



ARCHAEOLOGICAL SURVEYS

GEOPHYSICAL SURVEY REPORT

Malmesbury Town Defences

Resistivity survey

For

Cotswold Archaeology

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October 2005

Ref no. 116

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Report and fieldwork by David Sabin and Kerry Donaldson

Survey date – **19th October**

Ordnance Survey Grid Reference - **ST 935 873**

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SUMMARY

A resistivity survey was carried out across two small areas adjacent to Malmesbury town walls close to the surviving remains of the East Gate. Area 1, outside the town wall, revealed high resistance linear anomalies associated with a trackway and areas of high resistance immediately adjacent to the extant wall remains. Area 2, interior to the town defences, revealed an area of high resistance where the current land surface overlies the town wall. Little additional evidence for the development of the defences was revealed by the survey.

1 INTRODUCTION

1.1 *Survey background*

1.1.1 Archaeological Surveys was commissioned by Cotswold Archaeology to undertake a resistivity survey over two areas of land adjacent to Malmesbury town walls. The survey is close to the surviving remains of the East (Holloway) Gate and falls partly within a Scheduled Ancient Monument (Wiltshire 881). The work forms part of research and investigation ahead of the third phase of repair and reinstatement being carried out by North Wiltshire District Council.

1.1.2 The survey follows a brief prepared by North Wiltshire District Council in July 2004.

1.2 *Survey objective*

1.2.1 The objective of the survey was to use resistivity to locate geophysical anomalies that may be archaeological in origin so that they may be assessed as part of the process of archaeological evaluation. In particular, the location of structural remains within the interior or exterior of the surviving wall, or ditches outside the extant wall section, may provide additional evidence to the development of the town defences and associated settlement of Malmesbury.

1.3 *Site location*

1.3.1 The survey areas are located north east of Malmesbury town centre at OS reference ST 935 873.

1.4 *Site description*

1.4.1 The site is separated into two small areas by the extant remains of the town walls and these are referred to in the report as Area 1 and Area 2.

1.4.2 Area 1 lies outside of the wall on permanent pasture that slopes steeply away from the base of the wall to a tributary of the River Avon. The area is approximately 30m by 30m, the town wall lies along the north western edge, the remains of barns or sheds are located along the north eastern edge with

both disused railway embankment and cutting to the south west. A former trackway crosses the area and is terraced into the slope.



Plate 1 Part of survey Area 1 looking towards remains of the town walls.

1.4.3 Area 2 lies on a triangular platform of land on the inside of the town walls, however, the current ground surface is level with the top of the extant wall remains and some 4m higher than Area 1 to the southeast. The Holloway lane immediately to the northwest is similarly 3 to 4m below the site with the south western edge bounded by a disused railway cutting. The area is currently used as a small garden and contains a variety of surfaces including open soil, grass, gravel and formal flower beds.

1.5 *Site history and archaeological potential*

1.5.1 The archaeological potential of the survey area is considered as high and Area 2 falls within a Scheduled Ancient Monument (Wiltshire 881). The following extract (1.5.2) has been derived from the original brief issued by North Wiltshire District Council.

1.5.2 Malmesbury occupies a naturally defensive position on a rocky promontory overlooking the valley of the River Avon. Recent archaeological investigation supports and earlier hypotheses that the foundations of the town lie within an Iron Age Hillfort. This was apparently later re-fortified to become part of the Burgh defence system for Wessex established during the Saxon period under King Alfred. The fortifications were probably strengthened during the Medieval period by the construction of a substantial stone wall along the established line of the ramparts. It is likely that the wall has been subject to periods of reconstruction and alteration at various times, most notably during the Civil War period when it is known to have been partially slighted.

- 1.5.3 Sections of the wall are variously subject to statutory protection, either by being included in the List of Buildings of Special Architectural or Historic Interest or by designation as a Scheduled Ancient Monument.
- 1.5.4 North Wiltshire District Council has undertaken a comprehensive and phased programme of repair and reinstatement along the length of the eastern boundary, with the first two phases having been undertaken during 1998/1999 and 2001/2002. The third and final phase of work will cover the northern extremity adjoining and including the remains of the East (Holloway) Gate.

1.6 Geology and soils

- 1.6.1 The underlying geology is mainly Cornbrash of the Jurassic period (BGS, 2001) possibly with alluvial deposits towards the lower south eastern end of Area 1 (BGS, 1977).
- 1.6.2 The overlying soils belong to the Wickham 3 formation and are typical stagnogley soils (Soil Survey of England and Wales, 1983). The thickness of the soil profile is likely to vary considerably due to a combination of natural slope processes associated with weathering and a range of anthropogenic activities both ancient and modern.

2 METHODOLOGY

2.1 Technical synopsis

- 2.1.1 The electrical resistance or resistivity of the soil depends mainly upon moisture content and distribution within the soil. Buried features such as walls can affect the moisture distribution and are usually more moisture resistant than other features such as the infill of a ditch. A stone wall will generally give a high resistance response and the moisture retentive content of a ditch can give a low resistance response.

2.2 Equipment details and configuration

- 2.2.1 The resistivity survey was carried out using TR Systems Ltd Resistance Meter TRCIA 1.31 using a mobile Twin Probe array.
- 2.2.2 Readings were taken at 0.5m intervals across both survey areas giving 3600 readings within a full 30m x 30m grid.

2.3 Surveying and referencing

- 2.3.1 Areas were set out to cover the requirements of the survey brief as far as possible. Remains of concrete foundations to the northeast of Area 1 prevented survey in this area and sheds, shrubs and gravel paths determined the shape of Area 2.

2.3.2 Wooden pegs were set out and referenced using a Topcon GTS-212 total station, however it was observed that the Ordnance Survey base mapping for the area was not a good representation of current topographic features. For this reason a wooden marker was left at point B to assist in the reconstruction of the survey grid in that area. An attempt at referencing using Differential GPS failed to locate points to a high enough degree of accuracy due to the enclosed nature of the site.

2.4 *Data processing and presentation*

2.4.1 Data logged by the resistance meter is downloaded and processed within ArcheoSurveyor software. Raw data is analysed and displayed within the report as well as processed data. The following processing has been carried out on data in this survey:

Image processing

- Raw resistivity data has been clipped at 3SD in order to improve greyscale resolution.
- Processed data has been clipped between 2SD to enhance any possible archaeological anomalies. Negative values are a function of the mathematical operation carried out across the data during high pass filtering, see below.

Data processing

- Data has been “despiked” in order to remove spurious high contact responses.
- Data is passed through a high pass filter in order to enhance archaeological features.

2.4.2 The results are presented in the form of greyscale plots for both raw and processed data with an additional abstraction and interpretation plot using coloured linear, area and point symbols where appropriate.

3 RESULTS

3.1 *Area 1*

3.1.1 Two parallel high resistance linear anomalies, numbered 1 and 2 Figure 5, cross the survey area from northeast to southwest and are probably associated with a terraced former trackway.

3.1.2 A faint high resistance linear anomaly, number 3 Figure 5, is located towards the southern corner of the survey area and is of uncertain origin. This anomaly may be associated with a high resistance amorphous anomaly nearby, number 4.

3.1.3 Amorphous high resistance areas , 5 and 6, are of uncertain origin but may be associated with former agricultural structures immediately to the northeast.

3.1.4 Amorphous high resistance areas, 7 and 8, are located adjacent to extant stone walling and are discussed below.

3.2 Area 2

3.2.1 An area of high resistance, number 9 Figure 5, has been caused where topsoil overlies the extant remains of the town wall.

4 DISCUSSION

4.1 Area 1

4.1.1 Few distinct anomalies were located within the area and those abstracted were produced by relatively high resistance responses. This would tend to suggest areas of lower ground moisture associated with stone rubble.

4.1.2 Areas of high resistance immediately adjacent to sections of extant stone wall may be related to a number of factors: unconsolidated stone and soil that has fallen away from the wall, sheltering effects and terracing of the wall footings.

4.1.3 Two linear high resistance anomalies are associated with a terraced trackway that crosses the survey area. It is possible that these responses have been caused by very dry soil conditions along the 'break of slope' either side of the track.

4.2 Area 2

4.2.1 Defining and abstracting any anomalies within the area was problematic due to the very small section of ground surface available for survey. An area of high resistance has been caused where the topsoil overlies the extant town wall remains.

4.2.2 Small changes in resistance across the area are likely to represent variations in the surface cover associated with the present use of the site as a garden.

5 CONCLUSION

The results of the resistivity survey have revealed little evidence for buried structures or ditches associated with the development of Malmesbury and its town defences. Areas of high resistance immediately adjacent to the extant town walls on the exterior side, possibly suggest some thinning of topsoil either associated with terracing of the wall footings or natural thinning of the soil profile in this area. However, a number of other factors such as the sheltering effect of the wall and accumulation of weathered debris may have

caused the high resistance response. The homogeneous resistive response across much of Area 2 inside the town wall, would be consistent with the dumping of soil to raise up the area and does not suggest buried structural remains interior to the wall, at least within the first metre or so.

6 REFERENCES

British Geological Society, 2001, *Solid Geology Map, UK South Sheet, 1:625 000 scale, 4th edition*.

British Geological Society, 1977, *Geological Survey Ten Mile Map, South Sheet, 1:625000 scale, First Edition (Quaternary)*.

English Heritage, 1995, *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline No 1*.

Soil Survey of England and Wales, 1983, *Soils of England and Wales, Sheet 5 South West England*.

Geophysical Survey
Malmesbury Town Defences

Map of survey area

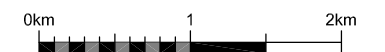
Reproduced from OS Landranger map no.173 1:50 000 by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Licence number 100043739.



● Survey location

Site centred on OS NGR
ST 935 873

SCALE 1:50 000



Survey location

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Referencing information

A - B 20m C - D 32m D - E 21m
C - E 12.67m D - F 21.02m C - F 45.92m

- A - B Baseline - Area 2 - 0.5m from hedge
- C - D Baseline - Area 1
- B Marker peg left in situ
- E Corner of outbuilding
- F Corner of building
- 1, 2, 3 Resistivity grid numbers

SCALE 1:500

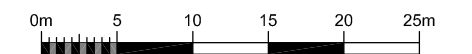
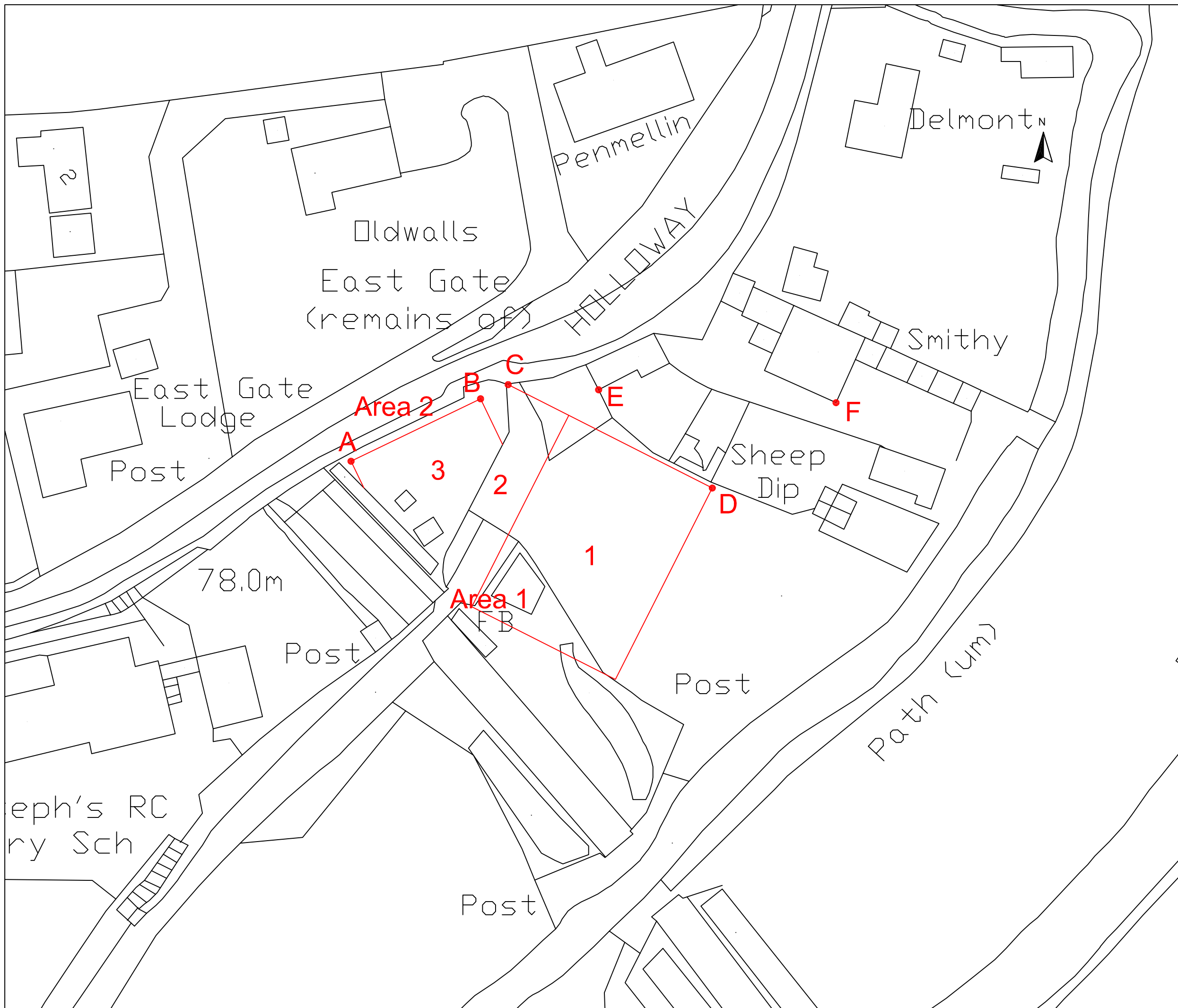


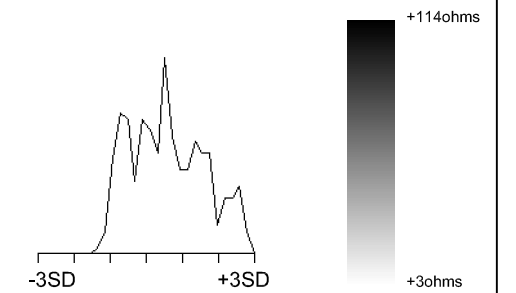
FIG 02



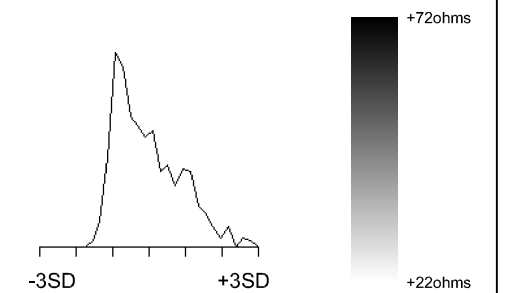
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Greyscale plot of raw resistance data - Area 1



Greyscale plot of raw resistance data - Area 2



SCALE 1:500

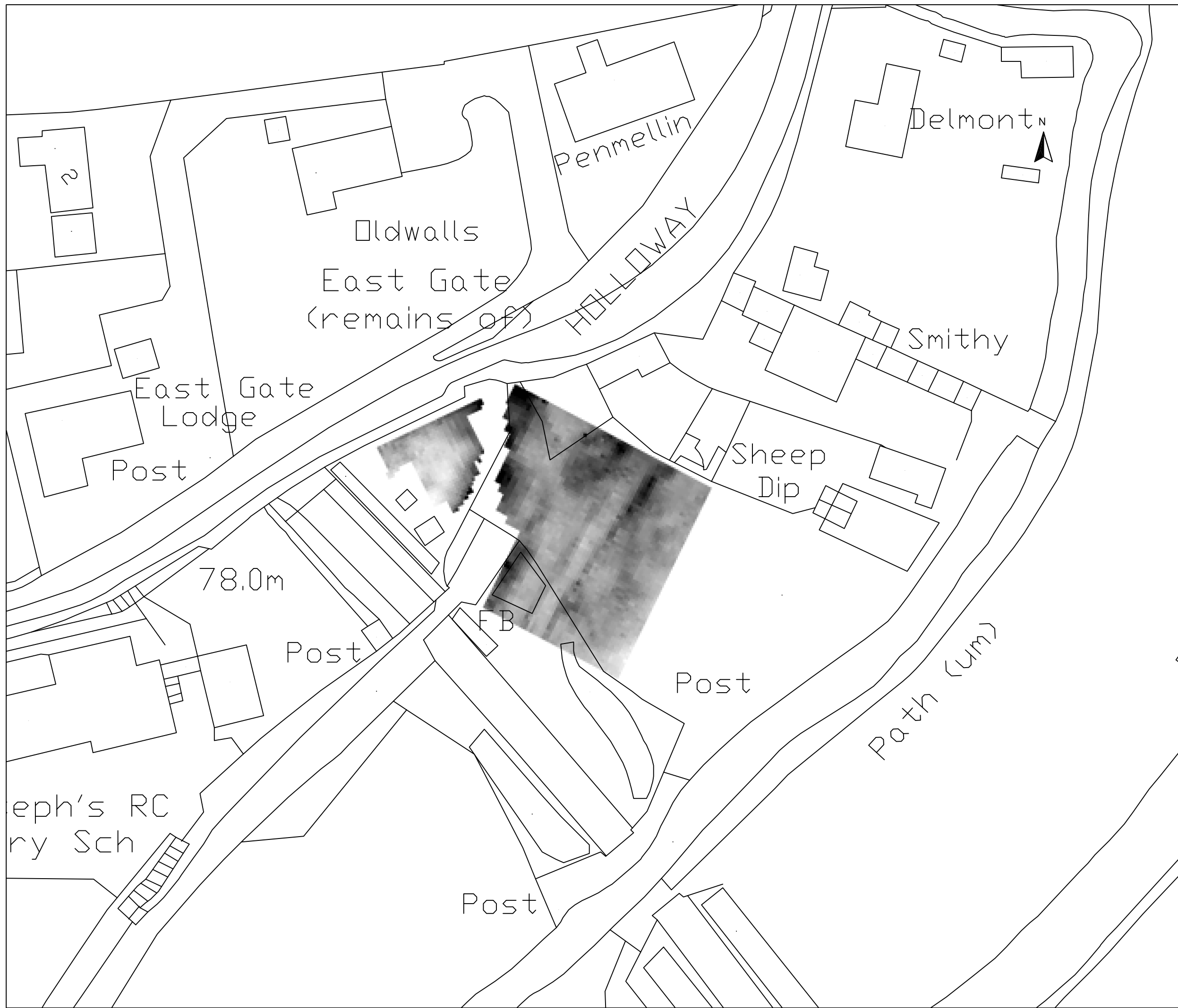
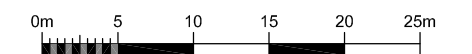
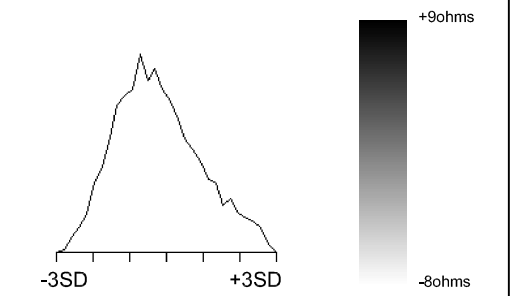


FIG 03

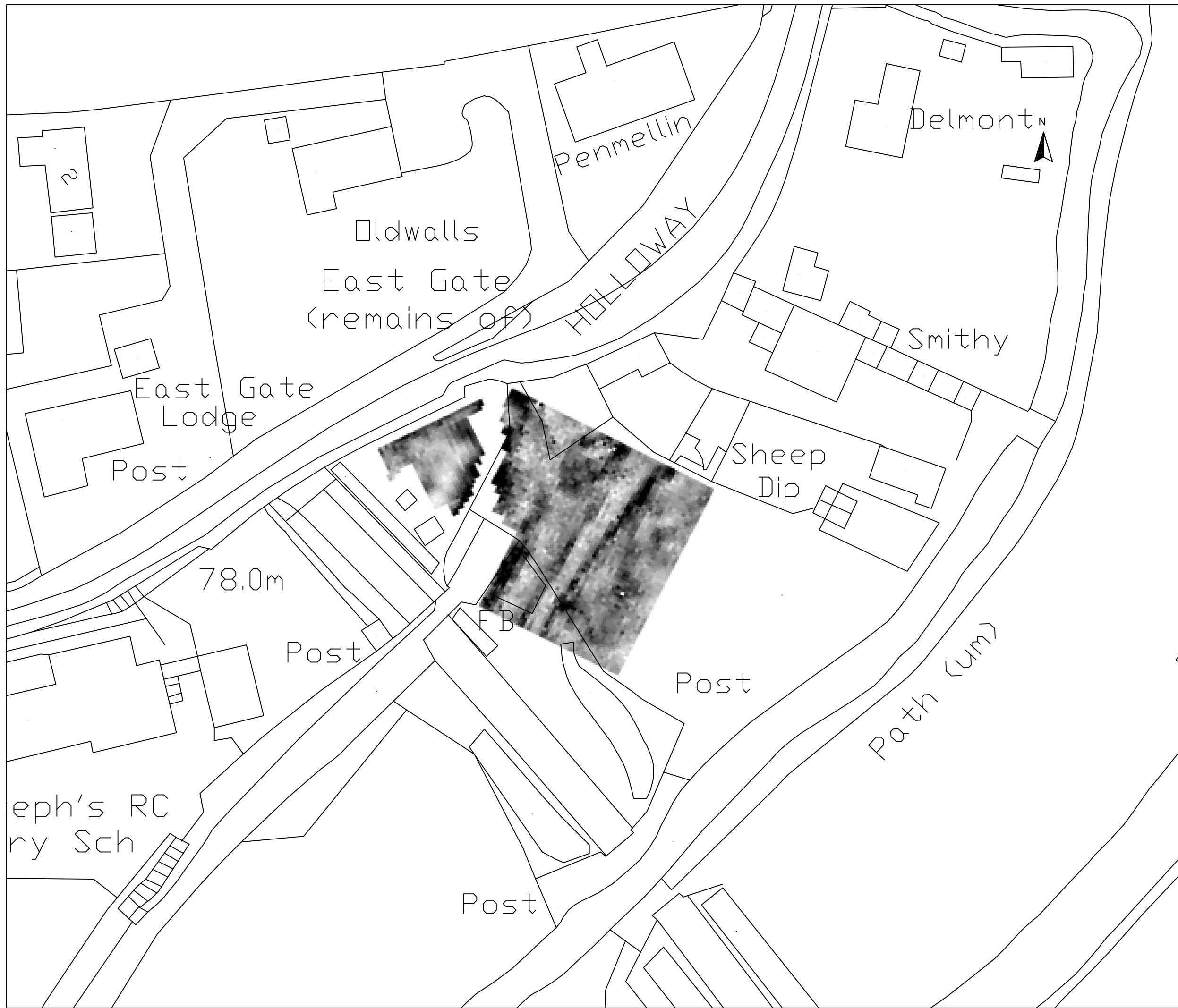
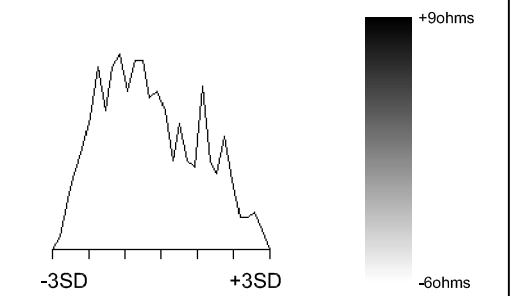
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Greyscale plot of processed resistance data - Area 1



Greyscale plot of processed resistance data - Area 2



SCALE 1:500

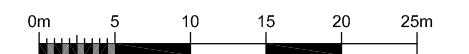


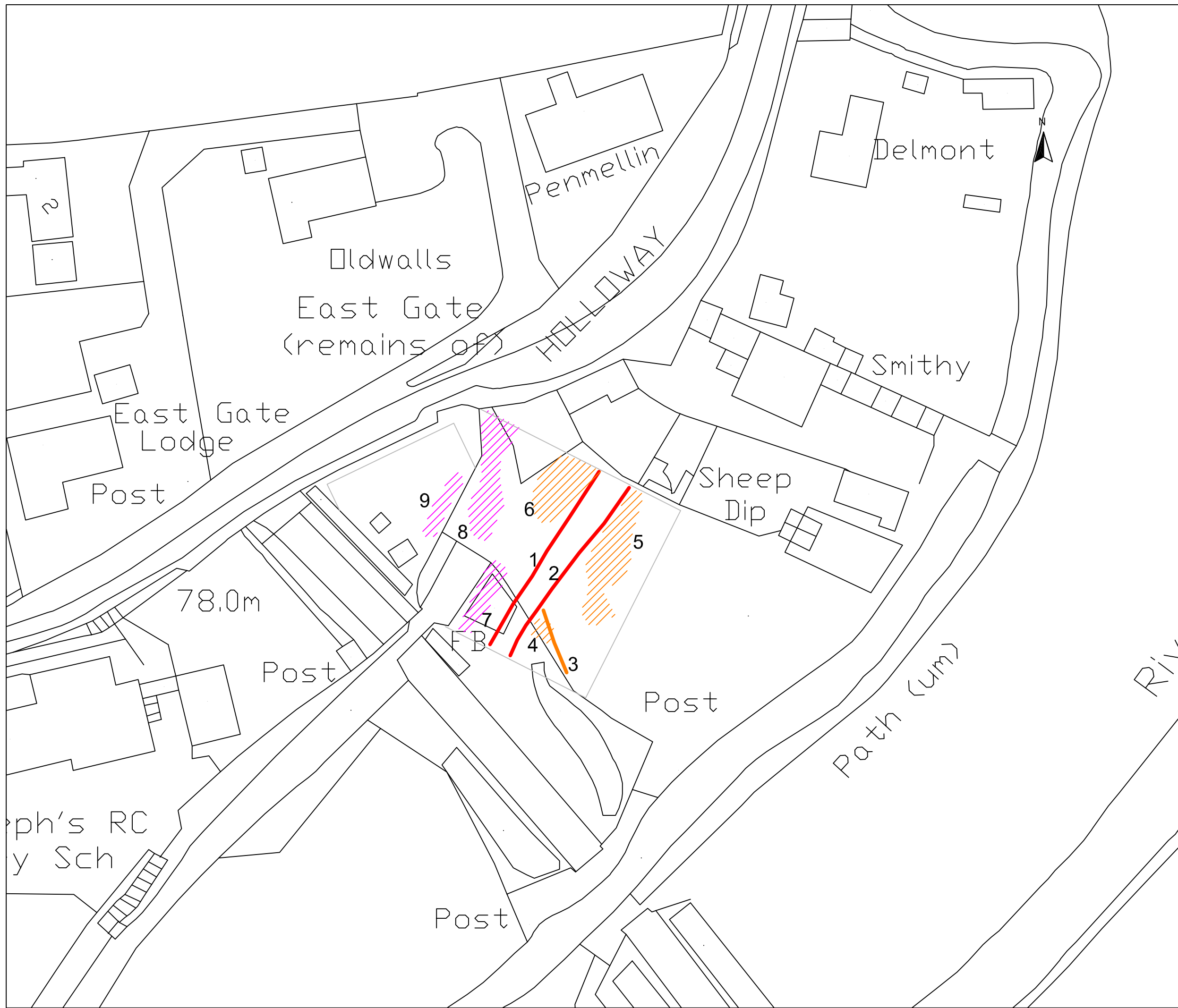
FIG 04

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Abstraction and interpretation of resistance anomalies

- High resistance linear anomaly - uncertain origin
- High resistance linear anomaly associated with terraced trackway
- Area of high resistance - uncertain origin
- Area of high resistance adjacent to and probably associated with extant stone walls



SCALE 1:500



FIG 05