

Ancient Monuments Laboratory
Report 115/93

BOLSOVER CASTLE, BOLSOVER,
DERBYSHIRE, REPORT ON
GEOPHYSICAL SURVEY, 1993

P Linford

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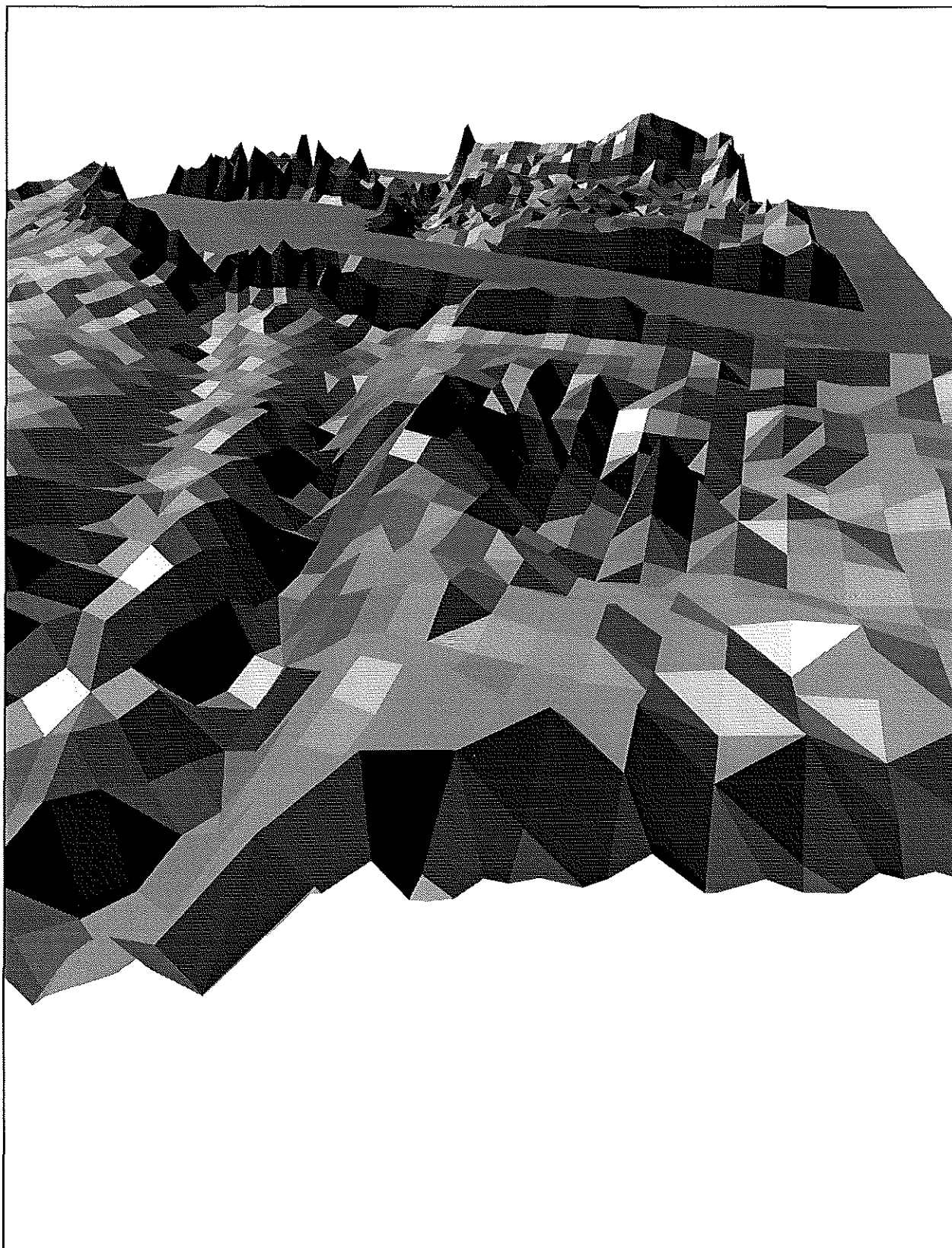
Summary

A geophysical survey was carried out in the walled garden at Bolsover Castle, with the hope of finding features related to a previous formal garden. Buried pipes were detected that were likely to have supplied water to the fountain at the centre of the garden, and to the adjacent Little Castle. In addition, a number of less distinct anomalies were identified that may represent the remains of the layout of a previous parterre.

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Three dimensional surface plot of resistivity survey, looking towards the Little Castle from the Well House.

BOLSOVER CASTLE, Bolsover, Derbyshire.

Report on geophysical survey, 1993

Introduction

This report describes the results of the geophysical survey carried out in the walled garden at Bolsover Castle. This garden, which adjoins the main dwelling area called the Little Castle, is presently laid out as two semicircular grass lawns, separated by a gravel path, and surrounding an ornamental fountain. Parch marks, visible in the grass during recent dry summers, attest to a previous, more formal, garden plan and the survey was requested to help elucidate its details by detecting any buried remains.

The castle (SK 470 707) is positioned on a promontory of Lower Magnesian Limestone, overlying Lower Permian Marl and overlooks the Derbyshire Middle Coal Measures to the west.

Method

The garden was surveyed using a series of parallel traverses, 0.5 metres apart and orientated approximately in the east-west direction. Each traverse was surveyed using a Geoscan RM15 resistance meter, connected in the twin electrode configuration, with a mobile electrode separation of 0.5 metres. Measurements were taken at 0.5 metre intervals along each traverse and the data was transferred to a portable microcomputer in the field.

Annex 1 depicts the untreated results of this resistivity survey in greyscale format, plotted at 1:200 scale and superimposed on the plan of the castle made in 1982 (drawing number S165/82). Annex 2 depicts the same results after processing with a gaussian high pass filter to remove regional trends more than 4.0 metres wide. Annex 3 depicts the survey after processing with a 0.75 metre Gaussian high pass filter, highlighting the narrow features detected by the survey. Note that in annexes 2 and 3 the geophysical plot has again been superimposed on the castle plan but some features of the latter have been removed to prevent them obscuring the resistivity results.

Results

The unprocessed survey (Annex 1)

On the unprocessed resistivity plot shown in annex 1, two anomalies may be related to surface features marked on the castle plan. The first is a missing reading, a white square corresponding to the stone marked on the plan in the northern half of the garden. The second is a dark circular patch, about 3 metres in diameter in the southern half of the garden that corresponds with the position of the yew tree marked on the plan. The low resistance anomaly is caused by the tree's root system concentrating soil moisture.

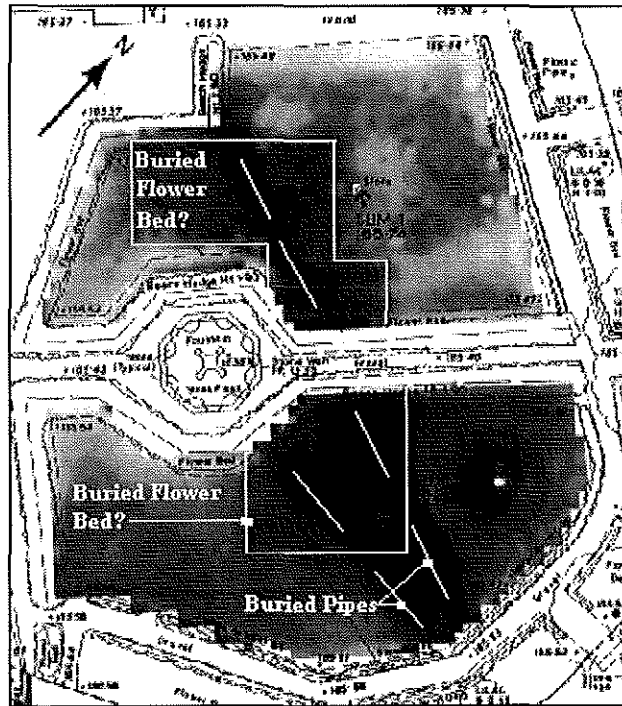


Figure 1; Detail of Annex 1 with significant anomalies marked.

Figure 1 shows a detail from annex 1 with the anomalies of interest indicated. Most readily apparent are two linear, low resistance (black) anomalies about 2 metres wide. These are marked with dashed lines in figure 1 and begin at the well house at the eastern corner of the plot. One runs towards the fountain, the other towards the eastern corner of the Little Castle. Given their alignment and width, they are almost certainly the original pipes supplying water to these structures. The extension of the low resistivity areas to either side of the line of each pipe, suggests that they may now be leaking water into the surrounding soil.

Also visible in annex 1 are three rectangular areas of low resistivity (dark grey); these are marked with a solid white line in figure 1. The anomalies may well represent the position of grassed-over flower beds, the less compact soil retaining proportionally more moisture than elsewhere.

The 4.0 metre high-pass filtered plot (Annex 2)

The survey data was enhanced using a Gaussian high-pass filter to remove broad trends and highlight anomalies less than 4.0 metres in width; the results of this process are depicted in annex 2, again superimposed on the castle plan. A number of anomalies are revealed that may potentially be the remains of a previous parterre garden layout. These have been indicated in the detail of annex 2 enclosed below as figure 2.

In this figure, a number of areas of high resistance are delineated by solid white lines. These anomalies could be caused by buried gravel or compacted soil and they surround the eastern sides of the rectangular, low resistance, anomalies conjectured above to be flower beds. The contrast in resistivity between these areas and their surroundings is relatively poor, hence the

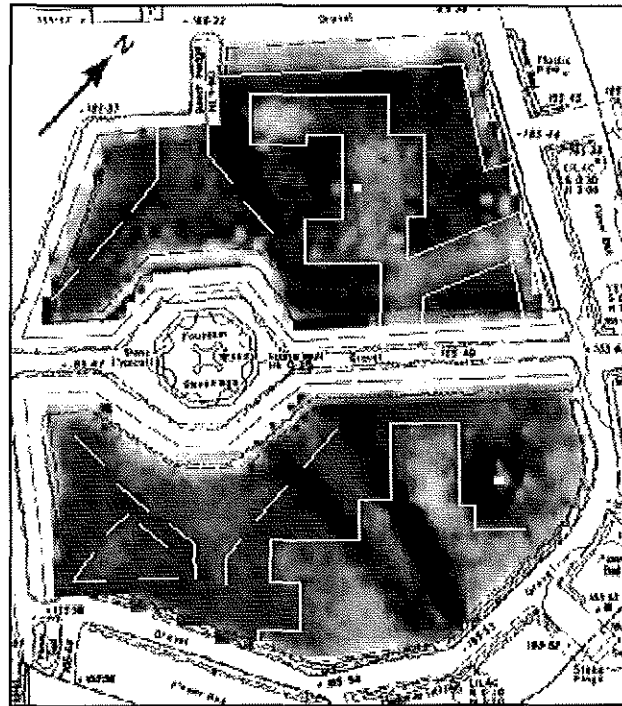
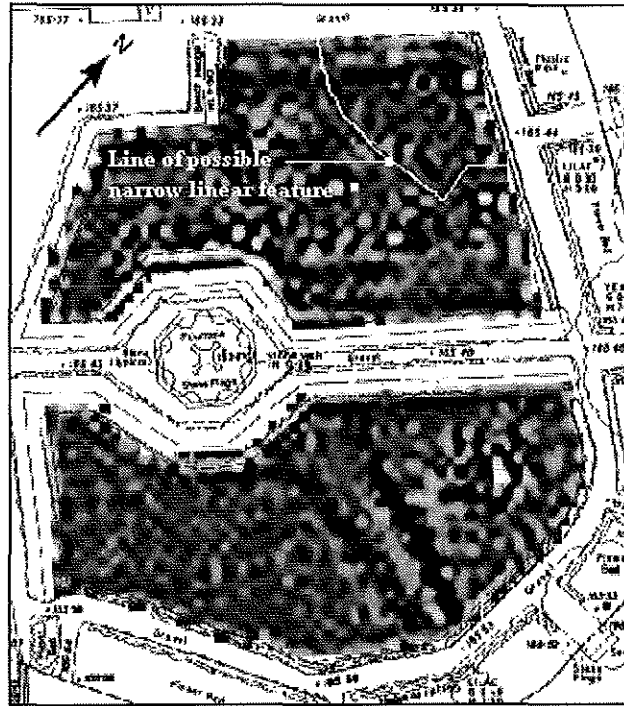


Figure 2; Detail of Annex 2 indicating significant anomalies.

precise outlines described by the white lines are somewhat speculative. Also marked in the figure, with dashed lines, is an indistinct, diamond shaped area, of very slightly raised resistivity. This area is centred on the fountain and may also represent the remains of a previous formal layout. A small triangular anomaly to the south of the fountain is possibly associated with this and is also indicated by dashed lines in figure 2.

The 0.75 metre high-pass filtered plot (Annex 3)

Processing the survey data to remove all but the narrowest features less than 0.75 metres in width, reveals one more linear anomaly of possible interest. It is situated at the northern corner of the survey area and is indicated in the detail of annex 3 depicted in figure 3. It consists of two parallel high resistance lines, about one metre apart, and describing a 90 degree arc with a dogleg at one end. Whilst this may well be a recently dug trench its alignment is rather curious. It is thus possible that it represents the edge of some previous formal garden feature.



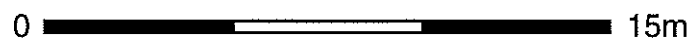
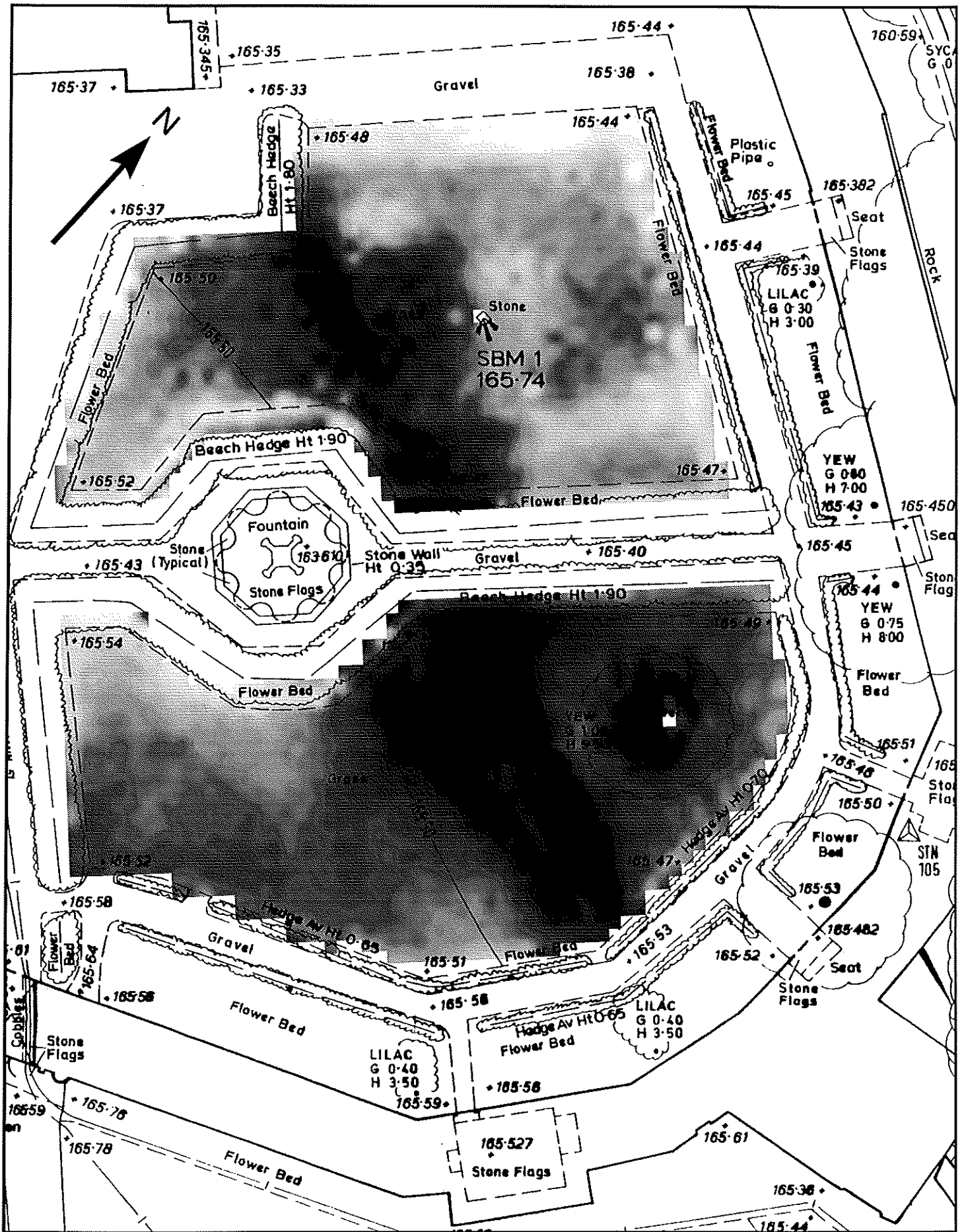
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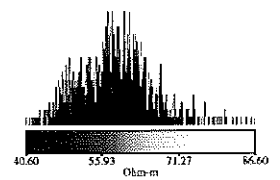
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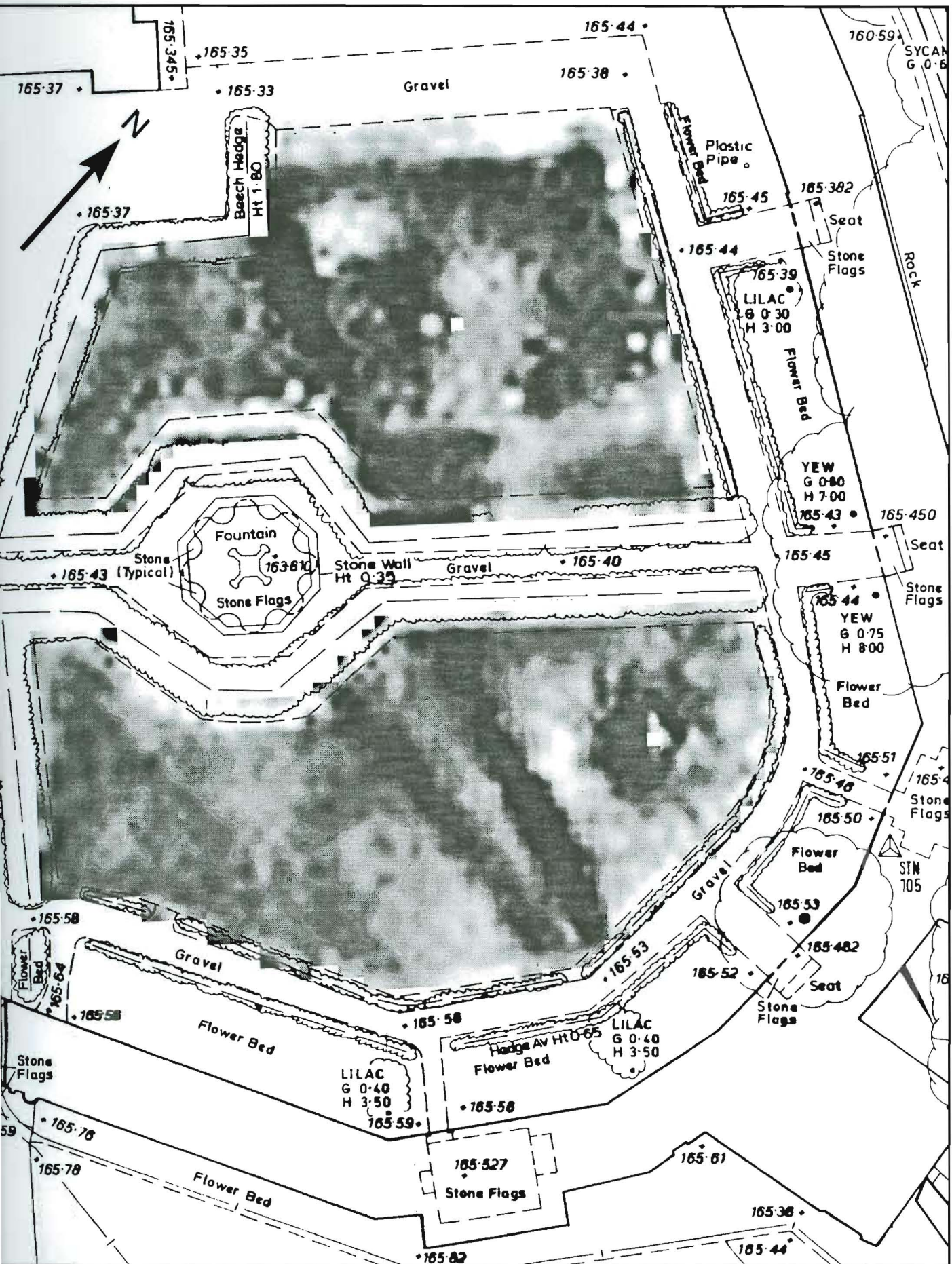
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Annex 1; Unprocessed resistivity survey superimposed on garden plan



Annex 2; Resistivity survey processed using 4m Gaussian high-pass filter

