BATH & COUNTIES ARCHAEOLOGICAL SOCIETY

Geophysics investigation in Ring Common Allotments, Bath (Royal Victoria Park project)

Janet Pryke and John Oswin

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Abstract

In a previous investigation[1] geophysical investigation involving resistivity profiling gave results showing a high resistivity volume present under the grassed area to the south of the Ring Common allotments in Bath.[1] Adjacent profiles indicated that if it was a linear feature it could continue under the allotments to the north. In this project additional profiles were carried out to investigate this feature and these results showed no continuation of it to support its further investigation.

Acknowledgements

Many thanks are due to the B&NES Parks Department for permission for the access to this area to undertake this survey. We are also grateful to the allotment holders for their forbearance, and we made every effort to restrict our work to the pathways between their plots.

Thanks for their help with the geophysics investigation are due to David Hall, John Knapper, Paul Lane, Elpitha Lemos, Ian Perkins, Linda Pike and Fay Stevens (also for photographs) and to Shaun Wilson (Director of Archaeology and excavation project leader) for overall direction of the work.

We thank the Bathscape Project for support and supplying us with the two Frobisher TAR3 resistance meters.

In our mapping work, we acknowledge the Ordnance Survey for allowing us download and reproduction of maps under Crown copyright license number 100060399.

1 Introduction

1.1 The site

The site in this proposal is shown in Figure 1. It is an area of allotments situated west of Marlborough Buildings, at the edge of the Royal Victoria Park, Bath, a Grade I registered park and garden. Between 2016 and 2022 a geophysical survey project had been carried out across most of the accessible areas of the Park by members of the Bath and Counties Archaeological Society.[1,2]

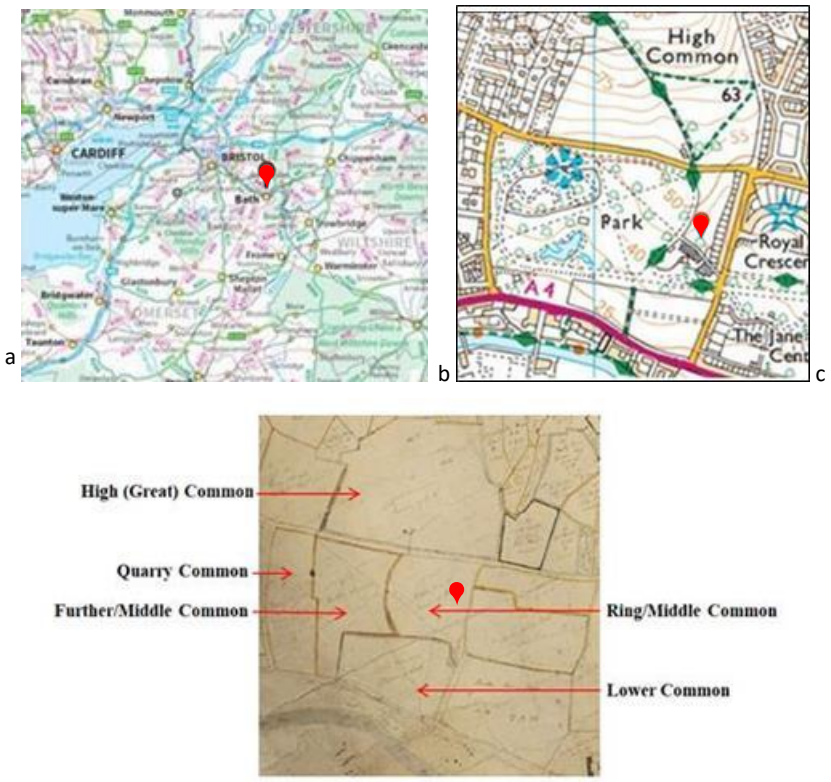


Figure 1 Location of excavation, (a) and (b) Ordnance Survey maps, (c) from earliest map of area Walcot Parish by T. Thorpe (copy of 1740 version), Museum of Bath Architecture

This allotment site had once been part of the medieval West Field of Bath,[3] an area which in time became owned by the Freemen of Bath as the Common Fields of Bath.[4] It is in Middle (Ring) Common. This alternative name of Ring Common relates to the small riding ring that was set up in the 18th century, and referred to by John Wood in his Description of Bath[5] as in "imitation of the Ring in Hyde Park, near London". This Ring is shown in Thorpe's 1742 five-mile map of Bath, immediately to the west of what is now the allotment area.[6]

The Royal Victoria Park was set up in 1830[7] to include much of the Common Fields. It did not include this area, which was later sold by the Freemen of Bath to the Corporation in 1879. With several other areas of the Park it was one of the allotment areas used during WWII,[8] and has remained since then for allotment use.

1.2 Geology

The Royal Victoria Park is on the north slope of the Avon river valley. The diagonal slope here towards the river is about 1 in 12. The floor of the river valley is formed of lower lias clay, obscured by river soil and alluvium. Above the valley is the Charmouth Mudstone layer, including this part of the Park. Mud/Mad/Muddle Brook runs down the area's eastern side (now culverted).

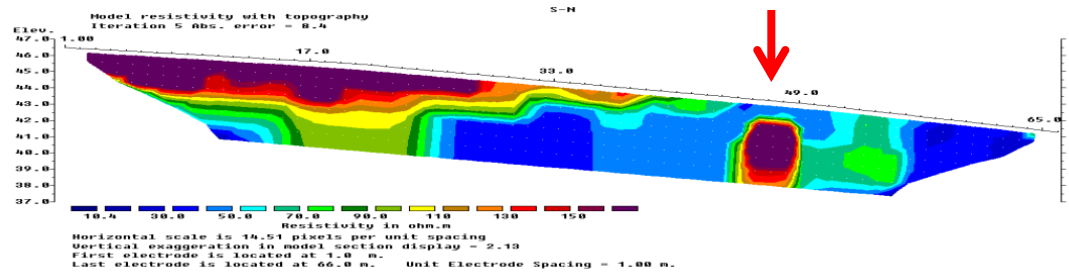
1.3 Background

This preliminary geophysics project is to further examine some of the results that had been reported from our previous survey. In this earlier work two profiles had been set across the slope at the southern end of the allotments. They showed results including the possible presence of a structural feature that could have been something like a culvert with a high resistivity possible void interior. Such a feature is of no known function or origin. The position is shown arrowed in Figure 3.

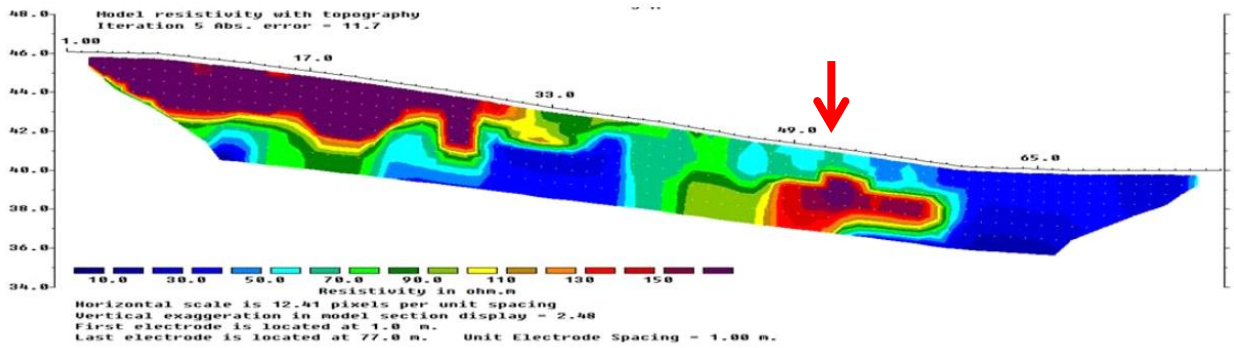
Figure 2 Resistivity profiles 1 (N) and 2 (S)

Figure 3 Concatenation of the above profile results west to east

Profile 1a,b,c concatenated with estimated topography



Profile 2 a,b,c,d concatenated with estimated topography



1.4 Aim

To obtain precise location of any possible continuation of this possible structure further up the slope in advance of any possible excavation.

2 Method

2.1 Gridding

The area was based on a line running along the path to the west of the allotments. The starting point (0) was set up from previous work. A series of profiles was set up to continue the possible path of linear features from those arrowed in Figure 3.

2.2 Resistivity Profiles

Profiles were taken using a Frobisher TAR-3 resistance meter with 30 probes available. They are imaged as arrows pointing 0-29 and 0-31m. Initially the equipment appeared not to function well and in Profile 1, the results included 10% interspersed anomalous high and 999.9999 readings through especially in the (later) eastern part of the profile. These values have been recalculated using adjacent (within normal range) readings and the adjusted profile has been included for comparison. The equipment read normally in subsequent profiles.

2.3 Software

At the time of the survey the new computers supplied by Bathscape still have compatibility problems with our instrumentation, so all fieldwork here was downloaded and analysed using BACAS' Windows XP computer.

The profiler data were downloaded from the Frobisher which also converted the data to resistivity values and locations prior to processing in Geotomo RES2DINV 32-bit software v 3.71.112 full version for analysis. Relative height data were added to provide topographic as well as electrical profiling.

2.4 Height determination

Heights across the area and along profiles were measured by Dumpy level and staff. They are described in Appendix A, together with the GPS profile positioning measurements.

Figure 4 Photographs showing use of the Dumpy level

3 Results and Discussion

The dates of this project were 11-13 February 2025. The profiles were set out in the pattern indicated in Figure 5, profiles 1-3 on the first day, 4 and 5 on the second and 6 and 7 on the third.

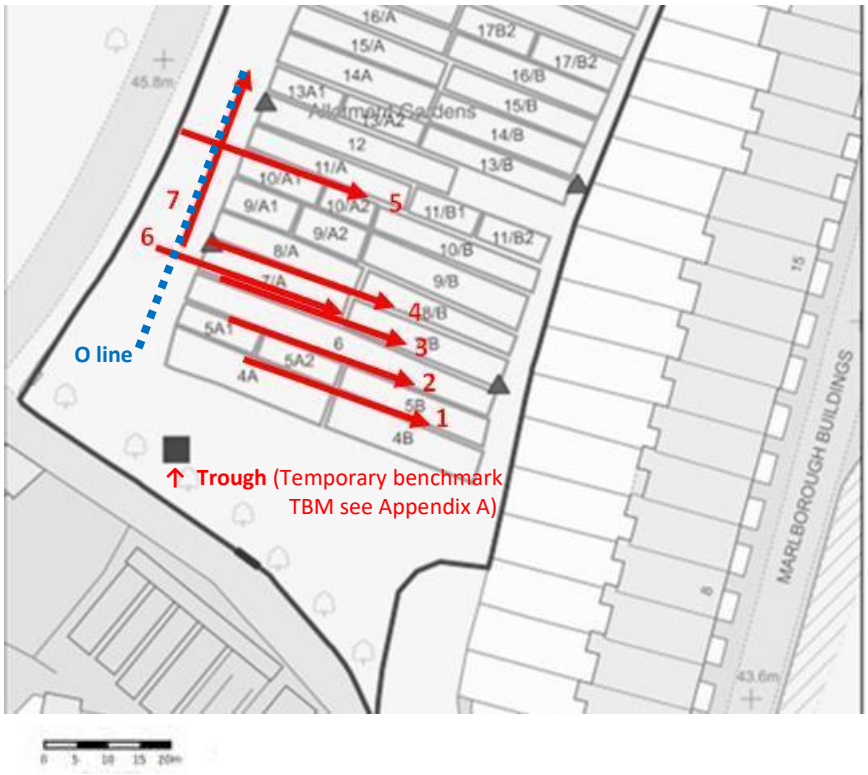


Figure 5 Diagram of profile pattern *With thanks to B&NES Council Parks for plan*

The individual profiles are shown in Appendix B. The results in Figure 6 show the resistivity patterns with the topography and the profiles are drawn on the plan in Figure 7.

The experimental profile positions 1-5 were set up to follow the line of the possible feature. Profile 5 shows some form of structure some 37 m to the north of the established targets on a possible alignment; and intermediate profiles show wet patches along this arrowed line that might demonstrate leakage from any conduit. Resistivity is generally higher at the top of the slope but that just indicates drainage down the steep slope. The arrows are drawn on the plan as straight lines, but the reality is three-dimensional, with the valley sloping up gently to the north and steeply to the west, but they are useful approximations.

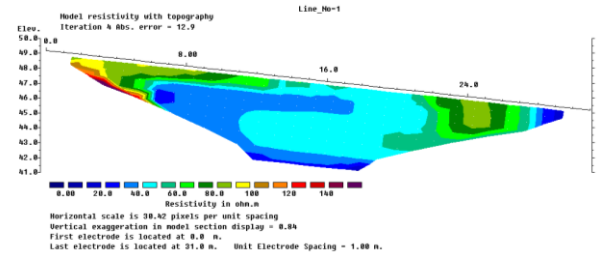
Profile 1 intersected the arrow drawn in Figure 7 but note the reservations in interpretation of its results due to its anomalous readings. Profile 1 may indicate a higher resistivity volume towards its eastern end. Profile 2 shows a matching feature, but this is only at surface level as greater depths were already truncated.

There might be a possibility of a conduit no longer intact approximately along the line of the dashed arrow in Figure 7, but the results cannot be at all conclusive. These results therefore do not indicate any definite continuation of the possible feature extending from the results observed in the previous results.

As further information, the higher resistivity results we had observed previously on the western side of the area can be added to by the comparative information from these profiles. The combination of these results may be of use in future investigation of the wider area.

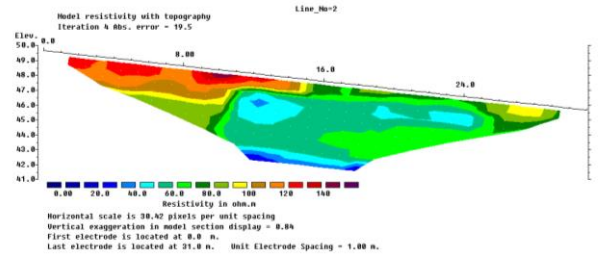
Figure 6 Profiles (west-east) showing their topography

Profile 1

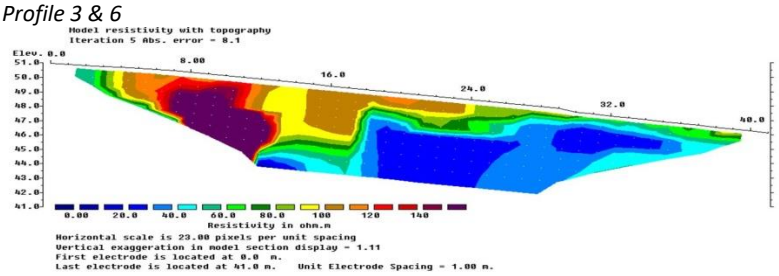


Note this profile is adjusted and included for comparison, but these results were found to include 10% reading errors concentrated toward the eastern end, which were corrected out here. The eastern portion of the profile is omitted in Figure 7.

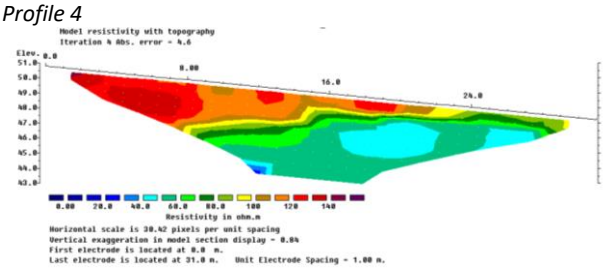
Profile 2



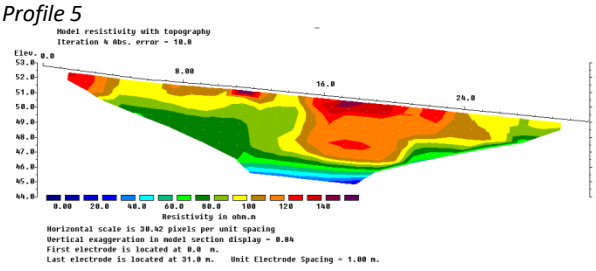
Profile 3 & 6



Profile 4



Profile 5



Profile 7

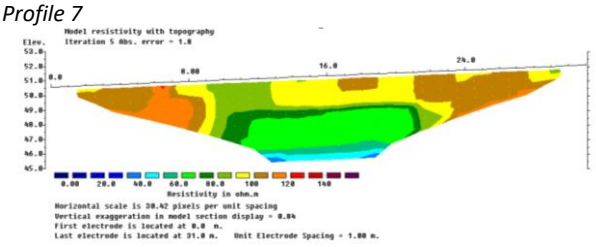
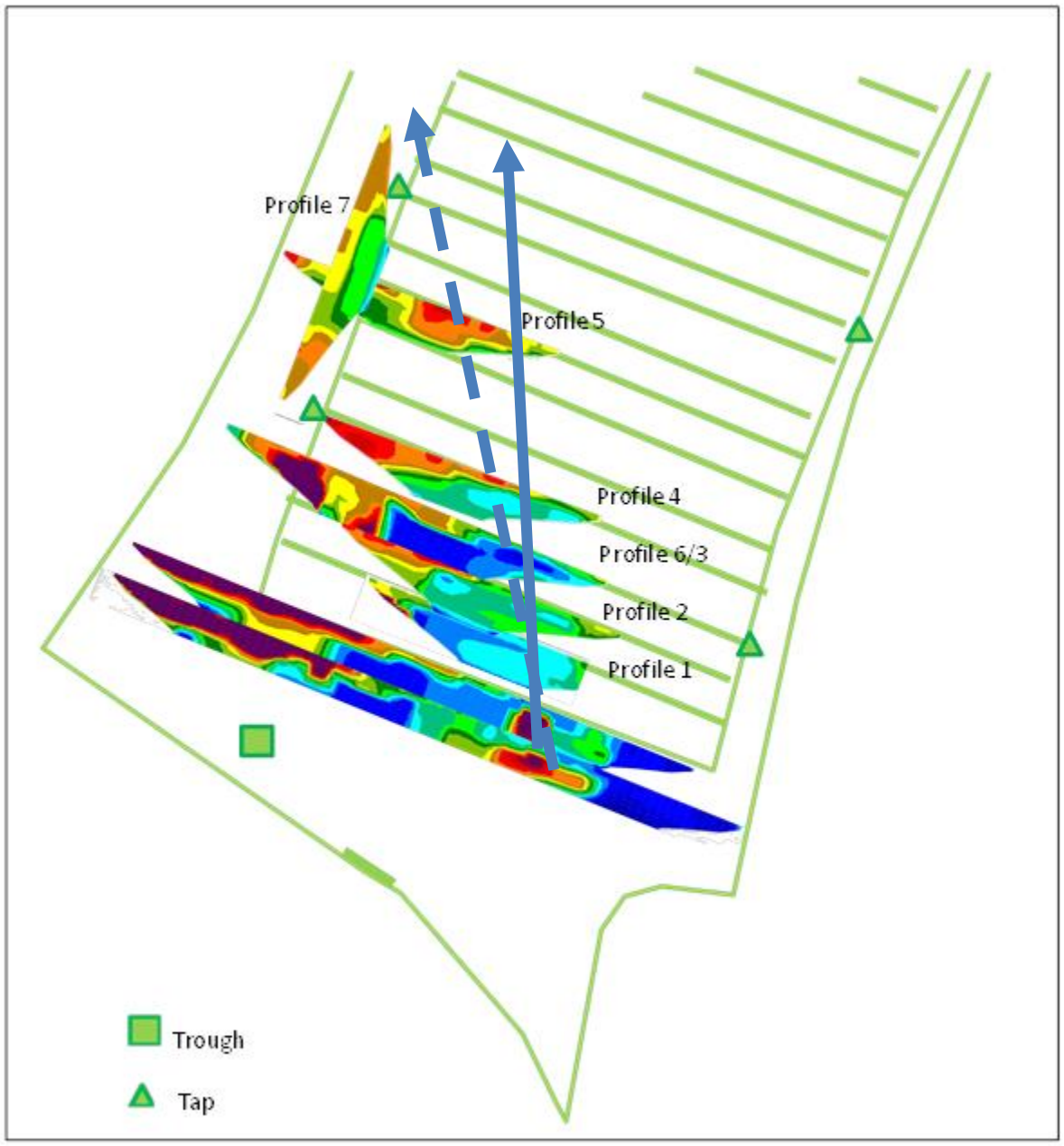


Figure 7 Image showing the resistivity results in the profiles across the site set up to the north of the two profiles completed in the earlier investigation. The blue arrows indicate the possible alignments of conduits based on the earlier measurements.



4 Comment

Profiling can be considered as a rather slow process compared with other techniques, but it provides a description of differential resistivity positioning at depth. The results from this investigation do not indicate the extended presence of any structure that would merit a suggested excavation.

References

1. Pryke J. and J. Oswin (2020) *Royal Victoria Park, Bath, west of the Royal Crescent, geophysical surveys between November 2016 and May 2019*, Report to BACAS, on website
2. Pryke J. and J. Oswin (2022) *High Common, Bath, (the Approach Golf Course) A report on geophysical surveys during 2022*, Report to BACAS, on website
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4. *Map of Walcot Parish* copied by Wm Newton in 1822 from the map drawn by Thomas Thorpe 1740, Building of Bath Museum, Bath In Time: Images of Bath 30559
5. Wood, J. A. (1769) *A Description of Bath*. 2nd edition
6. *Map of 5 miles around Bath*. Thorpe, T. (1742) Bath In Time: Images of Bath 13610
7. Whalley, R. (1994) The Royal Victoria Park Bath History, V,147-169
8. Air photograph. 1947. RAF/ CPE/UK/2095 28MAY47. English Heritage National Monument Record, Swindon

Appendix A

Height measurement and location for profiles

During the project, height data were provided for profiles by means of a dumpy level and 5 m staff. The site was sufficiently extensive and steep that the level needed to be moved a number of times in order to incorporate lines, and heights were often extrapolated from measured data where a slope was estimated to be of constant gradient.

The concrete base of a water tank towards the top of the slope at the southern end of the allotments was used as a temporary benchmark (TBM).

Figure A. Water trough at southern end of allotments. Its northern concrete base was used as a temporary benchmark (TBM).

This was related to a known benchmark on the lane outside the allotments at the end of the profiling exercise. The benchmark was about 30 cm above road level on the wall to the south of the track. It is about one metre east of the lamp post visible in the background of Figure A.

The height of this benchmark was taken from the 1904 edition of Ordnance Survey 25" to the mile, map of Kingsmead, as 136.174 ft., translated as 41.26 m. This gave the height of the TBM as 48.87 m above OD.

A tape had been laid out along a line set by the previous survey, running at the very southern edge of cultivation, starting at the western fence. At 16 m along this line, a right angle was constructed so that it ran up the western grass baulk for the allotments, at approximately mid-width, for 50 m.

Each profile could therefore be located by how far north along this line it occurred (northing) as well as the allotments that lay to north and south of it. The start point of each line could also be located as an easting from this line on the baulk, and by adding 16 m to this figure could be given an absolute setting relative to the earlier-established origin at the fence.

These could be tabulated as: [line. Length. Northing. Start point easting from 16m line]

Line 1.	31m.	7m north.	27.26 m east
Line 2.	31m.	11.5m north	24.1 m east
Line 3.	31m.	16m north	21m east
Line 4.	31m	21.2m north	17.2m east
Line 5.	31m	37m north	7m east
Line 6.	29m	6m north	-4.8m east

Note that Line 6 was designed to be concatenated to Line 3. It was made shorter as the length was limited by the hedging. A seventh line (Line 7) was also measured heading south to north along the 16 m line and was 31 m long. This started at 19 m north of the origin and extended to 50 m north.

The general rule was to measure the height of the zero point and the 20 m point along each profile, and interpolate height for the first 20 m and then extrapolate to the full length of the profile assuming constant gradient.

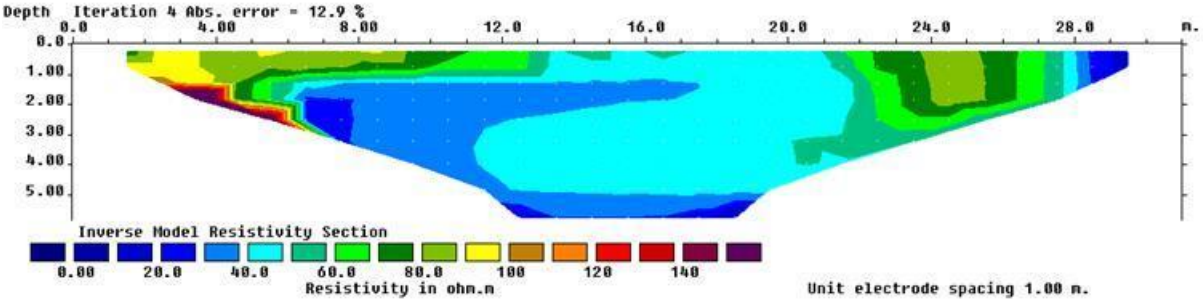
Some of the later profiles started on the grass baulk or even in the rough to the west of the baulk, and they had obvious changes in gradient. These gradients were established for each section and heights interpolated for each section with the same gradient.

Heights were expressed as absolute OD by adding the TBM height to the measurements.

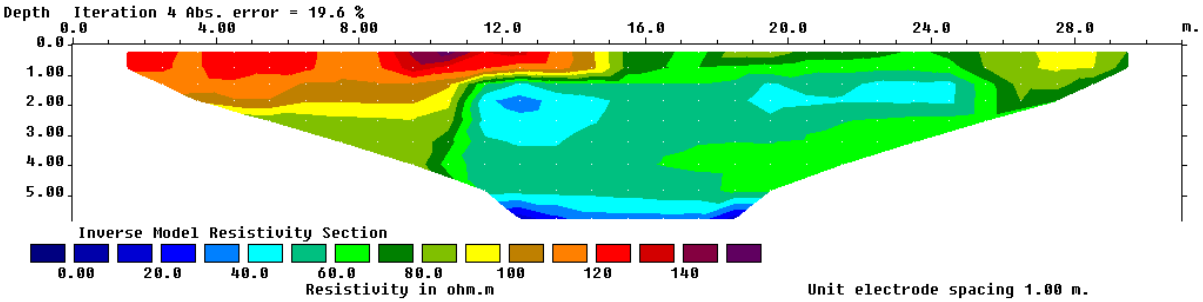
Appendix B

Resistivity profiles

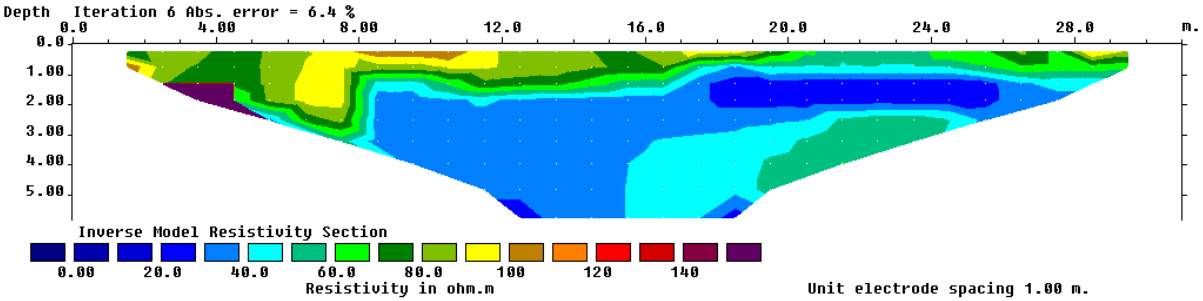
Profile 1 adj.



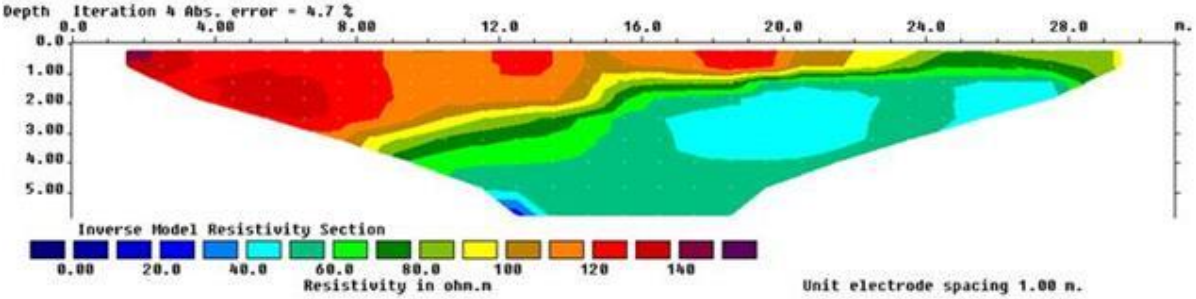
Profile 2



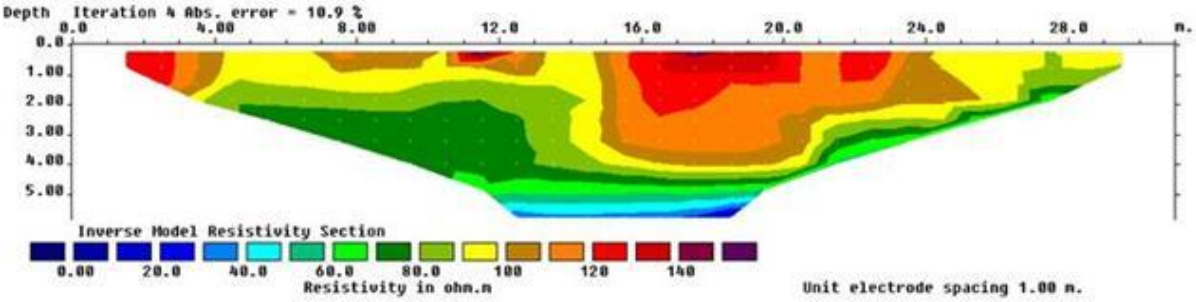
Profile 3



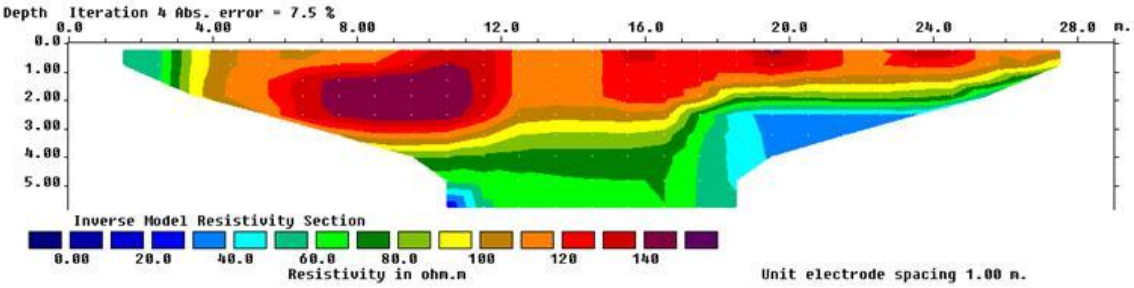
Profile 4



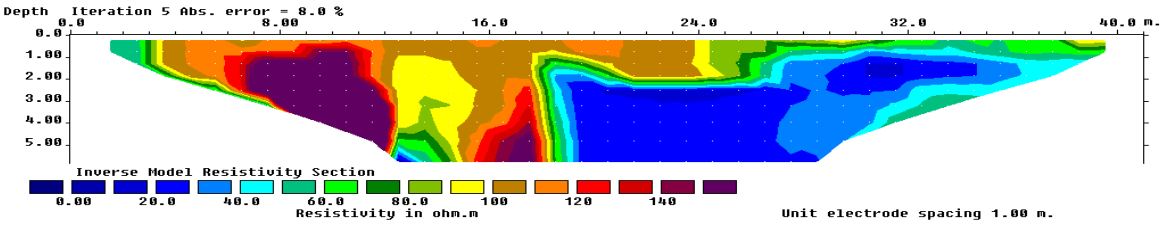
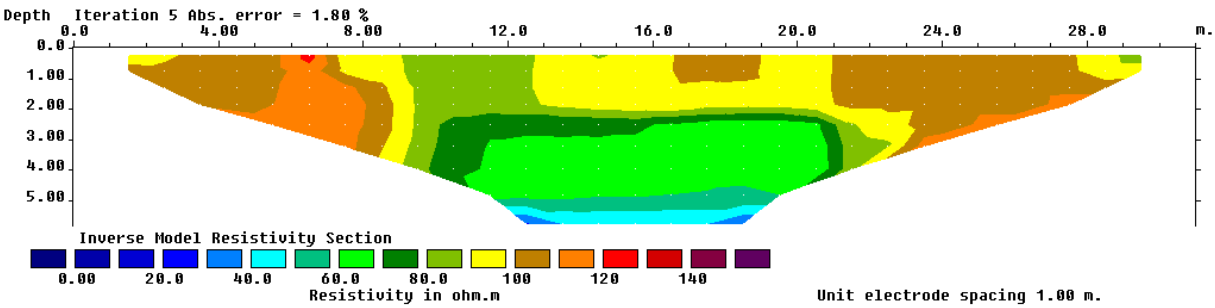
Profile 5



Profile 6



Profile 6 as above concatenated with profile 3, its continuation



Profile 7