



## SPOFFORTH CASTLE

### Geophysical survey

A geophysical survey of the field to the east of Spofforth Castle was undertaken by the Ancient Monuments Laboratory in 1973 at the request of the Inspectorate of Ancient Monuments.

#### Objective

To test the supposed presence of the buried remains of an outer wall and gatehouse, or an enclosing ditch, and to examine the remainder of the field for other evidence of occupation.

#### Survey method

Two methods were employed: a) resistivity and b) magnetometry, in the areas shown on Layout Plan A. Electrical resistivity prospecting detects regions of differing moisture content due to eg buried walls, of higher resistivity, or eg silted ditches whose fill presents a contrast in moisture retentiveness. The method is especially suited to the location of buildings. Magnetic prospecting detects local changes in the earth's magnetic field, due mainly to soil enhancement effects arising from occupational remains such as pits and ditches filled with organic refuse and/or the products of burning; fired clay structures (kilns, hearths etc) are, in general, also readily detectable, making the method more appropriate for the detection of general occupation.

(a) (i) A resistivity area survey was accordingly carried out across the trapezium of guardianship land to the east of the monument's boundary fence. Readings were taken at 1 m intervals on traverses 1 m apart (electrical trenching) using the Twin Electrode configuration. A Square Array table was used as the moving probe pair, taking readings with both the leading edge pair and a diagonal pair at each station, which afforded probe separations of 0.75 m and 1 m. (The depth to which anomalies can be detected is dependent on the probe spacing).

(a) (ii) In addition, long traverses with readings at 1 m intervals, were extended to the edges of the field using Wenner and Double Dipole configurations, 1 m probe separation, at each station. It was hoped that this would pick out areas of different or irregular response and find any in-filled enclosure ditch.

(b) A magnetic survey using a fluxgate gradiometer and the A M Lab automatic plotting system partly covered and extended the area of the resistivity survey.

#### Preparation of results

(a) Resistivity (i) The matrices of data from the area survey were computer plotted in dot density form, prepared as follows: unfiltered plots (no of dots  $\propto$  strength of reading) of 0.75 m spacing readings and 1 m spacing readings; filtered plots of the same data using a spatial numerical filter;

unfiltered plot of the matrix of ratios of the 0.75 m spacing reading to the 1 m spacing reading at each point.

(ii) The traverses were plotted as graphs of resistivity against distance along traverse.

(b) Magnetometry The traces from the automatic plotter were assembled as a montage of graphs for visual inspection. It was not felt that further treatment, by computer, would be of advantage.

### Conclusions

Despite the extensive data treatment no distinct feature is immediately discernible in the resistivity survey. However it is unlikely that features such as walls or ditches could readily be made out against the extremely high resistance and contorted geological background of the site. From the sandstone outcrop of which, and into which, the castle is built the land slopes down towards the eastern end of the field, and the concomitant increase in topsoil depth is reflected in the traverses as a general drop in resistivity in this direction. At the western end the area survey and traverses show irregular patterns of high resistance. From these results three situations appear possible: that the erosion or removal of buildings or walls which might have been built on shallow foundation has left too little impression to be detected by resistivity; that no features have existed; and that there are remains whose evidence is too heavily masked by the confusing background to be discernible by resistivity.

The third possibility is reinforced by several amorphous anomalies in the magnetic survey, whose positions are marked on Layout Plan A. Fortunately, the geology is not sufficiently magnetic to confuse the picture. It seems probable that these anomalies, characteristic of occupation, continue eastward beyond the survey.

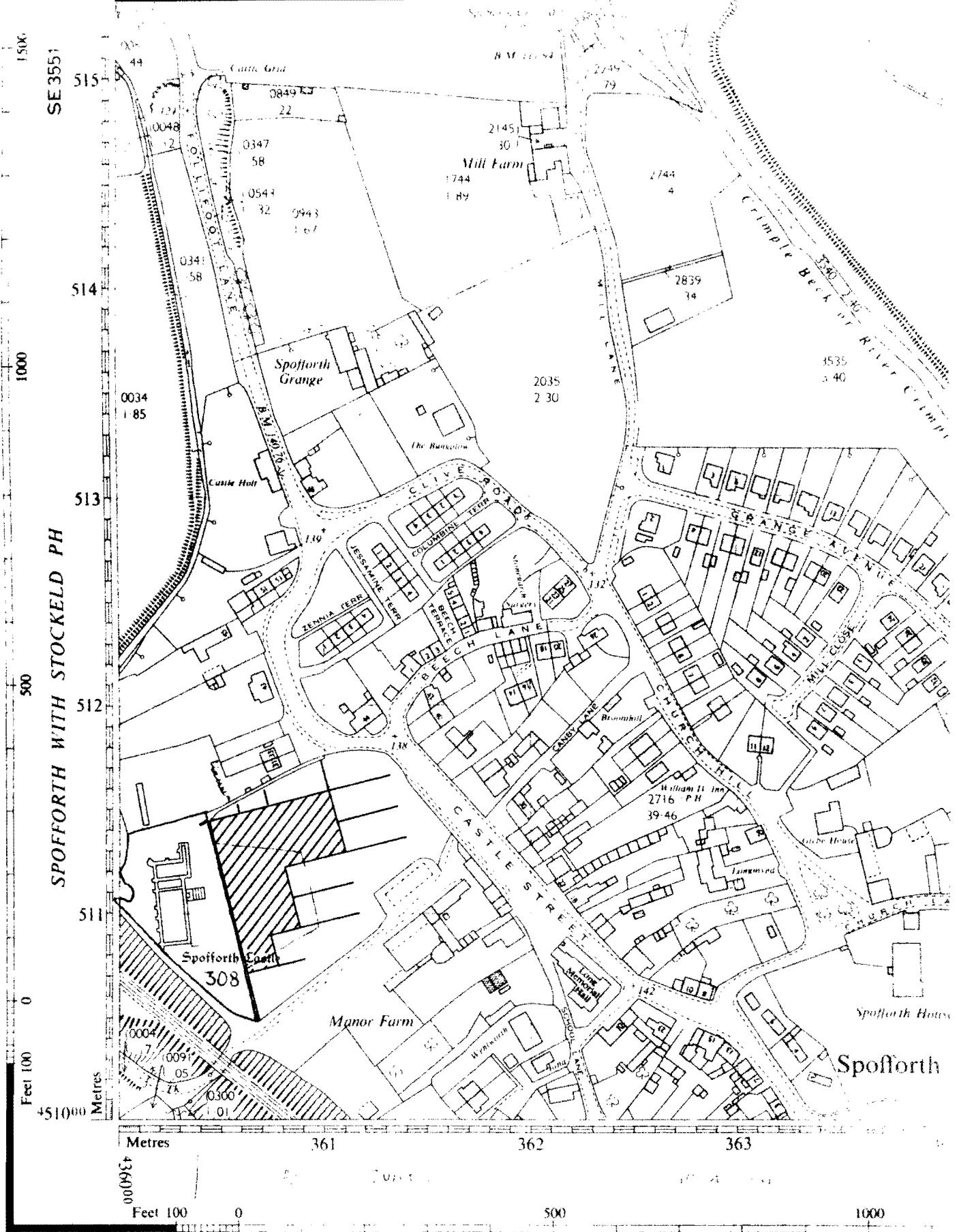
To sum up: while the resistivity survey shows no unambiguous evidence of archaeological remains in the field in question, the magnetic anomalies suggest this apparent lack of features may be due to indetectability. A total absence of archaeological features is not confirmed; and it seems advisable that a machine-cut trench be opened to put this to the test.

D HADDON-REECE

A BARTLETT

Ancient Monuments Laboratory,  
Department of the Environment

June 1975



Made and published by the Director General of the Ordnance Survey, Chessington, Surrey, 1965.  
 Reconstituted from former County Series plans and revised 1964. part of Plan SE 3651

# SPOFFORTH CASTLE

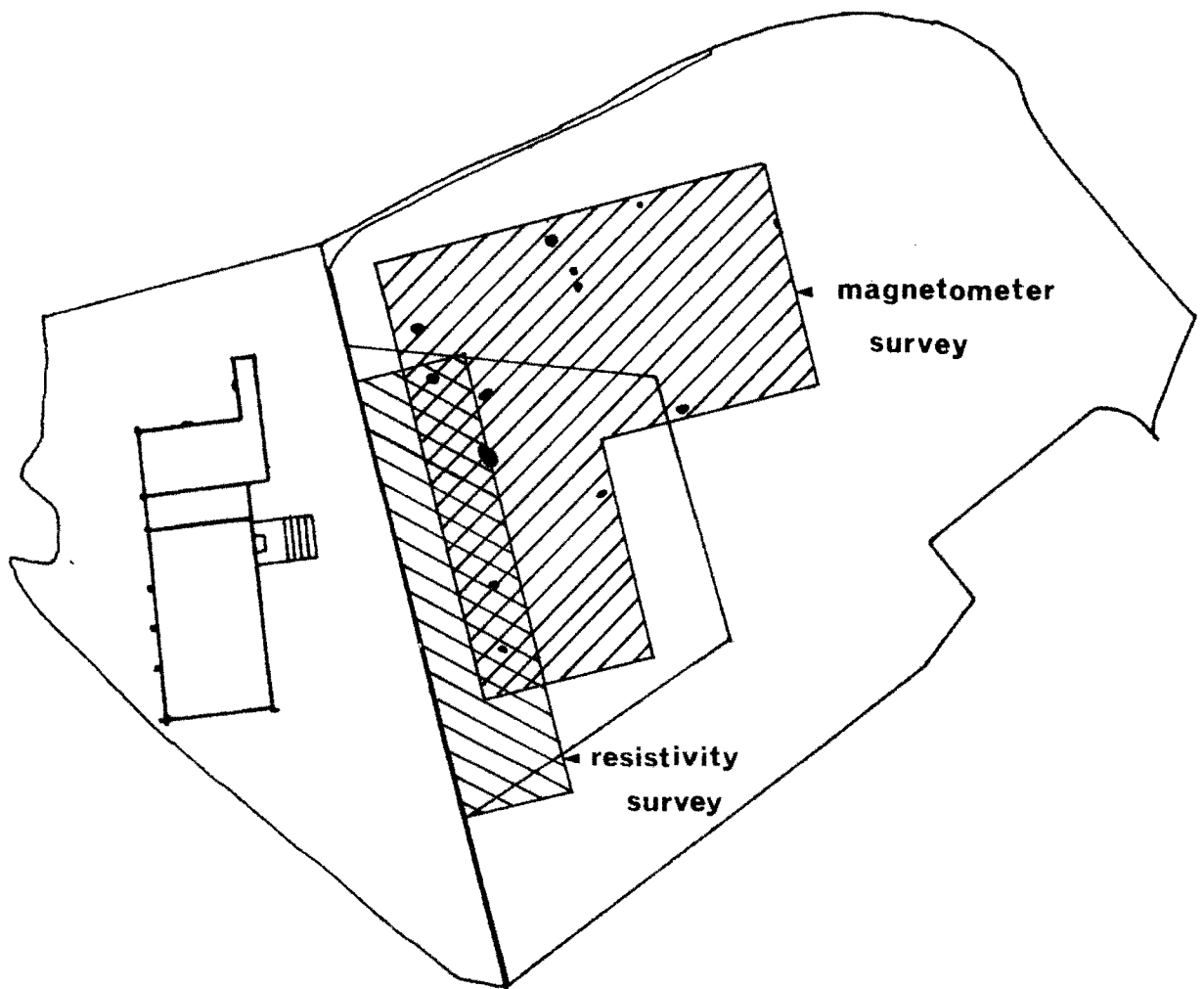
Scale 1:2500

© Crown Copyright and database right 2013. All rights reserved.  
 Ordnance Survey Licence number 100024900

# SPOFFORTH CASTLE

Geophysical survey layout A

Scale 1:1000 (enlarged from 25" map)



magnetic anomalies .....●

# SPOFFORTH CASTLE

## Geophysical survey layout B

