

Ancient Monuments Laboratory  
Report 2/93

BEADLAM ROMAN VILLA, NEAR HELMSLEY,  
NORTH YORKSHIRE.  
REPORT ON GEOPHYSICAL SURVEY  
JULY 1992

Andy Payne BSc PIFA

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Summary

A geophysical survey was carried out at Beadlam villa, employing resistivity, magnetometry and magnetic susceptibility. The aim was to complement the findings of excavations in the 1960s, now being prepared for publication by the MAP Archaeological Consultancy of Malton. The survey was generally unhelpful in achieving the initial aim of tracing the continuation of walls revealed by excavation. However the results do significantly augment previous knowledge of the development and layout of the settlement. The survey traced the course of a major enclosure ditch and detected probable remains of a hitherto unknown small square building lying to the south of the main villa complex. In addition the magnetometer located ditches to the east of the villa and an area of possible industrial activity south of the west wing of the villa. Resistivity contrasts between back-filled excavation trenches and undisturbed areas enabled the extent of former excavations to be mapped.

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## **BEADLAM ROMAN VILLA, NEAR HELMSLEY, NORTH YORKSHIRE.**

### **Report on Geophysical Survey, July 1992.**

#### **INTRODUCTION**

The Roman villa at Beadlam (SE 634 841) is located in the north-west of the Vale of Pickering at the foot of the southern edge of the North Yorkshire Moors.

The villa was initially identified as traces of earthworks in pasture by A. L. Pacitto in the 1960s. In 1966 farming activity threatened to level the earthworks, leading to a programme of rescue excavation by Pacitto and I Stead. Parts of the villa were excavated gradually up until 1978, but pressure from agricultural development continued to threaten the greater part of the site. Eventually the Department of Environment intervened to take the site into guardianship. More recently Pacitto has followed up his excavation with limited magnetometer survey, whilst the task of preparing the previous excavations for publication has fallen to the MAP Archaeological Consultancy of Malton. As a result of various questions arising during the latter post-excavation process, the Ancient Monuments Laboratory was commissioned in 1992 to carry out further geophysical survey at the monument. The initial aim of this was to address specific questions concerning the full extent of partially excavated wall alignments. However, a disappointing response to buried masonry led to these aims being adjusted to providing a more general survey of the villa structure and its immediate locality.

#### **METHOD**

A range of survey techniques, including magnetometry, magnetic susceptibility and resistivity was applied as appropriate to the nature of the site.

A grid of 30 x 30m squares was set up, consistent with a grid already in use at the time by Pacitto (see above). The survey location relative to the part of the villa preserved in situ is given on plans 1 and 2.

- i) Magnetometry : a Geoscan FM 36 fluxgate gradiometer was used, being carried zig-zag fashion along successive parallel 30m long traverses separated by intervals of 1.0m. Readings were recorded at intervals of 0.25m along each traverse. The resulting data is presented in the form of a grey-scale plot (plan 1).
- ii) Magnetic Susceptibility (MS) : a sample of topsoil was taken from the centre point of each grid square. The samples were subsequently dried and sieved in the laboratory and their MS values obtained using a Bartington MS1 meter and MS2B sensor, calibrated for a mass of 100g. The results are presented using scaled symbols illustrating the range of values obtained (plan 4).

- iii) Resistivity : readings were taken at 1.0m intervals along traverses spaced 1.0m apart, using a Geoscan RM15 integral resistivity meter and datalogger. The Twin Electrode array with a mobile probe spacing of 0.5m was employed. The resulting data is displayed in grey-scale format on plan 2.

## RESULTS

The alpha-numeric references quoted are a guide to locating the features referred to in the text on the grey-tone plots provided (Plans 1 and 2). Figures in bold text correspond to the portrayal of the geophysical survey evidence on the interpretation diagram (Plan 3).

### i) Magnetometry

**Walls** : The magnetometer survey was unhelpful in tracing the continuation of previously known walls beyond the limits of excavation (see **Introduction**). This was partly because magnetic disturbance around the former excavations made it difficult to isolate the subtle variations in magnetism associated with walls. (Greater success has been achieved over less disturbed Roman building remains at other sites.) Despite this limitation, the walls of an apsed building excavated in the east wing are recognisable as weak negative anomalies **3** in grid square D4.5 (see Plan 1), but there are few comparable responses from unexcavated areas. There is a suggestion, therefore, that outside the excavated areas, traces of walls might be less substantial or could have been robbed away.

**Ditches** : The value of the magnetometer survey was in its ability to detect former ditches associated with the villa complex.

Of particular interest is a series of linear anomalies of variable definition **4** running through squares A1-3, D3.5 and E2.5-3.5, which combine to give an impression of a sub-circular ditched enclosure. Excavation has shown that part of this arrangement (a substantial 4m wide ditch) underlies the north villa building. The resistivity survey provides complementary evidence for the extension of this on the north side of the villa, where it is only poorly defined by the magnetometer **5**; the circuit was not confirmed in the south-west by either technique, however. In the south it appears to be sub-divided by another linear feature **6** (discussed further under resistivity (4) below), although the survey does not reveal how the two relate to one another.

In the east of the survey area (grid squares B4, D3.5-4.5 and E3.5-4.5) is a pattern of smaller linear anomalies **7**, resembling the ditches of a field or drainage system. Several possible filled-in pits occur within this area (squares D3.5 and E3.5 represented by single isolated anomalies **8**).

**Occupation and industrial features** : Directly south of the partially excavated west wing of the villa (E2.5) are a group of strongly magnetic anomalies that may represent an area of industrial activity. Baked clay structures such as kilns and ovens

produce characteristic magnetic signatures. One such anomaly, perhaps a kiln, is indicated on the interpretation plan 9. Other anomalies in the group may also represent burnt features or, alternatively, buried pits containing burnt debris or occupation refuse.

## ii) Magnetic Susceptibility

The MS values complement the above results, showing high readings around the villa complex and low readings along the western edge of the survey. This indicates that it is unlikely that any substantial or sustained burning or occupation ever took place in the latter area and explains the failure of the magnetometer to respond to the hypothetical south-west part of enclosure circuit. An unexpected high reading in square A1 is probably the result of modern disturbance associated with a site-hut visible on old maps.

## iii) Resistivity

The resistivity data contains two distinctly different responses; firstly those derived from back-filled excavation trenches and secondly those resulting from probable archaeological sources.

The former excavation trenches have been mapped in sharp detail 10, agreeing well with the plans of the excavation supplied. This information should help to resolve any ambiguities about the number and location of the trenches, which may have arisen during the post-excavation stage. A discrepancy exists where two apparent trenches 11 have been located in square B4, which are not indicated on the plan. This would not be very significant, except for the fact that a strong linear anomaly was detected by the magnetometer survey here.

Anomalies interpreted as of archaeological origin are :

- 1) The possible enclosure ditch detected by the magnetometer (see above). The resistivity survey has located the northern part of the enclosure most clearly 5, in contrast to the magnetometer survey which responded better to the south and west segments.
- 2) A series of small peaks in the resistivity readings in grid square E3.5, may represent the buried foundations of a previously undiscovered small square building 12. A possible explanation for its outlying position could be that it is the site of a gatehouse or even part of a fourth wing around a courtyard plan (D. Sherlock pers. comm.). A similar isolated group of anomalies, occurs in square D3.5 and may also represent the fragmentary remains of wall footings 13.
- 3) An area of ill-defined higher resistance lying to the south-east of the east wing of the villa (square D/E4.5) 14, may contain buried masonry; crude stonework was observed protruding through the turf in this area.

- 4) Running obliquely across the boundary between squares C1 and B1 15 , there is a broad zone of slightly higher resistance values in the same alignment as the main excavated villa building. This may indicate the presence of a further range of buildings, perhaps linked to the putative fourth wing of the villa referred to above. Unfortunately, however, the evidence for this proposal is inconclusive. A ditch detected by the magnetometer survey also coincides roughly with this zone and may conceivably represent a feature such as a drain.

Apart from the aforementioned square building, the resistivity results have generally been unhelpful in completing the detailed picture of the unexcavated parts of the villa. No significant deviation in the readings is noticeable over areas expected to contain further building foundations. Conditions on the site were obviously not optimal for detecting buried stone structures, perhaps because of the wet weather prevailing prior to and during the survey acting in combination with poorly drained clay soils.

## CONCLUSIONS

Although the survey was unable to provide the missing details of the incompletely excavated buildings, it has provided a significant amount of new and unexpected information. In particular it has indicated the presence of a pre-villa phase of activity, represented by the sub-circular enclosure. In addition there is now also some evidence for outlying buildings and the continuation of other features to the east and south. The survey is notable too for having shown the value of resistivity as a tool for detecting back-filled excavation trenches.

Surveyed by: A Payne  
S Fear

Date: 7-10th July 1992

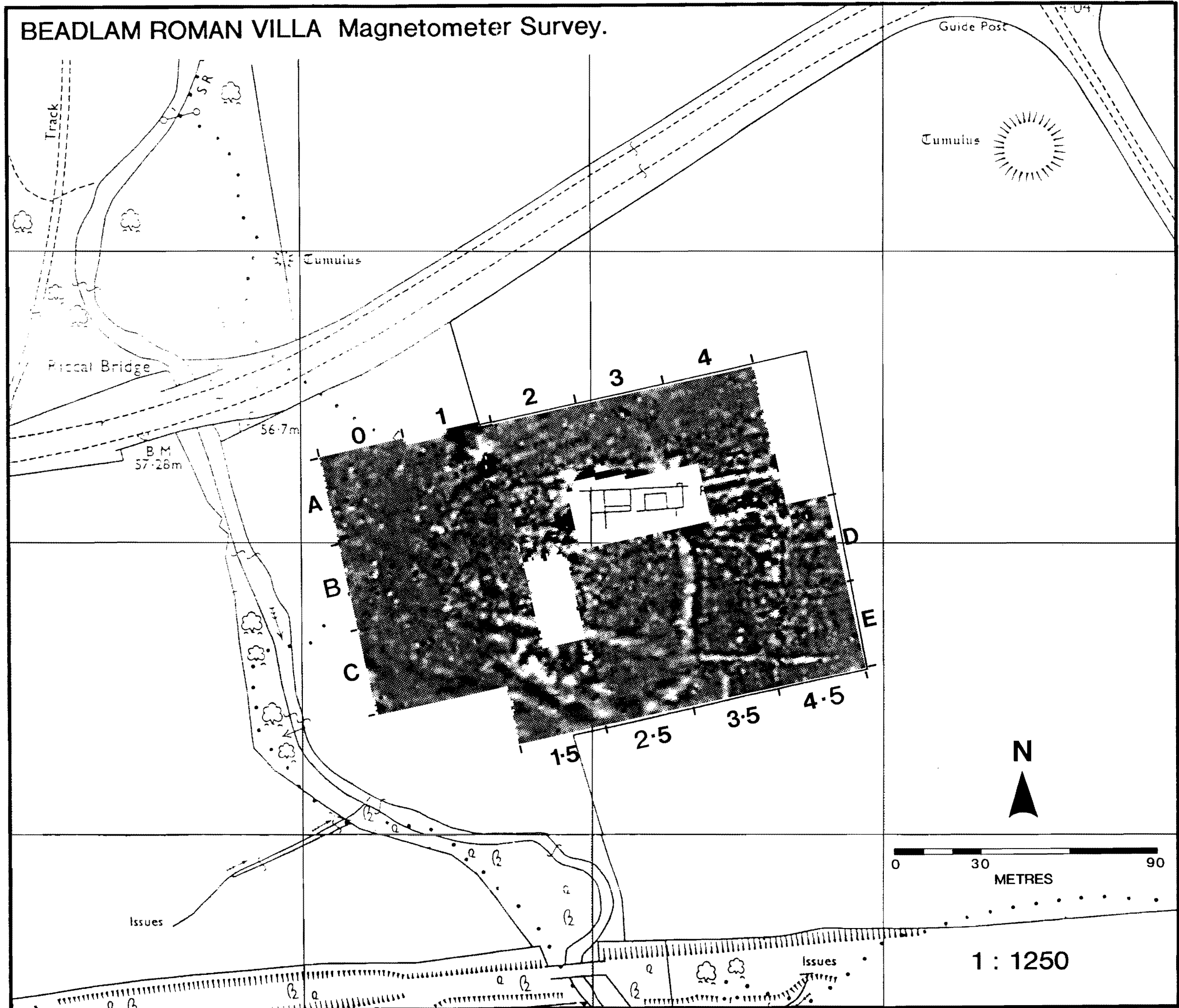
Reported by: A Payne  
with S. Fear

Date: 8th January 1993

Archaeometry Branch,  
Ancient Monuments Laboratory,  
Science and Conservation Services, TSG

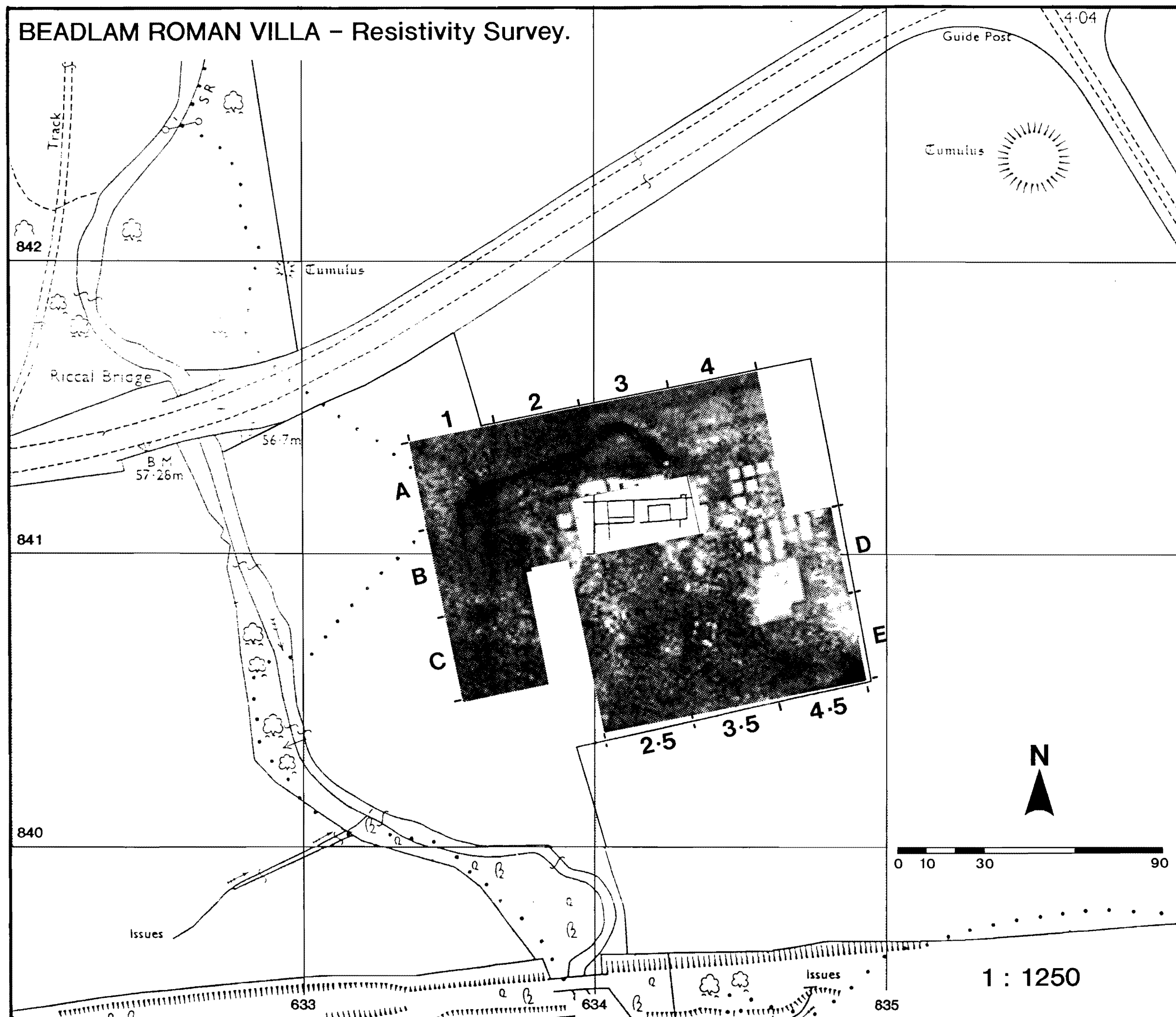
# PLAN

## 1.



# PLAN 2.

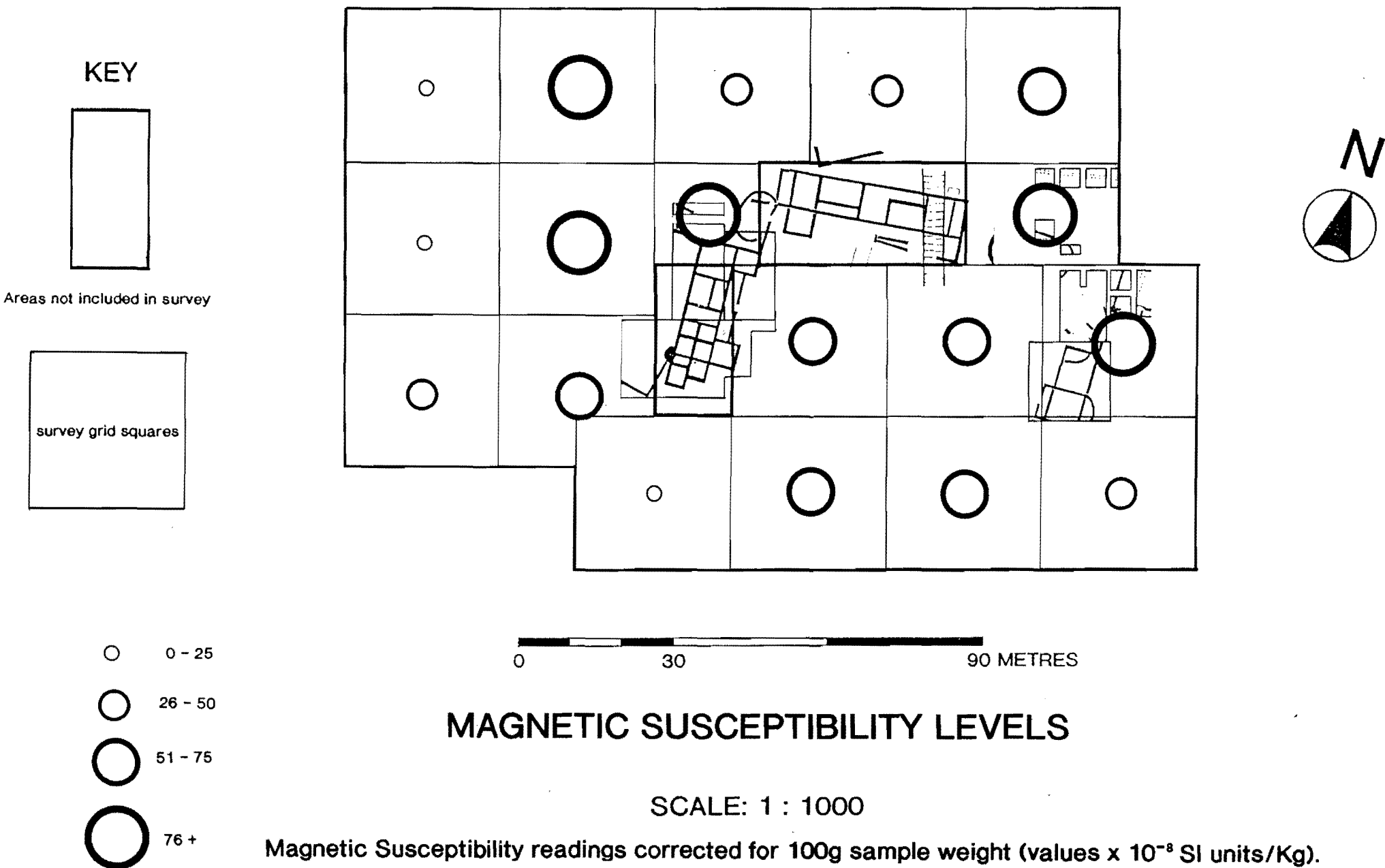
## BEADLAM ROMAN VILLA – Resistivity Survey.



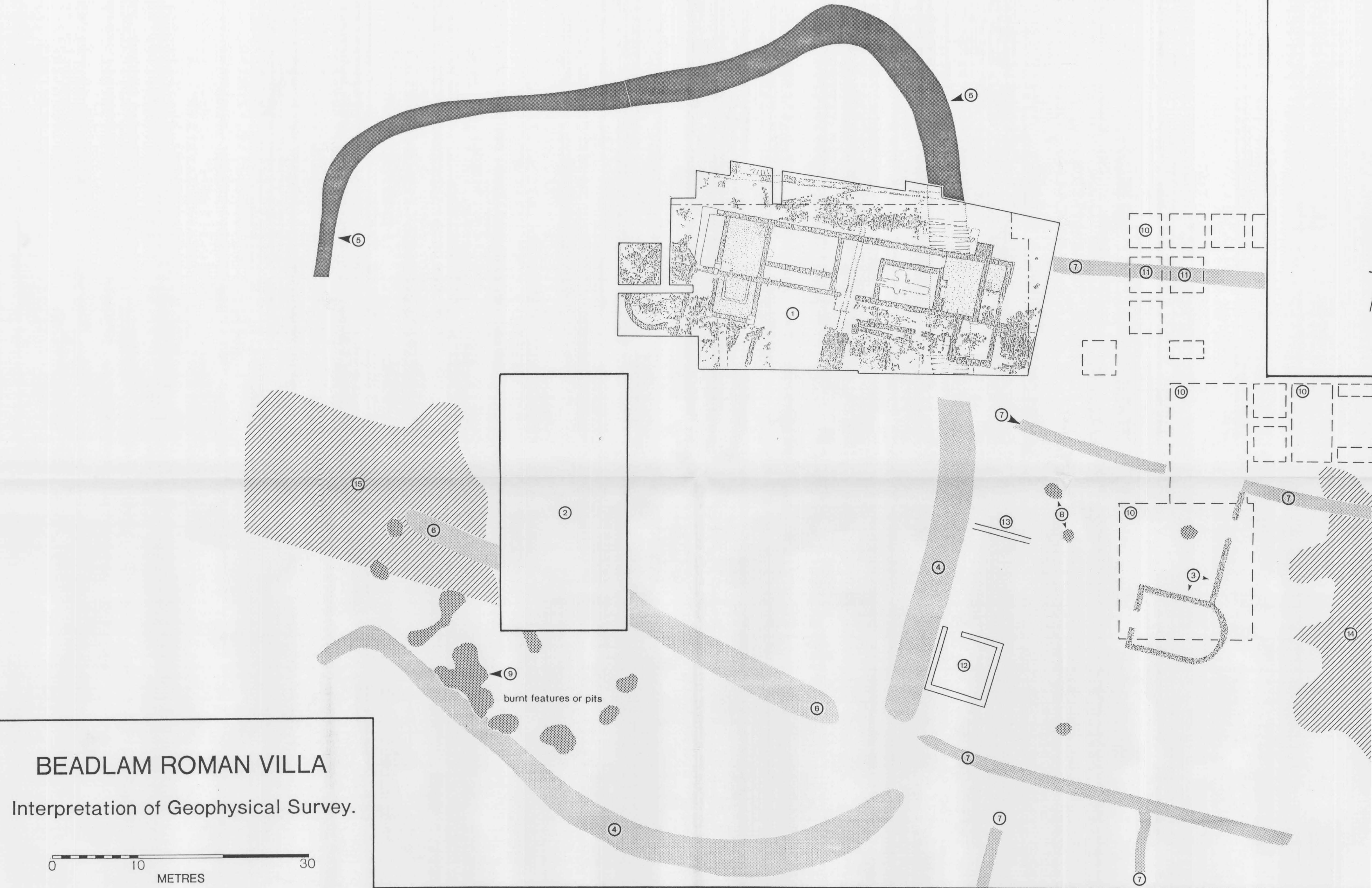


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PLAN 3.



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Interpretation of Geophysical Survey.

0 10 30  
METRES

1 : 250

① = North building as excavated – now preserved in situ for public presentation.

② = Area not surveyed due to surface obstruction.

--- = boundary of uncovered remains.

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