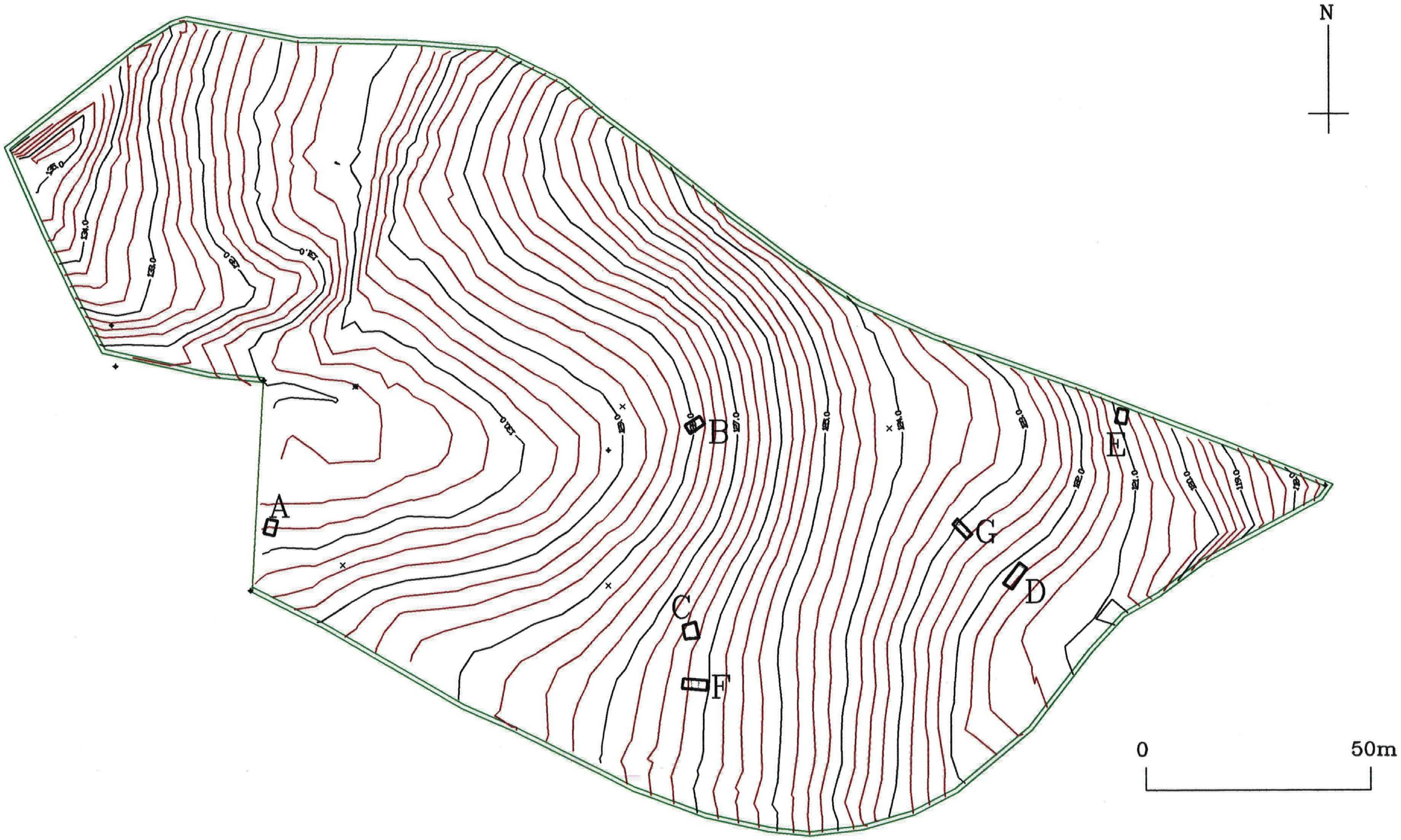


Fig.3 Contour plot of the site at Kirkby Malzeard showing the location of the trial trenches .

were divided by a small earthwork bank about 0 5m in height and 2m in width On the western side of this group lay a large hollow which measured about 40m in diameter and between 1 5m and Im in depth (Fig 2, J) To the north of this was a slight bank running north-south with a width of about 5m and a height of no more than 0 5m

The earthworks described above (H-K) bound an area of relatively flat ground

3 2 5 A further rise in the ground was observed along the south edge of the she (Fig 2, L) although it is thought that this is probably natural in origin as its orientation and form reflect those observed in the previously mentioned ridge, M

4. Fluxgate gradiometer survey

4.1 Fluxgate gradiometry: technical information and methodology
4 1 1 In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches, and the magnetic susceptibility of the geology into which these features have been cut, which causes the most recognisable responses Other features, such as kilns and ovens, can be more difficuh to identify, although their responses are generally stronger than soil filled features The highest responses are usually due to iron objects and these produce a characteristic response with a rapid change from positive to negative readings (iron "spikes")

4 1 2 There are a number of methods employing the fluxgate gradiometer The most basic of which is referred to as scanning and requires the operator to identify the responses whilst covering the site in widely spaced traverses This method is used as a means of selecting areas for detailed survey when only a sample area is required or to map out the full extent of features located during a sample detailed survey This method was employed to determine the initial area for detail survey

4 1 3 Detailed gradiometer survey employs the use of an ST1 Geoscan sample trigger and FM36 fluxgate gradiometer to take readings at 0 5m intervals on zig-zag traverses 1m apart within grids measuring 20m by 20m This means that 800 readings are taken within each 20m grid square In house software (Geocon Version 8) was used to interpolate the "missing" line of data so that 1600 readings in total were obtained for each complete grid This method was employed during the survey, the traverses being on a north-south to east-west alignment

4.2 Results of the gradiometer scanning
Preliminary scanning enabled positioning of the initial survey area A number of features were immediately distinguishable prior to detail survey, including the service pipe within the western region of the site

4.3 Results of the gradiometer survey
The data is presented as a 1 1250 grey scale plot in Figure 4 An interpretation diagram is included as Figure 5 Grey scale and X-Y trace plots of the data are shown at a scale of 1 500 as an appendix to the main report The X-Y trace plot is presented as it enables responses due to ferrous material in the topsoil ("spikes") to be differentiated from potential archaeological responses such as those caused by hearths or kilns

Fig. 4 The Earthwork Survey showing the gradiometer data

4 3 1 The types of response generally detected on a site can be divided into five main categories which are described below

a. Iron Spikes (Dipolar Anomalies)
These responses are sometimes referred to as dipolar, and are generally caused by buried iron objects Little emphasis can be given to such responses as iron objects are normally recent in origin on agricultural sites

b. Rapid, strong variations in magnetic response
Also referred to as areas of magnetic disturbance these can be due to a number of different features They are usually associated with burnt material such as industrial waste or other strongly magnetic material It is not always easy to determine their date of origin without supporting information

c. Positive linear responses
These generally vary between 1 5nT and 30nT dependent on the underlying geology and are commonly caused by ancient ditches or more recent drains

d. Isolated positive responses
These exhibit a magnitude of between 2nT and 300nT and, dependent on the strength of response, can be due to pits, hearths, ovens or kilns if archaeological in origin It is very difficult in the former case to be certain of their archaeological nature without some more intrusive means of examining the features

e. Negative linear anomalies
These are normally very faint and are commonly caused by features such as plastic water pipes which are much less magnetic than the surrounding soils and geology

4 3 2 A limited number of isolated dipolar anomalies/iron spikes typical of modern ferrous debris were located A number of these have been identified on the interpretation diagram (Fig 5)

4 3 3 Strong variations can be seen along the northeast and southeast edges of the survey and are caused by the presence of wire fences at these locations

4 3 4 Intermittent positive linear anomalies lie on an east/west orientation and extend across the whole of the site The separation (5-8m) combined with the magnitude of response (<2nT) of these anomalies is typical of ridge and furrow

4 3 5 It is mainly the positive linear anomalies that are most likely to be archaeological in origin The most striking of these is a strong positive L-shaped linear anomaly (>3nT) in the eastern part of the survey area (Fig 5, A) The anomaly is still identifiable within the strong negative responses from the fence at the edge of the survey area

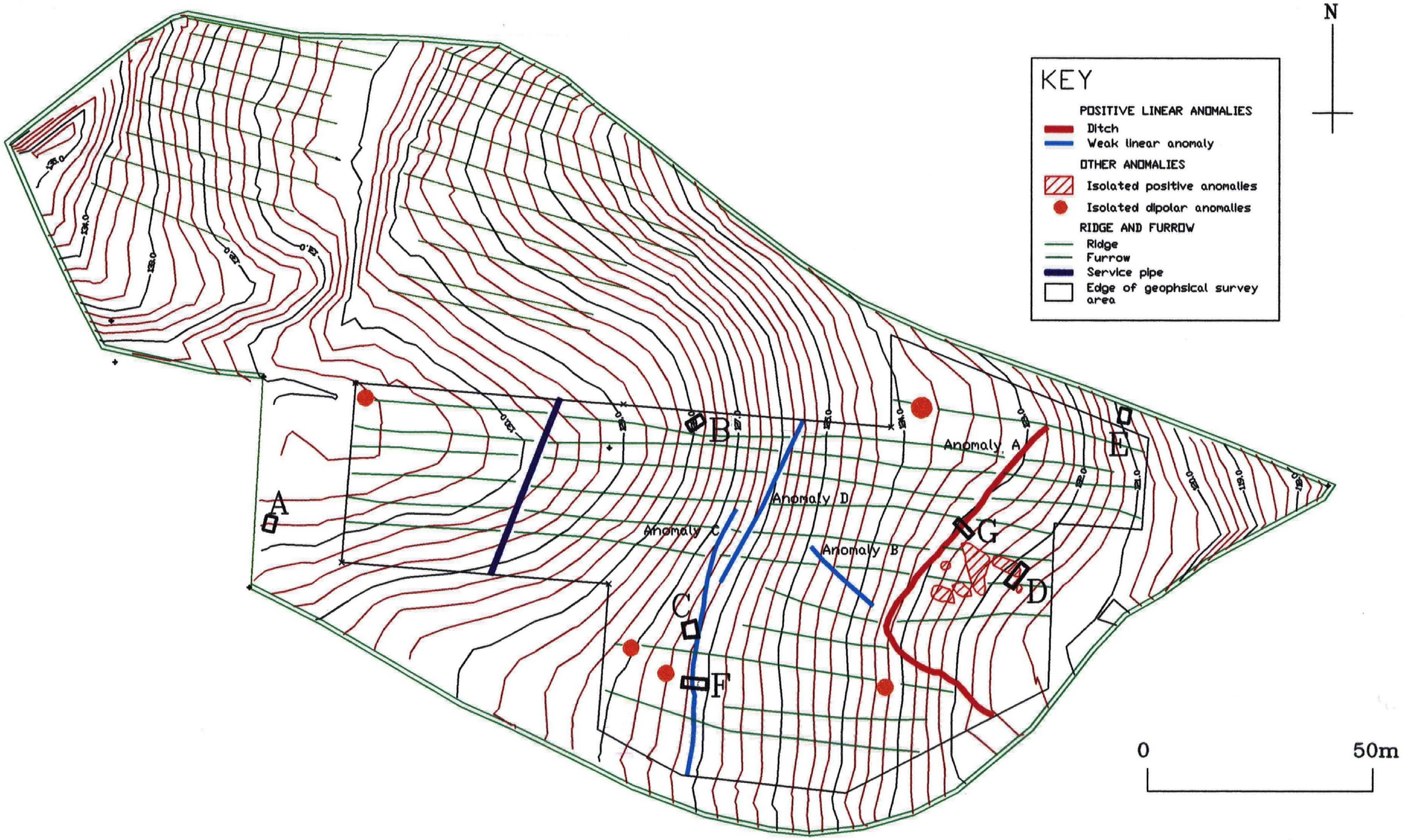


Fig.5 Interpretation of the gradiometer results overlaid on the contour plot of the site and showing the location of trenches .

A weaker (<2nT) linear anomaly (Fig. 5; B) continues the line of the southern stretch of the L-shaped linear anomaly. The northwest end of this weaker anomaly fades out before reaching Anomaly D.

4.3.6 A further weak linear anomaly (Fig. 5, C) crosses the site from south to north perpendicular to the ridge and furrow. The area of response is less distinct to the north although it appears to end in line with the projection of Anomaly B and may therefore be part of the same system of ditches.

4.3.7 Anomaly D comprises a broad band of positive response and could be due to a greater thickness of buried soil at the base of the slope formed by ridge M (Fig. 2).

4.3.8 An area of magnetic enhancement was located within the area defined by Anomaly A. The magnitude of its response does not exceed +2nT. The range of enhancement in this locality could suggest redeposition of magnetically enhanced materials, i.e. burnt deposits subsequently dispersed by erosion although burning in situ should not be discounted.

4.3.9 At the north-western end of the site a northwest/southeast running, negative linear anomaly (< -80nT) was located. The magnitude of response suggests a service pipe associated with a house just beyond the northern perimeter of the survey area.

5. The trial trenches

5.1 Method

5.1.1 Seven trial trenches were excavated following the geophysical survey. These were located to both investigate geophysical anomalies and to determine whether any features existed which had not been detected by geophysical survey (particularly in areas where access to the site might be located).

5.1.2 The dimensions of the trial trenches averaged about 2m by 3m in plan and up to 1.2m in depth. Variations to this were in Trench D where the length of the trench was 5.6m and Trench F where the trench was 1.6m wide.

5.1.3 All trenches were excavated to the top of subsoil or the first recognisable archaeological horizon and cleaned and planned. Features were then excavated by hand and recorded in both section and plan. A section from each trench was recorded regardless of the presence or absence of archaeology in the trench. Written drawn and photographic records were made for any archaeological deposits.

Trench F was tackled in a slightly different manner to the above as a section was cut through the feature using a machine. This rapidly enabled the depth and possible nature of the feature to be determined.

5.1.4 Soil samples were taken for environmental analysis from the lower fills of ditches. Samples were also collected for magnetic susceptibility analysis. In the case of the possible burnt feature in Trench D the latter were collected on a grid at 0.4m intervals with the aim of determining whether the feature represented one or more phases of burning.

5.1.5 Environmental samples were processed by wash over through a 300micron sieve with the residue collected in a 500micron sieve. These were subsequently sorted for environmental remains.

5.1.6 Magnetic susceptibility samples were dried at room temperature and then crushed in a mortar and pestle and weighed. The weighed samples were then measured using a Bartington MS2 susceptibility bridge and meter.

5.2 Results

5.2.1 The trenches

Trench A *(3m by 2m)*
This trench was located outside of the area of geophysical survey on the line of one of the possible choices for an entrance to the proposed development and was oriented north-south.. It was machine excavated to a depth of approximately 0.32m, 0.1m into the boulder clay that forms the natural in this area. There were no archaeological features visible in either the base or sides of the trench. Its east facing section was recorded (Fig. 6).

Trench B *(3.4m by 2m)*
This trench was machine excavated to a depth of approximately 0.9m and was positioned to see whether the feature causing Anomaly B continued in its direction. The soil horizons exposed comprised approximately 0.16m of topsoil, 0.2m of sandy clay subsoil and 0.5m of naturally deposited sand with clay lenses. The ditch that may have extended through this area was not detected and no other archaeological features were identified. The trench was oriented east-west and the north facing section was recorded. (Fig. 6).

Trench C *(3m by 3m)*
This trench was located to evaluate the features causing anomalies C and D in plan. It was machine excavated to a depth of approximately 0.47m where archaeology appeared. Two ditches were tentatively identified in plan. Ditch 300 was oriented north/south and ran along the eastern edge of the trench. Ditch 301 was oriented southwest/northeast and ran along the southern edge of the trench. Ditch 300 appeared in plan to cut 301 but the only evidence for this was the lack of large stones in 301 (this is not conclusive and further excavation would be necessary to define the relationship). There was no relationship visible in any of the sections. The west facing section was recorded (Fig. 7) and the contexts recorded were:

300 *Dark greyish brown sandy clay with frequent small and medium stones and moderate large stones*

301 *Dark greyish brown sandy clay with frequent small and medium stones and occasional large stones.*

Trench D *(5.64m by 2.1m)*
This trench was located to evaluate an isolated burnt feature or pit identified in the geophysical survey results. It was machine excavated to a depth of 0.72m initially. At this point the archaeology appeared in plan as an irregular red deposit context 401 within cut 400. It later transpired that the cut is not really an excavated feature but purely the edge of soil discoloured

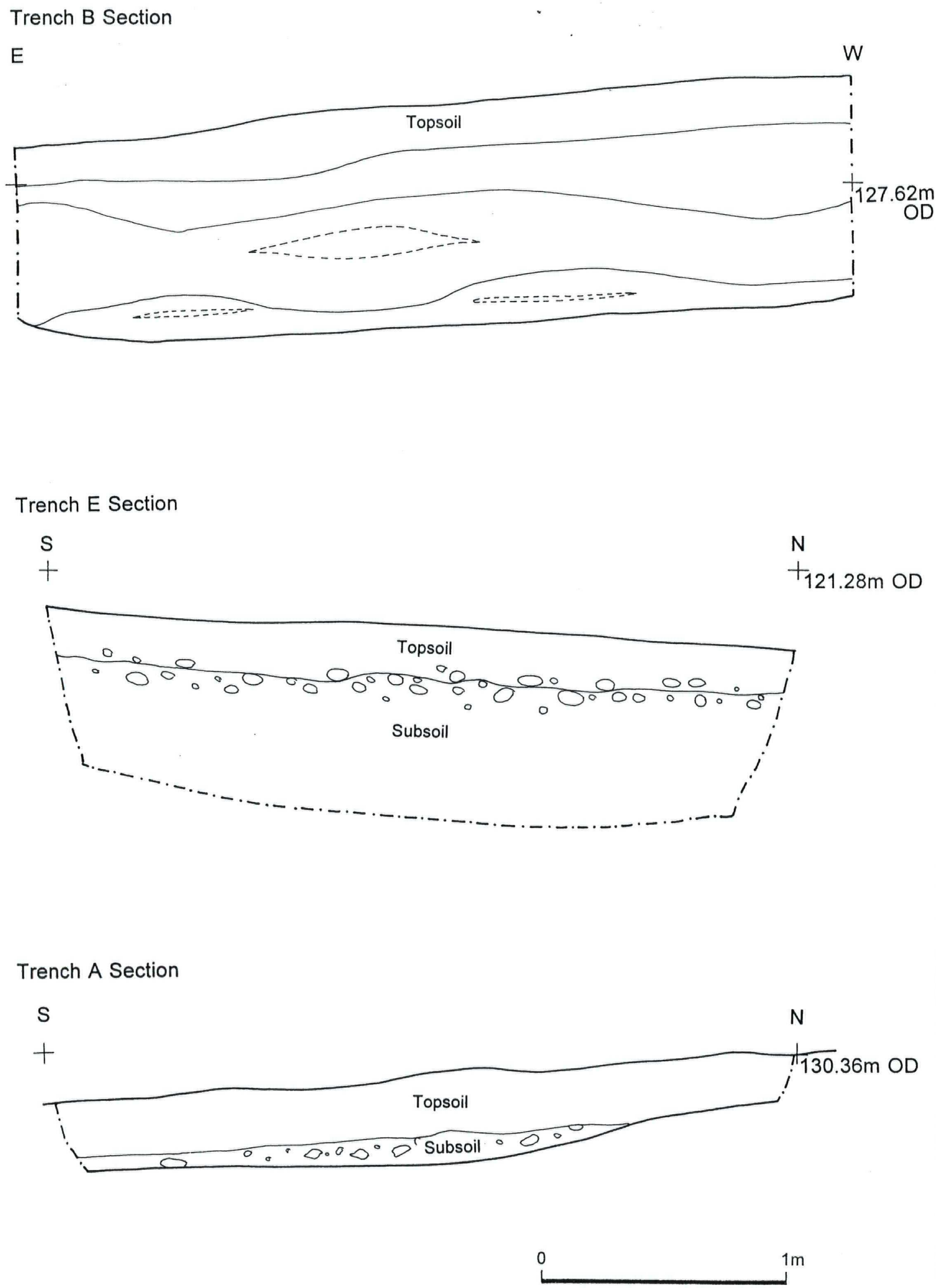
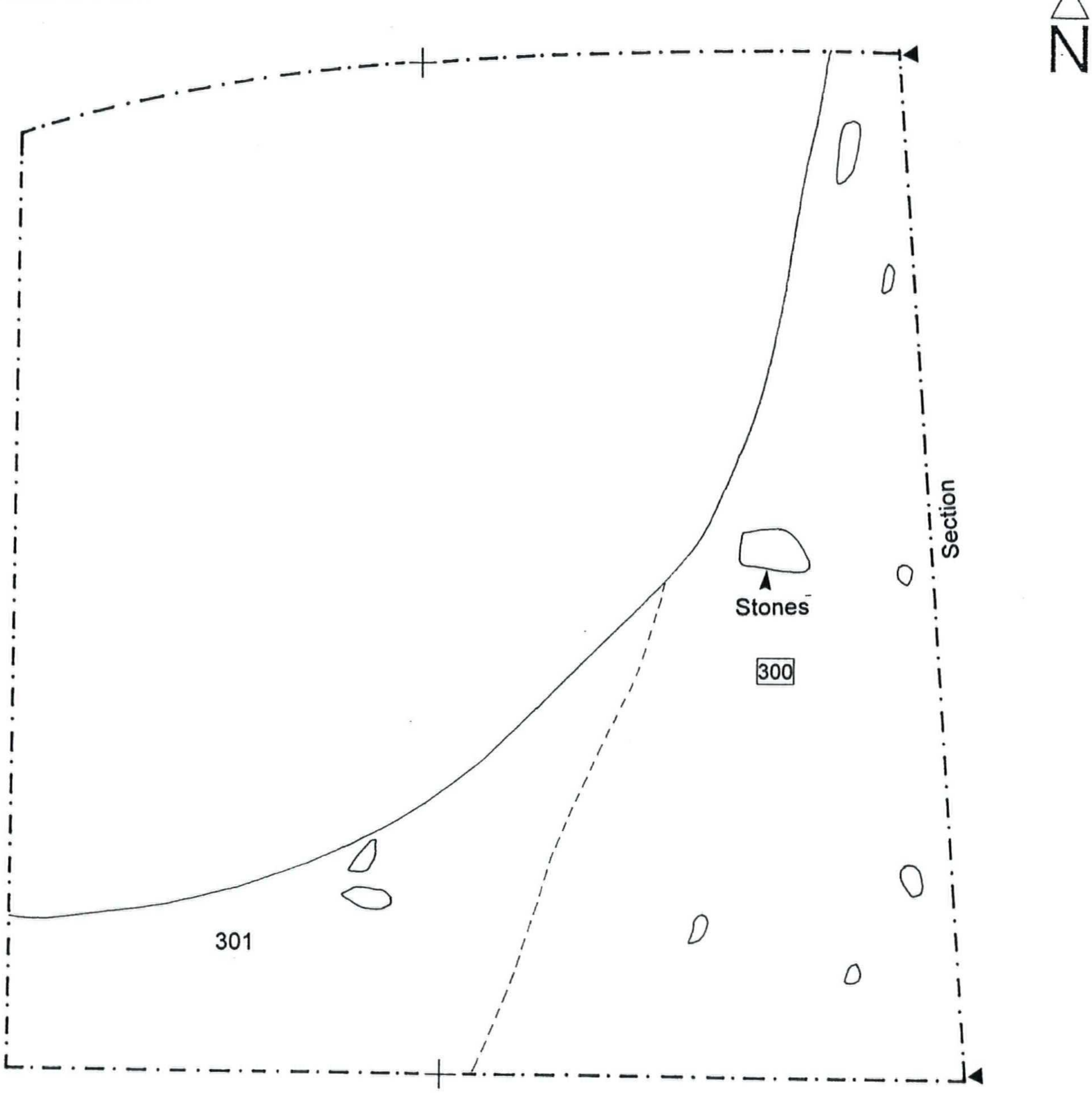


Fig. 6 Sections through Trenches A, B & E

Trench C Plan



Trench C Section

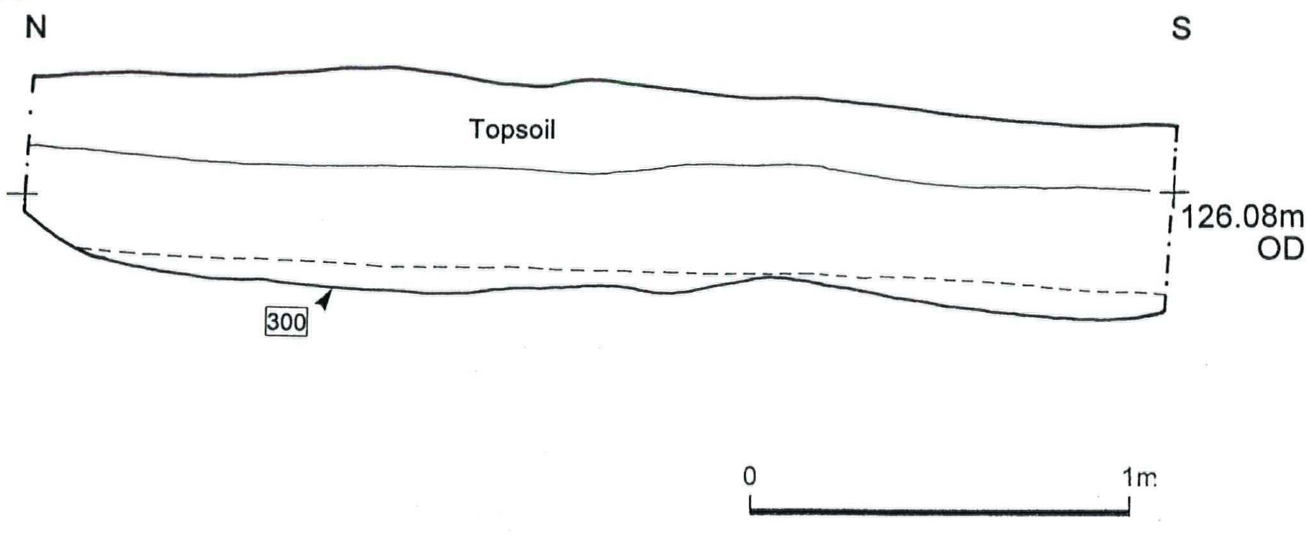


Fig. 7 Plan and Section of Trench C

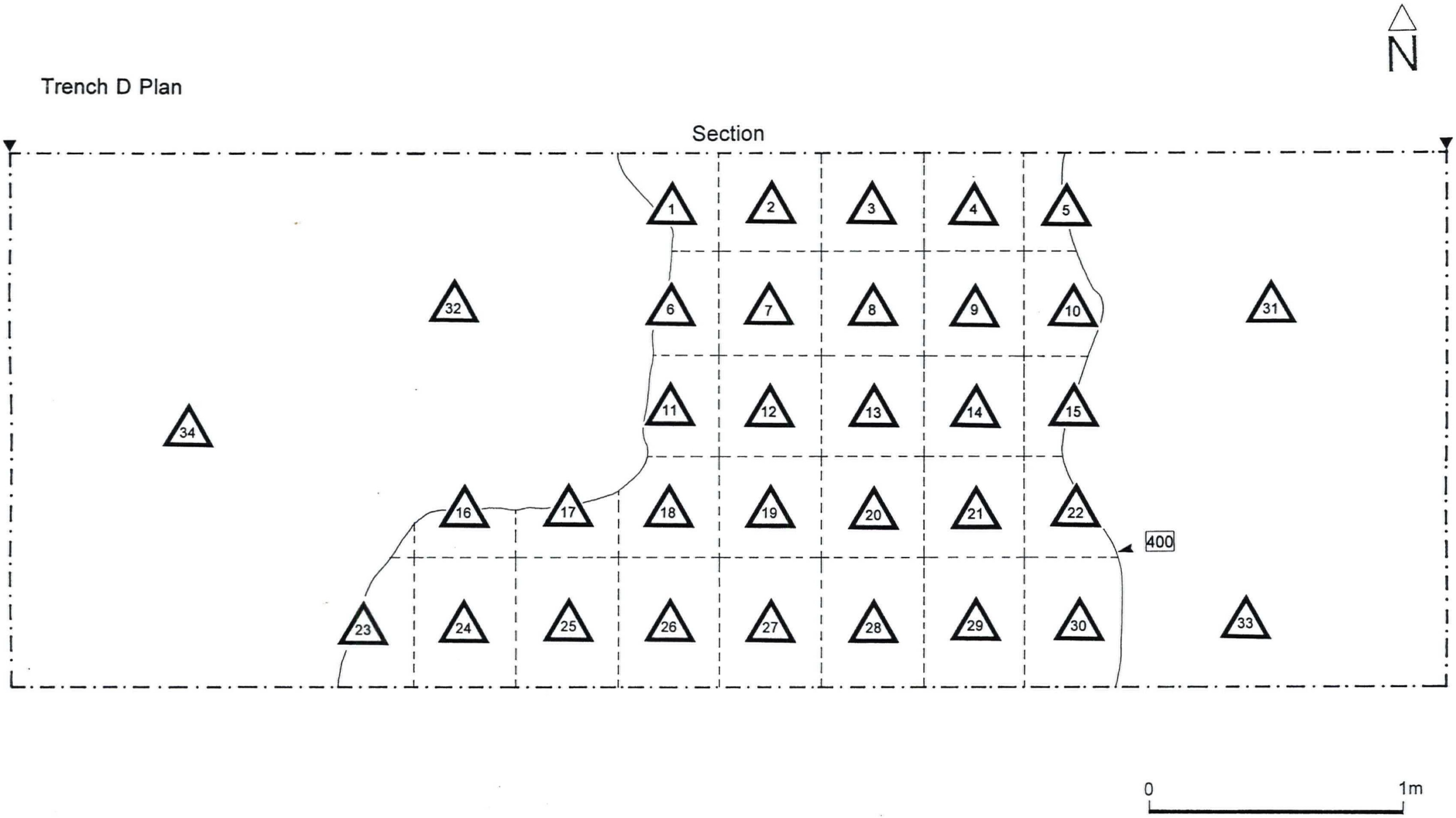


Fig. 8 Plan of F 400 showing location of magnetic susceptibility samples

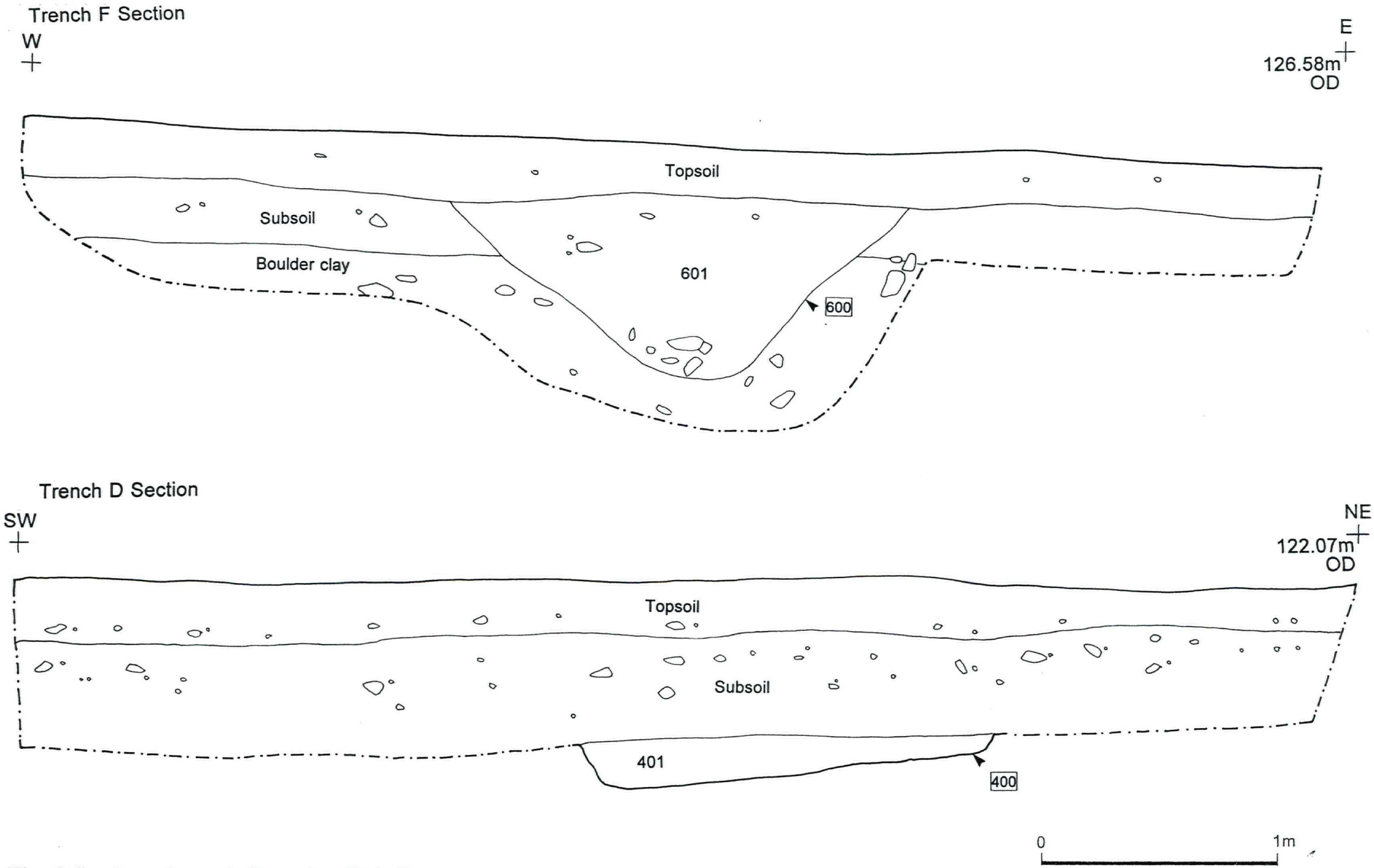


Fig. 9 Sections through Trenches D & F

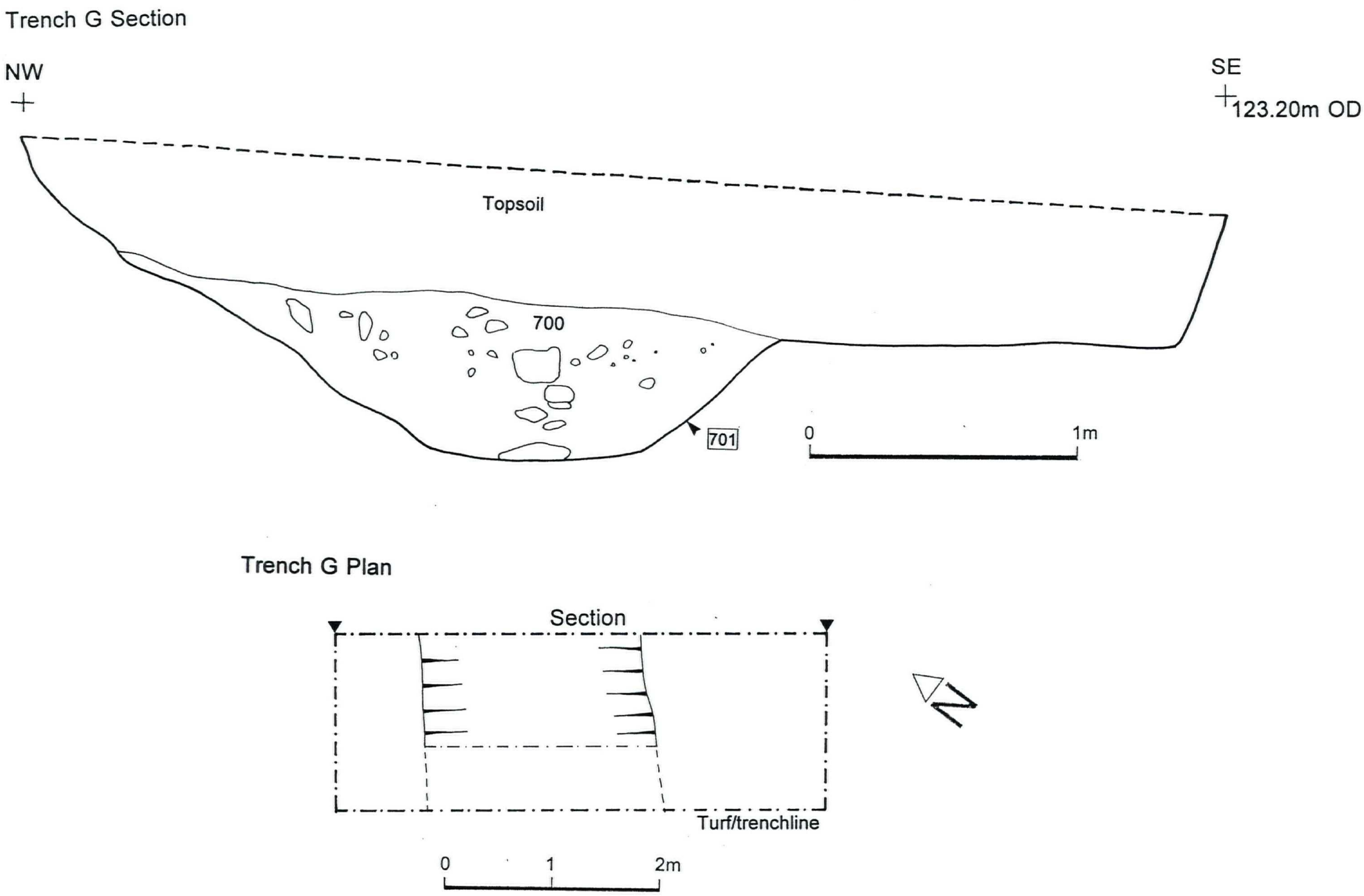


Fig. 10 Plan and Section of Ditch 701 in Trench G