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LINDSEY ARCHAEOLOGICAL SERVICES

LAND AT GREETWELL, LINCOLN
PROPOSAL FOR QUARRY EXTENSION

NGR : TF 007 724
Site Code : GWQ 97
LCNCC Accession No. 226.97

EVALUATION TRENCHING

for

Oxford Archaeological Associates Ltd

on behalf of

Butterley Aggregates Ltd

Report No. 277
January 1998

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Land at Greetwell, Lincoln
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Summary

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The trenching demonstrated the presence of a triple ditch system, dated to the Middle and Later Iron Age. An additional linear feature of Later Iron Age/early Roman date was also recorded.

Substantial remains from the Roman period were also present, predominantly in the north-west of the site. These included the remains of buildings, a pit complex related to industrial activity, and a ring ditch, possibly the remains of a burial mound, all datable to the 3rd century AD.

Post-Roman features on the site were confined to the remains of medieval/post-medieval ridge and furrow agriculture.

Introduction

Lindsey Archaeological Services was commissioned by Oxford Archaeological Associates, on behalf of Butterley Aggregates Limited, to undertake evaluation trenching at the above site. The scope of the work complies with the guidance from *Archaeology and Planning* (PPG 16), Department of the Environment (1990); *Management of Archaeological Projects,* English Heritage (1991); *Standard and Guidance for Archaeological Desk-Based Studies, Standard and Guidance for Archaeological Field Evaluations,* Institute for Field Archaeologists (1993, revised 1994).

The purpose of the evaluation was to :

- establish the presence or absence of archaeological remains and their location within the proposed development area.

- gather data to assist in the determination of the level of further archaeological investigation required prior to development.

Site Location

The development area lies close to the eastern outskirts of Lincoln, some 3km east of Lincoln cathedral. It is situated on the south-east slope of the Jurassic Limestone scarp known as the Lincoln Edge (c.35m AOD) on the northern side of the Witham Valley, immediately adjacent to the existing Butterley Aggregates Limited limestone quarry (Fig. 1).

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Planning Background
A desk top study was carried out in 1994 (Johnson 1994) to assess the archaeological potential of the site prior to submission of a planning application for the extension of an existing limestone quarry by Butterley Aggregates Limited. A non-intrusive evaluation, comprising geophysical (Johnson 1997) and fieldwalking surveys (Armour-Chelu 1997) formed the next part of a staged archaeological evaluation for planning purposes.

Archaeological Background
Previous work in the surrounding area has identified archaeological remains of prehistoric, Roman and medieval date. This includes a triple parallel linear feature recorded from the air as cropmarks within the western half of the survey area which appears to be part of a major linear trackway or boundary observed at several points north and south of the site, extending north and north-west for a distance of at least 5 km. Staff now working at LAS have excavated two narrow cross-sections of the ditches in 1979 and 1993. Whilst they appear to pre-date Roman features, little clear evidence of their function and date has been obtained thus far.

Several additional factors highlight the potential archaeological importance of the Greetwell area; its proximity to the Roman town/legionary fortress and thriving medieval city of Lincoln; its geology, providing accessible sources of both limestone and ironstone and its topographic location overlooking a significant crossing point of the River Witham immediately downstream from Lincoln. It has been suggested that the original crossing point of the Witham in Roman times may have lain east of the fortress and city (Hockley 1992). If this were the case, the higher ground overlooking a river crossing such as at Greetwell would be of great significance within a Roman military context .

Method
A Site Director and a team of seven experienced archaeologists undertook the evaluation trenching between the 3rd and 19th December 1997. A total of 14 trenches and 6 test pits were opened by 360° tracked excavator equipped with a 2.1m toothless bucket (Pl. 1). All trenches were hand-cleaned and photographed with archaeological layers and features hand-excavated and recorded as appropriate.

The positioning of the trenches was determined with reference to both geophysical and fieldwalking survey results and approved by the Lincolnshire County Archaeological Officer prior to excavation (Figs. 2 & 3). All trenches were laid out using a geodimeter 640 total station 1' machine working from a baseline tied into the National Grid and related to existing points of reference used during previous fieldwork carried out on the site.

Fieldwork Results
Trench 1 (20.10m x 4.90m, Pls. 2, 3)
Trench 1 was deliberately positioned beyond the point where the triple ditch system was recorded on the geophysical survey. Its purpose was to locate

the triple ditch at a point where colluvium may have protected any associated banks and to investigate the possibility of sealed ground surfaces.

This double width trench was machined to a depth of 1.2m into the natural geology. Although no archaeological features were present, the trench inferred the presence of at least three ditch termini to the south, part of the triple ditch system previously identified by both aerial photography and geophysical survey carried out prior to the evaluation trenching.

Trench 2 (13.10m x 11.10m, Figs. 4, 5a, Pl. 4)
Trench 2 was positioned to examine a sample of possible pit features identified by geophysical survey to examine their human origin and, if possible, their date.

Hand-cleaning of this small open area identified a number of irregular subsoil filled features. The best defined of these, cut **205**, was quarter-sectioned. It was 1.77m, 1.52m long, 0.26m wide and contained one uniform red-brown silty clay fill, **206**, which included a low percentage of small natural limestone fragments. No finds or other anthropogenic material was present in the fill of **205** which was almost certainly of natural origin.

Trench 2, extension (15.50m x 2.14m, Figs. 4, 5a, Pl. 5)
Trench 2 was extended northwards to pick up a linear anomaly recorded by the geophysical survey. This slightly irregular feature, **203**, was aligned east-west and had a maximum width of 0.69m and a depth of 0.29m. The clean silty fill, **204**, contained no finds and the general impression of the excavated section was that the feature may have been of natural origin.

Trench 3 (20.65m x 2.16m, Figs. 5b, 6, Pl. 6)
Trench 3 was positioned to investigate an enclosure boundary and internal features, including a large pit and possible ring-ditch, to determine whether these were domestic features.

One NW-SE aligned linear feature, **304**, was excavated at the eastern end of the trench (Pl. 7). It was c.1.1m wide and between 0.13m and 0.22m deep with a single fill, **305**, a dark brownish grey silty clay containing localised concentrations of charcoal and heavily inundated with broken limestone fragments which may have been elements of stone walls or footings. 3rd to 4th century Roman pottery and tile (some of it burnt) was recovered from this fill, along with quantities of animal bone and an iron nail.

A number of linear features, probably the remains of former buildings were identified along the length of this trench. Within the angle formed by the intersection of linear features **311** and **313** was a large oval posthole **309**. A second potential posthole **315** was located 0.25m east of **313**, and this group of features almost certainly relate to one structure. Curvilinear features **317** and **323** appear, in plan, to represent two elements of the same ring form, possibly a dwelling. **317** was cut by a sub-oval pit, **308**, which was 1.64m long and c.1.00m wide. **317** was cut through an earlier pit, **319**, which had similar dimensions to **308**. Part of a third pit, **321**, was visible adjacent to the

northern edge of the trench. A small linear feature or elongated pit **307**, 2.54m long and 0.50m wide was identified on a north-south alignment cutting through **323**.

On the advice of the County Archaeological Officer, only feature **304** was excavated in this trench, although general cleaning of the trench revealed quantities of what was apparently building debris (such as limestone and tile) and pottery within the fills of the exposed features listed above. The cleaned trench was subsequently covered with plastic before being backfilled.

Trench 4 (13.05m x 2.24m, Figs. 7a, 7b, Pl. 8)
Trench 4 was positioned to investigate a possible ring ditch to determine whether its function was domestic or funerary.

The ring ditch, **405**, was 1.5m wide and 0.46m deep and contained two fills. The upper fill **402** comprised a reddish brown silty clay, 0.30m deep. Quantities of Roman pottery and animal bone were recovered from this deposit. Below this was fill **404**, a limestone-rich silty clay containing animal bone and Roman pottery. This deposit was sampled for environmental data (Appendix 3).

Within the area defined by the ring ditch, an irregular feature, **411**, was hand cleaned but, in accordance with the Site Specification, was not excavated. **403**, the fill of **411**, was very similar in nature to that of the ring ditch, with contemporary pottery recovered from the surface.

Trench 5 (12.55m x 2.32m, Figs. 8a, 8b, Pl. 9)
Trench 5 was positioned to investigate a curving ditch, possibly an enclosure. The trench was positioned at 90° to the ditch.

The curving ditch, **504**, was aligned NE-SW (Pl. 10). It was c.1.00m wide, 0.28m deep, and contained a single red-brown silty clay fill, rich in fossil shell and small limestone fragments, from which a small quantity of animal bone was recovered.

An irregular sub-oval feature, **506**, was investigated at the north-eastern end of the trench, 0.80m x 0.50m in plan, with a depth of 0.22m. One fill was present, **505**, a dark red-brown silty clay heavily inundated with limestone fragments. This feature appears almost certainly to be the result of natural processes.

Trench 6 (31.53m x 2.14m, Figs. 9a, 9b, Pl. 11)
Trench 6 was positioned to investigate features contained within the curving ditch investigated in Trench 5. These included a large pit, an associated irregular ditch Their possible relationship to the triple ditch system was also examined.

Severe waterlogging occurred toward the north end of the trench some 0.10m below the topsoil making excavations below a depth of 1m impossible (Pl. 12).

The apparently large pit at the northern end of the trench, **604**, located by geophysical survey was sectioned and found to be a relatively shallow depression, c.0.40m deep within which two further discrete pits **610** and **611** were identified and excavated. The upper fill of this depression, **605**, was a dark brownish grey silty clay rich in large limestone fragments, Roman pottery, building materials, animal bone and oyster shell. Metal finds from this deposit included two concentrations of hobnails, two iron nails and a copper alloy coin, dated to the 3rd century. This deposit also contained a discreet concentration of material, originally interpreted as slag but later identified as degraded fragments of a quern stone. An environmental sample was collected from this deposit (Appendix 3). The primary fill, **606**, was a mid brownish grey silty clay 0.10m deep. Finds similar in nature to those found in layer **605** were recovered from this fill which appears to represent a disturbed or trampled area of natural clay between the pits discussed below.

Pit **610**, which was cut through deposit **606**, was sub-circular with a diameter of c.1.50m. Excavation ceased at a depth of 0.44m (c.1.00m below the ground surface) due to the aforementioned waterlogging. The earliest excavated fill of this pit was a small amount of redeposited natural clay, **609**, which was against the southern edge of the cut. Partially overlying this was a brownish grey silty clay, **608**, with a depth of at least 0.20m, which contained occasional charcoal and limestone flecks. Roman pottery, building materials and quantities of animal bone were recovered from this deposit. Overlying **608** and partially sealing **609** was fill **607**, a 0.22m deep brownish grey silty clay from which Roman pottery, building materials, animal bone and oyster shell were recovered. Deposit **607** was sealed below **605**. The pottery from these deposits was dated to the 3rd/4th centuries.

Part of pit **611** was identified in the western corner of the trench. It had a maximum depth of 0.75m, although a greater depth is almost certainly present beyond the limits of the trench. It contained a greyish brown silty clay fill, **612**, from which a quantity of 3rd/4th century Roman pottery was recovered. Like **610**, pit **611** was cut through deposit **606**.

South of the pit complex a 1m wide and 0.30m deep east-west aligned ditch, **622**, was excavated. The grey clay fill, **623**, contained a small quantity of animal bone, but no datable material. Cut by this ditch was a small sub-rectangular pit, **624**, 1.05m long, 0.39m wide and 0.20m deep. Two fills were present, the lower, **628**, was a manganese-rich grey clay 0.10m deep whilst the upper, though very similar in nature and depth, lacked the manganese content. No finds were recovered from either of these fills and the date and function of this feature remain unknown. Ditch **622** was also cut by a modern land drain.

In the approximate centre of the trench the terminus of ditch **619**, 0.55m wide and 0.33m deep was identified (Fig. 10c, Pl. 13). Its alignment and location suggested it may have been an element of the triple ditch system (see Trench 14, below). Its red-brown silty clay fill **620** contained no finds. To the south of **619** was **617**, a shallow curvilinear gully, 0.26m deep which

resembled an eaves-drip gully was excavated (Pl. 14). The red-brown silty clay fill **618** contained no finds and no associated features (ie. postholes) were present.

To the south of **617** two NW-SE aligned ditches were present. Ditch **615** was 0.90m wide and 0.35m deep (Fig. 10b, Pls. 15, 16). Its orange-brown clay fill contained a small quantity of animal bone and its alignment suggested it may be an element of the triple ditch system (see Trench 14, below). Cutting this feature was a shallow ditch, **613**, which was 0.80m wide and 0.20m deep (Fig. 10a, Pl. 16). It had one red-brown silty clay fill, **614**, which contained several sherds of Roman pottery.

Trench 7 (13.48m x 2.10m, Figs. 11a, 11b, Pl. 17)

Trench 7 was positioned to examine a flanking ditch and its relationship, if any, to a rectangular feature to the south. The trench was extended far enough to establish whether the rectangular magnetic anomaly was a building.

One SW-NE aligned ditch, **706**, 2.25m wide and 0.78m deep, was located toward the northern end of this trench (Pl. 18). Four fills were present within this feature, the earliest, **704**, was a soft brown clay, 0.07m thick, from which a small quantity of Roman pottery and animal bone was recovered. Overlying this was **703**, a 0.53m deep grey-brown silty clay containing relatively high percentages of limestone fragments and molluscan remains. Animal bone and pottery of Roman date were also present in this deposit. The upper fill of this ditch was an orange-brown silty clay, **702**, which was 0.22m thick and contained some larger fragments of limestone. This fill also contained Roman pottery and animal bone. Within **702** was a small deposit of light grey clay, **705**.

Trench 8 (9.79m x 2.24m, Figs.12a, 12b, Pl. 19)

Trench 8 was positioned to examine irregular, wavy linear anomalies at eastern side of magnetometer survey area to determine if they were ancient land boundaries or natural in origin. The trench was positioned at 90° to the anomalies.

Several small irregular features were present in this trench, all of which were the result of natural processes. However, one potential posthole **803** was identified at the north-east end (Pl. 20). It was sub-circular with a diameter of 0.32m and a depth of 0.12m. A single red-brown silty clay fill was present, **802**, which contained occasional limestone fragments but no finds.

Trench 9 (11.13m x 2.28m, Figs. 13a, 13b, Pl. 21)

Trench 9 was positioned to examine a group of irregular magnetic anomalies visible on the geophysical survey.

One irregular depression, **903**, was revealed in the trench and found to be a natural feature.

Trench 10 (14.55m x 2.17m, Figs. 14a, 14b)

Trench 10 was positioned to examine the source of weak anomalies on the brow of the hill which comprise an irregular linear feature running NW-SE west of the pylon and a second weaker linear anomaly which had been interpreted as being possibly indicative of a Roman marching camp. The trench was positioned at 90° to the linear feature crossing the weaker anomaly to the west, avoiding the point at which they crossed one another.

One NW-SE aligned ditch, **1003**, was identified in this trench (Pl. 22). It was 1.43m wide and 0.50m deep and had two fills. The lower fill, **1002**, was a friable red-brown clay silt, containing frequent small limestone fragments and occasional flecks of charcoal. Animal bone and shell-tempered pottery dated to the Late Iron Age/early Roman period were recovered from this deposit. **1002** was sampled for environmental data (Appendix 3). Above this was a mid brown clay deposit, **1005**, 0.35m in depth which contained no finds. No evidence was found for the existence of the second linear feature.

Trench 11 (11.22m x 2.20m, Figs. 15a,15b, Pl. 23)

Trench 11 was positioned to examine a curving double linear anomaly west of the triple ditch. The trench was positioned at 90° to the anomaly avoiding the point at which it crosses the triple ditch.

Banded clays present in the section at the south-west end of the trench (contexts **1116** to **1123** and **1126** to **1128** inclusive, Fig. 16a, Pl. 24) may represent the remains of a bank or dump. This material is recorded collectively as context **1125**. Subsequent machining was carried out to a depth of c.1.00m to investigate this material further. To the north-east, and upslope of this clay, the section showed a build-up of reddish brown subsoil, **1108**, very similar to the material present in Trenches 12 and 13 (see below).

The terminus of an east-west aligned, possibly linear feature **1103**, 1.65m wide and 0.44m deep was located at the north-east end of the trench (Fig. 16b, Pl. 25). Four fills were recorded within this cut. **1106**, a red-brown sandy silt 0.30m deep was located against the southern edge of the feature. This stony deposit appears to have tipped into the ditch from the south. Above this, and also apparently tipped in from the south was **1105**, a soft red-brown sandy clay c.0.14m thick with occasional small stone inclusions. Between these two contexts a stony tip line was observed. The main fill of this feature was a grey sandy clay, **1104**, which contained small pockets of heavier greenish-grey clay. This 0.28m thick deposit contained occasional small fragments of limestone. The upper fill of this feature was **1102**, a mottled red-brown and grey sandy clay up to 0.08m deep. One sherd of Roman pottery was recovered from this fill, although its position suggests it may have been deposited during the cutting of a modern land drain and thus should be regarded as intrusive.

Trench 12 (10.88m x 2.20m, Figs. 17a, 17b, Pl. 26)

Trench 12 was positioned to investigate a double linear anomaly, possibly a headland, which crossed a former field boundary, parallel to medieval ridge and furrow. According to the geophysical survey, its character apparently

differed to the north and south of the former field boundary so its structure was examined and compared in two places (Trenches 12 and 13).

Trench 12 was located north of the field boundary at 90° to the anomaly and machined to the base of the subsoil.

A projected medieval agricultural headland at the west end of this trench was found to be a large natural depression (recorded as 'cut' **1203**) in the limestone which was filled with a red-brown sandy silt, **1202**. This material was investigated further in Trench 13 (see below).

Trench 13 ('L'-Shaped, 14.10m x 2.20m, 28.70m x 2.20m, Figs. 18, 19a, 19b, Pls. 27, 28)

Trench 13 was positioned south of the field boundary to investigate a linear feature located between a zone of clearer ridge and furrow to the east and possible pits to the west, possibly the result of ancient quarrying. An extension, excavated at 45° to the first trench was positioned to examine the ridge and furrow visible on geophysical survey.

The NW-SE arm of this trench demonstrated the expected presence of medieval plough furrows in section. Furrow **1307** was 1.80m wide and 0.26m deep and filled with a dark red-brown clay silt, **1304** (Pl. 29). Furrow **1308** was located c.1.00m north-west of **1307** and was 0.95m wide and 0.35m deep. The fill, **1305** was identical in nature to **1304**. The third identified furrow was **1309**, located 0.75m north-west of **1308**. This 0.80m wide and 0.28m deep feature was filled by **1306** which was slightly stonier than the fills of the other two. The distance between ridges (centre to centre) was c. 2.00m.

The NE-SW arm was dug across the same natural depression as that recorded in Trench 12. Two sondages were dug by machine through deposit **1303**. The eastern sondage reached natural limestone at a depth of 0.85m, the western, though dug to a depth of 1.1m failed to do so.

The possible pit-like features recorded on the geophysical survey were actually the result of natural soil movements down the slope of the filled in depression.

Trench 14 (22.10m x 2.18m, Figs. 20, 21, Pls. 30, 31)

Trench 14 was located to examine the form and depth of the triple ditches, the general nature and date of their fills and to examine the possible survival of associated banks and the potential for sealed palaeosols or other pre-existing surfaces at a point along the alignment which was not too eroded.

The trench crossed at least three elements of a triple ditch system. The westernmost, and largest of the ditches, **1419**, was 2.36m wide and 0.92m deep. The uniform fill of this feature, **1418**, consisted of a red-brown sandy silt and contained abundant molluscan remains which increased with depth. Small quantities of animal bone and pottery of Late Iron Age/early Roman date were recovered from this context.

No finds were recovered from the central ditch, **1412**, which was 1.52m wide and 0.50m deep. The fill of this ditch, **1411**, was a red-brown sandy silt which contained occasional fragments of natural limestone.

The eastern ditch, **1403**, was 0.90m wide and 0.46m deep (Pl. 32). 27 sherds of Middle Iron Age pottery were recovered from the fill, **1404**, a red-brown sandy silt containing frequent small stones. Context **1402** was located adjacent to, and west of **1403** and was probably formed by plough damage to the top of fill **1404**. This deposit was very similar in nature to **1404**, with pottery of early Roman date, fired clay and animal bone recovered from it. All three of these ditches were sampled for environmental data (Appendix 3).

Excavation of an irregular feature, **1406**, located between the central and eastern ditches showed two depressions, both c.0.65m wide and 0.20m-0.30m deep, which may be the termini of two small ditches or gullies possibly associated with the ditch system. Filling this feature was a red-brown sandy clay silt, **1407**, which contained abundant molluscan remains. An environmental sample was taken to examine the possibility of similarities with the fills of the other features in this trench (Appendix 3).

Trenches 15-20 (2m x 2m test pits, Figs 22a, b, c & 23a, b, c, Pls. 33 to 38)
These six test pits were machined down into natural layers. Trenches 15 and 16 encountered natural limestone outcrops immediately below the topsoil (Figs. 22a, b, Pls. 33, 34). A deeper natural stratigraphy was present in Trenches 17 to 20 with mixed clays present to a depth of at least 1.20m (Figs. 22c, 23a, b, c, Pls. 35 to 38). With the exception of a land drain in Trench 18 (Fig. 23a, Pl. 36), no archaeological features were present in any of the trenches.

Discussion
Evaluation trenching at Greetwell revealed a number of archaeological features of the pre-Roman and Roman periods.

Trench 14 was positioned across a triple ditch system, some 14m in total width, identified both by aerial photographs and geophysical survey. Although previous excavations by LAS on this, and similar systems in Lincolnshire have produced little dating evidence, the ditches have been assumed to be of Iron Age date. At Greetwell, finds were recovered from the two outer ditches, and analysis of this material (Appendix 2) suggests they may not be contemporary. Pottery from the eastern ditch, **1403**, the smallest of the three, was dated to the Middle Iron Age whilst **1419**, the western and largest ditch produced material of the Late Iron Age/early Roman period. This dating evidence may be interpreted in a number of ways. It is possible that all three ditches date to the Middle Iron Age, or earlier, and that whilst the eastern (and possibly the central) ditch fell into disuse, the western ditch was cleaned and maintained up to, and possibly beyond the start of the Roman period. Alternatively, the ditch 'system' may only have comprised one or two ditches at any one time, **1419** representing its last incarnation. In both these scenarios, the increase in size of the western ditch may reflect a change in

function for the complex as a whole. No associated banking or palisading was observed within the trench.

The ditches also appear to skirt a large depression, now barely visible on the surface but evident during machining. This feature, filled with what appears to be large quantities of ancient soils (recorded in Trenches 12 and 13 as **1202** and **1303**) may be the result of quarrying in antiquity or, alternatively it may be a geological feature. It appears to have been gradually filled by ploughsoil moving downslope, the result of intensified agricultural practice through the Middle Ages. This hypothesis is largely borne out by both the fieldwalking results, obtained prior to the evaluation trenching phase, and examination of deposit **1303**. Practically no finds were recovered from either the surface in this area (Armour-Chelu 1997), or **1303**, suggesting its infilling to be a relatively recent event.

At the northern end of the site, the ditches terminate, as indicated by the lack of archaeological features in Trench 1. This suggests the ditches respect the field boundary, marked by a watercourse and demonstrates the presence of ditch termini within the proposed development area. At Brauncewell Quarry it was shown that ditch termini were associated with an increase in contemporary archaeological activity (Tipper 1994) and it is suggested that a similar situation may exist at Greetwell.

Evidence for earlier Roman occupation at Greetwell is scant. It is suggested that pottery from ditch **706**, associated with a rectangular structure visible only as a topsoil 'ghost' on geophysical plots, may be indicative of an earlier phase of activity (Appendix 2), but the poor state of preservation of the material makes absolute dating impossible.

Quantities of stone and tile were present within the unexcavated features in Trench 3 which may indicate the former presence of at least two stone buildings, although the fact that no significant quantities were noted on the surface makes it more likely that these represent the remains of stone footings associated with wooden buildings. Pottery and a coin recovered suggest a mid 3rd to 4th century date for these features. Broadly contemporary finds were collected from the ring ditch, **405**, an associated feature, **411**, in Trench 4 and the pit complex, **604**, in Trench 6.

At this evaluation stage, it is unclear whether the buildings are contemporary with the pit complex in Trench 6, as the date range from the finds thus far recovered is rather broad. The function of the pits themselves also remains rather ambiguous. Finds suggest they are contemporary with one another, and an area of trample between them suggests a fair amount of human activity in the area. A layer of probable backfill, **605**, was rich in 3rd and 4th century pottery, tile and stone was identified sealing both the pits and the trampled area between.

Fired clay fragments recovered from this deposit contained quantities of fossilised shell, suggesting a local origin. The majority of the surfaces were roughly flat with only three pieces exhibiting a smooth face. Two right-angled

surfaces exist suggesting that the clay fragments may once have been building bricks; however, the clay has been low-fired suggesting this to be unlikely.

The fragments also have unusual indentations and protrusions. These are similar to the crude tenon and mortise joints identified on possible furnace lining bricks found at the iron smelting site at Laxton, Northamptonshire (Jackson and Tylecote 1988, 288-290). Unfortunately no corroborative evidence of industrial activity was recorded in the trial trenches at Greetwell and none of the fired clay was slagged. Nevertheless, this raises the possibility that industrial activity may have been occurring close by. This deposit was also rich in environmental remains and evidence for nearby human habitation (Appendix 3). Feature **411**, within the area delineated by ring ditch **405** may represent one or more burials, assuming the ring ditch is indeed related to a barrow. As this feature remains unexcavated, further work would be necessary to clarify this situation.

The bank form, **1125**, identified in Trench 11 represents probably the most enigmatic feature at Greetwell. Both date and function remain undetermined, although the build up of subsoil, **1108**, behind it may suggest a post-medieval date. The soil build up is likely to be the result of an intensification of agricultural practice in the medieval and post-medieval periods, suggested by the ridge and furrow evident on the geophysical survey (Fig. 2) and recorded in Trench 13 (Fig. 19a).

Results from the evaluation trenching broadly agreed with those gained from fieldwalking and geophysical survey. Some results were, however, unexpected. For example, the ring form in Trench 4 proved to be considerably later than its hypothesised Bronze Age date and the projected non-contemporary nature of the Iron Age triple ditch system was a surprising development. All interpretation of the archaeology at Greetwell is, of course, based on features observed within the width of machine trenches and, though incomplete, the data does indicate substantial multi-period remains on the site.

Acknowledgements
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January 1998
R. J. Armour-Chelu

Contents of Site Archive for GWQ 97

Plans : 21
Sections : 30
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Context Sheets : 201-207, 301-324, 401-411, 501-507, 601-628, 701-712, 801-811, 901-907, 1001-1005, 1101-1111, 1113-1130, 1201-1204, 1301-1309, 1401-1421, 1501-1502, 1601-1603, 1701-1705, 1801-1810, 1901-1902, 2001-2002
Context Register
Small Finds Register
Environmental Samples Register
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Interim Report (copy)
Pottery Report (copy)
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Photographs :
LAS Film No. 97/84 negs 19-33
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Appendix 1

Greetwell Quarry GWQ 97 Context Summary

CONTEXT	TYPE	PART OF	FORM	DESCRIPTION
201	L	201	Layer	Topsoil (Trench 2) := 301, 401, 501, 601,701, 801, 901, 1001, 1101, 1201,1301, 1401,1501,1601,1701,1801,1901,2001
202	L	202	Layer	Natural clay
203	C	203	Linear	Ditch/Gully. Filled by 204
204	F	203	Linear	Fill of 203
205	C	205	Hollow	Natural Feature. Filled by 206
206	F	205	Hollow	Fill of 205
207	L	207	Layer	Irregular subsoil deposit
301	L	301	Layer	Topsoil (Trench 3)
302	F	307	Linear	Fill of 307
303	F	308	Pit	Fill of 308
304	C	304	Linear	Gully. Filled by 305
305	F	304	Gully	Fill of 304
306	L	306	Layer	Natural clay
307	C	307	Linear	Construction trench/elongated pit
308	C	308	Pit	Pit? Filled by 303
309	C	309	Posthole	Posthole. Filled by 310
310	F	309	Posthole	Fill of 309
311	C	311	Linear	Construction trench? Filled by 312
312	F	311	Linear	Fill of 311
313	C	313	Linear	Foundation trench? Filled by 314
314	F	313	Linear	Fill of 313
315	C	315	Posthole	Posthole. Filled by 316
316	F	315	Posthole	Fill of 315
317	C	317	Ditch	Ring ditch:= 323. Filled by 318
318	F	317	Ditch	Fill of 317:= 324
319	C	319	Pit	Pit. Filled by 320
320	F	319	Pit	Fill of 319
321	C	321	Pit	Pit. Filled by 322
322	F	321	Pit	Fill of 321
323	C	323	Ditch	Ring ditch:= 317. Filled by 324
324	F	323	Ditch	Fill of 323:= 318
401	L	401	Layer	Topsoil (Trench 4)
402	F	405	Ditch	Upper fill of 405
403	F	411	Feature	Fill of 411
404	F	405	Ditch	Primary fill of 405
405	C	405	Ditch	Ring ditch. Filled by 402 & 404
406	L	406	Layer	Natural gravelly clay
407	L	407	Layer	Natural clay
408	L	408	Layer	Natural clay
409	L	409	Layer	Natural clay
410	L	410	Layer	Natural clay
411	C	411	Feature	Internal feature associated with ring ditch. Filled by 403
501	L	501	Layer	Topsoil (Trench 5)
502	L	502	Layer	Natural clay
503	F	503	Ditch	Fill of 504
504	C	504	Ditch	Enclosure ditch. Filled by 503
505	F	505	Hollow	Fill of 506
506	C	506	Hollow	Natural feature. Filled by 505
507	L	507	Layer	Natural clay/limestone mix
601	L	601	Layer	Topsoil (Trench 6)
602	L	602	Layer	Natural clay
603	L	603	Layer	Natural clay
604	C	604	Pit	Pit. Filled by 605 & 606
605	F	604	Pit	Upper fill of 604
606	F	604	Pit	Primary fill of 604
607	F	610	Pit	Upper fill of 610

CONTEXT	TYPE	PART OF	FORM	DESCRIPTION
608	F	610	Pit	Fill of 610
609	F	604	Pit	Fill of 610
610	C	610	Pit	Pit. Filled by 607, 608 & 609
611	C	611	Pit	Pit. Filled by 612
612	F	611	Pit	Primary fill of 611
613	C	613	Ditch	Ditch. Filled by 614
614	F	613	Ditch	Primary fill of 613
615	C	615	Ditch	Ditch, element of triple ditch? Filled by 616
616	F	615	Ditch	Fill of 615
617	C	617	Gully	Eaves-drip gully? Filled by 618
618	F	617	Gully	Fill of 617
619	C	619	Ditch	Ditch terminus. Possibly element of triple ditch system. Filled by 620 & 621
620	F	620	Ditch	Upper fill of 619
621	F	619	Ditch	Primary fill of 619
622	C	622	Ditch	Ditch. Filled by 623
623	F	622	Ditch	Fill of 622
624	C	624	Pit	Sub-rectangular pit. Filled by 625 & 628
625	F	624	Pit	Upper fill of 624
626	C	626	Land drain	Modern land drain. Filled by 627
627	F	626	Land drain	Fill of 626
628	F	624	Pit	Primary fill of 624
701	L	701	Layer	Topsoil (Trench 7)
702	F	706	Ditch	Upper fill of 706
703	F	706	Ditch	Fill of 706
704	F	706	Ditch	Primary fill of 706
705	F	706	Ditch	Fill of 706
706	C	706	Ditch	Ditch. filled by 702, 703, 704 & 705
707	L	707	Layer	Natural clay
708	L	708	Layer	Natural clay
709	L	709	Layer	Natural clay
710	L	710	Layer	Irregular subsoil deposit
711	L	711	Layer	Natural clay
712	L	712	Layer	Natural clay
801	L	801	Layer	Topsoil (Trench 8)
802	F	803	Posthole	Fill of 803
803	C	803	Posthole	Posthole? Filled by 802
804	L	804	Layer	Natural clay/limestone deposit
805	L	805	Layer	Irregular subsoil deposit:=806, 807, 808 & 809
806	L	806	Layer	Irregular subsoil deposit:=805, 807, 808 & 809
807	L	807	Layer	Irregular subsoil deposit:=805, 806, 808 & 809
808	L	808	Layer	Irregular subsoil deposit:=805, 806, 807 & 809
809	L	809	Layer	Irregular subsoil deposit:=805, 806, 807 & 808
810	L	810	Layer	Infill of natural depression
811	L	811	Layer	Natural clayey/sandy deposit
901	L	901	Layer	Topsoil (Trench 9)
902	F	903	Hollow	Fill of 903
903	C	903	Hollow	Natural hollow. Filled by 902
904	L	904	Layer	Natural sandy/clay deposit
905	L	905	Layer	Natural clay
906	L	906	Layer	Natural clay
907	L	907	Layer	Natural clay/limestone deposit
1001	L	1001	Layer	Topsoil (Trench 10)
1002	F	1003	Ditch	Primary fill of 1003
1003	C	1003	Ditch	Ditch. Filled by 1002 & 1005
1004	L	1004	Layer	Clay/limestone natural
1005	F	1003	Ditch	Upper fill of 1003
1101	L	1101	Layer	Topsoil (Trench 11)
1102	F	1103	Linear	Upper fill of 1103

CONTEXT	TYPE	PART OF	FORM	DESCRIPTION
1103	C	1103	Linear	Probable ditch terminus. Filled by 1102, 1104, 1105 & 1106
1104	F	1103	Linear	Fill of 1103
1105	F	1103	Linear	Fill of 1103
1106	F	1103	Linear	Fill of 1103
1107	C	1107	Hollow	Natural feature. Filled by 1108, 1109 & 1110
1108	F	1107	Hollow	Subsoil build up/upper fill of 1107
1109	F	1107	Hollow	Fill of 1107
1110	F	1107	Hollow	Fill of 1107
1111	F	1114	Hollow	Fill of 1114
1112	n/a	n/a	n/a	Unused context number
1113	L	1113	Layer	Natural subsoil deposit
1114	C	1114	Hollow	Natural feature. Filled by 1111
1115	L	1115	Layer	Natural clay
1116	L	1125	Bank	Element of bank form. Component of 1125
1117	L	1125	Bank	Element of bank form. Component of 1125
1118	L	1125	Bank	Element of bank form. Component of 1125
1119	L	1125	Bank	Element of bank form. Component of 1125
1120	L	1125	Bank	Element of bank form. Component of 1125
1121	L	1125	Bank	Element of bank form. Component of 1125
1122	L	1125	Bank	Element of bank form. Component of 1125
1123	L	1125	Bank	Element of bank form. Component of 1125
1124	L	1124	Layer	Natural clay
1125	E	1125	Bank	Bank form? Contains 1116 to 1123 & 1126 to 1129 inclusive
1126	L	1125	Bank	Element of bank form. Component of 1125
1127	L	1125	Bank	Element of bank form. Component of 1125
1128	L	1125	Bank	Element of bank form. Component of 1125
1129	L	1125	Bank	Element of bank form. Component of 1125
1130	L	1130	Layer	Natural clay/limestone deposit
1201	L	1201	Layer	Topsoil (Trench 12)
1202	L	1203	Depression	Fill of 1203:=1303
1203	C	1203	Depression	Natural feature. "Filled" by 1202
1204	L	1204	Natural	Natural gravel
1301	L	1301	Layer	Topsoil (Trench 13)
1302	L	1302	Layer	Natural limestone
1303	L	1302	Depression	Fill of natural feature:=1202
1304	F	1307	Furrow	Fill of 1307
1305	F	1308	Furrow	Fill of 1308
1306	F	1309	Furrow	Fill of 1309
1307	C	1307	Furrow	Medieval plough furrow. Filled by 1304
1308	C	1308	Furrow	Medieval plough furrow. Filled by 1305
1309	C	1309	Furrow	Medieval plough furrow. Filled by 1306
1310	L	1310	Layer	Natural subsoil deposit
1401	L	1401	Layer	Topsoil (Trench 14)
1402	L	1402	Spread	Spread of material from ditch 1403
1403	C	1403	Ditch	Ditch. Filled by 1404
1404	F	1403	Ditch	Fill of 1403
1405	L	1405	Layer	Natural subsoil deposit:=1421
1406	C	1406	Ditch	Irregular ditch/guly termini. Filled by 407
1407	F	1406	Ditch	Fill of 1406
1408	L	1408	Layer	Natural clay layer
1409	C	1409	Land drain	Modern land drain. Filled by 1410
1410	F	1409	Land drain	Fill of 1409
1411	F	1412	Ditch	Fill of 1412
1412	C	1412	Ditch	Central ditch of the triple ditch system. Filled by 1411
1413	F	1414	Irregular	Fill of 1414
1414	C	1414	Irregular	Modern disturbance. Filled by 1413

CONTEXT	TYPE	PART OF	FORM	DESCRIPTION
1415	L	1415	Layer	Natural limestone
1416	L	1416	Layer	Natural sandy gravels
1417	L	1417	Layer	Natural limestone
1418	F	1419	Ditch	Fill of 1419
1419	C	1419	Ditch	Ditch. Part of the triple ditch system. Filled by 1418
1420	L	1420	Layer	Natural gravels
1421	L	1421	Layer	Natural subsoil deposit:=1405
1501	L	1501	Layer	Topsoil (Trench 15, T.P)
1502	L	1502	Layer	Natural limestone/clay mix
1601	L	1601	Layer	Topsoil (Trench 16, T.P)
1602	L	1602	Layer	Silty clay subsoil
1603	L	1603	Layer	Natural clay/limestone
1701	L	1701	Layer	Topsoil (Trench 17, T.P)
1702	L	1702	Layer	Subsoil deposit
1703	L	1703	Layer	Natural clay
1704	L	1704	Layer	Natural clay
1705	L	1705	Layer	Natural clay
1801	L	1801	Layer	Topsoil (Trench 18, T.P)
1802	L	1802	Layer	Silty clay subsoil
1803	L	1803	Layer	Natural (orangey/brown) broken limestone
1804	L	1804	Layer	Natural (light grey) broken limestone
1805	L	1805	Layer	Natural (yellowish/grey) broken limestone
1806	L	1806	Layer	Grey clay/limestone natural
1807	C	1807	Land drain	Modern land drain. Filled by 1808, 1809 & 1810
1808	F	1807	Land drain	Backfill of 1807
1809	F	1807	Land drain	Fill of 1807
1810	F	1807	Land drain	Fill of 1807
1901	L	1901	Layer	Topsoil (Trench 19, T.P)
1902	L	1902	Layer	Natural (orange/grey) clay
2001	L	2001	Layer	Topsoil (Trench 20, T.P)
2002	L	2002	Layer	Natural (light yellow) broken limestone

REPORT ON THE POTTERY FROM GREETWELL, GWQ97

for LINDSEY ARCHAEOLOGICAL SERVICES

by Margaret J Darling, M.Phil., F.S.A., M.I.F.A.

Report 23, 12 January 1998

QUANTITY AND CONDITION

The total quantity recorded is 376 sherds, 5.816kg. There is a quantity of tile, 40 fragments, 3.438kg. Condition is mostly good, and there are no problems for long term storage. The pottery has been archived according to the guidelines of *The Study Group for Roman Pottery*, the archive including sherd count and weight. A copy of the archive database can be supplied on disk, and is attached. Vessels selected for illustration have been assigned drawing numbers, and are separated from the main pottery bags.

The pottery came from 26 contexts, from seven trenches, mostly from trench 6. Tile is recorded from four trenches producing pottery (3, 4, 6 and 7), and also from trenches 2 and 9. A summary of the quantities by context, with date, comments and information relating to sherd links between contexts, ordered numerically, is on Table 1.

Table 1

Trench	Cxt	Shs	Wt	Date	Comments
3	301	4	132	3-4C	
3	302	11	156	3-4C	
3	305	15	94	M3 ON	
3	318	3	28	3-4C	
3	322	1	24	ML3-?4	
3	324	3	108	M3 ON	
4	401	16	244	M3 ON	
4	402	25	549	M3-?4	
4	403	18	268	ML3	
4	404	7	63	L2-3	NO STRONG DATE EVIDENCE
6	601	7	84	4C?	
6	605	64	1440	ML4	
6	606	63	836	ML3	
6	607	30	401	ML3	POSS LINKS 607-608
6	608	27	431	ML3	
6	612	1	79	L2 ON	
6	614	24	666	ML3	
7	701	2	14	RO	
7	702	3	11	RO	
7	703	4	17	RO	
7	704	4	6	RO	
10	1002	11	50	LIA/RO?	
11	1102	2	7	M3?	
14	1402	1	1	RO?	
14	1404	28	101	MLIA	
14	1418	2	6	LIA/RO?	
Total		376	5816		

Sherd links

The only possible links occurred between 607 and 608.

OVERVIEW OF FABRICS AND FORMS

The fabrics from the total site are detailed on Table 2.

Table 2

Fabric	Code	Sherds	%	grams	%
Amphorae	AMPH	2	0.53	73	1.26
Mortaria Swanpool?	MOSP?	3	0.80	157	2.70
Cream?	CR?	3	0.80	6	0.10
Nene Valley colour-coated	NVCC	11	2.93	61	1.05
Oxidized	OX	6	1.60	18	0.31
Grey fine	GFIN	1	0.27	6	0.10
Grey	GREY	211	56.12	3991	68.62
Dales ware	DWSH	96	25.54	1339	23.03
Grey minimal shell	GYMS	2	0.53	6	0.10
Iron Age coarse shell	IASHC	28	7.45	101	1.74
Shell-gritted	SHEL	13	3.46	58	1.00
Total		376		5816	

The distribution of fabrics across the trenches is shown on Table 3.

Table 3

		3	4	6	7	10	11	14	Total
Amphorae	AMPH	0	0	2	0	0	0	0	2
Mortaria	MOSP?	0	0	3	0	0	0	0	3
Cream	CR?	0	0	3	0	0	0	0	3
Oxidized	OX	1	2	1	2	0	0	0	6
NV colour-coat	NVCC	0	0	11	0	0	0	0	11
Grey fine	GFIN	0	0	1	0	0	0	0	1
Grey	GREY	23	60	114	11	0	2	1	211
Dales Ware	DWSH	12	3	81	0	0	0	0	96
Shell	SHEL	1	1	0	0	11	0	0	13
Grey min.shell	GYMS	0	0	0	0	0	0	2	2
Iron Age shell	IASHC	0	0	0	0	0	0	28	28
	Total	37	66	216	13	11	2	31	376

The two amphora sherds both come from the same type of amphorae, probably from Spain, but appear to be from two different vessels, despite coming from 605 and 606. The three mortarium sherds belong to a single mortarium, almost certainly from the late Swanpool kilns in Lincoln, but lacking the common white-slip finish.

The three sherds of Cream are flakes only from a single vessel in 606, the fine fabric with mica being of the type often used for flagons. Oxidized sherds are all flakes or tiny abraded bodysherds (from trenches 3, 4, 6 and 7). One from 401 could possibly be from a flagon or closed vessel. The 11 sherds of Nene Valley colour-coated ware represent just three vessels, a folded beaker with scale-decoration from 608 (9 sherds, the fabric suggesting a probable mid 3rd century date) and two sherds from 605, a bead-and-flange bowl of 4th century date, and a sherd from a beaker with a late fabric type, of later 3rd to 4th century date.

Of the sherds identifiable for vessel type, the GREY wares are dominated by sherds from wide-mouthed bowls, classic types for the later 3rd and 4th centuries, mostly of types seen at the

Rookery Lane and Swanpool kilns in Lincoln, at least 10 vessels. These account for 32% of identified forms. Nine sherds came from six bead-and-flanged bowls, ranging from low to high beads, accounting for 14% of identified grey vessel forms. Other identified types are of 3rd century date. There is little evidence to indicate vessels of earlier date.

Most of the shell-gritted sherds are from Dales Ware jars. 11 bodysherds from 1002 differed, appearing to be wheel-made and could be from Late Iron Age or early Roman vessels. Two sherds could not be positively identified, a thin-walled bodysherd from 302 and a flaked dark-grey fragment from 401.

Two sherds of GYMS, grey with minimal shell, come from a single vessel in 1418. This appears to be wheel-made and would be the type of fabric and technique seen in the late Iron Age or early Roman period. The Iron Age coarse shell-gritted sherds all belong to a single hand-made vessel, with a square-cut upright rim of a wide-rimmed vessel, and is the sole find from 1404.

TILE

The tile includes a stone fragment from 608 (81g). Most of the fragments are in a fairly abraded condition, and except for two thick fragments from 402 and 606 which could be from bonding tiles or similar, the fragments are from roof tiles, including *tegulae* and probable *imbrices*. Possible post-Roman tiles came from 201, 401 and possibly 901.

DISCUSSION

Overall the emphasis of the bulk of the material is the later Roman period, broadly the mid 3rd to 4th centuries. Notably no samian was found. The earliest pottery is the single vessel from 1404; this is very fragmentary and in poor flaked condition, and is a type which could be current in the middle Iron Age, possibly extending into the Late Iron Age. The single GYMS vessel from 1418 could fit the Late Iron Age or early Roman period. The group of shell-gritted sherds from 1002 could fit a similar date; these are too fragmentary to be definitive.

Trench 7 was unfortunate in its pottery, only 13 sherds, in that none of these, all coarse GREY or OX fabrics, can be closely dated. This could be from earlier Roman occupation than found in the other trenches.

Trenches 3, 4, 6 and 11 all seem to fit into the later Roman period, trench 11 having only two sherds. Trench 14 has a single flake (from 1402) possibly of Roman date, but is otherwise of Mid to Late Iron Age to possibly early Roman date, while Trench 10 could be date to the Late Iron Age to early Roman period.

RECOMMENDATIONS

Nine vessels have been selected as necessary to illustrate these excavations, all of later Roman date. The Iron Age vessel from trench 14 is barely drawable, but should be considered. Since further excavation is envisaged, these vessels for drawing should be reserved for decisions to be made after this work, which may produce more definitive and better examples.

Trench	Cxt	Fab	Fm	Dec	Ves	D?	DNo	Comment	Joins	Shs	wt
6	614	GREY	BWM	-	1	D	1	RIM>GROOVES;NONJ BSS;CURVED U/C	-	6	376
6	607	GREY	BFB	-	1?	D	2	RIM/WALL;F HIGH BEAD;NONJ BSS	-	3	118
6	606	GREY	BFL	-	-	D	3	RIM/WALL;STUBBY FL	-	1	58
6	606	GREY	BWM	-	1	D?	4	U/C CURVED RIM/SHLDR	-	8	170
6	605	GREY	BFBH	-	-	D	5	RIM/WALL;CHUNKY FL	-	1	169
3	302	GREY	JNN	-	1?	D?	6	FLANGED RIM/NECK/SHLDR;NONJ BSS	-	3	71
4	401	GREY	BFBL	-	-	D	7	RIM/WALL	-	1	59
4	402	GREY	DGR	-	-	D	8	COMP PROF	-	1	27
4	402	GREY	BWM	-	-	D	9	ROUND RIM NECK.>SHLDR	-	1	52

Trench	Cxt	Fab	Fm	Dec	Ves	D?	DNo	Comment	Joins	Shs	wt
6	612	GREY	BD					BASE SH		1	79
6	612	ZDATE						L2 ON			
6	614	GREY	BWM		1	D	1	RIM>GROOVES;NONJ BSS;CURVED U/C		6	376
6	614	GREY	JCUR					RIM ONLY;CP TYPE		1	13
6	614	GFIN	CLSD					BS NR ?NECK ?FLASK		1	6
6	614	GREY						BSS		11	115
6	614	DWSH	J		1			BASE		2	144
6	614	DWSH	J					BSS		3	12
6	614	ZDATE						ML3			
6	608	NVCC	BKFOS		1			BSS;LTBN FAB		9	49
6	608	GREY	BWM?					CURVED U/C RIM FR		1	11
6	608	GREY	JB					RIM FR ONLY		1	9
6	608	GREY			1			J BSS;DKGRY W LT GRYBN S		2	42
6	608	GREY			1			BASE;LTGRY FAB;GRYBN S		2	81
6	608	GREY						BSS		5	32
6	608	DWSH	JDW					RIM		1	13
6	608	DWSH	J					BSS 2+ VESS		6	194
6	608	ZDATE						ML3			
6	607	GREY	BFB		1?	D	2	RIM/WALL;F HIGH BEAD;NONJ BSS		3	118
6	607	GREY	JTR					RIM FR;UNUS TR;NECK;SHLDR		1	14
6	607	GREY						BSS		10	145
6	607	DWSH	JDW		2			RIMS		2	29
6	607	DWSH	J					BSS		14	95
6	607	ZDATE						ML3			
6	607	ZZZ						POSS LINKS 607-608			
6	606	AMPH	A					LTRB BS;MICA & CALC		1	35
6	606	CR?						FLAKES ONLY;FINE LTBN-CR;MICA		3	6
6	606	GREY	BFL			D	3	RIM/WALL;STUBBY FL		1	58
6	606	GREY	BWM		1	D?	4	U/C CURVED RIM/SHLDR		8	170
6	606	GREY	JCUR					RIM FR ONLY		1	11
6	606	GREY	J107					RIM FR ONLY;LTGRY		1	3
6	606	GREY	J?					STRING BASE;RB INT		1	20
6	606	GREY						BSS;ONE RB INT		24	174
6	606	OX?						FLAKE ONLY		1	1
6	606	DWSH	JDW		1			RIMS;2NONJ BSS		8	245
6	606	DWSH	JDW					RIM		1	9
6	606	DWSH	J					BSS		13	104
6	606	ZDATE						ML3			
6	605	MOSP?	M		1			BASE;LTBN GRYCORE SLAG TG		3	157
6	605	AMPH	A					LTRB BS;MICA/CALC;NOT SAME 606		1	38
6	605	NVCC	BFB					RIM FR ONLY;BURNT GRY		1	9
6	605	NVCC	BK					BS RB FAB		1	3
6	605	GREY	BFBH			D	5	RIM/WALL;CHUNKY FL		1	169
6	605	GREY	BFBH					RIM/FL ONLY		1	27
6	605	GREY	BWM?					RIM CURVED ONLY		1	20
6	605	GREY	BWM					RIM CURVED ONLY		1	21
6	605	GREY	JH?					BS W HDLE SCAR; OR F?		1	21
6	605	GREY	JNN?					NECK;SHLDR;?JNN		1	15
6	605	GREY	J?					SANDY BASE		1	149
6	605	GREY	JB					BASE PROB BWM		1	83
6	605	GREY						BSS		18	310
6	605	GREY	JB					BS RB INT;TRACES BURNISH EXT		1	57
6	605	DWSH	JDLS?					RIM FR ONLY		1	10
6	605	DWSH	JDW					RIM FR		1	7
6	605	DWSH	J		1			BSS		6	66
6	605	DWSH	J					BSS 2-3 VESS		12	123
6	605	DWSH	J		1			BASE/BSS		10	148
6	605	GREY	CLSD					BS HALF RB FAB;DK SURFS		1	7
6	605	ZDATE						ML4			
6	601	GREY	J					RIM FR;POSS JCR TYPE		1	10
6	601	GREY	BWM					SQUARISH RIM FR ONLY		1	18
6	601	GREY						BSS		4	48
6	601	DWSH?	J					BS ABR		1	8
6	601	ZDATE						4C?			
3	301	GREY	BD		1			BASE SHS J;STRING		2	113
3	301	GREY	CLSD		1			BSS THIN-W ?FLASK/BK	318	2	19
3	301	ZDATE						3-4C			
3	302	GREY	JNN		1?	D?	6	FLANGED RIM/NECK/SHLDR;NONJ BSS		3	71
3	302	GREY	BD					BASE FR		1	24
3	302	GREY						BSS/2 BASE FRS		6	59
3	302	SHEL	CLSD					SM BS;THIN WALL		1	2
3	302	ZDATE						3-4C			
3	305	OX						ABR BS;LTRB SURF;DKGRY SANDY FAB		1	3
3	305	GREY						BSS		3	26
3	305	DWSH	J					BSS		11	65
3	305	ZDATE						M3 ON			
3	318	GREY	CLSD		1			BSS THIN-W ?FLASK/BK	301	3	28
3	318	ZDATE						3-4C			
3	322	GREY	BWM					RIM FR;SPOOL?		1	24
3	322	ZDATE						ML3-?4			
3	324	GREY	JB					BASE FR;POSS BWM		1	76
3	324	GREY	CLSD					BS		1	13

3	324	DWSH	J					BS		1	19
3	324	ZDATE						M3 ON			
4	401	OX						ABR SM BS LTRB THRO ?FLAG		1	2
4	401	GREY	BFBL			D	7	RIM/WALL		1	59
4	401	GREY						BSS		10	129
4	401	DWSH	J					BSS		3	48
4	401	SHEL						FLAKED DKGRY BS		1	6
4	401	ZDATE						M3 ON			
4	402	GREY	BFB					RIM/PT WALL;F HIGH BEAD		1	36
4	402	GREY	DGR			D	8	COMP PROF		1	27
4	402	GREY	BWM			D	9	ROUND RIM NECK.>SHLDR		1	52
4	402	GREY	BD					BASE SH		1	12
4	402	GREY	BWM					SQUARISH RIM FR ONLY		1	13
4	402	GREY			1			LGEISH BASE FRAGS;STRING		3	186
4	402	GREY			3			BASES		3	75
4	402	GREY						BSS		14	148
4	402	ZDATE						M3-?4			
4	403	GREY	BWM		1?			RIM FRS; U/C RL TYPE		2	39
4	403	GREY						BSS		14	139
4	403	GREY						THICK SHS LGE VESS		2	90
4	403	ZDATE						ML3			
4	404	OX						ABR FLAKED BS;LTRB THRO		1	2
4	404	GREY	JBK					FR BASE FTM		1	2
4	404	GREY	J					FTM BASE		1	35
4	404	GREY	JBK?					THIN WALL BS DKGRY SURFS		1	1
4	404	GREY						BS LTGRY NR NVGW		1	3
4	404	GREY						BS ?CARINATED THIN W		1	2
4	404	GREY	BD?					BASE.?CHAMFERED		1	18
4	404	ZDATE						L2-3			
4	404	ZZZ						NO STRONG DATE EVIDENCE			
7	701	GREY						BSS ONE LTGRY		2	14
7	701	ZDATE						RO			
7	702	GREY						BS;RB FAB;DKGRY SURFS		1	5
7	702	GREY						THIN WALL BS & CHIP		2	6
7	702	ZDATE						RO			
7	703	OX			2			FLAKED RB & SANDY CHIP		2	10
7	703	GREY			1			J BSS LTGRY		2	7
7	703	ZDATE						RO			
7	704	GREY			1			BSS/CHIPS DKGRY F/GRYBN SURFS		4	6
7	704	ZDATE						RO			
10	1002	SHEL	WM		1			BSS;GRYF/LTBN EXT;SPARSE SH		7	35
10	1002	SHEL	WM?		1			BSS;GRYF/LTBN EXT;COMMON SH		2	8
10	1002	SHEL	WM					BS DKGRY THRO;F COMMON SH		1	6
10	1002	SHEL						CHIP		1	1
10	1002	ZDATE						LIA/RO?			
11	1102	GREY	BFB?		1			FLANGE BROKEN BEAD;SANDY		2	7
11	1102	ZDATE						M3?			
14	1418	GYMS	WM?		1			BSS;GRY W GRYBN SURF;V SPARSE SH		2	6
14	1418	ZDATE						LIA/RO?			
14	1402	GREY						TINY BS;DKGRY F WGRYBN SURFS		1	1
14	1402	ZDATE						RO?			
14	1404	IASHC	B?	HM	1			UPR SQ.CUT RIMS/FLAKES;DKGRY;RB SURFS		28	101
14	1404	ZDATE						MLIA			
										376	5816
3	310	TILE	TEG					FRAG		1	152
4	401	TILE	IMB?					FRAG		1	92
4	401	TILE						POSS POSTRO		1	35
4	401	TILE	TEG?					FRAG THICK		1	46
4	401	TILE						FLAKES		3	35
4	402	TILE	TEG?					FRAG		1	100
4	402	TILE						FRAGS/FLAKES		8	177
4	402	TILE	BOND?					FRAG		1	114
6	601	TILE						FRAGS GRY FAB THICKISH		2	103
6	601	TILE						LUMPS ABR		2	75
6	608	TILE						FLAKES		2	10
6	608	**STONE**						LUMP		1	81
6	614	TILE						ABR THICKISH FRAG		1	188
6	605	TILE	TEG?					THICKISH FRAG		1	398
6	605	TILE	TEG?					THICKISH FRAG		1	337
6	605	TILE	TEG?					THICKISH FRAG		1	220
6	606	TILE	TEG?		1			THICKISH;BURNT		5	676
6	606	TILE	BOND?					THICK FRAG		1	361
6	606	TILE	TEG?					FRAG		1	41
6	606	TILE						ABR FRAG		1	66
7	701	TILE						ABR FRAG		1	98
7	701	TILE						CREAMISH FRAG		1	26
7	702	TILE						FLAKE STREAKY FAB		1	6
9	901	TILE						FRAG ?RO		1	20
2	201	TILE						FRAG/FLAKES POSTRO		1	62
										41	3519

Greetwell Quarry, GWQ97

Environmental Archaeology Assessment James Rackham

Introduction

Eight soil samples were collected from Iron Age and Roman features revealed during the evaluation of the quarry extension at Greetwell (Table 1). Six of these were taken from ditch fills and in addition a possible natural feature and a late Roman, possibly industrial, pit were sampled. A small quantity of animal bone was recovered during the excavation and submitted for assessment.

These samples have been assessed and the results used to suggest the lines of enquiry which might warrant sampling and collection during further archaeological work at the site.

Table 1: List of soil samples collected

sample	context	cut	vol in l.	weight in kg.	description	date	sample type
2	1404	1403	9	9	primary fill of triple ditch?	mid-late Iron Age	flotation
3	1407	1406	9	11	fill, possible natural feature?	?IA	flotation
4	1411	1412	10	12	fill central ditch of triple ditch system	undated-probably IA	flotation
5	1418	1419	10	12.5	upper fill from outer ditch of triple ditch	Late IA	flotation
6	1418	1419	9	12	as above, lower fill	Late IA	flotation
7	1002	1003	9	11	primary fill of possible pre-Roman feature	Late IA, poss. early Roman	flotation
8	404	405	8	11	primary fill of ring ditch	Roman ring ditch	flotation
9	605	610	27	31	upper fill of pit	3/4th cent. AD	flotation

Methods

The animal bone collected during excavation was catalogued using the Environmental Archaeology Consultancy recording procedures (see Appendix 1), but no analysis has been carried out owing to the small size of the sample. Identifications were made by comparison to modern reference skeletons in the author's collection.

The soil samples were processed in the following manner. Sample volume and weight was measured prior to processing. The samples were washed in a 'Siraf' tank (Williams 1973) using a flotation sieve with a 0.5mm mesh and an internal wet-sieve of 1mm mesh for the residue. Both residue and float were dried, and the residue of sample 9 (Table 1) subsequently re-floated to ensure the efficient recovery of charred material. This was not carried out for the other samples which contained very little or no charred remains. The dry volume of the flots was measured, and the volume and weight of the residue recorded. A total of 91 litres of soil was processed in this way.

The residue was sorted by eye, and environmental and archaeological finds picked out, noted on the assessment sheet and bagged independently. A magnet was run through each residue in order to recover magnetised material such as hammerscale and prill. The residue was then discarded. The float of each sample was studied under a low power binocular microscope. The

presence of environmental finds (ie snails, charcoal, carbonised seeds, bones etc) was noted and their abundance and species diversity recorded on the assessment sheet. The float was then bagged. The float and finds from the sorted residue constitute the material archive of the samples.

The individual components of the samples were then preliminarily identified and the results are detailed below in Tables 2 and 3.

Results

Samples

The ditch fills were generally very poor in archaeological material and included little or no charred material, bone, pottery or other archaeological debris. A few fragments of pottery and bone were found in 1404, which also produced fire-cracked stone, but the other ditch fills were largely devoid of archaeological debris (Table 2). The only context that produced any 'rubbish' was the late Roman pit fill, context 605, where charcoal, charred cereals, chaff, bone, fired clay, pottery, hob nails and a couple of flakes of hammerscale were recovered. This was the only sample with more than one or two small fragments of charcoal and the flot, unlike the other samples which were composed almost entirely of snails, was mainly charred material (Table 3). Wheat, barley, pea/bean and straw were identified among the charred material in 605.

Table 2: Finds from the soil samples

sample	context	flot vol. in mls	pot wt. in g.	finds	bone wt in g.	comments
2	1404	15	15		1	fire-cracked stone; many small frags pottery-prob from one vessel
3	1407	5		tiny frag building material		
4	1411	15				
5	1418	8			<1	
6	1418	8			<1	residue includes 2 pebbles
7	1002	2				
8	404	2		few tiny frags brick/tile	7	
9	605	20	28	2 hobnails; 2 flakes h'scale; fired clay; stone	21	many pieces of fired tempered clay; 13 sherds pottery

Poor preservation is clearly a factor at the site. There was no survival of preserved organic remains in the samples and the animal bone was in general badly preserved. The most abundant and well preserved element of the environmental evidence are the snails (Table 3). These were abundant in most of the samples and showed a reasonable level of diversity. Although no quantification was made during the assessment it is clear that some of the assemblages recovered from the different samples varied appreciably. Species of grassland habitat, such as *Vallonia* sp., *Pupilla muscorum*, and *Vertigo pygmaea* are common; *Punctum pygmaeum*, *Hygromia hispida*, *Helicigona lapicida*, species of *Clausilia*, *Helix*, *Retinella*, *Oxychilus*, *Acanthinula*, *Cochlicopa*, *Vitrea*, *Truncatellina* and *Helicella* occur in a number of samples; *Carychium* sp were particularly common in some of the ditch samples and with *Discus rotundatus*, frequent in one sample, these suggest woodland or shaded habitats (Evans, 1972). Aquatic species were only present in ditch 1412, although a single planorbid shell was present in the late Roman pit fill.

The upper and lower fills of the Late Iron Age ditch 1419 were sampled to establish that snails occurred throughout the fills. The upper fills (sample 5) were dominated by *Vallonia* sp. with *Vertigo pygmaea* common, a typically grassland group, while the lower fill (sample 6) is dominated by *Carychium tridentatum*, a shade loving species. This suggests changes in the local environment and indicates that the mollusc evidence should be suitable for studying these changes.

Table 3: Environmental finds from the samples

sample	cont.	charcoal *	carbonised cereal *	chaff *	bone finds	snails * abundance	snails # diversity	comments
2	1404				sheep tooth	2	3	tooth enamel only-very poor bone preservation
3	1407		1			3	3	
4	1411	1				4	3	
5	1418				indet.	3	3	
6	1418				indet.	3	3	
7	1002					2	2	
8	404				indet. one or two burnt	2	2	bone poorly preserved
9	605	3	3	2	sheep tooth;juv pig; indet; small mammal	2	2	possibly a few charred weed seeds; preservation of charred material poor; pea/bean & straw present

* frequency of items: 1=1-10; 2= 11-100; 3=101-250; 4=251-500; 5=>500
# diversity of molluscs as follows: 1=1-3; 2=4-10; 3=11-25; 4=26-50 taxa.

Animal Bone

Animal bone was recovered from a number of contexts. The preservation of this category of find was variable across the site (Table 4) and this was assessed by categorising each fragment to a specific preservation condition (Table 4). In most contexts preservation was poor, with some being very poor, but in the late Roman pit fill, contexts 605, 606, 607 and 608, the bone was better preserved, although still showing evidence of root etching. The bones in trench 7, 10 and 14 were in very poor condition, a pattern substantiated by the finds of enamel only and very poorly preserved fragments from the soil samples from trench 14. In these contexts much of the original assemblage may have been lost, and many of the remaining fragments may not be identifiable.

The poor condition of the bone, despite the calcareous nature of the soil is probably due to solution of the mineral element in the bone tissue as a result of the leaching processes in the soil. The archaeologically rich context, 605, which had probably contained much more organic material, finer sediments and ash will have reduced the leaching effect leading to damage through root etching rather than solution of the bone. A time factor may also apply, in that middle Iron Age deposits, several hundred years older than the late Roman context, will have suffered a longer period of leaching and may therefore be in poorer condition; and variation in the soils across the site may have influenced bone survival.

The bone assemblage included finds of cattle (50 fragments), horse (12), sheep (or goat) (14), dog (2) and one pig bone, with 78 cattle size fragments, 14 sheep sized and 27 indeterminate. The catalogue of this material is attached (Appendix 1). There was evidence of dog gnawing but little for butchery and a few fragments were measureable and permitted an estimate of age at death.

Table 4. Number of bone fragments in different preservational categories from each context

Context	1	2	3	4	5
302			1		
305			1	1	
324			1		
401			12	2	
402			30	4	
403			14	2	
404			21		
503			2		
605			9	23	1
606				27	
607			1	10	
608				4	
616		1	1		
623		9	1		
702		4			
703			8		
704		3			
1002		3			
1402		1			
1418		2			

(1= tooth enamel only preserved; 2=very degraded corroded bone with little or no intact surface and considerable loss of bone; 3=serious surface etching and mineral loss;4=bone surface intact with only minimal etching and very little mineral loss; 5= bone in very good condition, no etching, no apparent mineral loss.)

Recommendations

The evidence from the evaluation suggests that if contexts are not archaeologically rich then preservation of animal bone will probably be poor. The condition of the bone is sufficiently bad for any assemblage collected from such contexts to have been affected by a preservational bias which would make it unlikely that it could contribute much more than species presence and animal size to the analysis and interpretation of the site economy. In contrast the finds from archaeologically rich 'occupation' or 'rubbish' deposits may not be so severely effected and any bias is likely to be much smaller or minimal. It will be necessary to do a detailed taphonomic and preservational analysis on any assemblages collected to establish their reliability for the economic interpretation of the site.

The dearth of charcoal and other charred remains from all but the late Roman pit, 605, suggests that sampling for evidence related to the agricultural economy of the site should probably be limited to contexts filled with darker sediments and containing visible pottery, bone or charcoal. In these contexts the charred remains should indicate whether crop processing activities or merely consumption was taking place at the site, and the range of crops grown.

The most ubiquitous remains from the site are the snails. The abundance and diversity of this group of finds indicates that they have good potential for assessing local environmental conditions at the site. The upper and lower fills of ditch 1419 both contained reasonable numbers of snails such that the larger ditches should yield a good sequence of samples for studying palaeo-environmental changes. If sampling is linked to a sequence of fills of the major ditches for each of the main phases of occupation at the site, and located where there is little

or no archaeological debris in the fills, then the mollusc data should permit interpretation in terms of general environmental changes such as between woodland, grassland and arable at the site.

The soils at the site have clearly limited the site potential and the main targets that could be expected to be addressed concern palaeoenvironmental changes through snail analysis; evidence of crops, processing activities, associated weed floras and possibly other food species through study of the charred remains; and the animal husbandry and food economy through analysis of the faunal assemblages from the better preserved contexts. Identification of any industrial activity at the site would accrue from the sample processing with no need for independent sampling.

Acknowledgments

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APPENDIX 1

ARCHIVE CATALOGUE OF ANIMAL BONE FROM

GREETWELL QUARRY - GWQ97
LCCM 273.97

D.James Rackham
The Environmental Archaeology Consultancy

28 January 1998

29/01/98

THE ENVIRONMENTAL ARCHAEOLOGY CONSULTANCY

Key to codes used in the cataloguing of animal bones

SPECIES

BOS	cattle
CSZ	cattle size
SUS	pig
OVCA	sheep or goat
OVI	sheep
SSZ	sheep size
EQU	horse
CER	red deer
CAN	dog
MAN	human
UNI	unknown
CHIK	chicken
GOOS	goose, dom
LEP	hare
UNB	indet bird
MALL	duck, dom.
GULL	gull sp.
FISH	fish
UNIB	bird indet
UNIF	fish indet
GSZE	goose size
BEAV	beaver
CORV	crow or rook
BUZZ	buzzard

BONE

SKL	skull
TEMP	temporal
FRNT	frontal
PET	petrous
PAR	parietal
OCIP	occipital
ZYG	zygomatic
MAN	mandible
MAX	maxilla
ATL	atlas
AXI	axis
CEV	cervical vertebra
TRV	thoracic vertebra
LMV	lumbar vertebra
SAC	sacrum
CDV	caudal vertebra
SCP	scapula
HUM	humerus
RAD	radius
MTC	metacarpus
MC1-4	metacarpus 1-4
INN	innominate
ILM	ilium
PUB	pubis
ISH	ischium
FEM	femur
TIB	tibia
AST	astragalus
CAL	calcaneum
MTT	metatarsus
MT1-4	metatarsus 1-4
PH1	1st phalanx
PH2	2nd phalanx
PH3	3rd phalanx
LM1-LM3	Lower molar 1 - molar 3
UM1-UM3	upper molar 1 - molar 3
LPM1-LPM4	lower premolar 1-4
UPM1-UPM4	upper premolar 1-4
DLPM1-4	deciduous lower premolar 1-4
DUPM1-4	deciduous upper premolar 1-4
MNT	mandibular tooth
MXT	maxillary tooth
LBF	long bone
UNI	unidentified
STN	sternum
INC	incisor
TTH	indet. tooth
CMP	carpo-metacarpus

SIDE

W - whole
L - left side
R - right side
F - fragment

FUSION

Records the fused/unfused condition of the epiphyses
P - proximal; D - distal; E - acetabulum;
N - unfused; F - fused; C - cranial; A - posterior

TOOTH WEAR - Codes are those used in Grant, A. 1982 The use of tooth wear as a guide to the age of domestic animals, in B.Wilson, C.Grigson and S.Payne (eds) *Ageing and sexing animal bones from Archaeological sites, 91-108.*

Teeth are labelled as follows in the tooth wear column:

h ldpm4/dupm4	f ldpm2/dupm2
H lpm4/upm4	g ldpm3/dupm3
I lm1/um1	
J lm2/um2	
K lm3/um3	

ZONES - zones record the part of the bone present.
The key to each zone on each bone is on page 2

MEASUREMENTS - Any measurements are those listed in A.Von den Driesch (1976) *A Guide to the Measurement of Animal Bones from Archaeological Sites*, Peabody Museum Bulletin 1, Peabody Museum, Harvard, USA

29/01/98

ZONES - codes used to define zones on each bone

SKULL - 1. paraoccipital process
2. occipal condyle
3. intercornual protuberance
4. external acoustic meatus
5. frontal sinus
6. ectorbitale
7. entorbitale
8. temporal articular facet
9. facial tuber
0. infraorbital foramen

MANDIBLE
1. Symphyseal surface
2. diastema
3. lateral diastemal foramen
4. coronoid process
5. condylar process
6. angle
7. anterior dorsal acsending ramus posterior M3
8. mandibular foramen

VERTEBRA
1. spine
2. anterior epiphysis
3. posterior epiphysis
4. centrum
5. neural arch

SCAPULA
1. supraglenoid tubercle
2. glenoid cavity
3. origin of the distal spine
4. tuber of spine
5. posterior of neck with foramen
6. cranial angle of blade
7. caudal angle of blade

HUMERUS
1. head
2. greater tubercle
3. lesser tubercle
4. intertuberal groove
5. deltoid tuberosity
6. dorsal angle of olecranon fossa
7. capitulum
8. trochlea

RADIUS
1. medial half of proximal epiphysis
2. lateral half of proximal epiphysis
3. posterior proximal ulna scar and foramen
4. medial half of distal epiphysis
5. lateral half of distal epiphysis
6. distal shaft immediately above distal epiphysis

ULNA
1. olecranon tuberosity
2. trochlear notch- semilunaris
3. lateral coronoid process
4. distal epiphysis

METACARPUS -
1. medial facet of proximal artciulation, MC3
2. lateral facet of proximal articulation, MC4
3. medial distal condyle, MC3
4. lateral distal condyle, MC4
5. anterior distal groove and foramen
6. medial or lateral distal condyle

FIRST PHALANX
1. proximal epiphysis
2. distal articular facet

INNOMINATE
1. tuber coxae
2. tuber sacrale + scar
3. body of illium with dorso-medial foramen
4. iliopubic eminence
5. acetabular fossa
6. symphyseal branch of pubis
7. body of ischium
8. ischial tuberosity
9. depression for medial tendon of rectus femoris

FEMUR
1. head
2. trochanter major
3. trochanter minor
4. supracondyloid fossa
5. distal medial condyle
6. lateral distal condyle
7. distal trochlea
8. trochanter tertius

TIBIA
1. proximal medial condyle
2. proximal lateral condyle
3. intercondylar eminence
4. proximal posterior nutrient foramen
5. medial malleolus
6. lateral aspect of distal articulation
7. distal pre-epiphyseal portion of the diaphysis

CALCANEUM
1. calcaneal tuber
2. sustentaculum tali
3. processus anterior

METATARSUS
1. medial facet of proximal artciulation, MT3.
2. lateral facet of proximal articulation, MT4
3. medial distal condyle, MT3
4. lateral distal condyle, MT4
5. anterior distal groove and foramen
6. medial or lateral distal condyle

Archive Catalogue of Animal Bone from Greetwell Quarry, GWQ97

site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	comment	preserv -ation
GWQ97	302	SSZ	LBF	1	F							SHAFT FRAG	3
GWQ97	305	BOS	HC	1	F							BASAL FRAG CORE	4
GWQ97	305	OVCA	TIB	1	L		4					MIDSHAFT	3
GWQ97	324	OVCA	RAD	1	L		4					PROX SHAFT FRAG	3
GWQ97	401	BOS	LM2	1	L					J15			4
GWQ97	401	CSZ	LBF	5	F							SHAFT FRAG	3
GWQ97	401	CSZ	LBF	1	F							SHAFT FRAG	3
GWQ97	401	CSZ	RIB	3	F							SPLIT SHAFT FRAG	3
GWQ97	401	OVCA	LM2	1	R					J11			4
GWQ97	401	UNI	UNI	3	F							INDET	3
GWQ97	402	BOS	FEM	1	R		34		DG			SHAFT-BOTH ENDS CHEWED	3
GWQ97	402	BOS	LI	2	W							WELL WORN-SAME JAW-HEAVY WEAR ON MEDIAL EDGE	4
GWQ97	402	BOS	MTP	1	F							DISTAL SHAFT FRAG- 2 PIECES	4
GWQ97	402	BOS	MTT	1	F							PROX POST SHAFT FRAG	3
GWQ97	402	BOS	PH1	1	L	PF	12					BROKEN	3
GWQ97	402	BOS	RAD	1	F	PF	1					SPLIT FRAG PROX END	3
GWQ97	402	BOS	SKL	1	R		2					OCCIPITAL CONDYLE-2 PIECES	3
GWQ97	402	BOS	TIB	1	R	DF	567				Bd-53 Dd-37.1	DISTAL END	3
GWQ97	402	BOS	ULN	1	R	PN	23					PROX HALF-EPI LOST	3
GWQ97	402	CSZ	LBF	4	F							SHAFT FRAG	3
GWQ97	402	CSZ	LMV	1	F		5					BASE SPINE-NEURAL ARCH	3
GWQ97	402	CSZ	RIB	6	F							SHAFT FRAG	3
GWQ97	402	CSZ	TRV	1	F							BASE SPINE	3
GWQ97	402	CSZ	TRV	2	F							SPINE FRAGS	3
GWQ97	402	CSZ	UNI	3	F							INDET	3
GWQ97	402	CSZ	VER	1	F	CFAN	4					CENTRUM	3
GWQ97	402	EQU	UI	1	W							WELL WORN	4

site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	comment	preserv -ation
GWQ97	402	OVCA	TIB	1	L		47					SHAFT-GRACILE	3
GWQ97	402	OVCA	TIB	1	R		7					DISTAL HALF SHAFT- 2 PIECES	3
GWQ97	402	SSZ	LBF	2	F							SHAFT FRAG	3
GWQ97	403	BOS	FEM	1	L	PF	14					PROX END AND SHAFT-EPI BROKEN	3
GWQ97	403	BOS	MAN	1	R							ANT FRAG HORI RAMUS WITH PM2 ALVEOLUS	3
GWQ97	403	CSZ	LBF	2	F							SHAFT FRAG	4
GWQ97	403	CSZ	SCP	1	F							MARGIN-3 PIECES	3
GWQ97	403	CSZ	UNI	1	F							INDET	3
GWQ97	403	CSZ	UNI	6	F							SHAFT FRAG	3
GWQ97	403	EQU	RAD	1	R	DF						FRAG DISTAL END	3
GWQ97	403	SSZ	TIB	1	R							ANT PROX SHAFT FRAG	3
GWQ97	403	UNI	UNI	2	F							INDET	3
GWQ97	404	BOS	MAN	1	F							LATERAL FRAG HORI RAMUS	3
GWQ97	404	CSZ	CEV	1	F							ZYGAPOPHYSIS	3
GWQ97	404	CSZ	LBF	2	F							SHAFT FRAG	3
GWQ97	404	CSZ	MAN	1	F							FRAG HORI RAMUS	3
GWQ97	404	CSZ	MAX	2	F							LATERAL FRAG	3
GWQ97	404	CSZ	RIB	9	F							SHAFT FRAG	3
GWQ97	404	CSZ	UNI	1	F							INDET	3
GWQ97	404	CSZ	VER	1	F							FRAG	3
GWQ97	404	SSZ	LBF	1	F							SHAFT FRAG	3
GWQ97	404	SSZ	SKL	1	F							INDET	3
GWQ97	404	UNI	UNI	1	F							INDET	3
GWQ97	503	BOS	ULN	1	L		3					SHAFT FRAG DIST TO PROX ARTIC	3
GWQ97	503	EQU	RAD	1	L	PFDF	123456				GL-298 SD-29 Bd-62.3	COMPLETE-GRACILE	3
GWQ97	605	BOS	AXI	1	F							ANT VENTRAL FRAG CENTRUM	4
GWQ97	605	BOS	FEM	1	R		4		DG			DISTAL HALF SHAFT-DIST CHEWED	4

site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	comment	preserv -ation
GWQ97	605	BOS	LM2	1	L					J7		ANT CUSP	4
GWQ97	605	BOS	LMV	1	F	CNAN	45					CENTRUM AND ARCH	4
GWQ97	605	BOS	LMV	1	F	CNAN	45					CENTRUM AND ARCH	3
GWQ97	605	BOS	MAN	1	R		12367			gh14I11J4K1		5 PIECES-HORI RAMUS	3
GWQ97	605	BOS	MAN	1	R							POST CENTRAL FRAG HORI RAMUS	4
GWQ97	605	BOS	MTT	1	F							POST SHAFT FRAG	4
GWQ97	605	BOS	SCP	1	F							VENTRAL FRAG CAUDAL MARGIN	4
GWQ97	605	BOS	SCP	1	L							PROX CAUDAL MARGIN	4
GWQ97	605	BOS	SCP	1	F							BLADE FRAG WITH SPINE	4
GWQ97	605	BOS	TIB	1	L	PF	2					FRAG PROX END	3
GWQ97	605	BOS	UM2	1	L					J11			4
GWQ97	605	CSZ	RIB	3	F							SHAFT FRAG	4
GWQ97	605	CSZ	SCP	2	F							BLADE FRAG	3
GWQ97	605	CSZ	TRV	1	F	CN						FRAG ANT CENTRUM	4
GWQ97	605	CSZ	UNI	1	F							INDET	4
GWQ97	605	EQU	AST	1	L		1				L1-55 L2-54 Bd-58.4	COMPLETE-SAME JOINT AS BELOW	4
GWQ97	605	EQU	TAR	2	L		1					SAME JOINT AS ABOVE-PITTING AND SOME BONE GROWTH BETWEEN BUT NOT FUSED	4
GWQ97	605	OVCA	MAN	1	L		23			GH14I16J13K12		IN PIECES-OLD SSHEEP	3
GWQ97	605	OVCA	MAN	1	R					FGH13I16J13		IN PIECES	3
GWQ97	605	OVCA	SCP	1	R							DISTAL HALF BLADE	3
GWQ97	605	SSZ	LBF	2	F				DG			SHAFT FRAG-CHEWED	4
GWQ97	605	SSZ	UNI	3	F							INDET	4
GWQ97	605	UNI	UNI	1	F							INDET	3
GWQ97	606	BOS	FEM	1	F							ANT SHAFT FRAG	4
GWQ97	606	BOS	LMV	1	F	CNAN	45					CENTRUM AND ARCH	4
GWQ97	606	BOS	MAN	1	L		6					POST VENTRAL FRAG	4
GWQ97	606	BOS	PH1	1	R	PF	12					COMPLETE	4

site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	comment	preserv -ation
GWQ97	606	BOS	SKL	1	R							ANT MAX AND PREMAX FRAG	4
GWQ97	606	BOS	UM1	1	R					I16		WELL WORN-POSS M2	4
GWQ97	606	CAN	TIB	1	R		4		DG			PROX SHAFT-SMALL DOG	4
GWQ97	606	CSZ	LBF	1	F							SHAFT FRAG	4
GWQ97	606	CSZ	LMV	1	F							FRAG WITH ZYGA	4
GWQ97	606	CSZ	MAN	1	F							FRAG HORI RAMUS	4
GWQ97	606	CSZ	RIB	1	F							SHAFT FRAG	4
GWQ97	606	CSZ	SCP	1	F							BLADE FRAG	4
GWQ97	606	CSZ	UNI	3	F							INDET	4
GWQ97	606	EQU	CAL	1	R		23		DG			PROX END CHEWED OFF	4
GWQ97	606	EQU	LMV	1	F	CFAF	234					CENTRUM	4
GWQ97	606	EQU	MTC	1	L	DF	123	CH			GL-228 Bp-49.3 SD-31 Bd-46 Dd-36.2 Bp-32.9	COMPLETE- IN 5 PIECES-PROX CHOPPED	4
GWQ97	606	OVCA	MAN	1	R		23			gh17		ANT FRAG RAMUS	4
GWQ97	606	OVCA	TIB	1	L				DG			ANT SHAFT FRAG-PROX CHEWED	4
GWQ97	606	SMA	UNI	1	F							SHAFT-POSS RAD OR FIB?	4
GWQ97	606	SSZ	TIB	1	F							DISTAL SHAFT-POSS PART ABOVE DOG	4
GWQ97	606	SUS	LC	1	F							MALE	4
GWQ97	606	UNI	UNI	3	F							INDET	4
GWQ97	607	BOS	DLP4	1	L					h8			4
GWQ97	607	BOS	FEM	1	L		4		DG			DISTAL SHAFT	4
GWQ97	607	BOS	HC	1	L		1	CH				BASE CORE-UPWARD BACKWARD TWISTING-CORE CHOPPED-2 PIECES-MED	4
GWQ97	607	BOS	MAN	1	L		68					ANGLE	4
GWQ97	607	BOS	SCP	1	R		2					FRAG GLENOID	4
GWQ97	607	BOS	TIB	1	R	DF	567				Bd-54.4 Dd-42	DISTAL END	4
GWQ97	607	CSZ	VER	1	F							FRAG	4
GWQ97	607	OVCA	HUM	1	L		5					PROX SHAFT	4
GWQ97	607	OVCA	LM2	1	L					J10			3

site	context	species	bone	no.	side	fusion	zone	butchery	gnawing	toothwear	measurement	comment	preserv -ation
GWQ97	607	UNI	UNI	1	F							INDET	4
GWQ97	608	BOS	HUM	1	L	DF	67890		DG		BT-65 HT-40.8 SD-29.7	DISTAL END AND SHAFT-PROX CHEWED	4
GWQ97	608	BOS	MAN	1	L		78					ANT FRAG ASC RAMUS	4
GWQ97	608	CSZ	RIB	2	F							SHAFT FRAG-ONE BROKEN	4
GWQ97	616	BOS	TIB	1	L	DF	47					SHAFT- 8 PIECES	3
GWQ97	616	EQU	MTT	1	L	DF	12					NEARLY COMPLETE-VERY FRAGMENTED- 12 PIECES	2
GWQ97	623	CAN	SKL	1	F							FRAG MAXILLA	2
GWQ97	623	EQU	UM	1	L							VERY WORN	3
GWQ97	623	UNI	UNI	8	F							INDET	2
GWQ97	702	CSZ	LBF	4	F							SHAFT FRAG	2
GWQ97	703	BOS	TIB	1	R	DF	5					SPLIT DISTAL END	3
GWQ97	703	BOS	UM2	1	L					J15			3
GWQ97	703	CSZ	LBF	2	F							SHAFT FRAG	3
GWQ97	703	SSZ	LBF	1	F							SHAFT FRAG	3
GWQ97	703	UNI	UNI	3	F							INDET	3
GWQ97	704	BOS	MTC	1	F							PROX SHAFT FRAG-2 PIECES	2
GWQ97	704	UNI	UNI	2	F							INDET	2
GWQ97	1002	BOS	HUM	1	F							POST MIDSHAFT FRAG	2
GWQ97	1002	SSZ	SCP	1	L		2					FRAG GLENOID	2
GWQ97	1002	UNI	UNI	1	F							INDET	2
GWQ97	1402	UNI	UNI	1	F							INDET	2
GWQ97	1418	EQU	HUM	1	L		69					DISTAL HALF SHAFT-GRACILE-SMALL	2
GWQ97	1418	OVCA	RAD	1	F							SHAFT FRAG	2

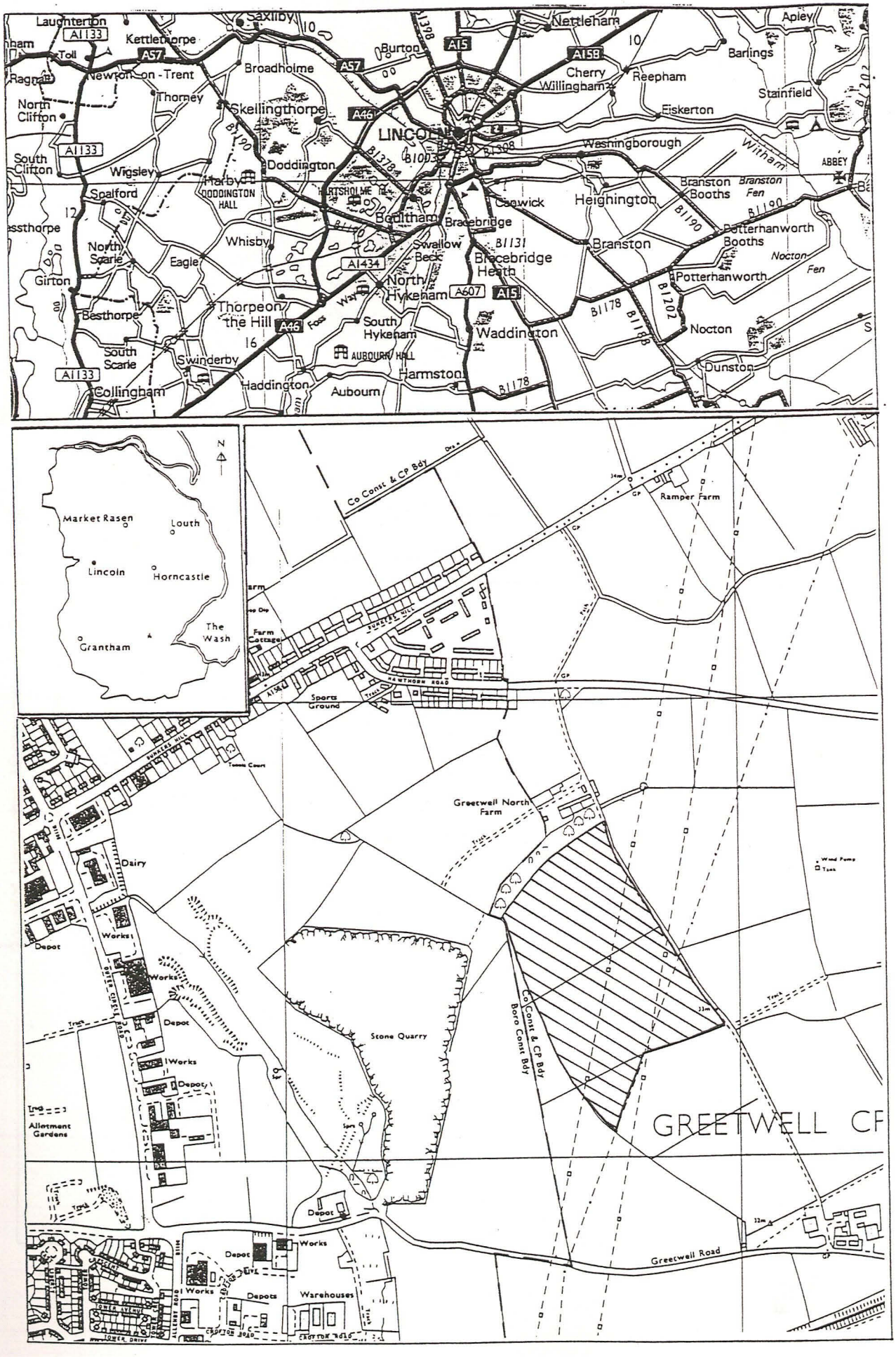


Fig. 1. Location of proposed quarry extension (reduced from 1:10,000 Ordnance Survey Map). Reproduced with permission of the Controller of HMSO. LAS Licence No. AL 50424A.

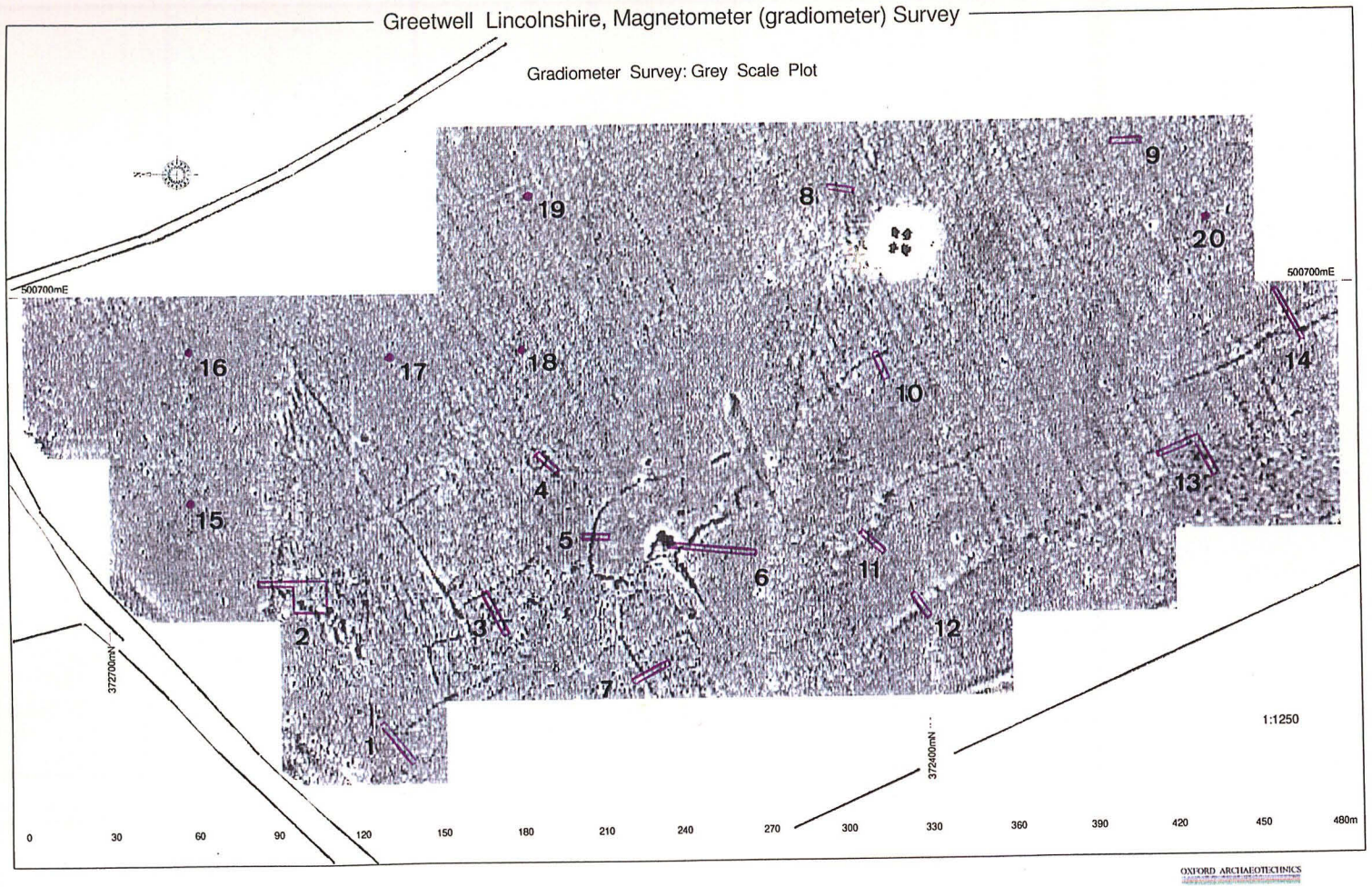
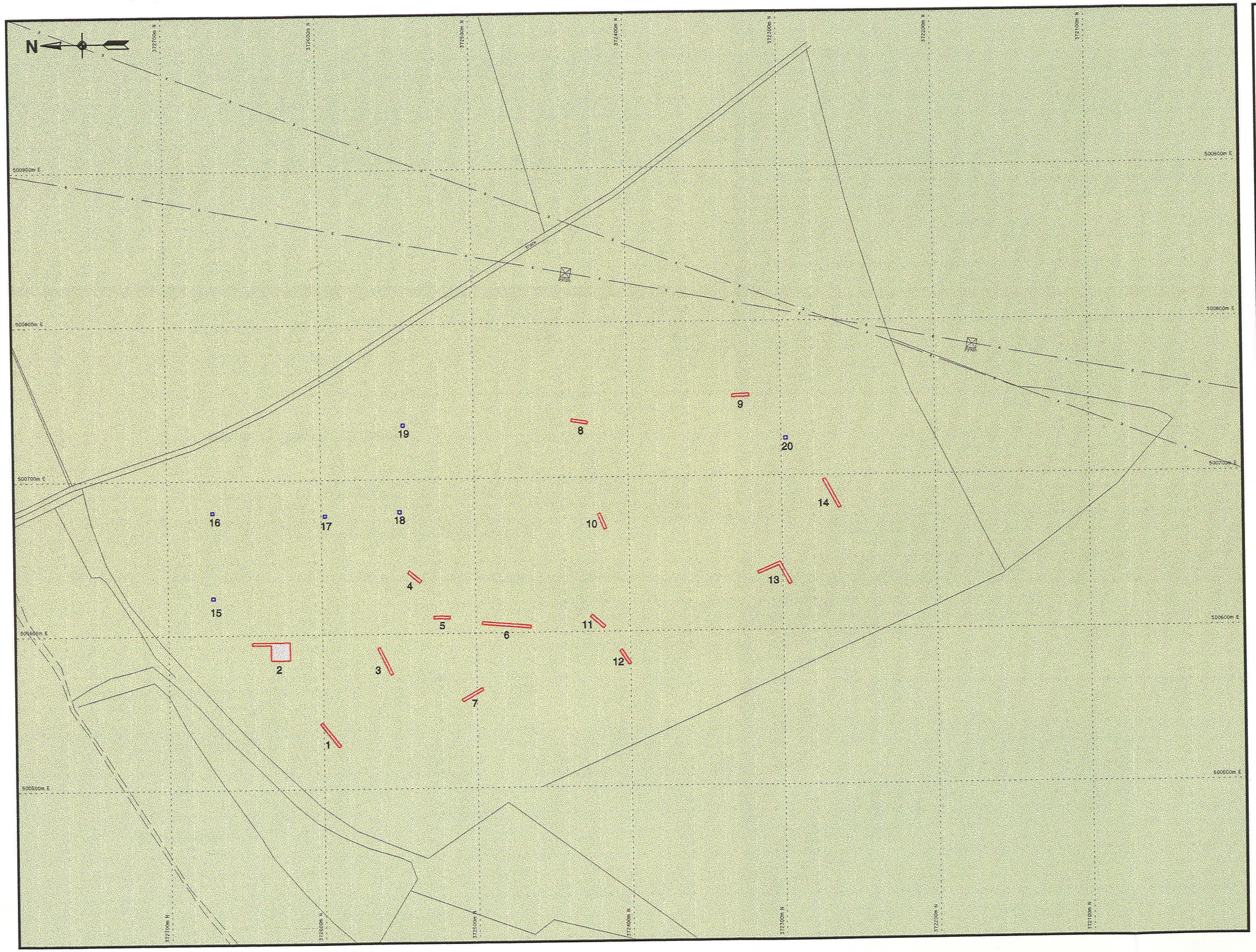


Fig. 2 Gradiometer survey: grey scale plot with superimposed trench locations. Scale 1:2500. Based on plot produced by Oxford Archaeotechnics ©, half original scale.



Notes

Trench location

Test pit location

Site

Land at Greetwell Lincoln

Project

Proposed Quarry Extension

Plan

Fig 3 Trench Locations

Scale : 1/2500 Date : 28/01/98

Plan Ref : LA/MSE/1048-1

LINDSEY ARCHAEOLOGICAL SERVICES
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259 Alfreton Road Blackwell Alfreton Derbyshire DE55 5JN
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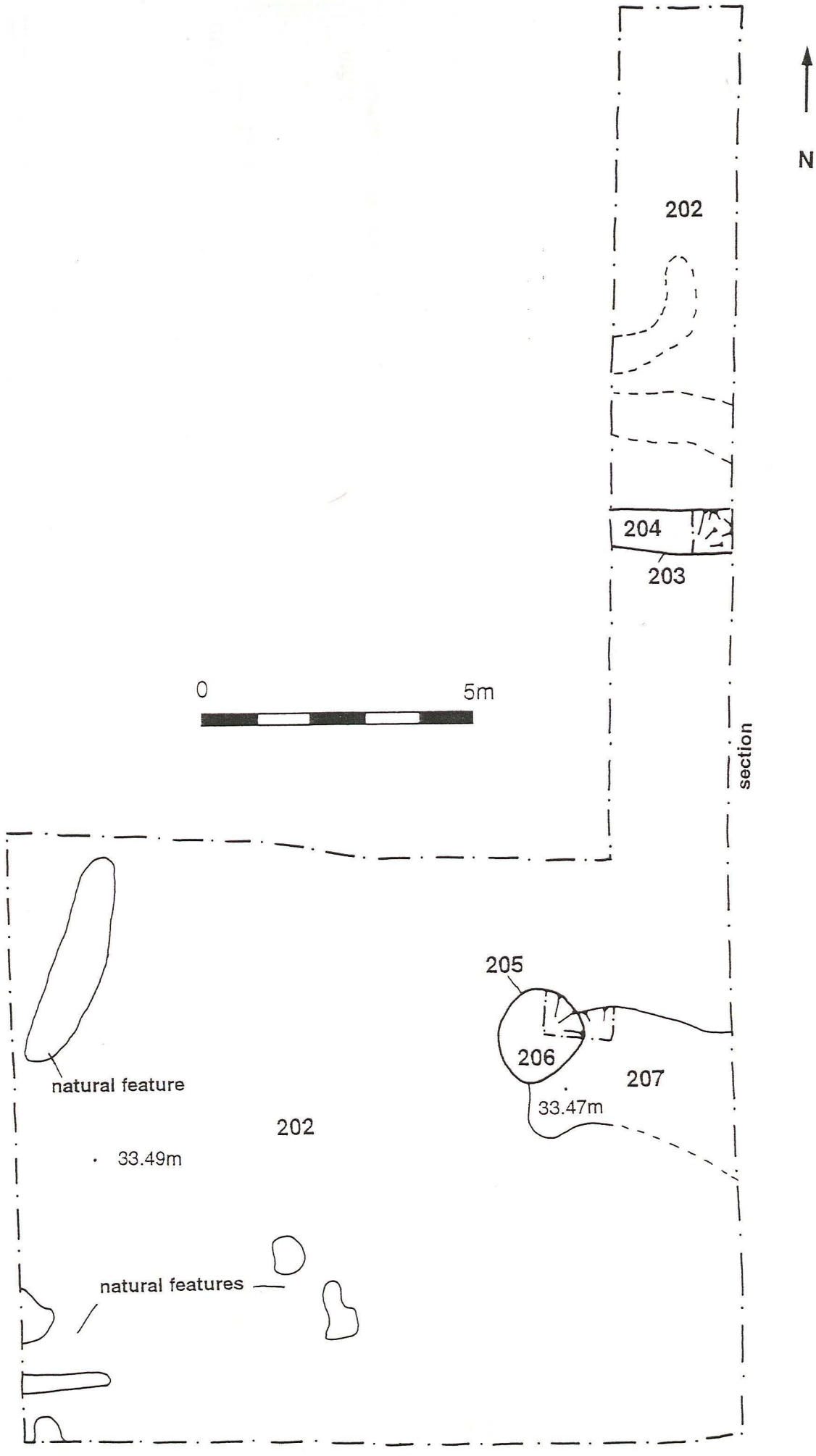


Fig. 4. Plan of Trench 2, drawn by R. J. Armour-Chelu

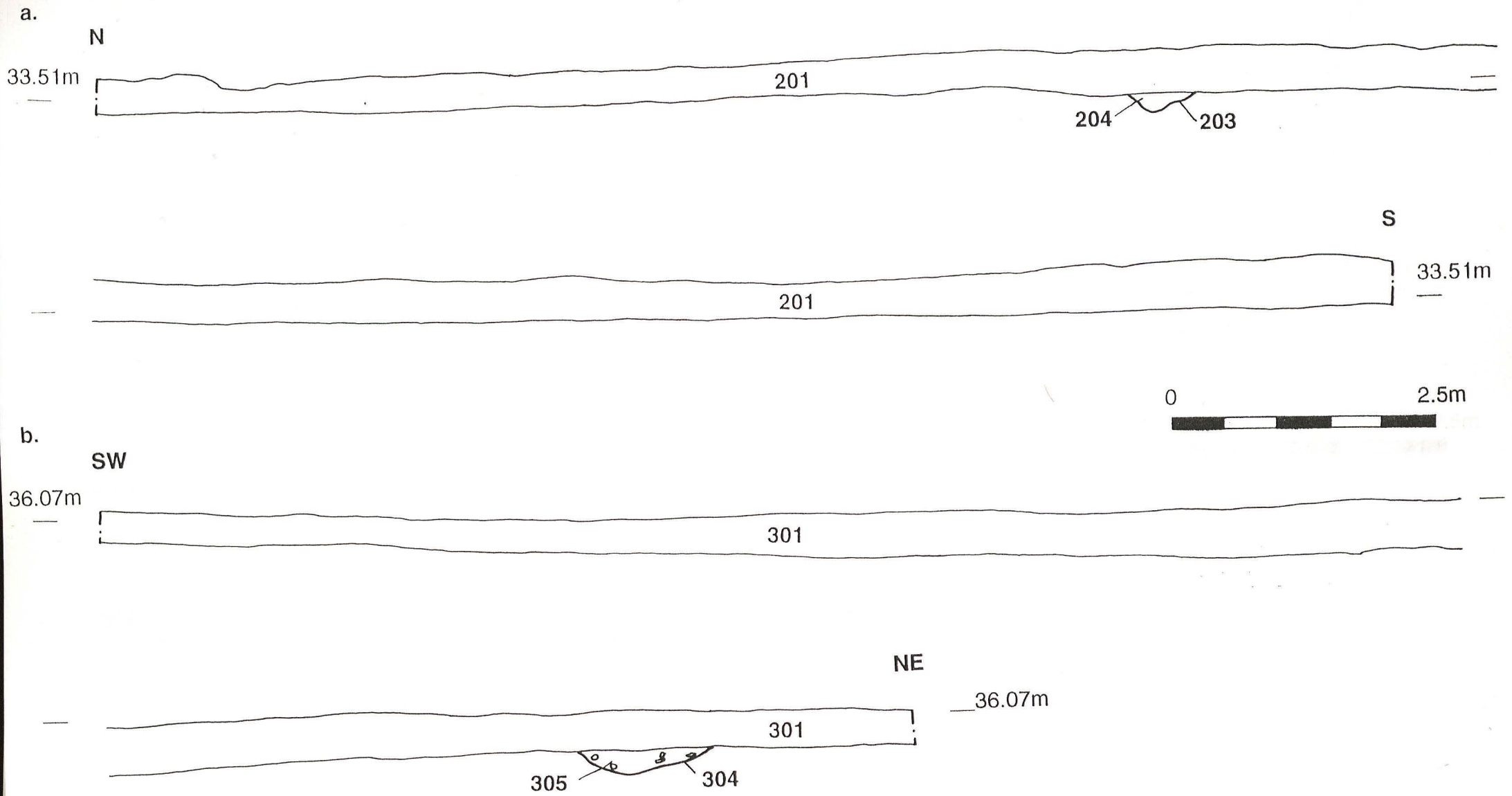


Fig. 5 a. West facing section, Trench 2 b. South-east facing section, Trench 3, drawn by R. J. Armour-Chelu

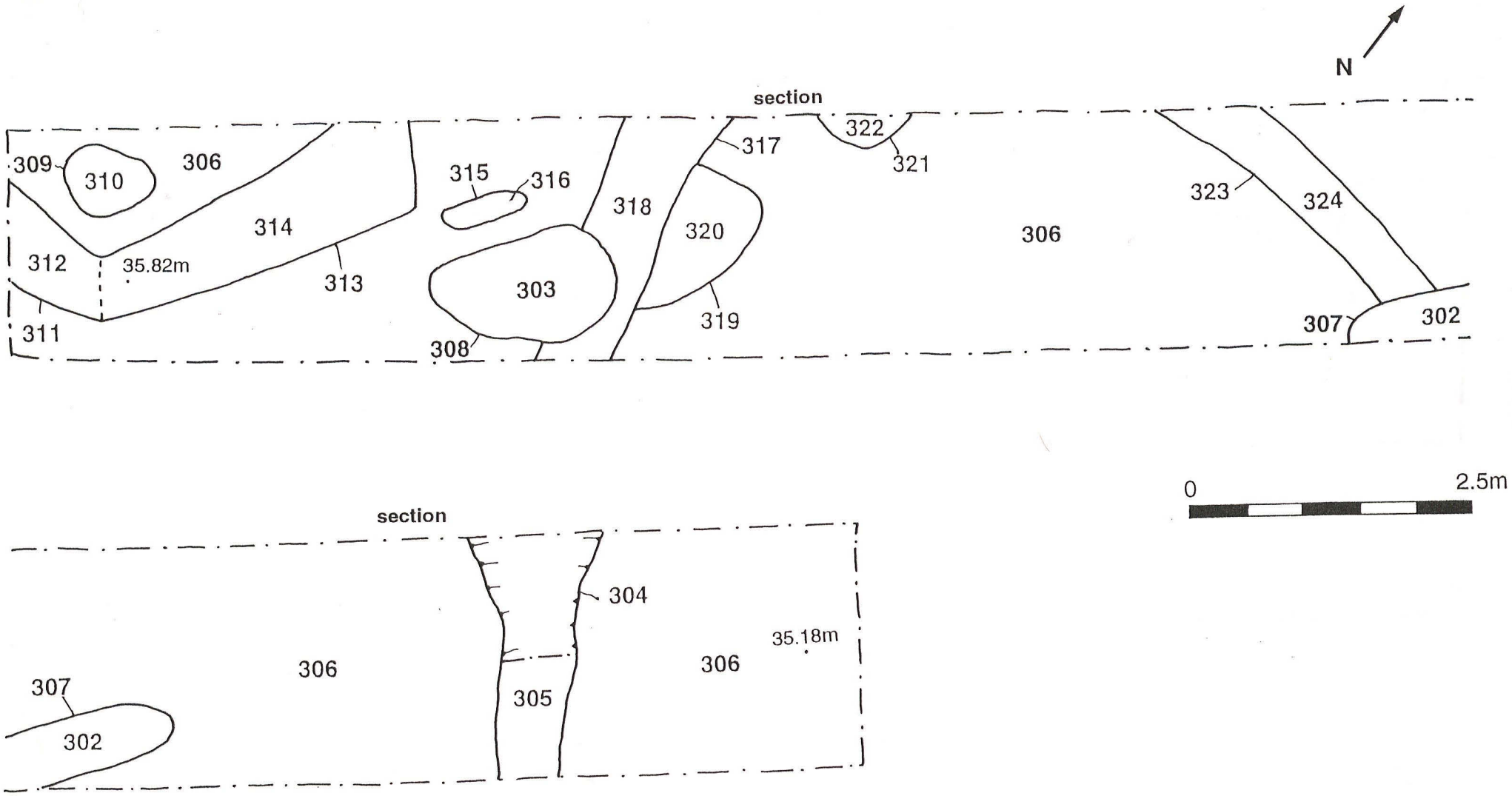


Fig. 6. Plan of Trench 3, drawn by R. J. Armour-Chelu

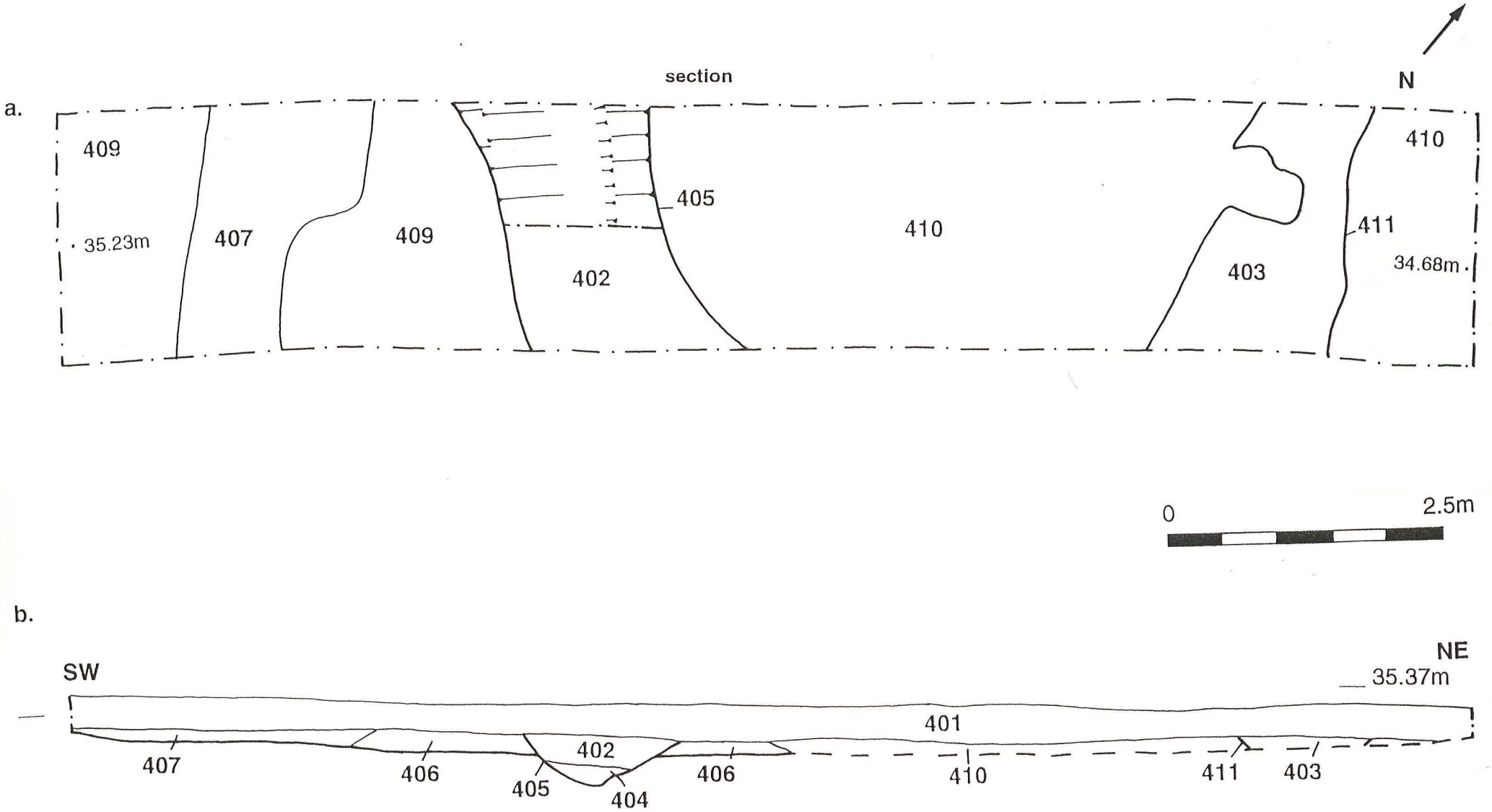


Fig. 7 a. Plan of Trench 4 b. South-east facing section, Trench 4, drawn by R. J. Armour-Chelu

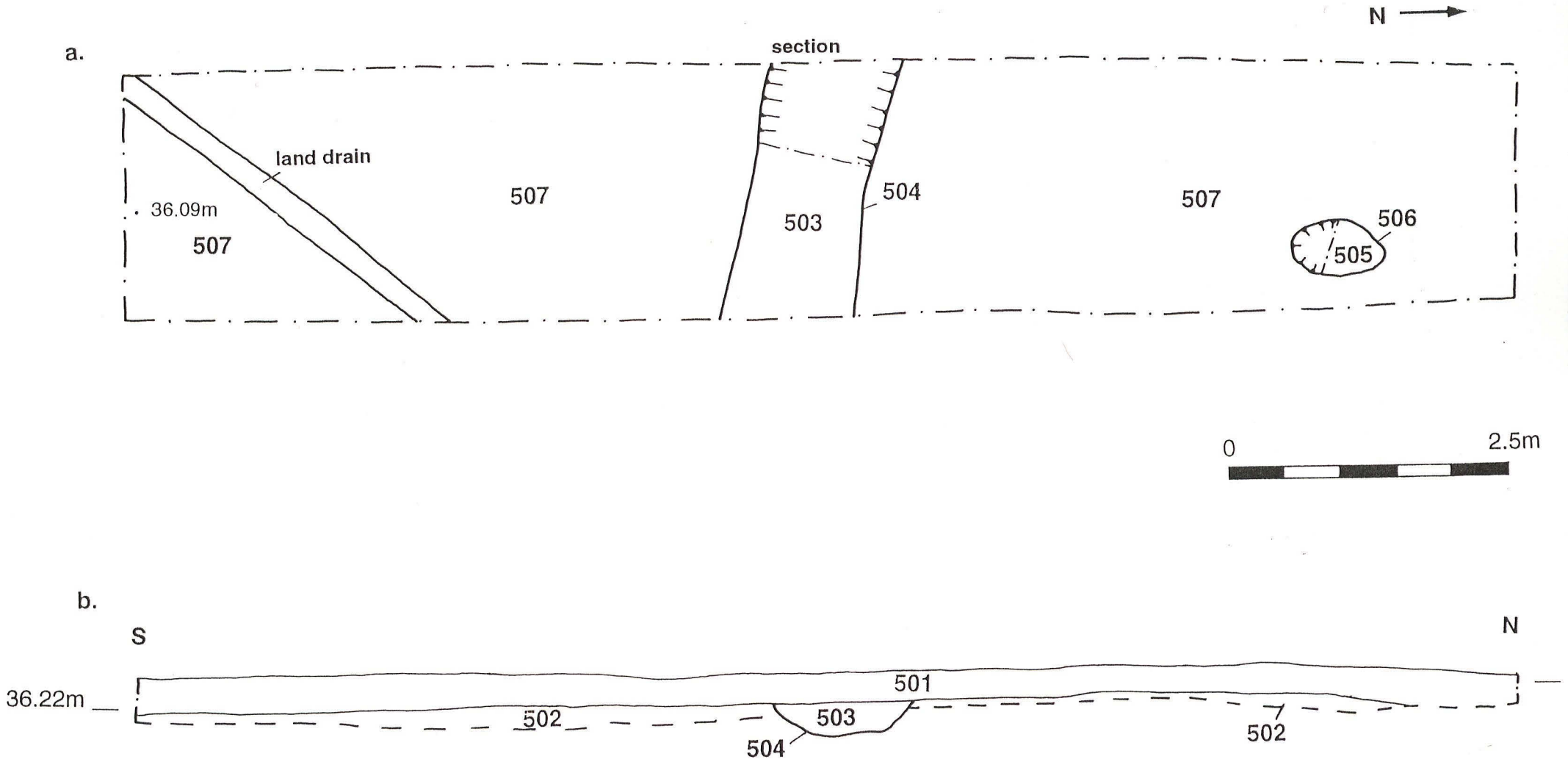
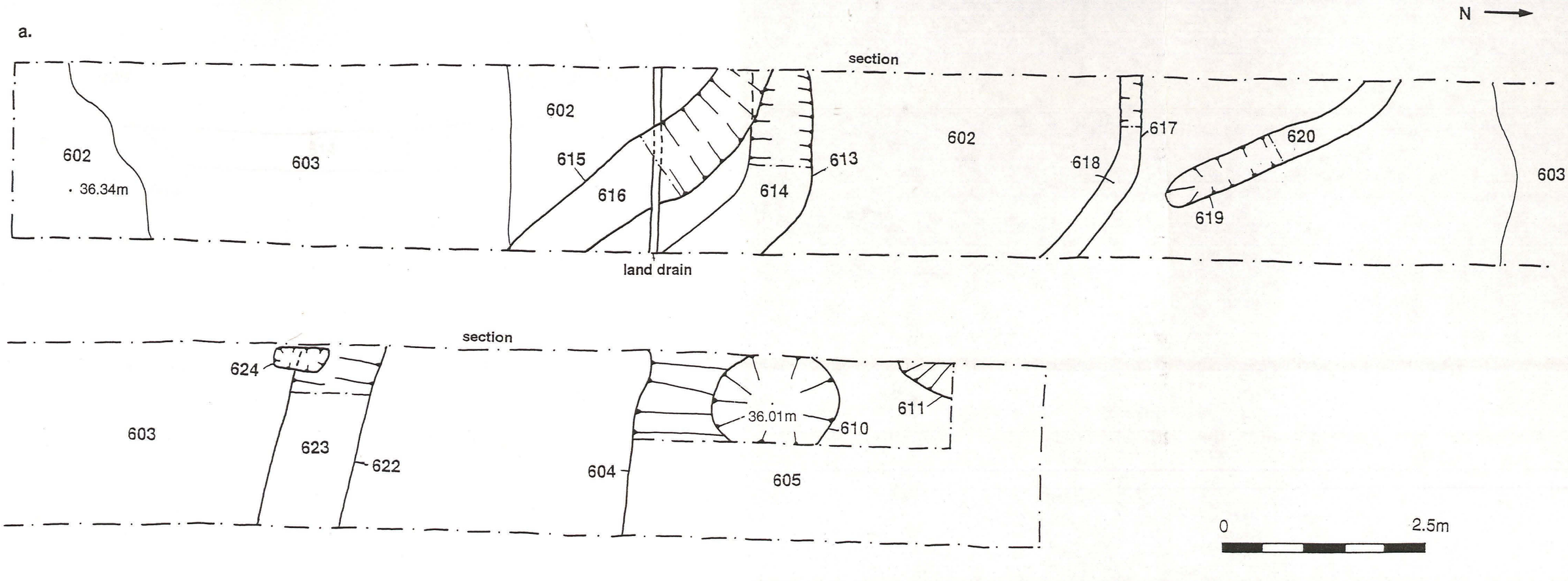


Fig. 8 a. Plan of Trench 5 b. East facing section, Trench 5, drawn by R. J. Armour-Chelu

a.



b.

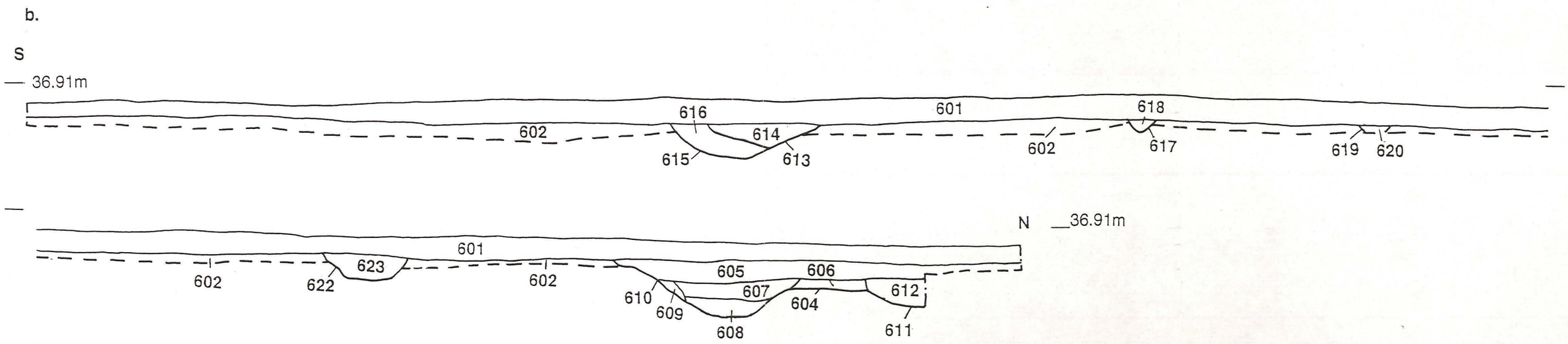


Fig. 9 a. Plan of Trench 6 b. East facing section, Trench 6, drawn by R. J. Armour-Chelu

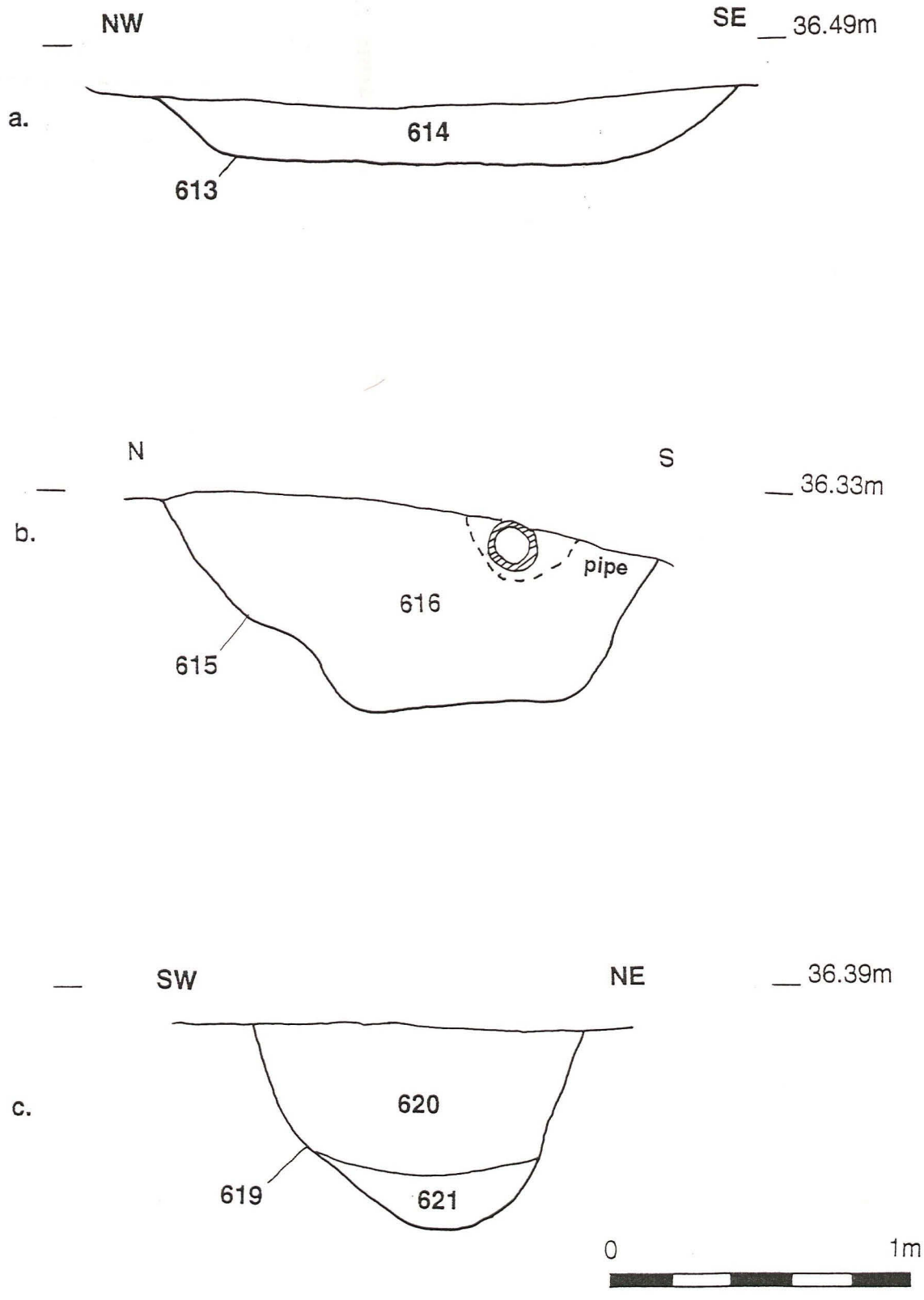


Fig. 10 a. South-west facing section across ditch 613, drawn by R. J. Armour-Chelu
b. West facing section across ditch 615, drawn by R. J. Armour-Chelu
c. South-east facing section across ditch 619, drawn by R. J. Armour-Chelu

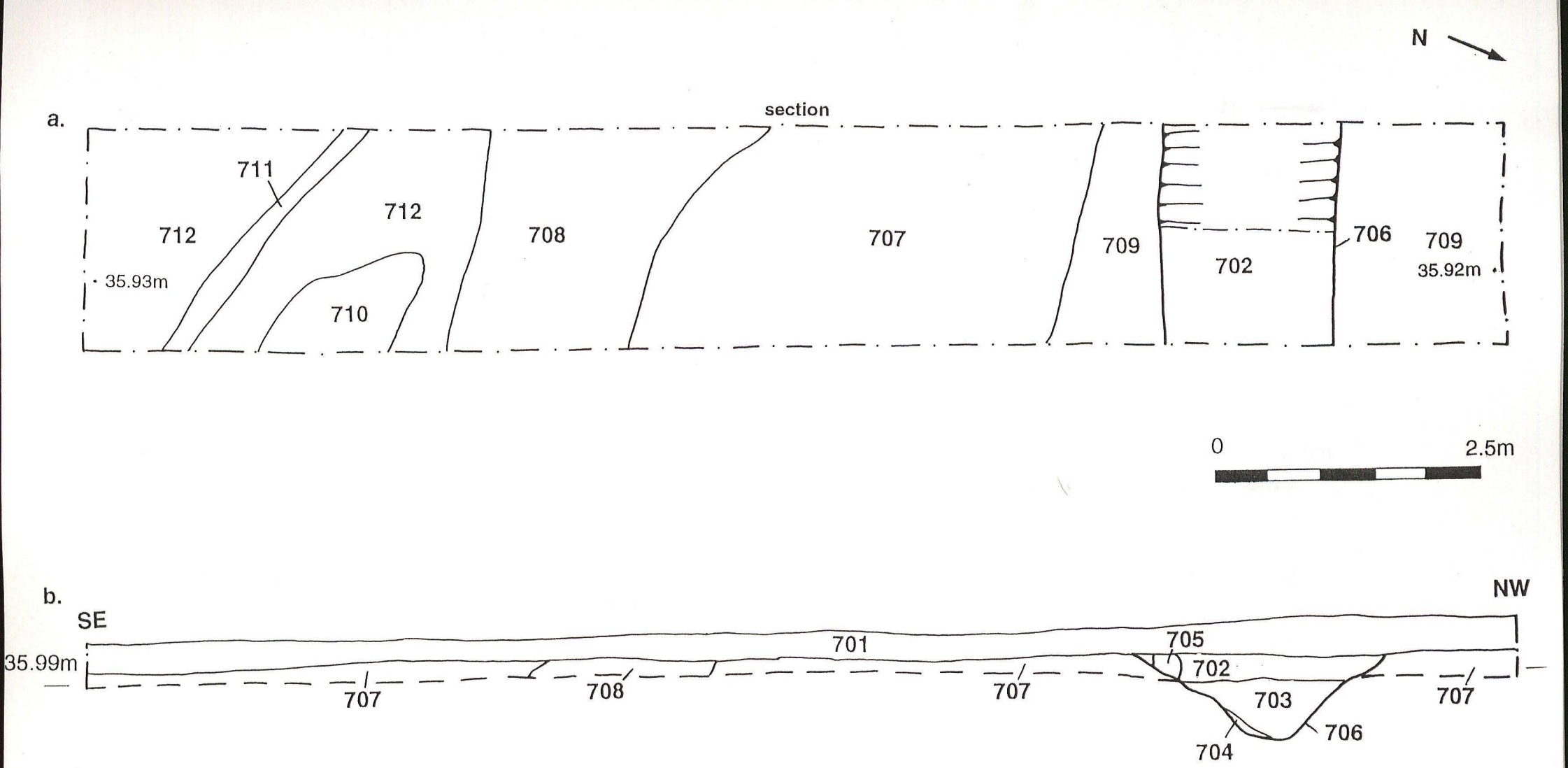


Fig. 11 a. Plan of Trench 7 b. North-east facing section, Trench 7, drawn by R. J. Armour-Chelu

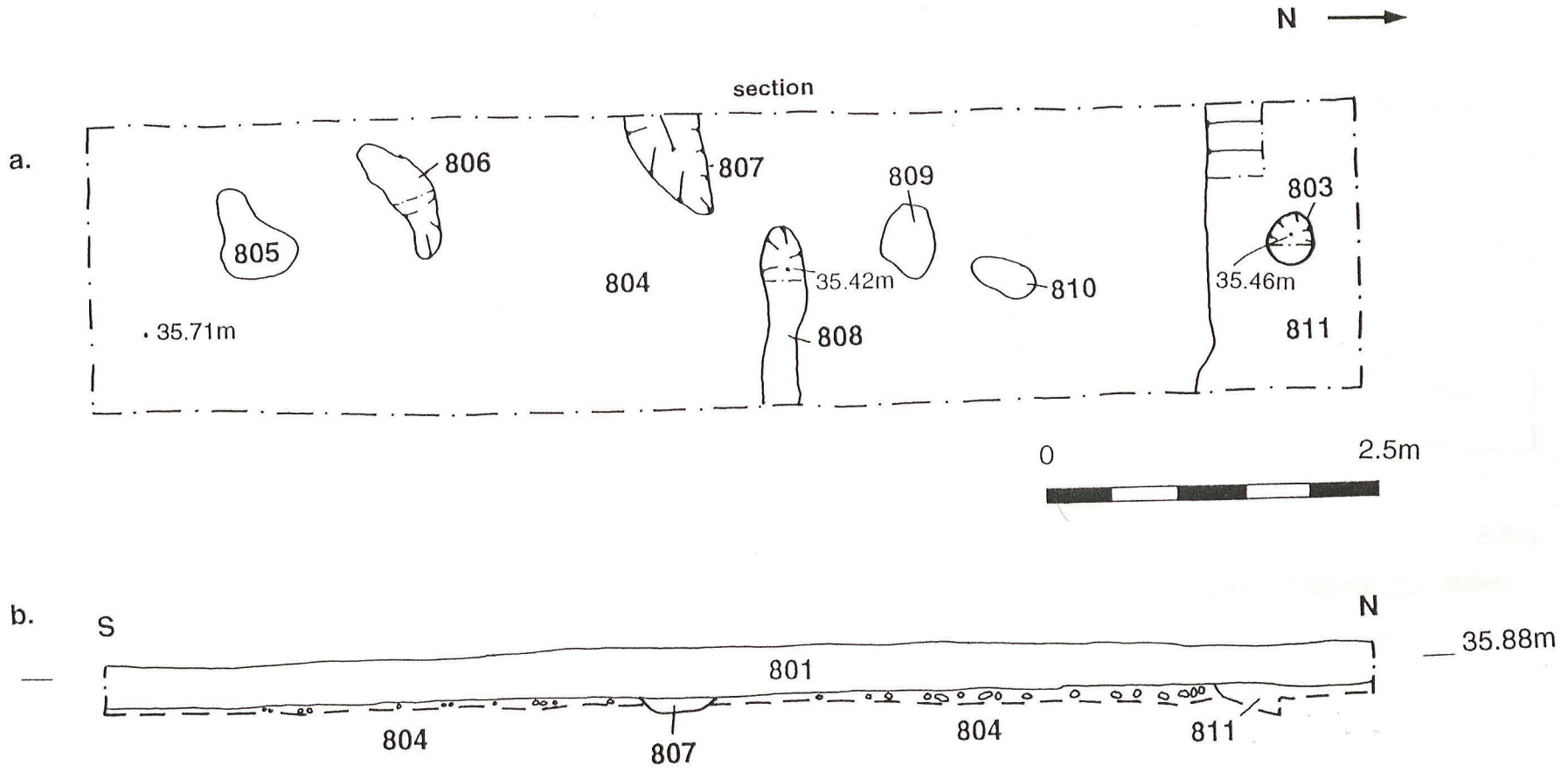


Fig. 12 a. Plan of Trench 8 b. East facing section, Trench 8, drawn by R. J. Armour-Chelu

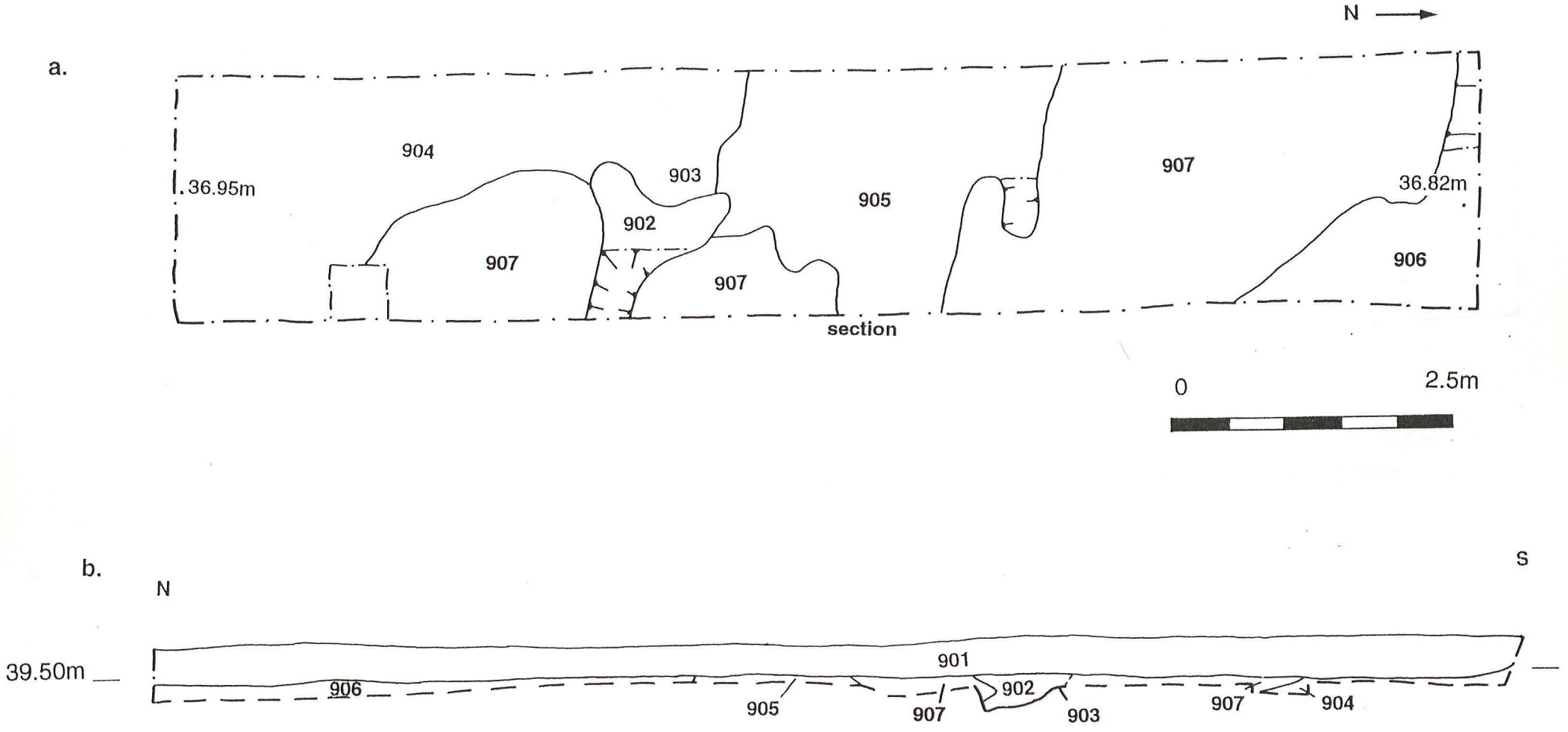


Fig. 13 a. Plan of Trench 9 b. West facing section, Trench 9, drawn by R. J. Armour-Chelu

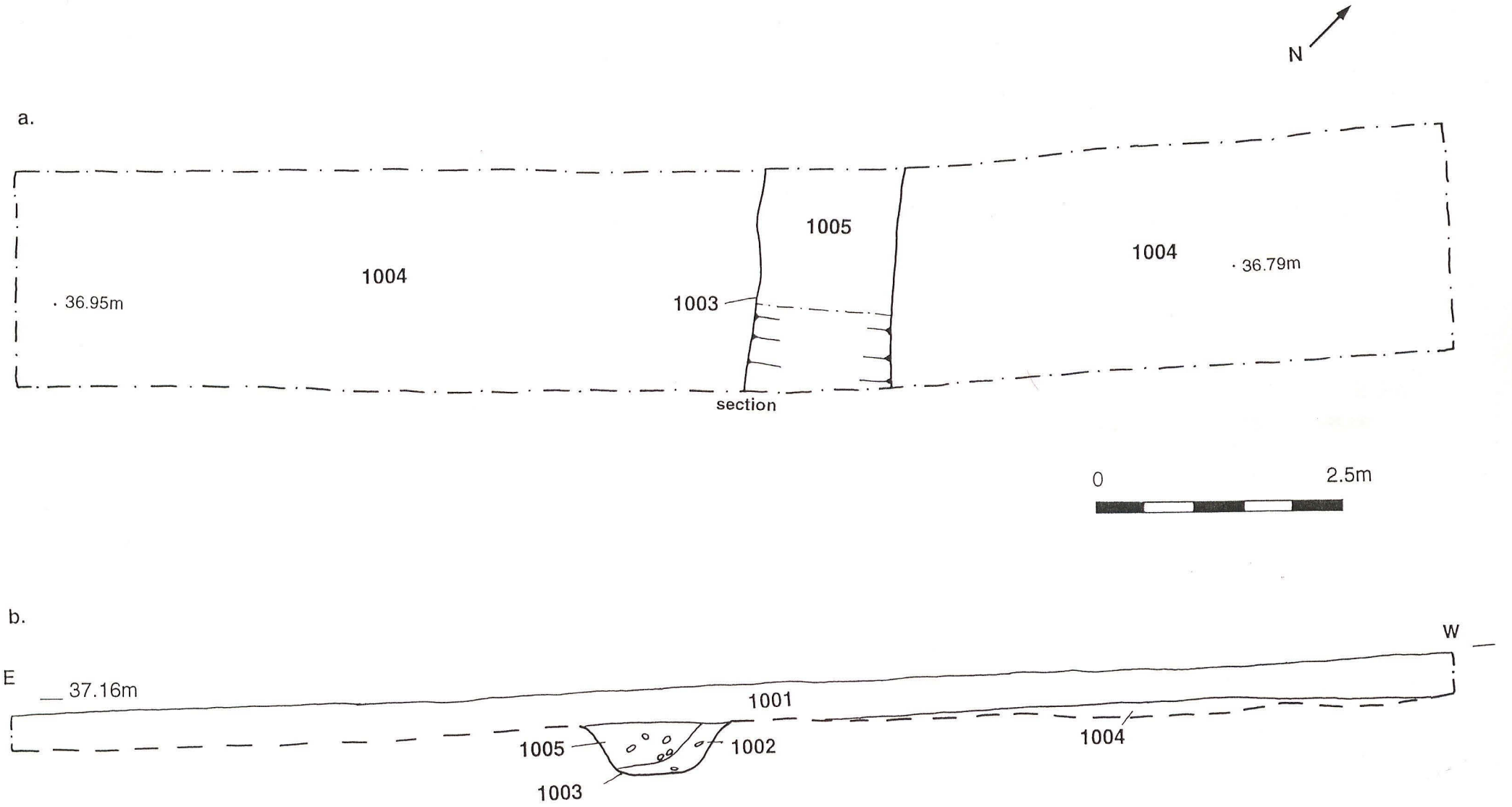


Fig. 14 a. Plan of Trench 10 b. North facing section, Trench 10, drawn by R. J. Armour-Chelu

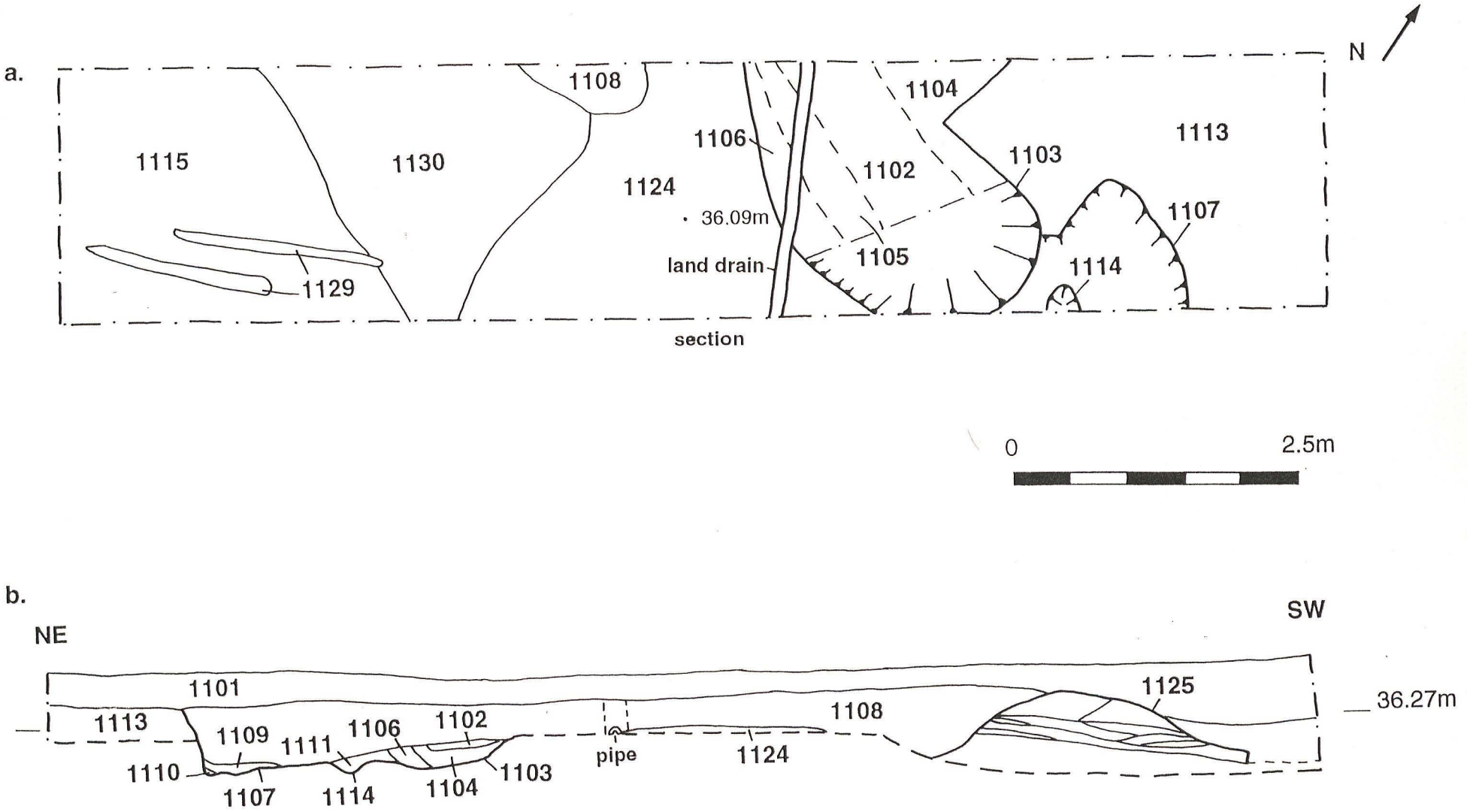


Fig. 15 a. Plan of Trench 11 b. North-west facing section, Trench 11 (see Fig. 16a for section across bank 1125), drawn by R. J. Armour-Chelu

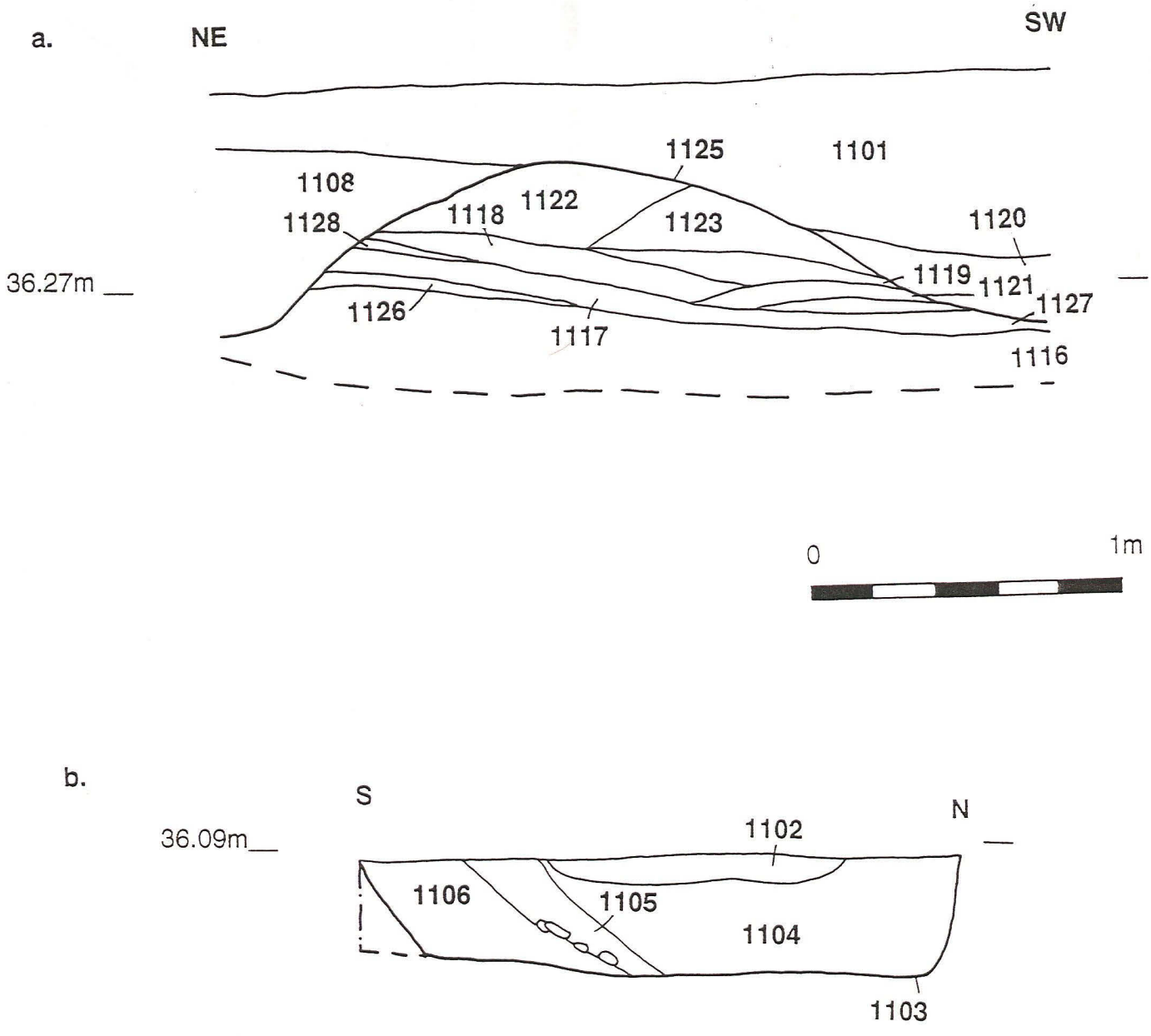


Fig. 16 a. North-west facing section through bank 1125
b. East facing section across ditch 1103, drawn by R. J. Armour-Chelu

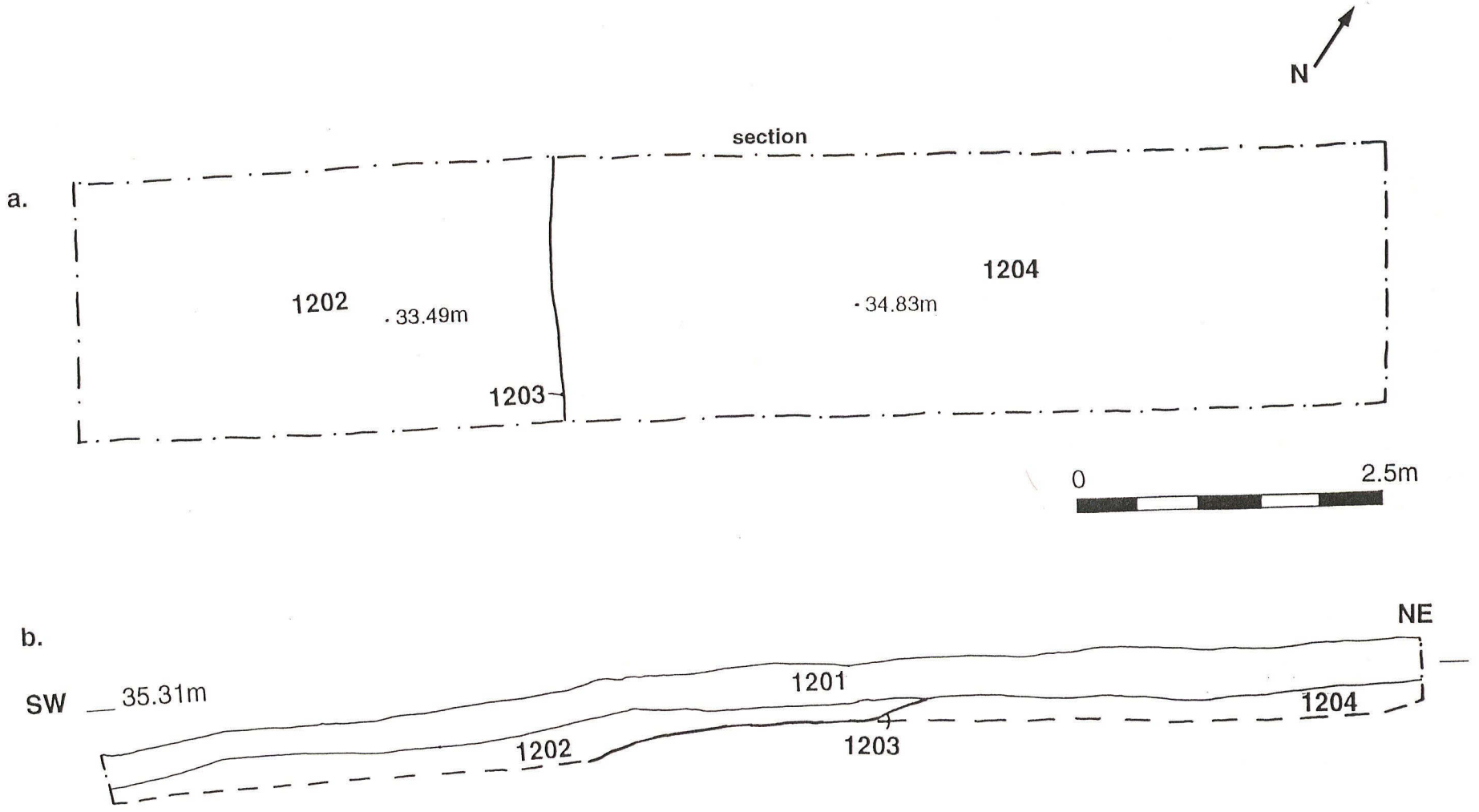


Fig. 17 a. Plan of Trench 12 b. South-east facing section, Trench 12, drawn by R. J. Armour-Chelu

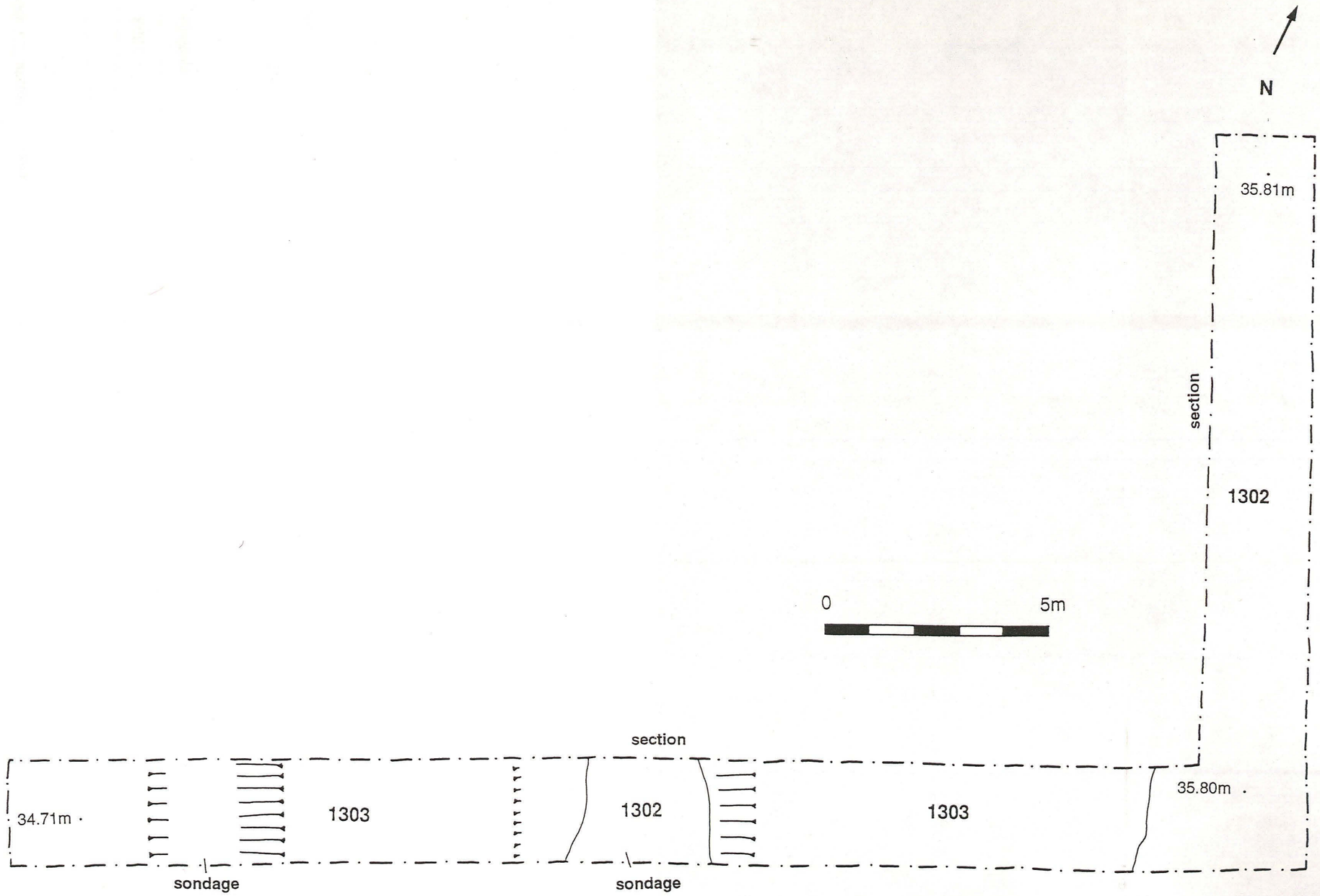


Fig. 18. Plan of Trench 13, drawn by R. J. Armour-Chelu

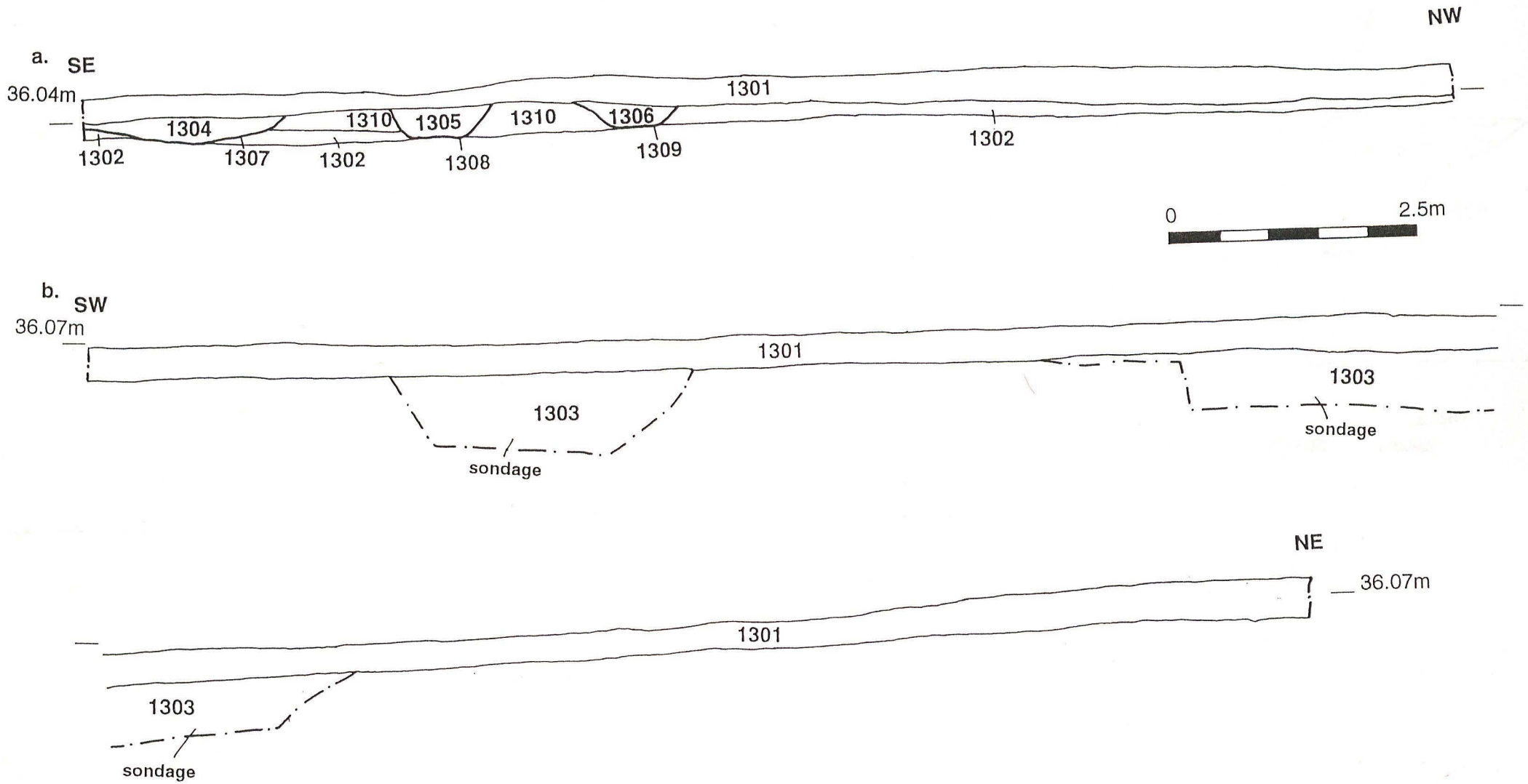


Fig. 19 a. North-east facing section, Trench 13, NE-SW arm b. South-east facing section, Trench 13, NW-SE arm drawn by R. J. Armour-Chelu

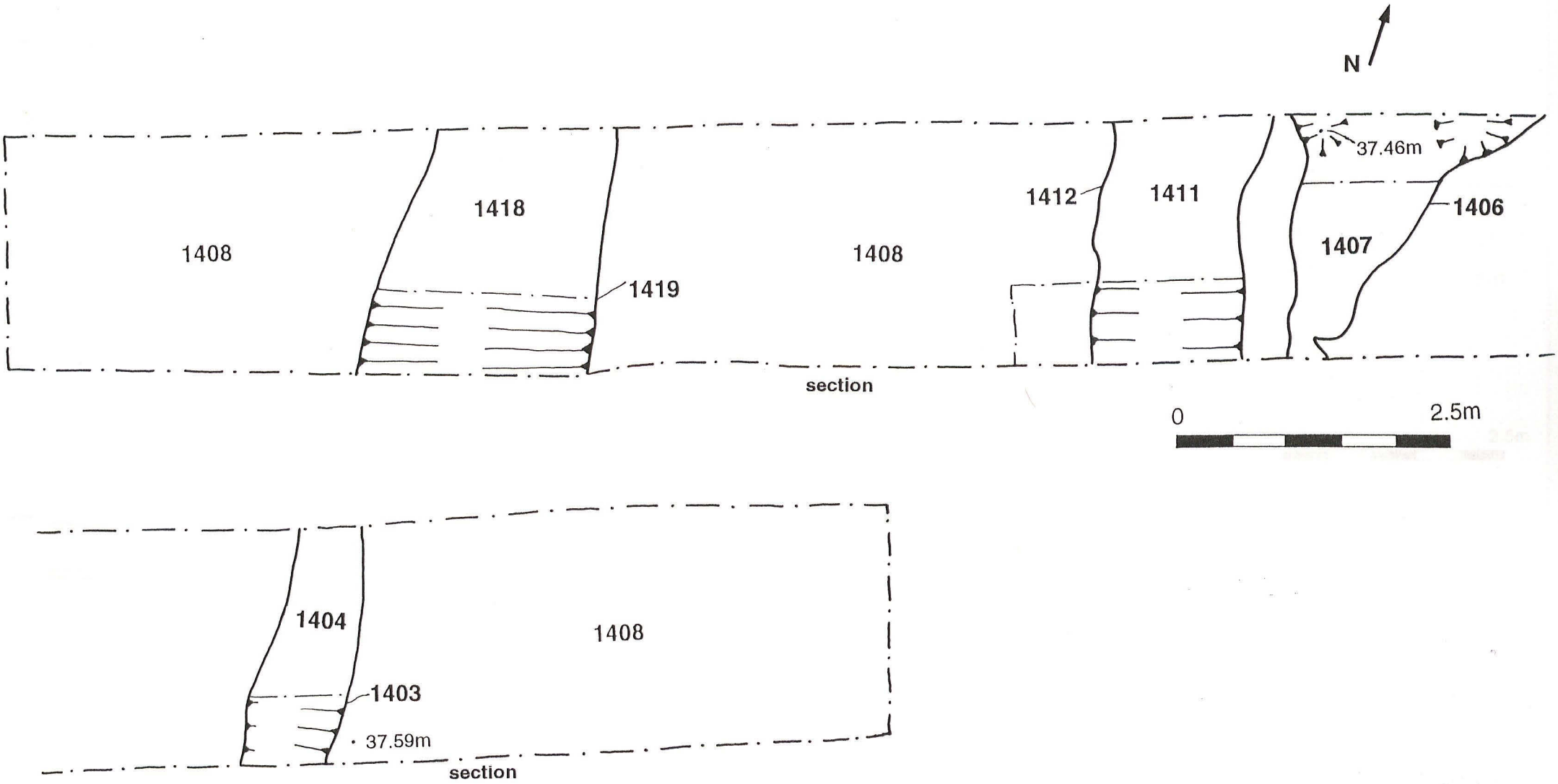


Fig. 20. Plan of Trench 14, drawn by R. J. Armour-Chelu

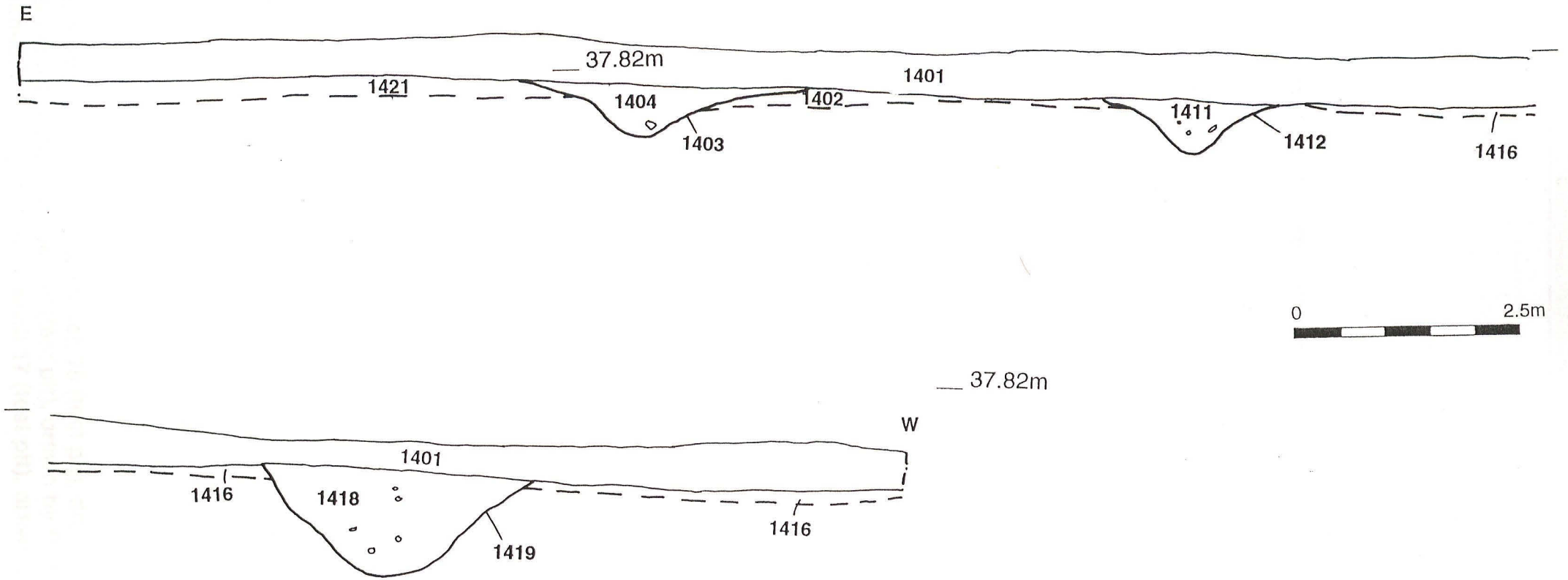


Fig. 21. North facing section, Trench 14, drawn by R. J. Armour-Chelu

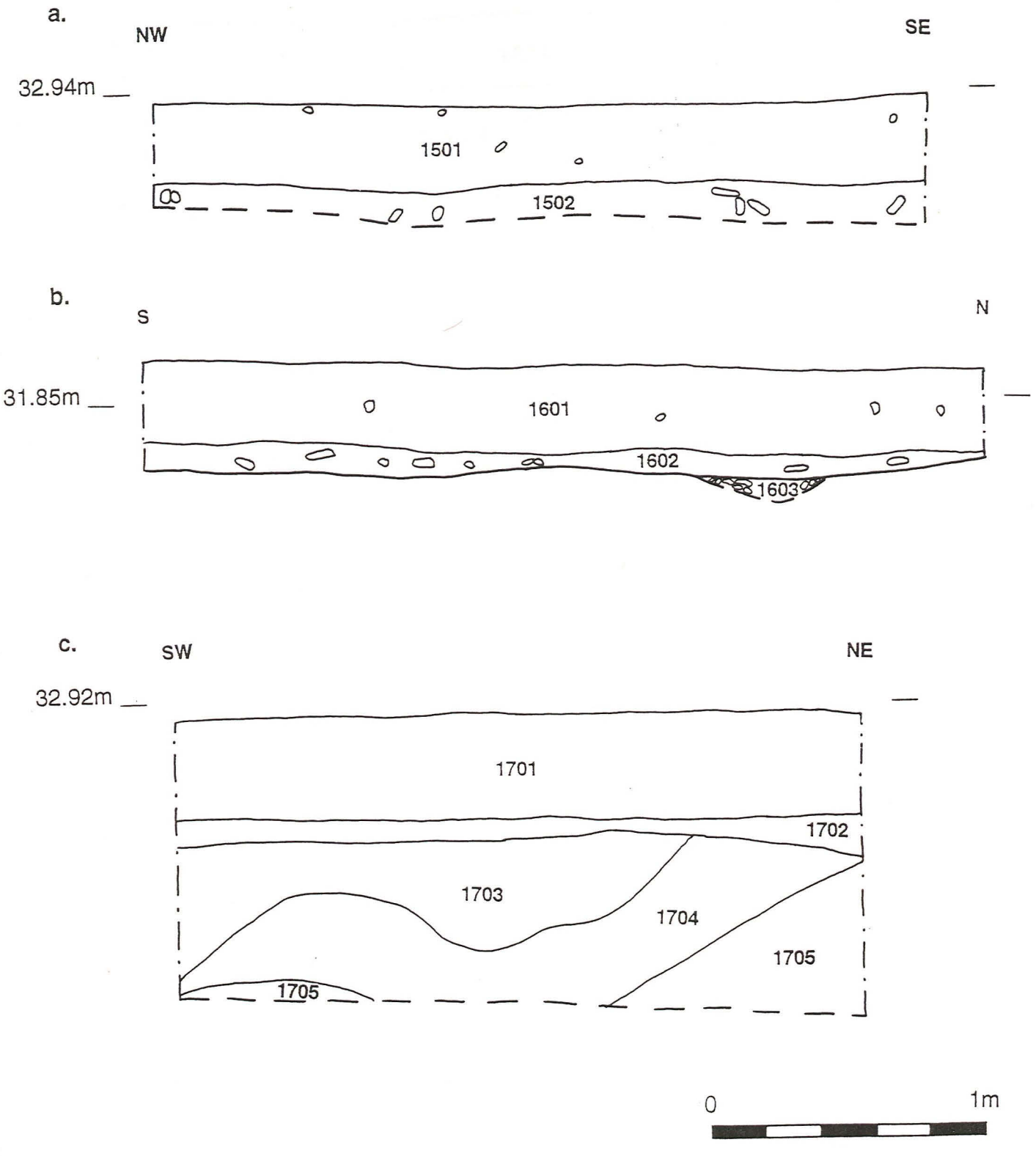


Fig. 22 a. South-west facing section, Trench 15 (test pit), drawn by R. J. Armour-Chelu
b. East facing section, Trench 16 (test pit), drawn by R. J. Armour-Chelu
c. South-east facing section, Trench 17 (test pit), drawn by R. J. Armour-Chelu

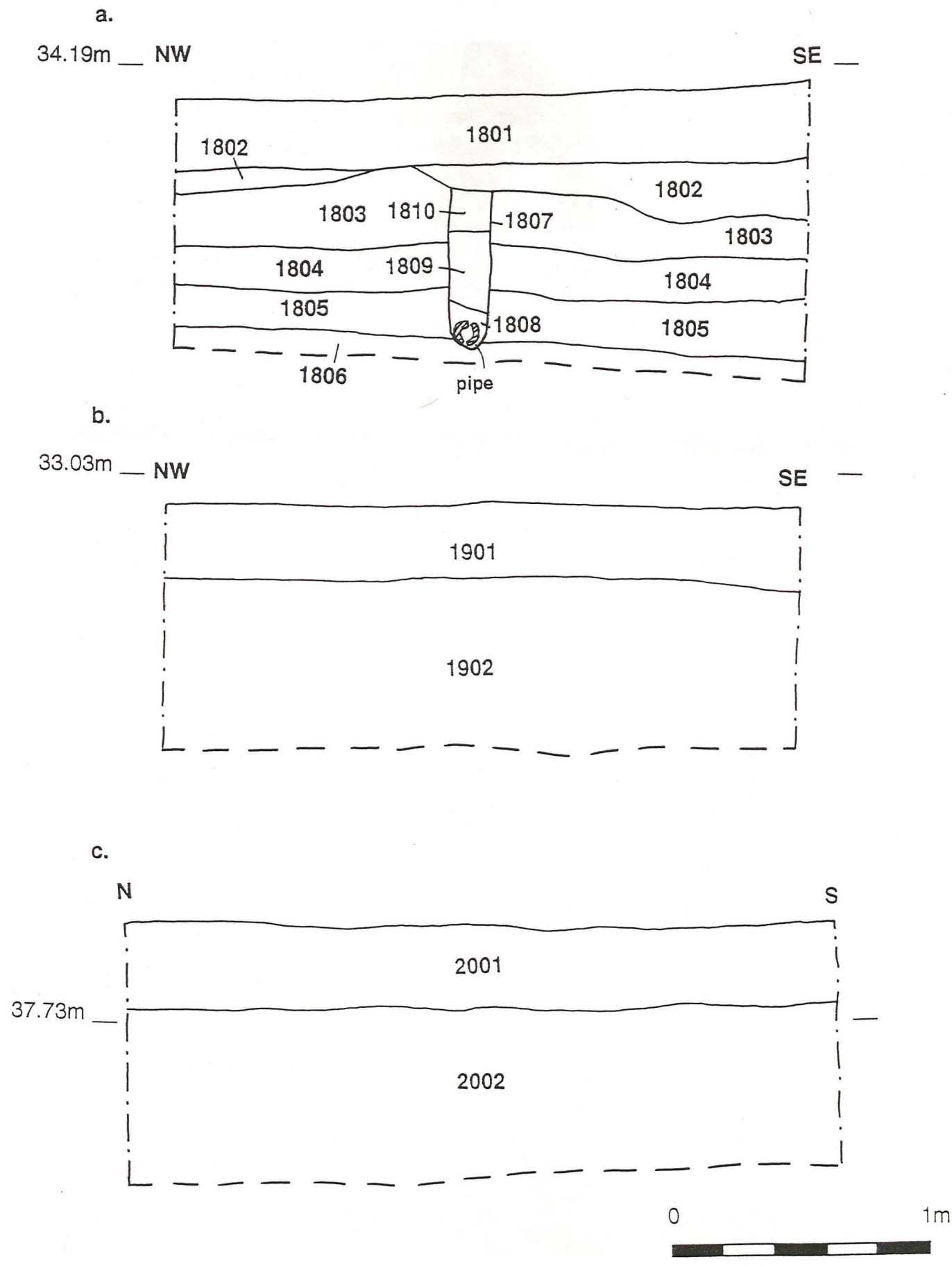
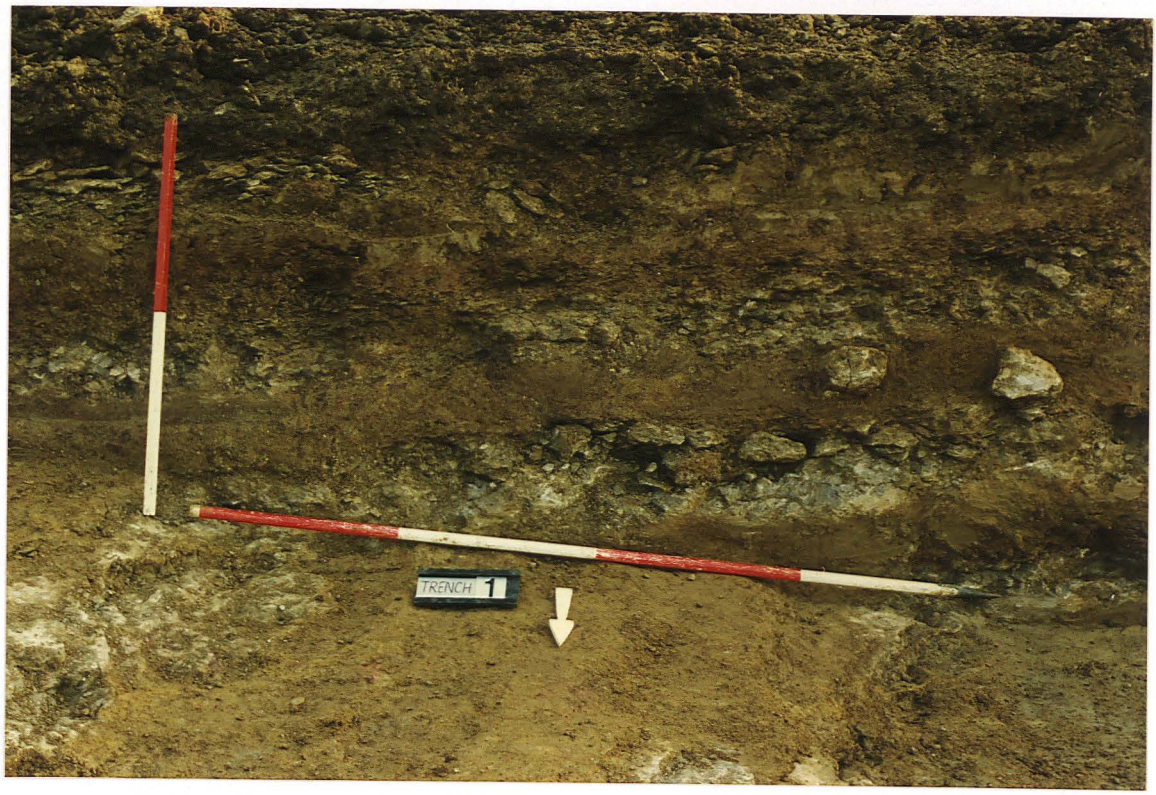


Fig. 23 a. South-west facing section, Trench 18 (test pit), drawn by R. J. Armour-Chelu
b. South-west facing section, Trench 19 (test pit), drawn by R. J. Armour-Chelu
c. West facing section, Trench 20 (test pit), drawn by R. J. Armour-Chelu

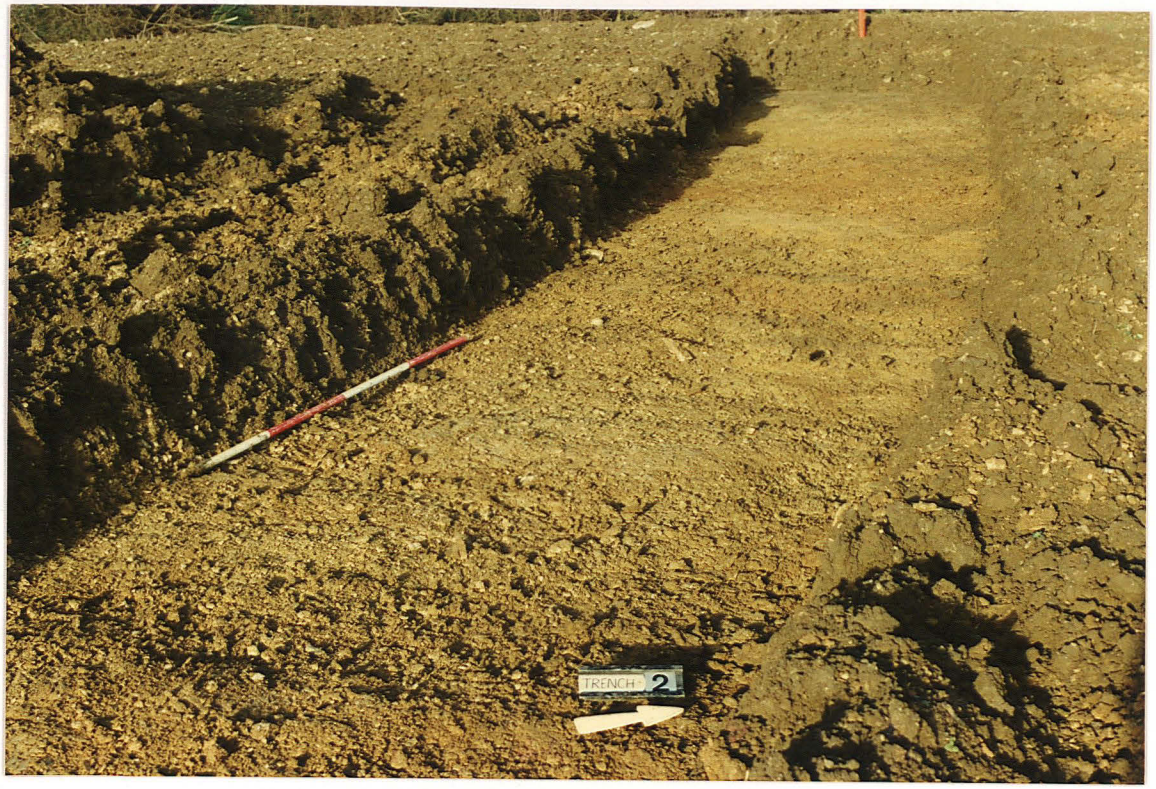
Pl. 1 Machine Trenching

Pl. 2 Trench 1 looking east, scales 2m



Pl. 3 Detail of geological section, Trench 1, looking south, scales 2m & 1m

Pl. 4 Trench 2, looking north-east, scales 2m



Pl. 5 Extension to Trench 2, looking north-west

Pl. 6 Trench 3, looking south-west, scales 2m

Pl. 7 Ditch 304, Trench 3, looking north-west, scales 2m & 0.25m

Pl. 8 Trench 4, looking north-east, ring ditch 405 visible in centre of trench, scales 2m

Pl. 9 Trench 5, looking north-east, ditch 504 visible in centre of trench, scales 2m & 1m

Pl. 10 Ditch 504, Trench 5, looking south-east, scales 1m & 0.25m

Pl. 11 Trench 6, looking south-east, pit complex 604 visible in foreground, scales 2m

Pl. 12 Pit complex 604, Trench 6, looking south, illustrating early stages of waterlogging, scale 2m

Pl. 13 Ditch terminus 619, Trench 6, looking north-west, scale 1m

Pl. 14 Curvilinear gully 617, Trench 6, looking north-east, scale 1m

Pl. 15 Ditch 615, Trench 6, looking east, scales 1m & 0.25m

Pl. 16 Ditch 613, Trench 6, looking east, ditch 615 to south, scale 2m

Pl. 17 Trench 7, looking south-east, scales 2m

Pl. 18 Ditch 706, Trench 7, looking south-west, scales 2m & 1m

Pl. 19 Trench 8, looking north-east, scales 2m & 1m

Pl. 20 Possible posthole 803, Trench 8, looking south-east, scale 0.25m

Pl. 21 Trench 9, looking north, scales 2m

Pl. 22 Ditch 1003, Trench 10, looking north-east, scale 1m

Pl. 23 Trench 11, looking south-west, scales 2m & 1m

Pl. 24 Bank form 1125, Trench 11, looking east, scales 2m & 0.25m

Pl. 25 Possible linear feature 1103, looking west, scales 1m & 0.25m

Pl. 26 Trench 12, looking west, deposit 1202 to west, scales 2m

Pl. 27 Trench 13, NW-SE arm, looking north-west, scales 2m & 1m

Pl. 28 Trench 13, NE-SW arm, looking south-west, scales 2m & 1m

Pl. 29 Furrow 1307 in section of Trench 13, looking west, scale 2m

Pl. 30 Trench 14, looking west, ditch 1403 in foreground, scales 2m

Pl. 31 Trench 14 after excavation, looking east, ditch 1419 in foreground, scales 2m

Pl. 32 Ditch 1403, Trench 14, looking south-east, scale 1m

Pl. 37 Section of Trench 19 (test pit), looking north-east, scales 2m & 1m

Pl. 38 Section of Trench 20 (test pit), looking east, scales 2m & 1m