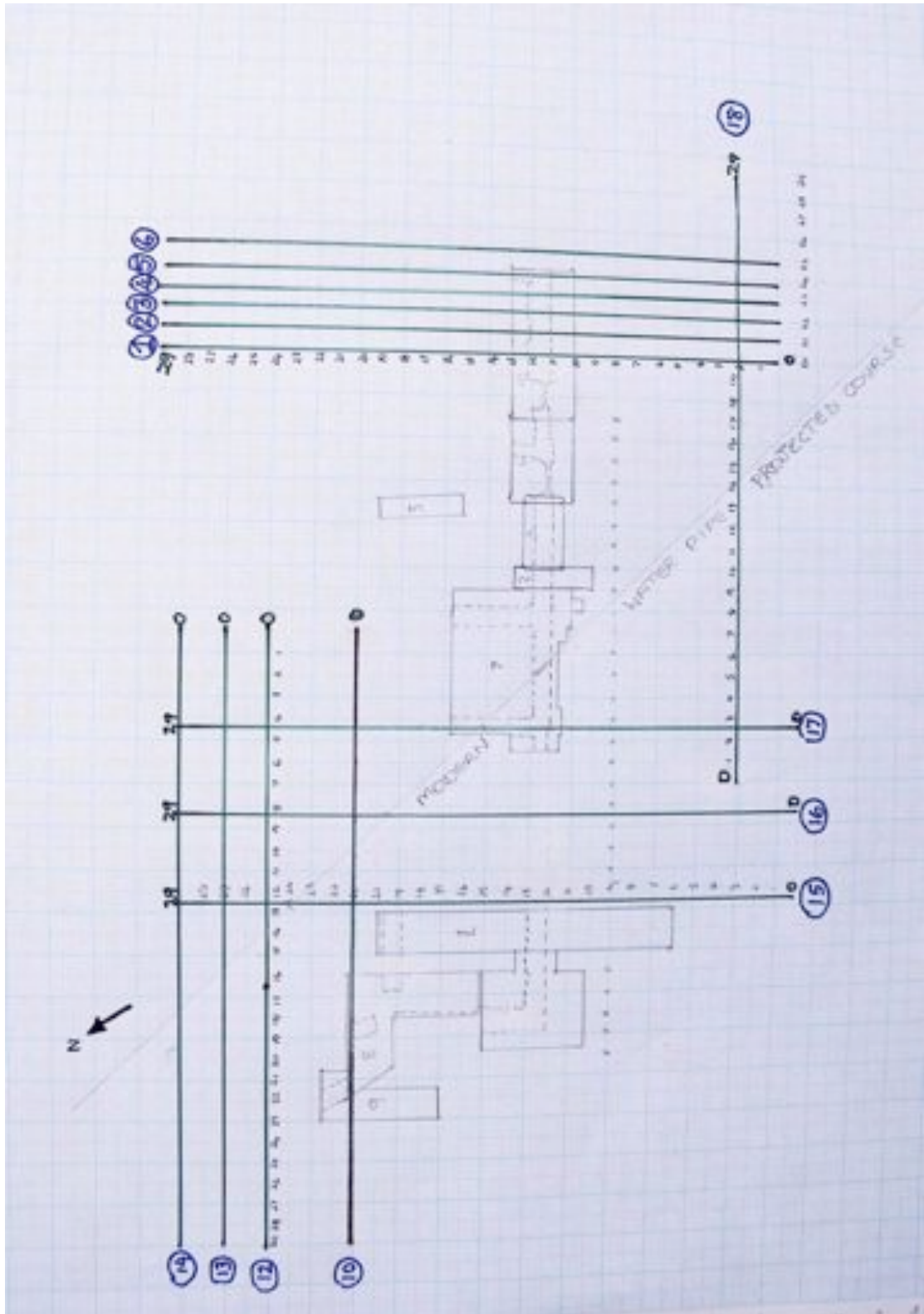


Figure 1. Masterplan of the trenches dug as of April 2013 showing the position of the pseudosection grids with their numbering system. The dashed lines are walls courses. The projected line of the modern waterpipe crosses diagonally, intersecting several grids.

4.0 Surveys undertaken

A total of 18 grids were surveyed. Grids 1 to 9 were laid out parallel and at 1m intervals orientated roughly SW/NE and placed over the excavated remains of what is believed to have been a rectilinear building. To date, only the majority of the south side and a small portion of the north have been excavated. Resistivity and magnetometry surveys have failed to locate a complete course for the north wall. The lines were targeted over both the known, and as yet, unknown archaeology.

Grids 10 to 14 ran NW/SE following the contours of a gentle downslope. Grid 10 was placed across previously uncovered archaeology, whilst 11 to 14 were purely speculative.

Grids 15 to 17 ran parallel to grids 1 to 9 but were placed further west. Grid 15 was placed immediately east of previously uncovered archaeology. Grid 16 was placed 4m to the east across an area of unknown archaeology and grid 17 covered a previously dug section where a specific question about the influence of geology needed to be answered.

Lastly, grid 18 was placed to the south of the excavation site NW/SE to test a hypothesis of there having once been a routeway leading to the church from the building thresholds.

The grids are indicated in figure 1 overlying the masterplan of trench positions and wall features.

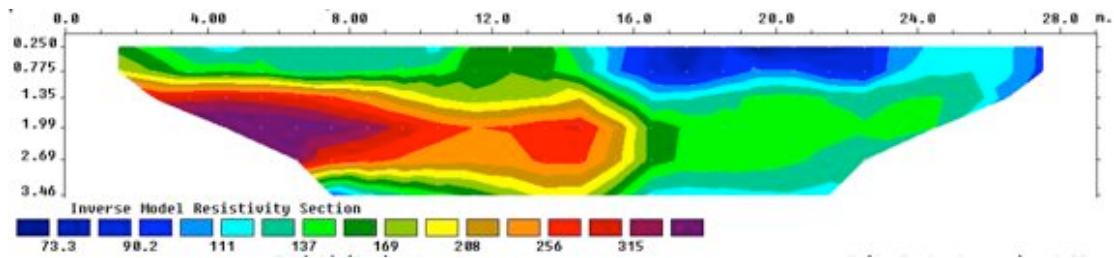
5.0 The Results and Interpretation

Some manipulation was required on one or two of the grids, where unusually high single readings occurred. Grids 7 to 9 failed for an unknown reason and will have to be repeated. Grid 11 also failed. Successful grids showed both predictable and surprising results.

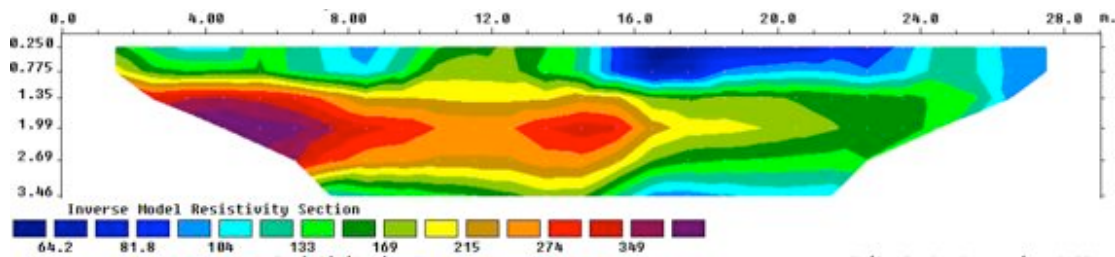
Grids 1 to 6 showed evidence of the known south wall, at, and just below the surface. It failed to suggest a north wall as predicted. Instead, an area of very low resistance was encountered.

Grids 1,2,3,4,5 across excavated section of building SW/NE. at east end. It must be born in mind that the grid sloped downhill to the NE by, on average, 3 metres, the most steep incline being between 20 and 29m.

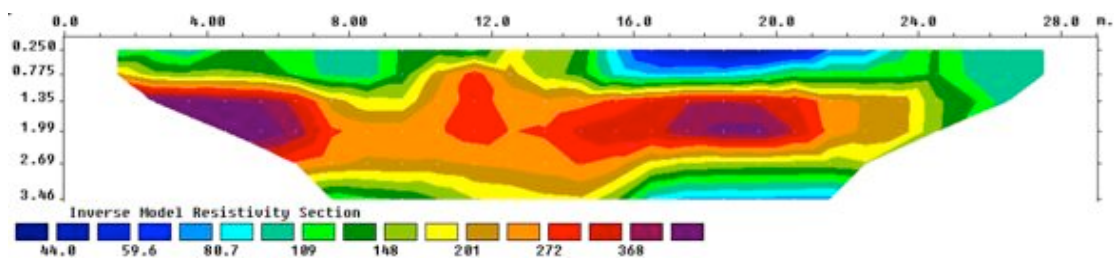
Grid 1 shows a dark green area of south wall at 12m, but dark blue of very low resistance at 18/19 where the north wall is projected to run. The lighter green between 5 and 10 may be the cobbled exterior surface. The bedrock shows as a dark brown area surrounded by layers of various clays and shale showing as reds, oranges and yellow.



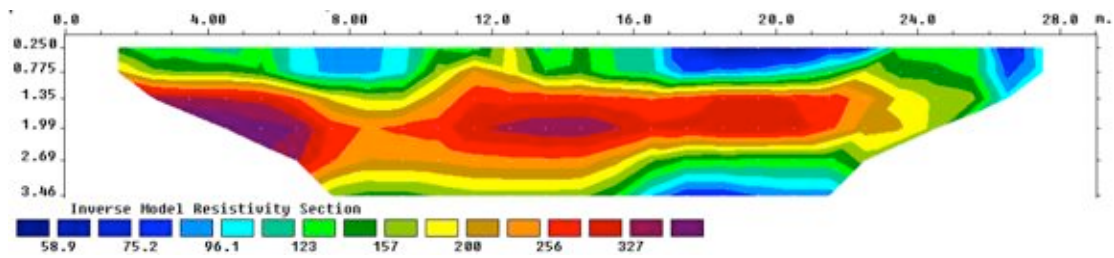
Grid 2 shows a similar picture, although the possible cobbled area differs, with undulations in values. An area of slightly higher resistivity surfaces at 25 and may be geology.



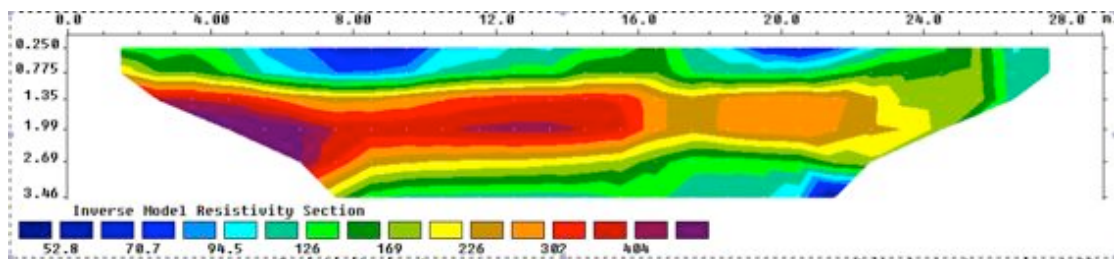
Grid 3 again shows archaeological activity in the region of 12, confirmed through excavation. A strong, dark green reading at 5 suggests an archaeological feature, as does that at 24.5. There is still no suggestion of a north wall at 19/20. The natural bedrock is closer to the surface throughout this grid.



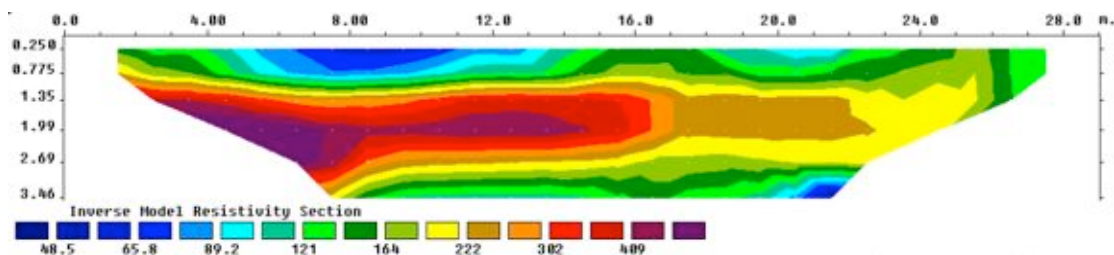
Grid 4 is similar to grid 3.



Grid 5 was placed across the possible east end wall of the building. Excavations in this area revealed that the archaeology had been almost obliterated through a combination of robbing out and surface damage in the past. There is only an ephemeral trace left at 12/13, though an east return wall shows between 12.5 and 16. The stronger reading at 16.5 is not understood but may be another archaeological feature. The stronger reading at 25/26 is not understood. The low readings around 8 do not suggest a continuation of a cobbled surface.

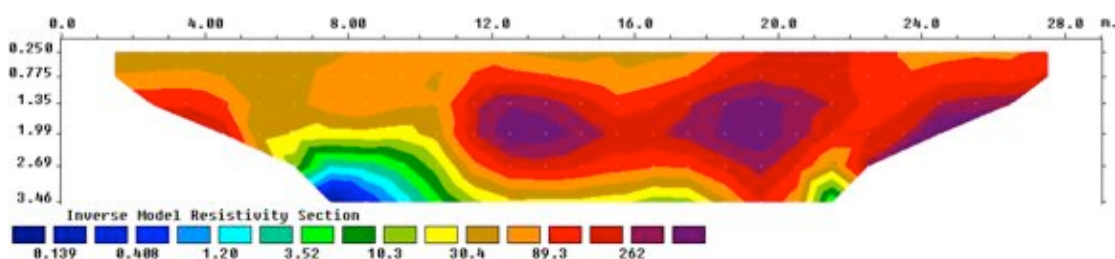


Grid 6 is outside the excavated area to date and suggests that the south wall has terminated. The feature at 15-17 is stronger, as is that at 24-26. The low readings between 7 and 11 are curious and need further investigation

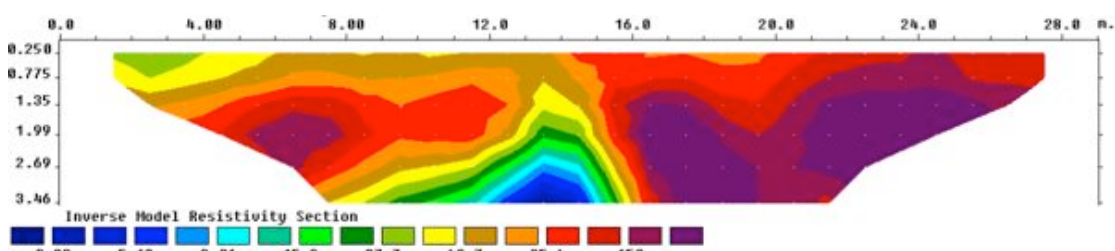


Grids 10,12,13 & 14 were placed NW/SE to the north of the building to assess the course of a medieval drain and two wall features uncovered during excavation.

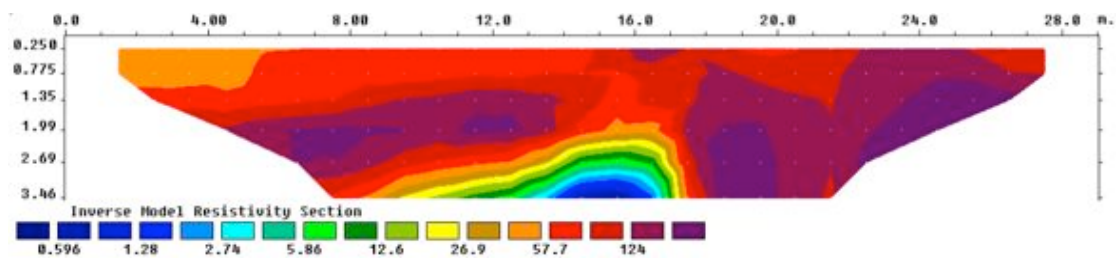
Grid 10 was placed across an area of cobble, paving and walling uncovered during excavation. This ran from 16 to 23. The survey shows some areas of bedrock a metre or so below the ground level. An area of high resistance also surfaces between 18.5 and 23.5. The surface higher resistance readings coincide with the known archaeology and would appear to directly relate to them. There is a small area of slightly higher resistivity than the surrounding area at 15/16, which might indicate the drain, but is inconclusive. The modern water pipe has a projected course at 10, but does not produce a trace.



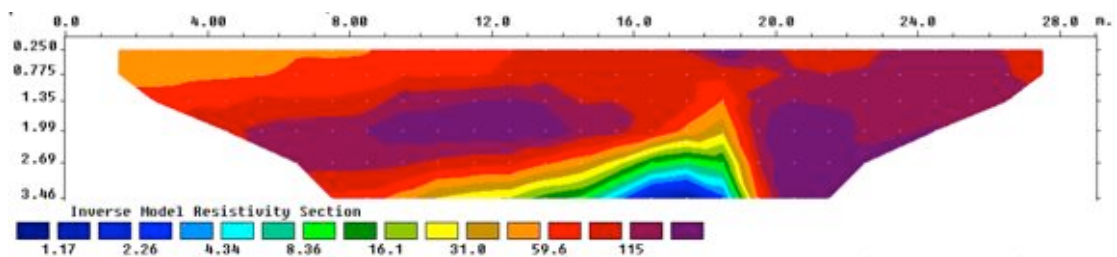
Grid 12 is parallel to 10 but 4 m downslope to the north. There is a more prominent area of very high resistivity between 16 and 28 indicating bedrock. Again, areas of higher resistance surface between 14.5 and 28. This may indicate the presence of archaeological features but needs further investigation. The projected course of the modern water pipe may show at 13.5 but is inconclusive.



Grids 13 and 14 are 2m apart and are very similar with higher readings at the surface throughout the length of the grid. It is too early to assess if any of these readings relate to archaeological features. There is a definite feature at 16 which might indicate the projected course of the modern water pipe. Likewise at 18/19 on grid 14.

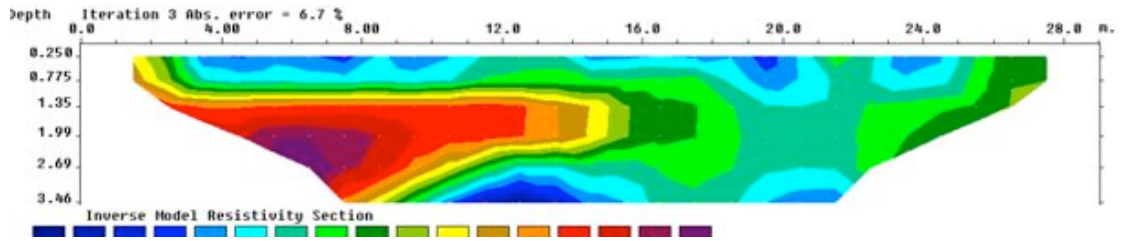


Grid 14

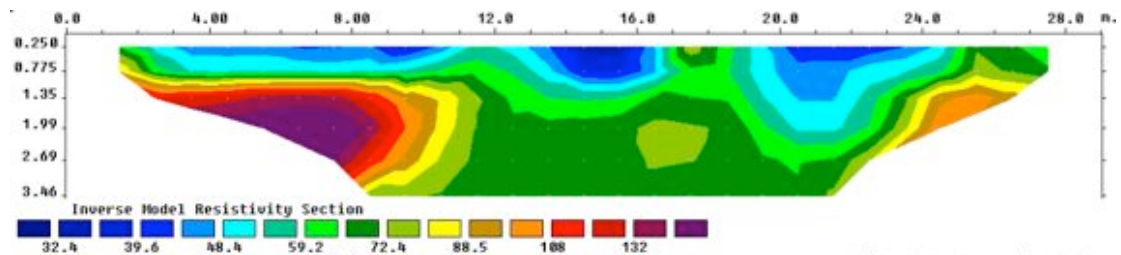


Grids 15, 16 and 17 were placed across the building SW/NE between the sites of trenches 1 and 7

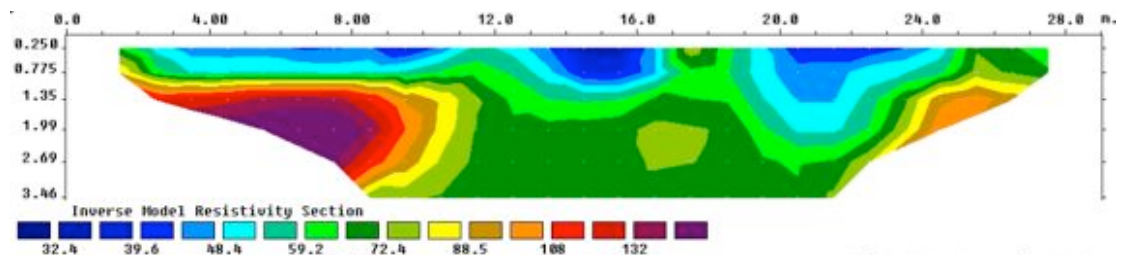
Grid 15 was placed immediately east of the east edge of trench 1 where both a north and south wall were uncovered. This grid shows bedrock to the south of the excavation site, with a light greeny-blue reading at 12 representing the south wall and surrounds. The projected course of the north wall at 19/20 is giving a very low resistivity reading, which is, as yet, unexplained. The projected course of the modern water pipe shows at 24.



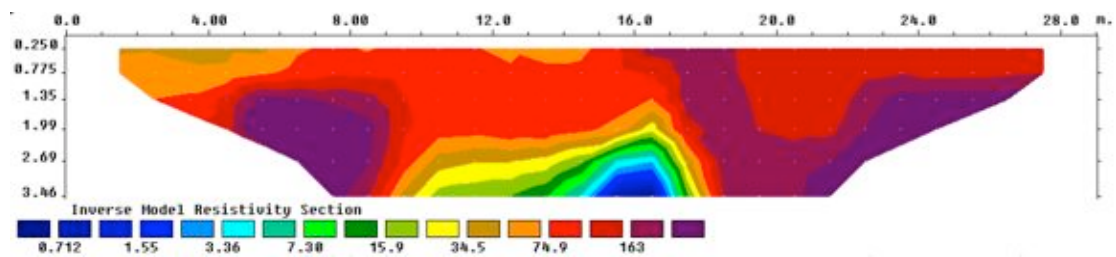
Grid 16 was placed 4m east of 15 across an area yet to be excavated. It confirms the course of the south wall at 12/13 and also the north wall at 18-20, coinciding with the diagonal course of the modern water pipe. A further 'feature' may lie at 25/26 but this may signify geology. The level area between 4 and 11 may relate to a cobble exterior surface as uncovered elsewhere to the south of the building.



Grid 17 was placed a further 4m east over the west edge of trench 7, to test how known archaeological features behave in the survey. This indicates the course of the south wall at 12, a further wall running at right angles and parallel with the grid directly beneath it between 12 and 15.5. The passage of the modern water pipe shows at 15/16, but the north wall is unexpectedly missing at 19/20.



Grid 18, orientated NW/SE and outside the excavation area was placed, in part, across a depression thought to be a possible route way to the church which lies between 16 and 19, showing as high resistivity. The projected course of the modern water pipe is at 14 and possibly indicated by an area of lower resistivity, but is inconclusive.



6.0 Evaluation and Recommendations

The results were felt to be a useful indicator in both understanding the underlying geology and in locating potential archaeology. It proved beneficial to have begun surveying from the known archaeology into the unknown, as this helped with interpreting the readings. Areas of low resistivity were not necessarily as predicted and these need further investigation, as do the areas of potential archaeology towards the east end of the site and in particular those down slope of the building. Where grids intercepted, consistency was not encountered, with wide discrepancies in resistivity values.

The south wall was well indicated, as was the modern water pipe. The medieval drain course does not appear to flow as projected and the downhill course of the wall features is ambiguous in grids 12-14.

It is recommended that those grids, which were null and void, be repeated and that further grids be surveyed over a wider area of the known building in an effort to locate the course of the north wall. In addition it would be beneficial to extend the survey to the west of the building.

7.0 Acknowledgements

CAMP wishes to thank the following people for their help.

Bob Smisson for lending the equipment, downloading and processing the results and helping to interpret the readings.

Brian Irwin and Richard Ivens for bringing the equipment to site and teaching the group how to operate it.

Various volunteers who turned up to help on the day.

Mr and Mrs Miles and Mr and Mrs Gosland, the land owners for their continued cooperation.

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